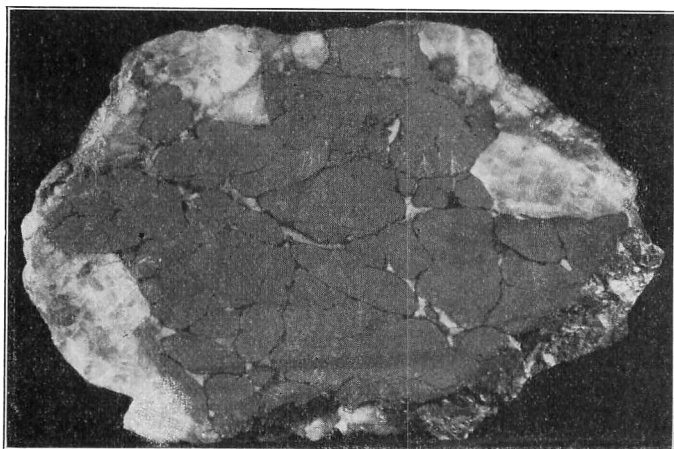


ART. XII.—*Temiskamite*, a new nickel arsenide from Ontario; by T. L. WALKER.

A FEW weeks ago the Royal Ontario Museum of Mineralogy received some specimens of niccolite from the Moose Horn Mine, Elk Lake, Ontario. On examining some of the material it was observed that much of the supposed niccolite was much paler in color than normal niccolite. The examinations thus initiated are detailed in the following paragraphs.

Paragenesis.—This mineral occurs in calcite veins carrying niccolite and smaller amounts of native bismuth and silver.

FIG. 1.



The new mineral appears to be one of the first to form. It is bordered and fringed by niccolite and bismuth, while the calcite appears to be later, as it fills in all the space between the branching masses of the other minerals.

Physical properties.—Color, silver-white with a touch of red, tarnishing very quickly to madder gray, and after prolonged exposure to tints resembling those of bornite. Hardness, 5.5; specific gravity, 7.901; fusibility, 2; luster, metallic; opaque; not magnetic; streak, brownish black.

Crystallography.—This mineral occurs in radiating fibrous masses suggesting rammelsbergite in structure. No crystallized material has yet been obtained. Traces of cleavage are seen upon examining polished surfaces with the microscope.

The radiating fibrous masses are built up into arborescent botryoidal forms, the outer surface sometimes covered with niccolite or bismuth or by a very thin layer of some undetermined black mineral resembling native arsenic (figure 1).

Chemical properties.—In strong nitric acid the mineral is attacked with violence accompanied by the evolution of red fumes and the separation of a very small amount of sulphur, which later oxidizes so that complete solution results. In sulphuric acid the decomposition is slower while in hydrochloric acid the mineral is only very slowly dissolved. Closed tube, a very slight deposit of crystallized arsenious oxide; open tube, abundant deposit of the same oxide, the oxidized residue greenish in color; plaster cast, coating for arsenic and in smaller degree bismuth; charcoal alone, the easily fusible mineral melts to a bright bead and oxidizes, covering the charcoal with arsenious acid, the bead after long treatment being magnetic.

Chemical analysis.—Several grams of this mineral apparently free from the associated minerals was selected, ground finely, dried at 110° C. and analyzed with the following result:

Nickel	49.07% ÷ 58.7 = .8359	} .8652
Cobalt	1.73% ÷ 59 = .0293	
Iron	trace	
Arsenic	46.34% ÷ 75 = .6179	} .6500
Sulphur	1.03% ÷ 32 = .0321	
Antimony	not determined	
Bismuth55%	
	<hr/>	
	98.72%	

$$.8652 \div 2163 = 4 \text{ ratio of Ni + Co,}$$

$$.6500 \div 2163 = 3.005 \text{ ratio of As + S.}$$

From the above analysis and calculation it seems very probable that this is a new mineral whose chemical composition may be expressed by the formula $(\text{Ni,Co})_4(\text{As,S})_3$ or, apart from very small proportions of isomorphous elements, Ni_4As_3 .

The small amount of bismuth, it will be observed, is not included in the above calculation, as it seems probable that it occurs in the form of small particles of native bismuth included in the mineral.

Although this mineral has not yet been found crystallized it seems reasonable to regard it as a new species, first, because of the exact ratio resulting from the analysis and calculation, and second, because we do not know any minerals which could be mixed so as to produce an aggregate of the above composition. Millerite contains as high a percentage of nickel but in it the

sulphur percentage is very high. In the classification this new mineral belongs to the dyscrasite group and to the basic division of the sulphides.*

The mine from which the material was obtained lies some distance to the west of Cobalt, but as the mineral associations are the same in both camps it seems probable that this new mineral should be found in the Cobalt mines if carefully looked for. To indicate the region from which the first specimens were obtained I suggest that this mineral be called Temiskamite from the district of Temiskaming in northern Ontario.

I wish to thank my assistant, Mr. H. V. Ellsworth, for assistance in connection with the chemical analyses.

Royal Ontario Museum of Mineralogy,
Toronto, Ontario, December, 1913.

* Since writing the above, my attention has been called to the new mineral Maucherite, recently described. This mineral has the chemical composition represented by Ni_3As_2 and is apparently closely related to Temiskamite.