

TETRADYMITE FROM THE HAILEY  
QUADRANGLE, IDAHO<sup>1</sup>EARL V. SHANNON, *U. S. National Museum*

A number of specimens collected by Mr. Stewart Campbell, Idaho State Inspector of Mines, and forwarded by him to Mr. C. P. Ross of the U. S. Geological Survey, for identification, were submitted to the writer for examination. Since a preliminary blow-pipe examination failed to determine the identity of the mineral it has been analyzed in the Museum's laboratory and found to be the bismuth sulfo-telluride, tetradymite. Since this is the first record of the occurrence of this rare mineral in the State, which is substantiated by definite analytical data made upon material of demonstrated purity, the following brief description is presented. The writer desires to express his thanks to Messrs. Campbell and Ross for the privilege of examining and describing the mineral and to Mr. M. N. Short, also of the U. S. Geological Survey, for making a careful mineragraphic examination of polished surfaces which showed the mineral to be unusually pure.

The locality is not given more definitely than "near the head of Trail Creek." This places the occurrence in the Hailey Quadrangle and in either Blaine or Custer Counties as the upper reaches of this Creek cross the county line.

The mineral consists of aggregates of bluish-gray grains in a gangue of quartz and carbonate, calcite and dolomite, which appears to form narrow veinlets cutting the limestone. Polished surfaces show the tetradymite to be arranged in somewhat dendritic aggregates of small grains in the gangue.

A sample separated with methylene iodide contained a considerable proportion of mixed grains and hence included some gangue. This included no other metallic mineral, however, than the tetradymite as shown by Mr. Short's metallographic studies. This was analyzed with the following results:

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ANALYSIS AND RATIOS OF TETRADYMITÉ

	Original	Recalculated		Ratios	
Quartz	1.90				
CaCO <sub>3</sub>	3.04				
MgCO <sub>3</sub>	1.63				
Pb	1.37	1.48	.007	.278	.97x2
Bi	51.98	56.35	.271		
Se	2.00	2.17	.027	.306	1.06x2
Te	32.86	35.62	.279		
S	4.04	4.38	.137	.137	.95x1
	<u>98.82</u>	<u>100.00</u>			

The ratios indicate with satisfactory exactness the formula Bi<sub>2</sub>Te<sub>2</sub>S or 2Bi<sub>2</sub>Te<sub>3</sub>. Bi<sub>2</sub>S<sub>3</sub>. The agreement would doubtless be still closer were it not for the selenium which may replace both tellurium and sulfur, being of intermediate atomic volume, although these elements may not replace each other.

The qualitative reactions of the mineral are very obscure and did not lead to its recognition. With sulfuric acid it gives only a faint and fugitive red color which does not suggest abundant tellurium. In the closed tube a faint upper ring of whitish oxide is obtained, succeeded downward by a ring of sulfur tinged reddish by selenium. With long heating a lower black ring of tellurium is obtained but this is faint. The mineral fuses to globules. Heated in the flame it volatilizes coloring the flame bluish-green with the production of white fumes which give odors of sulfur dioxide mixed with a faint odor of selenium which suggests arsenic.

BOOK REVIEWS

DIE MINERALIEN DER NIEDERRHEINISCHEN VULKANGEBIETE, MIT BESONDERER BERÜCKSICHTIGUNG IHRER BILDUNG UND UMBILDUNG. Reinhard Brauns. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 1922. Quarto, 225 pages, 3 portraits, 32 figures, 40 plates, each with 4 photomicrographs in photogravure.

This excellent treatise deals with the geological history as revealed by the microscopic characters of the minerals of the lower Rhenish volcanic province. The specimens examined were selections from the collections at the University of Bonn, which contain 4210 specimens of the Laacher See region, 1100 from Eifel, 3120 from the Siebengebirge and 1870 from Finkenbergr. Several thousand thin sections were studied of which 160 are reproduced in photogravure. About 300 minerals are described with reference to their physical and optical properties, occurrence, formation and alteration products. Many new chemical analyses are likewise given.

This work is undoubtedly one of the best examples of regional mineralogy and petrography that has appeared in recent years.

W. F. H.