PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

The Academy of Natural Sciences of Philadelphia, March 2, 1944

A meeting was held on the above date with Dr. W. Hersey Thomas presiding. Sixty-five members and visitors were present.

Dr. S. J. Shand, Professor of Geology at Columbia University addressed the Society on "Meteorites and the Interior of the Earth." Several lines of evidence indicate that the thickness of the earth's crust is somewhere in the vicinity of twenty miles. A number of slides were shown illustrating several well known meteorite falls and also charts illustrating seismic vibrations through the different layers of the earth.

Meeting of April 6, 1944.

Dr. W. Hersey Thomas presided with sixty-six members and visitors present. Harold Arndt announced the death of Dr. Benjamin L. Miller of Lehigh University and Harry Trudell read a memorial: "With the passing of Dr. Benjamin L. Miller the Philadelphia Mineralogical Society has lost a very warm friend. He could always be depended upon to give a good word and generous boost for our group which dates from 1913 when he was a Professor of Geology at the Wagner Free Institute of Science and since that time has given talks to our meetings on various occasions. We have ever found in him a fund of charming good fellowship; he seemed to radiate kindliness and inspiration wherever he went.

"His knowledge and interpretation of the Geology and Mineralogy of Pennsylvania has been very thorough and outstanding, and the loss to our State is most lamentable. His admirers are certainly legion, and the pleasantest memories will long survive in the hearts of those who knew Dr. Miller."

John Cochrane gave a talk on "Industrial Applications of the Lesser Known Elements." Nine of the rarer elements were dealt with, namely beryllium, titanium, zirconium, hafnium, columbium, tantalum, molybdenum, tungsten and rhenium. Most of these metals were exhibited in their pure state.

Louis Moyd who returned from Canada related some of his mining experiences in the Bancroft, Ontario, region and the Great Slave Lake district.

Meeting of May 4, 1944

Dr. W. Hersey Thomas presided, with 61 persons present.

Mr. Samuel G. Gordon addressed the society on "The Mineralogy of the Tin Mines of the Cerro de Llallagua, Bolivia." A monograph describing this unique deposit is now in preparation. In less than forty years, these mines have yielded about a seventh as much tin as was produced in thirty centuries of mining in the whole of Cornwall. The tin veins occur principally in a quartz porphyry, which is a striking example of metasomatism on a large scale. The felspars and biotite were successively altered to muscovite, and then to tourmaline and quartz, *prior* to the formation of the mineral veins. The larger veins were composite in character with an earlier generation of quartz, bismuthinite, cassiterite, wolframite, and apatite, followed by a central filling of pyrrhotite—the second stage of the mineralization. A third stage occurred in which the pyrrhotite was replaced along parting planes, by marcasite and pyrite, accompanied by deposition of franckeite, wurtzite, galena, siderite, sphalerite, and stannite. The sulfide deposition (II and III Stages) not only filled the central spaces of the larger veins and isolated pockets in the smaller veins, but extended to the margins of the fractures (beyond the tin mineralization) in all directions, and finally closed the channels below. Most of the minerals which replaced the pyrrhotite inherited a definite

crystallographic orientation from the latter, which remained after most of the pyrrhotite had been removed by supergene solutions. The removal of the pyrrhotite resulted in honeycomb (boxwork) residual masses of marcasite and pyrite with their inherited orientations. Goethite, variscite, wavellite, vivianite, paravauxite, childrenite, and greenockite were deposited on a large scale by supergene solutions. These abundant phosphates were derived from apatite, a common gangue mineral in the richer veins. Mineralogically the deposit is of interest because of the exceptionally large and perfectly developed crystals of bismuthinite, stannite, wurtzite, wavellite, and vivianite, as well as for the several minerals belonging to the vauxite group. Few of these extraordinary specimens were preserved. Thorium-free monazite was abundant, as was greenockite in minute cyclic-twinned crystals. The sixty minerals were illustrated by 80 crystal drawings, 30 photographs and a number of maps. The composition of the minerals described was expressed by a combination of chemical and structural formula, for example: greenockite, $\alpha[CdS]_2[C6mc]$.

JOHN FRANKENFIELD, *Secretary*

DISCREDITED SPECIES

Collophane, Nauruite, Monite, Ornithite, Pyroclasite (=Francolite or Dahllite)

CLIFFORD FRONDEL. *Am. Mineral.*, **28**, 215–232 (1943).

Metabrushite, Stoffertite (=Brushite)

CLIFFORD FRONDEL. *Am. Mineral.*, **28**, 215–232 (1943).

Bismutosphaerite, Hydrobismutite, Basobismutite, Normannite (=Bismutite)

CLIFFORD FRONDEL, *Am. Mineral.*, **28**, 521–535 (1943).

Agricolite (=Eulytite)

CLIFFORD FRONDEL, *Am. Mineral.*, **28**, 536–540 (1943).

Rhagite (=Atelestite)

CLIFFORD FRONDEL, *Am. Mineral.*, **28**, 536–540 (1943).

Zeugite (=Martinite)

CLIFFORD FRONDEL. *Am. Mineral.*, **28**, 215–232 (1943).

Pyrophosphorite (=Whitlockite)

CLIFFORD FRONDEL. *Am. Mineral.*, **28**, 215–232 (1943).

DISCUSSION: Frondel shows that martinite and whitlockite give identical x-ray powder patterns and differ only in that martinite contains CO_2 and H_2O. He suggests that the name martinite be dropped. However, martinite (Kloos, 1888) not only has priority over whitlockite (1941), but the original description and the later observations of Larsen (1921) and of Hendricks, Hill, Jacob and Jefferson (1931) characterized the mineral well enough to justify the retention of the name martinite, even if a single name is to be used.

It is suggested that both names be retained; whitlockite to be restricted to β-$Ca_3P_2O_8$, martinite to be used for the corresponding mineral containing CO_2 and H_2O. Martinite would then bear the same relation to whitlockite as francolite does to fluorapatite.

MICHAEL FLEISCHER