In calling attention to some of the important collections he cited those of Canfield, Hancock and Loesie and mentioned the service to science of Lazard Cahn as a distributor of unique Franklin minerals.

The talk was followed by a discussion of the various species, illustrated in many instances by original and unpublished drawings of the crystal forms.

Briefly discussing the origin of the deposits the speaker first took up the older theory of a strictly igneous origin, following which he spoke of Nason's theory of a purely metamorphic genesis and the third suggestion that the ore bodies were contact deposits. The speaker next advanced his own theory that they represented replacement deposits produced by the permeation of the Precambrian limestone by solutions similar to those which produced the surface deposits of Sterling Hill, but here depositing anhydrous minerals. At the close of Professor Palache's paper, his last statement was discussed by Professor Finlay.

On a motion by Mr. Ashby, a vote of thanks was tendered to the speaker for his highly interesting and valuable paper.

HERBERT P. WHITLOCK, *Recording Secretary*

THE PHILADELPHIA MINERALOGICAL SOCIETY

Academy of Natural Sciences, December 8, 1921

A stated meeting of the Philadelphia Mineralogical Society was held on the above date with the president, Mr. Trudell, in the chair. Nineteen members were present.

The following proposals for membership were made: Messrs. Frank J. Keeley, Arthur Low, and Walter Lapp.

Mr. Frederick Oldach presented a paper, illustrated with specimens, on "The Mineralogy of Brinton's Quarry," in which the origin and occurrences of the various minerals were discussed. Mr. Vaux called attention to a sepiolite locality where the Newton Square R.R. crosses Bryn Mawr Ave.

Messrs. Frankenfield and Boyle described the society's excursion on November 14 to Brinton's quarry, attended by Messrs. Boyle, Chalfont, Frankenfield, Jones, Knabe, Oldach, and Trudell. Clinochlore and colerainite (?) were found.

The secretary called attention to the exhibition case in the rear of the hall containing some new accessions, including a series of specimens from Sweden, Japan, Peru, Bolivia, and Chile, among them very fine tetrahedrites from Peru, remarkably translucent cassiterite crystals from Bolivia, and wavellite in crystals measuring 5×3 mm. from Bolivia.

SAMUEL G. GORDON, *Secretary*

NOTES AND NEWS

THE STATEMENT OF THEORETICAL COMPOSITIONS OF MINERALS.—In his *System of Mineralogy*, Dana stated the theoretical percentage compositions of minerals only to the first decimal place; but every now and then a mineral analyst, affecting greater precision, will state them to the second or even to the third place. The number of decimal places which can be correctly used is of course determined by that to which the atomic weights of the elements concerned is known, so the latter procedure implies that these values are established with great certainty. While this may be true of a few elements, as for instance bromine, chlorine, hydrogen, potassium, silver, and sodium,—modern precise work is con-

tinually leading to changes in long accepted values for other elements, as is illustrated by recent papers on aluminium[1] and on antimony.[2] The effects of these changes on the theoretical compositions of simple minerals are brought out in the following tabulations:

SILLIMANITE		
At. wts. of Al	27.10	26.96
Per cent. Al_2O_3	62.89	62.83
Per cent. SiO_2	37.11	37.17
	100.00	100.00

STIBNITE		
At. wts. of Sb	120.20	121.77
Per cent. Sb	71.42	71.68
Per cent. S	28.58	28.32
	100.00	100.00

It is plain that Dana's judgment was sound, for such changes in atomic weights affect even the first decimal place, so that the second, and even more the third, are quite meaningless. Only when the atomic weights of all the elements concerned in a mineral become known with greater finality than many of them are at present, will extension of the theoretical compositions beyond one decimal be justified.

E. T. W.

A real event in the mineralogical world has been the recent publication by the U. S. Geological Survey of *Bulletin 697*, "The microscopic determination of the nonopaque minerals," by Esper S. Larsen. We hope to have an extended review of this in an early number, but meanwhile advise every student of mineralogy to send for a copy to the Superintendent of Documents, Washington, D. C., the price being 30 cents (stamps not accepted).

We regret to note the death of Professor Albert Beutell, of the Technical School of Breslau, Germany, well known for his studies on the compositions of minerals, notably the cobalt-nickel arsenides and the zeolites.

On invitation of the Departments of Mineralogy and Geology of the University of Michigan, the next annual meeting of the Mineralogical Society of America will be held at Ann Arbor, Michigan, December 28 to 30, in conjunction with that of the Geological Society of America and other affiliated societies.

All petrographers will regret to hear of the death of Dr. Ernst Weinschenk, Professor of Petrography in the University of Munich. Dr. Weinschenk was the author of a number of books, three of which have been translated into English; Anleitung zum Gebrauch des Polarisationsmikroskops, Die Gesteinbildenden Mineralien, and the first volume of Grundzüge der Gesteinskunde.

ABSTRACTS—CRYSTALLOGRAPHY

A GROUPING OF THE THIRTY TWO CRYSTAL CLASSES. HERMANN TERTSCH, *Centr. Min. Geol.* **1916**, 145-154, 171-180.

The 32 crystal classes are grouped in 7 "grades" according to the symmetry of the crystal. The first two classes are made up of those crystals possessing only a polar or an alternating axis, respectively; the five other grades are derived by combining these with other symmetry operations. EDW. F. HOLDEN

[1] Richards and Krepelka, *J. Am. Chem. Soc.*, **42**, 2221-2232, Nov., 1920.

[2] Willard and McAlpine, *J. Am. Chem. Soc.*, **43**, 797-818, April, 1921.