A TETRAGONAL IRON PHOSPHIDE FROM THE RUFF'S MOUNTAIN METEORITE.[1]

EDGAR T. WHERRY

U. S. National Museum

In the course of his investigation of the composition of meteorites, Dr. George P. Merrill, Head Curator of Geology, U. S. National Museum, submitted a sample of the Ruff's Mountain iron to Dr. J. E. Whitfield for analysis. After dissolving the metallic constituents Dr. Whitfield obtained a bronze-colored residue, which qualitative analysis showed to be a phosphide of iron and nickel.[2] This was found to contain grains possessing crystal faces, and Dr. Merrill turned these over to the writer for crystallographic measurement. Two of them were found to show enough faces for this purpose, and proved to be tetragonal, agreeing very closely in angles with the artificial iron phosphides which have been measured by Mallard,[3] Hlawatsch,[4] and Spencer.[5]

TABLE 1—Measured and calculated angles of iron phosphide.

TETRAGONAL $c=0.346\pm0.001$

No.	Letter	Symbol	Crystals	Measurements	Angles measured		Angles calculated	
					ψ	ρ	ψ	ρ
1	a′	010	2	5	0° 00′—	90° 00′—	0° 00′	90° 00′
2	m	110	2	5	45° 00′±15′	90° 00′—	45° 00′	90° 00′
3	o	111	2	5	45° 00′±60′	26° 05′±15′	45° 00′	26° 05′

The crystals average about one-half millimeter in diameter and are irregularly distorted, some of the faces being cavernous; the system of crystallization is not evident on superficial examination. The faces yield, however, fairly good reflections, the positions of which can be located in many cases within 5-10′, unquestionable tetragonal symmetry being exhibited by the angular relations. The forms observed are: a (100), m (110), and o (111), and in addition there are rounded or poorly developed faces of other pyramids and prisms. All of the forms are incomplete, but there is hardly sufficient regularity in the suppression of faces to justify the assignment of the crystals to any particular hemihedral class.

In Table 1 are given the angles observed,[6] in comparison with

[1] Published by permission of the Secretary of the Smithsonian Institution.

[2] A quantitative analysis is to be made and published, in connection with the complete description of this meteorite, in another place, (by Dr. Merrill).

[3] *Compt. rend.* **92**, 933, 1881; *Bull. soc. franc. min.* **4**, 230, 1881.

[4] *Min. petr. Mitt.* **22**, 497, 1903.

[5] *Mineralog. Mag.* **17**, 340, 1915.

[6] The Museum equipment not including a Goldschmidt two-circle goniometer, the measurements were made on the one in the Geophysical Laboratory of the Carnegie Institution, and thanks are herewith extended to Messrs. Wright and Merwin of that laboratory for their kindness in placing this instrument at the writer's disposal.

those calculated from the measurements of the authors above cited.

In addition, crystal 1 shows one face each of a prism close to 120, a pyramid not far from 122, and two other pyramids which yield the complicated symbols 357 and 562. Crystal 2 shows a face vicinal to the base, and one of a pyramid 152. Most of these faces may, however, be mere accidental surfaces where crystal growth was interrupted by other crystals, and until better evidence is obtained may be classed as doubtful.

A tetragonal iron phosphide has repeatedly been reported to occur in meteorites, and has in fact been assigned the name rhabdite (Rose, 1864). No crystallographic measurements have heretofore been obtained, however, adequate to prove that this supposed species represents anything more than distorted crystals of the well known isometric phosphide schreibersite. The present measurements demonstrate that a definite tetragonal mineral does exist in this meteorite.

NOTES AND NEWS

NOTES ON AN OCCURRENCE OF QUARTZ CRYSTALS. EDWARD F. HOLDEN. York, Pennsylvania.

Some very interesting quartz crystals are found on the farm owned by Mr. Kimmel, located two miles north of New Kingston, Cumberland Co., Pa. I recently had the good fortune to visit this locality in the company of two teachers from the York High School.

The crystals occur loose in the ground; the bedrock is a limestone, as in the case of the Herkimer, N. Y., crystals.

The most unusual crystals are those in which the form *m* is lacking, which are composed of the forms *r* and *z* only. These crystals occur in groups, each crystal being attached to another at the end of its vertical axis.

There are also crystals rivalling those of Herkimer in clearness, and crystals tinged with yellow or purple, besides smoky hued crystals. In addition opaque crystals are found, red or white in color; the opaqueness being due to internal fractures.

All of these crystals are doubly terminated and about ½ to 1 inch long.

NOTES ON THE SPHEROSIDERITE FROM SPOKANE, WASHINGTON. L. P. GRATACAP. American Museum of Natural History.—Specimens of the spherosiderite recently found in Spokane (see *Am. Min.* **2**, (3) 30, March, 1917). have been presented to the American Museum by Mr. Henry Fair, of that place. The two large specimens which have been placed on exhibition show dark greenish black spherules in cavities in the basic igneous rock. In one the surface is slightly silky-chatoyant, and in the