

A NEWLY FOUND METEORIC IRON FROM PERRYVILLE, PERRY COUNTY, MISSOURI.¹

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The iron described below was found by Mr. John Monaghan in August, 1906, on the farm of a Mr. Patrick Monaghan, about 1 mile west of the town of Perryville. It lay in an open field and was about three-fourths buried in the soil. Nothing is known regarding its fall. As secured by the United States National Museum, the mass weighed 17.386 kilograms, including a 75-gram fragment that had been cut from it for testing. Allowing for waste in cutting, 17.5 kilograms would probably represent its original weight as nearly as obtainable. How much had been lost by oxidation from the exterior surface it is, of course, impossible to state.

The general appearance of the mass is well shown in figures 1 and 2, plate 44. The surface was almost completely coated with oxidation products, and scales of oxide could be readily removed by means of any hard, sharp instrument. Nevertheless, indications of surface fusion in its flight, in the shape of obscure, shallow pittings, were still evident, and are shown in the plate. In figure 2 two considerable pits, formed through the oxidation of troilite nodules, are in evidence. An etched surface of the iron brings out some rather unusual features. In structure the iron is an octahedrite, but the crystallization is so fine as to be almost microscopic. (See pl. 45.) The metallic plates aligned parallel with the octahedral face are rarely, if ever, a millimeter in thickness, and are lacking in uniformity throughout their lengths. They are also wavy, forming an irregular network of lines with a general octahedral trend as shown in figure 2 of plate 45. Parallel with these plates lie the extremely thin, almost microscopic plates of schreibersite, recognizable by the naked eye only by their bright metallic luster, and not at all differentiated in the photographic reproduction. The structure, on the whole, and particularly with reference to the uneven crystallization, as shown on an etched surface, more nearly resembles the iron of Ballinoo, West Australia,² than

¹ Catalogue No. 423, U. S. National Museum.

² Described by H. A. Ward, *Amer. Journ. Sci.*, vol. 5, 1898, p. 136, and classified as a "Finest octahedrite, Off."

any other available for comparison in the national collections. According to the figures given by Brezina and Cohen,¹ however, it would seem to more closely resemble the Cowra iron. The plessite areas are very poorly developed, and in places wholly indistinguishable or quite lacking. Troilite occurs in the usual rounded nodules, the remainders of two larger forms showing at the top and bottom of figure 1, plate 45, and a smaller one at the immediate left of figure 2. The metal, it is well to note, is very tough and hard and can not be cut at all by the ordinary hacksaw used by metallurgists.

In connection with investigations on the minor constituents of meteorites carried on under a grant from the National Academy of Sciences it was possible to make a very thorough analysis of the iron, the analytical work being done under the supervision of Dr. J. E. Whitfield. These results are given in column 1 below. In column 2 is given the average of two analyses of the Ballinoo iron by Sjöström² and Mariner and Hoskins.³

	(1)	(2)
	Per cent.	Per cent.
Iron (Fe).....	89.015	89.625
Nickel (Ni).....	9.660	9.86
Cobalt (Co).....	.545	.67
Copper.....	.025	.03
Manganese.....	None.
Phosphorus.....	.365	.49
Sulphur.....	.002	.03
Silicon.....	.003	Trace.
Carbon.....	.015	.02
Ferric oxide.....	.370
Iridium.....	Trace.
Palladium.....	Trace.
Platinum.....	Trace.
Ruthenium.....	Trace.
	100.00	100.725

Specific gravity 7.61. Determined in picnometer flask at 22.4° C. and on chips showing no visible troilite.

The amounts of the rarer elements found in different samples of the iron were quite variable though always small. In one portion of 25 grams was found 0.004 gram of platinum, and in another of 100 grams but 0.002 gram. The precipitates of ammonium platinum chloride were in all cases colored faintly orange, indicating the presence of palladium, but in amounts too small for determination. In another 100-gram portion of the iron was found 0.014 gram of ruthenium and 0.028 gram of iridium, while yet another portion of equal weight yielded 0.0009 gram of ruthenium and 0.0011 gram of

¹ Die Struktur u. Zusammensetzung der Meteoreisen, pl. 29.

² Sitz. der k. Preus. Akad. Wiss., Berlin, Jan.-June, 1908, p. 21.

³ Amer. Journ. Sci., vol. 5, 1898, p. 137.



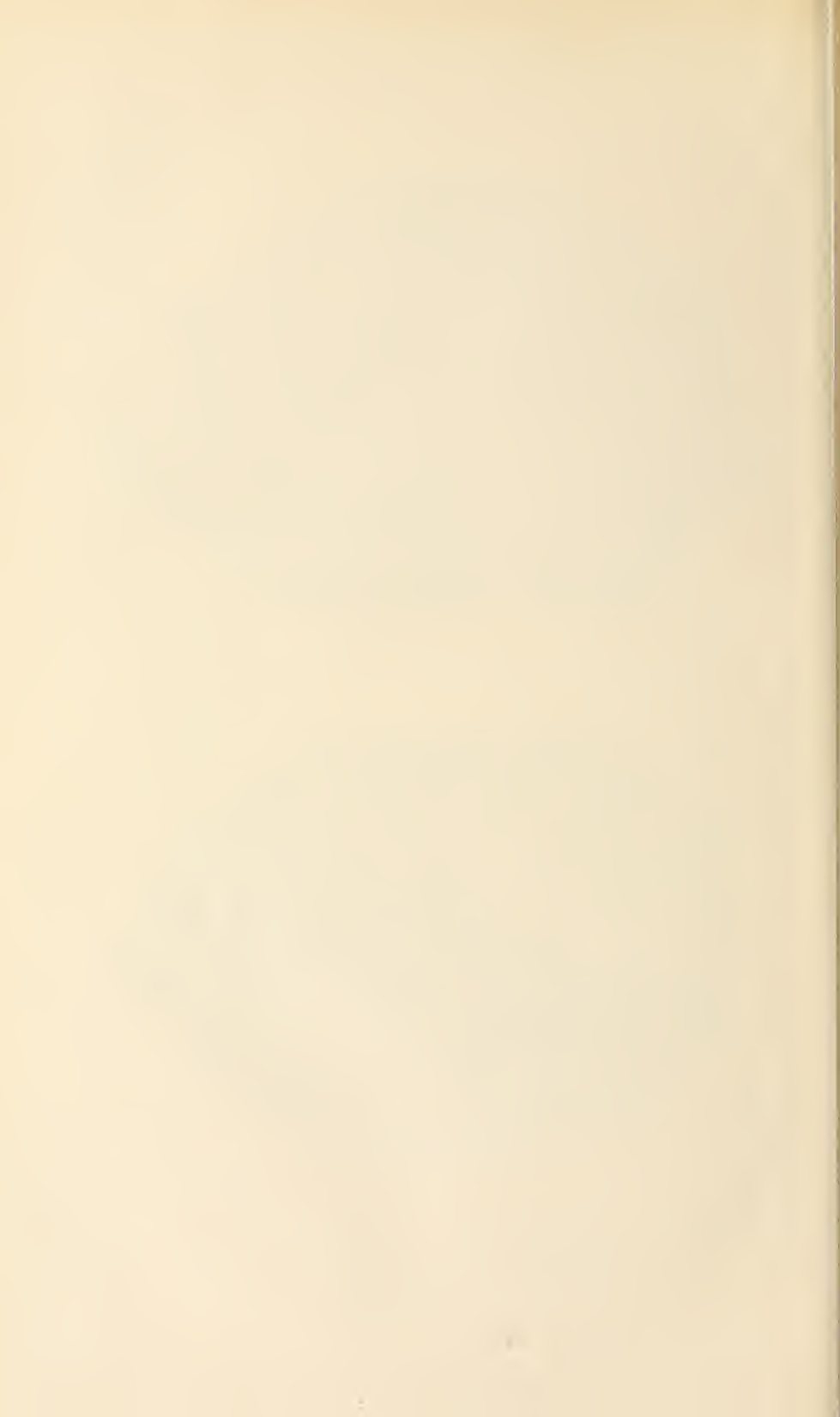
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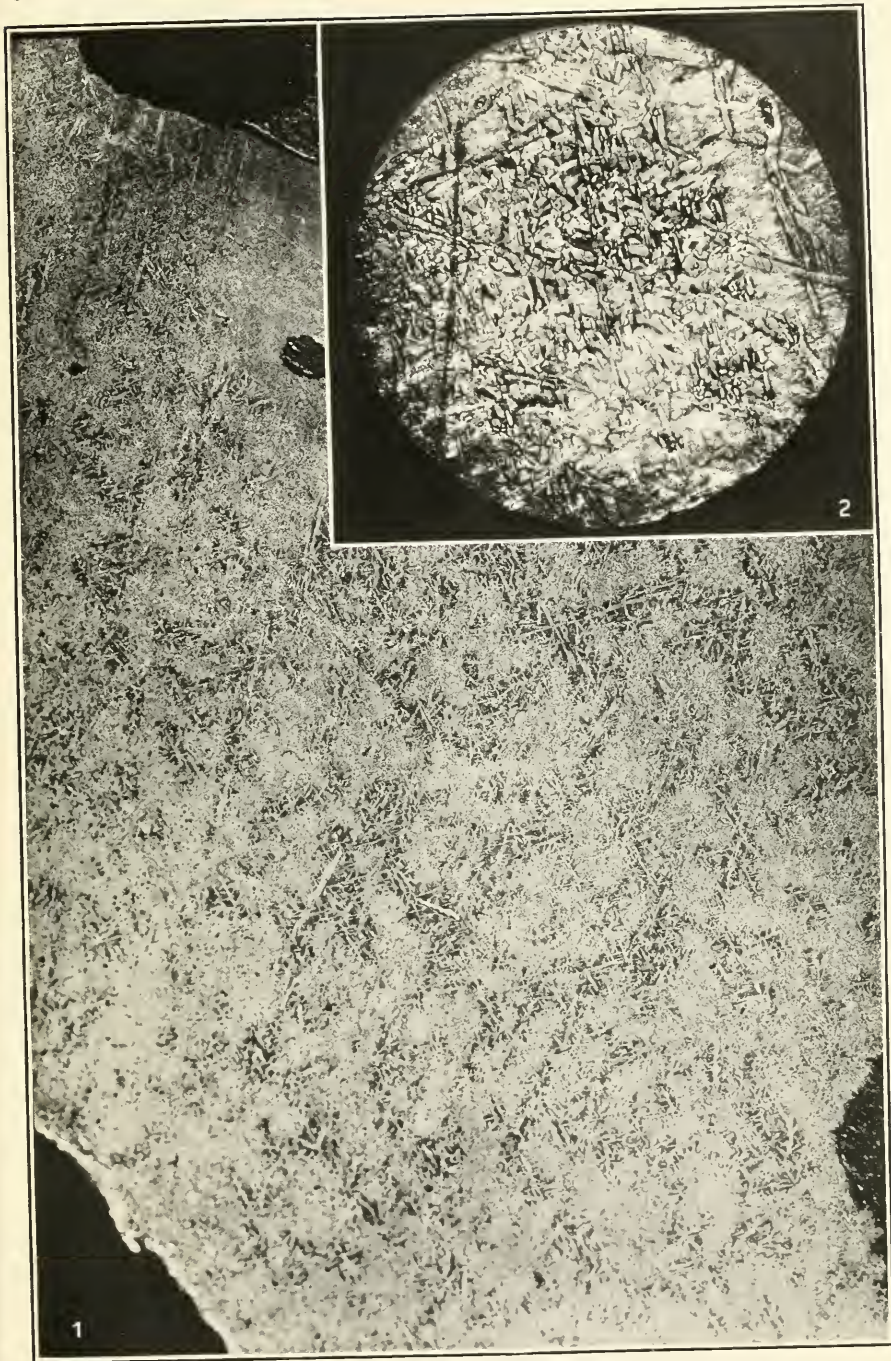


2

THE PERRYVILLE, MISSOURI, METEORIC IRON.

Fig. 1.—The specimen as received at the U. S. National Museum. About one-half natural size. Fig. 2.—The same in reversed position.





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1. Etched surface enlarged about 2 diameters. 2. Magnified surface photographed under the microscope and by reflected light.

