THE MARIA ELENA METEORITE

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HISTORY

The Maria Elena meteorite was presented to the United States National Museum, Washington, D. C., late in 1935, through the agency of Mr. Mark C. Bandy. The donors were Mr. Coope, Manager of the Oficina Maria Elena, Antofagasta, Chile, and Sr. Fernando Araya Valdes of the same company. Very little is known about the earlier history of this iron meteorite. It was not a witnessed fall but was found in the Chilean desert. It is reported that it was originally thought to be a mass of silver. Before its presentation to the Museum, a hole about one half inch in diameter had been drilled through the center along the shorter axis apparently for the purpose of sampling the mass.

It is catalogued at the United States National Museum as No. 1221. Three slices have been cut from the mass and two of these have been distributed to other collections as follows:

Mr. Coope, Manager, Oficina Maria Elena, Chile.....End piece,
H. H. Nininger, Denver, Colorado.....235 grams.

DESCRIPTION

The weight of the mass, as received by the Museum, was 15.5 kilograms. The maximum dimensions were 18.5 cm. by 23.5 cm. by 11.5 cm. It was an irregular ellipsoid with one large, rather flat face, the opposite face was well arched. The latter face apparently had been exposed to the weather and is covered with the fine pitting which is characteristic of the effect of sand blasting under desert conditions. Assuming that both faces of this meteorite were similar at the time of its fall, the part exposed to the moving sand grains has lost practically all of the features which are conspicuous on the protected face (Fig. 1). The protected flat face exhibits the original coarse pitting characteristic of meteorites. At one end of the buried face there is an unusually large and deep cavity, the dimensions of which are 7.6 cm. by 8.6 cm. by 4.5 cm. in depth. The iron is covered by a thin oxidized crust which is a little thicker in the bottom of the large cavity.

A slice, ground to a fine matte surface and etched with dilute nitric acid in alcohol, shows that the meteorite is a fine octahedrite (Fig. 2). Measurements made at random on the face, show the dimensions across

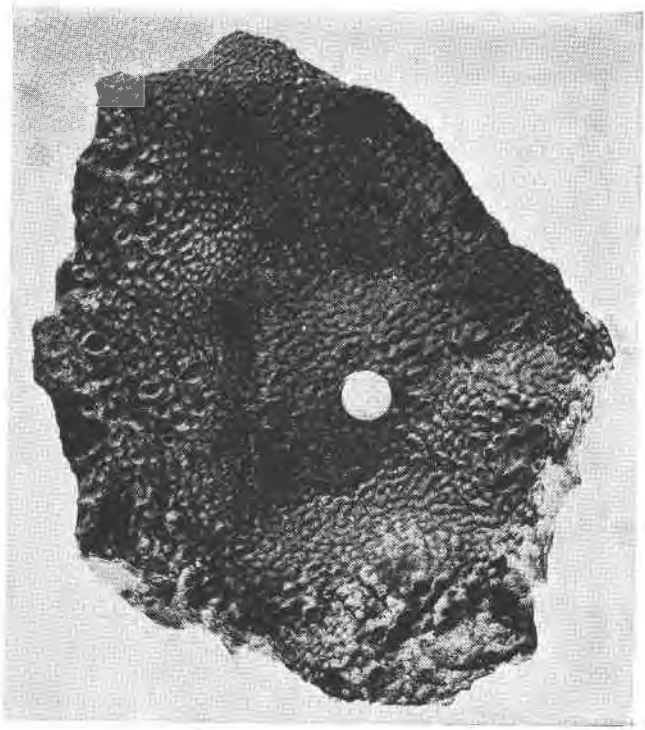

FIG. 1. Upper or exposed surface of the Maria Elena meteorite, showing the fine pitting which is the result of the sand blasting which has removed practically all the original meteoric structure. The hole, drilled for sampling purposes, is very noticeable. Two-fifths natural size.

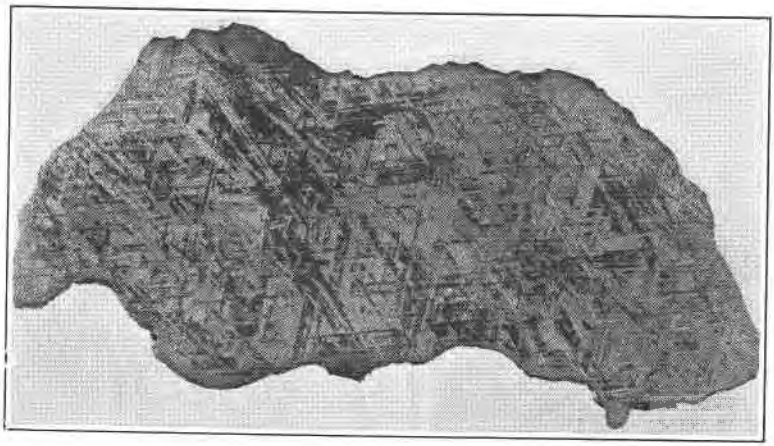

FIG. 2. Etched slice of the Maria Elena meteorite. One-half natural size.

the kamacite grains to range from 0.1 to 0.4 mm. The majority are about 0.2 mm. It is, for the most part, kamacite with moderately abundant, very thin lamellae of taenite. Plessite areas are small, inconspicuous or wanting. Troilite is sparingly present as a few small nodules, the diameters of which are less than 3 mm., and as a few thin, short blades. Schreibersite was not recognized in any of the etched surfaces.

Analysis

A piece, which weighed about 17 grams, was cut from the meteorite and the oxidized coating was ground off. One minute speck, which may have been troilite or schreibersite, was visible on the bright metallic surface but could not be identified. The specific gravity of this fragment was 7.74. It was dissolved in dilute nitric acid and aliquot portions were analyzed for the various constituents. Iron was determined both volumetrically and gravimetrically on separate samples and the nickel was determined in each of these portions. The iron in each sample was precipitated four times to remove the occluded nickel. The results of both determinations as well as the determinations of the other constituents are shown in Table 1.

Table 1. Chemical Analysis of the Maria Elena Meteorite*

Fe	94.93% (Gravimetric)	94.52% (Volumetric)
Ni	4.76	4.88
Co	0.131	(0.131)
Cu	0.010	(0.010)
P	0.052	(0.052)
S	0.029	(0.029)
C	0.007	(0.007)
Pt, etc.	Nil	(Nil)
Total	99.92%	99.63%

* Analyst: V. B. Meen.

The analysis shows that this meteorite has a low content of nickel for a fine octahedrite. This low nickel content may be referable to the not very abundant taenite which was shown on the etched surface. The low phosphorus content indicates that there is a very small amount of schreibersite present, although none was recognized in the examination with the binoculars.

Acknowledgments

The writer is indebted to the Assistant Secretary of the United States National Museum for the permission to use the laboratory and other

facilities of the Museum for these investigations. The assistance of Dr. W. F. Foshag and Mr. E. P. Henderson of the United States National Museum, and Dr. J. P. Marble was greatly appreciated.

NOTES AND NEWS

OCCURRENCE OF WAVELLITE, GILES COUNTY, VIRGINIA

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The specimens of wavellite described below were collected approximately one mile northeast of Kern post office, along Big Stony creek, Giles County, Virginia, during July 1938. The mineral occurs in red sandstone of Clinton age as incrustations on joint planes. The sandstone

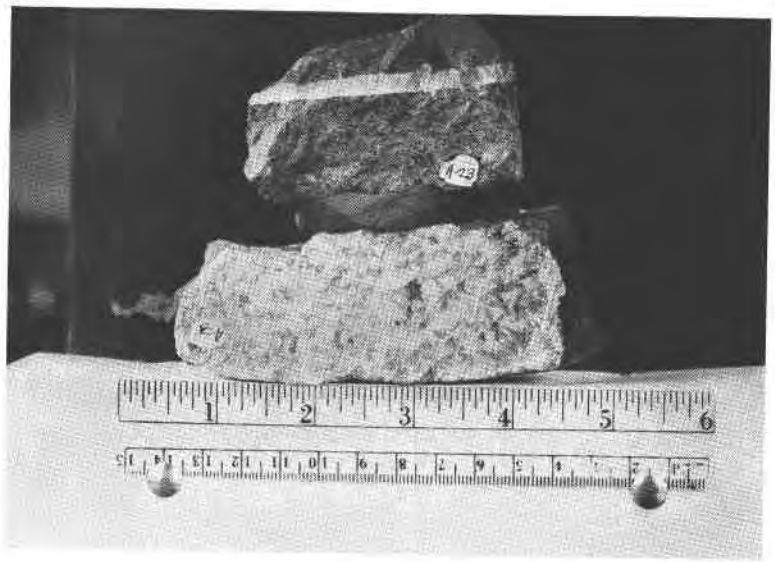

FIG. 1. Wavellite, upper photograph showing the thin incrustation in a joint plane, and lower the radiated mineral. Photo by Jos. K. Roberts.

is colored red to brownish red by iron oxides, and its Niagaran age is indicated by its fossil content. Wavellite is not at all a common mineral in Virginia or elsewhere, and only small amounts were collected at this one locality in Giles County.

The mineral occurs in radiated, fibrous form, and individual fibers attain as much as 1 cm. in length (Fig. 1). Some of the incrustations are as much as 4 mm. thick, but usually much thinner. The mineral aggre-