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THE SMITHONIA METEORITE

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SMITHONIA

Smithonia, Oglethorpe County, Georgia, United States of America.
Latitude 34° N., Longitude 88° 11′ W.
Iron, nickel-poor ataxite (D_2).
Found April, 1940.
Weight 69.85 kilograms (154 pounds).
Catalogue number, Me 2380.

The Smithonia meteorite was secured by purchase from Mr. Corbett Simmons, of Elberton, Georgia. Negotiations for the purchase began in November, 1941, but no settlement was arrived at until September, 1942. During the interval, Mr. Simmons apparently corresponded with others interested in the meteorite.

Referring to the meteorite (Popular Astronomy, **55**, p. 102, 1947), Dr. Frederick C. Leonard, University of California, states: "The place of find was 23° south of west of Elberton, Elbert County, and 23 miles thence in an airline. Presumably the nearest post office being Smithonia, Oglethorpe Co., the name of that town has been given to the meteorite. From the foregoing specification of the place of find, it follows that the coordinate number of the siderite is 0832,340 (Lat. 34° N., Long. 83° 11′ W.)."

Nothing is known about the circumstances of the fall of the meteorite, and all that is known of its history is contained in the following brief account sent to the Museum by Mr. Simmons: "This meteorite fell in Oglethorpe County about 15 miles from Athens, Georgia, at a little place called Smithonia. It was found on what used to be the Jim Smith plantation. At the time of its

FIG. 55. The Smithonia meteorite. The surface is covered with shale or platy oxides. ×⅓.

find the land belonged to Mr. Benton. I secured the meteorite from Mr. Benton. It was found at the foot of a hill on the north side, stuck in the ground a little bit. It was reported that one fell over here about six years ago. This one was found in the spring of 1940, about April. The first piece [sample for examination] I sent

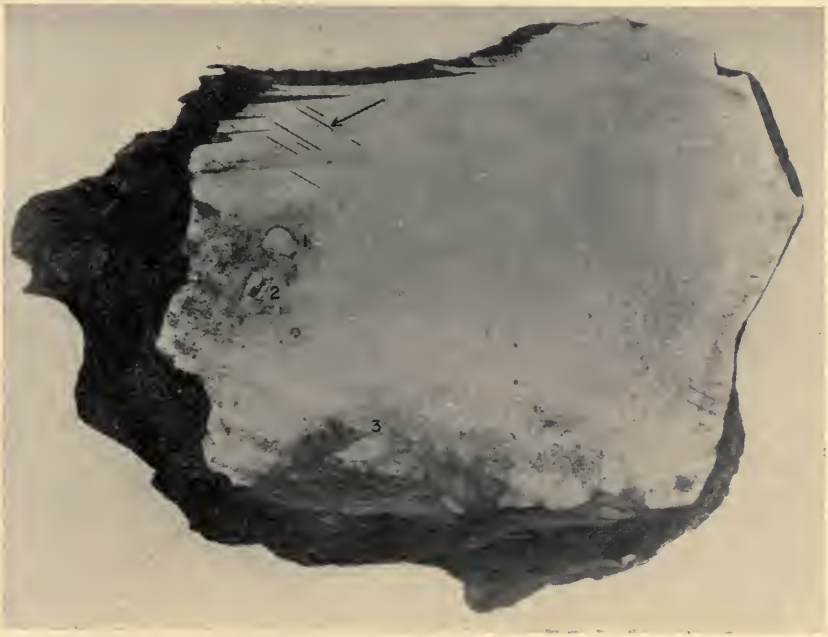

FIG. 56. A polished slice of Smithonia, showing layered structure (upper left). Rhombic pattern (arrow), where two sets of layered plates have intersected, may also be observed. The three (numbered) irregularly rounded bodies are troilite nodules. About $\times 7/10$.

was a piece of the veneering [shale, or platy oxides]. How long would it take to decay that much?" When received at the Museum the meteorite had a thick cover of shale, which would indicate that weathering had progressed for a longer period than six years.

The original crust of the meteorite is nowhere visible, and, as has been mentioned before, the present surface is covered with platy oxides, some of which are rhomboidal in outline. The meteorite is layered and thin plates with perfectly smooth surfaces may be split off. In places where two sets of layered plates have intersected, rhombic pattern is manifest (fig. 56). The layered structure is also responsible for the rapid oxidation of the meteorite.

The shape of the meteorite, as it appears now, is roughly that of a flattened elongated cone (fig. 55). The original shape cannot be reconstructed, chiefly because weathering has progressed unevenly. At one end, however, where it has progressed the least, outlines of

FIG. 57. Etched section with a rounded nodule of troilite, which is partially surrounded by schreibersite. No rhabdites have been observed in this section. About $\times 8/10$.

characteristic pittings are discernible, except that the ridges between the pits have lost their angularities and have become rounded, making the pits appear much shallower than they originally were.

The meteorite weighed 69.85 kilograms (154 pounds) when it was received at the Museum. Since then there has been a substantial reduction in weight, for weathering has caused natural shaling; also, sections have been made for study and exchange purposes. The present weight of the main mass, which has been coated with vinyl-seal as a safeguard against further disintegration, is 65.998 kilograms

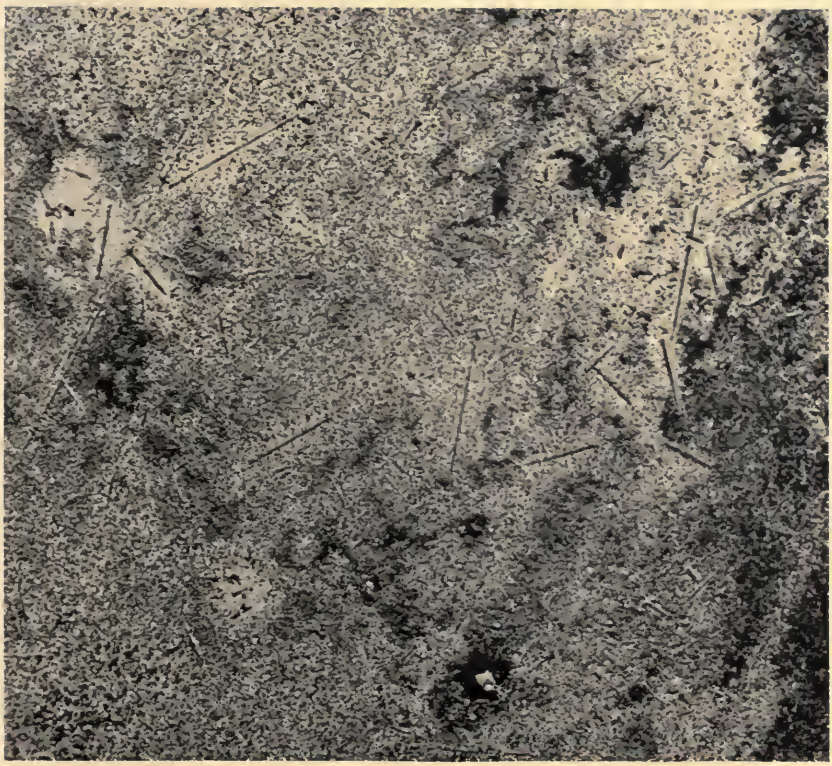

FIG. 58. Undiffused scattered rhabdites seen in an etched section of Smithonia. About × 9.

(145.5 pounds). The original maximum dimensions of the meteorite were 20 x 11 x 7½ inches.

CHEMICAL ANALYSIS

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Element	*Percentage*
Iron	93.42
Nickel	5.58
Cobalt	0.60
Copper	0.03
Phosphorus	0.20
Manganese	none
Chromium	0.04
Carbon	0.01
Sulphur	0.10
Chlorine	trace
Total	99.98
Specific gravity	7.76

Microchemical tests for platinum and tin were negative.

STRUCTURE AND CONSTITUENTS

Except for certain inclusions, little or no structural features can be seen in either the micro- or the macro-etched surface of the sections examined. Under the microscope, the kamacite is homogeneous. There is no trace of grain boundaries but the surface is dotted with numerous minute pits. Some of these are apparently etching pits; others may have contained schreibersite particles that were pulled out during grinding and polishing operations.

Of the accessory minerals, nodules of troilite (figs. 56, 57) and rhabdites (fig. 58) are present. Some of the nodules are partly or wholly surrounded by schreibersite, and some contain inclusions of the same mineral. The rhabdites are scattered sparingly and are clear-cut, showing no signs of diffusion.

In the absence of characteristic structural features of a hexahedrite such as cubic cleavage and Neumann lines, the present meteorite has been classed as a nickel-poor ataxite. It appears that there is no clear line of demarcation between hexahedrites and ataxites, so that exact classification is difficult unless the structural features are clear-cut.