

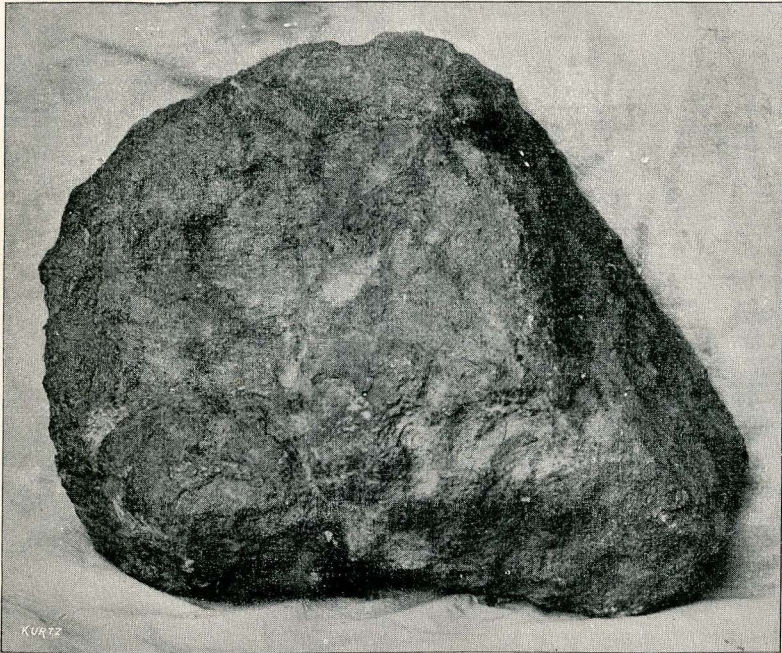
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By GEORGE F. KUNZ.



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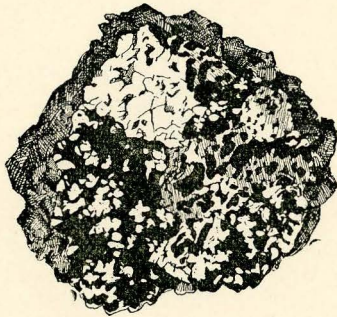
TANEY COUNTY METEORITE, MO.

By GEORGE F. KUNZ.

DURING June 1887 a meteoric mass came into my possession and through the kindness of Miss Hattie Payne, of Lamar, Ark., I learned that it was taken about thirty years before from a spot in latitude $36^{\circ} 35'$ north and longitude $93^{\circ} 12'$ west of Greenwich, near Miney, Taney Co., Missouri, eleven miles S.E. of Forsyth and over sixty miles from Limestone Valley, Ark. Miss Payne also stated that about thirty years ago a meteorite passed over the boundary line between Arkansas and Missouri and was supposed to have fallen near by. After considerable search it was believed to have been located on a farm eleven miles S.E. of Forsyth, whence it was taken sixty miles to a farm in Limestone Valley, Newton Co., Arkansas, on the supposition that it was of value. As it was decided not to be of meteoric origin, however, it remained unnoticed for twenty-eight years, except that a few gun sights were made from it by some of the curious neighbors. A portion of it was sent to the writer and he at once secured the balance of the mass. For figures see Plate X. The mass measures $34^{\text{cm}} \times 35^{\text{cm}} \times 29^{\text{cm}}$ and at the smaller end is 12^{cm} high. Its weight is 197 lbs., (89.796 kilos). It is similar to the Hainholz, Westphalia, iron* is one of the Syssidères of Daubrée and of the Logronite group of Meunier. Two large crystals of olivine are present, one measuring $10 \times 8^{\text{cm}}$ and another $4 \times 6^{\text{cm}}$; this part being so much lighter in color than the rest of the mass and so much more easily detached that the larger crystals have been almost entirely picked out to a depth of 5^{cm} . At one corner of the mass there is an inclosure of augite measuring $7 \times 4^{\text{cm}}$. This

* Pogg. Ann., 1857, vol. c, p. 342.

is gray and granular in structure, and has all the appearance of a common gray pebble inserted in the iron. The surface of the meteorite is deeply pitted and in many spots traces of a black crust are still visible; the pitting measures 1 to 4^m across. On one side a fungoid growth has slightly stained it green. Microscopic sections were made, and in these it was seen that the olivine did not occur in separate crystals, but rather in aggregations of irregularly shaped grains, surrounded by brown ferruginous veins and with banded anorthite grains interspersed



here and there. These aggregations are full of black microlites, glass masses and needle-shaped clear crystals, and are imbedded in the metallic iron without any border of alteration. The boundary line is perfectly sharp, fresh and distinct, in which characteristic it differs from the meteorite from Powder Mill Creek. The olivine appears to be fresh, but is clouded with the brown ferruginous stains abundantly scattered through it and between the grains. The following analyses were kindly furnished me by Mr. J. Edward Whitfield, and were made before its identity with the Newton County, Arkansas, meteorite was suspected. He says:

“The analysis of the metallic portion is as follows:

Fe	89·41
Ni	10·41
Co	·29
P	·16
	100·27

Of the rocky portion I have made an analysis of the whole part, i. e., not separated as soluble and insoluble, but with the metallic part separated.

The analysis is as follows :

SiO ₂	45.88
Al ₂ O ₃	7.89
FeO	19.73
CaO	6.02
MgO	17.96
NiS	1.67
FeS54
	99.69

“From the nickel and sulphur and iron we have the percentage corresponding to the formula (Ni, Fe) S, for the troilite.

Taking the piece as it was received the specific gravity is 4.484. Of the finely ground rocky portion, free from metallic particles as far as possible, I have made quite a number of analyses, to learn the nature of the insoluble mineral, and as far as I can judge it is enstatite only and the soluble part is a lime-iron silicate with considerable Al₂O₃. Of the insoluble in dilute hydrochloric acid the following is the analysis.

SiO ₂	52.39	=	.87
Al ₂ O ₃	7.11		
FeO	14.68		.20
CaO	4.49		.08
MgO	21.33		.53
	100.00		.81

“Ratio of SiO₂ : R'O = .87 : .81 which agrees pretty well with enstatite; but here the MgO is replaced by as much FeO and the presence of Al₂O₃ makes the ratio vary a little from the normal 1 : 1. Deducting all the S as NiS and the Fe to correspond to the remaining S from the soluble part, we have for the percentages of the soluble the following :

SiO ₂	26.95
Al ₂ O ₃	17.69
FeO	35.98
CaO	15.98
MgO	3.40
	100.00

“The little MgO here probably comes from the slight solubility of the enstatite.”

On looking up the literature on this subject the following facts presented themselves.

Prof. Shepard states,* in reference to the Forsyth, Taney Co., Missouri iron, that his first information regarding it was derived from N. Aubushon of Ironton, who reported that a small specimen of very curiously knitted, malleable ore, of a white color resembling silver had been sent him two or three years before by

*This Journal, II, vol. xxx, 1860, p. 205. He had so little of it, that it does not appear on any catalogue, not even in the Shepard collection at Amherst College, Mass.

a person residing near the locality. He had had an analysis of it made and found it to consist of iron and nickel. Prof. Swallow the State geologist of Missouri found it to be composed of similar constituents. He continues: "The mass evidently belongs to the rather rare group of amygdaloidal meteoric irons, in which like those of Hainholz and Steinbach, the peridotie ingredient preponderates over the nickelic iron. Its specific gravity is 4.46. The iron is remarkable for its whiteness, while the peridot is of a well marked green color and distinctly crystalline. No pyrite is visible in the very small fragments examined. It is reported that two very considerable masses of this meteorite were found buried in the soil upon a hill side, and that they are at present secreted under the belief that they contain silver."

Prof. E. J. Cox says* he was informed by Mrs. Scott of Van Buren, that when in the N.W. part of Crawford County, near Penneyoits, Sulphur Spring, attending a barbecue, on July 4th, 1859, about noon, a shower of small meteorites fell on the roof of a cabin half a mile distant, one of which was sent to Capt. Albert Pike, of Little Rock, Ark.† Although twenty-eight years have elapsed nothing has been heard of any of these pieces, in spite of frequent inquiries.

Dr. J. Lawrence Smith‡ describes a meteorite as coming from Newton Co., Ark., but without giving more exact data, as follows: "The original has not been obtained. The only fragment of it being in the hands of Judge Green was given to Prof. Cox, who has kindly presented it to me. The weight of this fragment is 22½ ounces and was evidently broken off from one corner of the mass, as it presents three of the original surfaces. The specific gravity taken on different pieces varies from 4.5 to 6.1. By mechanical means and the aid of the magnet the following minerals were separated: nickeliferous iron, chrome iron, sulphuret of iron, hornblende, olivine and carbonate of lime."

ANALYSES.

NEWTON CO., ARK., J. LAWRENCE SMITH.

<i>Olivine.</i>	<i>Hornblende.</i>	<i>Iron.</i>
Silica 42.02	Silica 52.10	Iron 91.23
Alumina 46	Alumina 1.02	Nickel 7.21
Prot. iron... 12.08	Prot. iron 16.49	Cobalt 71
Magnesia .. 47.25	Prot. manganese... 1.25	Copper } tr.
	Magnesia 29.81	Phosphorus } tr.
101.81	Alkalies 24	99.15
	100.91	

* Geol. Reconnaissance, Arkansas, 1860, p. 308.

† Learning that Capt. Albert Pike, now General Albert Pike, resided in Washington, D. C., a letter was sent him in regard to the meteorite; he replied on Nov. 15th, 1887, as follows: "Sometime before the war, and before 1860, I think, I was at Penneyoits Sulphur Springs, some 25 or more miles from Van Buren, and learned that a meteorite had shortly before fallen near there, and had been found. Afterwards a piece of it was procured for me, which became prize of war. I don't know where the piece that I had is or where the residue of the mass went to."

‡ This Journal, xl, pp. 213-216, 1865.

It is very evident that the carbonate of lime which Dr. Smith found in the Newton Co. meteorite was due to an abrasion on the limestone rock, with which the locality where it was last taken, Limestone Valley, is abundantly supplied. Not a trace of this substance could be detected by Mr. Whitfield. The difference in the analyses of the Taney Co. mass will suggest itself at once, but we must consider that these often vary considerable in different parts of the same meteorite?

From all the facts obtained it is quite evident that these two pieces are parts of one and the same meteorite, which originally fell near Miney, in Taney Co., Missouri. It is possible, also, that the report of the fall of a number of meteorites on the 4th of July, 1859, above referred to, may give the time at which this mass fell, although no definite statement can be made to that effect. To Dr. O. W. Huntington and Mr. J. H. Caswell the author is under obligations for comparative and microscopic data, and to Mr. Whitfield for the analysis, and to Prof. F. W. Clarke for his courtesy in regard to the same.