

# ON NEWLY DISCOVERED METEORIC IRONS FROM THE WALLAPAI (HUALAPAI) INDIAN RESERVA- TION, ARIZONA

---

By GEORGE P. MERRILL

*Head Curator of Geology, United States National Museum*

---

The iron meteorite here described was first brought to public attention through Mr. William A. Light, superintendent of the Truxton Canon Agency, who, early in the spring of 1927, sent a fragment from the larger mass to the Bureau of Mines in Washington, where it came into the hands of Mr. Frank L. Hess, and through him passed to the United States National Museum. A letter addressed to Mr. Light brought the information that there were two masses, recently discovered by an Indian named Dick Grover (Pl. 1) on the Wallapai Indian Reservation. He also sent the following detailed account:

I am glad to submit all the information I have regarding these specimens. I have the smaller of the two at the school. It is an irregular body with triangular sides and weighs 273 pounds. Its color is dark brown, and its surface is irregular, resembling metal that has been heated to the melting point and cooled quickly. Its shape is somewhat like an egg. Length is 19 inches, width 14 inches, greatest circumference 4 feet. These specimens were found on the slope of a limestone mountain, about 6 miles from the rim of the Grand Canyon of the Colorado River, in Mohave County, Ariz. Both of them were protruding from the earth so as to be readily seen, but three-fourths of the body of each is buried in the earth and stone. They were about 5 feet apart.

The larger specimen is three or four times the size of the smaller one. It lies where found, undisturbed. These bodies have lain in their present position for many years. The earth is level where they lie, and there is no indentation to indicate that they have fallen recently. They both show a weather-beaten appearance. \* \* \* The earth where they lie appears to have been washed into a crack or indentation. There is very little surface stone on this mark, but the specimens were surrounded by soft earth which extends along the mountain side for 10 or 12 feet. We did not excavate in this soft earth, but left it as we found it. Because the mountain slope is composed of broken and disintegrated limestone, this "crack" filled with softer material, which would have washed into it in a series of years, indicates that it may have been an open crack or indentation at one time.

In the course of further correspondence, Mr. Light gave the following account by a Mr. R. C. Jacobson, which is of interest as bearing upon the possible date of fall.

When he [Jacobson] was a young mining engineer, just out of the University of Arizona, he was employed by the Gold Basin Mining Co. on a location in the north central part of this [Mohave] County, Ariz. This mine is located about 40 miles north of Hackberry, Ariz., a few miles from the Colorado River. Hackberry was the point of supply and the post office for this camp. One of his duties was to make trips to and from Hackberry with mail, subsistence supplies, and small articles, using a team of mules to an old fashioned "buckboard."

This was in the year 1904 or 1905. One evening he was driving from the mine to Hackberry, in the afternoon, about 4.30 to 5 p. m., and he was startled by a distant roar and his mules were frightened by it. He looked up and to his rear, and observed a great "red body" falling obliquely toward him from the northwest. It was emitting sparks, but was not as bright as meteorites seen to fall in darkness. He was fearful that it would strike him; his mules ran and he let them go to get away from danger. The body passed over him to the southeast, and when it passed over the east rim of the valley (which, by the way, is the Wallapai Valley; the same is bordered on the east by the Music Mountains; they are the east rim mentioned) the red mass was high enough to clear the top of the rim. He states that it passed over this rim, directly over a mine known as the Music Mountain Mine, and he felt very sure that it struck the earth just a short distance after it had passed over this rim. He was so sure of this that he spent several days searching the part of the Music Mountain rim where it disappeared, in an attempt to locate it. He was unable to find it.

The interesting part of the story is that the meteorite that you have was discovered by Dick Grover, about 10 or 12 miles directly southeast of the Music Mountain mine, and in line with the direction the body was seen to fall by Mr. Jacobson. From my knowledge of the country and Mr. Jacobson's description of the falling of this body, and the direction and line given by him, I feel confident that the meteorite found by Grover is the one seen by Mr. Jacobson to fall in 1904 or 1905. He failed to search far enough from the point on the rim of the mountains where it disappeared from his view. The startling impression made upon him when the red-hot body passed over him, caused him to think it was closer to the earth than it really was, and its actual altitude permitted it to clear the rim of the mountains, and continue for 10 to 15 miles before coming to a stop by coming in contact with the surface of the earth.

With reference to the disposition of the iron Mr. Light suggested that the smaller of the two should become the property of the University at Tucson and offered his services in securing the larger for the United States National Museum, kindly making a recommendation to this effect in his letter to the Indian Commissioner in Washington. Through these combined agencies the iron reached Washington on June 9, 1927, where it was cleaned, weighed, cut, photographed, and analyzed with the results given below.

The iron as shown in the photograph is in form of an elongated rounded mass with abundant shallow pittings, but with no marks by which its orientation in flight can be estimated for a certainty; too much obscurity has been produced by terrestrial oxidation. The maximum length, or height of the mass, as it stands in Plate 2 is 22 inches; the width 16 or 17 inches, the form in cross section being

rudely triangular with roughly curving sides. Weight, as received, 672 pounds, or 305,454 grams. The fragment first received which had been "sledged" off weighed 535 grams, but whether this was all of it is uncertain. Considering its oxidized condition it would seem sufficient to say that its original weight was upwards of 306 kilograms. The weight of the smaller mass is given as 273 pounds, or 124 kilograms.

The weight of the mass under description made it somewhat difficult to handle, but nevertheless it was put upon the table of the bandsaw and three slices cut parallel with the rough broken face from which the fragment had been removed by hammering. The etched surface of the first of these is shown natural size in Plate 3. As will be noted it is a fine octahedrite (Of) of exceptional beauty. The sharply angular irregular enclosures are of schreibersite, an analysis of which yielded Mr. F. A. Gonyer, student analyst in the Museum laboratory, as follows: Fe, 63.62 per cent; Ni, 22.36 per cent; P, 14.37 per cent.

Of the three slices cut not one showed visible troilite or other enclosures than the schreibersite noted. The iron is soft, malleable, and etches very easily, with a uniformly dull surface.

The chemical composition of the iron, as a whole, as determined by Mr. Shannon in the Museum laboratory is given in column I below. In columns II and III are given the analyses of two other fine octahedrites made with equal care and reference to the presence of rarer elements.

REPORT BY MR. SHANNON ON THE ANALYSIS OF METEORITE FROM INDIAN RESERVATION IN ARIZONA

A piece of the iron weighing 70.2033 grams when freed as far as possible from scale, was dissolved for the analysis. This solution was made up to 1,500 c. c. Aliquot parts of 25 c. c., equivalent to 1.1701 grams, were taken for most constituents. In some cases checks were run on portions equivalent to .4680 grams. The results obtained are as follows (col. I):

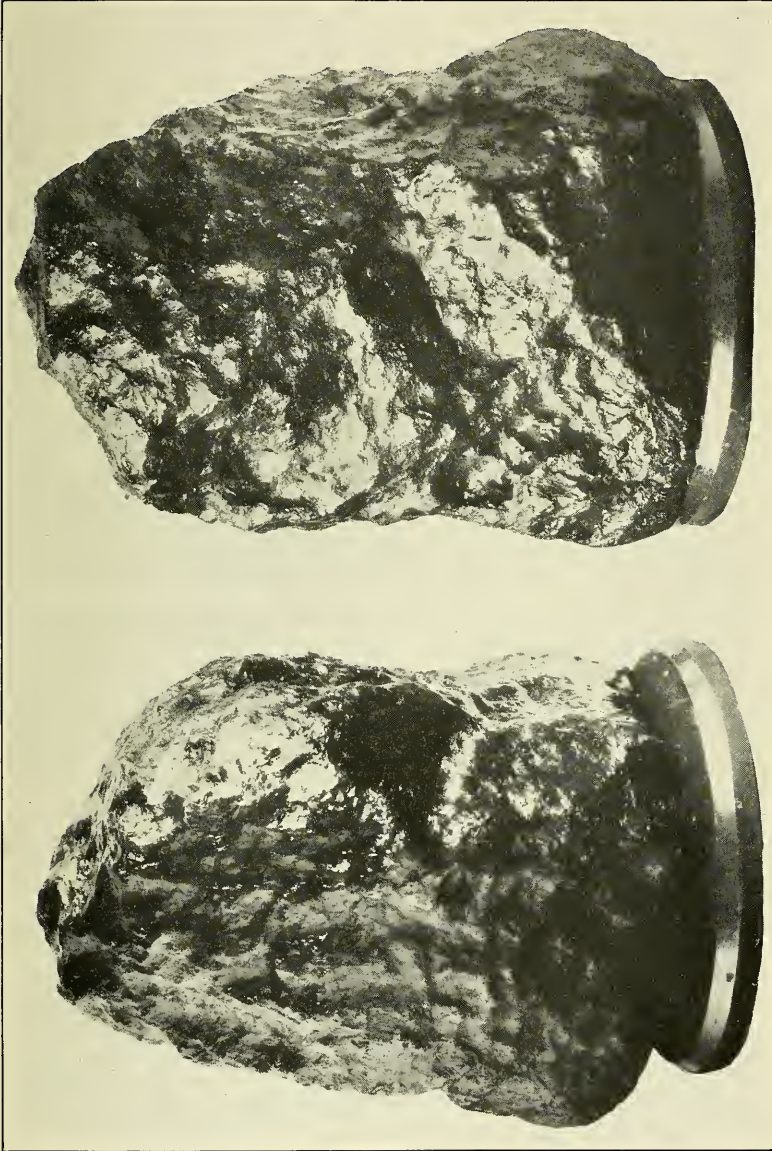
	I	II <sup>1</sup>	III <sup>2</sup>
Insoluble.....	0.032	0.003	0.003
Iron.....	90.118	90.94	89.015
Nickel.....	9.118	8.122	9.660
Cobalt.....	.147	.462	.545
Copper.....	.002		.025
Platinum.....	Trace.	Trace.	Trace.
Manganese.....	None.	None.	None.
Sulphur.....	.006		.002
Phosphorous.....	.402	.255	.365
Carbon.....		.032	.015
Total.....	99.825	99.814	99.630

<sup>1</sup> Owens Valley, Calif., Mem. Nat. Acad. Sci., vol. 19, 1922.

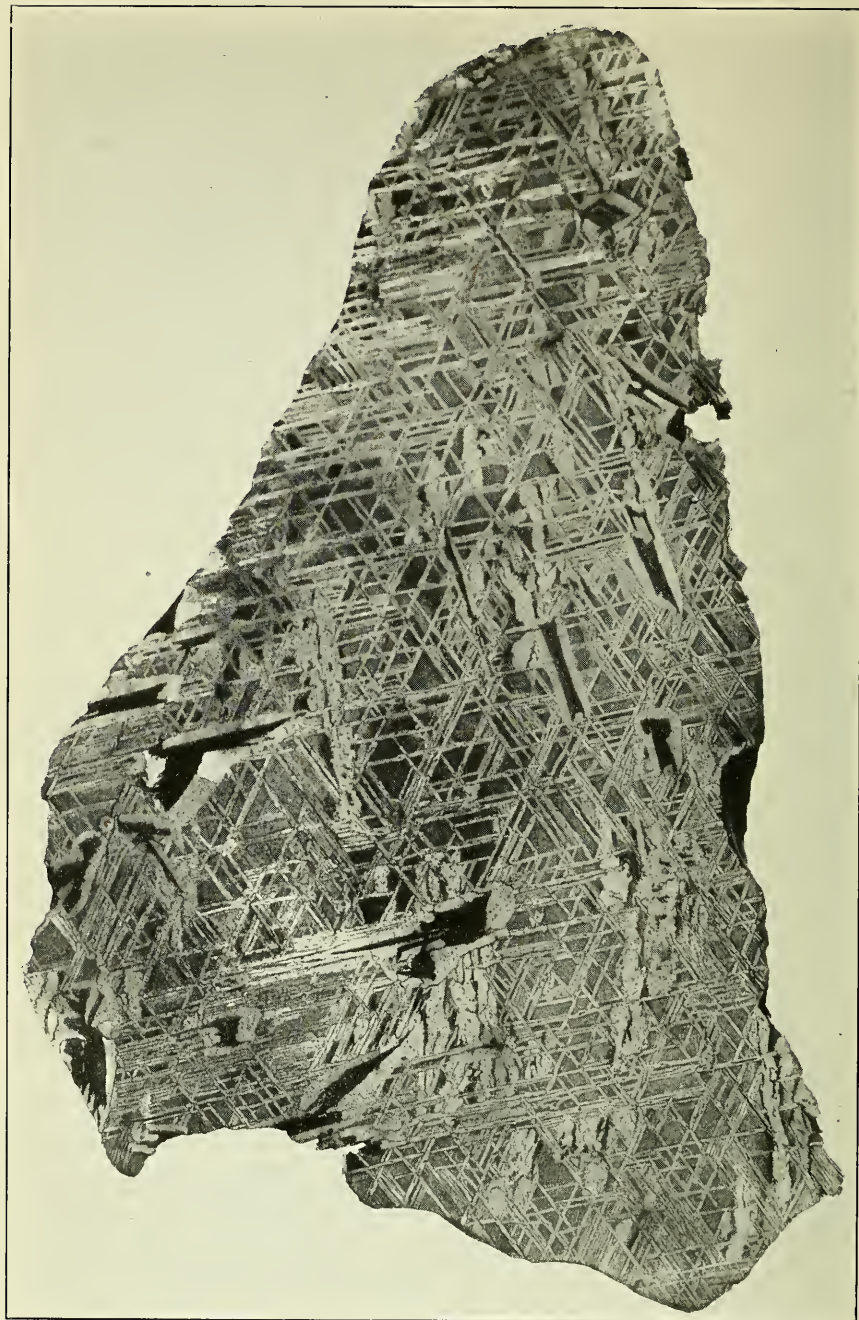
<sup>2</sup> Perryville, Mo., Proc. U. S. Nat. Museum, vol. 43, 1912.

The residuum of the solution equivalent to 46.8022 grams of the iron was used for the determination of platinum and copper. The copper content is unusually low. A faint reaction was obtained for platinum by the very delicate potassium iodide test. The insoluble matter was examined microscopically and found to be chiefly dust. No chromite, graphite, or diamonds could be recognized. Although the nickel is moderately high, the cobalt content is small. Most of the determinations were repeated at least once. The sulphur result is perhaps too low, due to loss as hydrogen sulphide. No trace of manganese could be detected colorimetrically by the persulphate method.





TWO VIEWS OF THE LARGER MASS OF THE WALLAPAI METEORIC IRONS



ETCHED SLICE OF WALLPAI, ARIZONA, METEORIC IRON, NATURAL SIZE