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FRANCEVILLE METEORITE

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(Read before the Academy, October 13th, 1902.)

This meteorite was bought by Prof. F. W. Cragin, of Colorado College, Colorado Springs, Colorado, from Mr. David Anderson and wife, of Colorado Springs. The meteorite was found by Mr. Anderson about twelve years ago on government land in El Paso County, Colorado, one and one-half miles south-west of the home-ranch of Skinner and Ashley, which is east of Franceville. In Mr. Anderson's own words "It was totally above ground, and found no signs of any other. When I found the meteorite I simply pushed it with my foot, but found I could not move it. The following day I went back with a wagon and got it to the ranch. I do not think at the time the land was entered by anyone; not near to any road."

The meteorite from the time at which it was found until purchased by Prof. Cragin was kept in the home of Mrs. Anderson in Colorado Springs, half forgotten, and when Prof. Cragin called to see it, was finally found beneath an old lounge. The meteorite entire was purchased from Prof. Cragin by Ward's Natural Science Establishment, Rochester, N. Y., in August, 1902.

From its external form it is one of the most interesting of the many meteorites that have been in their possession. It is a decidedly flattened, rhombic pyramid with a somewhat sharp ridge extending around the center of the mass on the four rhombic sides. The dimensions of the mass in these directions are 21 x 23 c. m., with a thickness of 11.5 c. m. On one side of this central axis the pyramid projects 6 c. m., on the opposite side 5.5 c. m., as seen in figure 2, plate VI.

The decidedly octahedral form of this iron seems unqestionably due to its separation along natural cleavage planes from a much larger mass. But it is surprising that the form should not have been much more distorted, by the erosion due to friction in passing through the atmosphere.

The whole iron is more or less mottled, ranging in color from a reddish brown to a brownish black, and is entirely covered with pittings on all sides. Those on what may properly be termed the upper side (figure 1, plate VI.) being much more distinct, owing to their size and depth, than elsewhere. Just below the medium ridge on one end there is an unusually large pitting, some 10 c. m. long and 2 c. m. deep. Two or three small but much deeper finger-like pittings, from which troilite has undoubtedly been weathered out, are on the mass.

Two small corners of the mass have been broken off and have the appearance of very old breaks, as the surfaces are entirely oxidized. These surfaces show markedly distinct octahedral cleavage.

Two small protuberences, one 2 c. m. and the other 1 c. m. in diameter, have been sawn off and the faces polished and etched. One of these is shown in figure 1, the other in figure 2, plate VI. Otherwise the mass was an entirely complete one, until sawed into sections by Ward's Natural Science Establishment; the probability being that not more than thirty grammes had been taken from it since it reached terra firma.

Upon slicing the mass but one troilite nodule of any size was found. This occurred on one end-piece and the adjoining slice, and was 14 mm. in diameter with two small patches of nickeliferous iron in its center.

The slices show more or less fractures extending across their surfaces along the natural cleavage faces, the edges of the kamacite plates, and in some instances (as in the San Angelo meteorite*) the rhombic form produced by the Widmanstätten figures are strongly outlined by these fissures.

Upon etching the iron the Widmanstätten figures are readily brought out by acids. These are particularly sharp and clear and of large size, as shown in figure 3, plate VI.

The kamacite plates average from 1 to 1.5 mm. in diameter, with an occasional one of 2 mm. They are unusual, from the fact that they extend in an unbroken line in many instances from 90 to 120

*Am. Jour. Sci. Ser. 3, Vol. 5, pp. 269-272.

mm. in length. The tænite occurs in minute films between the kamacite plates.

The plessite patches are comparatively small for an iron of such coarse crystallization. Some of these patches show no structure when etched, except a slightly pitted surface, while others are prominently made up of alternate layers of kamacite and tænite, producing sharply the so-called Laphamite lines.

Schreibersite is not visible on the etched surfaces macroscopically, not even surrounding the troilite nodules as is usually the case.

Mr. John M. Davison, to whom was given 23.9 gms. for analysis, reports as follows:

"The specific gravity of this siderite is 7.87. An approximate "analysis gave :

"soluble in hydrochloric acid - - -	kamacite and tænite -	99.16%
	combined carbon, not deter.	.....
"undissolved in hydrochloric acid	schreibersite	0.837
	graphite and silicates (trace)	.003
	platinum (from 23.9 gms.)	trace
		100.

"The analysis of kamacite and tænite together gave :

Fe.	91.92%
Ni.	8.13
	100.05"

The weight of this most interesting siderite is 41 pounds, 6½ ounces, or 18.3 kilograms.

Colorado has not been prolific in supplying meteorites to the scientific world. As far as noted, including the present iron, there have been but five. All of which are siderites.

Russel Gulch, Gilpin County, - - - - - - - -	found 1863
Bear Creek, near Denver - - - - - - - - - -	" 1866
Jefferson, 30 miles from Denver - - - - -	fell June, 1867
Franceville, El Paso County - - - - - - - -	found 1890
Mount Ouray, Chaffee County - - - - - - -	" 1894

I can find no account of one of these, the "Jefferson, (81 Shepard Collection) 30 miles from Denver, Colorado," listed as having fallen in June, 1867, except in the descriptive catalogue of the meteorite collection in the United States National Museum, Jan., 1902. It seems apparent that a mistake has been made in labelling this specimen, and it must be dropped as a distinct fall for the following reasons.

Bear Creek has been noted in most catalogues as having been found in Denver *County*, Colorado, also a mistake, as Colorado has no county by this name. It was first mentioned by Shepard* as found upon the eastern slope of the Sierre Madre Range of the Rocky Mountains. Again Henry† notes it as found in a deep gulch near Bear Creek, about 25 or 30 miles from Denver. Smith‡ in describing this meteorite gave it the name of Bear Creek. As Denver is on the boundary line between Arapahoe and Jefferson counties, and as there is a Bear Greek extending clear across Jefferson county from west to east, emptying into the Platte, according to Henry's description, this would bring the locality of the Bear Creek meteorite in the western central part of Jefferson county. Therefore, it seems likely that the iron noted in the Shepard Collection as "Jefferson, 30 miles from Denver," is in reality a portion of the Bear Creek meteorite labelled "Jefferson," meaning Jefferson county, and that the date of fall, June, 1867, is an error. Particularly so as the Bear Creek is described by Henry† as being "shattered on one end," so that small pieces could be readily detached.

Denver county has evidently been substituted for Denver city in many of the meteorite lists, as no county is given in any of the early reports of the Bear Creek meteorite. Moreover, the Sierre Madre Range is west of Denver, and Bear Creek is described as having been found on its *eastern slope*, which, in all probability, would bring it in Jefferson county. So it would seem best that "Jefferson" should be discarded entirely as a distinct fall and be called Bear Creek, and that Denver county in all meteorite lists should read Denver city. Thus we reduce the Colorado meteorites to four distinct falls.

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*Am. Jour. Sci. Ser. 2, Vol. 42, pp. 250-251.
†Ibid Ser. 2, Vol. 42, pp. 286-287.
‡Ibid Ser. 2, Vol. 43, pp. 66-67.

FIG. 1. UPPER SIDE, SHOWING PITTINGS. (Two-fifths actual size.)

FIG. 2. SHOWING PYRAMIDAL FORM. (Two-fifths actual size.)

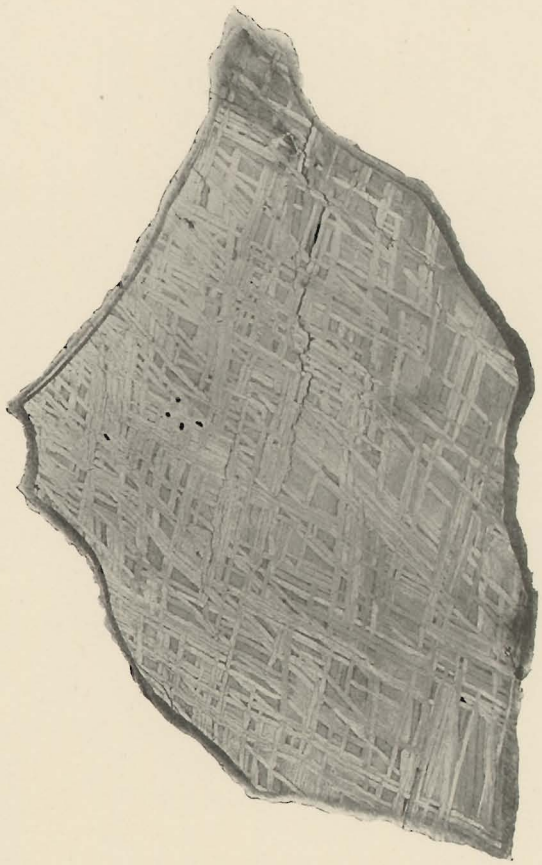

FIG. 3. SECTION SHOWING WIDMANSTÄTTEN FIGURES. (Three-fifths actual size.)

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