

ART. XIII.—*On the Meteorite of Fomatlán, Jalisco, Mexico*; by
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FOR my knowledge of the Fomatlán meteorite I am indebted to Mr. Carlos F. De Landero, Engineer, of Guadalajara, Mexico. Along with a fragment weighing 142 grams came his letter of March 11th, stating that it formed portion of a

* It was this compact rock, white, flint-like in fracture, 'clinking under the hammer, that was found on analysis by E. Silliman to contain 38.07 per cent of magnesium carbonate.

AM. JOUR. SCI.—THIRD SERIES, VOL. XXX. No. 176.—AUGUST, 1885.

stone that fell "about the end of the year 1883 on the farm of El Garganitello, near the coast in the State of Jalisco."

The fragment is somewhat prismatic in shape, two and a half inches long and one and a half in each of its two other dimensions. The broadest side retains the original black crust, which is rough and dull, with a thickness rather above the average in meteoric stones. It is broken with medium facility, showing a rather lighter color than common in these bodies. It abounds in pisiform grains of a pearl-gray or brownish color, varying in size from a pea downward to that of mustard-seed. The larger of these may be described as not strictly pisiform, but rather flattened globules or imperfect crystals, with rounded edges and angles. They often exhibit a single tolerably distinct cleavage in one direction, with traces of another perpendicular thereto.

The basis in which the globules are imbedded is rather peculiar. It is many shades lighter in color than the globules, and is fine granular resembling certain massive albites. Under the lens it appears an intimate mixture of the broken gray globules and a white mineral. This last in the field of the compound microscope is seen to consist of sharply crystalline, transparent or semi-transparent grains, and closely resembles the chladnite of the Bishopville meteorite. It should be mentioned that the pisiform globules situated within half an inch of the crust are much stained with iron-rust.

But the striking peculiarity of the Jalisco stone is the prevalence everywhere of octahedral crystals of nickeliferous iron. These are so distinct as to be recognizable with the naked eye, the brilliant equilateral triangular faces coming into view by every change of position in the specimen. Now and then a surface presents a pitted or dissected appearance, similar to what is common in quartz crystals. One or two instances were noted where a tendency to the arborescent structure showed itself, the octahedra being aggregated in a common line, and only touching by the tips of their pyramids. Neither the irregular globular form or the twisted pisiform shape of this substance, sometimes visible in meteoric stones, is recognizable in the present case.

This observation at first led me to suppose that the Jalisco stone offered the first instance of well defined crystals of nickeliferous iron. But on recurring to the stones of several other localities, I find their presence is by no means rare, though they have not hitherto attracted attention. The following of those showing occasional crystals may be instanced: Rochester, Sumner County, Little Piney, Richmond, Yorkshire, Montrejean, Daniel's Kuill, New Concord, Vouillé, Erxleben and Affianello.

The crystals are uniformly distributed, penetrating even to the center of the chrysolite globules, and are often so minute as to be invisible without the aid of a glass. To effect their entire separation by the magnet is wholly impossible. Neither can their estimation be accomplished by the aid of acids, since the chrysolite is more or less decomposed by the same action that dissolves the crystals. The nearest approximation to their percentage, as determined mechanically, gave it at about 7 p. c., though this is probably too high, through the adhesion of the pulverized chrysolite in the process of separation.

Particles of crystalline troilite of considerable size adhere occasionally to the nickeliferous iron, though on an average they cannot exceed 0.5 p. c. of the stone. The treatment of the metallic portion of the stone in aqua regia left undissolved a few very minute black shining scales of a plumbaginous nature, together with equally minute non-magnetic, dull, octahedral crystals of chromite, which gave with borax the characteristic chromium reaction.

Equally difficult, as in the case of the nickeliferous iron, is the determination of the proportions of the chrysolite and the supposed chladnite. The nearest estimate I can make would be eight of the former to one of the latter, thus presenting the following approximative table for the mineralogical constitution of the meteorite :

Chrysolite	80
Chladnite?	10
Nickeliferous iron	7
Troilite	} -----
Chromite	
Peroxide of iron)	
	3
	100

The specific gravity as determined upon two fragments, each having about one-third of its surface covered by crust, was 3.47-3.48.

In conclusion, it may be observed that the shape of the specimen indicated it to have belonged to a stone several inches in diameter. Additional particulars relating to the fall will probably be furnished hereafter, through inquiries promised by Mr. Landero.

Charleston, April 18, 1885.

Addendum.

The delay which has occurred in the publication of the foregoing enables me to append thereto the very interesting extract from a letter of Mr. De Landero, dated Guadalajara, May 30th, 1885 :

“Respecting the exact date of the fall, I shall sooner or later be able to fix it with precision. The aerolite passed over the

town of Fomatlán (40 miles S.S.E. of Cape Corrientes, a village of 800 inhabitants, belonging to the canton of Maseota in our state of Jalisco, at a height of some three to five thousand feet, between four and five P. M. It was a very clear day. Many persons saw the aerolite, and heard the explosion it made, which was very powerful. Its direction was from S.E. to N.W. It left a white cloud in its track. Two or three fragments fell, eight miles N.W. of Fomatlán, between the houses of the Gargantillo farm. The latitude of Fomatlán is $19^{\circ} 44'$ N. and its longitude near $6^{\circ} 20'$ W. of the city of Mexico. Its elevation above the sea is about 100 feet.

“The administrator of the Gargantillo farm, Cesareo Rodriguez, gathered two or three fragments of the meteorite a few minutes after their fall, when they were still at a burning heat. The largest of these weighed about two pounds. The main body of the meteorite, which must have been very large, continued on its path to the N.W. and fell into a large lagoon four or five miles distant from the farm.

“My uncle, Mr. Joaquin Castanos, who was at that time in Fomatlán, received one of the fragments from the hands of Cesareo Rodriguez, and kept it for me. I made a determination of the specific gravity of the meteorite upon a fragment weighing $28\frac{1}{2}$ grams, the result of which was 3.49.”

A late letter gives September 17th 1879, at 5pm, as the time of fall.