

ART. XXVII.—*Meteoric Iron from Dakota Territory—Description and analysis*; by CHARLES T. JACKSON, M.D., of Boston.

ON the 9th of June last, I received, through Messrs. John W. Shaw & Co. of this city, a mass of meteoric iron from John B. Hoffman, Esq., U. S. Indian Agent for the Ponca tribe of Indians. This mass of metal was supposed by Mr. Hoffman to be some native alloy of silver, and it was sent here to be assayed for that metal.

The mass in my possession weighs ten pounds ten ounces, and is six inches long, five inches wide, and about two inches thick, but is of an irregular form, the weathered or exterior surface being much indented, or wavy and pitted, while its opposite side is columnar, a natural fissure having existed between it and the large mass from which it was detached by the aid of a sledge

¹ At least this is true of all the specimens which have fallen under my observation, but in the original figure of the Tavistock crystals by Brooke, (Brande's *Quarterly Journal*, xvi, 274, and Dana's *Manual of Mineralogy*, ii, 424,) not only the basal plane *O* but also a second set of octahedral planes $\frac{1}{2}$ are represented. This figure in general appearance resembles quite closely the Hebron crystals and is very different from the pyramidal form we have given above. The difference is probably to be explained by the varying characters of the matrix in which the crystals occur at that locality, and it shows that, under certain conditions, the mineral has a tendency to the prismatic form which is only more fully developed in the specimens from Hebron.

hammer. It is stated that this piece was broken from a lump of the same kind, which was estimated to weigh 100 pounds.

It was found on the surface of the ground, in the Dakota Indian territory, ninety miles from any road or dwelling.

Where it has been rubbed and partially polished, the iron has a silvery appearance, and hence the mistake entertained as to its probable nature.

Excepting on the exterior of the columnar portions, which have a steel-like crust, the metal is very soft, and saws or files easily. It has a bright surface when cut. No earthy or stony matter has been found in it, and, judging from its great density, it appears to be solid in its interior. Pieces were sawed off in different places, and these were polished and tested with dilute nitric acid for the production of Widmannstätten figures, but none have thus far been produced, only a scaly like structure, quite fine, is developed by the acid, or when a lump of the iron is dissolved, ridges and fine projecting points are left on the undissolved metal. I noticed the singular phenomenon of the indifferent state of the iron to nitric acid, while dissolving this metal. After a rapid boiling effervescence, with a rush of red fumes of nitrous acid, the chemical action suddenly ceased and could not be renewed by the addition of more nitric acid, nor by a boiling heat, but on inclining the glass beaker, so as to cause the metal to come in contact with the other side of the glass, tumultuous chemical action instantly commenced, and the solution went on rapidly. This seems to show that the electrical state of the metal and of the glass was concerned in the indifferent state of the metal to the acid.

Chemical analysis of the Meteoric Iron.—Qualitative examination soon demonstrated the existence of nickel, phosphorus, tin, cobalt, and chromium in this meteorite.

Its specific gravity, taken with much care, was found to be 7.952. Its hardness that of the softest malleable iron, except on the exterior of the columnar portions, which were as hard as case-hardened iron, resisting the saw and causing a sharp cry under the file. No carbon was found.

The quantitative analysis was effected on two separate pieces, sawed from two of the columns, and the proportion of nickel was twice determined, the iron in both cases being removed as a succinate, by the well known processes.

By blowpipe examination, tin in metallic grains, was obtained, and the presence of small proportions of cobalt and chrome were proved. Phosphoric acid was found by molybdate of ammonia, and was in the analysis separated in the state of pyrophosphate of magnesia.

Although the analysis is not quite complete, yet it is enough so for our present purpose in demonstrating the meteoric nature of this metallic mass under examination.

The following are the per-centage results of my analyses, executed on a gram in each trial.

	1.	2.
Metallic iron.....	91.735	91.735
“ nickel	6.532	7.080
Tin.....	0.063	0.063
Phosphorus.....	0.010=98.840	0.010=98.888

The cobalt was proved by the blue color the nickel gave with the borax bead, chrome, as shewn by the bead of the nickel-oxyd in microcosmic salt, the green color being persistent in the reducing flame and coming out as the red color produced by nickel in the hot bead faded. Chlorine was searched for in a solution of 53.7 grs. of the meteorite, but none was discovered.

I have requested Mr. Hoffman to procure and send to me the remainder of this interesting meteorite, and also to inquire of the Indians for other specimens and to procure them if possible. Though of no economical value, these specimens from beyond our world, are of great interest to science, and if our friends on the Pacific shore will look for them, I have no doubt many larger masses of meteoric iron may be found there.

Boston, Aug. 13, 1863.