ON THE OCCURRENCE OF CALCIUM SULPHIDE (OLDHAMITE) IN THE ALLEGAN METEORITE.

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The occurrence of calcium sulphide in meteorites was first noted in 1862 [a] by N. Story-Maskelyne, in the Bustee stone and by him called "Oldhamite." In 1870 [b], the same author fully described this mineral as occurring in small, isotropic, chestnut brown nodules having a cubic cleavage; a hardness of 3.5 to 4; a specific gravity of 2.58; and of the following composition:

	CaS.	MgS.
A.	89.369	3.246
B.	90.244	3.264

The magnesium sulphide present being regarded by the author either as a constituent of the mineral or as a mechanically mixed ingredient.

Maskelyne, in the same paper, states that Oldhamite is apparently present in the Bishopville aerolite, and that it occurs in small, nearly round, spherules embedded in enstatite or augite, or in a mixture of both.

Flight,[c] in some further work on the mineral separated from the Bustee stone, noticed that when slightly warmed and illuminated by burning magnesium wire, Oldhamite emitted an orange-colored phosphorescence. Later Friedheim [d] found in the meteorite from Nagaya, a very small amount of calcium sulphide. In the Aubres stone, Brezina [e] calls attention to the occurrence of minute, yellowish to reddish-brown spherules which resemble the Oldhamite as described by Maskelyne. Merrill,[f] in his paper on the Hamblen meteorite,

[a] Brit. Assoc. Rept., 1862, App. 11, p. 190.
[b] Phil. Trans. London, 1870, CLX, p. 195.
[c] Chapter in the History of Meteorites, London, 1887, p. 119.
[d] Sitzber., Berlin Akad., 1888, I, p. 366.
[e] Meteoritensamm. k. k. nat-hist. Hofmus., May 1895, X, p. 239.
[f] Am. Journ. Sci., 1896, II, pp. 152–153.

calls attention to the possible presence of Oldhamite, which, though not visible in the thin sections or in the mass, is suggested by his qualitative and micro-chemical tests.

While working over some fragments of the Allegan aerolite with especial reference to the separation of its chromite and schreibersite contents, it was noticed that certain portions gave, while being treated, a marked evolution of hydrogen sulphide under conditions that led to the belief that some sulphide other than troilite was present.

Acting upon this, a portion of the fine powder was carefully freed from all magnetic particles and analyzed with the following results:

Ca	9.12
S	7.30
SiO_2	39.95
Al_2O_3	0.09
FeO	14.40
MgO	29.40

which may be calculated to an olivine-enstatite mixture with 16.66 per cent of calcium sulphide.

An analysis of another fragment of the meteorite, in which only the calcium and sulphur were determined gave:

Ca	4.070
S	2.632

a result that is in close agreement with the figures required for calcium sulphide.

In most of the previous descriptions of the occurrence of calcium sulphide in meteorites attention is called to its honey-yellow to reddish-brown color, when freed from incrusting calcium sulphate, and to its nodular form. The material here described was entirely free from sulphate. Exposure to strong sunlight or to burning magnesium did not cause a visible phosphorescence. It did not occur in nodules having a honey-yellow to chestnut-brown color and all attempts on my part to distinguish it under the microscope failed. Doctor Merrill,[a] who made a complete petrographic examination of the meteorite, tells me that he found nothing that resembled oldhamite.

It is not possible to describe the appearance of this calcium sulphide except by saying that neither macroscopically nor microscopically is it to be distinguished from the dust-like ash-gray interstitial material of the groundmass. It is present in aggregations of very fine grains in certain portions of the Allegan stone, but the great friability of the meteorite and the extreme difficulty of determining the mineral character of the interstitial material of the groundmass renders its recognition almost impossible.

[a] Proc. Wash. Acad. Sci., 1900, II, pp. 41–56.