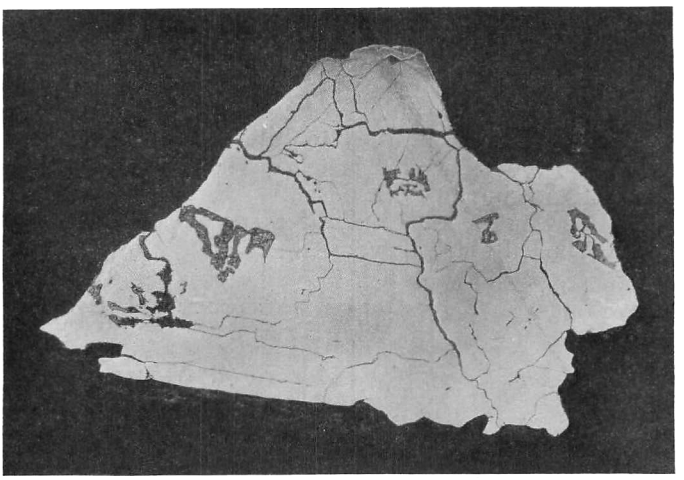
ART. XI.—*The Ainsworth Meteorite;* by EDWIN E. HOWELL.

THIS siderite, for which I propose the name of the town near which it was found, was purchased from Mr. J. C. Toliver. It was found last winter by one of Mr. W. G. Townsend's little boys, who called his father's attention to it as it lay partly buried in the sand beside a small creek in Brown Co., Nebraska, about six miles N.W. of Ainsworth. It measured approximately $4\frac{1}{2} \times 6 \times 7$ in. and weighed $23\frac{1}{2}$ lbs. (10·65 kilo.) with a specific gravity for the whole mass of 7·85. Two of the

1



Section 1. The Ainsworth Meteorite, half nat. size.

projections on one side are flattened, as if by pounding, but closer examination shows fine striæ running evenly across both surfaces, which are in the same plane, suggesting that the meteorite in falling may have glanced on a rock—making a slickensided surface. The most noticeable feature, however, is the presence, in a number of places on the surface, of bright unaltered troilite and schreibersite. This fact, in connection with the general freshness of the mass, would indicate that the "fall" was a comparatively recent one. A fractured surface on one of the sharp corners, and adjoining flat side, shows where perhaps two lbs. had been broken from the mass antecedent to its burial, probably when it fell. The fractured

corner exhibits the coarse octahedral structure, while the fractured side has the appearance of columnar structure, and there seems to be considerable tendency to columnar fracturing at this particular part of the iron, columnar-like pieces breaking from the sections as they were cut. Eight sections have been cut all parallel to the first—the one figured. The principal veins and the mixed figures of troilite and schreibersite continue through them all; in addition, however, three typical nodules of troilite were encountered, which contrast strongly in color and form with those in which the schreibersite forms a prominent part. The sections etch very slowly; in time, however, lines appear which I did not hesitate to call Neumann lines until Mr. Tassin proved the iron to be an octahedrite, as was at first indicated by the fracture. These lines do not cross the veins referred to, and they are differently oriented in each of the blocks outlined by these veins, making the blocks appear as separate units. Mr. Tassin finds the structure of this iron to be unique, although in general appearance—especially in the irregular graphic segregations of schreibersite and troilite—it very closely resembles the São Julião, and in a less degree the Tombigbee River, and in some respects the Kendall County.

Mr. Wirt Tassin of the U. S. National Museum has devoted considerable time to the study of this iron and gives a summary of his results as follows:

Analysis and Notes on the Ainsworth Meteorite, by Wirt Tassin.

Meteoric Iron from Ainsworth, Nebraska.

The iron (fig. 1) here described is triangular in outline and shows a well-marked octahedral fracture on one edge, in fact the three edges of the section approximate three directions of an octahedron with the cut surface forming a fourth, giving the mass as a whole the appearance of a flattened octahedron. The surface as cut shows octahedral lamellæ of the largest size, so large that they are not at once apparent, as the specimen is not big enough to contain more than a few of them. Careful etching develops a surface having in places a mottled or dappled appearance. These mottlings when magnified under a vertical illumination show a definite octahedral structure and an etch figure (fig. 2) directly comparable with that of other octahedrites, and may be regarded as centers of crystallization, which though minute, possess a well-defined lamellar structure and usually show the three characteristic alloys. The accessory constituent, shown in the figure as rows of crystals in relief, is unknown but is here assumed to be nickel-free iron. Such a structure, a most coarse octahedrite containing very minute octahedrites, has never before been observed by the writer. Contained in the mass

as a whole are irregularly shaped segregations of troilite, in forms suggesting graphic characters. These troilite areas contain more or less carbon with grains of nickel-iron and phosphide of iron and they are commonly bounded with a thin wall of schreibersite. This compound also appears abundantly elsewhere on the surface, usually as bright points which under the microscope

2

Section magnified 1500 diameters.

appear to be cross-sections of the lath-like form known as rhabdite.

The surface is also marked by veins or fissures of varying widths, certain of which are parallel to the several directions of the octahedron and form octahedral partings. These veins are commonly bounded by schreibersite and are filled with a carbonaceous material containing phosphorus, sulphur and iron.

The material available for analysis gave the following values:

Iron	92·22
Nickel	6·49
Cobalt	0·42
Copper	0·01
Phosphorus	—0·28
Sulphur	0·07
Chromium	—0·01
Silicon	0·049
Carbon	0·09