solution of high density is added to the crystals of thallous formate.

This method was used successfully in reworking several batches of discarded solutions which had been contaminated with the hydrolyzed salt.

Materials

The price of thallium metal has fluctuated greatly. That used for this investigation was obtained from Eimer and Amend, New York, at a cost of $17.00 for 500 grams, in November, 1931. The cost of the other materials is slight; and since 100 grams of the metal will yield almost exactly the theoretical 122 grams of thallium formate, the price per 100 grams of the formate is about $3.00 at the above price of thallium.[7]

[7] To obtain 100 grams of thallous formate (HCOOTl), we require:

Substance	*Amount*	*Price*
Tl	82 grams	$2.80
Conc. H_2SO_4	16 cc.	.02
$BaCO_3$	60 grams	.12
87% HCOOH	28 cc.	.05
		$2.99

THE BEARDSLEY METEORITE

H. H. Nininger, *Denver, Colorado.*

To the long list of Kansas meteorites this will add another, bringing the total number up to 22 falls for that state.

On October 15, 1929, the residents in the vicinity of Beardsley and surrounding villages to a distance of 40 miles or so were startled by a dazzling light followed by the usual thunderous sounds about 11:30 P.M. Those who were abroad at that hour saw a fire-ball pass from E.S.E. to W.N.W. and disappear at a considerable altitude. Unfortunately no scientist visited the locality until almost two years later so that the data are not as definite as they might have been.

In the village of Beardsley Mrs. Ray Gaines leaned out of the open window on the north side of the house and heard distinctly the fall of two stones, one of which seemed to fall in the yard. A whizzing noise was heard preceding each impact. A search was made by the Gaines' during the next few days and two stones were found, one of 4 oz. about 20 meters east of the house was evidently one of those heard to strike. The other was found some 40 rods to the east and a little south of the house. This one weighed slightly less than 2 lbs. and lay on top of the lately sown wheat ground. It is very doubtful if this was the second stone heard by Mrs. Gaines who is quite certain that the one she heard fell to the north of the house.

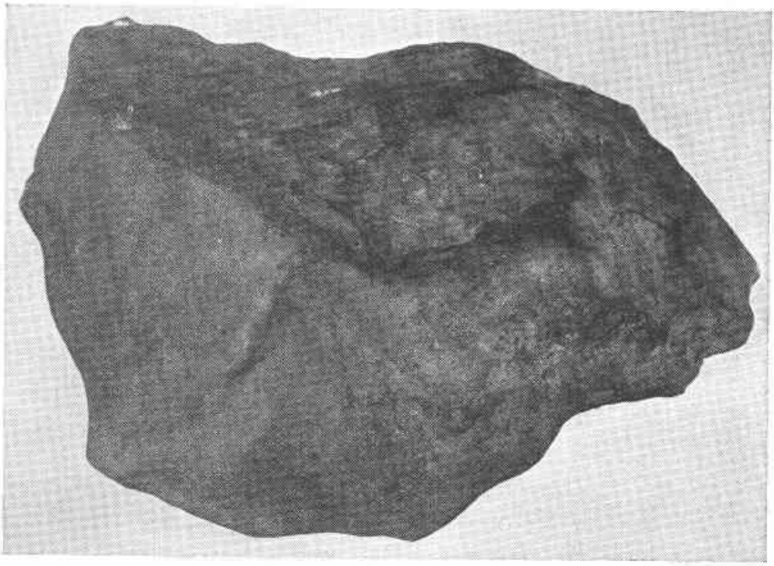

FIG. 1. View of the largest Beardsley stone showing tendency to orientation during flight.

The writer was in central Mexico at the time of this occurrence and word did not reach him until his return in late December. By this time the two stones had been sold to a collector in the east who was making an effort to recover any other stones which may have fallen, hence the writer did not visit the locality until August, 1931, after being informed by the party that the two stones constituted in his opinion the entire fall.

On August 10, 1931 I instituted a search by a visit to the village of Beardsley and during the next 60 days was rewarded by securing six masses weighing respectively 15, 2.5, 8.4, 10.6, 43, and 328 oz. Some of these had been in the possession of their finders since October, 1929. Others were found during the autumn plowing which was in progress at the time of my several visits during August and September.

All but the largest stone were found entirely on top of the ground. Three were found in pasture land the others on cultivated soil. The large stone was struck by the plow. Its upper surface lying at a depth of a little less than four inches.

The stones which were found two years after the fall seemed to be preserved about as well as those which were picked up within a few days of their arrival.

All of the stones are covered with the usual dark slaty grey fusion crust. Those which have lain exposed on the surface for two years have changed to almost jet black color where not in contact with the soil.

Most of the stones show a few small spots or streaks of brown stain, from oxidation, on certain portions of the fusion crust. These stains were less prevalent on a small stone picked up by the writer, September 15, 1931, than on some of those found earlier.

The crust is in most cases 0.25 mm. thick or less and is checked into polygonal areas of 2 to 10 sq. mm. In a number of places this crust also shows flowage lines. The large specimen of 9285 grams is fairly well oriented showing abundant pittings of the usual type. The crust is usually quite dull but in a very few places shows glossy black patches a few square mm. in size.

With two exceptions the eight stones recovered appear to be almost complete individuals, being covered with a crust of uniform thickness and showing no indication of late fragmentation; but the 2.5 oz. specimen appears to be the result of a break near the middle of an elongated mass upon its impact with the soil, while the 10.6 oz. specimen is very angular and shows one fresh fracture and apparently five degrees of fusion on as many remaining sides.

Where the crust was broken at the time the stones were found the interior shows abundant brown stains of oxide marking the locations of metallic grains; but where broken afresh the color of the interior varies from light ashy grey to dark mottled steel grey. In the 43 oz. stone where the finder hammered off a small piece it broke along a dark mottled surface exposing a slickenside which indicates quite definitely a faulting along a slightly undulating plane.

A small individual was cut exposing, in four polished sections, about 30 sq. cm. Also three thin sections were made. One slice and three sections were turned over to Mr. W. A. Waldschmidt of the Colorado School of Mines for a petrographic study.

An interesting fact concerning the Beardsley fall is its relation in point of time to three other falls within the bounds of the eastern half of the United States, namely, the North Carolina fall of July 9, 1929; Paragould, Arkansas, Feb. 16, 1930; and the Miller, Arkansas, fall of July 13, 1930. These constitute an unusual record of four falls (stones from which were recovered) within a twelve months period, or to be more exact a period of 369 days. If this area were taken as an index to the number of falls arriving on the lithosphere within the period under consideration, we should have to conclude that 532 falls landed on the earth during those twelve months. As a matter of fact it is practically certain that less than half of the falls which occur in any area, such as the eastern half of the United States, are ever found. It is also possible that those four might represent an unusual concentration of meteoric impacts.

PETROGRAPHY OF THE BEARDSLEY METEORITE

W. A. Waldschmidt

The portions of the Beardsley aerolite available for petrographic study were three thin sections and a thin slice about three centimeters square. The thin sections show that olivine and enstatite constitute about sixty per cent (estimated) of the aerolite, and that the remaining forty per cent consists of nickel-iron with minute inclusions of pyrrhotite. Olivine occurs primarily as anhedral grains, but a few grains have subhedral outlines. The majority of the olivine grains are small and are grouped together in chondrules and irregularly shaped masses which serve as a matrix for the alloy. The olivine grains with subhedral outlines are considerably larger than the anhedral grains surrounding them. This is true of the olivine in the chondrules as well as of that in the main mass. (Fig. 2, C.) Enstatite, though not abundant, occurs as lath-shaped to fine fibrous, radiating masses and chondrules. Two of the enstatite chondrules are shown in Fig. 2, B and D. Fracturing at right angles to the long direction of the lath-shaped crystals, is quite pronounced, but is poorly defined in the fine fibers. Mixtures of enstatite and olivine grains were not observed in the sections examined.

The thin slice was polished and examined with a metallographic microscope for the purpose of studying the relationships of the minerals and metals present. Pyrrhotite occurs only as small particles, most of which are included within the nickel-iron and a few of which are included in the olivine. An interesting relationship between the metallic grains and olivine is the variation in smoothness of the contacts. In some places the contact between the olivine and nickel-iron is decidedly smooth and in other places it is decidedly jagged and irregular. These variations may occur along the same line. Particles of olivine with relatively smooth outlines are included in many of the metallic grains. The relationships just described are illustrated in the photomicrographs, Figs. 3 and 4.

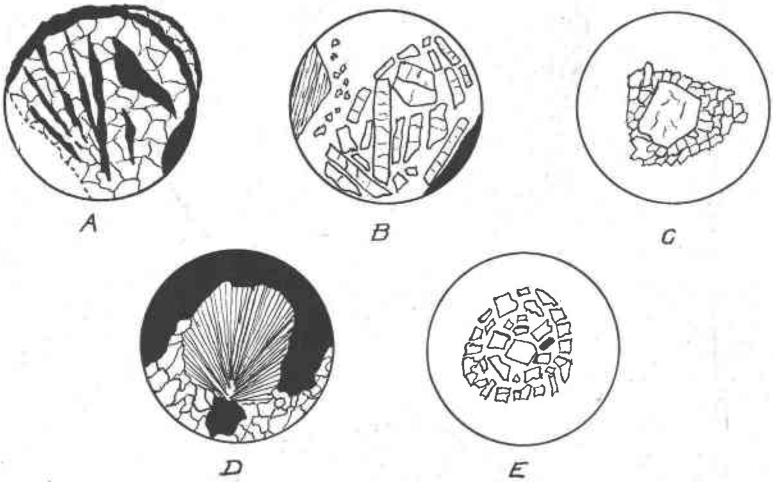

FIG. 2. Drawings by W. A. Waldschmidt showing microscopic appearance of several chondrules.

A. Olivine chondrule showing anhedral character of the olivine, and also included and surrounding black metallic material.

B. Enstatite chondrule, showing the lath-shaped character of the crystals. A portion of a fine fibrous enstatite is shown at the left, and between the two enstatite areas are a few anhedral grains of olivine.

C. Olivine chondrule with a central subhedral olivine grain.

D. Enstatite chondrule with fine fibrous radiating structure. In this chondrule the fibers radiate from a point on the edge instead of from a central point.

E. Olivine chondrule with a central anhedral grain surrounded by two concentric rings of anhedral grains. The concentric arrangement is more evident in the thin sections because of the brown color induced by limonitic alteration.

Alteration has progressed sufficiently to give the rough fracture surfaces of the aerolite a gray to brown stony appearance. Metallic material can not be readily distinguished in the fractured surfaces, but after polishing it may be seen constituting a large portion of the mass. The alteration product is limonitic in character and has evidently been formed from the alloy. The olivine and enstatite aggregates and chondrules, studied in the thin sections, do not show any marked alteration, but do show a brown discoloration where the limonitic material has penetrated into the fractures and

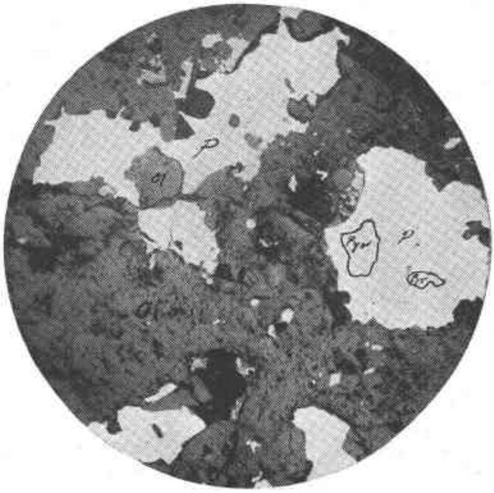

Fig. 3. Photomicrograph of the Beardsley aerolite. Ol. Olivine; P. Nickel-iron; Pyr. Pyrrhotite. The pyrrhotite grains in the nickel-iron have been outlined in this figure, and in fig. 4. 60×.

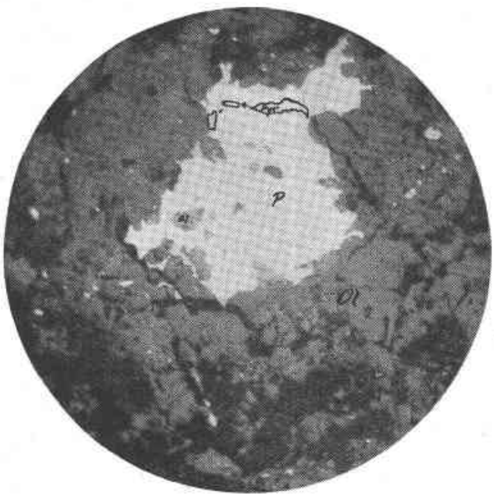

Fig. 4. Photomicrograph of the Beardsley aerolite. Ol. Olivine; P. Nickel-iron; Pyr. Pyrrhotite. This photomicrograph illustrates the variation in smoothness of the olivine-metallic contacts. 60×.

between the crystalline grains. The darkest discolored areas of pyroxene and olivine are adjacent to the outlines of the metallic grains but the color gradually decreases toward the center of the areas.