THE RANSOM METEORITES

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A number of stony meteorite specimens, presumably from a single fall, have been recovered from an area about 5-6 miles north of Ransom, Kansas. This paper presents a map of discovery locations, so far as known. Megascopic appearance, external and internal, of a typical (?) specimen is described. The Ransom meteorite has already been classified as an olivine-bronzite chondrite – chemical group H of Van Schmus and Wood. Features observed in thin section are characteristic of petrologic type 4.

A. D. Nininger (1939) reported that four stony meteorites totalling 15 kg had been found in a quarter section of land about 6 miles north of Ransom, Kansas, – Area A on the map, Fig. 1. It is not clear whether the Niningers succeded in acquiring all four. Eleven years later, H. H. and A. D. Nininger reported (1950) 15 kg as the "total known weight". So, if additional specimens were found during this time interval, their existence was unknown to the Niningers. In 1950, the "main mass" of one of the Nininger specimens was reported (Nininger, 1950) to weigh 6.37 kg. A smaller "individual" (presumably uncut) weighed 3.03 kg.

Hey (1966) gives Ward's Natural Science Establishment Catalog FM-2 (1949) as one of the principal references on Ransom. Their Catalog FM-2 gives the total as 15 pounds – presumably an accidental exchange of pounds for kilograms.

As late as 1964, the Catalog of Meteorites at Arizona State University still reports no increase in the total known weight.

However, additional specimens have been found. On a visit to Ransom during the summer of 1969, the writer had the good fortune to meet two of the town's citizens who had Ransom meteorites: Ralph Amstutz and Rip Van Winkle. Amstutz, incidentally, happened to know that Fred Plath, the man who first reported a Ransom meteorite to the Niningers, found one in his farmyard, which is located near the center of the south line of Section 25. Amstutz thinks it likely that all four of the specimens known to the Niningers came from the southwest quarter section (Area B, Fig. 1) rather than from the northwest quarter (Area A).

One of Amstutz's specimens and one owned by Van Winkle were found by Russell C. Strickler in Area C. The former, with two opposite ends sawed off, weighs 803.5 g. The latter, with a small end-piece missing, weighs 87.7 g.

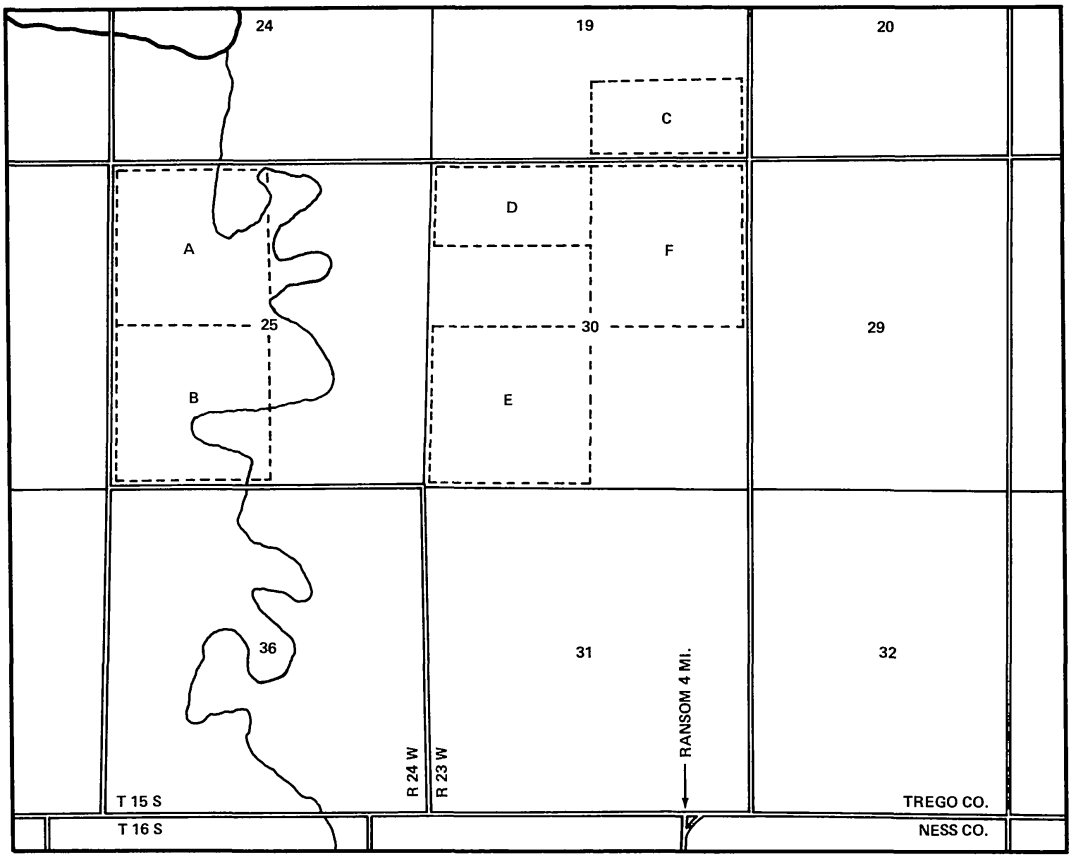

Fig. 1. **Areas in Trego County, Kansas, where Ransom meteorites have reportedly been found. North is toward the top of the map. Numbered sections are one mile on a side.**

Van Winkle had a second specimen, complete and weighing 1.23 kg, which I purchased from him. It was found in Area D, about 1948, by Earl Snodgrass.

A "small" specimen, according to Amstutz, was found by R. E. Schreiber in Area E. He subsequently lost or mislaid it.

Amstutz acquired two specimens which were found in Area F by Joseph F. Lutters, Jr. One, weighing about 2.2 kg, he still has. The other, which was found about 1955 and weighs 1.82 kg, Amstutz gave to the Fort Hays Kansas State College Museum (Miller, Constable, and Brooks, 1969).

No general description of a Ransom meteorite has yet been published. A few comments based on the 1.23 kg specimen I bought from Van Winkle may therefore be in order. Before cutting, it measured about 6 × 3 × 2½ inches. The overall shape was roughly that of a parellelepiped, with most of the edges and corners rounded off by ablation and showing well preserved

fusion crust beneath a thin coating of limonite. One of the large (6 X 3 in) surfaces was, however, exceptional: quite rough and without fusion crust, evidently produced by post-ablational rupture. Since the rust coating on this surface is about the same as elsewhere, it is reasonable to assume that the rupturing took place at, or just before, the moment of impact. A fair-sized chip (1 X 2 in) has been detached from one of the ablated surfaces much more recently, as indicated by the fact that the scar shows little or no rusting. This may be the result of an encounter with farm machinery.

A slice was sawed off here at Lawrence University roughly parallel to the (6 X 3 in) fracture surface. The cut reveals abundant metallic particles in a dark greenish-gray groundmass. Chondrules are scarcely visible to the naked eye, although a few may be discerned with the aid of a hand lens. Rusting is negligible beneath the fusion crust, except along an open fracture which penetrates to a depth of about half an inch. This is obviously a relatively recent fall.

Mason (1963) has determined the composition of the olivine in a Ransom specimen and gives the mole percent of fayalite as 19. This is, then, an olivine-bronzite chondrite, belonging in chemical group H of Van Schmus and Wood (1967).

Ransom was not, however, among meteorites examined by Van Schmus and Wood for their petrologic characteristics. I therefore prepared a thin section, using a block cut from the sawed off slab. Somewhat to my surprise, the thin section turned out to be more brownish- than greyish-green. It also revealed one or two hairline black veinlets, which were not apparent on the sawed surface.

Under the microscope, matrix material is seen to be transparent and microcrystalline, as illustrated in Fig. 2. Chondrules, though somewhat battered, are still "well defined". Some of the pyroxene is monoclinic, and primary glass, though turbid, is still present, Fig. 3. These are all distinguishing characteristics of Van Schmus and Wood's petrologic type 4.

In type 4 chondrites, the composition of the olivine (and pyroxene) tends to be somewhat variable. Is Mason's 19-mole-percent fayalite an average?

The remaining "main mass" of my specimen weighs 991.0 g. What is left of the slice weighs 158.0 g. Portion of the slice from which my thin section was prepared now weighs 8.6 g. Another portion, cemented to a slide for preparation of a second thin section (in case the first didn't turn out) weighs about 10 g. And there is a small fragment weighing 0.5 g which broke off the slice during sawing.

All of this material, excepting my thin section and the block glued to the slide, will be deposited in the collection of the University of California in Los Angeles.

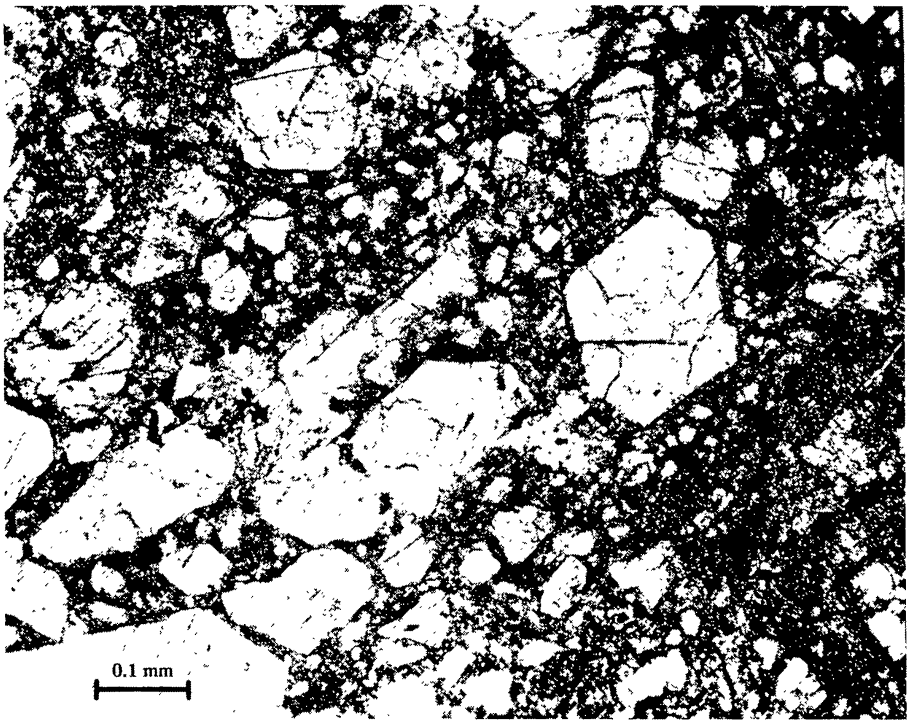

Fig. 2. Photomicrograph of part of thin section of Ransom meteorite showing interstitial microcrystalline material. Plane polarized light.

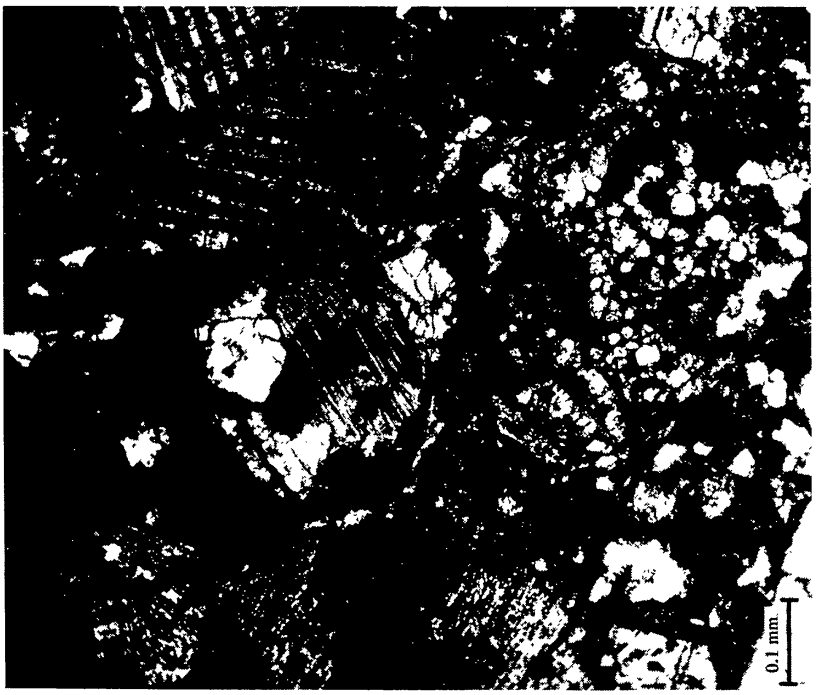

Fig. 3. Part of thin section of Ransom meteorite showing, just left of center, polysynthetically twinned clinopyroxene, and, above it, olivine barred with primary glass (black under crossed nicols).

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The Haverö Meteorite

This issue of "Meteoritics" contains 11 papers on the Haverö meteorite. This representative of the rare group of meteorites classified as ureilites fell on the island of Haverö in Southwestern Finland on August 2, 1971. Through the efforts of interested scientists at the University of Turku, it was recovered and made available for investigation by scientists throughout the world. Much of this work was coordinated by Professor K. Neuvonen of the University of Turku and Dr. H. B. Wiik of the Geological Survey of Finland. The meteoritic community is indebted to these men and their colleagues for making this material available. The papers published here represent the initial collection of work on the Haverö meteorite and illustrate its interesting, important and unique characteristics.

Editor