

FIRST REPORT ON A NEW METEORITE FIND FROM SEYMOUR, INDIANA. Philip Bonneau, Department of Geology, Ball State University Muncie, IN. 47305; Nelson Shaffer, and Abhijit Basu, Department of Geology, Indiana University, Bloomington, IN. 47405.

The meteorite was found in May, 1976 by Mr. C.F. Miller of Seymour, Indiana (at 85°56'50" W., 38°55'11" N.) about 2 km west of the local airstrip and also about 2 km southwest of a county road - Railroad - US Route 50 intersection called Hangman Crossing. Mr. Miller collects interesting and unusual objects from his fields and has recovered many Indian artifacts. The stone that Mr. Miller collected and suspected to be a meteorite stayed with him for about 11 years after which he gave it to his newly born grandson in 1987. The stone as collected was about 12 cm long, somewhat football-shaped, and probably weighed about 1300 g. Before the meteorite was brought to Indiana University for identification and other research, a few small pieces had been saved off. Saved faces show veins of metal, chondrules, and substantial yellowish stain, presumably from terrestrial weathering. Currently about 1050 g of material is on loan to Indiana University for research. The name "Seymour" is already given to an iron from Missouri and we do not wish to repeat it for this stone although Seymour, Indiana is the nearest post office. Instead, we would like to call this "Hangman Crossing".

A preliminary examination of one thin section of the meteorite shows that about 15% is made up of Fe-Ni alloy and about 50% of easily identifiable chondrules of various kinds. We have not yet completed bulk chemical analysis to assess the proportion of metal in this chondrite. The chondrules usually have very sharp outlines and are very well defined. However, there are many broken chondrules as well, the broken ends of which are not as sharp. Chondrules are of different types ranging from coarse grained, granoblastic through porphyritic, barred varieties, and some showing wavy extinction. Olivine and pyroxene, in about equal proportions, make up the bulk of the minerals in this chondrite; some are nearly euhedral. A detailed petrographic search of one thin section did not reveal clear plagioclase grains. Somewhat turbid and brownish glass is present inside several chondrules, especially in the interstices of barred pyroxene chondrules. The glass is intimately mixed with very small crystallites. The matrix between the well defined chondrules is made up of finely crushed chondrules. The minerals inside and outside chondrules look exactly alike under the microscope.

X-ray diffraction patterns of the non-magnetic fraction are dominated by peaks corresponding to hypersthene and olivine. Presence of low-Ca clinopyroxene, if any, could not be confirmed. Peaks at 28.1° and at 21.9° ($\text{Cu}_K\alpha$ radiation) suggest that plagioclase is present in a crystalline form.

A preliminary electron microprobe survey of the meteorite shows that the pyroxenes and olivines are fairly well equilibrated with respect to Mg/Mg+Fe ratio (Fig. 1). The ratio

ranges from 0.77 to 0.84 in low-Ca pyroxenes ($n = 19$) with a standard deviation of .0197, and from 0.81 to 0.83 in olivines ($n = 24$) with a standard deviation of only 0.0083. A few clinopyroxenes ($n=4$) are seen with an average composition of $Fs_{1.3}Wo_{2.0}$ and an Mg/Mg+Fe ratio of 0.82. Plagioclases, if present, are extremely small and accurate electron probe microanalysis may not be possible. One analysis shows a possible composition of $Ab_{6.8}$ provided the FeO (2.4%) and MgO (2.2%) contents are ignored.

We classify this meteorite as an H4 chondrite [1-4] because of the sharpness of chondrule boundaries and absence of clear plagioclase grains, despite the strong uniformity of pyroxene and olivine compositions. The variety of chondrules present suggests that this is likely to be less equilibrated than that indicated by mineral compositions of the few chondrules analyzed thus far.

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REFERENCES : [1] Dodd, R.T. (1981) *Meteorites : A Petrologic-Chemical Synthesis*. Cambridge University Press. 368 p. [2] Van Schmus, W.R. and Wood, J.A. (1967) A chemical-petrological classification for the chondritic meteorites. *Geochim. Cosmochim. Acta*, v.31, pp. 747-765. [3] Wasson, J. T. (1985) *Meteorite : Their Record of Early Solar System History*. Freeman. 267 p. [4] Wood, J.A. (1968) *Meteorites and the Origin of Planets*. McGraw-Hill. 117 p.

MINERAL COMPOSITIONS

Figure 1. Histogram showing the distribution of Mg/(Mg+Fe) variation in olivines and pyroxenes in the Hangman Crossing chondrite.

