

THE METEORITE FROM LAKE HOUSE.

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Introduction: In 1991 a very big meteorite (>60kg, dimensions: diameter 50cm x height 40cm) was brought to the Natural History Museum by the then occupier of Lake House, a country mansion in Wiltshire, UK, associated with a large estate of the same name. The circumstances concerning the likely origins of this 'find' are dealt with in a companion abstract [1]. Our attention was attracted to it because of its proximity to Danebury Hill (20 km east), where the only British meteorite 'find', collected under controlled circumstances, was located in 1974 [2]. If the large meteorite from Lake House turned out to be paired with the much smaller Danebury find, then the mystery surrounding its origin would be instantly solved.

The sample from Lake House was confirmed as a meteorite by Robert Hutchison [3] and subsequently returned to its owners. Our electron microprobe data from a PTS made from a chip taken at the OU suggest it should be classified as type H5 similar to our assignment for Danebury.

Petrography: The sample is a heavily weathered (W5) [4], moderately shocked (S4) [5], equilibrated ordinary chondrite (H5). Distinct chondrules are present, but these tend to have poorly defined boundaries. Porphyritic types predominate, but barred olivine and radial pyroxene textured chondrules are also common. Chondrule mesostasis is recrystallised, with grain sizes generally below 50µm. The sample is cut by a network of veins, up to 2 mm thick, filled with secondary weathering products.

Discussion: In respect of weathering characteristics, the two specimens are entirely different – areas in our Danebury PTS are grade W1 and the whole specimen is no worse than W2, whereas the meteorite from Lake House is W5. The thin section of the latter was made from a near surface chip of the highly corroded sample; the Danebury analyses were performed using a fresh interior portion. Not wishing to have what appeared to be a very delicate specimen disintegrate, we attempted to extract an interior core from the larger meteorite using an experimental drill being developed for robotic space missions. Much to our surprise prolonged drilling was unable to penetrate more than a millimeter into a location where the crust appeared to be absent. In earlier performance tests the drill had no difficulty in obtaining 1.5 cm long cores from basalt and concrete. We conclude that the interior of the meteorite from Lake House may not be as weathered as it appears from the outside.

Because we had obtained a very precise terrestrial weathering age for Danebury, samples of the meteorite from Lake House were removed for Accelerator Mass Spectrometry terrestrial residence dating. The first sample studied has a ¹⁴C weathering age of 10,600 +/- 1800 years BP. A second run with a better specimen gave 9500 +/- 560 years. The large meteorite is clearly not related to the small one authenticated from the archeological site a few kilometers away. Given that it is a single stone, the meteorite represents an unusually large ordinary chondrite find.

References: [1] C.T.Pillinger and J.M.Pillinger, this vol. [2] C.T.Pillinger et al., this vol. [3] pers. comm. [4] Wlotzka F. 1993 Meteoritics 28:460. [5] Stöffler D. et al. 1991. GCA 55:3845-3867.