

### CURATION OF THE WINCHCOMBE CM CHONDRITE FALL

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**Introduction:** The Winchcombe meteorite fell on 28<sup>th</sup> February 2021. At 21.54, the fireball was witnessed across the UK and recorded by 16 stations operated by the six meteor camera networks of the UK Fireball Alliance (UKFall), allowing for calculation of its strewn field and main belt source [1]. The event was widely observed by eyewitnesses and soon attracted considerable media attention. The first carbonaceous chondrite recovered in the UK, Winchcombe joins a short list of only 17 British falls for which material is known [2].

**Recovery:** The recovered material was initially examined by team members in the field, conducting home visits to potential finds and systematically searching the local area. Permission for minimally destructive analysis on the material was sought from all landowners. The largest mass landed on the driveway and lawn of a fortunate family who collected much of the material with rubber gloves and a stainless steel knife, storing it in cleaned supermarket cottage cheese/cream pots, and polyethylene sandwich bags. Some material was collected as soon as 12 hours after the fall. Additional material was collected at this site by the recovery team who, using nitrile gloves, tweezers, paintbrushes and a toothbrush, transferred the material directly into conservation-grade storage materials (aluminium foil, glass vials and polyethylene sample bags) provided by the Natural History Museum (NHM) meteorite collection [3]. The largest single stone was found in a field of Rushbury House Farm, during a search by the recovery team on 6<sup>th</sup> March, and collected using nitrile gloves and geological sample bags. The quick response of UKFall and associated media campaign was critical in raising awareness of how to identify a meteorite and how to handle specimens appropriately, resulting in many enquiries from the public. In total, approximately 602 g have been recovered from sites, such as driveways, gardens, fields and a solar farm, across an 8.5 km strewnfield.

**Immediate curation:** The first samples were received and placed into a desiccator at the NHM on the 4<sup>th</sup>. In the following fortnight, 709 g of material (including mud containing small meteorite fragments), from six sites, had been visually examined and documented under the NHM object entry process to enable investigation prior to official acquisition. Samples were quickly curated, and are stored in glass vials with polyethylene lids, with fragments > ~100 mg individually weighed. Twenty-three of the largest fragments have been encased in high purity Al foil, placed in acid-free cardboard trays and stored in heat-sealed Escal enclosures with Mitsubishi RPK system oxygen scavengers. The largest piece is stored in an individual dessicator and is currently on display in the Vault gallery in the NHM.

Two stones (BM.2022,M1-85 and BM.2022,M1-86) were taken directly from the field to the Open University to facilitate swift oxygen isotope measurements and are stored in a nitrogen cabinet in a class 100 cleanroom, under long-term loan from the NHM. Additionally, some material has been returned to the landowners for donation to local museums and thus not accessioned into the NHM collection.

**Tracking subsamples:** Thanks to the generosity of the local community, a total of 518.3 g have now been donated into the NHM collection. Specimens have been designated according to their find location and collection date. The subsamples are tracked with sequential numbers, similar to the NASA curatorial numbering system. The subsample relationship of any given fragment can be provided upon request to the curator.

Thus far, 47 loans, a total of approximately 80 g (including non-destructive analyses) and 20 polished sections have been made available to the Winchcombe consortium, covering analyses including bulk properties, mineralogy and petrology of the different lithologies, fusion crust, organics, magnetism, reflectance spectroscopy, and terrestrial alteration, as well as C, N, O, Ti, Cr, H, Ne isotopic systems [1, 3-16].

**Long term curation:** A nitrogen glove box (MBraun Labstar) with built-in microscope is on order and will be used for the permanent storage of the Winchcombe meteorite, funded by the Science and Technology Facilities Council (STFC), UK. Samples of the mud, lawn, and the original collecting vessels are all available as witness material. We welcome requests for scientific loans once the initial consortium work is published in a special issue of *Meteoritics and Planetary Science*.

**References:** [1] King A.J. et al., (submitted) *Science Advances* [2] Grady, M. M. (2000) Cambridge University Press. [3] Russell S.S. (in preparation) et al. *Meteoritics and Planetary Science* [4] Genge, M. M. et al., (submitted) *Meteoritics & Planetary Science* [5] Suttle et al., (submitted) *Meteoritics & Planetary Science* [6] Daly et al. *this meeting* [7] Jenkins et al., *this meeting*. [8] Greenwood et al., *this meeting*. [9] Johnson et al., *this meeting*. [10] Etienne-Martin et al., *this meeting*. [11] O'Brien et al., *this meeting*. [12] Vollmer et al., *this meeting*. [13] Shirley et al., *this meeting*. [14] Schroeder et al., *this meeting*. [15] Wombacher et al., *this meeting*. [16] Grady et al., *this meeting*.