Elephant dung, chewed antlers, weathered bones: documenting a unique taphonomic collection

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Introduction

The fossil mammal collection at the Natural History Museum, London, is estimated to contain approximately 250,000 specimens. The collection includes historically important material such as the Darwin, Koch and Fayum collections and the extensive British Pleistocene collection. Study and interpretation of these collections still relies heavily on comparisons with other specimens and collections. Despite this, identification and interpretation of the taphonomic history of a specimen, collection or site has depended almost entirely on the literature. Taphonomic reference collections themselves are very rare. The science of taphonomy examines the processes (agents/events, e.g. biological or physical) by which specimens are altered after death[1]. Figure 1 summarises hypothetical pathways for a mass-death event[2]. Taphonomic analyses are key steps in the study of any archaeological or palaeontological site, e.g. as a prerequisite for palaeoecological analyses. The availability of taphonomic reference collections can facilitate these studies. As such, this project aims to increase accessibility of one such taphonomic reference collection, through its documentation, re-storage and promotion.

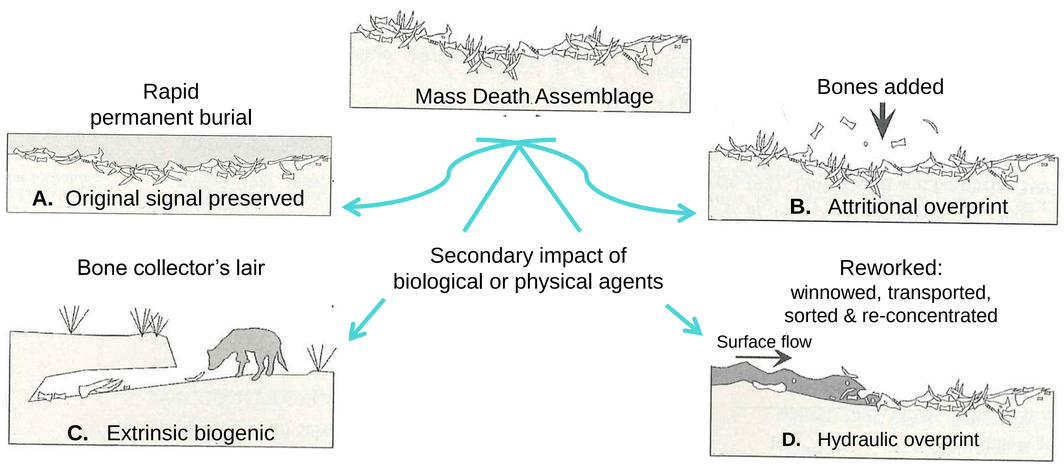

Figure 1. Hypothetical taphonomic pathways of a mass-death event (after[2]).

The Collection

The taphonomy collection was assembled by Antony John Sutcliffe (Fig. 2), Curator of Fossil Mammals (NHM) from 1957 to 1987. Sutcliffe studied Pleistocene mammals and became particularly interested in the alterations to bones that can occur after an animal's death and how these bones come to be fossilised. He was especially interested in how carnivores and herbivores, such as hyaenas and deer (Fig. 3), modified bones[3, 4, 5], but he also studied decay of arctic mammals[6]. The specimens in this collection are mainly vertebrates and were sourced from around the world (Fig. 4), either collected during Sutcliffe's own fieldwork or gifted to him by international colleagues[7]. Specimens are often accompanied by detailed notes on their provenance or letters of donation, which enhance the scientific value of the collection.

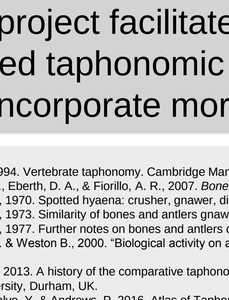

Figure 2. Antony John Sutcliffe (centre left).

Figure 3. Herbivore bone modified by gnawing. Sketch & photo[4], bone specimen NHMUK PV UNREG 374, Taphonomy collection.

Figure 4. Map showing the global distribution of the A. Sutcliffe taphonomic collection. Specimens from East Africa, Canada, Alaska, Siberia and northwest Europe make up the majority of the collection.

Taphonomy Collection - A glimpse inside drawers

The collection includes examples of many different taphonomic processes (with both biogenic and physical modifications) and of numerous vertebrate species. Fernandez-Jalvo & Andrews[8] included many specimens and images from this collection in their book and it is listed as one of four 'Special Taphonomic Reference Collections'. This clearly underlines the importance of this collection. **A.** Antelope (*Kobus kob*) skull with complete horns and dentition, from the entrance tunnels of spotted hyaena lair in the Queen Elizabeth National Park, Uganda. **B.** Scanning electron micrograph of polar bear (*Ursus maritimus*) fur from Ellesmere Island. **C.** Polar bear fur sample from Ellesmere Island. **D.** Weathered wildebeest (*Connochaetes*) jaws from Ngorongoro Crater, Tanzania. **E.** Channels formed by moth larvae, on a wildebeest horn from Kenya. **F.** Bone fragment with cut marks. **G.** Pellet from a snowy owl (*Bubo scandiacus*). **H.** Reindeer (*Rangifer tarandus*) antler, covered by lichen. **I.** Elephant (*Loxodonta africana*) dung. **J.** Letter from Michael Croydon (collector in Kenya) to Sutcliffe.**K.** Deer antler chewed by porcupine. **L.** Samples of wolf droppings from Canada, prepared by A. Sutcliffe for scanning electron microscopy.

Curatorial process

The entire collection was documented on EMu, the NHM collection management database (see below A & B). The specimens were given individual numbers, photographed, registered on the EMu database, repackaged using jiffy foam and acid free boxes and plastic bags (see below C & D) and re-housed at the NHM's offsite store at Wandsworth (see below G). Below is an example of a drawer before (E) and after (F) documentation and re-boxing. In order to complete the work, students and volunteers were trained on specimen handling and documentation procedures and were introduced to the science of taphonomy.

Outcomes

The Sutcliffe Taphonomy Collection is a unique reference collection containing mainly vertebrate skeletal concentrations (biogenic and physical) and associated data. Around 1600 objects were digitised and re-stored. Individual specimens can now be searched for and requested by researchers to support their projects. This project facilitated teaching on curatorial processes and collections care, as well as on the science of taphonomy. The specimens have the potential to form curated taphonomic reference standards for use by researchers around the world. In the future we would like to explore opportunities to expand this collection and incorporate more specimens.

References

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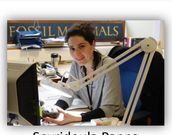
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