

12th Professional Zooarchaeology Group
Saturday 16th July 2011
The University Of York

Taphonomy: Spotting it, recording it and making sense of it...

The 12th Professional Zooarchaeology Group was organised and hosted by Terry O'Connor at The Kings Manor, University of York on Saturday 16th July 2011. The meeting was attended by 17 members and topic of the day was taphonomy, with a specific focus on recording and interpretation.

Following a welcome by Terry O'Connor, the morning session started with a series of short presentations. Firstly, Lee Broderick presented his work on '*Carcass Disposal and Inter-site Variability*'. Lee's research focused on the cultural variability in methods of carcass disposal at sites in Ethiopia and Mongolia. The site in Ethiopia has a mild climate all year round with minimal fluctuations in temperature. Animals are disposed of in a variety of ways. Old animals were lead away from the site and left to die and here they inevitably found there way into pits or ditches which may have provided some shade during the last hours of life. Diseased animals were deliberately buried to reduce the risk of infection though both methods of disposal resulted in a large number of articulated skeletons in pits and ditches. This case study highlights how articulated skeletons, which are often interpreted as evidence of ritualistic acts, may simply be evidence of good husbandry practice. Lee's second case study focused on sites in Mongolia which has a varied climate with big fluctuations in temperature between summer and winter. Sites are occupied seasonally and during the long winter months, when the ground is too hard to dig, carcasses are burnt. As the winter climate lasts for 8 months, Lee was able to analyse seasonal occupation by comparing the percentage of burnt, unburnt and calcined bone with the theory that a greater quantity of burnt and calcined bone would be found on sites that were occupied during the winter months.

The second presentation by Hannah Russ was entitled "Taphonomy of Fish Remains". Due to the small and fragile nature of fish bone, taphonomic processes often lead to a loss of bones rather than modification. The effects of a number of taphonomic factors including butchery, burning and gnawing were analysed as part of Hannah's PhD research. In summary, it was found that butchery marks were only easily recognisable on large fish and modification such as trowel marks could be easily misidentified as evidence of butchery on smaller species. When experimenting with burnt material, it was discovered that if fish were cooked at a temperature high enough to produce evidence of burning on the bones then the flesh would be inedible. Burnt fish bone does not provide evidence of consumption but of disposal. Hannah emphasised the need to ascertain the accumulation agent when studying archaeological fish bone as assemblages are often presumed to be human in origin when there are many animals, including wolves, bears and predatory birds, that may be the source. Various experiments have been carried out to test the effects of digestion on fish bone. Andrew Jones found that digestion by rats completely destroys the bone and Rebecca Nicholson's work on otter spraints revealed that these animals produce distinctly modified material. Hannah has attempted to undertake experiments in order to analyse the effects of consumption and digestion by Eagle Owls though her work was hampered by fussy appetites as the birds would not eat the fish unless the fish were placed inside rats to disguise them. The talk concluded with a discussion about the difficulty of interpreting fish bone assemblage, not only because of the factors listed above but also because of the diverse uses and hunting strategies humans adopt for fish.

Richard Madgwick then went on to discuss "Statistical approaches to modification prevalence in middens". As part of his PhD research, Richard applied statistical techniques, including binary and ordinal regression to analyse the effects of weathering, trampling and gnawing on archaeological animal bone assemblages. The preliminary study incorporated c.40000 fragments of bone from 11 British sites that ranged in date from the Bronze Age to Medieval period. The effects of species, age, sex, element representation and site type on weathering, trampling and gnawing were presented in a "Classification Tree" which ranked the variables in order of statistical significance. Element distribution and taxon had the greatest effect on the prevalence of weathering and gnawing whereas the prevalence of trampling was greatly

affected by site type. These results were used to analyse the animal bone assemblage from a large, late pre-historic midden. The midden had been excavated in spits and the level of weathering in each spit was compared using the Mann Whitney-U and Chi-Squared tests. The results showed that a number of spits with a similar species and element distribution were significantly more weathered than others which helped to identify when the midden had been rapidly filled and when it had been left exposed.

Jen Browning and Matilda Holmes presented our penultimate talk on “Bodies to bones: a fresh attempt at a fragmentation index”. This is an attempt to devise a way of quantifying preservation rather than relying on descriptive and often vague terminology. The fragmentation index compares the completeness of bones and is based on the zoning system outlined by Dale Serjeantson, a technique that many of us, though by no means all, use on a regular basis. In order to calculate the FI index, a three step method has been devised:

Step 1

Calculate the total number of zones present (completeness stage) on each fragment in the assemblage and tabulate the total number of fragments represented at each stage of completeness.

Step 2

Work out the proportion (%) of the assemblage represented by each completeness stage

Step 3

Multiply the % of fragments by the completeness stage to determine the fragmentation score (Z) for each level of completeness. The maximum score would be 800 i.e. – 100% of the assemblage is complete and all bones are recorded with 8 zones.

The formula for the fragmentation index is;

$$\mathbf{FI = \frac{\text{sum } Z}{N \times 100}}$$

Where Z = (% fragments x completeness stage) for all completeness stages; N= number of zones

This formula was tested on two previously recorded sites, Bath Lane and Enderby, and was used to compare the preservation of different species and elements. However, it was noted that using the formula as it stands has limitations and restrictions, such as not being able to take into account the variation in the size of the zones or the non-recordable and unidentifiable elements. Members were asked to trial the fragmentation index on their own work and contact Jen and Mattie with results and suggestions. The formula and step by step guide will be posted on the PZG Social network (at zooarchaeology.ning.com) by Jen and Mattie.

The final talk of the day was given by Claire Rainsford, York Archaeological Trust, on “Discard, retention and taphonomy in action”. A vast quantity of animal bone has been retrieved from area H1, Hungate, York and excavations are still ongoing. Due to lack of storage space in the archives, a rapid assessment technique has been adopted, the results of which will contribute to the formulation of a discard policy. The assessment of the bone involves commenting on the assemblage’s extrinsic value on a context by context basis. The extrinsic value of the assemblage is decided with reference to size, species composition, element representation, taphonomy and context information. A database will be produced that includes all of the assessment information though material will only be retained if it has research value.

During the discussion following Claire’s talk, it was recognised that a lack of storage space is an ongoing problem that is already being addressed by archivists. Members suggested that Zooarchaeologists and archivists get together to discuss retention and discard policies based on the principles applied to the Hungate assemblage though policies will vary depending on the site and the research aims.

Following a general discussion and lunch, Matilda Holmes discussed the results of the butchery questionnaire and Fay Worley proposed topics for future meetings.

Members were then ushered to the Hungate site for a quick tour of both the excavation area and the site offices. Claire Rainsford laid out a small quantity of material she has recently been working on and talked about the information she was recording at the assessment stage. She then asked members for their thoughts on what should be recorded and there was a general agreement that this would be influenced by what is already known about the site and key research questions identified prior to excavation.

The afternoon concluded back at The Kings Manor with a practical session where, down in the animal bone laboratory, Terry had laid out several small assemblages in various states of preservation. Members were asked to discuss how they would describe the preservation of each assemblage, what they would record, how they would record it and what this information could tell us.

Minutes submitted by Gemma Ayton, July 26, 2011

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