# Heslington East, York
# North Yorkshire

## Animal Bone Assessment

*Summary*

*The animal bone assemblage recovered from excavations at Heslington East on the outskirts of York is predominantly Roman in date. Give the location of the settlement, understanding its relationship with the fortress and colonia of York is important, as well as links it may have had to wider trade and exchange systems. Preliminary observations suggest an arable economy supported by livestock management. The availability of prime meat at the site indicates that not all high-value resources were inexorably drawn into the urban centre.*

ARCHAEOLOGICAL
SERVICES
WYAS

## Report Information

| | |
|---|---|
| Client: | Cath Neal |
| Address: | Department of Archaeology, The King's Manor, York, YO1 7EP |
| Report Type: | Animal Bone Assessment |
| Location: | Heslington East, York |
| County: | North Yorkshire |
| Grid Reference: | SE 644 512 |
| Period(s) of activity represented: | Bronze Age, Iron Age, Roman, post-Roman |
| Report Number: | 2325 |
| Project Number: | 3844 |
| Site Code: | HE08, HE09, HE10, HE11 |
| Date of analysis: | January to March 2012 |
| Date of report: | March 2012 |
| Project Management: | Jane Richardson BSc MSc PhD MIfA |
| Report: | Jane Richardson |

Authorisation for distribution: ----------


PO Box 30, Nepshaw Lane South, Morley, Leeds LS27 0UG
Telephone: 0113 383 7500.
Email: admin@aswyas.com

# Contents

## List of Plates



## List of Tables



## Acknowledgements

ASWYAS are grateful to Cath Neal for the opportunity to analyse and record such a large and interesting assemblage. Cath has been gracious with her time and prompt in providing the relevant site information. The author has also been commissioned to report on the assemblage excavated by On-site Archaeology as past of the same excavations. Ultimately the data from both assemblages will be combined into a single stand-alone report.

# 1 Introduction

Archaeological Services WYAS (ASWYAS) was commissioned by Dr Cath Neal of York University to assess the animal bones recovered from extensive excavations of pre-Roman, Roman and post-Roman features undertaken prior to the development of a new university campus at Heslington East, York. The animal bones have been fully recorded at this preliminary stage, but to date the resulting data have only been assessed as to their potential to elucidate diet, animal husbandry and livestock trade. Further, more detailed, analysis of the data is required.

# 2 Aims and Objectives

With reference to the project's research design, important issues to be considered are how quickly was the impact of the arrival of legions north of the Humber felt, and how this affected landscape exploitation, and the existing farming community occupying the Heslington East site (Roskams 2009). Close to two Roman roads emerging from the fortress, it is also important to establish what role the settlement may have played in feeding the fortress and later the *colonia*, and whether it was involved in trade and exchange beyond the city.

Ultimately it is expected that the animal bone assemblage excavated by On-site Archaeology as part of the same development will be incorporated into a single larger dataset. This should allow the research objectives of the project to be better meet, than is currently the case here.

# 3 Methodology

All hand-collected animal bone fragments were examined and entered onto an Access database. Diagnostic zones (which by definition are easily identifiable and non-reproducible) were also noted, allowing for the calculation of a minimum number of anatomical zones. Those recovered as a result of soil sample processing were largely tiny unidentifiable fragments, and were only added to the database if they included a diagnostic zone. In total, 16587 fragments were recorded onto the database (Table 1), of which only 3384 bone fragments (20%) were identified as diagnostic zones (Table 2). Definitions of the zones used, as well as details of the Access database, are held with the site archive.

The data are tabulated by phase (and other categories) as follows:

- A: Bronze Age/pre-Roman Iron Age;
- B: 1st-early 3rd century AD;
- C: 3rd-early 4th century AD;
- D: late 4th century AD;
- E: 5th-9th century AD (at this assessment stage, this phase has yet to be clearly defined);

- F: 10th century AD+;
- G: post-medieval;
- Currently undated (features that have been assigned to groups but have yet to be dated),
- UP: unphased (predominantly cleaning spits).

Bones were identified to species wherever possible. The separation of sheep and goat bones was routinely attempted, using the criteria of Boessneck (1969) and Payne (1969, 1985). It is also difficult to separate the bones of the closely related domestic fowl (Gallus gallus) and pheasant (Phasianus colchicus) and they tended to be separated (subjectively) on size. In addition, the possibility that donkey or mule are present within the 'horse' assemblage is acknowledged, although neither was identified when teeth were checked against the criteria of Churcher and Richardson (1978) and Armitage (1979). Donkey and mule bones from Roman Britain and even Iron Age contexts are known, albeit in small numbers (Johnstone 2010, 20). As such, while it was not always possible to fully separate the equid and galliforme remains, they are assumed to be horse and chicken respectively.

For age-at-death data, epiphyseal fusion (after Silver 1969) and the eruption and wear of deciduous and permanent check teeth were considered. Dental eruption and wear for cattle, sheep and pig were recorded using the letter codes of Grant (1982) and age stages were calculated using Halstead (1985) for cattle, Payne (1973) for sheep and a similar wear progression was assumed for pig. The eruption and wear of horse incisors were also noted (after Silver 1969), although as the incisors were so often loose, broad age categories were used. The sexing of the cattle and sheep populations was achieved with reference to the sexually dimorphic distinctions of the pelvis (after Prummel and Frisch 1986, 575), while the sexually dimorphic tusks of pigs were noted.

Bone condition, erosion and fragment size were recorded in order to assess bone preservation, while gnawing, burning and butchery marks were noted to determine bone treatment. Butchery was routinely differentiated into chop and cut (knife) marks and the position and direction of these marks were recorded.

Finally pathological bones were described, and biometrical data were recorded following the standards given by von den Driesch (1976). Unfortunately given the level of fragmentation, only 79 bones proved measurable. Withers' heights for horses were estimated using calculations devised by Kiesewalter (1888 in von den Driesch and Boessneck 1974), with the heights expressed in hands, where 1 hand equals 4 inches (i.e. 101.6mm). For cattle, factors detailed by Fock (1966), for sheep those detailed by Teichert (1975) and for dog those detailed by Harcourt (1974) were used.

Unfortunately not all the bone has been washed and, as a result, butchery and gnawing marks in particular may have been missed.

## 4 Results

Currently only sufficient diagnostic zones from late Roman deposits (Phase D) are available for detailed analysis (Table 2), based on a minimum reliable sample size of around 500 (with reference to a number of statistical parameters, after van der Veen and Fieller 1982, 296). As a result, the results below focus on this phase of activity. Comparisons by phase may be possible once the final phasing has been established, but currently the dataset is not sufficiently large to assess the impact of the founding of the legionary fortress *c*. AD 71 and the subsequent development of the *colonia*. It is hoped that with the addition of faunal data from the excavations by On-site Archaeology, such comparisons will be possible in the future.

*Bone condition*

In order to assess the usefulness of the bone assemblage for the reconstruction of animal husbandry practices, dietary intake, and trade and exchange, relevant taphonomic processes such as butchery techniques, trampling, gnawing, weathering, burial conditions and excavation strategies need to be considered.

Most bones were recovered during the hand excavation of deposits, which is known to bias against the smaller bones of the smaller taxa most severely (Payne 1992, 1). Fortunately bulk soil samples were also routinely taken and processed, with 113 of these samples producing *c*. 2000 fragments of bone, of which 355 warranted further recording. As expected, a significant proportion of the smaller taxa, in particular the voles, shrews, other small mammals and the frog/toad bones were recovered in this way. In addition, all three fish bones were retrieved from the samples.

In an attempt to determine how deposits were formed, bone preservation, surface erosion and gnawing were assessed and articulated bones were noted. Undisturbed, so-called primary, deposits are most clearly indicated by articulated parts. These were most commonly recorded from the late Roman well (Group 111) where partial sub-adult red deer, juvenile cattle and puppy skeletons were noted. A partial dog skeleton was also recovered from a late Roman ditch (Group 3), a pig skeleton came from a later Roman pit (Group 38) and a sheep/goat skeleton was associated with a currently undated spread (Group 24). In contrast, the disarticulated assemblage is more likely to have been exposed to the effects of trampling and weathering prior to final disposal, and may also have been middened. Certainly the assemblage is highly fragmented and eroded bone surfaces are fairly commonplace. These will have influenced the poor recovery of metrical data and potentially the levels of butchery marks noted. In contrast, gnawing both by dogs and rodents, although present, appears to have had less of an impact on the surviving assemblage. Burnt bones were also relatively rare.

Still to analyse is any variation in bone preservation and treatment by phase or feature type. It was noted that certain deposits contained very poorly preserved bones that are cracked,

flaking and fragile. From such contexts, loose teeth tend to predominate. The significance of this variation will be assessed once the final phasing has been established.

*Taxa present*

Cattle (and cattle-sized) bones dominate the Phase D assemblage (Table 2), with sheep (and sheep/goat) apparently contributing much less to the inhabitants' diet. Pigs may have contributed a similar quantity of meat as sheep, given their greater body size. Chickens and goats were rarely consumed and fish even less so, a pattern of consumption also seen in the nearby town (O'Connor 2000, 54). Given a Roman taboo on the consumption of horsemeat, it is unlikely that this animal was consumed, at least by the later Roman period. Despite this, 19 horse bones from Phases C/D and D display butchery marks, some of which are indicative of dismembering. Of the 67 red deer bone fragments from Phase D, 54 came from the well with the majority associated with a single sub-adult animal, that had been butchered. From the same feature, a complete antler from a mature male was also recovered.

*Age data*

Cattle dental wear and eruption data from Phase D deposits reveal similar slaughter patterns to those already observed from Roman York: relatively few juvenile and sub-adult animals and greater numbers of adult or old animals (O'Connor 1988, 86; 2000, 50). Assuming that the settlement at Heslington East was a producer site, such a pattern of slaughter may suppose the dispatch of prime meat animals to the easily accessible market of York's fortress and *colonia*. Given the similar dearth of prime meat livestock from the town, however, albeit from one part of the *Praetentura* (O'Connor 1987) and one limited area within the civilian settlement (O'Connor 1988), it seems more likely that this producer site was focusing on diary and traction cattle and was not engaged in raising animals specifically to supply the urban market. The cattle assemblage from Phase D contains 22 jaws, 28 loose third molars and four deciduous fourth premolars.

Sheep dental wear data from the same period reveal few lambs, with the majority of animals killed for their meat as young adults or maintained into adulthood for wool clips, milk and for breeding. The greater proportion of lambs noted from York (O'Connor 1988, 88) suggests that surplus livestock from Heslington East may have been dispatched to the city's market in order to free up milk (cheese and butter) for human consumption. The presence of prime meat animals at Heslington East, however, indicates that the city was not a sufficiently large market to draw in all available resources, or the inhabitants of this site were wealthy enough to raise or acquire animals specifically for meat. The sheep assemblage from Phase D contains ten jaws, 24 loose third molars and two deciduous fourth premolars.

Pigs, as might be expected, were typically slaughtered at an optimal age for meat production. Three mandibles from Phases C/D and D, however, came from much older animals (the third molar at wear stage D-F). Presumably these were valuable sows or boars that were maintained for their breeding prowess. As a guide to the size of the dataset, the pig assemblage from Phase D contains nine jaws and one loose third molar.

Horse is represented by both sub-adult and adult, but not juvenile, animals.

Preliminary observations suggest that during the later Roman period, the inhabitants of Heslington East may have focused on agrarian production, and consequently maintained valued traction cattle to an advanced age. Sheep will have provided wool clips and milk, but prime sheep and pigs were also available for consumption. Aged pigs, presumably breeding animals, indicate localised production, despite the apparent absence of neonatal pig bones. In addition, all livestock would have been vital for their manure to ensure the ongoing productivity of the arable fields.

*Metrical data*

Very few bones proved to be measureable, but withers' heights can be calculated for horse, cattle, sheep and dog, albeit from only a few specimens. Relatively to their proportion of the assemblage, horse bones were more commonly measureable than the other taxa. This is due to their bones tending to remain whole, probably indicating that they were not, or very rarely, consumed.

*Pathological bones*

Pathological cattle, horse, sheep, goat and pig bones have been noted. Oral problems, particularly periodontal disease is notably rare. There appears to be a greater tendency for cattle and horse bones to display pathological changes compared to the smaller taxa, and damage to joints suggests that this might be related to the use of cattle and horses for traction and/or as pack animals. Congenital abnormalities of the teeth (absence of the second premolar and the absence or reduction of the third cusp of the third molar) were noted for cattle only.

*Butchery*

Cattle, horse, sheep, pig, goat and red deer bones display butchery marks. The butchered deer bones include worked/sawn antler fragments, but cut marks to a few limb bones suggests that venison was occasionally available. Butchery to the domestic meat animals (excluding horse) is indicative of dismembering in the main, although meat removal is also noted. No definitive skinning marks were seen. Dumps of heavily chopped up limb bones, presumably for the extraction of marrow or for stock, as seen at Tanner Row, Rougier Street and Wellington Road (O'Connor 2000, 54-55), are not present here. Four examples of cattle scapula modified for smoking or steeping in brine were noted (Plate 1), while a red deer scapula may have been similarly treated.

Plate 1. Detail of a cattle scapula showing hook damage

## 5 Recommendations for Final Reporting

The bones have been adequately catalogued at this assessment stage, and only a few queried bones require further analysis, preferably with access to the reference collection held by the Department of Archaeology, University of York. A decision as to whether the amphibian bones require further attention will be made once the integrity of the archaeological deposits from which they came has been determined.

The pre-Roman and medieval assemblages are unlikely to be of sufficient size to warrant further investigation, although with the inclusion of the assemblage excavated by On-site Archaeology, this may be subject to change.

Following final revision of the phasing, it is recommended that the Roman data are subject to further interrogation. The presentation of tabulated data for age, sex and represented body parts for the main taxa is required and graphs displaying slaughter curves for cattle and sheep are proposed. In addition, the late Roman well deposits (Group 111) should be compared to the other late Roman material. It is likely, given the articulated nature of much of the animal bone, that the well was rapidly backfilled and may represent a ‘closure’ deposit. The well at Dalton Parlours (Wrathmell and Nicholson 1990), and the recently analysed example from Rothwell Haigh (Cool and Richardson, forthcoming 2013) are of similar date and should be used for comparison.

Other so-called ‘native’ sites, also occupied at the time the Roman army arrived, are known in the vicinity of York (Ottaway 2004, 27-29). Comparison of agricultural practices at these sites, for example Naburn and Rawcliffe Moor, should be attempted where data are available, and also compared to relevant deposits from the city (e.g. O’Connor 1987; 1988). Assuming that the legion at York took an area, or *territorium*, under its control, a practice that occurred elsewhere in the empire (Ottaway 2004, 53), surely local settlements such as Heslington East would have been subsumed? The implications of this for those living at Heslington East

should be assessed, and hopefully with the addition of data from the On-site Archaeology excavations, the animal bone assemblage may facilitate such research.

Publication-quality photographs of the butchered cattle scapula and perhaps some of the pathological bones are recommended.

## 6 Conclusions

The animal bones from the site at Heslington East are predominantly associated with the later Roman period. These indicate a settlement that may have been focused on arable production with livestock providing valuable manure and in the case of cattle and horses, important traction/pack capabilities. Prime meat from sheep and pigs, indicative of the inhabitants' wealth but perhaps also a reflection of the relative weakness of the city's market, was available for consumption.

Following the analysis of the animal bone from On-site Archaeology's excavations, and the finalising of the phases, further data manipulation and interpretation of this assemblage will be required.

## Bibliography


Armitage, P., 1979. 'Jawbone of a mule from the Roman levels, Billingsgate Buildings (TR 74), City of London' London Archaeol. 3, 340-345

Boessneck, J., 1969, 'Osteological difference between sheep (*Ovis aiies* Linne) and goats (*Capra hircus* Linne)', in D. Brothwell and E. Higgs (eds), *Science in Archaeology*, 331-358

Churcher, C. S. and Richardson, M. L., 1978. 'Equidae' in V. J. Maglio and H. B. S. Cooke eds., *Evolution of African Mammals* (Harvard University Press: Cambridge), 379-422

Cool, H.E.M. and Richardson J., forthcoming 2013, 'Exploring ritual deposits in a well at Rothwell Haigh, Leeds', *Britannia* (submitted 2011)

Fock, J., 1966. *Metrische Untersuchungen an Metapodien Einiger Europäischer Rinderrassen*, unpublished dissertation, Univ. Munich

Grant, A., 1982, 'The use of tooth wear as a guide to the age of domestic ungulates' in B. Wilson, C. Grigson and S. Payne (eds), *Ageing and Sexing Animal Bones from Archaeological Sites*. Br. Archaeol. Rep., Br. Ser. 109, 91-108

Halstead, P., 1985, 'A study of mandibular teeth from Romano-British contexts at Maxey' in F. Pryor, C. French, D. Crowther, D. Gurney, G. Simpson and M. Taylor, *Archaeology and Environment in the Lower Welland Valley Volume 1*, 219-224

Harcourt, R.A., 1974, 'The dog in Prehistoric and early Historic Britain', *J. Archaeol. Sci.* 1, 151-175

Johnstone, C., 2010, 'Donkeys and mules', in T. O'Connor and N. Sykes (eds), *Extinctions and Invasions. A Social History of British Fauna*, 17-25

O'Connor, T.P., 1987, *Bones from Roman to Medieval Deposits at the City Garage, 9 Blake Street, York*. Ancient Monuments Lab. Rep. 196/87

O'Connor, T.P., 1988, *Bones from the General Accident Site, Tanner Row. The Archaeology of York. The Animal Bones*, Fasic.15/2, York Archaeol. Trust

O'Connor, T., 2000, 'Bones as evidence of meat production an distribution in York', in E. White, (ed.), *Feeding a City: York. The Provision of Food from Roman Times to the Beginning of the Twentieth Century*, 43-60

Ottaway, P., 2004, *Roman York*

Payne, S., 1969, 'A metrical distinction between sheep and goat metacarpals' in P. J. Ucko and D. W. Dimbleby (eds), *The Domestication and Exploitation of Plants and Animals*, 295-305

Payne, S., 1973, 'Kill-off patterns in sheep and goats: the mandibles from Asvan Kale' *Anatolian Studs* 23, 281-283

Payne, S., 1985, 'Morphological distinctions between the mandibular teeth of young sheep, Ovis and goats, Capra' *J. Archaeol. Sci.* 12, 139-147

Payne, S., 1992, *Some notes on sampling and sieving for animal bones*. AML Rep. 55/92

Prummel, W. and Frisch, H-J., 1986, 'A guide for the distinction of species, sex and body size in bones of sheep and goat' *J. Archaeol. Sci.* 13, 567-577

Roskams, S., 2009, *Roman Occupation at Heslington East. Project Outline and Research Design*

Silver, I. A., 1969. 'The ageing of domestic animals' in D. Brothwell and E. Higgs eds., *Science in Archaeology*, 283-302

Teichert, M., 1975. ‘Osteometrische Untersuchungen zur Berechnung der Widerristhöhe bei Schäfen’, in A.T. Clason (ed.), *Archaeological Studies*, Amsterdam, Elsevier, 51-69

van der Veen, M. and Fieller, N., 1982, ‘Sampling seeds’, *J. Archaeol. Sci.* 9, 287-298

von den Driesch, A., 1976, *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum of Archaeology and Ethnology, Harvard University: Cambridge

von den Driesch, A. and Boessneck, J., 1974, Kritische Anmerkungen zur Widerristhöhenberechnung aus Längenmassen vor- und frühgeschichtlicher Tierknochen. *Säugetierkundliche Mitteilungen* 22, 325-48

Wrathmell, S. and Nicholson, A. 1990, *Dalton Parlours. Iron Age Settlement and Roman Villa*. Yorkshire Archaeology 3