

# *Reports from the Environmental Archaeology Unit, York*

**Material assessment of the animal bone assemblage from  
Flixborough**

by

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**Summary**

This report assesses the quality and quantity of the animal bone assemblage from excavations at Flixborough, S. Humberside as a prelude to an integrated assessment of bioarchaeological remains.

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## Excavation

Quarrying for sand during 1988 revealed an important Middle Saxon rural site near the village of Flixborough, South Humberside. Rescue excavations began in September 1989 and continued for twenty months, and revealed a series of at least fourteen rectangular buildings in three major areas, representing a minimum of three structural phases dated from 700-900 A.D. Typically these structures were aligned east-west, with foundation trenches where timber buildings would have been set in sockets. One particular building was unique to the site and consisted of timber uprights positioned in discrete post-pits with shallow sills running between them. The lack of evidence of building materials suggests that all the buildings were timber-clad and probably had thatched roofs.

The large quantity and high quality of the finds suggested that the settlement was a high status site which may have had monastic or even royal connections.

Rural settlement sites of Middle Saxon date are scarce and knowledge about the period relatively scant. Since this important site was discovered by commercial quarrying and imminently threatened, excavations were imperative to recover information about the nature and status of the site, aspects of its economic basis and evidence of specialist functions.

## General comments

### Dating

Occupation at the site has been divided into five major periods with periods 2, 3 and 4 representing possible Roman through to medieval occupation of the site. Period 3 represents the Anglo Saxon occupation within which five site-wide sub-phases have been defined on the basis of artefact research. The overwhelming majority of this very large bone assemblage is dated to the Middle Saxon

period (i.e. early 8th-late 9th century). This renders it extremely important in terms of the rarity of comparable assemblages of this date both regionally and nationally. The ability to further divide the assemblage into very tightly dated sub-phases will allow us to produce statistically valid data sets for each, thus potentially enabling us to highlight very short term changes in exploitation or husbandry practises.

## Recovery

### i) Main assemblage

Recovery procedures at Flixborough followed E.A.U. directives in screening, bulk sieving and sampling for bone and other biological material. These were set out prior to excavation in consultation with the E.A.U. and carried out throughout the project. 50% of every context was dry screened through 10 mm mesh. Bone fragments from the remaining proportion was collected by hand. Unfortunately these separate assemblages were subsequently amalgamated and comprise the main animal bone assemblage. This main assemblage consists of 2511 bags (650 standard boxes) of bones from 1050 contexts.

### ii) Samples

A total of 1759 whole earth samples were taken during the excavation. For 1086 of these, sub-samples, usually of about 10-20 kg (range 2-23 kg, mean 13.8 kg), were wet sieved on site (using 1 mm mesh for residues), the residues being dried bagged and boxed but not sorted. 'Voucher' sub-samples of 2 kg were retained for these and for the remaining 673 samples the whole sample was left unsieved.

Bulk sieved and voucher samples will not only ensure the systematic recovery of good samples of birds, small mammals and fish, but will also allow us to apply quantification procedures more accurately which will provide a systematic control over the main

assemblage. This is important since amalgamation of hand collected and dry screened material will have almost certainly created a bias in the main assemblage.

### Preservation

The presence of the material in wind-blown sand, coupled the sheer quantity of animal bone, have all contributed toward the quite exceptional preservation of the majority of the assemblage. The reasons for this exceptional preservation is partly discussed by Canti (1992). Although some material appears eroded, (particularly from occupation deposits and dark soils) the majority seems to have been incorporated into the deposits relatively rapidly, with little evidence of both physical and chemical alteration. Although a large proportion of fragments show evidence of extensive carnivore gnawing, the complete absence of canid remains from the assessment sub-sample is significant.

Little of the major bone deposits appears to have suffered fragmentation by compaction. Thus high numbers of measurable fragments, including mandibles with complete tooth rows, survive.

### The main assemblage (excluding wet-sieve samples and residues)

The main assemblage in total consists of 650 standard boxes weighing approximately 5000 kg, from a variety of context types. The main context types include:

**Dark soils:** 50 boxes. Abandonment phase overlying occupation

**Ditch/trench:** 36 boxes. Filled with slumped material

**Occupation** boxes. Fragmented and eroded material

**Pits** boxes. Filled with slumped material from dumps

**Dumps:** 315 boxes. Large quantities of well preserved bone with some degree of variation

between different areas.

**Soakaway** boxes. Filled with slumped material

**Special deposits** two animal burials in ditch.

### Sample contexts examined

**Dark soils:** 5 boxes of material from 4 spatially distinct contexts were examined: the material was relatively eroded; 229 'A'-bones (see Payne, Guidance note on assessments of animal bone collections), mostly sheep/goat, cattle, pig, goose, fowl, and 7 additional unidentified bird fragments; some horse, one fragment of roe deer and a cetacean vertebral fragment.

**Ditch/Trench:** 3 boxes from two contexts were examined: the preservation was good; 175 'A' -bones, mostly sheep/goat cattle pig goose and fowl. Some horse, 6 additional bird fragments and 1 cetacean skull fragment.

**Occupation deposits:** 5 boxes from 3 separate contexts were examined: the preservation varied from highly fragmented and eroded to very well preserved; 221 'A'-bones, mostly sheep/goat, cattle pig, goose and fowl; 1 burnt cat scapula.

**Pits:** 5 boxes from 3 contexts containing large quantities of bones and one possibly containing primary fill were examined: Again preservation was variable but mostly very fragmented; 159 'A'-bones, this time contained more cattle and pig than sheep/goat fragments (1 goat). Goose and fowl again common and 5 additional bird fragments including 2 certain and 1 possible crane fragment; 3 fish vertebrae also present.

**Dumps:** 28 boxes were scanned rapidly from 7 distinct dump deposits. Thus a range of dump deposits were viewed in order to ensure adequate scanning of material. Preservation was consistently very good with little fragmentation or erosion; 1830 'A'-bones, including mostly sheep/goat (3 goat fragments) cattle pig goose and fowl; a number of horse fragments were present, 5 cat

fragments, 2 hare fragments, 3 cervid fragments; 50 additional bird bones include 17 possible crane fragments; 18 fish fragments, and 2 cetacean fragments.

**Animal burials/special deposits ?:** 2 mature cattle burials of 1 relatively complete large individual and 1 smaller less complete animal, both in the surrounding ditch with no supposed ritual significance; complete well preserved long-bones.

## Species and Numbers

It was originally envisaged that 10% of the assemblage would be viewed but, since little variation was noted between the various groups, it was felt that viewing more than 7% would prove less cost effective for the amount of additional information that would be provided. In the event 2768 bones were identified to species, (excluding skull, vertebrae, ribs and shaft fragments) from approximately 7% of the total assemblage. This would suggest that there may be as many as 35,000 identifiable bones ('A'-bones) and 140,000 bone fragments ('B'-bones, i.e. including skull fragments etc.) present in the whole assemblage.

On the basis of sample counts there are likely to be:

7200 cattle 'A'-bones (including about 300 mandibles with full mandibular tooth rows, 1240 partial tooth rows, 1850 ageable isolated teeth and 2330 measurable bones),

6700 sheep/goat 'A'-bones (including about 470 mandibles with full mandibular tooth rows, 730 partial tooth rows, 1660 ageable isolated teeth and 1870 measurable bones),

4530 pig 'A'-bones (including about 490 mandibles with full mandibular tooth rows, 1000 partial tooth rows, 450 ageable isolated teeth and 1350 measurable bones),

600 horse, 5000 goose, 4700 chicken, and 350

Crane fragments.

## The wet-sieve assemblage

Much of the general information regarding the assessment of biological remains from the samples taken during excavation is presented in Dobney *et al.* (1994). However, since the animal bone assemblage makes up such a large proportion of these remains, it is necessary to deal with them in more detail.

86 BS samples from 21 contexts were selected by D.G. Tomlinson and examined and provisionally recorded in the store at H.A.U. in November 1991. These represented a series of context types mainly from periods 2-3, 3 and 4-5, (see table 1 in Dobney *et al.* 1994). On the basis of these limited preliminary observations it was clear that the most productive feature types for small bone fragments appeared to be period 3-4 dumps and soakaways. Six residues from which appeared very bone rich in this initial examination were brought back to the EAU and recorded in more detail.

Table 1 shows the representation of different taxa, their relative proportions and (in the case of fish and birds) the potential diversity within each sample. Large mammals (i.e. the major domesticates) pre dominate in all those samples both viewed and recorded. Unfortunately this fraction is invariably very fragmented and as a result numbers of both identifiable and measurable (i.e. 'A' bones) are present. Thus any additional information which will be available will be relatively limited. However, the amalgamation of material from numerous samples will provide statistically valid samples which can be used to provided detailed quantitative data on the relative importance of species. This will be crucial in providing a check on the main assemblage.

Although not represented in large numbers, the remains of birds are at least present in the majority of samples viewed, not surprising since they make up a large proportion of the

main assemblage. From the recorded residues they are most common from period 3 deposits. Their diversity in these samples is also moderate, where additional wild species such as woodcock and lapwing were identified. There is no doubt that the wet sieve assemblage will produce a moderate assemblage of additional bird species which will provide more detailed insight into local environment as well as information on the possible season and method of exploitation.

Fish were noted as being present in 19 (22%) of the 86 samples viewed. From those contexts recorded in detail, fish was present in all, being recorded as common in two and abundant in one. Diversity was high in all three and represented species of freshwater, marine and mixed preferences. These included, eel, grayling, smelt, flounder, burbot, perch, eel, dace, chub and mackerel. A tentative identification of a schelly/gwiniad/finnock (*Coregonus* c.f. *laveretus/autumnalis*) is extremely interesting since it is thought that this species became extinct in eastern rivers during the early post-glacial period. Fish scales were also present (all identified as perch) in small numbers from both period 3 deposits. Due to quantitative recovery and systematic sampling, an extremely important moderate-sized fish bone assemblage is also available from Middle Saxon Flixborough. As well as addressing what species were exploited, relative proportions will provide information on species availability, seasonality, cultural preferences and method of capture, as well as data regarding possible water body size and rates of flow. The possible presence in the assemblage of whitefish will provide extremely important biogeographical data

### Comparative assemblages

An important regional comparison can be made with the assemblage from the large Anglo-Saxon settlement of West Heslerton, and Wharram Percy, North Yorkshire. In addition, the Anglian material from

Fishergate, York, would provide a further important regional contrast. Other medium to large Saxon rural assemblages, with which comparisons could be made, include West Stow, Suffolk (Crabtree 1989), Staunch Meadow, Brandon, Suffolk (Crabtree in press), North Elmham, Norfolk (Noddle 1980), Thetford, Norfolk (Jones 1984), Wicken Bonhunt, Essex (Stevens unpublished) and St Albans Abbey, Hertfordshire. Those from urban contexts include Hamwih, Southampton (Bourdillon and Coy, 1980) Flaxengate, Lincoln (O'Connor 1982), Ipswich (Stevens, unpublished), Jubilee Hall, Maiden Lane, Barking Abbey and Westminster Abbey, London (West in prep).

### Implications

The quantity of animal bone, coupled with the quite superb preservation and systematic sampling procedures undertaken on-site, makes the animal bone from Flixborough one of the largest, most important, Middle Saxon assemblages so far recovered from England. Evidence for the economy of the Middle Saxon period is scant, not only for the North East, but for the country as a whole. This faunal assemblage is therefore not merely of regional but of national importance.

Thus a detailed study of the animal bones from Flixborough will provide much specific information regarding the extent to which wild resources were utilised, both locally and further afield; the range of husbandry regimes employed for the various domestic species at the site; techniques of butchery; specialist industrial activities; as well as information regarding the immediate and surrounding environment. Artifactual and architectural information may point to Flixborough being a monastic or high status settlement. This may well be corroborated by zooarchaeological data in terms of the range of species present, the types of husbandry regimes and whether there is any evidence of trade in livestock and the introduction of improved breeds.

## Academic objectives

In terms of the overall academic objectives of the project, as defined by Tomlinson *et al.* (1993), a study of the animal bones will be of value in addressing academic objective (i), i.e. evidence relating to the understanding and interpretation of the site. Within this heading, objectives (b) (concerning human activities) and (f) (concerning the status of the settlement) are relevant. In addition detailed study of the animal bones will address objective (ii), i.e. placing the settlement in its local and regional context. Within this heading objective (d) is most relevant, i.e. establishing Flixborough's position in the regional economy of Lindsey. Within objective (iii), i.e. assessing the relevance and importance of the Flixborough material for a wider understanding of Saxon culture, objective (a), comparisons of assemblages from similar sites, and (g), general considerations of UK and continental 'wics', is important.

The contribution of the Flixborough animal bone assemblage to the general archaeological objectives, outlined in *Exploring our Past* (1991), fall into three categories:

- **Processes of change** (EOP 35-37), where amongst others, the early medieval period (c. 350-700 AD) is targeted.
- **Landscapes** (EOP 37-39), where the development of medieval rural settlement patterns (between 700-1200AD) are highlighted
- **Patterns of industry and craftsmanship** (EOP 42-43)

Payne (1993), in addressing these priorities in terms of the use of zooarchaeological assemblages, points out that, to best address these questions, it is essential to recover and study sequences of comparable assemblages from the same site where stratification, recovery and preservation is good and the

assemblages are large. Integration of other lines of evidence is also stressed in sequences with fine chronological resolution. Priorities for the Saxon period include early, high quality and well dated assemblages from rural sites.

Payne also highlights broad national zooarchaeological priorities and objectives which, for Flixborough, will include:

- **The use of wild resources**
- **Marketing and trade** (i.e. status and diet/ the development of rural markets)
- **Seasonality of resource use**

In the light of these objectives and priorities, the animal bone assemblage from Flixborough is of extremely high priority.

## Material specific research

It is felt that some additional, more detailed, work on the bird assemblage is justified, on the basis of its large size and remarkable preservation. These research avenues may go some way to resolving a number of fundamental questions:-

- The numbers of Gruidae (crane) fragments from Flixborough are higher than from any previously excavated site, presenting a unique opportunity to investigate the taxonomic position of a now extinct large European crane *Grus primigenia*. There may well be over 300 fragments from the Flixborough assemblage, whereas previous detailed work has involved the use of less than 5 fragments in total (Northcoat and Mourer-Chauvire, 1985; Harrison and Cowles, 1977).
- Further, more detailed morphological and metrical analysis of the Anserinae (geese) and Anatinae (duck) assemblages are necessary in order to establish potentially

useful and more specific identification criteria between domestic and wild species. This will allow us to gain a more detailed insight into the extent of local exploitation of wildfowl, as well as providing a useful aid to future work on avian material.

### **Extant condition and stability**

Preservation of the material is good to excellent and as long as medium to long-term storage conditions remain dry, there is no reason to believe that serious deterioration of the material will occur.

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Period	Context type	Context no	Sample no	LM	MM	SM	Bird	Fish	Amp h	Egg
2-3	Dump	5983	10252/F	P (F)	-	-	P(L)	P(L)	-	-
2-3	Dump	5983 c	10221/R	C(F)	-	-	P(L)	P(L)	-	-
2-3	Dump	5983	10288	C(-)	-	-	P(M)	P(L)	-	-
3	Dump	3891	5316	A(F)	-	-	C(M)	C(H)	-	-
3	Skaway	4638	5337/R	A(F)	-	-	P(M)	C(H)	-	C
3	Skaway	4638	4639	A(F)	-	-	C(M)	A(H)	P	C

Table 1. Detailed record of six bone rich residues from periods 2-3 and 3.

P=present (i.e <10% of total assemblage), C=common (10-50%), A=abundant (>50%). Letters in parentheses: For large mammals (F) = few measurable bones (i.e <10%). For birds and fish (L)= low diversity (i.e. 1 species present), (M)= moderate (2-4 species) and (H) = high (>4 species).