The Animal Bone Remains from Ipswich
Report for Publication

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Introduction

The following report describes the faunal remains recovered from 16 sites in Ipswich that were excavated between 1974 and 1988. These sites were excavated as part of a systematic program of rescue excavation that was designed to recover detailed information about Saxon and early medieval activity areas, settlement structure, and settlement organization in Ipswich (Wade 1988: 93). All the archaeological deposits were screened through 10 mm mesh screening. A total of 115,998 animal bones and fragments from these sites were selected for analysis, and 45,713 (39%) could be identified to species or family level. The 16 sites discussed here range in date from the Middle Saxon period through the high Middle Ages and the post-medieval period. The vast majority of the faunal remains recovered from the Ipswich excavations date to the Middle Saxon (mid-7th to mid-9th century), Early Late Saxon (late 9th century), Middle Late Saxon (10th century), and Early Medieval periods (11th/early 12th century), and they are the focus of this report. The animal bone from the later periods was not part of the research aims of the project. These faunal remains, however, have been saved and are available to future researchers for study. In addition, the fish remains recovered from the Ipswich excavations are not included in this report. They will be the subject of a separate study.

The faunal remains recovered from each of the four main chronological phases are shown in Table 1. A complete listing of the animal bones identified from each period for each site is

provided in the Appendix to the archive report on the Ipswich fauna (Crabtree and Stevens n.d.).

Methods of Analysis

The analysis of the animal bones recovered from the 16 Ipswich sites was conducted by Patricia M. Stevens between 1985 and 1990. All of the animal bone fragments from Sites 11-19, Sites 21-23, and Site 25 were analyzed and recorded. Due to the mass of faunal material recovered from Sites 27-29, the animal bones from these sites were sampled by the excavator prior to analysis.

The faunal remains from Ipswich were recorded using the Ancient Monuments Laboratory Computer Based Osteometry Data Capture User's Manual (R.T. Jones et al. n.d.). Animal bones were measured following the recommendations of von den Driesch (1976), and withers heights were calculated for complete long bones following von den Driesch and Boessneck (1974). Dental eruption and wear on cattle, sheep, and pig mandibles was recorded following Grant (1982). Sheep and goat remains were not consistently distinguished using the criteria established by Boessneck et al. (1964) for post-cranial remains. Few sheep and goat post-cranial remains were identified to species.[1]

[1]The identified skull and horn core remains indicate that sheep outnumber goats in the Ipswich faunal assemblage by a ratio of nearly two-to-one. It is likely, however, that the cranial remains dramatically over-represent the number of goats in the overall faunal sample. Male goat horns were used in horn-working at Ipswich and at other emporium sites including Hamwih (Bourdillon and Coy 1980). Although sizable numbers of male goat horn cores were recovered from Hamwih, the post-cranial remains included very few goat bones. The goats that were identified

The Composition of the Faunal Assemblage

In general, the Ipswich faunal assemblages from all periods are dominated by the remains of domestic animals, especially cattle, sheep and goats, pigs, chickens, and geese (Table 1). Wild birds and mammals are rare, and hunting appears to have played a very limited role in the Ipswich economy.

A total of 10,530 animal bones and fragments from the Ipswich Middle Saxon sites were identified to species or family level. Most of the Middle Saxon faunal material from Ipswich was recovered from pits. The taxonomic diversity of the Middle Saxon assemblage is low (Table 1), and cattle are clearly the predominant species present. Remains of hunted mammals are limited to a small number of red and roe deer bones and a single identified specimen each of hare and otter. The avian assemblage is equally impoverished. The near absence of wild water birds such as cranes, herons, and bitterns is particularly striking and distinguishes the Ipswich faunal assemblage from rural East Anglian assemblages such as West Stow (Crabtree 1989: 27) and Brandon (Crabtree and Campana n.d.).

The vast majority of the Ipswich Middle Saxon animal bones

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were generally larger than the Hamwih sheep. For example the sheep metatarsal distal breadth (Bd) at Hamwih ranged from 20.1 to 25.4 mm (n = 50, mean = 23.8, s = 1.1), while the goat metatarsal distal breadth ranged from 25.6 to 28.3 mm (n = 4) (Bourdillon and Coy 1977: 12). The measurements on the caprine bones from Ipswich are generally small and show a low co-efficient of variation (see Table 3, below). I therefore assume that most of the post-cranial and dental/mandibular caprine remains from Ipswich represent sheep rather than goats.

are the remains of cattle, sheep/goat, and pigs. The species ratios for the main domestic mammals at Ipswich are shown in Fig. 1. The ratios were calculated based on the fragment counts or the number of identified specimens per taxon (NISP), following Grayson (1979, 1984). As noted above, cattle are clearly the predominant species from the Middle Saxon contexts, followed by pigs, and then caprines. When their large body size is taken into account, cattle clearly would have provided the bulk of the edible meat to the Middle Saxon inhabitants of Ipswich. Cattle are also the predominant species at other later Saxon urban sites in East Anglia including Thetford (G. Jones 1984) and Norwich (Cartledge 1987). Cattle are also the predominant species at all other English emporia including Hamwih (Bourdillon and Coy 1980: 82-86), London (West 1989: 152), and York (O'Connor 1991: 236-240). Horses are poorly represented at Middle Saxon Ipswich, making up less than 1% of the large domestic mammal bones. The proportion of horse in the Ipswich Middle Saxon assemblage is less than the percentage of horse bones seen on East Anglian rural sites such as Early Saxon West Stow (Crabtree 1989: 10) and Middle Saxon Brandon (Crabtree and Campana n.d.).

Domestic fowl is the most common avian species at Middle Saxon Ipswich, followed by domestic goose. Relatively small numbers of domestic duck/mallard bones were identified. The proportions of the domestic bird species are similar to Middle Saxon Brandon (Crabtree and Campana n.d.), but the near absence of wild bird remains at Ipswich presents a striking contrast with

the East Anglian rural Anglo-Saxon sites where water birds and waders such as cranes are far more common.

The Early Late Saxon features at Ipswich produced a total of 15,582 identified animal bones and fragments, the vast majority of which were recovered from pits. The faunal assemblage continues to be dominated by domestic mammals and birds. Wild mammal remains include single specimens of bat and whale, as well as a small quantity of fox bones. Small numbers of marine mammals have been recovered from other Anglo-Saxon sites in eastern England. For example, the remains of a small cetacean were recovered from Fishergate, York (O'Connor 1991: 255), and the remains of both dolphin and grey seal were recovered from Middle Saxon Brandon (Crabtree and Campana n.d.). The cervid remains from Early Late Saxon Ipswich include the remains of red deer, roe deer, and fallow deer. [Alternative 1:The fallow deer specimen is of particular importance, as the fallow deer is commonly accepted as a Norman re-introduction to the British Isles, and it "has been a common inhabitant of deer parks since Norman times" (Clutton-Brock 1981: 182). The evidence from Ipswich would suggest that the fallow deer began to be re-introduced in eastern England well before the Norman times.] [Alternative 2: The fallow deer bone was not recovered from a sealed context and therefore does not provide conclusive evidence for the re-introduction of the fallow deer prior to the Norman conquest.]

The Early Late Saxon bird remains are dominated by the bones

of domestic fowl and goose. The few wild bird remains identified include two crane bones. A species of crane bred in East Anglia until about A.D. 1600 (British Ornithologists' Union 1971). The remains of these cranes are far more common on East Anglian rural Saxon sites including West Stow (Crabtree 1989: 27) and Brandon (Crabtree and Campana n.d.).

Species ratios based on fragment counts show a substantial increase in the proportion of sheep and goats in the Early Late Saxon period (Figure 1). This increase results primarily from the large number of caprine bones that were recovered from the St. Nicholas site (Site 22). All the features at this site produced quantities of antler waste and some worked bone. The inhabitants of the St. Nicholas site may have been specialists in bone- and antler-working who were supplied with mutton, possibly through a system of staple finance (Brumfiel and Earle 1987: 6).

A total of 7506 animal bones and fragments were identified from Middle Late Saxon contexts in Ipswich. The Middle Late Saxon assemblage is dominated by the remains of dominated by the remains of domestic mammals and birds. Hunted mammal remains are limited to a few fragments of red deer, roe deer, and hare, plus a single rabbit bone. It is commonly accepted that rabbits did not reach the British Isles until the Norman period (see, for example, Clutton-Brock 1981: 146). [Alternative 1: The recovery of a rabbit bone from a well-dated pre-Norman context at Ipswich would indicate that the rabbit may have reached parts of the British Isles before the Norman conquest.] [Alternative 2: The

rabbit bone from Ipswich was not recovered from a sealed context and therefore does not prove that the rabbit reached the British Isles before the Norman period.] The small wild bird assemblage includes several species of raptors. Of particular interest is the presence of peregrine falcon (Falco peregrinus) which was also identified at the Middle Saxon rural site of Brandon, Suffolk (Crabtree and Campana n.d.).

Species ratios based on fragment counts (Fig. 1) show a decrease in the relative importance of sheep and goats. Cattle remain the predominant species, followed by pigs, and then caprines. Horses continue to be poorly represented in the faunal record, as they are at Hamwih (Bourdillon and Coy 1980: 84) and Lundenwic (West 1989: 152).

Twelve sites in Ipswich produced a total of 10,209 identified animal bones and fragments dates to the Early Medieval period. The medieval assemblage is generally very similar in composition to the Anglo-Saxon faunal collections from Ipswich. Cattle, sheep and goats, pigs, and domestic birds dominate the medieval faunal collection; wild birds and hunted mammals are rare. The wild mammals present include the remains of red deer, roe deer, fallow deer, fox, and hare. A single bone of a medieval cetacean was also identified.

The species ratios (Fig. 1) are very similar to those calculated for the Middle Late Saxon faunal assemblage. The quantitative evidence indicates little change in diet between the Middle Late Saxon and Early Medieval periods.

The above period-by-period examination of the faunal assemblages from Ipswich indicates that domestic animals played a major role in the Ipswich economy. A closer examination of the main domestic mammal species--cattle, sheep/goat, and pig--can reveal changes in the ways these animals were utilized through time.

Cattle

The measurements taken on cattle bones from the Middle Saxon, Early Late Saxon, Middle Late Saxon, and Early Medieval sites in Ipswich are presented in Table 2. The average long bone lengths show a decrease from the Middle Saxon to the Early Medieval period. The estimated withers heights decrease from a mean of 116.8 cm in the Middle Saxon period to 112.3 cm in the Early Medieval period. This size decrease can be seen clearly when the greatest length (GL) of the metacarpus for the four Ipswich phases is compared (Fig. 2). The distribution of the greatest length of the metacarpus from the Early Saxon (5th-6th century) sunken-featured buildings at West Stow has been included for comparative purposes. In addition to illustrating a long-term decrease in overall cattle size in East Anglia, Figure 2 also could also be interpreted to suggest that the Middle Late Saxon and Early Medieval faunal samples included smaller numbers of larger, presumably male cattle.

Distributional data for the distal breadth (Bd) of the tibia (Fig. 3) and other measurements suggest that fewer large, probable male cattle were present in the Middle Late Saxon and

Early Medieval faunal collections. The distribution of the Ipswich cattle withers heights (Fig. 4) also indicates that the smallest Early Medieval Cattle are clearly smaller than their Middle Saxon counterparts. It seems reasonable to conclude that the size decrease that is apparent in the cattle measurements (Table 2) results both from a decrease in the numbers of larger, male cattle in the Middle Late Saxon and Early Medieval periods and from a gradual long-term decrease in overall cattle size. Similar long-term decreases in cattle size during the Middle Ages have been documented for other parts of Europe (see, for example, Bökönyi 1971).

Ageing data for cattle are based on an analysis of dental eruption and wear following Grant (1982). The mandibles from the main chronological phases at Ipswich have been grouped into broader age classes following Bourdillon and Coy (1977). The aging distribution for the Middle Saxon, Early Late Saxon, Middle Late Saxon, and Early Medieval cattle mandibles is shown in Figure 5. The figure indicates that all phases at Ipswich included a high number of mature and elderly cattle which must have been slaughtered after they were no longer needed for breeding or working. These data, which are supplemented by information on epiphyseal fusion of the long bones, indicate that very few Ipswich cattle were slaughtered during the first 18 months of life. There is no evidence for the perinatal mortalities that are commonly found on rural Saxon and medieval sites. Approximately half the cattle survived for more that four

years. The ageing distribution suggests that Ipswich was a consumer site that must have been provisioned with cattle from the surrounding countryside. Some of these cattle are likely to have come from the woodlands and valleys of the central boulder clay areas, as the Sandling areas in and around Ipswich are more suited to sheep husbandry that to cattle rearing. The limited range of species present in the Ipswich assemblage and the focus on a limited range of age classes would suggest that the inhabitants of Ipswich were provisioned indirectly, that is, that there was little direct contact between individual producers and consumers (Zeder 1991: 43). The use of food-rents paid to the East Anglian royal house could represent one form of indirect provisioning.

Sheep

Although sheep played a relatively small role in the Ipswich diet during the Saxon and Early Medieval periods, these animals played a major role in the East Anglian economy throughout the Middle Ages. Sheep are the numerically predominant species at Saxon rural sites such as West Stow (Crabtree 1989) and Brandon (Crabtree and Campana n.d.). Analysis of the sheep remains from Ipswich may shed light on the relationship between urban consumers and rural sheep producers.

The measurements taken on sheep/goat bones from the Middle Saxon, Early Late Saxon, Middle Late Saxon, and Early Medieval periods at Ipswich are shown in Table 3. These data indicate that the Middle Saxon sheep are smaller, on average, that the Late

Saxon and Early Medieval sheep. The differences are seen most clearly in the long bone lengths and in the withers heights that were calculated from them. A series of Student's two-tailed t-tests was used to determine whether there were significant size differences between the Middle Saxon and Early Late Saxon sheep from Ipswich. The differences between four of the measurements (radius Bp, metacarpus GL, tibia Bd, and metatarsus Bd) were non-significant. The differences between the radius Gl, metacarpus Bd, and astragalus GLl were significant at the $p = .05$ level, while the differences between the metatarsus GL and the estimated withers heights were significant at the $p = .01$ level. In all cases, the Middle Saxon sheep were significantly smaller than their Early Late Saxon counterparts. The withers height distributions for the Middle Saxon and Early Late Saxon sheep from Ipswich are shown in Figure 6.

The small size of the Middle Saxon sheep from Ipswich is not an isolated phenomenon. For example, Middle Saxon sheep from Brandon, Suffolk were significantly smaller than the early Saxon sheep from the nearby West Stow site (Crabtree and Campana n.d.). It is possible that a new, smaller breed of sheep was introduced to Suffolk during the Middle Saxon period. By the Early Late Saxon period, however, the Ipswich sheep had returned to their larger, Early Saxon size.

Age profiles based on dental eruption and wear, following Grant (1982), were constructed for the Middle Saxon, Early Late Saxon, Middle Late Saxon, and Early Medieval sheep and goat

mandibles from Ipswich. The wear stages were grouped into six broad classes following Bourdillon and Coy (1980) and are shown in Figure 7. While most of the sheep from the Early Late Saxon, Middle Late Saxon, and Early Medieval contexts clearly come from late adolescent and mature-to-elderly animals, the Middle Saxon assemblage includes a substantial number of animals killed toward the end of their first year of life. These first-year culls are likely to be animals that the farmers who supplied the Ipswich sites chose not to overwinter. During the Middle Saxon period, the inhabitants of Ipswich may have been provisioned by relatively unspecialized sheep farmers. The Ipswich sheep age profiles show a gradual shift toward higher numbers of older sheep. In particular, there is an increase in the numbers of older subadults and young adult sheep. This may reflect a shift toward wool production on the part of the farmers who provisioned Ipswich. Alternatively, it may reflect better capacity to overwinter sheep on the part of the farmers who provisioned Ipswich or an increased demand for mutton by the inhabitants and/or provisioners of Ipswich.

Pigs

Pigs played a significant role in the Ipswich economy throughout the Saxon and Early Medieval periods. They were the second most important source of meat, after cattle, for the inhabitants of Ipswich. Pigs can be raised successfully in an urban environment, and it possible that some of the residents of Ipswich may have kept swine. In particular, high numbers of pigs

were recovered from the Middle Saxon and Early Late Saxon deposits from Site 27 (Foundation Street/ Wingfield). This site lies on the eastern edge of the town, near what have been interpreted as open fields. It is quite possible that some pig husbandry may have carried out at this site.

The measurements taken on pig bones from the Middle Saxon, Early Late Saxon, Middle Late Saxon, and Early Medieval periods at Ipswich are shown in Table 4. Withers height estimates calculated from the few available complete pig long bones indicate that the Saxon and Early Medieval pigs stood about 70 cm high at the withers. They are generally similar in size to the Middle Saxon pigs from Hamwih (Bourdillon and Coy 1980: 112) and Brandon (Crabtree and Campana n.d.: Table 10).

Measurements of the lengths of the lower third molars (Table 4) and their co-efficients of variation provide no evidence for the presence of wild boar in Saxon or Early Medieval Ipswich. This finding is not unexpected, since wild mammals and birds are generally rare in the Ipswich faunal assemblage.

The age profiles for pigs from all four Saxon and medieval phases are shown in Figure 8. The ageing data indicate that pigs were killed throughout the first three years of life and that relatively few pigs survived to advanced ages (MWS>40). This ageing pattern would not be unexpected if the inhabitants of Ipswich were raising their own pigs for home consumption. The presence of large numbers of pigs on rural sites such as Wicken Bonhunt, Essex, however, might indicate that some town-dwellers

were provisioned with pork through a food-rent system.[2]

Dogs

As might be expected in an urban site, the Ipswich excavations produced the remains of a large number of commensal species, especially dogs and cats. The dogs are particularly interesting because they show a great deal of variability, unlike the dogs from rural sites such as Brandon and West Stow. The reconstructed withers heights for the Ipswich dogs are presented in Table 5. The Early Late Saxon contexts produced a number of bones of a single dog (marked with an asterisk in Table 5) that appears to have had a withers height of only 30 cm. The largest Ipswich dogs approach the size of the Brandon (average estimated withers height = 58.6 cm) and West Stow (average estimated withers height = 59.5 cm) dogs, however Ipswich also produced some intermediate-sized dogs, with withers heights of 35-50 cm. The variability in size of the Ipswich dogs suggests that they may have served a variety of purposes from guard dogs to pets.

Birds

The vast majority of the bird remains recovered from the Ipswich excavations were bones of the domestic species. Domestic chickens were predominant throughout all periods at Ipswich, followed by geese. Only 68 (2.1%) of the 3230 bird bones recovered from the Ipswich excavations were the remains of wild

[2]Hodges (1982: 142) has gone so far as to suggest that Wicken Bonhunt may represent a rare example of a food-rent collecting center.

species. The most interesting of the wild birds is the peregrine falcon that was recovered from a Middle Late Saxon context in Ipswich. As noted above, a Middle Saxon falcon has also been recovered from the rural site of Brandon in Suffolk. The Brandon falcon is the earliest example of a peregrine falcon that has been recovered from Anglo-Saxon England. The presence of an additional falcon at Ipswich would suggest that falconry was established in East Anglia by the Middle to Late Saxon period. The falcon may also be an indicator of wealth and high social status at these sites.

Conclusions

Throughout the Middle Saxon, Late Saxon, and Early Medieval periods the inhabitants of Ipswich relied primarily on a small number of domestic mammal and bird species. Hunting played a very limited role in the Ipswich economy. The uniformity of the diet might suggest that the Ipswich residents, many of whom were probably full- or part-time craft specialists, were provisioned indirectly, possibly with food-rents obtained by the East Anglian royal house. The composition of the Ipswich faunal collection mirrors the faunal assemblages recovered from other Middle Saxon emporia including London, York, and Hamwih.

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Figure Captions

1. Species ratios based on NISP for Middle Saxon, Early Late Saxon, Middle Late Saxon, and Early Medieval sites in Ipswich.

2. Distribution of the greatest length (GL) of the cattle metacarpus for the four main Ipswich chronological phases and the 5th-6th century sunken-featured buildings at the West Stow, Suffolk site.

3. Distribution of the distal breadth (Bd) of the tibia for cattle from the four main Ipswich chronological phases.

4. Distribution of withers heights (in cm) for the Ipswich cattle.

5. Age profile, based on dental eruption and wear, for the cattle from the four main chronological phases at Ipswich.

6. Distribution of withers heights for the Middle Saxon and Early Late Saxon sheep from Ipswich,

7. Age profile, based on dental eruption and wear, for the Ipswich sheep.

8. Age profile, based on dental eruption and wear, for the Ipswich pigs.