# Chapter 6: Ecofacts and Environmental Evidence from the Roman Period

## THE HUMAN SKELETAL REMAINS

*by Annsofie Witkin*

### Introduction

The human skeletal remains relating to the Roman settlement comprised three cremation burials, 38 articulated skeletons and disarticulated remains from a minimum of seven individuals. The three cremation burials were very small because of truncation by post-Roman ploughing. The inhumation burials comprised 22 adults and 16 subadults. The adults consisted of 9 males, 11 females and 2 unsexed individuals. All the neonates were associated with buildings, whereas the adult burial ritual was very varied and included gender-based groups as well as isolated burials along boundaries.

The majority of the disarticulated remains were redeposited but the remains of a minimum of three individuals had been deposited in a well near building 8019 in Area G. All articulated and disarticulated remains date from the mid to late Roman period (Phases 4 and 5).

### Methodology

#### *Skeletal remains*

The human skeletal and cremated remains was analysed according to the recording standards set out in IFA paper number 7 (Brickley and McKinley 2004). Completeness was scored using four categories, namely poor (0-25%), fair (26-50%) good (51-75%) and excellent (76-100%). Skeletal preservation was scored using the same scale ranging from poor (near complete destruction of the cortical surface) to excellent (cortical surfaces of the bones preserved).

The skeletal inventory of the articulated remains was recorded pictorially and in tables. The disarticulated remains were recorded as to which side and part of the bone was present. Dental inventory was recorded following the Zsigmondy system. Dental notations were recorded by using the universally accepted recording standards and terminology (after Brothwell 1981).

The remains were sexed by using a combination of cranial, pelvic and metrical data. The features used were chosen from Standards (Buikstra and Ubelaker 1994) and Workshop (1980). Each observable feature on the cranium and pelvis was scored on a five-point scale (probable female, female, probable male, male and unknown). The overall score from the observed features provided the basis for the assigned sex.

The age of the subadult remains was estimated by using the long bone length (Scheuer *et al.* 1980; Hoppa 1992), epiphyseal fusion (Chamberlain 1994) and dental development (Moorees *et al.* 1963). The age of adults was assessed by using the degenerative changes of the auricular surface (Lovejoy *et al.* 1985) the pubic symphyses (Todd 1920; 1921; Suchey and Brooks 1990), dental attrition (Miles 1962; Brothwell 1981) and cranial suture closure (Meindl and Lovejoy 1985).

Adult stature was calculated by inserting the measurements of complete long bones into regression formulae for white males and females (Trotter 1970) The bones from the leg were favoured over those of the arm since these carry the least error. The remains were examined for abnormalities of shape and surface texture, and instances of pathological conditions were recorded.

#### *Cremated bone*

The cremated bone from each context was passed through a sieve stack of 10, 5 and 2 mm mesh size. The bone from each sieve was weighed and calculated as a percentage of the total weight of the cremation. This allowed the degree of fragmentation to be calculated. The degree of fragmentation may indicate if the cremated bones were further processed after the body was burnt.

In each of the sieved groups, the bones were examined in detail and sorted into identifiable bone groups, which were defined as skull (including mandible and dentition), axial (ribs, vertebra and pelvic elements), upper limb and lower limb. This may show deliberate bias in the skeletal elements collected for burial. Each sample was weighed on digital scales and details of colour and largest fragment and, where possible, the presence of individual bones within the defined bone groups was recorded.

The estimation of age of a cremated individual is dependent upon the survival of particular skeletal elements indicative of age. In cremations of adult individuals, cranial suture closure (Meindl and Lovejoy 1985), degenerative changes to the auricular surface (Lovejoy *et al.* 1985) and pubic symph-

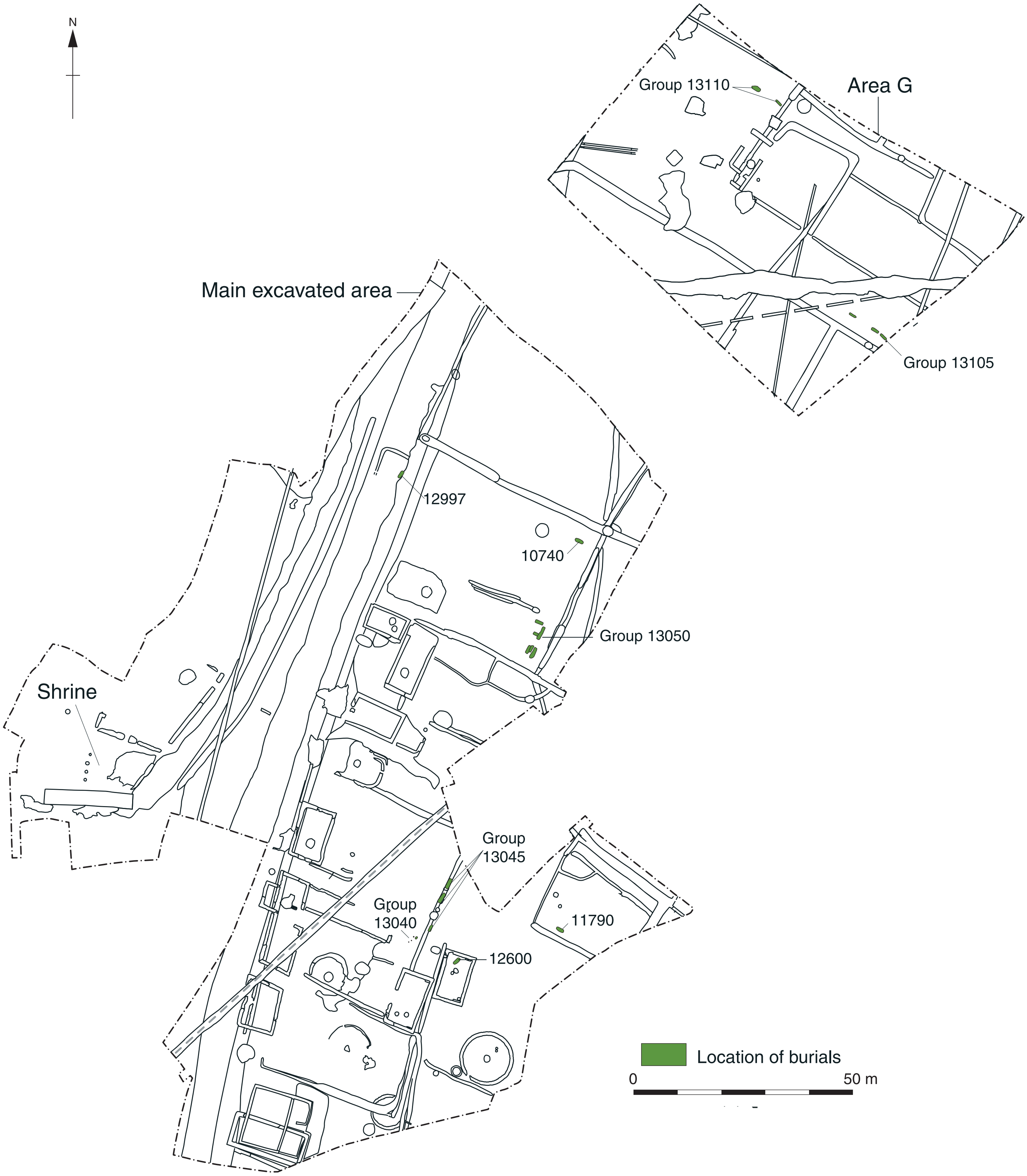



*Fig. 6.1 Location of burials within the site*

ysis (Suchey and Brooks 1990) may be used as a general guide.

**Provenance** (Fig. 6.1)

The three cremation burials (10912, 10931 and 10933) were located close together west of boundary ditch 12880 (burial group 13040). A burial of a young child (skeleton 10927) was also in this group, located between the cremation burials and the ditch.

There were three discrete clusters of inhumation burials. Five adult individuals (skeletons 10922, 10954, 12656, 12686 and 12727) were located within a 2nd-century boundary ditch (12880) behind the roadside settlement (burial group 13045). Two discrete clusters of inhumation burials were situated in the south-eastern corner of boundary ditches 11270 and 12970 (burial group 1350). The southern group consisted of three adults (skeletons 10794, 10938 and 10951) and there were five burials (four adults and one neonate) in the northern group (skeletons 10791, 10947, 12814, 12816 and 12902).

Six adult inhumations formed part of two linear arrangements within excavation Area G. Three skeletons (8018, 8155 and 8261) were situated near the northern edge of the excavation, just south of ditch 8291 (burial group 13110), while three further inhumations (8012, 8128 and 8131) were adjacent to ditch 8294 in the south-eastern part of the area (burial group 13105).

Four adult inhumation burials were isolated but associated with various features. Skeleton 10734 (burial 10740) was situated in the north-western corner of an enclosure formed by ditches 10690 and 11170. Skeleton 11775 (burial 11790) was situated alongside enclosure ditch 13060, skeleton 12599 (burial 12600) was located near the northern wall within structure 10900 and skeleton 12999 (burial 12997) was situated on the western side of the road, sealed by gravel pavement 13020.

One burial of a young child (skeleton 12742) was located near structure 10920. The remains were located within a pit (12826). Because of heavy truncation it is not clear if the human remains had been placed within the pit or the grave cut into the upper fill. All neonatal burials (skeletons 10876, 11389, 11642, 11687, 11782, 11808, 11815, 12613, 12757, 13011 and 13012) as well as one burial of a young child (12120) were situated within structures. Their location is summarised in Table 6.8.

**Cremation burials**

***Condition of the bone and disturbance***

The pits containing cremated bone deposits (10912, 10931 and 10933) were very shallow. Bone fragments were showing on the surfaces of the features, and fragments had also been scattered around the pits. The features had been truncated by ploughing which together with rain wash had caused the spread of the bone fragments. It is very likely that most of the bone within the three deposits has been lost through post-Roman ploughing. No charcoal was present amongst the cremated bone. The deposits are therefore likely to represent burials rather than redeposited pyre material. The cremated bone from the burials was slightly chalky (eroded) and very little trabecular bone was recovered; both largely reflective of the acidic burial environment.

***Demographic data and pathology***

The remains represented a minimum of three adult individuals, all of unknown sex (Table 6.1). The only pathological lesion present was porosity on a parietal fragment from deposit 10912. The lesion is indicative of anaemia but it was not active at the time of death.

***Pyre technology and ritual***

The burnt bone in all three burials comprised dark grey and black as well as white fragments (Table 6.1). The variable colour is indicative of poor oxidisation. It is not possible to discern the direct reason for the colour variations but the position of the body on the pyre, tending of the pyre, duration of the process as well as the temperature of the fire may all cause colour variations (McKinley 1994, 82-84).

The weight of the deposits varied from 10 g to 226 g (Table 6.1) and the largest fragment – from cremated bone deposit 10912 – measured 34.6 mm. Moreover, *c* 70% of all bone from this deposit was recovered from sieve fraction size 5 mm and below. The low weights of the burnt bone deposits and the small size of the individual fragments are indicative of post-Roman disturbance rather than deliberate manipulation of the remains. All the burials were also unurned, which would also have made the bone more susceptible to fragmentation.

Fragments from all skeletal areas were identified in burial 10912 and there was no evidence of any preference or exclusions of body parts.

*Table 6.1 Summary of Roman cremated human remains*

| *Context number* | *Weight* | *Colour* | *MNI* | *Age* | *Sex* | *Pathology* |
|---|---|---|---|---|---|---|
| 10912 | 226 g | White, dark grey and black | 1 | Adult | Unknown | Porotic hyperostosis |
| 10931 | 27 g | Dark grey | 1 | Adult | Unknown | |
| 10933 | 10 g | White and dark grey | 1 | Adult | Unknown | |

*Table 6.2 Preservation and completeness of human remains*

| *Preservation* | *Number of individuals* | *Completeness* | *Number of individuals* |
|---|---|---|---|
| Destroyed | 2.6% (1/38) | Destroyed (<25% complete) | 13.2% (5/38) |
| Poor | 23.7% (9/38) | Poor (25%-50% complete) | 26.3% (10/38) |
| Fair | 7.9% (3/38) | Fair (51% complete) | 5.3% (2/38) |
| Good | 63.2% (24/38) | Good (50%-75% complete) | 26.3% (10/38) |
| Excellent | 2.6% (1/38) | Excellent (76-100% complete) | 28.9% (11/38) |

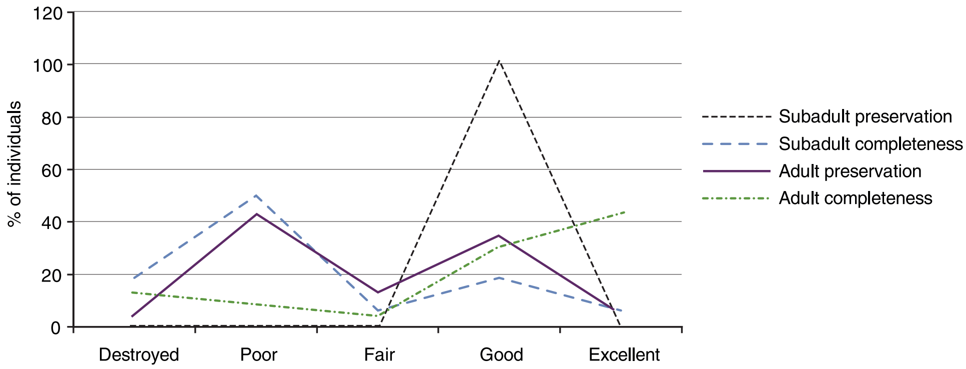



*Fig. 6.2 Human bone: adult and subadult preservation and completeness comparison*

## Inhumation burials

### *Preservation and completeness*

The preservation of the bone was generally good with 66% of the articulated skeletons either well or excellently preserved. Twenty-four percent of the inhumations were poorly preserved with considerable flaking and erosion of the cortical surface (Table 6.2).

The completeness of the articulated skeletons was generally good and 60% of the inhumations were more than 50% complete. Only 13% had less than 25% of the bones surviving. Seventy-eight percent of the adults were more than 50% complete compared to only 31% of the children. The preservation of all of the children was good, however, compared to the adults, only 52% of which had above average preservation (Fig. 6.2). This marked difference in preservation and completeness between the adults and the children is due to the soil matrix and excavation techniques. Most of the children were neonates and were buried in shallow graves within or near buildings. The natural soil within these areas was very silty with a more neutral soil condition. Moreover, the soil in the occupation areas where these graves were situated would probably have had a high organic component, which would have further promoted neutral soil conditions thereby aiding good preservation. However, the grave cuts containing the neonates were very shallow and were hard to detect; the relatively low figure for completeness is therefore likely to be a consequence of accidental discovery in the course of the excavation. The majority of the adult graves were dug through the Northamptonshire Sands and Ironstone where soil conditions had an adverse effect on the bones; many of the more fragile bones of the torso did not survive.

*Table 6.4 Summary of dental disease*

| | *Caries* |
|---|---|
| Permanent teeth (adults only) | 10.5% (39/370) |
| Per individual (adults only) | 84.2% (16/19) |
| Roman national prevalence (per tooth) | 7.5% (2179/29247) |

*Table 6.3 Age and sex of articulated skeletal remains*

| | *Neonate* | *Infant* | *Young child* | *Older child* | *Adolescent* | *Young adult* |
|---|---|---|---|---|---|---|
| | 0-1 m | 2-12 m | 1-5 yrs | 6-12 yrs | 13-18 yrs | 18-25 yrs |
| ?M/M | | | | | | 2.6% (1/38) |
| ?F/F | | | | | | 0% (0/38) |
| ? | 34.3% (13/38) | 2.6% (1/38) | 5.3% (2/38) | 0% (0/38) | 0% (0/38) | 0% (0/38) |
| Total | 34.3% (13/38) | 2.6% (1/38) | 5.3% (2./38) | 0% (0/38) | 0% (0/38) | 2.6% (1/38) |

### Demography

The articulated inhumation burials comprised 38 individuals of which 22 (58%) were adults and 16 (42%) were children (Table 6.3). The adults comprised 11 males, 9 females and 2 unsexed individuals. There is a slightly higher number of males within the assemblage, but considering the small sample size this is not significant. A total of 34.2% of the whole assemblage lived to an age greater than 40, and of the aged adults, 65% survived to an age greater than 40.

The mortality profile of the assemblage indicates that the main mortality peaks occurred in the neonate age group and amongst the mature adults. The largest proportion of males died as mature adults whereas females died as prime adults. Though a high infant mortality is expected, children aged 1-18 are underrepresented and there are no young females. It therefore appears that the individuals buried within the excavation area are not representative of the population as a whole.

### Stature

The female stature range was between 1.50 m and 1.62 m with an average of 1.57 m and the male stature range was between 1.68 m and 1.72 m with an average of 1.70 m. The marked difference in stature between the sexes is notable as it is more common to have an overlap of stature ranges between the sexes. The difference is, however, probably a consequence of the small sample size rather than any real sexually dimorphic difference.

The national mean stature for males and females in the Roman period was 1.69 m and 1.59 m respectively (Roberts and Cox 2003, 396). The mean statures of the Higham Ferrers sample indicate that the males were slightly taller and the females were slightly shorter than the national average. However, considering the small sample the stature difference is not considered to be significant.

### Dental pathology

The main categories of dental disease are summarised in Table 6.4. The prevalence of dental disease per tooth was based on the permanent dentition only. There was no dental disease present on the few deciduous teeth present within the assemblage. In addition, the prevalence of dental disease per individual only incorporates the adults with dentition present. The Romano-British prevalence is taken from the summaries provided by Roberts and Cox (2003).

#### *Caries*

Dental caries is a destruction of the enamel caused by the production of acid from bacteria present in dental plaque and is therefore considered to be an infectious disease (Hillson 1996, 269). The cavities are commonly found in areas where food is likely to get trapped such as on the biting surfaces of the premolars and molars, between the teeth and along the cemento-enamel junction (CEJ). When the cavities are present at the CEJ this may often be a consequence of periodontal disease (ibid., 275).

The caries prevalence of permanent dentition was calculated by using the total number of affected teeth expressed as a percentage of the total number of teeth observed. A total of 16 adults (84.2% of the 19 adults with surviving dentition) had carious lesions present. These included 8 males and 7 females. A total of 10.5% (39/370) of the permanent dentition was affected by caries (Table 6.4).

The mean caries rate as total number of teeth affected in the Roman period was 7.5% and per individual it was 17.7% (Roberts and Cox 2003, 130-132). The rate per individual at Higham Ferrers is significantly higher than the national average, but again this is likely to be due to the small sample size. The rate for the total number of teeth is within the normal range of the time period.

| | *Ante-mortem tooth loss* | *Calculus* | *Abscesses* | *Periodontal disease* | *Hypoplasia* |
|---|---|---|---|---|---|
| | 15.1% (55/363) | 56.2% (208/370) | 2.7% (10/363) | - | 26.5% (98/370) |
| | 63.2% (12/19) | 100% (19/19) | 31.6% (6/19) | 63.2% (12/19) | 78.9% (15/19) |
| | 14.1% (5042/35762) | 43.4% (1702/3923) | 3.9% (970/24995) | - | 9.1% (437/4796) |

| | *Prime adult* | *Mature adult* | *Ageing adult* | *Adult* | *Total* |
|---|---|---|---|---|---|
| | 26-40 yrs | Over 40 yrs | Over 50 yrs | Over 18 yrs | |
| | 5.3% (2/38) | 21% (8/38) | 0% (0/38) | 0% (0/38) | 28.9% (11/38) |
| | 7.9% (3/38) | 5.3% (2/38) | 7.9% (3/38) | 2.6% (1/38) | 23.7% (9/38) |
| | 2.6% (1/38) | 0% (0/38) | 0% (0/38) | 2.6% (1/38) | 47.4% (18/38) |
| | 15.8% (6/38) | 26.3% (101/38) | 7.9% (3/38) | 5.2% (2/38) | 100% (38/38) |

*Ante-mortem tooth loss*

The aetiology of ante-mortem tooth loss is multifactoral in its origin (Lukacs 1989, 265). The accumulation of calculus may lead to periodontal disease which would eventually lead to the loss of the tooth. The formation of a peri-apical abscess (caused by severe attrition or caries) and trauma may also cause premature exfoliation.

The prevalence of ante-mortem tooth loss was calculated by using the total number of teeth lost ante-mortem as expressed as a percentage of the total number of *in situ* teeth, tooth roots and empty sockets present. Unerupted and partially erupted teeth, loose teeth and teeth believed to be congenitally absent were excluded. Twelve adults (63.2%) comprising seven males and five females had ante-mortem tooth loss. A total of 15.1% teeth (55/363) had been lost ante-mortem (Table 6.4).

The national average of ante-mortem tooth loss for the time period was 8.3% in 481 individuals and 14.1 % of all observed teeth (Roberts and Cox 2003, 135). The per-tooth rate is very similar to that of Higham Ferrers.

*Dental calculus*

Dental calculus is formed by mineralised plaque which accumulates on the base of living plaque deposits (Hillson 1996, 225). It is a common pathological condition and is generally related to poor oral hygiene. The deposits are generally seen on the teeth nearest the saliva glands.

The prevalence of calculus was based on the total number of affected teeth expressed as a percentage of the total number of teeth observed. All of the adults (19 individuals, including 10 males and 8 females) with surviving dentition had calculus deposits. Calculus deposits were recorded on 56.2% (208/370) of all the permanent teeth observed (Table 6.4). This is slightly higher than the national average of 43.3% (Roberts and Cox 2003, 131).

*Dental abscesses*

Abscesses can have many causes; bacteria may enter the pulp cavity through dental caries, excessive attrition or trauma to the crown. An abscess can also occur when a periodontal pocket is formed. When bacteria accumulate in the pulp cavity an inflammation starts which can track to the apex of the root. As the pressure builds up from the continuous accumulation of pus, a hole (sinus) is formed on the surface of the jaw which allows the pus to escape (Roberts and Manchester 1995, 50). It is at this advanced stage that the abscess is visible and recorded archaeologically.

The prevalence of dental abscesses was calculated by dividing the total number of abscesses into the combined total of teeth lost ante-mortem, teeth lost post-mortem and *in situ* permanent dentition. Six (31.6%) adults (four males and two females) had dental abscesses present and 2.7% (10/363) of all sockets observed had an abscess.

The mean rate of individuals with dental abscesses for the Roman period is 10.7% and the average number of teeth affected by abscesses from a total of 22 Roman sites is 3.9% (Roberts and Cox 2003, 135-137). Again, the prevalence per individual is much higher in the Higham Ferrers assemblage than the national average. However, the rate per tooth is comparable to the national average.

*Periodontal disease*

Periodontal disease is commonly caused by the accumulation of calculus between the teeth and the soft tissue. This causes inflammation of the soft tissue, gingivitis, which may lead to inflammation of the bone. The inflammation of the bone causes horizontal bone loss and subsequent exposure of the roots of the teeth. The inevitable loss of the tooth would eventually follow (Roberts and Manchester 1995, 56).

A total of 12 (63.2%, six males and six females) of the 19 adults with some dentition preserved had vertical and/or horizontal reduction of the alveolar margin. The national Roman average was 29.3% (Roberts and Cox 2003, 261) which is much lower than at Higham Ferrers. This partly reflects the small sample size and the fact that a high proportion of the adults there were individuals aged over 40 years.

*Enamel hypoplasia*

Hypoplastic lines, grooves or pits on the enamel surface, are formed during periods of growth arrest during the development of the tooth crown. These bouts of growth arrest have been linked to periods of childhood diseases, weaning and malnutrition (Hillson 1996, 166-167). The prevalence of enamel hypoplasia was calculated in the same way as the prevalence of calculus.

Enamel hypoplasia was recorded on 15 (39.28%) adults, (9 males, 5 females and 1 unsexed individual). Of all teeth observed, 26.5% (98/370) displayed hypoplastic lines. This is greater than the nation average of the Roman period which was 9.1% but the figures reported from various sites ranged from 5.6% to 29% (Roberts and Cox 2003, 140) and the prevalence at Higham Ferrers is within this range.

*Dental anomalies*

A variety of dental anomalies can be found within the human dental arcade. These include impacted teeth, congenitally absent teeth (agenesis), supernumerary teeth and the retention of deciduous teeth. The only dental anomaly recorded in this assemblage was agenesis. However, without the aid of x-rays, teeth recorded as not present may in fact be impacted. The figures given here are therefore crude. Three (8.93%) adults (1 male and 2 females) had teeth recorded as not present. Within the whole of the assemblage, six teeth were recorded as not present; all of these were third molars.

*Masticatory and extra-masticatory wear*

Three of the adult males had damage consisting of slight chipping of the occlusal margins. The damage was situated on the molars rather than the anterior dentition which is consistent with a heavy masticatory function (Larsen 1997, 267). The teeth affected were four mandibular first molars, one maxillary first molar and one maxillary second premolar. The chipping had occurred on either the bucco-distal or mesio-distal edges. One male (skeleton 10951) had heavy wear on the anterior maxillary dentition and all the molars had been lost ante-mortem. This wear pattern is likely to be due to the anterior dentition taking on the function of mastication normally carried out by the molars.

Slight chipping of the occlusal margins of the anterior dentition was present on nine adults (2 females and 7 males) and the chips were present on 14 teeth (6 maxillary teeth and 8 mandibular teeth) (Table 6.5). The tooth damage can be due to heavy masticatory functions as well as extra-masticatory activities

Three individuals (one female, one male and one unsexed adult) had small notches present at the mesial and/or distal margins of one or more teeth (Table 6.5). The notches were clearly produced by an extra-masticatory function but it is difficult to ascertain the direct cause. However, ethnographical studies indicate that notches can be formed by pulling thin cords of animal tendons across clenched anterior teeth in order to soften and moisten sinew; notches may also be indicative of processing of plant materials (Larsen 1997, 260).

One female (skeleton 10734) had very unusual extra-masticatory wear to the mandibular anterior dentition. This comprised a continuous polished groove across the middle of the buccal surface of the incisors and the canines. The groove was also angled up towards the occlusal surface at the distal edges of the canines. It appears that this individual may have used her teeth for processing sinew or plant material. However, rather than pulling the matter between her anterior dentition, the material was pulled across her front teeth. She was not partaking in this activity at the time of her death since medium sized calculus deposits were situated on top of the groove on the central incisors.

### Skeletal pathology

All the pathological lesions present were observed on the adult individuals. Due to the small sample size, only gross prevalences were calculated, based on the articulated adults.

*Degenerative joint disease*

Joints are subjected to wear and tear throughout life. This gradual deterioration of the joint surfaces is therefore common in older individuals. The changes that take place are new bone formation on the joint margins or on the surface, and porosity. When the cartilage within the joint has worn away, the bone to bone contact causes the bone to be polished, or eburnated. Eburnation is an important criterion for the diagnosis of osteoarthritis in skeletal remains. The aetiology is multifactoral but increasing age, genetic predisposition, lifestyle and environmental factors such as climate all play a part in the development of osteoarthritis.

Eight individuals (three males and five females), some 36% of the adult population, had osteoarthritic changes. Six of these, plus a further three males and three females (55% of the adult population), had other evidence of degenerative changes. Most of these degenerative changes were situated on the joints of the upper limb (Fig. 6.3). Though the

*Table 6.5 Summary of extra-masticatory wear*

| *Skeleton number* | *Sex* | *Age* | *Location* | *Tooth/teeth affected* | *Lesion type* |
|---|---|---|---|---|---|
| 8155 | Female | MA | Mandible | Left lateral incisor | Small chip |
| 10734 | Female | PA | Mandible | Left and right canines, lateral and central incisors | Continuos polished groove across the center of the buccal surface |
| 10794 | Male | YA | Maxilla | Right central incisor | Small chip |
| 10922 | Male | MA | Maxilla | Left central incisor | Small chip |
| 10938 | Male | MA | Mandible | Right lateral incisor, both central incisors | Small chips |
| 10954 | Female | PA | Maxilla | Left lateral incisor | Small chip |
| 12599 | Male | MA | Maxilla | Right canine | Small chip |
| 12727 | Female | AA | Maxilla | Central incisors | Bucco-lingual notches |
| 12814 | ? | PA | Mandible | Lateral and central incisors | Small chips |
| 12814 | ? | PA | Maxilla | Right lateral incisor | Bucco-lingual notch |
| 12816 | Male | MA | Mandible | Left canine | Notch |
| 12902 | Male | PA | Mandible | Left canine | Small chip |
| 12902 | Male | PA | Maxilla | Right lateral incisor | Small chip |
| 12999 | Male | PA | Mandible | Right central incisor, left lateral incisor | Small chips |
| 12999 | Male | PA | Maxilla | Right lateral incisor | Small chip |

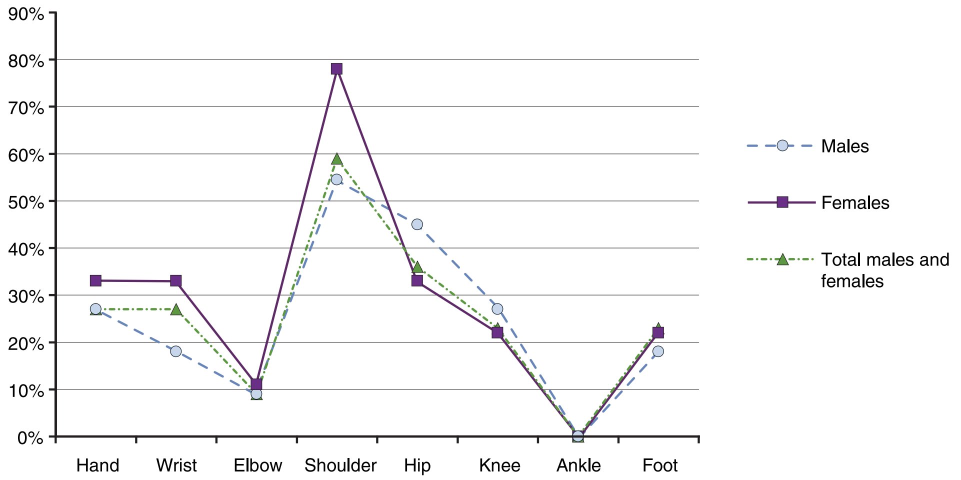



*Fig. 6.3 Human bone: prevalence of degenerative joint disease, including osteoarthritis*

patterning of degenerative joint disease in the skeleton is generally the same for males and females, it appears that a greater proportion of females had degenerative changes in their arms and a higher proportion of males had degeneration in their hips and knees (Fig. 6.3). This is possibly related to occupational differences. Spinal degenerative change was observed on 42 vertebral elements and was most common on the cervicals.

Schmorl's nodes are indentations on the vertebral bodies which are generally most common in the lower thoracic and lumbar regions. These are caused by the herniation of the intervertebral disc through the end plates and are in effect pressure defects (Rogers and Waldron 1995, 27). Eight individuals had Schmorl's nodes. The majority of these were male (five males and three females) which may suggest that males had a heavier work load.

*Trauma*

Fractures are either caused by an acute injury to the bone, an underlying disease or repetitive stress (Roberts and Manchester 1995, 68). Nineteen fractures were present amongst nine adults (41%) who consisted of six males, two females and one unsexed individual. All fractures were healed and longstanding. Eight of the lesions were caused by acute injury and five were situated in the lower legs or the feet, two fractures were present on the manual digits and one individual had a longstanding fracture of the clavicle (skeleton 12599). Two of the fractures are likely to have been caused by repetitive stress since these were situated on the articular surfaces of the upper thoracic region. The majority of the fractures were present on an elderly female (skeleton 12599). These consisted of a fractured femoral hip, fractured sacrum and eight intra-articular fractures on the tarsals and the metatarsals. All were secondary to osteoporosis since the underlying aetiology had weakened her bones considerably.

Soft tissue trauma recognised in palaeopathology involves the formation of new bone at sites of muscle tears, usually at ligament or muscle insertion points. One adult male (skeleton 10951) had a syndesmophyte present on the origin of the collateral ligament of the right femur, indicating that this individual once sustained a painful knee injury though it was healed at the time of death.

Osteochondritis dissecans is caused by the collapse of the joint and has generally an underlying traumatic aetiology (Roberts and Manchester 1995, 87). The lesions involve the separation of a necrotic bone fragment from the joint surface. The fragment may remain loose in the joint, become reabsorbed or heal back onto the defect. One adult male (skeleton 8128) had one osteochondritis dissecans present on the head of the right talus. It is likely that the lesion was related to the healed intra-articular fracture present on the bone.

*Infectious disease*

The most common non-specific infection present within the assemblage was periostitis which is an inflammation of the periosteum, the lining of the bones. The bone involvement can occur by the extension from a soft tissue infection, osteomyelitis or osteitis, or it can be a generalised disease. Apart from being caused by infection, it may also be a consequence of trauma, haemorrhage or chronic skin ulcers (Aufderheide and Rodríguez-Martín 1998, 179). Nine male and four female adults (59%) had periostitis. The majority of the lesions were healed and only two individuals, both males (skeletons 10794 and 12902), had active lesions. The lesions were most frequently situated on the tibiae and the fibulae and were usually bilateral. This is a common location since the shin bone lies close to the skin and can therefore be easily subjected to minor trauma (Roberts and Manchester 1995, 130). One individual (skeleton 12902) had active periostitis on the visceral surfaces of three left ribs. This may be indicative of pulmonary tuberculosis but could equally have been caused by a non-specific chest infection.

Maxillary sinusitis was observed on four individuals (two females and two males). The aetiology is multifactoral and may be caused by allergies, smoke and upper respiratory tract infections (Roberts and Manchester 1995, 131).

One adult female (skeleton 12656) had clear evidence of having suffered from tuberculosis. The primary lesion was situated on the right pubic ramus and had caused extensive bone destruction. The infection had subsequently spread haematogenously throughout the body and extensive new bone formation was observed on the shaft of left ulna and right fibula, the visceral surface of six left ribs and the spinal processes of four mid thoracic vertebrae. The location of the primary lesions indicates that the infection was contracted by the intake of infected meat or milk and caused by the tuberculoid strain *Mycobacterium bovis*. This strain affects primarily cattle and is then spread secondarily to humans through digestion (Roberts and Manchester 1995, 137).

*Metabolic disease*

Cribra orbitalia and porotic hyperostosis are caused by anaemia (iron deficiency). The aetiology of anaemia is multifactoral and it is impossible to discern the direct cause of the lesions but includes an iron deficient diet, parasitic infection, chronic disease and excessive blood loss (Roberts and Manchester 1995, 166-167). Eight adults (36%) – four females and four males – had cribra orbitalia and/or porotic hyperostosis. All lesions were healed and longstanding.

Two females, skeletons 11775 and 12656, had lesions consistent with osteoporosis. The condition is generally subdivided into two types. Type one affects menopausal females and is characterised by primarily trabecular bone loss with fractures of the vertebra and distal radius. Type 2 affects both genders over the age of 60 and features both cortical and trabecular bone loss with hip and vertebral fractures (Aufderheide and Rodríguez-Martín 1998, 314). Both females at Higham Ferrers had very light bones. Skeleton 11775 had a fractured femoral neck and was aged over 50. This may indicate that she was suffering from type 2 osteoporosis. It is not possible to say which type skeleton 12656 was suffering from since the condition was diagnosed from the first lumbar vertebral body which was concave (codfish vertebra), a collapse caused by thinning trabecular bone.

*Conclusion*

Overall, the range, type and frequency of pathological conditions broadly conform to the expected pattern for Roman populations of this date and type. Tuberculosis is rare for this period and the present case, if confirmed, is among the earliest examples that have been published from Britain to date (Roberts and Cox 2003, 120). Other examples have been identified from rural and urban sites (for example, Alington Avenue, Dorchester; Ancaster; Poundbury; Queensford Mill; Tolpuddle Hall and Winchester) and tend to be focused in the the south and east of England (Roberts and Buikstra 2003, 132).

## The disarticulated remains

### *Provenance*

Nine disarticulated human bones came from excavation Area G. Four were from layer 8004 (a general reference for finds from the spoil in this area) and five were from well 8278. A further five disarticulated bones were from the main roadside settlement. Two of these were from ditch fills (11539 and 12935, from Phase 3 enclosure 12310/12880), and three were from layers, 12691 (shrine interior soil layer), 12945 (internal occupation soil within building 10830), and 12961 (occupation soil in building 12900).

### *Condition and completeness*

The majority of the fragments had evidence of post-mortem damage consistent with the bones having been redeposited. The bones from well 8285 were, however, in very good condition but with recent post-mortem breaks which had occurred during the excavation.

### *Quantification, age and sex*

The neonatal bones from layers 12835 and 12945 and the three bones from ditch fills 11539 and 12935 the surface of the shrine (12961) are likely to have derived from earlier burials which had been disturbed and redeposited. Moreover, the adult unstratified remains (8004) may be part of skeleton 8261 since this burial was so heavily truncated. The disarticulated remains therefore represent a minimum number of seven individuals. These consisted of four adults (one male and one female), two subadults and one neonate (Table 6.6).

## Burial ritual

### *Location of the adult burials in the landscape*

The burials at Higham Ferrers consisted of small clusters, linear groups as well as isolated burials along boundary ditches, typically at the back of the roadside settlement. This pattern is not unusual and is often associated with small rural settlements and villas (Esmonde Cleary 2000). Overall, the relationship between the burials and the settlement can be seen as being concentrically ordered (Parker-Pearson and Richards 1994, 10). The burials of the neonates were generally within the buildings and

*Table 6.6 Summary of disarticulated human remains*

| *Context number* | *Feature type* | *Skeletal element* | *Side* | *Age* | *Sex* | *Comment* |
|---|---|---|---|---|---|---|
| 8004 | Unstratified | Tibia | Right | Juvenile (13-18 years) | ? | Near complete |
| 8004 | Unstratified | Radius | Right | Adult | ? | Distal half |
| 8004 | Unstratified | Ulna | Right | Adult | ? | Distal half |
| 8285 | Well fill | Femur | Right | Adult | Male | Proximal half |
| 8285 | Well fill | Femur | Left | Adult | Female? | Proximal half |
| 8285 | Well fill | Femur | Left | Juvenile (13-18 years) | ? | Near complete |
| 8285 | Well fill | Humerus | Left | Adult | Female? | Near complete |
| 8285 | Well fill | Fibula | Left | Adult | ? | Distal half |
| 11539 | Ditch fill | Vertebra | - | Subadult | | |
| 12691 | Surface from sanctuary | 1st metacarpal | - | Adult | ? | Partial bone, superior side only |
| 12835 | Surface of structure 10830 | Femur | Right | 35-36 wks | - | Near complete bone |
| 12935 | Ditch fill | Manual phalanx | - | Adult | ? | Part of one of the skeletons within the ditch |
| 12945 | Occupation layer | Cranial fragments | - | Neonate | - | |

therefore closest to the settlement space and the living. Further away were the young children and the three main burial clusters and on the outer ring were the isolated burials. Interestingly, the two most distant burials were females (skeletons 10734 and 11775). The organisation in terms of proximity to the settlement may allude to notions of pollution, with the burials furthest away being the most polluted or dangerous. The neonates may not only have been unthreatening to the living but may even have needed protecting.

All graves were located in or near boundaries. The burials can be seen as being situated within activity areas demarcated by these boundaries. This suggests that the disposal of the dead was integrated with other land-uses and activities rather than set apart in a separate domain (Esmonde Cleary 2000, 132). Their close proximity to contemporary boundaries is therefore not a coincidence but rather a deliberate placement. Its meaning is, however, harder to discern. The very least that can be said is that it suggests a recurring encounter of the living with the dead (Pearce 1999, 151). The burials may suggest that ancestors were used to legitimise claims to land and as such the dead would have had an active role in the lives of the living. A physical boundary can also be seen as a liminal space. The association with boundaries may therefore help to constrain the possible influence of the dead (Esmonde Cleary 2000, 138). That the burials were adjacent to contemporary boundaries may signify that as long as the physical boundaries were maintained, the liminal boundary was intact and the living was protected from the dead, conversely the boundaries may be there to protect the dead from malignant forces.

Discrete burial clusters may be interpreted as family groups. However, the inhumations (skeletons 10922, 10954, 12656, 12686 and 12727) in ditch 12880 were mainly females. Only the latest burial was male (skeleton 10922). This gender-based pattern was repeated in the two other groups in the south-eastern corner of boundary ditches 11270 and 12970. The southern group were all males (skeletons 10794, 10938 and 10951) and there were three males, one female and a child in the northern group (skeletons 10791, 10947, 12814, 12816 and 12902). This burial pattern does not indicate typical family grouping. However, it has been suggested that male groupings may represent kinsfolk organised on a patrilinial basis and the female burials could therefore represent women related by marriage or a matrilinial grouping (Davison 2000, 235). However, social status, wealth, occupational position, and religious beliefs may also to some extent account for the gender based burial pattern (Quensel-von-Kalben 2000, 217). The spatial organisation by gender is not unique and a study on rural sites from Hampshire with four or more burials found that groups of burials were biased towards either males or females (Pearce 1999, 156). Moreover, there is also evidence from the large urban cemetery at Lankhills that contemporary burials of males and females were separated on the basis of gender (Clarke 1979,126).

### *Aspects of adult funerary ritual*

Abundant domestic pottery sherds, including samian ware, were present within the backfill of the female burials in ditch 12880, with the pottery being restricted to the grave fills rather than the ditch fill.

*Table 6.7 Summary of adult burial ritual*

| *Skeleton number* | *Cut number* | *Orientation* | *Body position* | *Coffin* | *Grave goods* |
|---|---|---|---|---|---|
| 8012 | 8010 | NW-SE | Supine | Possibly | Ceramic vessel |
| 8018 | 8016 | SW-NE | Supine | None | None |
| 8128 | 8123 | SE-NW | Supine | Possibly | Ceramic vessel (SF 676) and tiles placed by the skull and feet (SF 677 and 678) |
| 8131 | 8132 | NW-SE | Supine, decapitated | Present | Coin (SF 686) |
| 8155 | 8154 | NW-SE | Supine | None | None |
| 8261 | 8301 | Unknown | Unknown | Unknown | Unknown |
| 10734 | 10732 | NW-SE | Supine | None | Copper alloy finger ring with glass intaglio (SF 1226), bone pin (SF 1227) |
| 10791 | 10792 | E-W | Supine | Present | None |
| 10794 | 10795 | SW-NE | Supine | Present | 3 iron keys (SF 1317-19), shoes (hobnails) |
| 10922 | 10923 | NNE-SSW | Supine | None | None |
| 10938 | 10937 | SW-NE | Flexed, right side, decapitated | None | Shoes (hobnails) |
| 10951 | 10949 | SW-NE | Supine | None | None |
| 10954 | 10956 | SW-NE | Prone | Present | None |
| 11775 | 11774 | E-W | Supine, decapitated | Present | Beaker |
| 12599 | 12597 | SW-NE | Supine | None | None |
| 12656 | 12654 | NE-SW | Prone | None | None |
| 12686 | 12684 | SSW-NNE | Supine | None | None |
| 12727 | 12726 | SW-NE | Flexed, left side | None | Copper alloy bracelet (SF 2934) |
| 12814 | 12811 | NE-SW | Supine | Present | Glass vessel fragment (SF 3004) |
| 12816 | 12813 | NE-SW | Supine | Present | None |
| 12902 | 12839 | E-W | Supine | Present | Ceramic vessel |
| 12999 | 12997 | NNE-SSW | Supine | None | None |

The backfill of the isolated burial of skeleton 11775 also contained frequent pottery sherds. This could symbolise the importance of the women within the domestic sphere, although it may of course express a more elusive religious belief.

The distinctive features of the burial ritual at Higham Ferrers are summarised in Table 6.7. The orientation of the burials was predominantly roughly north-south or south-north, which is quite a common pattern (Pearce 1999, 155-156). However, there are variations in the orientation and the close relationship of burials with other features such as boundaries has a strong influence on the burial orientation.

All but four of the adult inhumations were supine, two individuals had been buried flexed (skeletons 10938 and 12727) and two were prone (skeletons 10954 and 12656). Prone burials occur sporadically throughout the Roman period but become more common in the 4th century (Philpott 1991, 71).

### *Coffins*

Coffin nails were present in the graves of seven skeletons (8131, 10794, 10954, 11775, 12814, 12816 and 12902). A further two (skeletons 8012 and 8128) had one or two nails within the burial which may indicate the presence of a coffin (Table 6.7). An equal number of males and females had been interred in coffins. The evidence for the use of wooden coffins in the late Roman period is widespread in Britain, and from a sample of 3459 burials, 54% had evidence for the presence of a wooden coffin (O'Brien 1999, 13).

### *Grave goods*

Overall, grave goods are usually rare in late Roman burials (ibid., 21). The grave goods present can be divided into two groups, personal effects (clothing and jewellery) and domestic artefacts such as ceramic vessels. Two males were buried with footwear (skeletons 10794 and 10938). The majority of burials with footwear are found in south central England and are most commonly associated with villas and other minor rural settlements though quite a few examples have been found at urban sites such as Lankhills (Philpott 1991, 167; A Boyle pers. comm.). Burials with hobnails become more common in the 2nd and 3rd centuries but the vast majority of examples date to the 4th century. This rite may have mirrored current fashions in footwear but is more likely to have been associated with a belief such as in the individual's need for shoes in the afterlife (Hope 1999, 59).

Two females (skeletons 1074 and 12727) were buried wearing jewellery which comprised a ring and a bracelet respectively. Bracelets were the most common form of jewellery either worn or placed in the female graves at Lankhills, for example (Quensel-von-Kalben 2000, 223).

One male, skeleton 10794, was buried with three large iron keys which had been placed on the chest area. Though quite unusual, other instances of such an occurrence are known from sites at Old Ford, Chatham, and Kelvedon (Black 1986, 222). The key was an attribute of Epona, who may have been invoked to aid the dead buried with such an object (ibid.). It is, however, very rare that a burial can be linked with a specific deity (Alcock 1980, 50). Keys can also be seen as a symbol of hope in the face of death (Black 1986, 222),or perhaps as status symbols, denoting wealth and power.

Ceramic vessels were present in four burials (skeletons 8012, 8128, 11775 and 12902). These are likely to have contained food offerings. The glass fragment with skeleton 12814 may be an accidental inclusion or it may possibly represent the symbolic inclusion of a high status artefact.

### *Decapitation burials*

Three skeletons (8131, 10938 and 11775) were decapitation burials. They were all adults and comprised one male and two females. Although widely distributed in time and space, decapitation burials are most commonly found in small rural cemeteries from the 3rd century onwards, with most examples dating to the 4th century (Philpott 1991, 78). In a sample of 87 decapitation burials that could be sexed, Philpott (ibid., 79) found a slight predominance of females over males (51:36).

The placement of the cranium in the burial varies but the vast majority are placed below the hips and most commonly between the legs, knees and feet (ibid., 78). The crania in the two female burials at Higham Ferrers were placed between the lower legs, while that of the male skeleton (10938) was placed in the stomach area. This individual was flexed on his left side and the cranium was nestling in the space created by the drawn up legs and the left arm which was draped across the top of the skull.

Skeletal evidence is generally considered to suggest that the removal of the head was carried out post-mortem (Philpott 1991, 80). No cut marks were seen on the Higham Ferrers examples, but many of the bones were fragmented and/or missing at the regions where the marks could have been present. It is therefore not possible to say how these specific individuals were decapitated, although there is nothing to suggest that this was not in line with the widely observed pattern.

### *Neonatal burials*

A specific group of burials which merits a separate discussion is the neonates. All were associated with buildings and are summarised in Table 6.8. All neonates were aged between 33 and 42 weeks and the majority were aged between 37 and 40 weeks, which is indicative of being full term. The main locations for these burials were in or near a corner of the building and alongside a wall. The presence of infants within buildings is common and it has been noted that only infants were buried within the city walls in Winchester (Esmonde Cleary 2000, 135).

The presence of 13 neonates at the settlement may appear to be a substantial number and it may be tempting to suggest dramatic interpretations such as infanticide in which infants were selected, killed and buried surreptitiously for whatever reason (Scott 1991, 110). Mortality rates from the Roman period are clearly not available, though comparable population statistic figures from the Model West provide a guide to an approximate structure of pre-industrial populations (Pearce 2001, 129). This model provides a mortality rate in the first year of *c* 16-37%. At face value, the neonatal burials at Higham Ferrers amount to 36% of the total inhumations, but this crude figure cannot be taken as a simple reflection of the pattern suggested by the Model West life table. On the one hand, taphonomic factors such as grave depth and diagenesis may have resulted in the complete loss of infant burials. On the other hand, the adult burials are far too few to represent the complete population and many individuals are likely to have been buried elsewhere, perhaps in a more formal cemetery. Equally, the present figures take no account of the chronological range of the settlement. Nevertheless, they do suggest that the mortality rates are within the normal ranges for a pre-industrial society and there is nothing to warrant any other explanation.

The location of the infant burials indicates that a separation between the living and the dead was not needed. This may be due to the infant not having developed a definite social persona, which would have warranted exclusion from the domain of the living. Alternatively, the lack of a social persona may also have meant that infants could be buried with minimal amount of ritual (Esmonde Cleary 2000, 135-136). The location of the burials does, however, suggest a purpose and infant burials appear to have often been used to inaugurate construction or terminate the use of buildings (Pearce 2001, 127).

### *Disarticulated remains*

It is relatively unusual to find disarticulated fragments of adult burials within Roman contexts since adults normally received formal burials. All the adult and subadult bones at Higham Ferrers were from layers and feature fills and may have derived from disturbed burials.

Disarticulated remains from three individuals were recovered from well 8278, just north of the possible temple in Area G. Wells from settlements as well as temples have been found to contain human remains and these have usually formed part of a greater structured deposit which also included animal remains, building material, coins, pottery

*Table 6.8 Summary of the location of neonatal burials*

| *Skeleton number* | *Feature number* | *Feature type* | *Location* |
|---|---|---|---|
| 10876 (fill no.) | 10810 | Structure | Robber cut of south-west wall |
| 10947 | 12900 | Structure | Grave cut to the rear of the building |
| 12372 (fill no.) | 10830 | Structure | Soil deposit overlying building |
| 11389 | 10870 | Structure | South-east of entrance |
| 11642 | 10880 | Structure | Alongside southern wall, near south-eastern corner |
| 11687 | 10880 | Structure | Alongside eastern wall, near south-eastern corner |
| 11782 | 11370 | Structure | North-eastern corner |
| 11808 | 10870 | Structure | Near the northern wall |
| 11815 | 10870 | Structure | Near the northern wall |
| 12120 | 10850 | Structure | Alongside western wall near north-western corner |
| 12613 | None | None | Isolated on far southern side of excavation area |
| 12757 | 12900 | Structure | NE interior corner |
| 13011 | 10830 | Structure | Near southern wall |
| 13013 | 10830 | Structure | Near southern wall |

and metal vessels (Esmonde Cleary 2000, 138). The wells may be perceived as liminal spaces between the underworld and above ground. As such the shafts could have functioned as points or portals for communication with the deities and the structured deposits therefore take on a ritualistic aspect. On a more basic level, there is also a more obvious sexual connotation of the well shaft penetrating the earth, raising the possibility that they were therefore connected to sexuality and fertility (ibid.).

## ANIMAL BONE *by Lena Strid*

### Introduction

The animal bone assemblage from the Roman settlement comprises 16,157 refitted fragments, from securely dated contexts. The assemblage can be divided into three chronological phases: early Roman (Phase 3, mid-late 2nd century), mid Roman (Phase 4, late 2nd-late 3rd century) and late Roman (Phase 5, late 3rd-4th century).

The bones were recovered through hand collection during excavation and from wet-sieved bulk samples (processed using a $500^2$ m residue mesh). Almost all of the recorded bones derive from hand-retrieved contexts; only 4.2% were extracted from sieved samples. A full record of the assemblage, documented in a Microsoft Access database, can be found with the site archive.

### Methodology

The bones were identified at Oxford Archaeology using a comparative skeletal reference collection, as well as osteological identification manuals. All the animal remains were counted and weighed, and where possible identified to species, element, side and zone. Sheep and goat were identified to species where possible, using Boessneck *et al*. (1964) and Prummel and Frisch (1986). They were otherwise classified as 'sheep/goat'. Wild boar was distinguished from domestic pig by size (see Johnstone and Albarella 2002, 33), using domestic pig measurements from the ABMAP database as a comparison (http://ads.ahds.ac.uk/catalogue/specColl/abmap/). Ribs and vertebrae, with the exception for atlas and axis, were classified by size: 'large mammal' representing cattle, horse and deer, 'medium mammal' representing sheep/goat, pig and large dog, and 'small mammal' representing small dog, cat and hare. The condition of the bone was graded on a 6-point system (0-5) using criteria stipulated by Lyman (1996), grade 0 equating to very well-preserved bone and grade 5 indicating that the bone had suffered such structural and attritional damage as to make it unrecognisable.

Modern breaks were disregarded when calculating the total number of fragments. The minimum number of individuals (MNI) was calculated on the most frequently occurring bone for each species, using Serjeantson's (1996) zoning guide, and taking into account left and right sides, as well as epiphyseal fusion. For the calculation of the number of identified fragments per species (NISP) all identifiable fragments were counted, although bones with modern breaks were refitted. The weight of bone fragments has been recorded in order to give an idea of their size and to facilitate an alternative means of quantification.

For ageing, Habermehl's (1975) data on epiphyseal fusion were used. Three fusion stages were recorded: unfused, in fusion, and fused. In fusion indicates that the epiphyseal line is still visible. Cattle horn cores were aged according to Armitage (1982), using texture and the appearance of the horn core surface. Tooth wear was recorded using Grant's tooth wear stages (Grant 1982), and correlated with tooth eruption (Habermehl 1975), as well as the wear rate of the mandibular M3 (Benecke 1988, in Vretemark 1997), in order to estimate an age for the animal(s). Due to the very broad age ranges for pigs classified by Benecke, O'Connor (1988) was substituted for this species. Sex estimation was carried out on cattle metapodials and pelves, sheep pelves, and pig mandibular canine teeth, using data from Boessneck *et al*. (1964), Mennerich (1968), Prummel and Frisch (1986), Schmid (1972) and Vretemark (1997). Measurements were taken according to von den Driesch (1976), using digital calipers with an accuracy of 0.01 mm. Large bones were measured using an osteometric board, with an accuracy of 1 mm. Withers' height of dog and horse were calculated using Harcourt (1974) and May (1985) respectively.

*Table 6.9 Number of identified animal bones by major chronological phase*

| | *Early Roman* | *Mid Roman* | *Late Roman* |
|---|---|---|---|
| Cattle *(Bos taurus)* | 49 | 248 | 368 |
| Sheep/goat *(Ovis aries / Capra hircus)* | 264 | 2354 | 1199 |
| Sheep *(Ovis aries)* | 7 | 118 | 105 |
| Goat (Capra hircus) | | 1 | 1 |
| Pig *(Sus domesticus)* | 33 | 293 | 304 |
| Horse *(Equus caballus)* | 13 | 38 | 71 |
| Dog *(Canis familiaris)* | 20 | 63 | 49 |
| Cat *(Felis catus)* | 1 | 1 | 1 |
| Red deer *(Cervus elaphus)* | | 2 | 2 |
| Roe deer *(Capreolus capreolus)* | | 2 | 1 |
| Wild boar *(Sus scrofa)* | | 9 | 1 |
| Hare *(Lepus europaeus)* | | 4 | 1 |
| Rabbit *(Oryctolagus cuniculus)* | | 4 | |
| Rodents and shrews *(Rodentia* and *Sorex* sp.*)* | | 19 | |
| Domestic fowl *(Gallus gallus)* | 2 | 29 | 43 |
| Goose *(Anser anser/ Anser domesticus)* | | 1 | 3 |
| Duck *(Anas sp.)* | | 5 | 4 |
| Mallard *(Anas Platyrhynchos)* | | 2 | 3 |
| Pigeon *(Columba* sp.*)* | | 2 | 1 |
| Lapwing *(Vanellus vanellus)* | | 1 | |
| Crow *(Corvus corone)* | | 5 | |
| Rook *(Corvus frugilegus)* | | 5 | 1 |
| Raven *(Corax corax)* | | 2 | 4 |
| Indeterminate corvids | | 21 | 1 |
| Small passerine | | 1 | |
| Frogs and toads *(Rana* sp. and *Bufo* sp.*)* | | 23 | 3 |
| Carp *(Cyprinius carpio)* | | | 1 |
| Eel *(Anguilla anguilla)* | | | 1 |
| TOTAL | 375 | 3253 | 2168 |

### The assemblage

The Roman assemblage consisted of 16,157 fragments, of which 5796 (35.9%) could be determined to species (see Table 6.9) and 3604 fragments were considered completely unidentifiable. The rest of the unidentified fragments consist mainly of long bone shaft fragments, vertebrae and ribs, assigned to small, medium-sized and large mammal respectively. The bones were in good condition, with little burning and some gnawing from carnivores and rodents (see Tables 6.10-12).

Of the 4047 sheep/goat bones, 230 could be identified as sheep and 2 as goat. It is therefore assumed that the majority of the sheep/goat bones in the assemblage derive from sheep (cf. Maltby 1981, 159-160); and "sheep" is used throughout the report. The goat bones comprised one metacarpal and one metatarsal.

The dominant species in all Roman phases at Higham Ferrers is sheep, regardless of quantification method. This is in stark contrast to the usual

*Table 6.11 Number of gnawed animal bones*

| | *Gnawed bones* | *%* |
|---|---|---|
| Early Roman | 11 | 0.1% |
| Mid Roman | 160 | 1.8% |
| Late Roman | 159 | 2.6% |
| Total | 330 | 2.0% |

*Table 6.12 Number of burnt animal bones*

| | *Burnt bones* | *%* |
|---|---|---|
| Early Roman | 80 | 6.9% |
| Mid Roman | 29 | 0.3% |
| Late Roman | 41 | 0.7% |
| Total | 150 | 0.9% |

*Table 6.10 Preservation level of animal bones*

| | *N* | *0* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|---|---|
| Early Roman | 1157 | | 3.4% | 64.6% | 30.3% | 1.6% | 0.1% |
| Mid Roman | 8962 | 0.01% | 0.8% | 58.0% | 40.1% | 1.1% | |
| Late Roman | 6037 | 0.01% | 0.4% | 68.2% | 26.5% | 1.3% | 0.01% |
| Total | 16157 | 0.01% | 2.1% | 62.3% | 34.3% | 1.2% | 0.0% |

pattern for Romanised sites in Britain which are usually dominated by cattle and pig, whereas sheep tend to be dominant at 'native' sites (see Maltby 1981, 163; Hamshaw-Thomas 2000:passim). As Higham Ferrers is situated in an area of relatively dense population and just 4.5 km from a Roman town (Irchester), a non-Romanised population seems implausible. However, a similar species ratio to that observed in Higham Ferrers was found at the Harlow, Chelmsford and Uley temple sites (Legge and Dorrington 1985; Luff 1992; Levitan 1993), although the predominance of sheep at Harlow and Chelmsford was not explained by the authors. Uley is interpreted as having been mainly a shrine to Mercury whose sacrificial animals were the goat and the cockerel, an interpretation also confirmed by the archaeological finds (Woodward and Leach 1993, 333). No such specific cult focus has been found at Higham Ferrers. Apart from temple activity, the predominance of sheep may also be related to an intense focus on dairy production in the area, the young lambs being surplus (see below).

Both meat-bearing and non meat-bearing bones of cattle, sheep and pig were present in the assemblage, indicating that these species were slaughtered, butchered and eaten in the area.

### *The meat-providing domestic mammals*

#### *Cattle*

Cattle were mainly represented by rather young individuals. The dental age estimation show a consistently high percentage of cattle younger than 2.5 years (see Fig. 6.4a). However, as the number of ageable cattle jaws and bones is rather low in Phases 3 and 4, these figures must be used with care. The bone fusion evidence is consistent with the dental age estimation, in that both young and subadult cattle are present. Of the sixteen cattle in the 0-1 years interval, five were very young, with the first permanent molar either erupting or with very little wear (wear stage b). As this tooth erupts at 5-6 months of age (Habermehl 1975, 84f) it would equate to 5-7 month-old calves.

Both male and female cattle pelves were found in the assemblage (see Table 6.13). Using Mennerich's index, all four measureable metacarpals (late Roman Phase 5) were found to be within the range of bulls and oxen (Mennerich 1968, 11, 35, in Vretemark 1997, 48). Since only ten cattle could be sexed, little can be said regarding any cattle husbandry focus on males or females. The measurable cattle bones are about the same size as bones from other Roman sites in Britain. The size differences may reflect different ratios of cows, bulls and bullocks, as well as cattle of different ages.

*Table 6.13 Cattle sex estimation*

| | *Male* | *Female* |
|---|---|---|
| Early Roman | - | - |
| Mid Roman (n:4) | 50% | 50% |
| Late Roman (n:2) | 50% | 50% |
| Total (n:6) | 50% | 50% |

Butchery marks were found on several cattle bones, in all three phases. Cut marks deriving from skinning occurred on six first phalanges. Most butchery marks were associated with dismemberment, and were found proximally, mid-shaft and distally on long bones, as well as on pelvis (ilium, acetabulum and ischium), calcaneus, atlas and the articular process of the mandible. Other butchery marks were associated with severing of horn cores from the skull and extraction of marrow from long bones. It is possible that the longitudinal splitting of long bones may also be connected to boneworking, particularly for bones deriving from contexts containing other waste demonstrably derived from this activity.

Pathological conditions were found on seven cattle bones, mostly from the lower legs and feet. One mandible displayed extra bone growth on the ramus, suggesting periostitis. Other infections were found – woven bone growth on a distal tibia and bone absorption of the proximal joint surface of a metatarsal. Four phalanges displayed enthesophytes on muscle attachment sites. This may be caused by using the cattle for traction, and/or by the cattle walking on very soft or hard surfaces (Clutton-Brock 1979,147; Higham *et al.* 1981, 354-355).

#### *Sheep*

The sheep slaughter patterns are very similar for all three Roman phases, peaking at 0-1 years and 2-4 years (see Fig. 6.4b). Of the 92 sheep in the 0-1 years interval, 61 (66%) were very young, with the first permanent molar either erupting or very little worn (wear stage b). As this tooth erupts at 3 months of age (Habermehl 1975, 120) it would be equivalent of 2-4 month old lambs. The bone fusion is consistent with the dental age estimation, in that both young and subadult animals are present in large numbers, and adult animals are present in smaller numbers.

The majority of the sheep in the assemblage were ewes (see Table 6.14). This may be interpreted as a sheep husbandry regime focussing mainly on milk production, with secondary utilisation of meat and wool production. In a flock specialising in wool production, there would be far more wethers, as they yield a heavier fleece (Clutton-Brock 1976, 382). A flock dominated by young ewes would provide a constant supply of lambs, while each individual would yield some shearings of wool before being slaughtered for meat. The young males were either exported elsewhere to be raised for meat or wool, or were slaughtered before their secondary sexual characteristics developed.

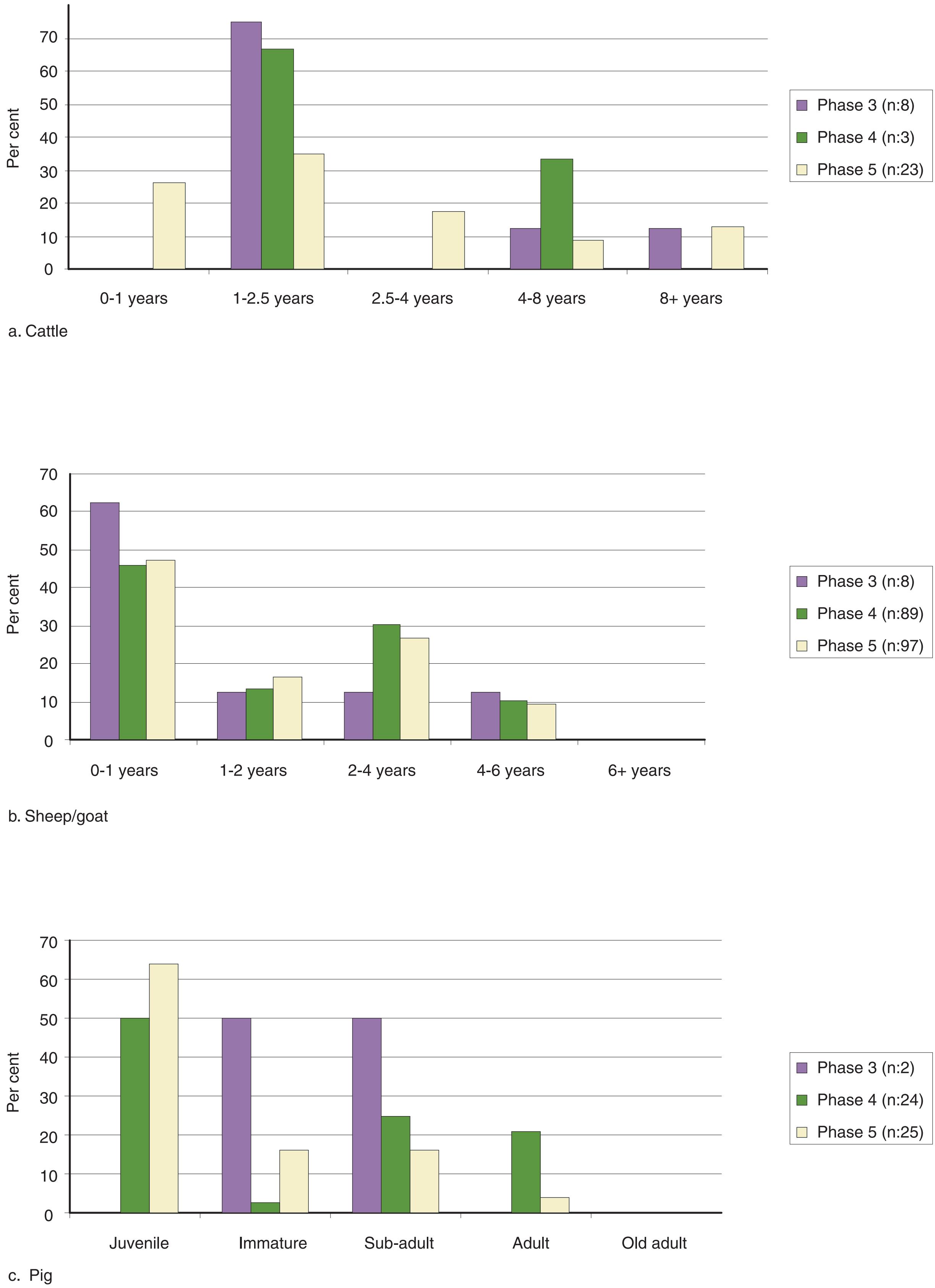



*Fig. 6.4 Dental ageing of main domestic species*

The measurable sheep bones are somewhat larger than sheep bones from other Roman sites in Britain. This is unusual, as in a flock with a majority of ewes, smaller sheep would be expected. It is possible that the Higham Ferrers sheep were of a larger breed, or that they benefited from better nutrition. O'Connor suggests that sheep from Romanised areas in the south of England were larger than ones from more peripheral less-Romanised areas, likely due to Roman introductions of larger breeds (O'Connor 1988, 97). As Higham Ferrers is situated in central Britain, the existence of larger Roman sheep in the herds would not be implausible. Similar large maximum measurements were found at Elms Farm (Johnstone and Albarella 2002, 190-192).

In all phases, most sheep were horned. However, several horn cores were very small. Only three hornless sheep were found: two in the mid Roman phase (Phase 4) and one in the late Roman phase (Phase 5). Finds from southern England indicate that hornless sheep were very rare in Iron Age and early Romano-British deposits, and began to occur more frequently later in the Romano-British period. This may indicate a difference in breed, with native British sheep being mainly horned, and introduced Roman breeds being mainly hornless or only having very small horns. The gene for hornlessness is dominant while the gene for small horns is recessive (Maltby 1994, 94; Föreningen gutefåret 2006). Breeding these sheep into native sheep flocks would likely change the appearance of the flocks fairly quickly. There are also some suggestions that these hornless sheep were somewhat larger than native sheep (Maltby 1994, 94).

Several sheep bones displayed butchery marks. Cut-marks associated with skinning were found on one first phalanx. Two pelves displayed chop marks on the pubis, suggesting a division of the carcasses into halves. Evidence of sagittal division was also found on a skull fragment. However, the vast majority of butchering marks on sheep bones were associated with dismemberment. These mostly occurred proximally, mid-shaft and distally on long bones, as well as on pelvis (ilium), astragalus and atlas. Cut-marks indicating filleting occurred on long bone shafts, a pelvis and a mandible. There is some evidence suggestive of marrow extraction. Bones, particularly metapodials, radii and tibiae, had frequently been split longitudinally. This feature was particularly prevalent in the assemblage from a bone dump (12913) immediately outside building 11370. However, as this context contained plenty of boneworking waste, probably resulting from pin manufacture, it is possible that these bones instead represent waste from this activity.

The 14 pathological sheep bones were mainly affected by infections and trauma. Woven bone growth was found on four long bones and one mandible. One case of bone absorption at the tooth row also occurred. Trauma was demonstrated by two healed fractures; on a humerus and a metatarsal respectively, and as haematoma on two metapodials. Three long bones and one phalanx displayed exostoses on muscle attachment sites, suggesting enthesophytes rather than infections.

*Pig*

The pig dental eruption and attrition data show a widespread slaughter age pattern consisting of juvenile, immature, subadult and adult pigs, with some focus on juvenile pigs (see Fig. 6.4c). The bone fusion evidence is consistent with the dental age estimation, in that both young and subadult animals are present.

In contrast to the sheep, the pig assemblage displayed a considerable bias in favour of boars (see Table 6.15). A predominance of boar is common in most Roman sites in Britain and north-western continental Europe (Luff 1982, 263), and has been interpreted in terms of the slaughter of surplus young boars (Johnstone and Albarella 2002, 31). Bengt Wigh further extrapolates on this, writing that as sows yield less meat, surplus sows would be slaughtered early, before the eruption of the permanent canines at 6-9 months (Wigh 2001, 80).

The measurable pig bones are somewhat larger than pig bones from other Roman sites in Britain. Unfortunately, as no measurable bones from late fusing elements could be measured, there is a possible margin of error regarding not fully grown individuals.

Most butchery marks on pig bones were associated with dismemberment. These mostly occurred proximally, mid-shaft and distally on long bones, as well as on pelvis (ischium), calcaneus, atlas and the articular process of the mandible. Three mandibles were split in left and right halves at the incisive area. Cut marks on a mandibular ramus further

*Table 6.14 Sheep sex estimation*

| | *Male* | *Castrate* | *Female* |
|---|---|---|---|
| Early Roman (n:4) | 25% | - | 75% |
| Mid Roman (n:30) | 13.3% | 16.7% | 70% |
| Late Roman (n:6) | 16.7% | - | 83.3% |
| Total (n:40) | 15% | 12.5% | 72.5% |

*Table 6.15 Pig sex estimation*

| | *Male* | *Female* |
|---|---|---|
| Early Roman | - | - |
| Mid Roman (n:10) | 90% | 10% |
| Late Roman (n:6) | 100% | - |
| Total (n:16) | 93.8% | 6.2% |

indicate the utilisation of cheek meat. Cut marks suggesting filleting were found on a pelvis and on the shafts of long bones.

Pathologies occurred on six pig bones. Haematoma was found on a metapodial and a tibia. More severe trauma was displayed by a dislocated shoulder blade, which was very deformed. Infections had occurred on two mandibles. One had woven bone growth at the incisor area and the other mandible displayed a large abscess, with subsequent pathological bone growth, from the deciduous fourth premolar (dp4) down to the root canal, and from the root canal to the buccal side of the mandibular horizontal ramus. Enthesophytes were found at the proximal articulation of a lateral metapodial.

### *Other domestic mammals*

*Horse*

The great majority of the horse bones derived from adult horses, which is consistent with other Romano-British sites (Locker 1990, 208; Johnstone and Albarella 2002, 34; Maltby 1993, 329-330; Luff 1999, 205). The measurable horse metacarpals are within the same size range as metacarpals from other Roman sites in Britain. Withers' heights of 1.294 m and 1.318 m respectively were calculated from these two bones. This is the equivalent of a modern day Icelandic pony.

Butchering marks occurred on eight horse bones. A calcaneus (Phase 4) displayed cut marks indicating disarticulation of the lower leg. Three metapodials (Phase 3) and one radius (Phase 4) had been chopped longitudinally, suggesting extraction of marrow or utilisation of the long bones as raw material for boneworking. This is likely also the case for two Phase 4 metapodials, one of which was split longitudinally into small pieces, and the other – a metatarsal – which had had parts sliced off supradistally. An ulna (Phase 4) was chopped through the shaft, which may suggest that the meat of the leg or the marrow of the radius was utilised for food – either for humans or for dogs (see Johnstone and Albarella 2002, 34).

Tarsal bones were found fused to a metatarsal in the late Roman (Phase 5) assemblage. This was interpreted as spavin, a disease associated with heavy traction and/or walking on hard surfaces (Baker 1984, 253).

*Dog*

The dog remains comprise four semi-articulated individuals (one juvenile dog in Phase 3, one subadult and one juvenile dog in Phase 4 and one adult dog in Phase 5), and 79 disarticulated bones. Of the disarticulated bones, 13 derived from juveniles, including one neonatal dog. One femur was very slender and thus similar to fox, but it could not be identified as such with certainty. Withers' heights of *c* 300 mm could be calculated on a humerus and an ulna from Phase 5. The Romano-British dog population displays a large variation in size (*c* 200-700 mm in withers' height), and the Higham Ferrers bones are within the range of small Roman dogs (see Harcourt 1974, 167), similar in height to a modern day small spaniel or terrier.

One dog skull in Phase 5 displayed cut marks behind the orbits, indicating the utilisation of dog skins. Skinning marks on Romano-British dogs are rarely noted, and the utilisation of dog skins seems to have been more common in the Iron Age (Maltby 1996, 23-24).

Seven dog bones, all Phase 5, displayed pathological conditions. Six belonged to an articulated animal. This dog was very old, judging by the heavy wear on its teeth. It had infections of the root sockets of P3-M1 in the left and right lower jaws. Its left radius and ulna were fused at the upper part of the bone shaft – likely a badly healed fracture – with subsequent lipping distally as well as at the elbow joint. The left humerus was also affected by lipping. All three bones had smooth woven bone growth, indicative of infection. The hind leg was also affected, with exostoses and a spot of eburnation on the proximal joint surface of the right tibia. A disarticulated ulna displayed an abscess mid-shaft.

*Cat*

The cat remains comprised one bone in each of the three Roman phases. A very small number (or complete absence) of cat bones is usual for Roman sites in Britain and on the continent (Luff 1982:265). No cut marks were found on the bones.

### *Wild mammals*

The wild species in Higham Ferrers comprised red deer, roe deer, wild boar, hare and rabbit as well as amphibians, rodents and insectivores. The scarcity of wild fauna is consistent with contemporary sites in Britain and continental Europe (Luff 1982, 268-283), indicating that hunting provided an insignificant part of the diet. The presence of amphibians and voles suggest that areas adjacent to the site included wetlands and open grassland.

*Deer*

Red deer and roe deer were identified in the assemblage, along with four antler fragments from unidentified deer species. Red deer and roe deer are native to Britain, whereas fallow deer were introduced. While the present fallow deer population derives from animals introduced by the Normans, and there was only a small introduction of fallow deer in the Roman period (Sykes 2004; Sykes *et al.* 2006), it is therefore more likely that the unidentified antlers are of red deer. The red deer remains consisted of meat-bearing limb bones, indicating that they were utilised for venison. The roe deer remains consisted of non meat-bearing lower leg bones, but it is assumed that this species was eaten as well. Two deer antlers were sawn off and smoothed, suggesting that they functioned as handles of some kind.

*Table 6.16 Epiphyseal closure of wild boar*

| *Phase* | *Bone* | *N* | *Unfused* | *Fusing* | *Fused* |
|---|---|---|---|---|---|
| Mid Roman | Humerus d | 1 | | | 1 |
| Mid Roman | Radius p | 1 | | | 1 |
| Mid Roman | Metacarpal d | 2 | 2 | | |
| Mid Roman | Metatarsal d | 1 | 1 | | |
| Late Roman | Metapodial d | 1 | | | 1 |
| Mid Roman | Radius d | 2 | 2 | | |
| Mid Roman | Ulna p | 1 | 1 | | |

*Wild boar*

Almost all wild boar remains were found in Phase 4. They seem to derive mainly from subadult individuals, judging by epiphyseal fusion evidence (see Table 6.16). However, this ageing method must be used with care, as research has shown variations between populations (Bull and Payne 1982, 70; Bridault *et al*. 2000, 15f; Magnell 2006, 43). Wild boar is rare on Roman sites in Britain, as well as on Roman and non-Roman sites in north-western Europe (Luff 1982, 268-283). No wild boars were found at the reference sites, but were possibly present at Colchester (Luff 1982, 127). A cut mark at the proximal end of a metacarpal suggests skinning, or possibly disjointing of the foot. Pathological changes were found on three bones. Two metacarpals displayed woven bone growth, and one metacarpal displayed massive bone growth along its entire shaft. Both of these changes suggest infection, possibly osteoperiostitis (Baker and Brothwell 1980, 64-69).

*Lagomorphs*

The scanty amount of bones from hares in Higham Ferrers is consistent with contemporary assemblages, in which they are rarely found, and then in small numbers. While hares are native to Britain, rabbits are commonly regarded as being introduced by the Normans (Yalden 1999, 158-159). As the few rabbit bones in Higham Ferrers derive from contexts near the topsoil, it is likely that they are intrusive. Since the numbers of lagomorph remains are so low, little can be discerned regarding hunting strategies. All hare and rabbit remains derived from adult individuals.

***Birds***

The bird species comprised fowl, goose, duck (probably including mallard) pigeon, crow, rook, raven and lapwing. It is uncertain whether the goose and duck bones derive from domestic or wild birds, as it is very hard to distinguish between greylag goose and its descendant the domestic goose, as well as between domestic duck and mallard. Many of the corvid bones were either crow or rook, but could not be securely identified to species. Small corvids, such as magpie and/or jackdaw were also present.

Domestic fowl is the most common species, as at other Roman sites (Maltby 1981, 161). Most fowl were adults, or subadults; only a few juveniles were present. In six of the seven tarsometatarsi it was not possible to determine sex, as only the proximal or very distal parts of the bone had survived. The remaining tarsometatarsus displayed a spur, and would thus derive from a cockerel or a capon. Medullary bone, which would positively identify female birds, was not observed. The domestic fowl were about the same size as fowl from other Roman sites in Britain. The number of measured bones, both at Higham Ferrers and at the comparative sites, is small and few conclusions can be drawn regarding size changes over time (cf Johnstone and Albarella 2002, 38). The presence of duck/mallard and goose is common on Roman sites in Britain (see Albarella 2005); they were kept/hunted for their eggs and feathers as well as for their meat.

It is uncertain whether the pigeon bones derived from the stock dove (Columba oenas) or rock pigeon (Columba livia) as these species are of similar size. Dovecotes were usually placed on the roof of buildings, according to Roman authors (Rivet 1982, 207), and would thus elude archaeological discovery.

Ravens have been connected to the Mithras cult (Macready and Sidell 1998, 114) and have been found in small numbers on some Romano-British Mithraea and other temple sites (Levitan 1993, 263; Macready and Sidell 1998, 209; Luff 1999, 220). However, as ravens and other corvids are scavengers, they may have been attracted to the site for more secular reasons.

Lapwing was the only wader in the assemblage, a probable indicator of opportunistic wildfowling. Waders occur fairly frequently in Roman assemblages (Johnstone and Albarella 2002, 41), but only constituted a small part of the diet.

Butchery marks were found on five fowl, one duck and one mallard bone. The marks derived from the disarticulation of the carcass as well as from the removal of meat. It is likely that most, if not all other species in the assemblage were eaten (Parker 1988, 201-202). Pathological conditions were found on a domestic fowl ulna, which displayed a mis-aligned healed fracture mid-shaft.

***Fish** by Rebecca Nicholson*

The only fish species in the Roman assemblage are eel (Anguilla anguilla) and carp (Cyprinius carpio), the latter represented by a single large spine. The scarcity of fish is typical for Roman rural sites, as is the complete absence of marine taxa. The eel bones indicate some limited fishing in nearby rivers, probably with the use of traps or by spearing. The carp bone is a particularly unusual find for a Roman site: carp were introduced to Britain, probably in the Middle Ages. Unfortunately the provenance of the bone is not completely secure, and it seems likely to be a later intrusion.

## Animals from the shrine

Almost 4400 bones were recovered from the shrine (see Table 6.17), which was dated to the mid Roman period (Phase 4). While most species were found in similar qualities to those found in the contemporary non-votive deposits (also shown in Table 6.17), large mammals, notably cattle and horse, were less common in the shrine contexts. It would seem likely that among the main meat-providing animals, sheep and pig were the preferred sacrificial animals, though this finding is not conclusive as the number of identified large mammal bones was fairly low across the site as a whole in the mid-Roman period. Animals absent at the shrine included goat, cat, red deer, goose, duck, lapwing, small mammals and fish. All these species were only present in small numbers in the mid-Roman non-votive contexts, so their absence is probably of little significance. The similarity in species composition between shrine contexts and secular contexts was also found at Folly Lane (Locker 1999, 243). In contrast, the species composition at temple sites such as Elms Farm (Johnstone and Albarella 2002, 50) and Uley (Levitan 1993, 259), showed marked differences between votive and secular contexts.

As no articulated remains were found and only 3.6% of the bones were complete, it is believed that the animal remains mainly derive from food offerings. Butchery marks occurred with the same frequency as in the contemporary non-votive contexts. One bone had evidence of burning, which may indicate that the food was not prepared by

*Table 6.17 Quantification of animal remains from the shrine area and settlement (phase 4) (by NISP, MNI and weight)*

| | Shrine | | | Settlement (phase 4) | | |
|---|---|---|---|---|---|---|
| | Total NISP | MNI | Weight (g) | Total NISP | MNI | Weight (g) |
| Cattle | 77 | 3 | 1637 | 172 | 5 | 9083 |
| Sheep/goat | 1305 | 79 | 7346 | 1159 | 46 | 9695 |
| Sheep | 50 | - | 405 | 70 | - | 1190 |
| Goat | - | - | - | 1 | - | 13 |
| Pig | 133 | 8 | 1337 | 163 | 8 | 2864 |
| Horse | 6 | 1 | 378 | 32 | 2 | 2547 |
| Dog | 39 | 2 | 85 | 25 | 3 | 235 |
| Cat | - | - | - | 1 | 1 | 0 |
| Deer | 3 | - | 15 | 2 | - | 14 |
| Red deer | 2 | 1 | 204 | - | - | - |
| Roe deer | 2 | 1 | 17 | - | - | - |
| Wild boar | 2 | 1 | 22 | 6 | 1 | 200 |
| Leporidae | 1 | - | 13 | - | - | - |
| Hare | 2 | 1 | 2 | 2 | 1 | 6 |
| Rabbit | 1 | 1 | 1 | 3 | 1 | 6 |
| Domestic fowl | 12 | 2 | 15 | 18 | 3 | 28 |
| Duck | 4 | 1 | 2 | 3 | 1 | 8 |
| Goose | - | - | - | 1 | 1 | 5 |
| Pigeon | 2 | 1 | 0 | - | - | - |
| Lapwing | - | - | - | 1 | 1 | 0 |
| Passerine | 1 | 1 | 0 | - | - | - |
| Crow | 3 | 1 | 3 | 2 | 1 | 0 |
| Rook | 5 | 2 | 4 | - | - | - |
| Raven | 1 | 1 | 1 | 1 | 1 | 0 |
| Corvid | 16 | - | 6 | 5 | - | 4 |
| Bird | 49 | - | 12 | 23 | - | 15 |
| Rat | 1 | 1 | 0 | - | - | - |
| Water vole | 1 | 1 | 0 | - | - | - |
| Bank vole | - | - | - | 3 | 1 | 0 |
| Frog/toad | 7 | 1 | 2 | 16 | - | 0 |
| Fish | - | - | - | 1 | - | 0 |
| Microfauna | - | - | - | 365 | - | 1 |
| Small mammal | 3 | - | 2 | 6 | - | 2 |
| Medium mammal | 1497 | - | 3279 | 1423 | - | 3800 |
| Large mammal | 228 | - | 1476 | 584 | - | 6349 |
| Indeterminate | 900 | - | 1557 | 990 | - | 2170 |
| Total | 4353 | 110 | 17821 | 5078 | 77 | 38235 |

roasting. Articulated remains were found at the Brigstock temple in Northants (Greenfield 1963, 261) and at Elms Farm (Johnstone and Albarella 2002, 51-52), and butchered remains were common at Harlow, (Legge and Dorrington 1985, 122-123), Chelmsford (Luff 1992, 122-123) and Elms Farm (Johnstone and Albarella 2002, 49-52).

The animal remains at Higham Ferrers were deposited in layers within the main shrine area and in layers associated with a stone platform surface and a wall immediately to the south. Dog gnawing occurred on less than 2% of these bones, indicating that dogs were rather successfully prevented from entering the shrine area.

The body part representation of sheep and pig mainly follow the pattern in the non-shrine contexts (see Fig. 6.5). The exception is the meat-bearing upper front limb of sheep, which were much more frequent among the shrine contexts, and pig skulls, which were more frequent among the non-shrine contexts.

Luff argues that the relatively large frequency of metapodials and other non meat-bearing bones of sheep in Ivy Chimneys could be connected to tanning or boneworking. Such bones were scarce in the temple contexts of Harlow and Chelmsford (Luff 1999, 222). It would seem as if the Harlow and Chelmsford bones mostly represent food offerings in the form of discrete cuts, or as if meat-poor body parts were removed from the temple area after the sacrifice. At Higham Ferrers, sheep humeri and radii are vastly over-represented, and this might be

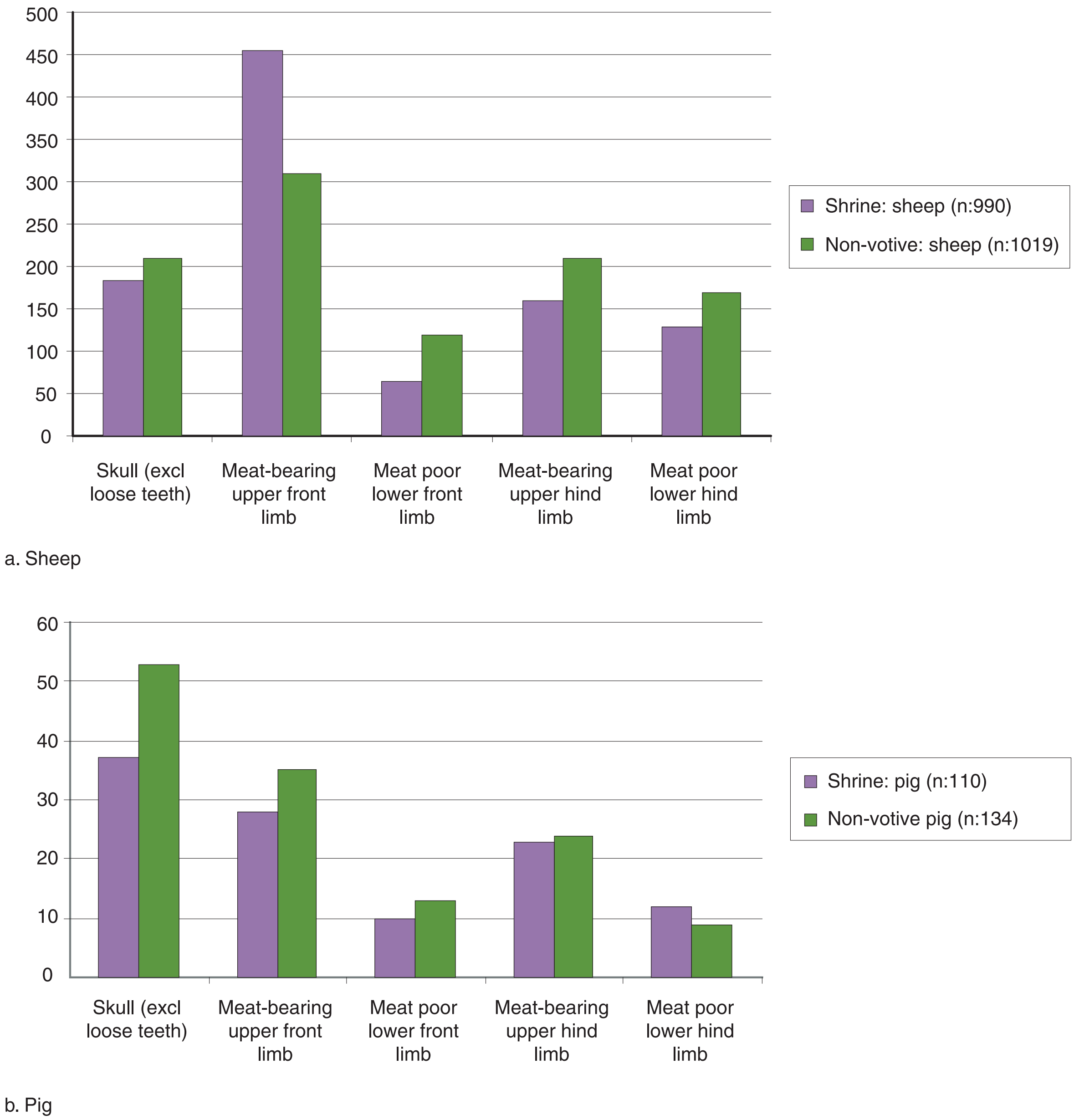



*Fig. 6.5 Body part representation of sheep and pig*

evidence of offerings of discrete cuts of meat. It is not clear whether the metapodials were deposited as waste from the manufacture of bone pins – many of which were found in the shrine – or if they represent a whole sacrificed sheep of which every part, including marrow, was used in the festivities.

Although the age structures of sheep and pig are similar for all the Phase 4 contexts, there are relatively fewer juvenile sheep and relatively more juvenile pigs associated with the shrine (see Fig. 6.6). It is clear that the sheep and pig offerings at Higham Ferrers were of prime meat animals, but there are insufficient ageing data from the cattle assemblage to characterise the slaughter pattern. However, both juvenile and subadult/adult cattle are present.

At the Higham Ferrers shrine sheep slaughter mostly occurred in the 0-1 year and at 2-4 year age ranges (see Fig. 6.6a). There appear to have been similar numbers of 3-4 month old lambs and the slightly older lambs. This suggests the absence of time-specific festivities focussed on a certain sacrificial animal. A very narrow time frame for sheep slaughter was found at the temple sites of Harlow, where almost all sheep had been slaughtered at 3-4 months of age, and Great Chesterford, where almost all sheep were either newborn lambs or 6-8 month old lambs (Legge *et al.* 2000, 153-154). These narrow time frames have been interpreted as related to slaughter for specific festivities, rather than everyday rituals (ibid.).

The sacrificial slaughter of adult and older sheep also occurred at Folly Lane (Locker 1999, 341), Elms Farm (Johnstone and Albarella 2002, 50-51) and Ivy Chimneys (Luff 1999). It remains unknown whether this was because adult sheep were more valuable than young lambs, and thus more appropriate to be sacrificed, or, in the case of the old sheep, less valuable and thus more economically useful as sacrifices.

It was not possible to compare the age of sacrificed pigs from other shrines, as there were either

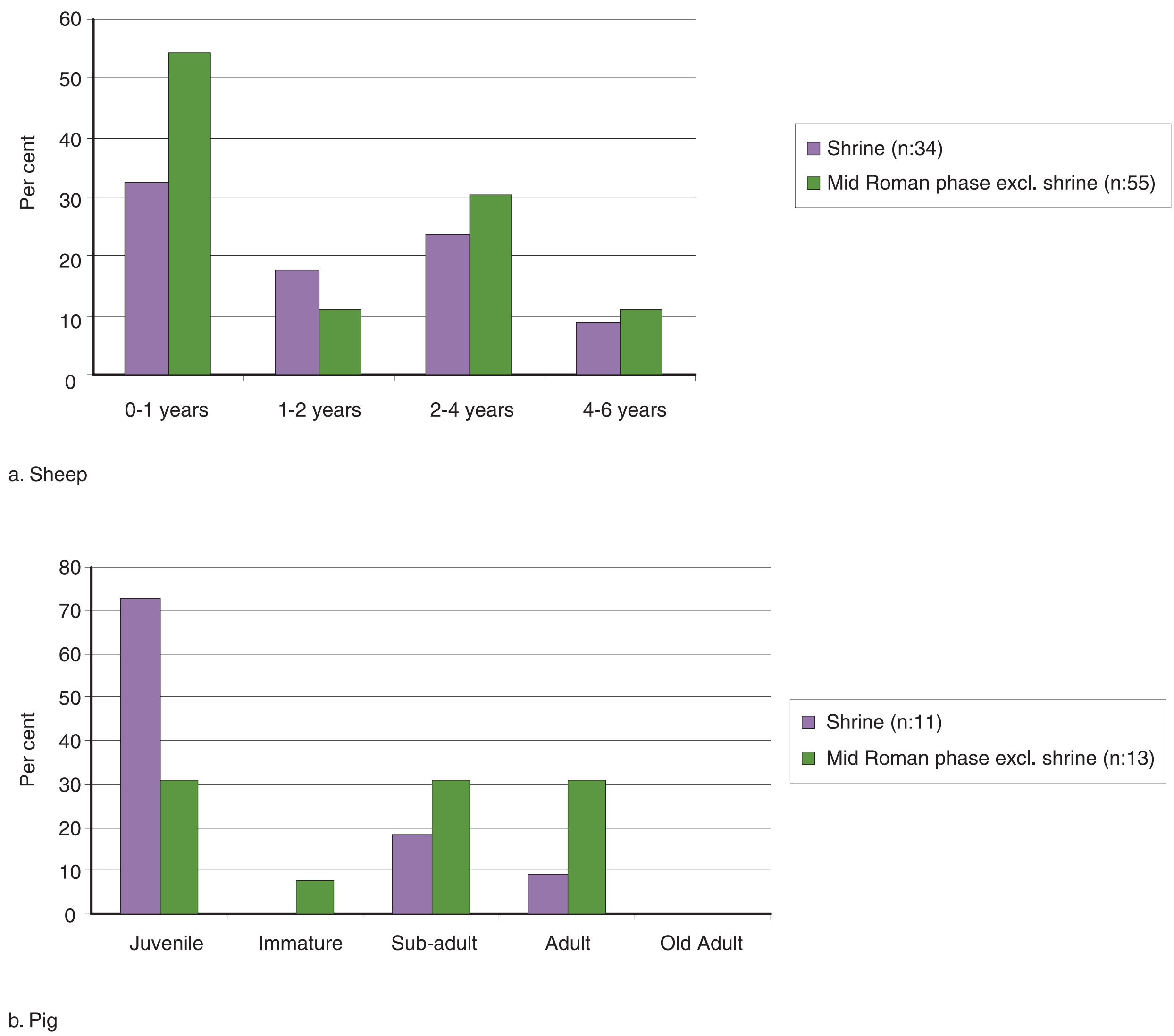



*Fig. 6.6 Age structures of sheep and pig*

not enough data in the comparative assemblages to render a comparison useful, or the votive contexts from these sites were not singled out in the ageing analyses.

The dog remains consisted of 30 bones from the hind part of an adult semi-articulated dog and 8 disarticulated bones. All dog bones were found in the layer within the shrine, and it is possible that some of the disarticulated remains derive from the semi-articulated dog. Butchery marks were absent, and it is therefore unlikely that the dog was intended as a food offering. Articulated and semi-articulated dogs have been found in ritual contexts at Ivy Chimneys (Luff 1999, 217), Elms Farm (Johnstone and Albarella 2002, 52), Folly Lane (Locker 1999, 335-336), and Uley (Levitan 1993, 262). In Greco-Roman religion, dogs were associated with the healing deity Asklepius, the hunting goddess Diana, and the war god Mars (Toynbee 1973, 101, 122-123; Simoons 1994, 237). Cicero also suggests that dogs, especially black ones, were appropriate sacrifices at funerals (Henig 1984, 193).

The remains of domestic fowl recovered at the shrine consisted of the larger bones from the wing and legs. As no attempt was made to identify bird vertebrae, ribs, skull fragments and phalanges to species, it is not unlikely that entire fowls were sacrificed. Bird skull fragments were, however, absent in the shrine contexts. As bird foot phalanges were present, the absence of skull fragments may be due to taphonomic loss. Fowl were a common sacrificial animal in the Roman period (Johnstone and Albarella 2002, 50) and examples include both temple sacrifices (Woodward and Leach 1993, 333) and grave offerings (Harman 1985, 279; Lauwerier 1993). According to Toynbee, sacrifices to lares, guardian spirits of house and fields, consisted of fowl (Toynbee 1973, 257).

Many of the other bird species retrieved from the shrine were associated with deities: Pigeons were sacred to Venus, while ravens were associated with several gods: Apollo, Mithras, and the Celtic god Lugus, who was also associated with Mercury (Toynbee 1973, 259-275). The corvids may have used the temple for scavenging or have been sacrificed; either as holy animals in themselves (see above) or as food offerings.

**Worked bone**

Work waste and pre-fabricates of bone pins were found in the southern area of the site (see Scott, Chapter 5). The waste mainly comprised long bone shaft fragments from large and medium-sized mammals. The worked bone dump (context 12913) also contained a large number of sheep metapodials and meat-bearing long bones that were split down the middle. It is not known whether these were related to boneworking or marrow extraction. Bone pins and prefabricates were also found at the temple site at Harlow (Gobel 1985b, 99-100).

**Animal utilisation**

There is little indication of changes in animal husbandry during the three phases of Higham Ferrers. Pig is somewhat more common than cattle in Phase 4, but the differences in NISP and MNI are not so great as to depose the far larger cattle as the more important meat provider of the two. Using body weight figures from O'Connor (1991), the 10 cattle in Phase 4 would have yielded 2750 kg meat, whereas the 116 sheep and 15 pigs would have yielded 4350 and 127.5 kg respectively. These figures are calculated on adult animals, and as a large number of the sheep are very immature, one must reduce the sheep body weight proportionally. Despite pigs having a higher proportion of meat on their carcasses than sheep, they remain the least important meat provider. As the number of sheep is greatly reduced in Phase 5, cattle becomes the main meat provider, with sheep coming a close second.

The numbers of ageable cattle mandibles in Phases 3 and 4 and the numbers of ageable sheep and pig mandibles in Phase 3 were very small, and it would therefore not be advisable to discuss any changes in slaughter ages for this phase in an intra-site comparison. Small differences in sheep and pig slaughter age patterns have been observed between Phase 4 and 5, but as the number of jaws in each age range is rather small, the perceived changes may be due to issues of representativity, rather than actual changes in animal husbandry strategies.

There is an unusually high number of young cattle at Higham Ferrers. The cattle remains in larger towns like Alcester, Lincoln, York and Exeter are dominated by adult and elderly cattle (Maltby 2001, 279; Dobney *et al.* 1995, 86; O'Connor 1988, 85; Maltby 1979, 31). The small town at Elms Farm is dominated by subadult and adult cattle (Johnstone and Albarella 2002, 68), whereas the rural settlement Owslebury is dominated by adult and elderly cattle, but with a large presence of immature and subadult cattle (Maltby 1994, 88). None of these sites has such a large percentage of 1-2.5 year old cattle as Higham Ferrers (see Fig. 6.7a). While the very young calves may have been killed, thus releasing milk for human use, the 1-2.5 year-old cattle would already have been weaned. We must therefore look to other possibilities to explain the high number of this age range at Higham Ferrers.

It has been suggested that inhabitants in smaller towns had livestock and fields outside the towns (Maltby 1994, 85). It would thus be possible for the Higham Ferrers inhabitants to have sold off their surplus adult and elderly cattle to larger urban markets rather than keeping them for themselves. The younger cattle in the assemblage might represent animals killed for local consumption, perhaps as a way to conserve resources for winter. Alternatively, the younger cattle were sold to Higham Ferrers from the surrounding countryside, and the adult and older cattle were either eaten at the farms, or sold to larger towns (see above). It is not possible to tell which of

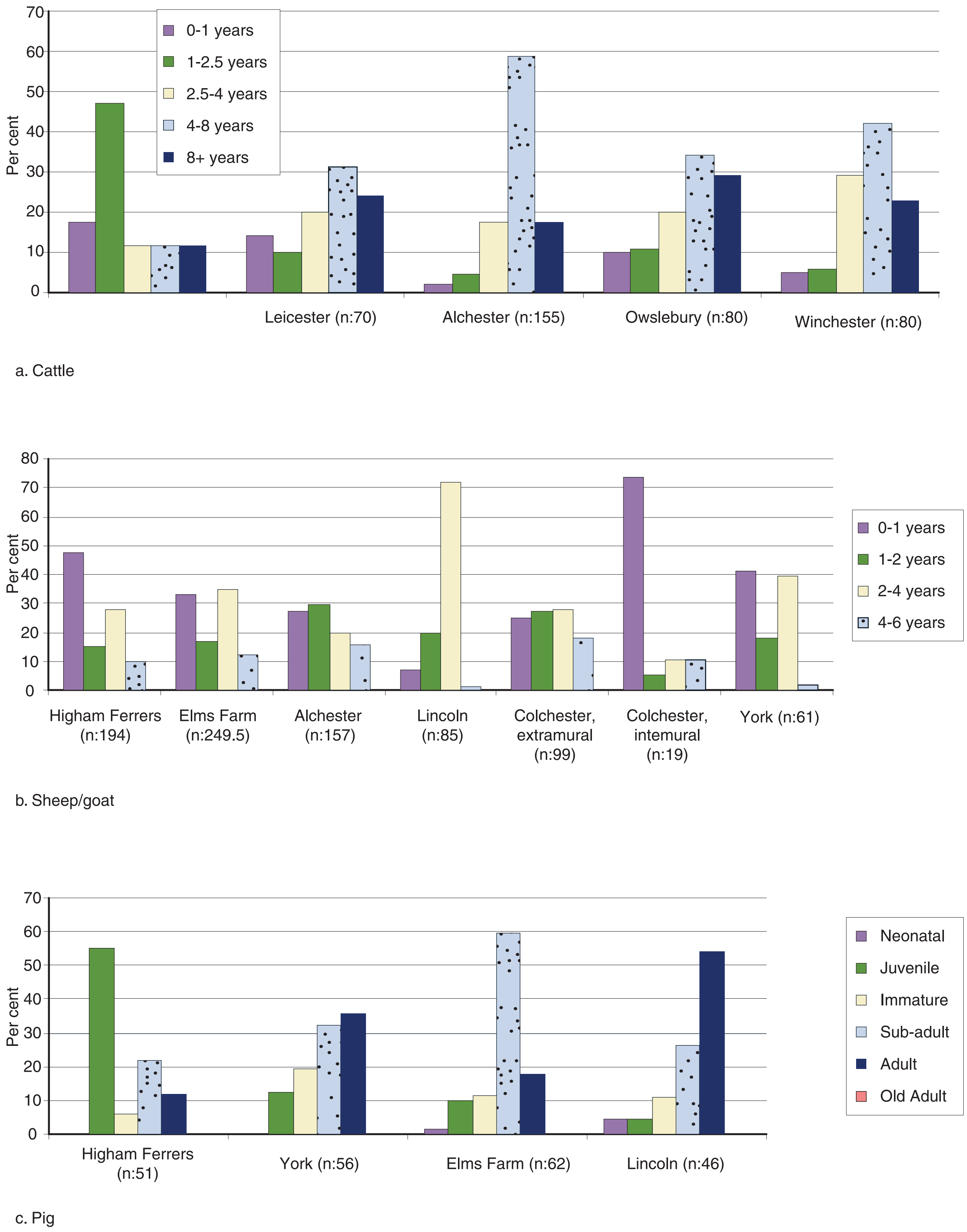



*Fig. 6.7 Ageing comparison of major domestic species*

these two options may have been the most likely without accessing data from several local and regional comparative assemblages.

The predominance of young sheep suggests a connection to dairy production in the area. Columella (*c* AD 4-70) recommended that young lambs should be killed immediately in order to reserve the milk for cheese production (*De re rustica*, VII, 3, 13, in O'Connor 1988, 88). This is very similar to the modern day sheep and goat husbandry in Turkey (Payne 1973), and it would not be unreasonable to suggest that the same strategy could have been used in Roman Britain. As most lambs at Higham Ferrers were not killed straight after birth, lamb meat would likely have had some economic significance. The surviving lambs yielded some shearings of wool and most were slaughtered for meat at 2-4 years of age.

The sheep assemblages most similar to Higham Ferrers are those from York and Elms Farm (see Fig. 6.7b). The high proportion of lambs in York has been interpreted as a surplus of animals from dairying flocks (O'Connor 1988, 88). Unfortunately, no sexing was carried out on sheep in York, so it remains unknown whether the assemblage displayed a predominance of ewes, similar to that in Higham Ferrers. The sheep assemblage in Elms Farm has been interpreted as representative of lambs slaughtered for meat, the adult sheep being used for secondary products and then slaughtered for mutton in their prime (Johnstone and Albarella 2002, 26). Similar interpretations have been put forward for Alcester, Leicester and Colchester (Maltby 2001, 285; Gidney 1999, 313-315; Luff 1993, 68-72). Intra-site differences were found in Colchester, where the extramural site focussed on adult sheep and the intramural site focussed on lambs (Luff 1993, 71-72).

The sex composition of sheep flocks may be used to discern husbandry strategies. Ewes are necessary for breeding and dairy production, while wethers are preferable for wool production because they have heavier fleeces. The predominance of ewes is consistent through all Roman phases of Higham Ferrers, and suggests a possible focus on dairy production. Sex estimation of sheep was not carried out in the comparative assemblages.

An intersite comparison of pig slaughter patterns suffers from difficulties in comparing the various ageing methods used by the researchers. Only at three sites were pigs aged using the same method as at Higham Ferrers (see Fig. 6.7c). The four sites show very different slaughter patterns; the only thing in common being the absence of elderly pigs and the small to non-existent number of neonatal pigs. The lack of elderly pigs probably indicates either a rapid turnover of breeding animals, or that none of these sites specialised in pig breeding for the meat market. If pigs were bred locally, one would expect a high neonatal mortality, but as neonatal bones are fragile, these may have been lost through taphonomic processes. It is therefore not certain whether pigs were kept in back yards by the Higham Ferrers inhabitants, or if all pigs in the assemblage had been brought on the hoof to the town. Based on the differences in pig slaughter ages between Elms Farm and Lincoln, Johnstone and Albarella have argued that consumption demands varied across the country (Johnstone and Albarella 2002, 31), a view supported by the great variation in slaughter ages between the Higham Ferrers and York assemblages.

The predominance of male pigs in Higham Ferrers suggests that sows were more likely than boars to be slaughtered before the age of one, when the sexually distinctive canine teeth erupt. According to Wigh (2001, 80), sows require more food/weight than boars, and it would thus be economical to slaughter the surplus sows early, leaving the greater part of the food supply to the boars. Another possibility is that the sows were kept for breeding replacements on farms, and that the boar predominance seen in Higham Ferrers and several other sites (Luff 1982, 63) represents boars fattened for the urban markets.

The utilisation of other animals differs very little from other contemporary sites. Game and domestic poultry were of relatively low dietary significance.

There is very little difference in butchery patterns between the three phases of the Higham Ferrers assemblage. Most vertebrae showed an intact neural arch, but some vertebrae were divided in half sagitally, probably by using a heavy knife/cleaver. A few vertebrae were divided in half paramedially, that is to say between the dorsal spine and the transverse process. The vertebral column was later divided into several parts. As most vertebrae were not split, it is likely that most butchery at Higham Ferrers took place on the ground or in semi-suspension. Sagittal splitting of vertebrae would, on the other hand, require suspension of the carcass (Seetah 2006, 111). Several ribs displayed chop marks, which were most frequently placed at the rib joint and on the body of the rib. The ribs were sometimes divided into three parts, sometimes into two. Most chop marks on limb bones occur mid-shaft, although the ends of the bones are also represented. Longitudinal butchering for marrow extraction also occurred. No evidence for the Roman practice of hooking cattle scapulae for curing or smoking was found in the assemblage. The lack of perforations on the blades (cf O'Connor 1988, 82-84, plate 3) may, however, be explained by the heavy fragmentation of scapula blades making possible perforations difficult to distinguish from pre- or post-depositional breakage. Butchery marks on horse bones suggests that their meat have been utilised, but it is unknown whether this was for human or animal consumption.

Most of the pathological conditions in the assemblage are related to muscle strains and/or infections. Pathological bones were somewhat more common in the late Roman phase, although to such a small extent that it would imply little changes in animal husbandry and animal keeping conditions.

In common with the secular deposits of mid-Roman date, the shrine at Higham Ferrers was dominated by sheep remains, although almost all other species seen in the contemporary non-votive contexts were present at the shrine. The sheep were mostly 0-1 and 2-4 years of age at death, thus representing prime meat animals. As evidenced by butchering marks and disarticulation, most animal remains found in the shrine seems to have been from food sacrifices. An exception to this is the semi-articulated remains of a dog. Many of the species found in the votive contexts have traditionally been associated with Roman deities, but at Higham Ferrers there is no clear evidence from the bone assemblage to suggest a focus on one specific deity, as has been suggested, for example, for the shrine at Uley (Levitan 1993). While the shrine assemblage is dominated by sheep, the dominance is less clear-cut than at the Harlow and Great Chesterford shrines (Legge and Dorrington 1985; Luff 1992) and in contrast with those two sites there is no clear evidence for seasonal slaughter, which may imply that sacrifices took place all year-round, rather than only during specific festivals.

### Conclusion

The evidence presented here suggests that there were no significant developments in animal husbandry practices during the three Roman phases at Higham Ferrers. Even the animal bone assemblage from the shrine diverges only a little from the general pattern. This appears to contrast with the conclusions drawn from bone assemblages from Alchester and Elms Farm (Maltby 2001, Johnstone and Albarella 2002), but is in agreement with findings from the southern sites of Fishbourne (Grant 1971) and Portchester (Grant 1975). As may be also the case at Fishbourne and Portchester, it appears that any cultural or environmental changes which occurred throughout the Roman period in the Higham Ferrers area had little effect on animal husbandry, or were not significant enough to be reflected in the animal bone assemblage.

## MACROSCOPIC PLANT REMAINS (EXCLUDING CHARCOAL) AND INSECTS

*by Mark Robinson*

### Introduction

Bulk sampling was undertaken for charred plant remains (CPR) from the non-waterlogged contexts of the site (76 samples in total). Bulk samples were also taken for waterlogged remains from the well bottoms (5 samples). The samples were processed and their potential assessed. Although remains were present in around half the Roman CPR samples, the concentrations were low and these assemblages mostly comprised poorly preserved grain. The assessment identified nine samples from late Roman contexts for detailed analysis (4 CPR and 5 waterlogged), in addition to the CPR sample from the early Bronze Age collared urn, discussed in Chapter 2. Charred remains from earlier Roman (Phase 3-4) contexts which were analysed at assessment level are also included in the discussion.

### The samples

*Sample 412*, Context 8779, Well 8032 (Phase 5: Late Roman).
The lower fill of a well – waterlogged macroscopic plant remains and insects.

*Sample 413*, Context 8285, Well 8278 (Phase 5: Late Roman)
The lower fill of a well – waterlogged macroscopic plant remains.

*Sample 605*, Context 10578, Waterhole 10589 (Phase 5: Late Roman).
A dump of burnt material comprising the upper fill of the waterhole – charred plant remains.

*Sample 606*, Context 10581, Waterhole 10589 (Phase 5: Late Roman).
A dump of highly burnt material within the upper fill of the waterhole – charred plant remains.

*Sample 607*, Context 10584, Waterhole 10589 (Phase 5: Late Roman).
A dump of ashy material in the upper fill of the waterhole – charred plant remains.

*Sample 619*, Context 10643, Pit 10642 (Phase 5: Late Roman).
A layer of ash and charcoal in the pit – charred plant remains.

*Sample 682*, Context 12716, Well 12885 (Phase 5: Late Roman).
A waterlogged layer in the well, above Sample 683 – waterlogged macroscopic plant remains.

*Sample 683*, Context 12716, Well 12885 (Phase 5: Late Roman).
A waterlogged layer in the well, above Sample 684 – waterlogged macroscopic plant remains.

*Sample 684*, Context 12716, Well 12885 (Phase 5: Late Roman).
A waterlogged layer in the well, below Sample 683 – waterlogged macroscopic plant and insect remains.

### Methodology

#### *Charred plant remains*

The samples were floated onto a 0.3 mm mesh using a flotation machine. The dried flots were scanned under a binocular microscope for charred remains. Those flots selected for detailed analysis were subsampled using a riffle box if they contained a very high concentration of remains, and sorted under a binocular microscope. The remains picked out were identified and the results given in Table 6.18, nomenclature following Clapham *et al.* (1987).

*Table 6.18 Charred plant remains*

| | | Number of items | | | |
|---|---|---|---|---|---|
| | *Feature* | 10589 | 10589 | 10589 | 10642 |
| | *Context* | 10578 | 10581 | 10584 | 10643 |
| | *Sample* | 605 | 606 | 607 | 619 |
| | *Sample volume (litres)* | | | | |
| | *No. items / litre* | | | | |
| GRAIN | | | | | |
| *Triticum spelta* L. | spelt wheat | 6 | 24 | 5 | 6 |
| *T. dicoccum* Schübl. or *spelta* L. | emmer or spelt | 35 | 162 | 22 | 42 |
| *Triticum* sp. - short grain | wheat | - | 11 | - | 6 |
| *Hordeum* sp. (hulled) | hulled barley | 1 | - | - | 5 |
| *Hordeum* sp. | barley | - | - | - | 1 |
| cereal indet. | | 122 | 250 | 6 | 87 |
| Total grain | | 164 | 447 | 33 | 147 |
| CHAFF | | | | | |
| *Triticum spelta* L. - glume | spelt wheat | 43 | 533 | 17 | 2979 |
| *T. dicoccum* Schübl. or *spelta* L. - glume | emmer or spelt | 420 | 988 | 38 | 1182 |
| *Hordeum vulgare* L. - rachis node | six-row barley | - | - | - | 1 |
| *Hordeum* sp. - rachis node | barley | - | 1 | - | 3 |
| cereal sprout | | - | 1 | 2 | 6 |
| Total chaff items | | 463 | 1,523 | 57 | 4,171 |
| OTHER CULTIVATED SEEDS | | | | | |
| *Linum usitatissimum* L. flax | | 1 | - | - | - |
| FRUIT STONES AND NUT SHELLS | | | | | |
| *Crataegus* cf. *monogyna* Jacq. | hawthorn | - | - | - | - |
| *Corylus avellana* L. - nut shell frags | hazel | 1 | - | - | - |
| *Quercus* sp. | oak | - | - | - | - |
| Total items | | 1 | 0 | 0 | 0 |
| WEED SEEDS | | | | | |
| *Ranunculus* cf. *repens* L. | creeping buttercup | - | 1 | 1 | - |
| Cruciferae indet. | | 2 | - | - | - |
| *Agrostemma githago* L. | corn cockle | - | - | 1 | - |
| *Cerastium* sp. | mouse-ear chickweed | 2 | 1 | - | - |
| *Stellaria media* gp. | chickweed | - | 1 | - | - |
| *Atriplex* sp. | orache | 1 | - | - | - |
| *Vicia* or *Lathyrus* sp. | vetch or tare | 15 | - | - | - |
| *Ononis* sp. | restharrow | 3 | - | - | 1 |
| cf. *Medicago lupulina* L. | black medick | - | 2 | 6 | - |
| cf. *Trifolium* or *Medicago* sp. | clover, medick etc | 12 | 8 | - | - |
| *Polygonum aviculare* agg. | knotgrass | 2 | 2 | 1 | - |
| *Fallopia convolvulus* (L.) Löv. | black bindweed | 4 | - | - | - |
| *Rumex* sp. (not *acetosella agg.*) | dock | 18 | 2 | 1 | 6 |
| cf. *Anagallis arvensis* L. | scarlet pimpernel | 2 | - | 1 | - |
| *Lithospermum arvense* L. | corn gromwell | - | 5 | 1 | - |
| *Hyoscyamus niger* L. | henbane | 1 | - | - | - |
| *Veronica hederifolia* L. | ivy-leaved speedwell | - | - | - | - |
| *Odontites verna* (Bell) Dum. | red bartsia | 3 | 2 | 2 | - |
| *Plantago niger* L. | great plantain | 1 | - | - | - |
| *P. lanceolata* L. | ribwort plantain | 7 | 9 | - | - |
| *Galium aparine* L. | goosegrass | 2 | 7 | - | - |

*Table 6.18 (continued) Charred plant remains*

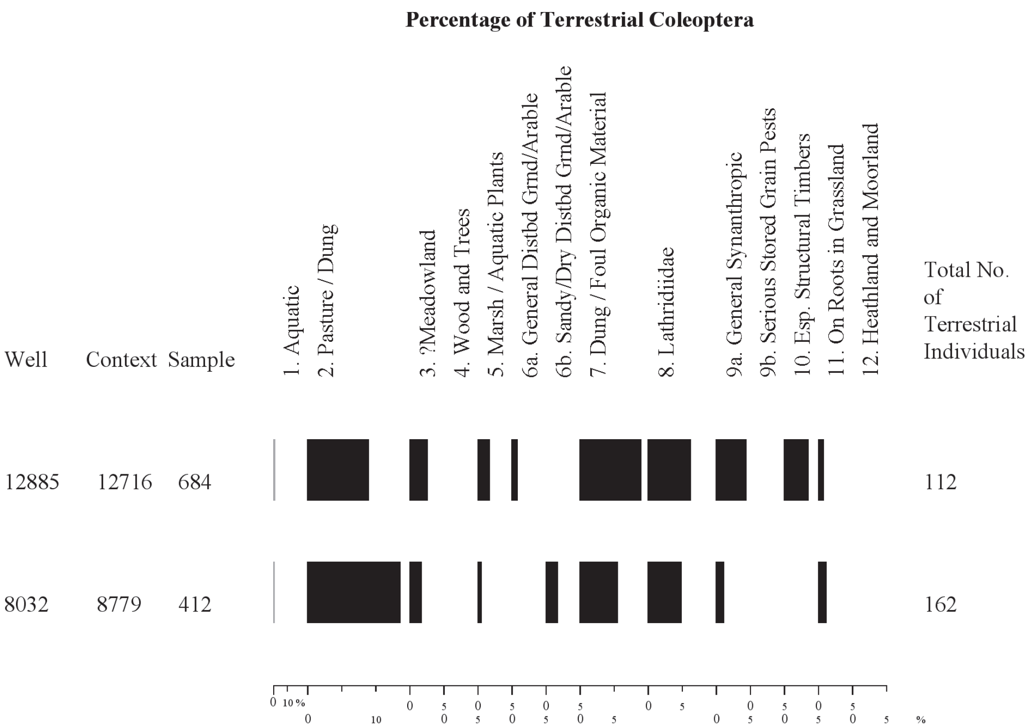
| | | | | | |
|---|---|---|---|---|---|
| *Sambucus nigra* L. | elder | 1 | - | - | - |
| *Anthemis cotula* L. | stinking mayweed | 14 | - | 1 | - |
| *Eleocharis* S. *Palustris* sp. | spike rush | - | 2 | 5 | - |
| *Carex* sp. | sedge | 1 | 1 | 4 | 1 |
| *Bromus* cf. *secalinus* L. | chess, brome grass | 2 | 4 | - | 6 |
| *Avena* sp. | oats | - | 5 | 1 | - |
| Gramineae indet. | grass | 7 | 27 | - | 14 |
| weed indet. | | 15 | 16 | 25 | 5 |
| Total weed seeds | | 115 | 95 | 50 | 33 |

### *Waterlogged macroscopic plant remains*

A sub-sample of 1 kg from each of the waterlogged samples was washed over onto a 0.2 mm mesh to extract the organic remains. The flots were sorted in water using a binocular microscope. The remains discovered were identified and the results given in Tables 6.19-20, nomenclature following Clapham *et al.* (1987).

### *Waterlogged insect remains*

From the samples selected for insect analysis, any insect remains in the sub-samples sorted for macroscopic plant remains were picked out. Additional sub-samples from these samples were washed over onto a 0.2 mm mesh to recover the organic remains which were then subjected to paraffin flotation to extract insect fragments. This gave a total of 3 kg analysed from each sample. The paraffin flots were washed in detergent and similarly sorted in water under a binocular microscope for insect remains. The remains were identified and the minimum number of individuals for each species in each sample calculated. The results are given in Tables 6.21-2, nomenclature for Coleoptera following Kloet and Hincks (1977). The results for Coleoptera are also displayed in Figure 6.8 by species groups as percentages of the minimum number of terrestrial individuals. The species groups used follow Robinson (1991, 278-81). Not all the Coleoptera have been placed into these categories.




Species groups expressed as a percentage of the total terrestrial Coleoptera (ie aquatics excluded). Not all the terrestrial Coleoptera have been classified into groups.

*Fig. 6.8 Species groups expressed as a percentage of the total terrestrial coleoptera (ie aquatics excluded) from late Roman wells*

*Table 6.19 Waterlogged seeds*

| | | *Number of seeds* | | | | |
|---|---|---|---|---|---|---|
| | *Well* | 8278 | 12885 | 12885 | 12885 | 8032 |
| | *Context* | 82856 | 12716 | 12716 | 12716 | 8779 |
| | *Sample* | 413 | 684 | 683 | 682 | 412 |
| *Ranunculus* cf. *acris* L. | meadow buttercup | 6 | 3 | 2 | 3 | 1 |
| *R.* cf. *repens* L. | creeping buttercup | 14 | 6 | 4 | 2 | 2 |
| *R.* cf. *bulbosus* L. | bulbous buttercup | 5 | - | 2 | - | 1 |
| *R. parviflorus* L. | smaller-flowered buttercup | - | 1 | - | - | - |
| *R. flammula* L. | lesser spearwort | - | - | 1 | - | 1 |
| *R.* S. *Batrachium* sp. | water crowfoot | - | 1 | 2 | - | - |
| *Papaver argemone* L. | prickly-headed poppy | - | 1 | - | 2 | 3 |
| *P. rhoeas* tp. | field poppy etc | - | 1 | - | 1 | - |
| *P. somniferum* L. | opium poppy | - | 1 | 2 | - | 6 |
| *Chelidonium majus* L. | greater celandine | - | 1 | - | - | - |
| *Fumaria* sp. | fumitory | 1 | 1 | - | 1 | 1 |
| *Brassica rapa* L. ssp *sylvestris* (L.) Jan. | wild turnip | - | - | 1 | - | - |
| *Brassica nigra* L. | black mustard | 1 | 1 | 5 | 2 | 13 |
| *Brassica* sp. ?cultivar | ? cultivated brassica | - | - | 1 | - | 11 |
| *Coronopus squamatus* (Forsk.) Asch. | swine-cress | 2 | - | - | - | 3 |
| *Capsella bursa-pastoris* (L.) Med. | shepherd's purse | 1 | 1 | - | - | 7 |
| *Reseda luteola* L. | dyer's rocket | - | - | - | 2 | - |
| *Silene* cf. *latifolia* Poir. | white campion | - | - | 1 | - | - |
| *Agrostemma githago* L. | corn cockle | 3 | - | 2 | - | - |
| *Cerastium* cf. *fontanum* Baum. | mouse-ear chickweed | - | 12 | - | 5 | 2 |
| *Stellaria media* gp. | chickweed | 5 | 17 | 16 | 8 | 4 |
| *S. graminea* L. | stitchwort | - | 4 | 2 | 2 | 3 |
| *Arenaria* sp. | sandwort | - | - | - | 1 | - |
| *Spergula arvensis* L. | corn spurrey | - | 1 | 1 | 1 | - |
| *Montia fontana* L. | blinks | - | 6 | 1 | 1 | - |
| *Chenopodium album* L. | fat hen | 4 | 1 | 3 | 2 | 5 |
| *Atriplex* sp. | orache | 40 | 17 | 7 | 9 | 6 |
| *Malva sylvestris* L. | common mallow | - | - | 1 | 1 | 1 |
| *Linum usitatissimum* L. | flax | - | 1 | 1 | 1 | 14 |
| *L. catharticum* L. | fairy flax | - | 1 | 2 | 13 | 2 |
| *Medicago lupulina* L. | black medick | - | - | 1 | - | 1 |
| *Filipendula ulmaria* (L.) Max. | meadowsweet | 43 | 1 | 2 | 1 | 3 |
| *Rubus fruticosus* agg. | blackberry | - | - | 2 | - | - |
| *Potentilla* cf. *erecta* (L.) Räu. | tormentil | - | 1 | - | - | - |
| *P.* cf. *reptans* L. | creeping cinquefoil | 1 | - | - | 5 | 1 |
| *Agrimonia eupatoria* L. | agrimony | 1 | - | - | - | - |
| *Aphanes arvensis* L. | parsley piert | - | - | - | - | 2 |
| *Crataegus* cf. *monogyna* Jacq. | hawthorn | - | - | - | - | 1 |
| *Anthriscus caucalis* Bieb. | bur chervil | - | 1 | 1 | 4 | 1 |
| *A. sylvestris* (L.) Hof. | cow parsley | - | - | 1 | - | - |
| *Scandix pecten-veneris* L. | shepherd's needle | 1 | - | - | - | - |
| *Coriandrum sativum* L. | coriander | - | - | - | 1 | - |
| *Oenanthe pimpinelloides* gp. | water dropwort | 2 | 1 | - | - | - |
| *Aethusa cynapium* L. | fool's parsley | - | 1 | - | - | 2 |
| *Foeniculum vulgare* Mill. | fennel | - | - | - | - | 1 |
| *Conium maculatum* L. | hemlock | - | 1 | - | 2 | 4 |
| *Apium graveolens* L. | celery | - | 1 | - | 1 | 1 |
| *A. nodiflorum* (L.) Lag. | fool's watercress | - | - | - | 1 | - |
| *Heracleum sphondylium* L. | cow parsnip | - | - | - | - | 1 |
| *Torilis* sp. | hedge parsley | - | - | - | - | 3 |
| *Daucus carota* L. | wild carrot | - | - | 2 | 2 | 1 |
| *Polygonum aviculare* agg. | knotgrass | 22 | 24 | 25 | 47 | 20 |
| *P. persicaria* L. | redshank | 1 | - | - | - | 1 |
| *P. lapathifolium* L. | pale persicaria | - | 1 | - | - | - |
| *Fallopia convolvulus* (L.) Löv. | black bindweed | - | 1 | 1 | - | 1 |

*Table 6.19 (continued) Waterlogged seeds*

| | | | | | | |
|---|---|---|---|---|---|---|
| *Rumex acetosella* agg. | sheep sorrel | 7 | 1 | - | 1 | - |
| *R. crispus* L. | curled dock | - | 1 | - | - | 194 |
| *R. obtusifolius* L. | broad-leaved dock | 3 | - | - | - | 3 |
| *R. conglomeratus* Mur. | sharp dock | 4 | - | - | - | - |
| *Rumex* sp. | dock | 33 | 6 | 9 | 4 | 10 |
| *Urtica urens* L. | small nettle | 11 | 20 | 36 | 6 | 4 |
| *U. dioica* L. | stinging nettle | 261 | 27 | 23 | 81 | 70 |
| *Corylus avellana* L. | hazel | 1 | - | - | - | - |
| Primulaceae indet. | | - | - | - | 1 | - |
| *Fraxinus excelsior* L. | ash | - | - | 1 | - | - |
| *Hyoscyamus niger* L. | henbane | 4 | 1 | 3 | 2 | 2 |
| *Linaria vulgaris* Mil. | common toadflax | - | - | - | - | 1 |
| *Rhinanthus* sp. | yellow rattle | 9 | 2 | - | 1 | - |
| *Odontites verna* (Bell.) Dum. | red bartsia | - | 8 | 1 | 12 | 1 |
| *Mentha* cf. *aquatica* L. | water mint | - | - | - | - | 1 |
| *Satureja hortensis* L. | summer savoury | - | - | 1 | - | - |
| *Prunella vulgaris* L. | selfheal | 12 | 2 | 4 | 5 | 1 |
| *Ballota nigra* L. | black horehound | 2 | 1 | 1 | 1 | - |
| *Lamium* sp. (not *album*) | dead-nettle | 1 | - | - | - | - |
| *Galeopsis tetrahit* agg. | hemp-nettle | - | - | - | 1 | - |
| *Glechoma hederacea* L. | ground ivy | 1 | 1 | - | - | - |
| *Verbena officinalis* L. | vervain | - | - | - | - | 1 |
| *Plantago major* L. | great plantain | 1 | - | 1 | - | 1 |
| *Galium* sp. (not *aparine*) | bedstraw | - | 1 | - | - | - |
| *Sambucus nigra* L. | elder | 2 | 1 | 1 | 3 | 1 |
| *Valerianella locusta* (L.) Lat. | lamb's lettuce | 3 | 1 | 1 | - | - |
| *V. dentata* (L.) Pol. | lamb's lettuce | - | - | - | 1 | - |
| *Senecio* sp. | ragwort | 5 | 2 | - | - | 2 |
| *Pulicaria* sp. | fleabane | - | 1 | - | - | - |
| *Anthemis cotula* L. | stinking mayweed | 3 | 5 | - | 15 | 9 |
| *Tripleurospermum inodorum* (L.) Sch. | scentless mayweed | 1 | 1 | - | - | 2 |
| *Achillea* sp. | yarrow | - | - | - | - | 1 |
| *Leucanthemum vulgare* Lam. | ox-eye daisy | - | 1 | 1 | 3 | - |
| *Carduus* sp. | thistle | 4 | - | - | - | 4 |
| *Cirsium* sp. | thistle | 1 | - | 2 | 2 | - |
| *Onopordum acanthium* L. | cotton thistle | - | - | 1 | - | 1 |
| *Centaurea* cf. *nigra* L. | knapweed | - | 2 | 3 | - | 1 |
| *Lapsana communis* L. | nipplewort | - | - | - | - | 3 |
| *Hypochoeris radicata* L. | cat's ear | - | 1 | - | - | - |
| *Leontodon* sp. | hawkbit | 13 | 6 | 4 | 8 | 1 |
| *Picris hieracioides* L. | rough ox-tongue | 2 | - | - | - | - |
| *Sonchus oleraceus* L. | sow thistle | - | 1 | 4 | - | - |
| *S. asper* (L.) Hill | sow thistle | 1 | 1 | 3 | - | 1 |
| *Taraxacum* sp. | dandelion | 1 | - | - | - | - |
| *Alisma* sp. | water plantain | - | 2 | - | - | 1 |
| *Juncus articulatus* gp. | creeping rush | - | - | 30 | - | - |
| *J. effusus* gp. | tussock rush | - | - | 10 | - | - |
| *Luzula* sp. | woodrush | - | - | - | 1 | - |
| *Eleocharis* S. *Palustres* sp. | spikerush | 1 | - | - | 1 | - |
| *Schoenoplectus lacustris* (L.) Pal. | bulrush | 1 | - | - | - | - |
| *Carex* spp. | sedge | 3 | 2 | 8 | 3 | 3 |
| *Glyceria* sp. | flote grass | - | - | - | 1 | - |
| *Bromus* S. *Eubromus* sp. | brome grass, chess | - | 1 | - | - | 1 |
| cereal indet. | | 1 | f | - | - | 1,f |
| Gramineae indet. | grass | - | 12 | 11 | 15 | 5 |
| Total | | 545 | 222 | 251 | 289 | 456 |

f = fragment

*Table 6.20 Other waterlogged macroscopic plant remains*

| | | | Number of items or presence | | | | |
|---|---|---|---|---|---|---|---|
| | | *Well* | 8278 | 12885 | 12885 | 12885 | 8032 |
| | | *Context* | 82851 | 12716 | 12716 | 12716 | 8779 |
| | | *Sample* | 413 | 684 | 683 | 682 | 412 |
| Bryophyta indet. | | moss | + | + | - | - | - |
| *Pteridium aquilinum* (L.) Kuhn. | - frond frag | bracken | 4 | 5 | - | - | 1 |
| *Camelina* sp. | - capsule frag | gold-of-pleasure | - | - | - | - | 2 |
| *Linum usitatissimum* L. | - capsule frag | flax | 1 | 1 | 2 | 1 | 10 |
| *Vicia* or *Lathyrus* sp. | - pod frag | vetch, vetchling etc | 6 | 2 | 1 | 3 | - |
| *Vicia* or *Lathyrus* sp. | - tendril | vetch, vetchling etc | 1 | 1 | - | - | - |
| *Trifolium* sp. | - flower | clover | 1 | 6 | 4 | - | - |
| *Trifolium* sp. | - calyx | clover | 2 | 2 | 3 | 2 | - |
| *Rubus* sp. | - prickle | blackberry | - | 1 | - | - | - |
| *Crataegus* or *Prunus* sp. | - thorn | hawthorn or sloe | 1 | - | - | 1 | - |
| *Rumex* sp. | - stem | dock | 4 | 1 | - | - | 7 |
| *Centaurea nigra* L. | - bract | knapweed | - | - | - | - | 2 |
| *Triticum spelt*a L. | - glume | spelt wheat | 38 | 2 | - | 1 | 9 |
| *T. dicoccum* Schübl. or *spelta* L. | - glume | emmer or spelt | 20 | - | - | - | 14 |
| Bud scale | | | - | - | 1 | - | 1 |
| Deciduous leaf frag. | | | - | - | - | 1 | - |
| Leaf abscission pad | | | - | - | 2 | 1 | - |

+ present

## Results and interpretation

### *Phases 3-4: 2nd-late 3rd century*

The evidence from these phases was restricted to charred remains, and their concentration was low. Almost half the samples contained remains but only three contained more than ten items and none was thought worthy of detailed analysis. The results of assessment showed that both *Triticum spelta* (spelt wheat) and hulled *Hordeum* sp. (hulled barley) were used in the settlement. A sample from context 11251, a damp layer in building 10870, contained at least 40 seeds of *Lithospermum arvense* (corn gromwell), an arable weed, and rather smaller quantities of cereal grains. *Lithospermum* seeds have a high silica content in their seed coat so tend to survive burning when other remains are fully oxidised, so this need not imply a preponderance of *Lithospermum* growing amongst the cereals.

### *Phase 5: late 3rd-4th century*

Both waterlogged and charred evidence was available from this phase. The samples from the three late Roman wells contained relatively high concentrations of well-preserved seeds and other macroscopic plant remains. Many of the seeds were from plants of relatively nutrient-rich disturbed ground, such as *Brassica nigra* (black mustard), *Stellaria media* gp. (chickweed), *Urtica urens* (small nettle) and *U. dioica* (stinging nettle). There were also many seeds from *Polygonum aviculare* (knotgrass), an annual weed which is favoured by trampling and *Atriplex* sp. (orache), an annual of a range of disturbed habitats. There were seeds of several plants which show a strong association with settlements: *Chelidonium majus* (greater celandine), *Papaver somniferum* (opium poppy) and *Hyoscyamus niger* (henbane). These plants probably characterised the various sparsely vegetated and neglected areas of the settlement. The insects reflected similar conditions. Carabidae (ground beetles) were well-represented. They included *Harpalus rufipes* from Species Group 6a and *Amara apricaria* from Species Group 6b. Together, these two species groups comprised 3% of the terrestrial Coleoptera in sample 412 from well 8032. Both are associated with disturbed ground habitats where there are some annual weeds but there is not dense vegetation at ground level. This includes arable land, but in the case of Higham Ferrers the beetles were probably from the area of the settlement itself. Many of the phytophagous insects were species which feed on disturbed and waste-ground vegetation, including several species of leaf beetle from the genus *Phyllotreta* which feed on members of the Cruciferae such as shepherd's purse and black mustard. There were several nettle-feeding insects, for example the bug *Heterogaster urticae* and the beetles *Brachypterus urticae*, *Apion urticarium* and *Cidnorhinus quadrimaculatus*.

Although some of the seeds of potential grassland plants were from taxa which also grow in waste-ground habitats, for example several species of *Rumex* (dock) and it is argued below that seeds of grassland plants were imported in hay, there do seem to have been some areas of pasture within the

*Table 6.21 Coleoptera*

| | Min. No. Indiv | | |
|---|---|---|---|
| *Phase* | 8 | 8 | |
| *Well* | 12885 | 8032 | |
| *Context* | 12716 | 8779 | Species |
| *Sample* | 684 | 412 | Group |
| *Carabus* sp. | 1 | 1 | |
| *Leistus spinibarbis* (F.) | 1 | - | |
| *Nebria brevicollis* (F.) | 1 | 1 | |
| *Notiophilus* sp. | - | 1 | |
| *Clivina collaris* (Hbst.) or *fossor* (L.) | 1 | - | |
| *Trechus obtusus* Er. or *quadristriatus* (Schr.) | 1 | - | |
| *T. micros* (Hbst.) | 3 | 2 | |
| *Bembidion properans* Step. | 3 | 2 | |
| *B. guttula* (F.) | 1 | 1 | |
| *Pterostichus anthracinus* (Pz.) | - | 1 | |
| *P.* cf. *cupreus* (L.) | - | 1 | |
| *P. madidus* (F.) | 1 | - | |
| *P. melanarius* (Ill.) | 1 | 1 | |
| *Calathus fuscipes* (Gz.) | 1 | 2 | |
| *C. melanocephalus* (L.) | 1 | 1 | |
| *Amara apricaria* (Pk.) | - | 2 | 6b |
| *A. bifrons* (Gyl.) | - | 1 | 6b |
| *Amara* sp. (not above) | 2 | 4 | |
| *Harpalus rufipes* (Deg.) | 1 | 2 | 6a |
| *Harpalus* S. *Ophonus* sp. | 1 | 3 | |
| H. affinis (Schr.) | - | 1 | |
| *Helophorus aquaticus* (L.) or *grandis* Ill. | 1 | - | 1 |
| *H. rufipes* (Bosc.) | 2 | 1 | |
| *Helophorus* sp. (*brevipalpis* size) | 1 | 2 | 1 |
| *Cercyon analis* (Pk.) | - | 1 | 7 |
| *C. haemorrhoidalis* (F.) | 1 | 3 | 7 |
| *C. melanocephalus* (L.) | 1 | - | 7 |
| *C. unipunctatus* (L.) | 1 | - | 7 |
| *Megasternum obscurum* (Marsh.) | 4 | 4 | 7 |
| *Cryptopleurum minutum* (F.) | - | 1 | 7 |
| *Onthophilus striatus* (Forst.) | - | 1 | |
| *Hister bissexstriatus* F. | - | 1 | |
| *Choleva* or *Catops* sp. | - | 1 | |
| *Thanatophilus rugosus* (L.) | - | 1 | |
| *Silpha obscura* L. | - | 1 | |
| *Lesteva longoelytrata* (Gz.) | - | 2 | |
| *Omalium* sp. | 1 | - | |
| *Coprophilus striatulus* (F.) | 1 | 2 | |
| *Platystethus cornutus* gp. | 3 | 8 | |
| *P. nitens* (Sahl.) | - | 3 | |
| *Anotylus sculpturatus* gp. | 3 | 1 | 7 |
| *Stenus* sp. | 1 | 1 | |
| *Rugilus* sp. | 1 | - | |
| *Gyrohypnus angustatus* Step. | 1 | - | |
| *G. fracticornis* (Müll.) or *punctulatus* (Pk.) | 1 | 3 | |
| *Xantholinus linearis* (Ol.) | 1 | 1 | |
| *X. longiventris* Heer | - | 1 | |
| *X. linearis* (Ol.) or *longiventris* Heer | 1 | 1 | |
| *Philonthus* spp. | 3 | 2 | |
| *Gabrius* sp. | 1 | - | |
| *Staphylinus olens* Müll. | 1 | 2 | |
| *Tachyporus* sp. | 2 | 2 | |
| *Tachinus* sp. | 1 | 1 | |
| Aleocharinae indet. | 3 | 6 | |
| *Geotrupes* sp. | 1 | 2 | 2 |
| *Aphodius contaminatus* (Hbst.) | 2 | 1 | 2 |
| *A. fimetarius* (L.) | 1 | - | 2 |
| *A. foetidus* (Hbst.) | 1 | 1 | 2 |
| *A. granarius* (L.) | 4 | 15 | 2 |
| *A.* cf. *sphacelatus* (Pz.) | 1 | 2 | 2 |
| *Aphodius* sp. | - | 1 | 2 |
| *Oxyomus sylvestris* (Scop.) | 2 | - | |
| *Calyptomerus dubius* (Marsh.) | 1 | - | |
| *Simplocaria maculosa* Er. or *semistriata* (F.) | 1 | 1 | |
| *Athous haemorrhoidalis* (F.) | - | 1 | 11 |
| *Agriotes* cf. *acuminatus* (Step.) | - | 1 | 11 |
| *Agriotes* sp. | 1 | - | 11 |
| *Cantharis* sp. | - | 1 | |
| *Stegobium paniceum* (L.) | 1 | - | 9a |
| *Anobium punctatum* (Deg.) | 4 | - | 10 |
| *Tipnus unicolor* (P. & M.) | 4 | - | 9a |
| *Ptinus fur* (L.) | - | 2 | 9a |
| *Malachius* sp. | 1 | - | |
| *Brachypterus urticae* (F.) | - | 2 | |
| *Omosita colon* (L.) | 1 | - | |
| *Rhizophagus parallelocollis* Gyl. | 1 | - | |
| Cryptophagidae indet. (not *Atomaria*) | 1 | 2 | |
| *Atomaria* sp. | - | 3 | |
| *Orthoperus* sp. | - | 2 | |
| *Olibrus* sp. | - | 1 | |
| *Subcoccinella vigintiquattuorpunctata* (L.) | - | 1 | |
| *Lathridius minutus* gp. | 4 | 2 | 8 |
| *Enicmus transversus* (Ol.) | 1 | 3 | 8 |
| Corticariinae indet. | 2 | 3 | 8 |
| *Anthicus antherinus* (L.) | 2 | - | |
| *A. floralis* (L.) or *formicarius* (Gz.) | - | 1 | |
| *Donacia* or *Plateumaris* sp. | - | 1 | 5 |
| *Chrysolina oricalcia* (Müll.) | - | 1 | |
| *Phyllotreta atra* (F.) | 2 | 4 | |
| *P. nigripes* (F.) | 1 | 4 | |
| *P. nemorum* (L.) or *undulata* Kuts. | - | 1 | |
| *P. vittula* Redt. | 1 | 1 | |
| *Longitarsus* spp. | 3 | 5 | |
| *Crepidodera ferruginea* (Scop.) | - | 1 | |
| *Podagrica fuscicornis* (L.) | 1 | - | |
| *Chaetocnema concinna* (Marsh.) | 1 | 2 | |
| *Chaetocnema* sp. (not *concinna*) | - | 2 | |
| *Psylliodes* sp. | 1 | 1 | |
| *Apion malvae* (F.) | 1 | - | |
| *A. urticarium* (Hbst.) | - | 1 | |
| *Apion* spp. (not *malvae* or *urticarium*) | 2 | 1 | 3 |
| *Phyllobius roboretanus* Gred. or *viridiaeris* (Laich.) | - | 1 | |
| *Sitona hispidulus* (F.) | - | 1 | 3 |
| *S. sulcifrons* (Thun.) | - | 1 | 3 |
| *Sitona* sp. | 1 | - | 3 |
| *Hypera punctata* (F.) | - | 1 | |
| *Notaris acridulus* (L.) | 1 | - | 5 |
| *N. scirpi* (F.) | 1 | - | 5 |
| *Cidnorhinus quadrimaculatus* (L.) | - | 1 | |
| *Ceutorhynchus erysimi* (F.) | - | 2 | |
| Ceuthorhynchinae indet. (not above) | - | 1 | |
| *Baris* sp. | 1 | - | |
| *Tychius* sp. | - | 1 | |
| *Gymnetron pascuorum* (Gyl.) | 2 | - | |
| Total | 112 | 162 | |

+ present, ++ many

settlement. Scarabaeoid dung beetles of Species Group 2 comprised 9% of the terrestrial Coleoptera in sample 684 from well 12885 and 13.8% of the terrestrial Coleoptera in sample 412 from well 8032. The most numerous species was *Aphodius granarius*. These beetles live in the individual droppings of medium and large-sized herbivores on pastureland. They do not commonly occur in middens or dung heaps. However, the chafer and elaterid beetles of Species Group 11 only comprised around 1% of the terrestrial Coleoptera in these two samples, so it is thought unlikely that there were large open expanses of grassland at the site. It is possible that the areas of pasture were relatively small but there were high concentrations of animals on them.

There was little evidence for woodland or scrub from the waterlogged remains. Beetles from Species Group 4 were absent. There was a single seed of *Fraxinus excelsior* (ash) in sample 682 from well 12885 and thorns of *Crataegus* or *Prunus* sp. were present in a couple of the samples. There were few seeds of *Rubus fruticosus* agg. (blackberry) and *Sambucus nigra* (elder), shrubs which rapidly colonise neglected areas around settlements. It is possible that there were a few isolated trees in the settlement and that some of the boundaries had thorn hedges along them. However, trees and bushes do not seem to have been major features of the settlement.

Insects which are associated with a wide range of foul decaying organic remains including manure heaps, Species Group 7, were not unusually abundant given that there was evidence for animal droppings on pasture. Members of this group, such as *Megasternum obscurum* and *Anotylus sculpturatus* gp., comprised 9.1% of the terrestrial Coleoptera in sample 684 from well 12885 and 5.6% of the terrestrial Coleoptera in sample 412 from well 8032 (Table 6.21). Doubtless some of these beetles were living in refuse generated by the settlement. Members of the Lathridiidae (Species Group 8), beetles which feed on surface mould on old hay, straw etc were, at around 5.5% of the terrestrial Coleoptera, quite abundant. As noted below, there is evidence of hay from the site. They also occur in such habitats as thatch and animal bedding.

Evidence for buildings was given both by woodworm beetles which infested the structural timbers (Species Group 10) and various other indoor synanthropic beetles (Species Group 9a). Sample 684 from well 12885 was perhaps adjacent to a building or had refuse from inside a building dumped into it. *Anobium punctatum* (woodworm beetle) comprised 3.6% of the terrestrial Coleoptera while members of Species Group 9a comprised 4.5% of the total. These included *Tipnus unicolor* (spider beetle), which sometimes feeds on grain-processing residues, stable debris and human food debris in kitchens, and *Stegobium paniceum* (bread beetle), a minor pest of dry farinaceous products. The serious grain pests of Species Group 9b were, however, absent. This would suggest that long-term storage of large quantities of grain was not occurring in the vicinity of the wells.

The wells are likely to have supplied very clean water until refuse began to be dumped into them. Very few aquatic insects were found in them and it is thought that these water beetles were individuals which accidentally fell in rather than representing the faunas of the water. A few beetles which tend to occur in dark voids underground, such as *Trechus micros*, perhaps lived on the sides of the shafts.

The only other habitats suggested on the site by the plant or insect remains were minor. For example, a few carrion beetles such as *Thanatophilus rugosus* and *Omosita colon* were found in the well samples but at a level of abundance that need imply no more than an occasional dead wild bird or mammal at the settlement.

The macroscopic plant remains gave much evidence for activities at the settlement. Cereal processing was represented by both carbonised and waterlogged remains. Although the concentration of carbonised cereals was low in the majority of the late Roman samples, four rich assemblages were found. Three were from the backfill of waterhole 10589 (contexts 10578, 10581 and 10584) and one from pit 10642 (context 10643). All contained remains from the de-husking and cleaning of *Triticum spelta* (spelt wheat). Charred glumes predominated in pit 10642, with grain and weed seeds comprising less than 5% of items. The samples from waterhole 10589 contained higher proportions of grain and weed seeds but chaff was still the most abundant category of remains in each sample. Context 10584 also contained many macroscopic silica remains of wheat chaff. These result from combustion under fully oxidising conditions and although the organic component is lost, the silica phytoliths in the chaff can become welded together by the heat (Robinson and Straker 1991).

*Table 6.22 Other waterlogged insects*

| | | *Min. no. indiv.* | |
|---|---|---|---|
| | *Phase* | 8 | 8 |
| | *Well* | 12885 | 8032 |
| | *Context* | 12716 | 8779 |
| | *Sample* | 684 | 412 |
| *Forficula auricularia* (L.) | | 1 | 2 |
| *Heterogaster urticae* (F.) | | 1 | - |
| *Scolopostethus* sp. | | - | 1 |
| *Aphrodes bicinctus* (Schr.) | | 1 | 2 |
| *Aphrodes* sp. | | - | 1 |
| *Stenamma* sp. | - worker | 2 | - |
| *Myrmecina graminicola* (Lat.) | - worker | - | 1 |
| *Lasius niger* gp. | - worker | - | 1 |
| Hymenoptera indet. | - | 1 | |
| *Melophagus ovinus* (L.) | - puparium | - | 1 |
| Diptera indet. | - puparium | 1 | 1 |
| Diptera indet. | - adult | 2 | - |

Much chaff must have been burnt to give rise to this deposit. It is likely that de-husking material was either being burnt as fuel or for waste disposal. The waterlogged plant remains in sample 413 from well 8278 and sample 412 from well 8032 also included glumes from the de-husking of spelt wheat.

*Triticum spelta* was the only wheat that could be identified with certainty from the site although it is possible that there was a little *T. dicoccum* (emmer wheat) amongst the less closely identifiable remains. Both context 10581 and context 10643 contained some short wheat grains which raises the possibility that a free-threshing variety of *Triticum* (rivet or bread-type wheat) was also being cultivated. However, some of these grains showed the angularity which is characteristic of hulled wheat. In the absence of any rachis fragments of free-threshing wheat, it is probably safer to regard these grains as being from a short-grained form of *T. spelta* growing amongst the spelt crop. There was a slight presence of hulled *Hordeum vulgare* (six-row hulled barley) in some of the charred samples but the proportion of barley was so low that it need only have been growing as a volunteer in the spelt fields. However, it is thought likely that barley would have been grown as a crop in its own right. In contrast, although a few charred grains of *Avena* sp. (oats) were noted, they have been placed in the weed category because wild oats were considerably more common in Roman Britain than cultivated oats.

The charred weed seeds were mostly from typical arable weeds such as *Vicia* or *Lathyrus* sp. (vetch or tare), *Rumex* sp. (dock) and *Anthemis cotula* (stinking mayweed). The occurrence of seeds of *Galium aparine* (goosegrass) suggests that at least some of the crops were autumn-sown. Two of the samples from waterhole 10589, however, contexts 10578 and 10581, also contained charred seeds of grassland plants including cf. *Trifolium* or *Medicago* sp. (clover or medick) and *Plantago lanceolata* (ribwort plantain). While it is possible that their presence was the result of bringing grassland into cultivation, given the evidence for hay being brought to the settlement, it is thought more likely that they were from burnt hay. It is likely that some of the waterlogged seeds were also from weeds growing amongst the cereal crops. It is not easy to distinguish them from the weeds of other disturbed habitats although *Agrostemma githago* (corn cockle) and *Scandix pecten-veneris* (shepherd's needle) are very closely associated with arable cultivation.

The charred remains gave evidence strongly biased towards cereal cultivation because heat was used in the dehusking of grain and perhaps the hardening of grain prior to milling. There was only a single charred seed of another crop, *Linum usitatissimum* (flax). In contrast, flax seeds were found in four of the five waterlogged samples and flax capsule fragments were present in all of them. These remains are likely to have resulted from the crushing of the capsules to extract the edible oil-rich seeds. It is uncertain whether the flax plants were rippled (had their capsules removed) at the site of cultivation and the stems sent elsewhere for retting (soaking to release the fibres which are spun into linen) or whether the entire plants were brought to the settlement for processing. In addition to flax capsules, sample 412 from well 8032 also contained a couple of capsule fragments of *Camelina* sp. (gold-of-pleasure). This weed is very closely associated with flax cultivation. In Continental Europe it became domesticated as an oil crop in its own right but there is no evidence that it was anything other than a weed of flax in Roman Britain.

The waterlogged remains (Tables 6.19 and 6.20) included seeds of various culinary herbs and spices: *Satureja hortensis* (summer savoury) in sample 683 from well 12885, *Coriandrum sativum* (coriander) and *Apium graveolens* (celery) in sample 682 from well 12885, and *Foeniculum vulgare* (fennel) in sample 412 from well 8032. The celery was probably cultivated for its aromatic seeds rather than its leaf petioles. Sample 412 also contained seeds of what is believed to be a cultivated species of *Brassica*. The seeds were larger than those of *B. nigra* (black mustard), which were also present in the sample, and had a black surface with low cell walls rather than the reddish-brown surface with high cells of *B. nigra*. The seeds were also larger than those of *B. rapa* spp. *sylvestris* (wild turnip) and did not have the elongate rectangular cells on the surface that characterise *B. oleracea* ssp. *sylvestris*. It is thought most unlikely that *B. oleracea* ssp. *oleracea* (wild cabbage) would have grown at the site since it is a wild plant of maritime cliffs. This leaves the various cultivars of *B. oleracea* (cabbage, kale etc), *B. napus* (rape, swede) and *B. rapa* (turnip), any of which would have been a plausible crop.

Remains of cultivated fruit were absent although a single nut shell fragment of *Corylus avellana* (hazel) was found. A couple of the plants which have already been noted as possible colonists of waste ground, *Papaver somniferum* (opium poppy) and *Brassica nigra* (black mustard) could also have been cultivated for culinary purposes. Doubtless some of the long list of wild plants in Table 6.19 were put to medicinal usage.

Much wild plant material was brought to the settlement. All three wells contained frond fragments of *Pteridium aquilinum* (bracken) which was perhaps imported for animal bedding. All the waterlogged samples also showed a hay meadow floral element, including seeds of *Filipendula ulmaria* (meadowsweet), *Rhinanthus* sp. (yellow rattle), *Leucanthemum vulgare* (ox-eye daisy) and *Centaurea* cf. *nigra* (knapweed). There were also pod and tendril fragments of *Vicia* or *Lathyrus* sp. (vetch, vetchling etc), flowers and calyces of *Trifolium* sp. (clover) and bracts of *Centaurea nigra* (knapweed). Many of the other seeds of grassland plants, for example *Ranunculus* cf. *acris* (meadow buttercup), *Stellaria graminea* (stitchwort), *Leontodon* sp. (hawkbit) and *Carex* spp. (sedge), could have been brought in amongst hay rather than from plants which grew locally. The occurrence of species of damp ground amongst the hay meadow flora such as *F. ulmaria* suggests that the hay had been cut from a rather wetter location than the ironstone ridge and had perhaps been derived from the floodplain of the River Nene. It is uncertain whether the material from the wells represented old hay which had been discarded into them or dung from animals which had been fed on hay.

The insect evidence raised the possibility that wool was being processed at the site. A puparium of *Melophagus ovinus* was found in sample 412 in well 8032. It is a wingless fly that is an ectoparasite of sheep. The adults glue their puparia onto the fleece of the host. Perhaps wool was being cleaned prior to spinning.

### Discussion

The results from the mid Roman period (Phases 3-4) fell into the usual Roman pattern of an arable economy based on the cultivation of spelt wheat and hulled barley. Unfortunately, the evidence from this period was very limited.

Considerably more evidence was available from the late Roman period (Phase 5). The results suggested that the settlement at Higham Ferrers had much open ground between the buildings. Some was trampled ground or had weeds growing on it but there were also small enclosures with domestic animals. It is also possible that there were horticultural plots. The synanthropic insects were appropriate to a Roman settlement but they did not comprise a full urban fauna, which was perhaps because of the scale of the open areas. The settlement was engaged in a range of activities related to the later stages of agricultural processing. Spelt wheat was being de-husked and flax seeds extracted. It is possible that the de-husking of wheat was a centralised activity rather than being undertaken on a small scale at a household level. The importation of hay to the settlement suggested a relationship with the floodplain of the Nene. The range of cultivated plants used at the site, including the culinary herbs, was probably typical for rural settlements of this date in the region. No examples were found of plants that could not have been grown locally, unlike the larger towns where such imported exotics are usually present. It was noticeable that although charred plant remains were very sparse in the majority of the samples, there were a few with a very high concentration of remains. What was perhaps most significant about the late Roman phase of Higham Ferrers, was the good preservation of the plant and insect evidence.

## THE WOOD CHARCOAL *by Dana Challinor*

### Introduction

Seven samples were selected for analysis following assessment; a single sample from a Bronze Age cremation pit (10002), discussed in Chapter 2, and six samples from various Romano-British features (hearths 11036 and 11809, posthole 11498, construction cut 12237, layers 11975 and 11252), that are reported on here. The assessment had shown that the preservation of charcoal at the site was very good and would enable an examination of the selection of fuelwood in the mid to late Roman period.

### Methodology

Fragments of charcoal >2 mm were considered for identification. Most of the samples were very rich in charcoal so were consequently divided and a percentage of the whole examined. The charcoal was fractured and sorted into groups based on the anatomical features observed in transverse section at x10 to x45 magnification. Representative fragments from each group were then selected for further examination using a Meiji incident-light microscope

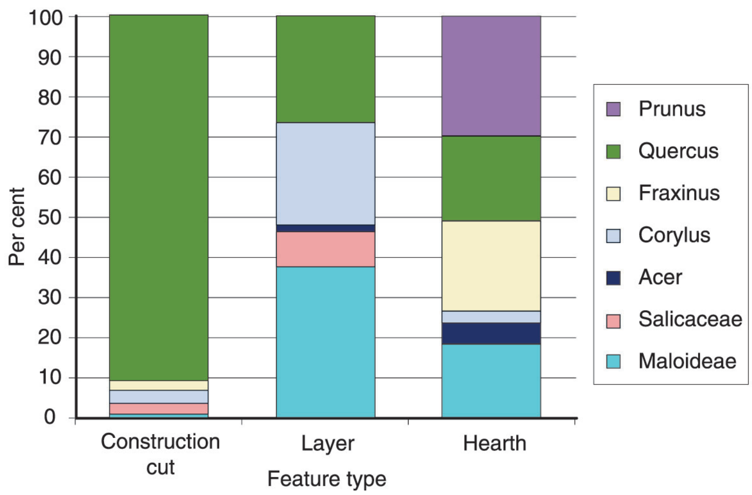



*Fig. 6.9 Percentage of charcoal taxa by feature type (based upon fragment count)*

at up to x400 magnification. Identifications were made with reference to Schweingruber (1990), Hather (2000) and modern reference material. Classification and nomenclature follow Stace (1997). The maturity of the wood was assessed where the condition of the wood permitted it. None of the roundwood pieces was complete enough to allow age calculations.

**Results and discussion**

The results of the analysis by fragment count are given in Table 6.23. Seven taxa were positively identified; *Quercus* sp. (oak), *Corylus avellana* (hazel), *Populus/Salix* (poplar/willow), *Prunus spinosa* (blackthorn), Maloideae (hawthorn, apple, service etc), *Acer campestre* (field maple) and *Fraxinus excelsior* (ash). The taxonomic level of identification varies according to the biogeography and anatomy of the taxa. The indeterminate fragments are likely to represent additional specimens of taxa positively identified in the sample.

The assemblages from the Romano-British period are generally very mixed, so it is immediately striking that, although oak is present in all samples, it is notably dominant in the construction cut samples (Fig. 6.9). Posthole and construction cut samples are often problematic since the provenance of the charcoal is frequently unclear, unless there is evidence of *in situ* burning. The assemblage from posthole 11498 is useful, therefore, being entirely composed of *Quercus*, since it supports the on-site suggestion that the deposit represented the remains of a burnt post. Certainly *Quercus* is likely to have been the main timber used for structural purposes, and is well documented at other Roman sites (Murphy 2001). The *Fraxinus* and *Corylus* from 12237 would also have been appropriate for structural purposes, and are suitable for management practices. The Salicaceae family consists of *Salix* spp. (willow) and *Populus* spp. (poplar), which are difficult to distinguish anatomically. Both generally have structural and artefactual uses; poplar was utilised for beams in medieval buildings and willow has many uses for basketry, cordage etc (Gale and Cutler 2000). Neither makes particularly good fuelwood unless well seasoned or converted to charcoal (*ibid.*). Both trees prefer damp grounds and probably grew in the Nene floodplain, so would have been an available resource. Although it is not possible to comment further on these samples, it is at least plausible that they represent structural remains rather than domestic hearth debris.

The remaining Romano-British samples came from various deposits associated with buildings, all of which are likely to represent the remains of domestic debris, although 11252 may also contain structural remains. Like the construction cut sample 12237, there is a quantity of *Populus/Salix* in the 4th-century deposit 11252. In general terms, the fuelwood used for domestic hearths would have been sourced from the local landscape, although the possibility that wood from broken artefacts or structural remains was also re-used as fuel should not be discounted. Moreover, the nature of the deposits (layers and hearths) examined means that multiple burning events may be represented. Certainly, it would be erroneous to assume that these samples provide a complete picture of domestic fuelwood selection or of the woody composition of the local environment. Nonetheless the results from Higham Ferrers are consistent with those from other sites of comparable date, where a variety of wood fuels are used.

*Table 6.23 Results of the charcoal analysis from Romano-British contexts (r=roundwood; s=sapwood; h=heartwood)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | *Feature type* | *Hearth* | | *Construction cut* | | *Layer* | |
| | *Phase* | *2nd Century* | | *2nd Century* | *3rd Century* | *Late 2nd/ Early 3rd Century* | *4th century* |
| | *Feature number* | 11036 | 11809 | 11498 | 12237 | - | - |
| | *Context number* | 10967 | 11810 | 11499 | 12240 | 11975 | 11252 |
| | *Sample number* | 618 | 664 | 654 | 677 | 667 | 634 |
| | *% flot identified* | 50 | 25 | 6.25 | 25 | 100 | 3.125 |
| *Quercus* sp. | oak | 11 | 37r | 167hs | 103hs | 2 | 57hs |
| *Corylus avellana* L. | hazel | | 6 | | 11r | | 55r |
| *Populus/Salix* | poplar/willow | | | | 8 | | 19r |
| *Prunus spinosa* L. | blackthorn | 66r | | | | | |
| Maloideae | hawthorn etc | 24 | 17r | | 2 | 77r | 6 |
| *Acer campestre* L. | field maple | | 12r | | | | 4 |
| *Fraxinus excelsior* L. | ash | 1 | 49rh | | 6 | | |
| Indeterminate | | 7 | 4 | | 4 | 2 | 5 |
| Total | | 109 | 125 | 167 | 134 | 81 | 146 |

At Gravelly Guy, Oxfordshire, Gale suggests that a combination of wood from managed trees and local hedgerow or scrub species was utilised for fuel (Gale 2004). While it was not possible to identify management practices from the charcoal, many of the samples from Higham Ferrers produced narrow roundwood fragments and the tree species identified (oak, ash, hazel, maple) are all suitable for pollarding or coppicing. Since the insect and plant evidence (see Robinson above) are indicative of hay meadows and open grassland, at least in the valley below, it seems likely that a local environment of managed stands of trees and hedgerows within a field system provided the wood required for domestic fuels (and other uses). Certainly, *Fraxinus* and *Prunus* do not thrive in dense woodland. It has not been possible to comment on any temporal differences in the samples, since so few were examined.

### Conclusion

The evidence from the Romano-British charcoal is consistent with the interpretation of an open landscape, although there is no suggestion that was any shortage of oak or ash in this period. It does seem likely that the tree resources were managed appropriately. The selection of fuel in this period is consistent with collection practices for domestic use at similar sites; a variety of woods was gathered from the vicinity of the settlement.

## MICROMORPHOLOGICAL ANALYSIS

*by M G Canti*

Micromorphological analysis was carried out on two layers of interest (10843 and 10842), located immediately downslope of a building (10800), and overlying a gravel path (10841), parallel with the settlement's axial road. The lower layer (10842) was a distinct orange-red colour and sealed the path surface. Above that was layer 10843, a distinct dark grey brown silt extending over, and infilling, the terrace of the former pavement area. It contained large quantities of occupation debris and other inclusions comprising animal bone, pottery, fragments of limestone and ironstone, occasional charred plant remains, as well as numerous iron artefacts including domestic items.

The aim of the micromorphological analysis was to contribute towards establishing the origins of the upper soil layer (10843), any modifications it may have experienced relating to the use or abandonment of the site, and whether it was reworked at all with 10842.

### Methodology

Two tins of soil were collected from the section. They were then dried in air, impregnated with crystic resin under vacuum and allowed to set before being thin sectioned by the Department of Environmental Science, University of Stirling. The slides were examined using polarised (transmitted) and reflected light at a range of scales.

### Results

The two slides are substantially similar, being composed of soil derived from the underlying rocks of the Oolitic limestone (upslope), the Estuarine series and the Northampton Sand with ironstone, all from the lower Jurassic. The basic soil material is a roughly equal mix of sand silt and clay, strongly reworked by soil fauna to produce a microfabric composed of silt-sized organo-mineral pellets. These are randomly distributed, remaining separated in some parts of the slide, and coalesced in other parts to form an undifferentiated mass. Within this basic fabric, there are various inclusions, such as limestone, flint and ironstone. The slide of 10842 contains slightly more >0.25 mm fragments of flint (18) and limestone (23) than 10843 which contains about 11 of each. Both slides contain similar contents of ironstone (around 16 fragments each), and charcoal (1 fragment each). 10842 contains a decaying bone fragment and some other unidentified decaying organic material. Slide 10843 contains a large mortar fragment and two patches of calcium carbonate crystals arising from a biological process, perhaps crushing of earthworm granules or root decay.

Overall, however the slides do not show microscopic differences reflecting the field scale differences noted on site. It seems most likely that the relationship between the two deposits has been blurred at this location by biological mixing. Both slides show almost complete reworking of the fine fabric into organo-mineral pellets by microscopic organisms, as well as a number of calcium carbonate earthworm granules which testify to activity by the larger earthworm species. At sampling time, it was noted that the boundary between the two layers was marked by some of the vertical stripes that are produced when the burrows of these larger species infill (Canti 2003). Such action would draw some of the material from 10843 down into 10842. This mixing would be untraceable under the microscopic scale since the gross colour differences between the two deposits are only visible at the field scale.