Ancient Monuments Laboratory
Report 57/91

LEICESTER, THE SHIRES, 1988 EXCAVATIONS: THE ANIMAL BONES FROM THE MEDIEVAL DEPOSITS AT LITTLE LANE

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Summary

The medieval deposits at Little Lane span the twelfth to sixteenth centuries. The excavated area lies behind the street frontage. The features encountered are principally pits and wells. The animal bones appear to derive in the main from domestic food waste. The presence however of sawn antler offcuts of red, roe and fallow deer in the fifteenth-sixteenth century phases indicates some craft working in the vicinity. The quantity of bones and range of species represented increases in the later phases, which may be associated with the occupation of the Lord's Place, a Tudor mansion. The proportion of sheep/goat to cattle bones increases through time with sheep/goat outnumbering cattle in the later phases. Pig remains occur at a more constant level. The commonest non food species is the cat. The age structure of the cattle is particularly unusual with very young calves, animals probably in their second or third year and extremely aged animals. There is a surprising absence of animals between these age groups. The sheep/goat bones show greater numbers of animals killed during their second-third year but virtually no infant lambs. The withers heights indicate animals of small stature between 0.5 and 0.6m. Of particular interest are two metapodials and a first phalanx from a dwarf or Ancon sheep from a sixteenth century context. This appears to be an early record of this mutation.

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The cultivation horizon F34b in phase 12.2 contained vast quantities of very broken up and rolled bone fragments, most of which appeared cattle sized. Amongst these were six horse fragments, a roe deer antler, a cat mandible and a polled sheep frontal. The remaining scanned features in this phase contained two dog bones - including a complete skull, a polled sheep frontal and three bird bones of woodcock size.

Phase 13.1 produced a frontal from a young but probably not neonatal calf, three fallow deer bones (not antler), four horse, one cat and three dog bones.

The unrecorded bones from F21 and F52 were very similar to those recorded and included several cat and rabbit bones, a red deer antler with shed pedicle and a fallow deer metatarsus.

In general the less common species are consistently represented in the scanned bones. The examples of species in phases where they were absent from the prioritised features are marked + in Table 1. Polled sheep are seen to be present in all phases and more evidence is seen for the disposal of, perhaps unwanted, human infants.

Skeletal Distribution by Fragment Count

Counts of all identified elements of cattle, sheep/goat and pig are listed in Appendix III. Figures 1-3 illustrate the frequency of fragments of 20 skeletal elements for cattle, sheep/goat and 19 for pig. They were chosen as being the most commonly found and representing the whole carcase. The number of first phalanges present has been divided by 4 to compensate for the greater number present in the body while the axis and atlas have been doubled since these are single bones.

Cattle (Figure 1)

Part of the patterning seen in Figure 1 may represent better survival of the more robust parts of the skeleton. However, eight elements of varying density occur at or above 70% frequency which suggests preservation is reasonable. The similar frequency of bones of the forelimb (scapula, humerus and radius) and the hindlimb (femur and tibia) together with their respective metapodials may suggest that debris from whole quarters of beef, if not whole carcases, was deposited. Lower jaw fragments are most numerous overall.

Sheep/Goat (Figure 2)

This pattern probably reflects in part the general state of preservation together with a bias against recovery of small bones by hand excavation. Only four elements occur at a frequency of 70% or above. The tibia in particular is both robust and easily identified. There is close agreement in frequency of both humerus/radius and ilium/femur, which may suggest these formed common

Leicester, The Shires 1988 Excavations

The Animal Bones from the Medieval Deposits at Little Lane.

L. J. Gidney.

This is the second of three archive reports analysing the animal bones from this excavation. The first report (Gidney, 1991) covers the Romano-British material and the third will cover the Post-Medieval assemblage. The format followed will remain the same throughout.

Introduction

The medieval activity on the Little Lane site has been divided into 5 phases spanning the twelfth to mid sixteenth centuries. In all 5 phases the archaeological features discovered are principally pits. The medieval activity was superimposed on the Roman levels and consequently much Roman material was disturbed by the digging of pits and wells. The features prioritised for the study of the animal bones were generally those with the least residual pottery.

The excavation was to the rear of the street frontage so no structural remains of buildings were encountered. However at least three property boundaries cross the site. Part of the excavated area lies directly across the road to the site of the Lord's Place, a Tudor mansion. In the mid sixteenth century this passed from the Reynolds family to the Earl of Huntingdon.

From phase 10.1, c.1100-1250 AD, two cesspits (F30 and F92) and six pits (F83, F128, F192, F76, F100, F134) had the animal bones examined. Phase 11.1, c.1250-1400 AD, had the bones from a well (F22) and a pit (F121) studied. Phase 12.1, c. fourteenth century-early fifteenth century, had two cesspits (F41, F72) and two pits (F70 and F81) selected. Phase 12.2, 1400-1550 AD, had four pits (F48, F63, F65, F102) and a well (F73) chosen for study. Phase 13.1, 1475-1550 AD, had five pits (F58, F66, F78, F21, F52), a channel (F38) and two wells (F31 and F47) chosen for study. Two of the phase 13.1 pits (F21 and F52) produced comparatively large quantities of animal bone so only half of these were recorded in detail to reduce the distorting effect of such groups on the whole medieval assemblage, as was seen in the Roman period with the cellar. However the metrical information from the remainder of these two pits will be utilised. Table 1 summarises the total of 4187 recorded fragments. No great variation in preservation was noted between the phases. The bones were generally in good condition with very few rolled fragments that might indicate incorporation of, for example, Romano-British material.

The material will be stored by the Leicestershire Archaeological Unit, 116 Humberstone Drive, Leicester, LE5 0RD.

Methods of Recording

The system of recording only fragments of cattle, sheep/goat and pig with 'zones' or teeth as described for the Roman deposits (Gidney, 1991) was used for all of the medieval bones. Details of zones and of anatomical abbreviations may be found in Appendices I and II respectively. It should be noted that under this system cattle and sheep/goat metapodials not distinguishable as either metacarpus or metatarsus and molars not determinable as either molar 1 or molar 2 are not recorded. The premaxilla does not encompass a 'zone' so upper incisors of pig are not recorded to ensure comparability with cattle and sheep/goat.

The number and proportion of fragments from the prioritised deposits which have not been catalogued are presented in Table 2. The fragment counts give an uncatalogued fraction of around 60% for all except phase 12.2 which is some 10% lower. The weight of the uncatalogued fraction is about 30% except for phase 12.2 which is again about 10% lower. This indicates that phase 12.2 has the highest proportion of identifiable fragments. In general the agreement between the proportion of uncatalogued fragments by fragment count and weight indicates the generally small size of these pieces.

All bones from features that were not prioritised were looked at briefly to see if there were any anomalous groups of bones or unusual species present.

Species

It can be seen from Table 1 that while the most common bones found in all phases are from domestic species, exploitation of wild birds and mammals seems to have slightly increased in the later medieval phases. The proportion of bird bones increases from 9-11% of the recorded bones in phases 10.1-12.1 to 18-19% in phases 12.2 and 13.1. Bird species marked ? in Table 1 require confirmation of the identification. Bird bones that could not with any confidence be attributed to species are not included in Table 1. These will be identified at the end of the project and may extend the species list.

In the later phases there is an increase in the size and number of the rubbish pits found, the quantity of bone waste recovered and the range of species represented. This may indicate a rise in the general standard of living in this part of the town which may be associated with the occupation of the Lord's Place. However Dyer (1988) indicates that there was a trend for increased consumption of fresh meat by all sections of the community in the fifteenth century.

Table 3 shows the relative proportions of the three common domestic species using the fragment counts. The occurrence of pig remains is at a similar level throughout. Cattle and sheep/goat occur in similar proportions in phase 10.1 with slightly more cattle than sheep/goat in phase 11.1. However from phase 12.1 to 13.1 the proportion of sheep/goat tends to increase at the expense of cattle. A rise in the proportion of sheep/goat to cattle was also seen in the medieval phases at the Austin Friars, Leicester (Thawley 1981, Fig. 64). This relative increase through time of sheep/goat to cattle has been noted at York and Lincoln and is probably related to the growth in wool production (O'Connor 1989, 15-18).

Cattle

The occasional horn cores found in each phase suggest that the cattle were horned, no evidence was seen for naturally or artificially polled cattle.

Sheep or goat

The separation of these two species was discussed in the Roman Report (Gidney 1991).

The only fragments seen that could be positively identified as goat were two horn core fragments from phase 10.1. Skull fragments clearly recognisable as sheep were more common, 39 from all 5 phases. None of the 88 humeri fragments nor 242 metapodials recorded as sheep/goat exhibited any of the obvious characteristics of goat. While occasional fragments of goat may be present it is assumed that the greater part of the sheep/goat fragments from the medieval phases are from sheep rather than goat.

Both horned and polled sheep are represented. Polled animals are less frequent with one skull fragment in phase 12.2 and four partial skulls in phase 13.1. In all phases 34 loose horn cores or skull fragments of horned sheep were found. Using only the skull fragments the incidence of polled to horned sheep is roughly 1:5.

A good example of a polled sheep skull is illustrated by Thawley (1981, Plate 2) from the Austin Friars, Leicester. Both polled and horned sheep were found on this site too.

Pig

The pig bones found were largely from immature animals hence it is difficult to visualise their type. However the pigs seem to be an unimproved type with no obvious indications of the presence of wild boar.

Horse

Horse bones are scarce forming less than 1% of the mammal bones in each phase, except for phase 11.1 where horse bones contribute 2% of the mammal bones. Of the total 21 horse bones, four are loose teeth, four tibiae, four metapodials and five phalanges. None of the horse bones appeared to articulate, rather all appeared to be isolated, dispersed fragments. No butchery marks were seen on the horse bones. Two tibiae, one from phase 12.2 and one from phase 13.1, were sufficiently intact for their lengths to be measured. These gave withers heights of 1.6m (16 hands) and 1.4m (14 hands) respectively using von den Driesch & Boessneck (1974, 333). These withers heights may be interpreted as a horse and a pony.

Dog

Dog bones are marginally more numerous than those of horse, and like the horse bones most seem to be stray disarticulated fragments that have become incorporated in backfill. The exception is a partial skeleton from phase 12.1, F72, a cesspit. Even this animal seems not to have been deposited as an articulated corpse as its bones were found in at least three contexts within the pit, this suggesting that it was shovelled in among backfill taken from its original place of interment. This animal was immature with no epiphyses fused other than the distal scapula tuberosity and the distal humerus recently fused. This suggests the animal was little more than 8-9 months old (Silver 1969, 285). The left innominate of this dog shows modification of the pubis perhaps caused by infection/inflammation and the right radius appears to have a healed greenstick fracture. Also in F72 were mandibles from two further individuals, one of which had resorption of the bone between premolars 2 and 3 and heavy wear on the carnassial which suggests that this was an elderly animal.

The remaining dog bones from all phases include immature and adult animals but no puppies. The extreme range of conformation is shown in phase 13.1 by a lumbar vertebra comparable in size to a skeleton with an estimated shoulder height of 70cm and an immature tibia from a short bow-legged animal. A complete humerus from phase 12.2 gives an estimated shoulder height of 33cm (Harcourt 1974, 154).

Cat

Cat remains are far more numerous than those of dog and more individuals are represented. The pattern of corpse disposal may suggest that cats were more common than dogs.

For Table 1 whole or partial skeletons have only been counted as one bone. Two partial skeletons were recovered in phase 10.1 from F30, a cesspit. Parts of a further 7 individuals were found in pits F48 and F63 in phase 12.2 and another 6 individuals in pits F52, F58, F21 in phase 13.1. The assortment of loose cat bones also found suggests that some of these cats were disposed of as corpses in these pits while other bones were redeposited in backfill. The youngest animals represented, with some epiphyses not fused or just fusing, were probably in the region of a year old but most bones had both epiphyses fused.

Hare and Rabbit

Remains of both species are sparse with hare appearing only in phases 12.1 and 13.1 and rabbit in phases 10.1, 12.2 and 13.1. Together both species contribute less than 2% of the mammal bones from phase 13.1, where a minimum of three rabbits are represented. Lagomorphs would seem to have been an infrequent or luxury food.

The presence of rabbit in phase 10.1 is noteworthy. Lever (1977, 65-6) suggests that rabbits were introduced to Britain in the twelfth century but did not become widespread until the mid thirteenth century. A femur and a mandible were found in the cess pit F30 in context 240 dating to the 13th century. This suggests an early introduction of the species to the urban market in Leicester in the 13th century.

There were no obvious skinning marks seen on either cat or lagomorph bones.

Roe deer

Roe deer is represented by a single piece of antler in phase 13.1. This had been sawn and indicates craft waste.

Fallow Deer

Remains of fallow deer appear only in phases 12.2 and 13.1. Of these 20 fragments, five are recognisable pieces of palmate antler which appear to be off-cuts from craft working. Six of the remaining fragments are metapodials while the remainder are from meat bearing parts of the carcase. Very limited consumption of venison is indicated.

Red Deer & Unidentified Deer

Red deer is only represented by antler offcuts in phases 12.2 and 13.1. Two of the four fragments include the pedicle which has been shed in both cases. The unidentified deer fragments are all antler off-cuts which are too small to determine between red and fallow deer.

Overall there is a notable absence of deer remains of any species in phases 10.1-12.1. The later phases indicate that antler was used as a raw material but that venison was a very rare commodity only provided by fallow deer.

Water vole?

A single humerus probably of water vole was seen in phase 10.1. The general absence of mammal bones of this size or smaller reflects the limits of trench recovery before sieved samples are analysed.

Human

A frontal bone from a human infant was found in pit F76, phase 10.1. Phase 12.2 produced a single fragment of adult humerus which appears to be disturbed and redeposited.

Birds

Fowl and goose bones are present in all phases with fowl bones outnumbering those of goose. However in phases 12.2 and 13.1 the proportion of goose bones increases relative to the fowl bones and duck bones become appreciably more common. The geese and duck bones are generally similar in size to modern greylag and mallard reference skeletons. There is some variation which, with further identification, may be determined as either domestic birds or other wild species. A great deal of care was taken with the identification of the fowl bones and none are included in Table 1 which were not confidently thought to be fowl.

Some wild birds would seem to have been eaten: woodcock?, teal?, pigeon and swan. More woodcock bones in particular may yet be identified with the possibility also of pheasant and black cock. Other wild birds seem more likely to have been urban scavengers: the crow family and perhaps the buzzard?.

Scanned Features

Roughly 123kg of bone from prioritised contexts were examined and about 145kg of bones were scanned only.

Phase 10.1 produced another 10 fragments of horse, including a metatarsal made into a bone skate from F99. More horse bones were seen in the scanned material than the prioritised features. Also seen were 13 fragments of dog, four of cat, three skull fragments of polled sheep and, from F96, a metacarpus of a goat. A large part of a neonatal human infant was found in F178, context 987, and would appear to have been deliberately disposed of in this rubbish pit.

Phase 11.1 produced a rabbit jaw in F112, a species which was not recorded in the prioritised material from this phase. A further three horse bones and a polled sheep skull fragment were seen.

The cultivation horizon, F64, in phase 12.1 produced two hare bones, one of rabbit, one of cat, a polled sheep skull fragment and a fallow deer metacarpus. No fallow deer bones were seen in the prioritised features. A frontal bone from a human infant was also found, perhaps indicating a disturbed infant burial.

butchery joints. Together with the high incidence of metapodials and mandibles, this indicates that entire corpses were processed.

Pig (Figure 3)

Again, a pattern probably influenced by preservation and recovery is seen, with only two elements occurring at a frequency of 70% or above. The predominant presence of lower jaws and major bones of fore and hind limb suggests that whole carcases were brought into town.

Skeletal Distribution by Zones

The frequencies of the 20 most commonly occurring zones for cattle, sheep/goat and pig are illustrated in Figures 4-6. These figures present the most common sections of individual skeletal elements and can therefore indicate either or both a) the most robust portions of individual elements and b) humanly selected parts of the body.

Cattle

Nine elements are represented in Figure 4: jaw, scapula, humerus, radius, metacarpus, pelvis, calcaneum, metatarsus and phalanx 1. The latter has been 'normalised' to make numbers comparable with those of bones which occur in pairs. Both metacarpus and phalanx 1 would seem to be largely intact while the single zones from humerus, radius and pelvis indicate that these elements are much more heavily fragmented. The minimum frequency of 60% suggests that preservation is not too dissimilar between these elements. The most common zone appears on the metacarpus compared to the most common fragment in Figure 1 which was the mandible. This suggests greater breakage of the lower jaw.

Sheep/Goat

Six elements are represented in Figure 5: jaw, humerus, radius, metacarpus, tibia, metatarsus. All elements have more than one zone represented indicating relatively intact specimens. The minimum frequency of 50% suggests some differences in preservation or fragmentation. This method clearly distinguishes the metapodials from the other four elements, both metapodials appear largely intact. The most common zone appears on the metatarsus compared to the most common fragment in Figure 2 which was the tibia.

Pig

Ten elements are represented in Figure 6: skull, jaw, scapula, humerus, radius, ulna, metacarpi, pelvis, femur and tibia. The diversity of elements coupled with the minimum frequency of 35% suggests a greater degree of fragmentation than was seen for the other two species. The most common zone is on the humerus whereas the most common fragment in Figure 3 was the jaw. This suggests that the mandibles were broken into fragments with tooth rows not encompassing zones.

Of the three species, sheep/goat bones tend to be more complete than either cattle or pig bones. This is a frequent pattern and may also reflect poorer recovery of small fragments besides less breakage.

Gnawing

From Table 4 it can be seen that the incidence of canid gnawing is very similar for all three species with 18 or 19 elements attacked and some preference for elements with later fusing epiphyses. The overall proportion of bones gnawed per species is much the same with the larger and more robust cattle bones having a very slightly lower incidence. The counts in Figure 4 are only of the bones left sufficiently intact for zones to be encompassed. Many more gnawed elements were seen which were reduced to a section of diaphysis not including a zone. Amongst these were many bones from immature animals, therefore much evidence for the state of epiphysial fusion will have been lost. This overall level of gnawing suggests that dogs may have been more common than the number of dog bones found might suggest. This implies that dog corpses were not generally disposed of in pits like the cat corpses.

Besides the mammal bones 18 goose, 13 fowl and 6 duck bones, principally from phases 12.2 and 13.1, were seen with very fine puncture marks, which may indicate gnawing by cats.

Butchery

The collection of animal bones from the medieval deposits at Little Lane would seem to be predominantly food refuse. However the antler off-cuts indicate the presence of some craft working waste and the relatively intact metapodials of sheep/goat, in particular, may be discards from skin processing for example.

Many bones have been broken in antiquity with impact splintering but no clear edged tool marks. The regularity of breakage suggests human agency prior to deposition. Most butchery appears to have been performed with a cleaver. Saw marks were principally seen on the antler off-cuts which suggests the saw was a tool of the artisan not the butcher. The incidence of butchery marks is related to the size of the carcase and so are seen more commonly on beef bones than mutton or pork bones.

Cattle and large ungulates

From Table 5 it can be seen that 24 different elements were recorded with butchery marks. There seems to have been routine division of the limb bones and pelvis. This may indicate utilisation of marrow besides the provision of jointed beef.

The spinal column shows a particularly high degree of carcase separation with 83% of cattle-sized vertebrae, excluding the tail, chopped and at least 48% split sagittally. The latter indicates the presence/use of facilities to suspend a beef carcase.

Knife marks are extremely rare. Only four examples were noted on an astragalus, pubis, tibia and first phalanx.

Sheep/Goat and small ungulates

The shoulder and leg joints show some division into smaller units, though this may be under estimated given that more bones from these joints were seen broken than had clear chop marks. Skulls generally seem to have been split for the extraction of the brain and the horncores removed.

The vertebral column seems to have been routinely sub-divided with 88% of the bones showing chop marks and 75% clearly split sagittally.

Knife marks are infrequent being seen only on three humeri, a calcaneum, a radius and a scapula. Knife marks, possibly from skinning activity, were seen on two metapodials and one skull.

One metacarpus and one metatarsus had the articular ends neatly sawn off and would appear to be industrial off-cuts rather than butchery debris.

Overall there is a lower proportion of sheep/goat bones showing butchery marks, 14%, compared to those of cattle, 26%.

Pig

There is a lower incidence of butchery marks on the pig bones, 9%, compared with the sheep/goat bones, 14%. Since an adult pig usually produces a larger carcase than a sheep this may be a reflection of smaller, immature animals needing less division of the carcase. Over half of the vertebrae had clearly been split.

Birds

Knife marks on bird bones were seen particularly in material from phases 12.2 and 13.1, and which also had the greatest numbers of bird bones. Some 11% of the goose bones have knife marks, particularly on the carpo-metacarpus which suggests the detachment of the wing tip. The wing tip, with primary feathers, of ducks and geese has been used as a hearth brush in recent times. Of interest are three neatly split, half skulls of goose and two of fowl suggesting the extraction of the brain. This task was done with great delicacy to avoid splintering the fragile cranium and damaging the brain. The technical carving term "to spoil a hen" (Mead 1931, 148) suggests that such operations were not always attended with success!

Analysis of Age Structure

The age at which livestock were slaughtered is estimated from the stages of tooth eruption and wear and epiphysial fusion. The ages of eruption and fusion used are taken from Silver (1969, 285-6, 296-80) and are presented as sequential guidelines only. Correlating age at slaughter from tooth eruption and epiphysial fusion data can be an uncertain process, particularly if the epiphysial evidence for juveniles has been obscured by canid gnawing. The teeth may be more reliable indicators for the younger age groups since they survive better than the porous, juvenile bone.

Teeth

The information on the eruption and wear stages for the teeth found is presented in three ways. Mandibles with the tooth rows sufficiently intact for Mandible Wear Scores (MWS) to be calculated after Grant (1982) are shown in Figures 7-9. Grant's tooth wear stages for individual mandibular teeth, both loose and in mandibles, are listed in Appendix 7. For Table 6 all cheek teeth present for each species have been used, whether mandibular or maxillary, *in situ* or loose. Wear stages have been divided into three very broad groupings:

'U' = deciduous tooth present or permanent tooth unerupted;
'S/W' = permanent tooth present with some attrition, corresponding approximately to Grant's wear stages A-E/F;
'H/W' = permanent tooth with full attrition corresponding to Grant's stages G onwards.

Loose teeth are particularly common for cattle, comprising some 10% of the identified fragments, and roughly 5% each of the identified sheep/goat and pig fragments. This pattern is unlikely to have been caused by preservational conditions after burial favouring decay of only cattle jaw bones. The presence of infant human and animal bones in all phases indicates a generally benign burial environment. The numbers of loose teeth may perhaps reflect the breakage of jaws before deposition, with the loose teeth so released being discarded with the waste bone. An eighteenth century recipe for ox cheek soup commences "First break the bones of an ox cheek" (Raffald 1782 facs., 5).

Cattle

Only 13 cattle mandibles had the tooth rows sufficiently intact for the MWS to be calculated, though as noted above loose teeth are reasonably common. While the numbers are very small, three groupings are seen in Figure 7. Most common are the seven examples of very young animals with dlp4 barely in wear. These animals can have been weeks old at most. Next are the four jaws at MWS 19-23, possibly representing beef animals aged approximately 2-3 years old, and, finally, there are two jaws at MWS 50 and above and which are therefore from extremely aged animals, perhaps culled breeding stock.

Table 6 indicates that teeth from juvenile/immature animals are predominant with strikingly low numbers of the later erupting teeth attaining full wear.

Despite the relatively low numbers Figure 7 and Table 6 exhibit a similar pattern. This may be interpreted as consumption of veal, with the possibility of the use of calf skins for vellum given the proximity of Parchment Lane (Sawday 1989, 14), and beef from animals that may have been reared for meat, as they do not appear old enough to have been used first for breeding or traction. Elderly cull stock were also utilised.

Sheep/Goat

The smaller and more numerous sheep/goat jaws are less fragmented than those of cattle; 46 jaws have MWS calculated. Figure 8 shows a predominant cull of the higher MWS. Only one infant lamb is represented, the small peak at MWS 7-12 may indicate a cull of weaned lambs and the peak at MWS 20-24 perhaps a cull of second year animals. This could be interpreted as an autumn cull. However, admittedly very limited, evidence from the author's own flock of Manx Loghtans kept on a low input/low ouput system suggests that this stage of tooth wear is reached in the summer. An alternative interpretation would be of a summer cull after shearing, with the skins perhaps destined for parchment.

Table 6 also illustrates the same overall pattern. The first molars with slight wear indicate a small cull of first year lambs and the second molars with slight wear a cull of slightly older, perhaps second year, animals. Nearly 50% of the third molars, and over 60% of the fourth premolars, have reached full attrition suggesting that the major cull was of animals in excess of 2 years.

This pattern may suggest that the commercial products of the flock were prime mutton and wool rather than milk and lamb.

Pig

Figure 9 shows that no mature animals are present. The highest MWS is only 25 compared to 44 for the sheep/goat and 57 for the cattle. One infant piglet is present, and the nine jaws at MWS 6-8 may indicate weaners or suckling pigs. The remaining jaws may be from porkers (killed at just under a year old) or baconers (killed at just over a year old).

Table 6 shows the same basic pattern with a preponderance of deciduous or unerupted teeth and a group of animals with slight tooth wear which were probably culled in their second year. However breeding stock may be indicated by the three third molars with full wear indicating that at only a few animals survived beyond 2 years old.

Epiphysial Fusion

For Tables 7-9 only unfused diaphysial ends have been counted with the number of loose epiphysial ends, which did not fit onto a diaphysis, shown in brackets.

Cattle

As previously mentioned, canid gnawing has almost certainly reduced the epiphysial evidence for younger animals. Table 7 shows that the proportion of unfused epiphyses increases in each broad age group. Some very young calves are present.

Cranial and post cranial elements of probably neo/perinatal and perhaps slightly older calves were found in all phases at a fairly consistent level, circa 5% of the cattle bones in each phase. Not all of these had teeth or epiphysial ends surviving so are under represented in Tables 6 and 7. A partial skeleton of a very young, probably new born, calf was found in phase 10.1, F76, a pit. Otherwise the calf bones were generally scattered throughout the assemblage. Such a consistent cull of calves suggests that the dams were thus freed for milking and may indirectly indicate the supply of dairy produce to Leicester.

There are roughly equal numbers of fused and unfused epiphyses in the 2-3 year old group which suggests substantial culling, continuing into the next age range. The vertebrae suggest that only a third of the beasts consumed had survived to full skeletal maturity.

Sheep/Goat

Table 8 suggests the presence, but perhaps not the true quantity, of lambs less than a year old. The slaughter of second year animals is more apparent with roughly a fifth of the epiphyses unfused or fusing. A higher proportion of animals would seem to have been killed between their third and fourth year with over half of these epiphyses unfused or fusing. The vertebrae suggest that only a fifth of the animals killed had attained full skeletal maturity.

Pig

Despite potential problems of loss of evidence Table 9 clearly shows that unfused epiphysial ends are in the majority: 60% of the first group and 90% of the second group. Fused epiphyses from animals that survived beyond their third year are very infrequent. There is one fused femur indicating a pig that survived into its fourth year at least, and four fusing vertebral epiphyses suggesting the demise of possibly a sole pig nearly at full skeletal maturity.

Roughly 5% of the pig bones from each phase were noted as piglet. Many of these lacked teeth or epiphysial ends so are not included in Tables 6 or 9. Bones of such young pigs have also been found in York (O'Connor 1989, 17) where it is suggested that they were bred within the town. Pigs were certainly roaming Leicester and causing a nuisance in the fourteenth century (Sawday 1989, 15). The proximity of the Swinesmarket suggests the trade in piglets may have been very local.

The above two lines of evidence, teeth and epiphyses, agree quite well for the age structure of the slaughter populations. For all three species the greater part of the meat was probably provided by animals bred for that purpose but cull breeding stock were not disregarded as a source of human food. In addition, the preference for mutton over lamb may indicate the importance of obtaining the wool crop which is in comparison with the cattle which were, apparently, bred primarily for beef rather than for dairy or draught.

Pathological and other abnormalities

Pathological conditions are very infrequent. Only 18 bones with severe disease or congenital abnormalities were seen; representing less than 1% of the assemblage.

Cattle

The only severe condition seen was a femoral head with eburnation. Minor conditions encompass a mandible which has a deep groove and extra lip of bone on the condyle. It is not clear if this is a healed break or a congenital abnormality. One mandible out of four was seen with congenital absence of premolar 2 and a maxillary third molar showed uneven wear. A first phalanx demonstrated a broadened proximal articulation and a second phalanx a congenital depression on the proximal condyle (Baker and Brothwell, 1980, p.110).

Sheep/goat

Three examples of bony growth on the proximal lateral radius, a condition commonly referred to as 'penning elbow', were seen.

A pit, F21 context 138, phase 13.1 produced the most interesting conditions seen: a metacarpal and a metatarsal both with abnormally short shafts and some distortion of the epiphysial plate and distal condyles on the metatarsus. A first phalanx articulating with the metatarsus was also found. These bones would appear to be from a dwarf (achondroplastic) animal. This short-legged mutant form appears to be a recessive genetic character, sometimes referred to as Ancon sheep (Ryder 1983, 606). Plate 1 illustrates an Ancon sheep (Hammond 1952, Fig. 124). These bones appear to be an early occurence of this condition which is not well documented until the eighteenth century, where it appeared as a spontaneous mutation in Massachusetts (Lydekker 1913, 36). A similar animal is described by Bewick (1980 facs., 70) as the Dunky or Dwarf Sheep, with the deformed face known as 'bulldog'. This condition subsequently arose in Norway in 1919 (Gruneberg 1963, 61). The deformity of these examples is more like the Norwegian occurence (Gruneberg 1963, Fig. 36) with the metatarsus more strongly affected than the metacarpus.

Minor conditions include five jaws with substantial deposits of calculus, and, out of 26 jaws with the second premolar present, one jaw with congenital absence of P2, one jaw with a partly rotated P2, and two jaws with periodontal disease.

Pig

A proximal humerus and a tarsal were seen with eburnation and pitting and a metatarsus with lumpy growths on the shaft, perhaps resulting from bruising of the periosteum.

Fallow Deer

A metatarsus was found with a bony growth midshaft, possibly initiated by injury.

Horse

An example probably of spavin was seen with at least two tarsals and the proximal metatarsus fused together with much extra bony growth.

Fowl

Two tibiae, a tarso-metatarsus and a mandible were seen with unusual bony growths. This was particularly pronounced on the tarso-metatarsus where growth covers the whole shaft.

Goose

A tibia with possible inflammation of the distal condyle was seen.

Duck

A synsacrum with the spine distorted and additional growth of cancellous bone was seen.

Scanned bones

The only abnormal conditions seen were a sheep/goat metatarsus with extra bony growth on the proximal end, and a dog radius with abnormal growth on the shaft.

Stature and Sexing

All bones sufficiently intact for measurements to be taken were measured. The measurements commonly used are detailed in Appendix 4. Table 10 lists the bones of cattle and sheep/goat which could be measured for greatest length and the withers heights calculated.

Complete bones of cattle, from which the withers height may be estimated, are scarce; only four metacarpals and two metatarsals. The withers heights were calculated after Zalkin (1960, 126) for animals where the sex is unknown. The withers heights are closely bunched with all six between 1.07m and 1.14m. The metapodial indices (Howard 1963, 92) for the metacarpals fall at the borderline where the values for cows and steers overlap while the metatarsals fall more clearly within the range of cows.

The withers heights of the sheep/goat were calculated using the figures given by Teichert (in Driesch & Boessneck 1974, 339). The metapodials show a very even spread of shoulder heights between 0.50m and 0.60m with only odd outliers beyond either end of this range. Most of the radii and the tibiae fall within the same range with the exception of two radii which seem to indicate taller animals.

On subjective, morphological grounds the examples of cattle acetabulum or pubis indicate twelve possible female examples to two male or castrate. Two frontals with horn core attached also appeared female. From the dental evidence for the consumption of immature animals more males might be expected.

From the sheep/goat acetabulum/pubis eight probable females were noted compared to five possible males or castrates. The horn cores suggest two females, one female or castrate and three males. The comparatively even sex ratio suggests that wethers were kept for wool production besides mutton.

No pig canines were seen which were thought to be male but thirteen were thought to be female. This is an unusual pattern which may imply that males were generally killed as piglets or porkers less than a year old.

Six fowl tarso-metatarsi were seen with spurs compared to seventeen without.

Samples

The volume of the samples taken varies but most are between 5 and 10 litres. The exception is the thick garden soil deposit, F34, where 30 litre samples were taken. Following wet sieving, all sample residues >6mm were sorted (the coarse fraction). A subset had the <6mm->1mm fraction sorted. A set of samples from F30, a cesspit, phase 10.1, were sieved to 2mm and the >2mm fraction sorted.

Table 11 shows the numbers of samples with bone fragments for each phase and Table 12 gives the fragment counts for the species identified in each phase. It can be seen from both tables that the absolute numbers of identifiable bones are very low. For cattle, sheep/goat and pig the numbers of identifiable fragments including and excluding 'zones' besides loose teeth have been listed.

Coarse Fraction (>6mm plus >2mm from F30)

The finds of cattle bones are virtually restricted to the coarse fractions. The numbers of sheep/goat and cattle fragments are roughly equal in the >6mm fraction from phase 10.1 but the >2mm fraction suggests that sheep/goat may be marginally under-represented. The numbers of sheep/goat fragments increase relative to cattle in the later phases and there is a wider range of species; both being trends already seen in the hand recovered material. The numbers of pig bones are much closer to those of cattle in comparison with the hand recovered material, where pig bones were least common. This may suggest that the hand recovered collection is slightly more biased against the recovery of pig than of sheep/goat as is more commonly seen.

Of particular interest from phase 10.1 was a pig humerus from a foetal animal estimated at 96 days gestation (Prummel, 1989, 78).

The, as yet unidentified, birds include several fragments probably of woodcock, some splinters of which may possibly be fragments of woodcock beaks.

Fine Fraction (<6mm >1mm)

Cattle bones are noticeably absent at this level but, in contrast, the presence of small mammals increases dramatically. Most of the pieces attributed to small mammal appear to be ribs, vertebrae, metapodials and some loose teeth. Limb bones and jaws are very infrequent. Identification of all small mammal material will be undertaken at the end of the project.

Sheep/goat and pig bones are very rare but occur in equal numbers. This may tenuously suggest more parity between the presence of these species than previously ascertained. Both bird and amphibian bones were retrieved at this level of sieving and will also be identified later.

Flots

These produced a predominance of tiny, small mammal size, fragments but disappointingly few identifiable items. Most appear to be mouse size. Odd fragments of sheep/goat, pig, bird and amphibian bone were also retrieved.

The samples suggest that pig and perhaps smaller bird species may be somewhat under-represented in the hand recovered collection and have demonstrated the presence of smaller mammal species which would not otherwise have been recovered.

Summary and Discussion

The medieval features, principally pits, cess pits and wells, on the Little Lane excavation produced an interesting assemblage of animal bones which appears to principally derive from human food waste. The proportion of sheep/goat to cattle fragments increases through time and the former are more frequent than the cattle bones in later phases. Such a trend is also seen in material from the medieval cities of York and Lincoln. Pig remains occur at a more constant level throughout the time span. The high proportions of juveniles represented suggest that pig, overall, is likely to be under-represented through selective canid gnawing and recovery bias during excavation. The bones from the sieved samples do seem to suggest that pig remains are under-represented in the hand-recovered bones.

The later phases show an increase in the range of species present, particularly with respect to birds and wild species. Rabbit, interestingly, is present from phase 10.1 (twelfth to mid-thirteenth centuries) suggesting that this species was kept near Leicester soon after its presumed introduction to Britain. The later phases also indicate presence of craft workers using antler from all three species of deer but venison only from fallow deer. The 'luxury' foodstuffs represented in the bone waste from phase 13.1 in particular may reflect rubbish disposal from the nearby Lord's Place, residence of the Reynolds family, many of whom were mayors of Leicester.

Amongst the non-food animals, cats are particularly common although gnaw marks on other bones suggest that more dogs were kept than otherwise indicated by the numbers of dog-bone fragments. At least one human infant was disposed of in a pit.

The age structure of the cattle is particularly unusual. Although the sample size is small, three groupings show very young calves, animals probably in their 2nd-3rd year and extremely aged animals. There is a surprising absence of animals between these age groups. The withers heights indicate consistently small animals which may all be female.

The sheep/goat bones show greater numbers of animals killed during their 2nd-3rd year but virtually no infant lambs. The withers heights suggest a population covering a range of ewes and wethers of small stature between 0.50 and 0.60m.

Overall, the site has produced a valuable assemblage of urban, medieval bone detritus from the British Midlands. The life-style of the inhabitants of this part of Leicester appears to have been comfortable and to have improved through time.

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Leicester, The Shires: Little Lane, Medieval deposits

Table 1. Fragment counts for the species present

(*) partial skeleton counted as one bone

+ = present in scanned features only

	c1100 -1250	c1250 1400	c14th- early 15th	c1400 -1550	1475 -1550	c1100 -1550
	Phase 10.1	Phase 11.1	Phase 12.1	Phase 12.2	Phase 13.1	Totals
Cattle	(*)211	70	112	193	431	1017
Sheep/goat	223	48	145	304	643	1363
Pig	77	24	48	87	217	453
Horse	2	3	2	5	9	21
Red Deer				1	3	4
Fallow Deer			+	3	17	20
Roe Deer				+	1	1
Indet Deer					12	12
Dog	11	1	(*)7	7	10	36
Cat	(2*)15	1	2	(7*)20	(6*)42	80
Hare			5		4	9
Rabbit	2	+	+	1	24	27
Water vole?	1					1
Human	1		+	1		2
S. Ung	46	6	16	89	155	312
L. Ung	40	1	20	30	71	162
Frog/toad			1	1		1
Fowl	56	10	27	82	186	361
Goose	25	5	8	57	119	214
Duck			1	27	45	73
Teal?					1	1
Swan			1	3		4
Raven				2		2
Jackdaw		2				2
Corvid					3	3
Pigeon				1		1
Woodcock?		1			2	3
Buzzard?				1		1
Totals	710	172	395	915	1995	4187

Leicester, The Shires: Little Lane, Medieval Deposits

Table 2. Proportions of fragments not catalogued from Medieval phases

	Phase 10.1	Phase 11.1	Phase 12.1	Phase 12.2	Phase 13.1
Total fragments	1802	506	1101	1873	5148
Frags not catalogued	1093	334	677	958	3153
	60%	66%	61%	51%	61%
Total weight	22370g	5055g	15123g	23510g	57162g
Weight not catalogued	6187g	1696g	4257g	4942g	18561g
	27%	33%	28%	21%	32%

Leicester, The Shires: Little Lane, Medieval deposits.

Table 3. Relative proportions of the domestic species from fragment counts

	Phase 10.1	Phase 11.1	Phase 12.1	Phase 12.2	Phase 13.1
Cattle &	251	71	132	223	502
L. Ung.	42%	47%	38%	31%	33%
Sheep/goat	269	54	161	393	798
& S. Ung.	45%	36%	47%	56%	52%
Pig	77	24	48	87	217
	12%	16%	14%	12%	14%
Totals	597	149	341	703	1517

Leicester, The Shires: Little Lane, Medieval Deposits
Table 4. Canid Gnawing

Element	Number Gnawed	Total		
Cattle				
Jaw	2	70		
Atlas	2	10		
Axis	1	6		
Scapula	5	51		
Humerus	20	49		
Radius	5	62		
Ulna	3	19		
Car R	1	5		
Metacarpal	5	61	Total Cattle Fragments	1017
Acetabulum	1	5	Total Frags Gnawed	112
Ilium	2	24	% Gnawed	11%
Ischium	5	18		
Pubis	2	20		
Femur	20	50		
Patella	1	8		
Tibia	15	62		
Calcaneum	10	34		
Metatarsal	6	52		
Phalanges	6	177		
TOTAL	112	783		
Sheep/Goat				
Jaw	1	120		
Occipital	1	13		
Atlas	2	17		
Axis	1	17		
Scapula	9	64		
Humerus	24	88		
Radius	24	88		
Ulna	12	26		
Metacarpal	6	112	Total Sh/Gt Frags	1363
Pelvis	2	7	Total Frags Gnawed	191
Acetabulum	13	18	% Gnawed	14%
Ilium	21	62		
Ischium	6	22		
Pubis	1	8		
Femur	14	67		
Tibia	31	160		
Calcaneum	5	37		
Metatarsus	17	130		
Phalanges	1	113		
TOTAL	191	1169		
Pig				
Jaw	2	47		
Skull	1	1		
Thoracic vert	1	9		
Lumbar vert	2	10		
Rib	1	5		
Scapula	3	27		
Humerus	12	43		
Radius	4	25	Total Pig Fragments	453
Ulna	11	22	Total Frags Gnawed	66
Metacarpals	3	23	% Gnawed	14%
Acetabulum	1	4		
Ilium	3	15		
Ischium	1	5		
Femur	11	23		
Tibia	7	29		
Calcaneum	1	5		
Metatarsals	1	12		
Phalanges	1	13		
TOTAL	66	318		

Leicester, The Shires: Little Lane, Medieval Deposits
Table 5. Incidence of Butchery Marks

Cattle

	Number Butchered	Total
Horn core	4	27
Jaw	21	70
Temporal	1	6
Frontal	1	10
Atlas	5	10
Axis	3	6
Sacrum	3	6
Scapula	29	52
Humerus	25	50
Radius	31	63
Ulna	13	18
Carpals	2	22
Metacarpus	11	61
Acetabulum	4	5
Ilium	17	24
Ischium	10	18
Pubis	15	20
Femur	20	50
Tibia	21	62
Calcaneum	11	34
Astragalus	7	19
Centroquartal	1	12
Metatarsus	5	52
Phalanges	4	177
TOTAL	264	874

Total Cattle Frags	1017
Total Frags Butch.	264
% Butchered	26%

Sheep/Goat

	Number Butchered	Total
Skull	12	16
Horncore	4	15
Jaw	5	120
Occipital	1	13
Frontal	4	14
Atlas	3	17
Axis	7	17
Sacrum	3	8
Scapula	6	64
Humerus	13	88
Radius	12	88
Ulna	1	26
Metacarpus	5	112
Pelvis	5	7
Acetabulum	3	18
Ilium	28	62
Ischium	6	22
Pubis	3	8
Femur	23	67
Tibia	34	160
Calcaneum	6	37
Astragalus	6	14
Metatarsus	5	130
TOTAL	195	1123

Total Sh/Gt Frags	1363
Total Frags Butch.	195
% Butchered	14%

Pig

	Number Butchered	Total
Jaw	5	47
Atlas	1	5
Scapula	8	27
Humerus	9	43
Radius	2	25
Ulna	1	22
Carpals	1	2
Metacarpals	1	23
Acetabulum	1	4
Ilium	8	15
Femur	2	23
Astragalus	1	5
TOTAL	40	241

Total Pig Frags	453
Total Frags Butch.	40
% Butchered	9%

Leicester, The Shires: Little Lane, Medieval

Table 6. Teeth in Approximate Order of Eruption

Ages after Silver 1969. m = months
U = Unerupted/Deciduous S/W = Slight Wear H/W = Heavy Wear

			U	S/W	H/W
Cattle					
	M1	5-6m	6		28
	M2	15-18m	7	17	11
	P2	24-30m	14	2	4
	P3	18-30m	22	4	4
	M3	24-30m	11	4	4
	P4	28-36m	29	6	3
Sheep/Goat					
	M1	3-5m		7	66
	M2	9-12m	4	24	60
	P2	21-24m	9	9	15
	P3	21-24m	18	7	35
	M3	18-24m	14	29	40
	P4	21-24m	20	3	38
Pig					
	M1	4-6m	3	18	15
	M2	7-13m	13	18	8
	P2	12-16m	10	5	
	P3	12-16m	11	10	3
	P4	12-16m	23	12	1
	M3	17-22m	23	7	3

Leicester, The Shires: Little Lane, Medieval Deposits

Table 7. Cattle Epiphyses in Approximate Order of Fusion

Ages of fusion after Silver 1969.
( ) = Loose unfused epiphysial end

	Fused	Just Fused	Unfused
by 18 months			
Scap tub	16		2
Acet symph	4		2
Prox rad	23		(1) 1
Dist hum	18		5
Prox Ph 2	43	3	1
Prox Ph 1	88	2	4
by 2-3 yrs			
Dist tib	12		8
Dist mc	15	1	(2) 12
Dist mt	10		(1) 15
by 3.5-4 yrs			
Prox cal	12	1	(2) 10
Prox fem	2	1	(2) 1
Dist rad	13		10
Prox hum	1	3	(1) 5
Prox tib	10	1	(2) 8
Dist fem	6		(6) 4
P&D uln	1		3
by >5yrs			
Ant vert ep	28	5	49
Post vert ep	29	8	53

Leicester, The Shires: Little Lane, Medieval Deposits

Table 8. Sheep/Goat Epiphyses in Approximate Order of Fusion

Ages of Fusion after Silver 1969
( ) = Loose unfused epiphysial end

	Fused	Just Fused	Unfused
by 1 yr			
Dist hum	51		2
Prox rad	36		1
Scap tub	21		
Acet symph	26		
by 1-2 yrs			
Prox ph 2	22		
Prox ph 1	71	4	(1) 6
Dist tib	60	1	4
Dist mc	47	4	(2) 17
Dist mt	55	2	(1) 21
by 2.5-3.5 yrs			
Prox fem	10		8
Prox cal	28	3	6
Dist fem	2	6	(5) 8
Prox tib	8	8	(1) 23
Dist rad	13	4	(1) 9
Prox hum	4	5	(1) 5
P&D uln	6	2	2
by >5 yrs			
Ant vert ep	32	32	89
Post vert ep	26	19	107

Leicester, The Shires: Little Lane, Medieval Deposits

Table 9. Pig Epiphyses in Approximate Order of Fusion

Ages of fusion after Silver 1969
( ) = Loose Unfused Epiphysial End

	Fused	Just Fused	Unfused
by 1 yr			
Acet symph	5		2
Scap tub	3		3
Prox rad	5	1	(1) 6
Dist hum	3	4	(1) 9
Prox ph 2	1	1	
by 2-2.5 yr			
Prox ph 2	4	2	7
Dist mc	2		14
Dist tib		5	(1) 14
Dist mt			9
Prox cal			4
by 2.5-3.5 yr			
P&D uln			(1) 11
Prox tib			4
Prox hum		1	4
Dist rad			5
P&D fem	1		10
by >5 yr			
Ant vert ep		2	16
Post vert ep		2	18

Leicester, The Shires: Little Lane, Medieval

Table 10. Withers Heights and Metapodial Indices

Cattle	GL (mm)	Withers Height (m)	BD (mm)	DB/L Index (BDx100/GL)
Mc	178	1.08	50.7	28.4
Mc	178	1.08	54.8	30.7
Mc	186	1.13	54.5	29.3
Mc	187	1.14	55.2	29.5
Mt	196	1.07	46.7	23.8
Mt	202	1.10	44.8	22.1

Sheep/goat	GL	WH		GL	WH
Mc x 2	107	0.52	Mt	106	0.48
Mc x 2	108	0.52	Mt x 2	112	0.50
Mc	110	0.53	Mt	114	0.51
Mc x 2	112	0.54	Mt	115	0.52
Mc x 2	113	0.55	Mt x 2	117	0.53
Mc x 4	114	0.55	Mt x 2	118	0.53
Mc	115	0.56	Mt	119	0.54
Mc x 3	116	0.56	Mt x 2	122	0.55
Mc x 2	117	0.57	Mt x 2	123	0.55
Mc	118	0.57	Mt x 2	125	0.56
Mc	120	0.58	Mt	126	0.57
Mc	121	0.59	Mt	127	0.57
Mc x 3	122	0.59	Mt x 2	128	0.58
Mc x 3	123	0.60	Mt x 2	129	0.58
Mc	124	0.60	Mt x 2	130	0.59
Mc	125	0.61	Mt	132	0.59
Mc	136	0.66	Mt x 3	133	0.60
			Mt	134	0.60
			Mt	135	0.61
Rad	140	0.56			
Rad	144	0.57			
Rad	148	0.59			
Rad	163	0.65			
Rad	179	0.71			
Tib	192	0.57			
Tib	194	0.58			

Leicester, The Shires: Little Lane, Medieval Deposits

Table 11. Faunal Remains Recovered from the Samples

Phase	No. of Samples	Numbers of Samples with: Cattle	Sheep /goat	Pig	Bird	Other	Small mammal	Indet.
Coarse Fraction (>6mm)								
10.1	89	15	16	17	16	3	1	80
11.1	20	3	8	3	5	.	.	17
12.1	22	2	3	3	1	4	.	17
12.2	90	21	37	20	18	5	4	78
13.1	81	15	29	11	25	9	.	75
Coarse Fraction (>2mm)								
10.1	57	3	5	2	2	1	6	52
Fine Fraction (<6mm)								
10.1	71	.	2	2	5	2	30	52
11.1	10	.	.	.	.	.	.	10
12.1	28	.	2	2	1	2	7	19
12.2	22	.	1	.	6	6	10	18
13.1	83	.	2	2	9	3	17	68
Flot								
10.1	76	.	3	.	5	.	50	36
11.1	14	.	.	.	.	.	9	6
12.1	23	.	2	1	1	1	10	15
12.2	66	1	5	2	19	1	17	59
13.1	59	.	5	1	13	4	14	52

Leicester, The Shires: Little Lane , Medieval Deposits

Table 12. Fragment counts from samples. Larger species only.

	Phase 10.1				Phase 11.1			Phase 12.1			Phase 12.2			Phase 13.1		
	>6mm	<6mm	Flot	>2mm	>6mm	<6mm	Flot	>6mm	<6mm	Flot	>6mm	<6mm	Flot	>6mm	<6mm	Flot
<u>Cow</u>																
Teeth	6				1						9			4		
Id/zones	6			2	1						5			14		
Id	6			1	1			1			12		1	6		
<u>Sheep/Goat</u>																
Teeth	4	2			2			3	2		14	1		10	2	
Id/zones	14		2	2	8			1		1	21			15		2
Id	3		2	3	1					1	11		6	8		4
<u>Pig</u>																
Teeth	8	2			2			1	2		15			5	2	
Id/zones	7			1	1						3			6		
Id	2							2		1	6		3	2		1
Fowl	8				1						12			14		6
Goose				1	1									7		
Duck											1					1
Bird	8	5	4	2	3			1	2	1	16	9	17	11	11	9
Cat	1			*								2		2		
Dog	1							1			1			1		
Frog/Toad	1	*						6	3	1	4	*3	1		3	2
Horse								1								
Rook/Crow											1					
Fallow														1		
Deer sp.														2		1
Rabbit														6		

* = partial skeleton counted as 1 bone

Id/zones = identified fragments with zones

Id = identified fragments without zones

Figure 1. Little Lane
Medieval Cattle Fragments

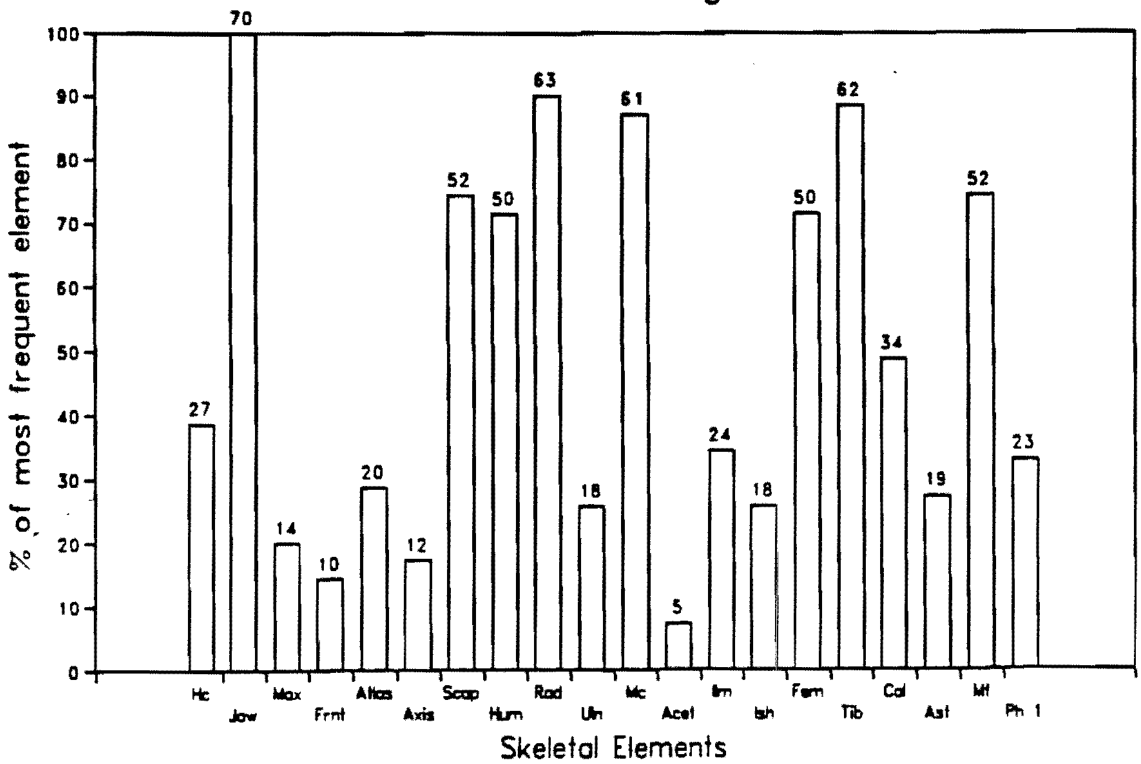


Figure 2. Little Lane
Medieval Sheep/Goat Fragments

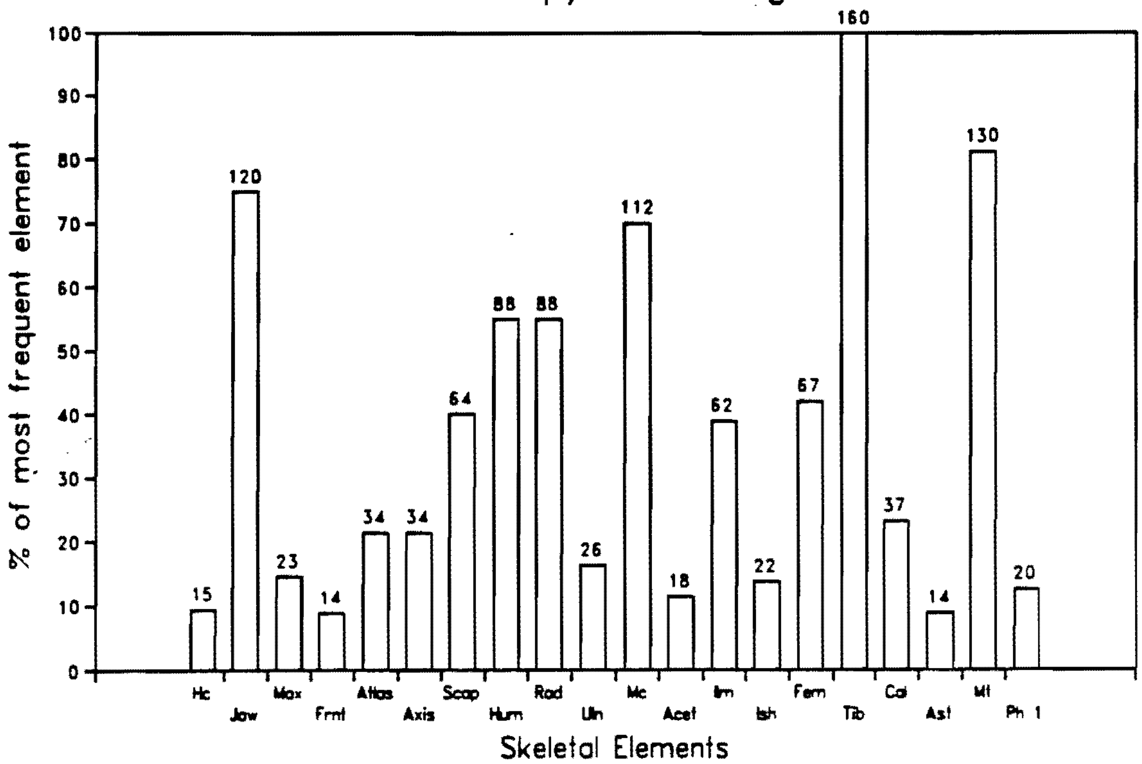


Figure 3. Little Lane
Medieval Pig Fragments

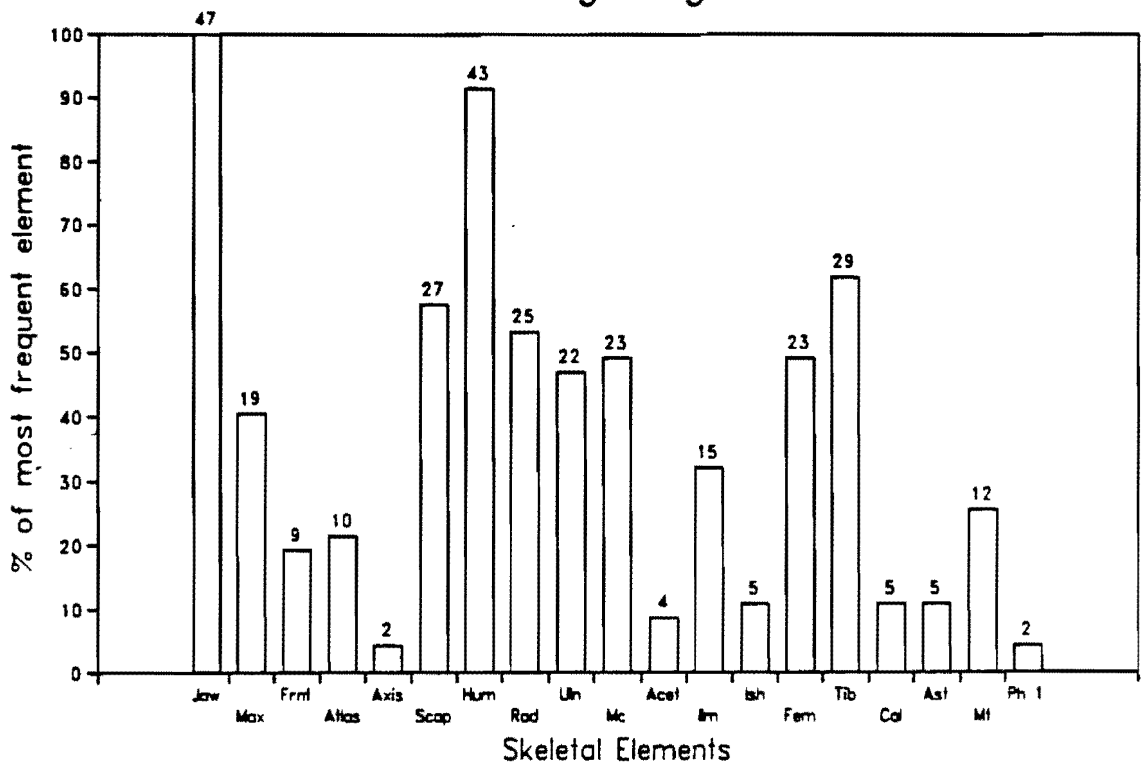


Figure 4. Little Lane
Medieval Cattle Zones

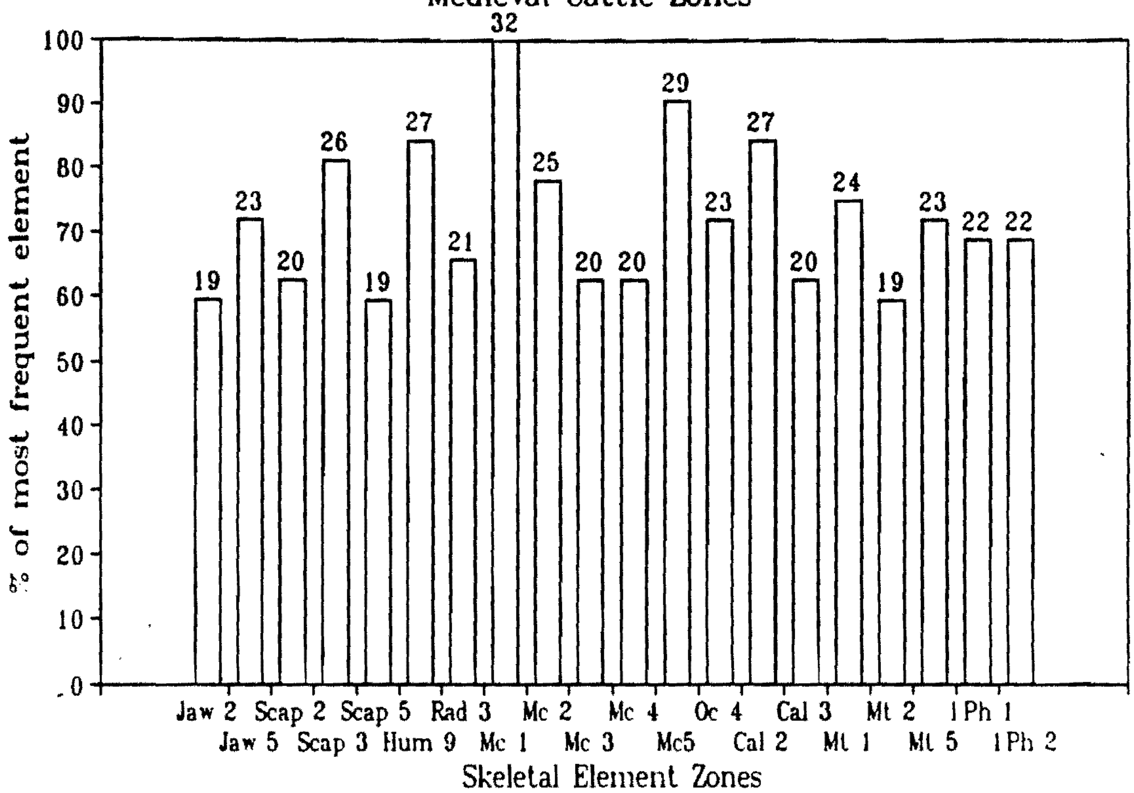


Figure 5. Little Lane
Medieval Sheep/Goat Zones

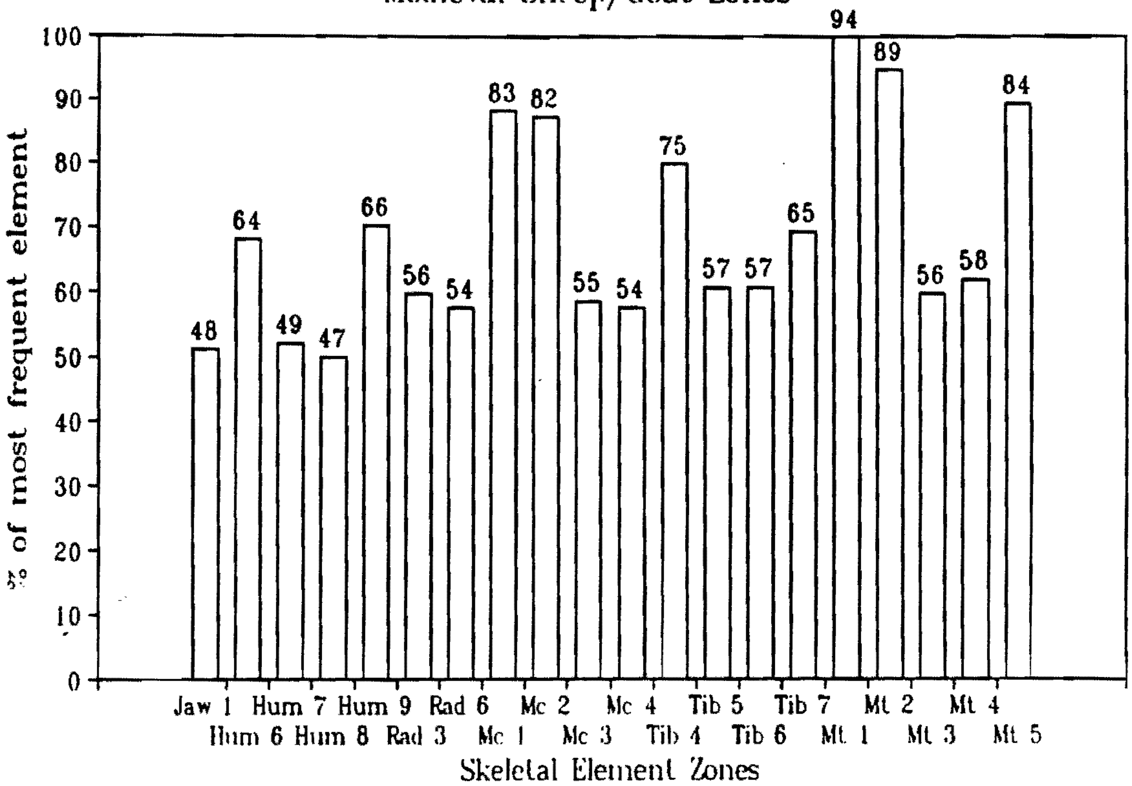


Figure 6. Little Lane

Medieval Pig Zones

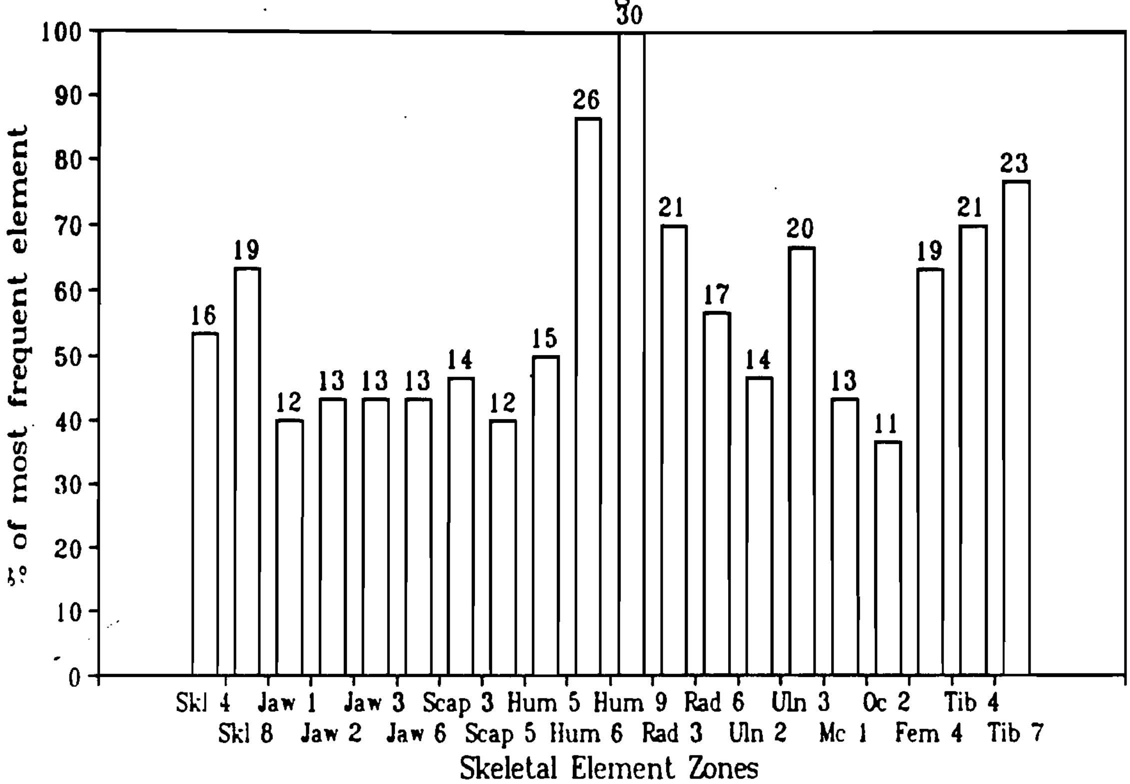


Figure 7. Little Lane

Cattle. All Medieval

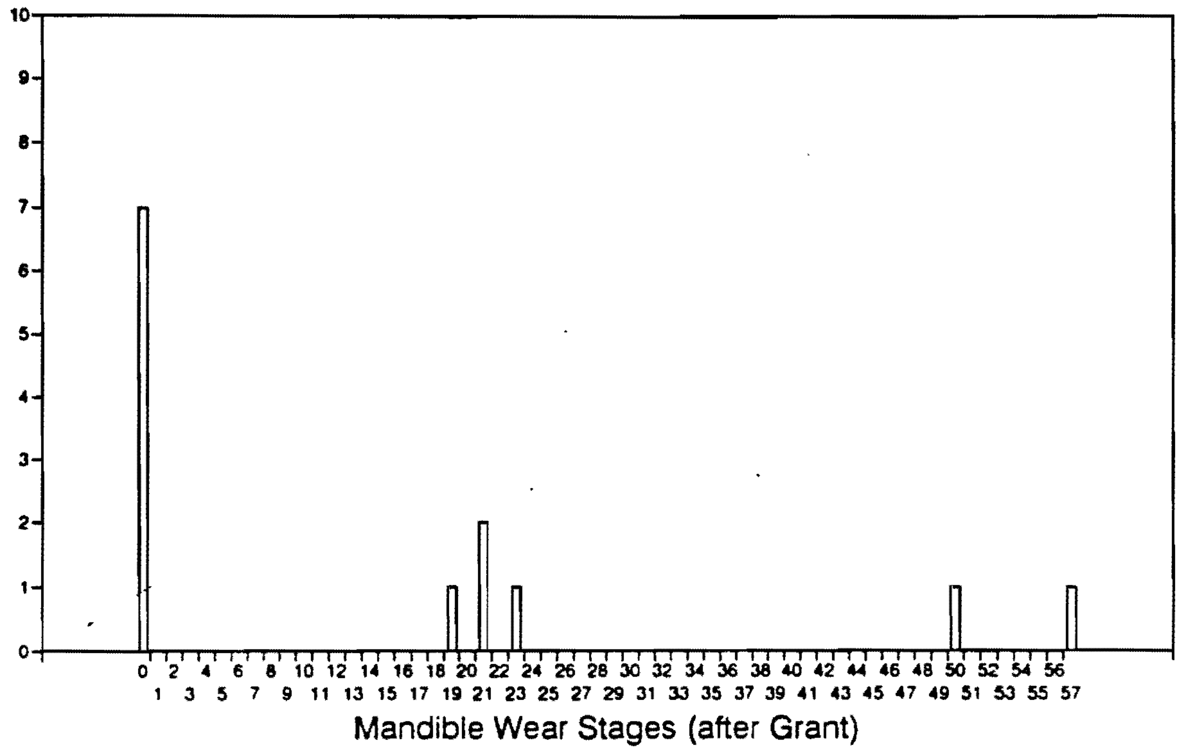


Figure 8. Little Lane
Sheep/goat. All Medieval

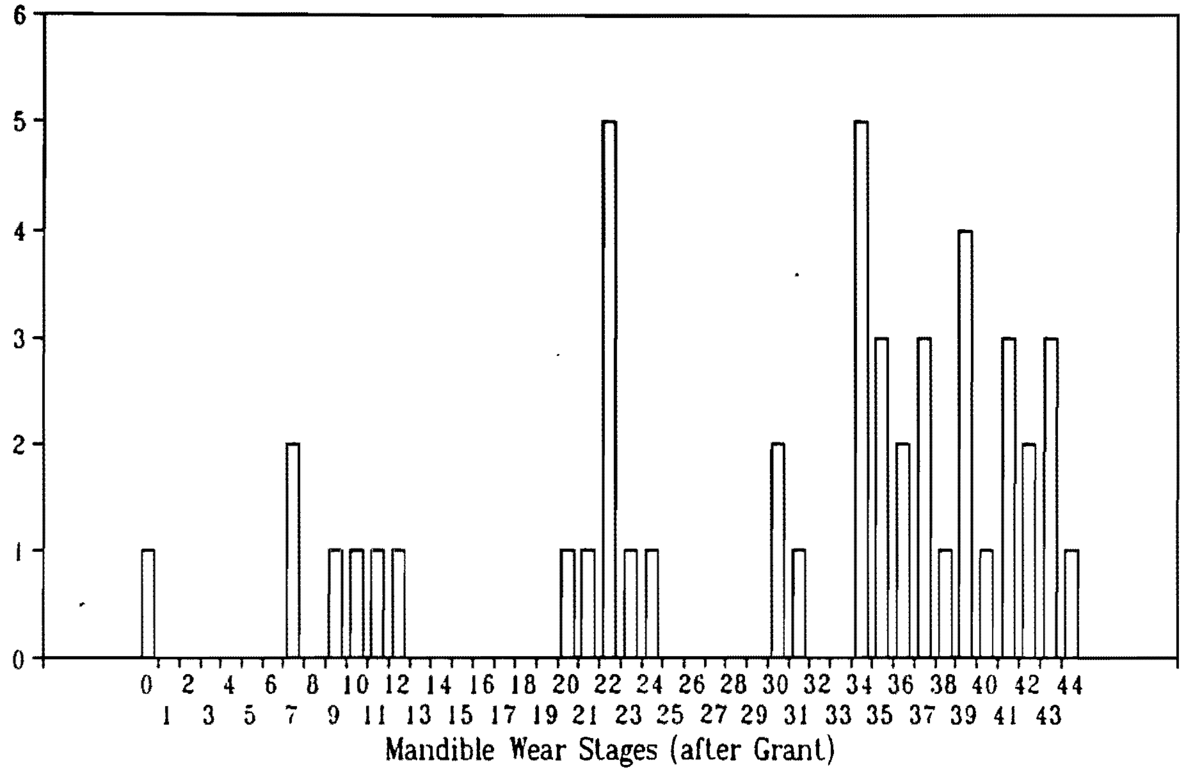
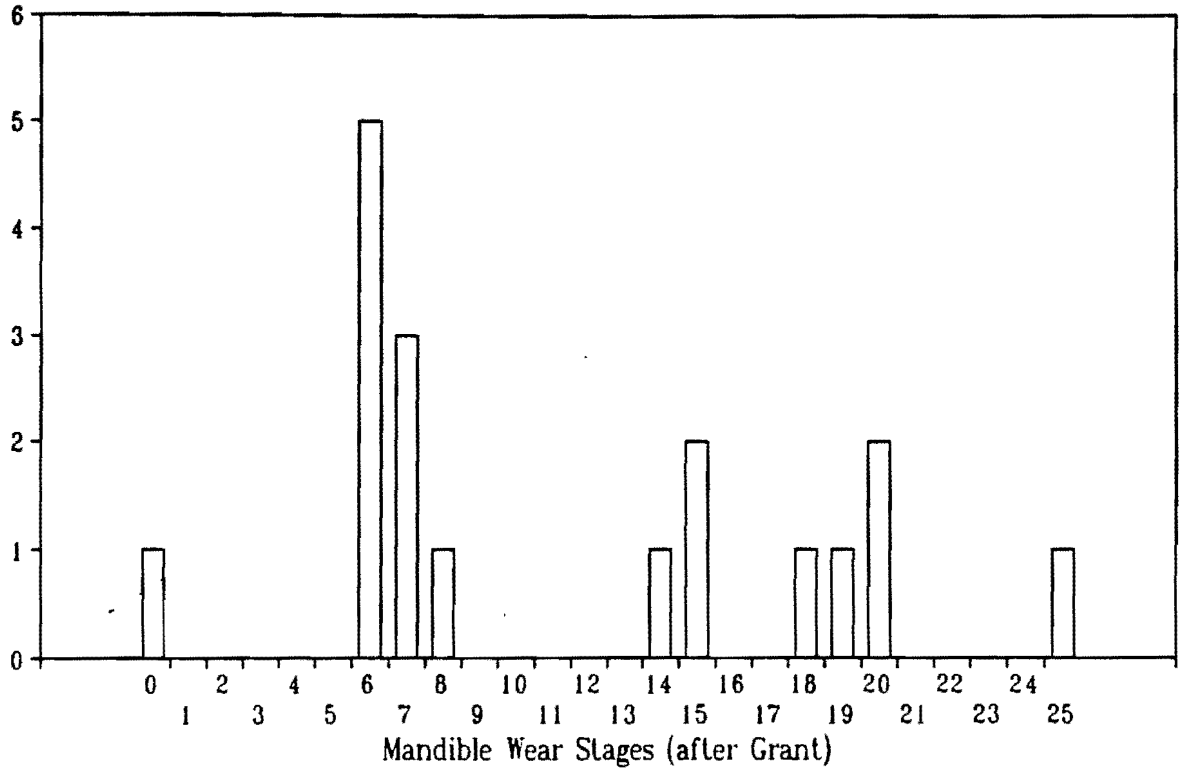


Figure 9. Little Lane
Pig. All Medieval



Appendix I: List of catalogued bone zones for abundance and fragmentation analysis

Scapula
1. Supraglenoid tubercle
2. Glenoid cavity
3. Origin of the distal spine
4. Tuber of spine
5. Posterior of neck with foramen
6. Cranial angle
7. Caudal angle

Humerus
1. Head
2. Greater tubercle
3. Lesser tubercle
4. Intertuberal groove
5. Deltoid tuberosity
6. Dorsal angle of olecranon fossa
7. Capitulum
8. Trochlea
9. Radial fossa

Radius
1. Medial half of proximal epiphysis
2. Lateral half of proximal epiphysis
3. Posterior proximal ulna scar and foramen
4. Medial half of distal epiphysis
5. Lateral half of distal epiphysis
6. Distal shaft

Ulna
1. Olecranon tuberosity
2. Trochlear notch
3. Lateral coronoid process
4. Distal epiphysis

Metacarpus
1. Medial facet of proximal articulation. MC 3.
2. Lateral facet of proximal articulation. MC 4.
3. Medial distal condyle. MC 3.
4. Lateral distal condyle. MC 4.
5. Anterior distal groove and foramen

First Phalanx
1. Proximal epiphysial junction
2. Distal articular facet

Innominate
1. Tuber coxae
2. Tuber sacrale & scar
3. Body of ilium with dorso-medial foramen
4. Iliopubic eminence
5. Acetabular fossa
6. Symphysial branch of pubis
7. Body of ischium
8. Ischiatic tuberosity
9. Depression for medial tendon of rectus femoris
0. Ischial tuberosity

Femur
1. Head
2. Trochanter major
3. Trochanter tertius
4. Supracondyloid fossa.
5. Distal medial condyle
6. Lateral distal condyle
7. Distal trochlea

Tibia
1. Proximal medial condyle
2. Proximal lateral condyle
3. Intercondylar eminence
4. Proximal posterior nutrient foramen
5. Medial malleolus
6. Lateral aspect of distal articulation
7. Distal pre-epiphyseal portion of the diaphysis

Calcaneum
1. Calcaneal tuber
2. Sustentaculum tali
3. Processus anterior

Metatarsus
1. Medial side of proximal facet. MT 3.
2. Lateral side of proximal facet. MT 4.
3. Medial distal condyle. MT 3.
4. Lateral distal condyle. MT 4.
5. Anterior distal groove and foramen

Mandible
1. Symphyseal surface
2. Diastema
3. Lateral diastemal foramen
4. Coronoid process
5. Condylar process
6. Angle
7. Anterior dorsal ascending ramus posterior to M3
8. Mandibular foramen

Skull
1. Paroccipital process
2. Occipital condyle
3. Intercornual protuberance or position of such
4. External acoustic meatus
5. Frontal sinus
6. Ectorbitale
7. Entorbitale
8. Temporal articular facet
9. Facial tuber
0. Infraorbital foramen

Vertebra
1. Spine
2. Anterior epiphysis
3. Posterior epiphysis
4. Body of centrum
5. Neural arch
0. One side only ie split

Other
1. Whole bones of phalanx 2, phalanx 3, carpals, tarsals, patella.

In measurement tables, Horncore max width (45) and min width (46) figures appear to be transposed.

E SKULL

ral) diameter of the horn core base (+)

al) diameter of the horn core base (+)

er curvature of the horn core (tape) (-)

ek tooth row (measured along alveoli) (+)

ar row (alveoli on buccal side) (-)

olar row (alveoli on buccal side (-)

ccipital condyles (+)

Sue Archer 22.9.05 oramen magnum (+)

9 29 Height of foramen magnum (Basion- Opisthion) (-)

I0 23 Greatest inner length of orbit (Ectorbitale- Endorbitale) (+)

II 40 Greatest height of occipital region. Basion- highest point intercornual ridge in median plane (+)

I2 4I Least height of of occipital region . Opisthion- ditto (+)

I3 39 Least inner height of temporal groove (roughly middle of one bone edge to anoth (-)

I4 3I Least breadth between bases of horn cores (-)

I5 37 Greatest breadth across orbits (Ectorbitale - Ectorbitale) (+)

I6 35 Facial breadth; across facial tuberosities (+)

I7 I Profile length = total length. Akrokranion - Prosthion (+)

I8 2 Oral palatal length: Palatinoorale- Prosthion (+)

I9 38 Greatest palatal breadth: across outer borders of alveoli (-)

20 47 Greatest tangential distance between outer curves of horn cores (-)

Order of Input.

Cattle horn core: I 2 3 - (4)

Cattle maxilla: 4 5 6 - - (5)

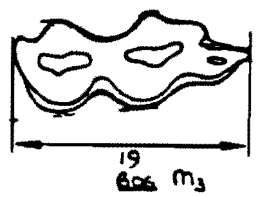
Cattle occipital: 7 8 9 I2 - - (6)

Cattle frontal: I0 I5 - - - (5)

Cattle parietal: I4 - (2)

Cattle temporal: I3 - (2)

RJ	VD		
I		CB	Maximum distance between lateral and medial order of condylar process
2		HI	
3	I3	H2	Middle height of vertical ramus (+) Gov ✦ notch
4	I4	H3	Oral height of vertical ramus: Gov - coronion (+)
5	I	LI	Gonion caudale - Infradentale (+)
6	5?	L2	Gonion caudale- oral border alveolus of P_2 (+)
7		L3	
8		L4	
9		TL	
IO		PML	length of premolar row (alveoli on buccal side) (-)
II		ML	Length of molar row (.. .. ..) (-)
I2	II	DL	Length of diastema P_2 -I_4 (or C?) (+)
I3	I5c	I	Height of mandible infront of P_2 (-)
I4		2	.. .. P_3 ..
I5		3	.. .. P_4 ..
I6	I5b	4	.. .. M_I ..
I7		5	.. .. M_2 ..
I8		6	.. .. M_3 ..
I9	L	M3L	Length of M_3 alveoli (-)
20	7	CRL	Length of cheek tooth row (alveoli on buccal side) (+)



Dog.

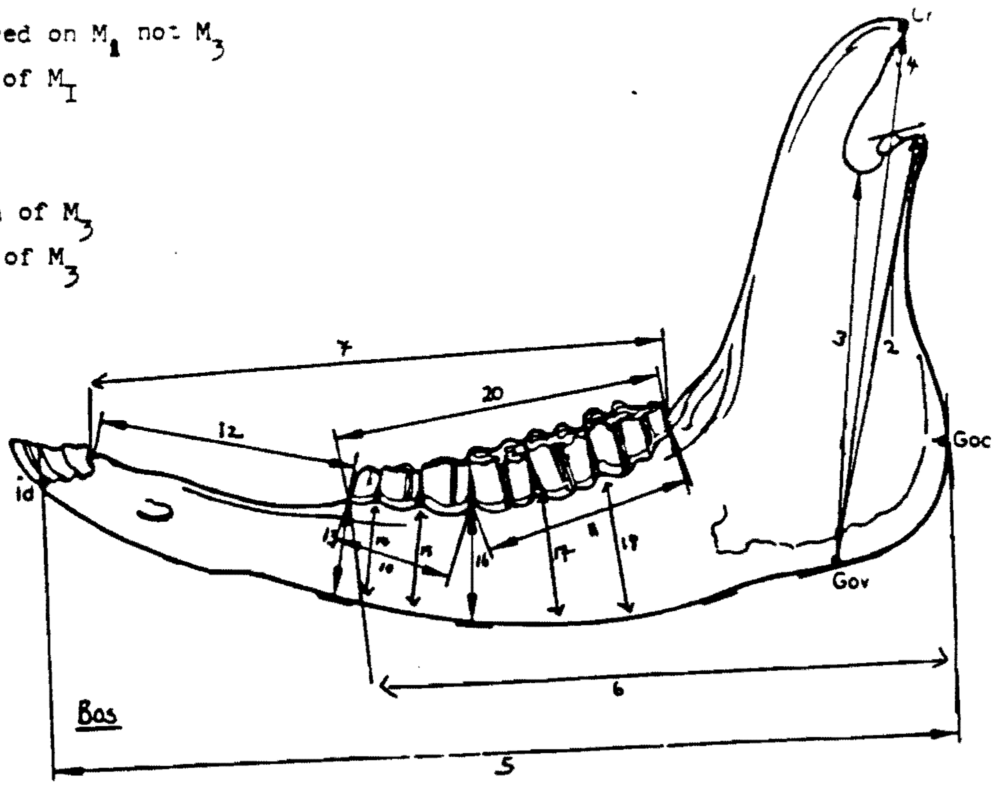
I9 Measured on M_1 not M_3

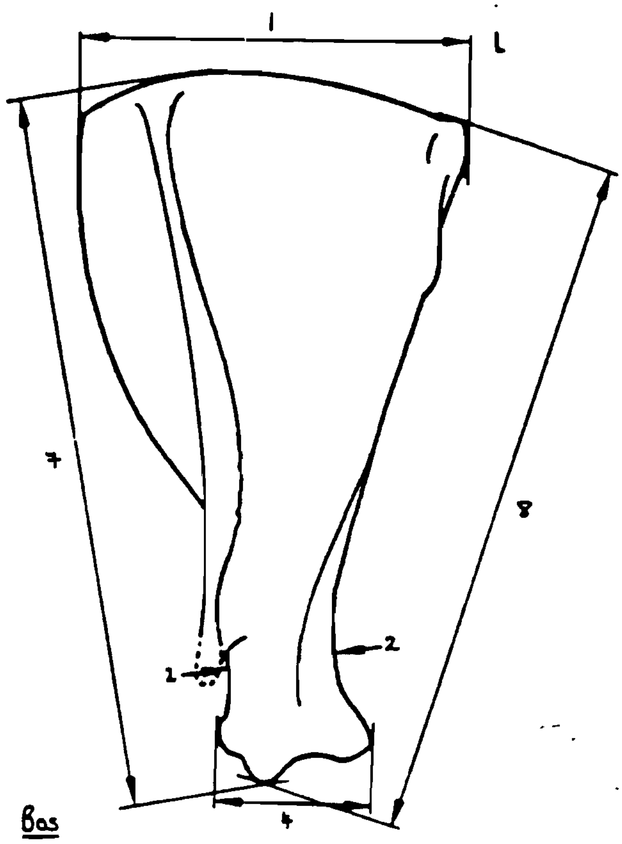
20 Width of M_I

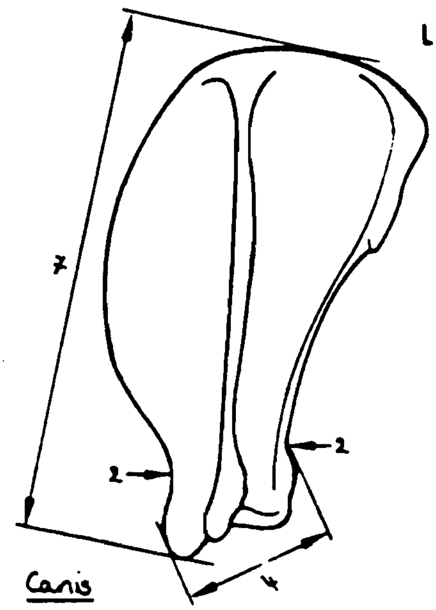
Pig.

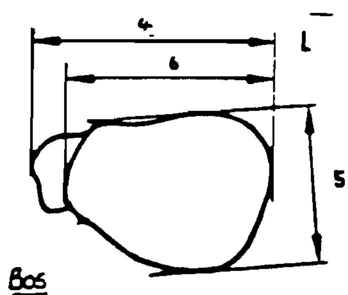
I9 Length of M_3

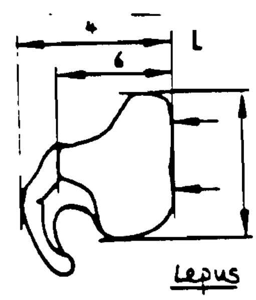
20 Width of M_3





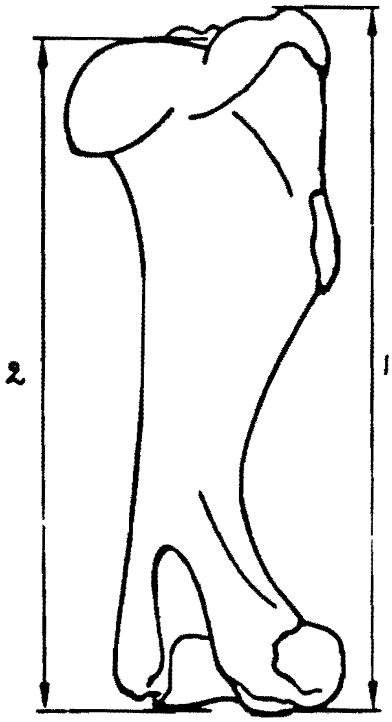




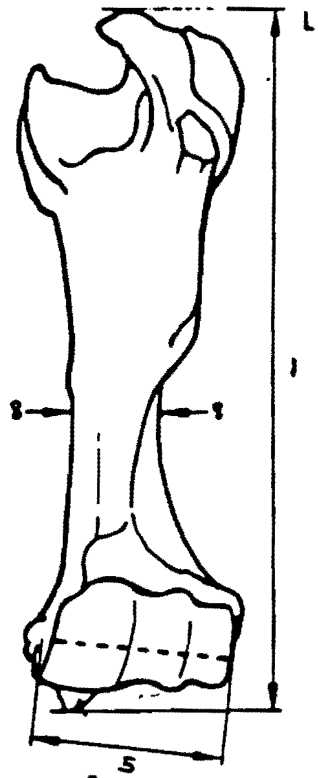


SCAPULA

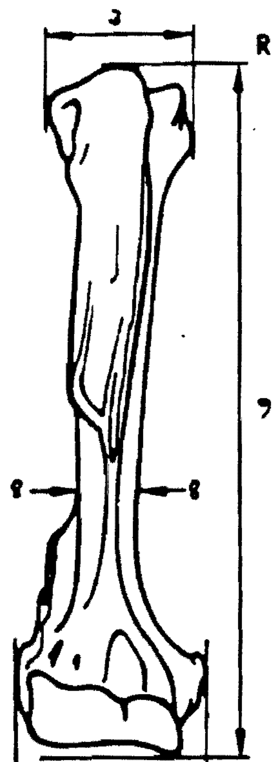
RT	VD		
I	Ld	Greatest dorsal length (only on squared scapulae) (+)	PB
2	SLC	Smallest length of collum scapulae (+ in some)	NB
3		Thickness of neck	ND
4	GLP	Greatest length processus articularis (glenoid process) (+)	GB
5	BG	Breadth of glenoid cavity (+)	GD
6	LG	Length of glenoid cavity (+) (different in pigs)	GC
7	HS	Height along the spine (+)	L
8	DHA	Diagonal height (only on squared scapulae)	
9		Spine to glenoid cavity	
IO		Spare	



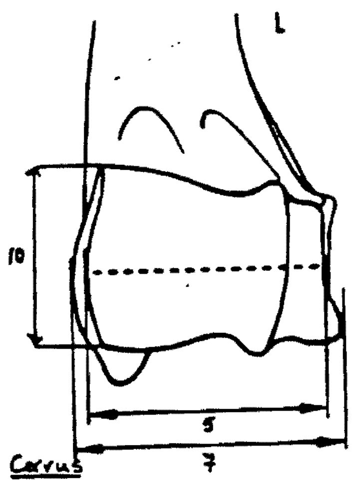
Equus



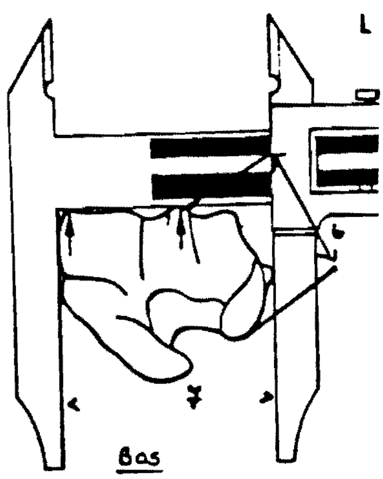
Bos



Ursus



Cervus



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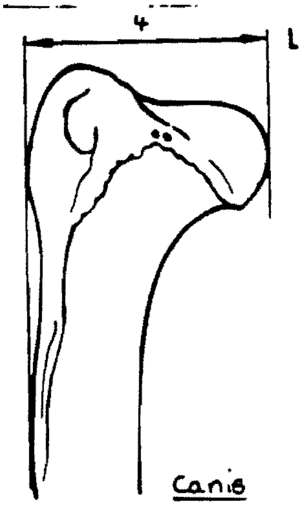
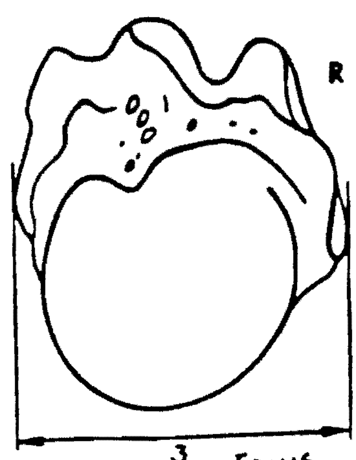


Canis

HUMERUS

RJ	VD		
I	GLI	Greatest length lateral (horse) (+)	LI
2	GLC	Greatest length from caput (+)	L2
3	Bp	Greatest breadth prox. end (not dog or lagomorphs	PB
4		3 tubercles, caudal s of head	PD
5	BT	Greatest breadth trochlea (-)	DB
6		Trochlea art. and caudal surface troch.	DD
7	Bd	Greatest breadth distal end (-)	
8	SD	Smallest breadth diaphysis (+)	
9	GL	Greatest length (+)	
IO	LT	Length Trochlea MM?	



Equus

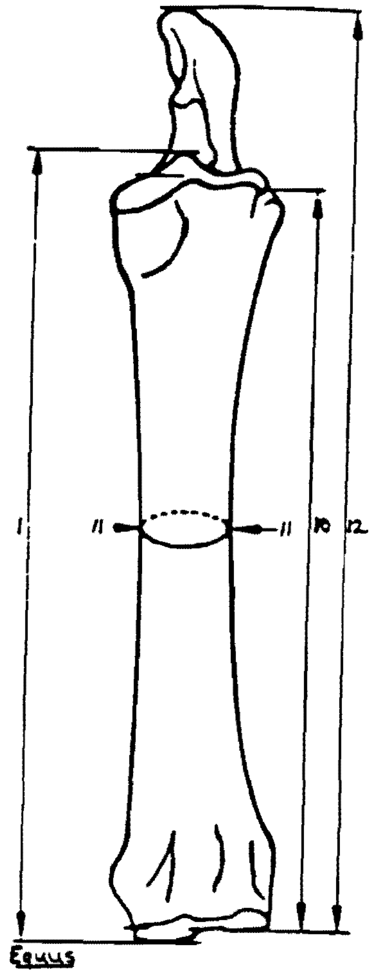
RADIUS

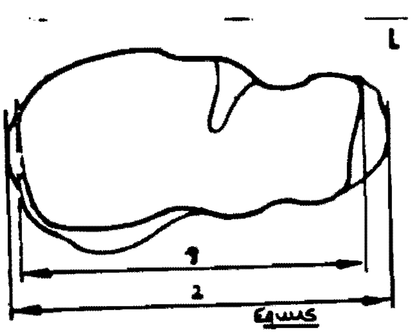
RJ	VD	
I	GL	Greatest length (+) L
2	Bp	Greatest breadth proximal end (+) PB
3		Proximal depth PB
4		Breadth at ulna scar MB
5		90 at MB MD
6	Bd	Greatest breadth distal end (+) DB
7		Distal depth DD
8	BFp	Greatest breadth facies art. prox.PJB
9	BFd	.. ..distal
IO	LP	Lateral length (Horse) (+)
II	SD	Smallest breadth diaphysis
I2	GLl	Radius and ulna greatest.Horse,

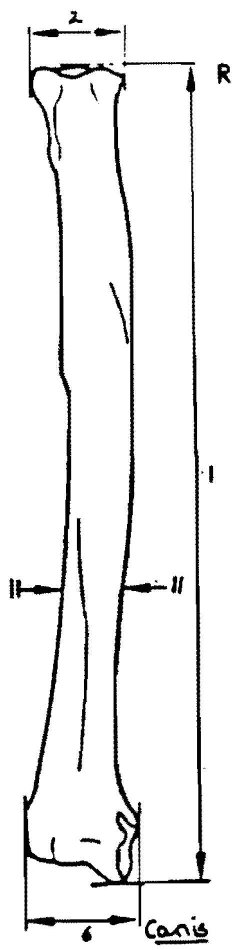
ULNA

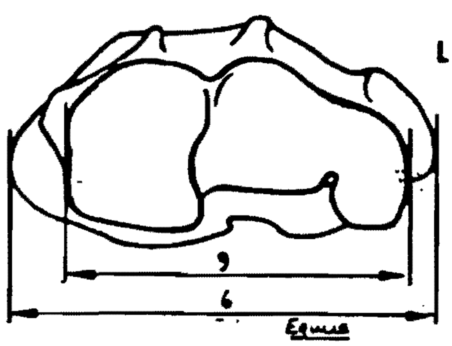
I	LO	Length olecranon (-) OL
2	BPC	Greatest breadth across.NB
3	GL	Greatest length (+) L
4	SDO	Smallest depth olecranon

When the radius is fused with the ulna the measurements are made to include the ulna with the radius eg MD MB, the four measurements of the ulna become measurements I3 to I6 inc.









CS COXA

RJ	VD		
I	GL	Greatest length of one half (epiphyses fused) (+)	A
2	LS	Length of symphysis if fused	B
3			C
4	GBA	Greatest breadth across acetabula (+)	D
5			E
6			F
7			G
8			H
9	SB	Smallest breadth of shaft of ilium	I
I0			J
II		Minimum pubis	K
I2		Length acetabulum	L
I3		Breadth acetabulum	M
I4			N
I5			O
I6	SH	Smallest height of shaft of ilium (+)	P
I7	LFO	Inner length of foramen obturatum (+)	Q
I8			R
I9	LA	Length acetabulum including lip (-)	S
20	LAR	Length acetabulum on the rim (+)	T

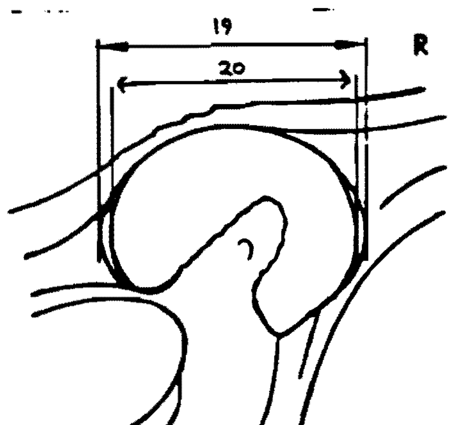
Order of Input.

Acetabulum: I2 I3 I9 20 - - (6)

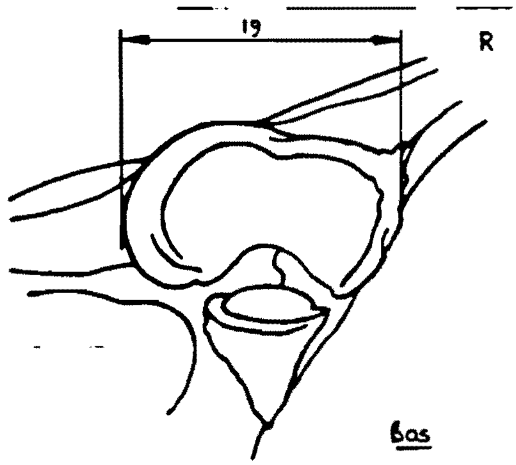
Ilium: 9 I6 (2)

Ischium: 5 7 8 I0 I4 I5 (6)

Pubis: II - (2)

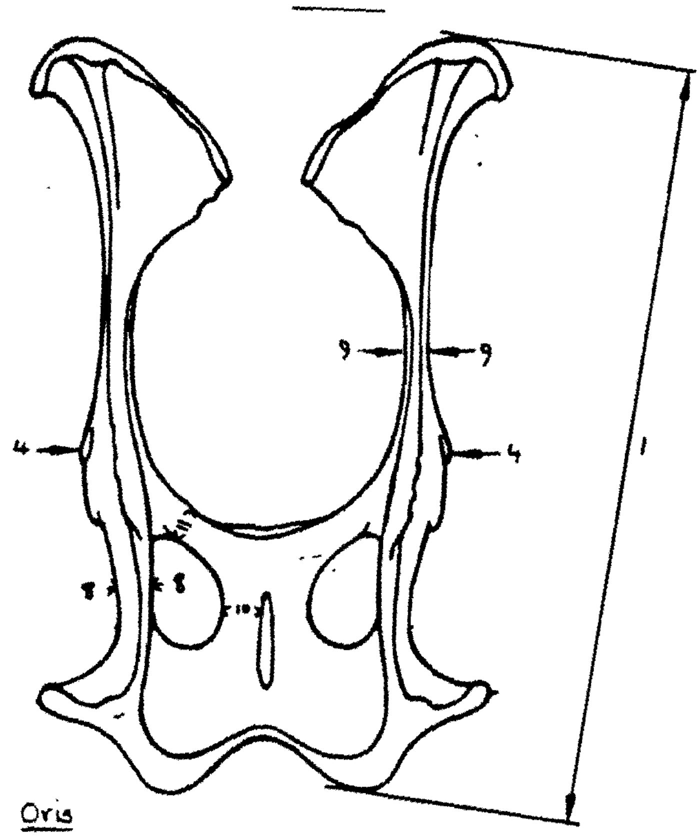


Equus

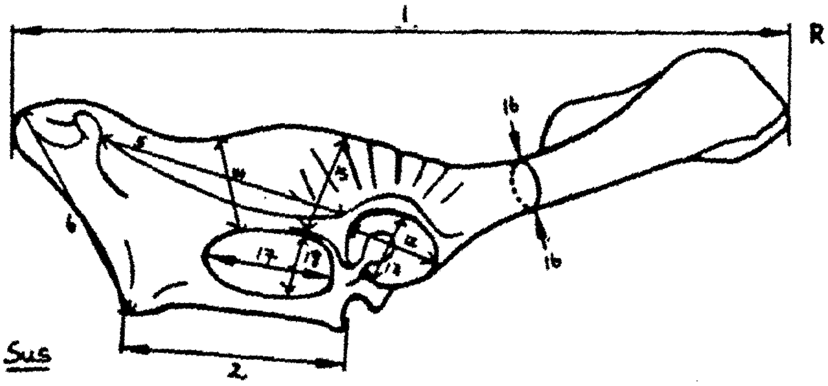


Bos

4p+

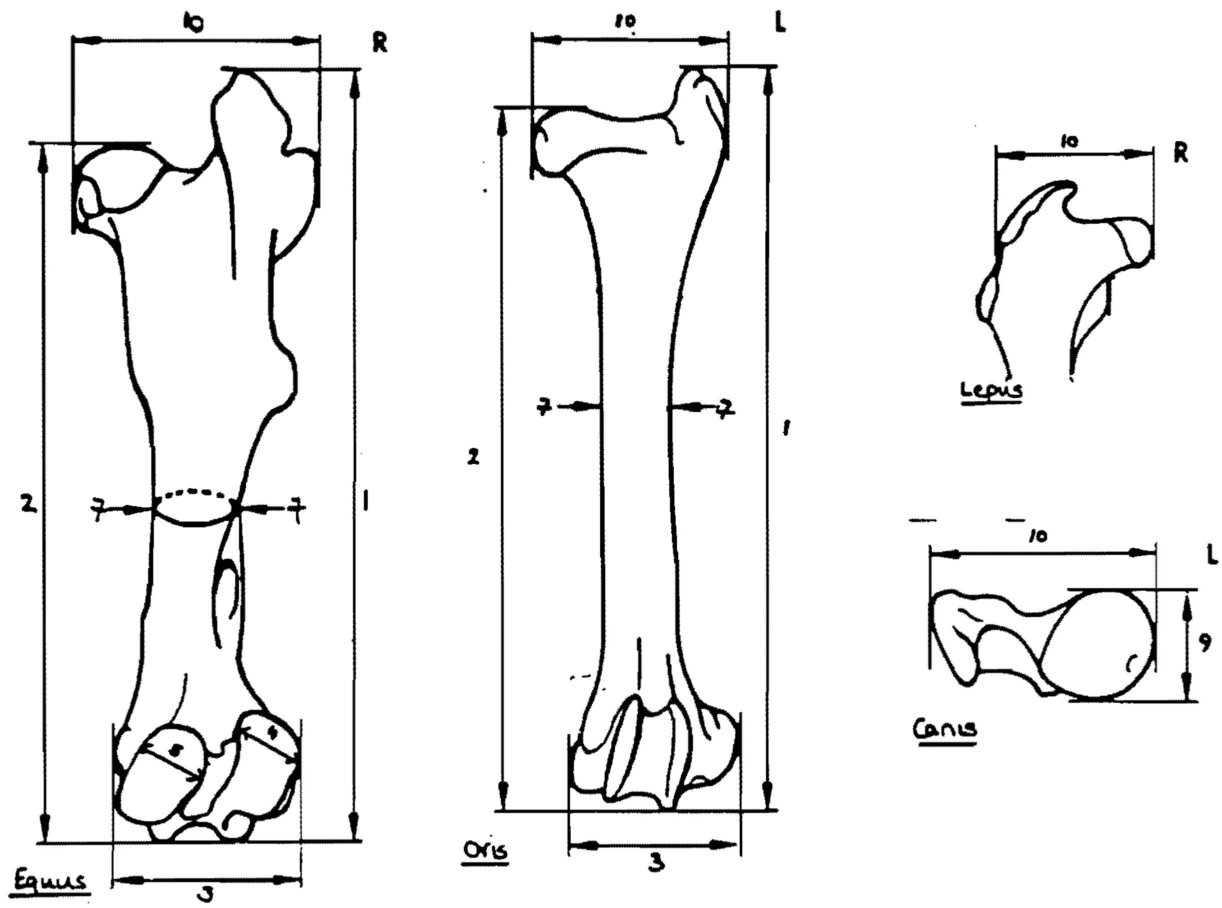


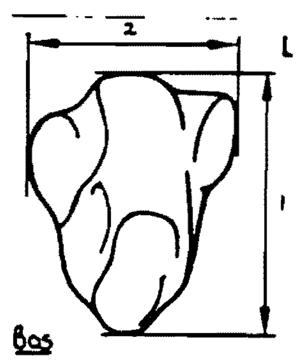
Oris



Sus

4p8



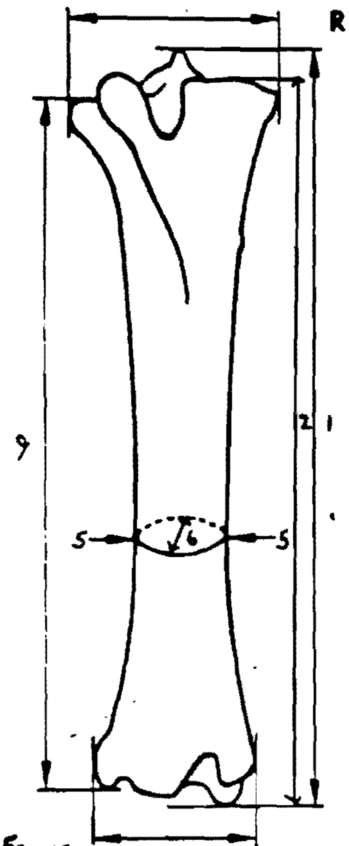


FEMUR

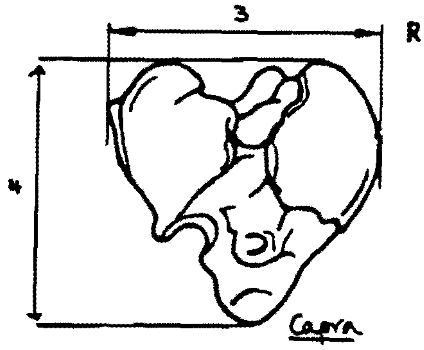
RJ	VD		
I	GL	Greatest length (= 11 in some)(+)	LI
2	GLC	Greatest length from caput. (+)	L2
3	Bd	Greatest breadth distal end	DB
4		Lateral condyle width	LCW
5		Medial condyle width	MCW
6		Greatest depth distal end	DD
7	SD	Smallest depth diaphysis (+)	MB
8		90° at SD	MD
9	DC	Greatest depth caput. (+)	HØ
IO	Bp	Greatest breadth proximal end	HT

PATELLA

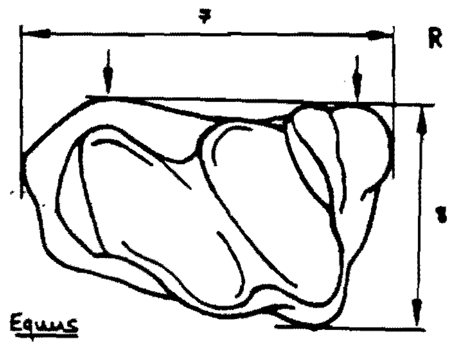
RJ	VD	
I	GL	Maximum length
2	GB	Maximum breadth



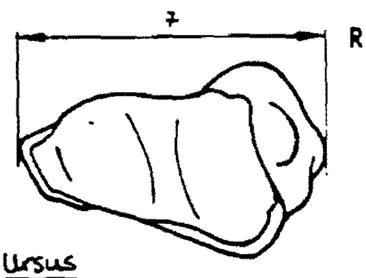
Equus



Capra



Equus



Ursus

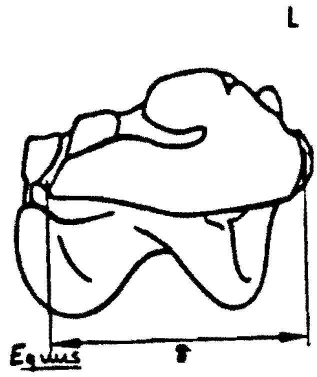
TIBIA

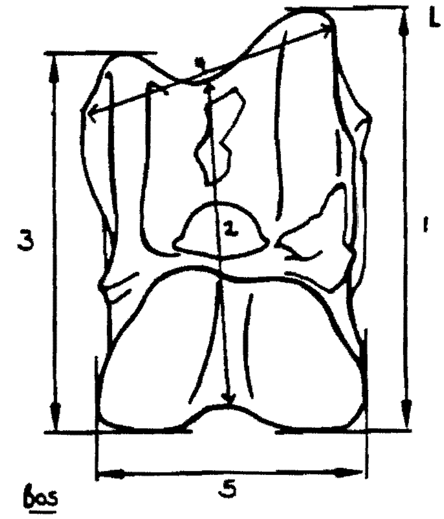
RJ	VD		
I	GL	Greatest length (+)	LI
2			L2
3	Bp	Greatest breadth proximal end (+)	PB
4			PD
5	SD	Smallest breadth diaphysis (+)	MB
6		90° at above	MD
7	Bd	Greatest breadth distal end	DB
8	Dd	Greatest depth distal end (equids + lagomorphs)	DD
9	Ll	Lateral length on outer side (horse)	
IO		Spare	

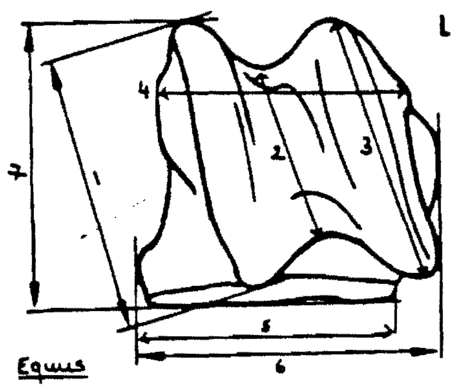
FIBULA

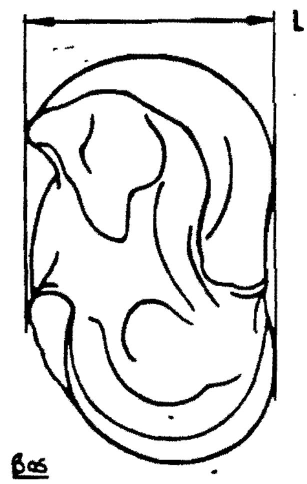
I Greatest length only is measured

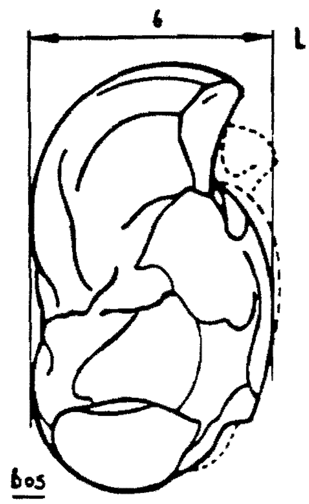
4 p10







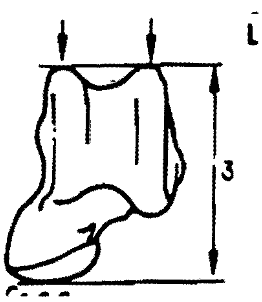




TALUS (ASTRAGALUS)

HORSE

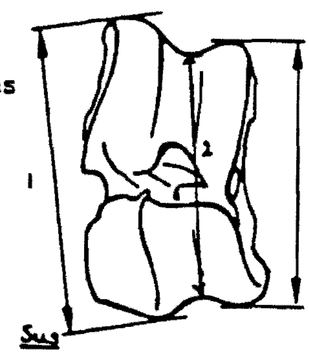
RJ	VD		
I	LmT	Length medial trochlea (+)	A
2		Length between troch.	B
3		Length lateral trochlea	C
4		Proximal breadth	D
5		Distal breadth	E
6	GB	Greatest breadth (board) (-)	
7	GH	Greatest height (board) (-)	
8	BFd	Breadth facies art. dist. (+)	

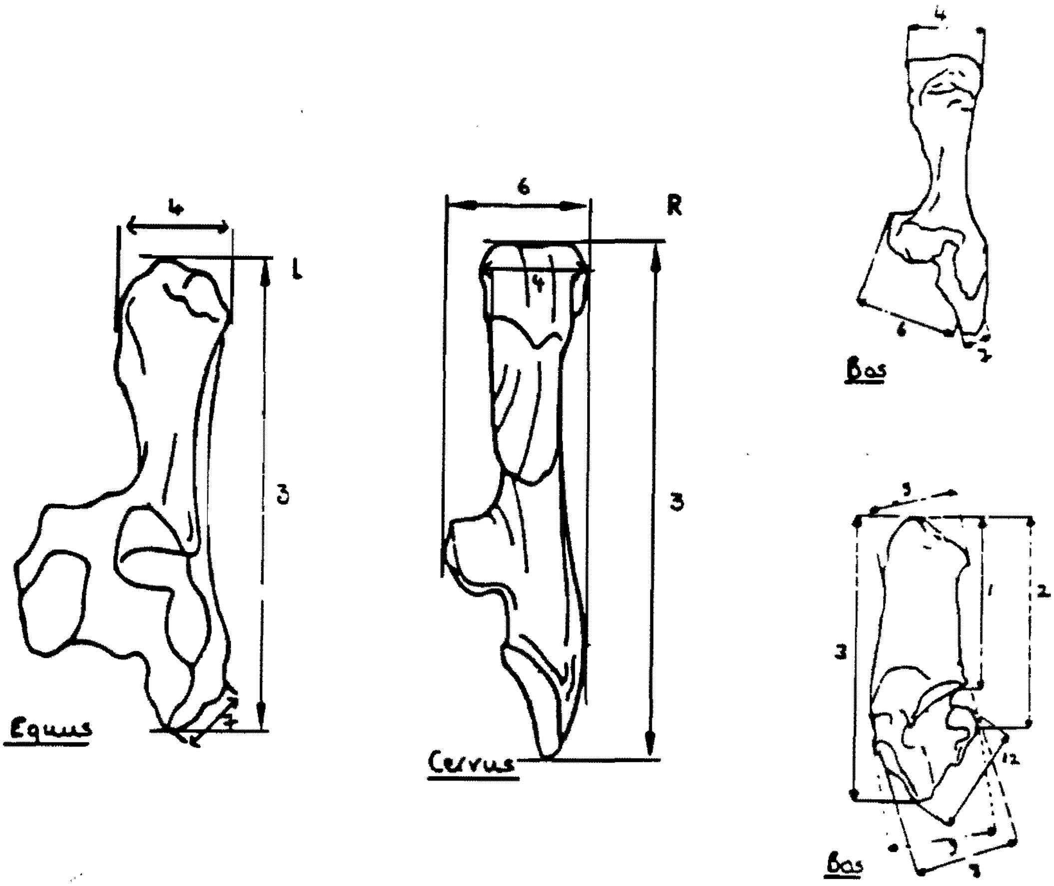


ARTIODACTYL

RJ	VD	
I	GL1	Greatest length lateral half (+
2		Length middle
3	GLM	Greatest length medial half (+)
4		Proximal breadth
5	Bd	Greatest breadth distal end
6	D1	Greatest depth lateral half (+)
7		Spare
8		Spare

NB Sus: only lengths





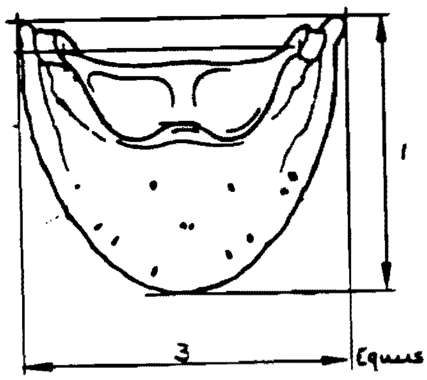
CALCANEUS

RJ	VD		
I		Max. distance most prox. calc. tuber to midpoint prox. art. face lat. prox. facet	
2		.. .. distal most point proximal facet	
3	GL	Greatest length (+)	
4		Greatest breadth tuber calcanei	
5		Max. depth	
6	GB	Max breadth	A
7		Distal lateral crest to medial point distal facet	A
8		Min. distance dorsal protr. prox. facet & pt. on plantar surf. calcaneum opp it	A
9		.. .. distal .. & medial most pt. same facet on plantar s.	A
IO		.. .. distal most pt. axial lat. ridge plantar s.	A
II	AD4	Distance most distal pt. axial lateral ridge plantar & most prox. pt. distal most facet	
I2	LDF	.. ..prox & most distal pts distal most facet	

NB II and I2 may only be for S/G

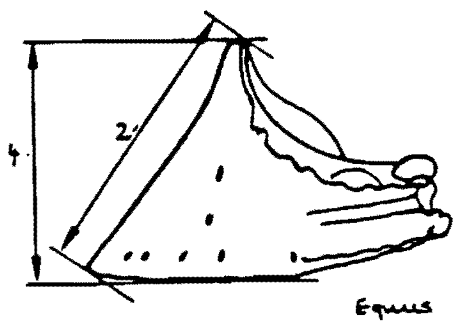
PHALANX I & PHALANX II

RJ	VD		
I	GL?		LP
2	Bp	Greatest breadth proximal end (+)	PB
3	Dp	Proximal depth	PD
4	SD	Smallest breadth of diaphysis	MB
5		90 at above	MD
6	Bd	Greatest breadth distal end	DB
7			MDD
8			LDD
9	BFp	Greatest breadth Facies articularis proximalis.Equids	
IO	BFd	.. .. distalis ..	
II	GLpe	Greatest length peripheral (abaxial) half. GL in artos	LL
I2		Spare	



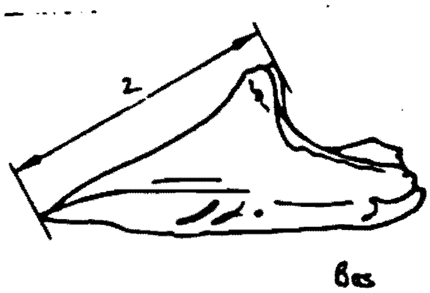
PHALANX III (HORSE)

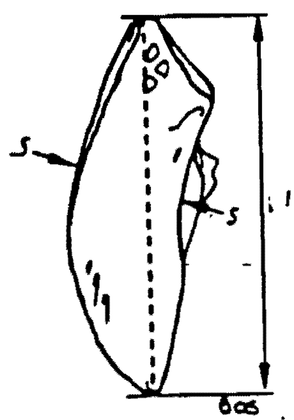
RJ	VD		
I	GL	Greatest length (+)	LI
2	Ld	Length of dorsal surface	L2
3	GB	Greatest breadth (+)	PB
4	HP	Height (board)	PD
5		Spare	



PHALANX III (ARTIODACTYL)

RJ	VD		
I	DLS	Diagonal length sole	LI
2	Ld	Length dorsal surface	L2
3		Proximal breadth	PB
4		Proximal depth	PD
5	MBS	Breadth in midsole	

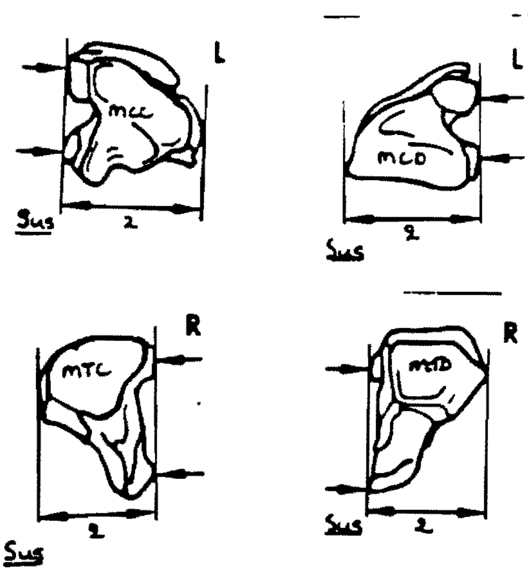




METAPODIALS

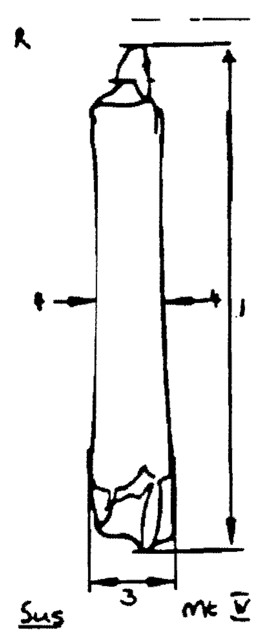
RJ	VD		
I	GL	Greatest length (+)	L
2	Bp	Greatest breadth proximal end (+)	PB
3	Dp	Greatest depth proximal end (not all)	PD
4	SD	Smallest breadth diaphysis (+)	MB
5		90° at above	MD
6	Bd	Greatest breadth distal end (+)	DB
7		Minimum medial depth distal condyle	MDDI
8		Maximum	MDD2
9		Minimum lateral depth distal condyle	LDDI
IO		Maximum	LDD2
II		Width medial condyle distally (taken distally)	WMC
I2		.. .. lateral	WLC
I3	DD	Smallest depth diaphysis	
I4	DFB	Maximum breadth at distal fusion point	
I5	DFD	Maximum depth	
I6	Ll	Lateral length (horse only)	

Measurements 7 to I2 are for Bovidae

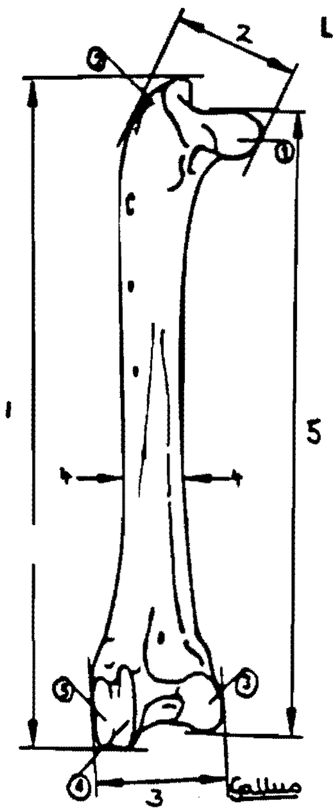


3RD & 4TH METACARPUS (for Sus sp)

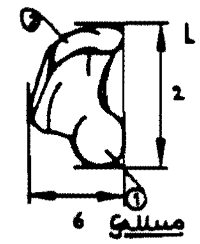
RJ	VD	
I	GL	Greatest length (-)
2	Bp	Greatest breadth proximal end (-)
3	Bd	Greatest breadth distal end (+)
4	B	Breadth in middle diaphysis



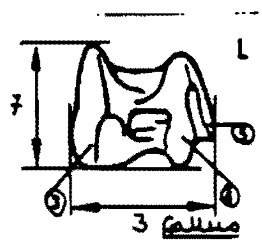
BIRD FEMUR



1 = Caput femoris
2 = Trochanter major
3 = Condylus medialis
4 = Condylus lateralis
5 = Condylus fibularis

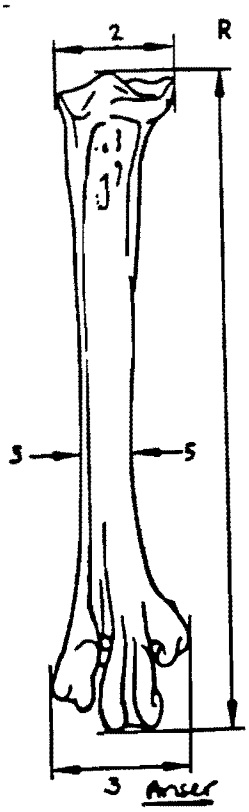


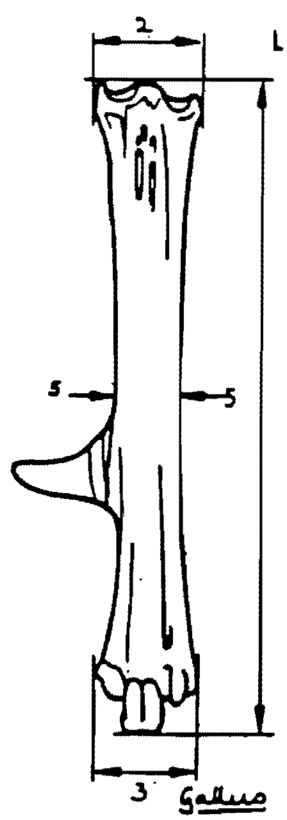
RJ	VD		
1	GL	Greatest length (+)	A
2	Bp	Greatest breadth proximal end (Erbersdobler Dp)	B
3	Bd	Greatest breadth distal end	C
4	SC	Smallest breadth corpus (-) same plane as Bd	D
5	LM	Medial length (+)	
6	Dp	Greatest depth proximal end (Erbersdobler Bp)	
7	Dd	Greatest depth distal end	
8		Spare	



BIRD TARSOMETATARSUS

RJ	VD		
1	GL	Greatest length (+)	A
2	Bp	Greatest proximal breadth (+)	B
3	Bd	Greatest distal breadth	C
4		Length of spur (at back)	A1
5	SC	Smallest breadth corpus	





Leicester: The Shires Site 39
Appendix 5: The sieved samples from Medieval deposits

Feature	Sample	Context no.	Volume	Wt(Kg)	Coarse Wt(Kg)	Fine Wt(Kg)	Flot.vol
Phase 10.1							
0030	6.2	178	0	1	0	0	
0030	6	178	5	6.3	1	0.78	
0030	12.2	193	0	1	0	0	
0030	12	193	5	6.4	0	0.45	
0030	17	194	5	6.6	1.4	0.7	
0030	17.2	194	0	1	0	0	
0030	14.2	197	0	1	0	0	
0030	14	197	5	6.5	0.89	0.5	
0030	13.2	198	0	1	0	0	
0030	43.2	204	0	1	0	0	
0030	43	204	5	6.2	0.6	0.45	
0030	44	221	5	8.8	8	0.67	
0030	60	223	5	4.6	0.3		
0030	18.2	227	0	0.5	0	0	
0030	29.2	235	0	1	0	0	
0030	29	235	2.5	4.2	0.41	0.5	
0030	15.2	236	0	1	0	0	
0030	35.2	237	0	1	0	0	
0030	25.2	238	0	1	0	0	
0030	25	238	5	5.3	0.9	1	
0030	41.2	239	0	1	0	0	
0030	16	240	5	6.1	1.3	0.86	
0030	16.2	240	0	1	0	0	
0030	40.2	241	0	1	0	0	
0030	40	241	2.5	4.6	0.6	0.6	
0030	38.2	242	0	1	0	0	
0030	46.2	243	0	1	0	0	
0030	48.2	244	0	1	0	0	
0030	50.2	245	0	1	0	0	
0030	50	245	5	6.7	0.8	0.75	
0030	47.2	246	0	1	0	0	
0030	47	246	5	5.2	0.7	0.35	
0030	49	247	2.5	5.8	1.1	1.1	
0030	49.2	247	0	1	0	0	
0030	507.2	275	0	1	0	0	
0030	23.2	279	0	1	0	0	
0030	24.2	280	0	1	0	0	
0030	20.2	281	0	1	0	0	
0030	22.2	283	0	1	0	0	
0030	33.2	284	0	1	0	0	
0030	33	284	5	6.8	1.1	0.7	
0030	39.2	285	0	1	0	0	
0030	39	285	5	6.9	1.4	0.65	
0030	54.2	286	0	1	0	0	
0030	55.2	292	0	1	0	0	
0030	58.2	293	0	1	0	0	
0030	56.2	294	0	1	0	0	
0030	59	295	5	6.6	0.7	0.6	
0030	60.2	295	0	1	0	0	
0030	59.2	295	0	1	0	0	

0030	487.2	300	0	1	0	0
0030	487	300	2.5	5.9	0.72	0.3
0030	57.2	301	0	1	0	0
0030	26.2	331	0	1	0	0
0030	26	331	5	6.6	1.2	0.7
0030	45.2	349	0	1	0	0
0030	53.2	353	0	1	0	0
0030	492.2	622	0	0.5	0	0
0030	494.2	624	0	1	0	0
0030	527.2	636	0	1	0	0
0030	426.2	638	0	1	0	0
0030	426	638	2.5	4	0.2	0.35
0030	427.2	639	0	1	0	0
0030	427	639	5	7.4	0.85	0.9
0030	445.2	640	0	0.5	0	0
0030	443	640	1	0	0.25	0.25
0030	443.2	640	0	1	0	0
0030	448.2	645	0	0.5	0	0
0030	454.2	651	0	0.5	0	0
0030	459.2	653	0	0.5	0	0
0030	462.2	656	0	0.5	0	0
0030	466.2	660	0	0.5	0	0
0030	467.2	661	0	1	0	0
0030	467	661	5	7	0.15	
0030	529.2	662	0	1	0	0
0030	531.2	664	0	1	0	0
0030	476.2	666	0	0.5	0	0
0030	536.2	672	0	0.5	0	0
0030	488	673	2.5	3.5	0.6	0.8
0030	488.2	673	0	1	0	0
0030	537.2	674	0	1	0	0
0030	490.2	676	0	1	0	0
0076	265	496	7.5	9	1.01	1.22
0076	312	496	5	5.4	0.55	0.3
0076	300	503	2.5	2.8	0.14	
0076	313	505	7.5	7	0.92	1.2
0076	315	507	7.5	9.5	1.4	1.09
0076	324	516	7.5	8.2	0.7	
0076	326	518	5	7	0.1	0.35
0076	329	519	7.5	7.8	0.3	0.82
0076	335	524	7.5	10.7	0.65	0.59
0083	325	501	10	9.1	0.8	
0083	327	508	7.5	7.5	0.7	
0083	328	511	2.5	2.8	0.45	
0092	370	523	5	4.3	0.39	
0092	373	533	2.5	3.4	0.41	
0093	364	552	7.5	9	1.25	
0093	365	581	7.5	9.4	1.21	
0093	366	582	2.5	3.3	0.6	
0094	348	.58	7.5	8.4	1.1	
0094	349	561	5	5.8	0.85	
0096	433	541	5	5.8	0.62	1.15
0096	434	678	7.5	9.1	1	1.83
0096	432	700	7.5	8.3	1.6	0.78
0097	402	554	10	12.8	2.25	
0097	351	558	10	12.3	1.3	
0097	356	572	7.5	8.4	1.74	1.25
0097	424	596	10	14.1	3	

0097	421	686	10	14.5	2.83	
0097	418	689	7.5	9.1	2.1	
0099	428	682	5	5.2	1.4	
0099	429	683	0	0	0.4	0.35
0100	384	566	10	10	1.2	
0100	395	587	10	11	2.55	
0100	399	599	5	7.2	1	0.77
0103	369	585	7.5	11.8	2	
0103	383	590	5	9.2	2.5	0.84
0103	391	591	5	8.5	1.8	
0103	409	592	0	0	0.8	
0103	411	593	7.5	8.8	2.2	
0103	412	594	7.5	10.4	2.36	
0103	413	595	7.5	8.5	1.21	
0103	419	690	0	0	0.76	
0110	455	726	1	0	0.24	
0114	520	736	5	6.6	0.95	
0114	521	746	5	5	0.8	
0114	522	748	7.5	8.7	1.8	
0114	523	749	5	4	0.35	
0114	524	750	5	7	1	
0114	526	763	5	4.4	0.2	
0115	479	22	5	4.1	1.2	0.3
0115	491	733	5	7.4	0.6	
0115	496	734	5	5.4	0.76	
0124	530	774	10	12	2.87	
0128	547	762	5	5.7	0.82	
0128	548	765	5	8.6	0.75	
0128	549.3	769	5	6.8	0.95	
0128	549.2	769	5	8.8	1.65	
0128	549.1	769	7.5	10.2	1.13	
0128	553	786	5	6.2	0.94	0.5
0128	558.1	787	5	8.7	1.33	0.5
0128	558.2	787	5	9.2	1.25	
0128	556.1	789	5	8.4	1.24	0.64
0128	556.2	789	5	7.4	1.01	
0128	554.2	790	5	9	1.49	
0128	554.1	790	5	7	1.09	0.54
0142	572	820	2.5	3.6	1.24	
0142	573	821	10	11	1.51	0.95
0142	574	822	10	7	• 0.8	
0142	575	823	10	9	0.81	1.03
0142	576	829	5	7.2	1.25	0.72
0178	660	870	7.5	8.1	0.95	0.6
0178	662	927	5	5.7	0.45	0.3
0192	677	908	10	14	6.45	1.13
0192	687	909	10	12	1.3	
0192	692	910	10	10.6	1.95	0.95
0192	696	1009	7.5	9.5	1.82	
0192	700	1034	7.5	7.7	2.86	0.56
0192	705	1035	7.5	9.8	2.05	0.28
0192	718	1036	7.5	8.8	2.01	
0192	741	1036	5	7.4	1.65	
0192	694	1067	7.5	9.1	1.26	
0192	736	1120	7.5	9.4	1.3	
0192	740	1125	7.5	10.6	2	0.7

Phase 11.1

0022	1.7	131	5	6.1	0.81	0.7
0022	1.3	131	5	5.4	1.3	0.56
0022	1.6	131	5	6.4	1.3	0.76
0022	1.4	131	5	6.5	1.1	0.76
0022	1.5	131	5	6.4	1.9	0.76
0022	1.2	131	2.5	4	0	0.34
0022	1.1	131	5	5.9	1.2	0.7
0022	2.5	182	5	6.7	0.8	0.56
0022	2.4	182	5	5.6	0.98	0.56
0022	2.3	182	5	6.2	1.1	0.62
0022	2.1	182	5	5.4	1.8	0.65
0022	2,2	182	5	6.1	1.4	0.61
0022	323	412	7.5	9.8	2.05	1.46
0080	253	471	10	12	1.1	
0080	267	497	10	10	1.25	
0182	639	959	10	10.8	1.3	
0182	654	991	10	8.8	1.05	

Phase 12.1

0041	246	413	7.5	9.6	2.7	
0064	131	381	20	20.91	1.99	1.95
0064	132	381	20	24.5	2.2	
0064	130	381	30	26.3	3.68	
0064	133	381	30	32.6	3.57	
0064	134	381	30	31.8	2.89	1.35
0069	266	408	10	12.2	2.05	1.11
0070	367	432	5	6	0.7	
0070	368	435	5	6.4	0.74	0.8
0070	381	467	2.5	4.6	0.96	
0070	371	470	2.5	7.1	1.8	0.8
0070	372	473	5	9.2	1.9	0.9
0070	386	474	5	4.9	0.64	
0070	401	476	2.5	5	1.1	0.43
0070	388	526	2.5	3.6	0.96	
0070	398	527	2.5	4.6	0.98	
0072	224	438	7.5	9	0.55	
0072	225	439	10	9	0.6	
0072	226	442	7.5	7	0.3	
0072	281	460	7.5	8.4	0.5	0.57
0072	282	466	7.5	8	0.66	
0072	283	491	7.5	9.2	1.2	
0072	284	498	7.5	10.3	1.87	
0072	285	499	5	5.8	1.04	
0081	286	479	2.5	3.5	0	0.34
0081	287	480	5	7.6	2	
0081	289	482	5	7.8	1.45	0.83
0081	290	483	5	8.1	1.64	0.82
0081	291	484	5	5.8	2.75	0.66
0081	292	485	5	6.4	1	0.65
0081	293	486	7.5	9	2	0.84
0081	294	487	5	4.6	0.86	0.52
0081	295	488	5	7	0.66	0.65

Phase 12.2

0017	333	119	5	7.3	2.33
0033	220	175	5	6.4	0.55
0033	222	177	5	6	1.55

0033	223	179	5	6.4	0.66	
0048	3	113	5	5	1	
0048	8	224	5	5.4	1.1	
0048	4	266	5	5.2	0.7	
0048	51	269	5	5.2	1.4	0.7
0048	11	270	5	5.2	0.8	
0048	52	270	10	10.2	1.4	1
0051	321	274	5	5	0.43	
0063	203	380	5	8.2	1	
0063	205	385	7.5	7.2	0.42	
0063	206	410	5	6.4	0.26	
0063	204	414	5	7.1	0.95	0.46
0065	241	384	5	4.2	1	
0065	268	390	5	5.2	0.7	
0065	304	404	5	6.6	1	
0073	317	440	7.5	9.6	1.68	0.72
0073	318	475	5	5.3	1.03	
0073	319	515	5	6.2	1.42	0.54
0079	270	461	7.5	7.7	1.06	
0079	274	464	7.5	10.6	3.15	
0079	276	468	5	7	0.6	
0079	277	493	5	6.1	0.61	
0102	511	688	5	6.2	1.1	
1034	90	176	30	32.3	6.68	
1034	89	176	30	28.7	3.78	
1034	92	176	30	34.3	3.49	3.25
1034	91	176	30	28.9	4.39	2.55
1034	86	176	30	28.6	3.45	
1034	85	176	30	32.2	4	
1034	88	176	30	36.2	4.28	
1034	87	176	30	32.5	4.58	
1034	94	195	15	16.4	1.85	
1034	93	195	30	30.4	3.79	
1034	98	195	30	29.9	7.45	
1034	99	195	30	31.3	4.15	
1034	100	195	30	33.2	4.65	
1034	95	195	30	31.2	4.6	
1034	96	195	30	36.4	4.2	
1034	97	195	30	31.8	4.36	
1034	106	213	30	29.4	8.27	3
1034	105	213	30	30.5	3.19	
1034	108	213	30	0	2.92	
1034	107	213	30	35.4	4.98	
1034	102	213	30	32.9	3.31	
1034	101	213	30	29.5	4.08	
1034	104	213	30	35.4	4.57	
1034	103	213	30	27.9	3.38	
1034	113	258	30	26.8	3.13	
1034	110	258	30	34.8	3.65	2.15
1034	109	258	30	36.3	5.21	
1034	114	258	30	29.5	6.09	
1034	111	258	30	28.3	4.6	
1034	116	258	30	28.2	3.9	
1034	115	258	30	42.1	6.1	
1034	112	258	30	27	2.8	
1034	122	302	30	31.6	6.4	
1034	124	302	30	33	5.47	2.93
1034	123	302	30	27.3	4.39	2.65

1034	118	302	30	33.2	0	3.75
1034	117	302	30	36.2	5.17	3.15
1034	119	302	30	34.2	4.3	
1034	121	302	30	32.9	3.52	3.4
1034	120	302	30	33.6	3.2	
1034	125	340	30	24.4	3	2.6
1034	128	340	30	28.4	3.4	2.7
1034	129	340	30	36.3	4.4	2.7
1034	127	340	30	32.3	3.65	3.2
1034	126	340	30	25.9	2.98	
Phase 13.1						
0016	415	80	7.5	7.8	0.9	
0016	352	112	5	8	0.6	
0016	353	120	2.5	4.6	1	0.37
0016	416	570	2.5	6.3	0.8	0.68
0016	417	684	7.5	7.3	0.57	0.5
0021	156	129	7.5	9.4	1.23	
0021	155	135	7.5	9.2	1.69	
0021	154	137	7.5	10.5	1.89	
0021	175	138	5	6	0.6	
0021	153	140	7.5	8	0.96	
0021	178	187	7.5	8.6	0.8	
0021	180	192	7.5	8.2	1.24	
0021	177	199	7.5	7.1	0.5	
0021	179	201	7.5	9.2	1.41	
0021	176	409	5	5.1	0.75	
0021	182	415	5	7.2	0.54	0.85
0021	186	417	5	6	0.8	0.86
0021	191	422	7.5	8.6	0.76	0.74
0021	192	423	7.5	8.4	0.9	
0021	193	424	7.5	9.2	1.79	0.84
0021	195	426	5	6	0	0.28
0024	214	133	5	4.6	0.44	
0024	215	142	5	5.2	0.6	
0024	216	154	2.5	3	0.3	
0031	28	171	5	6.3	1.6	0.9
0031	32	188	5	4.4	0.9	
0031	31	189	5	5.5	0.7	
0031	37	208	5	6.1	1.3	
0031	27	326	5	6.2	1	0.86
0031	30	334	5	4.2	0.5	0.55
0047	142	261	10	10.2	3.02	
0047	146	265	12.5	14.2	2.15	0.96
0047	151	320	12.5	17.2	8.69	1.05
0047	163	323	10	14.4	4.07	1.29
0047	158	333	7.5	10.4	1.75	1.19
0047	144	364	5	7.6	1.9	0.5
0047	149	365	10	14	6.85	0.7
0047	157	366	10	13.4	1.7	
0047	162	367	5	8	1.7	0.84
0047	167	368	7.5	9	2.45	0.86
0047	173	368	2.5	4.3	0.8	0.34
0047	166	369	2.5	2.9	0.89	0.3
0047	172	371	7.5	8.2	1.35	0.69
0047	174	372	5	4.3	0.4	0.52
0047	168	378	5	6.7	1.1	0.54
0052	72	271	12.5	12.9	2.68	

0052	143	298	10	11.4	1.44	
0052	159	319	12.5	13	1.4	
0052	233	327	7.5	11.2	2.08	
0052	234	328	7.5	10	0.9	0.77
0052	235	335	7.5	8.1	1.15	0.65
0052	160	336	10	10.8	0.95	
0052	219	338	2.5	2.5	0.2	
0052	147	342	10	11	0.99	0.84
0052	218	345	12.5	14	1.4	
0052	237	346	7.5	9.2	1.16	
0052	243	347	10	10.1	0.9	0.58
0052	238	348	10	14.6	1.7	
0052	244	348	10	13.2	2.61	
0052	200	431	10	9.7	0.5	
0057	242	322	5	6.3	0.65	
0058	145	354	10	10.5	1.3	0.85
0058	207	382	10	9.2	0	0.76
0058	152	397	5	5.2	0.8	0.3
0058	150	398	5	7	1.84	1.11
0058	208	399	2.5	2	0.1	0.34
0058	245	400	5	6	0.52	0.38
0058	250	401	10	10	1.5	0.51
0058	209	433	10	9	1.06	0.66
0058	210	434	7.5	10	1.65	0.42
0058	217	436	10	10	0.55	0.66
0066	161	363	5	6.5	0.6	
0066	181	383	7.5	7.1	0.6	
0066	202	392	5	7	0.5	
0066	201	405	7.5	7.8	0.71	
0071	298	402	10	12.5	1	
0095	437	604	5	8	1.6	0.96
0095	468	691	2.5	4	0.69	
0095	469	695	2.5	4	0.69	
0095	472	706	5	7.8	0.4	
0095	436	707	7.5	11.1	4.3	
0095	473	708	2.5	5.3	1.55	
0135	568	782	7.5	11.2	2.85	
0336	480	556	7.5	10	1.7	
0336	435	556	0	0	1.15	

Leicester, The Shires: Little Lane, Medieval Deposits

Measurements taken listed in Appendix 4

Appendix 6. Bone Measurements (in mm)

Anatomical abbreviations listed in Appendix II

Phase 10.1

			Measurements																			
Feature	Species	Element	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
83	cow	ph 1	47	32.2	32.5	27.8	26.9	27.4														
30	cow	ph 1	53	21.3	26.5	17.7	17.7	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	cow	ph 1	54.2	25.1	30	21.3	23.1	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83	cow	ph 1	55.2	25.9	28.3	22.5	22	24														
83	cow	ph 1	57.2	27.5	28.1	23.8	24.2	26.7														
100	cow	ph 1	57.9	27.2	23.3	20.9	26.6															
134	cow	ph 1	58.9	30.7	33.1	26.2	22.7	27.7														
100	cow	ph 1	59.5	27.8	29.7	22.8	24.9	25.4														
192	cow	ph 1	59.7	29.2	30.8	25	22.2	27.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	cow	ph 1	60.1	28.5	30.3	25	27.4	28.8														
76	cow	ph 1	62.3	29.2		25.6	24.3	28														
83	cow	ph 1	65.1	29.3	33.4	25	26.5	29.5														
134	cow	ast	63.9	49.8	59.5	42	39.8	36.5														
83	cow	ph 2	32.8	23.5	22.9	18.8	19.2	19.4														
83	cow	ph 2	35.2	24.2	25.4	18.7	18.5	19.4														
100	cow	ph 2	36.8	25	25.8	19.3	17.8	20.3														
100	cow	ph 2	38.4	27.8	26.8	21.9	22.2	24.3														
83	cow	ph 2	40.1	27.9	27.4	21.3	19.7	22.1														
192	cow	ph 2	41.3	29.4	30.3	22	22.3	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	cow	ph 2	41.9	27.5	27.7	21.5	22	22.4														
100	cow	ph 2	42.7	30.9	30.5	24.5	24.3	25.9														
100	cow	ph 2	43.7	28.9	29	21.3	23.1	23.3														
83	cow	ph 2	44.2	30.7	32.7	23.9	22.9	23.6														

Phase 10.1

192	cow	ph 3	63.8	50.1	22	36.1	19.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	cow	ph 3	66.3	47.1	22.4	34.3	18.3															
83	cow	ph 3	68.9	49.4	23.5	36.5	18.7															
30	cow	ph 3	74.6	56.1	2.3	40.4	24.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	cow	hc	38.2	52.3	158																	
30	cow	hum	0	0	0	0	61.4	0	0	0	0	36.1	0	0	0	0	0	0	0	0	0	0
83	cow	mc		64.2	37.4																	
30	cow	mc	187	54.4	0	31.3	21.6	55.2	22.2	0	21.4	0	22.9	22.7	20.5	53.4	28.4	0	0	0	0	0
30	cow	mt	0	42.7	40.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	cow	mt	0	44.4	41.8	24.2	26.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	cow	mt	0	46.2	41.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	cow	mt	201.5	43.2	40.1	23	26.7	44.8	19.1	26.4	18.6	25.9	19	19	21.8	42.5	26.5					
100	cow	rad						66.6	34.3		59.2											
76	cow	rad		79.5	42.9					73.3												
134	cow	scap				65	43.3	53.4														
192	cow	scap	0	48.2	20.5	70.2	47.6	59.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	cow	tib	0	0	0	0	0	0	57.4	41.5	0	0	0	0	0	0	0	0	0	0	0	0
100	fowl	coracoid	51.2																			
100	fowl	coracoid	52.7																			
100	fowl	coracoid	55.2																			
100	fowl	coracoid	56																			
100	fowl	coracoid	56.8																			
100	fowl	fem	70.5																			
83	fowl	hum	64.5																			
83	fowl	hum	68.4																			
83	fowl	rad	57.2																			
100	fowl	rad	66.3																			
100	fowl	scap	75.5																			
100	fowl	scap	77.9																			
30	fowl	tib	111.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

6 P2

30	s/g	rad	0	0	0	0	0	0	26.3	20.1	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	rad	0	29.7	15.1	15.6	7.7	0	0	26.6	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	rad	0	33.7	16.3	19	9.5	0	0	28.5	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	rad	0	33.9	17.2	18.6	9.9	0	0	32.5	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	rad	144	29.1	15.1	18	8.5	25.7	16	26.5	23.8	0	0	0	0	0	0	0	0	0	0	0
100	s/g	scap				31.9	20.6	25.9														
76	s/g	scap				33.1	21.2	26.1														
100	s/g	scap	0	18.5	9.6	30.9	19.9	24.3														
76	s/g	tib							23.9	19.9												
134	s/g	tib							24.1	18.5												
100	s/g	tib							25.2	19.4												
76	s/g	tib							25.5	18.8												
134	s/g	tib							26	20.1												
76	s/g	tib							26.5	19.4												
134	s/g	tib			43.1	37.3																
76	s/g	tib	0		40.8	36																
192	s/g	tib	0	0	0	0	0	0	23	17.5	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	tib	0	0	0	0	0	0	23.7	18.9	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	tib	0	0	0	0	0	0	24.1	18	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	tib	0	0	0	0	0	0	24.8	19.1	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	tib	0	0	0	0	0	0	26.1	19.6	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	tib	0	0	0	0	0	0	26.6	19.5	0	0	0	0	0	0	0	0	0	0	0	0
30	s/g	uln	39.5	18.2	0	20.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	sheep	mc	113.6	21.3	15.5	13.1	9.9	23.7	10.1	14.9	9.2	14.4	9.1	8.9	8.2	22.5	11.7	0	0	0	0	0

Phase 11.1

Feature	Species	Element	Measurements 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
22	cow	ph 1	54.3	26.3	30.2	22.1	24	23.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 1	58	24.8	28.8	20.5	21.7	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 1	61.3	28.7	32.2	25	25.9	27.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 1	61.4	24.6	29.2	21.2	22.9	25.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 1	61.7	26.1	30.3	22	22.4	23.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 1	62.1	126.8	0	22.8	22.8	25.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 1	66.2	28.2	0	22.4	22.9	26.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 2	0	25.6	25	19.8	19.6	20.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 2	42.9	30.9	30.2	23.7	25.2	25.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 3	55.9	46	21.1	33.1	17.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 3	60.6	50.2	22.1	34.2	17.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	ph 3	68.8	51.3	24.3	36.3	22.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	cow	hc	22.8	32.5	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	hc	24	30.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	hc	28	33.7	93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	hc	28.8	36.1	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	hc	29.9	34.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	hc	30.1	42.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	mc	0	0	0	0	0	53.3	22.8	29.7	21.8	29.5	22.7	22.2	19.4	48.6	26.7	0	0	0	0	0
121	cow	mc	0	48.8	29.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	cow	tib	0	0	0	0	0	0	51.7	39.5	0	0	0	0	0	0	0	0	0	0	0	0
22	fowl	coracoid	51.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	fowl	fem	82.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	fowl	hum	66.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	horse	mc	0	49.7	30.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	pig	ph 1	36.4	17.3	17.3	0	0	15.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	ph 1	32.9	10.7	12.7	9.2	9.1	10.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	ph 1	38.9	12.5	15	9.6	10.9	11.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	ph 2	22.5	11.9	12.8	9.9	9.7	10.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	hum	0	0	0	0	26	0	29.4	0	0	17.8	0	0	0	0	0	0	0	0	0	0
22	s/g	mc	0	22	16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	mc	0	22.8	16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	mc	0	23	16.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	mc	0	23.4	17.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	mt	0	20.3	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	mt	127.8	20.1	19.8	11.8	13.2	23.6	9.7	0	9	0	10.2	9.1	9.9	23	12	0	0	0	0	0
22	s/g	rad	0	0	0	0	0	25.5	17.5	0	24.9	0	0	0	0	0	0	0	0	0	0	0
22	s/g	rad	0	29.6	14.7	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	0
22	s/g	tib	0	0	0	0	0	0	24.6	18.4	0	0	0	0	0	0	0	0	0	0	0	0

Leicester, The Shires: Little Lane, Medieval Deposits

Measurements taken listed in Appendix 4

Appendix 6. Bone Measurements (in mm)

Anatomical abbreviations listed in Appendix 11

Phase 12.1

			Measurements																			
Feature	Species	Element	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
70	cow	ph 1	56	25.4	28.9	22.9	20.7	24.2														
81	cow	ph 1	56.7	30.1	32.1	25.1	22.9	27.1														
72	cow	ph 1	57	24.7	28.2	18.4	18.2	23.5														
41	cow	ph 1	58.1	24.4	30.6	21.6	21.1	24.6														
72	cow	ph 1	66.1	29.3	33.6	24.4	24.2	26.7														
70	cow	ast	57.6	44.2	52.9	36.7	35.7	32.2														
41	cow	ast	61.3	48.9	56.5	40.5	41.3	36.8														
72	cow	ph 2	37.8	26.4	28.5	20.3	19.3	21.7														
72	cow	ph 2	38	25.8	26.7	19.8	18.7	20.3														
81	cow	ph 2	39.2	26.4	27.5	20.8	19.8	22.3														
41	cow	ph 2	40.6	29.3	29.3	22.8	22.9	24.5														
70	cow	ph 2	42	25.3	28.2	21.5	21.4	21.4														
41	cow	ph 2	45	34.3	32.7	26.4	26.3	28.9														

72	cow	frnt	28.5	41.2	104												
72	cow	mc	186	53	32.3	30.6	21.3	54.5	24	31.1	22.6	30.5	24.5	23.4	21.4	52.7	29.5
70	cow	mt						49.2	20.7	27.6	19.4	26.6	21.8	19.7	22.2	46.9	27.1
41	cow	mt	196	0		21.6	24.2	46.7	19.2	26.7	17.7	26.2	20.8	18.9			
41	cow	rad		67.6	35.4												
72	cow	scap				63.7	43.9	52.8									
72	cow	tib							53.4	41							
70	duck	cmc	61.6														
70	fowl	fem	71														
81	fowl	fem	76.4														
41	fowl	fem	80.6														
70	fowl	tib	94.7														
70	fowl	tib	110.9														
70	fowl	tmt	61.4	11.5	11.1		4.9										
70	fowl	tmt	75.2	13.3	12.8		5.9										
70	goose	cmc	89.2														
41	pig	tib							26.9	24.6							
41	s/g	ph 1	38.5	13.6	15.9	10.5	10.9	11.8									
72	s/g	cal			54.8	12.6											
41	s/g	hum					25.7	20.5	27.5			17.2					
81	s/g	hum					28.6	20.6	29.8			18.3					
70	s/g	mc						22.5	10.7	0	10.6	9.1	8.6	9.3	22.4	12.2	
72	s/g	mc						23	9.9	14.8	9.2	14.1	9.7	8.6	8.3	22.8	12.3
81	s/g	mc						26.3	11.2	16	9.9	15.3	10.7	10.5	9.8	26.6	13.2
41	s/g	mc		16.3	10.8												
70	s/g	mc		17.5	17.8												
70	s/g	mc		18	12.8												
70	s/g	mc		20.9	14.4												
70	s/g	mc		21.8	15.8												
81	s/g	mc		22.3	16.6												

6p9

41	s/g	mc	118.1	20	14.6	12.2	10.2	22.3	9.5		9.1	13.9	8.8	8	9.5	23.6	12.9					
41	s/g	mt		17	17.8																	
41	s/g	mt		19.3	18.7																	
81	s/g	mt		19.3	18.9																	
81	s/g	mt		19.6	19.4																	
41	s/g	mt		20.4	20.8																	
81	s/g	mt		21.5	20.2																	
70	s/g	mt		21.7	20.9																	
72	s/g	oc											21.5	18.5							27.4	23.2
72	s/g	rad						26	18.5		22.9											
81	s/g	rad						29.3	17.7		24.3											
81	s/g	rad		29.9	14.9																	
72	s/g	tib							23.7	19.1												
41	s/g	tib							25.4	19.4												
70	s/g	tib							25.6	19.5												
41	s/g	tib							26.2	19.2												
41	s/g	tib							27	21.3												

Leicester, The Shires: Little Lane Medieval Deposits

Measurements taken listed in Appendix 4

Appendix 6. Bone Measurements (in mm)

Anatomical abbreviations listed in Appendix II

Phase 12.2

			Measurements																			
Feature	Species	Element	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
102	cow	ph 1	53.3	28.5	29.1	22.1	22.6	26.1														
102	cow	ph 1	54.9	25.6	27.7	23.2	21.5	24.2														
65	cow	ph 1	55.5	27.7	29	24.2	24.2	24.6														
65	cow	ph 1	56.7	25.2	30	20	21.8	23.9														
65	cow	ph 1	58.4	31.1	33.1	27.2	23.9	29.9														
48	cow	ph 1	58.7	25.4	30	21.9	23.7	24.7														
65	cow	ph 1	58.7	26.8	30.2	23.2	25.2	26.6														
102	cow	ph 1	60.2	28.6	29.4	23.3	24.4	26.2														
73	cow	ph 1	62.6	31.9	32.4	27.2	26.6	30.7														
65	cow	ph 1	62.9	29	31.3	23.1	23.7	26.6														
48	cow	ph 1	63.9	28.2	32.1	25.1	27	28														
65	cow	ph 1	74.5	33.8	37.8	27.5	28.7	31.4														
73	cow	ast	56.6	43.6	52.2	36.4	36.4	33.3														
102	cow	ast	57.5	43.9	53.5	0.6	35.3	34.2														
65	cow	ph 2	37.4	27	26.6	21.9	19.3	20.9														
102	cow	ph 2	37.6	25.8		21.2	20.7	20.4														
102	cow	ph 2	39	25.2	25.9	20.1	19.1	21.5														
48	cow	ph 2	40.9	28.5	28.3	23.2	22.1	26.5														
73	cow	ph 2	42.2	28.3	28.3	22.4	22	23.8														
63	cow	cal			118.5	27.2	33.1															
48	cow	cal			127.9	29.4	33.6															
65	cow	ph 3	60.4	45.5	21	34.3	19.3															
102	cow	ph 3	64.2	47.9	21.3	36.1	17.9															

6 p10

48	cow	ph 3	64.6	47.8	22.1	34.9	21.2								
65	cow	ph 3	71.3	54.2	23.9	36.6	21.2								
65	cow	hc	34.8	43.4											
48	cow	hc	41.9	53.8											
73	cow	mt						54.7	22.7	30.6	21.4	29.2	22.5	21.8	0
48	cow	mt		39.3	36.4										
73	cow	mt		39.5	37.7										
65	cow	mt		40.7	39.8										
63	cow	rad		85.1	41.8					77					
73	cow	scap				61.6	40.8	50.9							
63	cow	scap	61.2	46.4	21.3	34.9	17.7								
65	dog	hum	103.1												
48	duck	cmc	56.9												
48	duck	cmc	57.2												
63	duck	cmc	60.9												
48	duck	coracoid	52.2												
48	duck	coracoid	53.5												
48	duck	fem	50.1												
48	duck	fem	53.6												
48	duck	fem	55.7												
48	duck	fem	58												
48	duck	hum	89.3												
48	duck	hum	93.7												
48	duck	scap	73.2												
48	duck	tib	95.6												
48	duck	tmt	50	10.9	11.4		5.3								
48	duck	tmt	50	10.9	12		5.3								
48	duck	uln	79.8												
48	duck	uln	81.1												
48	fowl	coracoid	53.8												

48	fowl	coracoid	57.8				
65	fowl	coracoid	59.3				
63	fowl	coracoid	63.5				
65	fowl	fem	72.1				
63	fowl	fem	82.6				
63	fowl	fem	82.9				
48	fowl	fem	83.8				
63	fowl	hum	62.4				
65	fowl	hum	71.4				
63	fowl	hum	73				
63	fowl	mt	68.2	12.1	12.2		5.8
48	fowl	rad	62.3	0	0		
65	fowl	rad	69.6				
48	fowl	scap	71.5				
63	fowl	tib	99.2				
48	fowl	tib	101.1				
63	fowl	tib	116.8				
63	fowl	tib	138.4				
63	fowl	tmt				23.7	
48	fowl	tmt	68	12.2	12.4		5.8
65	fowl	tmt	68.5	12.5	12.6		6.2
63	fowl	uln	61.7				
48	fowl	uln	68.3				
73	goose	cmc	85.3				
48	goose	cmc	86.9				
48	goose	cmc	92				
63	goose	cmc	94.2				
48	goose	rad	143.4				
48	goose	rad	145.6				
48	goose	rad	156				

48	goose	tmt	79.9	17.3	18.1		8															
48	goose	uln	155.2																			
48	goose	uln	156																			
73	horse	aph	80.5	55.8	36.3	34.3	25.2	43.1														
48	horse	tib	0	0	102.4	84.5			88.6	57.1												
48	horse	tib	369				42.9	33.9	76.7	46.9												
65	pig	acet												33.3	29.8						37.7	34.9
48	pig	ph 1	46.7	19.7	18.3	15.2	13.4	17.9														
48	pig	ph 2	27.8	16.1	16.5	13.6	11.4	14.1														
73	pig	hum					29.6	27.6	37.8			27.7										
65	pig	rad		28.2	19.4																	
48	pig	rad		28.7	19.5																	
73	s/g	acet												19.8	18.2						26.2	21.5
65	s/g	acet												20.1	18.5						25.5	22.3
102	s/g	ph 1	30.6	10.7	12	8.8	8.7	10														
63	s/g	ph 1	31.1	11.4	12.9	8.5	8.5	10.1														
63	s/g	ph 1	31.7	10.6	12.8	8.3	8.3	10.1														
63	s/g	ph 1	31.8	10.8	12.6	9.1	9.2	10.4														
63	s/g	ph 1	31.9	11	13.1	8.6	9.1	10														
63	s/g	ph 1	32	10.3	12.9	9	9.3	10.2														
63	s/g	ph 1	32.1	9.9	12.8	8.2	8.6	9.5														
63	s/g	ph 1	32.2	11.7	12.9	9	8.7	10.5														
63	s/g	ph 1	33.3	11.6	13.2	9.2	8.8	11.2														
63	s/g	ph 1	33.4	10.8	13.3	7.6	8.3	10.2														
63	s/g	ph 1	33.4	10.9	13.5	8.8	9.5	10														
63	s/g	ph 1	33.4	11.2	12.9	8.4	8.2	10.1														
63	s/g	ph 1	33.4	11.8	13	9.8	9.5	11.3														
63	s/g	ph 1	33.6	11.3	13.3	8.4	8.6	10.5														
65	s/g	ph 1	33.7	12.6	14.1	10.2	9.3	11.6														
63	s/g	ph 1	33.9	11.3	13.4	8.7	9	10.5														

< 74 >

Gp13

63	s/g	ph 1	33.9	11.5	13.6	8.4	8.7	10.4
63	s/g	ph 1	34	11.5	13.1	8.6	8.7	11.3
63	s/g	ph 1	34.3	10.6	13.6	8.1	9.1	10.1
63	s/g	ph 1	34.3	11.3	13.7	8.9	9.6	10
63	s/g	ph 1	34.4	11.4	13.2	8.7	8.3	10.4
63	s/g	ph 1	34.4	11.8	13.4	9.2	8.7	11.1
63	s/g	ph 1	34.5	11.6	14.5	9.5	9.7	10.7
63	s/g	ph 1	34.6	11.6	13.8	8.9	9.2	11.4
63	s/g	ph 1	34.7	11.8	13.5	9	9	11.4
63	s/g	ph 1	34.8	11.1	13.1	8.4	8.6	9.7
63	s/g	ph 1	34.9	11.4	13.4	8.9	9.5	10.3
63	s/g	ph 1	34.9	12.4	14.5	9.8	10.1	11.5
63	s/g	ph 1	35.1	10.8	13.2	8.2	8.5	9.9
63	s/g	ph 1	35.2	10.8	13.4	8.2	8.6	9.9
63	s/g	ph 1	35.2	12.8	14.8	10.2	10.1	11.9
65	s/g	ph 1	36.7	12.3	15.2	10.3	10.9	11.9
48	s/g	ph 1	36.8	12.4	14.9	9.4	10.1	11.1
63	s/g	ph 1	37.3	12.3	14.5	10.2	10.3	11.5
63	s/g	ph 1	37.5	12.8	14.7	10.6	10.3	11.6
63	s/g	ph 1	37.7	12.8	14.7	10.7	10.5	11.9
63	s/g	ast	25.6	21.1	25.1	17.1	16.6	14.4
48	s/g	ast	28	21.7	26.2	18.4	18.8	16.2
63	s/g	ph 2	20.1	10	11	7.7	7.3	8
63	s/g	ph 2	20.5	10.2	11	7.8	7.5	8.3
63	s/g	ph 2	20.6	10.1	11.1	7.2	7.2	8.4
63	s/g	ph 2	20.7	9.9	10.7	7.1	7.2	8.6
63	s/g	ph 2	21.3	10.3	12	7.9	7.2	8.5
63	s/g	ph 2	21.6	10.2	11.2	7.4	7.3	8.1
63	s/g	ph 2	21.7	9.8	10.7	7.1	7.2	8.2
63	s/g	ph 2	21.7	12	12.5	9	8.7	10.2

63	s/g	ph 2	22.1	11.5	11.4	8.4	8.1	9.2				
63	s/g	ph 2	22.2	9.6	10.8	7.1	7	8.4				
48	s/g	ph 2	22.3	10.6	11.3	7.7	8.5	8.8				
63	s/g	ph 2	22.5	11.2	12.1	8.7	8.4	9.4				
63	s/g	ph 2	22.6	10.1	10.9	7.7	7.7	8.9				
63	s/g	ph 2	22.6	10.6	11.4	7.9	8.1	9.1				
63	s/g	ph 2	22.8	11.3	12	8.7	8.2	9				
63	s/g	ph 2	23.4	11.6	11.4	8.4	7.8	9				
63	s/g	ph 2	23.9	12.6	12.9	9.5	9.4	10.2				
63	s/g	ph 2	26.1	11.9	12.7	9.4	9.4	0				
48	s/g	cal			47.4	12.1	11.8					
63	s/g	cal			50.8	12.5	13.1					
65	s/g	cal			54	14.7	15.1					
48	s/g	cal			54.1	12.2	12.6					
63	s/g	cal			58.9	13.5	14.4					
48	s/g	cal	0		52.3	12.3	13.2					
48	s/g	cal	57.1	13.6	15.1							
63	s/g	ph 3	22.4	18.3	7.8	11.6	5.4					
63	s/g	ph 3	23.8	16.3	8.4	12.3	5.8					
63	s/g	ph 3	24.3	17.7	8.5	12.8	5.2					
63	s/g	ph 3	24.7	19.3	8.6	13.1	5.5					
63	s/g	ph 3	24.8	19.2	8.3	12.5	5.1					
63	s/g	ph 3	25.2	19.5	8.7	13.1	5.2					
63	s/g	ph 3	25.3	19.5	9.2	13.9	5.5					
63	s/g	ph 3	30.6	21.5	10.9	15.5	6.3					
48	s/g	fem				13.4	16.6					
63	s/g	fem			37	15.9	14.3	45.7				
65	s/g	hum					24.9	17.6	27.5			16.8
63	s/g	hum					27	20	29.4			18.2
102	s/g	hum					27.1	19.5	27.9			

73	s/g	hum					27.3	20.5	29			18.3							
65	s/g	mc						23.7	10.8		10.2	14.7	9.6	8.9	8.6	23.5	12.9		
63	s/g	mc						24.1	10.7		10.1		9.8	9.2	9	24.1	12.5		
65	s/g	mc						25.9	11.1	16	10.2	15.4	10	9.3	9.4	25.1	12.5		
48	s/g	mc		16.9	25														
63	s/g	mc		21	15.3														
63	s/g	mc		21.1	15.4														
63	s/g	mc		21.1	15.5														
73	s/g	mc		22.5	17														
73	s/g	mc		22.9	18.2														
63	s/g	mc	0	19.8	15														
63	s/g	mc	108.2	20.5	14.3	12.5	9.9	22.4	9.7	14.2	8.7	13.6	8.7	8.6	8.2	21.7	12		
63	s/g	mc	108.3	20.2	14.7	12.3	9.6	22.9	9.6	14.3	8.7	13.6	8.7	8.8	8.1	21.9	12.2		
73	s/g	mc	112.7	21.2	15.2	13.1	10.5	22.4	10	14.6	9.3	14	9.4	8.4	8.2	22.6	11.6		
63	s/g	mc	119.5	21.9	15.5	12.2	11.1	22.9	10.2	14.6	9.9	14.2	9.3	8.5	8	22.7	11.5		
65	s/g	mc	122.1	21.2	14.9	13	10.4	24	10.3	15.1	9.9	14.6	9.2	9.1	8.5	23.5	12.3		
63	s/g	mc	123	21.9	15.4	12.2	9.6	22.6	10.2	15.3	9.4	14.9	9.3	9.2	8.2	24.3	12.7		
63	s/g	mc	123.1	23.8	17.8	14.5	11.5	25.2	10.2	15.9	9.7	15.2	10.3	9.7	9.6	25.1	13		
63	s/g	mc	123.5	22.6	16.6	14	10.8	24.8	10.2	15.6	9.3	14.7	9.7	9.5	8.2	25.2	10.4	0	0
63	s/g	mc	124.7	22.7	17.3	12.9	10.4	25.5	11.2	16.7	10.8	16.2	10	9.7	8.8	24.3	15.2		
73	s/g	mc	136	24.1	17.9	15.4	13.9	26.7	12.3	17.8	11.5	17.2	10.6	10.5	10.2	27.9	15.1		
102	s/g	mt						22	9.2	14.8	9.1	14	9.2	8.5	8.2	21.5	11.8		
73	s/g	mt						22.9	9.4		9.2	14.3	10.3	9	9.3	22.3	12.7		
65	s/g	mt						23.3	9.7	16.1	9.7	15.1	9.9	9.1	9.6	22.4	12.4		
63	s/g	mt						23.6	9.5	15.8	9.7	15.2	10	8.9	9.7	22	13.1		
63	s/g	mt						25.6	12.6	17	12.1	17.1	11	10.8					
48	s/g	mt		17.4	17.1														
63	s/g	mt		18.3	18.8														
63	s/g	mt		19	18														
63	s/g	mt		19.7	18.8														

< 82 >

6P16

63	s/g	mt		20.2	19.9												
63	s/g	mt		20.7	20												
63	s/g	mt	111.6	18.1	17.7	10.5	11	23	8.6	14	7.6	12.9	9.6	8.8	8	22	11.3
63	s/g	mt	112.2	18.3	18.1	10.5	11.1	22.9	8.1	13.9	7.9	13	9.9	9.1	7.9	22	11.7
63	s/g	mt	114	18.6	18.8	10.7	10.5	23.5	8.8	14.7	8.2	13.7	9.9	9.3	8.9	22.4	13.7
63	s/g	mt	117.4	18	18.1	10.8	11	21.8	9	14.7	8.4	13.3	9.2	8.4	9.1	21	12.6
63	s/g	mt	117.6	18.5	18.2	11.1	11.5	22.1	9.3	14.8	8.7	13.4	9.6	8.3	9.1	21.2	13
63	s/g	mt	121.8	19.5	18.8	11.1	11.4	22.7	9.5	15.3	9	14.2	10.2	9	8.4	22.5	12.2
63	s/g	mt	123.4	18.6	18.5	10.8	10.9	22.5	9	14.6	8.6	13.8	10.1	9.3	8.8	22.2	12.8
65	s/g	mt	129.3	18.9	18.2	11.6	11.8	22	9	14	8.3	13.1	9.4	8.7	9.3	21.8	11.4
63	s/g	mt	129.7	18.6	18.7	10.6	12.4	21.8	9.5	14.6	9.3	14	9.3	8.6	8.3	21.5	11.4
63	s/g	mt	132.8	20.5	20.7	13.2	12.8	24.2	10	15.9	9.3	14.9	10.7	10.2	9.9	23.7	12.8
63	s/g	mt	134	19.7	19.2	10.3	12.2	22.7	9.7	15.4	9.7	14.7	10.1	9.3	9	22.7	12.1
48	s/g	rad						24.7	16.8		21.8						
65	s/g	rad						28.4	17		23.5						
73	s/g	rad		30.3	16.4	17.2	9.8			27.7							
48	s/g	rad		31	15.5	18.4	8.8			28.3							
63	s/g	rad		31.2	15.6	18.1	8.7			28.4							
73	s/g	rad		31.7	15.9	17.6	9			29							
65	s/g	rad		32.7	16.7	17.8	9.2			30.1							
48	s/g	rad	163	32.4	16.2	18	8.9	29.5	18.6	29.5	25.9						
73	s/g	scap				29	18.6	23									
63	s/g	scap	0	19.8	13.2	37.3	24.8	30.2									
48	s/g	tib							2.5	20.6							
73	s/g	tib							23.8	17.7							
73	s/g	tib							24.4	20.2							
48	s/g	tib							25.1	20.2							
73	s/g	tib							26	18							
73	s/g	tib							28.6	21.2							
65	s/g	tib			37.7	32.1											

6 p 18

48	s/g	tib			38.7	34.1		
65	s/g	tib	193.5				27	20.3
63	s/g	uln	41.5	19.8		21.9		

Leicester, The Shires: Little Lane, Medieval Deposits

Measurements taken listed in Appendix 4

Appendix 6. Bone Measurements (in mm)

Anatomical abbreviations listed in Appendix II

Phase 13.1

Feature	Species	Element	Measurements 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
52	corvid	tib	64.1																			
52	corvid	tmt	45.9																			
66	cow	acet																			66.2	53.9
21	cow	ph 1	54.4	27.6	28.3	23	22.1	25.1														
38	cow	ph 1	54.7	26.5	28.7	23.5	20.2	25.1														
31	cow	ph 1	55	24.2	27.5	20.9	19.9	22.9														
47	cow	ph 1	55.2	27.2	28	24.1	22.6	25.4														
47	cow	ph 1	55.5	25.2	29.4	21.8	22.4	25.2														
21	cow	ph 1	57.5	25.7	30.5	23.5		24.8														
58	cow	ph 1	57.9	24.2	28.5	20.3	21.1	22.6														
52	cow	ph 1	58.6	32.7	31.7	27.2	22.6	30.3														
52	cow	ph 1	59.3	30.6	30.8	25	27.4	30.2														
52	cow	ph 1	59.9	29.8	30.3	25.5	23.5	26.8														
21	cow	ph 1	60.4	27.2	30.3	22.8	21.5	25														
31	cow	ph 1	60.9	27.9	28.6	22.3	24.8	24.7														
31	cow	ph 1	62.3	31.1	31.4	25.9	24	27.5														
58	cow	ph 1	62.8	30.8	35.3	25.1	25.2	29.6														
31	cow	ph 1	65.1	26.7	31	21.5	24	25.5														
47	cow	ph 1	66.6	30.6	35.4	24.6	24.7	29.4														
31	cow	ph 1	67	31.2	36	26.5	24.8	27.4														
21	cow	ast	54.6	24.9	26	21	22.7	24.4														
31	cow	ast	61.2	46.8	55.7	41.1	40.1	36.9														
66	cow	ast	62.8	49.5	58.9	44.2	39.2	36.9														

47	cow	ast	64.8	48.6	57.7	40.9	39.4	36.9				
58	cow	ph 2	36.4	24.9	25.2	19.1	18.5	19.4				
58	cow	ph 2	36.9	25.8	26.7	20.3	20.8					
52	cow	ph 2	37.3	24.9	26.6	19.5	19.2	19.9				
66	cow	ph 2	39.3	27.1	26.9	22.2	21.3	23.2				
52	cow	ph 2	39.7	26.3	26.4	20.6	20.7	21.5				
21	cow	ph 2	40.1	27.8	27.9	20.6	22.1	21.6				
58	cow	ph 2	40.5	29.1	31.6	23.1	22.3	22.5				
21	cow	ph 2	41.2	28.4	26.7	22.8	21.6	23.8				
52	cow	cal				27.4	30.4					
52	cow	cal				33.1	40.3					
21	cow	cal			129.3							
21	cow	cal			131.5	32.1	36.5					
58	cow	cal			138.2	34.6	39.7					
21	cow	cal			149.1	34.1	40.1					
31	cow	ph 3	55.4	43.7	21	33.8	18					
58	cow	ph 3	55.5	43.4	19.6	32.4	18.3					
31	cow	ph 3	65.9	51.1	22.8	35.3	17.6					
66	cow	ph 3	69.2	52.1	24.2	37.8	23.2					
52	cow	ph 3	72.5	51.3	26.6	36.3	21.8					
47	cow	ph 3	77.9	59.6	27.7	41.6						
47	cow	frnt	28	36.7	115							
52	cow	hc	31	42.5								
47	cow	hc	31.8	39.7								
31	cow	hc	33.4	40								
31	cow	hc	38.4	58.6	165							
52	cow	hc	39.7	50.3								
31	cow	hc	40	51.7								
21	cow	hc	42.6	59.7								
52	cow	hum					64.2		74.7			36.6

52	cow	hum					68.8					39.8					
21	cow	mc						55.1	21.9		20.5	27.8	22.2	21.6			
31	cow	mc						56.1	22.8	29	22.1		22	22.3	19.7	49.9	25.9
47	cow	mc						57.1									
52	cow	mc						57.3	23.8		23		22.3	22.4		53	27.8
47	cow	mc						60.3	24.6	33.9	24.1		26.7	25.5		56.4	29.6
38	cow	mc		49.8	29.6												
31	cow	mc		56.9	33.9												
21	cow	mc		58.1	33.4												
58	cow	mc	178	51.2	30.8	31.1	21.3	54.8	22.8	30.1	21.4	29.6	23.1	22.8	18.9	49	26.5
21	cow	mc	178	51.8	29.9	27.7	19.6	50.7	21.7		20.3		22.1	21.2	19.6	47.4	26.8
31	cow	mt						43.8	18.8	25.6	16.9	24.6	19.3	18.2		41.1	24
38	cow	mt						44.7	18.8	26	18.3	25.4	19.1	18.9		41.6	24.3
47	cow	mt						48.9	21.2	27.9	19.5	26.3	20.9	19.4	21.9	45.8	27.9
47	cow	mt						50.7	22.3		21.7	29.2	21.5	22		47.6	
21	cow	mt		38	36.7												
21	cow	mt		46.4	46.2												
31	cow	mt		48.7	44.8												
52	cow	pub											20.3				
66	cow	pub											26.4				
47	cow	rad						64.8	36.8								
66	cow	rad						83	43.4		73.2						
52	cow	rad		82.1	43.6					73.7							
21	cow	tib							51.8	36.9							
21	cow	tib							59.5	41.6							
21	duck	cmc	54.7														
21	duck	cmc	54.9														
21	duck	cmc	55.5														
52	duck	cmc	56.2														
58	duck	cmc	56.9														

58	fowl	coracoid	60.5				
52	fowl	coracoid	66				
31	fowl	fem	68.6				
21	fowl	fem	69.3				
21	fowl	fem	78.3				
21	fowl	hum	66.1				
58	fowl	hum	66.5				
21	fowl	hum	66.9				
21	fowl	rad	57.4				
58	fowl	rad	57.9				
21	fowl	rad	59				
52	fowl	rad	59.9				
31	fowl	rad	65.4				
52	fowl	rad	67.4				
38	fowl	rad	69.2				
58	fowl	rad	73.7				
31	fowl	scap	65.9				
52	fowl	scap	73.4				
78	fowl	tib	99.3				
21	fowl	tib	106.8				
58	fowl	tib	108.3				
47	fowl	tmt			13.7	19.6	
21	fowl	tmt	71.6	11.7	12.8		5.9
21	fowl	tmt	75.9	12.7	13.5		5.8
21	fowl	uln	61.3				
21	fowl	uln	62.9				
21	fowl	uln	63.5				
52	fowl	uln	64.1				
31	fowl	uln	65.4				
47	fowl	uln	72.2				

21	fowl	uln	73.5									
21	fowl	uln	73.9									
52	fowl	uln	74.1									
58	fowl	uln	79.4									
58	fowl	uln	79.9									
52	goose	cmc	83.8									
21	goose	cmc	87.3									
47	goose	cmc	88.3									
52	goose	cmc	91.3									
52	goose	cmc	91.7									
52	goose	cmc	92.3									
21	goose	cmc	93.5									
52	goose	cmc	94									
52	goose	cmc	95.3									
52	goose	cmc	96.1									
52	goose	cmc	98.9									
21	goose	coracoid	75									
21	goose	hum	151.5									
31	goose	hum	168									
58	goose	rad	140									
21	goose	rad	151.4									
21	goose	rad	154									
58	goose	scap	354		13.1					9		
58	goose	tmt	81.4	18.8	19.1		8.1					
58	goose	tmt	82.1	18	19.8		8.4					
58	goose	uln	154									
47	horse	tib	342		95.5	86.5	38.1	32.6	71.7	46.4		
38	pig	ph 1	42.6	18.5	18.8	17.8	16.3	17				
31	pig	ph 1	44	20.2	17.3	15.8	14.5	18.1				
52	pig	hum					33.6		39.3			30.9

6p23

47	pig	hum					34.1					26.4										
52	pig	hum					37.3		44.4			33.4										
58	pig	mc4	70.6	15.8	16.8	12.3																
58	pig	rad		29.8	23.3																	
21	pig	scap	0	26.5	12.4	42	29.5	34.2														
52	pig	tib							29.5	27.6												
21	pig	tib							33.6	31.3												
58	s/g	acet																			26.6	23.4
21	s/g	acet																			27.2	
66	s/g	acet																			29	
58	s/g	acet											7.3								27.5	
21	s/g	acet											8.2								28.1	
58	s/g	acet											6.6								27.1	
58	s/g	ph 1	32.4	11.7	13.4	9	9.3	11.4														
21	s/g	ph 1	32.7	10.5	12.6	8.3	9.1	9.6														
47	s/g	ph 1	33.4	10.7	12.8	8.2	8.4	9.7														
47	s/g	ph 1	33.5	11.1	12.8	8.5	8.8	9.7														
21	s/g	ph 1	33.6	11.2	12.7	8.7	8	9.5														
21	s/g	ph 1	33.6	11.9	13.3	9.2	8.3	10.2														
58	s/g	ph 1	33.8	10.3	12.4	8.3	8.2	9.4														
21	s/g	ph 1	33.8	12	13.5	9.9	9.1	11.7														
21	s/g	ph 1	34	11.6	16.1	8.5	10.1	9.8														
52	s/g	ph 1	34	12.3	13.6	9.9	10.4	11.2														
21	s/g	ph 1	34.1	11.4	13.4	9.6	8.9	11.6														
21	s/g	ph 1	34.2	12.2	13.5	9.8	9	11.2														
21	s/g	ph 1	34.4	12.6	13.9	9.4	10	11.2														
21	s/g	ph 1	34.5	11.8	13.4	9.1	9.2	10.7														
21	s/g	ph 1	34.5	11.9	13.3	9.5	9.5	10.7														
47	s/g	ph 1	35	12.7	13.7	10.4	9.6	11.8														
47	s/g	ph 1	35.3	11.3	14.1	8.6	8.5	10.3														

58	s/g	ph 1	35.6	10.8	12.9	8.5	9.8	10.3				
58	s/g	ph 1	35.8	12.2	14	9.5	10	11				
21	s/g	ph 1	36	12	14.1	9.8	9.8	10.8				
21	s/g	ph 1	36	12.8	14.5	10.6	10.1	12.3				
21	s/g	ph 1	36.2	12.4	14.6	10.3	10.6	12.2				
31	s/g	ph 1	37.5	12.1	14.5	9.4	10.1	10.7				
52	s/g	ph 1	38.6	12.2	14.4	9.4	9.6	11.7				
38	s/g	ast	28	22.9	26.5	18.7	18.3	16.2				
21	s/g	ast	29	23		19.5	18.9	17.8				
58	s/g	ast	29.7	24.6	27.9	19.3	20.2	17				
58	s/g	ph 2	20.5	10.2	11.4	7.7	8.4	8.4				
21	s/g	ph 2	21.9	11.2	12.2	9	9.1	9.1				
52	s/g	ph 2	23.6	11.4	13	8.7	8.4	9.3				
58	s/g	cal			50.4	13.5	13.3					
58	s/g	cal			53	13.6	13.5					
47	s/g	cal			56.8	14	14.5					
21	s/g	cal			56.8	14	16.5					
58	s/g	cal			58.4	14.1	14.2					
21	s/g	cal	0		74.4	17.2	18.9					
21	s/g	ph 3	28.8		9.8		6.2					
47	s/g	fem									19.8	40.2
47	s/g	fem									20.1	46.5
21	s/g	fem									21.9	46.5
58	s/g	fem			33.9	14.4	12.1					
47	s/g	fem			35.9	15.8	13.1	38.2				
47	s/g	hum					24.8					15.1
21	s/g	hum					25.8	19.8	28.1			16.6
21	s/g	hum					26.1	20.4	29.2			17.1
47	s/g	hum					26.2					17.1
21	s/g	hum					26.6	17.5	28.3			17.7

21	s/g	mc		21.5	15												
78	s/g	mc		21.7	15.4												
58	s/g	mc		22.3	16.1												
58	s/g	mc		22.5	15.9												
21	s/g	mc		23.3	17.1												
21	s/g	mc		23.6	16.5			25.7	9.9	15	9.4	14.8	10.2	10.1	9.5	26.7	14.5
47	s/g	mc		23.6	16.6												
21	s/g	mc	68.8	22.4	16.8	14.9	10.3	23.6	11.3	16.1	11.1	15.6	11.6	11.6	9.9	24.8	15.9
21	s/g	mc	92.7	23.4	17	14.1	11.1	25.7	11	16.7	10.3	16.1	10.2	10.2	9.4	27	15
52	s/g	mc	106.5	22.6	15.9	14	10.2	24.5	10.8		10.4		9.7	9.4	8.3	25.8	12.3
58	s/g	mc	107.2	20.6	14.4	12.8	10.3	23.8							9.1	23.9	
21	s/g	mc	110.3			12.3	10.2	23.5	10.9	15.7	10.2	15.2	9.5	8.7	8.8	22.7	13.1
21	s/g	mc	111.6	20.8	15.5	12.4	10.2	23.2	10.9	15.8	10.1	15	9	8.9	8.8	23.2	12.9
21	s/g	mc	112.3	21.2	16.1	13.5	11.5	24.5	10	14.9	9.6		9.8	9.8	8.1	24.5	11.2
21	s/g	mc	112.8	20.4	15.5	11.7	10	22.1	10.2	14.7	9.5	14.2	9.1	8.8	7.7	22.2	11.8
21	s/g	mc	113.5					22.7	10.1	14.7	9.5	14.4	8.9	8.5	8	21.9	13.2
21	s/g	mc	113.8	20.6	15.1												
78	s/g	mc	113.9	22.3	16.1	13.3	10.5	24.9	10.1		9.6		10.2	9.4	9.1	25.1	13
21	s/g	mc	114.2	21.9	14.7	12.6	9.4	24.2	10.4	15.6	9.7	15	9.5	9.2	7.3	24.2	12
21	s/g	mc	114.6	21.9	14.6	12.4	9.7	24.3	10.4	15.7	9.5	14.9	9.6	9.2	7.3	24	12
21	s/g	mc	115.9	22.6	16.2	13.1	10.9	24.6	10.4	15.8	9.7	15.1	9.6	8.7	8.8	23.9	12.8
58	s/g	mc	116	23.1	16.6	13.6	11.2	25.2							7.9	24.3	12.1
21	s/g	mc	117	21.8	16.3	13.2	11.6	24.7	10	15.8	9	15.1	9.7	9.5	8.2	23.9	12.8
21	s/g	mc	120.5	21.5	15.2	13.1	10.8	24.8	10.4	15.6	9.8	15.1	10.1	9.7	8.9	23.6	13
21	s/g	mc	121.5	21.8		12.5	10.1	23.3	10.7	15.3	10	14.9	9.9	9.7	8.6	23.9	12.5
21	s/g	mc	122.3	23.7	16.6	14.4	10.7	26	10.9	15.8	10.2	15.4	10.8	10.4	9.3	26.8	13.8
58	s/g	mc	123.1	21.1	15.1	13.4	10.5	25.2	10.9	16.3	10.8	15.8	9.6	8.8	8.7	23.1	12.6
58	s/g	mc	124.3	22.4	16.5	14.4	12	26.1	11.1		10.1		10.2	9.6	8.8	24.5	12.2
52	s/g	mt						21.3	8.2	13.8	8	13.4	9	8.6	8	20	11.3
47	s/g	mt						22.6	10.1				9.9	8.8	8.9	22.1	

<93>

6p27

58	s/g	mt						23.1	0						9.9	22.7	12.4
31	s/g	mt						23.7	10.2		9.8	15	10	8.9	9.8	23.2	13.5
21	s/g	mt						23.9	10.5	16.2	9.8	15.3	9.8	9.2	9.7	23	13.2
21	s/g	mt						24	9.5	15.5	9.6	14.9	10.3	9.7	10.5	24.7	14.6
47	s/g	mt						24.1	10	0	9.7		10.3	9.3	9.6	22.5	12.4
21	s/g	mt						24.2	9.7	15.8	9.6	15	10.5	9.3	11.1	24.3	13.8
21	s/g	mt						24.2	11.1	16	10.5	15.5	10.3	9.2	11.6	23.8	14.3
31	s/g	mt						25.1	10.9	17.3	10.4	16.6	10.5	9.3		25	14.3
21	s/g	mt		17.7	18.4												
31	s/g	mt		17.9	17.8												
52	s/g	mt		18.1	17.5												
21	s/g	mt		18.1	18												
21	s/g	mt		18.2	18.6												
66	s/g	mt		18.6	18.3												
58	s/g	mt		19.2	18.3												
21	s/g	mt		19.3	19.3												
47	s/g	mt		19.4	19.1												
21	s/g	mt		19.5	18.7												
31	s/g	mt		19.9	19.3												
31	s/g	mt		20	20.4												
21	s/g	mt		20.1	19.3												
66	s/g	mt		20.8	15.2												
21	s/g	mt		21.1	20.5												
21	s/g	mt	105.8	19.6	19.2	11.3	12.7	23.8	9.7		9.4		10.8	8.3	7.9	22.6	11.6
47	s/g	mt	114.7	19.6	18.3	10.1	10.9	21.7	8.8	14.2	8.5	13.3	9.5	8.8	8.8	21.7	11.8
21	s/g	mt	118	19.6	18.5	11	11	22.7	8.5	14.1	8.1	13.3	10	9.3	8.4	22.5	11.6
47	s/g	mt	119.1	17.5	17	9.3	10.3	19.9							8.3	20.1	12.1
58	s/g	mt	122.1	20.1	18.9	10.2	12.7	22.9	9.4	15.5	9.1	14.6	10.1	8.9	9.4	22.4	12.7
21	s/g	mt	122.9	18.4	18.3	10.9	13.2	22.1	9.7		9.8	14.1	9.7	8.6	8.7	21.7	12.2
21	s/g	mt	125.2	19.7	18.2	10.3	11.8	23.3	9.7	15.6	8.9	14.4	9.9	8.9	8.9	22.9	12.8

< 94 >

6p28

58	s/g	mt	125.4	19.5	18.4	10.6	12	22.8	9.6	15.9	9.6	15.3	9.5	8.6	8.4	21.3	12					
52	s/g	mt	125.9	19.5	19.6	12.1	13.3	23.9	9.7		9.7		10.4	9.7	9.9	23.6	13.6					
21	s/g	mt	127.2	18.5	17.8	10	11.4	21.6	9.7	14.8	9.2	13.8	8.7	8	8.9	21.1	12.6					
261	s/g	mt	128.6	19.7	19.5	11.8	12.1	23.1	9.8		9.6		10.1	9.2	10.1	23	12.9					
21	s/g	mt	129.9	19.1	18.3	10.7	11.2	22.2	9.9	15.5	9.3	14.5	9.7	9	9.3	22.1	12.1					
21	s/g	mt	131.6	19.8	20	12.6	13.7	23.6	9.1		8.8		10.6	9.6	9.6	23.6	13.9					
66	s/g	mt	132.6	20.9	19.7	11.7	12.3	24.3	9.8		9.4		10.7	10.2	10.1	23.9	13.6					
21	s/g	mt	133.2	21	19.6	11.9	12.7	25.8	10.1	16.4	9.9	15.5	10.9	10.2	10.3	24.7	12.9					
58	s/g	mt	135	18.9	18.3	10.2	12.4	23.5	9.6	15.7	9.3	15.1	9.8	9	9.5	22	13					
58	s/g	oc																			25.8	22.8
58	s/g	oc											9.4								28.8	
66	s/g	oc											9.7						34.2		27.4	
52	s/g	pub											7.4									
21	s/g	rad						27.5	17.7		24.1											
58	s/g	rad						27.8	18.8													
31	s/g	rad						29.1	19.2		23.9											
47	s/g	rad						29.8	18.7	25.1												
21	s/g	rad				16.6	8.4	26	17.7													
21	s/g	rad		30.4	15.7	16.5	8.3															
52	s/g	rad		30.7	15.6	17.2	7.8			27.9												
58	s/g	rad		30.8	15.2	18.2	7.8			27.5												
58	s/g	rad		30.9	15.5	17.9	9			28.5												
21	s/g	rad		31.2	15.6	17.8	8.8															
47	s/g	rad		31.9	16.2					29.2												
31	s/g	rad		32.2	16.6	17.5	8.9															
21	s/g	rad		32.4	16.7	17.8	8.7															
52	s/g	rad		32.7		18.2	9.2	30.1	20.1		26											
21	s/g	rad	140.1	27.3	13.4	14.3	7.9	25.3	16.7	25.3	21.5											
52	s/g	rad	147.9	33.1	17.5	18.9	9	29.9	19.5	30.5	25.5											
47	s/g	rad	179	35.4	19.3	19.2	10.6	31.3	21.1	33.1	29.1											

31	s/g	scap		19	10.2	33.8	21.1	27		
58	s/g	scap		19.2	9.3	32	18.4	24.7		
58	s/g	scap		19.5	10.9	31.4	19.5	24.5		
52	s/g	scap		19.7	10.4	32.2	20.8	24.9		
52	s/g	scap		19.8	11.1	31.9	20.1	25.4		
58	s/g	scap		19.9	9.9	32.1	19.7	24.6		
21	s/g	scap		20.2	11.6					
21	s/g	scap		20.6	9.5	31.5	19.4	25.5		
66	s/g	scap		21.6	10.8	35.3	20.9	27.1		
31	s/g	tib							22.9	18.1
21	s/g	tib							24	19.6
21	s/g	tib							24.1	19
21	s/g	tib							24.7	19.5
47	s/g	tib							25.3	19.7
21	s/g	tib							25.5	19.5
52	s/g	tib							25.6	19
21	s/g	tib							25.6	19.3
21	s/g	tib							26	20.2
21	s/g	tib							26.1	19.8
58	s/g	tib							26.2	20.1
21	s/g	tib							26.3	20
21	s/g	tib							26.4	19.6
31	s/g	tib							26.4	20.7
52	s/g	tib							26.5	20.4
47	s/g	tib							26.9	20.8
58	s/g	tib							27.5	20.3
21	s/g	tib							28	21.6
58	s/g	tib	192						26.6	19.8
31	s/g	uln	33.3	15		18.9				
47	s/g	uln	38.7	16.7		23.2				
21	woodcockhum		54.5							

Leicester, The Shires

Little Lane: Medieval Deposits

Appendix 7: Grant's wear stages of individual mandibular teeth.

Cattle

	Grant's Wear Stage															
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
Phase 10.1																
dp4	1													1		
P4	1		1													
M1										2	1	1		2		
M3						1		1								
Phase 11.1																
dp4																
P4			1													
M1										1						
M2					1		1									
M3							3	1								
Phase 12.1																
dp4																
P4	1															
M1								1		1		2	1			
M2							2									
M3	1	2														
Phase 12.2																
dp4		1	1							1						
P4	1						1									
M1							4			3						
M2		1		1	1	1										1
M3							1					1	1			
Phase 13.1																
dp4		5	1							1						
P4										1						
M1							1				1	2	1		1	
M2					1					1			1			
M3					1		1									

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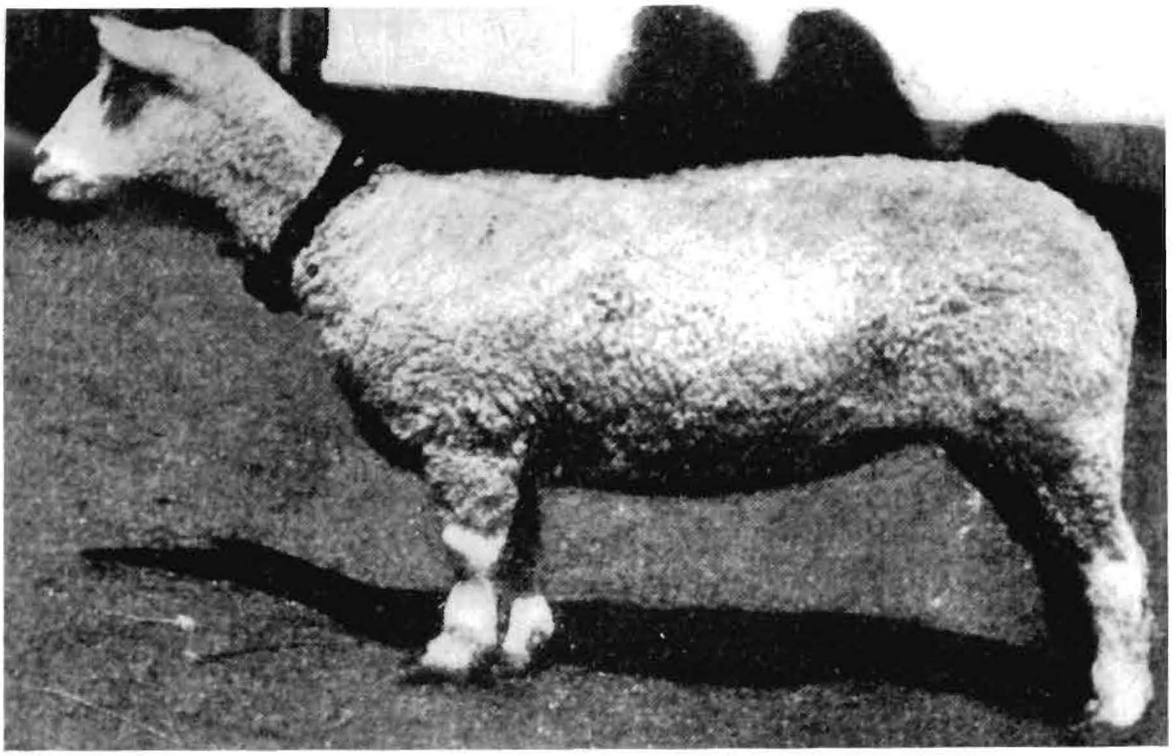
Appendix 7: Grant's wear stages of individual mandibular teeth

Sheep/Goat

	Grant's Wear Stage													
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Phase 10.1														
dp4							2	2					1	1
P4						1	1							
M1		1				1	6	3					1	
M2			2	1	2		5			1				
M3				1	1	1	5							
Phase 11.1														
dp4														
P4														
M1							1							
M2					1	1	1							
M3			1											
Phase 12.1														
dp4		1												
P4	1				1		2	1		1				
M1							3			1	2		1	
M2							6	1						
M3	1				1		5							
Phase 12.2														
dp4							1							
P4						1	1							
M1			1	1			3							
M2				1	4		3							
M3	1		1				2							
Phase 13.1														
dp4		1					1					1		
P4							3	10		1	2			
M1		1			1		7	4		2	2	3	5	
M2				1	1	2	17	3		2	1			
M3			2	1	6	1	15							

PLATE 1

bones



The Ancon Sheep: a short-legged mutant form which is recessive in inheritance.

The Ancon Sheep: a short-legged mutant form which is recessive in inheritance.

Leicester, The Shires

Little Lane: Medieval Deposits

Appendix 7: Grant's wear stages of individual mandibular teeth

Pig

	Grant's Wear Stage													
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Phase 10.1														
dp4					1									
P4														
M1		1				1								
M2			2											
M3	1	1												
Phase 11.1														
dp4														
P4														
M1														
M2	1													
M3														
Phase 12.1														
dp4	1							1						
P4														
M1			1				1							
M2			1											
M3														
Phase 12.2														
dp4				1										
P4	1	2												
M1				3		1	1							
M2	3	1	1											
M3														
Phase 13.1														
dp4	2			1	2	1				2	1	1		
P4	1													
M1	5	2	2			1								
M2	1	1	1											
M3		1									1			