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Medieval and early post-medieval horse bones from Market Harborough, Leicestershire, England, U.K.

Ian L. Baxter

Leicestershire Archaeological Unit, Museum Annex, 116 Humberstone Drive, Leicester LE5 0RD, U.K.

Summary

Two assemblages of horse bones from Market Harborough—one medieval, the other post-medieval—are described in relation to the known historical background of the town and its place in the post-medieval horse trade.

Introduction

The town of Market Harborough is situated in the extreme south of the county of Leicestershire near the border with Northamptonshire. Market Harborough is first mentioned in documentary sources in the Pipe Roll of 1176-7 which records the Sheriff rendering eight-and-a-half marks from Great Bowden and seven marks from Hauerberga (OE *hæfera beorg*: 'the hill where oats grew'). At the time of the Norman Conquest the manorial centre was at Great Bowden, with Harborough merely part of the Great Bowden field system. The similar contributions recorded in the Pipe Roll suggest a rapid development of the town, which is assumed to be a planned creation because of its proximity to the River Welland crossing point on the Leciester-Northampton road. By 1179-80 it held a separate manor but without its own field system.

The foundation charter for a market has unfortunately not survived, but this was probably the reason for the town's creation. A Monday market is mentioned at Market Harborough in 1219. The surnames of merchants in a 1327 subsidy list suggest that the population was recruited from amongst the freemen of neighbouring towns. One hundred and thirty-three people, including fifteen craftsmen, fourteen artificers, five merchants and eight victuallers, are listed in the poll tax returns of 1381. A bridge crossing the River Welland is mentioned in the Close Rolls of 1228 but it is not known if a bridge existed prior to the town's inception. There is evidence to suggest changes in the course of the river between the Middle Ages and the present time, with the original course closer to the Kettering Road [St Mary's Road] as it entered the town.

Until 1991 no controlled archaeological investigation had ever been undertaken in the town. Amongst early post-medieval buildings of particular interest is the Peacock Hotel, fronting St Mary's Road. During re-furbishments in 1954-5, excavations beneath the floor revealed hearths and a pebbled surface associated with medieval pottery (Cooper, unpublished a, 3-5). A series of evaluation excavations were undertaken by Leicestershire Archaeological Unit at Market Harborough in the summer of 1991 prior to proposed redevelopment. More extensive excavations in selected areas followed in September 1991 and concentrated in the yard and car park area of the Peacock Hotel (Fig. 18). Archive reports and reports to the developers on these excavations and a full animal bone report are held by Leicestershire Archaeological Unit (Cooper, unpublished a and b; Baxter, unpublished). Amongst the more remarkable finds were significant deposits of horse bones in an excavated section of ditch F4031 in Trench 4 and pit F2031 in Trench 2 (Figs. 19 and 20). It is these remains which form the subject of the present paper.

Animal bone from ditch F4031

Ditch F4031 extended across the width of Trench 4 on a NE-SW alignment (Fig. 20). It had a shallow U-shaped profile and was 2.00 m wide and 0.59 m deep. The primary fill [909] produced 12th/13th century pottery. Its secondary fill, from which most of the bone was recovered, contained an abundance of

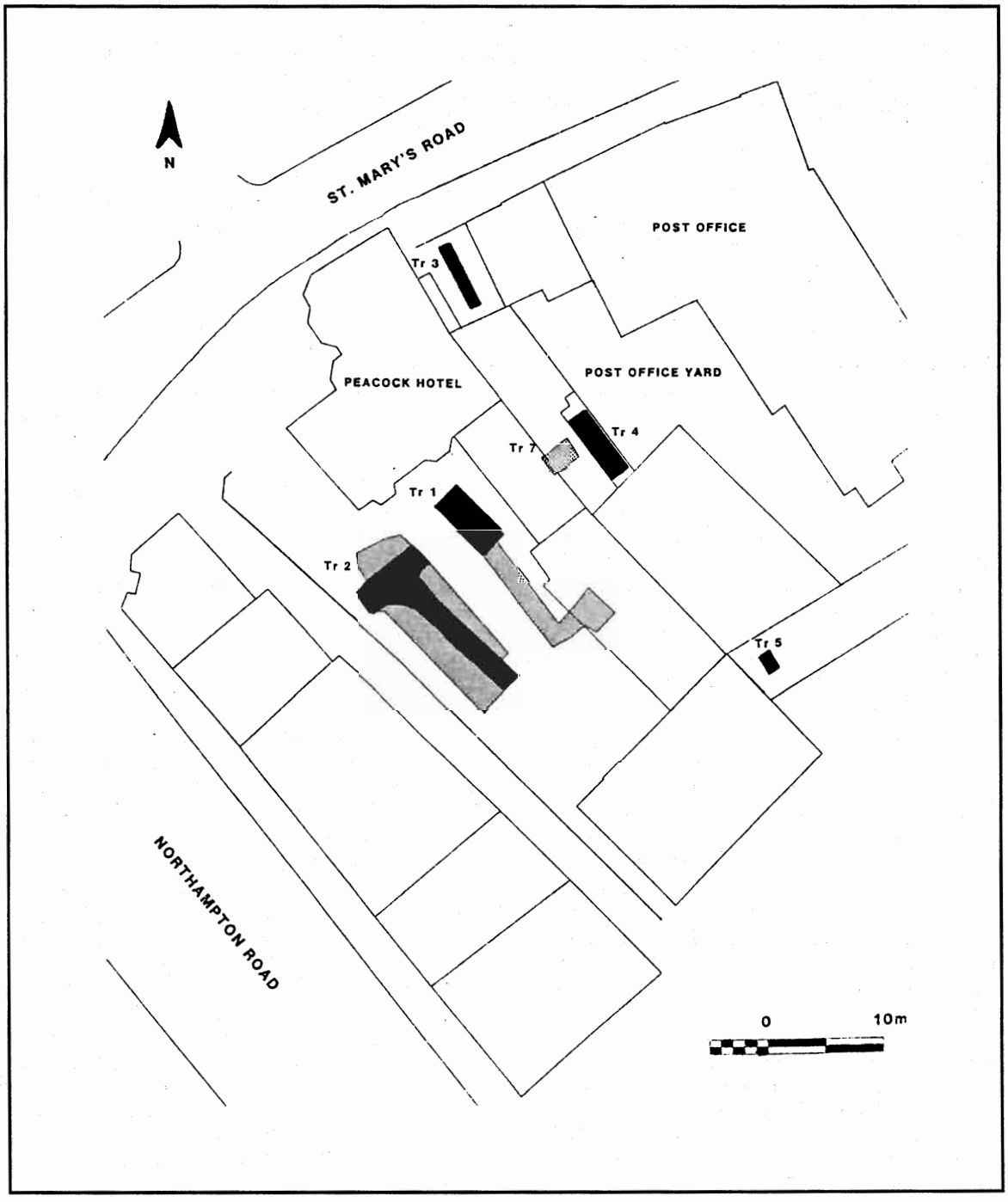

Figure 18. Location map for Trenches 1-5 and 7 (blocked areas indicate evaluation trenches).

12th/13th century pot together with two sherds of 16th century pot. These later sherds may have been intrusive, although an unidentified re-cutting of the ditch is possible. Ditch F4031 was cut into alluvial deposits of yellowish brown silty clay [913] and overlain by a mix of further alluvial and refuse deposits [907] that seem to have accumulated over a period of several hundred years (Cooper, unpublished a, 10-11). Part of the same ditch was also found in Trench 7 (F7003), where pottery recovered from its fill suggested backfilling in the 13th/14th centuries. Only a small portion (1.00 x 0.60 x 0.30 m deep) was located, in the south eastern corner of the trench (Cooper, unpublished b, 15).

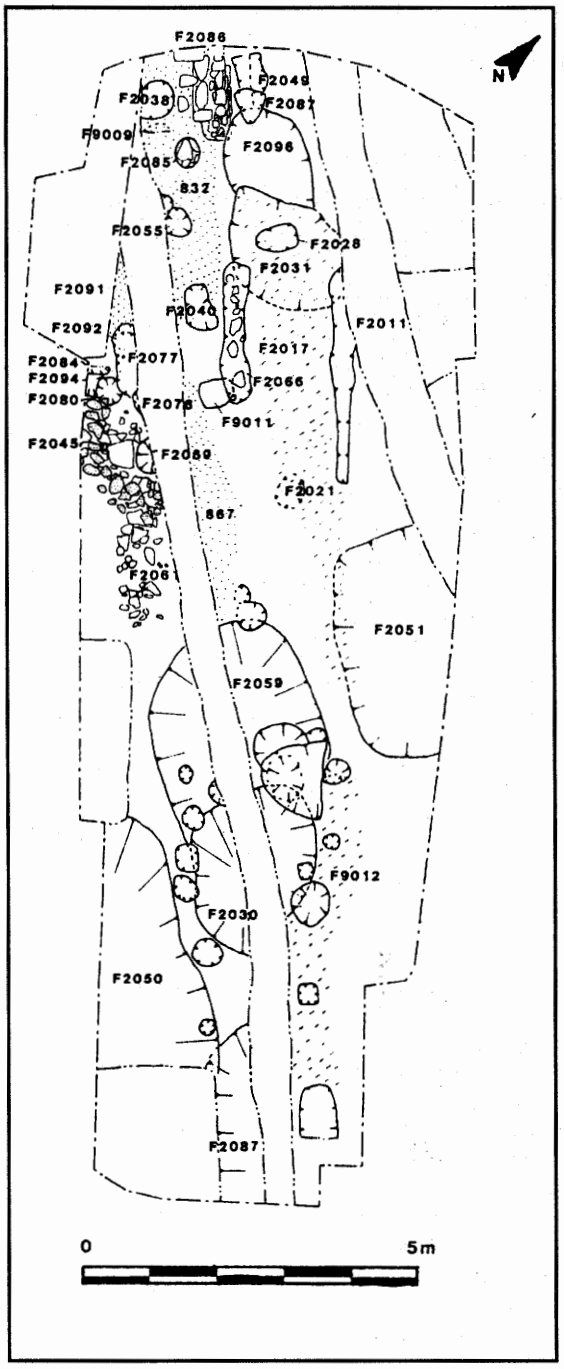

Figure 19. Trench 2 plan showing later medieval features.

Animal bone from F4031 was dominated by cattle fragments (over 68% of fragments identified to species) including 13 measurable horn cores and numerous horn core fragments. These were from predominantly adult and old adult animals and came from short-horned beasts (Armitage 1982). From the site as a whole, 70% of identifiable cattle fragments

Species	Feature 2031	4031	Total
Horse	89	28	117
Cattle	109	119	228
Sheep/Goat	21	18	39
Pig	7	7	14
Hedgehog	-	1	1
Crow	2	-	2
Fowl	1	-	1
Large mammal	37	5	42
Medium mammal	19	5	29
Indeterminate	166	118	284
Total	451	301	757

Table 16. Numbers of fragments per taxon (fused and articulating elements counted as 1).

Species	Feature 2031	4031	Total
Horse	8	3	11
Cattle	12	7	19
Sheep/Goat	2	1	3
Pig	2	1	3
Hedgehog	-	1	1
Crow	1	-	1
Fowl	1	-	1
Total	26	13	39

Table 17. Minimum Number of Individuals (based on the most numerous non-reproducible elements).

were from the cranial region (this includes a large number of frontal sinus fragments excluded from Table 18).

The sheep/goat bones from F4031 were mostly cranial and fore limb elements (Table 18).

Twenty-eight horse fragments were recovered from F4031 [908] representing 16% of identified bone and the second most numerous species. Fore-limb elements were twice as numerous as bones from any other region of the body (Table 18). No vertebrae, ribs or cranial elements attributable to horse were recovered from F4031, with the exception of one very worn lower 1st Molar from an old animal (cf. Levine 1982). One of the animals had an arthropathic condition of the hind leg in which the 3rd tarsal and metatarsal III were

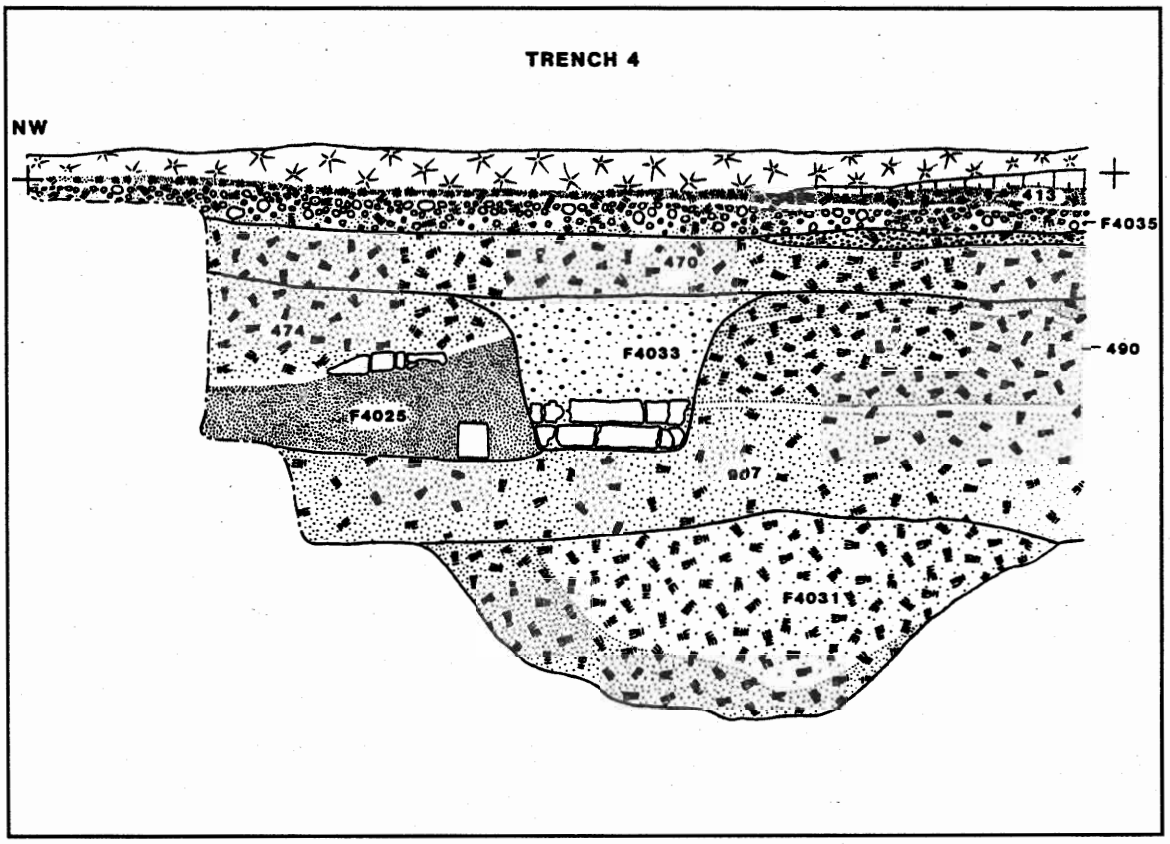

Figure 20. Trench 4 section.

Species and elements	F2031	F4031
Horse		
Cranium, maxilla, mandible	0.0	0.0
Vertebrae	0.0	0.0
Scapula, humerus, radius, ulna	13.8	17.7
Carpals	7.8	0.0
Mc II, III, IV	6.4	0.0
Pelvis, femur, patella, tibia	8.7	6.3
Calcaneum, astragalus, tarsals	14.7	1.3
Mt II, III, IV	8.3	3.8
Phalanx I, II, III	7.3	8.9
Cattle		
Horn core, cranium, maxilla, mandible	13.3	27.8
Vertebrae	0.5	0.0
Scapula, humerus, radius, ulna	3.2	5.1
Carpals	0.0	0.0
Metacarpus	0.0	0.0
Pelvis, femur, patella, tibia	4.6	3.8
Calcaneum, astragalus, tarsals	0.5	1.3
Metatarsus	0.5	2.5
Phalanx I, II, III	0.0	1.3
Sheep/Goat		
Horn core, cranium, maxilla, mandible	2.7	5.1
Vertebrae	0.5	0.0
Scapula, humerus, radius, ulna	3.7	6.3
Carpals	0.0	0.0
Metacarpus	0.0	2.5
Pelvis, femur, patella, tibia	3.7	2.5
Calcaneum, astragalus, tarsals	0.0	0.0
Metatarsus	0.0	0.0
Phalanx I, II, III	0.0	1.3

Table 18. Frequency of skeletal elements represented for main domestic species (%). (Excludes non-diagnostic frontal sinus fragments and isolated teeth.)

fused together with some new bone formation (exostosis). The joint surfaces are unaffected and this example is referrable to spavin, a non-arthritic equine joint disorder affecting the hock (Baker and Brothwell 1980, 117-8). Two horse radius fragments have been trimmed by

Figure 21. Pit F2031 with elements of horse and cattle limbs in anatomical relation.

Limb A: rt. hind leg	Limb C: lt. hind leg	Limb E: rt. fore leg	3rd carpal	Central tarsal }
			Metacarpal II	1st/2nd tarsal }f
	Tibia	Metacarpal III	Metacarpal III	3rd tarsal }
Femur	Astragalus	Metacarpal IV	Metacarpal IV	4th tarsal
Tibia	Central tarsal	Phalanx I	Phalanx I	Metatarsal II
Calcaneum	3rd tarsal	Phalanx III	Phalanx II	Metatarsal III
Astragalus	4th tarsal		Distal sesamoid	Metatarsal IV
Central tarsal	Metatarsal III		Phalanx III	Phalanx I
3rd tarsal		Limb F: lt. fore leg		Phalanx II
4th tarsal				Distal sesamoid
Metatarsal III		Humerus		Phalanx III
Metatarsal IV	Limb D: hind leg	Radius+ulna	Limb G: rt. hind leg	
		Radial carpal		
Limb B: rt. fore leg	Phalanx I	Intermediate carpal		
	Phalanx II	Ulnar carpal	Tibia	
Humerus	Distal sesamoid	Accessory carpal	Calcaneum	
Radius+ulna	Phalanx III	2nd carpal	Astragalus	

Table 19. Articulating horse skeletal elements from F2031; f—fused.

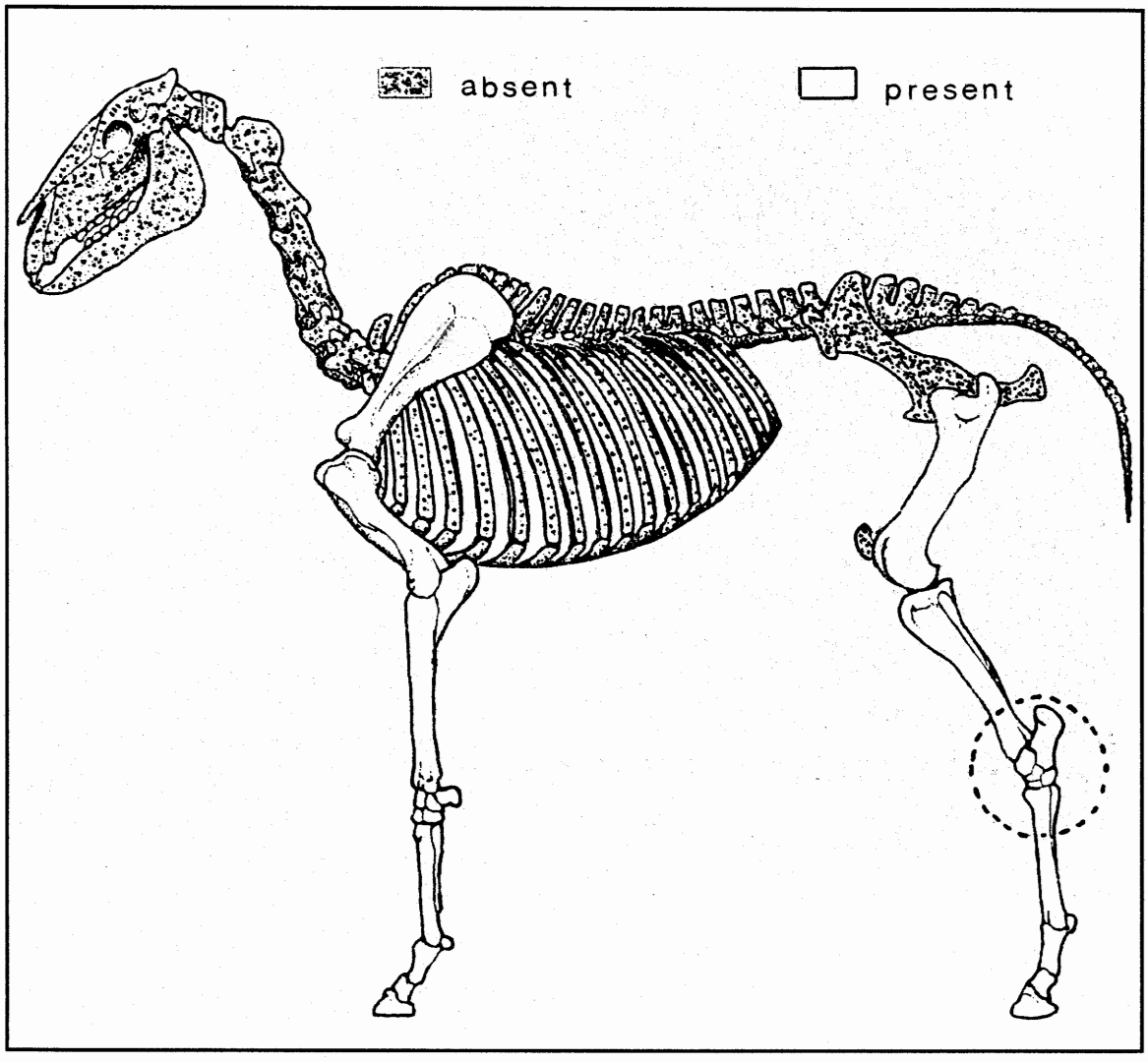

Figure 22. Horse skeletal elements from F2031. Circle indicates locus of arthropathic conditions.

(A) Articulating elements from F2031 [241]

Limb	Skeletal element	GL (mm)	GLl (mm)	Ll (mm)	Withers ht. (cm)
A	r Tibia	-	-	335	146.1
	r Mt III	277	-	270	143.9
B	r Humerus	-	298	-	145.0
	r Radius	354	-	338	146.7
C	l Mt III	279	-	268	142.8
E	r Mc III	231	-	221	141.7
F	l Radius	346	-	332	143.7
	l Mc III	233	-	224	143.6
G	r Mt III	273	-	264	140.7

Data for F2031 (n = 16): mean = 141.0; range: 131.7-146.7; SD = 3.97

(B) Isolated elements

F/C	Skeletal element	GL (mm)	GLl (mm)	Ll (mm)	Withers ht. (cm)
2031/241					
	l Radius	339	-	325	140.7
	l Radius	329	-	315	136.7
	r Mc III	226	-	217	139.1
	l Mc III	226	-	216	138.5
	r Tibia	334	-	302	131.7
	r Mt III	269	-	260	138.6
	l Mt III	266	-	257	137.0
4031/908					
	r Radius	325	-	312	135.4

Table 20. Horse withers heights (based on Kiesewalter 1888 in von den Driesch and Boessneck 1974); F/C—feature/context.

multiple light chops removing the distal ulna and opening the distal anterior shaft (Fig. 26). Both are highly polished and seem to have been used as implements of some kind, possibly wedges (G. C. Morgan, pers. comm.). Only one horse bone had been obviously butchered, a left distal humerus showing transverse cut marks on the medial condyle and a vertical cut mark next to the lateral condyle.

Animal bone from pit F2031

Pit F2031 situated in the car park area of the Peacock Hotel in Trench 2 was completely excavated (Fig. 19). This was sub-square in plan, measuring 1.60 x 1.60 x 0.45 m in depth and contained a single fill [241]. Pottery from [241] was mainly of 13th/14th century date, though a small number of 15th/16th century sherds were also recovered. A 14th century copper alloy belt buckle of 'Jews Harp' type was also found in the fill of the pit which is probably best dated to the late 15th/early 16th centuries (Cooper, unpublished b, 12).

As with ditch F4031, cattle fragments were the largest component of the animal bones in the fill of pit F2031 (over 47%). Similarly, head elements predominated, followed by elements from both fore- and hind legs (Table 18). A total of 16 measurable horn cores together with a number of horn core fragments were recovered. The horn cores from F2031 were from short-horned beasts, but differ from the F4031 assemblage in containing a much higher proportion of young adult and sub-adult animals including a frontal fragment with a horn core bud (Baxter, unpublished).

At the base of pit F2031, amongst the articulating elements of from five to seven horse legs, were found the fore- and hind limb elements of at least one small bovine. These comprised a left humerus and articulating radius+ulna and a right femur and articulating tibia. Calculations based on the multiplication factors of Matolcsi (cited by von den Driesch and Boessneck 1974) give withers heights of 104.5 cm and 107.6 cm from the radius and tibia respectively. Apart from some peripheral dog gnawing, these four bones are complete and show no signs of butchery.

The sheep/goat and pig bones from F2031 were unremarkable and, together with the single bone of domestic fowl, seem to be domestic food refuse. The corvid bones consisted of a right coracoid and humerus from a single individual. The humerus had tooth puncture marks at its distal end, characteristic of a cat. From their size, these bones could belong to either carrion crow (*Corvus corone* L.) or rook (*C. frugilegus* L.). Soil samples taken from [241] produced a few more sheep/goat fragments (including a what may have been a goat horn core fragment), a frog or toad tibio-fibula, five phalanges probably belonging to domestic dog and eleven fragments of dog coprolite containing bone fragments (Baxter, unpublished). Bone from the samples is not included in Tables 16-18.

Horse fragments made up 39% of the bones recovered from F2031, and included sixteen complete long-bones, over half of which came from the articulating elements of between five and seven legs (Tables 16 and 20). Whole limbs seem to have been mostly deposited at the bottom of the pit. It was not possible at the time to relate any of the scapulae to particular limbs, but in at least some cases these were certainly attached at the time of deposition. The only butchery noted was a depression, probably the result of a heavy blow with a blunt instrument, on a proximal humerus fragment just below the articulation on the medial side (Limb B), and a radius shaft fragment with multiple light chop marks on the posterior surface resembling those on the implements from ditch F4031 mentioned previously. Canid gnaw marks were far more frequent and on the complete limbs occurred particularly on projecting areas of ligament attachment, such as the ulna olecranon, femur trochanter major, and calcaneum tuber calcis.

A minimum number of eight horses was represented in the fill of pit F2031 (based on left scapula fragments) and at least five limbs were articulated when deposited (Tables 17 and 19). Apart from one very worn lower 3rd molar, no skeletal elements from the head, vertebral column, pelvis or ribcage were found in F2031 (Fig. 22).

Age and size of the horses

As noted above, the only teeth recovered from both F4031 and F2031 belonged to aged animals and all of the limb bones had fused epiphyses. About half of the animals represented were afflicted with arthropathic joint disorders affecting the hock joint of the hind leg associated with heavy work and advanced age (see below). The horses represented in these deposits were adult and old adult animals.

Humerus

Feature/context	side	GL	GLl	GLC	Bp	SD	BT	DT	Bd
2031/241	r	-	298.0	287.0	-	34.0	74.0	35.0	79.0
	l	-	-	-	-	34.0	78.0	40.0	82.0
	l	-	-	-	-	-	73.0	34.0	80.0
	l	-	-	-	-	32.0	70.0	34.0	72.0
	r	-	-	262.0	-	30.0	69.0	34.0	71.0
	l	-	-	-	-	37.0	76.0	39.0	79.0
	l	-	-	270.0	-	34.0	69.0	36.0	79.0
	l		-	-	84.0	-	-	-	-

Radius

Feature/context	side	GL	Ll	BFp	Bp	SD	CD	Bd
2031/241	r	354.0	338.0	74.0	82.0	39.0	115.0	74.0
	l	346.0	332.0	79.0	84.5	39.0	115.0	78.0
	l	339.0	325.0	72.5	79.5	38.0	115.0	77.0
	l	329.0	315.0	-	77.0	37.0	110.0	73.0
	l	-	-	-	-	-	-	72.5
4031/908	r	325.0	312.0	70.0	79.0	38.0	105.0	73.5

Radius and ulna

Feature/context	side	GL1
2031/241	l	402.0

Ulna

Feature/context	side	LO
2031/241	l.	79.0

Carpals

Feature/context	side	GB radial carpal	GB 3rd carpal
2031/241	l	42.0	44.0
	l	42.0	44.0

Metacarpal III

Feature/context	side	GL	Ll	Bp	SD	Bd
2031/241	r	231.0	221.0	50.0	33.0	48.0
	l	233.0	224.0	52.0	33.0	51.0
	l	226.0	217.0	52.0	33.0	48.5
	r	226.0	216.0	-	-	50.0
	l	-	-	44.0	30.0	-

Femur

Feature/context	side	GL	GLC	Bp	SD	CD	Bd
2031/241	r	-	357.0	-	41.0	150.0	92.0
	r	-	334.0	-	39.0	135.0	-

Table 21 (above, opposite and page 74). Equine measurements (based on von den Driesch 1974).

Tibia

Feature/context	side	GL	Ll	Bp	SD	CD	Bd
2031/241	r	-	335.0	-	41.0	125.0	73.0
	l	-	-	-	43.0	125.0	80.0
	r	-	-	-	41.0	120.0	73.0
	r	-	-	-	38.0	115.0	74.0
	r	334.0	302.0	-	37.0	110.0	71.0

Calcaneum

Feature/context	side	GL	GB
2031/241	r	-	51.0

Astragalus

Feature/context	side	GB	GH	LmT	BFd
2031/241	r	60.0	55.0	56.5	47.0
	l	63.0	61.0	64.0	53.0
	r	65.0	59.0	56.0	50.0
	r	61.0	60.0	62.0	50.0

Tarsals

Feature/context	side	GB Central tarsal	GB 3rd tarsal	GB 4th tarsal
2031/241	r	49.0	47.0	31.0
	l	53.0	49.0	38.0
	r	-	-	37.0

Metatarsal III

Feature/context	side	GL	Ll	Bp	SD	CD	Bd
2031/241	r	277.0	270.0	46.0	31.0	102.0	49.0
	l	279.0	268.0	53.0	32.0	100.0	49.0
	r	273.0	264.0	50.0	30.0	100.0	47.5
	r	269.0	260.0	48.0	29.0	100.0	-
	r	-	-	-	29.0	95.0	45.5
	l	266.0	257.0	-	32.0	95.0	49.0
4031/908	r	-	-	-	27.0	90.0	-
	l	-	-	47.0	25.0	85.0	-

Phalanx I

Feature/context	GL	Bp	SD	Bd
2031/241	83.0	52.0	38.0	53.0
	89.0	54.0	33.0	46.0
	89.0	58.0	36.0	52.0
	81.0	51.5	35.0	49.0
	-	59.0	35.5	-
	86.0	54.0	35.0	47.0
	77.0	51.0	35.5	44.0
4031/908	83.0	55.5	34.0	-
	86.0	56.5	35.0	49.5

Phalanx II

Feature/context	GL	Bp	SD	Bd
2031/241	49.0	55.0	46.0	50.0
	48.0	55.0	47.0	52.0
	49.0	54.0	43.0	47.0

Distal sesamoid

Feature/context	GB
2031/241	52.3
	50.0
	47.0

Phalanx III

Feature/context	GL	GB	Ld	HP
2031/241	71.0	78.0	56.5	43.0
	68.0	80.0	-	-
	-	-	55.5	42.0
	62.0	75.0	52.0	39.0

Withers heights of the horses represented in F2031 range between 131.7 cm and 146.7 cm with a mean of 141.0 cm or 14 hands (Table 20). The more limited evidence from measurable bones in F4031 indicates animals smaller, on average, than those represented in pit F2031 (Tables 20 and 21). The mean height for the F2031 horses is identical to that for the 18th century horse bones from Witney Palace in Oxfordshire (Wilson and Edwards 1993, 48). Most of the horses from F2031 are at the top of the height-range for medieval horses (Clutton-Brock 1992, 124) and would have been of a size acceptable to the 1537 Act of Henry VIII which sought to improve the quality of English horses (Chivers 1976, 7). If male, they would have been too small to comply with the later Act of 1541 which sought to limit the size of stallions to 15 hands and over in most counties including Leicestershire (*ibid.*, 8). The sex of the horses from the yard of the Peacock Hotel, however, is unknown.

Pathologies

As noted above, a case of spavin from F4031 is represented by ankylosed tarsals and metatarsals. In addition, four hock joints from F2031 had ankylosed elements of varying severity (Figs. 22-5). In one case all the tarsals and metatarsals of the right hind leg were fused together to form a jack spavin (Fig. 25, above). Two other legs both had the central, 1st/2nd and 3rd tarsals fused (Fig. 25, below). A left hock joint had the calcaneum, astragalus, tarsals and metatarsals fused together with considerable pitting of joint surfaces and exostoses (Figs. 23-4). In this case the condition is infective arthritis.

Spavin is principally a disease of the tarsus of the horse, affecting the small bones of the inner lower aspect of the joint and causing exostoses which limit its movement. Spavin is not an osteo-arthritic condition and the joint surfaces are relatively unaffected. The causes are believed to include hereditary factors, inflammation of soft tissue resulting in fibrosis and new bone formation, and severe concussion possibly resulting from faulty conformation, faulty shoeing, heavy work, or working on hard surfaces (Baker and Brothwell 1980, 117-8). Spavin is also documented in recent and archaeological draught cattle (*ibid.* 117, 119).

Infective arthritis, resulting in pitting of the joint surfaces, ankylosis and exostoses of variable extent, is relatively unusual in modern horses, where the causal agent is often *Brucella abortus* which causes infectious abortion in cattle and a severe undulant fever infection in man (Baker and Brothwell 1980, 125). Brucellosis was apparently already present in medieval England (Trow-Smith 1957, 129-30). No evidence of 'ring bone' or of navicular disease was present in the foot elements found in either F4031 or F2031.

The horses with joint disorders would have been fit for slow work once the joint had ankylosed and were presumably worked until they were no longer profitable. Of course, lame mares or entire horses could still be used for breeding purposes as noted by Henry Best in 1641 (cited in Edwards 1988, 31-2). Horses in England were not well treated in the medieval and early post-medieval periods, being worked too strenuously too early in their lives and fed largely on grass. This undoubtedly contributed to their relatively

Figure 23. Fused hock joint from F2031 with infective arthritis: outer aspect.

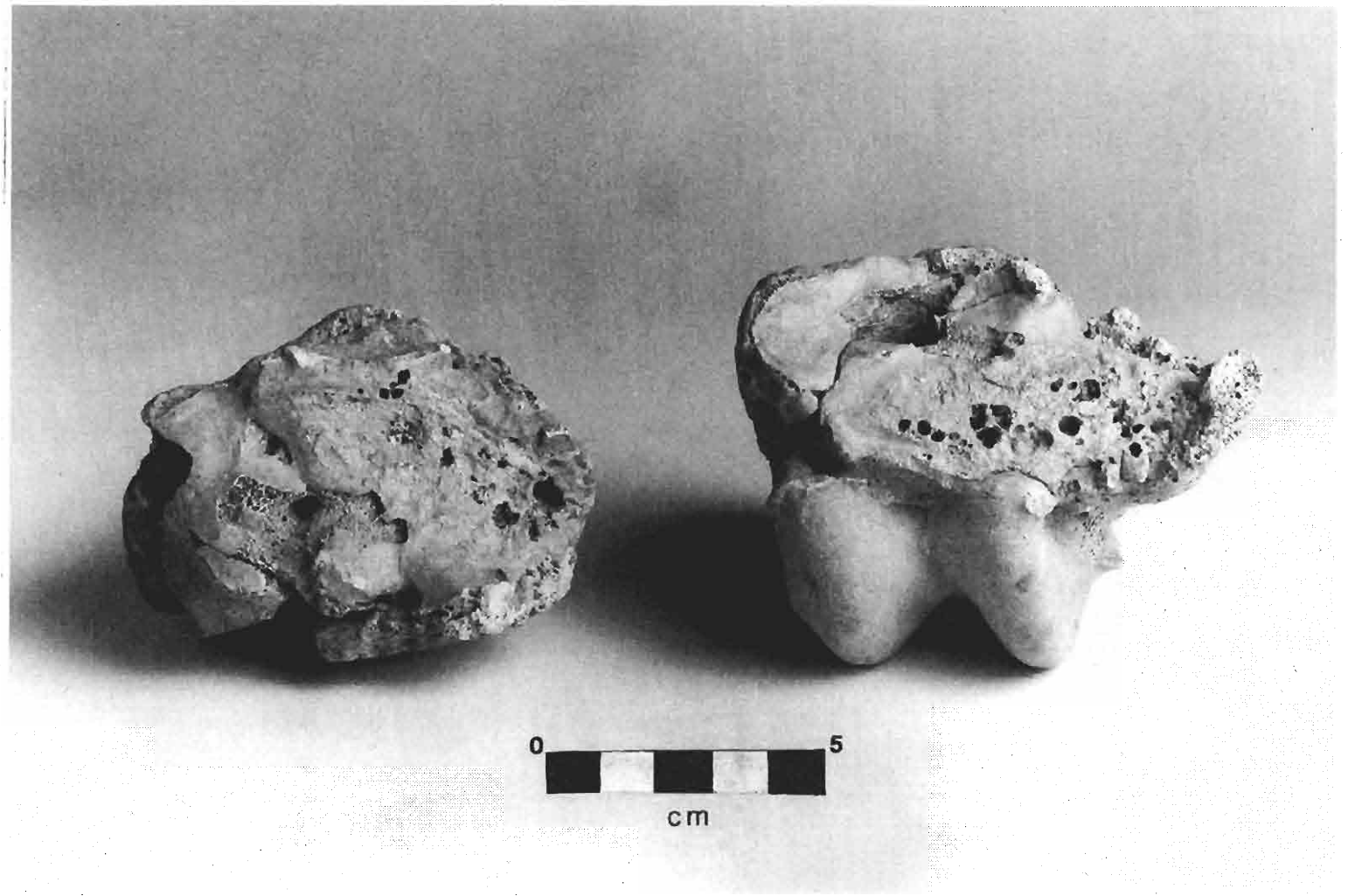

Figure 24. Fused hock joint from F2031 with infective arthritis: joint surfaces.

Figure 25. Spavin in bones from F2031: a fused metatarsal and tarsals (above) and fused tarsals.

small size and inferior performance compared with continental horses (Edwards 1988, 39).

Discussion

Regional parallels for urban accumulations of horse bones can be found from two sites in Bedford (Grant 1979; 1983). In both cases large numbers of cattle horn cores were also found in the same deposits. An early medieval assemblage of 300 horse bones from at least nine animals found in pit F34 at St John's Street, Bedford contained no cranial elements apart from four loose teeth, no phalanges, and only one metapodial. The other limb bones were all well represented, along with carpals, tarsals, patellae and many vertebral and rib fragments. The horse bones showed few butchery marks on them in contrast to the bones of other domestic animals at the site, suggesting that the carcasses were dismembered for easier disposal rather than for the removal of meat (Grant 1979, 105).

The similarities between the deposit in F2031 and the larger Bedford assemblage are striking and they undoubtedly originated from the operation of similar industrial processes. As Wilson and Edwards (1993, 50) have observed, the activities of specialist horse knackers are not well documented in the medieval and

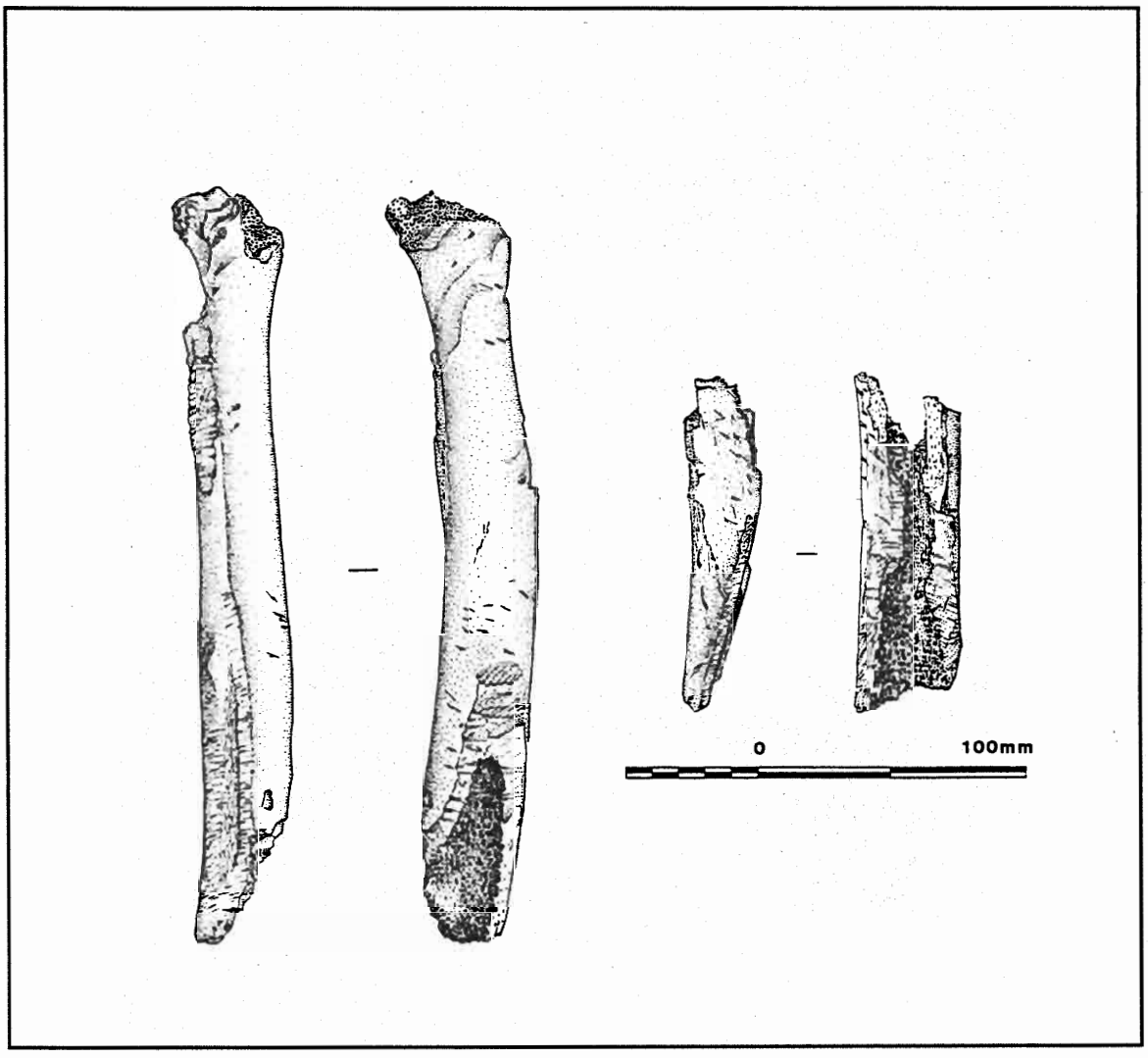

Figure 26. Bone implements from ditch F4031.

earlier post-medieval periods, especially in small towns. The Peacock Hotel site, very near to the probable earlier course of the River Welland, would have been well situated as a locus of the more offensive industrial processes concerned with animal products such as tanning and hornworking. The animal bones from ditch F4031 and pit F2031 would suggest that activities of this sort had a long history in the area.

It is not possible to determine the exact nature of the work to which the horses from the Peacock Hotel yard were put when alive. Horses were used as mounts, pack animals and for draught purposes to pull ploughs, harrows and carts. In Leicestershire the substitution of horses for oxen as a means of draught and traction is discernible in the 1530s and seems to be linked to the growth in the acreage of oats. With the reduction in common land, farmers in the late 16th and early 17th centuries found it necessary to buy in young stock in order to make the best use of their grazing rights (Edwards 1988, 5). By the 1720s, Leicestershire had become the foremost rearing area in the country for horses bred elsewhere, especially those destined for use as coach and dray horses (*ibid.* 35).

In the 17th century, the Duke of Newcastle considered that the East Midlands fairs, and particularly those at Market Harborough and Melton Mowbray in Leicestershire and Northampton and Rothwell in Northamptonshire, were the best for the purchase of good draught horses (*ibid.* 39).

Conclusions

The accumulation of horse bones and cattle horn cores in ditch F4031, dating from the 13th century, and pit F2031, dating from the late medieval/early post-medieval period, at Market Harborough, suggest a long history of industrial activity concerned with animal products in the vicinity of the Peacock Hotel in close proximity to the River Welland. They seem to have been primarily concerned with the production of leather from the hides of cattle and horses and possibly with horn working. The average size of the horses shows signs of increase during this period and the numerous arthropathic conditions to which these animals were subject suggests that they were primarily draught animals. The production of draught horses for the whole of England and particularly London later became centred in Leicestershire with Market Harborough as one of the chief distribution centres.

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References

Armitage, P. L. (1982). *A system for ageing and sexing the horn cores of cattle from British post-medieval sites (17th to Early 18th century) with special reference to unimproved British Longhorn cattle*, pp. 37-54 in Wilson, R., Grigson, C. and Payne, S. (eds.) Ageing and sexing animal bones from archaeological sites. *British Archaeological Reports (British Series)* **109**. Oxford.

Baker, J. and Brothwell, D. (1980). *Animal diseases in archaeology*. London: Academic Press.

Baxter, I. L. (unpublished). A44.1991 Peacock Hotel Car Park, Market Harborough. Report on the animal bones.

Chivers, K. (1976, reprinted 1988). *The shire horse. A history of the breed, the society and the men*. London: J. A. Allen.

Clutton-Brock, J. (1992). *Horse power. A history of the horse and the donkey in human societies*. London: Natural History Museum Publications.

Cooper, L. (unpublished a). An archaeological evaluation in Market Harborough 1991: St Mary's Road and the cattle market. Report to developer. Leicestershire Archaeological Unit. Leicestershire County Council.

Cooper, L. (unpublished b). Archaeological excavations in Market Harborough 1991: the Peacock Hotel yard, St Mary's Road. Report to developer. Leicestershire Archaeological Unit. Leicestershire County Council.

Edwards, P. (1988). *The horse trade of Tudor and Stuart England*. Cambridge: University Press.

Grant, A. (1979). *The animal bones*, pp. 103-7 in Hassall, J., St John's Street. *Bedfordshire Archaeological Journal* **13**.

Grant, A. (1984). *Medieval animal husbandry: the archaeozoological evidence*, pp. 179-85 in Grigson, C. and Clutton-Brock, J. (eds.), Animals and archaeology: 4 Husbandry in Europe. *British Archaeological Reports (International Series)* **227**. Oxford.

Levine, M. A. (1982). *The use of crown height measurements and eruption-wear sequences to age horse teeth*, pp. 223-50 in Wilson, B., Grigson, C. and Payne, S. (eds.), Ageing and sexing animal bones from archaeological sites. *British Archaeological Reports (British Series)* **109**. Oxford.

Trow-Smith, R. (1957). *A history of British livestock husbandry to 1700*. London: Routledge and Kegan Paul.

von den Driesch, A. (1976). A guide to the measurement of animal boneS from archaeological sites. *Peabody Museum Bulletin* **1**. Harvard.

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

Wilson, B. and Edwards, P. (1993). Butchery of horse and dog at Witney Palace, Oxfordshire, and the knackering and feeding of meat to hounds during the post-medieval period. *Post-Medieval Archaeology* **27**, 43-56.

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