

## Post-medieval cattle horn cores from the Greyfriars site, Chichester, West Sussex, England

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### Summary

Osteometric study of an excavated group of horn cores from Chichester, West Sussex, believed to be the discarded waste products from a local butcher's slaughteryard, has revealed considerable heterogeneity in the size and appearance of Sussex cattle in the post-medieval period. This unexpectedly wide variation in what has hitherto been regarded as a geographically isolated (and therefore uniform) population of cattle most probably reflects marked differences in the standards of livestock husbandry as practised by stockmen throughout the region.

### Introduction

Excavations carried out by Alec Down in 1984 at the Greyfriars site, Chichester, uncovered a post-medieval pit (Area D, feature A50) filled with cattle horn cores. The date of this assemblage is suggested by the associated pottery, which is late 16th century (A. Down, pers. comm., 1990). A sample of 118 horn cores from the pit was sent to the author (then working at the Booth Museum of Natural History, Brighton) in order that a detailed study could be undertaken. Apart from being briefly mentioned in the paper by Bruce Levitan (1985), which describes an assemblage of 18th century cattle horn cores found during archaeological investigations at Alphington Street, St Thomas, Exeter, in 1984,

this group of Sussex cattle horn cores has until now remained unpublished. The main purpose of this short paper is therefore to bring this Sussex material to the wider attention of fellow archaeozoologists, and to provide them with sufficient data for use in comparative metrical analyses.

### Methodology

#### (i) Age of the cattle at death:

Using the method of Armitage (1982b, 40-3) the specimens can be classified into three age classes on the basis of size, surface texture and appearance of the bone (Table 1). No juveniles (age class 1: 1-2 years) or old adults (age class 5: over 10 years) were identified.

Table 1. Greyfriars, Chichester, 1984. Cattle horn cores, summary of the attributed ages of the specimens.

Age class	Suggested age range (years)	Number of specimens	% total
1. Juvenile	1-2	0	0
2. Sub-adult	2-3	33	28
3. Young adult	3-7	42	35.6
4. Adult	7-10	43	36.4
5. Old adult	over 10	0	0

(ii) Sex of the horn cores:

Tentative determinations of the gender of the young adult and adult specimens (age classes 3 and 4) were made on the basis of a visual appraisal of the shape, curvature and angle of attachment of the core to the frontal bone, after the method of Armitage and Clutton-Brock (1976, 332) and Armitage (1982b, 43). The following identifications were made: female 22 (25.9%), male 3 (3.5%), castrate 31 (36.5%) and indeterminate 29 (34.1%).

(iii) Size of the cores and classification into the groups small/short horned, short horned, short/medium horned and medium horned:

Measurements taken from the young adult and adult specimens are summarised in Tables 2 and 3, below.

As discussed by Martin (1847, 56) it is common to subdivide cattle into the broad categories: short, medium and long horned, on the basis of horn length. This is the classification system adopted by Armitage (1982b) to describe cattle horn cores from British post-medieval sites. It should be noted that the method can only be applied to adult

cores over 3 years of age (age classes 3 to 5); in younger animals (age classes 0 to 2) it is not possible to determine their potential adult length, and so they are omitted from the analysis.

Using the classification system of Armitage (1982b, 43) the young adult and adult cores (complete and broken) from Greyfriars, Chichester, have been assigned to their respective groups (Table 4). Even though many of the Greyfriars' specimens are broken, with only between one third and one half of the core remaining intact, it proved possible to derive estimates of the original complete length of the outer curve (measured from the tip to the base) by projecting the dimensions of the surviving basal portion. Although the estimated values so obtained allowed these incomplete specimens to be classified, they are not considered sufficiently accurate for use in metrical analysis with measurements taken of intact specimens and have therefore been omitted from the tables of measurements given in this report. Estimates made from 'virtually' complete cores (i.e. specimens with only the very tip missing), however, are believed to be sufficiently close to the original values to justify their use in the metrical analysis.

Table 2. Greyfriars, Chichester, 1984. Cattle horn cores, summary of the metrical data. All measurements are given in millimetres.

Key to Measurements: LOC—length of outer curve; BC—basal circumference; MxD—maximum diameter of base; MnD—minimum diameter of base; ½BHC—half breadth between horn core bases (see measurement 31, von den Driesch 1976, p. 29).

Age class	Measurement	Number of specimens	Mean	Range	Standard deviation
3. young adult (3-7 years)	LOC	24	137.1	90.0-205.0	40.1
	BC	41	146.8	98.0-208.0	32.0
	MxD	41	51.3	34.0-74.0	10.8
	MnD	42	40.5	25.3-56.8	9.2
	½BHC	4	85.4	82.7-93.1	-
4. adult (7-10 years)	LOC	23	128.7	86.0-300.0	42.2
	BC	35	130.8	83.0-189.0	27.1
	MxD	36	47.0	34.7-68.5	8.7
	MnD	38	37.1	23.0-55.5	8.8
	½BHC	6	71.3	57.4-105.5	-

Table 3. Greyfriars, Chichester, 1984. Cattle horn cores, frequency distribution for the basal circumference (mm). Young adult and adult cores only (age classes 3 and 4).

Number of specimens = 76, mean = 139.47 mm; range = 83–208 mm; standard deviation = 30.72 mm.

Basal circumference class interval (mm)		Number of cores
80–89	x	1
90–99	xxx	3
100–109	xxxxxxxxxxxx	11
110–119	xxxxxxxxxxxx	10
120–129	xxxxxxxxxxxx	12
130–139	xxxxxxxx	8
140–149	xxx	3
150–159	xxxxx	5
160–169	xxxxxxxx	8
170–179	xxxxxx	6
180–189	xxxx	4
190–199	xx	2
200–209	xxx	3

Table 4. Greyfriars, Chichester, 1984. Cattle horn cores, summary of the length classes identified. Young adult and adult cores only (age classes 3 and 4).

Notes: [a]—exceptionally small-sized cores but otherwise generally similar in shape and curvature to cores of the short horned group; [b]—specimens with LOC less than 220 mm but with larger (more 'robust') bases than the 'true' short horned cores; [c]—includes one male core (LOC 205 mm), best classified under the medium horned group.

Group (length class)	Length of outer curve (class limits in mm)	Number of specimens	% of total
Small horned/short horned [a]	under 100	10	11.8
Short horned	100–220	50	58.8
Short horned/medium horned [b]	(200–205)	11	12.9
Medium horned [c]	220–360	13	15.3
Long horned	over 360	0	0
Indeterminate	-	1	1.2

## The problem of classifying late 16th century cattle

As discussed by Armitage (1984, 6) the late 16th century was a time of significant advances in cattle husbandry, which is reflected in the very wide variety of size and general appearance of cattle horn cores found at archaeological sites of this period. In the light of these changes, the existing horn core classification system devised by Armitage (1982b) is proving inadequate to deal with the intermediate forms encountered in deposits of this date and there is clearly a need to revise the system in order to provide a more precise typology which will accommodate *all* late 16th century cattle. Until this revision has been carried out, the intermediate types in the Greyfriars sample have had to be assigned to two temporary classes: small/short horned and short/medium horned (Table 4).

## Interpretation and discussion

### (i) Source of the cattle horn cores:

Deposits of cattle horn cores found at archaeological sites generally derive from one (or a combination) of the following three sources:

- (a) slaughteryard (butcher's shambles)
- (b) tanyard
- (c) horn-worker's premises

The connection between deposits of cattle horn cores and the crafts of butchery, leatherworking and horn-working may be explained as follows:

### (a) butchery

During preparation of the carcass for disjoints, the butcher would leave the horns attached to the hide. Occasionally, however, he would remove them for sale directly to the horn-worker; either as complete horns (i.e. outer sheath and bony core) or sheath only (inner core removed). Evidence for this dual practice appears in a late 15th century petition from London horners to the Lord Mayor where mention is made of the purchase by horn-workers of 'hornes in the bones' and horns 'oute of the bones' from City 'bochers' (Fisher 1936, 23). If the butcher sold the horners horn sheaths only, he soon accumulated large quantities of the inner bony core (horn core) which were then

thrown away along with the other unwanted slaughteryard waste.

### (b) leather-working

Pictorial evidence showing that tanners bought hides of cattle which still had horns attached is provided by an early 19th century engraving of the 'skinmarket' at Leadenhall, City of London (Wilkinson 1825) and a photograph of a modern leather market (Cooke 1917, 17). As discussed by Prummel (1978, 399-402) this practice is well documented and there is archaeological evidence showing that the tradition is long established and may be traced back to medieval times. Having purchased hides, the tanner's first task in preparing them for the tanning process was to cut out the horns (see Thomson 1981, 162) which he would sell to the horn-workers either as complete horns (sheath and core) or as outer sheaths only. If the latter procedure was followed large quantities of horn cores quickly accumulated as demonstrated by the excavation of a 16th century tannery site in St Albans, Hertfordshire, where there was found a pit filled with oak bark and cattle horn cores (Saunders 1977).

### (c) horn-working

If the horn-worker purchased complete horns from butchers and tanners, his first task was the removal of the inner bony core (Armitage and Clutton-Brock 1976; Prummel 1978, 409). In this way the horn-worker soon accumulated a large quantity of horn cores which he disposed of with the other horn-working waste. Archaeological evidence for the association between cattle horn core deposits and the horn-working industry was found by Wenham (1964) during excavations at Hornpot Lane in the city of York, which uncovered a 14th century horn-soaking pit containing over 500 cattle horn cores. Further evidence of this comes from Stamford where excavations on the site of a 16th/17th century horn-worker's workshop revealed ten horn-soaking pits filled with cattle horn cores (Cram 1982).

There is no evidence for either tanning or horn-working activity in this part of Chichester in the early modern period (Down, pers. comm.) and it is very unlikely therefore that the Greyfriars horn cores came from a tanyard or horn-worker's premises. The presence of butchers in the area is, however, well attested; documentary sources examined

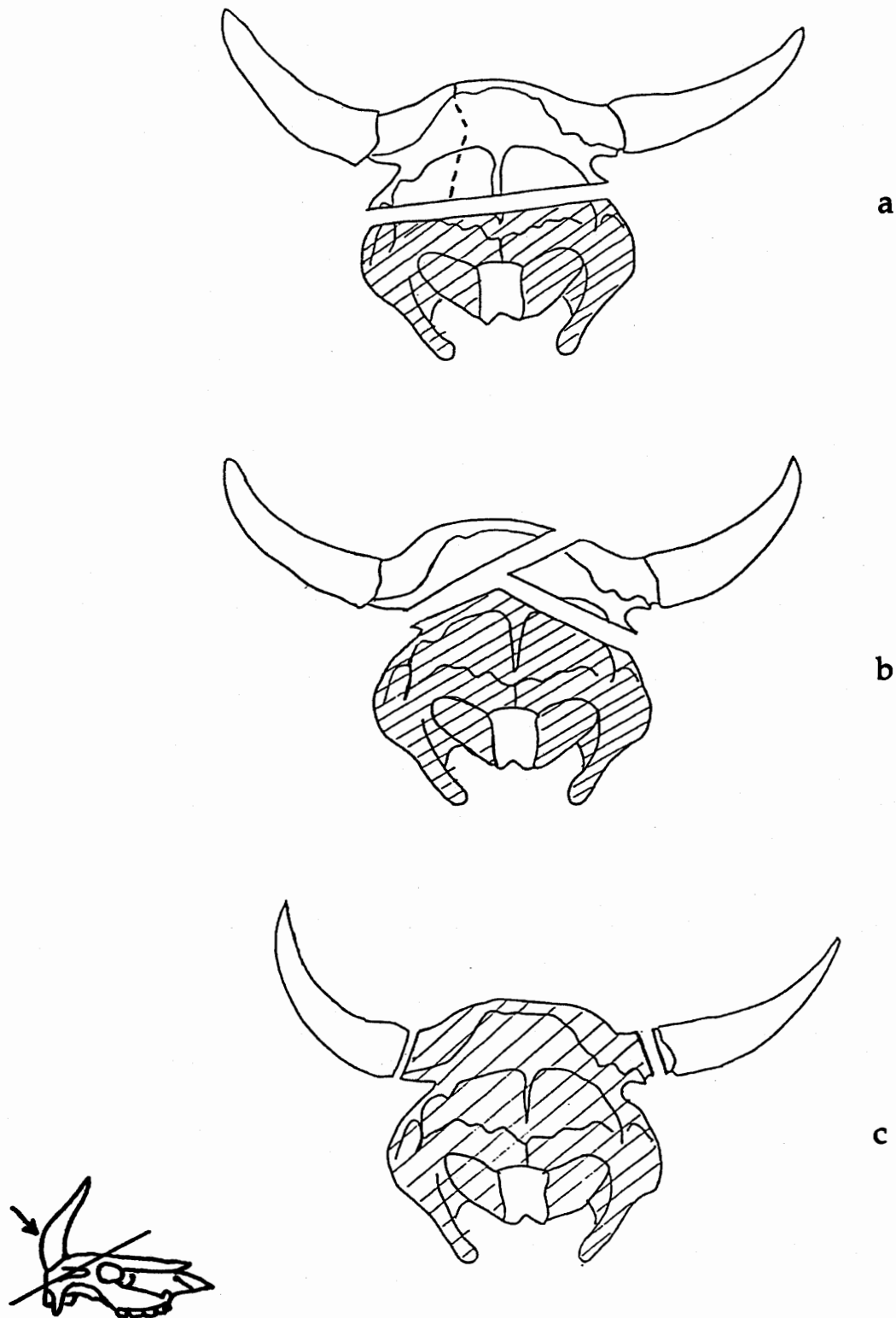


Fig. 1 (top to bottom: a-c). Methods of detaching horns from cattle heads. Shaded area—portion not present in pit. Inset: arrow indicates nuchal view seen in (a)-(c). Broken line in (a)—subsequently broken (in antiquity).

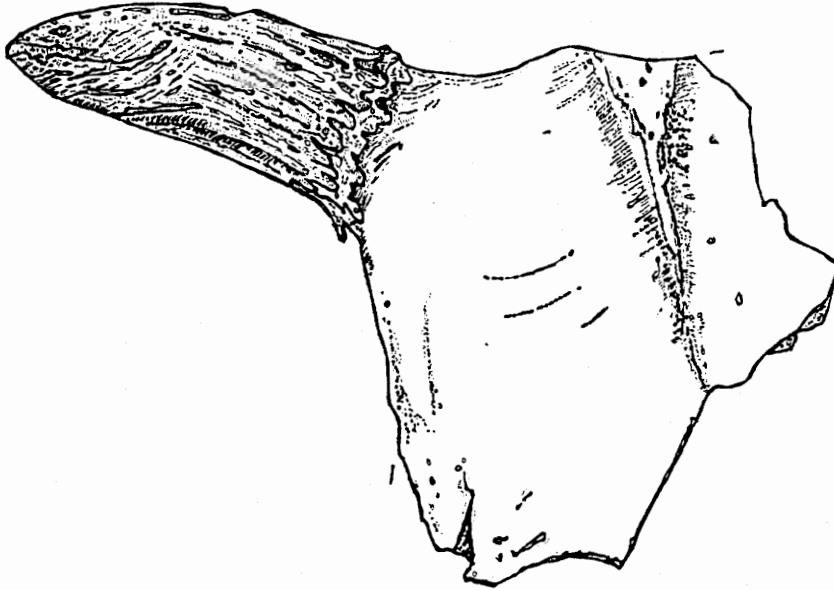


Fig. 2. Frontal view of right horn core and part of frontal bone of small/shorthorned cow from Greyfriars, Chichester. Length of outer curve 90mm. (Drawing: Kate Armitage)

by Morgan (1984) revealed that the Greyfriars site in the 16th and 17th century—then a garden—belonged to the Exton family who were engaged in the butchery trade. It seems very probable, therefore, that the cattle horn cores in the pit came from a local slaughterhouse run by this family.

(ii) Evidence for the removal of the hide:

Twelve specimens (10.2% of the total: Table 5) have small superficial cuts on the frontal bone, across the intercornual protuberance or at the base of the skull (Table 6). These marks are recognised as having been made by a skinning knife and provide evidence for the removal of the hide (in this case by the butcher prior to disjuncting the carcass).

(iii) Marks made by cleaver or axe:

Almost all the specimens examined show evidence of having been hacked off the skull by means of a cleaver or axe. In the majority of the specimens the right and left horns had apparently been removed together (as a single unit) from the head by a sweeping blow

directed across the back of the skull—possibly when the animal's head was positioned on the ground (Fig. 1a).

Subsequently (in antiquity) the portion of the cranium bearing the two horn cores broke in two; whether this was done purposely or accidentally during deposition and burial in the pit is, however, unclear—but as no conjoined core was found it may be suggested that separation occurred prior to deposition.

A few specimens show evidence of the right and left horns having been removed separately, by blows directed to the side of the head just below the base of each horn in turn (Fig. 1b).

A third method for detaching the horns from the head is indicated by the core of a young adult shorthorn, in which the blow delivered by the cleaver—or axe—fell across the base of the horn, severing it completely from the parietal and frontal bones (Fig. 1c). As this method is represented by only a single core it was probably the least favoured; it would

Table 5. Greyfriars, Chichester, 1984. Cattle horn cores, evidence of skinning. Note: in the specimens where the description of the evidence for skinning is 'uncertain', it is not possible to ascertain whether knife marks had originally been present because the horn core only has survived or because the frontal and/or parietal bones are poorly preserved.

Age class	Description	Number of specimens
2. sub-adult (2-3 years)	with knife marks	3
	without knife marks	10
	uncertain	20
3. young adult (3-7 years)	with knife marks	6
	without knife marks	13
	uncertain	23
4. adult (7-10 years)	with knife marks	3
	without knife marks	18
	uncertain	22

have created problems when the time came to extract the bony core from its outer sheath. In the other two methods (Figs. 1a and b) the surviving portions of frontal and parietal bones left attached to the core would have functioned as 'hand-holds' when the horn sheath was being pulled off.

(iv) Kill-off pattern (age at slaughter):

Over two-thirds of the Greyfriars' horn cores are from animals over three years of age (Table 1). This preponderance of fully grown cattle fits very well with the picture of urban centres being principally supplied with culled draught animals. Such animals would not have been sent into the town for slaughter until at least six years of age. Draught cattle generally started their working lives when about two or three years of age (Fussell 1952, 63; Cornwall 1954, 73) and after working for a period of between three to five years they were then fattened ready for the meat market (Oschinsky 1971, 162). According to Leonard Mascall (the author of *The Governmente of Cattell* of 1587 and owner of Plumpton Manor, near Lewes), working oxen could be kept till ten, and then fattened for slaughter (Fussell 1952, 63). In view of Mascall's advice, it is somewhat strange to discover that the sample of horn cores from Chichester does not include at least a few old adults (i.e. animals over 10 years of age); the reason for

this discrepancy is unclear.

The presence of immature (sub-adult) horn cores (28%) in the Chichester sample (Table 1) suggests that at least some of the cattle reaching Chichester in the late 16th century were supplied by livestock farmers specialising in the rearing of fat cattle (cf. Sir Thomas Pelham of Laughton—referred to below).

Very young veal calves may also have been slaughtered in significant numbers in Chichester in the late 16th century but as the horns of these animals would have been very little developed (i.e. were no more than horn buds) evidence for this is unlikely to be found in excavated horn-core deposits such as that discovered at the Greyfriars site.

(v) Cattle husbandry—evidence of heterogeneity in Sussex cattle:

Coefficient of variation (variability) in the length of outer curve, calculated after the method of Pearson (Simpson *et al.* 1960, 90) was 29.2 for young adults and 32.8 for adults (data from Table 2). These high values indicate that the collection of horn cores from the Greyfriars site is heterogeneous in composition. A 'pure' (homogeneous) sample would be expected to have a coefficient of variation between 4 and 10 (*ibid.* 91).

Table 6. Greyfriars, Chichester, 1984. Cattle horn cores, details of specimens showing evidence of skinning.

Key to Length class: SH—short horned; MH—medium horned (classification of Armitage 1982b).

Age class	Side	Length class	Number of marks made by knife (per specimen)	Location of marks
2. sub-adult (2-3 years)	R	-	1	on surface of frontal bone
	R	-	1	on surface of frontal bone
	L	-	1	on surface of frontal bone
3. young adult (3-7 years)	R	SH/MH	1	on surface of frontal bone
	R	SH	2	on surface of frontal bone
	R	SH	2	on surface of frontal bone
	R	SH	1	base of skull
	L	SH/MH	5	on surface of frontal bone
	L	SH	1	on surface of frontal bone
4. adult (7-10 years)	R	SH	4	around base of horn core, anterior surface
	L	SH	1	across intercornual protuberance
	L	SH	2	on surface of frontal bone

The high variability within the Chichester horn core sample can in part be ascribed to the presence of male, female and castrated animals, but it also clearly demonstrates that more than one type of stock is represented. Indeed, the very wide variety of horn cores includes those from exceptionally small shorthorned animals (see Fig. 2) reminiscent of the dwarf ('scrub') cattle of the high middle ages (see Armitage 1980, 406; 1982a, 53) as well as those from individuals of similar size and horn conformation to the modern Sussex breed. (A few of the larger Greyfriars cores are not much different in size from the horn cores of the two adult Sussex cows in the modern comparative osteological

collections of the Booth Museum of Natural History, reg. nos. 100026 and 102040 whose length of outer curvature measure 310 mm and 238 mm, respectively).

The very wide variety recorded in the Greyfriars sample is all the more remarkable when one considers that cattle in Sussex in the 16th century formed a geographically isolated population. Although recognised as an important cattle rearing district, very few Sussex farmers had sufficient capital to fund long distance movement of breeding stock and they could not therefore afford to import animals, except in a few, rare, instances from outside the county (Cornwall 1954, 77).

Virtually all cattle found within the county at this period were therefore 'native' bred. This situation may be contrasted with other farming areas at this period where cattle populations comprised a mixture of local and non-local (sometimes even foreign) stock. The cattle population of Lincolnshire in the 17th century, for example, included recently imported Dutch shorthorned cattle as well as black longhorns from Lancashire and Yorkshire (Markham 1657, 69; Mortimer 1707, 166).

If the variety in the Greyfriars sample cannot be ascribed to the presence of more than one regional 'race' of cattle, the alternative explanation must be that the wide range in size reflects different standards of livestock husbandry practised by Sussex stockmen, i.e. the more progressive farmers reared animals of reasonable size and quality while others, who largely neglected their stock, produced smaller and inferior quality animals, though even a wealthy landowner such as Sir Thomas Pelham of Laughton—who specialised in beef production in the first half of the 17th century—had many runts in his herd; these poor quality animals (mostly females and castrates) were only half the value of the better sort of cattle, when fattened and sold for meat (Cornwall 1954, 73–4). Fussell (1952, 95) also considered that the majority of Sussex cattle remained little improved until comparatively recent times, and that the Sussex cow was especially 'tiny ... in spite [sic] of the efforts of ... breeders'.

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### References

[A copy of the complete Level III Archive Report on the cattle horn cores from the Greyfriars site, Chichester, is held by The Booth Museum of Natural History, Brighton, where it may be inspected, on request. Alternatively, any

archaeozoologists seeking a copy of the measurements taken of these specimens may write directly to the author at the address shown at the beginning of this paper.]

Armitage, P. L. (1980). A preliminary description of British cattle from the late 12th to the early 16th century. *The Ark* 7(12), 405–12.

Armitage, P. L. (1982a). Developments in British cattle husbandry from the Romano-British period to early modern times. *The Ark* 9(2), 50–4.

Armitage, P. L. (1982b). '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 B. Wilson, C. Grigson and S. Payne (eds.) Ageing and sexing animal bones from archaeological sites. *British Archaeological Reports, British Series* 109. Oxford.

Armitage, P. L. (1984). 'Report on the cattle horn cores from Church Street, West Ham, 1973.' Unpublished Level III Archive Report: Museum of London and Passmore Edwards Museum.

Armitage, P. L. and Clutton-Brock, J. (1976). A system for classification and description of the horn cores of cattle from archaeological sites. *Journal of Archaeological Science* 3, 329–48.

Cooke, A. O. (1917). *A day with leather workers*. London: Hodder and Stoughton.

Cornwall, J. (1954). Farming in Sussex, 1560–1640. *Sussex Archaeological Collections* 92, 48–92.

Cram, L. (1982). 'The pits and horn cores', pp. 48–51 in C. Mahany, A. Burchard and G. Simpson, Excavations in Stamford Lincolnshire 1963–69. *Society for Medieval Archaeology Monograph Series* 9.

Defoe, D. (1724, reprinted 1974). *A tour through the whole island of Great Britain*. London: Dent.

Fisher, F. J. (1936). *A short history of the Worshipful Company of Horners*. London: Privately published by George Becker.

Fussell, G. E. (1952). Four centuries of farming in Sussex, 1500–1900. *Sussex Archaeological Collections* 90, 60–101.

Levitan, B. (1985). 'Early 18th-century horncores from Shooting Marsh Stile', pp. 15-18 in C. G. Henderson, Archaeological Investigations at Alphington Street, St Thomas, Exeter, 1984: preliminary report. Exeter Museums Archaeological Field Unit.

Markham, G. (1657). *A way to get wealth*. (9th ed.) London: E. Brewster and G. Sawbridge.

Martin, W. C. L. (1847). *The ox*. London.

Morgan, R. (1984). [Unpublished report to A. Down].

Mortimer, J. (1707). *The whole art of husbandry*. London: H. Mortlock and J. Robinson.

Oschinsky, D. (1971). *Walter of Henley*. Oxford: Clarendon Press.

Prummel, W. (1978). Animal bones from the tannery pits of 's Hertogenbosch. *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* 28, 399-422.

Rees, A. (1819). *Manufacturing industry*. London.

Saunders, G. (1977). A sixteenth century tannery in St Albans. *Hertfordshire's Past* 3, 9-12.

Simpson, G. G., Roe, A. and Lewontin, R. C. (1960). *Quantitative zoology*. New York: Harcourt, Brace and World, Inc.

Thomson, R. (1981). Leather manufacture in the post-medieval period with special reference to Northamptonshire. *Post-Medieval Archaeology* 15, 161-75.

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

Wenham, L. P. (1964). Hornpot Lane and the horns of York. *Annual Report of the Yorkshire Philosophical Society, York, for the Year 1964*, 25-56.

Wilkinson, R. (1825). *Londinia Illustrata*. London.

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