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PRELIMINARY REPORT ON THE CATTLE HORN CORES FROM TRIAL HOLE NUMBER TWO, CUTLER STREET WAREHOUSES, LONDON (Cut 78)

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1. INTRODUCTION

A total of 169 horn cores of cattle were recovered from the spoil heap to a trial hole dug by workmen under warehouse E 2, Cutler Street, London (Fig. 1, trial hole 2). These cores were found altogether on the one spoil heap and are believed to have come orginally from a single feature (represented by Contexts numbered 30-35 & 56-61 shown on sections 1 & 2; Figs. 2 & 3 in this report) identified as a wall made of earth (see section 3, discussion). A further 33 cores were removed from the sides of the trial hole (from Contexts 30, 31, 32, 33, 34 & 56, 5, 58, 59, 61) when sections 1 & 2 were cut back to expose the underlying stratigraphy.

Before it was uncovered and removed by the workmen, the length of earth-wall containing the 169+ horn cores lay sealed beneath the floor to the basement of warehouse E 2, below a tread layer (section 1, Context 20; Fig. 2) associated with the phase of the building of the foundations to the warehouse[1]. It follows therefore that the wall must have been constructed before the warehouse was erected on the site, the date of the warehouse providing the terminus ante quem for the underlying levels. Examination of the documentary sources revels that the construction of warehouse E was completed in February 1801 AD[2], and the earth-wall must be assumed therefore to be certainly earlier than this date. The terminus post quem for the wall is provided by part of a queen Ann tin glazed plate and a potsherd dated to the last quarter of the 17th century[3], both from Context 30.

On the basis of the ceramic evidence and stratagraphic sequence, a provisional date of between late 17th and early 18th century is therefore proposed for the cattle horn cores.

The complete collection of 202 horn cores is held by the British Museum (Natural History)[4] where it may be examined on request. Under the BM(NH) computer-based catalogue scheme, the collection has been assigned the following registration Number:

ARD 1979 5210

NOTES:

1. Details of the stratigraphy of the site are given in the D.U.A. archival report by A. Balfour-Lynn & J. Schofield (1978) Cutler St. Warehouses (Cut 78).
2. For an account of the history of the warehouses at Cutler St., reference can be made to the D.U.A. archival report by H. Wade (1978) Cutler Street Warehouses: The Archaeological Potential.
3. Pottery identified by C. Orton, D.U.A.
4. The official record of the donation of the Cutler Street horn cores by the D.U.A. to the BM(NH) is contained in BM(NH) Osteology General Letter File 1978-9.

2. DISCRIPTION OF THE SPECIMENS

2.1 General Description

The collection from Cutler Street comprises 105 right and 97 left horn cores of cattle, all of which have been chopped from the skull (see section 2, 3 (I), below).

All the horn cores are stained a light, yellowish brown colour. Several specimens also have patches of green staining on them, showing that the horn core whilst buried in the ground had been in close contact with an object made of bronze.

Of the 202 horn cores recovered from the spoil heap and sections to the trial hole, 56 are complete or partially complete, and the remaining 146 are either sawn (6 specimens) or broken (140 specimens). There are, in addition, 73+ fragments of horn core, frontal bone and parietal bone. The groups are described as follows:-

I. COMPLETE - Intact, unbroken core, attached to portion of frontal & parietal bone

II. PARTIALLY COMPLETE - Almost the entire length of the core remains intact except for the very tip which is either broken or shows evidence of having been sawn-off (see section 2, 3 (II), below)

III. SAWN - Incomplete specimen which has been sawn completely through either at the base or further along the length of the core (see section 2, 3 (II), below)

IV. BROKEN - The base and only between one third and one half of the core remains intact. In almost every case the damage done to the horn core is of recent origin and occurred when the workmen were digging out the trial hole.

V. FRAGMENT - Small piece of broken core, frontal bone or parietal bone (NOTE: These fragments are excluded from the subsequent analyses)

2.2 Evidence for the removal of the hide

Just under one half (43%) of the complete and partially complete specimens examined have small, superficial cuts on the frontal bone and back of the skull (Fig. 4). These cut marks are recognised as having been made by a skinning knife and their distribution (Fig. 5), clearly shows the way in which the skin was removed from the head. This involved cutting away the skin from around the base of each horn to allow the hide to be pulled free from the skull.

During the late 17th and early 18th century, hides from cattle slaughtered in the City of London were sold at Leadenhall market which was situated south of Cornhill and east of Gracechurch Street (Defoe, 1724 rept. 1974, vol. 1, p. 343; Master, 1974, pp. 20-27).

Fig. 4: Cutler St. 78. Cattle horn cores. Specimens showing evidence of skinning (complete & partially complete cores only)

No. specimen	Age class*	No. of marks made by a knife	Location of knife mark(s)
1	adult	4	frontal bone & back of skull
2	adult	1	frontal bone
3	adult	1	frontal bone (base of horn core)
6	sub-adult/adult	3	frontal bone
9	sub-adult	3	frontal bone
11	sub-adult/adult	1	base of skull in region of the frontal-parietal suture
13	juvenile	2	across frontal eminence
14	juvenile	4	base of skull across fused frontal-parietal suture and across external occipital protruberance
16	juvenile	2	frontal bone
18	juvenile	1	across frontal bone
22	adult	1	frontal bone
24	adult	5	across frontal-parietal suture at back of skull
25	sub-adult	4	back of skull
26	adult	4	frontal bone & over nuchal eminence
32	juvenile	1	back of skull
33	juvenile	4	frontal bone
38	juvenile	3	frontal bone
39	sub-adult	2	across nuchal eminence
40	sub-adult	2	frontal bone & around base of core
41	juvenile/sub-adult	4	frontal bone & back of skull
42	juvenile	3	frontal bone & back of skull
48	juvenile	2	frontal bone
54	adult	2	frontal bone
55	juvenile	2	frontal bone

Total number of specimens examined = 56

* see Section 2.4 for an explanation of these age classes

2.3 Evidence of horn working

The Cutler Street horn cores are recognised as the discarded waste from a horn working industry by the presence on the specimens of marks made by a cleaver and saw:-

(I) Marks made by a cleaver

All 202 specimens show evidence of having been 'hacked-off' the skull by means of a cleaver. The right and left horn cores (together with their outer sheaths and portions of the frontal and parietal bones) would have been removed separately by a sweeping blow delivered across the base of the head in the manner depicted in Figure 6. The presence, on the surviving fragment of parietal bone of many of the specimens, of two or more chop marks clearly indicates that more than one strike with the cleaver was often required before the horn core was successfully detached from the rest of the skull. In some specimens, even the repeated blows to the back of the head failed to penetrate completely through the cranium, and an additional chop across the frontal bone, just above the orbit, had been necessary before the horn core was finally broken free.

(II) Sawn specimens

Eight cores show evidence of having been sawn, these specimens are listed as follows:-

No.	Age class	Description
15	juvenile	tip of core is sawn-off
57	adult	the core is sawn completely through approximately ⅓ of the distance from the base

No.	Age class	Description
58	Adult	the core is sawn completely through at a point ½ the distance along the length of the outer curve
59	"	part of the end of the core is sawn-off
60	"	the core is sawn completely through across the base
61	"	" " " " "
62	"	tip of core is sawn-off
63	sub-adult	the core is sawn completely through at a point ½ the distance along the length of the outer curve

Specimens 57 to 61 are illustrated in Figure 7

The exact purpose of sawing the horn core into sections of various length is unclear. With its thin, fragile structure, it seems improbable that this bone element would have been chosen for use as a raw material in bone working. This observation is supported by the absence of any bone artefact from the City of London identitied as having been made from an ox horn core. An alternative explanation for these specimens is that in each case the horner cut up the horn sheath whilst it was still on the bony core. The more common practice was for the horner to first pull-off the outer sheath from the bony core and then cut up the sheath as required (Armitage & Wade, 1979, in prep.).

In addition to the eight specimens described above, there is a horn core (specimen no. 30, sub-adult/adult) which has an oblong hole (14 X 27mm) cut (sawn ?) out of the core at a point along the outer curve 1/3 of the distance from the base (110 mm). The hole is not of recent origin and must, therefore, be connected with 17th/18th century horn working practice, but the purpose is unclear.

2.4 Number of adult, sub-adult and juvenile horn cores

The horn cores can be classified into the following age classes on the basis of the density of the bone:-

Fig. 8: Cutler St. 78. Cattle horn cores. Number of adult, sub-adult and juvenile animals

Age class[1]	Suggested age (years)	No. specimens		% of total
I. Juvenile	1 - 2	28		14%
II. Juvenile/sub-adult	2?	6		3%
III. Sub-adult (?)[2]	2 - 4 (mostly 4+)	80		40%
IV. Sub-adult/adult	4?	12	88	43%
V. Adult	over 4	76		

Notes: 1. Each age class is recognised as follows:-

Class I Juvenile: Spongy bone, very light in weight

Class III Sub-adult: Porous bone, especially round the base, with the end of the core becoming hard and compact

Class V Adult: Whole core comprised of hard, compact bone

Class II Juvenile/Sub-adult: Intermediate between classes I&III

Class IV Sub-adult/Adult: Intermediate between classes III&V

2. Effect of castration on growth and development:-

The age range given for each of the classes is tentative, and is based on the series of skulls of Chillingham cattle held by the BM(NH). If, as is indicated by the large size and long tapering shape, the majority of the cores included in the sub-adult group (i.e. classes III & IV) are from oxen (castrated males) then they were probably of greater age than four years at the time of slaughter. This is because, if the normal practice of castrating a bull at 10 to 20 days after birth is carried out, the growth pattern is much affected and the onset of maturation of the skeleton (including the horn core) is delayed.

Figure 8 shows that of the 202 horn cores, 168 (83%) are from animals whose ages are assesed at 4 years and over (see Fig. 8, note 2,) compared with only 34 (17%) from juveniles aged 1 to 2 years. There are no specimens identified from very young calves.

This preponderance of animals aged 4 years and over may in part reflect the selection made by the horner for large, well developed horns. Although it is known that large numbers of veal calves were being slaughtered in the City at this time (McGrath, 1948; Trow-Smith, 1959, P. 22), these animals would have had horns that were very little developed and, in consequence, they would not be expected to be represented in the waste from horn working. This explains the absence of horn cores of very young calves in the Cutler Street collection. Another possible explanation for the relatively high proportion of animals aged over 4 years in the sample is provided by the observation made by Wheaton-Smith (1963, P. 59) that the average age of the cattle, other than calves, supplied to slaughteryards in the early modern period was between 4 and 5 years. The London meat markets were also frequently furnished with much older cattle, in the form of old draught oxen aged over 6 years (Trow-Smith, 1959, p. 166).

2.5 Sex of Cores

Although the sex of horn cores of most Roman, medieval and early Tudor cattle can now be recognised from the size, shape, curvature and angle of attachment of the core to the frontal bone (see Armitage & Clutton-Brock, 1976) the same criteria can not be applied to early modern cattle. Many of the cores from Cutler Street are, however

believed to be from oxen, on the basis of their large size and long tapering shape. But it is not, as yet, possible to ascertain with any degree of certainty the sex of all of the Cutler Street specimens; this may only be attempted when the present research being conducted on post-medieval and modern cattle is completed (Armitage, 1979, in progress).

2.6 Size of horn cores

Measurements were taken from the specimens using dial calipers (Mitutoyo No. 505-635, range 300 mm with dial graduations of 0.05 mm) and a flexible tape measure. The series of measurements for the complete adult, sub-adult and juvenile cores are given in the appendix at the end of this paper.

(I) Length of the outer curve

The combined adult and sub-adult cores range in length of the posterior-dorsal (outer) curve from 215 to 612 mm. There are, however, two smaller sized cores whose lengths are estimated at 150 and 200 mm, although the exact dimension in each case can not be determined with any degree of precision as the end of the core is broken-off.

The wide range observed for the length of the posterior-dorsal curve clearly indicates that more than one stock of cattle is represented. Although there are several specimens from medium and short (?) horned cattle, the majority of the cores are identified as coming from longhorns.[1]

This evidence of the preponderance of the long horn over the other classes of cattle fits very well the picture we already have of 17th and early 18th century livestock based on contemporary documentation (Markham, 1657; Mortimer, 1707) and from the remains of cattle from other archaeological sites (Armitage, 1978 & 1979, in prep.).

NOTE: 1. The terms 'long', 'medium' and 'short horned' used here are <u>not</u> the same as those used for Iron Age, Roman, medieval and early Tudor Cattle (as proposed by Armitage & Clutton-Brock, 1976). They are merely temporary 'labels' adopted for convenience whilst describing the Cutler Street collection. Research is currently being carried out on early modern and modern cattle with the aim of producing a more satisfactory system for the classification of the horn cores of cattle from post medieval sites in Britain (Armitage, 1979, in progress). The term 'longhorn' (or 'longhorned') as used here denotes the unimproved form of the modern Longhorn breed: the term being applied to the small, mainly black (& red) cattle common to Britain in the 17th/early 18th centuries AD.

(II) Basal circumference

The distribution of values for the basal circumference of the complete, partially complete and broken (incl. sawn) specimens is shown below:-

Fig. 9: Cutler St. 78. Cattle horn cores. Basal circumference

9.1 Adult Cores only

class limits (mm		No. of specimens
90 - 99		
100 - 109		
110 - 119		
120 - 129		
130 - 139		
140-- 149	XXX	3
150 - 159	XXX	3
160 - 169	XXX	3
170 - 179	XXXXX	5
180 - 189	XXXX	4
190 - 199	XXX	3
200 - 209	XXXX	4
210 - 219	XXXXXXXXX	9
220 - 229	XXXXXXXXXX	10
230 - 239	XXXXXXXXXX	10
240 - 249	XXXXXXXXXX	10
250 - 259	XXX	3
260 - 269	XXXXX	5
270 - 279	X	1
280 - 289	x	1
290 - 299	X	1
300 - 309		
310 - 319		
320 - 329		

No. specimens = 75
Mean value = 217.7 mm
Range = 146 - 292 mm
Standard deviation = 35.1
Standard error of the mean = 4.1

Figure 9 (continued)

9.2 Adult and sub-adult cores combined (including those specimens classified as adult/sub-adult)

class limits (mm)		No. of specimens
90 - 99		
100 - 109		
110 - 119		
120 - 129	X	1
130 - 139		
140 - 149	XXX	3
150 - 159	XXX	3
160 - 169	XXXX	4
170 - 179	XXXXXXXXX	9
180 - 189	XXXXXXXXX	9
190 - 199	XXXXXXXXXXXXXX	14
200 - 209	XXXXXXXXXXXXXXXX	16
210 - 219	XXXXXXXXXXXXXXXXX	17
220 - 229	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	34
230 - 239	XXXXXXXXXXXXXXXX	16
240 - 249	XXXXXXXXXXXXXXXXXX	19
250 - 259	XXXXXXXX	8
260 - 269	XXXXXXXX	8
270 - 279	XX	2
280 - 289	XX	2
290 - 299	X	1
300 - 309		
310 - 319		
320 - 329		

No. specimens = 166
Mean = 217.7 mm
Range = 122 - 292 mm
Standard deviation = 30.6
Standard error of the mean = 2.4

2.7 Shape of frontal eminence and direction of horn core

(I) long horned group

In respect of the angle of attachment to the skull, shape and curvature, the Cutler Street horn cores resemble closely the modern Longhorn in the collection of the BM(NH) (skull reg. no. 1953.3.3.1). The horn core stands outwards from the skull throughout its length (i.e. is held in a horizontal position in relation to the plane of the frontal bone) with the end of the core twisting upwards.

It is of interest that the bow-shaped horn seen in certain of the early 19th century Longhorn cattle (as depicted, for example, in the engravings by Garrard, 1800) is not represented in the sample from Cutler Street. The distinctive bow configuration must, therefore, have been a later development, probably introduced sometime during the latter half of the 18th and the beginning of the 19th century.

The Cutler Street specimens predate the changes wrought upon the Longhorn breed by Robert Bakewell and the other pioneer livestock breeders of the late 18th and early 19th centuries. They do not, therefore, exhibit a convex frontal eminence, but instead have a frontal bone that appears flat when viewed from the back of the skull (see Grigson, 1973, p. 184). In the modern, improved Longhorn the convex frontal eminence produces a prominent, 'dome shaped' forehead.

(II) medium horned group

Specimens ascribed to the medium horned group have a frontal eminence that appears flat when viewed from the back of the skull,

with the horn core held straight out from the skull, the end of the core either twisting upwards or else curving gently forewards.

(III) shorthorned group

According to one contemporary writer on agriculture, Markham (1657, p. 69), the short horned cattle of the 17th century had horns that were "little and crooked". The three specimens from Cutler Street which are provisionally classified as short horns, however, can not be described as "crooked" but instead are curved in the horizontal plane with only very slight torsion (twisting) towards the end of the core. Each specimen has a frontal bone that appears flat when viewed from the back of the skull.

2.8 Pathology

Only one specimen (no. 64, right, sub-adult?) shows evidence of pathology. Following a traumatic injury to the horn, which probably occurred early on in the life of the animal, the normal growth pattern of the horn was much affected, resulting in the development of a stunted and deformed horn core (Fig. 10). Such injuries are not umcommon among cattle today and usually arise from fights between young, boistrous calves. The incidence of such injuries can be relatively high in certain herds. In a herd of cattle that I recently (1976) observed in a field near Hertford, for example, 25% of the animals present had deformed (mis-shapen) horns:-

Composition of the Hertford herd:

4 Dairy Shorthorn cows, 1 with a deformed horn*
8 Friesian cross Hereford bullocks, 2 with deformed horns*

Footnote: *These injuries were the direct result of fighting with other individuals in the herd (information supplied by owner of the cattle, Mr. H. J. Brooks of Jepps Farm).

3. DISCUSSION

Contemporary documentary sources that have been examined indicate that there was considerable horn working activity in the immediate vicinity of Cutler Street throughout the 17th and 18th centuries (Armitage & Wade, 1979, in prep.). Many of the premises along Petticoat Lane (which today runs diagonally across the eastern side of the Cutler Street warehouse complex) were once owned by horners[1], and it is not unreasonable to assume that the group of cattle horn cores found on the Cutler Street site represents the unwanted waste from these local workshops. What does seem strange, however, is that such a large quantity of industrial refuse should have been buried in the centre of what was essentially a residential part of the City. According to the contemporary maps[2], much of the area was covered by rows of terraced houses arranged round open squares and gardens, and therefore an unlikely choice for the location of an industrial rubbish dump. Another, alternative explanation must be sought in order to account for the presence of the large number of cattle horn cores on the Cutler Street site.

Closer examination of the sections cut through the feature containing the horn cores (Figs. 2 & 3) reveals the following:-

a) the cores are stacked neatly in courses, with their tips pointing all one way

b) each course of horn cores is separated from the next by a band of earth approximately 15cm thick

Within the structure there is thus an orderly arrangement of rows of horn cores sandwiched between layers of soil, and it is this vertical

series of distinct, alternate bands of horn cores and earth which provides the clue to the interpretation of the feature. For this sequence fits very well the mode of construction of an earth-wall bonded (i.e. reinforced & strengthened) by horn cores of cattle, as described by Kalm (1748 reptd. 1892, p. 69). The proximity of the Cutler Street site to the horners' workshops in Petticoat Lane meant that there was a ready supply of cattle horn cores at hand for use in the construction of the wall.

According to the description given by Kalm, two lines of horn cores were laid horizontally on top of each of the layers of earth, the cores so placed that their tips pointed inwards towards each other. The two sections cut through the earth-wall beneath warehouse E2, Cutler Street (Figs. 2 & 3), however, show only one line of horn cores in each course. This indicates that only one side of the orginal wall has in fact survived, the other part having been dug away probably during construction of the foundations to the warehouse in c.1801 AD.

Further sections of this wall will be investigated when excavations on the site re-open in April, 1979. The principal objective of the new excavations will be to demonstrate that the 'dotted lines' drawn round what look to be square garden plots (allotments) on the Rocque map of 1746 (Fig. 11) are in fact walls built of earth and cattle horn cores.

NOTES: 1. (a) A list of the members of the horners company for 1641 (reproduced in Fisher, 1936, Appendix VIII,pp,117-119) shows that 34 of the 41 horners working in London owned premises in Petticoat Lane.

(b) In the Court Minute Book (Guildhall MS 6513) reference is again made to horners in 'Pettycoat Lane" e.g. John Burrell in 1780; Richard Knowles in 1782; Judith Linn in 1783.

2. See for example the maps by Rocque 1746 & ? 1676

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APPENDIX

TABLES OF MEASUREMENTS - complete specimens only

Table 1: Adult cores --- hard compact bone

No.	Side	Sex	LOC	BC	MND	MXD
1	R	C?	600	249	76.3	85.0
2	R	C?	473	233	60.8	85.0
3	R	F	244	146	41.1	52.4
4	R	F	314	187	53.5	65.4
5	R	C	409e	265	81.1	93.9
7	R	C?	350e	217	59.7	78.0
8	R	F?	483	241	73.0	77.6
10	R	F	215e	155	47.9	53.3
19	R	?	280e	207	60.2	70.8
21	L	F?	273	153e	42.6	56.0
23	L	C?	435	234	69.2	82.5
26	L	F?	432	222	66.5	71.3
28	L	F	347	175	50.2	59.1
46	R	F?	257	187	53.7	64.8
50	R	F?	471	245	70.1	82.5
51	R	F?	350	172	51.2	62.8
53	L	M?	356	236	65.5	82.5
54	L	F?	517	219	71.1	67.8

	N	M	Range	SD	SE
LOC	18	378.1	215 - 600	106.1	25.0
BC	18	207.9	146 - 265	36.6	8.6
MND	18	60.8	41.1-81.1	11.7	2.8
MXD	18	71.7	52.4-93.9	12.3	2.9

Table 2: Sub-adult cores --- porous bone, especially round the base

No.	Side	Sex	LOC	BC	MND	MXD
9	R	C	612	251	78.3	83.2
12	R	F?	331	176	50.5	61.2
17	R	?	425	239	72.3	80.7
25	L	C	503	235	69.4	80.9
27	L	F?	329	193	55.0	67.2
39	L	C?	285	225	60.5	82.7
44	L	?	371	219	65.5	71.5
56	L	?	343	209	58.0	71.5

	N	M	Range	SD	SE
LOC	8	399.9	285 - 612	109.1	38.6
BC	8	218.14	176 - 251	24.9	8.8
MND	8	63.7	50.5-78.3	9.4	3.3
MXD	8	74.9	61.2-83.2	8.2	2.9

Table 3: Juvenile cores --- spongy bone, very light in weight

No.	Side	Sex	LOC	BC	MND	MXD
13	R	?	349e	189	55.4	63.1
14	R	?	330e	203	56.9	73.4
16	R	?	230e	170	50.9	55.2
18	R	?	369	209	59.8	69.1
32	L	?	261	186	52.6	65.0
33	L	?	379	199	59.7	65.6
34	L	?	297	202e	56.4	72.1
38	L	?	170	135	38.8	49.0
42	L	?	250	190	52.2	65.8
47	L	?	309	199	58.2	67.1
48	L	?	360	211	62.9	72.2
52	L	F?	361	177	51.0	58.5
55	L	C?	307e	195	59.8	63.3

	N	M	Range	SD	SE
LOC	13	305.5	170 - 379	62.7	17.4
BC	13	189.6	135 - 211	20.2	5.6
MND	13	55.0	38.8-62.9	6.2	1.7
MXD	13	64.6	49.0-73.4	7.0	2.0

KEY: All measurements are given in mm.

e estimated value

Abbreviations used:-

(1) Side: R right
L left

(2) Sex: M male
F female
C castrate
} tentative identifications only (see section 2.5 above)

(3) Measurements:
LOC length of outer curve
BC basal circumference
MND minimum diameter across the base
MXD maximum diameter across the base

(4) N = Number of specimens examined
M = Mean (estimated by average value of the observations on the varaiat
Range = Observed size range (lowest and highest values of the variate)
SD = Standard deviation
SE = Standard error of the mean

(Note that horn cores classified as Sa/A and J/Sa are not included in the above tables)

Fig. 1

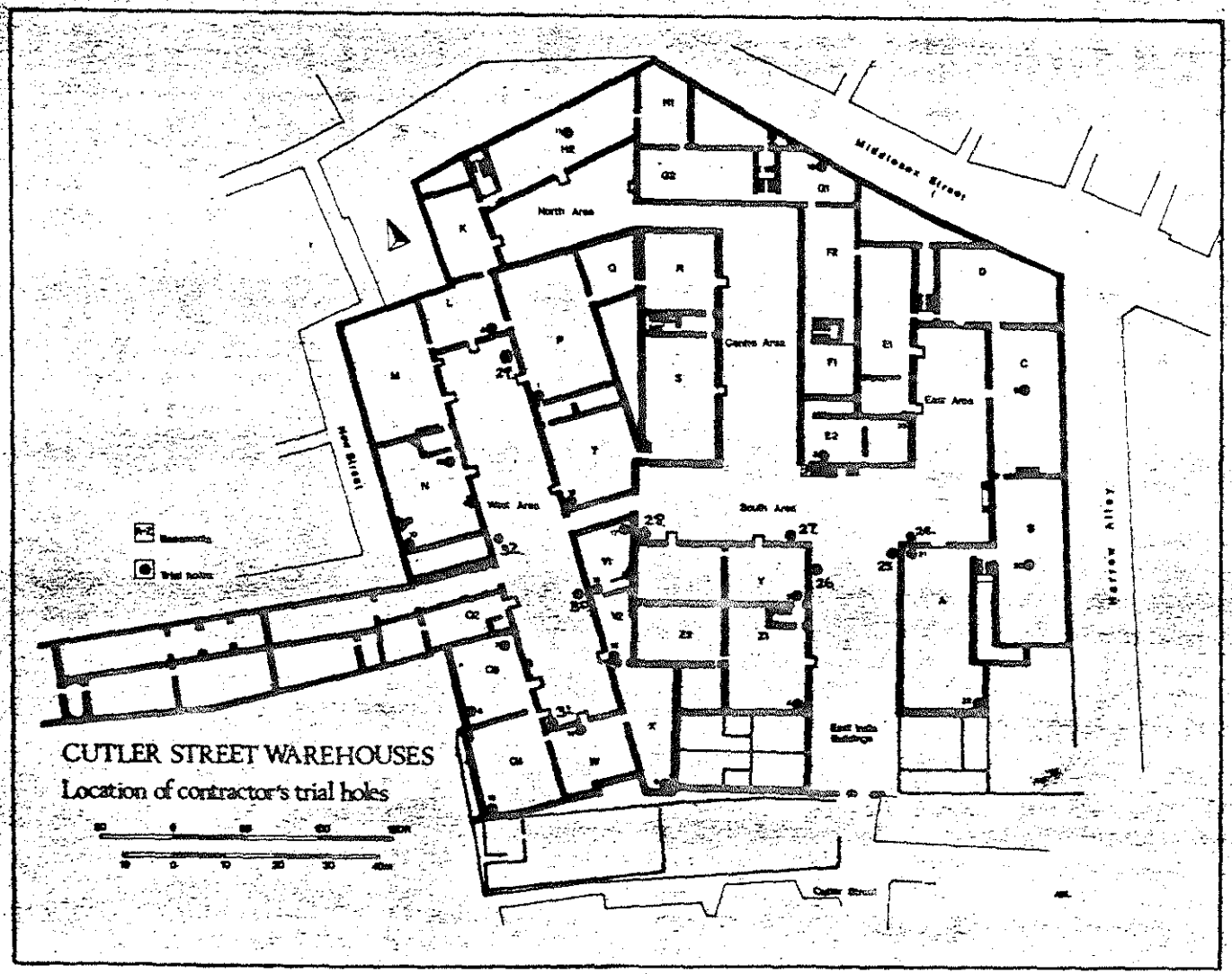
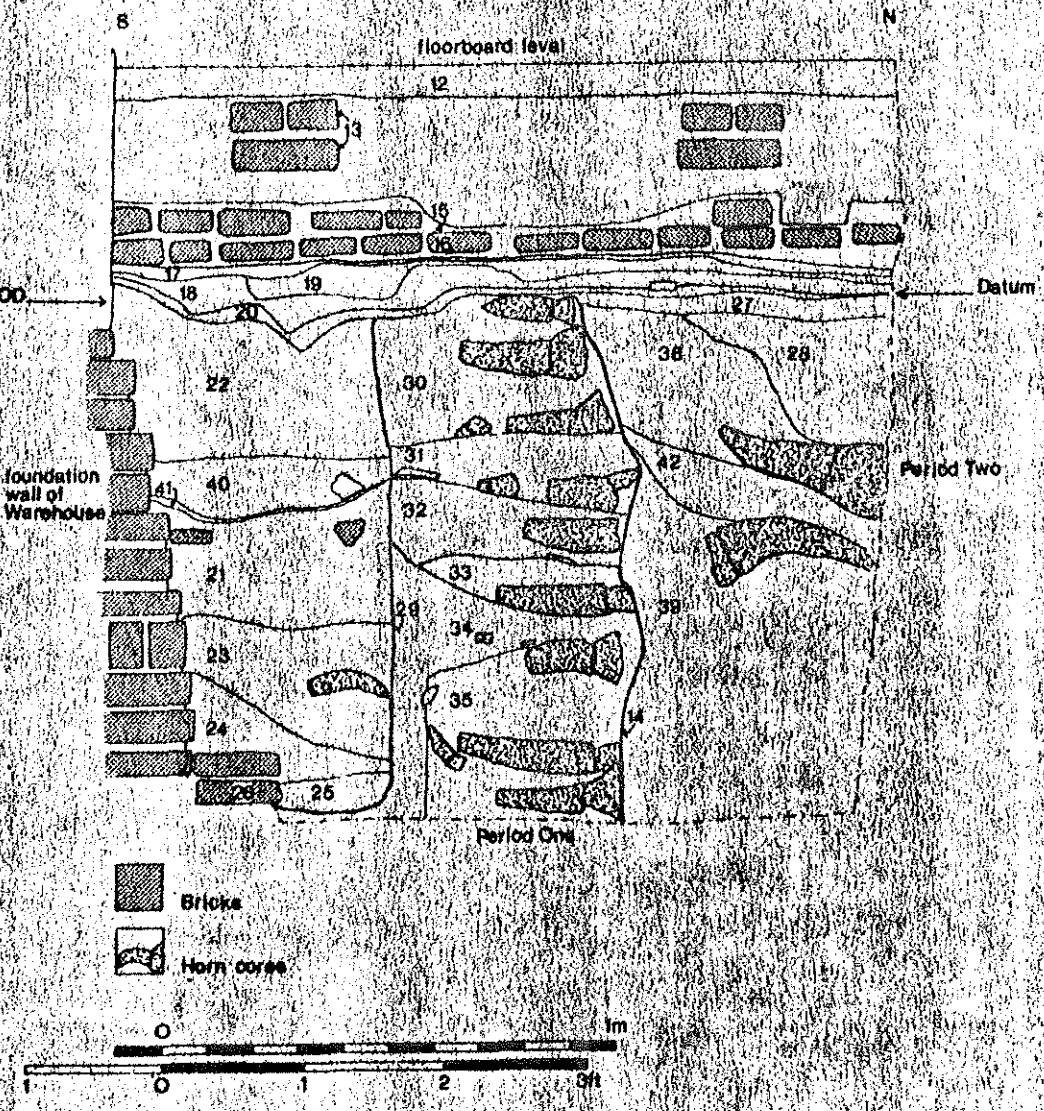

Middlesex Street
North Area
Centre Area
East Area
West Area
South Area
Wentworth
Trial holes
Warrow Alley
CUTLER STREET WAREHOUSES
Location of contractor's trial holes

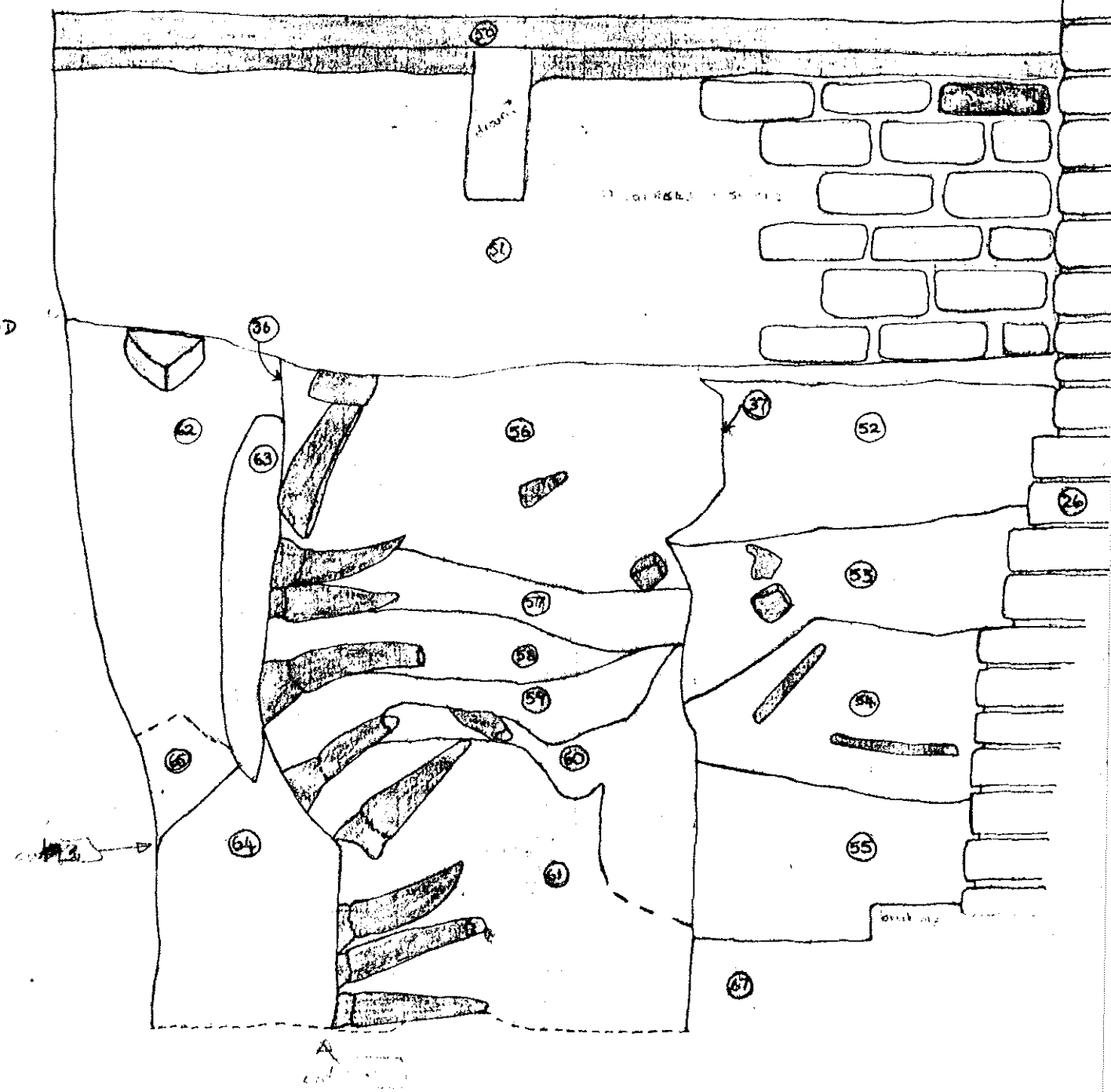
Fig. 2



CUTLER STREET WAREHOUSES
Trial hole 2: Section 1

MM & ABL

Fig. 3



PLAN/SECTION NO.		NOTES
DRAWN BY ALISON BALFOUR-LYNN.		
CHECKED BY		
DATE APRIL 5TH 1978.		
SCALE 1:10.		

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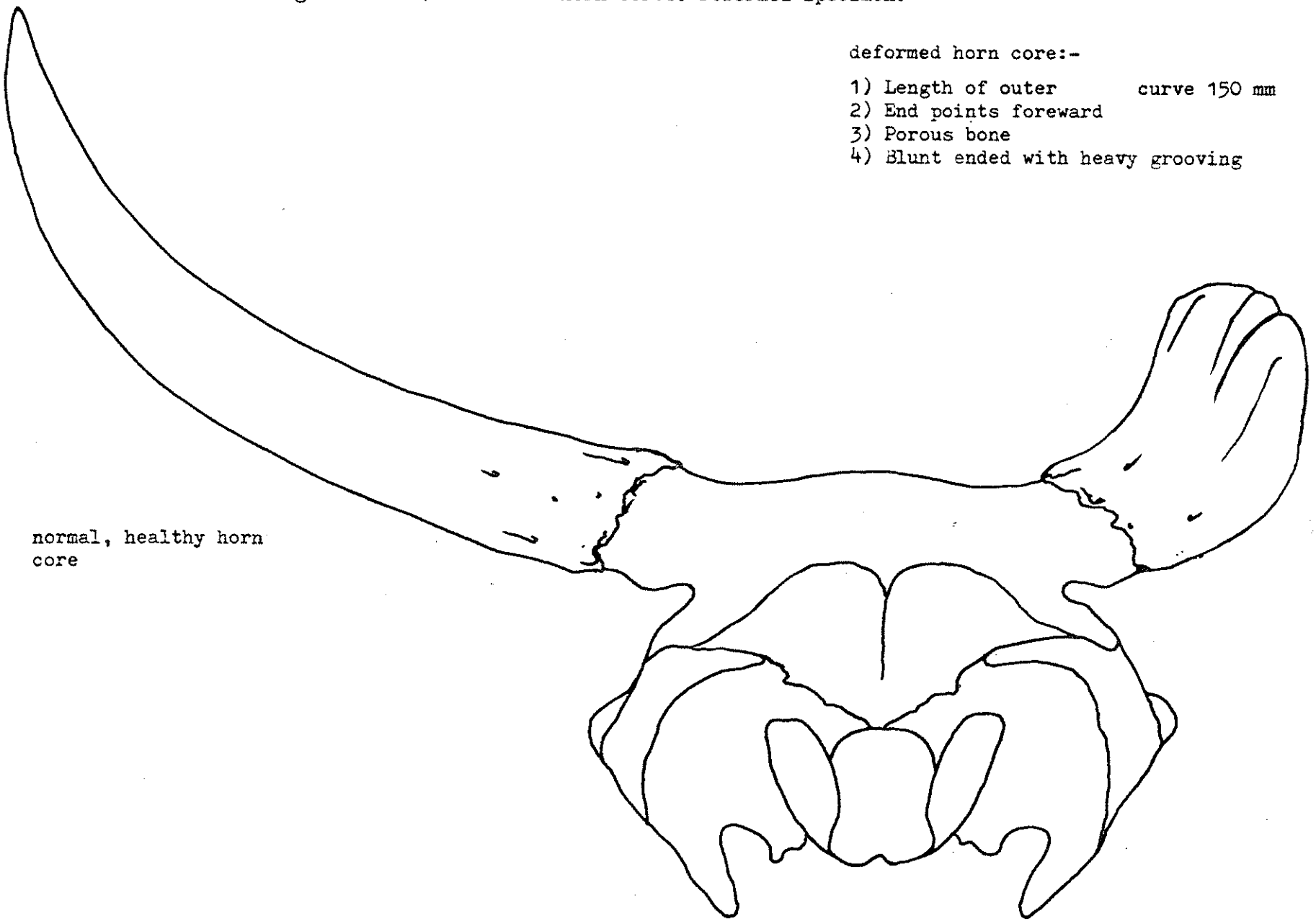
SIT

Fig. 10: CUT 78. Cattle horn cores. Deformed specimen.



deformed horn core:-

1) Length of outer curve 150 mm
2) End points foreward
3) Porous bone
4) Blunt ended with heavy grooving

normal, healthy horn core

Fig. 11: CUT 78. Rocque map of 1746.