Three Saxo-Norman Tenements in Durham City

By M. O. H. CARVER

Department of the Environment Research Fellow in Archaeology, University of Birmingham

with contributions by

H. M. APPLEYARD, ELISABETH CROWFOOT, ALISON DONALDSON

HARRY KENWARD, JAMES RACKHAM and JOHN THORNTON

A WELL-PRESERVED SEQUENCE of craftsmen's premises and their associated refuse was found in three tenements off Saddler Street in Durham City. The earliest occupation took place in the second half of the 10th century and a tenement area had been defined within a few decades. The destruction of the occupied tenement by fire took place sometime in the second half of the 11th century and was contemporary with the collapse of the local late Saxon pottery trade. This was followed by the development of the two adjacent properties and the fencing of the boundaries between them. The tenements were occupied by shoemakers and cobblers from their earliest days and their economic interdependence with the community is shown to be high. There was no special evidence for Scandinavian influence in a culture that otherwise resembled in many respects that of Anglo-Scandinavian York. The recorded sequence ended in the early 13th century.

INTRODUCTION

Excavations took place between Durham Castle and Saddler Street during the spring months of 1974, and the records were analysed over the next four years (1974–78). Although limited by the area available, the results were valuable due to good preservation of the deposit, and their principal reward was a detailed sequence of settlement between the 10th and 13th century.

In trying to create an account of this sequence that is both evocative and credible, an attempt was made to transliterate the many analyses that were undertaken (while respecting their tenets). Thus, presented here are condensed and abridged accounts of the *Site Conditions*, *Structural Sequence*, *Chronology*, *Artifacts*, *Animal Bone*, *Plant Remains*, *Insect Remains* and their assemblages, edited and adapted for the practising archaeologist from full reports in archive. The *Synthesis* which follows depends only on the data presented but makes use of ideas put

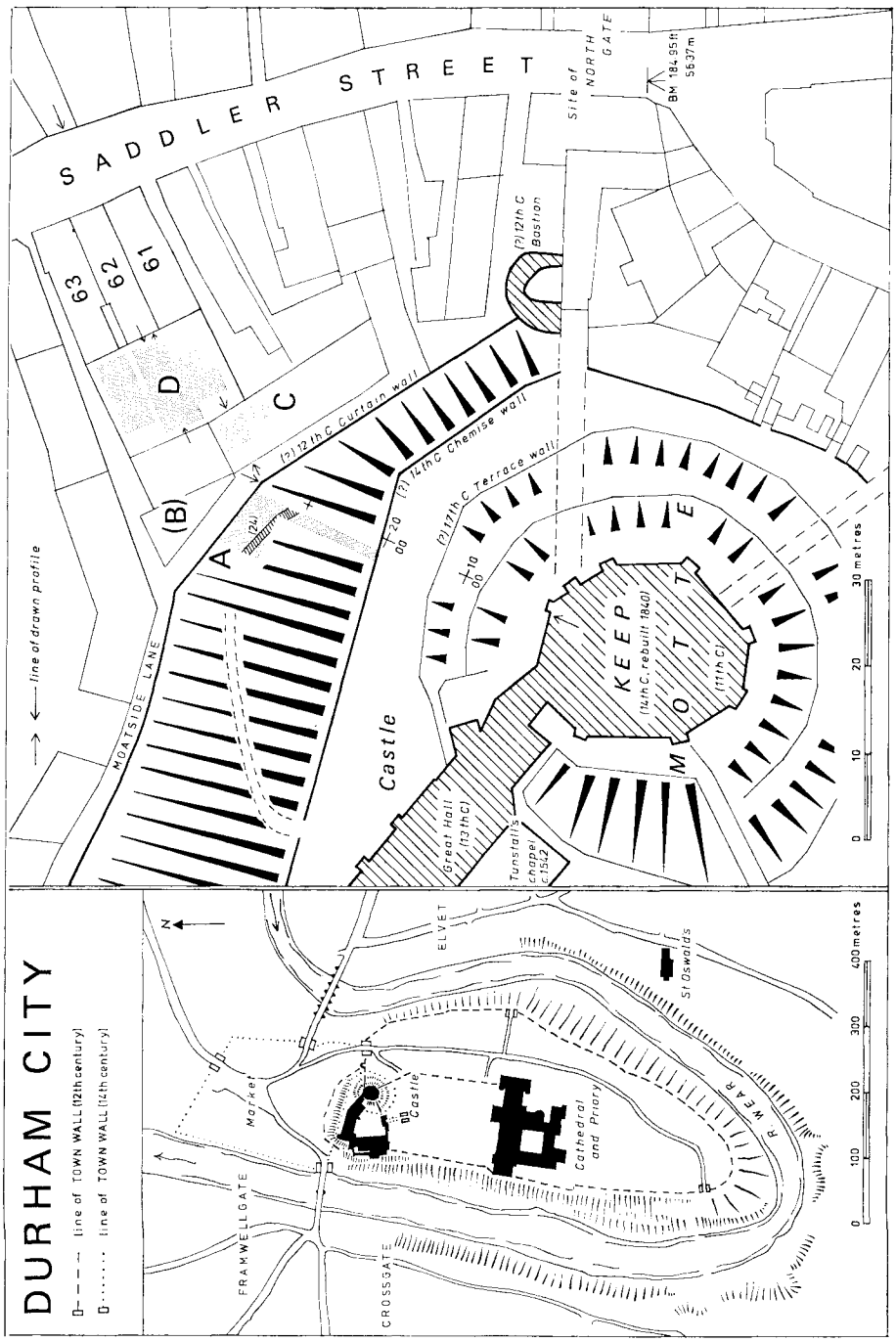


FIG. 1
Durham City, showing position of 1974 excavations

forward elsewhere[1] to isolate those assemblages which have direct relevance to the life of the inhabitants. A documented essay on the historical and archaeological context of the excavations has been previously attempted,[2] and is the source used for the paragraphs which follow.

The excavation records and the analytical reports are held in archive at Durham University, and the interrelationship between the information which was found and that which was recorded, analysed and published is set out in Table 1, which acts as an index both to the archive, and to this paper.

SITUATION

Durham City developed upon a peninsula of sandstone contained by the River Wear (Fig. 1). According to the documentary record, the higher ground occupied by the Cathedral and the Castle was first settled by an Anglo-Saxon community in the 10th century, defended in the 11th century, and fortified with a stone wall by Bishop Flambard (1099–1128). The lower-lying peninsula neck was exploited as a market place, possibly as early as the 11th century; it existed as the *Borough of Durham* at least from 1130, and was walled in the early 14th century. *Saddler Street* winds down from the precinct containing Castle and Cathedral through the site of the North Gate to the Market Place. It has characteristically narrow tenements to east and west, including nos. 61–63 whose rear areas were available for excavation in 1974 (Sites C, D). Looking south-west from these properties, the ground rises rapidly through a series of terraces to the summit of the motte (Fig. 2; Pl. 1, A). The motte itself was erected by 1072, heightened after 1075, and a shell-keep supported by four radial walls was in existence by the late 12th century. The so-called "curtain-wall" has been thought to be part of Flambard's system. Bishop Hatfield (1345–81) broadened and lowered the mound and rebuilt the keep, perhaps adding the so-called "chemise-wall" to the north. Bishop Cosin (1660–72), who demolished the south barbican, is also recorded to have built the terraces on the motte slopes. The upper stories of the keep were pulled down by Bishop Thurlow in 1789, and the 14th-century keep was finally demolished in 1840, before being rebuilt (on the same plan) for University College. The excavations of 1974 were occasioned by the building of further premises for University College in the area between Saddler Street and the Castle.

SITE CONDITIONS

The Saddler Street properties affected by building development included two houses (nos. 51–52) formerly in use by the Archaeology Department, together with the 'Buffalo Head' public house (nos. 57–58), and the Sutton Sale Rooms (rear part of nos. 61–63). Terraced into the hill-side behind nos. 58–61 was the massively founded three-story warehouse known (from the intermittent users of its top floor) as the 'Judo Hall'. Apart from the cellars beneath the Sutton Sale Rooms (Site D), the Judo Hall (Site C), and a patch of rough ground between the curtain wall and the chemise wall (Site A), all the threatened area was in use at the time of the excavation.

TABLE 1

PUBLICATION SCHEDULE

(Figures in brackets refer to *Archive* based at Durham University; the archive itself is indexed in *Archive* A 1)

LEVEL I (found)	LEVEL II (recorded)	LEVEL III (analysed)	LEVEL IV (published)
SITE GEOMETRY (see Figs. 1 and 2 for area sampled)	Plan of the site before demolition (C/A 4) Section E.–W. through Site A (C/A 1) Plan of wall 23/24, Site A (C/A 2) Elevations of excavated walls, Site A (C/A 3)	Plans combined with O.S. map and architects plan	Fig. 1
	Plans of Site C after excavation (C/C 1) Sections N.–S. and E.–W. through Site C (C/C 10)	Plan and N.–S. section drawn	Fig. 3
	Plans of Site D, during and after excavation (C/D 1–6) Sections E.–W. through Site D (C/D 11–13) Sections N.–S. through F 9, F 100 Site D (C/D 14)	Plans redrawn at periods interpreted from *Stratigraphy* Central E.–W. section (C/D 11) redrawn and interpreted	Figs. 5–7 Fig. 8
	3 site notebooks containing descriptions and relationships of 447 contexts (B 2–4) Card index containing descriptions and relationships of 98 features (B 9) Director's site book, with on-site interpretations (B 1)	Stratigraphy constructed (Site C and D) Descriptions and identifications of timber structures standardized Typed transcript of Site D notebook (A 5)	Figs. 4, 10 Fig. 9 Table 4
	Table of 102 levels related to OD (B 1)	Profile constructed Typed transcript of profile readings (A 3c)	Fig. 2
	*c.*400 photographs of features in Site A, C, D (D 1)	Indexed album of negatives (D 1a) Indexed album of selected prints (D 1b) Structural sequence interpreted (A 3–4) Synthesized with documentary and archaeological record	Plates I–IIIb p. 9, Fig. 32 p. 67
METALWORK	All recognized objects (24) collected, sketched, mapped and photographed (B 5–6) (A 6)	Photographs in indexed album of negatives and of prints (D 2) Conserved, drawn and described (A 6b) X-ray photographs taken (D 2d)	p. 17–21, Figs. 13–14 Durham University Museum
WOOD	All recognized pieces thought to be worked (17) collected, sketched, mapped and photographed, excluding structural timbers, which were sampled, measured and drawn *in situ* (A 6; B 5–6, B 8). Fence F 49 lifted	Conserved, identified, drawn and described Structural samples identified	p. 24–26, Figs. 14–15; Pls. III, V Table 2 Durham University Museum

TABLE 1 (continued)

LEVEL 1 (found)	LEVEL II (recorded)	LEVEL III (analysed)	LEVEL IV (published)
LEATHER	All recognized pieces thought to be manufactured objects (103) collected individually (A 7, B 5–6)	All but 46 groups reported on by J. H. Thornton (A 7) Conserved and drawn Selected pieces photographed (D 2)	Abridged report, p. 26; Figs. 17–20; Pl. IV Durham University Museum
	Cutting scrap collected from all contexts but sampled for major deposits (190 groups) (A 7, B 8)		
CLOTH, HAIR, WOOL	All identified pieces (15) collected, sketched and mapped (B 5–6)	Reported on by E. Crowfoot, H. Appleyard, M. Ryder (A 8) Conserved, and photographed (D 2)	Edited report, p. 36; Fig. 21 Ryder (1977); see note 28 Durham University Museum
CLAY	All recognized Pottery (*c.* 1,000 sherds) collected, sketched and mapped for earliest contexts (generally Period 1) (B 5–6); remainder collected by context (B 7) All recognized daub collected and mapped (C/D 4, B 7) Other clay artifacts (2) collected and mapped (B 5–6)	Pottery, etc., from Site A jettisoned Pottery, etc., from disturbed levels on Site C and D jettisoned Stratified pottery grouped macroscopically by fabric and fabrication and seriated (A 4d) Fabric examined microscopically by L. Addis (*et al.*) (Work in progress) Pottery, daub, and other clay artifacts drawn, photographed and described (A 6b, D 2)	p. 39 p. 39; Figs. 22–27; Pl. V Durham University Museum
ANIMAL BONE AND ANTLER	All recognized visible bone collected (B 5–6, B 7, B 8). 1575 (F 100) sieved for bone, etc. Recognized artifacts (12)	Identified by J. Rackham (A 10) Artifacts drawn, photographed and described (A 6b, D 2) Animal bone quantified, analysed, and interpreted by J. Rackham using principal deposition groups (A 10)	p. 21; Figs. 14, 15; Pl. V Durham University Museum Abridged report p. 47
ORGANIC RESIDUES	1–2 kg samples taken from contexts selected on site (B 7, B 8)	Plant species content identified, quantified, and interpreted by A. Donaldson Insect species content identified, quantified and interpreted by H. Kenward	Edited report p. 55 Edited report p. 60
MINERALS AND CHARCOAL	Samples of sand and stones taken from selected contexts (B 7) Samples of burnt wood taken from selected contexts (B 7, B 8, A 13)	—— Radiocarbon dated by AERE Harwell (certificates at A 13)	—— Table 3, Fig. 11

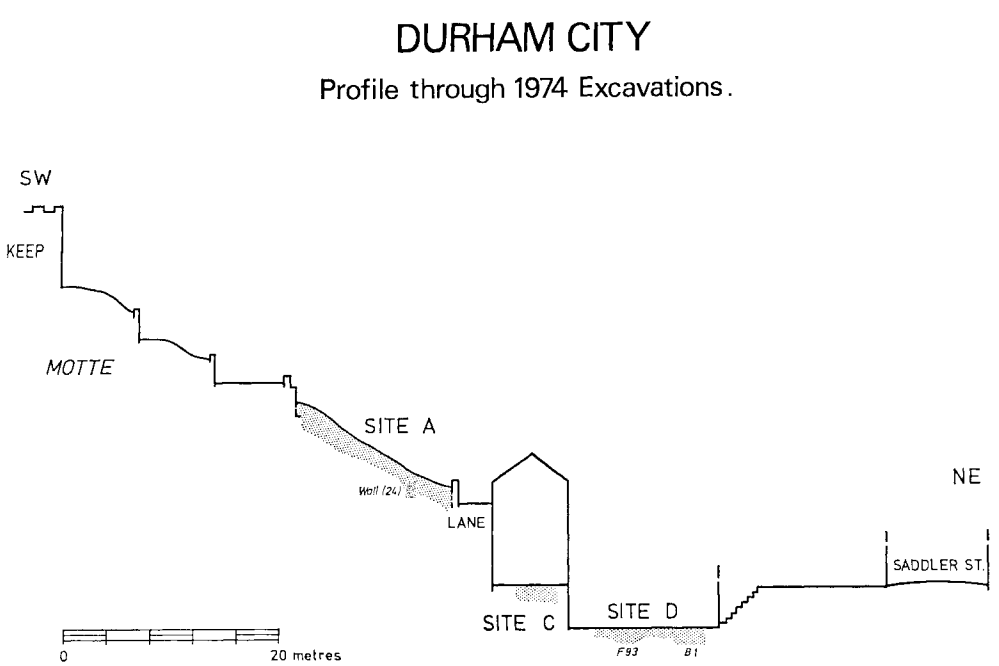


FIG. 2
Profile through 1974 excavations and adjacent area

The brick floor of the Site D cellars lay *c.*4 metres below street level and was covered with modern rubbish; the unroofed floor above was badly deteriorated, infested with woodworm and wet rot, and over-grown with grass, nettles, and other wild plants (cf. pp. 55, 60). A large working septic tank or sewer interchange occupied the south-east corner of the cellar. The deposit immediately beneath the brick floor on Site D was medieval and well preserved. Its composition of wooden structures, leather offcuts, leaves, straw, nuts, twigs and other organic material was immediately obvious. It was highly compressed, had a characteristically warm, sweet smell, and wood pieces were stained blue with vivianite. Organic layers were generally separated by damp sand or more rarely, charcoal debris and clay floors. The site was not waterlogged, and preservation was more likely to be due to anaerobic conditions.[3] The pH of the soil varied between 7 and 7.5.[4] The sandstone bedrock forming the floor of S 1 had been beaten into a 'ferruginous concretion' such as Whitworth had observed on his site on the peninsula.[5]

The cover of Site C was tarmac over modern rubble, and a modern drain (F 102) had been tunnelled into the deposit from the east.

The area around Site A between the curtain and chemise walls, was overgrown with brambles. Exploratory excavations were first carried out, as a result of which Site A was abandoned, Site B not dug, and all resources concentrated on Sites C and D.

SITE DESCRIPTION

Site A (Figs. 1, 2)

A small area where damage was expected through construction of a stepped access to Moatside Lane, and a north–south trench, were opened on Site A (Figs. 1, 2). It was originally intended to reconstruct a profile through the Castle mound but there were no adequate resources for such an excavation. The proposed steps were subsequently cancelled, the Site D excavation claimed priority and Site A was abandoned after recording to a depth of about 2 m below ground level. To this depth the strata were 19th century in deposition date, no doubt deriving principally from rebuilding at the Castle, and none of the buried structures was shown to be earlier than the 18th century.

The *chemise wall* was composed of irregular sandstone ashlar bonded with light brown-grey mortar. The buried elevation was examined to a depth of 1.9 m; it was stepped out four times northwards by 5–8 cm at *c.*40 cm intervals. The lower courses were over-pointed but still sealed by layers 46,45 which contained clay-pipe and other 19th-century material. The *terrace wall* (23,24) (Figs. 1, 2; Pl. 1, B) examined to a depth of 85 cm, was roughly built of ashlar, bonded with mushroom-coloured mortar. It appeared to seal a cut filled with rubble of 18th-century date and was itself buried by 19th-century tip. The south face of the *curtain wall* was examined to a depth of 1.4 m and was found to consist of a 1.2 m height of ashlar rubble set in grey mortar, resting on irregular ashlar blocks set in mushroom-coloured mortar. The excavated face was sealed by 19th-century tip. The residual pottery from Site A was 12th–16th century. There is no evidence that the examined wall-faces were constructed (or reconstructed) earlier than the 18th century.

Site C (Figs. 3, 4; Pl. 1, C)

Beneath the ground floor of the Judo Hall were rubbish pits and a fragmentary stone building (S 16) of the 12th–14th centuries. The lifespan of these features was probably short in date and continuous from those in Site D (Period 3). Fig. 3 shows the plan and sections and Fig. 4 gives the stratified sequence as analysed and interpreted.

A flagstone floor lay on undisturbed sandstone bedrock and had been relaid three times (F 106, F 105, F 103). Immediately to the west, with the tidy face inwards, a row of more substantial stones, F 104, was recorded as the revetment-wall of a building, S 16. The final stone floor, F 103, was buried in a debris of building stone and broken clay (1067) containing some later medieval pottery. Similar pottery was found in the foundations of S 16 (1091). The two pits, F 101, F 107, with similar material, were remote from this structure and from each other. They had survived complete neither in plan nor section and their shapes remain uncertain.

Site D (Figs. 5–10; Pls. 1, D–III, B)

Excavations on Site D were concentrated firstly on the two northern tenements, nos. 62 and 63 (Tenements B and C), which were separated by a brick wall. The rotting timber floor above was cleared and the site opened to the sky. The southern tenement (no. 61; Tenement A) was opened a month later and the brick wall between it and no. 62 removed. The main purpose of this extension

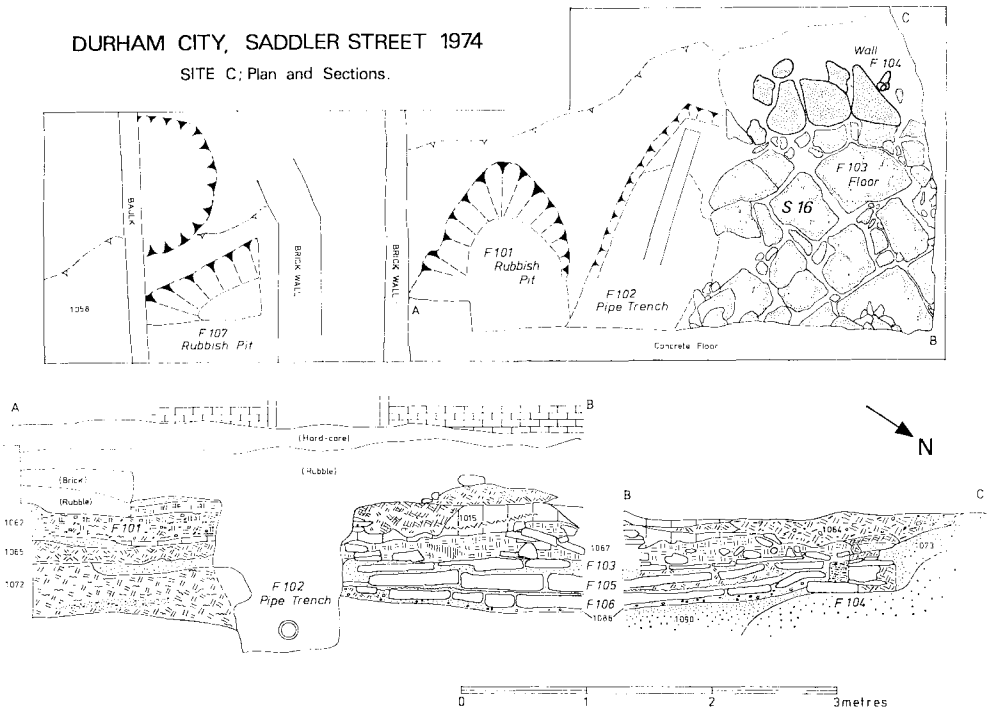


FIG. 3
Site C: Plan and sections

(to recover more of the plan of S 1) was frustrated by the active sewer junction which was leaking and had to remain clad by baulks to avoid contamination. The central and southern areas of the site retained a deep deposit (up to 2 m thick) containing a sequence of upstanding timber structures interpreted as HOUSES, DRAINS and SHEDS. To the north, the deposit had been largely removed to the natural sandstone, but pits and gullies survived.

The excavated contexts and identified features (indexed in Table 4 and described below) were ordered by their stratified sequence (Fig. 10), and separated into three periods suggested both by their stratigraphy and the pottery assemblage (p. 39). The features recorded on site have accordingly been redrawn into three plans (Figs. 5 and 6 relating to Period 1, Fig. 7 relating to Periods 2 and 3). Fig. 8 shows the E.–W. sections through the central tenement, and their interpretation, together with sections through pits F 9, and F 100. Comparative dimensions and identifications of the timber structures are given in Table 2, and reconstructions in Fig. 9. Nine samples were taken for radiocarbon dating (Table 3), whence dates between the 10th and 13th century A.D. were obtained. A relative and absolute chronology is given in Fig. 11.

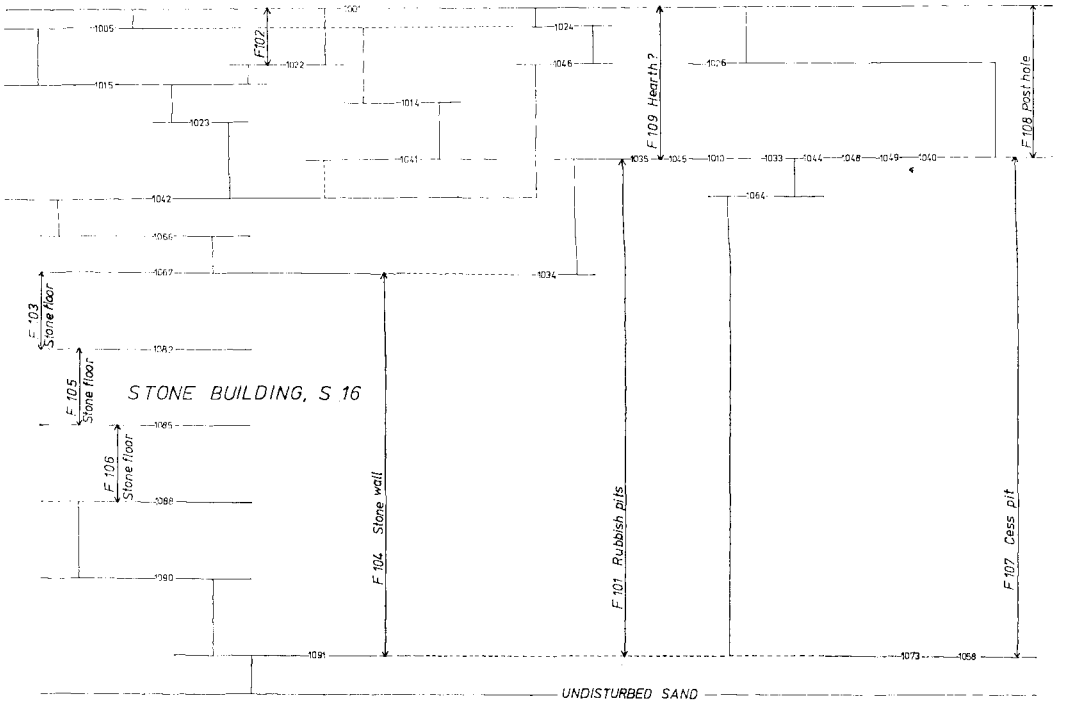


FIG. 4
Site C: Stratigraphy

Period 1 features (Figs. 5, 6; Fig. 8)

The earliest structure on Site D was part of a HOUSE, S 1 (Pl. II, B) which had been terraced into the hillside bedrock — here a compact yellow-to-white sand banded with grey clay. The building had four components: (1) a revetment of hazel, woven on to oak and alder posts (F 75, F 89, Pl. II, B, C); (2) post sockets (F 88, F 85, F 91); (3) a sequence of floors of rammed sand (F 84, F 87) and (4) a hearth (F 83), (Pl. II, A). By a mischance the remains of S 1 had been damaged on its southern side by an active sewer and on its eastern side by the foundations of nos. 61–62 Saddler Street. This made its alignment uncertain; but the placing of the hearth suggests that it was aligned north-west–south-east, in a sense parallel to Saddler Street, rather than at right-angles to it (p. 68). S 1 was burnt down, the charred debris (1779) being covered with patches of burnt sand (1768), indicating an attempt to extinguish the fire. A plank (F 86) and a few sandstones lay on the floor at its destruction. The hearth (F 83) contained scraps of wood debris, ash and burnt wood pieces. An unburnt sandstone lay upon it. S 1 was replaced by a similar building S 2, which had survived only in a fragment (F 76).

Following the horizontal curvature of the hill, further to the north-west, was a sequence of DRAINS (S 14, S 15) (Pl. I, D). The first of these was a round-bottomed ditch, F 93, F 97, subsequently back-filled with clay (1792) (Fig. 8). It was revetted on its north side by a lining of thickly woven willow twigs on slender posts, which was not traced further south (F 30). After backfilling, revetments of different character — constructed of more open strands of hazel, oak, holly or birch — appeared on the south side (F 58, F 21) (Figs. 5, 9). These drains contained layers of clay, groups of river boulders and sandstone (F 71), and upcast dumps to the south (1751, etc.), all of which were construed as attempts to keep them running. A pit, F 81, was dug during the life of

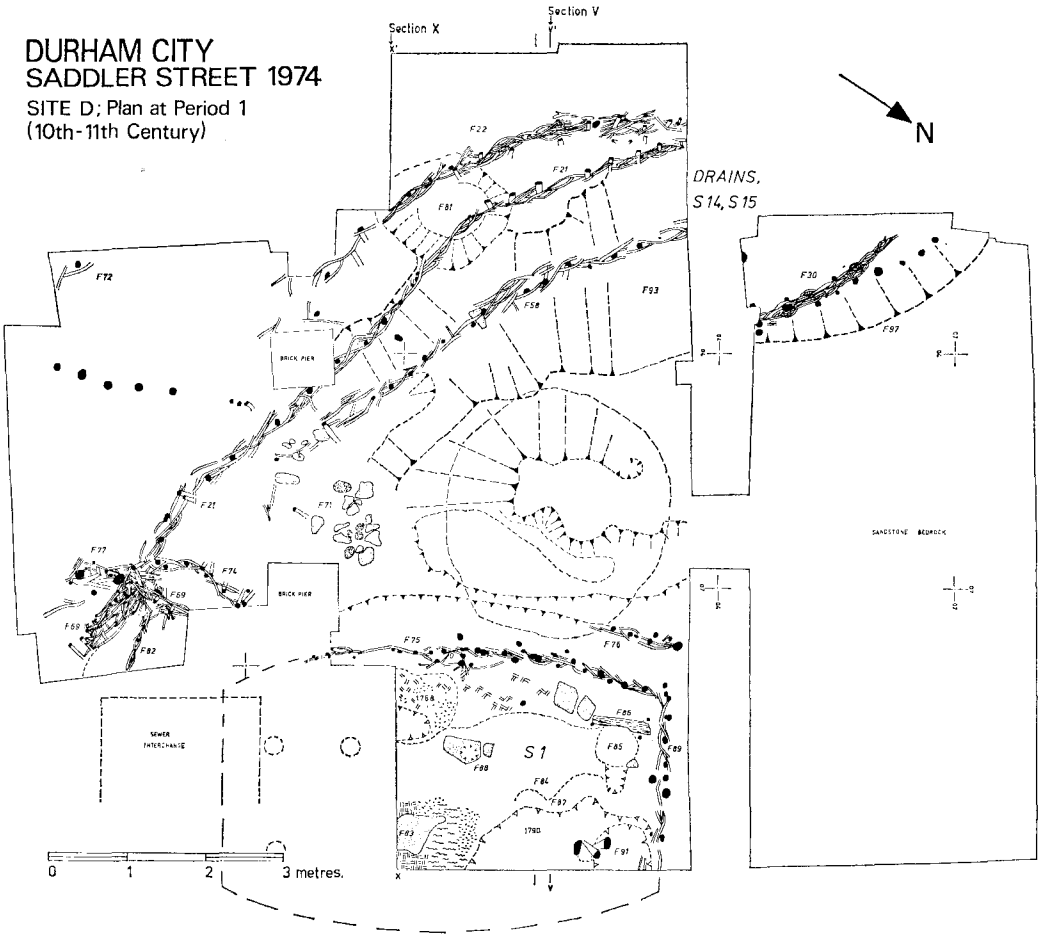


FIG. 5
Site D: Plan at Period 1 (Structures 1 and 2). South-east and north-east walls of S1 are conjectural

the drain, perhaps to obtain the clay that lay beneath. The drains were ultimately buried in mounds surviving up to half a metre high, composed of organic debris interleaved with sand. These were interpreted as MIDDENS (1–3). An articulated dog skeleton was found in Midden 1 (1595). A series of wattle-work panels was woven into the extreme eastern end of the fence F 21 (F 74, F 69, F 82), the function of which is uncertain; it had perhaps constituted a water cistern.

The wattle and daub HOUSES S 3 and S 4 (F 12, F 37, F 57, Fig. 6) which followed were placed further up the hill than S 1 and S 2, and were more damaged by cellaring in modern times. They had also suffered badly from the construction of the oven F 6 (see below). Nevertheless enough survived to observe a construction of hazel on oak and alder posts and a bowed end to the buildings. These structures were contemporary with floors of trodden clay (F 67, 1737, 1718) and were sealed by layers containing charcoal (1696) and burnt daub (1685). The north wall of S 4 (F 57) was carbonized and covered by further patches of pink-grey sand (1701), attributed to fire-extinguishing. This event defines the end of Period 1 (Fig. 10).

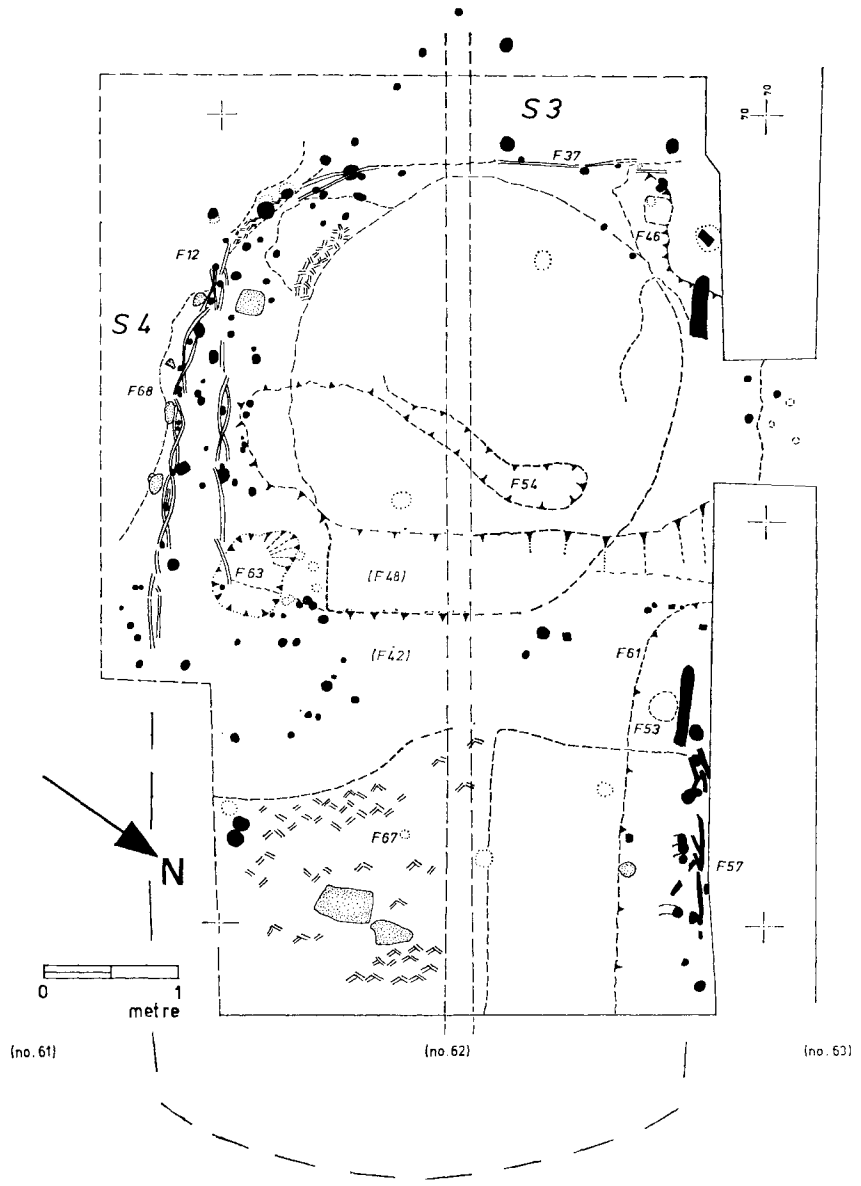


FIG. 6
Plan at Period 1 (Structures 3 and 4)

TABLE 2

TIMBER CONSTRUCTION

Period	Context/ Feature/ Structure	UPRIGHTS			WEFT			Identified as
		Diameter	Interval	Species	Diameter	Weave (Vertical interval)	Species	
1	1757/F 75/S 1	4.5 to 6 cm	30–40 cm	Oak	1–2 cm	blundered, diagonal (6/20 cm)	hazel, alder (c)	Wall of building
	1789/F 89/S 1	5–6 cm	30–35 cm	—	1–2 cm	regular, horizontal (7/20 cm)	—	Wall of building
	1758/F 76/S 2	2.25–4 cm	23–29 cm	hazel	*c.*1.5 cm	regular, horizontal (5/9 cm)	hazel (c)	Wall of building
	1625/F 30/S 15	6–7 cm	*c.*30 cm	willow	0.5 to 2 cm	irregular, brushwood (—)	willow twigs	Lining of drain
	1713/F 58/S 15	4.5 to 6 cm	30–35 cm	hazel, oak alder (c)	2–3 cm	regular, horizontal (3–4/12 cm)	hazel, alder (c)	Lining of drain
	1591/F 21/S 15	4.5 to 6 cm	30–35 cm	hazel, birch (c)	2–3 cm	regular, horizontal (3–4/12 cm)	hazel, birch (c)	Lining of drain
	1670/F 37/S 3	2–4 cm		insufficient evidence		insufficient evidence		Wall of building
	1594/F 22	4.5 to 6 cm	30–35 cm	hazel, oak	2–3 cm	regular, horizontal (3–4/12 cm)	oak, hazel (c)	Wall of Midden heap
	1711/F 57/S 4	2.5–4 cm	28–30 cm	hazel, oak	1–2 cm	regular, horizontal (6/14 cm)	oak, hazel (c)	(burnt) Wall of building (d)
	1565/F 12/S 4	2–3 cm (pairs)	25–30 cm	oak, alder	0.5 to 1 cm	(*c.*4/8 cm)	hazel (c)	Wall of building (d)
	1673/F 38/S 13	4.5 to 6 cm	30–35 cm	—	2–3 cm	regular, horizontal (3–4/12 cm)	—	Lining of Path
2	1679/F 43	4–6 cm	*c.*25 cm	—	*c.*2 cm	tight; set in sub-circular pit	—	Lining of pit
	1675/F 40/S 5	4–6 cm	*c.*25 cm	—	1.5–2 cm	regular, horizontal (daubed)	—	Wall of building (d)?
	1715/F 60/S 12	3–4 cm	28–36 cm	—	1.5 to 2 cm	regular, horizontal (6/12 cm)	—	Lining of path
	1613/F 27	10 × 5 cm	*c.*35 cm	Oak(s)		insufficient evidence	Oak	Property fence
3	1689/F 49/F 35	5 cm	*c.*25 cm	birch, oak, hazel		irregular	birch, oak, hazel (c)	Lining of rubbish pit

NOTES: (s) Squared or split. (c) Coppiced. (d) Daub in association

Vertical interval = number of horizontal members in a given height
Dimensions of 1679 taken from drawings and photographs; remainder from measurements on site

TABLE 3

RADIOCARBON DATES

Status	Period	Harwell Lab. no.	Site Context no.	Delc 13 (‰/10)	Years bp (Libby)	Years bp (corrected)	Date A.D. 68% Confidence Range (uncalibrated)	(S 1) lab. error (years)	(S) standard error (years)	95% Confidence Range bp (years)	Calibrated Range bp (years)	Calibrated age A.D. (years)
						× 1.03						
P	2	599	1574	−27.3	900	927	1023±80	80	189	1116−738	1091−680	859−1270
P	2	601	1574	−24.0	1090	1122	828±130	130	280	1402−842	1357−772	593−1178
P	1	602	1562	−27.6	970	1000	950±80	80	189	1189−811	1179−747	771−1203
P	1	826	1591	−27.1	920	950	1000±80	80	189	1139−761	1117−693	833−1257
P	1	827	1625	−28.5	1010	1040	910±70	70	172	1212−868	1199−832	751−1118
P	3	828	1689	−29.3	740	763	1187±70	70	172	935−591	908−571	1042−1379
P	1	829	1757	−28.6	1010	1040	910±80	80	189	1229−851	1212−807	738−1143
S	1	830	1783	−27.0	830	855	1095±80	80	189	1044−666	1008−615	942−1335
S	1	831	1796	−26.8	1490	1535	415±100	100	224	1759−1311	1707−1275	243−675

$S = 2\sqrt{S_1^2 + S_2^2}$, where $S_2 = 50$ Dates are calibrated following Clarke (1975), see note 102

TABLE 4
INDEX TO CONTEXTS AND FEATURES FROM SITE D

SITE D
7, 8 Cleaning layers, tenement B
1500/F 100 (Cesspit) secondary fill
1501/F 100 (Cesspit) secondary fill
1502–05 Cleaning layers, tenement B
1506/F 1 (Cesspit) secondary fill
1507 Midden 3, sand
1508 Midden 3, sand (=1507)
1509 Unidentified, contaminated
1510/F 2 (slot) secondary fill
1511 Unidentified, strat. uncertain
1512 Unidentified, strat. uncertain
1513 Midden 3, vegetable matter
1514 Midden 6, decomposed vegetable matter
1515/F 2 (slot), secondary fill
1516/F 5 (slot), contaminated fill
1517–1522/F 100 (cesspit), layers 2–7
1550/F 6 (oven) clay and sandstone foundations
1551/F 7 (posthole), fill
1552 Cleaning layer, tenement B
1553/F 1 (cesspit), layer 1 (secondary fill)
1554/F 8 (stake-holes), fill
1555 Unidentified
1556–1560/F 1 (cesspit), spits 2–8 (primary fill)
1561/F 9 (pit) layer 1 (secondary fill)
1562 Midden 3, vegetable matter
1563/F 11 (modern intrusion), fill
1564 Midden 3, clay
1565/F 12 (wattle wall of S 4)
1566 Unidentified; strat. uncertain
1567 Midden 2, sand
1568 Midden 5, decomposed (=1514)
1569/F 13 (modern intrusion) fill
1570/F 13 (modern intrusion) fill
1571/F 2 (slot) primary fill
1572 Midden 5, vegetable matter
1573 Midden 4, clay and vegetable matter
1574 Midden 5, scrap leather
1575 F 100 (cesspit), primary fill
1576 F 100 (cesspit), primary fill
1577/F 15 (west wall of S 10), stake-trench fill
1578 Unidentified
1579 Unidentified
1580/F 12 (wattle wall of S 4), post
1581 Midden 4, clay and vegetable matter
1582 Unidentified
1583/F 18 (post-pit of S 9), fill
1584 Midden 2, sand
1585/F 19 (pit), fill
1586 Unidentified: floor of S 8
1587/F 98 (pit), secondary fill
1588/F 98 (pit), secondary fill
1589 Midden 1, vegetable matter
1590 Midden 1, vegetable matter
1591/F 21 (lining of S 15), wattlework. 1b/1c
1592 Midden 1, vegetable matter
1593/F 94 (post), post
1594/F 22 (revetment of midden 2), wattle work
1595/F 23 (dead dog), skeleton
1596 S 12 (vennel), sand
1597/F 24 (slot), contaminated fill
1598 Unidentified; strat. uncertain
1599/F 25 (stake holes), strat. uncertain
1600/F 26 (depression), modern
1601 Unidentified; strat. uncertain
1602 Midden 3, vegetable matter
1603 ? upcast from F 6 (oven foundations)
1604–1606/F 9 (pit), layers 2–4
1607 disuse of S 8
1608 destruction of S 3; burnt wood
1609 floor of S 3; clay and stones
1610–/F 9 (pit), layer 5
1611 Unidentified; strat. uncertain
1612 Midden 3; grey clay
1613/F 27 (boundary fence), oak posts
1614 Unidentified; strat. uncertain
1615 destruction of oven S 7; clay and stone
1616 (unused)
1617 Unidentified
1618 Unidentified
1619 Midden 1, sand
1620/F 9 (pit), layer 6
1621 Midden 2, burnt sand
1622/F 9 (pit), wattle work
1623 Floor of S 6 or S 8, clay
1624/F 97 (storm drain S 14), back filling
1625/F 30 (lining of S 14), brushwood lining
1626/F 31 (post-pit in S 9), fill
1627 Unidentified; ? levelling
1628 within 1627
1629–30/F 9 (pit), layers 7–8
1631–F 32 (post-pit 1 in S 8), fill
1632/F 9 (pit), layer 9
1633 Unidentified; ? levelling
1634 Unidentified; ? levelling
1635 grey sand, ? extinguishing 1636
1636 destruction of S 5, burnt wood
1637/F 33 (post-pit in S 9), fill
1639 floor debris on S 5; wood
1640–46/F 9 (pit), layers 10–16
1647 floor debris on S 5; wood
1648 floor of S 6; clay
1649/F 34 (lining of ?S 13); wattle work
1650 Unidentified
1651 cleaning layer, tenement A (south)
1652 Unidentified; ? levelling
1653 Unidentified; strat. uncertain
1654 Unidentified; strat. uncertain
1655 F 35 (refuse pit), fill
1656 Unidentified; strat. uncertain
1657 Midden 2; sand
1658 Midden 1; sand and wood
1659 Midden 1; sand
1660 Unidentified; strat. uncertain
1661 Unidentified; (?) ultimate use of S 7 or S 8
1662 Unidentified; (?) floor of S 8
1663 Unidentified; (?) floor of S 8
1664 Unidentified
1665 backfill of vennel, S 12 (?)
1666 Unidentified dump in tenement A
1667/F 36 (pavement of S 12); bonded stones
1668 back fill of vennel, S 12 (?)
1669 floor of S 3; clay
1670/F 37 (wall of S 3); wattle work
1671/F 36 (pavement of S 12); fill
1672 Midden 2

TABLE 4 (continued)

1673/F 38 (? lining of S 12); wattle work
1674 Unidentified dump, in tenement A
1675/F 40 (wall of S 5); wattle work
1676/F 41 (wall of S 5); posts
1677/F 42 (pit); fill
1678 destruction of S 4; burnt wood (=1696)
1679/F 43 (lining of F 42); wattle work
1680/F 44 (posthole); fill
1681/F 46 (posthole in S 3); fill
1682 Unidentified; (?) floor of S 3
1683/F 47 (pit); fill
1684 Midden 4; vegetable matter
1685 (?) levelling of burnt S 4 for S 5
1686 (?) upcast from F 47
1687/F 48 (step for S 7); bonded stones
1688/F 48 (step for S 7); clay bonding
1689/F 49 (lining of F 35); wattle work
1690 Unidentified dump in tenement A
1691 Unidentified; strat. uncertain
1692/F 50 (post-pit in S 11); fill
1693 Midden 5; vegetable matter
1694 Unidentified
1695 equivalent to 1685
1696 destruction of S 4; burnt wood
1697/F 51 ((?) wall of S 9); wattle work
1698/F 96 (pavement of S 12); stone matrix
1699 Unidentified dump in tenement A
1700/F 52 (lining of S 12); wattle work
1701 (?) sand extinguishing 1696
1702 destruction of S 4; burnt wood
1703 Unidentified dump in tenement A
1704 Unidentified dump in tenement A
1705 Unidentified; strat. uncertain
1706/F 53 (posthole in S 3 or S 4); fill
1707 Unidentified dump in tenement A
1708/F 54 (runnel); fill
1709/F 55 (post-pit in S 11); fill
1710/F 56 (post-pit in S 4); fill
1711/F 57 (N. wall of S 4); burnt wattle work
1712 back fill of S 15
1713/F 58 (lining of drain S 15); wattle work
1714/F 59 (post-pit in S 11); fill
1715/F 60 (? lining of S 12); wattle work
1716 primary fill of S 15; sand and wood
1717/F 61 (foundation trench for F 57); fill
1718 (?) floor for S 4; clay and sand
1719 Unidentified dump in tenement A
1720 Midden 3; vegetable matter
1721/F 62 (post-pit in S 11), fill
1722 Midden 3
1723 Unidentified; strat. uncertain
1724/F 63 (posts in S 4); posts
1725/F 35 (pit); pit floor
1726 ultimate fill of S 14
1727 equivalent to 1726
1728 undisturbed natural sandstone
1729 Unidentified dump in tenement A
1730/F 95 (post-pit in S 11); fill
1731 Midden 1, vegetable matter
1732 Midden 1, vegetable matter
1733/F 64 (modern intrusion)
1734 Unidentified dump in tenement A
1735 Unidentified dump in tenement A
1736 floor in S 3; clay
1737 floor in S 3; clay
1738/F 67 (posthole in S 3); fill
1739/F 68 (foundation trench for F 12); fill
1740 Midden 1, vegetable matter
1741 (?) levelling for S 3; wood and clay
1742 destruction of S 3; burnt wood
1743/F 69 (lining of pit F 79); wattle work
1744 Unidentified; strat. uncertain
1745 Unidentified; strat. uncertain
1746 equivalent to 1741
1747/F 71 (lining from S 15 (?)); river cobbles
1748 (?) upcast; sand
1749/F 72 (lining of S 12); wattle work
1750/F 73 (wall of S 6); posts and wattle work
1751 (?) upcast or clearance of S 14 or S 15
1752 (?) upcast or clearance of S 14 or S 15
1753/F 74 (lining of pit); wattle work
1754 (?) upcast or clearance of S 14 or S 15
1755 Unidentified; strat. uncertain
1756 floor of S 2; sand
1757/F 75 (wall of S 1); wattle work
1758/F 76 (wall of S 2); wattle work
1759 (?) upcast or fill of S 15
1760/F 77 (group of posts); strat. uncertain
1761 Unidentified; strat. uncertain
1762 Unidentified; strat. uncertain
1763 scar of F 58 (lining for S 15)
1764 Unidentified, strat. uncertain
1765(?) upcast or clearance from S 14 or S 15
1766(?) upcast or clearance from S 14 or S 15
1767/F 79 (lined pit), fill
1768 destruction of S 1; burnt wood
1769/(F 80) primary fill of S 15
1770/F 92 secondary fill of S 14
1771/F 93 secondary fill of S 14
1772/F 93 secondary fill of S 14
1773/F 93 secondary fill of S 14
1774/F 81 (quarry (?) pit); fill
1775/F 82 (contamination of F 21); wattle work
1776 Unidentified; strat. uncertain
1777 Unidentified; strat. uncertain
1778 Unidentified; strat. uncertain
1779 ultimate uncleaned floor of S 1
1780 debris on floor of S 1
1781/F 83 (hearth in S 1); ash and sand
1782/F 84 (floor of S 1); beaten sand
1783/F 85 (posthole in S 1, 2, 3 or 4); fill
1784/F 86 (plank in S 1); plank
1785 debris on floor of S 1
1786/F 87 floor in S 1; beaten sand
1787/F 88 (posthole in S 1); fill
1788 debris from hearth, F 83
1789/F 89 (wall of S 1); wattle work
1790 debris on floor of S 1
1791 Unidentified; strat. uncertain
1792/F 93; backfilling of S 14
1793/F 93; backfilling of S 14
1794/F 93; backfilling of S 14
1795/F 93; backfilling of S 14
1796/F 93; backfilling of S 14
1797/F 91 (post-pit in S 1); fill
1798 floor of S 1 (?); beaten sand
1799/F 81 (pit); secondary fill
1800/F 81 (pit); secondary fill
1801/F 81 (pit); secondary fill
1802/F 93 (sector of storm drain, S 14)

Period 2 and 3 features (Fig. 7)

Timber structures later than S 4 generally survived as post rows (F 41), or sockets, although the north wall of the first building, S 5, retained its wattlework (F 40). A series of sets of post rows (S 6, S 8, S 9, S 10) followed the destruction of S 5 by fire (1636), all of which are interpreted as SHEDS. Although none was adequately seen in plan, the floors in each case indicated a working space. S 6 and S 8 were contemporary with or later than an OVEN, S 7, which survived as a set of circular foundations, F 6, consisting of sandstones set in grey clay. On the surface of the foundations were thin layers of clay alternately grey and scorched orange. A large sandstone slab (F 48) lay on clay bedding immediately to the east. After the destruction of the oven, large quantities of sand, clay and organic debris (among which offcuts of leather dominated) were habitually dumped in disused SHED areas (MIDDENS 4, 5, 6).

On the south-east of the site a passage-way was marked by two parallel wattle fences (F 60, F 52, F 72) with a series of stone pavements (F 36, F 96) between them, interpreted as a VENNEL (or alley-cum-drain), S 12.

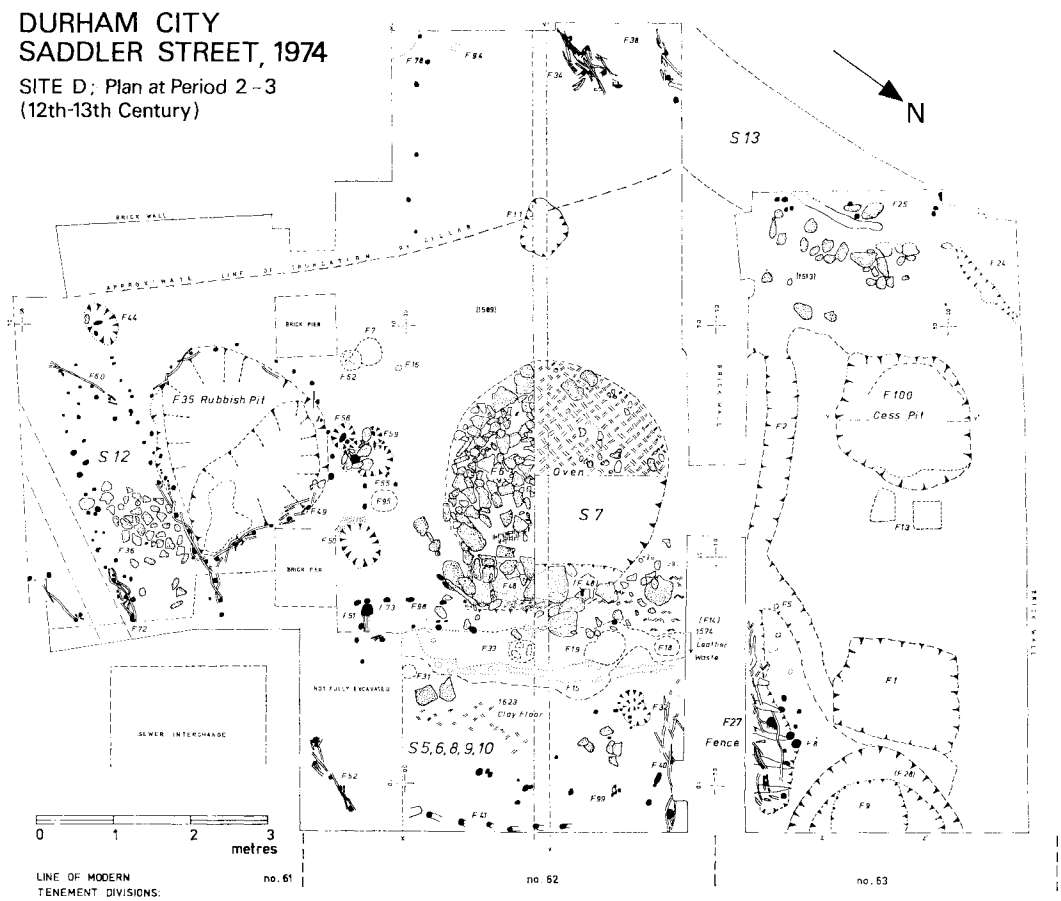


FIG. 7
Site D: Plan at Periods 2 and 3

On the north-west side, two wattle fences (F 34, F 38) associated with stakes and a raft of stones (F 25) may have formed another vennel (S 13) but little of it remained. Two unlined pits (F 1, F 100) had black fills of cess, while a third, F 9, had a wattle-lining (F 28), and numerous tip lines (Fig. 8c). Separating this group of three pits from the OVEN and MIDDENS in the centre was a collapsed post-and-rail fence, F 27 (Pl. III, B), which lay beneath the brick wall which formed the modern property boundary between 62 and 63 Saddler Street.

A row of post-pits and postholes (F 56, F 59, F 50, etc.) similarly marked out the line of the property boundary which in 1974 separated 61 and 62 Saddler Street. To the south of this line was recorded a wattle-lined rubbish-pit F 35 which was bonded into the west side of the vennel, S 12 (Pl. III, A). The MIDDEN (5a) which sealed S 12 did not however encroach on the rubbish-pit, which remained in use, to receive artifacts contemporary with those deposited on Site C.

ARTIFACTS

Note

Reference to artifacts is given in the form 15/1574, where the small find (SF) number is followed by the context number. If the artifact has been examined by a specialist, the laboratory number is affixed, thus: 142/1685/766466. In discussion, SF 15, SF 142 is used.

METAL

a. *Tools* (Fig. 13)

15/1574. *Iron awl* (?). A bent narrow shaft with a small central knob, both rectangular in section. One end pointed, the other squared ((?) broken off), and presumably the tang for insertion into a wooden handle. 'Awls' are mentioned by the *Sagacious Reeve*,[6] and other examples have been found at York.[7] Period 2.
L. (extant) 11.6 cm; W. at centre 0.6 cm.

108/1647. *Steel knife blade.* Tang is broken off but central point of join remains visible. Blade is triangular in section with slightly curved back; surface of metal pitted and variegated in texture. Point worn smooth. Similar knives are known from late Saxon contexts elsewhere.[8] Period 2.
L. 9 cm; max. breadth 1.9 cm; max. W. 0.4 cm.

138/1667. *Iron borer*(?). With badly corroded shaft-end associated with wood fragments. Hollow cylindrical shaft. Period 2.
L. 11.5 cm; int. diam. at shaft-end 0.35 cm; average diam. of shaft 0.4 cm.

147/1685. *Iron drawknife or leather scraper.* The convex edge is rounded and the concave edge is sharp; the surviving extremity narrows as though to become a tang. There is a slight curvature of the blade out of the horizontal plane. Period 1.
Thickness of convex edge 0.5 cm; of concave edge 0.05 cm.

It is the angle of the handle end and the curvature of the blade which suggest the identification. It is not a spade-shoe, since the cutting edge is the wrong side. It might perhaps be a clumsy sickle. If a scythe, it differs markedly from other known late Saxon scythes which are straight-bladed, including those from the nearby Hurbuck Hoard.[9]

185/1741. *Iron borer*(?). Square in section at sharp end, rolled into cylinder (? for shaft) at the other. Period 1.
L. 6.3 cm; ext. diam. at shaft 0.6 cm; thickness of metal at base 0.2 cm.

b. *Keys* (Fig. 15)

59.1574. *Bronze key for barrel-padlock.* The shaft is marked across the corners of one edge by small saw cuts; these have sometimes slipped across the width of the shaft to leave an incised line. The cuts are made from alternate sides on upper and lower edges, and are continued (as decoration) around the key handle. The wards are fresh and the key shows no signs of wear. Period 2.
L. 10.8 cm; max. width 1.9 cm.

79/1581. *Iron key.* The shaft is twisted and the apex of the handle is fractured, but there is little wear on the wards. Period 2.
L. 6.8 cm; W. of handle 0.3 cm (rectangular section); W. of shaft (circular section) 0.5 cm; W. of wards (rectangular section) 0.3 cm.

c. *Arrowhead* (Fig. 13)

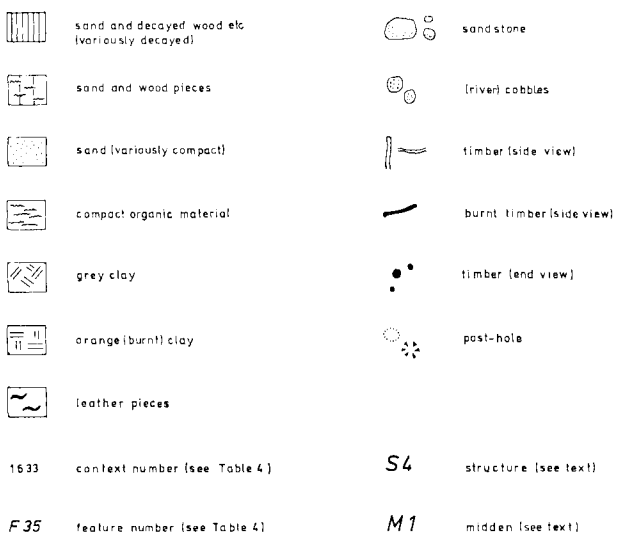
174/1659. *Iron arrowhead or bolt of solid metal.* A cylindrical socket for a shaft may have been sheared off, or there may never have been one. Point slightly damaged. Period 1.
L. 5.8 cm; breadth 1.8 cm; W. 0.3 cm at blade; 0.9 cm at shaft extremity.

d. *Nails* (Fig. 13)

19/1574. *Iron nail* of square cross-section and round convex flattened head. Period 2.
Dimensions: L. 4 cm; diam. of head 1.5–1.9 cm.
84/1581. Distorted *iron nail* of square cross-section and rectangular head. Period 2.
98/1627. *D-headed nail*, trimmed and hammered. Period 2.
The D-shaped head is thought to be 10th–13th century, and to be distinctive of horse-shoe nails.[10]
99/1627. *D-headed nail*, trimmed and hammered. Period 2.
151/1696. *Iron nail* of square cross-section and circular flat head. Period 1.
163/1677. *Shaft of iron nail* with square cross-section. Period 2.
L. 4.8 cm; x-section 0.35 cm.

e. *Fittings and Bindings* (Fig. 13)

47/1513. *Corroded iron ring* of rectangular cross-section. Charred charcoal deposit inside and was probably a binding for a wooden shaft. Period 1.
Ext. diam. 4.5 cm; int. 4.2 cm; breadth 1 cm; W. 0.2–0.3 cm.
69/1607. *Bent iron strip*, broken off at one end; perhaps a boring tool with tang or a binding. Period 2.
Breadth 0.6 cm; W. 0.3 cm.



KEY

Key to symbols (Figs. 1–8)

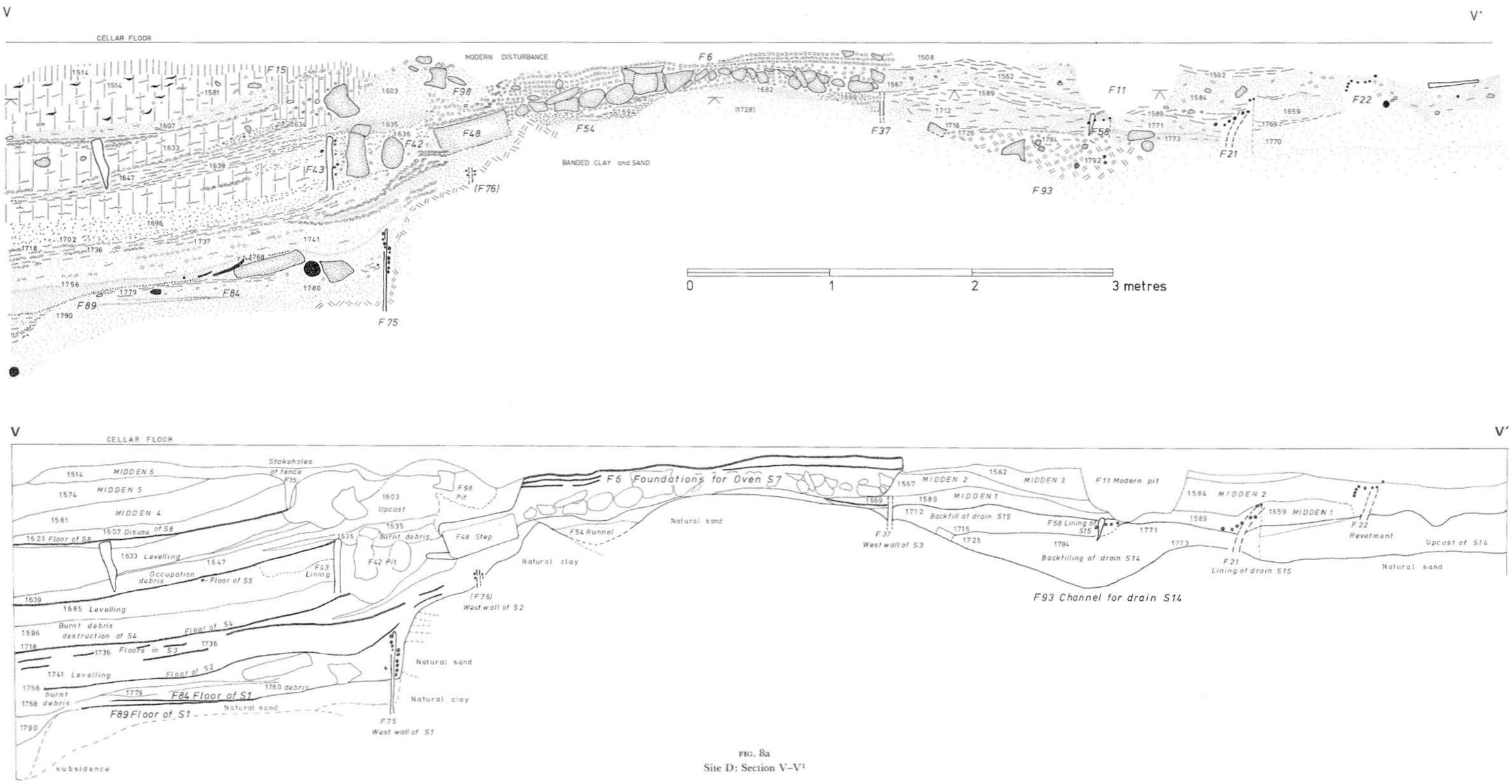


FIG. 8a
Site D: Section V–V¹

DURHAM CITY, SADDLER STREET 1974 SITE D Sections

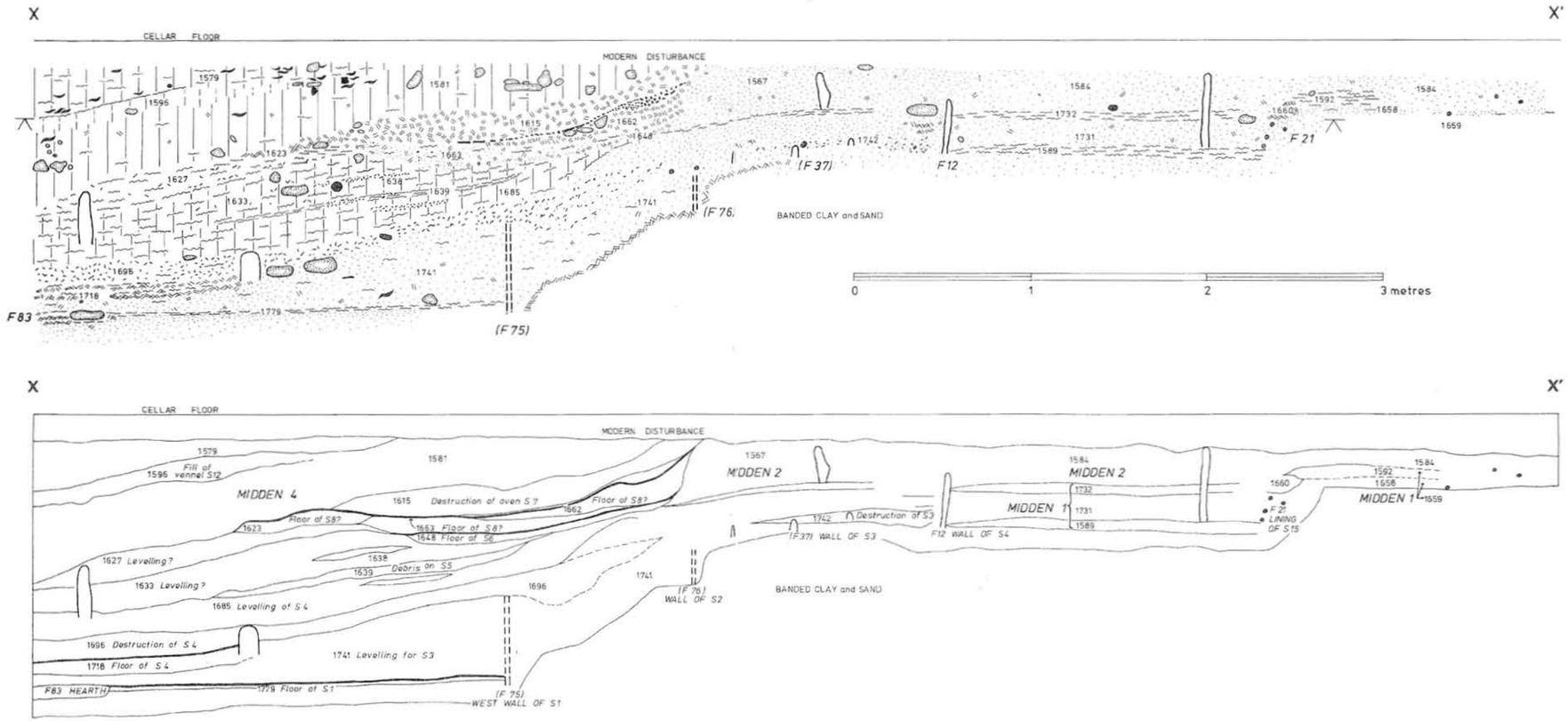
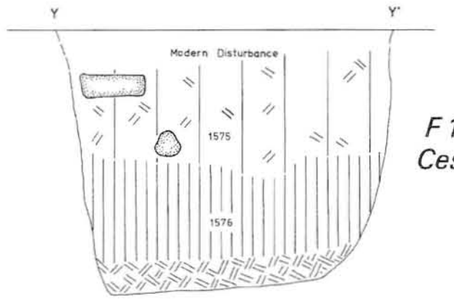


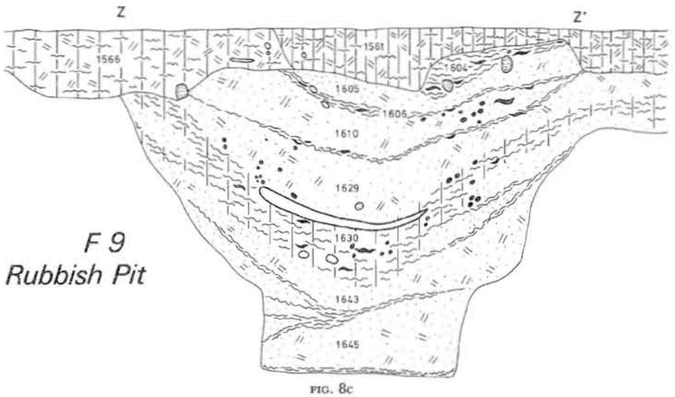
FIG. 8b
Site D: Section X–X¹

DURHAM CITY SADDLER STREET 1974

SITE D; Pit Sections



F 100
Cess Pit



F 9
Rubbish Pit

FIG. 8c
Site D: Pit sections

DURHAM CITY, Saddler Street

RECONSTRUCTIONS of TIMBERWORK

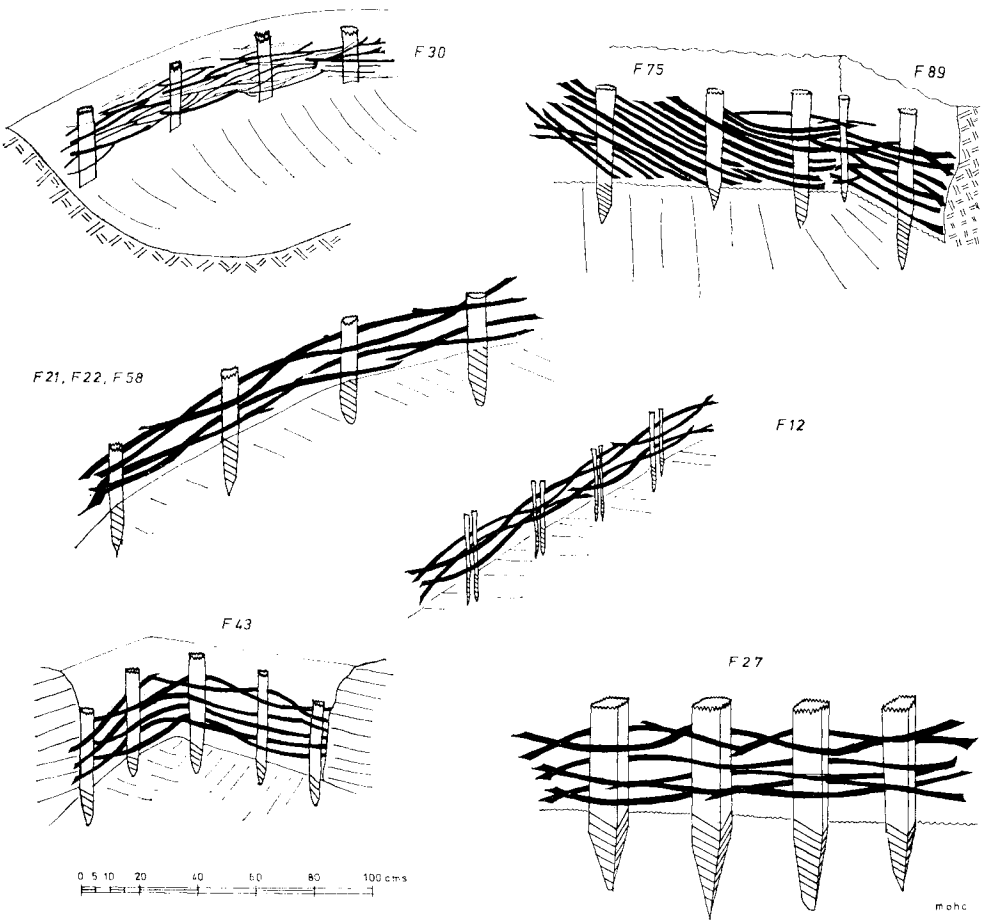


FIG. 9
Reconstructions of Timberwork

82/1581. *Ring of silver*; interior is flat and unworn, exterior has criss-cross ribbing and axial seam. The section is semicircular and its edges are sharp and unworn. Thus, in spite of the diameter (suitable for the average male fourth finger) the object is probably a fitting or binding for a shaft of wood or other material. Period 2.
Ext. diam. (max.) 2.2 cm; int. diam. 1.8 cm.
125/1636. *Strip of iron* punctured (from the convex side) by three holes. (Not illustrated.) Period 2.
129/1668. *Hinged fitting of iron.* A flat horned component with a hole for a stud or rivet is hinged to a damaged hasp which is decorated by punched dots. Probably used as a hasp for a leather container. Period 2.
164/1665. *Iron binding or clip* with rivet and rivet hole. Period 2.

DURHAM CITY, SADDLER STREET 1974
STRATIGRAPHY, SITE D

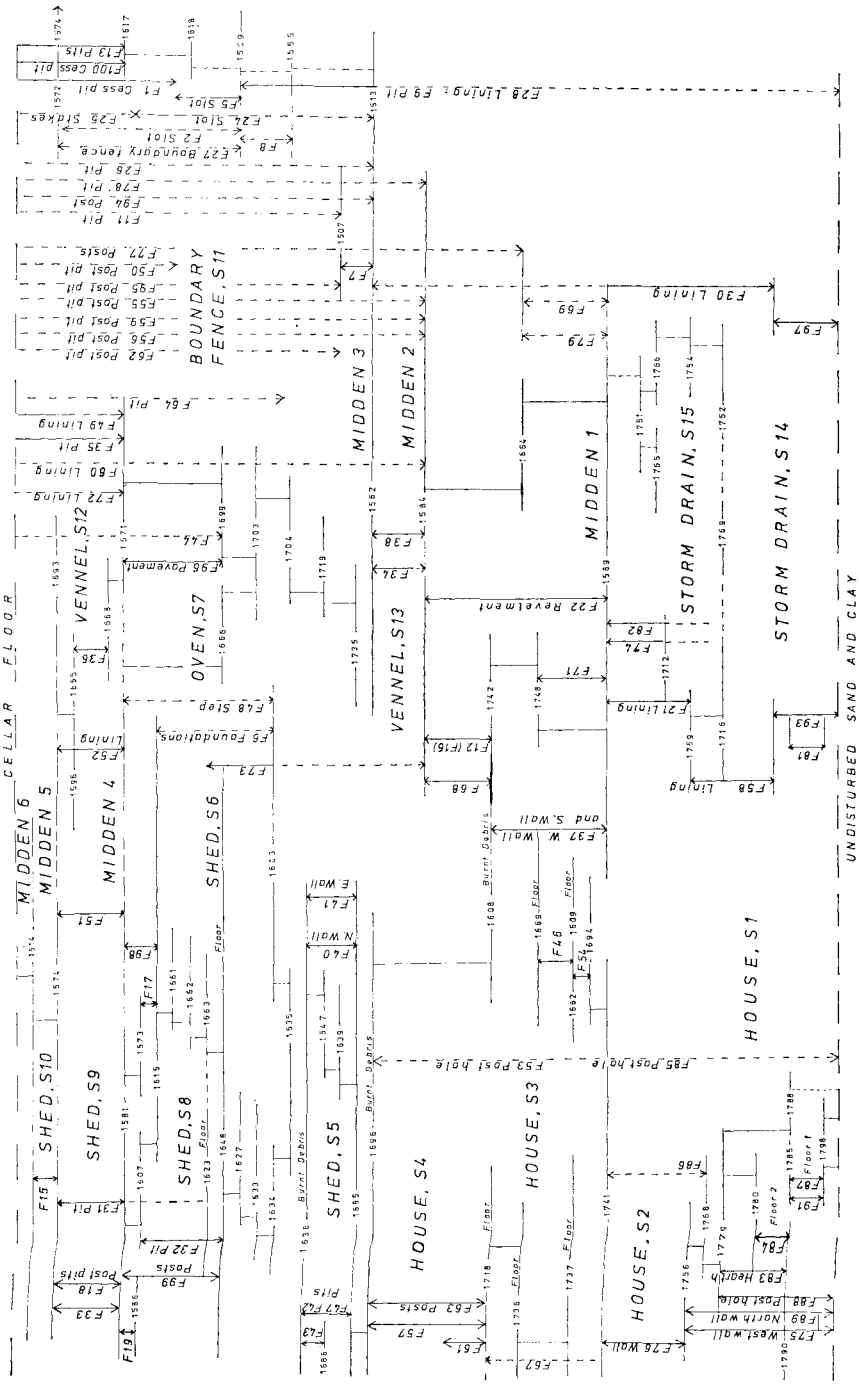


FIG. 10
Site D: Stratigraphy

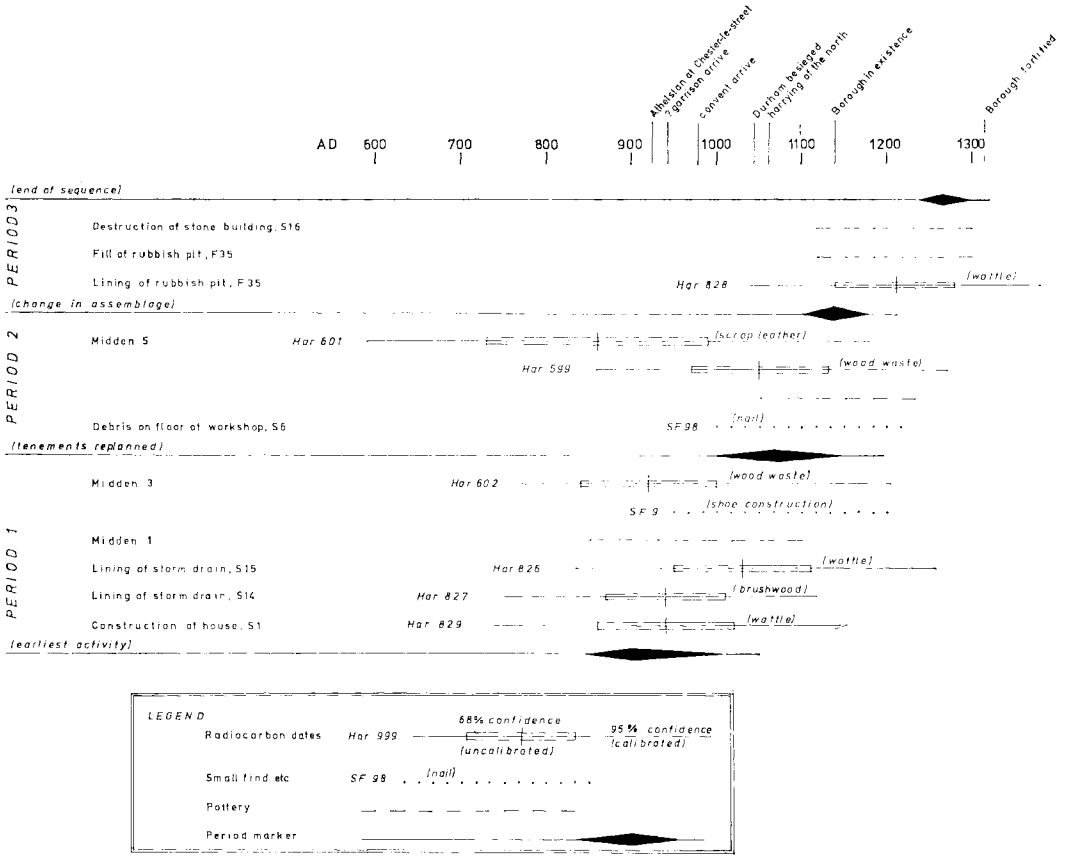


FIG. 11
Chronology

f. *Miscellaneous Fragments* (Fig. 13)

16/1574. *Shaving of silver* (Not illustrated).

38/1588. *Curved strip of iron* of rectangular cross-section. Period 2.
X-rayed to give following dimensions: L. 6.7 cm; W. 0.4 cm × 0.6 cm.

58/1574. *Lead splash.* Found resting in horizontal stable contact within 1574, and interpreted as having fallen *in situ* in the molten state. (Not illustrated.) Period 2.
3 cm across.

137/1655. *Iron strip* with square section and flattened head. Probably a waster nail. (Not illustrated.)

BONE AND ANTLER ARTIFACTS

(Bone identification by J. RACKHAM)

a. *Bone Utensils* (Fig. 14)

22/1574. *Fragment of worked bone.* A sawn and smoothed plate of a split rib bone, from a large ungulate such as an ox or horse. (Not illustrated.) Period 2.

39/1589. *Toggle or dress fastener.* Made from left metacarpus III of a juvenile pig, minus its distal epiphysis. The bone is unworked apart from a hole drilled through the shaft. No sign of wear against the perimeter of the hole, or elsewhere. Period 1.
L. 5 cm; max. W. 1.3 cm.

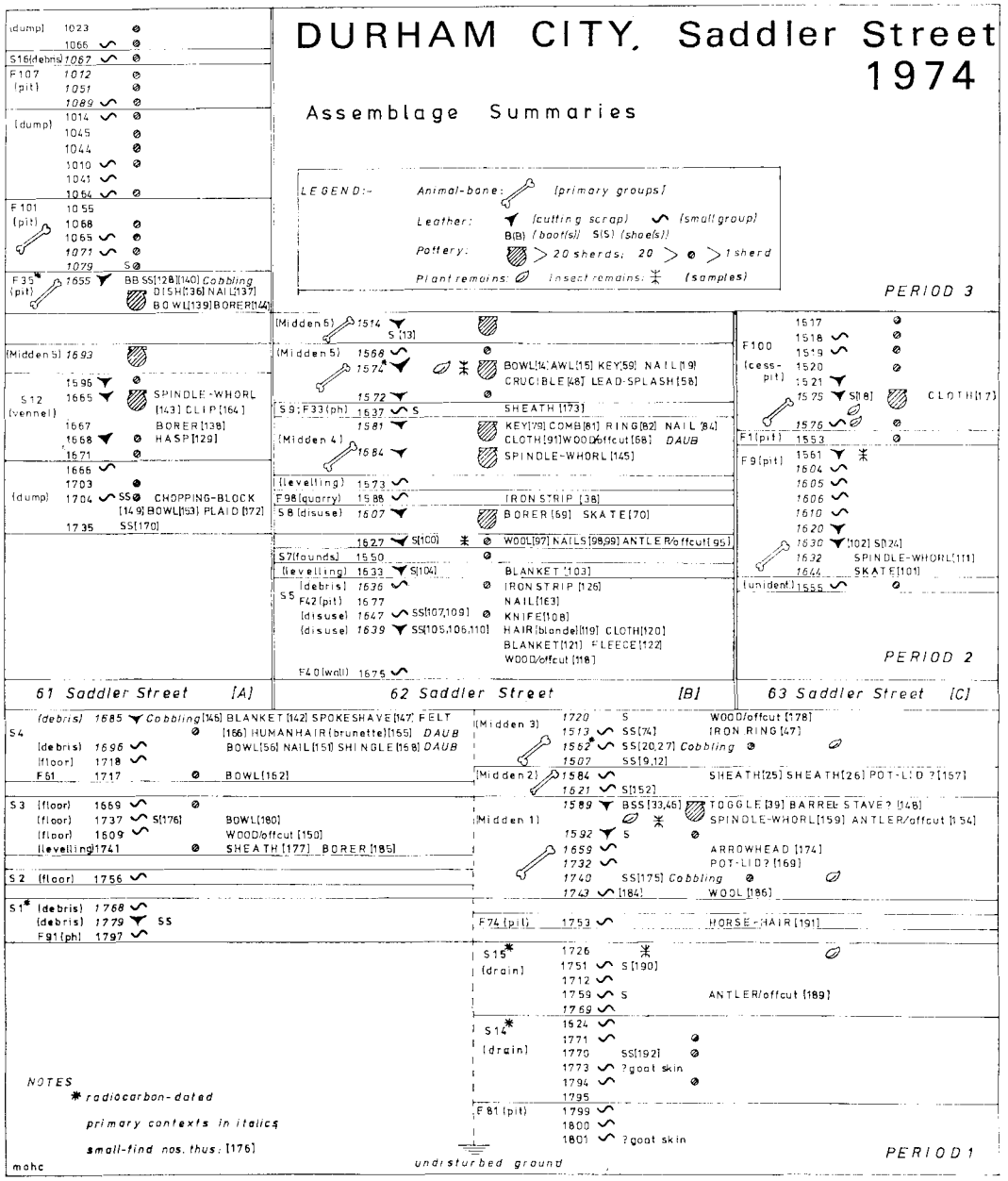


FIG. 12
Assemblage summaries

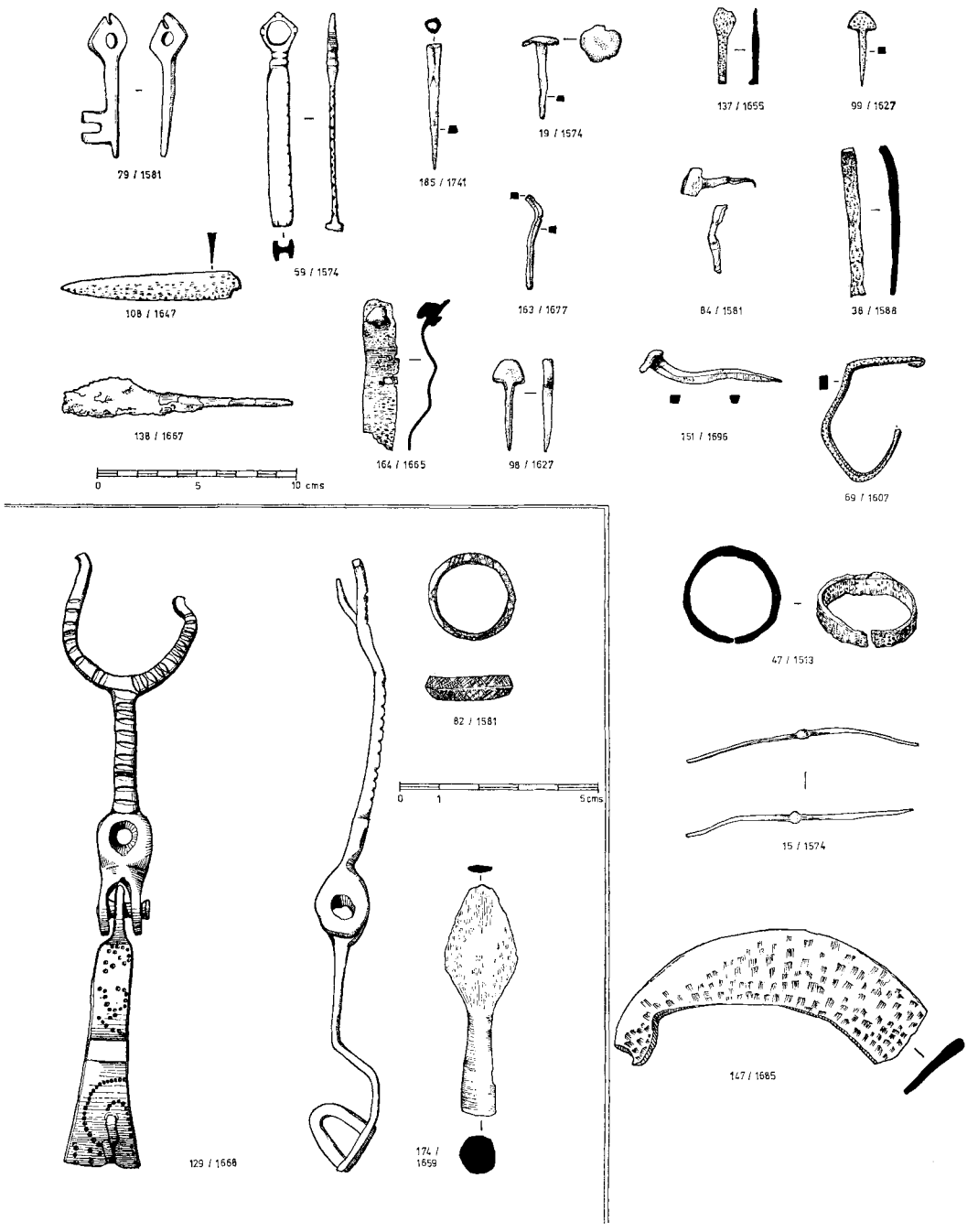


FIG. 13
Small finds (metal). Scales as shown

The same type of object has been recorded from York,[11] Freswick, Caithness[12] and from the Iron Age village at Glastonbury[13] (without certain identification being offered).

70/1607. *Bone skate.* Made from the right metatarsus of a horse. The distal end has an axial hole from which worn grooves lead away to the shaft. The proximal end has a lateral hole through the artificially tapered condyle which is stopped on the shaft side with a cross-cut. The posterior surface of the shaft has been roughly planed, filed and rubbed to provide a worn level surface. Parallel to this is the smooth, flat, and highly polished anterior surface. Identified as a skate with peg holes and grooves for lashings.[14] Period 2.
L. 24.6 cm; breadth 2.3 cm; W./H. 2.5 cm; diam. of distal hole 1 cm; diam. of proximal hole 0.8 cm.

101/1644. *Fragment of bone skate.* Incomplete section of smoothed and polished anterior surface of horse metapodial. The surface is criss-crossed with light scratches. Period 2.

143/1665. *Spindle whorl.* Made from a femur head sawn from the femur of an adult ox. Pronounced wear on the mouth of the upper (rounded) end of the spindle hole which flares outwards. Period 2.
Max. diam. 4 cm; int. diam. 1.3 cm.

The type appears to be common at York.[15]

159/1589. *Spindle whorl.* Made from the femur head of a juvenile sheep or goat. The unfused nature of the bone made it unnecessary to saw the head off since it would have come off during cleaning or boiling. Period 1.
Max. diam. 2.4 cm; int. diam. 0.8 cm.

1648. *Fragment of worked bone.* A fragment of a worked shaft of a long bone of a large bird. One end is slightly charred and the surviving piece, worked and cut, is whistle-like in shape. (Not illustrated.) Period 2.

1579. *Fragments of worked bone.* (a) Fragment of pig fibula, cut, and shaped to form a crude point. (b) Left nasal bone of an ox, with one side of the anterior fork broken. The surviving point appears to be worn and resembles fork-shaped artifacts found in York which are fashioned from the same member. (Not illustrated.) Period 2.

b. *Antler* (Figs. 14, 16)

81/1581. *Comb.* Constructed of antler. Smooth connecting plates,[16] semicircular in section, were riveted with bronze to flat segments which were then sawn into teeth. Ten teeth survive and saw cuts for 55, in the extant length (probably about two-thirds of the original), indicating a coarse spacing. Period 2.
L. 11 cm; breadth 3 cm; W. 1 cm; L. of teeth 1 cm.

Of similar construction to examples from York and Jarlshof.[17]

95/1627. *Offcut.* Tine of red deer antler, sawn off, pointed and smoothed. (Not illustrated.) Period 2.
L. 5 cm; diam. at base 0.8 cm.

144/1655. *Tool (borer).* Made from part of a roe deer antler beam with tine. The base and head of the antler have been sawn and cut off with a knife, leaving the anterior tine as a short spike sticking out from the beam. Provides an easy grip to operate the working point. Period 3.
L. 13 cm; diam. at base *c.* 1.9 cm.

154/1589. *Offcut.* The crown of a red deer antler with the beam and all three tines sawn off. Originated from a stag of 12 points or larger. The cutting appears from the scratch-marks to have been carried out with an extremely fine blade and is done at right angles to the axis of the beam-end tines. Period 1.

189/1759. *Offcut.* Tine of red deer antler, sawn off, pointed, smoothed and polished. Period 1.
L. 6 cm; diam. at base 2.0 cm.

WOODEN ARTIFACTS

a. *Structural Timbers* (see Table 2 and Fig. 8) (Figs. 15, 16)

168/(1696)/1565. *Roof shingle,* made of oak (Pl. III, c). The hole at the narrow end (peg hole) is rectangular with rounded corners. That in the centre is ragged and circular and was made by a post (1565) driven through the shingle at glancing incidence after deposition. The upper surface shows a gentle fall at the rounded (drip) end; the lower surface shows a band of burning (3 cm

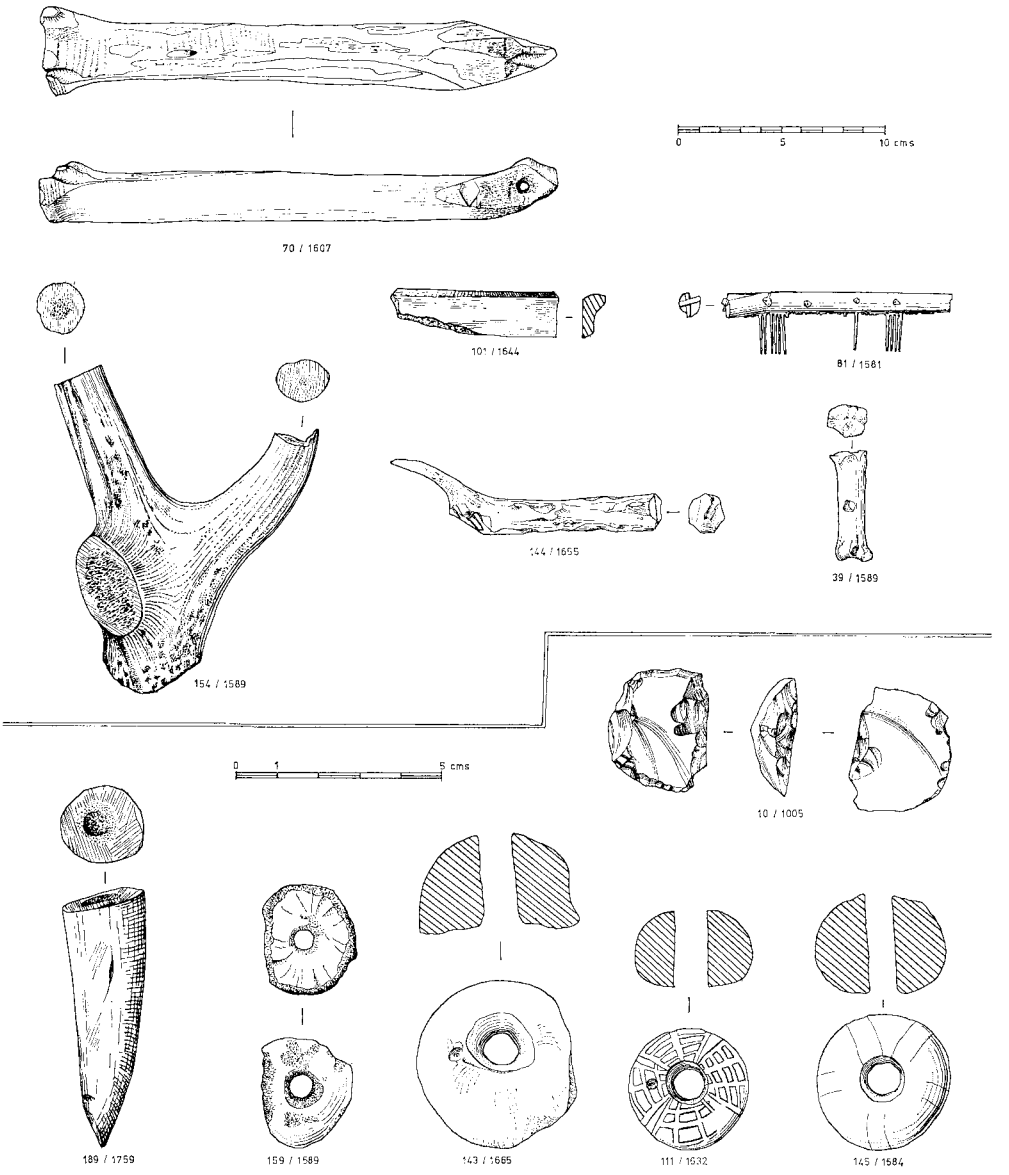


FIG. 14
Small finds (bone, antler, clay, flint). Scales as shown

wide) which crosses the shingle along its short axis. These attributes confirm the identity of the object as a shingle wasted from a roof destroyed by fire (probably that of structure 4). Period 1.

Oak shingles are the earliest roofing material for which there is evidence in medieval Winchester, being there recovered from 11th and 12th-century contexts.[18] An alternative interpretation might be possible — that of a wooden spade or hoe.

21/1562 (Midden 3). *Typical upright oak.* Period 1.

b. *Bowls and dishes*

14/1574. *Fragments of bowl*, made of ash (*Fraxinus excelsior*). (Not illustrated.) Period 2.

56/1596. *Fragment of bowl.* (Not illustrated.) Period 2.

136/1655. *Dish*, made of ash (Pl. v, c). Base of pedestal worn but retaining turn marks. Distortion of one side probably due to post-deposition conditions. Period 3.

Thickness at mid-wall 0.9 cm; of pedestal 1.2 cm.

139/1655. *Fragments of two bowls* (Pl. v, a). Made of field maple (*Acer campostre*). Both show scooped lathe marks internally as well as (decorative) turn marks outside. Period 3.

153/1704. *Part of bowl* made of ash. The section shows that the wood was turned with the grain perpendicular to the axis of the lathe. (Not illustrated.) Period 2.

162/1717. *Fragments of bowl* made of ash. Period 1.

180/1737. *Fragments of bowl* made of alder (*Alnus* sp.). Rim is slightly beaded. Grain is in a plane perpendicular to axis of lathe. Period 1.

c. *Worked Fragments and Offcuts* (Fig. 16)

68/1581. *Offcut, from chopping.* (Not illustrated.) Period 2.

118/1639. *Offcut.* (Not illustrated). Period 2.

148/1589. ? part of a *barrel stave* with bung hole. The corners have been rounded by wear which may be primary and not refer to the period after the stave became obsolete. This must put its identification in doubt. Period 1.

149/1707/(1704). *Chopping block.* Cylinder with beaten ends, and hacked indentation in centre. (Not illustrated.) Period 2.

150/1682. *Offcut of birch*, burnt on one side. (Not illustrated.) Period 1.

167/1584. *Half an oak disc.* (Not illustrated.) Period 1.

Diam. 11 cm; thickness 1.0 cm.

Such an artifact might have served as a lid for a small cooking-pot.

169/1732. *Half an oak disc*, perforated with a stilted hole, showing signs of wear. No wear on edge which is rounded and damaged by fire. One flat side of the disc is also burnt. Pot lid? Period 1.

Dimensions: Thickness 2.5 cm; diam. of perforation 2.5 cm.

178/1720. *Fragment* of worked holly (*Ilex aquifolium*). (Not illustrated.) Period 1.

181/1745. *Fragments* of worked holly and oak. (Not illustrated.) Period unidentified.

LEATHER ARTIFACTS AND MANUFACTURE

(Adapted from a full report in *Archive* by J. H. THORNTON)

Leather artifacts and cutting scrap from shoemaking and the manufacture of other articles occurred in all periods on Sites C and D. The majority of the artifacts were worn soles and uppers from shoes or boots, but other objects were also found: four sheaths and a number of fragments which probably derived from belts, gloves or garments of some kind. In most cases the leather was oxhide, but two finer examples may have been sheep or goat skin.

Most of the 189 groups of leather have been examined and described in detail by J. H. Thornton but a comparative technology using contemporary material is a valuable exercise which remains to be done.

In this summary report, examples of the main artifact-types are given and the evidence for leather manufacturing techniques briefly discussed.

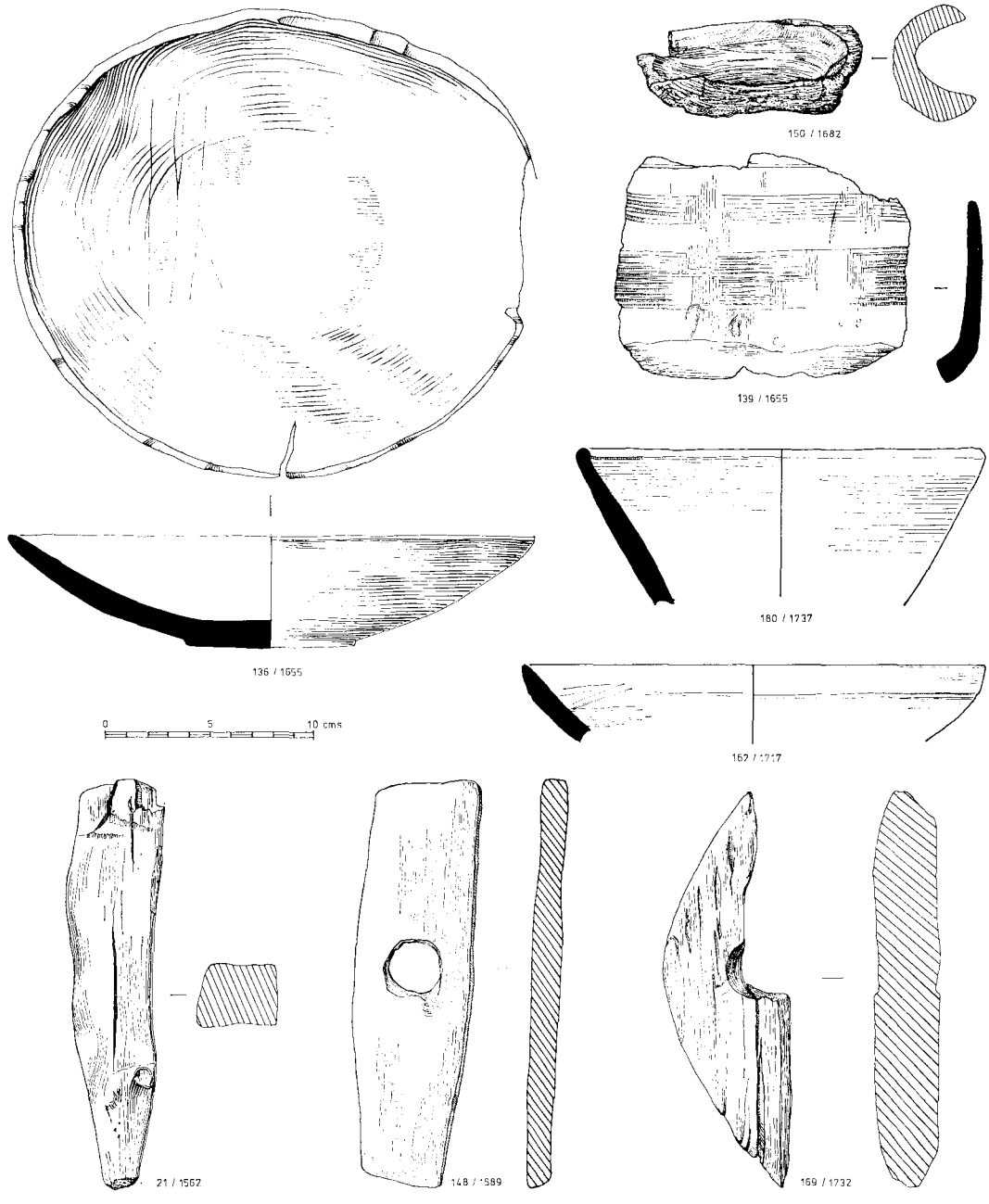


FIG. 15
Small finds (wood). Scale as shown

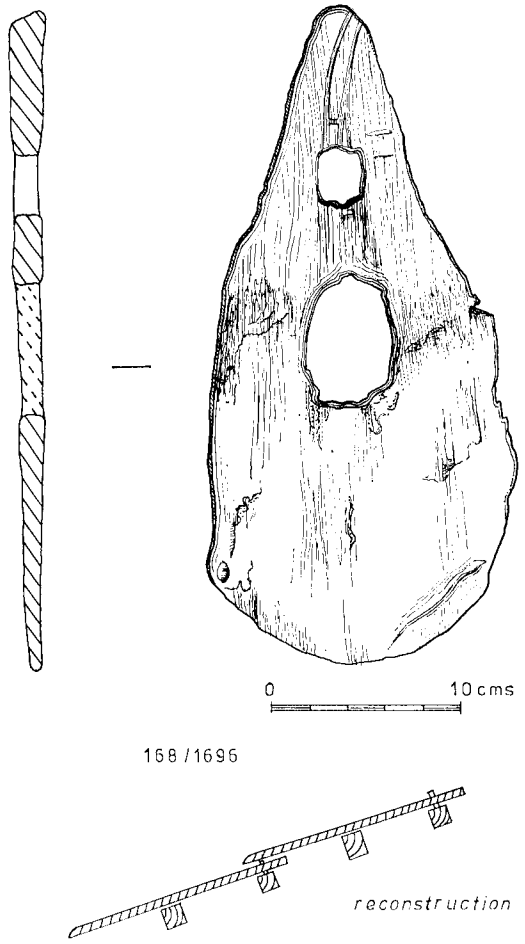


FIG. 16
Oak shingle. Scale 1:4

Sheaths

177/1741/766500 and 173/1637/766505 (Fig. 17; Pl. IV, c) have a similar construction: pliable leather folded along one side and stitched along the other, which has a flange with a perforation, presumably where the sheath was suspended from a belt or strap. 177/1741/766500 is the better made, and has a criss-cross incised decoration. 173/1637/766505 is a rougher production — the stitching does not follow the line of the flange, in which the hole has been torn. 25/1584/766477 (Fig. 17), for a long knife or sword, is pliable and has a central butted seam down one side, and stitch holes for a lost repair-patch at one end, which has been cut to a taper and may have been the bottom. 26/1584/766477 is a much heavier specimen of stiff leather. There is some indication that the sheath was originally continuous round one side, and stitched down the other with coarse stitches, some over 10 mm long; but both sides are now separated and the two pieces are held together by thonging. This sheath, too, should be for a sword or long knife.

Boots and Shoes

Most examples were turnshoes, of which many have the raised quarters of the upper which classifies them as a low boot. The turnshoes generally consisted of a sole joined to an upper by an edge/flesh seam (with stitch holes 4–8 mm apart). The whole upper was prepared as far as possible

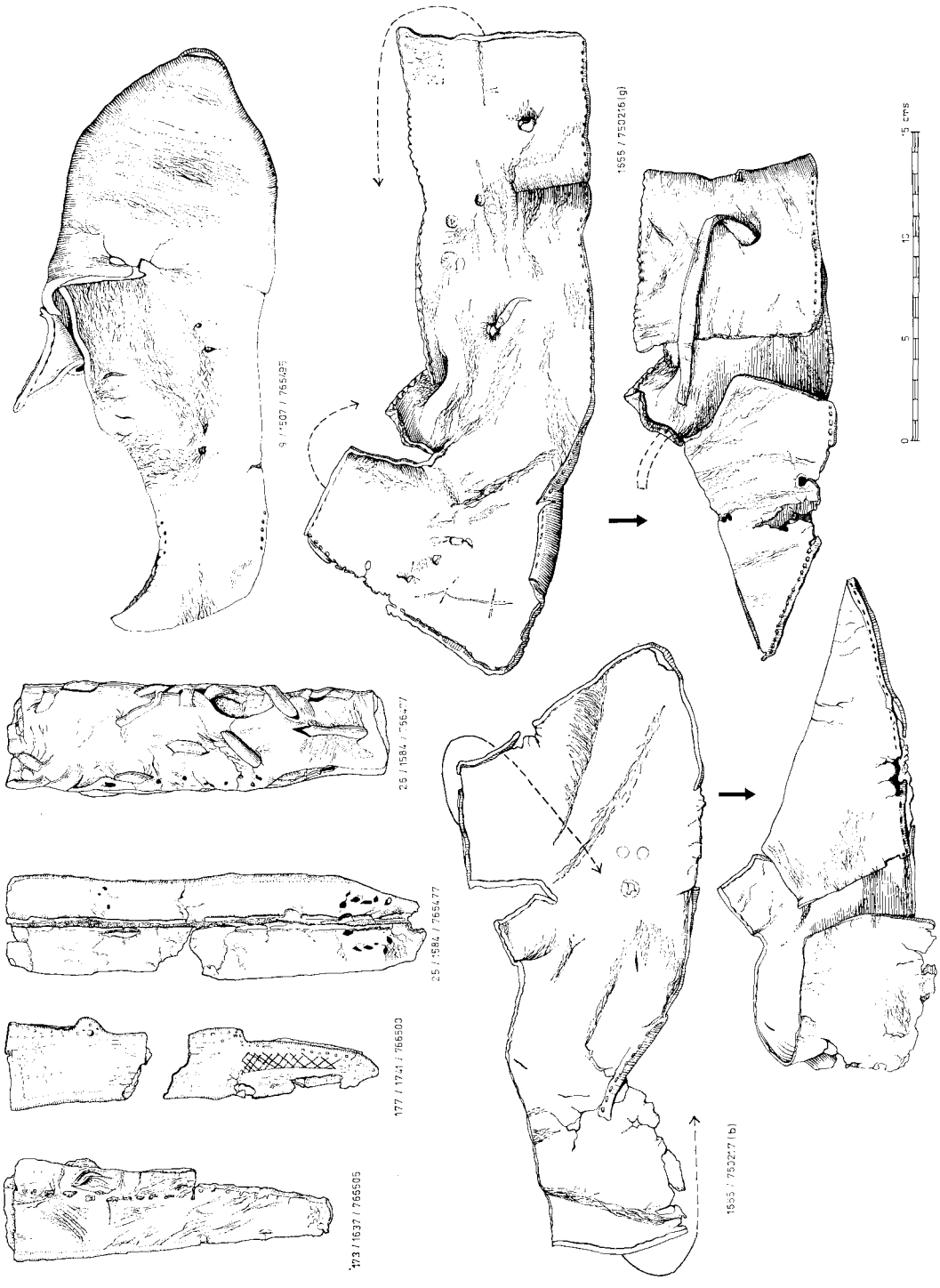


FIG. 17
Leather (sheaths, shoes). Scale 1:3

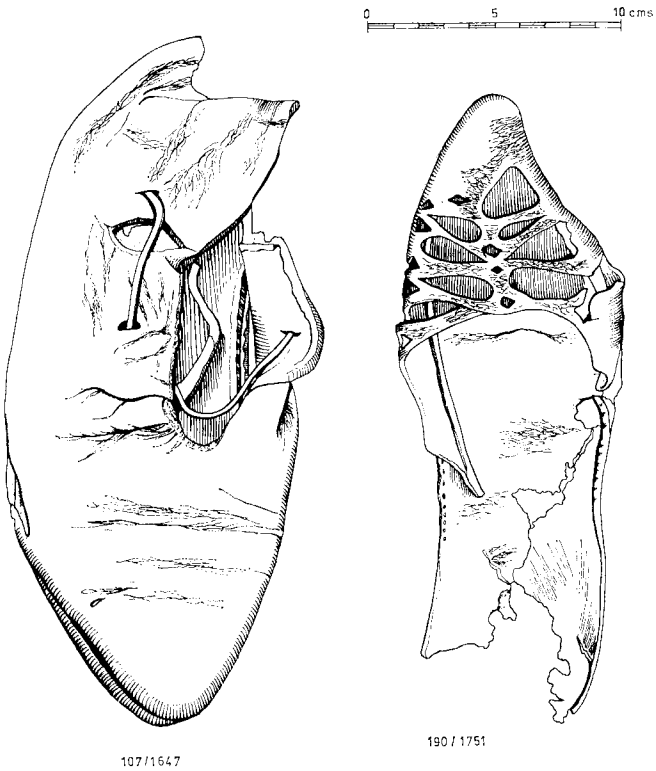


FIG. 18
Leather (shoe 107, sandal 190). Scale 1:3

from a single piece of leather folded and wrapped round. In the case of 9/1507/766472 (Fig. 17), the top and bottom edge of the upper curve upwards at the back, where presumably a v-shaped extension of the sole bent upwards and joined them. Similar types of the same period have been found at York,[19] and in Sweden and Norway.[20] 1770/750266 was joined at a vertical seam at the back, or just off-set from the back (Fig. 20); but more usually, especially with the low boots, the join is at the quarter (Fig. 20). A small rectangular piece of leather was normally used to complete the shape, though 124/1630/766491 used a triangular joining piece (Fig. 20).

1655/750216e (from Period 3), is a 'classic' example of the medieval one-piece upper; it does not even require an insert to complete the wrap-round quarters. This principle of construction seems to have died out by the 14th century. Another example, 1655/750216f (also Period 3), has its lengthy inside quarter folded back on itself and stitched down to the flesh side by an overseam; this is a hitherto unrecorded feature of an early shoe.

A threaded top-band might be attached to the top edge of the quarters, (leaving a scalloped edge/flesh seam), and a stiffener included to reinforce the heel (140/1655/766493). 1655/750216e carried a clear impression of a small crescent-shaped heel stiffener (*c.* 110 mm long × 32 mm high) on the flesh side of the lasting margin. The top-edge of the impression has stitch holes in pairs 2.5 mm between two in a pair, and 8.0 mm between pairs. These were made when the top of the stiffener was "whipped" to secure it to the flesh side of the upper, and is the earliest recorded example of this practice. Romano-British shoes often have stiffeners[21] but these were not stitched in along the top edge. Tudor shoes normally had their stiffeners "whipped" along the top edge.[22]

The shoes were secured to the foot by means of thongs which passed through slits cut in the quarters. The thongs were widened (or knotted) at their ends to prevent them pulling through (Fig. 20).

Two unusual shoes were found in Period 1 layers. 190/1751/766503 is a turnshoe which has been sandalized by perforating the upper (Fig. 18; Pl. IV, B). The part of the upper covering the big toe (the left side of the toe-end) is unperforated — a good point of design. The surviving quarter is cut away to match the vamp with a strap projecting upwards. Two pairs of holes at the end of this strap suggest that it was folded to form a loop for tying to a thong, but it may have been stitched to another strap, or joined to a buckle. A strip of similar width (1 cm) with a patch of rust at one end, which may indicate a buckle, was found in 1704 (750270d).

192/1770/766504 is of turnshoe construction and has a straight throat with no indication of joining to other sections. It might be identified as a slipper, size 5 (adults) (Fig. 20, Pl. IV, A).

Sizes (Figs. 19, 20)

The size of shoes increases through the sequence, though this probably has no historical significance. In Period 1 all measurable soles were children's sizes (12, 13, 8½, 12½) apart from one adult size 5; adult sizes 4 and 6 were found in Period 2. In Period 3, the range was from 8½ (children's) to adult sizes up to 7 (128/1655/766492) and 11 (1655/750216(a)), both unusually large for excavated shoes of the early middle ages.

Shoemaking, cobbling and other evidence of manufacture (Table 5; Fig. 20)

Evidence for shoemaking came from numerous finds of cutting scrap, fragments of uppers, thongs and straps which occurred in large deposits in the contexts of all periods (Table 5). There was also evidence of old shoes being cannibalized to make new ones (1655/750215g; 1655/750214f). The cutting scrap was generally in the form of characteristic triangular pieces, having one or more of the sides concave; (modern shoe factories produce exactly similar scrap — the 'unavoidable waste' occurring between patterns placed as close as possible during cutting.) The example from 1574/750241 (Midden 5) is folded in half as though to cut out two upper sections at the same time. An unusually-shaped piece from F 9 (102/1630/766483) was overcut, suggesting it is scrap of an unknown manufacture rather than an artifact itself. A trapezoidal-shaped piece from 1655/750215e is possibly an ankle-boot-leg. The pieces from 1773/750258 and 1801/750260 were both thought to be goat-skin, and thus more suitable for the manufacture of gloves (or some other garment) than shoes. The shape however is not diagnostic in either case. Other enigmatic pieces may have been scrap from manufacture of garments, sheaths or other artifacts (e.g. 1655/750215d); but no positive evidence was found.

Several fragments, 750217a from 1655 (Period 3) and 750261 from 1797 and 1800/750263 (Period 1) were edges of tanned skins from which sections had been cut; holes along the edge showed where the skins had been 'toggled' (stretched out) during drying and finishing.

Cobbling was practised throughout the sequence. 146/1685/766490 was a Period 1 shoe which appeared to have been made by thonging together numerous scraps from other shoes almost at random. The contrived "upper" is only 25 mm above the (re-used) sole and carries another row of thonging, so possibly yet another section was added. A more usual form of repair was the addition of a clumpsole either by tunnel stitching, or less usually (1655/750217d) by thonging. Impressions of nails were found in 20/1562/766476.

Styles and Fashions (Fig. 20)

Some stitching patterns (33/1589/766470) occur on the shoes, and also horizontal striations, and a pair of incised or stitch lines 1.5 mm or 3.0 mm apart along the centre of the vamp (which is a characteristic of Periods 2 and 3 (124/1630/766491; 1655/750216g). Apart from these, there is little decoration and the main indication of shoe style is given by the shape of the sole and upper, although children's shoes are consistently rounded at the toe and adults' shoes may not all equally reflect the fashion of their period. In Period 1, 152/1621/766495 is a good example of a turnshoe sole before fashion exaggerated the pointed toes and narrowed the waist, as happened in the later middle ages. But in other work of the same period, for example the sandal, finer stitching is accompanied by a more pointed toe shape. Stitch length (3.0–3.5 mm) and toe-shape suggest that a sole from S 5 (100/1627/766482) was also a high quality product, but another sole, (13/1514/766474) possibly from its stitch length (*c.*3.5 mm) from an expensive indoor shoe, had the more usual rounded toe.

The rounded toe remains in current use in Period 3 (for example 1655/750214e, whose shape suggests the 11th century), but a new styling at the toe-end is given by the outsize 1655/750216(a). This has a pointed toe but almost parallel sides which distinguish it from the later (15th century)

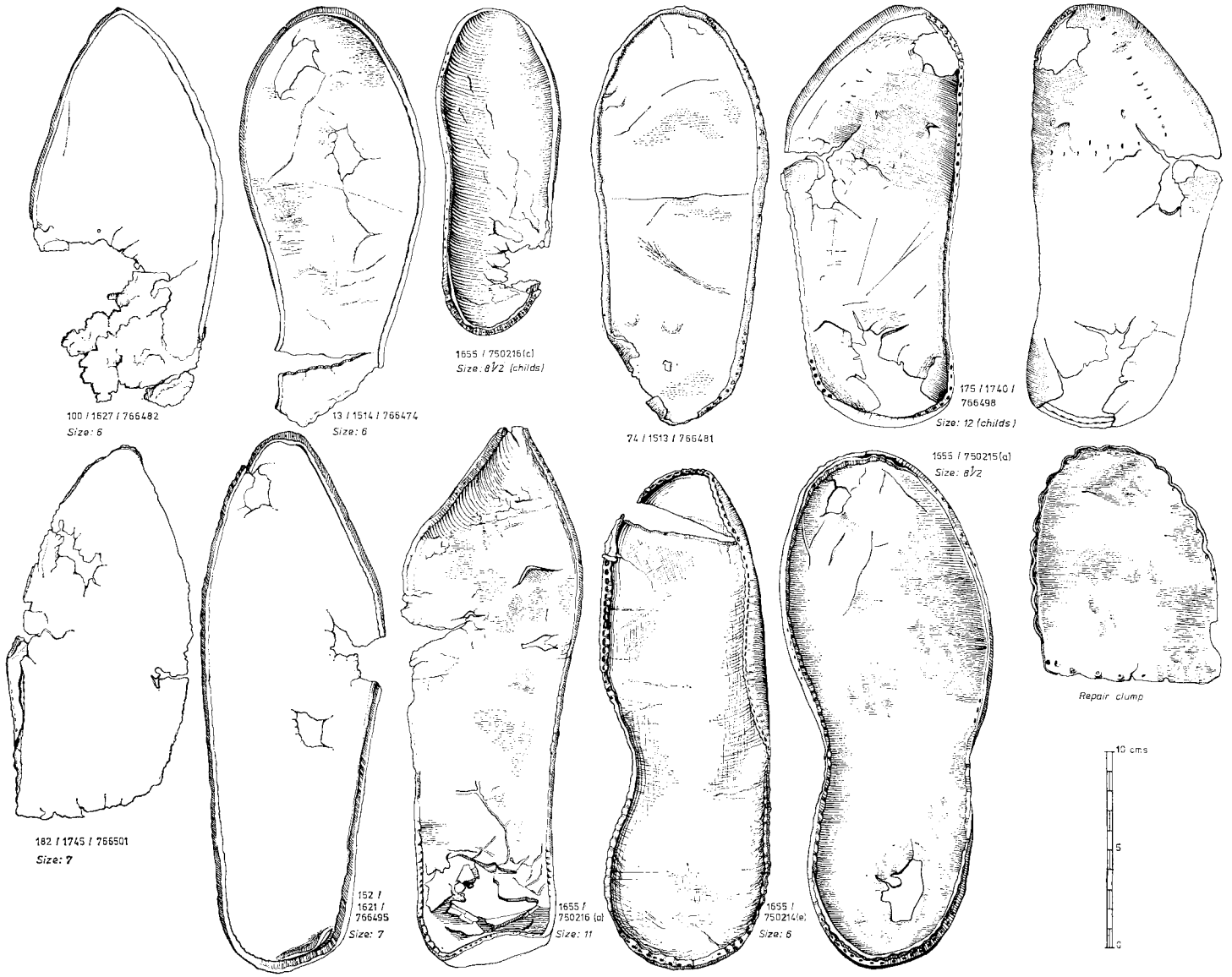


FIG. 19
Leather (soles). Scale 1 : 3

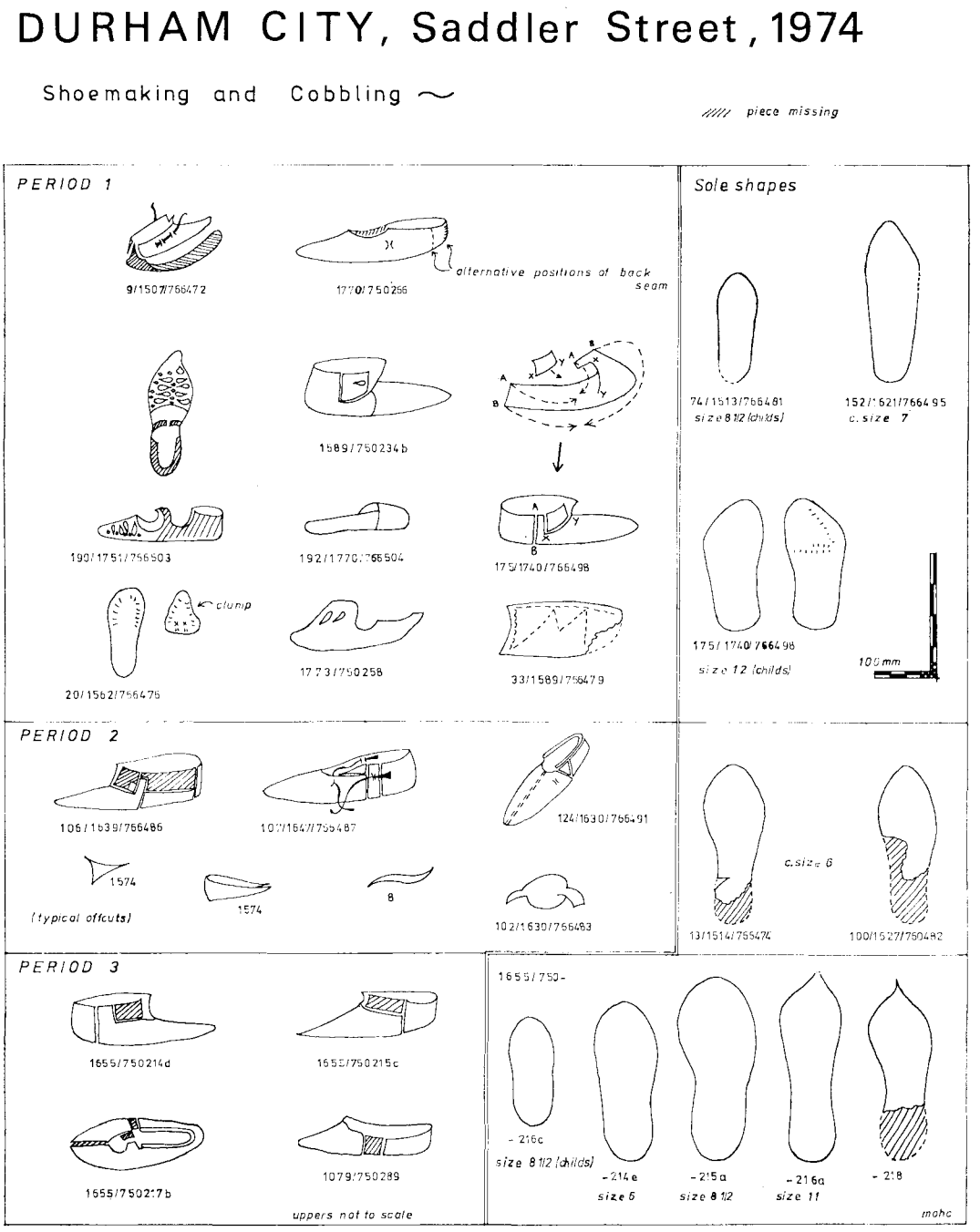


FIG. 20
Leather (shoemaking and cobbling)

TABLE 5

LEATHER ARTIFACTS AND MANUFACTURE

(tip) 1066: c, t
(S 16) *1067: f
(F 107) *1089: c
(tip) 1014: c, f, t; 1010: f; 1041: c; 1964: c, f
(F 101) 1055: f; *1071: c, f; *1079: u
(F 35) *1655: CCC, h, f, t, R, U(12), B(6) S(17), g — — sizes: 3, 3½, 6, 7, 7, 8½, 11 (adult) 8½ (child)

LEGEND
b — boot
c — cutting scrap (ccc — large deposit)
d — sandal
f — fragment(s)
g — (?) belt, jerkin, glove or part of other garment
h — hide, including fleece
k — sheath
p — strap
r — repair or cobbling
s — sole
t — thong
u — upper of shoe
Capital letter — reported on in text
* — primary context

PERIOD 3

TENEMENT A	TENEMENT B	TENEMENT C
(S 12) *1596: ccc, f; *1665: ccc, f; 1668: ccc, f	(M 6) *1514: ccc, f, s, t	(F 100) 1518: c, f; 1519: f; 1521: ccc, f; *1575: ccc, f, s; *1576: (f) decomposed
(tip) 1666: c, f; 1704: f, t, u, s; 1735: u(2), s	(M 5b) *1568: c, f; *1574: CCC, t(5), u(3), S, f; *1572: ccc, f	(F 9) 1561: ccc, f; *1604: c, f; *1605: c, f; *1606: c, f; *1610: c, f; *1620: ccc, f; *1630: ccc, u; 1555: f, c
	(S 9) 1637: c, f, K, S — size: 7 (child)	
	(M 4) *1581: ccc, f; *1684: ccc, f	
	1573: f	
	(F 98) 1588: c, f	
	(S 8) *1607: ccc, f	
	(S 7) 1627: ccc, s — size: 6 (adult)	
	(S 6) 1633: ccc, f, s — size: 6 (adult)	
	(S 5) *1636: c, f; *1647: c,f,F,U,T,S — size: 4 (adult); *1639: ccc, U(2), h, f, t; 1675: c, f	

PERIOD 2

Table 5 (continued)

(S 4)
- *1685: ccc, f, R
- *1696: c, f
- 1718: c, t
- 1717: F

(S 3)
- 1669: c, f
- 1737: c, s — size: 12½ (child)
- 1741: K

(S 2)
- 1756: c

(S 1)
- *1779: CCC, t(2), s(2), f
- 1797: C, F, h

(M 3)
- *1720: f
- *1513: t, p, U, S — size: 8½ (child)
- *1562: c, f, U, s(2), R
- *1507: t, U(2), c

(M 2)
- *1584: c, K(2)
- *1621: c, s, f

(M 1)
- *1589: c. f. t(2), U(4), B
- *1592: ccc, f, s
- *1659: c
- *1732: c, t
- *1740: b, U, S(2) — sizes: 12 (child)
  r, t, c 13 (child)
- *1743: c, p,

(F 74)
- 1753: c, f

(S 15)
- 1751: b, D, t
- 1712: c, t
- 1759: f, u
- *1769: f

(S 14)
- 1624: c, f
- 1794: f
- 1771: c
- 1773: c, t, G (goat-skin?)
- 1775: U(2), s — size: 5 (adult)

(F 81)
- 1799: c
- 1800: c, t, h
- 1801: f (? goat skin)

PERIOD 1

curved and narrow-waisted soles. The poorly-preserved specimen 750218b has a very interesting shape: a short point at the toe, broad fore-part, well-defined and narrower waist, and presumably a broad seat.

The different forms of *construction* of uppers have been touched on above. Larsen considers that the back pointed sole and leash (thong) binding are both characteristic of the period A.D. 950–1200 in Scandinavia.[23] But the most common technique of upper-construction is practised in all three periods at Saddler Street. The most striking change in manufacture to be seen is the increase in quantity, of both off-cuts (1574) and discarded shoes (F 35), in Periods 2 and 3 over the corresponding deposits of Period 1.

TEXTILES

By ELISABETH CROWFOOT: with analysis of fibres by H. M. APPLEYARD, F.T.I.

The small group of textile material consists of pieces of seven woven fabrics, some scraps of felt, and fragments of unspun wool, human hair and horse hair. The only English finds near to this date are the Anglo-Scandinavian textiles of the 10th century from York, which have been fully studied by John Hedges,[24] and small fragments of the 11th century from the Brook Street area at Winchester,[25] but it is a period that has produced a very considerable quantity of textile in northern Europe, particularly that published by Agnes Geijer at Birka[26] and by Janina Kamínska and Adam Nahlik in Polish and North Russian cities.[27]

All the fragments preserved from Durham are of animal fibre. In the catalogue, counts are given in threads to the centimetre; the letters Z and S indicate the direction the fibres are twisted in spinning the yarns. No selvedges are preserved, but in most medieval textiles Z-spun yarn is used for warps, and except where otherwise stated the Z count is placed in the first (warp) position.

Period 1

142/1685/766466: piece 17.0 × 12.0 cm, dark brown wool, rather harsh. Spinning: Z warp, even worsted yarn, S weft, softer, very uneven (cf. SF 91); no selvedge; weave three-shed (2/1) twill, very solid and even, count 11/7–8. Ragged piece from *blanket* or *outer garment*. H M. Appleyard writes: The fibres are animal, probably wool, but the scales are not very clear. They are mixed in thickness, some fine, some coarse with wide lattice type medullae. There is no pigment but they look to have been dyed.

166/1685/768413: Fragments of *felt*, dark brown, the largest 8.0 × 2.5 cm, made of wool of noticeably coarse fibres. Simple felt, no trace of spun fibres, and no fragments of thread in it. H. M. Appleyard writes: The fibres could be wool, but they are very badly degraded and there is a lot of debris about. They are certainly from a double coated animal, having some fine fibres and some coarse, with wide lattice type medullae. A few are pigmented.

Period 2

17/1575/768410: Narrow cut strip, *c.*17.0 cm long, 0.4 to 0.5 cm wide, of light brown wool probably worsted (combed). Spinning: Z one system, S the other, both yarns regular; no selvedge; weave fine even three-shed twill (?2/1), count 20–22/18 (taken as 9 on 5 mm). Originally *a good quality garment fabric*. H. M. Appleyard writes: The fibres are very badly degraded, some of them appear to have been badly eroded by bacterial action. However there are a few very small areas where some scale structure has survived. They are certainly animal and from what little scale structure there is, probably wool. There is no pigment and all the fibres are badly stained.

91/1581/766463: Two fragments, *c.*22.0 × 9.5 and 6.0 × 21.5 cm overall, of near-black wool, rather harsh. Spinning: Z warp, even worsted yarn, S weft, softer, very uneven with lumps; no selvedge; weave 2/1 twill, count 15/10. The two pieces are cut opposite ways of the fabric. There are remains of seams on the longest sides of both, edges turned under singly, only one stitch preserved, in double Z thread similar to that in warp; the direction in which the seams are turned under indicates that the warp-face (2/1) side of the weave was used as the front of the cloth. Pieces from *garment*. H. M. Appleyard writes: Wool fibres are dyed brown. They are well preserved and are of medium diameter, a few are medullated; there is no pigment visible.

103/1633/766464: Two pieces, 4.0 × 6.5 and *c.*4.0 × 2.0 cm (fragmentary), grey-brown wool, soft. Spinning: S one system, Z the other, both regular but Z yarn finer, deteriorated; no selvedge;

weave three-shed (?2/1) twill, loose and open, count 9–10(S)/5–6(Z). At one edge of the larger piece, two rather finer dark brown S threads may be part of selvedge, or possibly a stripe. *?Blanket material.* H. M. Appleyard writes: In general the fibres are well preserved wool apparently from a double coated sheep. There are some very fine fibres and some coarse fibres with wide lattice type medullae. There is no pigment or dye.

120/1639: This fragment was not available for study. A drawing showed it to measure *c.*4.3 × 5.0 cm, and sectional drawing suggested that it was probably a tabby weave.

121/1639/766465: Strip of coarse dark grey-brown wool, length 54 cm, width at widest point 2.0 cm, cut edges. Spinning: Z one system, S the other, both yarns as far as can be seen even and similar; no selvedge; weave three-shed twill, count 6/4; fabric possibly fulled, but may be simply matted by use. One edge has been oversewn with double Z wool. The piece has a self-knot in it, and has probably been used as a cord; it may have been cut from a *blanket* to which the oversewn edge belonged. H. M. Appleyard writes: The fibres are wool. Some are fine and others are of medium diameter with fragmental medullae. There is no pigment; they look to be coloured light grey.

172/1704/768414: Three fragments, *c.*6.6 × 7.0, 4.0 × 4.0, and 3.5 × 2.5 cm, of wool, worsted type. Spinning: Z one system, S the other, both even; both systems include well preserved dark threads (naturally pigmented), and deteriorated lighter threads; no selvedge; weave three-shed (?2/1) twill, plaid formed by groups of threads in two colours in both systems, count 7(Z)/8(S). The pattern is difficult to decipher but the three clearest parts are shown in Fig. 21. The looseness of the weave is probably due to the deterioration of the lighter threads. Suitable fabric for *cloak or blanket.* H. M. Appleyard writes: The threads from weft are very darkly pigmented. There are very fine fibres and some fairly coarse. Scale casts of these fibres had little success, but what scale pattern was found indicated wool. The lighter threads from warp and weft are badly degraded animal fibres with no recognizable surface structure.

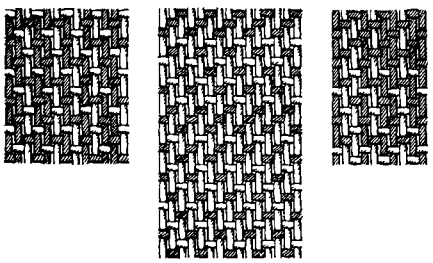


FIG. 21

Diagram of textile 172, showing three clearest colours in three-shed (2/1) twill with plaid pattern; warp z spun, weft s spun, in both colours

179/1744/768415 (Unstratified): Fragment of coarse grey-brown, *c.*6.5 × 4.0 cm, soft wool. Spinning: S in both systems, ? warp fairly even, ? weft very coarse and uneven; weave three-shed twill, count 7/4. In one place a probable weft loop is curled as if at the selvedge, though broken before re-entering, and edge warp missing. Coarse *cloak or blanket material.* H. M. Appleyard writes: The wool fibres are fine to medium thickness, some with broken medullae. There is no pigment but they could possibly have been dyed.

Samples from Unwoven fibres. By H. M. APPLEYARD

97/1627/768411 (Period 2): Dark brown lock, length 8.0 cm, curling, as cut from fleece. Undyed wool with some slight staining. A few fibres are medullated but there is no pigment.

119/1639/768418 (Period 2): Straight lock, cut end. These are very coarse straight animal fibres. From their cross-sectional appearance they have the characteristics of *human hair*; there is very little pigment, and it seems likely that the hair is blonde.

165/1685/768412 (Period 1): *Hair tied in knot.* Very coarse straight animal fibres, some of them densely pigmented. In cross section they have the typical thick cuticle, some with little or no medulla, which suggests *human hair*; probably brunette.

186/1743/768416 (Period 1): Small broken lock, light grey-brown. *Wool* fibres, fine to medium diameter, the scale structure is clear; there is no pigment or medulla, and though there is a slight yellow colouration, the fibres look to be undyed.
191/1753/768417 (Period 1): Very coarse and straight fibres that are very densely pigmented. These have many of the characteristics of horse hair, certainly one fibre has the stellate type of medulla seen in *horse tail hair*.
122/1639 (Period 2): *Sheepskin fragment.*[28] By M. L. Ryder. The wool fibres were more straight than usually found in wool, presumably due to long relaxation, in wet conditions. 15% of the fibres had a non-latticed medulla. The wool lacked pigment and the symmetrical distribution indicated a true medium fleece type which began to emerge in small numbers in Roman times. The previous English Saxon wools described by Ryder[29] were hairy medium, generalized medium or true fine.

It will be seen from the catalogue that all the cloth available for study was of the same weave, the three-shed twill (see Fig. 21). The pieces are varied, but there are no clear differences between those dated to Periods 1 and 2. Thus we have two fabrics with medium counts in which the warp is Z-spun worsted, smooth and even, and the weft S-spun, noticeably thick and variable (SF 91, SF 142), and another coarse fragment with similar differing yarns but S spinning throughout, in soft wool (SF 179); fragments with even spinning and soft open weave (SF 103); a very coarse matted soft wool piece (SF 121); a fairly coarse worsted plaid with two-colour checks (SF 172); and one fine fragment, probably worsted (SF 17). There is nothing here approaching the most striking of the Viking three-shed twills at York[30] and at Birka,[31] fine worsteds with diamond or chevron patterns, high warp counts and Z-spinning in warp and weft, a practice which throws into relief a surface texture pattern. Even SF 17, which in colour and quality must have been near to some of the York pieces, has mixed spinning, and as far as can be seen no pattern.

A few coarse unpatterned fragments both from Birka and York, nearer in quality to the majority of the Durham pieces, do also have mixed spinning. This usage is particularly suitable both for smooth finishes, where the threads binding the warps are not intended to catch the eye, and for fulled fabrics, where the similar lie of the fibres when the cloth has been woven makes them easier to raise. It is a usage that increases the later the date — 30% of woven fabrics from Gdansk in the 10th century have Z, S spinning, and 95% in the 11th century,[32] a rise that may be connected with the increasing use of fulling as a finishing process.

The most distinctive feature in any of the Durham textiles is the use of soft, very uneven weft yarn with finer well-spun warp (SF 91, 142, 179); in these cases warp and weft are identifiable in spite of the lack of selvedges, as the lumpy yarns would be totally unsuitable for use as a warp. This feature is often found in later medieval fabrics, but not apparently in the Viking material from York. Again, it is a practice generally connected with fulling. Such weft yarns mat easily, and when worked up give a close warm surface; this is frequently done in 14th- and 15th-century material from Baynard's Castle, London. Kamínska and Nahlik, when the same combination of yarns appears in earlier fabrics from Poland,[33] suggest that the weft face was used as the front of the material, raised to give a velvety finish that would have been a protection against wind and rain; but the arrangement of seams on garment fragments from Baynard's Castle indicates that here the weft face was worn inside, and the smooth warp face with unmatted threads and "satin" finish, was the side intended to be seen. The two pieces 91 and 142 present something of a problem. The style of warp and weft yarns obviously place them in this category, but, in neither has there been any attempt to mat the weft face. Without any such finishing process, however, the combination still adds considerably to the thickness and warmth of the cloth, and it seems probable that the practice of using this type of coarse weft to back the fine warp face was introduced before the additional refinement of deliberately matting the under-side of the fabric.

Plaid patterns are more common in four-shed than three-shed twills, but an 11th-century fragment in this weave from Winchester (Brook Street, textile no. 15) has

narrow stripes in one system suggesting those in parts of SF 172. With so small a collection it is unwise to draw any conclusions as to the local preference for this type of weave, but it may be worth noting that the three-shed twill, which appears in some Roman finds in Europe,[34] in the Iron Age moor-finds in Schleswig,[35] and on Anglo-Saxon sites in England,[36] increases in popularity from the 10th century onwards. Forming 32% of the textiles found at Birka (9th–10th centuries) and Gdansk in the 11th century, it rises to 62% in that town by the 13th century.[37] Material of the 13th to 14th centuries in Swedish towns also shows a preponderance of coarse three-shed twills.[38] This trend is no doubt connected with the general use of the horizontal loom with treadles, on which the weaving of an unbalanced construction like a three-shed twill presents no problem. On the evidence of weaving tools and loom parts, this loom was already in use in Poland, in the 10th century, and a much earlier date has been suggested by Kostrzewski.[39] Kamínska and Nahlik however prefer to connect its appearance with changes in the political and social order resulting in the rise of urban centres, in which textile production became a trade, rather than a domestic occupation. It is to be hoped that tangible evidence, such as shuttles and pulleys, will eventually be found to demonstrate the period of its adoption in England.

CLAY AND STONE

111/1632. *Spindle whorl* (Fig. 14; Pl. v, B) made of cream-buff clay with smooth shining brown slip. Decorated with criss-cross incisions through slip. Little sign of damage or wear. Period 2. Max. diam. 2.8 cm; diam. of spindle hole 0.8 cm.

An example from York[40] similarly decorated is made of chalk.

145/1684. *Spindle whorl* of clay or stone (Fig. 14). Fine dark grey stripes descend the outside at intervals. These are areas of wear (the same smooth effect is noticeable at the spindle hole lip), as though the whorl had been bound with thread. Traces of vertical grooves coincide with these bands of wear. Period 2.

Max. diam. 3.2 cm; diam. of spindle hole 0.8 cm.

The darkened areas may have been painted, like an example from York, which had bands "apparently of reddish paint".[41]

48/1574. *Crucible.* A flat-bottomed base sherd (*c.*6 cm in diameter, *c.* 0.5 cm thick), in coarse fabric, thickly covered with green glaze on its outer surface. The inner surface carried a grey residue which had settled in liquid form and which contained a lead pellet. This was examined by S. Colledge of Birmingham University and found to be a dull yellow colour when cut. The chemistry of the residue has yet to be fully elucidated but is provisionally identified as a mixture of lead and sulphur compounds. The crucible is thought to have been for the preparation of lead glaze, possibly in the form of powdered lead salts which would then be applied direct to the pot, producing the characteristic splashed or dribbled effect[42] of the Period 2 glazed cooking-pots (p. 40).

POTTERY

(Fabric descriptions and analysis by L. ADDIS, University of Durham)

About 1,000 sherds were recovered from the excavations on Site C and D, mostly of fabric and forms that suggested no immediate parallels with pottery excavated in the north or elsewhere, although of typical early medieval manufacture. The group is presently being studied at Durham University by Laurie Addis.[43] Reported here is a dated sequence of forms (Figs. 22 to 27), and a preliminary statement of the more obvious fabric characteristics. The incidence of pottery on the site is quantified in Fig. 12 (Assemblage Summaries) where it will be seen that the groups most likely to be of primary deposition are those from 1589, 1575, 1607, 1684, 1581, 1574, 1514, 1665, 1693, and 1655 (see Table 4 for layer descriptions). Sherds are designated by small find number (where used) and context number. Standard Munsell colours are quoted where applicable.

Period 1 (Figs. 22, 23). Late 10th–early 11th century

The pottery of this period comprises cooking-pots and possibly storage vessels, although no certainly diagnostic sherds were found to indicate the latter. The vessels are wheel-thrown, tempered mainly with quartz (< 2 mm. diam.), and mica, and are generally fired orange to pink although reduced fabrics also occur.

Small spots and scabs of lead glaze and quartz occur on 86/1589, and 193/1773, although not on other sherds of Period 1. Rim forms show considerable variety. 193/1773 (the earliest) has finger tipping along the inner edge of the rim. Sherds from the same vessel were found in other contexts (1771, 1794, 1795) in the storm drain S 14, the lining of which gave a radiocarbon date of A.D. 910 ± 80 (Fig. 11).

Sherds belonging to 86/1589, 134/1589, 157/1589, 127/132/133/1589, 300/1589, 24/1589, or similar vessels were the most common deposition in Midden 1. Rims have a fingered groove along the top. Bases (127, 132, 133–1589) are slightly sagging and show knife trimming, and there were two decorated body sherds: 301/1751 with girth grooves, and 300/1589 with a peak of incised ornament.

The quartz-tempered fabric of these vessels is numerically dominant and characterized principally by its pink (7.5 YR 7/4) surfaces. It is provisionally designated 'Durham-type' ware.

An exceptional fragment (160/1716, not illustrated) of a thin (3.0 mm) walled vessel was made in a white (10 YR 8/1) fabric with small quartz (*c.*0.2 mm), pyrite and mica inclusions. The internal surface has a thin coating of transparent glaze, visible under × 20 microscope. The external surface is thinly lead glazed, appearing grey over the smokey background of the pot, but with transparent pale green spots where the glaze is thicker. The sherd has some affinity with Stamford Ware, from which however mica is reported to be absent.[44]

76/1602 (not illustrated) was a coil-built body sherd from near the base of a (?) storage vessel, estimated diameter 36 cm.

None of the pottery deposited in Period 1 offers any close parallels with other excavated groups, although there is a general similarity of manufacture and finish with York wares.[45] Girth grooves (301/1751, 171/1732) occur on some middle Saxon Northern examples,[46] and the rim 158/1708 shows formal similarity with one from Otley.[47]

Period 2 (Figs. 23–27). Later 11th–mid 12th century

Within the stratified sequence, Period 2 begins with a levelling operation (1685) and the erection of a shed (S 5). The dominant pottery of Period 2 (which resembles no Period 1 vessels) occurs in quantity from this first activity. It comprises folded, flanged or roll-rimmed cooking-pots externally spotted or splashed with green-yellow glaze, and asymmetrically potted in a harsh gritty fabric with white quartz and quartz sandstone inclusions up to 3.00 mm. in diameter. The fabric is grey-cored (N 4) with slight but varying amounts of surface oxidation, generally brown (7.5 YR 5/4) to red (2.5 YR 5/6) at the brightest.

In at least one case the rim was added and pinched-on rather than thrown. Bases are nearly flat. Incised ornament occurs on two body sherds 302/1665, 303/1574 (Figs. 23, 25). Additional forms in use in Period 2 are a bowl 304/1574 (Fig. 24), a crucible from 1574, possibly for the preparation of lead glaze (see Clay and Stone report, above), and a spouted pitcher 30/1588 (Fig. 23).

There were three isolated sherds which, although unprecedented on the site, may be residual from an earlier period. The bowl 155/1696 was exceptional in fabric, being made from a clay which fires to almost pure white in fracture. It was covered externally and (mostly) internally by an even yellow to green glaze. The fabric (but not the form) is exactly paralleled by some of the white wares excavated at St Paul's Monastery, Jarrow, where it first occurs in 7th–9th-century levels.[48]

374/1575 (Fig. 26), a rim sherd, was made in a hard fabric, very dark grey (10 YR 3/1) in fracture, with rounded quartz inclusions up to 1.00 mm in diameter, thought to derive from beach sand. It is exactly paralleled by an unstratified sherd from Hart.[49]

314/1648 (Fig. 23) was unglazed, evenly potted and fired to reddish yellow (5 YR 6/6). It has a strong formal resemblance to a Saxo-Norman example from Otley.[50]

In the later contexts of Period 2, a more symmetrically potted cooking-pot in a fine buff fabric with a club rim makes its appearance in small numbers (341/1574, 343/1693, Fig. 25). These sherds would seem to be the fore-runners of the widely distributed club-rimmed cooking-pot, as found for example at New Elvet, Durham.[51] They are however without the buff pimply finish of the later pottery, and are still spotted with glaze.

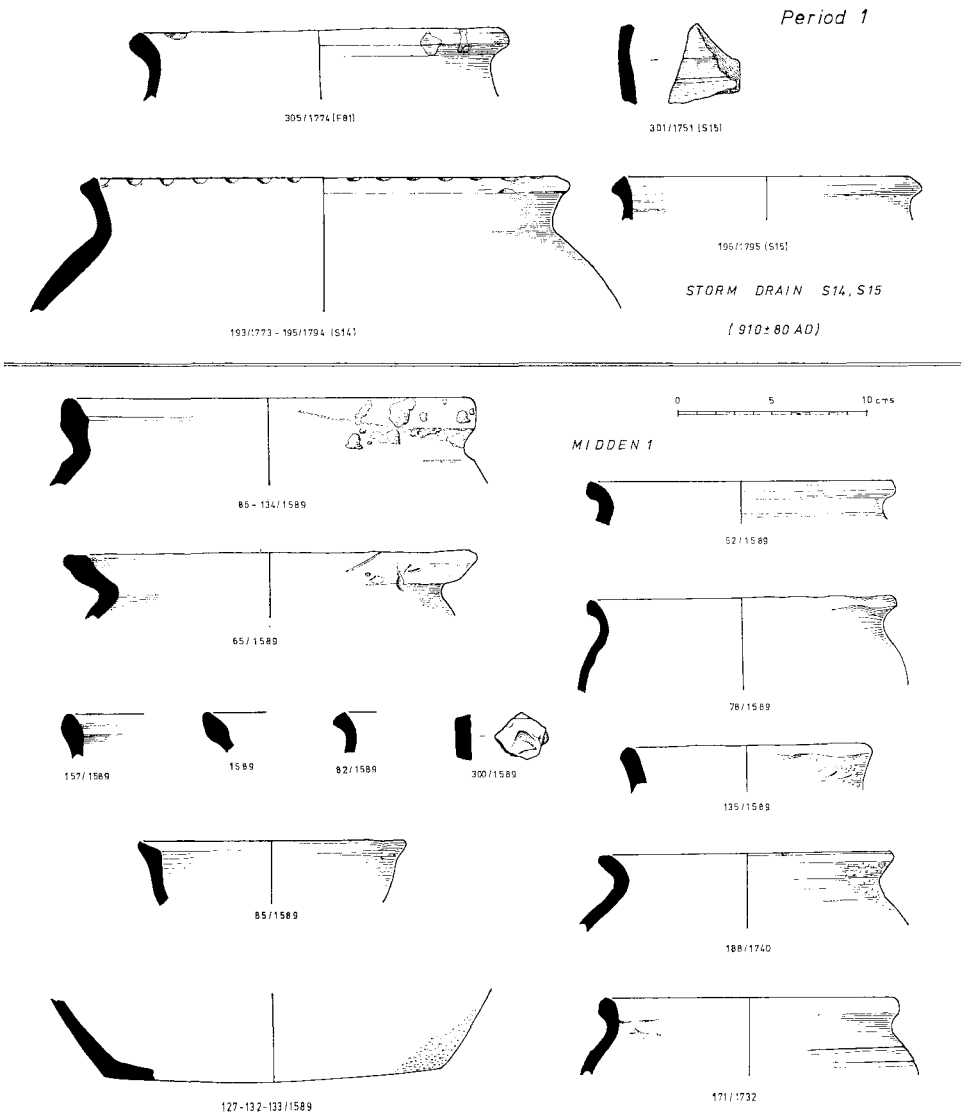


FIG. 22
Pottery (Period 1). Scale 1:4

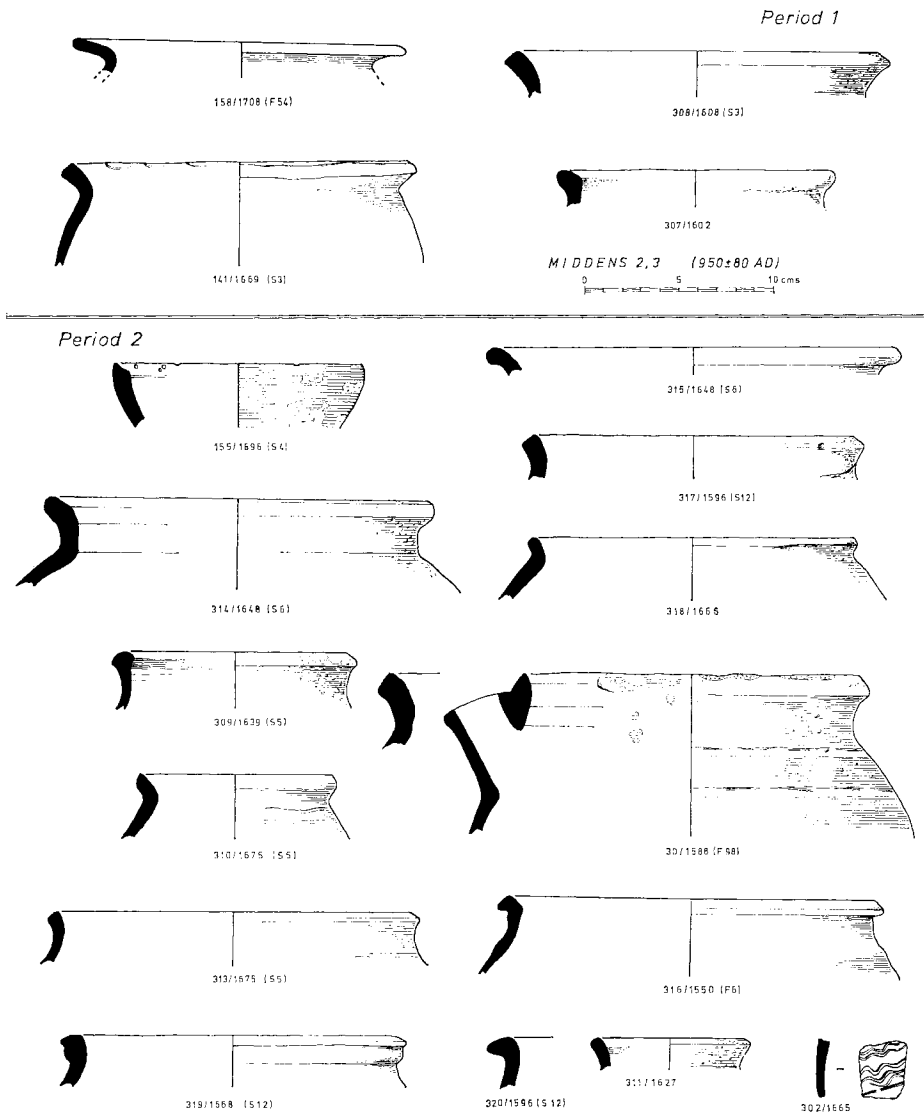


FIG. 23
Pottery (Periods 1 and 2). Scale 1 : 4

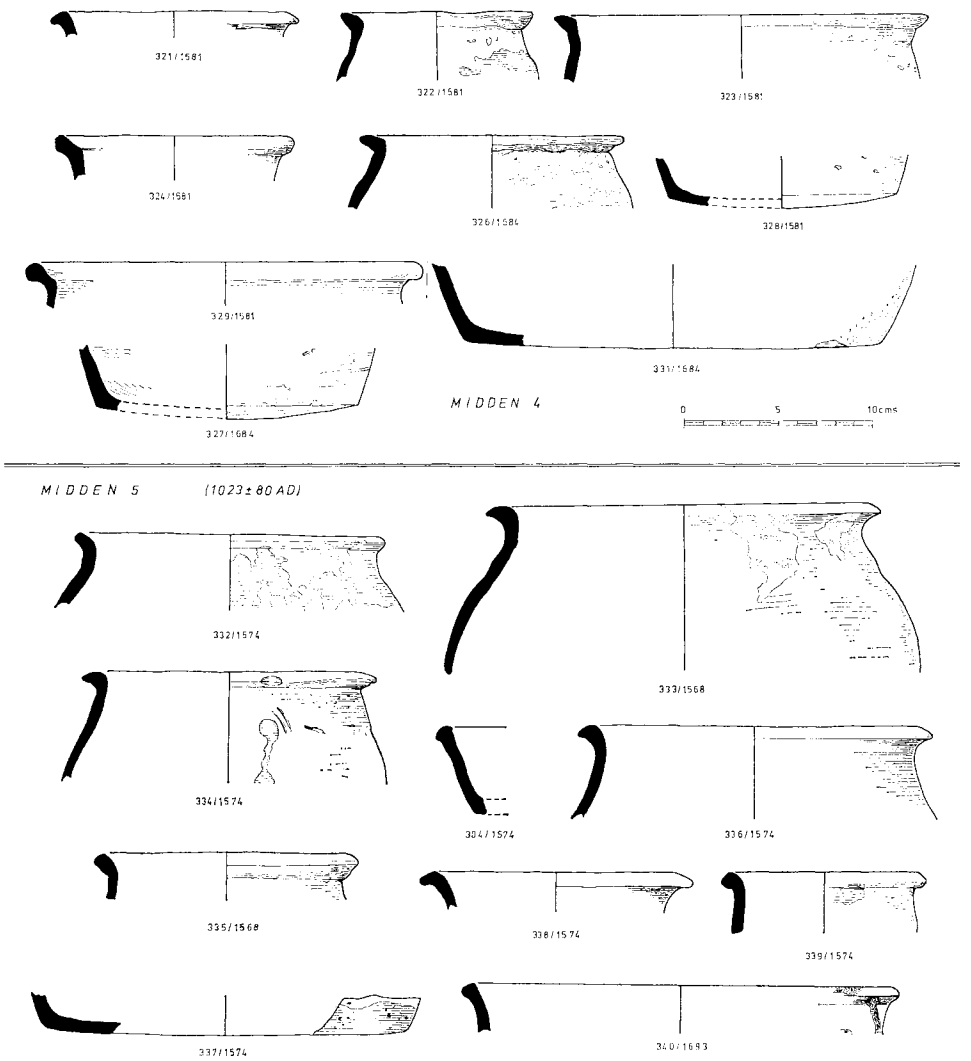


FIG. 24
Pottery (Period 2). Scale 1:4

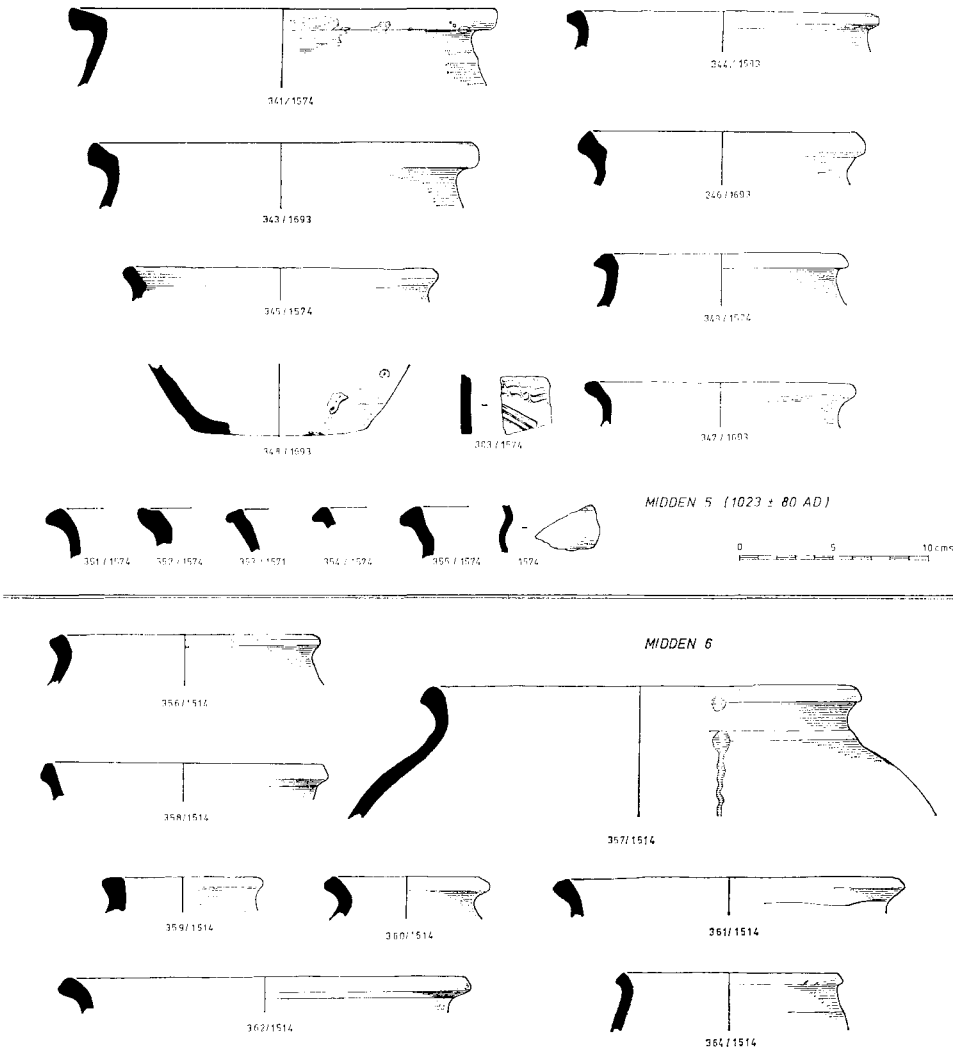


FIG. 25
Pottery (Period 2). Scale 1 : 4

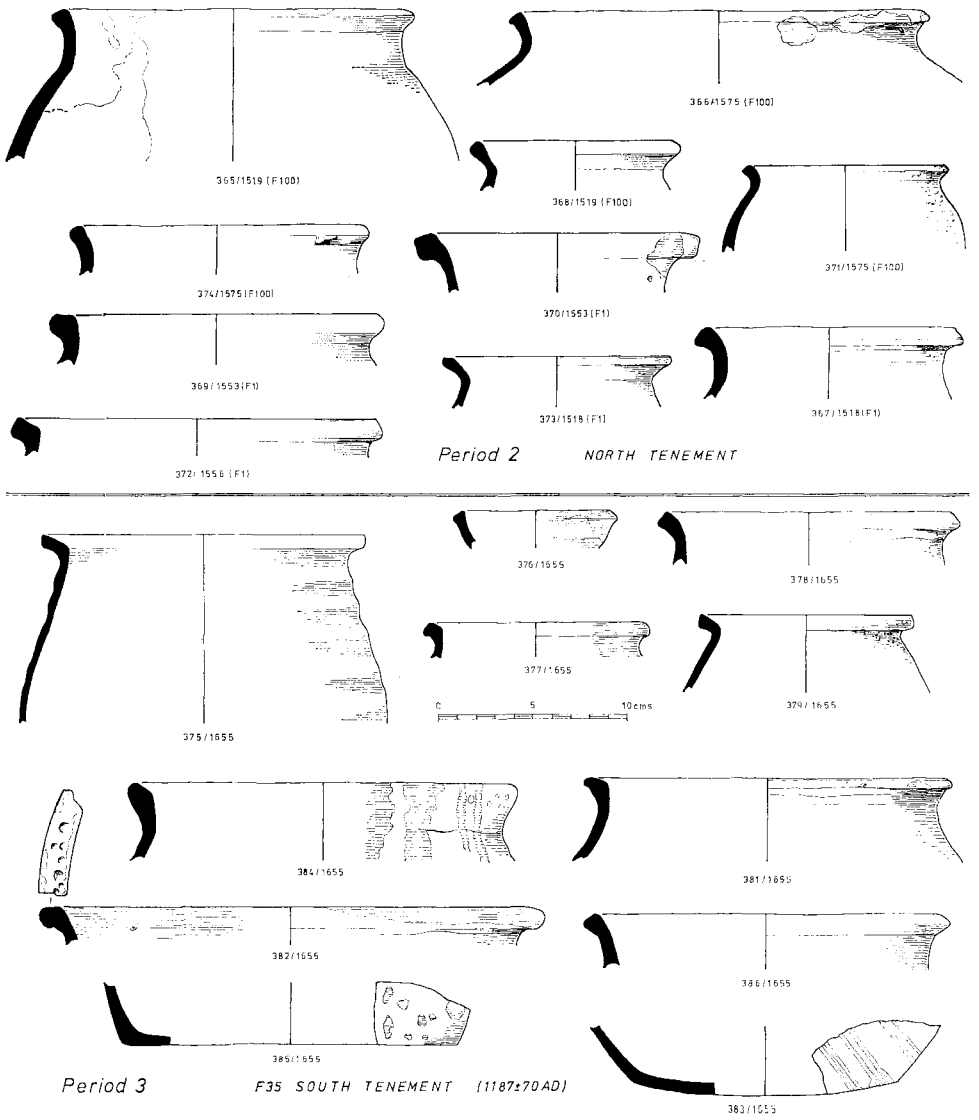


FIG. 26
Pottery (Periods 2 and 3). Scale 1 : 4

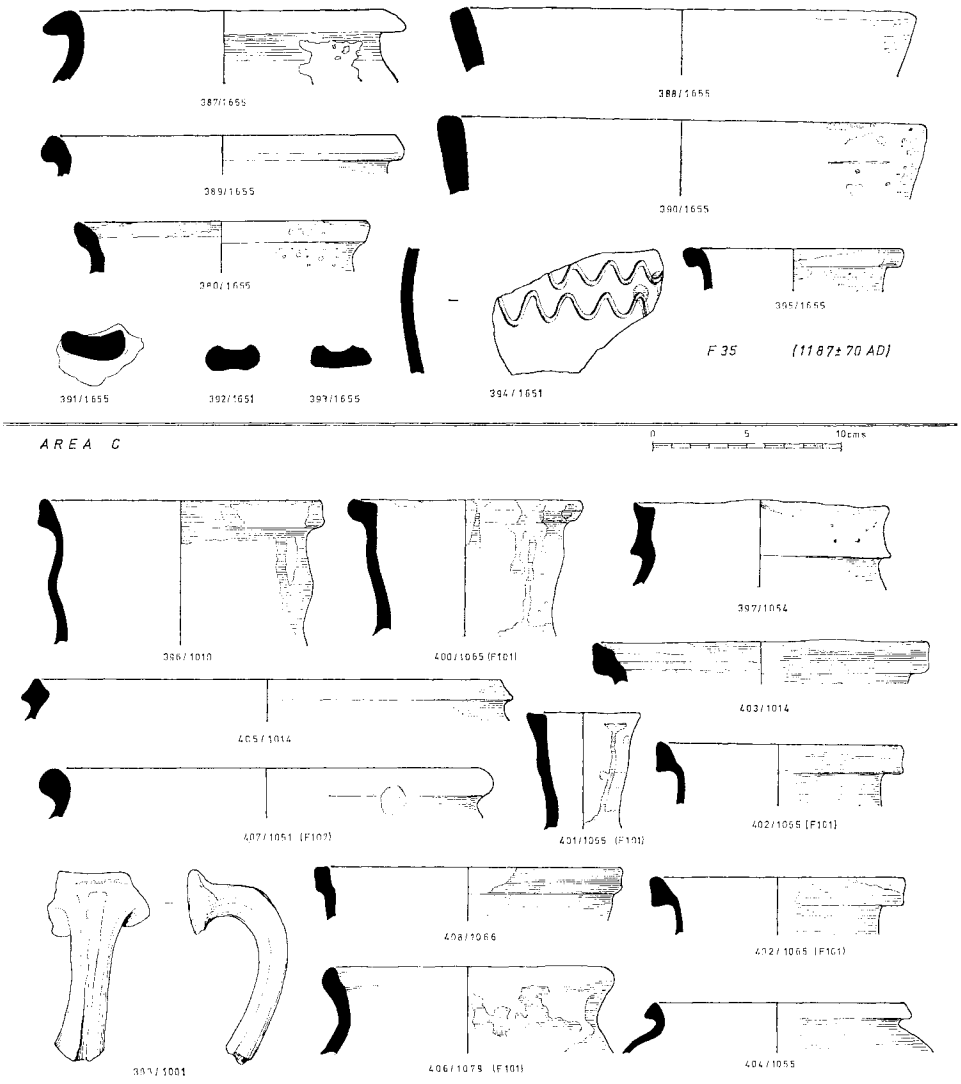


FIG. 27
Pottery (Period 3). Scale 1:4

Period 3 (Figs. 26, 27). Mid 12th to early 13th century

Pit F 35 on Site D followed in immediate sequence with Period 2 and contained a large group of pottery. Innovations are given by jug handles and straight-sided bowls. The coarsely made cooking-pots of Period 2 are now scarce, although splash-glazing still occurs on their more robust successors.

An isolated sherd is 375/1655, thin-walled (4.0 mm) with pronounced body grooves in a hard dark grey unglazed fabric. This type of vessel is paralleled at Jarrow, in contexts thought to be 11th century.[52]

Site C is remote from Site D and not necessarily in continuous sequence with it. The pottery (Fig. 27) should be internally contemporary and a deposition date for the group near to that of F 35 is suggested by similar fabrics and the continuation of splash-glazing; but the absence of club rims is odd if this is so. The presence of a bifid form (397/1054, Fig. 27) assigned in the New Elvet sequence to the later 14th century[53] might mean that Site C is a full century later when club rims have less currency. No formal parallels are noted with the pottery from the south curtain wall of the Castle at Newcastle, thought to be 11th century and later.[54] It is unfortunate that the Site D sequence does not continue into the later centuries of the middle ages, and it is hoped that a recently excavated group of pottery from Back Silver Street, Durham[55] will fill the gap.

DAUB

Apart from one piece (123 below) all the daub came from a layer of burnt wood 1696, or from the clay and wood (1695, 1685) immediately above it. The material from these contexts represents mainly the inner wall lining to the north wall (F 57) of the house S 4 which was destroyed by fire (p. 10). It is most likely that it was this event which caused the clay to bake, and, in consequence, recognizably to survive. It is apparently lacking in temper of any kind, and seems to have been applied to the wattle as raw brown sandy clay. Such material presumably reverted to the natural state on disuse and was undetected in association with other wattle fences.

Daub survived in small lumps with smooth parallel semi-cylindrical grooves left by the wattle cross-pieces. The wattle grooves vary in thickness from 1–2 cm. The thickness of the daub is up to 6 cm where the full thickness has survived, a condition indicated by the burnt inner face. There were no grafitti, or, apart from a set of knife-cuts, any other markings on the surfaces. Occasional impressions of planks or poles of larger diameter may indicate interior structure, but more probably refer to support posts.

The quantity of daub recovered from 1696 was 4.7 kg and from 1685 and 1695 0.75 kg.

The isolated piece of daub from 1581 (123) was similar in composition and dimensions, but whether by accident or design had been fired to the consistency of stoneware. It may, from its find-spot, have derived from the oven S 7, but there was no other comparably fired clay in association.

ANIMAL RESOURCES

By JAMES RACKHAM

(Edited and abridged from full reports by JAMES RACKHAM and ALWYNE WHEELER, *Archive*. Identifications by JAMES RACKHAM (domestic animals, game and shellfish), ALWYNE WHEELER (fish), D. BRAMWELL (birds). Analysis by JAMES RACKHAM.)

A list of animal species identified, both from the whole group recovered and from food-waste deposits (p. 68), is given in Table 6. The group is dominated by the bones of large animals, and since no sieving was undertaken (except in cess-pit F 100), it is likely that the sample is biased in their favour.

It is evident that the animal remains principally derived from domestic refuse associated with a meat diet. Meat was probably obtained already butchered, except perhaps in the case of pig which is likely to have been owned by the town residents and grazed in nearby woodland. Fowl and domestic goose were also town residents and although no eggshell is recorded from the site, must have supplied eggs as well as meat to the occupants.

TABLE 6

NUMBERS OF FRAGMENTS OF EACH SPECIES (AND SIZE-GROUP) FOR THE SITE AS A WHOLE

		Primary Deposit	Secondary Deposit	Others	Total
Domestic animals	Horse	18(2)	3	3	26
	Ox	329(39)	47(6)	97(12)	533
	Pig	159(21)	15(5)	31(4)	235
	Sheep/g	162(22)	15(1)	32(11)	243
	Sheep	13	1	3	17
	Goat	5(1)		1	7
	Dog	43(7)	1	4(1)	56
	Dog or Fox			(1)	1
	Cat	4(11)	1	1	17
	Fowl	77(12)	4(1)	22(10)	126
	Goose, cf. domestic	29	2	6	37
Game	Red deer, *Cervus elaphus*	6(3)		(1)	7
	Roe, d. *Capreolus capreolus*	6(4)			10
	Hare, *Lepus cf capensis*	1(1)		(1)	3
Wild Fowl	Cormorant, *Phalacrocorax carbo*		2		2
	Black Grouse, *Lyrurus tetrix*	4	1		5
	Capercailzie, *Tetrao urogallus*	5		1	6
Fish	Cod, *Gadus morhua*	21		8	29
	Haddock, *Melanogrammus aeglefinus*	2			2
	Saithe, *Pollachius virens*(?)	(4)			4
	Ling, *Molva molva*			2	2
	Salmon, *Salmo salar*	1			1
	Eel, *Anguilla anguilla*	1			1
	Gadoid	(1)			1
	Fish, indeterminate	61	33		94
Shellfish	Lobster, *Nephrops norvegicus*	1			1
	Limpet, *Patella vulgata*	1		1(1)	3
	Periwinkle, *Littorina littorea*	1			1
	Common cockle, *Cardium edule*	2			2
	Common mussel, *Mytilus edulis*			1	1
	Pearl mussel, *Margaritifera margaritifera*	3(1)	1	1	6
	Large ungulate	268	52	70	390
	Small ungulate	197	15	40	252
	Large animal	328	36	56	420
	Medium animal	122	4	58	164
	Small animal	18	2	5	25
	Bird and small mammal, indet.	19	3	1	23
	Unidentified	49	3	11	63
				TOTAL:	2717

( ) figures in brackets indicate animals 'comparable with' the species against which they are entered.
Tenement A is 61 Saddler Street; Tenement B is no. 62; Tenement C is no. 63.

TABLE 6 (continued)

FRAGMENTS OF EACH SPECIES (AND SIZE-GROUP) IN THE MAJOR FEATURES

	Period 1			Period 2			Period 3			
	(Tenement B)			(Tenement B)			(Tenement C)		(Tenement A)	
	M 1	M 2	M 3	M 4	M 5	M 6	F 9	F 100	F 35	F 101
Horse	1	2	1	1		4		1	7	
Ox	25	13	40	52	75	19	15	9	63	3
Pig	45	10	19	28	23	1	3	3	21	
Sheep/g	7	2	22	26	31	12	5	10	45	5
Sheep			1	1	1	1			7	1
Goat						1	3			
Dog	38	6							1	
Cat			1		4	1	2	2		
Fowl	42	2	11	5	15	5		2	1	1
Goose, cf. domestic	10	3	4	1	3	1			3	1
Red deer	1		1						4	
Roe deer	1	1	2		3				2	
Hare	1								1	
Black grouse	3									
Capercailzie	3								1	
Cod	1			3	7	2		2	3	
Haddock				1		1				
Saithe (?)					2	1		1		
Salmon							1			
Eel								1		
Gadoid						1				
Fish, indet.	1		3	2	4	6	1		8	
Lobster									1	
Limpet	1									
Periwinkle					1					
Common cockle					1				1	
Pearl mussel	4									
Large ungulate	37	11	28	46	28	14	6	7	27	6
Small ungulate	44	5	16	23	33	15	2	5	9	4
Large animal	27	3	27	52	72	25	14	18	22	6
Medium animal	25	2	10	15	35	7	5	3	6	
Small animal	9	1	2		1			3	1	
Bird and small mammal	2	2	1	2	8			1	1	
Unidentified	3	3	15	3	2		1	11		

(Bones described as 'comparable with' a species are entered in the species total)

A wide range in the size of cattle was noted, there being present adult specimens both larger and smaller than the comparative material used for identification (an adult Chillingham ox). One or two bones of pig were large (even when juvenile) but it is not possible to determine whether a wild variety was present.

Both sheep and goat have been identified on the basis of skull fragments, but no attempt was made to distinguish between these two species from other skeletal elements, which are given as 'sheep/g'. Goats were less common on skull remains and it may be assumed that the majority of bones assigned to sheep/g are of sheep. Only horned sheep were identified as present but one skull fragment with the damaged posterior region of the frontal bones may have been hornless.

Fowl bones and those of geese, the latter being larger than most wild species and comparable to domestic types, were common on the site, constituting 14% of the identified domestic fauna from the primary deposits. Both male and female fowl were identified by the spurred and non-spurred tarso-metatarsi. Two definite groups of fowl bones were recovered; the smaller specimens are interpreted as females and the larger as males of the same breed, although it is possible that two types of domestic fowl were present.

Bones of wild animals and birds were infrequent (about 2.5%), which shows that hunting was not an important source of food for this section of the community. Red deer are represented by antler and bone. The antler is likely to have been shed and collected, but the animal was also eaten. Roe deer was certainly eaten, for besides some antler fragments of this species, two or three limb-bones, one butchered, were definitely identified.

The Black Grouse and Capercailzie, although no longer native to the area, may have been so in the early middle ages (see below), and occurred in food-waste deposits in Period 1. Of other wild species only hare and some bird bones were recovered and must have contributed little (but occasional variety) to the diet.

Contact with the sea or a local fish market is evident, but in no great quantity since only 4% of the remains derive from a marine environment. The principal species identified was the cod. Of other species recognized, both salmon and eel are represented by a single bone.

The bones identified as saithe are questionable because the two species of the genus *Pollachius*, the pollack (*P. pollachius*) and the saithe (*P. virens*), are difficult to tell apart from the skeletal material. However, in the vicinity of Durham the saithe is much the more common species and is commercially fished today. The probability is therefore that the bones positively identified as *Pollachius*, are in fact referable to the saithe, *P. virens*.

The absence of oysters from the small collection of shell-fish is perhaps surprising since they are present in numbers at sites of the same period in other towns such as York. The numbers of shell-fish do not indicate a great contribution to the diet. The cormorant wing bones occurred in a secondary context, 1724 (F 63), a posthole in S 4, but may refer (indirectly) to the diet of the Period 1 inhabitants. Cormorant remains are common on medieval sites and cormorant was almost certainly eaten.

The pearl mussel, *Margaritifera margaritifera*, is a freshwater species, and was presumably collected from the River Wear. This mussel produces small pearls.

Between Periods 1–3 there was an apparent change in the importance of the major dietary animals, the pig becoming less important in the later period and the sheep more so. No appreciable changes in butchery or slaughter-practice of any species occurred, although Feature 25 is distinctive in that the bones are less fragmented than elsewhere; ribs are almost absent and a high proportion of the bones is skull fragments.

Animal products were exploited also for purposes other than food. The leather industry made use of oxhide and sheep or goat-skins (see Leather Artifacts and Manufacture, above). Wool, both dyed and undyed, was used to make cloth, and hair from a horse's tail was also used for an undetected purpose. Two horse bones were fashioned

into *skates* (Fig. 14). *Offcuts* of red-deer and roe-deer antler occurred in Periods 1 and 2 and antler had been used to make a *comb* and a leather-working *tool*. A pig metacarpus was drilled to make a *toggle*, and *spindle whorls* were made from femur heads of sheep or goat and ox. Other bones may have been worked — a fragment of the long bone of a large bird and of a pig fibula.

Horse and domestic pets — cat and dog — were present, the latter being responsible for gnawing many bones. The articulated dog skeleton found in Midden 1 (p. 10) was of an animal about the size of a Border Collie. The dog bones are not described in this report, but measurements have been taken for this and all other species. No vermin were identified, although a few unidentified remains of bird and small mammal were in the collection.[56]

Domestic Animals — Changes in Use Pattern, Periods 1–3

Figures for the percentages of cattle, pig and sheep (and goat) fragments for each of the chronological periods (Table 7) give consistent changes that may represent actual changes in preference, availability or husbandry pattern.

TABLE 7

PROPORTION OF IDENTIFIED OX, PIG, SHEEP/G FRAGMENTS WITHIN MAJOR FEATURES

	Period 1			Period 2					Period 3
	Tenement B			Tenement B			Tenement C		Tenement A
	M 1	M 2	M 3	M 4	M 5	M 6	F 9	F 200	F 35
Ox	32·5	52	49	49	58	56	58	41	46.3%
Pig	58.5	40	23	26	28	3	11.5	13·5	15.4%
Sheep/g	9	8	18	25	24·5	41	31	45·5	38.2%
No. of bones	77	25	82	107	130	34	26	22	134

The bones of pig, the most common animal in M 1 and other deposits of the first period, decrease in number throughout the whole sequence of deposits. This reduction is consistent throughout the life of the site, perhaps 150–200 years, which suggests that it is due to a reduction in availability and husbandry, perhaps associated with the progressive clearance of pannage areas or because fewer animals were being kept by the townspeople for one reason or another. In step with the percentage reduction in pig bones are increases in the numbers of both sheep (or goat) and cattle. The increase in the percentage of sheep bones is also consistent and may reflect the development of sheep farming at the expense of pig-herding or merely the expansion of pastoralism into previously unexploited (or relatively unexploited) countryside. The increase in cattle is marked by a peak in Midden 5 from which the percentage falls off, although cattle in all periods were the main contributors to the meat diet. Using carcass weight figures of 1,000 lb for ox, 200 lb for pig and 100 lb for sheep the comparative meat yields based upon the number of fragments of each species recovered (first column) in the individual periods are:

TABLE 8

	Period 1			Period 2			Period 3		
	F	C	P	F	C	P	F	C	P
Cattle	82%	78%	61.5%	83%	81.5%	74%	88%	77%	75%
Pig	14.8	15.6	30.75	10.25	12.8	16.4	5.2	11.5	15
Sheep/g	3·5	6.7	7.7	6.6	10	9.8	6.45	11.5	10

It can be seen that the relative contributions of pig and sheep/g have been reversed by Period 3. The figures of the relative contribution were also calculated from the minimum numbers of animals of the three species by context (C) and by each Phase (P), (the second and third columns in the table).[57] The trend here is similar, but not so marked. Calculations based upon minimum animal numbers are perhaps more inaccurate for urban sites than those based upon fragments, particularly since the meat, certainly of cattle, will probably be obtained butchered and not by carcass.

15.75% of all the bones from the primary contexts had been cut or chopped and of these 72% were ribs, vertebrae and skull fragments; 13.8% were pelves and scapulae and 14% were the long bones of the limbs. A few bones had been burnt or charred. Few bones other than phalanges were complete. Rib bones are generally the most numerous fragment and are also the commonest meat-bearing bones of the body; they tended to be fragmented into at least two pieces. In the middens, ribs, the most common bone from large animals and large ungulates also constituted between 20 and 31% of the bones of sheep/g, pig, small ungulate and other medium-sized animals, but in F 35 (Period 3) they constituted less than 3%. F 35 also had a very low count of long bones and fragments from large animals and large ungulates, but had in contrast a large count of cattle skull fragments. It also contained the skull and jaw bones of an adult horse and parts of the skulls and mandibles of at least six sheep (23% of the identified sheep/g bones in this feature).

Many bones were not evenly represented by their proximal and distal parts. Conditions of burial were similar over most of the site, so it is unlikely that differential preservation is responsible for these variations. The proximal end of the humerus is under-represented for all species, as are the distal end of the radius and ulna, the proximal tibia and the distal metapodials of sheep/g. The lower number of distal pig metapodials is due to the loss of the epiphyses, the animals being immature, and the lack of sheep/g tarsals may be explained by failure to recover smaller bones. But the pattern may otherwise illustrate a preference for types of joint or mode of butchery — that is, a preferred joint which includes the distal humerus and proximal radius and ulna, or the distal tibia and proximal metatarsus. There is little meat on the latter joint, but perhaps it was stewed for soup or gruel.

On the other hand the missing bone parts are the ends of the bones that fuse last, particularly the proximal humerus and tibia and the distal radius and if these bones were derived from animals exceeding two years (18 months–2 years for sheep), but less than four years, their epiphyses would have been lost and the bones more subject to erosion and the attention of dogs, which tend to chew the softer bones of the epiphysis and diaphysial ends, particularly if unfused or incompletely so. Forty-four bones from the site showed evidence of having been chewed, apparently by dogs, and of these 31 were the ends of humeri, radii, femorae and tibiae, mainly the ends that fuse last.

Domestic Animals — Age at Slaughter

Table 9 indicates the percentage of the ageable bones that were identified as juveniles for each period and for the site as a whole:

TABLE 9

Period	1	2	3	Total
Cattle	10.1%	11.8%	8.1%	10.3%
Pig	54.5	45.5	57	51.25%
Sheep/g	35.75	17.6	28	25.5%
L. ung. & anim.	80	76	40	74.5%
M. anim. & s. ung.	66.6	88	83	79%

The high percentages of unidentified animals can be explained by the high proportion of ribs and vertebrae, the last bones of the body to fuse.

Of the bones of cattle and large ungulates, 41% are from animals definitely older than 2 years, 25% older than $3\frac{1}{2}$ years, 9% older than 4–5 years and 7% older than 7–9 years. 22% of the bones are from animals definitely under 7–9 years, that is animals with any epiphyses unfused or any teeth unerupted. Of the vertebral epiphyses from the cattle and large ungulates, 65% were in an unfused condition. It would appear that although relatively few young cattle were slaughtered (approx. 9% of the total being definitely under $3\frac{1}{2}$–4 years) the majority were slaughtered before the vertebral epiphyses had fused, that is 7–9 years. The evidence indicates no preferred slaughter

ages, animals being killed from their first year onwards until at least their seventh, with no apparent concentration

The pig bones are mainly immature. 21% are from animals less than 2 years old, 47% less than $3\frac{1}{2}$ years and 51% less than 4–7 years. 32% of the bones could be shown to be over 2 years and 14% over 3 years but none over $3\frac{1}{2}$ years. The five vertebrae specifically identified were all unfused. Few animals in their first year were slaughtered; only three bones could be aged to this group, and apart from 16 bones and teeth from animals at least three years of age, no evidence of aged or fully adult animals was found. Slaughter may have been evenly distributed between animals in their second, third and fourth years.

There was little evidence of very young sheep/g being slaughtered. Three bones only indicated animals under 18 months of age, one of these being a lamb of less than six months. 55% of the bones for which data was obtained were older than 18 months, 38% older than $2\frac{1}{2}$ years and less than 2% definitely older than 4–5 years. 8.5% of the bones indicated ages of less than $2\frac{1}{2}$ years, and 25.5% less than 4–5 years. Few sheep or goat appear to have been slaughtered in their first or second year. The evidence suggests an increase in numbers slaughtered between 2 and 5 years old but at least 21% of the bones and teeth are from animals over 3–4 years in age, a proportion of which are mandibles in which the last cusps of the third molar is showing medium but not extensive wear. There appeared to be no aged sheep or goat evident from the teeth and jaws, and only two specimens of sheep/g vertebrae had epiphyses fused.

No divison was made as to which vertebrae may have been pig and which sheep/g (if indeed these were the only species represented), but the high figure indicates that the majority of both species may be considered to have been slaughtered before the fusion of the vertebral epiphyses, that is 4–7 years for pig, and 4–5 years for sheep/g. This agrees with the identified sheep vertebrae where four of six bones are unfused. It is evident that adult sheep/g in excess of four years were also slaughtered.

This discussion of slaughter ages is not subject to generalization since no very large sample of any species was obtained. Furthermore a much larger sample of dental elements, indicating the state of eruption and degree of wear, is desirable before reliable conclusions on the slaughter ages of the adult animals can be reached.

Domestic Animals — Sex

Few bones could be sexed and no species in sufficient numbers to indicate any preference in slaughter between the sexes, or the presence of castrated animals. No attempt was made to distinguish sex by metrical analysis since the sample was insufficiently large.

Sex determination on morphological criteria (for the whole site) gave the following result:

	Ox	Pig	Sheep
Male	1	27	2
Female	—	8	10

The skull and pelvic bones of the sheep[58] suggested that ten were females or fairly young animals and two were males. However it is conceivable that the former group constituted wethers as well. The figures for pig are based upon the mandibular and maxillary canines.

Domestic Animals — Bone Pathology

A number of bones showed pathological features, healed fractures and other abnormalities.

1562 (M 3), *Pig metapodial.* A juvenile specimen with a healed break showing heavy ossification around the fracture.

1595 (M 1), *Dog rib.* A complete rib with a neatly healed fracture with little extraneous ossification.

1514 (M 6), *Chicken femur.* A complete femur with a local exostosis just distal to the proximal epiphyses.

1693 (M 5), *Cat femur.* A complete femur showing a slight exostosis on the lateral side of the distal condyle.

1655 (F 35), *Ox tibia.* The bone has a marked increase in the bulk of bone around the distal end, but it is not apparently arthritic in origin.

1602 (M 3), *Ox metatarsal.* The distal end of the bone has a marked extension of the lateral condyle but no secondary ossification or evidence of inflammation. Possibly a genetic abnormality, or a response to load.

1574 (M 5), *Ox pelvis.* The fragment is a portion of the illial shaft adjacent to the acetabulum. The bone shows marked thinning and substantial surface erosion. Although conceivably a factor of preservation the condition appears more likely to be pathological.
1655 (F 35), *Horse mandibles.* Both rami and skull were recovered of one specimen. The jaw articulations have extensive lesions, involving both erosion and deposition, particularly severe on the right ramus.
1562 (M 3), *Sheep (or goat) mandible.* The mandible has heavy exostosis of the symphysis and caries at premolar 4 and molar 1. Both teeth have dropped into the jaw and are extremely worn. The animal is adult with the third cusp of molar 3 well into wear.
1655 (F 35), *Pig mandible.* Inflammation of a juvenile mandible (M 3 unerupted) resulting in extensive wear on molar 1 and lesion and swelling of the jaw beneath premolar 4.

Wild Fowl

Black grouse and capercailzie are the only two species of wild bird identified from the primary deposits. The generally accepted habitat for the black grouse is moorland fringes with rough, sparsely wooded ground, preferably conifer and birch, with a good scrub or ground cover, often swampy;[59] and that of the capercailzie is open pinewoods particularly on hillsides with a good ground cover such as blueberry and heather.[60] Neither of these habitats occurs near Durham at present and although there is a post-glacial record of capercailzie in Upper Teesdale associated with the bones of wolf, brown bear and lynx, among others (including domestic animals),[61] there are no recent occurrences of this species in the county. Blackgame on the other hand are still found in Upper Teesdale.[62]

Even in the early medieval period there is no indication in the pollen studies carried out on recent deposits in the county[63] of any pinewoods, although birch does occur consistently. Those of Donaldson & Turner deal specifically with the last five thousand years, including dated deposits of the medieval period, on deposits about two miles from Durham City. The importation of carcasses from Scotland, likely to be the nearest site of the typical habitat of the capercailzie, or the uplands of Durham County, seems unlikely and it appears necessary to reconcile the two species to a local habitat.

The capercailzie, although a bird of pine forests or mixed pine and broadleaved woodlands in Europe, being found in pure broadleaved woodland only beyond the pine limit in the birch woods of Lapland,[64] has since its reintroduction into Scotland in the 19th century expanded in to areas of deciduous woodland.[65] Open broadleaved wood with plentiful undergrowth is at present common on the steep banks of the River Wear and was almost certainly also in the early medieval period. Bannerman,[66] quoting another source, notes a reference to a grant of land in the 14th century held by tenure, *inter alia*, of paying "one wode-henne yearly" to the Bishop of Durham. It would seem that this species was present in the broadleaved woodlands of Durham during the early medieval period. Blackgame have, before their recent restriction in range, commonly been associated with lowland areas of broadleaved woodland, and with clearings and adjacent moorland or heath with birch growths such as the New Forest,[67] a situation likely to have been present locally in early medieval Durham. It appears most likely that these two species were of local origin and the absence of any other wild birds suggests that the species was relatively common or easily caught, the tendency of both to run rather than fly perhaps suggesting the latter.

FISH

By ALWYNE WHEELER

A notable feature of the small quantity of fish remains was the preponderance of bones from the heads of cod. Even those bones which are not strictly skeletal elements of the head were associated with the anterior region, e.g. pectoral girdle, or anterior abdominal vertebral column. This was true also for the haddock and saithe bones. One explanation for this could be that fish were beheaded at the site and only the posterior edible portion consumed elsewhere. On the other hand, fish heads may themselves have been obtained for food. Heads of such relatively large gadoid fishes yield a substantial quantity of palatable meat for the effort of picking it off, but have often been (and still are) treated as of low value by fishmongers, and might have been obtainable very cheap.

The lengths of the fishes (where estimation was possible) were: *c.* 50 cm, 100 cm, 115 cm, 100 cm, 110 cm (cod), *c.* 90 cm (?saithe) and *c.* 74 cm (3.6 kg weight) (salmon).

Shellfish

The lobster was equivalent in size to that of a seven to eight pound lobster (estimate by courtesy of Mr Peacock, a Durham fishmonger).

PLANT LIFE AND PLANT USE

By ALISON DONALDSON

General

Samples of macroscopic plant remains for botanical analysis were taken by the excavator from the contexts shown in Table 10. Plant remains, including structural timber, were also collected and identified from a number of other contexts. The species identified are listed in Table 10 and below, using nomenclature according to Clapham, Tutin and Warburg[68] and Watson.[69] The species have been divided into groups depending on their normal habitats and on their potential contribution to the economy of the site and its inhabitants. These groups are listed below and represented in the right-hand column of Table 10.

Before interpreting these results it is worth considering what the samples represent. They are not natural sediments, recording changes in the surrounding vegetation through time, but are an artificial assemblage, representing not only the plants growing on or near the site, but those brought in from other areas, for example, with crops, or as flooring material. Some seeds may arrive on the soles of the feet, or in bird droppings,[70] and thus represent vegetation growing some way from the site. The proportion of these different components may vary spatially over the site, as well as over a period of time.

All the samples examined here were very similar in ecological implication. The few peaks of individual species will be mentioned in the discussion, but minor differences in species composition represented are as likely to be due to their random provenance as to any change in environmental or economic conditions, either in time or spatially.

Economic and Ecological Grouping of Identified Species

(Plants which are thought to contribute to a particular group are marked with the group letter in Table 10.)

HIGHER PLANTS

A. *Introduced Cultivated Plants*

Flax seeds occurred in almost all samples and were of the introduced, cultivated species, *Linum usitatissimum*. Their presence almost certainly means that flax was being cultivated throughout the period represented as it can rarely persist in a naturalized state for more than a season or two after its original sowing. It may have been cultivated for the production of linen from the stem fibres or for the seeds which contain oil and are also edible. Only three carbonized wheat grains were found. Their size puts them in the range of the modern bread/club wheats (*Triticum aestivum* (s.l.). Carbonization was probably accidental and these grains were probably discarded, hence their incorporation into midden deposits. Turner[71] found wheat pollen in deposits of a similar age on the Durham peninsula, but suggested it was of *Triticum dicoccum* (emmer), a more primitive, diploid species. The oat grains, in the absence of flower bases, were identifiable only to genus level, but both wild and cultivated oats are introduced species. Seeds of turnip and carrot were also found, but it is not possible to say if they were wild or cultivated varieties. Turnips could have been for human or animal consumption, both root and leaves being edible.

There are so many possible explanations for the presence of a single seed of the opium poppy that it certainly need not represent cultivation in the region. The plant has a variety of uses (see below).

TABLE 10

Context	1726	1589	1740	1562	1576	1575	1574		
Description	Ultimate fill of Storm drain, S 15	Midden 1	Midden 1	Midden 3	Primary fill of Cesspit, F 100	Secondary fill of Cesspit, F 100	Midden 5	Plant Species	Group
REMAINS								SPERMATOPHYTA	
Achenes	—	—	—	1	—	—	—	*Achillea millefolium* L. (Yarrow)	D I *
Fruits	—	1	—	—	—	—	—	*Aethusa cyanapium* L. (Fool's Parsley)	B C
Seeds	1	3	6	40	2	29	5	*Agrostemma githago* L. (Corn Cockle)	B I *
Achenes	1	—	5	12	—	—	4	*Anthemis cotula* L. (Stinking Mayweed)	B C I
Seeds	2	14	12	5	15	9	103	*Atriplex hastata* L./*paula* L. (Orahce)	B C H
Carbon. grains	1	—	—	—	—	1	2	*Avena* sp. (Oats)	A
Seeds	1	10	1	3	10	4	3	*Brassica rapa* L. (Turnip)	A B C H I J
Shoots	—	—	—	—	—	—	+	*Calluna vulgaris* (L.) Hull (Heather)	F J
Seeds	—	1	1	—	—	—	—	*Caltha palustris* L. (Marsh Marigold)	E I
Nutlets	—	6	—	—	—	—	4	*Carex paniculata* L. (Panicled Sedge)	E I
Nutlets	3	2	3	—	3	1	—	*Carex* spp. (Sedges)	E
Achenes	—	—	—	1	—	1	—	*Centaurea nigra* (Knapweed)	D I
Seeds	15	24	50	16	31	23	48	*Chenopodium album* L. (Fat Hen)	B C H I* J
Achenes	—	—	—	—	—	—	1	*Chrysanthemum segetum* L. (Corn Marigold)	B I
Nuts	—	—	—	1	—	1	1	*Corylus avellana* L. (Hazel)	G I *
Seeds	6	—	—	—	—	—	—	Cruciferae	
Achenes	—	1	—	—	—	—	1	*Daucus carota* L. (Carrot)	A B D I
Nutlets	—	—	1	3	1	1	—	*Eleocharis palustris* (L.) Roem. & Schult. (Spike Rush)	E
Fruits	—	—	—	—	—	—	5	*Filipendula ulmaria* (L.) Maxim (Meadowsweet)	E I* J
Nutlets	1	—	—	2	—	—	3	*Galeopsis tetrahit* L./*speciosa* Hull (Hemp Nettle)	B
Caryopses	6	9	4	7	3	4	2	Graminae (Grasses)	
Seeds	—	—	—	—	—	—	+	*Juncus articulatus* L./*acutifolius* Hoffm. (Rushes)	E J
Seeds	—	—	—	—	—	—	+	*Juncus bufonius* L. (Toad Rush)	C D
Seeds	—	—	—	—	—	—	+	*Juncus effusus* L./*conglomeratus* L. (Rushes)	E F
Achenes	12	2	14	—	2	16	2	*Lapsana communis* L. (Nipplewort)	B C H I
Achenes	—	—	—	—	—	—	—	*Leontodon* sp. (Hawkbit)	D
Seeds	3	7	3	—	—	—	7	*Linum usitassimum* L. (Flax)	A I J
Seeds	—	—	—	1	—	1	2	*Luzula campestris* (L.) DC (Sweep's Brush)	C D
Seeds	—	—	—	—	—	2	1	*Malus sylvestris* Mill. (Apple)	G I *
Seeds	—	—	—	—	—	1	—	*Papaver somniferum* L. (Opium Poppy)	A I*
Seeds	—	7	—	1	—	—	—	*Pedicularis palustris* L. (Red Rattle)	E F
Seeds	—	—	—	—	—	—	—	*Plantago lanceolata* L. (Ribwort Plantain)	D I*
Fruits	30	2	2	2	—	1	7	*Polygonum aviculare* L. s.l. (Knotgrass)	B C I*
Fruits	81	6	1	2	—	1	3	*Polygonum hydropiper* L. (Water Pepper)	E
Fruits	8	1	5	1	2	1	3	*Polygonum lapathifolium* L. (Pale Persicaria)	B C

Fruits	4	2	—	—	2	—	—	*Polygonum persicaria* L. (Persicaria)	B C H J
Achenes	—	1	1	2	—	2	—	*Potentilla erecta* (L.) Rausch (Tormentil)	D F J
Achenes	—	2	—	—	1	—	6	*Potentilla palustris* (L.) Scop. (Marsh Cinquefoil)	E F
Nutlets	—	—	2	3	—	—	8	*Prunella vulgaris* L. (Self-heal)	C D I
Stones	—	—	—	—	+	1	—	*Prunus domestica* L. (Plum)	G
Stones	—	—	—	—	—	—	+	*Prunus spinosa* L. (Sloe or Blackthorn)	G I* J
Achenes	—	1	2	3	—	1	—	*Ranunculus* sect. Ranunculus (Buttercups)	C D E I*
Achenes	1	—	1	—	—	—	1	*Ranunculus sardous* Crantz (Hairy Buttercup)	B
Achenes	7	1	2	—	—	1	105	*Ranunculus sceleratus* L. (Celery-leaved Crowfoot)	E I
Seeds	1	2	—	—	—	1	—	*Raphanus raphanistrum* L. (Wild Radish)	B I*
Seeds	—	—	2	—	38	120	—	*Rubus fruticosus* agg. (Blackberry)	C G I* J
Seeds	—	—	—	—	2	—	—	*Rubus idaeus* L. (Raspberry)	G I
Nutlets	1	—	1	—	1	—	17	*Rumex acetosella* L. (Sheep's Sorrel)	B D F
Nutlets	17	—	8	2	—	2	12	*Rumex crispus* Type (Docks)	B I*
Seeds	—	1	—	—	—	—	1	*Sambucus nigra* L. (Elder)	G I*
Achenes	1	—	—	—	—	—	—	*Sonchus avensis* L. (Field Milk Thistle)	B C H
Achenes	—	—	1	2	1	—	2	*Sonchus asper* (L.) Hill (Spiney Milk Thistle)	B I*
Seeds	—	—	—	—	—	—	1	*Sorbus aucuparia* L. (Rowan)	G I
Seeds	—	—	—	1	—	1	—	*Spergula arvensis* L. (Corn Spurrey)	B H
Seeds	—	—	3	—	—	—	—	*Stellaria alsine* Grimm (Bog Stichwort)	E
Seeds	6	—	—	1	—	—	4	*Stellaria media* (L.) Vill. (Chickweed)	B C H
Seeds	—	—	1	—	—	1	4	*Thlapsi arvense* L. (Field Penny Cress)	B
Carbon. grains	—	—	1	—	—	1	—	*Triticum aestivum* L. s.l. (Wheat)	A
Achenes	21	—	20	—	3	1	152	*Urtica dioica* L. (Nettle)	C D H I* J
Achenes	—	—	—	—	—	2	—	*Urtica urens* L. (Small Nettle)	B H
Fruits	—	—	—	—	—	—	—	*Valerianella dentata* (L.) Poll. (Slender Corn Salad)	B
TOTAL	230	105	148	112	117	232	520		
								PTERIDOPHYTA	
	+	—	—	+	—	+	+	*Pteridium aquilinum* (L.) Kuhn (Bracken)	F J
								BRYOPHYTA	
	—	—	—	+	+	—	+	*Acrocladium cuspidatum* (Hedw.) Lindb.	
	—	—	—	—	—	—	+	*Acrocladium stramineum* (Brid.) Rich. & Wall	
	—	—	—	+	—	—	+	*Barbula fallax* Hedw.	
	—	—	—	—	+	—	—	*Brachythecium* spp.	
	—	—	—	—	—	—	+	*Camptothecium* sp.	
	—	—	—	—	—	—	+	*Dicranum scoparium* Hedw.	
	—	—	—	—	—	—	+	*Dicranum* sp.	
	—	—	—	—	—	—	—	*Drepanocladus* cf. *revolvens* (Turn.) Warnst.	
	—	+	—	—	—	—	+	*Eurhynchium praelongum* (Hedw.) Hobk.	
	—	—	—	—	—	—	+	*Hylocomium splendens* (Hedw.) B., S. & G.	
	—	+	—	+	—	—	+	*Hypnum cupressiforme* Hedw.	
	—	+	—	—	—	—	—	*Mnium hornum* Hedw.	
	—	—	—	—	—	—	—	*Mnium longirostrum* Brid.	
	—	+	—	—	—	—	+	*Rhitidialelphus squarrosus* (Hedw.) Warnst.	
	+	—	—	—	—	—	+	*Sphagnum palustre* L.	

B. *Weeds of Arable Land*

Several of these weeds have since become relatively rare due to improved cleaning of grain seed and, very recently, the use of weed killers. *Agrostemma githago*, the Corn Cockle, was a very prevalent weed of cornfields until recently. It is a Mediterranean species probably introduced by the Romans. Seeds were present in all samples but their abundance in the midden deposit 1562 could represent their discarding after the cleaning of grain before storage. The seeds are not only slightly poisonous but also affect the physical properties of wheat flour.

Of the other species represented it is interesting to note that *Polygonum persicaria* and *Spergula arvensis* frequently occur at the present day as weeds of flax fields. The presence of calcareous soils in the region is indicated by *Valerianella dentata* and *Daucus carota*, and sandy soils low in calcium by *Spergula arvensis* and *Chrysanthemum segetum*.

C. *Plants of Wasteland, etc.*

Many of these are fast-growing annuals with a high rate of seed production. Some, e.g. *Polygonum aviculare*, are adapted to growing in well-trodden places like paths, while nettles (*Urtica dioica*) and Fat Hen or Muckweed (*Chenopodium album*) favour the nutrient-rich disturbed soils associated with habitation sites. The peak of *Urtica dioica* in 1574 (Midden 5) probably only demonstrates the presence of nettles growing very near the sample site.

D. *Weeds of Grassland*

The presence of grass caryopses and the seeds of pasture weeds throughout the sequence suggests areas of pastureland in the region or at least large grassy clearings for grazing by sheep, cows or geese.

E. *Plants of Wet Meadows*

The meadowland flora represented by this group were probably harvested for fodder or flooring material, hence their representation on the site. The plants which can also grow actually in water tend to indicate slow-flowing, nutrient rich, silty water and could represent, additionally, a ditch flora, perhaps on or near the site. The peak of *Ranunculus sceleratus* in 1574 (Midden 5) and *Polygonum hydropiper* in 1726 (Storm drain S 15) must represent the presence of these plants in the area of the samples, either growing or having been collected.

F. *Plants of Heathland and Acid Bogs*

Areas of heath and bog, possibly rough grazing for sheep and goats some distance from the site, are indicated. Many of the plants involved could have been gathered for a specific purpose.

G. *Trees and Shrubs with Edible Fruits or Nuts*

Trees and shrubs in the surrounding woods, and scrubland must have provided a considerable amount of food. The presence of coppiced hazel is demonstrated by the wattle fences, and broken shells of hazelnuts were found in several samples, and scattered throughout the site. Blackberry and elder could have been growing on the site itself or in scrubland or woodland, while raspberry tends to grow only in woodland. The abundant blackberry pips in samples 1576 and 1575 from the fill of the cesspit (F100) could be faecal in origin. Sloe stones, from the wild plum or Blackthorn (*Prunus spinosa*) were found scattered throughout the site. There were also stones of the cultivated plum (*Prunus domestica*) which resemble the Damson (ssp. *domestica*) rather than the Bullace (ssp. *interstitia*). Presumably, either the plums themselves were imported or a tree was planted in the vicinity. It is not possible to say whether the apple pip from 1574 (Midden 5) is from a wild (crab) or cultivated variety.

H. *Edible Wild Plants*

There are references in the literature to these plants having been used as a source of food at some period, or simply to their being edible.[72] *Atriplex hastata/patula* and *Chenopodium album* are closely related to spinach and can be prepared and cooked in the same way. Their seeds are also edible. The use of *Chenopodium album* (Fat Hen) especially persisted in the more remote areas of Europe long after the introduction of spinach and was used again during the famine conditions of the Second World War.[73]

I or I*. *Plants with Medicinal Uses*

These plants are listed because there are references in the many herbals, etc., to their medicinal uses or properties. Grigson[74] has collated much information from earlier floras and herbals and is a major source of information. The species marked with an asterisk have medicinal uses described in Anglo-Saxon literature.[75] Brackets indicate where there is doubt that the plant referred to in the older literature is of the precise species.

The plants range from herbs for the treatment of common ailments and injuries, to those containing powerful alkaloids, like the opium poppy, and the yarrow; while some, like rowan and hazel were also thought to possess magical powers.

J. *Plants with other Domestic or Economic Uses*

It has been suggested that many other plants may have been collected for specific purposes.[76] Sedges (*Carex* spp.), rushes (*Juncus* spp.), etc., could have been used for flooring. The flattened stems and leaves of monocotyledons were found frequently in the samples. The sweet-smelling Meadowsweet (*Filipendula ulmaria*) could also have been strewn over floors. Oil could have been extracted from the seeds of turnip (*Brassica rapa*), flax (*Linum usitatissimum*), and opium poppy (*Papaver somniferum*). Both flax and nettles (*Urtica* spp.) have been used for the production of fibres and cloth, while several plants could have been used for dyeing, e.g. *Chenopodium album, Calluna vulgaris, Polygonum persicaria, Potentilla erecta, Prunus spinosa, Rubus fruticosus* agg., and *Pteridium aquilinum*. The bulky plants of bracken (*Pteridium aquilinum*) and heather (*Calluna vulgaris*), and also some of the mosses, could have had a variety of uses such as bedding, roofing, draught-proofing, etc.

From the plant remains there is no real evidence for vegetable tanning in the area excavated. Bracken (*Pteridium aquilinum*) does contain tannins but was also found in layers not containing abundant scrap leather. Only two seeds of elder (*Sambucus nigra*) were found on the entire site and one would expect them in far larger quantities if vegetable tanning was going on.[77] Some of the dye plants could have been used on leather but their remains were not at higher concentrations in the leather-containing samples, 1562 (Midden 3) and 1574 (Midden 5).

BRYOPHYTES

Most samples contained mosses. As a group they probably represent areas of woodland (e.g. *Mnium hornum*), grassland (e.g. *Rhytidiadelphus squarrosus*), heathland (many of the woodland species also grow on heaths), and bog (e.g. *Acrocladium stramineum*). The presence of *Acrocladium cuspidatum, Barbula fallax* and a *Camptothecium* species indicate calcareous soils in the region, while most of the other species grow on acid soils. Context 1627 (Period 2, tenement B) yielded a bundle of twisted stems of the large moss *Polytrichum commune*, which had a variety of domestic uses[78] including caulking for boats.

Wood Identifications

Period 1

The earliest brushwood material (F 30) (1625), possibly the lining of a drain, consisted of tightly packed thin twigs of willow (*Salix* sp.), probably collected from the nearby riverside area.

All other fences and walls of Period 1 (F 75, 88, 89, 76, 58, 21, 69, 22, 57, 49, 37, 12) were of an entirely different wattle construction (p. 9). The wood used for weaving was always hazel and the unbranched twigs of uniform diameter suggest coppicing. The upright posts/pegs were usually oak or hazel with alder, ash, holly, birch and a *Prunus* sp. occurring more rarely. Apart from the *Prunus* sp. which could possibly be a cultivated plum or cherry, these trees are all native to this part of the country and are species one would expect in a fairly open woodland. In Periods 2 and 3, panels and linings continued to be made of the same materials (F 40, 41, 73, 35), but the fence, F 27, of post and rail construction, was made entirely of oak. Scattered wood fragments from various levels revealed no additional species.

Plant Environment

The identification of wood and other botanical remains from the site indicates the presence of several different plant communities in the region; areas of fairly open woodland, arable land, pasture, and meadow, heath, bog and wasteland. A radiocarbon-dated pollen diagram[79] from a natural peat deposit two miles to the north-west includes the period during which the Saddler Street site was occupied. It shows the local landscape to have been dominated by fairly open, secondary woodland with some pasture-land but little arable. The excavated samples are an artificial assemblage and cannot endorse this landscape or give an impression of the relative concentration of natural plant communities or their distance from the site. Nevertheless, an interesting range of plants and plant communities is indicated, of significance for the early medieval economy.

FIVE INSECT ASSEMBLAGES

HARRY K. KENWARD, *Environmental Archaeology Unit, University of York*

A small group of samples, chosen on site as most likely to be of archaeological value (1726, 1589, 1627, 1574, 1561), was processed using a standard paraffin flotation technique.[80] Coleoptera (beetles) and hemiptera (bugs) recovered from the samples are listed in full, with numbers of individuals, percentage, number per kilogramme and rank position for each species in each sample, in a theoretical paper published elsewhere,[81] together with a summary of the records of other invertebrates.[82]

In many cases identification was made difficult by the highly fragmented condition of the remains, and this is reflected in the large proportion of uncertain identifications. The damage was probably due to both drying and compression of the deposit *in situ* and to the rough treatment needed to break down the matrix during processing.

The interpretation of the faunas

Archaeological information is obtained from insect remains by using the habitat requirements of the recorded species, either directly to reconstruct past ecological conditions, or indirectly to detect human activity. However, this process is beset with problems, especially those caused by the presence of a transported 'background' component in assemblages.[83] Before any ecological conclusions are drawn, the assemblage from any sample must be tested to determine the extent to which it represents the community of insects which lived at the site of deposition.[84] This may be done by using certain properties of the whole assemblage, particularly its species richness and the proportion of 'outdoor' insects. The former is partly a measure of the complexity of the local insect community but, more importantly, reflects the degree of inter-mixture of communities. The latter, defined as the proportion of the fauna which would be unable to breed in a primitive building or an accumulation of organic rubbish, may be used in urban situations to estimate the rate at which a deposit formed and its degree of exposure to the open air. A full discussion of the problems of interpretation, and some methods found helpful in overcoming them, appears elsewhere.[85]

The implications of the five assemblages from Saddler Street are summarized below. This account should be read in conjunction with Table 11 which gives totals of species and individuals, concentrations and an estimate of diversity; Tables 12–16, which give the number, rank position and percentage of the species occupying the first ten ranks in each assemblage; and Figs. 28–31, which summarize the remaining important properties of the faunas. The totals of species and individuals, concentrations and an estimate of diversity are set out in the Table in Section 12b of the *Archive* (Durham University).

A detailed account of the reasoning used in the interpretation of these assemblages has been given elsewhere as part of a general account of interpretative methods.[86]

TABLE 11

Some statistics of five insect assemblages from Saddler Street. The index of diversity is estimated from the nomogram of Fisher *et al.* (1943)

	1726	1589	1627	1574	1561
Number of individuals	222	439	164	186	90
Number of species	95	90	74	74	41
Index of diversity (Fisher's α)	61	35	50	46	30
Standard error of α	6.7	2.8	5.3	5.5	5.3
Number of individuals per kg	44.4	87.8	36.4	41.3	18.0

1726: Ultimate fill of storm drain (S 14), Period 1 (Table 12)

This is the most remarkable of the assemblages and, although its fauna is plentiful, difficult to interpret. It is extremely rich in species, its diversity being comparable with pure 'background' assemblages from modern roofs. The proportion of outdoor insects is also very high. The fauna is thus of varied origin, formed outdoors, and quite possibly largely a background assemblage. All the most abundant species are known to be, or suspected of being, common in the background 'rain'. The only likely alternative, that it is a waterlain sediment, is supported by some data, for example the presence of large numbers of resting eggs of 'water fleas', *Daphnia* sp. The balance of the evidence suggests that the layer had been deposited by seepage and run-off water from the slopes behind the site, incorporating insects from areas of semi-natural vegetation and background fauna.

TABLE 12

Species occupying the first ten ranks of abundance in the assemblage from sample 1726

Rank	Species	Number of individuals	Percentage
1	*Anotylus nitidulus*	34	15.3
2	*Platystethus arenarius*	27	12.2
3	*P. cornutus* group	16	7.2
4	*Carpelimus* sp. indet.	12	5.4
5	Aleocharinae sp. indet.	5	2.3
	Aphodius granarius	5	2.3
7	*Helophorus* sp. (small)	4	1.8
	Anotylus rugosus	4	1.8
	Stenus sp. indet.	4	1.8
	Corticaria sp. indet.	4	1.8

1589: Midden 1, Period 1 (Table 13)

This layer was unusually rich in insect remains. The assemblage is dominated by a single clear ecological group of species only likely to be found together in abundance in an accumulation of rotting vegetation. Most of these species are associated with rather foul conditions. Although outdoor insects form only a moderate proportion of the fauna their concentration is high when compared with records from other sites and it is likely that they have simply been diluted by abundant breeding insects. Pale individuals, which probably died before they emerged from the site of development and are thus convincing evidence of breeding, are recorded for four of the abundant species. There can be little doubt that this layer represents the compressed remains of rotting matter deposited fairly slowly outdoors.

TABLE 13

Species occupying the first ten ranks of abundance in the assemblage from sample 1589.
P — Pale individuals recorded

Rank	Species	Number of individuals	Percentage
1	*Oxytelus sculptus*	50 P	11.4
2	*Cercyon pygmaeus*	29 P	6.6
	Leptacinus ?intermedius	29	6.6
4	*Cercyon analis*	28 P	6.4
5	*Carpelimus fuliginosus*	22	5.0
6	*Ptenidium* sp. indet.	18	4.1
	Gyrohypnus fracticornis	18	4.1
8	*Anotylus rugosus*	15	3.4
9	*Platystethus arenarius*	14 P	3.2
10	*Xylodromus concinnus*	12	2.7

1627: Unidentified: Period 2 (Table 14)

The fauna from this sample is dominated by species associated with rotting matter. The high diversity and high proportion of outdoor species suggest the presence of abundant background fauna. The layer seems to represent the remains of an accumulation of moist refuse formed in the open, but little more can be said.

TABLE 14

Species occupying the first ten ranks of abundance in the assemblage from sample 1627

Rank		Number of individuals	Percentage
1	*Platystethus arenarius*	18	11.0
2	*Cercyon lateralis*	15	9.1
3	*C. unipunctatus*	10	6.1
4	*Oxytelus sculptus*	7	4.3
	Anotylus nitidulus	7	4.3
6	*Lathridius minutus* group	6	3.7
7	*Megasternum obscurum*	5	3.0
8	*Cercyon analis*	4	2.4
	Anotylus complanatus	4	2.4
10	*Cryptophagus* sp. indet.	3	1.8
	Gyrohypnus fracticornis	3	1.8
	Philonthus sp. indet.	3	1.8
	Aleocharinae indet. sp.	3	1.8
	Cercyon pygmaeus	3	1.8
	Omalium rivulare	3	1.8

1574: Midden 5, Period 2 (Table 15)

Although in many respects the fauna from this sample is similar to that of 1627 it has less definite ecological implications. The layer seems to have formed in the open air as the proportion of outdoor insects is high. Several species associated with dung and foul rotting vegetation are rather abundant and the proportion and concentration of species found in decaying matter are close to those for the previous sample. However, some species suspected of being abundant in the contemporary background fauna are common and the assemblage may be dominated by transported insects. The evidence is compatible with the interpretation of the layer as a midden, but does not confirm it.

TABLE 15

Species occupying the first ten ranks of abundance in the assemblage from sample 1574

Rank	Species	Number of individuals	Percentage
1	*Anotylus nitidulus*	20	10.8
2	*Cercyon pygmaeus*	15	8.1
3	*Platystethus arenarius*	14	7.5
4	*Cryptophagus dentatus* group	9	4.8
5	*Lathridius minutus* group	7	3.8
6	*Carpelimus* sp. indet.	6	3.2
	Aphodius granarius	6	3.2
8	*Anotylus rugosus*	5	2.7
	Oxytelus sculptus	5	2.7
	Platystethus nitens	5	2.7

1561: Backfill of pit F 9, Period 2 (Table 16)

Too few insects were recovered from this material to permit a confident analysis; the remains were, however, well preserved. This, together with the small number of 'outdoor' insects, suggests that the layer formed rapidly. There is little evidence that insects bred in it; the index of diversity, although low in comparison with other samples from the present site, falls in the high range for contemporary material from York. Species associated with fairly dry plant remains form an unusually high proportion of the fauna, suggesting that this habitat may have existed very close to the site of deposition. Alternatively, they may have been the result of short-term reworking, the deposit including material derived from some near contemporary deposit formed in association with dryish vegetation, for example straw. Thus although the evidence is compatible with the layer having been a rapidly dumped seal, the significance of the assemblage is uncertain.

TABLE 16

Species occupying the first ten ranks of abundance in the assemblage from sample 1561

Rank	Species	Number of individuals	Percentage
1	*Atomaria* species A	12	13.3
2	*Lathridius minutus* group	9	10.0
3	*Atomaria* species B	5	5.6
	Aleocharinae species indet. A	5	5.6
5	*Cryptophagus dentatus* group	4	4.4
	Phyllodrepa floralis	4	4.4
	Xylodromus concinnus	4	4.4
8	*Monotoma picipes*	3	3.3
	Lyctus fuscus	3	3.3
	Aleocharinae species indet. B	3	3.3

These five assemblages have given information of varying direct value to the archaeological interpretation of the site — more data might have been obtained from the examination of a larger number of samples, especially if taken from related contexts. Further insight into conditions on and around the site can, however, be obtained by more general inspection of the fauna. As there are so few samples it is not reasonable to look for any trends in time and the material will be considered as one.

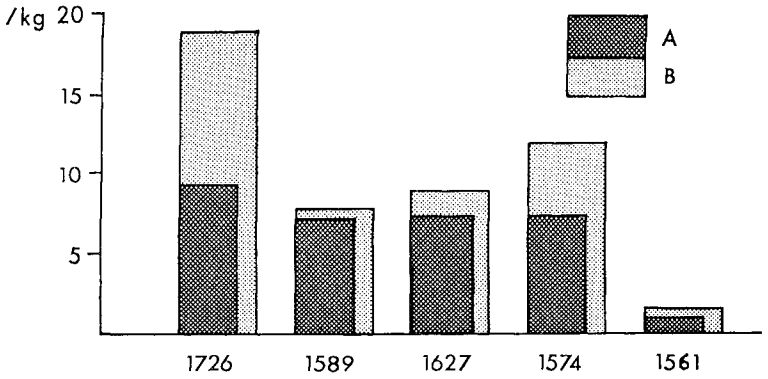


FIG. 28

Concentration of 'outdoor' individuals (numbers per kg) in five samples from Saddler Street. A – certain, B – certain plus probable

The first striking point is the overall high proportion of outdoor insects and, associated with this, the high diversity of most of the samples. This is best appreciated by comparing the values with those obtained from a large number of samples from two excavations at York; 6–8 Pavement and 5–7 Coppergate.[87] The proportion of outdoor insects tends to be higher even than in the material from 5–7 Coppergate, which like most of the Saddler Street samples is believed to represent layers formed in the open air. This suggests that the open ground near the Saddler Street site was not entirely sterilized by the activity of man. Some hints as to the vegetation can be gained from the plant associations of the beetles (Table 17). A number of unspecialized root feeders is also recorded The number of ground beetles (Carabidae) in the samples is higher than normal in the York sites. This too suggests the presence of areas of ground neither too trampled nor damaged by livestock. These beetles may, however, have originated as

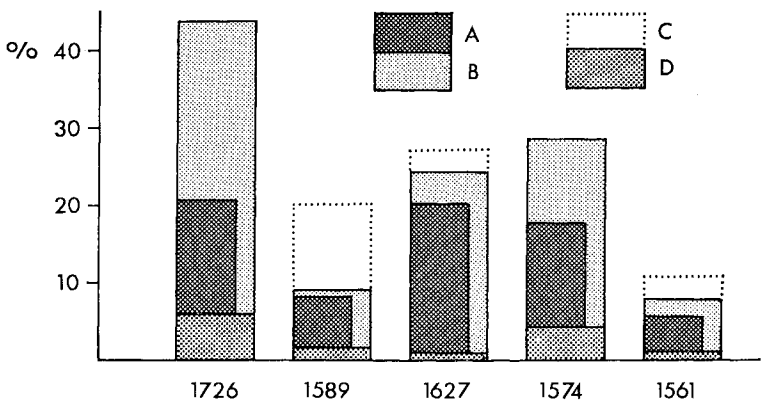


FIG. 29

Percentage of aquatics and other 'outdoor' individuals in five samples from Saddler Street. A – certain; B – certain plus probable 'outdoor' species, excluding aquatics; C – as B, calculated after subtraction of species forming 10% or more of assemblage where appropriate; for 1589 calculated after subtraction of abundant compost-dwelling species. D – aquatic and aquatic-marginal species

part of the 'background' rain and not have lived on the site. Indeed, some of the larger species were twisted and fragmented in a way suggesting their possible origin in bird droppings.[88] Importation in bird droppings may be one reason why a large proportion of the 'outdoor' species were highly fragmented.

TABLE 17

Host plants of phytophagous beetles in five samples from Saddler Street.
Catholic root feeders (e.g. *Otiorhynchus*, Elaterids) are excluded

Species	Number of samples/ individuals	Hosts
Brachypterus glaber	1/4	Nettles (*Urtica*)
Bruchus spp. (sens. lat.)	1/1	Papilionaceae
Lema sp.	1/1	Found on various herbs
Gastrophysa viridula (?)	1/1	*Rumex* (docks), probably also *Polygonum* (knotgrasses)
Phyllotreta nemorum and *undulata*	2/2	Cruciferae
Crepidodera ferruginea (?)	1/3	Found on various herbs
Apion (*Eutrichapion*), sp.	1/1	Mostly Papilionaceae
Apion aethiops (?)	1/1	*Vicia* spp. (Vetches)
A. fuscirostre	1/1	*Sorothamnus scoparius* (Broom)
Phyllobius argentatus	1/1	Various deciduous trees
Strophosomus nebulosus	1/1	*Erica* (heathers), *Calluna* (Ling); possibly *Ulex minor* (dwarf furze)
Hypera punctata	1/1	Herbaceous Papilionaceae
Cidnorhinus quadrimaculatus	1/2	Nettles (*Urtica*); rarely *Parietaria*
Ceuthorhynchus quadridens	1/1	On Cruciferae
Gymnetron sp.	1/1	Various herbs
Phloeophthorus rhododactylus	2/4	*Genista* (greenweeds), *Ulex* (gorse), *Sorothamnus* (brooms)

Most or all of the 'outdoor' species may have originated in the background fauna but nevertheless samples with similar properties have rarely been encountered in contemporary material from elsewhere and areas of weedy waste ground probably existed quite nearby. It seems very likely that the slopes behind the site supported a semi-natural plant community.

Having recognized the large outdoor influence in most of the assemblages it can be said that in other respects the fauna is very similar to that of the explored parts of York in the 9th to 12th centuries. Indeed the overall impression gained from superficial inspection of the species lists from Durham and contemporary York is that they are indistinguishable. Almost every species found in the Saddler Street samples is known from York and all the common ones have been found in abundance at the latter. The species not recorded from York are present at Durham only as single individuals; some are probably represented by indeterminate specimens in the York material. A notable exception is the bark beetle *Phloeophthorus rhododactylus*, which was represented by three specimens in sample 1589 and one in 1726, both contexts dating to the earliest phase of occupation. The beetle lives in dead and dying stems of broom, gorse and greenweeds (*Sarothamnus*, *Ulex*, *Genista*) and may occur in immense numbers. It seems likely that it is occasionally abundant in the background fauna and cannot be used as evidence that the host grew very close to the site, although a second species associated with broom, the weevil *Apion fuscirostre*, is present. Probably broom grew on the slope backing the site.

Rather a large number of insects associated with dead wood is recorded, although none are very abundant (Table 18) and their implications are hard to determine. Some, like *Anobium punctatum* (the 'wood-worm'), *Lyctus fuscus* ('powder post beetle') and *Ptilinus pectinicornis* in all probability infested structural timber. The remaining species may have

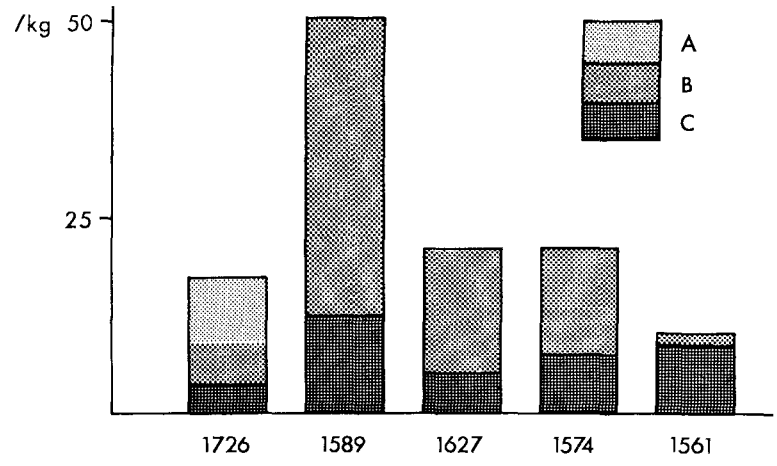


FIG. 30

Concentration of beetles associated with decaying matter in five samples from Saddler Street. A – *Platystethus arenarius*, suspected of having a 'background' origin in sample 1726; B – species associated primarily with dung and foul rotting matter (excluding *P. arenarius* in 1726); C – species primarily associated with dryer plant remains

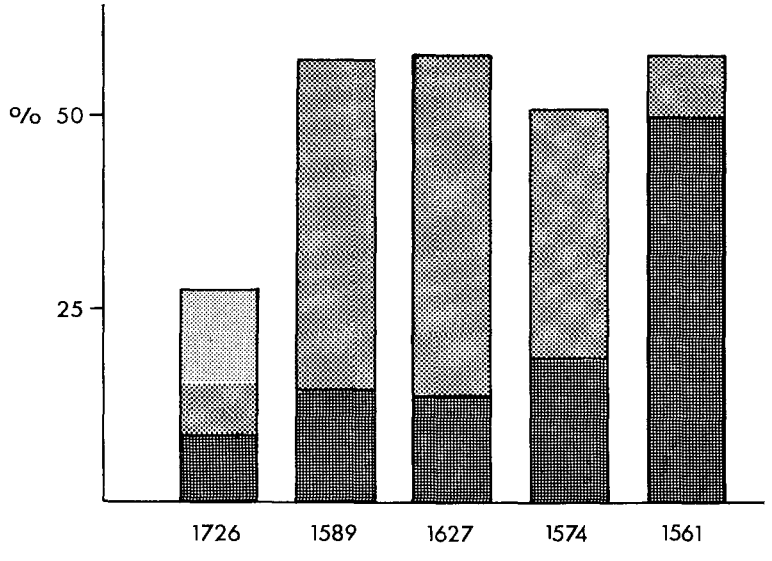


FIG. 31

Percentage of beetles associated with decaying matter in five samples from Saddler Street. For key to tones see caption to Fig. 30

lived in wood on the site, have been imported in dead wood or, less probably, have had a background origin. Some of them require wood which retains bark. It seems that dead wood was rather more abundant than at York, although the habitat is constantly represented by small numbers of individuals in the latter.

TABLE 18

Species associated with dead wood in five samples from Saddler Street

Taxon	Number of samples/ individuals	Larval site
Grynobius planus	1/1	Dead wood; timber; mostly associated with man
Anobium punctatum	2/2	Dead wood; timber; mostly associated with man
Ptilinus pectinicornis	1/1	Dead wood of deciduous trees, occasionally in timber
Lyctus fuscus	4/7	Dead wood; timber
Rhizophagus bipustulatus	1/1	Under dead bark of deciduous trees
Cis spp.	1/1	Fungi, usually on trees
Rhinosomus planirostris	3/3	Under dead bark of deciduous trees
Rhagium bifasciatum	1/1	Damp rotting wood, coniferous and deciduous
Phymatodes alni	1/1	Under bark of small branches and twigs of deciduous trees
Eremotes ater	1/1	In decaying wood, deciduous and coniferious
Scolytus rugulosus (?)	2/2	Under bark, mostly of woody Rosaceae
Hylastes sp.	1/1	Under bark of conifers
Phloeophthorus rhododactylus	2/4	Under bark of *Genista, Ulex, Sorothamnus*
Typodendron domesticum (?)	3/3	In dead wood of deciduous trees
Aneurus avenius or *laevis*	2/2	Under dead bark of deciduous trees

SYNTHESIS

Principles of the Synthesis

A reconstruction is here offered which tries to use together the evidence which has been presented, whether derived from structures, artifacts, bones, seeds, insects or documents.[89] It was perhaps more than usually worth attempting in this case because, as emphasized by Peter Addyman,[90] a complete assemblage is overwhelmingly more valuable than one in which organic materials have not survived. We should here be able to test ideas, such as one recently put forward by Mrs Jean Le Patourel, that pottery may have played only a minor part in the medieval domestic economy,[91] and to be able also to view a timber-using culture of the early middle ages in something approaching its correct perspective.

Certain principles, implicit in the analyses, have had to be applied.[92] In their reports, both Kenward and Donaldson have indicated the importance of interpreting the insect and plant remains in terms of their deposition circumstances. Thus, it is not strictly correct to refer biological groups from settlement sites to 'the environment' since they have collected in an area 'sterilized by the activity of man' (to use Kenward's phrase), and can represent resources gathered by him over a very wide area. The establishment of deposition circumstances is equally vital for artifacts. Only contexts of *primary status* can have relevance for the life of the inhabitants: the remainder, a large number of redeposited contexts of *secondary status* brought in by cart or hopper from other places and other archaeological

periods, contain finds which must be isolated in the argument. To call them 'residual' is not good enough, since they may never have resided on the site.

It was also necessary to pre-judge the deposition circumstances before comparing whole assemblages in time, an operation which is practicable on sites where the preservation is good, since not only the composition of the context, but its degree of decay on deposition can be observed. Cess and rubbish, although both might be food-waste (e.g. F 100 and Midden 1), are formed in different ways, and therefore cannot be used together to contrast diet. As far as possible only like was compared with like when investigating how changes may have occurred in this domain, and in others, such as industrial activity, between periods and between tenements. Following these principles, an attempt was made to understand the site using the sequence of assemblages, which have been summarized in Fig. 12. A model of the interpreted sequence of activities is given in Fig. 32.

The Settlement Sequence

One deficiency of the excavation was its failure to establish whether the earliest building, S 1, was bow-sided or bow-ended. Both reconstructions are possible and both types are known in the period.[93] Although the position of the hearth argues for a bow-ended house, it would be a wide building, difficult to hold up on slender aisle-posts without corner posts (such as the narrower S 3 and S 4 featured):[94] a north–south alignment (i.e. along the street) is therefore preferable. The building had an open hearth, and like most of the others, whether supposed to be residential or not, it had a perfectly clean floor (in this case of beaten sand), before disuse. It could nowhere be deduced on this site that the human population was sharing its daily life with rotting plants or feasting insects.[95]

These first residents were leather workers, like most of those who succeeded them. They protected their dwelling place from water off the open hill slopes with a storm-drain which was kept running by means of river cobbles, clay linings and wattle revetments. Similar types of lined drain have been found at York, Oxford, and Trondheim;[96] in Durham the water seems to have been fed to a cistern for storage.

Neither S 1, S 2, nor the drainage system (S 14, S 15), respected what later became the three bounded properties of 61–63 Saddler Street. But when S 1 had been destroyed by fire — an attempt was made to extinguish it with sand — and S 2 had vanished also, their successors (S 3, S 4) were confined within boundaries, apparently of a regulation width (see note 94), which were to survive until 1974 as the tenement limits. At the same time the drains fell into disuse, to be slowly buried in domestic refuse (Middens 1, 2 and 3). It is probable (since S 3 cut Midden 1) that this process had begun earlier; a continuous dump spread to west and south of the new buildings, whose inhabitants were constrained but not inhibited by any new regulation there may have been. S 3 and S 4 were in their turn destroyed by fire, their site was levelled up with clay, sand and debris, and the three tenements were then set out with post-and-rail fences.

It would be easy to make too much of these changes in settlement plan. Alignment both along and against the street is known from late Saxon Winchester,

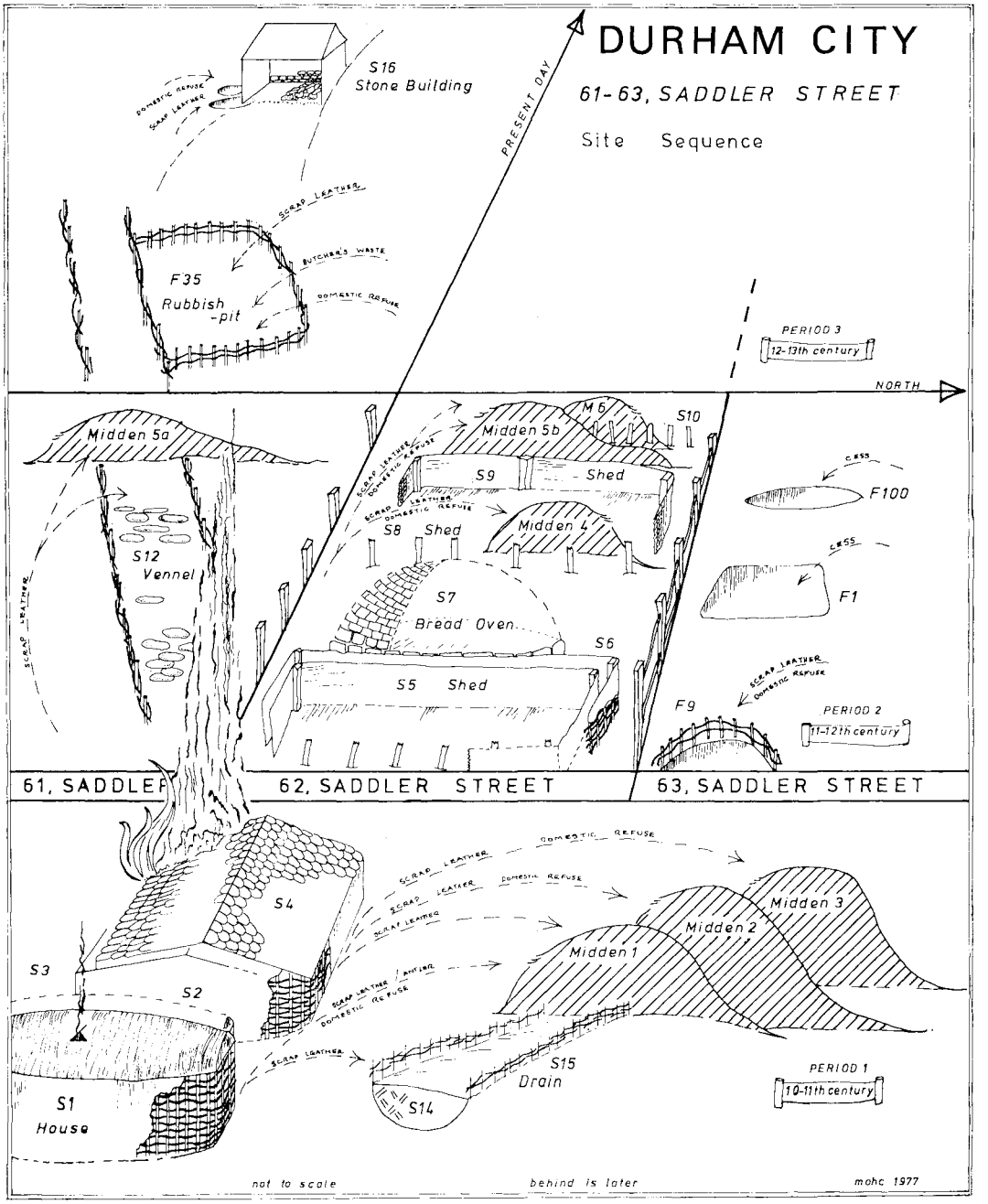


FIG. 32
Durham City, Saddler Street, 1974. Interpreted site sequence in diagrammatic form

the former in at least one case succeeding the latter[97] and as Harvey[98] has suggested, the rear of tenement areas could be shared while different properties and trades were active on the street frontage. Thus it is just possible that the three tenements being studied existed from the beginning of the sequence. However, after the destruction of S 4, it became rare for activities to cross the tenement lines into the fenced properties that began to grow on either side. These events, which are held to define the end of Period 1, coincided with a total change in the pottery assemblage, a sudden cessation of types in an otherwise continuous sequence which can best be explained by the collapse of an industry (see below).

In the next Period (2), each of the three tenements grew independently. No. 63, the most damaged, left only two cess-pits and a rubbish pit, but enough was preserved in them to show that leather working was here, too, a principal activity. In the centre, no. 62, a wattle structure S 5 was interpreted as a shed. It had a hard clay floor and a variety of domestic refuse was abandoned within it when it was burnt down. The stone building which followed it was the only one excavated which did not appear to be concerned with leather-working. The oven (S 7) was so interpreted from its circular plan and burnt clay floor. The latter was renewed a number of times, the thin scorching of the surface showing that no great heat was involved, and the users were probably bakers.[99] If there had been an interruption to the leather trade it was short lived: other post structures, supposed to be sheds, succeeded the levelled oven, and, as they in turn were demolished, large quantities of leather offcuts accumulated on their sites in the open air, spattered with bird droppings and overgrown with nettles (p. 65, 57).

In no. 61, to the south, a *vennel* (S 12) was built. Constructed of paving stones bordered with wattle, this alleyway (which served also as a drain) headed down hill north-east across the tenement and was probably destined to meet the street along the property boundary. One or two *vennels* survive in modern Durham, although no longer retaining their primary function as drainage, among them Moatside Lane, which bounded the site to the north. Towards the end of the sequence, vennel S 12 became choked with leather-working debris and lost any currency it may have had as a right of way; but a wattle-lined rubbish-pit (F 35), bonded to it, continued in specialized use. Although surviving to no great height, F 35 had been cleaned out and refilled at least once, and its ultimate assemblage places it in Period 3, sharing pottery types with activities on Site C.

At this point rubbish disposal had evolved some way in a direction that implies both increased hygiene and organization: from middens piled directly behind the houses in Period 1, to a series of (open) pits dug for accumulating cess and rubbish in Period 2, to the cleanable wattle-lined rubbish pit of Period 3. The slightly later sequence at New Elvet across the river offered a further refinement: the stone-lined washable cess-pit with access steps.[100]

Still concerned with leather-working, and terraced into the hill-side well to the back of no. 61, was the earliest stone building to be found (apart from the oven). The discovery of this fragmentary structure (S 16) with its flag-stone floor is a reminder of the large buildings in stone which may have been lost from the later town.[101]

As explained by the specialists, reconstruction of the natural environment is not possible from settlement assemblages. There were, however, several indications that an area of rough open ground supporting a semi-natural plant and insect community lay adjacent to the site throughout the sequence. It can probably be identified with the slopes up to the castle mound, overgrown to this day (p. 64).

The Settlement Sequence in History

The evidence for the absolute dating of the events detected and sketched here is summarized in Fig. 11. It depends heavily on the radiocarbon dates,[102] but uses also such independent dating as has been suggested by the artifacts (pp. 17, 26, 39). It offers a date about the middle of the 10th century for the earliest settlement; late 10th or early 11th century for the constraint of the centre house-site into a tenement; and later 11th century for the destruction of the house S 4, and the collapse of the pottery industry, which end Period 1. The fencing of the tenements and the development of nos. 61 and 63 which took place in Period 2 belongs to the later 11th or early 12th century. Period 3 as represented by the excavations is probably over before the 13th century begins.

Documented events of public history contemporary with this dated sequence are the arrival of the Anglo-Saxon community in 995 reported by Symeon, the siege of Durham by the Scots in 1040, the Norman Conquest in 1066, the harrying of the north by William in 1069, the building of the castle by Earl Waltheof in 1072, Flambard's clearance of the peninsula in the late 11th or early 12th century and the building of stone defences and establishment of the borough of Durham during the next few decades.[103] Matching these events with those excavated carries the usual caveat of medieval archaeology; none of these great public affairs need have had any direct or even indirect effect on life in Saddler Street. Nevertheless, one can say with confidence that this settlement, and the organization of a service industry during Period 1, is part of the beginning of the late Saxon town. It was contemporary with the foundation of Durham cathedral or with the establishment of a garrison which may, as suggested elsewhere, have preceded it.[104] The firing of a house and the collapse of the pottery supply which ended the period may have had an internal cause; but if not, then the "harrying of the north" in 1069–70 must be a suspected culprit.[105] Flambard (1099–1128), an energetic urban organizer, is a strong candidate for the instigator of fenced tenements on Saddler Street. Certainly his defences, if really including the "curtain wall", would have limited the tenement backs and perhaps the grazing potential of the rough slopes for the townspeople's pigs and poultry (see below). But so, equally, would the building of the motte, and there is an uncomfortable gap of 30 years here, which, besides being undetected on the site, leaves unexplained the continuity of the boundaries which were established in the late Saxon town. It seems that the tenements were first fenced and the pottery trade ceased together, either in the 1070s (under Waltheof or Walcher) or at the end of the 11th century (under Flambard). The archaeological dating is not yet good enough to arbitrate on such matters. The material sequence, on the other hand, does, with a little

courage, allow the application of the cultural terms 'late Saxon' and 'Norman' to Periods 1 and 2 respectively.[106]

Economy and Interdependence

Within these limitations of accurate dating, it can be said that the resources of the settlement and its urban character experienced only a few observable changes during the late Saxon and Norman periods. This character can perhaps be best discussed by contrasting the evidence for the external economy with that for the internal economy; by considering what activities reflected on site had need of other people, and how specialized, how organized, or, in effect, how urbanized such activities had become.

The inhabitants of 61–63 Saddler Street ate meat, fish, bread, vegetables and fruit. Of these, all meat with the possible exception of poultry and pigs, which are seen as domestic, was probably obtained in joints from a butcher rather than slaughtered on site. Beef was always the most popular (by weight) with mutton taking over second place from pork in the Norman period, probably as a result of changes in husbandry.[107] The roe deer and the red deer were also eaten, though not in comparable quantities, and we have no hint as to how the supply of these animals was controlled. Sea fish, the most popular being cod, would have required a dealer to bring them regularly fresh from the coast; fish were purchased whole (unless bought for their heads), and the same tradesmen presumably supplied lobster, limpets, periwinkles and cockles. The freshwater mussel was available in the River Wear, and the salmon, not previously recorded on Anglo-Saxon sites[108] could have been fished (?poached) from the same source. Rackham suggests as local the unusual finds of black grouse and capercailzie in the late Saxon Midden 1, birds which, like the hare, could be caught with dogs or weapons (or with patience) and, then as now, difficult for the affluent to keep wholly for themselves.

The preparation of bread was also a centralized concern. No evidence for grinding was found on the site, and remarkably little grain. That there was arable land within reach is shown by grainfield weeds (corn cockle, etc.), whose presence can be explained as coming in with straw, rather than as waste from grain cleaning on site. If the oven, S 7, is good enough evidence for a bakery, then its size suggests that this part of the preparation, too, was centralized. The presence of flax was not explained; none of the textiles was linen, but flax may have been spun, or made into oil for food or for softening leather. Of the other grain, fruit, nuts and vegetables reaching the site, most, such as blackberry, raspberry, rowanberry, elderberry, hazel-nuts, fat-hen, nettles, and perhaps even carrot, could be gathered wild, assuming a certain amount of common land, and were possibly found as close by as the river banks and the castle slopes. But others, such as oats and turnip, imply more organized cultivation, and the small plum and apple too may have been orchard fruits.

It is not easy to know how far the supply of wood was under control. Certainly each tenement must have absorbed a great deal for fuel and building, especially

in the first few decades when virtually every building was destroyed by fire. None of the timbers used came from trees wider than 7 cm, except the uprights for the boundary fences, which may in any case have been from a public supply. Material like the willow brushwood for lining the earliest drains was obtainable from the riverbank (the clay used for the same purpose (1796) contained twigs whose 5th-century carbon-date suggests that it too came from the river bed or from a pond). Oak, hazel, alder, ash, holly and birch, which were all used for making wattle uprights, are native to the open woodland predicted by Alison Donaldson's pollen diagram from Hallowell Moss, two miles from the excavated site. Parts of such woodland may have been reserved for use by the townspeople. This is more likely still for hazel, which was used in every case for the horizontal weft, and which had been coppiced.

It is very unlikely that the large timbers which were needed to construct broad artifacts, like oak shingles and wooden bowls, would be freely available on common land at any time in the town's life, and the special tools that were needed (e.g. a lathe) for their manufacture implies that they were not made everywhere. The find of wooden cup-cores in contemporary Coppergate, York[109] indicates that making wooden vessels was one of the town trades. In a region where thick timber was scarce, wooden vessels may actually have been rather an expensive commodity;[110] their expected domination over pottery in Durham was not fulfilled — 6 bowls in all, as against 30 or more pottery vessels of great variety. On the other hand, wooden artifacts, once broken, can be remade into elementary tools or used as fuel; so the archaeological statistician must admit defeat here, in the face of human ingenuity and thrift.

The use of pottery in Saddler Street was particularly interesting. The late Saxon group is outstanding in its quality of fabric and in its variety of form, including fine-glazed pots similar to Stamford ware. All were apparently made in the region, but all have both the standardization and finish that suggests commerce. Equally impressive is the sudden cessation of the supply; there are no examples in any primary context after Period 1, and the Period 2 settlement was obliged to make use of coarse "splashed-ware" pots whose variety in fabrication appears decidedly home-made. The new vessels do not need to have been made on site (although the crucible and lead splash in no. 62 might suggest that glaze was being made there) but the trade, if it was one, was severely localized. On the other hand, the same period sees a widening in the range of utensils available; and when vessels of professional manufacture return, this full range, including jugs and bowls, remains. This may again reflect national rather than local prices. These interpretations will of course be checked, modified and refined to a considerable degree as more becomes known of late Saxon and Norman pottery groups from the north of England.

Artifacts of metal were in common use by the Saddler Street inhabitants, either in their domestic or business life, and were presumably produced centrally. Antler, on the other hand, was brought in as raw material and worked on the premises (although apparently only in Period 1) as the offcuts indicate. Antler, being shed in the countryside, might have been gathered in the same way as other

wild resources, but, with a glance at the comb and comb-case industries which are known at York, it is hard to believe that there was no market for it. The same may have been true of bone, but this is generally such a common and inferior material to work that scrap was freely available.

Locks of untreated grey-brown wool from the local sheep were found on site, and spinning was a feature of the internal economy, presumably for the all-purpose thread. The cloth found, however, with one possible exception, was made in three-shed twill. The adoption of this weave, and by implication the horizontal loom, has been connected with changes in the political and social order resulting in the rise of urban centres in the early middle ages, textile production thus becoming a trade rather than a domestic occupation.

It can be seen that the evidence from these Saxo-Norman tenements suggests that their dependence on a larger community was high. What did they offer in return? Their main contribution was certainly leather-working, which was carried out on a scale which must be commercial, from the first signs of occupation in the 10th century. The raw material was predominantly ox-hide (with a few possible examples of sheep or goat), which was obtained uncut direct from the tanners (their toggle-holes survive). Tanning was not carried out on site,[111] but hides may have been finished there, using a leather scraper or grainer. The leather was made mainly into shoes and boots, with some sheaths and hints of gloves or possibly other garments. Those who were shoemakers were also cobblers, and cobbling, although mainly re-soling with a clump, sometimes went to extraordinary lengths — in one case virtually rebuilding an upper from scraps. The leather was worked with an awl of iron or antler, perhaps also with a knife, and shoes and boots were stitched, rather than nailed on an anvil. Unfortunately, no thread survived, but flax or wool spun on the ever-busy spindle whorl would no doubt have been a domestic contribution to what was essentially a trade conducted from home. Two other means of livelihood were detected on site: the bakery in no. 63, Period 2, and an unidentified occupation in no. 61, Period 3. The latter was suggested by the find in the pit F 35 of a disproportionately large number of heads, of ox, sheep, and horse, as against food bones of the usual cut. The principal activity of the users of F 35 was still leather-working, and the skull deposit may be connected with this. On the other hand, a shared or additional trade in butchery is possible.

Life-Style

We know more about life inside the houses of these leather-workers for the early period than for the later, when the residential part of the premises was presumably up by the modern street frontage. As mentioned previously, there is really no reason to picture these interiors as squalid compounds of decomposing flesh and vegetation. The organic layers which might have suggested such an interpretation were either deposited when the building had gone out of use (as S 1), or were deposited as midden heaps at the back of the tenements. Even in these cases, the middens were regularly sealed with sand — it may be to this

practice that we owe their preservation. This concern for hygiene continued to some extent with the introduction of pits, which were sealed on disuse. Within the houses, sedges, rushes, heather, bracken, meadowsweet and crowfoot were laid, presumably as a (sweet-smelling) floor cover, and were ejected and replaced before becoming unpleasant.[112] Moss was also used in the houses, for comfort and draught-proofing, as well as, like the little square of cloth from the cess-pit F 100, as lavatory tissue. No furniture was found.

Timber, clay and nails, which were used in house building, must have been obtained by allowance, barter or by purchase. The construction itself was probably do-it-yourself, at least at first, to judge from the west wall of S 1, which was woven *in situ* against the sand and laid like a hedge (Pl. II, B). Pre-fabricated panels were not used. Not nearly enough has survived from any of the buildings; but the houses of Period 1 were daubed, internally at least, and roofed with oak shingles. Wood was burnt in the hearth; embers survived and no traces of suspension equipment were found near it, so it is probable that cooking took the form of stewing in the sagging based cooking-pots set in the embers. This produces an ashy meal unless a lid is used (as anyone who has tried it will know). The dishing or everting of the rims of the cooking-pots makes them quite suitable to take lids — perhaps those perforated discs of wood found in the Middens of Period 1.

There were no clues from Saddler Street as to how the working and living parts of the premises were disposed; an upper story, as in early medieval Winchester,[113] may have been employed on the street frontage, but several buildings could have occupied the tenement. From Period 2 onwards, we can see only the rear areas which are mainly given over to the dumping of scrap, from both domestic and commercial activities.

People

How many individuals and of what variety lived in the three tenements during these early years unfortunately cannot be known. The main evidence — that of the leather — refers to the town as a whole rather than the inhabitants of 61–63 Saddler Street. The shoes worn included sandals, boots with leather ties, and slippers, but the principal footwear was the low shoe laced with thongs under the ankle bone. Their soles were thin but not too soft. Sizes ranged from $8\frac{1}{2}$ (children's) to size 11 (adult's). Although there was a tendency for sizes to be smaller in Period 1, the full range of feet, and presumably therefore of personal stature, was visible in Saxo-Norman Durham. Children's shoes were, as now, characteristically round-toed, and only the better quality shoe reflected the fashionable aspiration towards the pointed toe that became so quaint a feature of the later middle ages. No fine cloth survived, at least not in comparison with York, and the most common material was blanket or cloak, in one case a plaid, worked up against the weather.

To the live individuals themselves we can approach only a little nearer. One of the early medieval occupants of no. 62 Saddler Street had knotted brown hair; and in the same tenement after its reorganization lived a straight-haired blonde.

There was also a dog, about the size of a Border Collie, which died in the early 11th century and was thrown on to the midden heap at the back of the house. And there we have probably reached the limits of inference allowable by this investigation.

ACKNOWLEDGEMENTS

The excavations were directed by the author and paid for by the Department of the Environment. They were carried out by permission of Durham University who were redeveloping the site on behalf of University College. The initiative and subsequent support for the work came from Professor Rosemary Cramp and staff of the Department of Archaeology, Durham University. The site was evaluated with considerable help from a site report by Messrs Ove Arup (3650 dated September 1971). Packaging was generously supplied by McMillan Bloedal Containers Ltd.

Recording and excavation on site was carried out principally by Andy Dutton, Madeleine Hummler, John Sawle and Jan Wills, with excavation assistance from Neville Bowman and John Greene. The finds were recorded and administered by Catherine Hills and Jean McKiernan. Analysis of animal bone and bone artifacts was carried out by James Rackham (Department of Archaeology, Durham University); of insect remains by Harry Kenward (Environmental Archaeology Laboratory, University of York); of plant remains by Alison Donaldson (Department of Archaeology, Durham University); of the sheep's fleece by Dr M. Ryder (Animal Breeding Research Establishment, Roslin, Midlothian); of cloth and hair by Elisabeth Crowfoot and H. M. Appleyard; of leather artifacts by John Thornton; and of pottery fabrics by Laurie Addis (Department of Archaeology, Durham University) who also drew some of the pottery. Radiocarbon measurements were made by Bob Otlet (C14/Tritium Measurements Laboratory, Harwell). Conservation of the artifacts has been done by Jim Spriggs (York Archaeological Trust) and Janey Cronyn (Department of Archaeology, University of Durham).

The finds were drawn by Yvonne Brown. Photographs of finds are by Tom Middlemass. The initial stratification diagram (Fig. 10) was designed by Madeleine Hummler who also compiled the finds and feature lists for archive. Nigel Baker and John Clark assisted with the preparation of Figs. 1–8 and 10 for publication. Mrs Hilda Wilmot typed the text with great speed and care.

I am most grateful to these colleagues, and to Peter Addyman, Rosemary Cramp and Madeleine Hummler who kindly read the full report in draft, and made a number of valuable suggestions.

NOTE

The Society is grateful to the Department of the Environment for a publication grant for this paper.

NOTES

[1] M. O. H. Carver, 'Notes on some general principles for the analysis of excavated data', *Science and Archaeology*, forthcoming.

[2] M. O. H. Carver, 'Early Medieval Durham — The Archaeological Evidence' (publication forthcoming in Durham Proceedings of British Archaeological Association).

[3] Although, as stated by L. Bick, the reasons for preservation can be more complex. I. M. Stead, 'Excavations at the South Corner Tower of the Roman Fortress at York, 1956', *Yorkshire Archaeol. Jnl*, 39 (1956–58), 515–38, appendix.

[4] Measurement and record by H. C. M. Keeley. Ancient Monuments Laboratory, Department of the Environment.

[5] T. Whitworth, 'Deposits beneath the North Bailey, Durham', *Durham University Jnl*, 59 (1968–69), 18–31.

[6] P. V. Addyman, 'Archaeology and Anglo-Saxon Society', in G. de G. Sieveking, I. Longworth, and K. E. Wilson (eds), *Problems in Economic and Social Archaeology* (London, 1976), 319.

[7] Referred to in Addyman, ibid., 320.

[8] For example, from York: D. M. Waterman, 'Late Saxon, Viking and early medieval finds from York', *Archaeologia*, 97 (1959), Fig. 7.

[9] D. M. Wilson, *The Anglo-Saxons* (1966), Fig. 11, for scythes. For a draw-knife, D. M. Wilson, 'Craft and Industry', in id., *The Archaeology of Anglo-Saxon England* (London, 1976), 257, Fig. 6.2 g. A leather-scraper in use is shown by Erik Schia in Fig. 33, 34 of his 'Sko som arkeologisk kildemateriale', *Hikuin*, 3 (1977), 320.

[10] I. H. Goodall, 'Iron objects', in P. A. Rahtz, *Excavations at Cheddar, 1960–62* (in press), no. 133.

[11] Waterman, op. cit. note 8, Fig. 19, no. 18.

[12] H. Shetelig, *Viking Antiquities in Great Britain and Ireland*, VI (Oslo, 1954), Fig. 21.

[13] A. Bulleid and H. St G. Gray, *The Glastonbury Lake Village*, I (1911), 406.

[14] A. MacGregor, 'Bone Skates: a review of the evidence', *Archaeol. Jnl*, 133 (1976), 57–74, Appendix I, 28.

[15] Waterman, op. cit. note 8, 93, Fig. 20, no. 1.

[16] Term adopted from P. Galloway, 'Note on descriptions of bone and antler combs', *Medieval Archaeol.*, 20 (1976), 155.

[17] Illustrated in Waterman, op. cit. note 8, Fig. 16.

[18] M. Biddle (ed.), *Winchester in the Early Middle Ages* (Winchester Studies, I, 1976), 348.

[19] Stead, op. cit. note 3, Fig. 6, no. 4.

[20] A. J. Larsen, 'Skomaterialet fra Utgravningene I Borgund PA Sunmore 1954–1962', *Arbok for Universitetet I. Bergen, Humanistisk Serie*, 1 (1970), Pl. x.

[21] D. Charlesworth and J. H. Thornton, 'Leather found in Mediobogdum, the Roman fort of Hardknott', *Britannia*, 4 (1973), 141–52.

[22] J. H. Thornton, 'The Examination of Early Shoes to 1600', *Transactions of the Museums Assistants Group*, 12 (1973), in which a full glossary of shoemaking terms will be found.

[23] Larsen, op. cit. note 20.

[24] J. Hedges, 'Textiles', in P. V. Addyman (ed.), *The Archaeology of York*, 17 (forthcoming).

[25] In M. Biddle and S. Keene, *Winchester Studies*, 7 (forthcoming).

[26] A. Geijer, *Birka III: Die Textilfunde* (Uppsala, 1938).

[27] J. Kamínska and A. Nahlik, 'Etudes sur l'industrie textile du haut moyen age en Pologne', *Arch. Pol.*, III (Wrocklaw, 1960).

[28] Abridged from M. L. Ryder, 'Some Miscellaneous Ancient Fleece Remains', *Jnl Archaeol. Science*, 4 (1977), 177–81.

[29] M. L. Ryder, 'Changes in the fleece of sheep following domestication', in P. J. Ucko and G. W. Dimbleby (eds), *The Domestication and Exploitation of Plants and Animals* (London, 1969), 495–521.

[30] Hedges, op. cit. note 24, Table 1, Group 1.

[31] Geijer, op. cit. note 26, 26–29, Figs. 5–8.

[32] Kamínska and Nahlik, op. cit. note 27, 112 ff., Fig. 20.

[33] Ibid., 106.

[34] J. P. Wild, *Textile Manufacture in Northern Roman Provinces* (1970), no. 50, p. 101; nos. 79–84, p. 117.

[35] K. Schlabow, *Textilfunde der Eisenzeit in Norddeutschland*, Gottinger Schiften zur vor- und Frühgeschichte, 15 (1976), 81, 83, 85–86.

[36] G. M. Crowfoot, 'Anglo-Saxon tablet-weaving', *Antiq. Jnl*, 32 (1952), 190; G. M. Crowfoot, 'The Textile remains', in E. T. Leeds and H. de S. Shortt, *An Anglo-Saxon Cemetery at Petersfinger, near Salisbury, Wilts.* (1953), 61; E. Crowfoot, 'The Textiles', in P. Hutchinson, 'The Anglo-Saxon Cemetery at Little Eriswell, Suffolk', *Proc. Cambridge Antiq. Soc.*, 59 (1966), grave 11; R. Bruce-Mitford, *The Sutton-Hoo Ship Burial*, 1 (1975), 446, 450; SH7,8,22; and unpublished fragments from many sites.

[37] A. Nahlik, 'Tkaniny wsi Wschodnioeuropejskiej X–XIII W', *Acta Archaeologia Lodziensia*, 13 (1965), 32.

[38] A. M. Franzén and A. Geijer, 'Textile finds from excavations in Swedish towns 1960–66', *Res Mediaevales*, III (1968), 131, 133.

[39] Kamínska and Nahlik, op. cit. note 27, 94, 100–101.

[40] Waterman, op. cit. note 8, Fig. 20, no. 12.

[41] Ibid., no. 5.

[42] H. Hodges, *Artifacts* (1964), 49.

[43] I am particularly grateful to Ms Addis for allowing some of her early results to be published here. It is intended that her full report shall refine the fabric definitions so that accurate comparison can be made with other pottery from Co. Durham and elsewhere. It will also enable a seriation table to be made. In an earlier attempt to do this, the fabric definitions were considered too crude to publish here, although the results have been used to illustrate the method; see Carver, op. cit. note 1, Fig. 3.

[44] K. Kilmurry, pers. comm.

[45] J. G. Hurst, 'The Pottery', in D. M. Wilson (ed.), *The Archaeology of Anglo Saxon England* (1976), 328.

[46] Ibid., 306.

[47] Ibid., 329; Fig. 7.22, no. 6.
[48] R. J. Cramp, pers. comm.
[49] D. Austin, 'Fieldwork and Excavation at Hart, Co. Durham, 1965–1975', *Archaeologia Aeliana*, 5s, 4 (1976), 69–132; Fig. 19, no. 194.
[50] Hurst, op. cit. note 45, Fig. 7.22, no. 5.
[51] M. O. H. Carver, 'Excavations in New Elvet, Durham City, 1961–1973', *Archaeologia Aeliana*, 5s, 2 (1974), 91–148; Fig. 10; no. 1/11.
[52] R. J. Cramp, pers. comm.
[53] Carver, op. cit. note 51, 128; Fig. 10; no. 1/110.
[54] B. Harbottle, 'Excavations at the South Curtain Wall of the Castle, Newcastle upon Tyne, 1960–61' *Archaeologia Aeliana*, 4s, 44 (1966), 79–145.
[55] Department of Archaeology, University of Durham; in preparation.
[56] The discussions which follow are supported by full quantitative analyses of bone fragments by context contained in *Archive A10*. The age estimates are based on figures given by I. A. Silver, 'The ageing of domestic animals', in D. Brothwell and E. S. Higgs (eds), *Science and Archaeology* (2nd edn, 1969).
[57] Structural phases were originally designated within periods, but were subsequently abandoned in favour of the sliding sequence given in Fig. 10. See Carver, op. cit. note 1.
[58] J. Boessneck, 'Osteological differences between sheep (*Ovis aries* Linne) and goat (*Capra hircus* Linne)', in D. Brothwell and E. Higgs (eds), *Science in Archaeology* (2nd edn, 1969), 331–58.
[59] B. Vesey-Fitzgerald, *British Game* (London, 1946); D. A. Bannerman, *The Birds of the British Isles*, Vol. 12 (1963).
[60] Ibid.
[61] C. Simms, *Cave Research at Teesdale Cave, 1878–1971* (from Yorkshire Museum; privately printed, 1971); Bannerman, op. cit. note 59.
[62] B. Unwin, F. G. Gray and T. H. Wall (compilers), *Durham County Bird Report 1974*, New Series, no. 5, no. 38 (Durham County Bird Club, University of Durham, 1975).
[63] A. M. Donaldson and J. Turner, 'A Pollen diagram from Hallowell Moss, near Durham City, England', *Jnl Biogeog.*, 4 (1977), 25–34; D. D. Bartley, C. Chambers and B. Hart-Jones, 'The Vegetational History of parts of South and East Durham', *New Phyt.*, 77 (1976), 437–68; B. K. Roberts, J. Turner and P. F. Wood, 'Recent forest history and land-use in Weardale, Northern England', H. J. B. Birks and R. G. West, *Quaternary Plant Ecology* (Oxford, 1973).
[64] Bannerman, op. cit. note 59.
[65] Vesey-Fitzgerald, and Bannerman, op. cit. note 59.
[66] Bannerman, op. cit. note 59.
[67] C. R. Tubbs, *The New Forest* (1968).
[68] A. R. Clapham, T. G. Tutin and E. F. Warburg, *Flora of the British Isles* (2nd edn, Cambridge, 1962).
[69] E. V. Watson, *British Mosses and Liverworts* (2nd edn, Cambridge, 1969).
[70] Compare remarks by H. K. Kenward on p. 65.
[71] In Whitworth, op. cit. note 5.
[72] See G. Grigson, *The Englishman's Flora* (London, 1975) and R. Mabey, *Food for Free: A Guide to the Edible Wild Plants of Britain* (London, 1972).
[73] Mabey, op. cit. in note 72.
[74] Grigson, op. cit. in note 72.
[75] Information from Helen Cayton, Department of Archaeology, University of Durham; acknowledged with many thanks.
[76] J. G. D. Clarke, *Prehistoric Europe: The Economic Basis* (London, 1952); G. W. Dimbleby, *Plants and Archaeology* (London, 1967); Grigson, op. cit. note 72; etc.
[77] P. C. Buckland, J. R. A. Greig and H. K. Kenward, 'York, an early medieval site', *Antiquity*, 48 (1974), 25–33.
[78] J. H. Dickson, *Bryophytes of the Pleistocene* (Cambridge, 1973).
[79] Donaldson and Turner, op. cit. note 63.
[80] H. K. Kenward, 'Methods for paleo-entomology on the site and in the laboratory', *Science and Archaeology*, 13 (1974), 16–24.
[81] H. K. Kenward, 'The analysis of archaeological insect faunas: a new approach', *The Archaeology of York*, 19/1 (1978).
[82] Ibid. A list of species of coleoptera and hemiptera recorded is given in Table 12b of the Archive. The nomenclature in Tables 12–17 follows G. S. Kloet and W. D. Hincks, *A Checklist of British Insects, part 3* (2nd edn, 1977). The raw data, specimens and unprocessed samples are stored at the Environmental Arch. Unit, University of York.
[83] H. K. Kenward, 'Pitfalls in the environmental interpretation of insect death assemblages', *Jnl. Archaeol. Science*, 2 (1975), 85–94; H. K. Kenward, 'Reconstructing ancient ecological conditions from insect remains; some problems and an experimental approach', *Ecological Entomology*, 1 (1976), 7–17.
[84] H. K. Kenward, 'The value of insect remains as evidence of ecological conditions of archaeological sites', in D. R. Brothwell et al. (eds), *Research Problems in Zooarchaeology* (London, 1978), 25–38.
[85] Kenward, op. cit. note 81.
[86] Kenward, op. cit. in note 81; rank order curves are also given in this paper.
[87] Summary tables in Kenward, op. cit. note 81.

[88] Kenward, 1976, op. cit. note 83.

[89] Compare Department of the Environment report, *Principles of Publication in Archaeology* (D.o.E., 1975). The full presentation of evidence (which is still necessary) in a small space is attempted here by means of figures, tables and lists.

[90] P. V. Addyman, op. cit. note 6, passim.

[91] J. Le Patourel, 'Pottery as evidence for social and economic change', in P. H. Sawyer (ed.), *Medieval Settlement* (1976), 'in the one case (Sutton Hoo) where the whole range of articles in contemporary use is known by excavation, pottery plays a very small part. . . . There is nothing else in the post-Roman archaeological record to show how common such a proportion would be'. See below, p. 73.

[92] The reasoning behind these principles is discussed in Carver, op. cit. note 1.

[93] P. A. Rahtz, 'Buildings and Rural Settlement', in D. M. Wilson (ed.), *The Archaeology of Anglo-Saxon England* (London, 1976), and Appendix A (Gazetteer of Anglo-Saxon domestic settlement sites), gives comparable examples from Thetford, Buckden, St Neots, Hound Tor and Dunbar. The published example of construction most similar to the Durham buildings is one excavated at Winetavern Street, Dublin: Brendan O'Riordain, 'Excavations at High Street and Winetavern Street, Dublin', *Medieval Archaeol.*, 15 (1971), Fig. 28: size 4.6 × 5.1 m. Unpublished buildings excavated at Dublin fall into a size range between 3.5 × 4.5 m and 5.9 × 8.5 m. They are square or rectangular in plan, and all have rounded corners (except those with plank construction) and slightly curved walls. The distinction between bow-ended and bow-sided buildings is clearly less significant in the light of these parallels, for knowledge of which I am particularly grateful to Dr Hilary Murray. The earliest Durham buildings have a presumed size of 5.5 m × 2.75 to 14 m.

[94] Estimated size of S 3, S 4 was 4.6 m × (say) 14 m; cf. the Dublin house and several examples of similar size given by Rahtz, op. cit. note 93. The standardization of width (4.6 m = 181 inches or nearly 5 yards is interesting. Allowing for eavesdrip this suggests a regular tenement width of 1 pole (5½ yards; 5.02 m). The distance between the 11th-century boundary fences in 62 Saddler Street was 5.05 m (Fig. 7).

[95] As opposed to the interpretations of Buckland *et al.*, op. cit. note 77, at York: 'the contrast between the apparent affluence of the purely archaeological material . . . and the total squalor demonstrated by the biological evidence cannot be overstated.' See below, p. 74.

[96] At Hungate, York, where only one side of the channel was revetted with wattle hurdling, similar structures were interpreted as gullies or drainage ditches: K. M. Richardson, 'Excavations in Hungate, York', *Archaeol. Jnl*, 116 (1959), 51–114. Another example with single-side revetment has been found in Oxford: B. Durham, 'Archaeological investigations in St Aldate's, Oxford', *Oxoniensia*, 42 (1977), 180. At Trondheim, the drains were revetted both sides and covered: C. D. Long, 'Excavations in the Medieval City of Trondheim', *Medieval Archaeol.*, 19 (1975), 13 and Plate Ib.

[97] Biddle, op. cit. note 18.

[98] J. Harvey, *Medieval Craftsmen* (London, 1975), 74.

[99] An example 2.0 m in diameter from Fladbury, Worcestershire, was similarly interpreted. Rahtz, op. cit. note 93, appendix.

[100] Carver, op. cit. note 51, Fig. 2, 101. There dated to later 13th century.

[101] A sequence of stone buildings in tenement areas running from the late 13th century to 1971 was excavated in the Borough of Elvet, Durham City by J. E. Parsons and others. See Carver, op. cit. in note 51.

[102] Radiocarbon dates are calibrated following R. M. Clarke, 'A Calibration curve for radiocarbon dates', *Antiquity*, 49, no. 196 (1975), 251–66.

[103] Carver, op. cit. note 2.

[104] Carver, op. cit. note 2. I suggest there that Durham was founded for military purposes as a promontory burh, and that only after suitable fortification did it become eligible for the site of St Cuthbert's Monastery and the seat of Bishop Aldhun (the Earl of Northumbria's son-in-law).

[105] 'A deliberate attempt was made to destroy the livelihood of the inhabitants': D. C. Douglas, *The Norman Achievement* (1969), 71. But a repartition of territory has also been blamed for the quantity of 'waste' in the Yorkshire Domesday: see C. Platt, *Medieval England* (1978), 6.

[106] It is the documentary record which suggests the epithet 'late Saxon' rather than 'Anglo-Scandinavian'. The question of Scandinavian presence or influence in early Durham has not yet been adequately reviewed, and will in any case be difficult to define without preserved sequences from equivalent non-Scandinavian settlements (if such things can be said to exist in 11th-century England). Loyn has suggested a 'strong localized Danish settlement' in Durham (H. R. Loyn, *The Vikings in Britain* (1977), 123) but it is not clear how this might be supported positively, either by documentary, place-name or material evidence, cf. Carver, op. cit. note 2. It is admitted that the best archaeological parallels with the Durham settlement are contemporary sites at Dublin (op. cit. note 93), York (P. V. Addyman, 'Excavations in York 1972–73. First Interim Report', *Antiq. Jnl*, 54 (1975), 218–24), and in Norway. But this may be due to a coincidence in site survival; or cultural distinctions may be impossible to observe, or indeed have not existed to any great degree, among equivalent classes of early medieval North European settlement.

[107] Perhaps partly as a result of regulations, such as the Ordinances of 1467 and their recension which outlawed pigs from the streets of 15th-century Worcester; V.C.H., *Worcestershire*, IV (1906), 387.

[108] J. Clutton-Brock, 'The animal resources', in D. M. Wilson (ed.), *The Archaeology of Anglo-Saxon England* (London, 1976), 391.

[109] P. V. Addyman, pers. comm.

[110] Although documentary evidence suggests them to be generally cheaper than pottery. J. Le Patourel pers. comm.

[111] For contemporary tanning and leather-working in York, see J. Radley, 'Economic Aspects of Anglo-Danish York', *Medieval Archaeol.*, 15 (1971), 50.

[112] The degree of decay on sealing could be observed (see above p. 6), and plants were generally not in a putrid condition. Plant deposits were compressed, but it was not possible to distinguish trodden organic matting from compression by later occupation.

[113] Biddle, op. cit. note 18.