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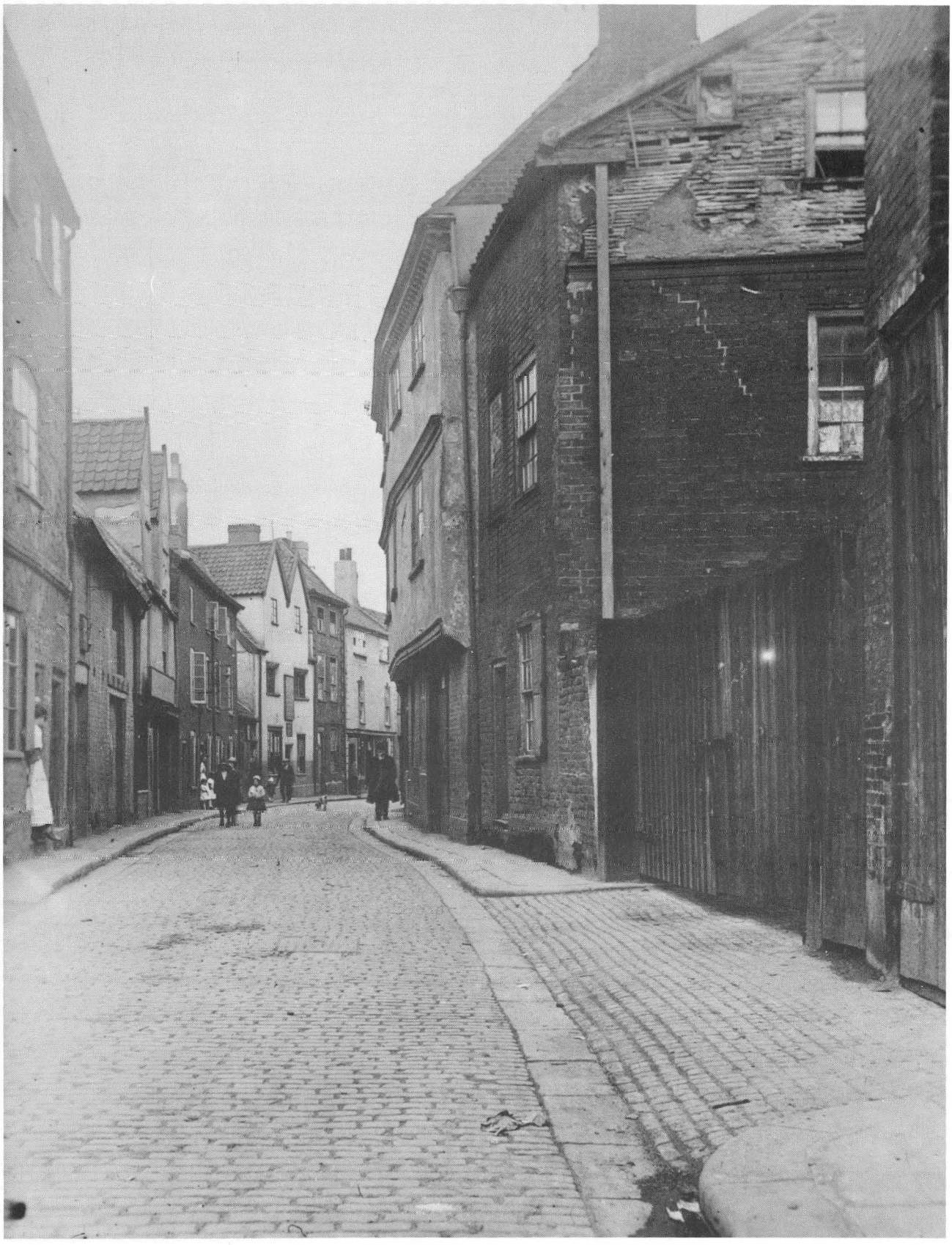
EXCAVATIONS AT FISHERGATE, NORWICH, 1985

East Anglian Archaeology

Field Archaeology Division, Norfolk Museums Service 1994

EAST ANGLIAN ARCHAEOLOGY



Frontispiece:
View of Fishergate looking east, between the wars. The entry to Soman's yard (the excavation site) may be that in the right foreground. Taken from a negative of W. Buston, printed by E.C. Legrice, *copyright National Monuments Record.*

Excavations at Fishergate, Norwich, 1985

by Brian S. Ayers

with contributions from
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Cover:
Fye Bridge, Norwich 1885 (detail) by Charles John Watson.
Norwich Castle Museum R.J.Colman Bequest (1378.235.951).
(The excavation site is on the left hand side of the painting on the far, downstream, side of the bridge).

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text was transcribed from scrawl to typescript by Joan Daniells.

During the course of the excavation the site also harboured a swan's nest, the mother eventually hatching successfully three cygnets. This event was a major morale-booster and thus final thanks for such a worthwhile and happy two months must include Mother Nature.

Summary

Trial excavation was undertaken in the spring of 1985 off Fishergate to the north of the River Wensum in Norwich. The excavation, a trench some two metres wide and four metres deep, lay between the street and the river within a defended enclosure of probable tenth-century date first recognised in the early 1970s. The 1985 excavation was only the third archaeological excavation to be undertaken within this area and the first to reach Saxon deposits at the critically important southern end.

The trench was cut at right-angles to the street and river, one metre east of the boundary between the parishes of St Clement and St Edmund (the excavation lying in the latter). Earliest deposits consisted of early Flandrian and later peats some 1.30m thick nearest to the river, tapering away towards the north. The top of this deposit was first occupied in the tenth century by which time it had become grassland. The occupation took the form of ditching and fencing, possible consolidation and perhaps the erection of out-buildings.

Around the beginning of the eleventh century such usage appears to have ceased and the dumping of rubbish became increasingly prevalent in the area. A thick mixed deposit accumulated, identical in composition to water-front deposits located south of the river in 1979 (Ayers and Murphy 1983) and 1981 (Ayers 1987) although somewhat earlier in date than these. Above this, at the end of the eleventh century, it is likely that structures were erected within the area, a large expanse of chalk and several possible post-holes indicating such a development. Ditching, however, also resumed. In the twelfth and thirteenth centuries it is likely that occupation followed a similar course although the evidence was slight. A barrel, most probably used as a cesspit, was recovered. The latest features recorded were two flint walls at the extreme southern end of the excavation which may have formed part of a building of fourteenth-century or later date. Further levels were unstratified due to necessarily deep machinework.

The artefacts recovered from the excavation were startling in a Norwich context. The site produced the largest single assemblage of Ipswich-type ware from the city, imported pottery of Middle Saxon and Saxo-Norman date, a range of eighth-century finds including a sceatta and two brooches as well as quantities of later Saxon and Saxo-Norman material. All the Middle Saxon material was found in secondary contexts although, given the nature of the site, this was not unexpected. Environmental data has amplified knowledge of the river and its environs, providing evidence in particular of changes in ground-water levels and on the pre-urban vegetational history. Documentary work, drawing on material from the Enrolled Deeds and other sources, outlines the development of the area, being particularly useful as the only medium of information from the later medieval and early post-medieval periods. Finally the site was occupied, prior to clearance, by an interesting group of late nineteenth- and early twentieth-century industrial buildings and the report includes an assessment of these.

Chronological Summary

Period I:	tenth century and earlier
Period II:	tenth century
Period III Phase 1:	early eleventh century
Period III Phase 2:	eleventh century
Period IV:	twelfth century
Period V:	thirteenth century to fourteenth century
Period VI:	fourteenth century onwards

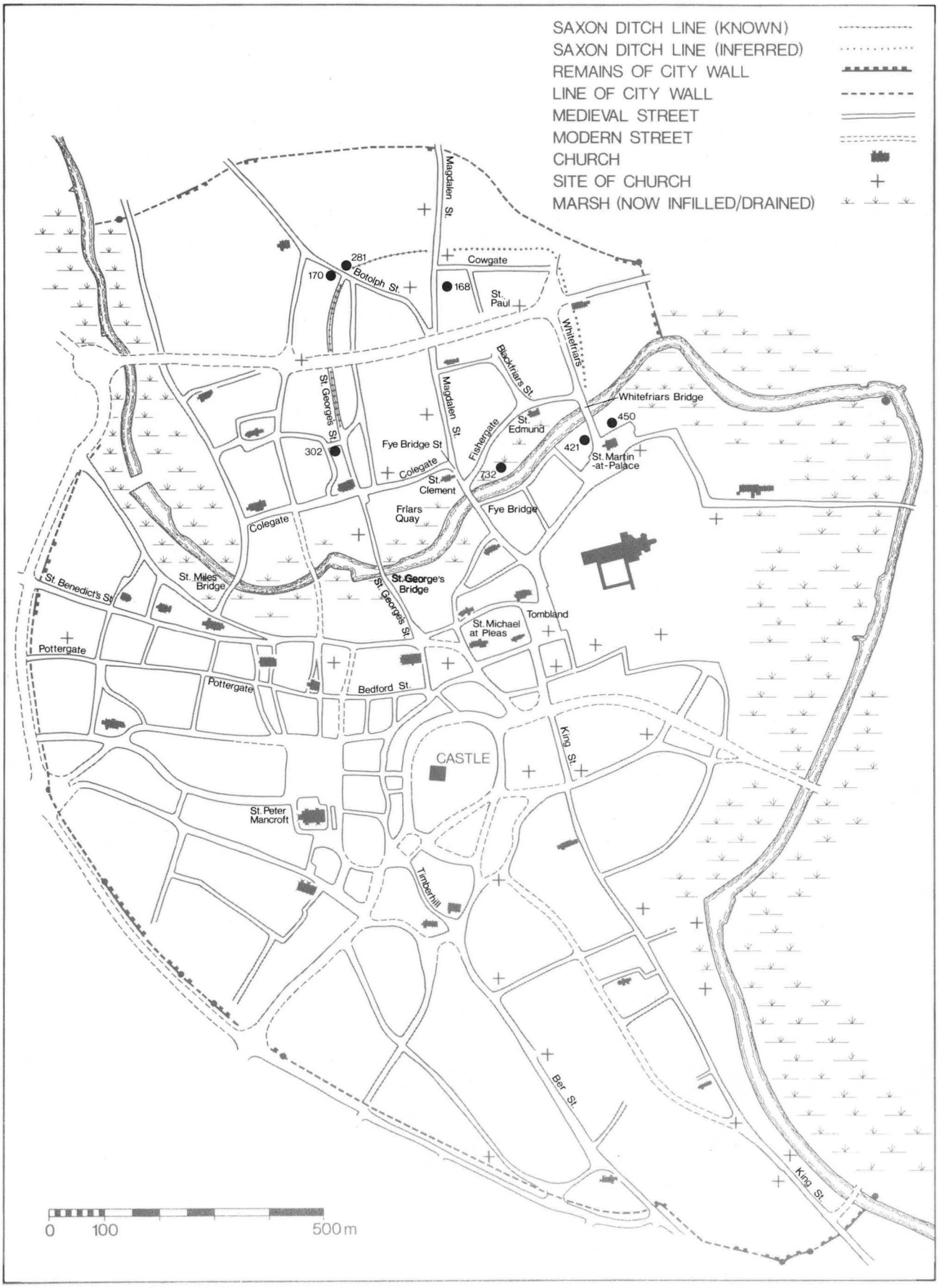


Figure 1 Norwich: the walled city area showing the location of the excavation (732) and other sites and places mentioned in the text. Scale 1:10,000.

Chapter 1. Introduction

I. The site

(Figs 1, 2)

The excavation (County Site No. 732) was situated on the north bank of the River Wensum, south of the curving street of Fishergate (TG 2397 0907). It lay within the parish of St Edmund, the parish boundary with that of St Clement running the length of the western perimeter of the site. Pre-excavation trial work by the developer established that the boundary wall extended to a depth of at least two metres and was constructed of successive builds. The antiquity of this boundary is probably very great, perhaps originating in the pre-Conquest period, and it is quite likely that the extant wall preserves the original alignment and, therefore, an early urban land division.

The excavation, which was a rescue operation prior to redevelopment, was considered necessary for two principal reasons. The lesser of these was that archaeological work in the area might aid a better understanding of the development of local urban topography in a part of the city where the distinctive line of Fishergate (Fig. 2) is idiosyncratic. The greater consideration was the necessity for archaeological work to be undertaken within a known defended enclosure of probable tenth-century date (Fig. 16). This enclosure was identified in excavation and topographical study by the Norwich Survey (Atkin *et al* 1985, 1, fig. 0.1 and plate XV) and yet very little archaeological excavation has ever been undertaken within it. It was clear that any attempt to understand the early development of Norwich, and the general development of urban communities and trade in the early medieval period, would be hampered by such a *lacuna* in the historical archive. Fishergate, by its very location, seemed one of the more important areas and, indeed, had already been cited as of great potential (Ayers 1985a, 46). The opportunity to investigate even a small site on the street was grasped therefore with eagerness.

Fishergate is a riverine street running east-to-west between Whitefriars (part of Cowgate in the Middle Ages) and Fyebridge Street. It lies at the southern edge of the defended enclosure, downstream of the probable early crossing (either by ford or bridge) at Fye Bridge. This crossing, on the important north-to-south King Street/Magdalen Street line, is situated at the approximate mid-point of the enclosure's east-to-west length, the riverine street upstream being formed by Colegate (Figs 1 and 2). Although no documentary evidence for Fye Bridge exists before the mid-twelfth century there is archaeological evidence to suggest a causeway structure of oak piles at this point in the pre-Conquest period (Hudson 1896; Roberts 1975, 101). Fishergate, which practically meets the northern end of the bridge, also terminates close to the northern end of Whitefriars' or St Martin's Bridge, this latter documented as early as 1106 and argued elsewhere as possibly of pre-Conquest origin (Ayers and Murphy 1983, 56).

The alignment of Fishergate (Fig. 2) is therefore marked, being a great curve to the north of the river linking two early crossing points. The distinctiveness of the alignment is, however, slightly distorted as significant topographical changes have been undertaken in the present century. Following the disastrous floods of 1912 most of the north bank of the Wensum was removed by some twelve feet (4 metres) in order to widen the river. More recently the street itself has been widened on the south side, removing some of the street frontage. The narrow pre-war street (Frontispiece) is now wide enough to permit two-way traffic and one lane of kerbside parking. The effect of both undertakings has been to accentuate the bend of the street while squeezing the area between street and river.

Despite accentuation, however, the alignment of Fishergate is distinctive enough to warrant an explanation. The 'pull' of the street towards the river crossings from an apex at St Edmund's church could be the result of commercial pressure, reflecting a desire to group properties as closely as possible to the bridgeheads and important north-to-south routes (Alan Carter, pers. comm.). Indeed the 1883 Ordnance Survey could be seen to suggest a slight clustering of small tenements at the Fye Bridge end of the street. An alternative explanation, however, is that the street respects pre-existing topographical features and that its alignment was thereby forced upon it. These features would have been the River Wensum itself and, probably, its small tributary the Dalymond which discharged into the Wensum somewhere near St Edmund's church (below).

The Wensum within the area of the medieval city of Norwich is constricted to the south by the Ber Street hill and to the north and east by Mousehold Heath. In order to force a passage between these features the river winds its way via a series of bends, notably a large one at both east and west (Fig. 1), and is bounded on both banks by gravel terraces. These vary in width, frequently being quite narrow on the south bank where the steep hill slopes approach the river closely. To the north, however, the immediate hinterland is more flat, providing a relatively level, well-drained site with ease of access to the river. The edge of the terrace is now obscured by occupational build-up although borehole and occasional watching brief evidence suggests that a marshy edge to the river existed prior to urban development. Fishergate might thus have developed as a street skirting the edge of a marshy area. The curve of the street may have become even more marked if the Dalymond did flow into the Wensum near St Edmund's church (as suggested on map 2, Campbell 1975), as a marshy area at the mouth of this watercourse could have extended slightly further north than the main riverside marsh. Alternatively, it is possible that the Wensum braided between the bridges, with an island between channels which was subsequently joined at the north bank (such an island or bitmay is known to have existed upstream near St Miles' bridge).

The excavation was thus partially designed to test these various hypotheses. The wider application of the work, however, was grounded in the academic aims formulated for rescue archaeology in Norwich. The Norfolk Archaeological Unit, since it assumed responsibility for excavation from the Norwich Survey in 1979, has followed the research priorities established by the Survey of which the

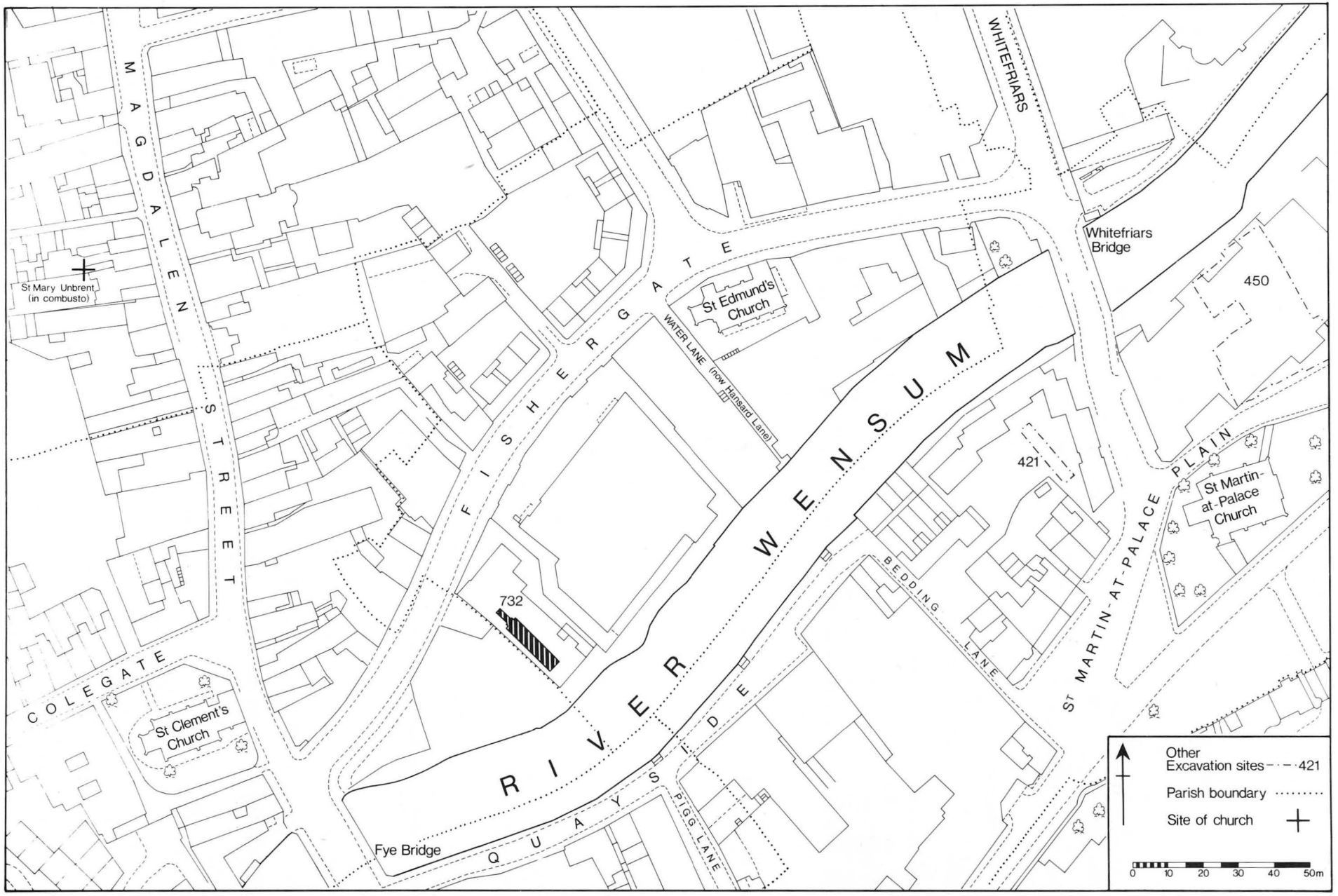


Figure 2 Location of the excavation. Scale 1:1500.

most important has been the attempt to understand the origins and early development of Norwich. This particular priority aims to isolate and study areas of early occupation, the type and density of settlement, the cultural background of the population and the economic, social and political reasons for the dynamic establishment of Norwich as *the* major East Anglian centre by the late eleventh century. To these ends a variety of evidence has been sought and utilised, ranging from archive collections of ceramic and other material to early documentation and even negative evidence (Carter 1978 *passim*). The work of the Survey has been supplemented by that of the Unit with major and minor excavations on the south bank of the river (Ayers 1983; Ayers and Murphy 1983; Ayers 1985b; Ayers 1987). These, however, despite discoveries of fundamental interest and importance, have also underlined the paradox already evident when the Survey ceased to excavate in 1978: to whit, in a settlement where documentary and coin evidence points to a significant community of tenth-century date, the archaeological material can generally only offer occupation of the eleventh century and onward.

An examination of the data recovered so far from excavations and building sites in Norwich reveals that one major area of the city remains almost untouched by archaeological work. This area, north of the river, is that within the enclosure mentioned above. It is apparent that data-collection here is of major importance in the search for tenth-century occupation. The Fishergate site offered the first significant opportunity to explore the potential of the enclosure's interior.

II. Surface geology

The excavated site lay at the southern edge of a relatively flat sand and gravel terrace abutting the north bank of the River Wensum. The gravels ultimately overlie chalk but this latter was too deeply stratified to be encountered within the archaeological excavation. To the east a watercourse called the *Dalimund* or Dalymond entered the Wensum in the early medieval period, probably close to the church of St Edmund (Figs 2 and 36). To the west a further watercourse known as *water of Muspool* or *Muspole* entered the river upstream of Fye Bridge (Fig. 36).

III. Excavation method

The excavation was designed as trial work, primarily to sample deposits and obtain a dating sequence. Constraints were placed upon the excavation by the location of structural elements within the proposed redevelopment; these constraints determined the location of the trial trench a mere one metre east of the western boundary of the site. Further constraints restricted the length of the trench: to the south, the proximity of the unembanked river meant that some eight metres of deposit could not be excavated; to the north pressure of time due to the impending redevelopment and the requirement that backfilling be conducted to a time-consuming high specification meant that the trench was only some 24 metres in length instead of the desired 37 metres. Total excavation of the shorter trench was, however, achieved and the site cleared on schedule. Redevelopment eventually followed in 1987.

Boreholes and trial pits had demonstrated that archaeological deposits in excess of four metres could be expected with waterlogging of the bottom two metres. Machinework by Hymac excavator started on 1st April 1985 and an upper, 4m wide and 2m deep, trench had been cleaned, straightened, shored and close-shuttered by 4th April. Thereafter all material was hand-excavated. All soil was sifted in wheelbarrows and then dumped by context on the spoil heap where it was metal-detected. This latter operation was most successful, yielding a high proportion of finds which would otherwise have been missed in the glutinous conditions. Metal-detecting was also attempted within the trench but this proved less effective due to the quantity of steel shuttering.

Sampling of the waterlogged deposits was carried out under the supervision of Peter Murphy, Environmental Archaeologist at the University of East Anglia. Timber samples for both identification and dendrochronology were taken. Standard recording procedures were followed. Excavation ceased on Sunday 2nd June 1985 and backfilling took place the following week. The excavation archive is held by the Norfolk Museums Service.

Chapter 2. The Excavation Sequence

I. Introduction
(Plate I)

The logistics of excavating a deep trench within a confined space close to the river necessitated that part of the work should be carried out by machine. The top 1.8 metres of deposits were removed in this way and the trench was then immediately close-shuttered and shored. The end sections, however, were not treated thus, the south section remaining visible throughout the excavation while the north section was battered back to give ease of access and an additional escape route to the trench. Hand-digging of the lower deposits took place within an inner trench, a little under two metres wide (Plate I). It is this trench which appears on most of the plans. Occasionally, as when the trench was extended to the north or when features encountered in the machine-cut deposits were recorded, parts of the outer trench are also shown (*e.g.* Fig. 6).

In the following text, the various periods have generally been dated with reference to the artefactual material. The secondary nature of many of the deposits clearly hampers this approach and a discussion on dating therefore follows later in the report.

Plate I Overall view of the excavation looking north (CRV14).

II. Period I (tenth century and earlier)
(Figs 3–5)

Natural coarse sand and gravel was uncovered at the base of the excavation (Fig. 5). This sloped from north-to-south towards the River Wensum, being recorded at a height of 0.22m above Ordnance Datum at the northern extremity of the site and at a height of –1.36m O.D. at the southern end of the site, a fall of seven per cent or one in fourteen. A natural peat (*104*, *106* and *129*) had accumulated above most of the gravel (the northern edge of the peat is indicated on Fig. 4). Most of the deposit was free of artefacts although the upper levels did contain some material. The top of the marsh was reasonably level although there was a slight incline towards the south; the consequence of such a relatively level surface was a marsh deposit which was extremely thick at the southern end of the excavation. The location of this marsh has implications for the urban topography of the area although, by the beginning of Period II, environmental evidence would suggest that the top of the deposit was above the water table.

III. Period II (tenth century)
(Fig. 4, Pls II,III)

Evidence for the consolidation of the marsh deposit took the form of a timber surface (*168*) consisting of a mixture of brushwood, occasional larger timbers and the odd stake (Plate II). Deposition appears to have been random although there is a possibility that many of the timbers could have been aligned parallel to fence *157* (below). The surface survived in two parts, either side of a later intrusive gully (*112*). The larger area to the south was revetted by a wickerwork fence (*157*, also cut by gully *112*) consisting of driven whole stakes in pairs and interwoven withies (Plate III) which defined the north-western edge of the timber surface. There was a slight indication that the fence continued within the northern area of the surface although, if so, timber here was located to the west of its alignment. Some of the timbers showed evidence of working or reworking.

Further north, between grid points 10/60 and 10/65 a large number of randomly positioned stakes were uncovered (Fig. 4). These may have been associated with the timber surface although their function remains unclear. South of the timber surface, gully *122* cut the peat although it did not bottom it due to the great thickness of the peat near the river (Fig. 5). This gully may have been cut for use in association with the timber surface. It is more difficult to suggest this for a further feature (*89*) at the north end of the trench which contained fills of brushwood fragments, organic material and sandy loam, probably a sealing deposit of early Period III Phase 1 date.

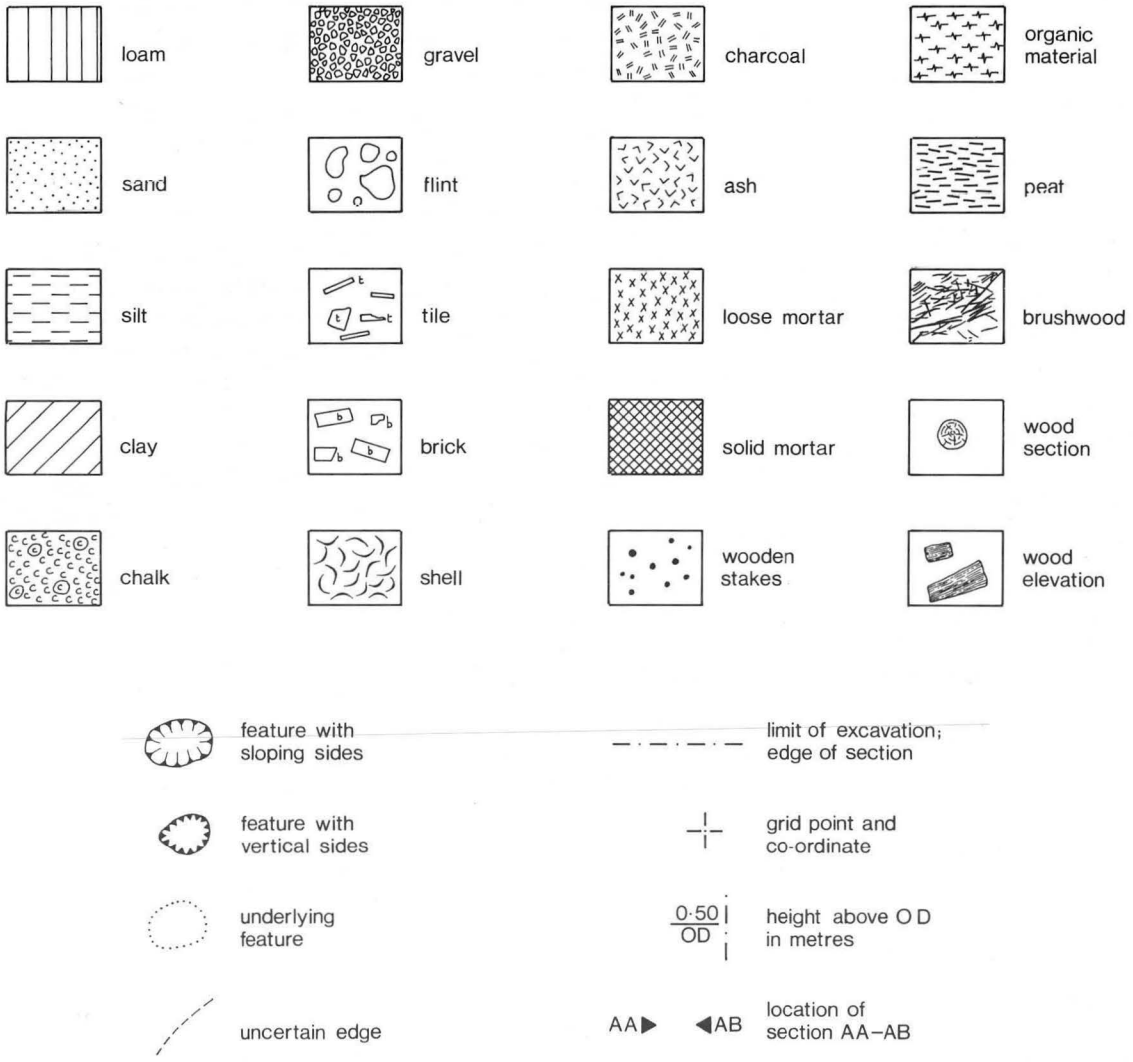


Figure 3 Key to symbols used on the excavation sections.

Period/Phase	Context	Small finds	Date
II	*123* gully fill	Hook (Fig.10, No.4) *S.F.143*	Tenth-eleventh century
III1	*91* layer	Pin (Fig.9, No.1) *S.F.56*	Prob. eighth century
III1	*91* layer	Brooch (Fig.9, No.2) *S.F.65*	Prob. eighth century
III1	*91* layer	Antler ring (Fig.18, No.10) *S.F.142*	Fifth-seventh century
III2	*92* layer	Bowl frags (Fig.19, No.4) *S.F.s 83 & 84*	Pre Conquest
III2	*78* layer	Strap end (Fig.9, No.3) *S.F.88*	Twelfth-fourteenth century
III2	*181* spit	Sceatta (Cat.No.2, Pl.V) *S.F.218*	*c.* 710–725
III2	*181* spit	Comb frag. (Fig.17, No.3) *S.F.284*	Prob. eleventh-twelfth century
IV	*37* layer	Augur bit (Fig.11, No.11) *S.F.21*	Tenth-eleventh century
IV	*37* layer	Key (Fig.11, No.12) *S.F.22*	Post Conquest
VI	*183* layer	Bale pin (Fig.19, No.7) *S.F.227*	Twelfth-fifteenth century
U/S	U/S	Coin (Roman) (Cat.No.1) *S.F.55*	337–40 AD
U/S	U/S	Buckle (Fig.11, No.14) *S.F.123*	Early Medieval or Medieval
U/S	U/S	Brooch (Fig.11, No.15) *S.F.241*	Prob. eighth century

Table 1 Dated artefacts tied to outside parallels.

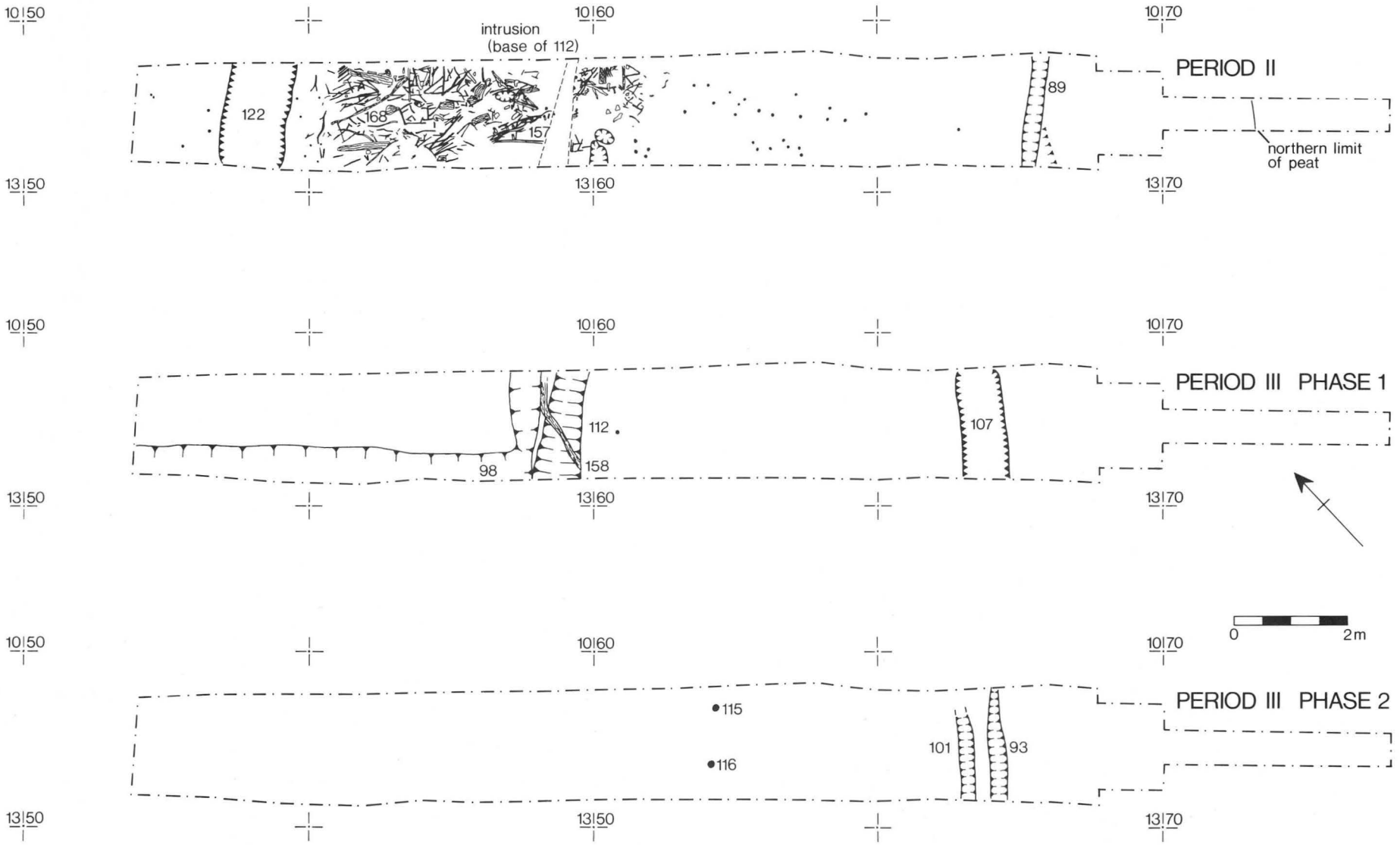


Figure 4 Plans of Period II features, Period III Phase 1 features and Period III Phase 2 features. Scale 1:100.

IV. Period III Phase 1 (early eleventh century)
(Fig. 4)

The timber surface was overlain by a thin layer of structured peat (*97*) and was also cut by an east-to-west gully (*112*). This was associated with further deposits (*87*; *91*; *100*) which effectively occupied the length of the excavated trench (Fig. 4). These deposits (of which *91* was notable for finds of eighth-century date) consisted of sandy silts, *97* itself being a highly organic, compact peat with densely packed straw, leaves and other vegetation. It occupied the area to the south of 5800 N on the grid (Fig. 4). It was cut by feature *98*, a shallow gully which ran parallel to and below the east excavation section before turning west at 5870 N (Figs 4 and 5). This gully contained a fill of *99*, a material very similar to, but more organic than, layer *97*. An uncut branch (*158*), possibly driftwood, was placed or became lodged across the top of feature *112* (Fig. 4 and Plate II). It followed the line of part of the south side of the feature, perhaps suggesting an accidental wedging in place. At the north end of the trench, levels *87* and *91* were cut by an east-to-west feature *107*, a straight-sided gully which contained sandy silts in its lowest fills and organic material with much vegetation at the top.

V. Period III Phase 2 (eleventh century)
(Fig. 4)

Two stakes (*115*; *116*) were driven into layer *100*. If two stakes can be said to form an alignment, their alignment appeared to be east-to-west, perhaps associated with further stakes beyond the confines of the excavation. To the north, feature *107* was re-cut by two shallow and narrow features (*93* and *101*). Both were aligned east-to-west. They contained very similar fills of brushwood fragments and organic material, the quantity of wooden fragments being particularly noticeable, as well as traces of silt.

Levels were then sealed by a dense homogeneous 'Dark Earth' deposit consisting of sticky, gritty, silty clay loam (Fig. 5). This layer was given a series of context numbers at intervals *along* the trench rather than as vertical spits within the deposit (the numbers within the main trench were, from south-to-north, *75*, *78* and *20*). This was done for two reasons: firstly, to divide the artefacts, notably pottery, into more manageable groups; secondly, and more importantly, as an experiment in data recovery. The deposit was very similar to 'Dark Earth' layers recorded at waterfront excavations on the south bank of the river (site 421, Ayers and Murphy 1983 and site 450, Ayers 1987). At the first of these the homogeneous level had been divided into spits in an attempt to isolate earlier and later deposits. The results were not successful and the policy was abandoned at the second site. On Fishergate, however, it was felt that arbitrary divisions at intervals along the trench might isolate earlier deposits which could perhaps be expected nearer to the street frontage. In practice, however, little or no distinction could be seen between the artefact groups recovered despite the fact that in underlying levels the eighth-century brooches, pin and antler ring (below) formed a relatively closely associated group of early material at the northern (street) end of the trench. In the

Plate II Timber surface. Scale 1 metre (CRY13).

Plate III Detail of wickerwork fence *157*. Scale 10cm (CRZ15).

northern extension of the excavation the removal of the homogeneous deposit was undertaken by a reversion to spit-digging (*165*; *166*; *167*; *180*; *181*; *182*).

VI. Period IV (twelfth century)

(Fig. 6)

The top of layer *20* at the southern end of the homogeneous deposits was cut by a circular pit (*83*) which contained fills of sand and clay loam. It was sealed by a thick deposit of chalk (*54*; Fig. 5) which extended north from the south excavation section until it was cut by an east-to-west feature (*82*). Westward, the chalk also ran below the excavation section but to the east it stopped short of the section. Examination of the south section (Fig. 8) following excavation showed a cut feature in the south-eastern corner of the site although no such cut could be seen in the east section. Several small, shallow features, possibly the remains of post-holes, cut the chalk (*66*; *68*; *70*; *72*; *74*). A thin length of timber *86* also lay above it.

North of feature *82* a further feature (*56*) was cut to the south by *82* and to the north by feature *79* (Figs 5 and 6). Both *56* and *79* ran east-to-west across the excavation, the former containing a fill of crumbly moist chalk and silty clay, the latter clayey and sandy silt. The top of feature *56* (which, despite its lack of edges *is* felt to have been a feature) was cut by three subcircular features, possibly the remains of post-holes (0.10 m deep). The top of feature *79* was notable for the large oak timber *49* which rested on its side in alignment with the feature. The timber had been squared although some bark was still intact on its north side.

Feature *79* was cut by yet another east-to-west aligned feature (*76*) which contained a fill of compacted, very humic material. It, in turn, ran parallel to a further feature (*47*) with a fill of clayey silt and organic material as well as lenses of ash and charcoal, and a few chalk lumps. It appeared to have been lined with a rich brown humic material. A small subcircular feature (*64*), also with a silty fill containing much humic material, lay between features *76* and *47* adjacent to the east section. At the northern end of the site a wide linear feature (*34*) ran east-to-west. Its fill was a gritty sandy clay with much ash and material similar to underlying (and cut) layer *20*.

VII. Period V (thirteenth to fourteenth century)

(Fig. 6)

All these features (except Feature *34*, sealed by *2*) were sealed either by layer *37*, a smooth clayey silt, or by layer *52*, a dumped deposit consisting of chalk, chalky gravel and gravel (Fig. 5).

Several features were uncovered, notably *39*, irregularly-shaped with a sloping base. It contained a fill of peaty clayey silt and may have been the remains of a post-hole. Four other indifferently preserved features (*25*; *41*; *43*; and *45*) were also recorded. One of these (*25*) was initially sectioned north-to-south; excavation revealed an apparent recut to the east (reconstructed on Fig. 6). Scrappy frag-

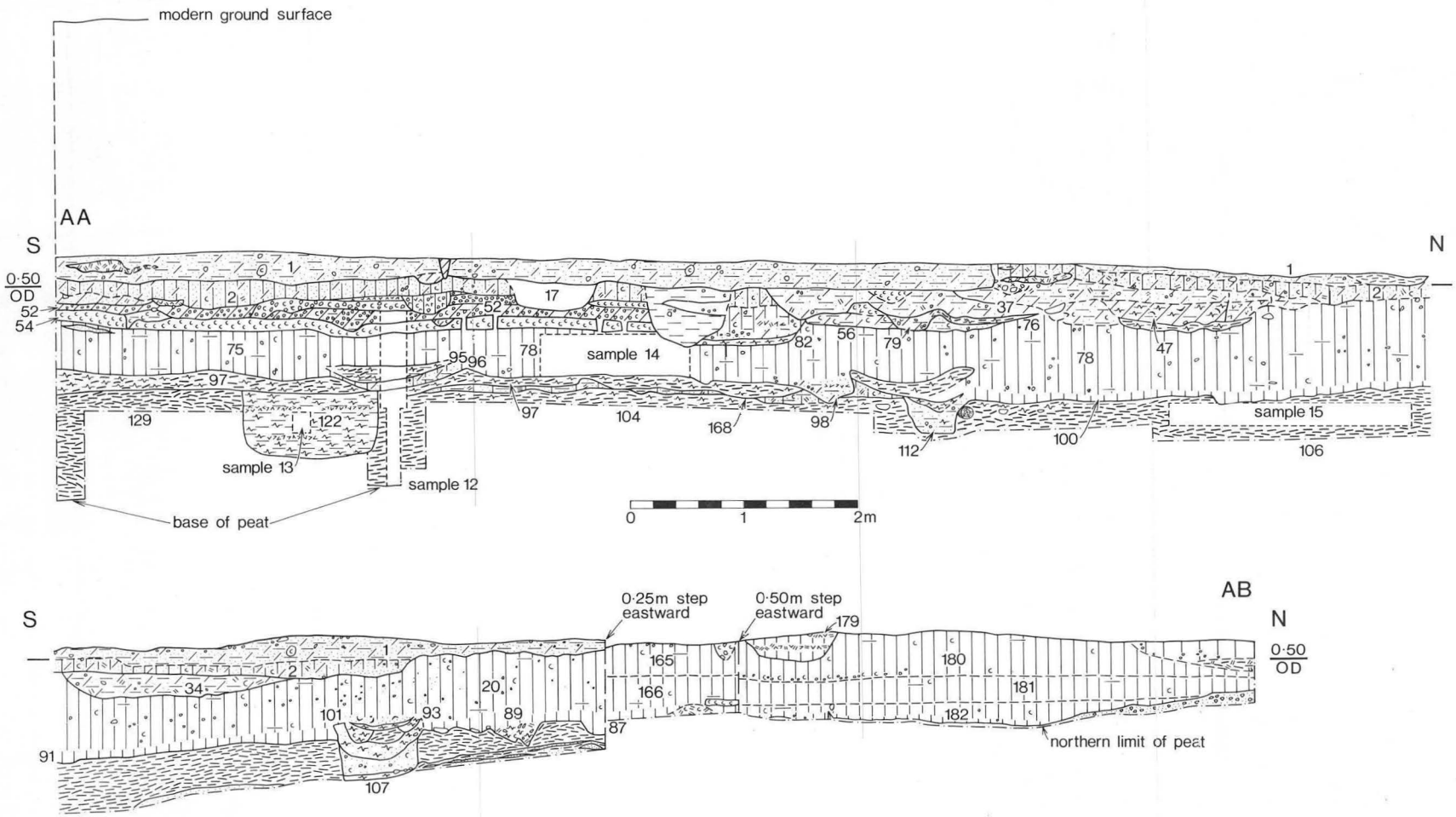


Figure 5 West excavation section AA–AB. Scale 1:75.

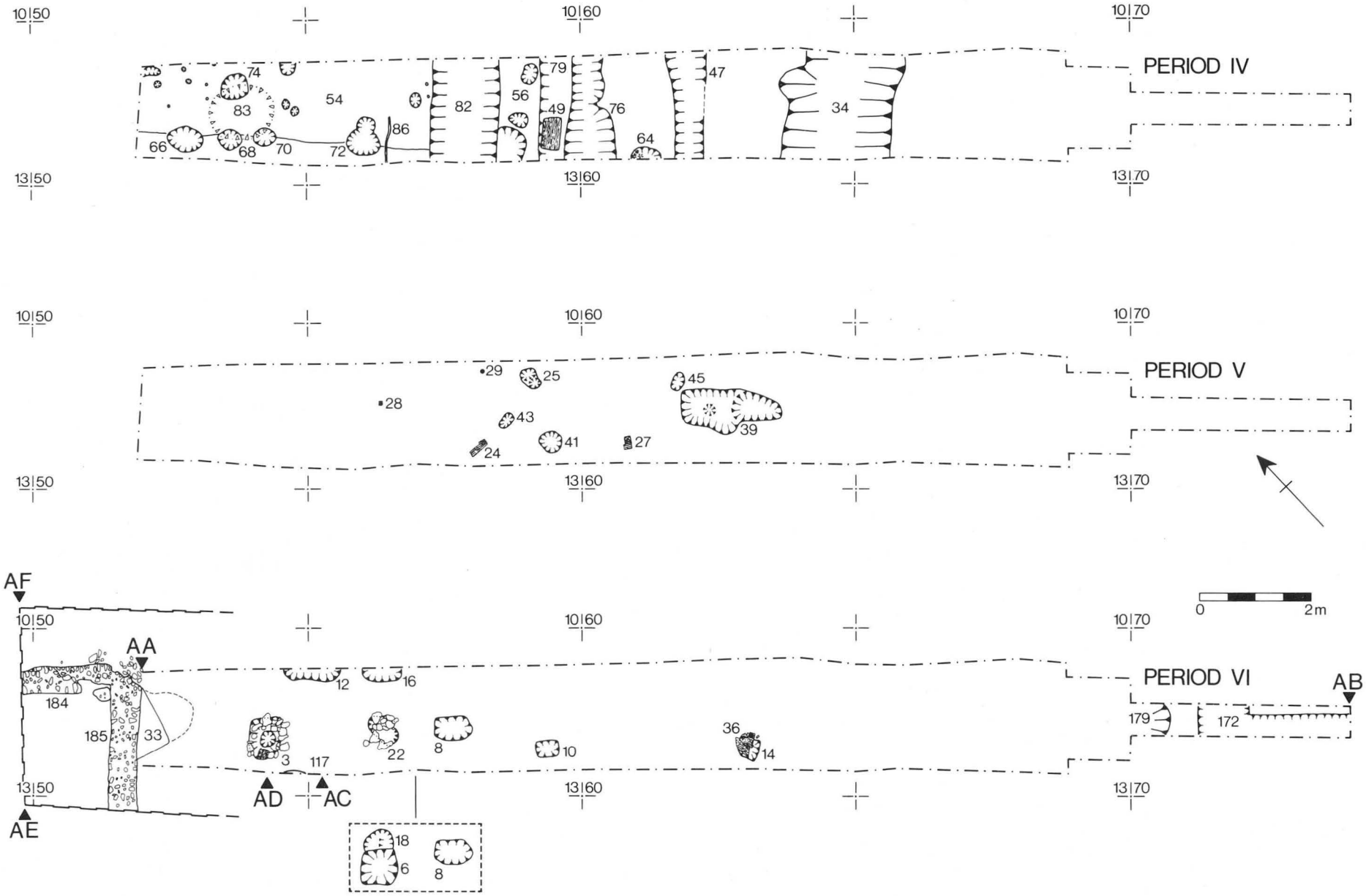


Figure 6 Plans of Period IV features, Period V features and Period VI features (which also locates the sections). Scale 1:100.

ments of worked timber (*24* and *27*) and two squared stakes (*28* and *29*) were also uncovered. All the features were sealed by layer 2, a deposit of dumped material (Figs 5 and 7).

VIII. Period VI (fourteenth century)

(Figs 6–8, Pl. IV)

A series of post-holes was uncovered at the southern end of the trench. Two of these (*3* and *22*) were packed with large flint nodules and post-hole *3* also contained the remains of a post. Subcircular features *12* and *16*, adjacent to the west section, feature *10* and feature *14* (which contained small pieces of timber) may have also been the remains of post-holes. Feature *22* was succeeded by a shallow feature *18* and a pit containing horncores (*6*), only the very base of which survived (Fig. 6 inset). Pit *6* was associated with a further core pit containing horncores (*8*), also of slight dimensions. Isolated timber fragments (*36*) were also located.

At the extreme southern end of the trench a layer of chalk (*33*) extended north from the excavation section and formed a right-angle diagonally within the excavated area (Fig. 6). It was overlain by a series of hard, laminated, thin burnt deposits containing ash, charcoal and tiny fragments of burnt bone. These, in turn, were overlain by a thin soil interface (Fig. 8) before a wall (*185*) was constructed. This wall (unavoidably damaged by machinework) was constructed of flint rubble and lime mortar and ran eastward below the section. To the west, however, it turned south as wall *184* which was constructed in a similar fashion but with very occasional bricks. The surviving height of this wall prior to machinework is shown on Figure 8. A layer of gritty clay loam with common traces of ash and charcoal fragments (*183*) was enclosed by the walls.

Within the hand-excavated trench, straightening of the east excavation section revealed a barrel (*117*) preserved in

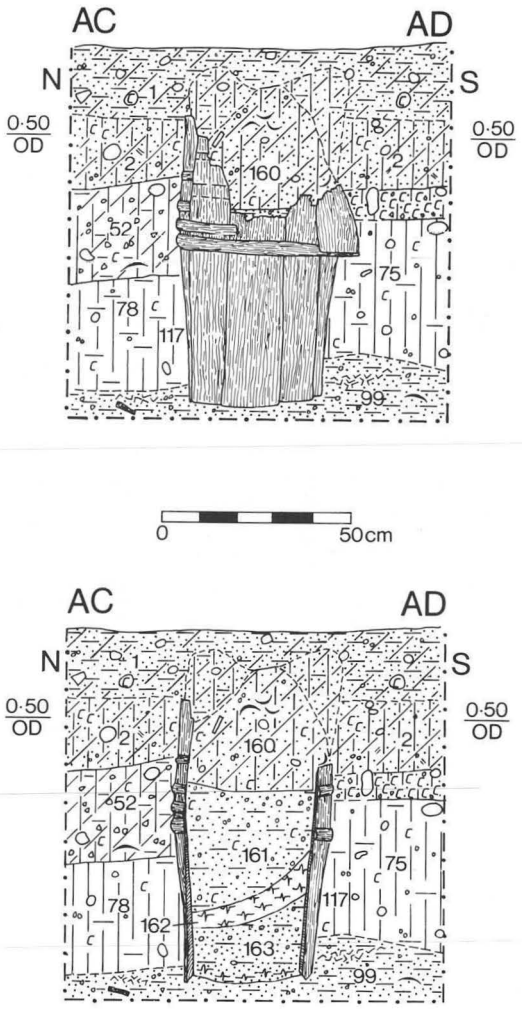


Figure 7 Elevations of barrel *117*, AC–AD. Scale 1:20.

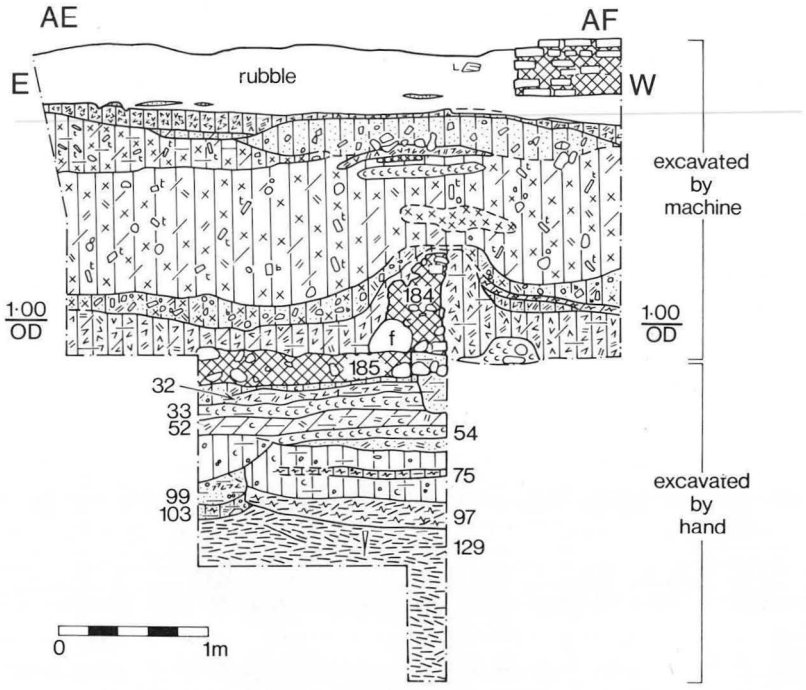


Figure 8 South excavation section AE–AF. Scale 1:50.

the wet deposits (Fig. 7, Pl. IV). It proved extremely difficult to see a cut for the insertion of this barrel although it seems likely to postdate layer 2. It was constructed of staves with hoops and did not have a base. The top part was not preserved. Sectioning of the feature (Fig. 7) revealed a number of deposits which were sampled for environmental analysis. The barrel was salvaged for conservation and possible display at Norwich Castle Museum.

Extension of the excavated trench to the north revealed a foundation cut (*172*) probably for a late cellar. A small pit (*179*) with a fill of many small layers of burnt material was also uncovered. The excavated trench was sealed by layer *1*, essentially an unstratified deposit which represented cleaning after machinework. The deposits removed by machine are illustrated on Figure 8.

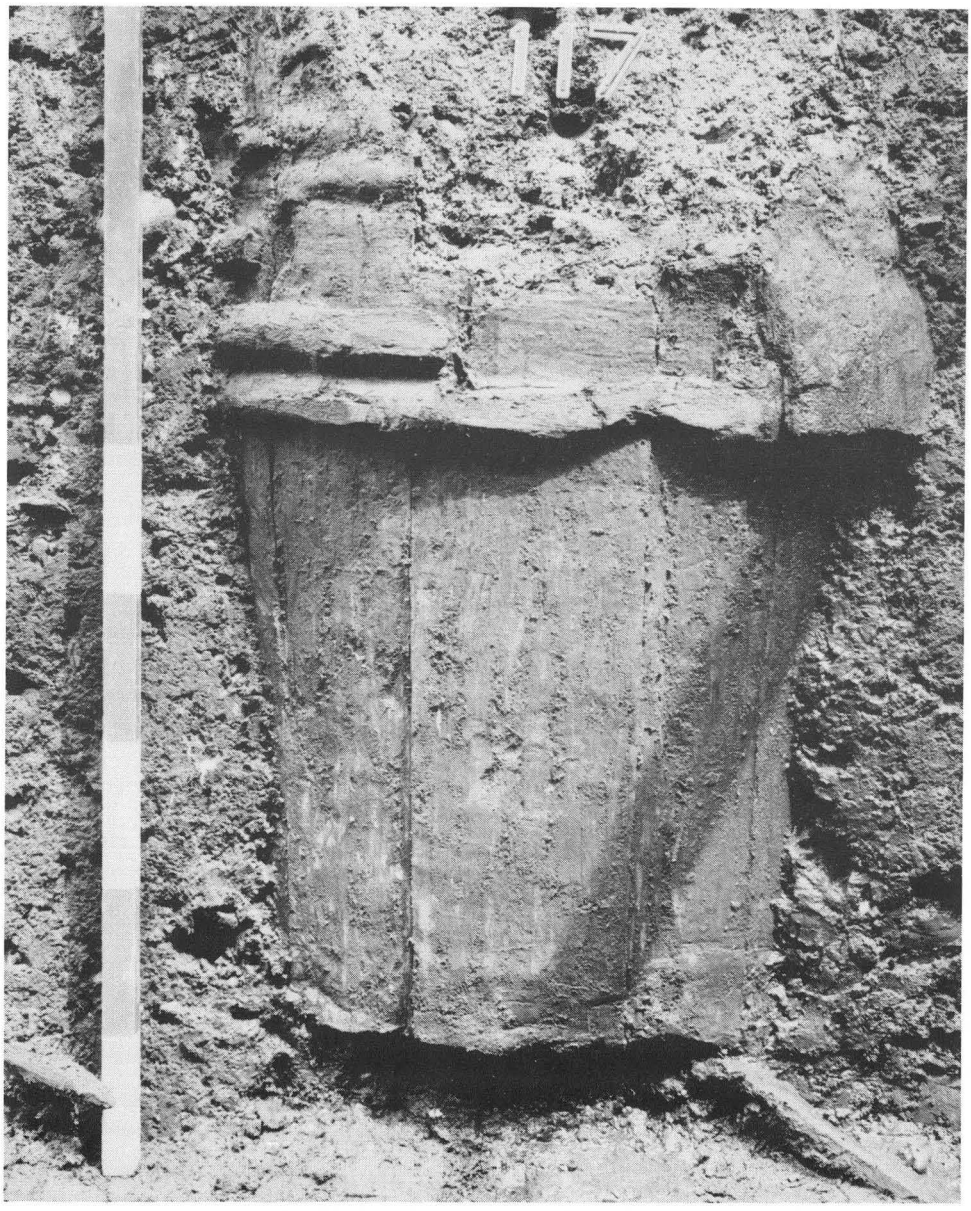


Plate IV Barrel *117*. Scale 10cm and 50cm (CRX 15).

Chapter 3. The Artefacts

I. Introduction

by Val Williams

The catalogue of artefacts from the excavation has been ordered by material. Thereafter, each object is classified by period, small find (S.F.) number and context number. Where the catalogue number is suffixed by a small case letter, this indicates that the object is not illustrated. The catalogue and figures for each material are numbered separately.

With the exception of pottery, which is dealt with separately, material has been selected for the catalogue because it is of intrinsic interest, is datable by typology or is distinctive of a particular aspect of the site. The catalogue (excluding pottery as above) is arranged according to material and period. An upper case letter after the small find number in the fiche indicates that the number was allotted to more than one object. As a metal detector was used extensively during the excavation and as the conditions on site militated against the retrieval of small non-metallic artefacts by hand, a possibly unrepresentative percentage of metallic to non-metallic artefacts recovered has occurred.

The non-ceramic finds give evidence of activity on, or in the area of, the site in the Late Saxon and Early Medieval periods. In addition, isolated Roman artefacts and several finds of Middle Saxon date were recovered but these are unassociated with any contemporary activity on site. The Late Saxon material includes evidence, largely in the form of waste material, for several industries operating on or near the site. The fishing industry (as the street name may suggest) is well represented in the assemblage by ten iron fish hooks (Fig. 10), predominantly of the large, barbed, spade headed type. In addition, nine pieces of rolled lead sheet (Fig. 9) interpreted as line or net weights and four large flints (not small finds) with natural perforations, presumed to be net weights, were recovered (the latter were notable as all the deposits on the site were virtually free of large stones and it was therefore seen as significant that the only ones recovered were perforated). Other artefacts probably associated with a fishing industry are the large bone needles (Fig. 17) possibly used for net making or repair, and a fragment of rope. There is also evidence for bone and antler working. A total of thirty-seven worked pieces were recovered of which twenty-six are antler and eleven are bone. Of the antler, ten pieces are finished objects while sixteen pieces are working waste, largely associated with comb manufacturing. This is a significant assemblage, as evidence for this industry is scarce in Norwich and this material may be indicative of a second area of antler working separate from the King Street and Castle Bailey focus (Margeson and Williams 1985, 27). Other industries and crafts represented in the assemblage are iron working, domestic activities such as weaving, and tanning and leather working.

The Early Medieval finds are largely of a domestic nature including an iron key (Fig. 11) and the remains of two others (fiche), an iron auger bit (Fig. 11) and two iron needles (fiche), although some dress fittings were also recovered including a copper alloy strap end (Fig. 9) and an iron buckle (Fig. 11).

II. The Coins

(Pl. V)

by A.K. Gregory (1) and D.M. Metcalf (2)

1. Roman. Helena Pax Publica AD 337-40. Largely illegible. *Unstratified. S.F.55 u/s.*
2. Sceat. Series J, Type 85 (Plate V). *Period III2. S.F.218.181.*

Plate V Sceat Series J, Type 85 (EAJ3).

The East Anglian runic sceat from the Magistrates Court site, St Martin-at-Palace Plain (Williams 1987, 63b, no.2, plate XXXIII), is now joined by a second excavated sceat from Norwich[1]. It is of Series J, Type 85[2], and is of an intermediate date (*c.*710–725), which overlaps with the date-range for the runic sceattas (*c.*710–740 or later) (Blackburn 1984, 165–74). Type 85 was originally designated BIII by S.E.Rigold (1960–1, 6-53; 1966, 1–6), and is an epigraphic imitation, in free style, of his BI-BII. If the Norwich find is compared with the plates in Rigold's catalogue, it is clear that it matches his variety BIIIB much more closely than BIIIA or BIIIC, but an examination of the style reveals small inconsistencies which mean that it is difficult to say that it is a specimen of the regular or substantive issue. Thus, on the obverse, it is unusual for so little of the outer dotted border to be visible (it is present in front of the face), the two dots which represent the lips are, in comparison with some of the specimens in Rigold, unusually far over to the right; the loop of the ear is flattish; and the double row of dots of the diadem are round rather than seed-shaped. On the reverse, the V of the bird's wing is unusually wide-angled, and the three tail feathers droop down from the wing almost at right angles, and the third is set almost at the tip. These are all very small details, within the coin's general correspondence with the normal style of BIIIB. Rather than being good silver, however, the coin seems to be plated, and this must raise the delicate question whether it is an unofficial counterfeit. The nearest stylistic parallel to the Norwich find is the Repton find of 1976, which is also debased.

BIIIB is an issue in a regular style, minted on some scale and therefore presumably 'official' rather than the work of some individual copyist. A

Mercian origin has been proposed (Metcalf 1966, 26–39; Hill and Metcalf 1984, 30–3 and 62), while BIIIA and BIIIC are derivative from it and not necessarily from the same place. Type 37 (two facing heads/whorl of four birds) is in the same style as BIIIB and would seem to follow on from it as the next issue from the same workshop (Metcalf 1966; Hill and Metcalf 1984). These two types together, 85 and 37, have a highly distinctive distribution pattern within southern England, and they make up a prominent share of the (not very numerous) finds from the furthest fringes of the area over which sceattas are found in southern England (*e.g.* Ilchester, Banbury, Brackley, Chipping Warden, Repton, Winteringham). The same two types are equally distinctive among early/intermediate sceattas in that their alloy is erratic. Whereas the better specimens have been found to contain 85–90% silver, alongside them there are found many others which are plated on base cores, or at least (where plating has not been scientifically demonstrated) certainly of very doubtful quality[3].

How does the Norwich find fit into this context? It offers no support, obviously, for a Mercian attribution, and it is subsequently possible that the distribution pattern is not similar to those for several types of sceattas which are of continental origin, as illustrated in the maps by Op den Velde, De Boone, and Pol[4].

BIIIB has been found in some numbers on the Continent, *e.g.* as many as twelve specimens among 1,000 sceattas from Domburg, *cf.* eight of Series A, four of Series BI–BII, and eighteen of Series C (Rigold and Metcalf 1984, 141). It is reported also from Nijmegen, Utrecht, and Wijk-bij-Duurstede, and from the Hallum hoard. On balance, it is still probably English, but the question is obviously debateable. Until a great deal more numismatic and archaeological evidence has accumulated, it will remain uncertain where the plated specimens of Type 85 were produced. At present it seems likely that the Norwich find is a coin which has been carried into East Anglia from some other Anglo-Saxon kingdom, with Mercia as the best guess, but that can be no more than a guess.

The distribution of plated or debased specimens of Type 85 and 37 shows no obvious regional contrast with that for specimens of good silver. The inferior versions certainly occur in Mercia[5].

The other finds from East Anglia and Essex are: a Type 37 from Caister-on-Sea (quality of alloy not known); a plated Type 37 from Woodbridge (or nearby ?); and a Type 85 (BIIIC) from the deserted medieval village site of Wicken Bonhunt (Essex) (Rigold and Metcalf 1984, 257). The North Elmham find, which has been described as 'BIIIB, imitation or odd variety' is in the writer's view not closely related to Type 85. It is stylistically akin to Type 56 and to a specimen in the Rashleigh sale (21 June 1909, lot 33) which link with Type 70 and are probably all East Anglian or in any case east-coast issues. The recent report of a Type 37 from near Cambridge (Hill and Metcalf 1984, 224) now appears to have been based on disingenuous information and should be discounted.

III. Non-ferrous metal objects

(Fig. 9)

by Val Williams

Personal ornament and dress fittings

1. Cu alloy **pin** of ? eighth-century type with faceted head and slightly hipped shaft. Discolouration on the shaft is possibly due to wear or staining by fabric. *Residual in Period III1 S.F.56.91.*
2. Cu alloy **equal-armed brooch**. Probably eighth century. A similar example from Swan Lane, London (Frances Pritchard pers.comm.) was also a residual find from a later waterfront dump deposit. *Residual in Period III1 S.F.65.91.*
3. Cu alloy **strap-end**. Probably twelfth to fourteenth century and is possibly intrusive. *Period III2 S.F.88.78.*

Lead weights

4. Weight = 40 gm. *Period III1 S.F.80.91.*
5. Weight = 35 gm. *Period III2 S.F.169.75.*

5a. Partly rolled. Weight = 38 gm. Length = 40 mm. *Period III2 S.F.194.165.*

6. Weight = 30 gm. *Period III2 S.F.196.165.*
7. Probably a **scale weight**. Weight = 28 gm (1 oz). *Period III2 S.F.268.78.*

7a. Loosely rolled and folded. Weight = 59 gm. Length = 23 mm. *Period III2 S.F.269.78.*

8. Probably a **scale weight**. Weight = 50 gm. *Unstratified S.F.8 u/s.*

8a. Tightly rolled. Weight = 43 gm. Length = 34 mm. *Unstratified S.F.244A. u/s.*

8b. Loosely rolled. Large sub-rectangular central hole. Weight = 42 gm. Length = 30 mm. *Unstratified S.F.244B. u/s.*

8c. Partly rolled. Weight = 38 gm. Length = 22 mm. *Unstratified S.F.244D. u/s.*

8d. Tightly rolled. Weight = 27 gm. Length = 27 mm. *Unstratified S.F.244D. u/s.*

Nos 4–6, 7a and 8a–8d are all made from rolled or rolled and folded lead strips and are interpreted as fishing line or net weights. Nos 4, 6, 7a, 8a, 8b and 8c all have surface markings which appear to be pinch marks, probably caused whilst securing the weights to the lines. Nos 4 and 5a both show severe stressing of the lead and it is suggested, along with No.8c which has pinch marks and slight metal stressing but is only partly rolled, that these indicate the reuse of the weights by unrolling and re-rolling where required.

Miscellaneous

9. Cu alloy **decorative feature**, possibly a finial or terminal. Circular scar on base. *Unstratified S.F.60 u/s.*

IV. Iron Objects

(Figs 10, 11)

by Val Williams

Fish hooks

(Fig. 10)

1. *Period III2 S.F.74.78.*
2. *Period IV S.F.62.84*

A total of ten fish hooks were recovered, predominantly of the large, spade headed, barbed type (see fiche).

Other Iron Objects

(Figs 10 and 11)

3. Large **buckle-pin**. Similar examples from Castle Acre Castle (I.H. Goodall 1982, fig. 41 nos 117 and 121) are interpreted as pins from either dress or harness buckles. *Period I S.F.75.88.*
4. **Hook**. Function uncertain. A similar but larger example from Fuller's Hill, Great Yarmouth (Rogerson 1976, fig. 52 no. 19) is interpreted as a possible gaff or net lifting hook of tenth to eleventh century date. *Period II S.F.143.123*
5. **Hasp**. *Period III1 S.F.59.91*
6. **Ring** formed from twisted rod with overlapping ends. Period III2 S.F.57.78
7. **Fitting** formed by two pieces of rod, bent at *c.* 90°, joined at the centre. Three nails or rivets still *in situ* and bent to secure. The length of the nails before being bent over (5–7 mm) may suggest that this was a fitting for a wooden object, possibly a box. Although similar in form to the handle attachment from a Romano-British bronze bucket from Burgh Castle (Gregory 1979, fig. 4), the incomplete plate on the Norwich example appears to be thin and flat, matching the other three, and incapable of bearing any weight. It is suggested therefore, that this is a purely decorative fitting, similar to the copper alloy examples from Castle Acre Castle (Goodall 1982, fig. 43) and that it was mounted in an 'X' rather than an upright position. From an eleventh century context. *Period III2 S.F.216.181*
8. Fine **awl** or **reamer**. *Period III2 S.F.219.181*
9. **Fitting**, possibly with non-ferrous plating. Function uncertain although similar objects from Thetford (I.H.Goodall 1984, fig. 130 no. 162) and York (MacGregor 1982, fig. 46 no. 415) are respectively a hasp and a clasp. *Period III2 S.F.'s 225 and 237.78*
10. **Hasp**. *Period IV S.F.87.54*
11. **Augur Bit**. Spoon bit with lanceolate terminal. Similar examples from Thetford (I.H.Goodall 1984, fig. 117 nos 14–16) date from the tenth to eleventh centuries. *Period IV S.F.21.37*
12. **Padlock-key** with expanded terminal and lateral bit. Post Conquest. *Period V S.F.22.37.*

12a. Small rivet or stud with one flat and one conical rove. Square section shank 5mm long. Possibly decorative. *Unstratified S.F.61.u/s*

13. **Decorative-object**, possibly a small belt/strap slide (see no.16 below) or a stud or staple. Both arms broken. *Unstratified S.F.68.u/s*
14. **Buckle**. Early medieval or medieval type. *Unstratified S.F.123.u/s*

14a. Stud with domed head. Possible non-ferrous plating on head. Length = 23 mm. *Unstratified S.F.186.u/s*

15. Square ended **equal-armed brooch** with incised design. Traces of non-ferrous plating (possibly silver) remain in the incised lines. Pin broken but retained within the corrosion products. Probably eighth century. *Unstratified S.F.241.u/s*
16. Possible **strap mount** or **belt slide**. A similar belt slide was recovered from a Viking burial at Balladoole, Isle of Man (Bersu and Wilson 1966, 36–7, pl.viid, fig. 26) although this example is very

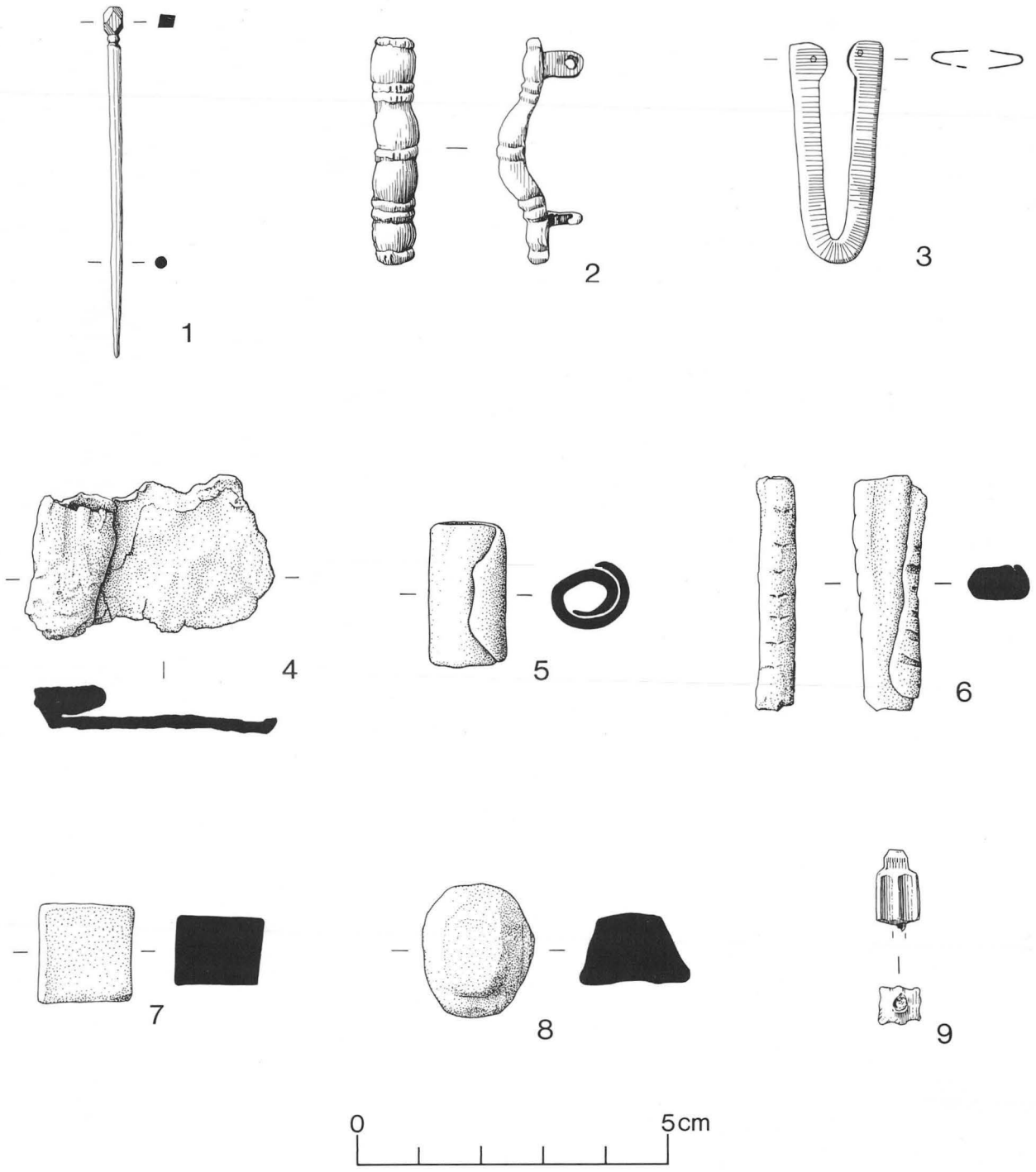


Figure 9 Non-ferrous metal objects, Nos 1–9. Scale 1:1.

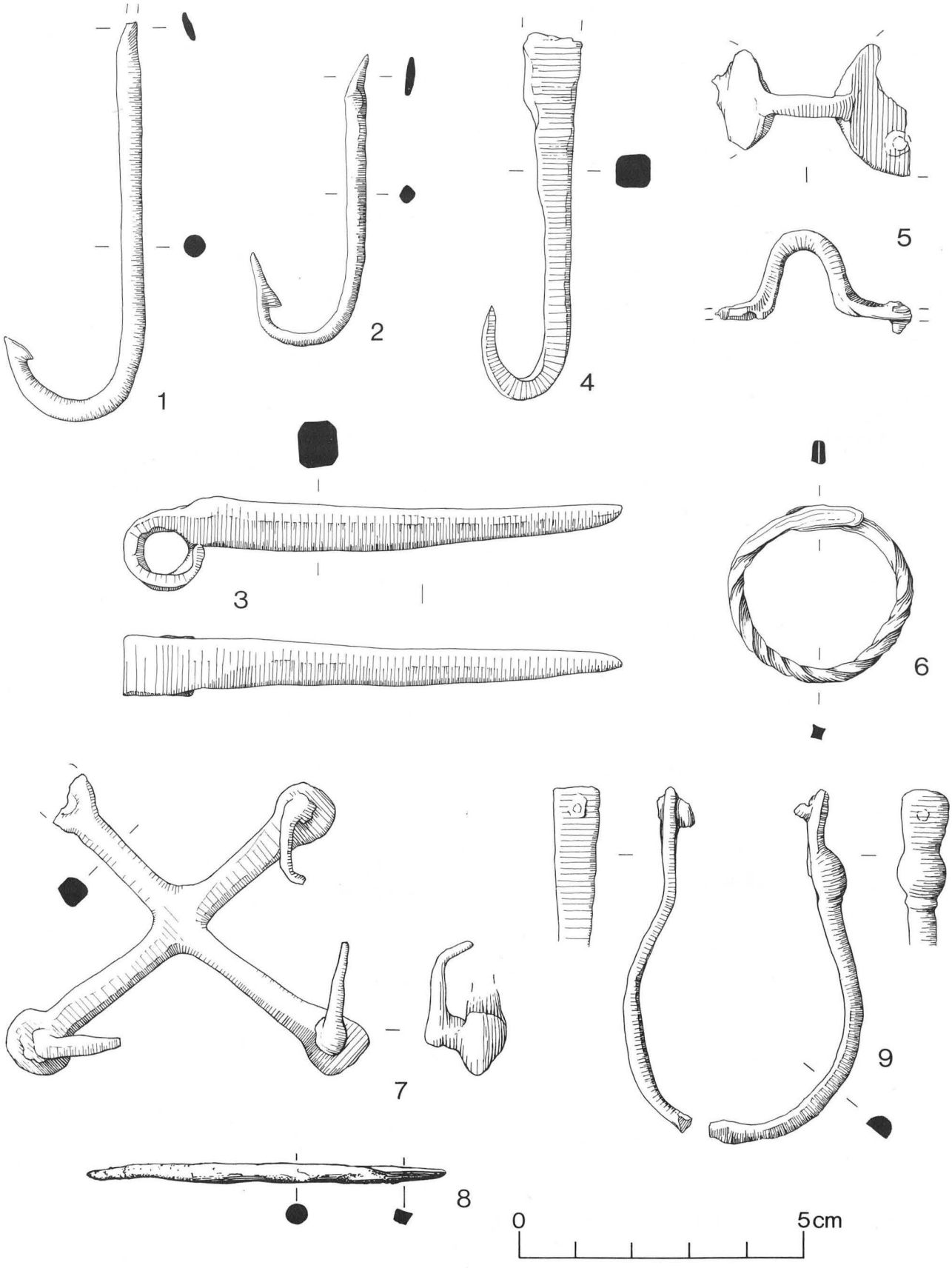


Figure 10 Iron objects, Nos 1–9. Scale 1:1.

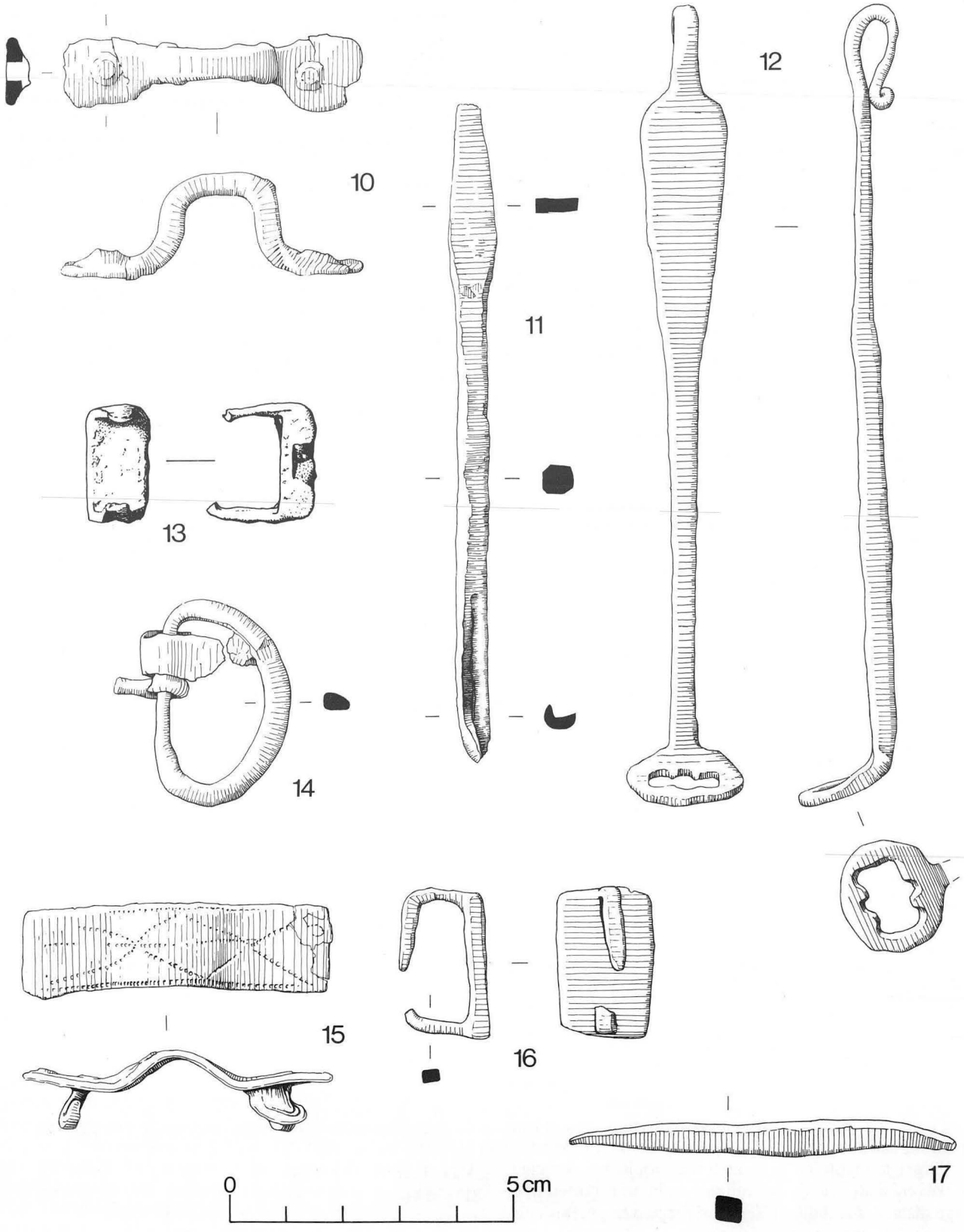


Figure 11 Iron objects, Nos 10–17. Scale 1:1.

ornate. An undecorated slide was recovered from an undated pit at North Elmham, Norfolk (I.H. Goodall 1980, fig. 267 no.120). *Unstratified S.F.245.u/s*

17. **Awl** or **reamer**. *Unstratified S.F.247.u/s*

V. Slag and other technological material

by Paul Budd

Approximately 10 kg of material thought to be associated with iron working, was examined. The great majority of the material was found to be slag and this has been divided into two basic groups, fuel ash slags and fayalitic slags. The latter group are associated with iron working and have been further divided into those derived from smithing and those derived from smelting processes.

There were only a few pieces of fuel ash slag amongst the material examined. These alkali silicate slags are formed as a result of the accidental fluxing of silicate-rich materials, such as clay, by the ash in a fire during strong heating. Fuel ash slags are not therefore diagnostic of any particular process, they merely indicate the presence of a fire burning at high temperature.

The majority of the material examined was found to be fayalitic (iron silicate) slag. Not all of the slag was easily recognisable since in many cases iron corrosion products had concreted soil and stones from the burial environment in a thick layer around the slag pieces. These fayalitic slags are far denser than fuel ash slags as they contain a high proportion of iron. They are produced as a result of reactions between iron oxides and silicate-rich materials at elevated temperatures during either smelting or smithing operations. It is the morphology of the slag rather than its compositional variation which normally differentiates between the two processes.

The great majority of fayalitic slag examined was found to be smithing slag. Smithing slag results from the working of iron in the blacksmith's hearth and is produced at a lower temperature than smelting slag. It tends to be highly vesicular but with a relatively small vesicule size. Some of the smithing slag had formed into 'hearth bottoms', roughly circular pieces of slag with a lens shaped cross section formed as a result of molten slag collecting in the bottom of the hearth and solidifying on cooling.

Two pieces of smelting (tap) slag (S.F. 276 and S.F. 204) were also noted from the site. Smelting slag tends to have fewer, but much larger, vesicules separated by dense, non-vesicular material. Smelting slags may also be characterised by the presence of flow lines caused by the solidification of the liquid slag as it is run out (or 'tapped') from the furnace.

In general the nature of the slag examined and the quantities which have been discovered are consistent with small scale iron smithing either on or near to the site. Iron working of this nature is to be expected on virtually every medieval occupation site. The few fragments of smelting slag recovered are not particularly significant since if iron smelting had been carried out on the site the presence of far larger amounts of such material would be expected. However, such material is unlikely to be transported over large distances and the presence of the two fragments does suggest that smelting was being carried out somewhere in the area.

Also included with the slag was a rim fragment from a shallow, circular, dish shaped crucible or 'heating tray'. The fragment was 8–12mm thick and the tray would have been 60–70mm in diameter. The fabric, which was only sparsely tempered and contained some finely divided charred organic matter, was reduced fired to a grey colour. The top surface was deeply vitrified, indicating that the tray had been heated from above, and the fabric near to the top surface was altered by high temperatures. Qualitative analysis of the upper surface of the sherd by energy dispersive X-ray fluorescence revealed traces of copper, zinc, lead, silver and tin.

Heating trays of this type have been recovered from a number of late Saxon and Anglo-Scandinavian sites in England including Lincoln, York, Thetford, and Northampton (Bayley 1982). There has been some debate regarding the use of the trays. Quantitative analyses of slag deposits on a number of heating trays from Netherton, Hampshire (Tite *et al* 1985) and a reassessment in view of the continuing examination of such material at the Ancient Monuments Laboratory (Bayley, forthcoming) has, however, led to the general conclusion that some form of refining or cupellation (to extract precious metals from impure alloys) was being practiced. The small size of the heating trays has led to speculation that the process may have been one of assaying; the cupellation of a small sample from a batch of alloy to determine its precious metal content.

VI. Stone objects

(Fig. 12)

by Val Williams

Stone identification and petrological analysis by David Moore.

The Hones

1a. Fragment of irregular section sandstone (provenance probably the English Coal Measures). Possibly a hone, although very smooth overall and possibly water worn. Length = 120 mm. *Period III 1 S.F.180.167.*

1b. Fragment of thin rectangular section Norwegian Ragstone hone. Smoothed overall. One end broken. Length = 34 mm. *Period III 1 S.F.307.108.*

1c. Fragment of purple phyllite hone. Broken longitudinally. One surface smooth. Length = 54 mm. *Period IV S.F.37.37.*

2. Fragment of irregular section Norwegian Ragstone hone. Wear pattern consistant with transverse honing. *Period IV S.F.40.55.*

2a. Fragment of schist (not Norwegian Ragstone). Minimal signs of wear. Length = 67 mm. *Period VI S.F.29.1.*

Lava fragments

(not illustrated see fiche)

Seven fragments of lava were recovered, ranging in size from 37mm ×37mm×16mm to 70mm×59mm×28mm. All but one fragment came from tenth-century deposits. For a discussion on the origin of the lava see Williams 1987.

Miscellaneous

3. Fragment of shaped and smoothed fine micaceous sandstone. Probably an **industrial sharpening stone** (A.K. Gregory pers. comm.). *Period IV S.F.17.35.*

VII. Glass objects

(Fig. 13)

by Val Williams

1. Fragment of a bun-shaped, black glass **linen-smoother**. Similar objects were in use from the Roman period until the twentieth century, but contemporary examples have been recovered from Anglo-Scandinavian deposits in York (Roesdahl *et al* 1981, YT11),

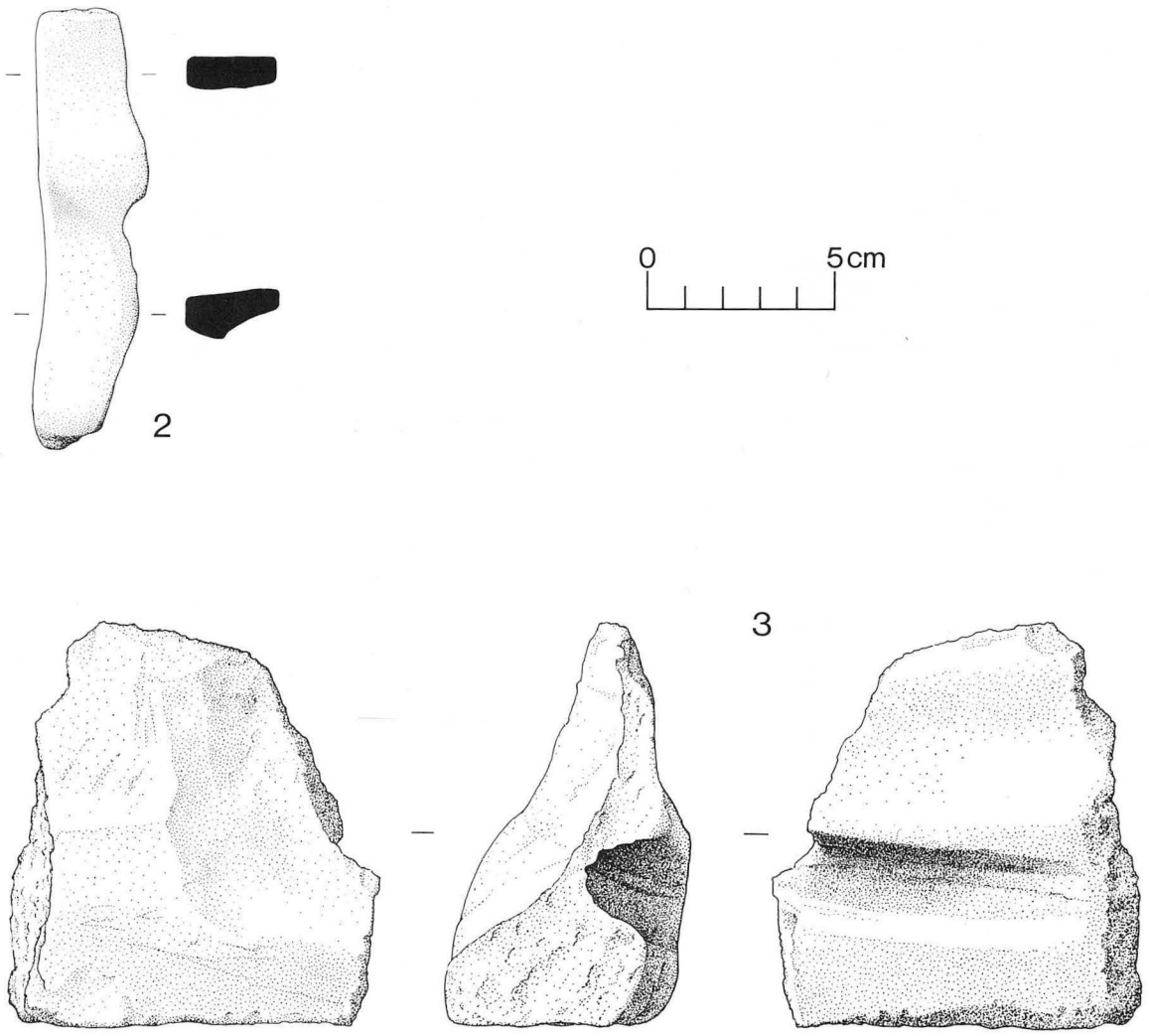


Figure 12 Stone objects, Nos 2–3. Scale 1:2.

and tenth to eleventh century layers in Thetford (Harden 1984, fig. 116 nos.3–5). *Period II S.F.173.123*

2. Complete **bead**, possibly of a dark coloured glass. Burnt or devitrified. Found within wattle fence *157*. *Period II S.F.285.157*
3. Half of an orange/red **bead**. *Period III S.F.220.181.*

VIII. Pottery

(Figs 14–16)
by Carolyn Dallas

Introduction

This material has been examined in some detail in view of the important position of the site in the waterfront area of the Late Saxon settlement. Moreover, it provides a stratified sequence which shows the development of pottery types in Norwich, including the Saxo-Norman overlap between Thetford-type and Early Medieval wares.

The material has been examined macroscopically (×10 handlens) and quantified by sherd count. The pottery is qualified by its fabric type in chronological order. The pottery catalogue is arranged firstly by fabric type, and then by period within each category so that residual sherds in later contexts are placed after vessels which were contemporary with their period. This has been done in an attempt to keep the sequence pure, although two problems were encountered:

a) Some contamination has occurred in Period III2. This was all at the northern end of the trench (in contexts *20*, *180*, *181*) and included some medieval to modern material: this accounts for the distortion in Table 2. In the illustrated material, rim no.65 would seem on fabric grounds to be late eleventh-to-twelfth century in date. It could have been at the top of black deposit *20* rather than part of the contamination but has been placed later in the catalogue layout to allow for the latter possibility.

b) A problem of archaeological theory arose, particularly in the interface between Periods III1 and III2. A series of gullies (*e.g.* F*98*, F*112*, F*107*, F*101*, F*93*, F*89*), which were cut into the peat and brushwood deposits, had their use in Periods II and III1, but their filling post-dated this

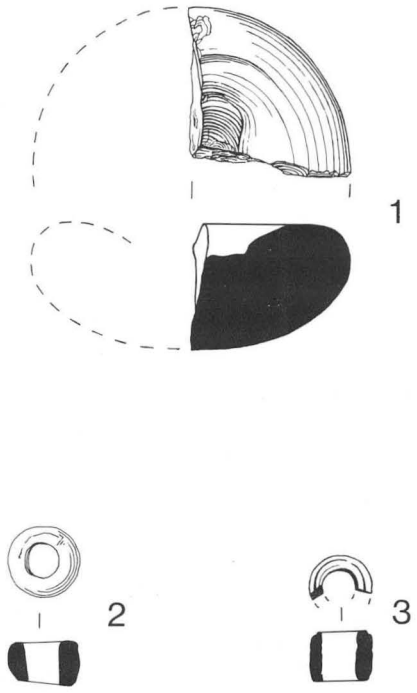


Figure 13 Glass objects, Nos 1–3.
No.1 scale 1:2, Nos 2–3 scale 1:1.

use. They were sealed by the black deposits *20*, *75* and *78* of Period III2, so this material is usefully stratified between Periods III1 and III2. The sherds from context *111*, the sealing of the top F*112* (Fig. 14, Nos 31–34) would seem to be eleventh-century although in the Thetford Ware tradition, and can perhaps be pinpointed as the beginning of the eleventh-century form changes (they have been counted in Period III2). A similar instance occurs with three sherds from one medieval vessel on top of F*79* Period IV/V (see Table 2).

The assemblage includes hand-made pottery of probable Middle Saxon date, Ipswich-type ware, Thetford-type ware, Early Medieval wares, medieval and later wares, and a quantity of Continental imports, which have been placed at the end of both the fabric categories and the catalogue of drawn material.

English Wares

Hand-made vessels

Thirty-one hand-made sherds were found, representing almost as many vessels. They can be divided into four basic fabric categories.

1. Sandy. Ten sherds. One sherd contains rounded quartz grains up to 2 mm, but the other sherds in this class are finer. All contain fine silver mica, often in some quantity (Fig. 14, Nos 1, 2, 4, 5).
2. Harsh sandy with organic particles. One sherd. This contains quartz sand and organic material, but very little mica.
3. Sandy with organic particles. Sixteen sherds. These are similar to class (1) except that they contain some organic inclusions. The organic material may include grass but is mostly short husk-like material which is probably chaff. In this class, the organic content can be sufficient for the sherd to show a laminated appearance in part of the fracture but the sand content is more dominant. One sherd also appears to contain some grog (Fig. 14, No. 3).
4. Organic. Four examples. These sherds have a predominantly organic tempering, although some quartz sand and fine particles of silver mica occur.

Except for the sherd classed as fabric (2) above, which has a red outer margin, all sherds are dark grey or black. Some have internal wipe marks or 'grass' impressions, and some have smoothed external surfaces although only one sherd was heavily burnished. Sooting occurs on both inner and outer surfaces.

Forms are all small vessels and the four rims found include one narrow-mouthed vessel (Fig. 14, No. 1).

Ipswich-type ware

There are 119 sherds which can be attributed to this category, only two or three of which seem to be from the same vessels. They can be divided into the four fabric groups previously used for Ipswich-type ware.

1. Fine sandy, with extremely fine inclusions. Forty-eight sherds, including four rims (Fig. 14, Nos 6, 7, 9) and ten bases.
2. Coarse sandy, with disparate sand particles. Thirty-three sherds, including three rims (Fig. 14, No. 8) and four bases.
3. Intermediate 'pimply', with rounded quartz grains. Twenty-two sherds, including two rims and three bases.
4. 'Pimply' with many rounded quartz grains. Sixteen examples, including two rims (Fig. 14, Nos 10, 11) and three bases.

Many sherds contain fine silver mica, sometimes in quantity. Evidence of two possible storage jars was found (*cf.* West 1963, fig.45, P11 L3 11) and one exceptionally thick base (Fig. 14, No. 12) looks like fine sandy Ipswich-type ware, but the other nine rims are from small 'cooking pots'. All bases sag. Sooting occurs on the vessel exterior, and on both surfaces of rims.

Middle or Late Saxon wares

Six rims were found in Periods III2 and IV which are jars in forms which may be transitional between Middle and Late Saxon forms (Fig. 14, Nos 13–18). Four have a small diameter and everted rims, usually with a long neck: the other is a larger form resembling Ipswich-type ware (No. 18). Fabrics are grey and similar to Thetford Ware but might be Ipswich-type coarse sandy fabric IW3 above.

Both form and fabric are ambiguous, and a Late Saxon date seems more likely although the vessels seem early in character. Similar sherds have been found at Caister-on-Sea (Dallas 1993) and it is possible that they were imported by sea from another area, particularly as such long-necked forms occur in Middle Saxon pottery in the north (Hurst 1976, fig. 7.9) if they are not continental imports. It is noticeable that none of these sherds are sooted.

Thetford-type ware

This was the most frequent pottery type found on the site, some 1273 sherds, 60.6% of site total.

Fabrics were all sandy, with no coarse sherds, the range being a spectrum of medium to fine. The particles of quartz sand are visible to the naked eye and most sherds contain fine silver mica, often in quantity. Occasional particles of calcite and chalk occur, and at least two sherds show evidence of grogging (one certainly with other Thetford Ware). Of note are thirteen sherds (from one or two vessels in *20*, *78* Period III2) which contain small black particles of organic material (Fig. 15, Nos 47–49). The source remains unknown but the form of the vessel(s) on this site would suggest an origin in Norwich rather than the west

side of the county. Only one eleventh-century 'sandwich' sherd was found (EMSW Jennings 1981, 23) (in *180*, III2).

Sherds are mostly dark grey to black, although there are some light grey sherds and some vessels have colour variations in the core and margins. A firing characteristic which is typical of (and possibly confined to) Norwich has black surfaces and a white core, apparently present from the tenth century onwards. There seem to be too many sherds for this to be imported. Some twenty sherds were partly orange or red on their surfaces. Several sherds (about three) are very hard, possibly over-fired and one other (in *100* III1) has become twisted and may be a waster.

Some 126 rims were found, of which three fragments are too small to be identified and seven are transitional with the Early Medieval wares with which they can be classed (*cf.* No. 32 with EM Nos 58–59, and No. 33 with EM Nos 55–56). Two rims were found with organic inclusions (see Fig. 15, Nos 47–49), and another storage jar stood out as also being a different (not Norwich?) fabric in that it contained an exceptionally high quantity of rounded quartz grains (Fig. 15, No. 50).

Most (93; 73.8%) of the rims are plain jars or 'cooking pots'. Of these, seven are small (diameter of 11cm or less). Only fourteen rims have no internal hollow and this includes five elongated everted, often tapering, examples which date to the eleventh century (Fig. 14, Nos 32–34) from the top of feature F*112*, and Period III2 onwards. Of the rims with internal hollow, common wedge-shaped types (*e.g.* Fig. 14, Nos 24, 25, 27) predominate (48.4% of rim total), including those with an exaggerated hollow (Fig. 14, No. 40). A dozen rims of larger jars (diameter of 16cm or more) were also found (Fig. 14, Nos 29, 41) and evidence is lacking as to whether these might have had handles or spouts; they all occur in eleventh-century or later contexts and they may simply reflect the tendency for vessels to become larger in the Early Medieval period. Two handled fragments were found which are probably from pitchers, and there is one 'O' spout fragment. Two rims have added clay bands indicating that they were storage jars, and there are twenty-two bodysherds with applied thumbed strips, derived from storage jars and deep bowls possibly of similar function. Rim fragments of three smaller bowls were found, one of which is spouted. A fragment of a probable flange suggests another bowl, and there is one small flat-bottomed dish of uncertain function which has curved areas cut out of the rim (Fig. 14, No. 44). No lamp fragments can be identified in this material.

Five bases (4.9%) were sagging, and 98 (95.1%) were flat. As well as the sherds with applied strips, seven rouletted sherds were found, one of which was square patterned and the rest diamond. One sherd has exterior burnishing. Many vessels are sooted, usually on the rim and exterior of the base or shoulder, and some have internal lime deposit (comparable to 'kettle fur'). Some sherds have an iron-coloured internal brown deposit, but this may have been caused by the layers of peat on the site (sherds not analysed). There are few sherds from the same vessels in this collection, gully F*122* (Period II) being the only feature with some matching sherds.

Figure 14 illustrates most of the Thetford-type ware rims from Periods I, II and III1, as, except for the top of gully F*112* in Period III1, these would seem to be late ninth-to-tenth century. Except for one storage jar (not illustrated), one bowl and larger jars Nos 26, 29 which may have had handles, the earlier vessels all seem to be cooking pots of common types, although the long neck of No.23 is unusual and may be later (*cf.* F*112*). It is also rather large, and an early eleventh-century date might be more satisfactory for this vessel.

Shelly wares

Most of the twenty-one calcitic-tempered sherds found were in the black deposits of Period III2, although an Early Medieval jar rim may be intrusive in this context. A similar rim was found residually in Period VI and there are two Late Saxon rims: a cooking pot and an inturned bowl. There is one sagging base. The particle size of the shell varies, probably indicative of different sources rather than date. Several sherds seem to belong to the inturned bowl, but otherwise different vessels seem represented. The bowl is heavily sooted on the exterior and the jar is stained internally with red; the other late jar has internal sooting finishing on a level line below the expanded rim top.

Stamford Ware

Thirty-nine sherds were found altogether, of which nine were of the late 'Developed' type (Fabric B, Glaze 3; all codes derived from Kilmurry 1980). These last represent three or four vessels, and one sherd is a handle fragment with combed decoration at the sides (H48, M33). Of the remainder, two sherds are unglazed, and one is a lamp or crucible (unsooted) V16/19). The twenty-eight glazed sherds come from eight to ten vessels, and seem to be mostly Fabric A or G although Glazes 1, 2, 5 and possibly 4, are present on the exterior only. One sherd has evidence for a handle.

A4 (*c.* 900–1150) occurs first in Period III2 (with one 'Developed' B3 associated with later intrusive material) but occurs otherwise residually in Periods IV–VI with non-joining sherds from same vessels possibly occurring in more than one context *e.g. 13* and *2*, *23* and *2*.

Some twenty-three residual sherds were found in *1* and *2* (Periods V and VI). A small 'Developed' sherd in *52* is contemporary with Period V.

Early Medieval wares

The 223 sherds in this category constitute some 10.6% of the site total and first appear in Period III2. The fabrics can be roughly divided into four groups.

1. Fine sandy (11.0% of EM). This resembles the fine Thetford- type wares and is mostly distinguishable by rim form and vessel size. Colours are grey (often light grey) and black. Fig. 15, Nos 52, 54, 57, 61, 63, 67, 68.
2. Sandy (60.1%). This includes thin sherds in red and black colours, but mostly comprises black sherds with mixed sand particles, some fine silver mica and occasional (varying amounts of) calcite. Fig. 15, Nos 53, 55, 56, 58, 59, 62, 64. This fabric is similar to the more sandy Thetford-type wares.
3. Harsh sandy (11.9%). This comprises sherds with larger and more frequent sand grains than (2), usually of rounded protruding quartz grains. Very occasional particles of mica and calcite occur. Colours are usually grey and red but can be brownish. Fig. 15, Nos 51, 60.
4. 'Sparse shelly' (EMSS Jennings 1981, 39) (17.0%). This has harsh quartz inclusions and coloration similar to (3), but the calcitic content is increased. Fig. 15, Nos 65, 66.

Fabric groups (1) and (2) can be related to Thetford-type wares by form in the eleventh century, but (3) and (4) are Early Medieval. Fabric type (4) in particular would seem to have appeared in the late eleventh-to-twelfth century. On this site rim No. 65 is intrusive or from the top of dumped material of Period II2, but otherwise fabric EM4 appears in Period IV.

Of the forty-eight rims found, only one may have been a bowl (Fig. 15, No. 51) and five are 'ginger jars' (Fig. 15,

Nos 52, 53). The rest are jars of varying forms. Some typology may be suggested here, based on fabric and form, in that small plain jars (*e.g.* No 54), upright (Nos 58, 59) and everted (Nos 55, 56, 57) precede the more 'developed' forms such as No. 68 which continues into the thirteenth century. Ginger jars are present from the beginning of the eleventh century. No handles were found in this collection. There were eighteen sagging bases. The only decoration is the slashed lines on No. 52 (Fig. 15) and one fragment which seems to show the remains of an applied thumbed strip (both in EM fabric (1)). Five rims have thumb-impressed tops (*e.g.* Fig. 15, No. 61). The raised lug of No. 69 is unusual for Norfolk, as it appears to be on the rim of a jar or cooking pot rather than a bowl (*cf.* Mellor 1976). The fabric of this vessel is fine sandy and would seem to date to some time in the twelfth-thirteenth century. The form is likely to be derived from imitating metal cauldrons. A similar example occurs in King's Lynn Museum but is unprovenanced.

Medieval wares

Of the 135 sherds found, half (53.5%) are Norfolk unglazed wares. These are thin-walled and occur in fine sandy, usually light grey, fabrics. Only one rim fragment (a jar) was found (but *cf.* EM No. 68) and six sagging base fragments. Most sherds are sooted, usually on the exterior.

The glazed wares (46.5%) seem to all be jug fragments, there are only two rims (Fig. 15, Nos 70, 71). Some twenty-two glazed sherds, representing about five or six vessels, have fabrics tempered with rounded quartz sand inclusions, silver mica, and occasional small particles of chalk and calcite; this would seem to be a local fabric. Two sherds, from different vessels, have vertical narrow applied strips with pinched-looking finger impressions. Finer sandy sherds, with little or no mica and smaller more varied inclusions, also occur and one of these may have derived from Grimston in north-west Norfolk. Four sherds with bands of glaze stripes in different colours may have been imported from Sible Hedingham in Essex. Only two orange-glazed sherds occur, and there are two sagging bases and two bodysherds in a fine sandy orange fabric (in *2*, Period V). The medieval sherds would seem to be nearly all of Norfolk origins except for three sherds with white slip which may come from other areas of England (see Unidentified below).

Late Medieval/Early Post-Medieval

A few LM/EPM bodysherds were found in Period VI which would seem to be of local origin. One bodysherd of a Dutch-type vessel (Jennings 1981, 134–142) in an orange sandy fabric with orange- glaze spots on the interior and exterior was found in F*172*. The soil *183* between walls F*184* and F*185* produced a bodysherd of Glazed Red Earthenware (Jennings 1981, 157–185) with internal and external orange glaze, the base of a handled bowl in an orange sandy fabric with thick internal greenish-yellow glaze, and the base of a bowl with an internal mottled green glaze. Two sherds of imported German stoneware (one Frechen, one Raeren) were found unstratified.

Unidentified

Sherds left unidentified in Table 2 are possibly imported. They are:

a) Seven bodysherds (two vessels) in Period III2 in a fine sandy micaceous fabric with grey exterior and light pink or orange interior may be French if they are not a local Thetford-type variant.

b) One bodysherd in Period V may be an unusually fine and dense local sherd if a patch of green glaze on its exterior is not accidental: on fabric grounds it could be Rhenish or North French (M. Redknap pers. comm.).

c) Three medieval sherds from different vessels in Period V have white slip beneath the glaze, and may be regional imports from other parts of England.

Continental Imports

Some 221 sherds (10.6% of the site total) have been classed as Continental imports (see also Unidentified and Middle or Late Saxon categories). About 110 of the imported sherds are tiny flakes of red-painted 'Pingsdorf-type' ware in Period IV (see below) which have been included in Table 2 but placed in brackets in Table 3 and are not included in the percentage calculations of the imports.

Except for one Dutch bodysherd in Period VI, the Continental imports span the eighth-twelfth centuries although only five sherds are Middle Saxon (Fig. 16, Nos 72–75). The quantity of imports from the Rhineland may be as high as 95% as the sherds of uncertain origin could be from this area if not North French.

The imported wares have been classed as follows:

1. Flanders (not illustrated). One sherd residual in Period III1. A fine black bodysherd with orange partly 'sandwich' core, exterior burnished cordon. Southern Belgium, eighth-ninth century (ident. C. Coutts).

2. Badorf-type ware (Fig. 16, Nos 72–75). Nineteen sherds, 17–18 vessels, Periods III1 onwards. All are bodysherds with rounded quartz grain inclusions, in buff, yellow, light brown and pinkish colours. Three sherds with square-patterned rouletting (illustrated Nos 73–75) are eighth-ninth century in date, and one probable Badorf-type sherd has a horizontal incised line. The sherds are otherwise featureless and most seem likely to be from cooking pots and pitchers rather than large storage jars. No Relief-band Amphorae seem to be present. Some sherds may date to the twelfth century (Mark Redknap pers. comm.), and others to the tenth-eleventh century. Except for unstratified rim No. 72 the sherds are likely to be Middle Rhenish in origin.

3. 'Pingsdorf-type' ware (Fig. 16, Nos 78–91). Sixty-seven sherds *c.* thirteen to fourteen vessels, plus about 110 tiny chips and flakes, Periods III2 onwards. Most of these sherds (*c.* 167 fragments representing three or four incomplete vessels) were found in a clay patch (feature *53*) on top of chalk floor (*54*) in Period IV (twelfth century) which contained some charcoal but which did not appear to have been a hearth. Some twenty-seven sherds (in this group and in layers above) represent one red- painted pitcher in a reduced bluish-grey fabric (Fig. 16, Nos 85–89). One collared rim of a red-painted vessel was found in the black soil of Period III2 (Fig. 16, No. 78), and there are two pinched footring bases (Fig. 16, Nos 80 and 90). The red-painted wares occur in eleventh-twelfth century contexts on this site and would seem to be of that date. They all seem to be Middle Rhenish in origin.

4. Paffrath-type ware (Fig. 16, No. 92). Thirteen sherds, *c.* four vessels, Period V onwards. There may be other grey Rhenish sherds classed as Thetford-type ware (*cf.* the black and white vessels, p.21 which coincide with the Thetford-type wares in tempering and form and seem too numerous to be imported) but this is unlikely as these vessels are hard, often with distinctive quantities of rounded quartz grains, and 'blue-grey' in colour. One cooking pot rim of tenth-eleventh century date was found (Fig. 16, No. 92) and the other sherds are bodysherds, one of which has at least two horizontal grooves. The introduction of these vessels in Medieval Period V would seem to be in residual context and as most of them are in layer *52* they perhaps derive from the same twelfth-century deposit above chalk floor *54* as the dump of Middle Rhenish red-painted wares *53* (see 'Pingsdorf-type' above). An eleventh-twelfth century date for these Rhenish imports seems likely.

5. Source uncertain (Fig. 16, Nos 76–77). Four bodysherds in Period III2 have been left unclassified although they would seem to belong to the above groups, and two other sherds may be either Rhenish or Northern French. Both of these last are illustrated. Number 76 (Fig. 16) (Period III1) is from a buff vessel with almost vertical sides and a ridged exterior. Number 77 (Fig. 16) (Period III2) is orange and has two horizontal grooves on the exterior.

	Modern	PM	LM	Med.	Dev. Stamford	Stamford	Early Medieval	Shelly	Imports	Thetford	MS or LS	Ipswich	Hand-made	Roman	Unident.	Total
I										26		4	3	1		34
II										25		1				26
III1									7	133		27	11	1		179
III2	2	2		4	1	4	41	13	20	831	5	73	15		7	1018
IV				3		5	40	2	157	61	1	4				273
									(47)							
V				76	4	14	77	2	31	148		8	1		4	365
VI	1	3	2	21	3	4	37	3	4	22		1	1			102
1	4	4	1	31	1	3	28	1	2	27		1				103
Total	7	9	3	135	9	30	223	21	221	1273	6	119	31	2	11	2100
Percentage	0.3	0.4	0.2	6.4	0.4	1.4	10.6	1.0	10.6	60.6	0.3	5.7	1.5	0.1	0.5	

Table 2 Pottery: fabric types.

	Flanders	Badorf	Red-Painted	Paffrath	N.French or Rhenish	Andenne	Normandy	Dutch	Source Unident.	Total	Percentage
III1	1	5			1					7	6.3
III2		8	6		1		1		4	20	18.0
IV			1		46					47	42.4
			(+110)							(157)	
V		3	14	11		3	31	27.9			
VI		1		2				1		4	5.4
1		1	1							2	
Total	1	19	67	13	2	3	1	1	4	111	
			(177)							(221)	
Percentage	0.9	17.1	60.4	11.7	1.8	2.7	0.9	0.9	3.6		100
Unstrat.			3	1					1		

Table 3 Pottery: continental imports.

The unidentified bodysherds are three plain grey vessels, probably Rhenish or Rhenish/North French, and an orange bodysherd with a band of horizontal grooving on the exterior (possibly Rhenish?).

6. Andenne (Fig. 16, No. 93). At least three sherds (three vessels) in Period V. The rim of a pitcher is illustrated (Fig. 16, No. 93) and there are two bodysherds with yellow and orange glaze. They are probably all twelfth-century or later.

7. Normandy gritty ware (not illustrated). One bodysherd, intrusive in Period III2. White fabric with many rounded quartz grains, patchy yellow glaze on exterior. Twelfth-century or later.

Catalogue Nos 1–71, English Wares
(Figs 14, 15)

Nos 1–5 Hand-made

1. Fabric HM1. Black. Interior and exterior soot. *100 Period III1.*
2. Fabric HM1. Black. Exterior soot. *20 Period III2.*
3. Fabric HM3. Black with brownish, smoothed, surfaces. *104 Period I.*
4. Fabric HM1. Black. *116 Period III2.*
5. Fabric HM1. Black. Internal 'grass' impressions. *91 Period III1.*

Nos 6–11 Ipswich-type ware

6. Fine sandy Fabric IW1 with much fine silver mica. Dark grey with black interior, core partly reddish. Scraped vertically on exterior and horizontally on interior. Soot on exterior but also on broken edge. *182 Period III2.*
7. Fine sandy Fabric IW1 with fine silver mica. Medium grey smoothed exterior, interior horizontally trimmed. Some external soot. *99 F98 Period III1.*
8. Fabric IW2. Black surfaces, dark reddish-brown core with grey margins. Heavy soot on exterior and top of rim interior ending in a horizontal line. *F89, Period II, filled in III1.*
9. Fabric IW1 with some fine silver mica and find sand particles. Dark grey with black exterior surface. Soot on exterior and some patches on interior. Rim slightly twisted. *111 F112, Period III1, filled in III2.*
10. Fabric IW4. Dark grey surfaces, medium grey core. Heavy patches of soot on exterior and rim top, soot on rim interior ending in a horizontal line. *85 primary fill of pit F83, Period IV.*
11. Fabric IW4. Light grey with black interior and part of rim top. *121 Period III1.*

Nos 12–18 Middle or Late Saxon

12. Exceptionally thick base, grit drag-lines on exterior indicate wheel-thrown. Quartz sand fabric, fairly fine resembling IW1. Black with grey interior margin and red/grey exterior surface. Thickness possibly acquired by applying internal layer after throwing. Trimmed. Some burning after breakage. *181 Period III2.*
13. Quartz sand tempering. Dark grey. *20 Period III2.*
14. Quartz sand tempering. Medium grey. Some internal horizontal wiping. *20 Period III2.*
15. Quartz sand tempering. Black. Rim slightly twisted. *20 Period III2.*
16. Fine quartz sand. Light grey. *20 Period III2.*
17. Quartz sand tempering. Black. *35 F34 Period IV.*

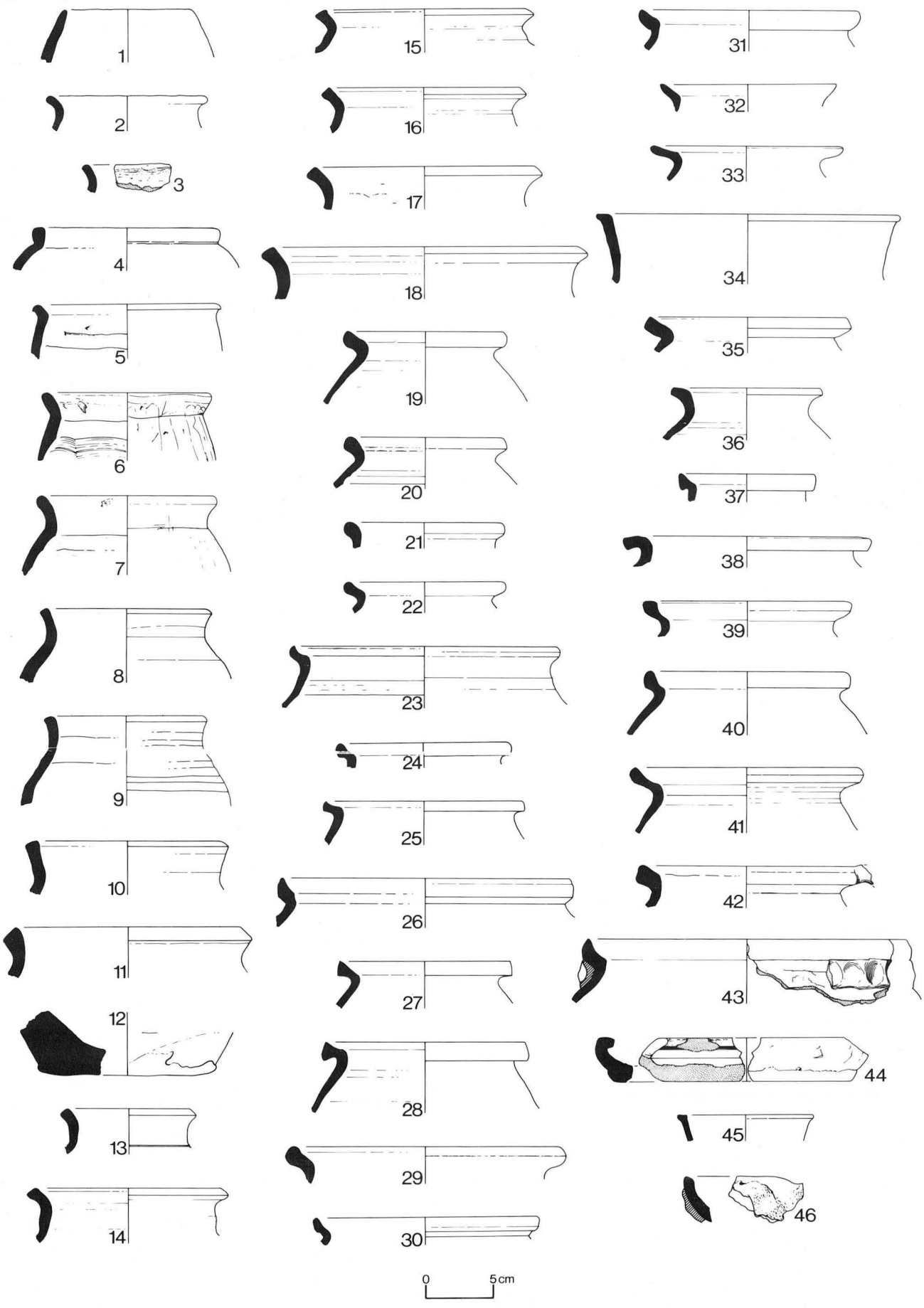


Figure 14 Pottery, Nos 1–46. Scale 1:4.

18. Fine quartz sand. Light grey. *75 Period III2.*

Nos 19–50 Thetford-type

19. Fine. Light grey core, dark grey/black surfaces. Soot on rim top. *104 Period I, peat marsh.*
20. Fine. Core partly reddish, dark surfaces. Soot on rim top. *123 F122 gully, Period II.*
21. Fine. *123, F122 gully, Period II.*
22. Fine. Soot on exterior and interior of rim. *123, F122 gully, Period II.*
23. Medium-fine. Black with light grey margins. *F89 gully, Period II, filled in III1.*
24. Fine with fine silver mica. Black. Soot on rim top. *97 Period III1.*
25. Medium. Black, possibly sooted, exterior and rim top, rest medium grey. *97 Period III1.*
26. Medium. Dark grey, light grey margins and interior below rim. *97 Period III1.*
27. Fine. Core and interior below rim whitish light grey, rim and exterior black (possibly sooted). *121 Period III1.*
28. Fine. Light orange. Rim edge heavily sooted. *100 Period III1.*
29. Medium. Medium grey. *100 Period III1.*
30. Fine. Medium grey surfaces, whitish light grey core. *96 Period III1.*
31. Medium. Medium grey. Some soot on rim top. *111 Gully F112, Period III1, filled in Period III2.*
32. Medium. Medium grey core, darker surfaces. Soot on exterior and rim top. *111, F112. Period III1, filled in Period III2.*
33. Medium. Medium grey core, darker surfaces. Soot on exterior and rim top/edge. *111, F112 Period III1, filled in Period III2.*
34. Medium with fine silver mica. Black. Soot on exterior and rim top. *111, F112 Period III1, filled in Period III2.*
35. Fine-medium. Medium grey interior and core, black exterior. Soot on exterior and rim top. *181 Period III2.*
36. Fine. Medium grey. Soot on rim edge. *cf.* Ipswich-type ware. *78 Period III2.*
37. Fine. Dark grey surfaces, medium grey core. *78 Period III2.*
38. Fine. Dark grey surfaces, medium grey core. *78 Period III2.*
39. Medium-fine. Dark grey surfaces, medium grey core. *78 Period III2.*
40. Medium. Dark grey to black. Some soot patches on exterior. *20 Period III2.*
41. Fine. Black surfaces and whitish core. Soot on exterior and rim ending in a horizontal line at bottom of rim. *78 Period III2.*
42. Pitcher or handled jar. Medium. Medium grey. Abraded interior. Burnt after breaking. *78 Period III2.*
43. Storage jar: no handles on 1/8 rim surviving. Medium-fine. Black surfaces, medium grey core. *166 Period III2.*
44. Dish. Rim trimmed, and cut into at least two hollows. Medium. Black with light grey margins and interior. Purpose unclear. *20 Period III2.*
45. Small bowl. Medium. Black. Internal soot. *78 Period III2.*
46. Crucible. Possible fragment of a heating tray (see section V. above). *2 Period V.*

Fig. 15

47–49. Storage jar, probably same vessel. Fine sandy with small organic particles (rounded up to 3 mm, thin elongated (?chaff) up to 5mm). Black surfaces, whitish light grey core. Interior abraded. *20 and 78 Period III2.*

50. Storage jar, no handles on small fragment surviving. Fabric with many small (up to 1mm) rounded ?quartz grains (mostly dark grey, some clear or white), rare flat white particles and extremely fine silver mica. Very light grey surfaces, light grey core. *1 Period VI, contaminated.*

Nos 51–68 Early Medieval

All forms are jars unless stated otherwise.

51. Bowl. Fabric EM3. Dark grey to black. Soot on interior. *75 Period III2.*
52. Ginger jar. Fabric EM1. Light brownish-grey surfaces with black exterior, light grey core. *20 Period III2.*
53. Ginger jar. Fabric EM2. Black with reddish-brown exterior margin and abraded grey exterior surface. *20 Period III2.*
54. Fabric EM1 with fine silver mica. Medium grey. Some soot on exterior and interior. *20 Period III2.*
55. Fabric EM2 or sandy Thetford-type ware. Dark grey. Soot on rim and exterior. *75 Period III2.*
56. Fabric EM2. Black. Soot on exterior. *20 Period III2.*
57. Fabric EM1. Light grey with black exterior. Some soot on exterior. *180 Period III2.*
58. Fabric EM2. Black. *20 Period III2.*
59. Fabric EM2. Black. Some soot interior and exterior. *20 Period III2.*
60. Fabric EM3. Dark grey to black. Some soot on rim top. *20 Period III2.*
61. Fabric EM1. Black. Diameter *c.*30 cm. *52 Period V.*
62. Fabric EM2. Black. Cracked from burning, and untidily made (but would seem to be EM rather than hand-made). *40 F39, Period V.*
63. Fabric EM1. Light grey. No soot. *2 Period V.*
64. Fabric EM2. Medium grey. Soot on top, interior and exterior of rim. *2 Period V.*
65. Fabric EM4. Medium grey with red margins. Some exterior soot. *20 Period III2.*
66. Fabric EM4. Dark grey with red exterior margin. Some soot on exterior. *38 F22, Period VI.*
67. Fabric EM1. Medium-light grey, light grey margins. *178 Period VI.*
68. Fabric EM1. Light grey with black exterior. Soot on exterior, top of rim, part of interior of rim, and lower interior. Fabric similar to local unglazed medieval wares. *2 Period V.*

No. 69 Early Medieval or Medieval

69. Raised pierced lug. Probably on jar rather than bowl (*cf.* EM form No. 59), but rim compressed by addition of lug. Fine sandy fabric, *cf.* EM1. Light brown surfaces, light grey core. Soot on exterior and top of lug. Diameter unclear because of distortion, but probably in excess of 20cm. *2 Period V.*

Nos 70–71 Medieval

70. Jug. Sandy, with visible mica. Light grey with red exterior. *2 Period V.*
71. Jug. Sandy. Light orange with light grey core. External dark yellow and dark green glaze. *2 Period V.*

Nos 72–93 Imported wares

(Fig. 16)

Nos 72–75 Middle Saxon Badorf-type wares

72. Rim of storage jar. Fabric many subangular quartz grains, up to 2mm, occasional dull red and dark grey particles, rare fine silver mica. Orange. Seventh-eighth century, possibly Lower Rhenish. *Unstratified.*
73. Fabric dense with fine (average *c.*0.3mm) quartz inclusions, and occasional dark brown inclusion (ore?). Yellowish-white. Badorf-type, eighth-ninth century. *100 Period III1.*
74. Fabric dense with fine quartz grains, occasional fine red and brown inclusions (ores?) and fine silver mica. Yellowish-buff with greyish-brown exterior. Badorf-type, eighth-ninth century. *78 Period III2.*
75. Fine sandy with fine quartz and occasional fine silver mica. Medium grey core, light grey interior, dark grey exterior, some soot interior and exterior. Laminated fracture Badorf-type, eighth-ninth century. *1 Period VI.*

Nos 76–77, source not certain

76. Fabric many rounded quartz grains, average less than 0.5mm. Buff. Rhenish or North French. *95 Period III1.*
77. Fabric fine quartz inclusions with occasional larger irregularly-shaped white, red (up to 2 mm) and brown (ores?) particles. Light reddish-orange. North French or Rhenish. *78 Period III2.*

Nos 78–91 Middle Rhenish red-painted wares

78. Collared rim, red-painted. Fine (*c.* 0.2mm) rounded quartz grains. Black core, white margins, light grey exterior, pinkish interior. Eleventh to twelfth century. *75 and 78 Period III2.*
79. Fabric fine quartz, fine silver mica, occasional fine white and soft red particles. Light orange core, yellowish-white margins, light yellow surfaces, ochre-coloured paint. *78 Period III2.*
80. Base. Fabric sub-angular quartz (*c.* 0.5mm) grains. Light whitish-grey with light grey exterior. *53 Period IV.*
81. Fine quartz inclusions. Whitish with light yellow exterior, red paint. *53 Period IV.*
82. Fabric fine quartz, some white granular inclusions up to 5mm. Greyish-white with medium grey exterior, dark red paint. *53 Period IV.*
83. Fine quartz inclusions. Light grey with medium grey exterior, (burnt?) black paint. *53 Period IV.*
84. Fine quartz, with occasional black, dark brown, white, and light grey inclusions (up to 2mm). Light grey, part of core dark grey, red paint. Laminated fracture. *53 Period IV.*
85–89. Same vessel. Fabric dense and harsh with many quartz inclusions (up to *c.* 0.5mm), occasional black particles (up to 2mm), very occasional soft red (ore), soft brown (iron ore?), granular white, and very fine silver mica. Reduced Middle Rhenish red-painted ware.

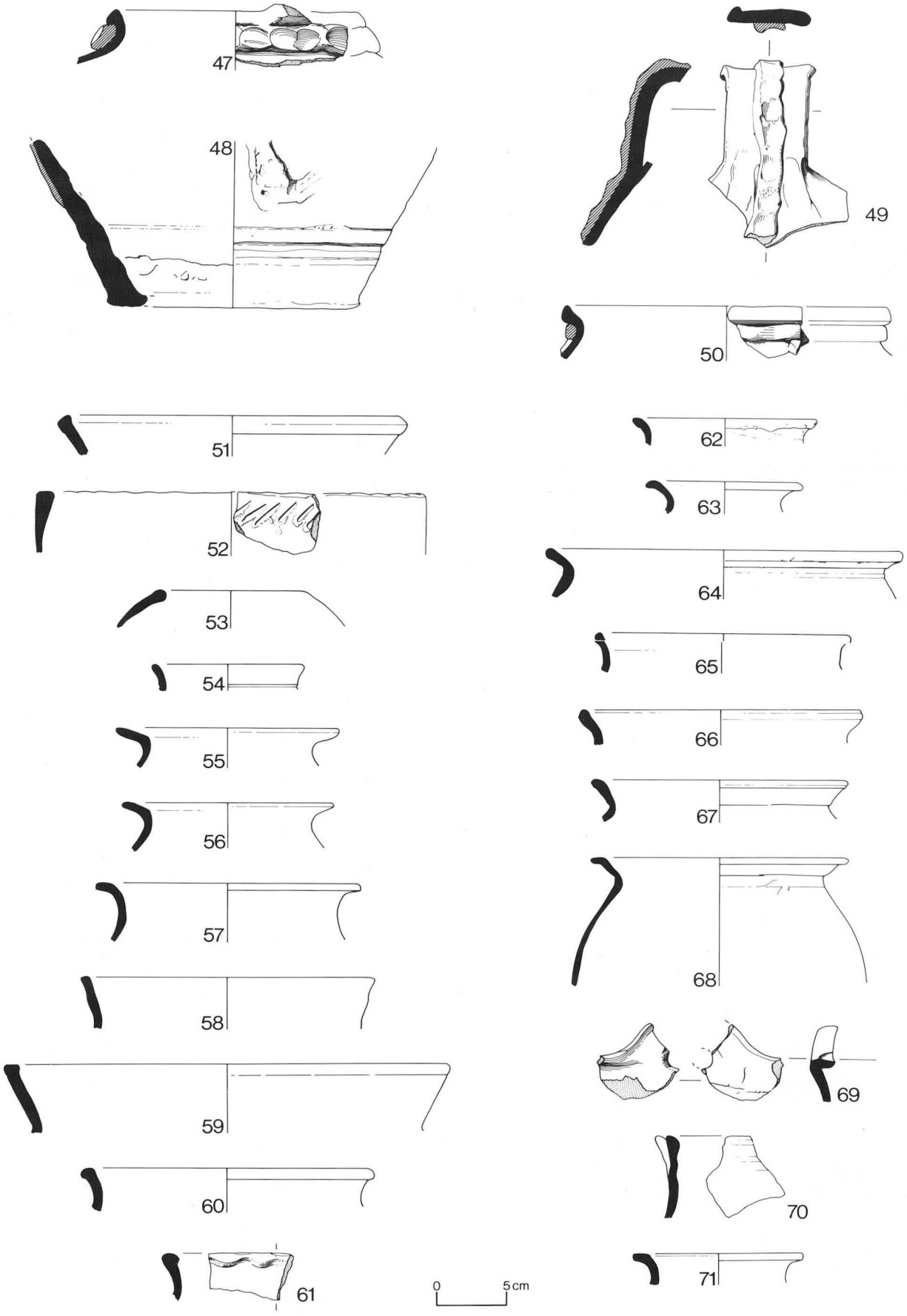


Figure 15 Pottery, Nos 47–71. Scale 1:4.

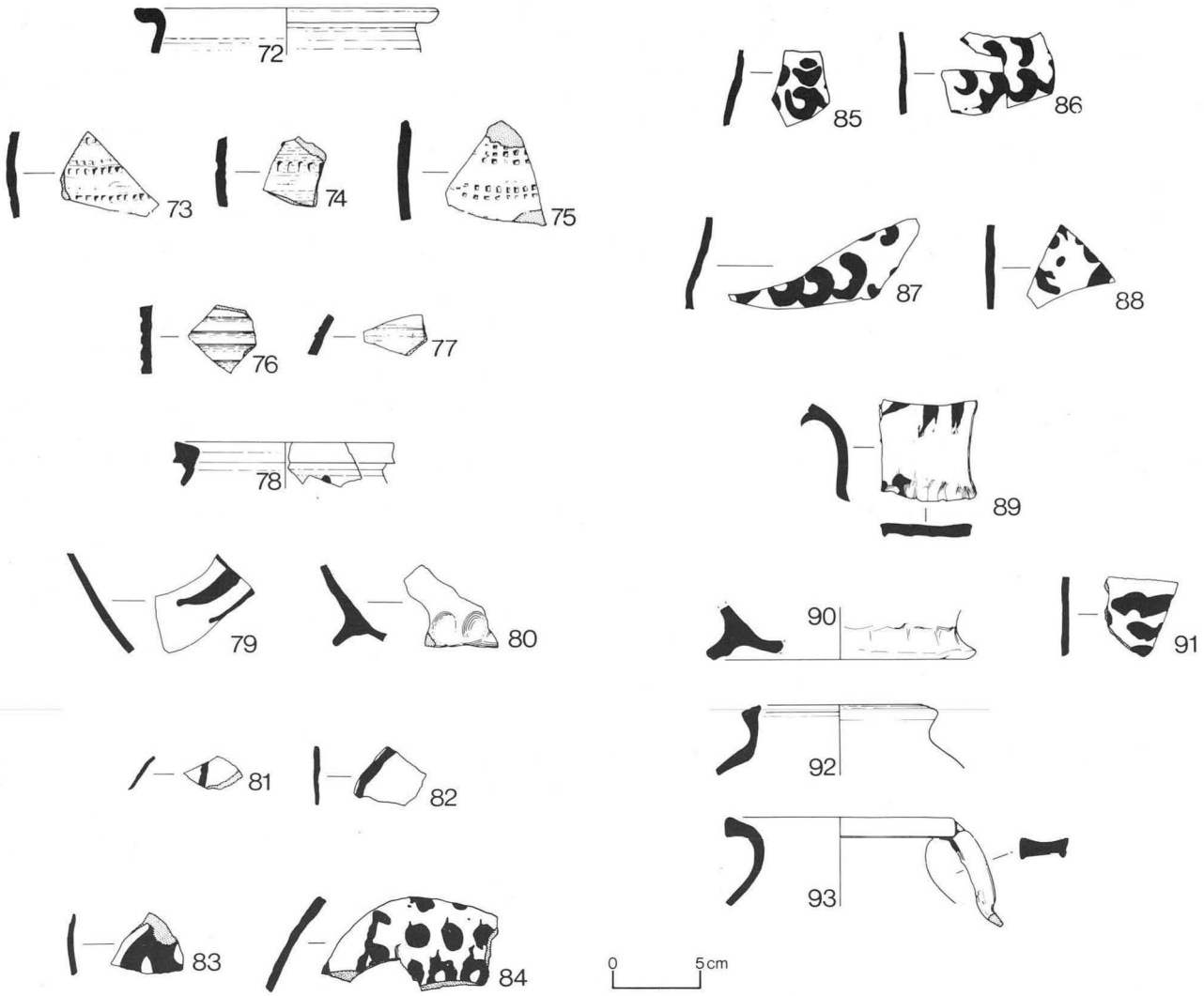


Figure 16 Pottery, Nos 72–93. Scale 1:4.

Nos 85–87 *53 Period IV*; No. 88 *52 Period V*; No. 89 *2 and 37 Period V*.

90. Base. Fabric dense quartz grains, occasional dull red inclusions, very occasional black particles and fine silver mica. Light bluish-grey core, light yellowish-brown surfaces. Middle Rhenish red-painted. *37 Period V.*

91. Fabric quartz, occasional black particles. Light brown, dark grey paint. Middle Rhenish. *1 Period VI.*

No. 92 Paffrath

92. Rim of cooking pot. Fabric contains rounded quartz, angular black inclusions, some very fine silver mica? Light grey core, blue-grey surfaces. Sooted, including some on broken edges. Paffrath/Katterbach type. Tenth to eleventh century. *Unstratified.*

No. 93 Andenne

93. Rim of pitcher. Fine quartz sand. Light orange core and interior, dark orange exterior, top of rim light yellowish- orange, one spot of orange glaze. Andenne. *52 Period V.*

Discussion

A couple of Roman sherds were found in this assemblage, but this is not sufficient evidence for Roman occupation in close proximity to the excavations. The Middle Saxon pottery, however, must indicate seventh- (or more likely eighth-) to ninth-century occupation in the area. The presence of the marshy area precludes features of this date and the sherds would seem to have been haphazardly deposited. They were all found associated with Thetford-type ware in residual contexts and although the area of the settlement did not occur within the excavated trench it must have been close at hand as the Middle Saxon pottery was found throughout the site sequence. This also would indicate that the Middle Saxon pottery is likely to have derived from this bank, rather than a possible area of Middle Saxon settlement in the Cathedral Close and Tombland area opposite (Carter 1978), as mere discard from the other side of the river cannot have occurred so consistently. The Fishergate trench produced more Ipswich-type sherds from a small area than had previously been recovered in total from Norwich. Within this earlier total, over sixty sherds came from the area of the Cathedral Close across the river from Fishergate. Only a few sherds have hitherto been found in the north bank and Magdalen Street area near the Fishergate trench, *e.g.* two at Botolph Street (Sites 281N and 170N) (one of which was in the Late Saxon ditch, Jennings 1985, 130), one at Alms Lane (Site 302N) (Jennings 1985, 179), and one in Magdalen Street (Site 168N). The position of the 1985 excavations under discussion on the river front near the central bridgehead perhaps accounts for more fruitful ceramic results.

Although most of the Middle Saxon sherds from these excavations were found in Period III, they occur in all phases and have not simply been deposited in the homogenous black soil of Period III2. Their presence on a percentage calculation by period is greatest in Period III1 (21.2%) and then in Period I (20.6%), Period III2 (8.6%), and Period II (3.8%). Above the Period III2 black deposit, the quantity decreases significantly.

These percentage calculations with high totals of M/S pottery relative to finds elsewhere in the city include both the Ipswich-type ware and the hand-made wares, as the latter need not indicate a seventh-century or Early Saxon phase for at least three reasons: (a) hand-made pottery has been found in association with Ipswich-type ware in other large groups of Middle Saxon pottery found so far in Norfolk (1986) *e.g.* Burgh Castle (Dallas 1983, 105), Caister-by-Yarmouth (Dallas 1993), North Elmham (Wade 1980, 416 and 419), Bircham (Dallas 1978, 40), Congham (Norwich Castle Museum 153.971) and Sedgeford (Hurst 1957, 35); (b) its frequency on this site is relative to the frequency of the Ipswich-type ware, particularly in Periods I–III2; and (c) the rather developed form of a few of the rims suggests a Middle Saxon date (*e.g.* Nos 4 and 5) and there are no stamped or decorated forms. It is therefore probable that the hand-made vessels could be contemporary with the Ipswich-type ware and it is not necessary to argue a seventh-century overlap.

Any interface is more likely, perhaps, to have occurred with the introduction of the Thetford-type wares, perhaps as early as the late ninth century. The site sequence begins with activity associated with Thetford-type ware and this type of pottery is the most numerous in the total assemblage. As a percentage of each phase it too declines after Period III, being I (79.4%), II (96.2%), III1 (74.3%), III2 (81.8%), but IV (38%), V (39.7%), VI (23.9%).

Although other sites in Norwich have produced similar quantities of tenth- to twelfth-century Thetford-type wares, the assemblage on this site must indicate Late Saxon occupation of this bank for the same reasons given for the Middle Saxon period (above). Late Saxon settlement in this area, although clearly inferred by topographical and other evidence, has hitherto not been supported by excavated material. Thus, the assemblage from the Fishergate site is of great importance being of relatively substantial quantity and scattered throughout the sequence rather than merely dumped. This demonstrates that there must have been tenth-century occupation on this bank.

In general, the Thetford-type wares from this site are fine vessels which are likely to be Norwich kiln products (kilns are known to have been in production from the tenth to twelfth centuries in the Bedford Street and Pottergate area (Atkin *et al* 1983). One overfired bodysherd in Period III1 may indicate that some pottery production also took place on this side of the river in the late tenth century, but the evidence is too slight to have much significance placed upon it. Several other sherds have been fired to an unusual state of hardness, but this might have been caused by subsequent firings, including other industrial practices.

This site provides a good temporal sequence of Thetford-type ware rim developments in the tenth and eleventh centuries (Figs 14 and 15) with some new forms and larger vessels in the eleventh century. Forms seem limited in variety, being mostly 'cooking pots' in average sizes. The vessels have been used, probably for domestic purposes as many are sooted from cooking or have internal lime accretion from boiling water. Few sherds belonging to the same vessels were found, which accords well with the secondary nature of most of the material with no pit groups or likely rubbish heaps. The pottery was mostly derived from other areas nearby and did not originate from domestic occupation within the trench area.

The quantity of Early Medieval wares seems less than might have been expected, although the production of Thetford-type wares in Norwich into the twelfth century may partly account for this. Some of the fine sandy Early Medieval wares resemble Thetford Wares so closely in fabric that they must be Norwich products, whereas other, coarser, sherds come from a variety of other (as yet undefinable) sources.

The Early Medieval sherds appear first in Period III2, which must be eleventh-century in date. The renewed activity resulting in more archaeological features in Period IV above the black deposit of Period III2, would seem to be of the twelfth century. The incidence of Early Medieval wares as a percentage of each phase increases steadily although they must be residual in Periods V and VI: *viz.* Period III2 (4.0%); IV (24.5%); V (21%); VI (31.7%). Of note is dye production of twelfth-century date as several vessels, including a shelly ware, seem to have been used to heat madder dye.

Also appearing in Period III2 are wares from other parts of England such as Stamford Wares and shelly St Neots-type wares from west of the Fens: none are present in Periods I-III1 and none of the sherds need to be earlier than the eleventh century, particularly as no Stamford Wares earlier than the late tenth century were found. Also in Period III2 were several enigmatic rims which would seem acceptable for local fabrics but are in unusual forms. The rims resemble Middle or Late Saxon wares but the long-necked forms are not usual for Norfolk. Similar vessels were found at Caister-by-Yarmouth (Dallas 1993) and it would seem that these are either an east Norfolk variant or imported by water from Northern England.

Period III2 also sees the appearance of red-painted imported sherds from the Rhineland, which account for over half of the Continental imported wares. At least five imported sherds (one from Flanders and four Rhenish) are of Carolingian date comparable to the Middle Saxon pottery and these occur residually. They show evidence for Continental trade in the vicinity in the eighth-ninth century although these sherds would only constitute 3.3% of the Middle Saxon sherds.

The absence of Continental imported sherds in Periods I and II perhaps reflects the absence of imports which can be postulated as tenth-century in date. A few Rhenish (and Northern French?) sherds appear in Period III1, all of Badorf-type and undecorated except for grooving. Middle Rhenish red-painted wares appear in Period III2 and would seem to continue into Period IV. This accounts for over half of the imported wares, including residual sherds (Table 3). The few Paffrath-type sherds do not occur until Period V but the only rim (No. 92) is Saxo-Norman and most of the sherds seem to be from this vessel. A few Andenne sherds, and one from Normandy, complete the import sequence (until Dutch material in the early post-medieval period) and medieval continental imports seem to be lacking. This shows a marked decline in this area after the twelfth century as the site sequence continues with a limited range of local wares. In terms of archaeological theory this could simply indicate changes of use as it is known that the Abbots of

Waltham Abbey acquired the property at about this time and several vessels in them medieval group derive from Sible Hedingham in Essex, perhaps reflecting this connection. However, it is also probable that the ceramics reflect the changes in Norwich after the Norman Conquest and the shift of the port downstream to the King Street area (Ayers 1983, 56–7).

A similar decline was observed in the waterfront excavations some 250m downstream east of this trench, at Whitefriars (Ayers 1983) and the Magistrates' Court site at Palace Plain (Ayers 1987). In the former the Saxo-Norman imports form a similar percentage of the site total, and Pingsdorf-type wares also dominate the imports, although again the statistics are affected by many sherds from the same vessels. On the larger Courts site, the Continental imported wares constitute less than 4% of the site total, although there are three times as many sherds as from Fishergate. The composition of the types within the imported groups is rather different (Wilkinson 1987) as only some 37% are Middle Rhenish and nearly 10% of these are Relief-band Amphorae. Andenne wares account for nearly 40% and there is a small percentage of French imports. Although there are medieval imports on the Courts site, a decline is noticeable after *c.*1150 (Wilkinson 1987, 87) and there is a *floruit* in the eleventh and twelfth centuries (Wilkinson 1987, table 6). The differences in origin of the imports witnessed by the larger quantities of Andenne wares on this site may be partly accounted for by date range (there is also a higher percentage of local Early Medieval wares), but may also reflect the trade contacts of different properties along the early waterfront.

Although the quantity of imported material from the Fishergate site is not a very large group, it shows Middle Saxon occupation in the area with some, possibly limited, continental trading contacts. The development of the trench area in the tenth century is not accompanied by obvious Continental links, an occurrence observed elsewhere (Wilkinson 1987, 102). The activity peaks in the eleventh and early twelfth centuries, although the sources for the imported wares still seem narrow in range being nearly all Middle Rhenish. Although the haphazard nature of archaeological recovery should be borne in mind, neither Relief-band Amphorae in the earlier contexts nor many Andenne wares in the later contexts seem to have reached this spot, and the significance of this may be economic rather than purely temporal. Only further excavations could demonstrate whether this sample is typical.

Summary of Conclusions

The importance of the Fishergate pottery can be summarised thus:

1. It demonstrates the presence of Middle Saxon occupation in the vicinity with some Continental trading contacts with the Rhineland.

2. It demonstrates the presence of Saxo-Norman occupation, and the site sequence begins with the consolidation of the waterfront in the late ninth or early tenth century. Evidence for Continental trade at this stage is lacking, but quantities of eleventh-twelfth century Rhenish imports were found. The range of sources seems limited, with no Relief-band Amphorae and little Low Countries Andenne wares. After the twelfth century the site ceramics contain little of significance being all local or English wares, although the importation of sherds from Essex is of some interest.

IX. Bone and antler objects

by Val Williams

Combs and comb fragments

(Fig. 17)

Terminology follows Galloway (1976)

All pieces are of antler.

1. Broken **end tooth segment** from a composite single sided comb. *Period III1 S.F.205.99*
2. Broken **tooth segment** from a composite single sided comb. *Period III2 S.F.124.20*

2a. Broken uncut tooth segment. Length = 26mm. *Period III2 S.F.125.20*

A total of five uncut tooth segments or segment fragments were recovered from deposits of Periods III1, III2, IV and VI. These, along with fifteen fragments of worked antler and seven fragments of worked bone are probably the residue of an antler and bone working industry operating on or near the site, as with a similar assemblage from the north-east bailey of Norwich Castle (Margeson and Williams 1985, 27).

3. Decorated **connecting plate fragment** from a composite single sided comb. Four rivet holes. The base is notched and indicates five teeth per cm. Probably eleventh to twelfth century. *Period III2 S.F.284.181*

Tools and utensils

(Fig. 17)

4. **Implement** formed from the tip of an antler tine. Function uncertain. A similar recent find from Southampton (Ian Riddler pers. comm.) has been tentatively identified as a pottery stamp but this does not have the transverse groove. A possible use in leatherworking has been suggested (*ibid.*) although again the transverse cut is problematical.From a tenth century context. *Period II S.F.157.168*
5. **Double-ended pinbeater.** Highly polished overall. ?Horse metapodial. For discussion on use see Rogerson and Dallas (1984, 170). *Period III2 S.F.12.20*

5a. Pin shaft. Minimum of working, point formed by oblique cut. Length = 60mm. *Period III2 S.F.34.20*

6. **Needle.** Pierced twice, probably due to breakage of upper hole. Highly polished overall, including broken edges. ?Cetacean mammal bone. *Period III2 S.F.47.20*
7. Incomplete **pin.** *Period III2 S.F.58.75*
8. Incomplete **pin.** ?Cetacean mammal bone. *Period III2 S.F.135.20*

8a. Pin shaft. Minimum of working. Length = 41mm. *Period III2 S.F.282.78*

Nos 5a, 7 and 8a are manufactured from pig fibulae. For a discussion on the use of similar implements see Williams (1987, 100).

Miscellaneous

(Fig. 18)

9. **Worked antler point.** *Period III1 S.F.131.100*
10. Undecorated **antler ring.** Shaped from antler burr. Peripheral hole probably part of natural coronet. Similar pieces recovered from Early Saxon contexts, *e.g.* Spong Hill, Norfolk (Hills and Penn 1981, fig. 178 nos 1719, 1878 and 1922), are dated to the fifth to seventh centuries. For a discussion on the use of antler rings see MacGregor (1985, 108). *Period III1 S.F.142.91*
11. Fragment of decorated antler **plate** with part of an incised dot in double circle motif. *Unstratified S.F.234 u/s*

X. Wooden objects

(Fig. 19)

With comments by Carole Morris

All pieces are of oak unless otherwise stated.

1. **Trenail** fragment. Ash. *Period I S.F.230.88*
2. Faceted-headed **peg.** This is unlikely to be a peg for securing structural elements and is therefore probably domestic in origin. *Period III1. S.F.138.97*
3. Fragment of structural element, probably an offcut of **beam slot.** The slot appears to have been chiselled out. *Period III1. S.F.172.103*

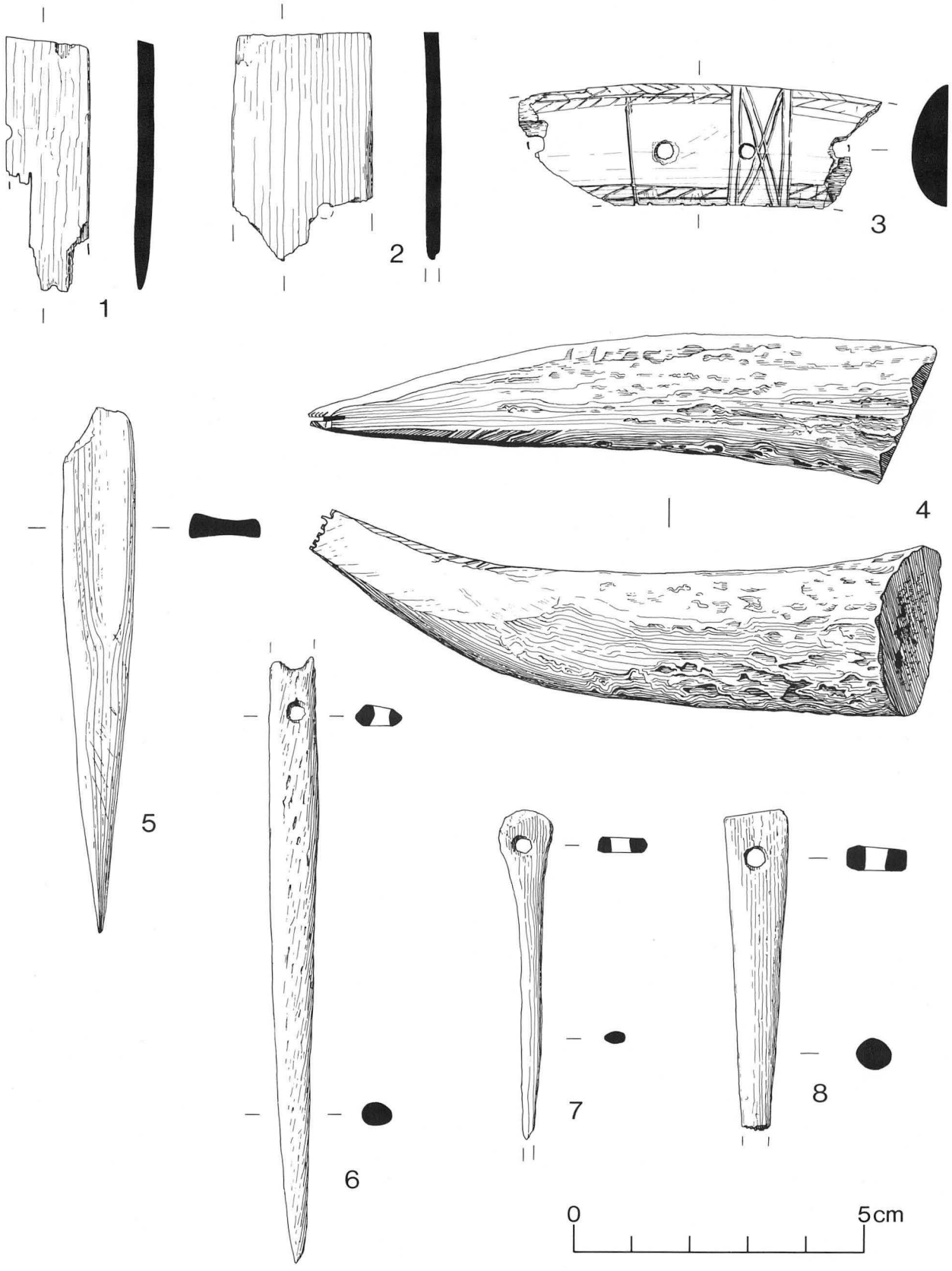


Figure 17 Bone and antler objects, Nos 1–8. Scale 1:1.

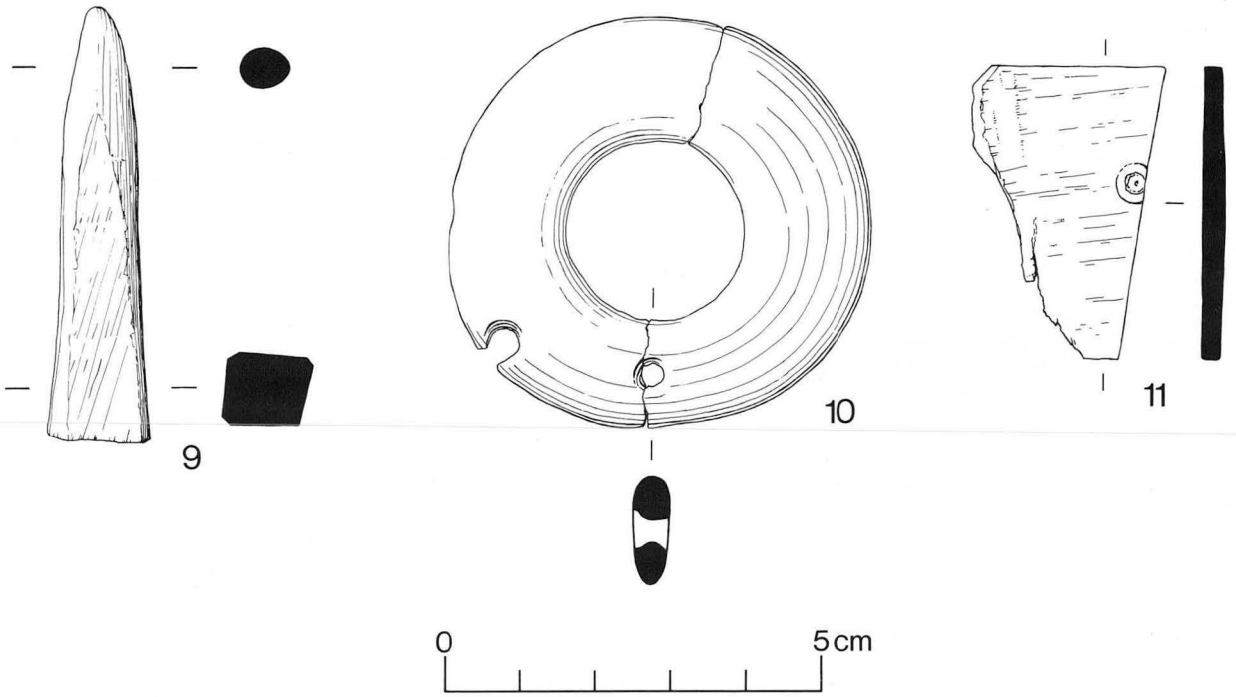


Figure 18 Bone and antler objects. Nos 9–11. Scale 1:1.

4. Small lathe-turned **bowl**. Decorative groove on external surface just below rim. Alder. Alder was the most popular wood for lathe-turned vessels before the Conquest, the preference turning to ash in the post Conquest period (Morris 1984, 231). *Period III2. S.F.83.92 and 84.92*
5. Possible **tool** with a chamfered blade. The hole at the tip is damaged and appears to have been pulled through. One side of the handle is shaped, the other being roughly cut. *Period III2. S.F.101.94*
6. Crude **peg**. Wood type unknown. *Period V. S.F.30.37*
   Nos 1, 2 and 6 all appear to be made of wood from split billets or sections, not branches. This is for strength as branches are comparatively brittle.
7. **Bale pin**. Used to hold sacking or similar material round bales of wool. This type dates from the twelfth to the fifteenth centuries. Yew. *Period VI. S.F.227.183*

XI. Leather

(Fig. 20)
by Brian Ayers

Fragments of leather objects and offcuts were recovered from deposits in Period I, Period II and Period III (Phases 1 and 2). The greatest numbers were located in Period II (eleven) and Period III Phase 1 (ten). The Period II finds were all from context *123*, the fill of linear feature *122*. Those from Period III Phase 1 were mainly from context *108*, the upper fill of linear feature *107*, the only other find being a fragment from Period IV.

The Period II material generally consists of offcuts and fragments with evidence of stitching, presumably indicating cobblers waste. The deposit, however, also contained a thonged shoe (No. 1). The Period III Phase 1 material consists of belt and strip fragments, probably comprising the remains of two belts in total (Nos 2 and 3). The Period I and Period III 2 fragments comprise offcuts and thongs with one belt or strip fragment from context *75*, one of the homogeneous silty clay loam deposits.

Catalogue

1. Upper and fragment of the sole of a thonged turnshoe. The pieces are attached by a thong passing through lozenge-shaped holes at the margins. The sole is delaminated, the upper partly so. The upper has been cut at the heel so that one of the quarters is missing. The vamp has a rectangular tongue with edge-stitching. A hole in the side of the upper and markings on the leather indicate shoe thongs or similar ran across the instep. *Period II. S.F.159.123.*
2. Fragments of a belt. All delaminated except for one fragment (S.F.118) which is only partly so. Each fragment has two central parallel channels of stitching (stitch length 6mm). *Period III Phase 1. S.F.109.108; S.F.118.108.*
3. Fragments of a belt. Each edge of the belt has rows of parallel stitching (stitch length 3–4mm). *Period III Phase 1. S.F.112.108.*

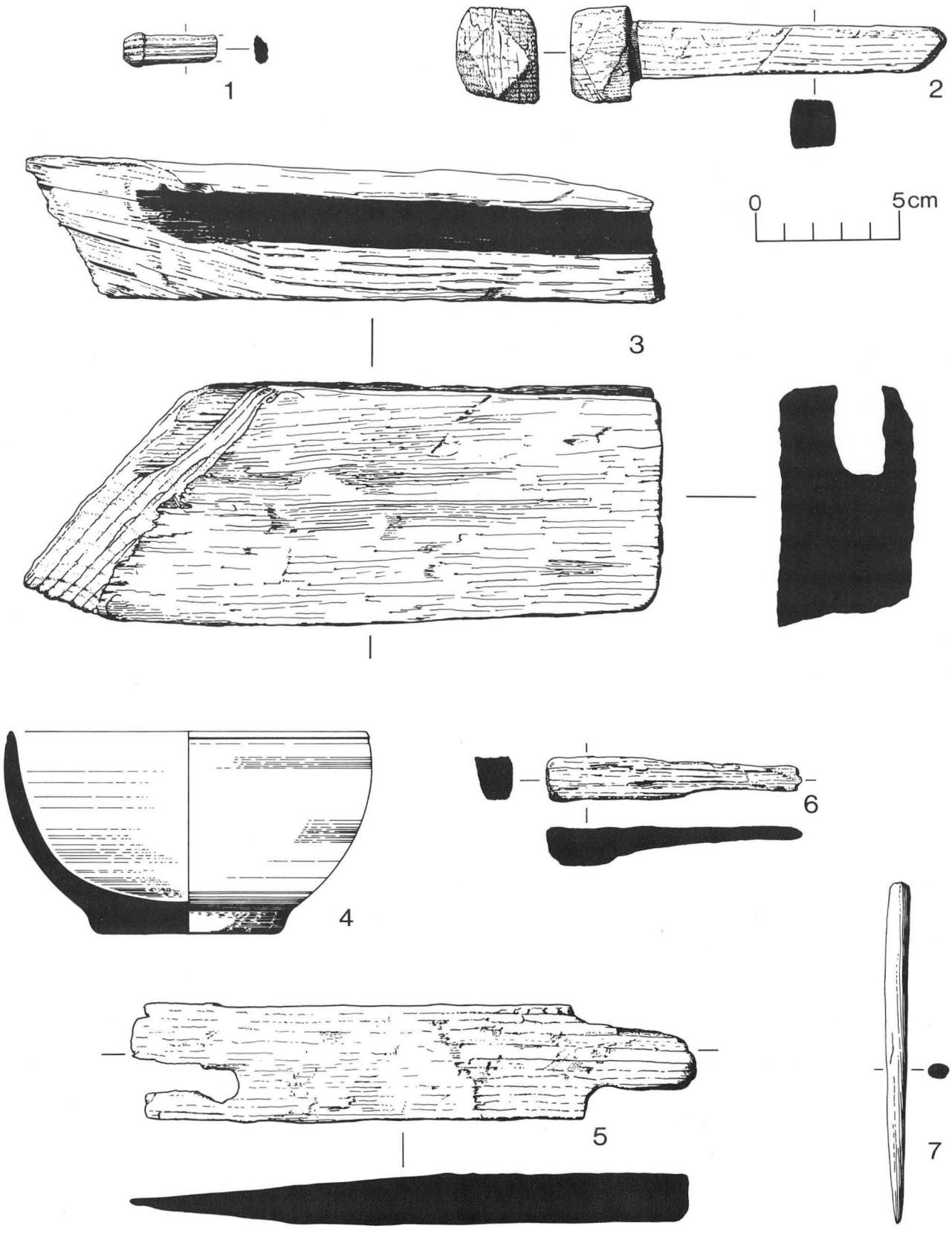


Figure 19 Wooden objects, Nos 1–7. Scale 1:2.

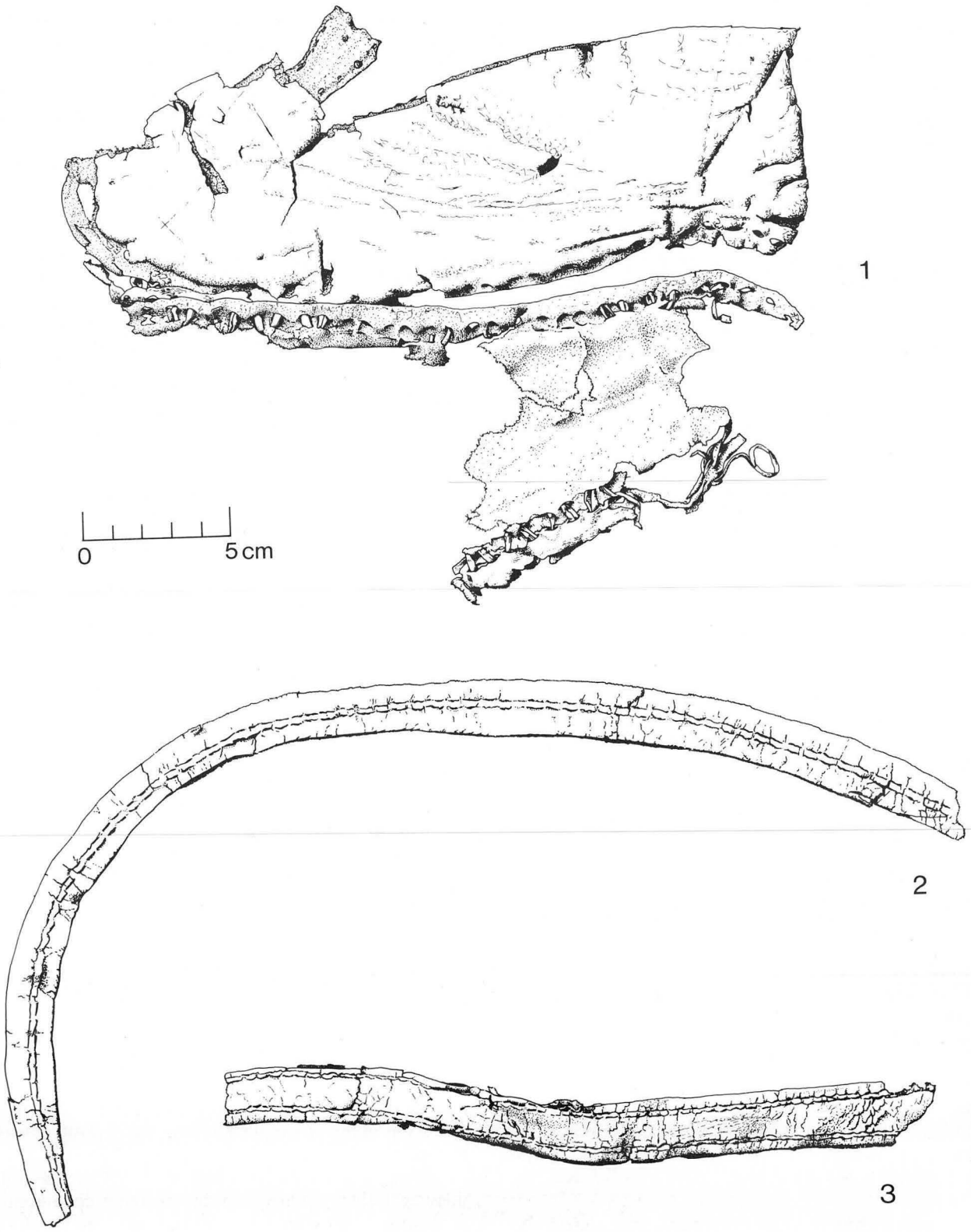


Figure 20 Leather objects. Nos 1–3. Scale 1:2.

Chapter 4. The Environmental Evidence

I. Introduction

by Peter Murphy

At Fishergate a single exploratory trench was dug in order to assess the depth, character and date of waterfront deposits in this area. The results are in some ways complementary to those obtained during recent excavations on the waterfront at the Whitefriars Street Car Park and the Magistrates' Courts (Ayers and Murphy 1983; Ayers 1987). These two sites produced data mainly on the economy and local environment of the Late Saxon and medieval city, but at Fishergate dumped deposits of tenth century and later date overlay layers of peat. Peat development began during the early Flandrian, after which there is a gap in deposition, followed by renewed peat growth, continuing until approximately the tenth century AD. Analysis of macrofossils and pollen from these peats has yielded a discontinuous picture of habitat change in the area prior to urban development. Biota from the overlying archaeological deposits and from the few features exposed in plan give further information on Late Saxon and medieval economic activities. A short summary and discussion of the results for the non-specialist reader is given below.

Methods

To investigate the main sequence of deposits two column samples (numbered together sample 12) were collected from the section face close to the southern edge of the trench for analysis of pollen and macrofossils. Sampling the lowest 20–30 cm of the sequence was difficult because the compacted peat *175* (=*104*) acted as a seal over the subjacent gravels and when this peat was removed water gushed out. The peat/gravel contact was under water in the deeper parts of the trench even with pumps in operation and the lowest macrofossil samples had to be collected by levering up blocks of peat from below the water with a spade. Samples were also obtained for laboratory processing from the Period II linear features *90* and *123*, and from *162*, the organic fill of the Period VI barrel. In addition smaller samples were taken where conspicuous concentrations of macrofossils occurred, including locally shell-rich deposits (*121*) and discrete groups of fish-bones (*55*, *99*, *111*). Large samples from *78* and *106* were collected for bulk-sieving/flotation (*c.* 70 litres and 25 litres respectively).

As at earlier excavations on the Norwich waterfront, macrofossils were extracted from the deposits using the methods of Kenward *et al* (1980). Exactly the same procedures were followed at Fishergate as at the Magistrates' Courts and Whitefriars Street Car Park sites (see Murphy, in Ayers 1987; Ayers and Murphy 1983 for full details).

The deposits and their biota: general characteristics

The deposits at this site included a wide range of natural and semi-natural sediments and archaeological layers formed in very different depositional environments. Before discussing in detail the results of analyses of macro- and micro-fossils it will be helpful to describe the general characteristics of these deposits, to outline the distribution of biota in them and to draw some inferences from these characteristics about the conditions in which the deposits were formed.

Field descriptions of deposits sampled in column sample 12 are given in Table 4. Percent dry weight and percent loss on ignition were determined by drying samples in an oven at 100°C for twenty-four hours and ashing in a muffle furnace at 500°C for four hours. The results are given in Table 6 (fiche) and summarised in Figure 21. Loss on ignition is partly determined by the organic content of the deposits but is also related here to the presence of other components such as charcoal, wood, chalk and shell. The residue after ignition from most samples of *175* (=*104*) consisted mainly of a red powder and this is thought to indicate that *175* included a high proportion of hydrated iron oxides precipitated in this peat from water percolating through the local terrace sands and gravels. These terrace deposits are known to have a high limonite content in places, which was exploited as a low-grade iron ore in the Late Saxon period (Fisher 1985).

Small ferrugenous concretions from the peat were examined by Paul Budd, who comments:

'The material is certainly iron-rich and is highly vesicular, giving it an appearance not unlike iron smithing slag. It is the nature of the vesicles themselves which allows the material to be distinguished from fayalitic slag. Close examination under the microscope revealed that the vesicles (or voids) were highly irregular shapes, often long and thin, whereas in smithing slags the vesicles are usually roughly spherical (since they are formed by gas bubbles in molten or semi-molten material). Also many of the voids in the material had slight black deposits on their inner surfaces, probably the remains of organic material. It seems likely from this that the numerous small voids which give the material its vesicular appearance have been left by the decay of rootlets around which the ferrugenous concretion has built up.'

The distributions of macrofossils in column sample 12 are summarised in Table 5. In part these distributions reflect depositional factors: charcoal, carbonised cereals, nutshells, mollusca, bone and avian eggshell are obviously common in the archaeological deposits but rare or absent in the underlying peat *175* (except in the topmost level). Differential preservation has also affected these distributions, however. In the permanently waterlogged anaerobic deposits at the base of the section uncarbonised seeds and insects are well preserved but they are rare or poorly preserved in the predominantly mineral deposits towards its top.

From the characteristics described in Tables 4–6 it is possible to assess in outline the changing conditions of deposition. Brief references will be made here to relevant results from macrofossil and pollen analyses, which are discussed in detail below.

1. Fluvial sandy gravel, deposited in a vigorously-flowing channel presumably in the Late Devensian or Early Flandrian.

45–56cm	(*52*)	Very dark greyish-brown silt loam; stony with small chalk pebbles and rare small angular and subangular flints; bone, mollusc shells and charcoal fragments; sharp boundary.
56–65cm	(*54*)	Layer of crushed chalk in a greyish-brown silty matrix; some very dark greyish-brown patches; brownish and ochreous staining on surfaces of chalk fragments; sharp boundary.
65–93cm	(*78*)	Black humose loam; stony with small to medium angular to sub-rounded flints and quartzite pebbles; (small flecks of vivianite); charcoal fragments common; mollusc shells and bone; narrow boundary.
93–104cm	(*95*)	Black structured organic loam; slightly stony, with small angular to rounded flint and quartzite pebbles; rare small chalk fragments; (calcium phosphate concretions); scraps of decayed wood and fibrous plant material; charcoal fragments common; fly puparia abundant; mollusc shells; sharp boundary.
104–113cm	(*96*)	Very dark grey structureless humose loam; very stony with small to medium subangular to rounded flints and quartzite pebbles; rare small chalk fragments; scraps of decayed wood; mollusc shells; sharp boundary.
113cm		Thin layer of *Phragmites* culm and leaf fragments with other indeterminate monocotyledonous plant remains; sharp boundary.
113–133cm	(*97*)	Very dark greyish-brown structured organic deposit; slightly sandy; stoneless; abundant twigs, wood and bark fragments at top, decreasing towards base; becoming more compacted towards base; merging boundary.
133–163cm	(*175*)	Very dark brown compacted peat; slightly sandy; *Phragmites* stems and rhizomes and other monocotyledonous plant remains common; indistinct boundary.
163–183cm	(*175*)	Very dark brown compacted peat; slightly sandy with discrete irregular patches of yellowish-brown coarse sand; rare small rounded and subangular flint pebbles; reddish concretions; rare small twigs; some monocotyledonous plant remains; red fibrous plant material; one large (6cm diameter) branch fragment; indistinct boundary.
183–195cm (approx)	(*175*)	Very dark brown compacted peat; very slightly sandy; very rare small subangular flints; some monocotyledonous plant remains and woody roots.
195cm + (approx)		Gravel in a coarse greyish-brown sandy matrix.

The main features of these deposits visible without magnification are recorded. Features noted in brackets were not apparent in the untreated samples, but were obvious after sieving. The peat/gravel contact was not seen, being under water even with pumps operating. Measurements of depths were taken from the top of the section exposed. Due to lateral variations in the thicknesses of these layers the depths recorded in the pollen column differ from those of the macrofossil column.

Table 4 The deposits and sediments sampled in column sample 12

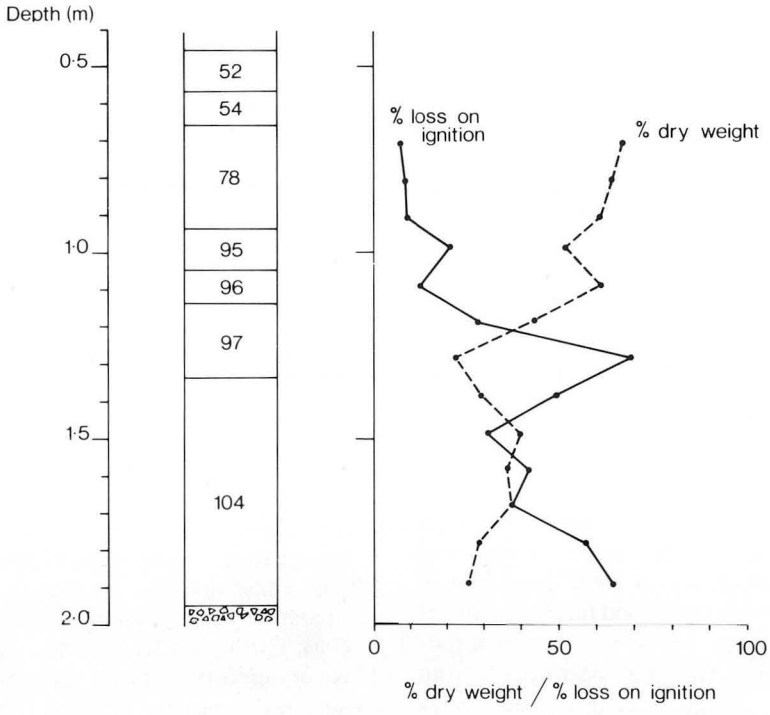


Figure 21 Percentage dry weight and percentage loss on ignition for deposits sampled in column sample 12.

	52	54	78	95	96	97	175
Wood	+	-	-	+	+	++	+
Charcoal	+	+	++	++	+	+	+
Carbonised cereals	+	+	+++	+++	+	+	-
Seeds *etc.*	+	+	++	+++	++	++	++
Nutshells (*Corylus*)	+	-	+	+	-	+	-
Mosses	-	-	-	-	-	+	+
Charophytes	-	-	-	-	-	-	+
Phragmites etc.	-	-	-	-	-	+	++
Foraminifera	-	-	+	-	-	-	-
Insects *etc.*	-	+	+	++	+	++	++
Marine molluscs	++	+	++	++	++	++	+
Land/freshwater molluscs	+	+	-	-	+	-	-
Fishbone	++	+	++	++	++	+	-
Other bone	++	+	++	+	++	+	+
Avian eggshell	-	-	+	+	+	+	-

The number of '+' gives an approximate indication of the relative abundance of different types of macrofossil.

Table 5 Distribution of macrofossils in sub-samples of column sample 12.

2. Peat below 183 cm (*175* (=*104*): Period I). A radiocarbon date of 9410±110 BP (uncal) (HAR 7062) was obtained on a peat sample from the base of this peat at 195 cm. The peat below 183 cm was highly compacted and humified, with a loss on ignition of around 65%. Plant macrofossils from this peat are mainly of aquatic and reedswamp taxa. The insect remains similarly are predominantly of aquatics and waterside species, including insects characteristic of slow-moving or stagnant water. Peat development during the early Flandrian under reedswamp and isolated from the main river channel is indicated.

3. Peat at 173–183cm (*175*: Period I). The macrofossil assemblages from this level are sparse and poorly preserved. Badly degraded nutlets of *Urtica dioica* are present, together with single individuals of only seven insect taxa. The sample at this depth thus appears to indicate a phase of desiccation and humification, during which the peat formation ceased. This break in deposition was not recognised on site, mainly because the deposit was partly submerged when sampled.

4. Peat between 133 and 173cm (*175*: Period I). Loss on ignition decreases reaching a minimum value of 32% at 143–153 cm, before increasing above 143cm. These variations are partly due to the presence of iron compounds and partly to variations in the sand content of the peat. The resumption of peat growth was thus followed by an increase in the mineral content of the peat. These changes correlate with a *Tilia* decline in the pollen record (see below, section VIII). It is thought that a phase of extended deforestation, probably of later prehistoric date, followed by increased surface run-off resulted in wetter conditions in the valley floor and in increased soil erosion. Between 163 and 183cm there were discrete patches of sand and pieces of wood, possibly relating to some local human disturbance. There was, however, no food refuse in the peat at this level, nor any artefacts. Above this there is a progressive reduction in the frequencies of macrofossils from aquatic and reedswamp plants, and a rise in the frequencies of marsh, riverbank and grassland species towards the top of the peat, suggesting a drier marsh surface towards the end of Period I. The increase in percentage loss on ignition at the very top of the peat may be registering a decrease in the frequency of flooding episodes, hence less mineral sediment deposition.

Hudson (1898) describes a section just upstream from this site, at Fye Bridge, which showed peats extending across the valley floor for about 100m with an average depth of about 1.5m.

5. Organic deposits between 113 and 133cm (*97*: Period III(1)). No deposits of Period II (tenth century) were present at this point in the section, though linear features, *90* and *123*, whose fills incorporated domestic refuse were sampled at other locations in the trench. The upper part of *97* included quantities of carbonised cereals, wood, marine mollusc shells, bone and avian eggshell, together with an insect fauna indicating abundant decomposing matter. The top of this layer thus represents the earliest large-scale dumping of refuse onto the marsh surface. However, the assemblages of macrofossils from the lowest 10cm of *97* are more similar to those from the top of the Period I peat. *97* is best seen as a transitional layer between natural peat development and the use of the site for dumping. Within it there is a very marked change in organic content, as measured by percentage loss on ignition and dry weight. Artefacts place this layer in the late tenth-early eleventh-century, though the radiocarbon date on the organic matrix at the top of *97*, at 113cm, is 1150±80 BP (uncal) (HAR 7061). This discrepancy presumably arises from the trampling and reworking of the peat surface during refuse dumping.

6. Thin layer of *Phragmites* stems and leaves at 113cm. These seem to represent a brief phase of stability during which refuse dumping ceased and reeds colonised the dumped deposits, which presumably remained wet by capillary action.

7. Dumped deposits between 93 and 113cm (*95*, *96*: Period III(1)). These deposits are clearly dumped layers with a comparatively high mineral content.

8. Dark Earth between 65 and 93cm (*78*: Period III(2)). This very uniform deposit, some 30cm thick at this point, closely resembles the organic Dark Earth described by MacPhail (1983, 46) from the site at Whitefriars Street Car Park (Site 421N). It has a similar uniformly dark colour and very similar loss on ignition (6.8–8.9% compared to 6.9% at Site 421N). Like the Whitefriars Street Dark Earth that

at Fishergate includes vivianite and large quantities of charcoal and food refuse. It seems to consist predominantly of dumped material.
9. Deposits above 65cm (*52*, *54*: Period IV (eleventh-twelfth century)). *54* consists of a densely packed deposit of crushed chalk, laid down presumably to provide a firm surface for riverside activities. On this surface deposits of refuse with a high chalk content (*52*) accumulated.

II. Mammal and Bird Bone

by Gillian Jones

The mammal and bird bone from Fishergate, of late ninth century to late medieval date, is summarised in Table 7.

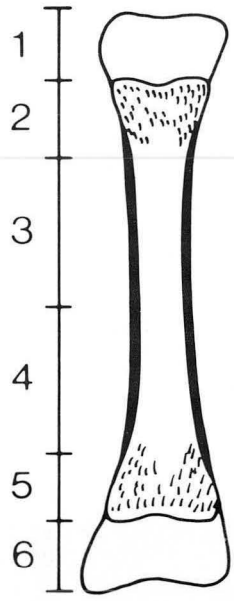
Method

(Fig. 22)

The main bone assemblage was hand collected. A small quantity of bone was recovered from the sieved samples. Bone was recorded on two lists, with the more complete bones on a zone list and the other bones on a fragments list. On the zone list were recorded complete bones or bone pieces as follows:

Skull:
substantial pieces of horncore, frontal, lacrimal, malar, parietal, squamous temporal, occipital; upper jaw and mandible with at least one tooth present; loose teeth.

Long-bones:
where more than half of any of the six areas shown on Figure 22 was present and where the following small areas of bone were present: humerus, the distal posterior part of the shaft; radius, the proximal part of the ulnar groove; femur, the supracondylar fossa; tibia, the anterior, distal part of zone 4.



Division of Long Bones into six zones (figure after Baker and Brothwell, 1984 p.44).

Figure 22 Division of long-bones into six zones.

Other bones:
more than half the following bone or bone elements: vertebra, the body and central arch; scapula, the neck and glenoid cavity; ulna, the olecranon and proximal articulation; pelvis, the iliac shaft and the iliac, ischial and pubic parts of the acetabulum; calcaneum, the proximal part and articulation; the patella, astragalus and phalanx.

With cattle, substantial pieces of the ends of long-bones, even when less-than-half complete, were included on the zone list. This was done in order to avoid loss of important epiphysial fusion data. However, few bones fell into this category, due to the well-preserved and relatively unfragmented nature of the bone assemblage.

The separation of the fragments in bone recording may be useful, in that it is likely to be less repeatable than that of the more-complete segment. Accurate identification of fragments probably varies somewhat between bone analysts, and for a single analyst depending on the time available for study. It will also tend to vary according to the number of similar-sized species present. Some fragments may be assigned to cattle which, if red deer and horse were as common as cattle, would have remained as 'large unidentified'. However, a fragment was not identified unless it bore clear features typical of the particular species.

Table 9 (microfiche), the Anatomical Analysis, shows the total number of bones (BN) and a reduced number of zones. For long-bones, these are zones 2 and 5, labelled p (proximal) and d (distal), and zone 4 for the humerus, femur and tibia, and zone 3 for the radius and metapodials, labelled s (shaft).

Dating

The dating of the bone is based on the identified site periods (see Chronological summary, p.ix) which were themselves dated by artefacts. There was, however, residual earlier pottery in later phases and some of the bone may therefore also be residual earlier material.

General description of the bone

The bone from the Period I marsh deposits was well-preserved and dominated by cattle. Many of the bones were fairly complete and had surfaces which were dark in colour and hard with little abrasion. The good state of preservation of the bone suggests that the marsh was used as a primary dump. In general few bones appeared to relate to each other. Upper and lower jaws of cattle from context *129* probably belong to each other, but, for example, no distal tibiae with matching astragalus were found and only two immature cattle bones were recovered as both metaphysis and epiphysis (against fourteen unfused metaphyses without epiphyses and eight epiphyses without metaphyses). Of thirty immature vertebral centra, in only one case was a matching epiphysis preserved.

Bone from Periods III1 and III2 was also well-preserved. The bone was less dark in colour than the Period I bone and some of it bore a sandy accretion. Again, few bones related to each other (upper and lower jaws, hock joint bones, or metaphyses and epiphyses). One might suggest that casual dumping of bone took place over time and that there may have been some post-depositional movement of bone in the deposits.

It is expected that access to the marsh to dump bone would favour the large bones of cattle and that the high percentage may be more informative about the particular area of the town than the general supply of meat in Nor-

	I		II		III1		III2		IV		V		VI	
	z	BN	z	BN	z	BN	z	BN	z	BN	z	BN	z	BN
Cattle	317	497	22	46	235	350	480	774	107	178	5	8	76	120
		75%		*56%*		*54%*		*61%*		*41%*			*67%*	
Sheep/Goat	47	60	12	20	96	142	147	219	68	90	3	7	25	33
		9%		*24%*		*22%*		*17%*		*21%*			*18%*	
Pig	71	85	9	14	100	117	170	223	57	66	2	2	6	9
		13%		*17%*		*18%*		*17%*		*15%*			5%	
Horse		9				11		4						
Deer	red	1	red	2					cf.red	1a			fallow	2
									roe	1				
Dog		1								1				
Cat		1						2		4+2s		1		
Hare						1s								
House-mouse										3s				2s
Black Rat										6s				1s
Fowl		2				11		47		66		1		14
						1.7%		*3.7%*		*15%*				*7.7%*
Goose		3				7		8		25				2
						1.1%		*0.6%*		*5.7%*				*1.1%*
Duck (cf dom.)						1		1		3				
Teal (*Anas crecca*)								1		1				
Woodcock (*Scolopax rusticola*)										1				
Frog/Toad								10s						
Total identified														
3295		659		82		639		1279		437		19		180
Total 6207		1084		185		1101		2472		1001		40		324

Notes: z - more complete bones; BN - total number of bones; s - sieved (not counted in totals)

Table 7 Summary of animal bone.

wich. Percentages using other methods of calculation give the results shown on Table 8.

As is usually the case, proportions which exclude fragments give lower percentages for cattle. This is so for all the phases. It is even more marked in the count of the more complete main bones alone. This excludes those bones which were seen to be under-represented in the sheep or pig anatomical analysis, *i.e.* skull pieces, maxillae, loose teeth, vertebrae (except the first two cervical vertebrae), astragali, calcanea and phalanges.

Dominance of cattle bones was greater in Period I than Periods III1 and III2. This could be a depositional difference. The marsh may have been further from the settlement in the earlier period. It remains possible, however, that the difference reflects a greater reliance on cattle husbandry in the late ninth and tenth centuries. Pig bones were also significantly more numerous than sheep. There seems to be no reason why dumping in the marsh should favour pig rather than sheep bones, so it is concluded that more pork than mutton may have been eaten at this period in Norwich.

Period IV bone has a pattern more typical of occupation debris. The cattle percentage is lower and sheep bones are more numerous than pig. The number of species is greater and includes cat, house-mouse, teal, woodcock, rat and a surprisingly large quantity of fowl and goose, together forming 21% of the Period IV identified bone. The packed chalk surface of this phase indicates occupation/riverside work, and the bone also suggests occupation rubbish. The poultry bones may be remains from 'working lunches'. (The poultry percentage seems to be a real difference; fowl and/or goose were present in ten of the seventeen contexts and where many bones were found, *e.g.* forty-one bones in context *55*, they did not appear to be partial skeletons).

Very few bones from Period V were found. They include both cat and fowl and perhaps suggest occupational debris.

Period VI was of note for the pit containing cattle horncores (see Cattle section) which suggest a nearby horn workshop, appropriately sited near the river. Even excluding the horncores, the percentage of cattle bones is high for the late medieval period. This is the only phase of the site where sheep bones greatly outnumber pig. Numbers of poultry bones are also high. The only records of fallow deer (including a metatarsal, see measurements) are of this late medieval date.

Cattle

An anatomical analysis of the larger groups of cattle bones is shown on Table 9 (microfiche). For Period I, the body parts found reflect the good preservation of the bone. Upper jaws with at least one tooth present were as common as the stronger lower jaw, and there was moderately good preservation of the large cancellous long-bone epiphyses. It appears that all parts of the carcass were being deposited including numerous ribs and fragmentary vertebrae (see unidentified bone). The lack of caudal vertebrae may be a recovery bias.

The proportion of cattle bones recorded on the more-complete list was surprisingly similar for the main periods, at 64%, 67%, 62%, 60%, and 63% for Periods I, III1, III2, IV and VI respectively, suggesting similar degrees of fragmentation. This is higher, for example, than is usual on Romano-British sites where cattle bones were chopped into smaller pieces (*e.g.* 48–54% at Prestatyn, 52% at Amersham, Jones 1989 and forthcoming). An interesting question at this point is the size of cooking pot available. Many of the cattle main limb bones survived as one end plus a substantial length of shaft. For example, substantial pieces of cattle bone from context *100*, in Period III, measured 12–18cm. Rib pieces were also quite often as long as 17 or 20cm.

The Period III1 and III2 cattle bone shows some of the characteristics of poorer preservation. The lower jaw is much more numerous than the upper, and the compact-bone epiphyses are much more numerous that the softer, cancellous-bone epiphyses. Notable for their near-absence from these tenth-eleventh century periods were horncores.

	I				III1				III2			
	N	C	S	P	N	C	S	P	N	C	S	P
Total (BN)	642	*77*	*9*	*13*	609	*57*	*23*	*19*	1216	*64*	*18*	*18*
Zone	435	*73*	*11*	*16*	431	*55*	*22*	*23*	797	*60*	*18*	*21*
Zone, main bones	227	*65*	*12*	*22*	248	*47*	*28*	*25*	476	*52*	*24*	*25*
Min. no. of individuals		9	3	6		10	7	9		12	9	11
		(pe	sc	ra3)		(ti5	sc	md)		(sc	ti4	md)

	IV				VI			
	N	C	S	P	N	C	S	P
Total (BN)	334	*3*	*27*	*20*	162	*74*	*20*	*6*
Zone	232	*6*	*29*	*25*	107	*71*	*23*	*6*
	without horncores				77	*59*	*32*	*8*
Zone, main bones	152	*44*	*34*	*22*	60	*58*	*37*	*5*
Min. no. of individuals		3	3	4		16	5	1
		(sc	ti5	md)		(hc	ra3)	
						4		
						(hu5)		

N - sample size; C, S, P, - cattle, sheep/goat, pig;

"zone main bones" counts only mandibles with at least one tooth, atlas and axis vertebrae, scapulae, pelves and long-bones including metapodials (not abaxial ones). The minimum number is the most numerous bone element; e.g. for Period III1 cattle this was the right tibia, zone 5 (Fig.22).

Table 8 Percentages of the cattle, sheep and pig bones.

They were probably removed with the horn sheath and deposited elsewhere, as was the case at Thetford (Jones 1984 and 1993). Otherwise, all parts of the skeleton and many ribs were deposited.

Evidence of chopping up the carcass was common. Heavy chop-marks probably breaking the bone were more common than superficial, lighter cuts from filleting or carving. Chop-marks were commonest on the distal humerus and around the acetabulum of the pelvis. Chopping up of the scapula blade was frequent, though the glenoid and tuber scapulae were often not chopped. Dismemberment may have been done through the softer bone of the proximal humerus. Several humeri, radii, and metapodials seem to have been split lengthwise from one end. Rixson has observed that it is easier to cut a long bone and then split it lengthwise, to reach the bone marrow, than to chop across the thick compact bone of the shaft (pers. comm.). Vertebrae were sometimes chopped through transversely, suggesting that the spinal column was being chopped into sections.

Ageing data are shown on Table 10 (microfiche). Both mandible data and the long-bones show that few remains from calves were found. The mandible data gives tenuous evidence for later mortality during Periods III1 and III2, with nearly half the specimens in the latest stage.

The meat supply came as often from culled working and breeding animals as from young beasts. Proportions of unfused and late-fusing long bone epiphyses show little change, though there is confirmation of later slaughter in Period III2 from the vertebrae (late-fusing long-bone epiphyses: I N21, 48% unfused; III1 N9, 44% unfused; III2 N23, 48% unfused; vertebrae: I N43, 67% unfused; III1 N38, 68% unfused; III2 N42, 57% unfused).

In the latest mandible wear stage, the cement-enamel junction of M3 was above the alveolar border, *i.e.* the tooth was very worn. Absence of the second premolar was not observed. The posterior cusp of M3 was reduced or absent in four cases (I, 0 of 10; II, 0 of 1; III1, 2 of 6; III2, 1 of 7, IV, 1 of 2, counting only those M3s within mandibles) (and see Pathology).

The position of the nutrient foramen on the distal shaft was recorded. Occurrence inside the supracondylar fossa was slightly less common than outside (I, 2 inside, 2 outside; III1, 1 inside 3 outside; III2, 5 inside, 5 outside).

Measurements of the cattle bones are summarised on Table 11 (fiche). Numbers of specimens were not large enough for detailed study. There is some slight evidence that cattle from the earliest period (Period I, late ninth-early tenth century) were of good size. Most measurements fall within the range for tenth-century Thetford (Jones 1993) but some show a higher average or upper range; for example, the radius proximal breadth (mean 77.5) and metatarsal greatest length (208, 216, 223, and one at 244 but still unfused).

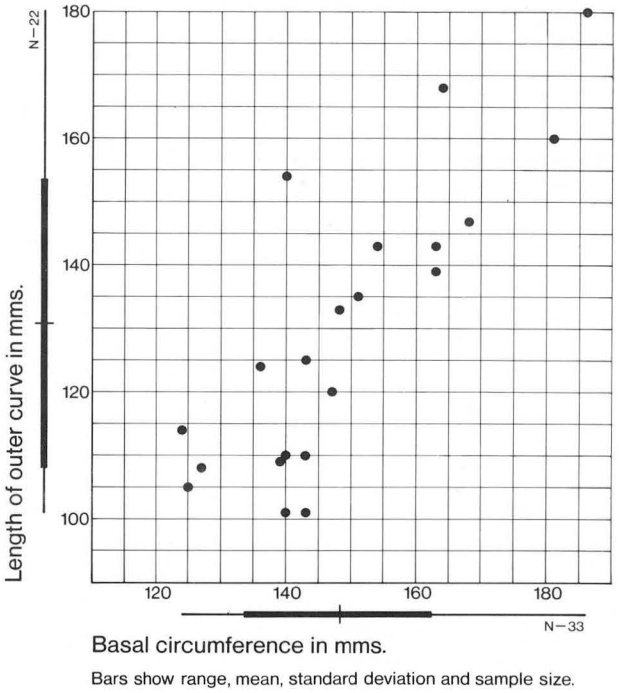
The Period I horncores included one specimen much larger than the rest and showing a forward and somewhat downward direction of horn growth as expected in bulls. The direction of horn growth of the others was forward and somewhat upward, sometimes with some torsion. One partial skull was found. Following Grigson (1976) the frontal profile showed a pointed boss and the intercornual bridge a high double arch. The two horncores were different lengths (138mm and 149mm) but with similar basal circumference (139mm, 138mm). Measurements of the Period III1 and III2 bones fall within the range for the tenth-eleventh centuries at Thetford.

There were too few measurements to attempt a metrical study of sexual dimorphism. Morphological distinctions on the pelvis suggested the presence of thirteen males and seven cows; (Periods I, 4 males, 4 cows; III2, 7 males, 3 cows IV, 1 male; VI, 1 male). More oxen than cows may, therefore, have been sent to market.

The few Period IV, late eleventh- to early twelfth-century, bones included some small specimens. Of note was a tibia with a distal breadth of only 44.4mm (I am grateful to Bruce Levitan for help with checking the identification of this bone).

The Period VI material included two deposits of cattle horncores of late medieval date. Some residual Late Saxon pottery was present, but the horncores are unlikely to be residual. They are probably waste from a horn workshop in the vicinity. High numbers of other bones, *e.g.* phalanges, which might indicate a tannery, were also found. Most of the horncores were still attached to part of the frontal bone. Some bore chopmarks on the horncore base or on the frontal bone.

The sex of the cores was not obvious, either from their morphology or their size (Fig. 23). Most showed a simple forward curve without torsion. A few showed some torsion with a forward/upward direction of growth, and one was quite tightly curved. The horncores were noticeably different from the early medieval ones from Thetford (Jones 1993, fig.167). They tended to have a larger basal circumference for a given length. Their size was less variable (*i.e.* the ranges were smaller). The mean length of the outer curve was larger, and the mean basal circumference was much greater (148.1, compared with 126.1 for tenth century and 130.4 for eleventh-twelfth century Thetford). The basal circumference was nearly always greater than the length (in 19, of 21, cases). In size, all are in Armitage's



Bars show range, mean, standard deviation and sample size.

Figure 23 14th/15th-century cattle horncores.

short group (1982, 43). Although larger than early medieval horncores from the area, they do not approach the seventeenth/eighteenth century unimproved longhorns described by Armitage.

Sheep, goat

The sheep and goat assemblage was striking for its small size, forming only 9% of the total identified bone for Period I (ninth-tenth century) and only 18% in Period VI (late medieval).

Separation of the sheep and goats for the horncore, young mandibles and metapodials is shown on Table 12 (microfiche). Goat was present in nearly every phase. The proportion of goats is highest for the horncore, but this figure may be influenced by trade in horn.

The proportion of goat from the mandibles and metapodials is still fairly high at 13%. It is higher than was found at St Martin-at-Palace, (1 of 32, Cartledge 1987) or Thetford (1 in 34 young mandibles, Jones 1993).

The proportion recorded in *Domesday* for the Norfolk demesne land was 6.1% (Darby 1971). As with the bone assemblage in general, disposal in the river-side area introduces a bias which is difficult to interpret. It is certainly possible that some goats were kept by townspeople (though there is no confirmation from, for example, finds of neonatal goat bones). Such goats would not appear in the *Domesday* accounts, which recorded only demesne holdings. The single adult mandible at stage G (Table 12, microfiche) is probably a goat; the teeth are low-crowned, the mandibular bone is relatively shallow (Rackham, pers.comm.) and the condyle is goat-like with a larger posterior facet than in sheep, probably related to the browsing habits of goats.

The anatomical analysis of the tenth-eleventh century bone (Periods III1 and III2 combined) is shown on Table 9 (microfiche). The pattern of survival and recovery of bone shows some similarities with the cattle bone of these layers. For example, the low number of maxillae with teeth compared with mandibles contrasts with the Period I deposits. Sheep bones are usually less fragmented than cattle, but the more complete bone percentages here suggest little difference, *viz.* 68%, 67%, and 76% for Periods III1, III2, and IV. Sheep bones were less fragmented in the occupation-type, Period IV assemblage. As with the cattle, long-bones often survived as one end plus a substantial length of shaft. For sheep this often consisted of zones 1, 2, 3 and 4, or 3, 4, 5, and 6. Chopping the bones to this extent may have happened after roasting, or the carcass may have been cut into pieces and boiled on the bone, which allows the marrow juices to seep into the liquid. This method is usual in modern Moslem cooking. Butchery marks where the shaft had been chopped across were quite common.

The lack of horncores observed for the cattle in the bone of Periods III1 and III2 did not apply for the sheep and goat. Both the goat horns from III1 and III2 were small, and presumably are from females. At Site 1092 in Thetford (Jones 1984) there were deposits containing cattle horncores and large, presumably male, goat horncores. At Fishergate, horn from nanny goats and from sheep of both sexes was doubtless used; most horncores bore chopmarks. The use of this horn, however, may have been less specialised.

It was noted that for all of the III1 and III2 long-bones the highest zone figure, which show the minimum number of individuals represented, was one of the shaft zones, not the epiphyses (or metaphyses). The most numerous zones were on the radius (zone 3) and tibia (zone 4).

Data on the age of death and size of the sheep and goats were too few for detailed discussion. Considerable variation in size was observed, *e.g.* two radii from Period III2 with greatest lengths of 133mm and 158mm (both probably sheep). Of the same date was a scapula larger than any from Thetford or Hamwih (Bourdillon and Coy 1980), and short-necked (see measurements). The bone bore no characteristics typical of goat or fallow deer.

The few measurements from Period VI were of small to average size in terms of the tenth-eleventh century data, that is typically small, late medieval sheep were present in the fourteenth- and fifteenth-century deposits (there is no evidence from the small amount of thirteenth/fourteenth century Period V bone).

Pig

Pig bones were nearly as numerous, and in some phases and/or methods of calculation, more numerous than sheep bones for the late ninth to eleventh century phases, declining somewhat by the twelfth century, and notably so by the late Middle Ages. Pig bones were generally in a more complete state than those of cattle or sheep, with a higher proportion of bones being recorded on the zone list (76–86% for periods I, III1, III2 and IV, compared with 60–67% for cattle and 68–76% for sheep). Comparison of the Period III1 and III2 sheep and pig bones (Table 9 microfiche) shows that, although the number of bones identified was similar, the parts of the skeleton found were rather different. For both species, bones of the main body were the most numerous, and, as with the sheep, minimum numbers based on long-bone shafts are usually higher than bone ends. For pig, however, a higher proportion is made up of bones of the head, and this is probably a consequence of the greater density and strength of the bones of the skull in the suiformes, rather than a cultural difference. The bones of the foot, in pigs, were very little fragmented, most metapodials being found as whole bones, and this in fact largely explains the difference in the zone percentage between pig and sheep. The number of right mandibles was much higher than for the left side, and although this may have arisen by chance, perhaps some customary method of butchery favoured faster disposal of one side than the other. Chopmarks were common on the mandibles, and the male canines were broken.

The age stages of the mandibles are shown in Table 10 (microfiche). Piglet was a rare delicacy: there were no early-stage mandibles and only one very immature bone in Periods II–III2. Half the jaws were from pigs more than about eighteen months old. No overcrowding of the jaws was observed.

Measurements are similar to those at Thetford and there were no very large pigs from Period VI comparable to the large specimens of fifteenth- to sixteenth-century date from Thetford (Jones, 1993).

Other mammals

Horse bones were very few and all adult. A horse pelvis from Period I was chopped through the iliac, ischial and pubic shafts. Dog and cat were also scarce, and gnaw-marks on the bones were uncommon. Cat and dog bones do seem to be more common in areas of occupation (*e.g.* Thetford, Jones 1993) but it might have been expected that

horse remains would have been better represented in the marsh deposits.

Of note was a dog ulna which was chopped transversely on the upper shaft on the radial groove, as if the radius had been chopped through at this point (Period III2). Perhaps a dog radius would have been useful in bone working?

House-mouse (*Mus musculus*) and rat, probably black rat (*Rattus* cf. *rattus*) were found only in sieved samples. They were present in Periods IV and VI (late eleventh-twelfth century and late medieval).

Bird

Both fowl and goose were present in the late ninth-early tenth century Period I deposits. The largest group of bird bones was from Period IV (late eleventh-twelfth century), nearly all of them poultry, but including also teal (*Anas crecca*) and woodcock (*Scolopax rusticola*). Of the fowl and goose bones, 27% were goose in this period, which compares with 26% (N135) and 29% (N235) at Thetford for the tenth century and eleventh-twelfth century (Jones 1993). Knife marks were observed on the distal femur and distal tibiotarsus of fowl. As at Thetford, variation in size was considerable, some being as small as a modern bantam (*e.g.* as illustrated by Cohen and Sergeantson 1986).

Pathology

Cattle

MANDIBLE (III2, eleventh century); M_3 lacks the posterior cusp; in consequence, the posterior part of the upper tooth has not been worn down, causing deep wear on the distal part of the lower tooth and reduction of the mandibular bone behind the tooth.

VERTEBRA (III1, tenth/eleventh century), thoracic. One of the facets at the base of the spine is reduced in size. There is a round depression 8x6mm above the facet, 2.8mm deep, which may be an abscess cavity.

RADIUS (I, late ninth/early tenth century), proximal fused, distal unfused; abnormal proliferation of the periosteal bone (26x15mm) on the ulnar groove, mid-shaft (the ulna shaft is not fused to the radius).

PELVIS (III1): area 18x7mm of eburnation on the pubic part of the acetabulum. The morphology of the bone indicates a male.

PELVIS (III2): three further specimens with similarly-placed eburnation and with some degeneration (pitting) of the articular surface, but without proliferation of the bone around the joint. The bones were too fragmentary to judge their sex.

METATARSAL (I): a rounded swelling 18x22mm on the lateral shaft, with a central depression 5x2mm, 1.9mm deep (bone cavity normal).

METATARSAL (I): distal end; eburnation, grooving and some destruction of bone on the external part of the medial condyle, affecting an area 16x7.5mm.

METATARSAL (III1): similarly placed area, 19x10mm of polish and grooving with alteration of the bone around the articulation.

METATARSAL (III1), proximal end: almost complete disorganisation of the proximal facets, but apparently without fusion to the tarsal bones; much surrounding bone alteration.

Most of these pathologies are of the joints, and of these all affected the hind limb. They are probably stress and/or age-related.

Sheep, Goat

MANDIBLES. Periodontal disease was not observed. In one mandible (III1, tenth-eleventh century) P4 and M1 were strongly angled and the anterior half of M1 was worn away.

METACARPAL (III2, eleventh century); healed fracture of the proximal shaft, set at a slight angle, with swelling of the bone, and nodules of extra bone ventrally.

Pig

METATARSAL IV (III2, eleventh century): gross enlargement of the shaft. The bone cavity has probably also suffered alteration. The alteration suggests a localised or systemic infection.

Pathologies suggesting injuries to the foot in pigs were observed at Thetford in tenth/eleventh-century deposits (Jones 1984 and 1993) providing circumstantial evidence of sty husbandry.

Goose

1st phalanx, pes (IV, eleventh/twelfth century): extensive patches of periosteal, porous extra bone.

Cattle, sheep and pig from Norwich

Figure 24 shows the proportions of the bones of the three main species (the total of identified fragments) for three recent sites in Norwich: at Fishergate, just north of the River Wensum; Whitefriars, on the south bank (Cartledge 1983); and the Magistrates' Courts site, also on the south bank (Cartledge 1987).

Comparison of the early medieval groups from Fishergate and Whitefriars demonstrates variation within the city, with cultural and/or depositional differences giving higher percentages of cattle at Fishergate. Proportions of pig and sheep are much less contrasting with pig numbers quite close to, or equalling, sheep in most groups.

In the Norfolk *Domesday* record, the amount of woodland in the more densely settled south-eastern part of the county was low, contrasting with the higher records of woodland in mid-Norfolk. This latter area includes North Elmham where pig bones recovered from excavations amounted to between 23 and 32% of the bone assemblage (Noddle 1980).

'Curiously enough, the village with the largest amount of wood was in (the) eastern part of the county; Thorpe next Norwich had wood, sufficient to support 1200 swine (folio 137b),' (Darby 1952, 127). It is possible that Thorpe could therefore have been used for the keeping of pigs specifically to meet the needs of Norwich.

III. Fish bones

by Alison Locker

Introduction

The fish bones from Fishergate were all recovered from sieved samples (including some very small samples from localised fish-bone concentrations) except for contexts *20* and *94*, which are shown in Table 13. Only identifiable bones are included.

748 bones were identified to species or group level and the following taxa were identified; Elasmobranch indet., spurdog (*Squalus acanthias*), ray indet. (Rajidae), eel (*Anguilla anguilla*), herring (*Clupea harengus*), cf. smelt (*Osmerus eperlanus*), bream (*Abramis brama*), Cyprinidae, cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*), sandsmelt (*Atherina presbyter*), stickleback (*Gasterosteus aculeatus*), scad (*Trachurus trachurus*), cf wrasse (Labridae), mackerel (*Scomber scombrus*), plaice (*Pleuronectes platessa*) and flounder (*Platichthys flesus*). The terms 'large and small gadoid' were used for bones not specifically identified that probably belong to the cod family.

Period II

A 1kg sample was taken from context *90* (the fill of a linear feature). In this feature a whiting articular was from a fish of approximately 29cm in length, the lower end of the normal size range of 30–40cm (Wheeler 1978, 153). The remaining whiting bones were vertebral centra. Herring,

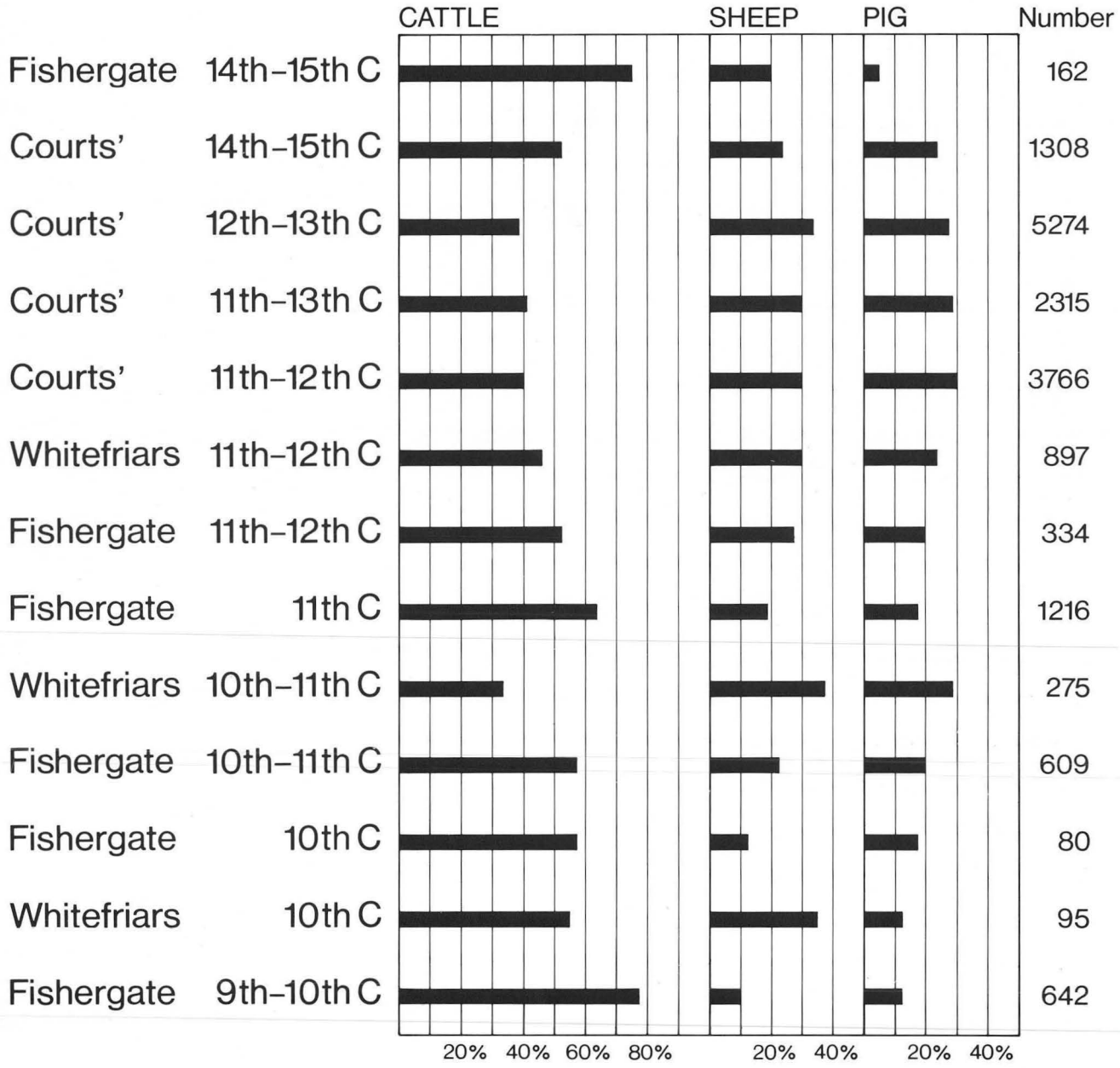


Figure 24 Cattle, sheep and pig from Norwich.

the most commonly occurring species throughout all periods, was identified from nine vertebral centra and an operculum fragment. Mackerel, eel and plaice were identified from vertebral centra.

Period III1

In Period III1, of tenth/early eleventh century date, some sixty-five fish bones were identified from six different contexts of variable sample size ranging from 1kg to 150 gm. These indicate a variable density of fish bone since the smallest sample was from context *111* which contained the most fish. Herring is again the most numerous species with ray, eel, cod, whiting, scad, mackerel and plaice occurring in small numbers.

Period III2

In Period III2, of eleventh century date, contexts *20* and *94* are the only unsieved contexts shown on the table and have a depleted fish assemblage represented by a herring dentary, a bream pharyngeal and a cod vertebral centrum (excluding six indeterminate branchiostegal and fin rays) from *20* and one whiting otolith from *94*. Context *78* was a homogeneous thick deposit, from which 70 litres of material was sieved, producing the largest sample and greatest number of fish species for the site. Herring is again the most numerous species, although a large number of eel bones was also identified. Some small flounder bones include a pair of dentaries, a premaxilla and a preoperculum, which may be from a single fish of under 15cm in

Period	II	III1						III2			IV			VI		
Context	90	95	96	99	108	111	121	20	78	94	51	52	55	162	163	Total
Elasmo	-	-	-	-	-	-	-	-	4	-	-	-	-	-	1	5
Spurdog	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Ray	-	1	-	-	-	-	-	-	4	-	-	1	-	-	-	6
Eel	1	2	-	-	-	-	-	-	179	-	-	2	-	5	-	189
Herring	10	2	3	1	8	20	1	1	239	-	-	8	65*	1	1	360
cf Smelt	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	23
Bream	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
Cyprinid	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Cod	-	-	-	-	-	3	-	1	24	-	-	1	9	-	-	38
Haddock	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Whiting	5	-	2	-	-	-	-	-	1	1	-	-	-	-	-	9
Lge Gad	-	-	-	-	-	11	-	-	4	-	-	-	-	-	-	15
Sm Gad	2	-	-	-	-	1	-	-	-	-	-	-	-	-	1	4
Sandsmelt	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2
Stickleback	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Scad	-	-	-	1	-	-	-	-	2	-	-	-	-	-	-	3
cf Wrasse	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Mackerel	7	-	-	-	-	1	-	-	11	-	-	-	-	-	-	19
Plaice	4	-	-	5	-	1	1	-	32	-	-	-	-	-	-	43
Flounder	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	13
Flatfish	-	-	-	1	-	-	-	-	11	-	-	-	-	-	-	12
Total	29	5	5	8	8	37	2	3	554	1	1	12	74	6	3	748

Lge Gad = Large Gadoid; Sm Gad = Small Gadoid; * = inc 57 fin rays from same fin

Table 13 Fishbones.

length. A cod dentary was estimated to be from a small immature fish of around 35cm (using Wheeler and Jones 1976). Most of the species identified from this deposit were probably eaten except the stickleback and sandsmelt, which may have been caught incidentally, or represent the stomach contents of other larger fish.

Period IV

Three contexts in Period IV (eleventh/twelfth century) contained fish bone. Context *51* produced a spine of spurdog, the only record of this species from the site. Context *52*, a dumped layer from which 1kg was sieved, had ten herring bones, one cod, one ray and two eel. Context *55*, a gully fill, from which 100gm was sieved, contained sixty-five herring bones of which fifty-seven were fin rays from the same fin. Nine cod bones were also found amongst the hand-collected bones, including a premaxilla from a fish of approximately 95cm total length.

Period VI

In Period VI, the fills of a barrel (dated to the thirteenth century onwards), *162* and *163*, produced nine fish bones including elasmobranch, herring, eel and a bone attributed to the small gadoid group.

Fishing methods

Although the number of identified fish bones is not very large and at least half are herring, the other species present are sufficiently numerous to suggest a variety of fishing methods. Norwich is less than 20 miles from Great Yarmouth on the coast, so a wide range of marine fish would have been available in the medieval period. This has also proved to be the case at other Norwich sites such as the Magistrates' Courts (Locker 1987), where much larger samples of fish were identified from deposits of tenth to fifteenth-century date. Herring was the most numerous species at the Magistrates' Courts also, and at this site the range of the less commonly occurring species is similar to that from Fishergate.

The large number of herring bones draw attention to the importance of the herring fishing industry which flourished during the thirteenth and fourteenth centuries, Great Yarmouth being an important port from which the fleets set out. The fish could be salted, pickled or smoked, providing a continuous source of protein, not just confined to the fishing season.

Offshore line fishing would have caught cod and haddock. Whiting were netted and occur in shoals in inshore waters. Mackerel and scad both form large surface shoals and could have been caught on lines or in nets. The other marine species would have been caught close to the shoreline. Spurdog, rays and flatfishes could be caught on lines on the bottom, or the latter were often trapped at high tide on the shoreline.

Smelt are coastal/estuarine fish which enter fresh water to spawn. They are a seasonal catch and can be netted in large numbers. Smelt were also identified from the Magistrates' Courts. Similarly eels can be trapped in freshwater or estuaries as they migrate to the sea.

The only freshwater species to be identified is bream, found in slow flowing rivers and ponds, but an indeterminate fragment of cyprinid pharyngeal was also found.

This small collection of fish bone from Fishergate is of value in adding further to the data from other sites in Norwich regarding the availability and consumption of fish during the medieval period.

IV. Insects

by Harry Kenward and Enid Allison

Sub-samples from column sample 12, and a sample from the ditch, context *123*, were examined.

Methods

Sixteen 1kg 'test' subsamples taken from the column samples and from a tenth century linear feature, *123*, which had been exposed in plan, were processed by paraffin flotation to extract insect remains (Kenward *et al* 1980). Methods used for the analysis of the insects are based on those described by Kenward (1978). For most samples Coleoptera and Hemiptera were identified to species wherever practicable within project constraints. Their nomenclature in the lists follows Kloet and Hincks (1964 and 1977). Numbers of individuals (N) and taxa (S) present in each sample were recorded and taxa were also divided into broad ecological groups as given by Kenward *et al* (1986). The remaining orders of insects and other classes of invertebrates were recorded if present but were not usually identified to specific level. The insects from a few samples were only examined superficially in order to save time.

The data archive

Data obtained from the insect samples were recorded and processed on the VAX-cluster mainframe computer at the University of York, using a PASCAL system written by HK which produces species lists and statistics of value in interpretation. This system also creates database files, initially for analysis by the DATATRIEVE data interrogation program.

All statistics produced are stored in hard copy at the Environmental Archaeology Unit (EAU), University of York, and copies have also been deposited with Norfolk Archaeological Unit and the Ancient Monuments Laboratory, H.B.M.C. All lists and statistics are also stored in the EAU's database system.

The insect samples

The insect assemblages obtained from the samples are described below in chronological order. Remains from most of the samples were very fragmentary, with most sclerites of the larger species broken into small pieces. The fossils were also rather fragile, presumably as a result of destruction of some components of the cuticle by microbial action; some of them showed signs of decay such as bleaching and surface erosion. Identifications were consequently often difficult, and many specimens could not be determined closely within the constraints of this project. A list of all taxa recorded is given in Table 14.

Period I peat (Early Flandrian–800 AD)

Sample 183/T, Context *175*, 183–195cm

The insect remains were mostly highly fragmented, making identification difficult; hence only a small proportion of the records are to species. The fauna consisted predominantly of a mixture of aquatics and waterside species (29% and 14% of the individuals respectively). Several species such as the dytiscids *Colymbetes fuscus*, *?Rhantus* sp. and a hydroporine, and the whirligig beetle *Gyrinus* sp. suggest slowly moving or stagnant water. The chrysomelids *Donacia* sp. and *Plateumaris* sp. are also usually found on plants either standing in, or floating on, still or sluggish water, and their larvae live in the roots of these plants. *Oulimnius ?tuberculatus* (represented by one individual) does not fit in with the general picture of a reed swamp growing in stagnant or slowing moving water, being a species of running, well-aerated water. It is possible that it entered the deposit in floodwater from the main river channel, or alternatively may have arrived in flight as 'background' fauna.

Waterside habitats are indicated by the weevils *Notaris acridulus* (found on *Glyceria maxima*; Hansen 1965), *Limnobaris pilistriata* (found particularly on *Scirpus lacustris*, *Cladium mariscus* and Juncaceae; Hansen 1965), and *Bagous* sp. (found on marshland plants); all are typical of marshy areas around water margins. Other species, such as *Cercyon ?tristis*, *Anotylus nitidulus*, *Carpelimus ?elongatulus* and *?Lesteva* sp., indicate the presence of areas of organic-rich waterside mud, although masses of litter within swamp vegetation could also be exploited. *Prasocuris phellandrii* is found on waterside umbelliferous plants, especially water hemlock *Sium latifolium* and water dropwort *Oenanthe aquatica* (Hansen 1927). The homopteran bug *Aphrodes flavostriatus* feeds on grasses in moist places (Le Quesne 1965), and this presumably includes reedbeds.

The most interesting beetle recorded was the ground beetle *Trechus rivularis*, represented by a single pronotum. This species is very rare at the present day and in Britain is found only in dark forest swamps with *Sphagnum* among sedge litter in Cambridge and Huntingdon (Lindroth 1974). It has been recorded in some numbers from sites of similar date to these lowest deposits, however; at Lea Marston and West Bromwich for example (Osborne 1974 and 1980), and also from early Hoxnian deposits at Nechells, Birmingham (Shotton and Osborne 1965). The whole insect assemblage from the present sample bears many similarities to those from the first two of these sites and deposition seems to have occurred in a similar environment during a warm period in the Early Flandrian.

Since this deposit was of such an early date, a second subsample of 1.5kg was processed and scanned for any additional species. The assemblage was much the same as from the previous subsample, with species typical of reed swamps, emergent and aquatic vegetation, and weedy open water. Remarkably few additional taxa were noted considering the high value for the index of diversity estimated for the first subsample. Several individuals of a *Gyrinus* species were recorded. There was a striking lack of terrestrial forms *sensu strictu*, and those that were present, such as *Apion* sp, and *Aphodius* spp., appeared to be 'background' strays. Rootlets were present among the plant remains recovered along with the insects.

Sample 173/T, Context *175*, 173–183cm

Few insects were recovered: single individuals of seven taxa, a group compatible with a small random extract from the fauna of sample 183 (at 183–195cm) or of the overlying layer. Since this sample is from the layer where humification occurred, more insect remains might be expected (insects are usually more preservationally robust than the softer parts of plants, and so become concentrated as plant tissues disappear). It is possible, however, that preservational conditions were so poor that any insects that were originally present rotted away and the few which are recorded came from the top or bottom of the unit.

Sample 143/T, Context *175*, 143–153cm

This sample was quite rich in insects, but many were highly fragmented. There were 101 taxa and 142 individuals of beetles and bugs. A moderate proportion of the remains could be identified to species. Aquatics were numerous (%N W = 27), and included nine *Oulimnius ?tuberculatus*, found in clean flowing water. Since most of the other aquatics recorded are typical of still or sluggish water it is likely that these beetles entered the deposits in flood water from the main river channel. This sample gave a single fragment of a pronotum of a *Pterostichus* species, indistinguishable from the generally synanthropic *P.madidus*. This is discussed below. A prothoracic spine of the thorn bug *Gargara genistae* was also recorded.

Sample 133/T, Context *175*, 133–143cm

The insect remains were sorted but then only superficially examined. The fauna was essentially similar to that from the underlying layer.

Sample 123/T, Context *97*, 123–133cm

Here too the insect remains were not systematically identified. The assemblage was of the same general kind as those from the lower layers, but there were distinctly more terrestrial forms.

General comments on Period I assemblages

There was little variation in the assemblages recovered from the peat, and remarkably few remains which appear to have been 'background' fauna. The entire fauna from Period I was broadly what might be found in deposits laid down by an unpolluted 'unspoiled' large stream or river in lowland England at the present day, with abundant aqu-

Nomenclature for the Hemiptera and Coleoptera follows Kloet and Hincks (1964 and 1977).
sp. indet. = record may include taxon listed above
sp(p). = taxon not listed above

Oligochaeta egg capsules
Daphnia sp.
Dermaptera sp.
Mallophaga or Siphunculata sp.
Hemiptera:
- *Heterogaster urticae* (Fabricius)
- Lygaeidae sp.
- Pentatomoidea sp.
- *Lyctocoris campestris* (Fabricius)
- *Cimex lectularius* Linnaeus
- Cimicidae sp.
- *Gerris* sp.
- Corixidae sp.
- *Gargara genistae* (Fabricius)
- *Aphrodes flavostriatus* (Donovan)
- Auchenorhyncha spp.
- Aphidoidea sp.

Diptera:
- *Melophagus ovinus* (Linnaeus)
- Bibionidae sp.
- Diptera sp. adults
- Diptera spp. puparia

Siphonaptera sp. (?*Pulex irritans* Linnaeus)
Hymenoptera:
- Formicidae sp.
- Hymenoptera sp.

Coleoptera:
- *Dyschirius globosus* (Herbst)
- *Trechus rivularis* (Gyllenhal)
- *Trechus secalis* (Paykull)
- *Bembidion ?guttula* (Fabricius)
- *Bembidion* spp.
- *Pterostichus diligens* (Sturm)
- *Pterostichus ?madidus* (Fabricius)
- *Pterostichus nigrita* (Paykull)
- *Pterostichus ?strenuus* (Panzer)
- *Pterostichus* (*Poecilus*) sp.
- *Pterostichus* spp. indet.
- ?*Calathus* sp.
- *Agonum* sp.
- *Amara* spp.
- *Harpalus* sp.
- *Bradycellus harpalinus* (Serville)
- *Odacantha melanura* (Linnaeus)
- *Demetrias monostigma* Samouelle
- ?*Dromius* sp.
- Carabidae spp.
- Carabidae spp. indet.
- ?*Haliplus* sp.
- Hydroporinae spp.
- ?*Rhantus* sp.
- *Colymbetes fuscus* (Linnaeus)
- Colymbetinae sp.
- *Gyrinus* sp.
- *Helophorus* spp.
- *Cercyon analis* (Paykull)
- *Cercyon tristis* (Illiger)
- *Cercyon unipunctatus* (Linnaeus)
- *Cercyon* sp.
- *Megasternum obscurum* (Marsham)
- *Cryptopleurum minutum* (Fabricius)
- *Hydrobius fuscipes* (Linnaeus)
- *Chaetarthria seminulum* (Herbst)
- Hydrophilinae spp.
- *Acritus nigricornis* (Hoffman)
- Histerinae sp.
- Histeridae sp.
- *Ochthebius* spp.
- *Hydraena* sp.
- *Limnebius* sp.
- *Ptenidium* sp.
- *Acrotrichis* spp.
- *Micropeplus fulvus* Erichson
- *Micropeplus porcatus* (Paykull)
- *Micropeplus staphylinoides* (Marsham)
- *Anthobium* sp.
- *Lesteva* spp.
- *Dropephylla* sp.
- *Omalium* sp.
- *Xylodromus ?concinnus* (Marsham)
- *Carpelimus ?bilineatus* Stephens
- *Carpelimus ?elongatulus* (Erichson)
- *Carpelimus fuliginosus* (Gravenhorst)
- *Carpelimus pusillus* (Gravenhorst) group
- *Carpelimus ?rivularis* (Motschulsky)
- *Carpelimus* sp.
- *Platystethus arenarius* (Fourcroy)
- *Platystethus cornutus* (Gravenhorst) group
- *Platystethus degener* Mulsant and Rey
- *Anotylus complanatus* (Erichson)
- *Anotylus nitidulus* (Gravenhorst)
- *Anotylus rugosus* (Fabricius)
- *Anotylus sculpturatus* (Gravenhorst) group
- *Anotylus ?tetracarinatus* (Block)
- *Oxytelus sculptus* Gravenhorst
- *Stenus* spp.
- *Lithocharis* sp.
- ?*Othius* sp.
- *Leptacinus ?intermedius* Donisthorpe
- *Leptacinus ?pusillus* (Stephens)
- *Gyrohypnus* sp.
- *Xantholinus linearis* (Olivier) or *longiventris* Heer
- *Neobisnius* sp.
- *Philonthus* spp.
- *Gabrius* sp.
- Staphylininae spp. indet.
- *Mycetoporous* sp.
- *Tachyporus* sp.
- *Tachinus laticollis* Gravenhorst or *marginellus* (Fabricius)
- *Tachinus* spp. indet.
- *Falagria caesa* Erichson or *sulcatula* (Gravenhorst)
- Aleocharinae spp.
- Pselaphidae sp.
- *Trox ?scaber* (Linnaeus)
- *Geotrupes* sp.
- *Aphodius* spp.
- *Oxyomus sylvestris* (Scopoli)
- *Phyllopertha horticola* (Linnaeus)
- *Clambus ?pubescens* Redtenbacher
- *Dryops* sp.
- *Oulimnius ?tuberculatus* (Müller)
- Elateridae spp.
- *Anobium punctatum* (Degeer)
- *Ptinus fur* (Linnaeus)
- *Ptinus* sp.
- Melyridae sp.
- ?*Brachypterus* sp.
- *Meligethes* sp.
- *Rhizophagus* sp.
- *Monotoma bicolor* Villa
- *Monotoma* sp. indet.
- *Cryptophagus ?scutellatus* Newman
- *Cryptophagus* sp.
- *Atomaria* spp.
- Phalacridae sp.
- ?*Sericoderus lateralis* (Gyllenhall)
- *Orthoperus* sp.
- *Lathridius minutus* (Linnaeus) group
- *Enicmus* sp.
- *Dienerella* sp.
- *Corticaria* spp.
- *Corticarina* or *Cortinicara* sp.
- Corticariinae spp. indet.
- *Typhaea stercorea* (Linnaeus)
- *Tenebrio obscurus* Fabricius
- *Gracilia minuta* (Fabricius)
- Bruchinae sp.
- *Donacia* spp.
- *Plateumaris* sp.
- Donaciinae spp. indet.
- *Phaedon* sp.
- *Prasocuris phellandrii* (Linnaeus)
- Chrysomelinae sp.
- *Psylliodes* sp.

Halticinae sp.
Apion spp.
Phyllobius or *Polydrusus* sp.
Strophosomus sp.
Eremotes ater (Linnaeus)
Bagous sp.
Notaris acridulus (Linnaeus)
Rhinoncus pericarpius (Linnaeus)
Ceuthorhynchinae sp.
Limnobaris pilistriata (Stephens)
Curculionidae spp. indet.
Coleoptera sp.

Insecta sp. larva

Arachnida:
Acarina spp.
Aranae sp.

Gastropoda:
Pupilla muscorum (Linnaeus)

Table 14 List of insects and other invertebrate taxa recorded from Fishergate.

atics, very high diversity, and a restricted decomposer fauna. The lowest sample (183–193cm), dated to 7460 bc, included fauna essentially like that of the remaining layers, although perhaps with a more restricted range of taxa, and also *Trechus rivularis*; the assemblage may usefully be compared with some other contemporaneous ones (see above). It seems possible that there was a a substantial hiatus between this and the later layers, the latter perhaps being contemporaneous with human occupation.

None of the recorded taxa suggest much higher or lower temperatures than at the present day, although *Gargara genistae* is a little to the north of its present range (Le Quesne 1965, 15). *Trechus rivularis* is not known as far north as Norwich at the present day, but habitat change or restriction is probably responsible in this case (see above).

While the phytophages could rarely be identified to species, they were mostly sufficiently closely identifiable to provide abundant evidence for aquatic and waterside plants, with surprisingly little evidence for terrestrial vegetation. *Phyllopertha horticola* feeds as a larva at the roots of terrestrial plants; *Gargara genistae* is recorded mainly from broom (*Sarothamnus*), less often on *Genista* spp. and *Onobrychis* sp. (Edwards 1896, 20; Le Quesne 1965, 15). Taken at face value the insect remains suggest that the surroundings may have been predominantly an open landscape throughout the time the succession was being laid down, as there is little evidence for the present of woodland. However, as dry land forms in general were rare, the lack of woodland taxa may be a result of isolation of the site of deposition from any but rare strays from other habitats. It is possible that these deposits formed far from 'dry land' in extensive swampy vegetation which effectively isolated them from the river, preventing deposition of waterborne insect corpses other than autochthones (those originating at the point of deposition). This would explain the lack of the wide range of taxa expected in riverine deposits. Most of the recorded decomposer or littoral taxa could exploit litter within such a swamp. Reed beds would probably also function as an efficient filter for flying insects, few of which might penetrate beyond the fringes as 'background' fauna.

The almost certain record of *Pterostichus madidus* is unexpected from natural deposits of an early date, although if sample 143/T dates to a period when the settlement at Norwich was well developed it would be less surprising. Its presence in the complete absence of any of the typical 'urban' synanthropic fauna is peculiar, however, especially since it is flightless. Perhaps it originated in bird pellets or faeces. The uppermost sample gave some evidence of the onset of terrestrialisation with a proportion of non-aquatic beetles which even by simple inspection was clearly higher than in the lower units.

Period II (tenth century)

Sample 13/T, Feature *123*

This sample was taken from the linear feature *123* which was dated to the tenth century. The fill of this feature contained some domestic and other refuse.

A rather small group of beetles was recovered, fifty-three individuals of thirty-eight taxa being noted. A large part of this fauna was typical of human settlements and, apart from an unidentified Melyridae sp., it would pass unnoticed amongst contemporaneous groups from York and elsewhere. There is nothing to suggest that the insects bred in the feature, and the fauna may have been of 'background' origin or introduced in the backfills. The species list, including four *Anobium punctatum* (the woodworm beetle) and a typical group of decomposers commonly recorded from archaeological house floor deposits, and the unidentified flea and louse, offers a small hint that material was brought from within a building, but this is by no means certain.

Period III1 (late tenth-early eleventh century)

Sample 113/T, Context *97*, 113–123cm

The processed subsample gave a fairly substantial group of insects including about 217 individuals of fifty-two taxa of beetles and bugs. Nearly half of this assemblage was accounted for by about 100 individuals (estimated) of *Carpelimus fuliginosus*. This small rove beetle is rare at the present day. It is said by Fowler (1888, 388) to occur in 'damp and marshy places; under dead leaves, in moss, flood refuse etc.; also by sweeping herbage', but there are records from decomposer habitats generated by human activities, such as in heaps of animal bedding and compost (Hansen 1951). It is of regular occurrence in archaeological deposits formed where the insect assemblages as a whole show that conditions were none too clean, in Roman organic dumps at Tanner Row, York, for example (Hall and Kenward 1990), and also in Anglo-Scandinavian pits and other deposits at York (Hall *et al* 1983), and from Saxo-Norman tenements in Durham City (Kenward 1979). In archaeological deposits it often occurs with other taxa found in the present sample: *Neobisnius* sp., *Carpelimus pusillus* group, *Anotylus nitidulus*, *Leptacinus* spp. and *Oxytelus sculptus*, for example. Indeed there are (subjectively) considerable similarities between the assemblage from 113/T and some 'dump' layers early in the Roman sequence at Tanner Row (Hall and Kenward 1990). (This is not to imply any dating, for none of the taxa in the present group offer any such evidence). Decomposers accounted for only 23% of the individuals as conventionally coded by the authors, but inclusion of *C. fuliginosus* raises this to 69%: inclusion of other uncoded taxa probably belonging to the same community gives %N RT in excess of 80, a very high proportion.

There were plenty of beetle taxa favoured by the presence of man but no strict synanthropes. Most of the fauna may have invaded dumped organic matter *in situ*, although the sheep ked adults (*Melophagus ovinus*) and fleas (possibly *Pulex irritans*, the human flea) seem more likely to have been carried from in or around buildings, and a proportion of the beetles — *Ptinus fur* and *Tenebrio obscurus* for example — also seem more likely to have invaded plant remains in buildings than a midden suited to *Carpelimus fuliginosus*. Several individuals of the weevil *Rhinoncus pericarpius* (which feeds on *Polygonum* spp.) were also present. *Polygonum* spp. seeds were recorded in quantity at this level in the column.

Sample 104/T, Context *96*, 104–113cm

The processed subsample gave seventy-five individuals of beetles and bugs, with forty-two taxa recorded. As in sample 113/T, the most abundant species was *Carpelimus fuliginosus* (with nine individuals), and there were other similarities between the assemblages from the two samples. Outdoor forms were proportionately unimportant in sample 104 (only five individuals, %N OB = 7; more tellingly, only 12% of the taxa were coded 'outdoor'). Decomposers were abundant (%N RT = 64, with an additional 12% of *C. fuliginosus*, uncoded but probably belonging to this category). This group of insects was typical of many urban deposits and clearly

represented decomposing plant remains, but its more precise implications are not clear.

Sample 93/T, Context *95*, 93–104cm
A rather small beetle and bug assemblage was recovered (N = 54; S = 38). Outdoor taxa were proportionally well represented (%S OB = 29; %N OB = 26). Some taxa may have bred in the deposit, the more abundant *Acrotrichis* sp. for example, but decomposers made up only 56% of the individuals and the fauna may have been mostly of 'background' origin. The presence of a *Cimex lectularius*, one subspecies of which is the human bedbug, does indicate that some material probably came from human habitations.

General comments on the Period III1 assemblages

The insect fauna indicates that these deposits included material from around and, on the evidence of probable human bedbug and flea remains, within human dwellings. A record of sheep ked, *Melophagus ovinus*, may be indicative of fleece cleaning. A considerable insect population developed in context *97*, dominated by *Carpelimus fuliginosus*, which was also the most abundant species in context *96*. This species is poorly known at the present day but of frequent occurrence in archaeological deposits interpreted as including abundant moist organic matter, and in the present case the fauna as a whole indicates abundant decomposing matter.

Period III2 (eleventh century)

Sample 85/T, Context *78*, 85–93cm
Only single individuals of nine beetle taxa were recorded, and there were a few remains of other insects, including several fly puparia. Little interpretation is therefore possible.

Sample 75/T, Context *78*, 75–85cm
The only insect recovered was a single woodworm beetle, *Anobium punctatum*.

Sample 65/T, Context *78*, 65–75cm
Again there were few insect remains, and only seven beetles.

Summary of Period III2

These samples from the 'dark earth' contained few insect remains. Seen together the three assemblages probably indicate continued human occupation, but interpretation must be limited.

Period IV (eleventh-twelfth century)

Sample 56/T, Context *54*, 56–65cm
No insects were recorded; the only animal present was a single individual of the snail *Pupilla muscorum*. This is a species usually found in dry habitats such as short turf, rocks or scree where there is little competition from other species.

Sample 45/T, Context *52*, 45–56cm
Only three beetles and a single earwig were recovered.

General discussion

The degree of fragmentation of insect remains was high throughout the deposits, perhaps an indication that the whole sequence had dried out at some time. With the probable exception of sample 5 from 173–183cm and 45–93cm, differences in concentration of fossils between samples are probably related to variations in the net input of matrix, rather than to variations in the preservation of the insects themselves.

Assemblages from the Period I peat deposits were basically uniform. This is perhaps surprising as they appear to represent a period of 8000 years. Since a break in deposition occurred towards the bottom of the peat, it is possible that deposition did not recommence for a considerable time and the deposits above the break were formed relatively rapidly over a period of 1000 years or less. There are also suggestions from both plant macrofossil and pollen assemblages for this.

Some unusual taxa might be expected from the earliest levels but since only a rather small assemblage of beetles and bugs of limited ecological origins was obtained it is not particularly surprising that only *Trechus rivularis* was exceptional amongst those recorded. Apart from this species the rest of the assemblage from the lowest part of the column was similar in composition to the other Period I assemblages, indicating similar local ecological conditions.

There was no certain evidence for the presence of humans in the vicinity of the site during Period I, the only possible indication being the almost definite record of *Pterostichus madidus* (at 143–153cm, towards the top of the Period I peat), which would not be expected in natural deposits of an early date. Its occurrence would not be so unusual if the settlement at Norwich was already well developed by that time.

No species indicating the presence of trees or woodland, and indeed very few insects which could be regarded as 'background' fauna, were recorded from Period I. Phytophages were mainly species associated with aquatic plants, although some of these insect taxa could not be determined to species so precise host plants were not known. If these were riverine deposits, insects from the whole catchment area would be expected so it would be deduced that the landscape was probably rather barren. An alternative explanation could be that the deposits were formed in a backwater (as indicated by the seed evidence) and extensive reed beds may have caused river-carried remains to settle before reaching the area under investigation here. As a consequence of this, only the autochthonous and circumjacent fauna is represented in the present assemblages (Kenward 1978). Some of the insect samples, however, do provide evidence of at least some river penetration (the presence of *Oulimnius tuberculatus* at 183–193cm and 143–153cm, for example) which may have occurred during periodic flooding of the main channel. The occurrence of more 'dry land' terrestrial forms towards the top of the peat deposits indicates that the deposit was becoming drier by 800AD.

Little can be said of the small assemblage from the tenth century linear feature. None of the recorded species of insect appear to have bred in the feature and most may be either 'background' fauna or have been introduced with the dumped material used as a backfill. Some of this material may have been brought from within a building. The larger assemblages from Period III1 also provide evidence of the dumping of material from inside houses, and a considerable insect population must have developed in abundant moist organic matter in context *97* at least. Human occupation probably continued through Period III2 but very few insects were recorded. No interpretation was possible for the few remains from Period IV.

V. Mollusca

by Peter Murphy

Shells and fragments of marine, freshwater and terrestrial molluscs were recovered by hand during excavation and

Period	I	II	III(1)	III(2)	IV	V	VI
Mytilus edulis L	2	7	11	13	2	4	8
Ostrea edulis L	10	29	258	959	274	339	325
Pecten maximus (L)	-	-	-	-	-	1	-
Cerastoderma sp	-	-	-	-	-	1	1
Macoma balthica (L)	-	-	3	1	1	-	-
cf.*Ensis siliqua* (L) (frags)	-	-	-	-	-	1	2
Nucella lapillus (L)	-	-	1	-	-	-	-
Neptunea antiqua (L)	-	-	-	-	-	-	8
Buccinum undatum L	1	1	4	8	2	17	44

Table 17 Summary table listing marine mollusca collected by hand during excavation (minimum numbers of individuals).

	99	121
Nucula turgida Leckenby and Marshall	-	15
Mytilus edulis L	-	+
Ostrea edulis L	-	+
Tellina (Fabulina) fabula Gmelin	-	1
Tellina sp	-	1
Macoma balthica (L)	1cf	378
Tellinidae indet (fragments)	+	819
Abra alba (Wood)	-	3
Abra sp	-	3
Scrobiculariidae indet (fragments)	-	23

Counts refer to numbers of valves.
+ = non-hinge fragments only

Table 18 Marine mollusca from contexts 99 (Sample 5) and 121 (Sample 6).

by sieving soil samples. Full species lists and counts are given in Tables 15 and 16 (microfiche).

The results from the hand-collected material are summarised in Table 17. Deposits of Periods I and II produced only small quantities of oyster, mussel and whelk shells, but the dumped layers of refuse from Periods III to VI contained much larger amounts of shell. In all periods the oyster is the predominant species, with some mussels and whelks (*Buccinum* and *Neptunea*), the latter becoming more abundant in the latest site phases. Infaunal molluscs characteristic of sandy coasts (*Cerastoderma*, *Ensis*) are completely absent before Period IV (twelfth century) and rare thereafter, suggesting that estuarine shell fisheries in the lower Yare were of primary importance. The species composition of shell assemblages from Whitefriars Street Car Park supports this conclusion (Ayers and Murphy 1983, 34–6).

Fragments of Solenacea (cf. *Ensis siliqua*) occurred at this site in Period V and VI deposits. They have also been identified in medieval deposits at other sites in Norwich, notably at site 176N, where an assemblage of 21 *E.siliqua* valves was recovered, and in eleventh century refuse deposits at Castle Acre Castle (both Murphy, unpublished). It is thus clear that razorshells formed a widespread, if minor, component of the medieval diet in Norfolk.

From deposits of Periods III and IV a few shells of the small inedible bivalve *Macoma balthica* were collected and two soil samples from Phase III(1) (tenth/early eleventh century) included shells of this and similar species: *99* and *121*. (Table 18) *99* produced only one abraded hinge fragment, probably of *Macoma balthica*, with some non-hinge fragments of tellinid bivalves, but a 0.9 kg sample from *121* contained valves and fragments from numerous individuals of *M.balthica*, associated with valves of *Nucula turgida*, *Tellina fabula* and *Abra alba*. *121* was a layer of organic sandy silt with wood fragments, charcoal and rare small subangular flint pebbles. Some of the bivalve shells from this layer had an internal encrustation of light greyish-brown sandy clay which probably is the type of sediment from which these bivalve shells originally came.

M.balthica, the predominant species in this assemblage, is an infaunal bivalve particularly common in intertidal mud in estuaries (Tebble 1976, 150) where it can occur in densities of more than 6000 individuals per square metre (Yonge 1949, 267). *Abra alba* and *Tellina fabula* can occur in similar sediments from low in the intertidal zone to depths of about 65 and 55m respectively (Tebble 1976, 144 and 152). *Nucula turgida* is found in sandier substrates down to depths of about 90 m (*ibid*, 18). Estuarine conditions would not have extended up the River Yare beyond the area of Breydon Water in the tenth century (Coles and Funnell 1981, 127–9) and it is thus clear that these bivalves must have reached the Fishergate site by some artificial means. The most likely interpretation is that these shells represent shell refuse discarded when shellfish catches were picked over prior to sale though they could have arrived in mud adhering to vessels, fishing gear or footwear. Fish hooks, net weights and bone netting needles from the site establish the presence of fishermen at the site as, of course, does the street name Fishergate.

Soil samples produced a very few shells of freshwater and terrestrial molluscs, including *Lymnaea truncatula*, Succineidae, *Cochlicopa* sp, *Pupilla muscorum*, *Acanthinula* sp, Limacidae and *Helix aspersa*, and some shells of *Cepaea* spp were collected by hand. The assemblages are, however, too sparse to provide any useful palaeoecological information.

VI. Miscellaneous faunal remains

Coprolites and other faecal concretions

by Peter Murphy

Fragments of coprolites were recovered by hand during excavation from five contexts and, in addition, samples from the organic fill of a barrel (*162*) included a high proportion of flat platey faecal concretions. The plant macrofossils associated with the concretions from *162* establish that the deposit included human faeces mixed with plant material used for flooring or litter (*Pteridium*, *Calluna*, grass/cereal culm). The coprolites seem, however, to be of animal origin (see Table 19 (microfiche) for details). They fall into two main groups. The coprolite from

123 contains large fragments of monocotyledonous (grass?) culm and leaf but no bone or seed fragments. High power examination of a suspension of acid-insoluble material from this coprolite showed the presence of a *Trichuris* ovum, phytoliths and angular sand grains. It is possible that this coprolite was formed from herbivore droppings. The remaining coprolites, from *33*, *94*, *96* and *121* all include bone fragments up to about 25 mm. The fragments in *33* are rounded, but those from the other three coprolites are sharp and angular. No plant tissue was observed in *33* and *121*, but in *94* and *96* testa fragments from seeds of arable weeds are present, together with some monocotyledonous stem tissue and flecks of charcoal. It seems reasonable to suggest that these bone-rich coprolites represent the droppings of dogs and/or pigs scavenging on the deposits of refuse dumped along the waterfront from Period III onwards.

Intestinal parasite ova from soil samples

by Andrew K.G. Jones

Subsamples from column sample 12 and from the tenth-century ditch *123* were inspected for parasite eggs, and produced the following results:

Sample 12			
45–56cm	*52*	(Period IV)	1 *Trichuris* and 2 *Ascaris* ova
65–75cm	*78*	(Period III2)	2 *Trichuris* ova
75–85cm	*78*	(Period III2)	1 *Trichuris* ovum
104–113cm	*96*	(Period III1)	3 *Trichuris* ova
Sample 13			
	123	(Period III)	2 *Trichuris* ova

Multiplying the counts by 100 gives an approximate number of ova per gram of deposit. The concentrations are not sufficiently high to indicate that the layers were composed mainly of faeces, but it seems that some faecal material was deposited. Measurements of the *Trichuris* ova fall within the range of *T. trichura*, the human whipworm.

No ova were seen in samples from column sample 12 below 113cm.

Avian eggshell

by Peter Murphy

Small quantities of eggshell fragments were recovered from the Period II features *90* and *123*, from dumped layers of Period III (*97*, *96*, *95*, *78*, *121*), from a Period III gully (*108*) and from the organic barrel fill *162*, of Period VI. There were no concentrations of fragments. The sample from *162* also contained eggshell membrane, which commonly occurs in cesspit deposits (Allan Hall, pers. comm.).

VII. Mosses

by Robin Stevenson

Samples of mosses from soil samples from the Period I peat (*175*), from the Period II features *90* and *123*, from the Period III1 dumped layer *97* and from the Period IV wooden barrel (*161*, *162*, *163*) were examined. In all cases the quantities were small. Lists of identifications are given in Table 20 (fiche).

Remains of mosses were uncommon in *175*, though a small fragment of *Amblystegium serpens*, characteristic of woodlands, came from the sample at 153–163cm, and fragments of *Pleurozium schreberi*, a plant most characteristic of heathlands, were present at 143–153cm.

Context *90* contained few remains of mosses, but *123* produced an assemblage dominated by a single species, *Calliergon cuspidatum*, which is most usually found in wet places, although it is capable of surviving in fairly dry habitats. Associated species, which were all present in fairly small quantities, are either indicative of woodland or damp habitats.

Context *97* contained many unidentifiable fragments, with remains of *Antitrichia curtipendula*, (a woodland moss), *Homalothecium sericeum* (a plant of wide tolerance), *?Isothecium myurum* (woodland?), *Thuidium tamariscinum* (neutral woodlands/shaded grass), and *Ulota* sp (woodland: most species are obligate epiphytes).

In context *161* nine moss species were present, all represented by small fragments or isolated leaves. They represent a range of habitats including heathlands, woodland and damp eutrophic habitats. The sample from *162* was less diverse; about two thirds of the sample consisted of *Calliergon cuspidatum*, typical of acid to basic damp places. The remaining third consisted of *Amlystegium riparium*, a rather weedy plant of damp eutrophic habitats, with one fragment of *Dicranum scoparium* and one of *Rhytidiadelphus squarrosus*. Both of these are most typically found in rather acidic habitats. *163* produced only two identifiable fragments, of *Brachythecium velutinum*, a plant of living and dead wood, and a piece of *Pleurozium schreberi*.

Conclusions

Taken as a whole it is difficult to draw firm conclusions from these samples. Many of them were very small and frequently the species present have very wide ecological tolerances. The most distinctive are the 'obligate' woodland species, such as *Antitrichia curtipendula*, *Neckera complanata* and *Ulota* sp.. Plants such as *Pleurozium schreberi*, although most characteristic of open heathland, can survive light shading in acidic woodlands.

VIII. Pollen analysis

by Robert G. Scaife

Introduction

The deposits sampled for pollen include natural peats and sediments (contexts *97* and *175*) and organic deposits of anthropogenic origin (contexts *96*, *95* and *78*). These represent a number of different environments, and might be expected to produce plant macrofossil assemblages and pollen spectra of diverse character. This has been confirmed with the pollen data presented here.

Methodology

Samples for pollen analysis were obtained from an open section close to the southern face of the excavation. These were taken nearby, and in conjunction with, samples for macrofossils. Samples of the organic deposits were taken at 8cm intervals and span contexts *78*, *95*, *96*, *97* and *175* (from the top downwards). Due to lateral variations in the thicknesses of these layers depths of contacts recorded in the pollen column do not correspond exactly with depths in the column for macrofossil samples. Compacted peats below 176cm were not sampled due to rapid influx of water into the trench and consequent threat of contamination. These basal deposits were, however, bulk sampled by P. Murphy using a spade 'to lever up larger samples for plant

macrofossils'. Vegetation data are thus available for the base of context *175* and which was shown to lie directly on gravels of presumed Devensian age.

Standard techniques were used for the extraction and concentration of the sub-fossil pollen and spores (Moore and Webb 1978). This included deflocculation of the organics using sodium hydroxide (10%); digestion of silica with hot hydrofluoric acid and removal of cellulose using Erdtman's acetolysis (Erdtman 1960). The extracted pollen was stained with safranian and mounted in glycerol jelly. Pollen and spores were not abundant and were in a moderate state of preservation. This is not surprising in view of the molluscan remains present which indicate a relatively high pH. It is likely that pollen preservation has resulted from the site being constantly waterlogged. The sum of identified and counted pollen grains and spores ranged from 300 to 925. These totals have been calculated as a percentage of the sum of total pollen (excluding spores). Spores have been calculated as a percentage of total pollen. The results of these calculations are given in pollen diagram form (Figs 25 and 26) and pollen counts are given in Table 21 (microfiche). Pollen taxonomy in general follows that given by Moore and Webb (1978).

Pollen stratigraphy

(Figs 25, 26)

Four distinct pollen assemblage zones have been identified (Figs 25 and 26). These are described from the base at 176cm upwards. It appears that these pollen zones are broadly coincidental with the archaeological contexts described. The relationship of these contexts is given in the stratigraphical column shown in Figure 25. From the base upwards, the pollen assemblage zones recognised are characterised as follows.

Pollen assemblage Zone I (176-156cm; context *175*)

The deposits of this zone comprise dark brown, highly humified detritus peat containing some monocotyledonous remains, fine silt and sand. Arboreal pollen is dominated by *Pinus* which increases throughout the zone to 53% of total pollen at 160cm. *Betula* is represented (10% at 176cm). Small numbers of *Ulmus* (individual occurrences), *Quercus*, *Alnus* and *Corylus* type are recorded. Dry land herb pollen is dominated by Gramineae (to 50% TP) and Cyperaceae (to 40% TP). Gramineae pollen having a size of greater than 45 microns was recorded separately. Attention is drawn to *Filipendula*, which increases throughout the zone. Pollen of aquatic plants is present (*Nymphaea*, *Nuphar*, *Myriophyllum alterniflorum* and *Potamogeton*). Other wetland and aquatic marginal plants include *Caltha* type, *Alisma* type, *Iris*, *Sparganium* type and *Typha latifolia*. Spores of *Dryopteris* type (monolete spores) attain 30% of total pollen at 160cm.

Pollen assemblage Zone II (158-132cm; contexts; top of *175*)

The peat of this zone consisted largely of dark brown, highly humified detritus peat. This was texturally similar and apparently the same as that comprising Zone I. In the larger samples obtained for plant macrofossil analysis, Murphy (below) notes the presence of *Phragmites*, other monocotyledonous remains and abundant twigs and wood. The principal arboreal taxa are *Quercus* (to 10% TP) and *Alnus* (to 10% TP). Low numbers of *Ulmus*, *Tilia* and *Fraxinus* and a single occurrence of *Fagus* were present in the analysis. A marked decline in the pollen of *Pinus* (from 55% to 7% TP) occurs across the boundary with Zone I. In the shrub category, *Corylus* type is the principal component reaching a maximum value of 10%. Herbs are more numerous and are dominated again by Gramineae (to 60% TP) and Cyperaceae (to 40% TP). Large Gramineae (cereal type: >45 microns) are also noted. A more diverse range of herbs is present compared with those in Zone I. Of particular note are the relatively high values of *Plantago lanceolata* and *Taraxacum* type (Compositae group Liguliflorae). Pollen of aquatic taxa is reduced but with *Sparganium* type remaining important. Fern taxa are dominated by *Dryopteris* type and notably *Pteridium* which makes its first appearance in the base of this zone.

Pollen Zone III 132-108cm; contexts *97*, *96*)

Stratigraphically, the deposits of this zone were similar to that comprising Zones I and II (humified detritus peat) though some dumped organic refuse may be present. Palynologically this zone is differentiated from Zone II by the absence of *Tilia* and minor reductions in pollen of *Pinus*, *Alnus*, *Corylus* type, and *Salix*. *Plantago lanceolata*, *Taraxacum* type and Cyperaceae increase. Tree pollen remains dominated by *Quercus* and *Alnus*. Gramineae and Cyperaceae remain the dominant herbs. The spores of fern taxa remain little changed from Zone II.

Pollen Zone IV (108-56cm; contexts *95* and *78*)

Stratigraphically this zone is highly heterogeneous comprising flints, quartzite pebbles and comminuted calcareous fragments. These are set in a humic loam. Murphy (this volume) has also noted the presence of wood, charcoal, insects and molluscs. This pollen zone is characterised by a marked reduction in pollen of arboreal taxa which, with the exception of *Quercus*, occur only sporadically. Herbaceous pollen are dominated by Gramineae. Wild grasses (that is, size of less than 45 microns, thin walled and with small pori and annuli) attain high percentage values. Cereal type pollen (Gramineae with a size greater than 45 microns, thick exine displaying coarser sculptural elements and large pori and annuli), is also dominant throughout this zone (to 45% TP). In contrast to pollen Zones I and II, Cyperaceae are much diminished. Pollen of *Taraxacum* type (Liguliforae) is co-dominant reaching up to 35% of total pollen. The 'curve' for this taxon does, however, fluctuate markedly from only isolated grains to the substantial values noted above. Other herb taxa which are of note include *Sinapis* type, *Plantago major* type and *Centaurea cyanus*. Pollen of aquatic and marginal taxa are largely absent with only individual occurrences of *Sparganium* type and *Typha latifolia*. Fern spores are similarly reduced.

Discussion

It is clear that the four broad pollen zones represent three main periods of organic accumulation. The stratigraphical boundary between Zones I and II is indistinct. This is perhaps due to the highly humified character of this apparent fen peat and to its compaction. The junction between Zones III and IV is, however more distinct because of the contrasting biofacies and lithofacies. This division into four units is not surprising in view of the diverse ages of the different stratigraphical units analysed. Zone I has been radiocarbon dated at 9410±110 bp (HAR 7062) and therefore falls within the earlier part of Flandrian Zone I (Pre-boreal/early Boreal). In contrast, assemblage Zone III is associated with Saxon deposits which have been dated at 800 ad (HAR 7061). This date was from peat obtained from deposits at the top of the pollen Zone III. The intermediate pollen Zone II, is more problematic since no absolute dating was undertaken on these deposits: the peats in Zones I and II were initially thought to be part of a continuous depositional sequence. Suggestions on dating are, however, made in the light of the pollen evidence presented here (see below). Zone IV has been dated on artefactual evidence to the medieval period.

The radiocarbon date of 9410±110 bp (HAR 7062) clearly places the basal pollen assemblage zone within the early Flandrian. This date is commensurate with the vegetation/environmental data from many other English sites (including East Anglia). The environmental picture can be divided into two aspects; these are the 'on site' vegetation and the vegetation of the surrounding area. The former (autochthonous) record is portrayed as vegetation dominated by grass and sedge fen with areas of open water present. It is likely that the River Wensum was a slow flowing river in which aquatic plants (*e.g. Nuphar*, *Nymaphae*, *Potamogeton*) grew. This was apparently bordered by fen swamp in which grasses, sedges and rooted marginal aquatics grew (*e.g. Alisma*, *Sparganium*, *Typha angustifolia* and *T.latifolia*). This view is commensurate with Murphy's (this volume) interpretation of 'deposition in, or

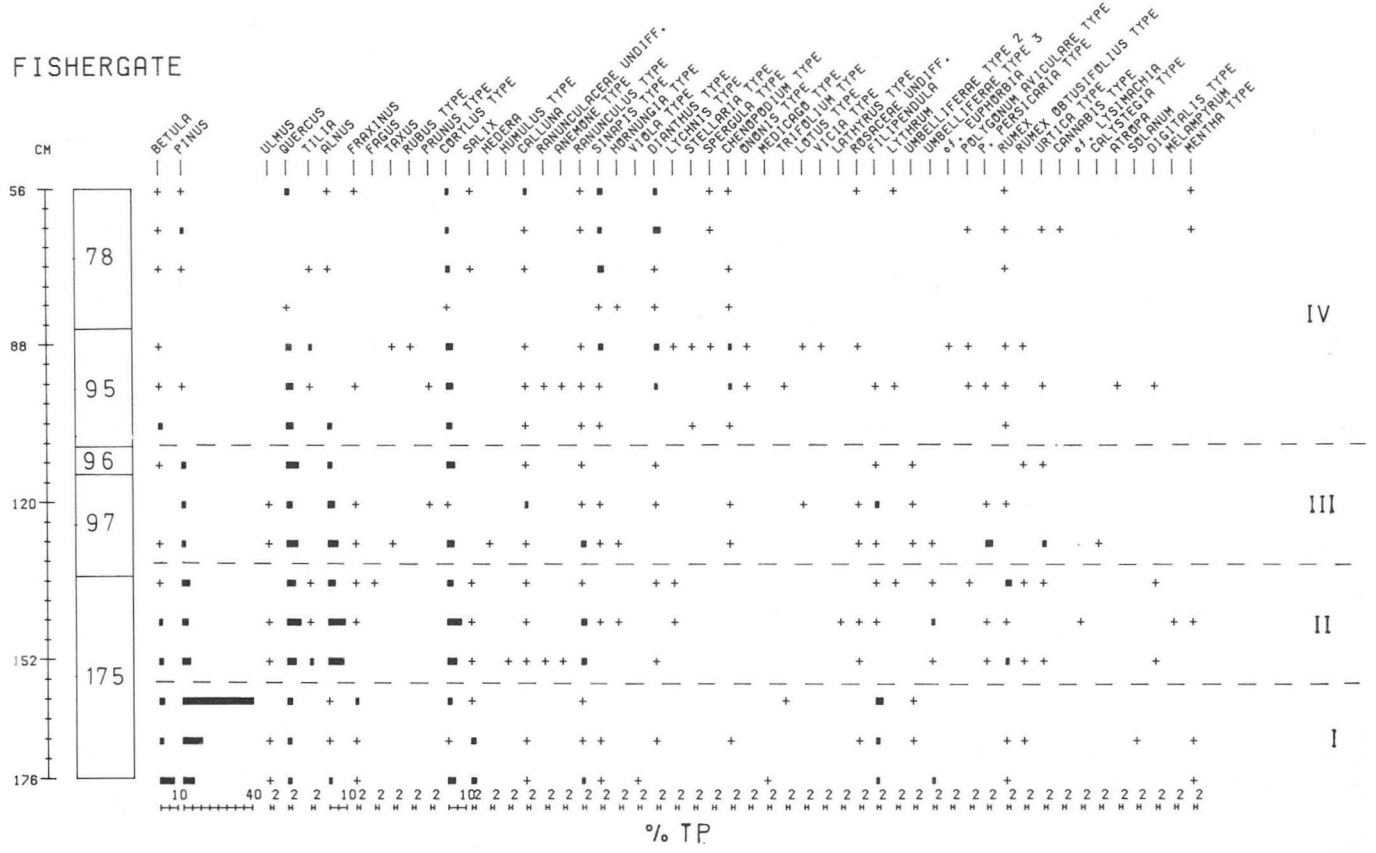


Figure 25 Pollen diagram (NB depths of layers in the pollen column do not correspond closely with those for the macrofossil diagram due largely to lateral variations in layer thicknesses).

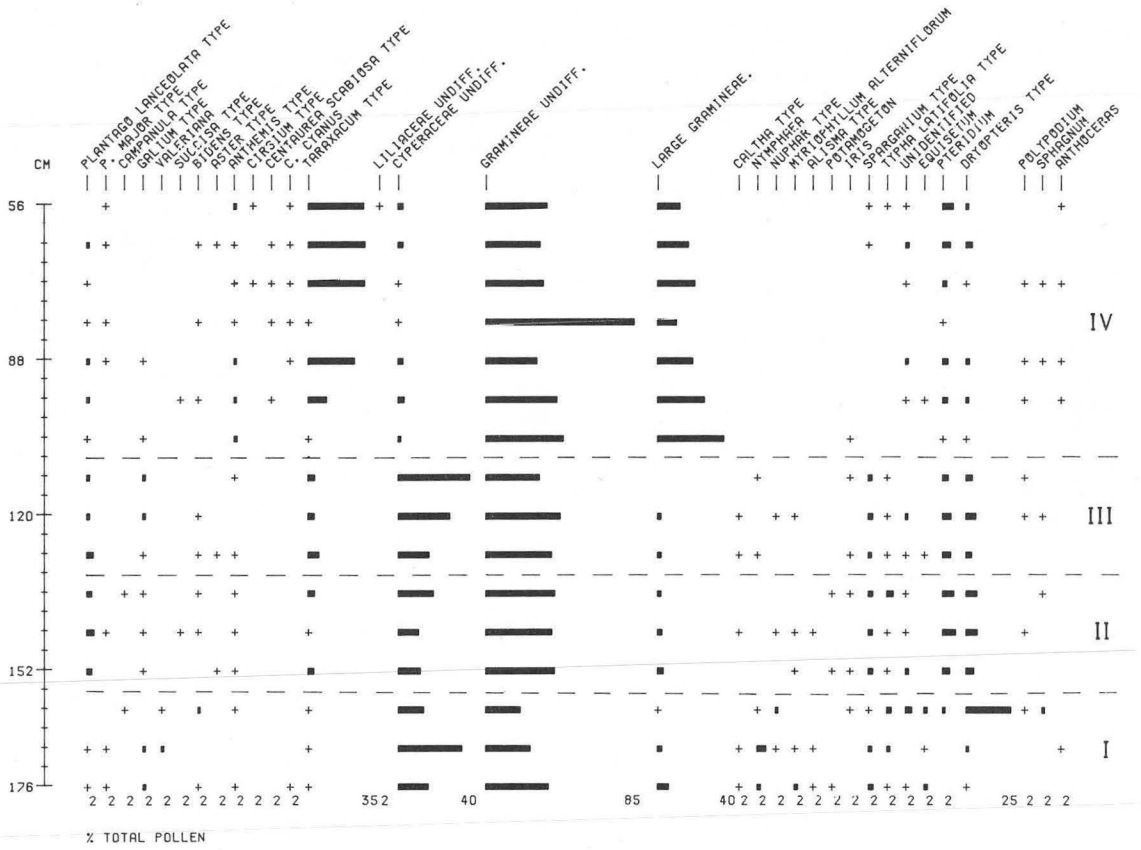


Figure 26 Pollen diagram (continued).

adjacent to, open reed swamp growing in shallow water, isolated from the main river channel'. Murphy also notes the presence of *Nymphaea alba*, *Nuphar lutea*, *Caltha palustris*, *Iris psuedacorus* and *Typha* species, all of which were recorded in the pollen record.

Pollen has the advantage over plant macrofossils in that it may also portray the characteristics of the regional vegetation. This is the case here. It appears that the basal sample represents the time at which *Pinus* was spreading at the expense of *Betula*. This is a characteristic phenomenon of early Flandrian vegetation succession when, subsequent to climatic amelioration at the end of the last glacial stage (Devensian), *Betula* became rapidly dominant. This was superseded by *Pinus* which had a competitive ability over *Betula* and which similarly became dominant. *Corylus* is often associated with this phase of the Flandrian vegetation development, with its arrival in England being asynchronous due to differing migration routes (Deacon 1974; Godwin 1975). It appears that the uppermost level of pollen assemblage Zone I (160cm) pre-dates this arrival. Since we are here dealing with negative evidence, it may be argued that *Corylus* may never have been present in such dominance at this site. When compared to the majority of early Flandrian pollen records, this does, however, seem unlikely. It is therefore suggested that this pollen record represents the early Boreal period immediately before *Corylus* became co-dominant with *Pinus*. In view of the early Holocene date of these peats, it is not surprising that *Ulmus* and *Quercus* are present in only small values.

From the pollen evidence there is a distinct break in the stratigraphical record between 152–160cm. No unconformity was apparent in the peat stratigraphy, all of which falls within context *175*. Murphy (this volume) has also pointed to drying out of the marsh surface within context *175*. There is undoubtedly a major hiatus between Zones I and II when peat accumulation ceased or where the peat stratigraphy has been removed by erosion. It has often been noted that the climate of the Boreal period (Flandrian Ib and Ic) was a time of continental dryness. Evidence cited by a number of writers includes the reworking of sediments on the margins of Lake Windermere (Pennington 1970) and Hockham Mere, Norfolk (Godwin and Tallantire 1951) during the late Boreal. It is not inconceivable therefore that such a period of dryness may have upset the hydrological status of this area. Lowering of water levels may have caused a cessation of peat growth and have been responsible for the highly humified and detrital character of the peat. Alternatively, cessation of peat growth may have

resulted from spatial shifts in the drainage channel. This can only be verified with a wider stratigraphical survey of these basal peat sequences.

Pollen Zone II is of interest and it is unfortunate that at present no absolute dating is available for the peats of this zone. It is hoped that with future excavation this will be feasible. It is clear that the depositional environment was similar to that of Zone I, but of much later date; that is, with open water and fringing reed swamp with associated plant taxa. The 'terrestrial' flora is, however, substantially different to that of pollen Zone I. *Pinus* and *Betula* woodland was replaced by *Quercus*. *Tilia* (lime) and *Fraxinus* (ash) are also present in small pollen frequencies. These two trees are insect pollinated and produce relatively small quantities of pollen and hence are usually under represented in pollen spectra. Consequently, when present in pollen spectra their relative importance must be considered in relation to these factors. It appears therefore that some *Quercus* woodland with *Tilia* and *Fraxinus* was present in the region. Alder pollen is also in evidence in this zone. It is difficult to assess whether its pollen came from sporadic local growth or whether it was transported from areas of dominance growing at a distance from the site. The herb pollen spectra provide an insight into the dating of this zone. Pollen of *Plantago lanceolata* and large Gramineae (which may include cereal pollen) and the spores of *Pteridium aquilinum* (bracken) are perhaps indicative of Neolithic or post-Neolithic anthropogenic disturbance. This is also substantiated by the relative absence of *Ulmus* and the presence of *Fraxinus*. From this it is clear that we are dealing with a post-Elm-Decline sequence. It has often been shown that *Fraxinus* expanded into those areas once dominated by elm. Similarly, *Tilia* might be expected in higher frequencies for any period between Flandrian II (Atlantic at 7000 bp) and the *Tilia* decline which has been variously dated from the Late Neolithic to Iron Age. It is perhaps interesting to note the higher values of *Tilia* in the basal level of this zone (104cm). Throughout southern and eastern England, a *Tilia* decline in the pollen record has been shown to have been the result of anthropogenic clearance for agriculture. This event is asynchronous but appears to have taken place especially during the middle and late Bronze Age (Turner 1964; Baker, Moxey and Oxford 1978; Scaife 1980). Such clearance of woodland for agriculture could have the effect of raising the water table causing renewal of the peat-forming community adjacent to the River Wensum.

The organic deposits of pollen Zones II and III are compacted and humified detrital peats, and it is likely therefore that the time-span represented is relatively long. The date of 1150±80 bp (HAR 7061) near the top of Zone III provides an upper date for this peat accumulation. Consequently, the underlying peats down to 158cm may span all or parts of the Bronze Age, Iron Age and Romano-British periods. This view would be commensurate with the interpretation given above that we are seeing (in Zone II) the *Tilia* decline and recursion of organic deposition consequent upon higher ground water tables. This view is substantiated by the abundance of marsh taxa in the pollen and seed record (Murphy below).

Zone IV exhibits markedly different characteristics to Zones I, II and III both in the biostratigraphy and the lithostratigraphy. Whilst the deposits of Zones I to III contain pollen which were derived through normal and natural taphonomic processes, Zone IV displays many of those elements indicative of different modes of arrival. The pollen spectra between 108 and 56cm are typical of those assemblages found on, or adjacent to, urban areas. This is of course in accord with the Saxon to medieval urban character of this area of Norwich. Such urban pollen and plant macrofossil assemblages are normally very diverse in character. This is generally due to the importance of plant materials used by the occupants in urban areas. Such uses are numerous but notably include human and animal food; building materials; floor coverings; and the by-products of crop processing. Urban dwellers were responsible for producing substantial quantities of refuse and ordure. This was frequently dumped into stream channels and on waste ground. Organic waste and especially human and animal faecal material may contain large quantities of pollen which has remained in foodstuffs during their preparation. On ingestion this pollen is readily preserved in the gut and intestinal tract (Greig 1981; Scaife 1986). Ultimately this is excreted as faeces and becomes a major constituent of urban waste. The presence of intestinal parasites is also common in such circumstances. Here, this was similarly the case with numbers of *Trichuris* (Whipworm) and *Ascaris* (Maw worm) nematode eggs present in the pollen preparations. In addition, urban waste areas may have a prolific growth of weeds which may contribute to the pollen and seed record where suitable conditions for preservation occur (Greig 1976; Hall *et al.* 1983; Krzywinski *et al.* 1983; Scaife 1982, 1986). It is these elements which have contributed to the pollen record of assemblage Zone III.

High values of cereal pollen noted in Figure 26 are likely to have come from faecal material which was dumped into the River Wensum or its fringing marsh land. Murphy (this volume) has noted the presence of coprolites in a number of contexts. One of these (from context *94*) was shown to have arable weed seeds incorporated. This helps to substantiate the view that the high cereal frequencies recorded here result from faecal waste and not by direct transport from local crop cultivation or cereal processing. It is further likely that much human and animal ordure was similarly dumped into this wetland area and contributed to the pollen spectra of the segetals associated with arable cultivation (*Centaurea cyanus*, *Sinapis* type and other weeds). It appears that woodland was sparse by the time of deposition of contexts *78* and *95*. This is, however, problematic because the natural pollen rain may have been swamped by the large quantities of pollen incorporated in the organic material introduced by humans.

IX. Plant macrofossils (excluding wood and mosses)

(Fig. 27)

by Peter Murphy

Plant macrofossils were extracted from column sample 12, which included sub-samples from the Period I peat *175* together with samples from the overlying dumped deposits of Periods III and IV, and also from several archaeological features of Periods II, III and VI. Full lists of identifications are given in Tables 23–27 (fiche). The results are summarised in Table 28 and Figure 27.

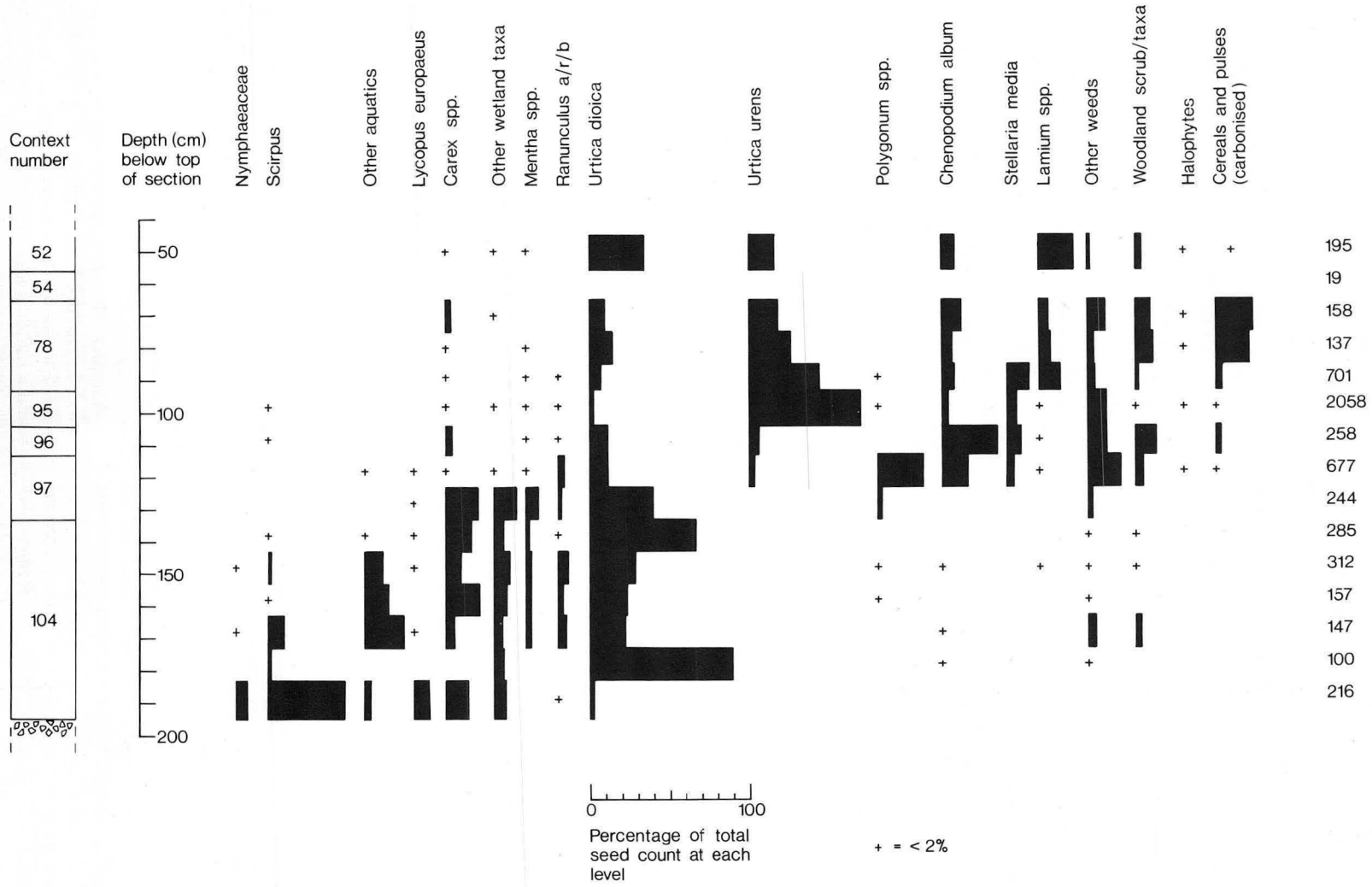


Figure 27 Summary diagram showing frequencies of plant macrofossils in column sample 12. For details see microfiche Tables 22 and 27. NB Context *104 = 175.*

Local vegetation

The assemblages of plant macrofossils from column sample 12 and from samples from Period II features provide information on changes in local vegetation between Periods I and IV (*i.e.* pre- tenth century–twelfth century). The results from sample 12 are summarised in Figure 27. Percentage frequencies of some of the more abundant or ecologically characteristic taxa in successive sub- samples are plotted individually in this diagram but most species are plotted as ecological groups. The species composition of these groups is given in Table 22 (microfiche). Inevitably any such grouping is to an extent artificial, for many of the plants here represented by macrofossils can occur in more than one type of plant community. For this reason grouping in very general ecological categories has been preferred to attempts at reconstructing particular communities or associations.

The earliest macrofossil assemblage comes from the base of the peat *175* (=*104*) at 183–195cm, a sample of which has yielded a radiocarbon date of 9410±110 BP (uncal) (HAR–7062). The assemblage is dominated by fruits of *Scirpus* cf *lacustris*, a characteristic plant of open reed-swamp. Fruits and seeds of the submerged and floating-leaved aquatic plants *Ranunculus* subgenus *Batrachium* and *Nymphaea alba* are also present, together with seeds of wetland plants, particularly *Lycopus europaeus* and *Carex* spp. Formation of peat under reed-swamp, probably in a back-swamp isolated from the main river channel is indicated.

The peat just above this, at 173–183cm, produced a quite different assemblage of macrofossils with very few remains of wetland and reedswamp plants. Poorly-preserved nutlets of *Urtica dioica* dominate the sparse assemblage. It appears that at this level the peat surface had dried out to some extent, with resulting partial degradation of macrofossils. The remaining four assemblages from *175* between 173 and 133cm indicate an initial return to wetter conditions followed by a long-term drying of the peat surface. The assemblage from 163–173cm is fairly similar to that at the base of *175*. Above this, however, there is a progressive reduction in the frequencies of aquatic and reedswamp plants, whilst frequencies of marsh, riverbank and grassland species increase, suggesting that the marsh surface had become drier by the end of Period I.

No deposits of Period II (tenth century) were present in column sample 12 but two samples of this date came from the small linear features *90* and *123*. Conditions were clearly quite dry on the marsh surface whilst these features became infilled. Fruits and seeds of obligate aquatic plants are absent and macrofossils from species of marsh and littoral habitats, (including *Ranunculus sceleratus*, *Ranunculus flammula*, *Hypericum* spp, *Lychnis flos-cuculi*, *Filipendula ulmaria*, *Apium* cf. *graveolens*, *Pedicularis palustris*, *Mentha* spp, *Lycopus europaeus*, *Juncus* spp, *Eleocharis* sp, *Scirpus/Schoenoplectus* and *Carex* spp) are rare: in *90* these taxa account for only 1.8% of the total seed count (Σ = 1051), in *123* 5.6% (Σ = 727). In *123* seeds of grassland plants are common, particularly uncarbonised grass caryopses (35.1%) with fruits of *Ranunculus acris/repens/bulbosus* (1.5%) and *Prunella vulgaris* (1.5%). Other taxa characteristic of meadows (Greig 1984, 222) in these samples include *Trifolium* sp (flower and pod fragments), *Torilis japonica*, *Daucus carota*, *Achillea millefolium*, *Hypochoeris* sp and *Juncus* spp. On this evidence it appears that reedswamp and marsh vegetation had been replaced by valley floor pasture or meadow in the vicinity of the site by the tenth century although some, or all of these grassland taxa could be derived from dumped waste hay or animal dung. There are high frequencies of weed taxa in both samples: in *90*, for example, *Anthemis cotula* alone accounts for 39.3% of the seed count and *Lapsana communis* 22.7%. This, together with the presence of crop plant remains, abundant wood chips and charcoal provides evidence for refuse dumping in these ditches, though there does not appear to have been any significant dumping of plant wastes on the peat surface at this date.

By contrast, the deposits of Periods III and IV (tenth-twelfth century), sampled in the upper part of the column sample 12, consist almost entirely of dumped material (see Chapter 4:I). All samples above 123cm, from layers *97*, *96*, *95*, *78*, *54* and *52* produced assemblages in which seeds of wetland and grassland plants are very rare and in which seeds of annual weeds predominate. For example, the perennial *Urtica dioica*, abundant in the lower part of the column, is largely replaced in the upper layers by the annual *Urtica urens*. The disturbed conditions associated with dumping on the waterfront clearly encouraged the development of an annual weed flora with some elder (*Sambucus nigra*) and bramble (*Rubus fruticosus*) in less-disturbed areas. Other plant remains in these upper layers (macrofossils of cultivated plants and coastal species including halophytes (see below)) are also related to much more intensive human activity at the site.

In summary, then, the macrofossils from the Period I peat indicate growth of reedswamp in the early Flandrian, a phase of lowered ground-water levels, and later renewed peat growth. By the tenth century (Period II) reedswamp and marsh vegetation had been replaced at this site by grassland and weed vegetation, and ground-water levels were apparently not high enough for aquatic vegetation to develop in the gulleys *90* and *123*. Dumping of refuse and spoil on the marsh surface from Period III(1) (tenth/early eleventh century) resulted in the development of predominantly weedy vegetation. The evidence for low ground-water levels in the valley floor at this site in the tenth century is consistent with results from elsewhere in the east Norfolk river valleys: it was at about this time that the water table became sufficiently low for deep peat excavation in the Broads to begin (Coles and Funnell 1981, 129; Lambert *et al* 1960).

Cultivated and utilised wild plants

The distribution of macrofossils of cultivated plants and of some potentially useful wild species in samples from deposits of site Periods I–VI is summarised in Table 28. Compared to earlier excavations on the Norwich waterfront the range of utilised plant taxa is limited (*cf.* Ayers and Murphy 1983; Murphy, in Ayers 1987), mainly because few waterlogged deposits rich in plant wastes were available for sampling.

Samples from *175*, natural and semi-natural peats of Period I, produced no remains of definitely cultivated plants. The few fruitstones and seeds of *Rubus fruticosus* (bramble), *Rubus idaeus* (raspberry) and *Sambucus nigra* (elderberry) in these samples could easily have been incorporated in the peats from local vegetation by natural processes of dispersal.

The assemblages of plant macrofossils from the Period II (tenth century) contexts *90* and *123* are quite different in character. Samples from the fills of these features produced

Site Period		I	II	III	IV	VI
Date		Before 10th cent.	10th cent.	10th-11th cent.	11th/12th cent.	13th cent. onwards
Avena sativa	(cultivated oats)	-	-	++	-	+
Avena cf *strigosa*-group	(sand oat *etc*?)	-	-	++	-	-
Avena sp	(indeterminate oats)	-	+	+++	+	+
Hordeum spp	(barley)	-	-	+++	-	+
Secale cereale	(rye)	-	+	+	-	+
Triticum aestivum	(bread wheat)	-	+	+	-	+
Triticum sp	(glume wheat)	-	-	-	-	+
c.f.*Panicum miliaceum*	(millet)	-	-	-	-	+
Vicia faba var *minor*	(horse-bean)	-	-	+	+	-
Pisum-type	(?pea)	-	-	?	-	-
Linum usitatissimum	(flax)	-	+	+	-	+
Reseda luteola	(dyer's rocket)	-	+	+	-	+
Rubus fruticosus	(bramble)	+	-	+	-	+
Rubus idaeus	(raspberry)	+	-	+	-	+
Fragaria vesca	(strawberry)	-	+	-	-	+++
Malus sylvestris/domestica	(apple)	-	-	-	-	++
Prunus sp	(?sloe)	-	-	+	-	-
Ficus carica	(fig)	-	-	-	-	++
Sambucus nigra	(elder)	+	+	++	+	+
Corylus avellana	(hazel)	-	+	+	+	-
Brassica spp	(cabbage *etc*)	-	-	++	+	+++
Beta vulgaris	(beet)	-	-	+	+	-
Foeniculum vulgare	(fennel)	-	-	-	-	+
Humulus lupulus	(hop)	-	+	-	-	-

Abundance is summarised on a three point scale from '+' (single fruits/seeds or small numbers of seeds in large seed assemblages) to '+++' (seeds forming the predominant components of assemblages.

Table 28 Summary of the distribution and relative abundance of macrofossils from crop-plants and potentially useful wild species in samples from Fishergate.

remains of cereals, flax (*Linum usitatissimum*) and several potentially useful wild plant species. The cereal remains include a few carbonised grains and awn fragments of oats (*Avena* sp) and a grain of free-threshing wheat (*Triticum aestivum s.l.*). The sample from *123* also produced some non-carbonised fragments of rye rachis (*Secale cereale*), large culm nodes, probably of cereals, and seeds of common arable weeds. This material probably indicates some crop processing in the vicinity. The sparse remains of flax include seeds and fragments of capsules, but no stems or fibres were observed. This again could indicate local processing, or even flax-growing in the valley floor: macrofossil assemblages from these features and from the top of the peat *175* include rather few remains of wetland taxa, implying that the marsh surface would have been sufficiently dry in the tenth century for the cultivation of flax. Other potentially useful plants identified from macrofossils in these features are *Reseda luteola* (dyer's rocket), *Fragaria vesca* (strawberry), *Sambucus nigra* (elder), *Corylus avellana* (hazel) and *Humulus lupulus* (hop). However all these taxa are represented by few fruits or seeds, and these could have come from plants growing wild on the river terrace or in the valley floor.

The dumped deposits of Period III (tenth-eleventh century) and IV (eleventh-twelfth century) include waterlogged highly organic layers overlain by humified organic deposits, a Dark Earth layer and predominantly inorganic chalky and silty layers. From the lower organic deposits in sample 12 came occasional fruits, seeds and other macrofossils of *Reseda luteola*, *Rubus* spp, *Prunus* sp (a fruitstone fragment), *Corylus avellana* and *Brassica* spp, some or all of which may have been utilised. In addition *121* (Sample 6) produced a few flax capsule fragments. In the upper layers, particularly the Period III Dark Earth *78* and the underlying more organic loam *95*, remains of carbonised cereals and pulses were common. These include large numbers of oat caryopses, with a few floret bases of *Avena sativa* and possibly of the *Avena strigosa*-group, with numerous caryopses of hulled barley most of which are symmetrical grains, which implies a predominance of *Hordeum distichum*. Samples from these layers also produced a few grains of wheat (*Triticum aestivum s.l.*) and rye (*Secale cereale*) with a seed of horse bean (*Vicia faba* var *minor*) and cotyledon fragments possibly of peas (*Pisum sativum*). A single barley rachis node, a few awn fragments of oats, a few small grass or cereal culm fragments and some carbonised seeds of arable weeds were also present, but the overwhelming predominance of grains in the assemblages from these layers implies that carbonisation occurred during domestic grain drying or cooking rather than the earlier stages of crop cleaning.

Layers *52* and *78* also produced some non-carbonised examples of durable fruits and seeds including fruit clusters of *Beta vulgaris*. Many of these clusters are fragmentary but the intact examples are mostly 3-fruited with a few 4-fruited clusters. Berggren (1981, 43) states that the wild ssp. *maritima* has 1–3 fruits per cluster whilst the cultivated ssp. *vulgaris* has 2–8: this, of course, ignores modern monogerm beets. Modern reference material of ssp. *maritima* from the Essex coast in the author's collection

consists of fruit clusters with up to three fruits. From this characteristic it would appear that the *Beta* from Fishergate could represent a cultivated form. However in view of the extreme variability of this species, the inter-fertility of the sub-species and considering also the frequent occurrence of seeds of coastal plants in the Fishergate samples (see below) the possible presence of ssp. *maritima* cannot be excluded.

The latest deposits sampled were the fills of a barrel, *161*, *162* and *163* dated to Period VI. *161* and *163* were predominantly sandy and silty deposits with flint and chalk pebbles, samples of which contained few macrofossils. Most of these were seeds of common weeds with remains of *Calluna* and *Pteridium*, occasional carbonised cereal grains, *Brassica* seeds, *Rubus* fruitstones and, in *163*, fragments of *Malus* endocarp tissue (apple core). *162* was different, consisting of a dark brown structured organic deposit with abundant cereal/grass culm fragments, pieces of bracken frond and fly puparia. The deposit was partly mineralised and included phosphatic concretions. A sample from this deposit produced abundant seeds of *Fragaria vesca* (strawberry) and *Ficus carica* (fig) with seeds and leathery endocarp fragments of *Malus sylvestris/domestica*, cereal periderm fragments and small fragments of arable weed seeds, particularly *Raphanus raphanistrum*, *Agrostemma githago*, *Rumex* sp, *Polygonum convolvulus* and *Centaurea cyanus*. These macrofossils are clearly human faecal residues from the consumption of soft fruits and wholemeal grain foods. Fruits and seeds of fennel (*Foeniculum vulgare*), flax (*Linum usitatissimum*) and elderberry (*Sambucus nigra*) were also identified and seeds of *Brassica* spp. (including some *B.rapa*) were common. Large *Prunus* fruitstones and nutshells of *Corylus* and *Juglans*, which often occur in comparable deposits, such as the eleventh-fifteenth century cesspits at the Magistrates' Courts site (Murphy, in Ayers 1987) were absent from the sample examined, which implies that kitchen and table refuse was not discarded in this barrel. The assemblage from *162* does, however, include some plant material from other sources. Remains of bracken and heather, flowers and pods of *Trifolium* and *Medicago* perhaps from hay and the abundant fragments of cereal straw with arable weed seeds and occasional cereal rachis fragments may all represent discarded flooring materials.

The uncharred cereal remains include short rachis sections of rye (*Secale cereale*) and, interestingly, remains of at least one cereal which would not normally be expected to occur in medieval deposits in this country. This is a poorly-preserved spikelet fork of a glume wheat, either spelt (*Triticum spelta*) or emmer (*Triticum dicoccum*). From the evidence available at present it appears that glume wheat cultivation had ceased in Norfolk and Suffolk before the Middle Saxon period: the latest record of *T.spelta* from a reliable context is from a mid-5th-century layer at West Stow, Suffolk (Murphy 1985a). The presence of a glume wheat spikelet fork at Fishergate could indicate either that such wheats persisted in this area as minor contaminants of other cereal crops or could perhaps be related to the importation of cereals from the Continent.

In addition a grass floret tentatively identified as *Panicum miliaceum* (broomcorn millet) came from this feature. It is, perhaps, significant that the only other British medieval record of this crop, from a late medieval pit at Sewer Lane, Hull, is from an east coast city with extensive trading contacts on the Continent (Williams 1977).

Coastal plants

Fruits and seeds of coastal plants occurred fairly consistently but at low frequencies (always under 2% of the total seed count) in samples from deposits of Periods II to IV, that is, from the tenth-twelfth centuries. Three of the taxa identified are halophytes, characteristic of salt-marsh vegetation: *Suaeda maritima*, *Glaux maritima* and *Triglochin maritima*. The fourth, *Beta vulgaris*, may, as noted above, represent the cultivated subspecies *vulgaris* but it is possible that some fruits of the subspecies *maritima*, a plant often found on sea-banks (Petch and Swann 1968, 122) are also present. Samples from the site also produced some fruits of *Daucus carota* which is common in coastal habitats, though not confined to them (*ibid*, 163) and of the aquatic species *Zannichellia palustris* which occurs in both fresh and brackish water (Clapham, Tutin and Warburg 1962).

Well before the tenth century, in fact probably by about 1500BP, a range of factors, probably including the development of the Yarmouth spit, had confined estuarine conditions to the area of the present-day Breydon Water (Coles and Funnell 1981, 127–9). Consequently the fruits and seeds of coastal plants from Fishergate must have reached the site by some artificial means. At the Whitefriars Street Car Park site (Ayers and Murphy 1983, 43) the presence of coastal species, including *Suaeda maritima*, *Armeria* or *Limonium* sp and *Triglochin maritima*, was tentatively attributed to the shipping upriver of livestock which had been pastured on salt-marsh: the seeds could have adhered to the coats or hooves of the animals or could perhaps have arrived at the site in their guts. Such an explanation could well account for the specimens from Fishergate, although there is another possibility. Numerous small shells of inedible intertidal bivalve molluscs were found in the Period III contexts *99* and *121* and these are thought to have reached the site either as contaminants of shellfish catches or in intertidal mud encrusting vessels or fishing gear (see section V. above). The coastal plant remains could have arrived by this means. Whatever the particular explanation, these plant remains do provide evidence for river traffic between the Breydon Water area and Norwich from the tenth century onwards.

X. Wood

by Peter Murphy

The quantity of wood recovered during this limited excavation was small and much of it is in rather poor condition, particularly the pieces from layers of Period III onwards. Some of these upper deposits have apparently not remained permanently waterlogged and consequently many pieces from these layers were partly rotted, with spongy surfaces. The largest collection came from Period II deposits, being mostly of stakes driven into the peat surface and larger wood fragments strewn on this surface. The stake tips, well-embedded in the peat, were well preserved, but many fragments from the peat surface were partly decayed, particularly on their upper surfaces. A full list of wood identifications is given in Table 29 (microfiche).

Periods I and II

The wood from deposits of these periods consisted largely of straight roundwood stakes with bark and 1–4 facetted tips. Most of these were of hazel (*Corylus* sp) generally

30–40mm in diameter but including some older stems. There were also a few roundwood stakes of *Quercus* sp (oak), *Betula* sp (birch), *Prunus* sp (?sloe) and the *Crataegus*-group. Period II deposits also included some squared oak stakes, mostly similar in size to the roundwood stakes but cut from larger timber. *168* produced some larger wood, including irregular fragments of branches with rotted surfaces, mostly of oak with some fragments of quartered oak branches, a hazel roundwood stake and a decayed branch fragment, probably of the *Crataegus*-group.

The Period II wattle fence, *157*, was lifted intact on a block of soil for conservation. Due to its rather poor state of preservation it proved impossible to conserve this structure, but fragments retained by the conservator for identification were mostly of hazel roundwood stems, compressed but originally about 14–27mm in diameter, with one oak withy, triangular in cross-section, cut from larger wood.

Periods III–VI

The small collection of wood from these periods was mostly of oak with some *Pinus* sp (pine) and *Fraxinus* sp (ash), predominantly fragments from boards, stakes and large posts, cut from mature timber. Preservation was generally poor. *49* (Period IV) was a massive squared timber of oak, the only piece thought to be potentially suitable for dendrochronology: the remaining pieces were too small or too poorly preserved. A stave from the Period VI barrel (*117*) was of oak.

A cross-section of *49* was sent to Dr Jennifer Hillam at the Dendrochronology Laboratory, University of Sheffield. The section showed 97 rings, including 50 sapwood rings, with an average ring-width of 1.84mm. The sequence could not be cross-matched, perhaps because the timber was very knotty and asymmetrical. The ring-width data are given in Table 31 (microfiche).

Context *36* (Period VI), a group of timbers of indeterminate function, included board fragments of oak and pine (*Pinus* sp). Pine has not previously been identified at a waterfront site in Norwich, though in the 1507 fire debris at Pottergate (Site 149N) coniferous softwood charcoal, probably pine, was present (Murphy 1985). At Bridge Street, Ipswich (Site IAS 6202) pine boards came from fourteenth/fifteenth century structures (Murphy, unpublished). As yet pine has not been identified in early medieval contexts at either Norwich or Ipswich. It is probable that these pine samples all represent imported timber. Coniferous softwoods are not thought to have grown in this area in the earlier Middle Ages and there is historical evidence for a medieval trade in softwood boards from the Baltic (Rackham 1980, 151).

There were also a few roundwood stakes from Period III, cut from young stems of oak and hazel.

XI. The Environmental Evidence: Summary and Discussion

by Peter Murphy

In this concluding section a short account of the main environmental results is presented for the non-specialist archaeological reader. For more detail readers should consult the reports on individual categories of material, presented above. This small trench exposed sections through a remarkably diverse range of deposits dating from the early Flandrian through to the medieval period, with some major discontinuities. The deposits contained rich assemblages of macro- and micro-fossils. It seems appropriate to begin by discussing the evidence for local habitat changes, relating these where possible to wider changes in the east Norfolk river valleys. Evidence for the exploitation of local habitats, for agriculture and for the utilisation of marine resources will then be considered.

Local habitats

(Table 30)

An unexpected feature of the excavation was the exposure at the base of the trench, overlying river gravels, of an early Flandrian peat, dated to 9410±110 BP (uncal) (HAR 7062). Plant macrofossils, principally of reedswamp plants and aquatics, indicate formation of peat under reedswamp in shallow water, most likely in a river backswamp. The insect remains are also mainly of reedswamp and stagnant water species, though there is some indication of occasional flooding from the main channel. Neither the plant macrofossils nor the insects give any useful information on the surrounding terrestrial vegetation. However pollen analysis has yielded data on both local and regional vegetation. The pollen results confirm the local presence of fen, reedswamp and shallow open-water communities. In addition they show that woodland in the area during this local Pollen Zone I was largely of pine and birch, the former becoming more dominant through time. Elm, oak, alder and hazel-type pollen were recorded at lower frequencies. Dry land herb pollen is dominated by grasses and sedges.

An early Flandrian peat deposit known as the Broadland Lower Peat has been recorded elsewhere in east Norfolk river valleys in deep borings (Jennings 1955, 200; Coles and Funnell 1981, 125). It represents a phase of freshwater sedimentation under reedswamp or carr, predating the local Flandrian transgression. In the lower reaches of these rivers the Lower Peat is covered by estuarine clay, dating from about 7500 BP, though estuarine conditions never extended as far up the Yare valley as Norwich.

At the top of this basal peat at Fishergate there is evidence for a phase of lowered groundwater levels in the valley floor: both plant macrofossils and insects at this level are sparse and poorly preserved, implying desiccation and humification of the peat surface. This may be related to a drier climate, perhaps during the Boreal period, or may just have resulted from very local changes in the pattern of channels in the valley floor.

Above this, peat growth recommenced. The discontinuity of deposition was not recognised in the field, mainly due to problems of flooding in the trench. Consequently no radiocarbon sample was collected from this level, and the renewed peat growth is not securely dated. The insect assemblages from this peat indicate very similar local conditions to those under which the earlier basal peat formed: reedswamp and still water with occasional river flooding. There is one record of a synanthropic beetle from near the top of the peat. Above this remains of terrestrial beetles increase in frequency, indicating drier conditions. The plant macrofossils also include a range of taxa similar to that from the basal peat, though frequencies of aquatic and reedswamp taxa decline towards the top of the peat, whilst riverbank and grassland plants and weeds increase,

Site Periods (with contexts sampled)	Date	Deposits and local conditions	Human activity
Period IV (52, 54)	11th–12th century	Dumped deposits and crushed chalk layer	Refuse dumping and site levelling. Chalk hard-standing for riverside activities.
Periods III(1) and III(2) (Top of 97, 96, 95, 78)	Late 10th–11th century	Organic deposits and Dark Earth.	Large-scale refuse dumping.
Period II (90, 123)	10th century	Ditch fills. Groundwater levels low. Grassland plants common.	Some refuse disposal. Marsh surface potentially suitable for grazing/haymaking.
Period I (175, base of 97)	Pre-10th century	Peat. Marsh surface becoming drier, less frequent flooding.	Some refuse disposal (mostly bone).
	Unknown (?Later prehistoric)	Renewed peat growth. Oak, lime and ash woodland with alder in valley sites; locally open water and reedswamp.	Evidence from sediments and pollen for woodland clearance (lime decline).
	Unknown	Phase of lowered groundwater levels and peat humification.	
	Early Flandrian (base dated to 9410 BP)	Peat development under reedswamp and shallow water. Woodland of pine and birch with some elm, oak, alder and hazel-type.	

Table 30 Summary of local habitat change.

further implying that the marsh surface became less wet towards the end of the Period I peat formation.

Pollen analysis of this peat, assigned to local Pollen Zone II shows that, whilst local conditions in the valley floor resembled those of Zone 1, woodland composition was very different. Pine and birch woodland had been replaced by oak and lime with ash, and alder in valley woods. Lime pollen is most frequent at the base of Zone II, and rare above, whilst it is absent in Zone III. Over much of southern and eastern England a lime decline was the result of woodland clearance for agriculture, most commonly during the middle and late Bronze Age. Dr Scaife suggests, above, that renewed peat growth was a consequence of wetter conditions in the valley floor caused by increased surface run-off during such a phase of extended deforestation. Increases in the mineral content of the peat may be related to consequent increases in soil erosion. Other indications of human activity come from the herb pollen, which includes ribwort plantain, large grass pollen (which may include cereal pollen) and bracken spores.

None of the deposits in the section could be attributed on artefactual evidence to the archaeological site Period II (tenth century), though two ditches of this period were sampled. The plant macrofossils from these ditch fills show that groundwater levels were too low for aquatic vegetation to become established: remains of grassland plants and weeds are much more common than those of marsh and aquatic plants. Groundwater levels were low at this time throughout the east Norfolk river valleys, and this permitted deep excavations (up to 4 m) for peat extraction. The peat pits only became flooded, to form the Broads, from the thirteenth century onwards (Lambert *et al* 1960). A low groundwater level would have made the river marsh at Fishergate potentially suitable for use as pasture or meadow, though there is no direct evidence for this. In fact the biota from the ditches give no indication of their functions, though they are evidently back-filled with domestic refuse such as bones of domestic animals and fish, with crop plant remains and a synanthropic insect fauna including woodworm beetle, flea and louse.

The deposits of site Periods III (late tenth-eleventh century) and IV (eleventh-twelfth century) consisted largely of dumped layers, mainly organic at the base, with predominantly mineral layers at the top. Food refuse of all types (bones of mammals, birds and fish, marine mollusc shells and plant food wastes) was common. Coprolites from these layers seem to represent the droppings of dogs and/or pigs scavenging the refuse, and ova of intestinal nematode parasites were noted. On size criteria ova of the human whipworm are thought to be present, indicating deposition of some sewage. The plant macrofossil assemblages are dominated by seeds of annual weeds, whilst the insect assemblages include a high proportion of species characteristic of decomposing organic matter. Probable human bedbug and flea remains were found, indicating that some of the dumped material may have come from within human dwellings, as well as bones of rats. Preservation conditions were poorer in the mainly mineral upper layers (Periods III(2) and IV), which included a typical Dark Earth deposit. However, the surviving macrofossils clearly indicate that these layers, too, mostly represent dumped rubbish. The pollen spectra from deposits of these site periods are all assigned to Pollen Zone IV and are typical of assemblages from urban areas. Cereal and grass pollen is dominant and pollen of weeds common. It is thought that much of this pollen was derived from human and animal faeces and from local weed vegetation. Pollen from woodland and marsh vegetation is poorly represented, probably because the natural pollen rain was swamped by the human input. In short, the waterfront at this site was a foul rubbish tip for much of Periods III and IV.

There are several lines of evidence for the exploitation of local habitats. Plant remains and bones of wild animals indicate plant food gathering, hunting and probably wildfowling in local fields, woods and marshes. Fruitstones, seeds and nutshells including bramble, raspberry, straw-

berry, apple, sloe, elder, and hazel were recovered from deposits of Period II onwards. Bones of red deer came from Period I and II deposits, roe deer from Period IV and fallow deer from Period VI, whilst hare is represented from Period III. From Period III and IV layers came a few bones of teal and woodcock. River fisheries were also exploited, though the rarity of bones from exclusively freshwater fish (bream and indeterminate cyprinid) compared to those of marine and estuarine fish implies that this was on a small scale. Only small quantities of wood came from this limited excavation. In general the wood from Periods I and II consists of untrimmed roundwood stakes, mostly of hazel with some oak, birch, *Prunus* and ?hawthorn, derived presumably from local woodlands. Much of the wood from deposits of Periods III–IV consists of boards, stakes and large posts, predominantly of oak with some ash and pine. It is probable that this includes some imported timber.

Agriculture

Evidence for animal husbandry is provided mainly by the bone collection from the site, but there are other incidental sources of information. As has been noted above, there are grounds for thinking that by the tenth century the peat surface was comparatively dry, and the river marsh was therefore potentially suitable for grazing or haymaking. One tenth-century ditch produced a coprolite, probably of a herbivore. From a Period III(1) layer came adults of the sheep ked, which might be an indication of fleece cleaning. Avian eggshell fragments occurred sporadically in deposits of Periods II, III and VI.

The earliest bone assemblage came from the very top of the Period I marsh deposits. Cattle bones predominate with some pig and a low proportion of sheep and goat and a few bones of horse, dog, cat, fowl and goose. This general pattern persists through Periods II and III, but by Period IV the cattle percentage is lower and sheep bones are more numerous than pig. Bones of fowl and goose were common in Period IV deposits (21% of total bone), and it has been suggested that these poultry bones represent the remains of 'working lunches'. Deposits of Period V produced few bones, but the late medieval Period VI deposits included a high proportion of cattle bones, followed by sheep and goat with some pig. A deposit of cattle horncores of this date must represent waste material from a horn workshop.

Ages of slaughter were determined from mandibles and long-bones of cattle, sheep/goat and pig. Few remains of calves were found: meat came from culled older working and breeding stock with some immature and sub-adult cattle. The sheep and goat bone sample was too small to yield useful ageing data. Pigs were rarely slaughtered very young, and half the jaws were from animals more than about eighteen months old. Bone measurements provided data on the sizes of animals, and some information was gained on butchery methods. Some pathological bones were also noted.

Crop plant remains, of cereals and flax, came from Period II ditches, and may be related to some crop processing nearby. However, remains of crops were much more abundant in the dumped layers of Period III, which contained carbonised remains of oats, barley, rye, bread wheat, horsebean, possibly pea, flax, dyer's rocket, a species of *Brassica* and beet. These macrofossils mostly appear to represent domestic food waste, though the fruits of beet might possibly be related to local cultivation. The organic fills of a Period VI barrel clearly contained a component of human faeces amongst other refuse. Seeds of strawberry and fig, endocarp fragments and seeds of apple, cereal bran fragments and crushed weed seeds are thought to represent dietary residues which had passed through the human gut. Other crop plant remains from this feature included fruits and seeds of fennel, flax and a *Brassica* species, besides remains of rye, a glume wheat and possibly broomcorn millet.

Marine foodstuffs

Fishbones were recovered by sieving and hand collection from deposits of Periods II–IV. The total collection is not very large (748 identified bones) but the results seem closely comparable to those from earlier excavations where more extensive sieving was undertaken. Herring is the most abundant fish at all levels, and in the Period III2 Dark Earth eel bones are also common. Other marine and estuarine fish include elasmobranchs, spurdog, ray, smelt, cod, haddock, whiting, sandsmelt, scad, wrasse?, mackerel, plaice and flounder. Despite the street name 'Fishergate' there is no evidence for the disposal of fish refuse relating to commercial activities: the collection seems to represent domestic refuse.

The marine mollusc shells again seem to consist largely of domestic rubbish. Oyster shells predominate throughout, with some mussels and whelks and a few shells of scallop, cockle, dogwhelk and razorshell, the latter being an edible species of minor importance. A sample from Period III1 contained very large numbers of shells of *Macoma balthica* and other inedible small estuarine bivalves. These could have reached the site in estuarine mud encrusting boats, gear or footwear or, perhaps more probably, as unwanted contaminants of shellfish catches. There are also a few fruits and seeds of estuarine plants, which may have come from the same source.

XII. Results of Radiocarbon Analysis

Two samples of the Period I peat deposits were submitted through the Ancient Monuments Laboratory to the Isotope Measurements Laboratory at AERE Harwell for radiocarbon analysis. The first sample (732/113) was from the top of the peat. The other (732/195) was from the base. The results were as follows:

HAR-7061 732N/113 1150±80 BP Cal AD 780–980
HAR-7062 732N/195 9410±110 BP

The upper sample had a result which tallies neatly with the archaeological evidence for initial occupation on the site. The lower sample was an unexpectedly early date. The radiocarbon analysis has been complemented by pollen and macrofossil analyses which suggest that, despite appearances to the contrary, the peat did not accumulate continuously but that there was a break in the stratigraphic record, possibly in the Boreal period. A future priority, therefore, for excavations on the north bank of the river must be a comprehensive sampling strategy for such peat deposits.

The calibration was carried out using the data of Stuiver and Pearson (1986). The error terms are all at one standard deviation.

Chapter 5. The Documentary Evidence

by Margot Tillyard

I. Introduction

(Fig. 28)

This report records an attempt to discover the history of the Fishergate site in St Edmund's parish excavated in 1985. Previous work by the Norwich Survey had compiled a series of topographical reconstructions for the City based on surviving property deeds for the period 1285–1340[6]. From these it was clear that the excavated site, which is immediately east of the parish boundary, belonged at that time to the Abbey of Waltham Holy Cross in south-west Essex. The reconstructions also revealed that they had owned two other properties, one on the north side of Fishergate almost opposite the first, and the other round the corner on the east side of Fybriggate (now Magdalen Street) (Fig. 28).

It became clear during the course of the documentary investigation that the excavated site remained in the possession of Waltham Abbey until the Dissolution. This accounted for the dearth of evidence concerning it in Norwich records such as landgable lists and property deeds, and meant that reliance had to be placed on surviving Waltham Abbey documents for the medieval period.

Sources are itemised on microfiche (Table 32). Printed sources are in the bibliography.

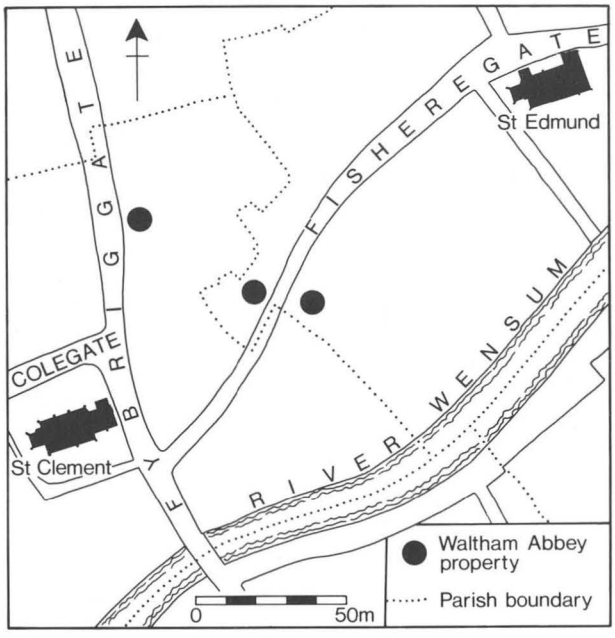


Figure 28 Location of Waltham Abbey properties north of the River Wensum. Scale 1:2500.

II. Waltham Abbey and the excavated site

Waltham Abbey was established by Harold, afterwards King of England (who was reputed to have been buried there) and refounded by Henry II, first as an Augustinian Priory in 1177 and then as an abbey in 1184. In 1252/3 Henry III exempted it from Royal dues (Dugdale 1830 VI, 56ff and V.C.H. Essex II, 166–172). With the advantages of proximity to London and continued Royal patronage it grew to become the richest religious house in Essex and one of the most important in England (V.C.H. Essex II 169). It outlasted every other abbey in England, only surrendering to Henry VIII on 23rd March 1540, when the value of its possessions was £900.4.3 (Valor Ecclesiasticus 1810 I, 435).

In the County of Norfolk, Waltham Abbey had been given land and the church at Scarning, as well as the churches of Guist, Gasthorpe and Norton (Dugdale 1830 VI, 59). For information about its possessions in Norwich a search was made in the five cartularies which survive in the British Library. The transcription of a document headed 'Robert Benne de terra invadiata Bruno Judeo' was found in a thirteenth-century cartulary[7]. This may be summarised as follows:

> 'I, Robert Benne, am bound to repay to Jurnet the Jew and Muriel his wife £6 of silver, in six instalments of £1 over two years beginning at Midsummer after Bishop John of Norwich vows to go on pilgrimage. At the end of this time I will pay 2d a week for each pound still owing. And for this debt and interest I pledge all my lands, houses and rents in the town of Norwich and all my chattels'.

The document may be dated to 1187, the year John of Oxford, Bishop of Norwich from 1174 to 1200, took his vow[8]. The rate of interest, which works out at about 43% per annum was usual at that time (Roth 1949, 107). Jurnet (*fl.* 1160–1199) was by far the wealthiest of the Norwich Jews and was in partnership with Brunus, or Lebrun of London (Lipman 1967, 97). Although Jurnet was out of the country between 1186 and 1189, his charters were being held by the whole body of English Jews who were made responsible for the balance of an amercement of 6000 marks which had been imposed on him (Jacobs 1893, 90 and Pipe Roll Society Volume 38, 22).

By what subsequent steps the Norwich properties came into the possession of Waltham Abbey is not known. The king may have acquired them as part-payment of a fine and donated them to the Abbey, or Robert Benne may have made them over to Waltham himself in return for a settlement of his debts (Richardson 1960, 89). Religious houses welcomed even encumbered estates and Jews preferred reliable institutional debtors (Richardson 1960, 92 and 93). Therefore such a transfer would have suited all parties[9].

The inclusion of the pledge to Jurnet in a Waltham Abbey cartulary is sufficient proof of the abbey's acquisition of the Norwich properties. In subsequent pages of the

same volume three rentals for them were found. The earliest, in a very similar hand to the copy of the pledge is as follows[10].

[In margin] *Norvic xxiiiis.vid.*

Symon clericus de mesagio quod fuit quondam Robert Benne. Creddit ad duos terminos viii sol. [*i.e.* 4/- at Michaelmas, 4/- at Easter] *assignatos Camere*

Alice relicta Arnoldi per mesag. iux. mesag. aliud Creddit vi.sol.

Nicol piscator per mesag. quod fuit Willm. Knotte Creddit v.sol.

Due soppe que fuerint Magge Benne reddunt iv sol. & ipa Magga tenet

Unam soppam per quam nich Niche reddit in vita sua per quam poterimus habere duos sol. post mortem sua

Sawalus Nedlere pro mesag. in Berestrate ultra Manecroft reddit xviii.d.

Alanus de Stokesbi de dono Rob. filii Rogeri reddit xx sol.

[In margin] Norwich 24/6

Simon the clerk for the messuage which was once Robert Benne's. Paid, in two instalments, 8/-, assigned to the abbot's office

Alice, Arnold's widow, for the messuage near the other Paid 6/-

Nicholas the fisherman for the messuage once William Knott's Paid 5/-

Two shops which were Magga Benne's paying 4/- and Magga herself holds them

One shop for which Nicholas Niche pays during his lifetime and for which we shall be entitled to 2/- after his death

Sewell the Needler from the messuage in Ber Street beyond Mancroft paid 18d.

Alan of Stokesby from the gift of Robert son of Roger paid 20/-

The date of the Stokesby donation is known. It was 1212[11], so the rental must post-date that. By this time Robert Benne was dead, but appears to be survived by a female relative. The third entry on the list seems most likely to represent the excavation site, initially because of the occupation of the holder. Other reasons for believing this will become apparent.

The second rental is no more than a shortened form of the first[12]. The third is a slightly later version[13], which reads:

Reddit. de Norwic

D. firma dom. ix S.

D. Nich piscatore v s.

D. domo apud Manecroft xviii d.

D. tribus soldis v s. & x d.

D. Roger Ailweit xl d.

D. Willo. capllo. xl d.

D. Alan de Stokebi xx s. Sm. xlviii s.

The first property on the earlier list had by this date been let to farm. The second had disappeared but the two rents of 40d may have represented its by then two separate parts.

The Index Monasticon, drawn up in 1291, provides financial information about all the English religious houses, but is reticent on the subject of Waltham Abbey. It mentions one property only belonging to it in Norwich, in St Peter Mancroft parish, and omits the rent paid (Taylor 1821, 63). There is an isolated cartulary reference to a 20/- rent received from Norwich in 1320; but this gives no details of the property from which it derived[14].

It was hoped that information about the excavation site would be found in the series of property transactions enrolled at the City Court of Norwich which survive from 1285. However, the excavated property is merely referred to in the abuttals of the neighbouring properties when the phrase 'messuage of the Abbot of Waltham' is used with no mention of tenants or occupiers. Not until 1399 does specific evidence appear in this source. Then John Clerk, vicar of Redenhale, transferred the lease of the messuage belonging to Waltham Abbey on the east side of Fybriggate (Magdalen Street) to a group of Norwich tradesmen, together with the 'whole income from the tenements of the exempt Monastery of St Cross of Waltham, and the convent of that place, as they lie in Norwich in the said parish of St Clement, St Edmund and the parish of St Peter Mancroft for thirty eight years, paying to John Clerk or his attorney at Waltham 20/- per annum'[15]. The subtenants were to be responsible for repairs and had to pay John £20 for their sub-lease.

The adjective 'exempt' applied to Waltham Abbey in this deed probably refers to its freedom from royal dues, a privilege granted by Henry III in 1252/3 (see above). Its Norwich properties indeed seem not have paid landgable (originally an annual charge payable to the Crown) nor was any collected from them after the Dissolution[16]. It may be noted that in 1399 Waltham Abbey was receiving less for its properties in Norwich than it had been nearly two centuries before, when they had been worth 24/6 a year.

III. The location of the Waltham Abbey properties

An attempt can now be made to locate the properties which Waltham Abbey owned in Norwich. It is suggested that the order in which they were described on the earliest cartulary rental of *c.*1220, in which no parishes are mentioned, corresponds in part to their order in the sub-lease of 1399 in which parish names are their only identification. The evidence from these two sources is considered together with that furnished by the Norwich Survey reconstructions.

The entries on the rental may be summarised and numbered as follows:

The messuage once Robert Benne's 1

The messuage nearby 2

Nicholas the fisherman's messuage 3

The three shops 4

The messuage in Ber Street 5

They will be referred to by these numbers in the discussion.

Robert Benne's name and the high rent it paid make his (No. 1) the most important property on the rental and this would seem to link it with the 'head property' of the 1399 sublease. The 1399 abuttals enable it to be precisely located on the east side of Magdalen Street in St Clement's parish and it corresponds to a property belonging to Waltham Abbey in that position on the *c.*1300 reconstruction (Fig. 28).

No. 2 cannot be distinguished on the 1399 sublease. Known from the *c.*1220 rental to be near to No. 1, its rent could have been included under St Clement or St Edmund in 1399. However the 'reconstruction' shows that in 1291 the Abbot of Waltham owned a property on the north side of Fishergate in St Edmund's parish[17] (Fig. 28). In 1323 a testator directed that this messuage formerly of the Abbot of Waltham be sold[18], and this description is repeated in

the executors' sale of 1326[19]. It is therefore suggested that this is the location of No. 2 and the sale explains its absence from the 1399 sublease.

No. 3, the messuage of Nicholas the fisherman, may thus represent the tenement in St Edmund's parish on the 1399 sublease. It would correspond to the property of Waltham Abbey shown in the 'reconstruction' to occupy the excavation site (Fig. 28).

This leaves Nos 4 and 5 of the cartulary rental and a tenement or tenements in St Peter Mancroft parish in 1399. No evidence of any other property of Waltham Abbey appears in the reconstructions for *c.*1300, either in St Peter Mancroft (where the overwhelming majority of Norwich shops were located) or in any of the Ber Street or Timberhill parishes (the present Timberhill being then part of Ber Street). Moreover, as none of Ber Street was in St Peter Mancroft parish, it seems probable that Waltham Abbey had disposed of No. 5 before 1399.

This would leave Nos 1, 3 and 4 still in Waltham Abbey's possession in 1399. Taking together the rents for these as they are given on the *third* cartulary rental (the order of the items being slightly different, they are the first, second and fourth items on that list) a total rent of 19/10 is reached, almost exactly the figure of the farm of 1399.

IV. The excavation site in fifteenth and sixteenth-century documents

The name of Waltham Abbey consistently appears on abuttals of the properties on either side, but no other evidence dating from the fifteenth and early sixteenth centuries has so far come to light among Norwich records. In the Public Record Office is an undated rental recording the collection of 20/- from three unspecified tenements of Waltham Abbey let to farm in the town of Norwich[20]. As the rent was paid to Thomas Cromwell, the document must be from the period between the surrender of the abbey to the king on 23rd March 1540 and Cromwell's fall on June 10th of the same year.

Henry VIII disposed of the holding in 1545, when he granted John Eyer all messuages *etc.* in the parish of St Clement in Norwich in the tenure of Simon and Thomas Reade (formerly of) Waltham Holy Cross (Calendar of Letters and Papers of Henry VIII Vol.XX, Part II 1545 1g 282 (37)). The buyer was John Eyer of Narborough 'King's Servant', a member of the commission of 1546/7 to enquire into the chantries of Norfolk and Suffolk (*ibid* 1546/7 1g 302 (30)), and Queen Elizabeth's 'Receyvor Generale' for Norfolk, Suffolk, Cambridge and Huntingdon before he died in 1561. He was a great buyer of religious property and purchased Bury St Edmunds Abbey and all four Lynn Friaries among much else (Rye 1913, 188 and Blomefield VI, 159).

It is unlikely John Eyer kept Waltham Abbey's Norwich properties for long. He had also bought a messuage nearby in St Clement's parish formerly the property of Horsham St Faith's Priory, but sold it less than a year afterwards[21]. From its having been in the same ownership as the other Waltham Abbey properties 'over the water' in 1399 and in the later sixteenth century (see below) it is a not unfair presumption that the St Edmund's riverside tenement was included in John Eyer's purchase.

From the mid-sixteenth century onwards information about the excavation site is even more scarce. From 1568 and probably before, it was in the hands of the Wood family[22]. The first for whom there is evidence was Robert. He was a grocer, and mayor of Norwich in 1588 when Queen Elizabeth visited the city. She was so pleased with the entertainment he provided for her that she knighted him (Blomefield III, 351). In 1554 he had purchased St Clement's tithes from Queen Mary and restored them to the then rector and the rectory[23]. He owned the ex- Waltham Abbey property in St Clement's parish and all the Fybriggate corner on the north side of Fishergate. On part of this stood what was probably the 'great house' containing 'the great chamber' left when he died in 1590 to his son Robert[24]. Sir Robert Wood's father Edmund, also a grocer, who became a freeman in 1521/2 (L'Estrange 1888, 151) seems to have constructed this from three former dwellings[25]. Although it is not mentioned in the will, the second Robert appears to have inherited the former Waltham Abbey property. Later it may have belonged to Thomas Tofts, mayor in 1654, who probably also owned the big house on Fybriggate (Fyebridge Street) (Cozens-Hardy and Kent 1938, 88 and Blomefield III, Map of Norwich).

Shortage of time has precluded a search of the later enrolled deeds which might have resulted in a sequence of seventeenth- and eighteenth-century owners of the excavation site, so that relevant information could be extracted from such material as the Hearth and Window Tax records. It might also have been possible to indicate, had the occupiers been identified, what use was being made of the site, and therefore the nature of the buildings.

However, it is known from the OS map of 1885 that the western part of the site was then a public house. This appears in the Ale House Recognisances of the late eighteenth century, first as the Dyers' Arms, then as the Dyers[26]. Publicans had to dwell on the premises and to state their trades, so certainly in 1760 a dyer, in 1763 a bricklayer and in 1806 a woolcomber, lived there. A few years later the Friendly Societies which met in alehouses had to be registered because they were suspected of being subversive radical groups. In 1816 and 1825 articles were approved for such a society which met in the Jolly Dyers in St Edmund's parish.

Although this completes the documentary history of the excavation site itself (apart from its industrial use in the nineteenth and twentieth centuries which is charted in a separate chapter) some inferences may be drawn from a short study of the immediate area. Accordingly, there follows a brief analysis of information concerning seven neighbouring plots (Figs 29 and 30). The sources used are mainly the enrolled property deeds with some reference to landgable lists and leet roll material. Plot numbers are shown on Figure 29. All references will be found in Figure 30 under the appropriate date.

Size of tenements: width

The only measurements found in the property deeds concern Plot 7. John Clever bought a narrow strip of land (from the 1313 Leet Roll evidence about 100 feet long) along the east side of Plot 7 in 1316. It measured 10 feet along the road and 8 feet along the river. Whether he incorporated it into the main plot before he bequeathed that to the rectory in 1337 is not known. This further obscures the size of plot 7, for with or without the strip, the meaning of 'the rod of land' which the bequest constituted is vague. The dictionary defines 'a rod' as either a ¼ of an acre or 'a loose term for a small piece of land'. If the precise definition is accepted, together with the depth of 100 feet, the width of

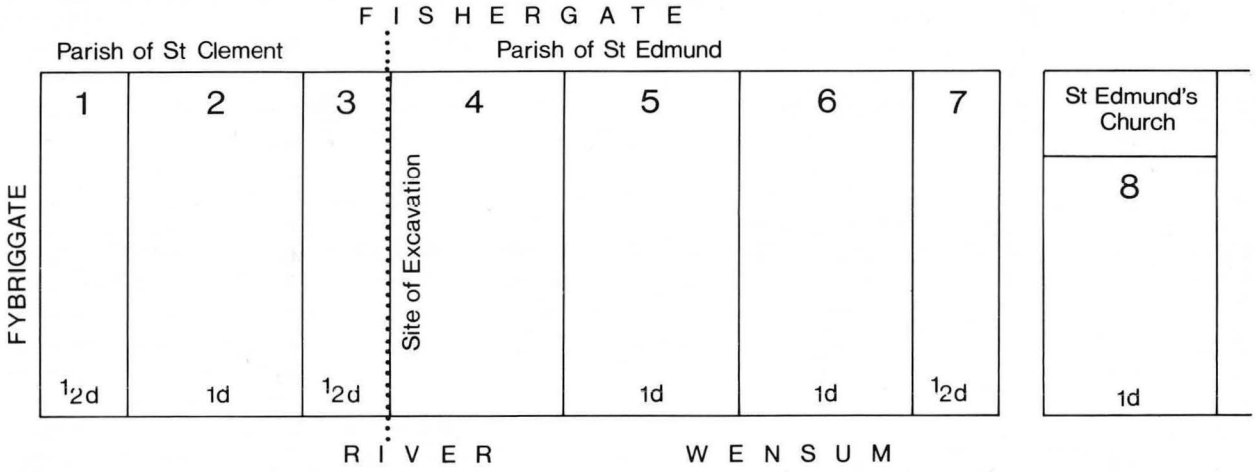


Figure 29 Tenement reconstruction from the documentation. (Plots are numbered for cross-reference to Fig.30).

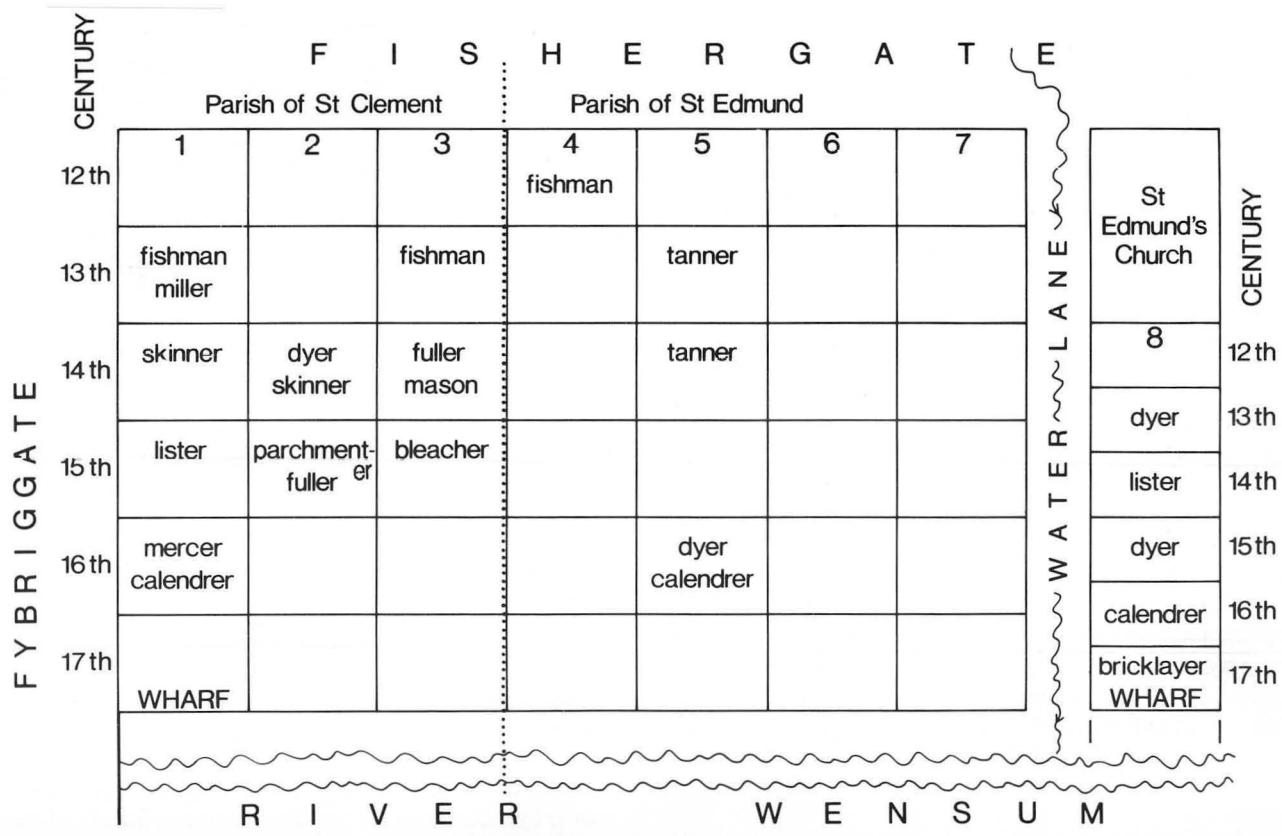


Figure 30 Occupations of plot holders derived from the documentation.

the plot including the strip appears also to be about 100 feet. This seems unlikely considering that it bore a landgable charge of only ½d (Blomefield even speaks of two roods).

The landgable lists are considered next. From Fybriggate to Water Lane, west of St Edmund's church is a distance of about 530 feet, divided into seven messuages for the purposes of landgable. One at each end and one

immediately to the west of the excavation site paid ½d. Three others paid 1d. No payments are recorded for the site itself (though it is listed after the Dissolution as having belonged to Waltham Abbey) presumably because of the monastery's exemption from royal dues, granted in 1252. From landgable records therefore it is only possible to say that the widths of the plots probably measured between about fifty and about 100 feet.

Size of tenements: depth

As with the width, so with the depth of the tenements. From documentary evidence it is not possible to estimate the depth of the excavation site. Plot 7, judging from the 1313 Leet Roll Evidence, may have been about 100 feet deep. Plot 1 may have approached that before the river widening after the floods of 1912. The curve of Fishergate may reflect an earlier course of the river so that in former times Plot 4 may have been shallower than it appears on the OS 1885 map. More than that cannot be said.

Division of plots

Plots 5 and 6 had already been divided from north to south by 1300 and probably Plot 2 by 1379. The earliest evidence for east to west division is found for Plot 1, where the southern abuttal appears as the 'common wharf' in 1379. This feature is mentioned once more in the following year, when shops are first included on the property description, though they are not precisely located. By 1541 the southern part of the property was divided into three little tenements. The excavation site was probably similarly divided with the river bank being successively consolidated. Owners or tenants of waterside properties would have had to ensure access to them from the street. Some evidence of this problem is found in the records for Plot 8. This was a special case. Not only was it between the church and the river but it was next to a small watercourse running down to the river to the west of the churchyard. It was bought by John Clever in 1309 when his right to take horses and carts through the churchyard was confirmed. In 1313 the owner of Plot 7 was amerced for blocking access to the Quay there by a wall which he had built along the west side of the lane. John Clever may have incorporated the strip of Plot 7's land, which he purchased in 1316, into the lane. Plot 8, his capital messuage, was left to his wife, but the churchyard right of way was not mentioned in the will or in any later deed though the property is still described in a sixteenth-century landgable list as 'in the churchyard'.

Ownership of the land

Waltham Abbey was not the only ecclesiastical owner in the neighbourhood. Plot 6 belonged to Bromholm Priory, at least until the mid-fourteenth century and Plot 7 to the rectory of St Edmund from 1337 onwards. Unlike Waltham Abbey the owners of these two had to pay landgable. Further downriver in the parish Chicksand Priory owned a property.

Multiple ownership was common in St Edmunds as in the whole of Norwich and many of the seven plots were probably investment property. Plots 6 and 7 had been connected with the Knot family who may have owned a high proportion of the property of the parish in the thirteenth century. Some owners held property on both sides of the street (Plots 3, 4 and 5 in the fourteenth century) (*cf.* Rutledge and Rutledge 1978, 90) or more than one property. Of those under discussion Plots 3 and 4 were owned by the Woods and Plots 5 and 6 by the Cleres in the sixteenth century. From this date, when pressure from immigrants and a rising population caused greater subdivision, landlords tended to live in the county and to be very wealthy citizens such as mercers or grocers (Plots 1, 2 and 3).

Use of the land

(Figs 29, 30)

The accompanying figure (Fig. 29), giving occupations of plot holders where known, offers some pointers as to possible uses of the river. The strongest evidence comes from Plot 5 when, in both the late thirteenth century and the late sixteenth century, lead vessels are included in sale agreements.

Plot 7, at least in the fourteenth and fifteenth centuries, was described as a garden, which unfortunately makes it unlikely that the description of the burglary given in the record of the Eyre of 1268 is applicable here. It is not however impossible, so has been included (Fig. 30).

Details of buildings

There is scant evidence of these in the surviving documents. The shops of 1394 on Plot 1 may or may not be represented by the three little tenements of 1541. Drips from the roof of 'houses' on Plot 2 occasioned the transfer to the occupiers of a strip of land 18 inches wide from the property next door, perhaps also part of Plot 2, in 1379. Probably the same property (that is, the western half of Plot 2) is described in more detail in 1521 as a 'tenement with buildings and with a house and a wall called a pikewall at the east end next to the road, and another house next to the river with a gable at both ends, and with a garden and a wall called a panell wall and a gutter 18 inches wide to the east of the panell wall and the length of the said panell wall'. In 1556 what was the panell wall is described as 'a stone-wall, thatched'. In 1598 a feature on the river in Plot 2 is described as 'a garden or rental with houses on it measuring 6 feet wide'. Near the churchyard, on the east side of Plot 8 in 1601, there was a 'gable' with a wall running down from it to another by the river. The wharves there towards the lane measured 30 feet by 22 feet in 1550.

Plot 8 bore a landgable charge of 1d, though it cannot have been large. Perhaps it was originally for the whole area extending to the road frontage before the church occupied this. Was the church on this side of the street because development of the north side was too intense by the eleventh century for there to be room for it there?

Conclusion

As far as the excavation site is concerned, it can be inferred from the foregoing that it may have been divided both laterally (*i.e.* east to west) and longitudinally (*i.e.* north to south) by the fourteenth century. It is more than likely that the river was being used, perhaps not as a quay, but by tradesmen connected with cloth production, until the more varied industry of the nineteenth century took over. The buildings on Fishergate were almost certainly residential, becoming, as population increased and particularly after the influx of Huguenots in the late seventeenth century, ever more congested.

Chapter 6. Industrial Buildings on the Site: results of a survey conducted by the Norfolk Industrial Archaeology Society

by Mary Manning

I. Topographical situation

(Figs 31, 32)

The western side of the site was formed by the boundary between the parishes of St Clement and St Edmund. The area to the west of the boundary is now open ground but was formerly known as Long Yard (Figs 31 and 32). To the south the site ran almost to the bank of the River Wensum, which has been widened in this stretch, probably after the 1912 floods (Fig. 37). The north side covered the area fronting Fishergate (Fishgate Street), formerly occupied by Nos 16 to 20, which included the Jolly Dyers Public House and Elvin Bros. Boot and Shoe Factory (Fig. 32).

II. History

In 1802 David Soman, a refugee from France, founded a boot and shoe factory on the site, thus giving his name to the yard. His factory, shown on Goad's map of 1897 as 'St Edmund's Shoe Factory' was at the river end of the yard (Fig. 32).

Phillip Haldinstein married Soman's daughter and became a partner in the firm in 1846 with a consequent expansion of the business. In 1853 the partnership was dissolved, Haldinstein carrying on the name, hence the 1897 map listing as 'Haldinstein's' of the factory which had been Soman's. In 1870 Phillip's eldest son, Woolfe, was made a partner, running the London branch of Haldinstein's shoe firm, which grew rapidly in importance (Burgess and Burgess 1904).

Extensive new factory premises, some designed by Edward Boardman, were built extending from Queen Street to Princes Street, with a warehouse of five floors by St Michael-at-Pleas. However, ownership of the Fishergate site was retained and it appears in the 1919 will of Alfred Haldinstein, second son of Phillip.

Haldinstein moved the Norwich Box Company to the site *c.*1895, from 40 Magdalen Street where it was listed in 1885. This factory made shoe boxes for Haldinstein's own shoes, and also sold them to other shoe factories (White 1896).

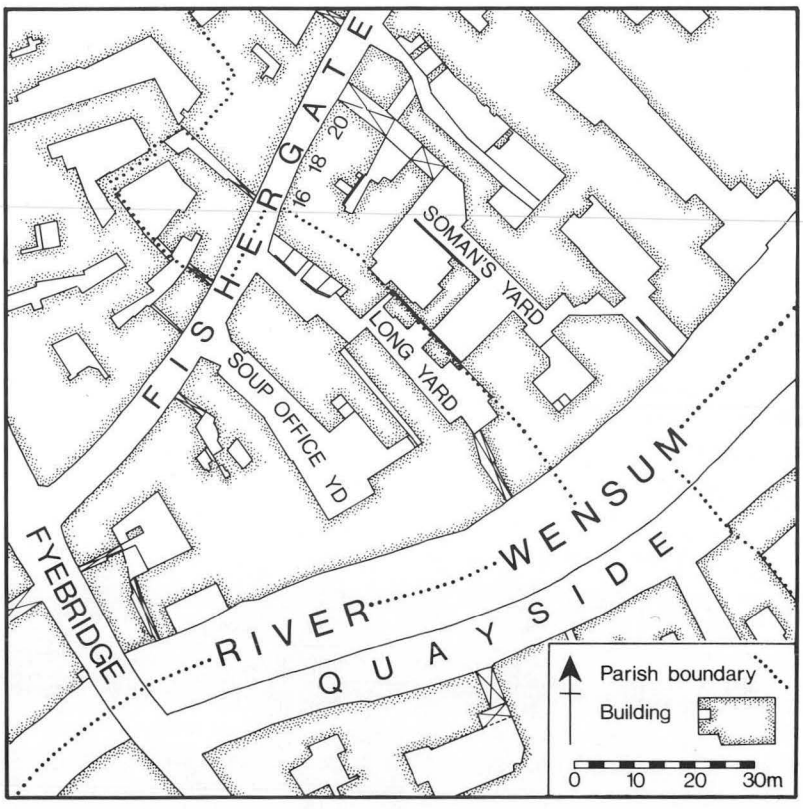


Figure 31 Industrial buildings: site of Soman's Yard. Scale 1:1250.

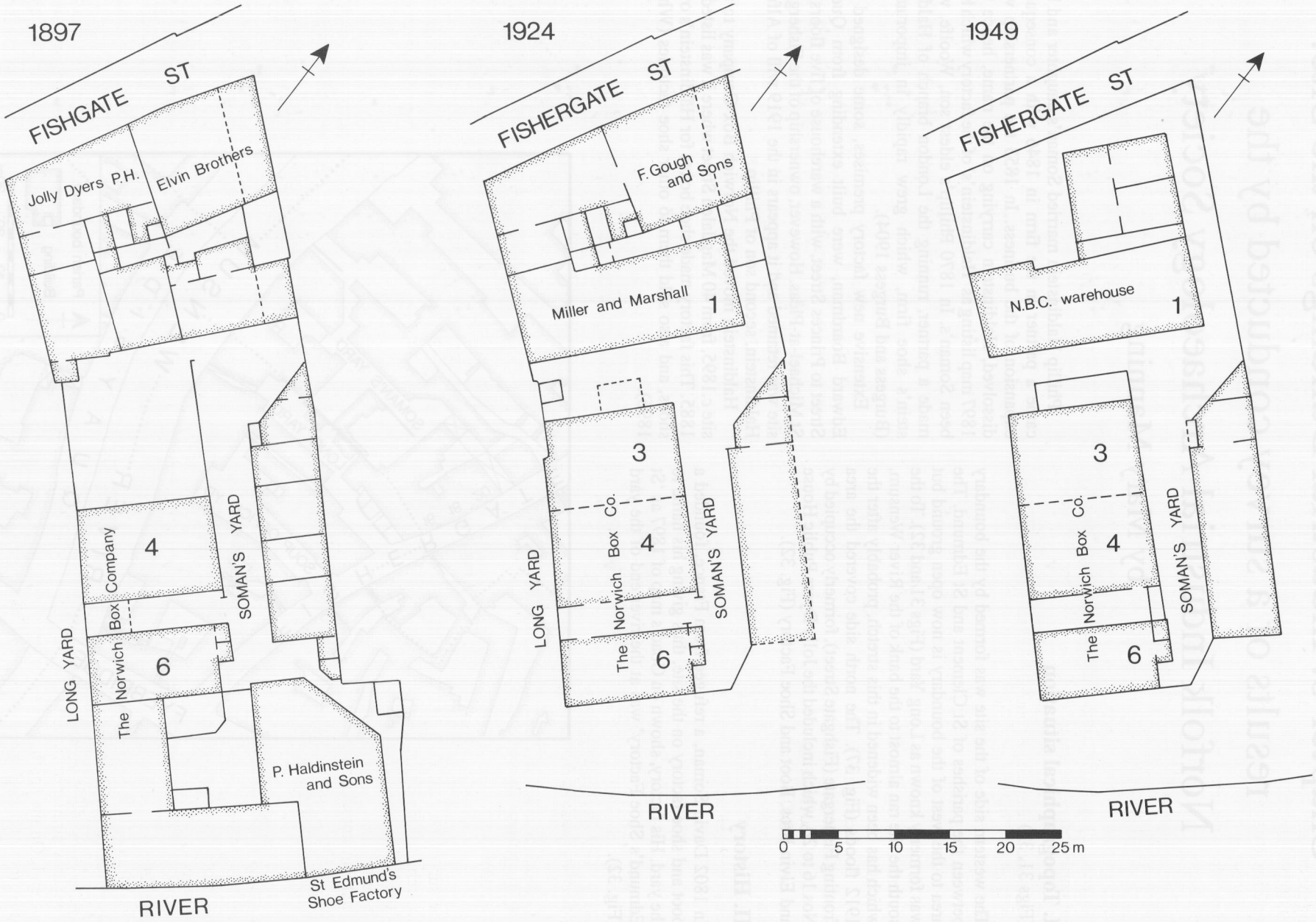


Figure 32 Industrial buildings: successive insurance maps 1897, 1924 and 1949. Scale 1:500.

Another cardboard box manufacturer, Fred Gough and Sons, was established in 16, 18 and 20 Fishergate, adjoining the entrance to Soman's Yard in *c.*1908 (Fig. 32) (Kelly 1908). Prior to 1908, these sites and adjoining properties were listed as small tenements.

Between *c.*1916 to 1931, Miller and Marshall, Boot and Shoe Manufacturers, had a small shoe factory backing on to Messrs. Gough's[27]. This was taken over *c.*1931 by the Norwich Box Company for additional warehousing (Fig. 32).

The site was blitzed on 27 June 1942, Messrs. Gough's buildings and the Norwich Box Company warehouse being destroyed. Gough's Box Company was re-established on the north-east Fishergate/Cowgate (or Fishergate/Whitefriars) corner. The destruction explains the post-war appearance of Buildings 1 and 2 surveyed nearest to Fishergate (below). Buildings 3 and 4 must have survived. They showed an architectural style which suggested that they were built in the 1890s, each having had a gallery at first floor level running around an open well from ground level to roof. Building 4 was shown on Goad's map of 1897 (Fig. 32) and Building 3, by its similarity, must have followed soon afterwards. Neither appeared on the 1885 OS map (Fig. 32) which limits the earliest possible date for Building 4. No other documentary dating evidence has been found.

Mrs Alfred Haldinstein held a controlling interest in the firm until *c.*1940 when she died. At this time the Swiss shoe firm of Bally took a minority interest in Haldinstein's.

In 1946–47 Haldinstein's and the Norwich Box Company became a wholly owned subsidiary of Bally. In 1950 the site and premises were sold out to the Norwich Box Company. Bally moved to Harford in 1966 and it seems that the Fishergate site closed then. The buildings were subsequently acquired by Taskers, house furnishers, for warehousing. In 1981 Taskers was taken over by Glasswells. The premises were closed in 1984, sold for redevelopment and were demolished in March 1985.

III. Building descriptions

(Fig. 33)

The survey was undertaken on Sunday 13 January 1985. An archive of the notes, drawings and photographs is held in the NIAS records at the Bridewell Museum. Buildings are numbered as on Figure 33. The structures were functional, but not attractive architecturally. Bomb damage in 1942 led to repairs which were practical but featureless such as asbestos roofs and cement rendering.

Building 1

Formerly Miller & Marshall Shoe Factory. Then Norwich Box Company warehouse. Damaged in blitz, 1942, and subsequently repaired.

Exterior walls were rendered and the roof was of asbestos. Entrance was by double wooden doors at the west, metal-framed windows of fifteen panes forming the upper part of each door. The roof had ten window lights with three long panes of glass in each. The ceiling was plasterboard. A window similar to those in the doors was placed at the east end. On the south side were four metal framed windows, three of which opened into Building 2, the fourth on to Soman's Yard. Each had twenty-four panes. There were three electric lights and three electric radiators at the east end, two on the north wall and one on the south wall. Double doors at the east end of the south wall opened into Soman's Yard.

This building (and all the others) was completely cleared, no tools or fittings remaining.

Building 2

This building occupied what was a space between 1 and 3 (see 1924 map, Fig. 32). The windows were therefore those of the original exterior walls of Buildings 1 and 3. Entrance was from the west by double wooden doors. At the east end were double wooden sliding doors. An opening had recently been knocked through to Building 3 (probably by Taskers or Glasswells). At the west end of the south wall was a wooden door with a window light above, labelled 'Office' (the office stood in Building 3). The roof was of asbestos sheeting with steel trusses, the walls of standard brick, rendered on the west exterior. Truss plates had been inserted in the wall to support roof trusses. The floor was concrete. The south wall was buttressed between the windows. There were two metal-framed windows: possibly a third existed where the wall had been knocked through.

Building 3

Originally the north and west sides of the upper floor were galleried, the space from the galleries to the south and east walls having been boarded in later.

Ground floor

In the south east corner an area had been partitioned off to form an office, lighted by a sixteen-paned metal-framed window. It had a wooden-framed wicket with frosted glass for enquiries. A wooden door in the east wall gave access to Soman's Yard (above).

Three metal pillars of 3 ½ inch diameter, painted green, were evenly spaced, once supporting the front of the upper gallery. The easternmost pillar was set at right angles to the other two as it supported a cross beam to the south wall. Similarly the western pillar supported an additional beam to the north wall. The pillars supported RSJs set flush to the south wall. On the south wall, a staircase had been removed leaving an opening to Building 4. The floor was of deal planks.

The building served as a warehouse for the Norwich Box Company, finished orders for delivery being stored there. The time clock and some platform scales stood in the building. At the north west corner was a stable with a door giving access to what was a yard and became Building 2. The original double doors at the east end gave access for horse-drawn delivery wagons. An awning once projected into the yard that became Building 2, for sheltered standing for delivery wagons.

Upper floor

The floor was wooden, the original gallery in its own alignment, the infilled part being of rougher timber and aligned in different directions. The upper part of the staircase, removed at ground floor level, entered at the south west. A partition once existed in the north east corner making an office, which was principally used for making tea in the 1920s and 30s. A women's lavatory had been inserted behind a partitioned area in the north west corner.

The ceiling was of lath and plaster with reeds behind, at the time of the survey being covered in plasterboard. Roof lights were wire-netted. Blinds in the apex of the roof were arranged to cover the north face of the lights, an

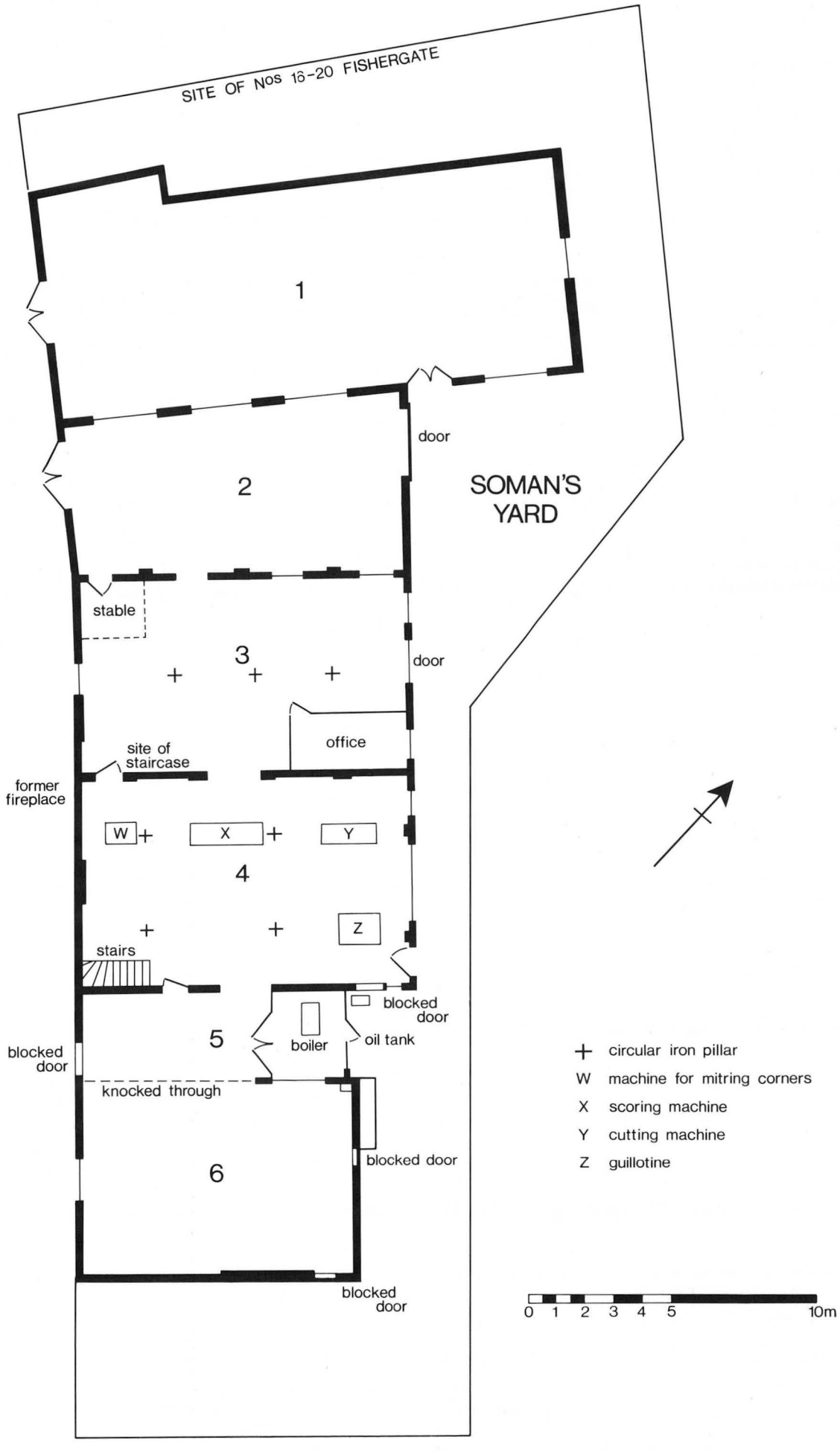


Figure 33 Plan of industrial buildings 1–6. Scale 1:200.

unusual feature for which no reason could be found. The rafters were wooden and nondescript.

Four windows in the north wall were iron-framed, those in the south wall being of wood. Two steps led down to the upper floor of Building 4. The large window on the east wall was similar to that in Building 4 but not identical and was cut off below first floor level by a wooden sill which appeared to be original. The opening below was subsequently filled with dissimilar brick and a pair of doors under a cast concrete lintel. The original doors gave access for wagons. Two smaller windows were iron-framed. The wall bosses were on strap bolts which were fixed to the purlins inside.

A large hot water pipe entered at the east end, running overhead to two louvred fans, electrically driven (post-1945). There was no evidence available of what work was done in this upper floor of Building 3. As with Building 4 it was galleried.

Building 4

This building had been altered the least of any on the site. It must have escaped the effects of the blitz. The upper floor was galleried to the north, west and south. The original space from the gallery to the east wall had been boarded-in, probably after Taskers took over the site.

Ground floor

The gallery was supported by four iron pillars of four inch diameter with ornamental tops. The floor was of wooden blocks of good quality. A staircase in the south west corner rose to the gallery. It was of good design with turned newel posts.

A large arched window was located in the wall, a fine wooden-framed construction, with iron glazing bars horizontally between the main wooden glazing bars (Fig. 34 where thin horizontal lines represent ironwork, double lines woodwork). On each side of the large window was a wooden-framed window of twelve panes. One of these and a wooden door at the south end of the east wall conformed to the general design of the large window. A filled-in doorway was situated at the east end of the south wall. This was of cast iron but a maker's name was not found.

A gas engine was indicated against the north wall on the 1897 map (not shown on redrawn Fig. 32). No trace of this remained.

During the 1920s–1930s this building was used as a cutting room for the Box Company. New stocks of strawboard were stored along the north and west walls. A guillotine, a cutting machine, a scouring machine, and a mitring machine stood here (Fig. 33).

Upper floor

The gallery extended round the north, west and south walls, the parapet being of varnished deal three feet high. Flat iron bars supported the roof timbers from the gallery floor to the cross beams. They were smith-made with twisted tops. The roof was of king-post type. Window lights were placed in the roof at the apex. The ceiling was timber panelled and painted.

A section of the west gallery balustrade had been cut through to give access to the boarded-in floor section between the galleries.

Two or three women were employed by the Box Company on hand work in the south gallery. Beside them at the

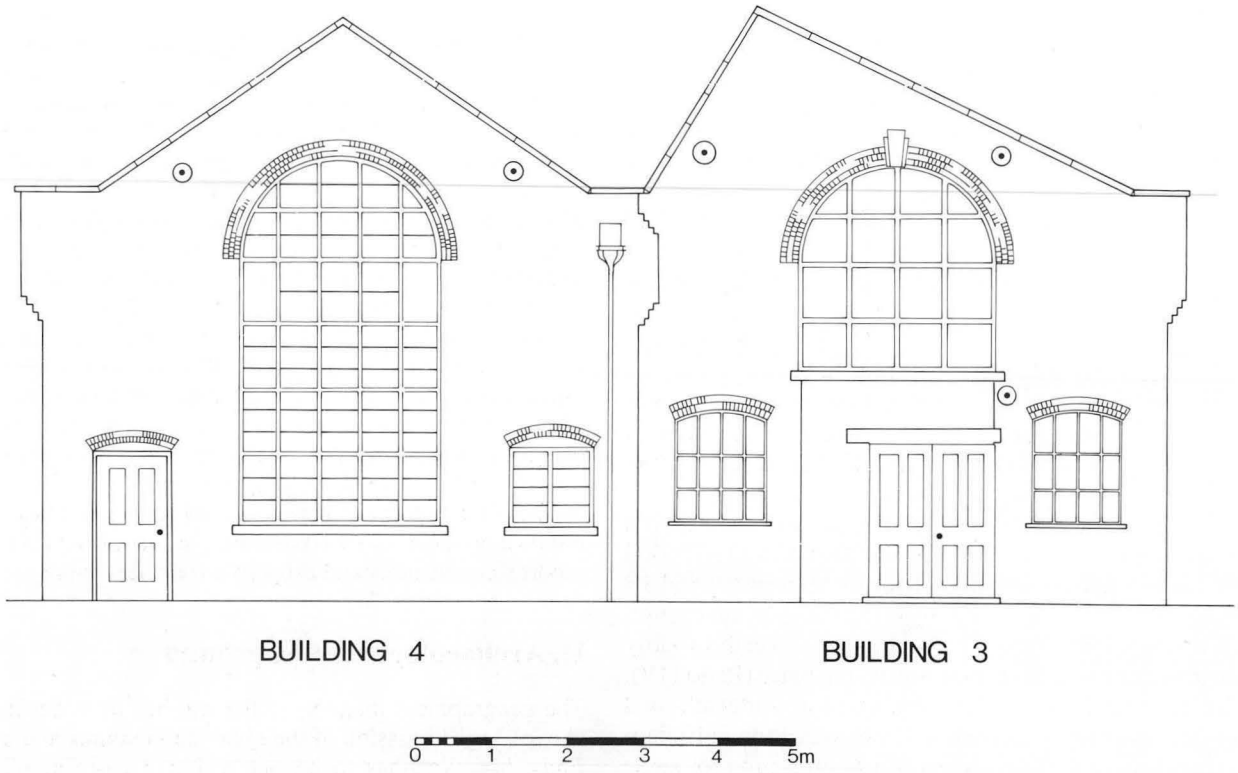


Figure 34 East elevation of industrial buildings 3 and 4. Scale 1:100.

east end was a gas-heated glue boiler. A small printing-press, treadle operated, for printing box labels stood in the west gallery where the parapet has been cut through.

The external east elevation of Buildings 3 and 4 was the best architecturally. End gables were of 2½ inch red brick surmounted by coping stones. There was discontinuity of the brickwork between the two buildings, suggesting that Building 4 was marginally earlier (Fig. 34).

The galleries in both Buildings 3 and 4 were reminiscent of the style of Boulton and Paul's Conservatory Department buildings as shown in their pre-1900 catalogues (Anon 1947) (the original internal design of Building 4 is suggested on Fig. 35) .

Building 5

This was formerly a yard, but it had been covered in. The floor was of concrete, sloping down slightly from the west. At the east end was a partitioned-off shed-like area, housing a boiler. This had a concrete floor over Victorian pamment tiles. An old lavatory opened into this boiler shed. The boiler was coke-fired but had been adapted for oil burning. No maker's name plate was found. Entrance doors to the boiler shed were double, being made up of oddments: a side panel, one of what was probably an old pair of double doors re-used, and one standard door. A door led out to Soman's Yard.

In the west wall was an infilled window with a curved top, *c.*eighty-two inches high by eighty-two inches wide.

Building 6 Workshop at river end

This appeared on the 1897 map (Fig. 32) and so predated Building 3. It was not of such good workmanship as Building 4. The roof trusses were circular iron rods with braces and ornamental wrought iron brackets acting as stiffeners to the principal wood rafters. The apex of the roof was glazed, some glass being plain, some reinforced. Cloth blinds were fitted to the central section of these roof lights.

The floor was boarded with a wooden skirting or trunking along the south wall, which had irregularly spaced circular holes; twelve to twenty-four inches apart. These may have been conduits or possibly connected to former machinery. The walls were of brick, rendered.

There were eight junction boxes, irregularly spaced on the west, south and east walls; some may have been missing.

Windows were as follows:

i) east wall at high level, a metal-framed window with a flat metal lintel. The central four panes opened. Probably this was fitted with a blind originally as there was indication of housing and fittings. This window was six feet wide.

ii) west wall, at high level, a window similar to (i). It had been bricked up.

iii) north wall, a window of eighty-two inches high by eighty-three inches wide. It had a curved top and the sill was thirty-two inches from the ground. It had twenty-four panes, the central four opening.

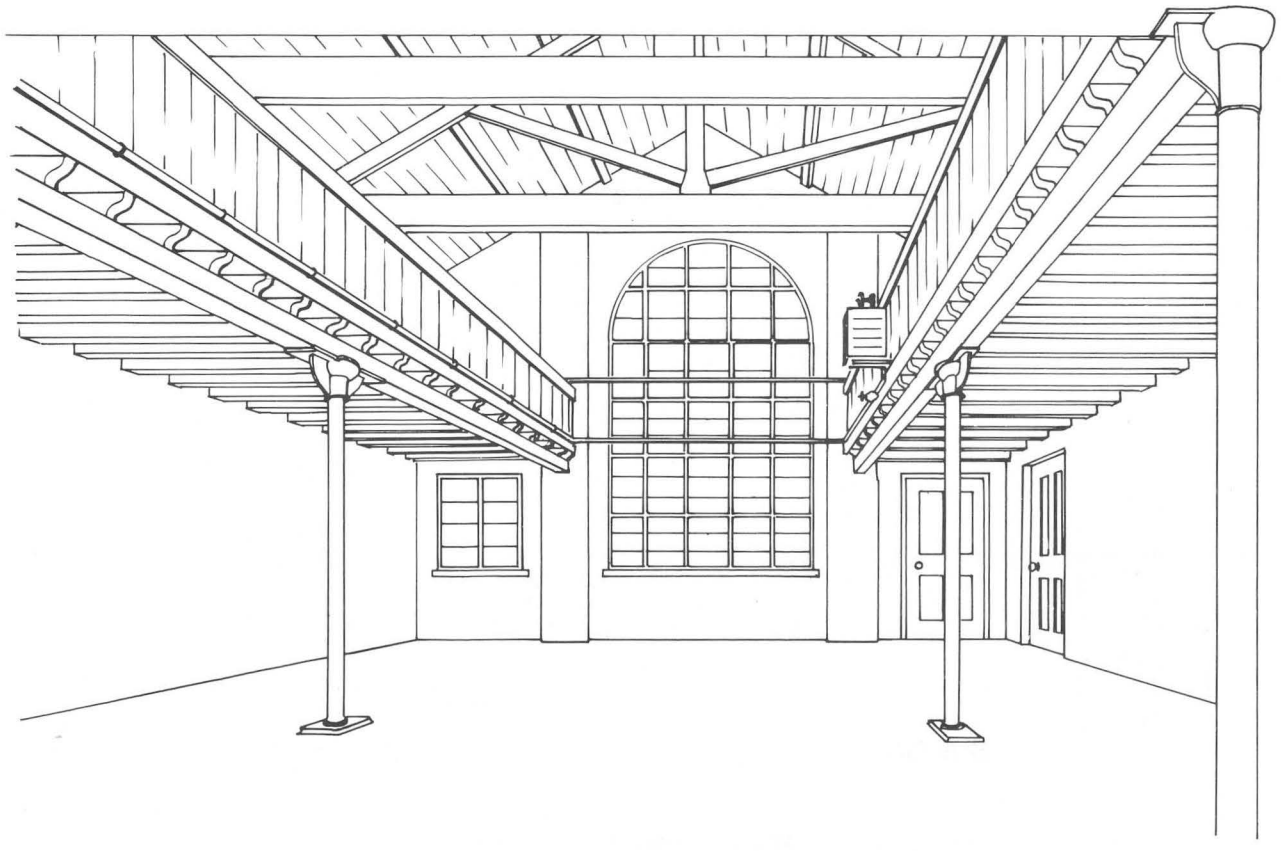


Figure 35 Interior of galleried building 4 with later additions removed.

This building held two box-assembling and papering machines. In the 1920s–1930s about twelve women worked there, some on the machines and some doing hand work.

IV. Summary

The precise dating of the buildings has proved difficult because the business records of the various firms using the site have not survived, a situation all too often found in industrial archaeology surveys. The Soman's 1802 buildings (St Edmund's Shoe Factory Fig. 32)[28] had been demolished by 1924, almost certainly when the river was widened after the floods of 1912. Buildings 1 and 2 were developed on the site of the buildings destroyed in the 1942 bombing. Building 5 was formed by covering in an earlier yard sometime between 1924 and 1949 (Fig. 32). Buildings 3 and 4 are considered to be late nineteenth century, 4 being constructed before 1897 (Fig. 32) and after 1885 at which date the OS map does not show either 3 or 4. Building 6 is shown on Goad's map of 1897 (Fig. 32). It may possibly be a survival from Soman's premises but more probably was built on part of the Soman's site, after earlier buildings were demolished.

This survey of the industrial buildings on the site was considered necessary for three reasons:

1) The buildings gave a sample of style, alteration and redevelopment from the late nineteenth century to the present day and included repair work from World War II.

2) The site had been used for the manufacture of boots and shoes and/or cardboard packaging for them from the early days of the Norwich shoe industry to its decline in recent years, *i.e.* from 1802 to 1966. Thus it provided an opportunity to record the extant buildings and relate them to the surviving documentary evidence.

3) To record industrial buildings in advance of demolition is a policy of the Norfolk Industrial Archaeology Society. In this case, to have made such a survey in advance of an archaeological investigation of the site by digging, ensured that the industrial history of the site could be integrated with below-ground evidence of earlier site usage.

The remaining Soman buildings, marked as P. Haldinstein and Sons on Goad's map of 1897 (Fig. 32) had been demolished after the floods of 1912 when the river was widened (Fig. 37). The late nineteenth century buildings (3 and 4) perhaps showed the solid prosperity of the Norwich shoe industry, since their strength and quality of construction withstood the effects of the 1942 bombing. The continued use of the site for shoe manufacture and for the making of cardboard boxes for that industry, reflects the long association of industry with the river front in this area. The closure of the site by Bally in 1966 exemplifies the decline of the shoe industry and also the present trend for industry to move to the outer fringes of the city. The use of the buildings for warehousing and their subsequent demolition in 1985 are examples of the run-down of riverside buildings of an industrial kind in Norwich.

Chapter 7. General Discussion and Conclusions

I. Nature of the deposits

Consideration of the excavation and its implications is not possible without a consideration of dating. Dating is, of course, crucial to any historical undertaking, none more so than archaeological research. The Fishergate site was excavated partly to obtain such evidence of dating; as has been outlined above, a major *lacuna* within urban studies in Norwich has been knowledge of north bank occupation and the relative stages by which such occupation took place. The almost complete lack of pre-Conquest material from the enclosure area presents a formidable hurdle to interpretation. It was hoped that the Fishergate site, although small, would produce quantities of datable material to help fill the gap. This it did do, mainly due to its waterfront location where deep rubbish deposits help to build up the foreshore of the river.

It is precisely this waterfront location, however, that causes problems of dating. Much of the material is redeposited; indeed probably the vast bulk of the excavated levels consisted of dumped and re-excavated deposits. It also seems unlikely that these accumulated layers were the result of a short-term deliberate policy of infilling (as evidenced from Lübeck for instance at the end of the thirteenth century: Lübeck 1980, 87–8) but rather an *ad hoc* assemblage consisting of rubbish material garnered from a variety of locations.

The effect of such deposition can be seen from examination of an intrinsically-dated object. The sceat is dated to *c.*710–725AD. It was located, however, in a Period III deposit which also contained a comb bar fragment of eleventh-to-twelfth century date and a considerable quantity of Thetford-type ware fragments of probable tenth-to-eleventh century date. A further Period III deposit (*91*) contained four objects datable to the seventh or eighth centuries yet was stratigraphically later than numerous deposits containing Thetford-type wares, a Late Saxon and Saxo-Norman fabric.

The deposits therefore were mixed and the dating of the various periods is thus difficult, not least because more conventionally stratified deposits at the street frontage (which might have helped to clarify a chronology) were not available for excavation. However, analysis of the pottery showed that it was still possible to obtain broad date ranges for the periods identified stratigraphically in the excavation. This demonstrated that actual utilisation of the site probably started by the early tenth century (Period I) with revetting and surface-laying in the tenth century (Period II), use continuing into the eleventh century (Period III Phase 1) and decline setting in during the eleventh century itself (Period III Phase 2). By the late eleventh or early twelfth century reoccupation was taking place (Period IV). The hand-excavated trench terminated in thirteenth- and fourteenth-century deposits. There was thus sufficient archaeological data to suggest *in situ* utilisation for some 500 years, overlapping at the later end with the fragmentary documentary evidence.

However, the location on the excavation of numerous intrinsically-dated objects in relatively late contexts, including the above-mentioned sceat, enables hypotheses to be drawn concerning earlier occupation of great value to the overall history of settlement in Norwich. The off-site provenance of these objects (and that of the pottery) is unknown but it is reasonable to suggest that their deposition results from the dumping of waste heaps, middens and the contents of cesspits into the river from tenements in the surrounding area. Initially, if access to the foreshore was communal, then dumped deposits could have come from much of the immediate locality; subsequently it may have been confined to the rubbish of a single tenement. An obvious but important point to make is that the rubbish was almost certainly generated from sites on the north bank of the river.

This observation *is* important when the intrinsically-datable objects are analysed. It seems quite clear that, despite its modest size, there were more objects of Middle Saxon date recovered from the 1985 excavation than from any other single excavation ever undertaken in the city. Pottery alone can demonstrate this: the quantitative analysis (Table 2) indicates some 119 sherds of Ipswich-type ware, from a waterfront site of 37.5m^2. This compares with seven sherds from the 1981 waterfront site at St Martin-at-Palace Plain (Ayers 1987, 74), an excavation of some 1928m^2 or fifty times bigger. In addition, imported wares of Carolingian provenance were also located at the Fishergate site.

The pottery is augmented by a range of other Middle Saxon objects such as two iron brooches, a copper alloy brooch, a copper alloy pin and an antler ring. Together this makes up a formidable assemblage, especially when put into the context of its discovery. Caution must be observed when interpreting the results of one small excavation but, within the known and inferred framework for urban development on the north bank of the River Wensum, the least that can be drawn from the above material is that there is a great likelihood of a Middle Saxon settlement of some importance in the area. Supplement this with the overall impression of dating gleaned from an imperfect stratigraphic situation, namely that the consolidated marsh/grassland deposits seem to have been sealed by rubbish deposits at the end of the tenth century/beginning of the eleventh century compared with south bank results that indicate a similar dumping in the eleventh/twelfth centuries after eleventh-century growth (Ayers 1987), and the possible pattern of urban development becomes very interesting indeed. This possible pattern influences this report's conclusions and proposals for future work.

II. Archaeological Background

The geographical location of the site has been described above. Any discussion of the excavated features and other finds, however, has to be put within a more amplified context. It was mentioned *en passant* in Chapter 1 that a paradoxical situation exists with regard to urban studies in

Norwich. There is limited but sufficient documentary and numismatic evidence to suggest a tenth-century settlement of some importance and yet the archaeological evidence, although producing material from the eighth century onwards, cannot provide enough data to support a major settlement prior to the eleventh century. The present model for the urban development of Norwich sees the establishment of a number of disparate settlements in the eighth and ninth centuries, their gradual growth and amalgamation (helped, no doubt, by the creation of a Late Saxon burh as an administrative area after 917AD) until, by 1066, a town of 5000 or more people was in existence. The actual mechanics of this process are disputed and are not relevant here although it must be stated that the crucial period is almost certainly the tenth century, a period of transition from proto-urban nucleii to full-blown early medieval mercantile, industrial and administrative community.

It may well have been the case that the superlative geographic position of Norwich (Atkin forthcoming) ensured that settlement developed without any major centralising influence until necessary political functions due to changing circumstances were grafted on to an existing urban topography in the Late Saxon period. It is as likely, however, that a focal point was in existence by the second quarter of the tenth century at the latest and possibly earlier. Such a focus would be necessary either for an administrative authority, of which coins, although sparse, are an indicator (Campbell 1975, 3a), or of a commercial network, the existence of which can be implied from the reference to Norwich in the *Liber Eliensis* of late tenth-century date when the settlement was compared favourably with Cambridge, Ipswich and Thetford, as being 'of such liberty and dignity that if anyone bought land there he did not need witnesses' (Blake 1962, 100). In addition Norwich was of sufficient status by 1004AD to warrant inclusion in the Anglo-Saxon Chronicle when 'Swegn came with his fleet ... and completely sacked the borough and burnt it down' (Garmonsway 1953, 134).

The dearth of archaeological material therefore seems almost capricious unless excavation has not been undertaken in the critical area. A glance at Figure 1 immediately reveals that the interior of the defended enclosure on the north bank of the Wensum is the most obvious such area. Indeed, even if watching briefs and the evidence from building sites were added to Figure 1, the paucity of archaeological evidence from within the enclosure remains marked. Only some eight such additional sites can be enumerated[29]. The pottery from all these sites was assessed prior to the publication of the Norwich Survey/Norfolk Museums Service catalogue (Jennings 1981) and the results tabulated (Jennings 1981, tables 1a–1e, 264–273). Of the twelve sites in total, some of which are extremely close to (or even outside) the periphery of the enclosure, only one (Site 168 on Magdalen Street/Cowgate, a Norwich Survey excavation of 1974) produced any Ipswich-type ware (one sherd) and only two (Site 168 again and Site 36 off Whitefriars) produced Thetford-type ware (these figures exclude sites on the defences such as Site 302, Alms Lane). While it is significant that both of these were properly conducted excavations rather than watching briefs the quantities are minimal especially given the ubiquity of Thetford-type ware over much of the remainder of the medieval city.

At first, therefore, it might seem unlikely that the enclosure is a fruitful area for archaeological research seeking to locate tenth-century settlement. The above ceramic finds, however, have to be put into perspective. As will become apparent below, the most favoured area for early occupation is that part to the south of Stump Cross (Fig. 36). Of the sites within the enclosure from which material had been recovered up to 1979 only five were within this area. Of these one record concerns material recovered 'within buildings' in 1898 or earlier, close to St George's Bridge where deposits of four metres or more can be expected above Middle and Late Saxon deposits (it seem unlikely that such depths would have been reached and, indeed, the earliest fabric retrieved was Grimston-type ware of the thirteenth-to-fifteenth centuries). Similarly, trial work by the Norwich Survey off Colegate in 1972 was of limited extent with Frechen stonewares being the earliest pottery recorded. This only leaves a building site at 8, Magdalen Street (Site 85), work undertaken in 1964, for the construction of a relatively lightweight structure which still survives (local medieval unglazed wares being found). In sum, it is safe to conclude that no previous observed excavation, either commercial or archaeological, can be expected to have located pre-Conquest material never mind evidence for tenth-century activity.

The lack of work inside the defended enclosure can largely be put down to a lack of opportunity. Apart from the Anglia Square development in 1974 in the north-western part of the enclosure, there has been little development since the establishment of an archaeological unit within the city in 1971. This has been particularly the case in those areas near the river, Colegate, Fishergate and the southern end of Magdalen Street. The development of the Friars' Quay complex in 1972 without prior excavation is a major matter of regret but otherwise much of the enclosure remains for future work. Paradoxically, the lack of opportunity for archaeological excavation is partly due to the relative density of listed buildings, clustering along Magdalen Street and Colegate in particular, and inhibiting large scale clearance. In addition, many of those sites which were developed, often before 1972, were not the subject of a watching brief and hence do not appear within the list in endnote 29. When activities such as watching briefs had to be undertaken by museum staff in a voluntary capacity at lunch-time, sites at some distance from the Castle Museum would clearly be visited infrequently. Many sites probably remained unknown until the completion of groundwork, not least because few museum staff lived north of the river and hence travelled infrequently in that direction.

The paucity of archaeological data, therefore, is considerable and a priority for the immediate future must be the rectification of this situation. The lack of data, however, is compensated in part at least by hints from topographical and other information concerning the area.

III. Historical and topographical background

The later documentary evidence has been summarised above. For the earlier period the lack of documentation necessitates analysis of surviving streetnames, the relationship and relative antiquity of churches, the study of street patterns and the analysis of boundaries. All these approaches are, of course, fraught with problems yet some consistent pattern for the early development of the urban topography of the Fishergate area can be gleaned from evidence such as these afford.

The broad topographical evidence has been outlined above. The distinctive curve of Fishergate was probably

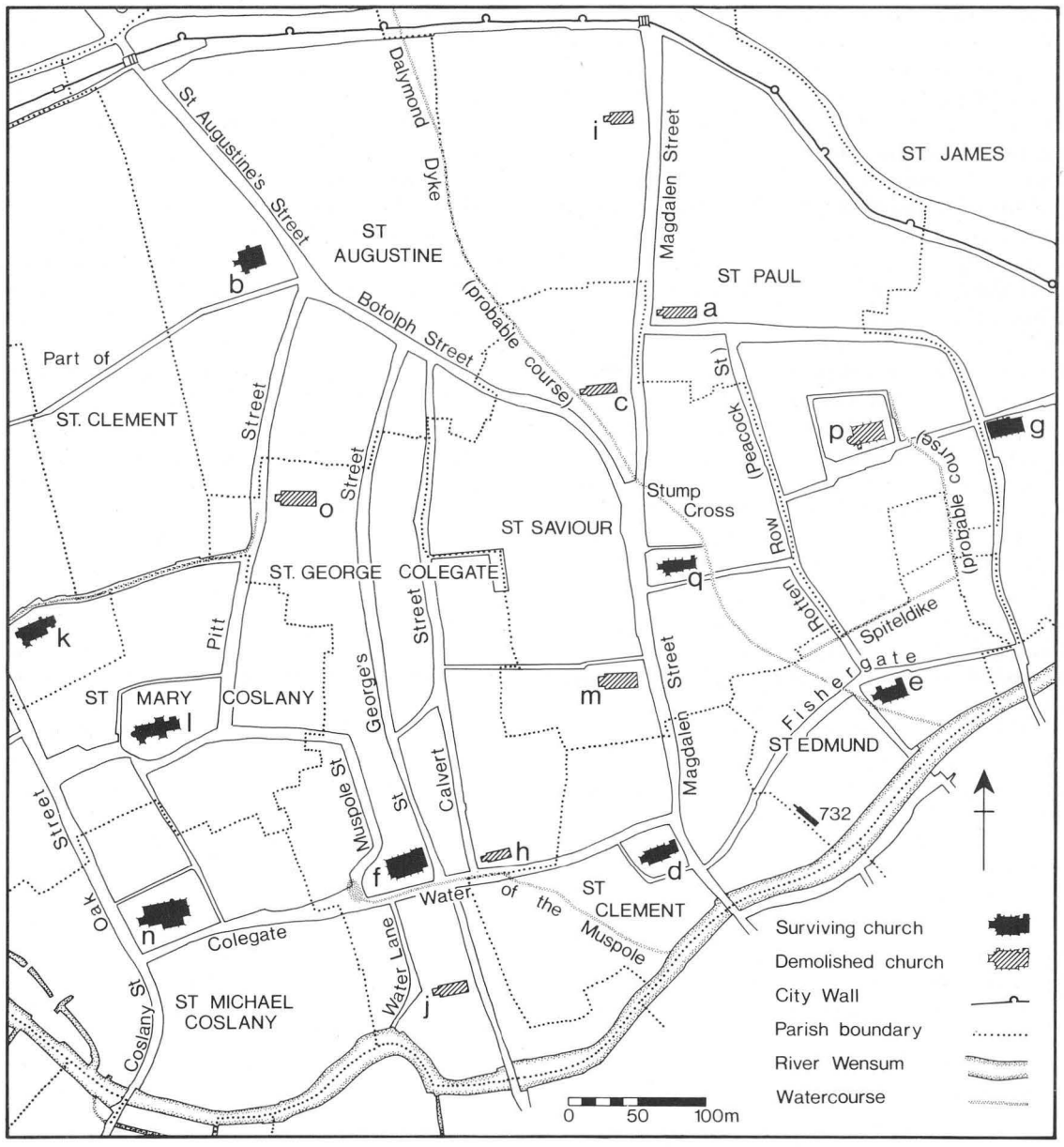


Figure 36 Map of area of Late Saxon enclosure showing churches, parish boundaries and topographical features. Scale 1:50.

Churches as follows:

a All Saints
b St Augustine
c St Botolph
d St Clement
e St Edmund
f St George
g St James
h St John the Baptist
i St Margaret *in combusto*
j St Margaret Newbridge
k St Martin-at-Oak
l St Mary Coslany
m St Mary Unbrent
n St Michael Coslany
o St Olave
p St Paul
q St Saviour

bisected by the Dalymond watercourse, the approximate line of which is indicated on Figure 36. The Dalymond flowed from Catton, north of the city, entering the medieval walled area somewhere between St Augustine and Magdalen Street gates. It seems to have passed close to the Botolph Street site excavated in 1975 (Site 281) and was mentioned in abuttals recorded in the documentation (Atkin *et al* 1985, 88–89, figs 2–4). It is possible that it may have subsequently run further east than is indicated on Figure 36; observations in 1985 during the excavation of stanchion pits at intervals along the east side of Blackfriars Street (*ex* Peacock Street; *ex* Rotten Row) revealed considerable evidence of water at a depth of some two metres. These observations could have also been influenced by the *Spiteldike* (Fig. 36) although the possibility that the Dalymond may have run here has topographical implications.

Dalimund is first recorded in 1271, the *Spiteldike* in 1285 as *communis Fredisch* (Sandred and Lindström, forthcoming). The earliest reference to *Le Spiteldike* as such is 1311, from the neighbouring Norman's Hospital to the north which stood between it and St Paul's church (Fig. 36).

The Dalymond is reputed to have flowed into the Wensum near to St Edmund's church, close to Water Lane (now Hansard Lane, Fig. 36). Kirkpatrick (Hudson 1889, 86) records the earliest reference to this 'lane leading to St Edmund's key' as 1312/13. Fish were landed here (Sandred and Lindström, forthcoming) and Fishergate itself (*Fischergate* in 1285) implies a concentration of fishermen. In Kirkpatrick's time (the early eighteenth century) Hansard Lane was 'used as a Watering Place for Horses, & called St Edmunds Watering' (Hudson 1889, 86). Kirkpatrick also records that in 1312/13 'Rob^{t}. Champanye was amerced 40^{d} for a purpresture w^{ch} He had made upon the King's Lane leading to St Edmunds (Kayum) Stath in Fhischergate with a wall 100 feet long and half a foot broad' (Hudson 1889, 86). Champayne's property was held by Stephen de Cathone in 1337 when the messuage was said to extend from Fishergate to the river[30]. The implication of Champayne's purpresture, therefore, is that he not only extended his property slightly into Hansard Lane but that the approximate distance from street-to-river in the early fourteenth century was a hundred feet (compared to approximately 225 feet in 1883, Fig. 37) (see also discussion of tenement size). The Period VI walls uncovered at the southern end of the 1985 excavation (Fig. 6), dated to the thirteenth century and later, were approximately 120 feet from the medieval street frontage.

The relationship of Fishergate to the river and bridges has been remarked upon above. Most of the street, including the excavated site, lay in the parish of St Edmund although the western end lay in that of St Clement. There is no documentary evidence to suggest that St Edmund is a pre-Conquest foundation, neither do any obvious architectural features survive to indicate such antiquity. Nevertheless the dedication to a popular East Anglian royal martyr and the location of the church both suggest that a pre-Conquest origin is highly likely. It seems probable that the church was founded as a proprietary church or *Eigenkirche* as, unusually, the living was still in secular hands in the fourteenth century (those of the Clere family of Ormsby, Norfolk: Tanner 1984). If the foundation was such it is possible that the parish was carved out of either (or both) of two important early parishes, those of St Clement and St Martin-at-Palace (Fig. 2). The former is perhaps more likely given the predominance of St Clement in the area. The probable early creation of the parish can also be suggested from its relationship to the Spiteldike which forms part of the parish boundary (Fig. 36). This length of boundary is interesting as Campbell suggests the possibility that the north-eastern part of the city 'approximately E. of Rotten Row... and N. of Fishergate may have lain outside the bounds of early Norwich' (1975, 5a, n.45). He suggests elsewhere that the Spiteldike could have formed the boundary of the burh (1975, 4b, n.40) and thus this ditch would be a logical northern limit to St Edmund's parish.

This suggestion, when taken with the proximity of the outflow of the Dalymond, implies a location of some topographical importance for St Edmund's church. Rotten Row itself (Fig. 36) runs north from Fishergate opposite St Edmund, for much of its length following, or being followed by, the boundary of St Saviour. The Rotten Row/Fishergate junction had therefore, in close proximity, two watercourses, two parish boundaries, a possible major division between early settlement and an area not regarded as part of that settlement, and a church of early dedication. The implications of all this must be explored elsewhere (Ayers forthcoming) but the above summary underlines the probable importance of the Fishergate area within the early medieval town.

At its western end the junction of Fishergate with the southern end of Magdalen Street (originally called Fyebridgegate, Fyebridge Street now being reserved for that section between Colegate and the river) and with Colegate is also of interest. The relationship between Fishergate and Colegate, both riverine streets, is not an easy crossroads with Magdalen Street/Fyebridge Street, but rather is a dog-leg around St Clement's church. However, an alleyway on the southern and west sides of St Clement (Fig. 2) does provide direct access to Colegate from Fishergate. As above, this interesting topographic feature cannot be explored here but its location does emphasise the importance of the church, St Clement occupying an 'island' site not unlike that occupied by another important early church, St Martin-at-Palace (Ayers 1987 and Beazley forthcoming).

St Clement would, indeed, seem to be a crucial element in the development of the north bank area. Although not documented for the pre-Conquest period, the dedication suggests such an antiquity while its medieval tithe pattern implies a parish of widespread influence. It received two-thirds of the tithes from the old Dominican site north of Colegate, suggesting that it predated St Mary Unbrent and St John the Baptist (Campbell 1975, 4b, n.42; both churches now lost but indicated on Fig. 35). It may also have received two-thirds of the tithes of St George Colegate, probably a foundation of *c*.1100[31]. The parishes of St Augustine and St Martin-at-Oak are known to have been cut out of St Clement's parish (Campbell 1974, 4b)[32] and the possibility that the parishes of All Saints, St Botolph, St Edmund, St Margaret and St Saviour had a similar relationship must be strong (all churches on Fig. 36 together with parish boundaries; these latter, however, must be treated with caution: Carter 1978, 193–4). A detached part of St Clement's parish survived in the north-western part of the walled city and, extramurally, the parish extended via St Clement's Hill to Mile Cross until the nineteenth century.

These more wide-ranging parts of St Clement's parish are not pertinent here. The location of the church itself, however, has implications for the topographical and historical importance of the southern Magdalen Street area in general and the bridgehead of Fye Bridge in particular. Several churches dedicated to St Clement can be offered as parallels in analogous riverside positions (for example Cambridge: Haslam, 1982–3, 19–20 and fig. 1) while it also seems the case, though the link remains unproven, that there is a marked correlation between churches dedicated to St Clement and urban areas associated with Danish or Anglo-Scandinavian settlement (the churches of St Clement Danes in London, St Clement, Ipswich and St Clement, Stamford can be cited). There is as yet very little evidence to suggest Danish occupation in Norwich although the number of 'gata' streetnames and the existence at one time of two churches dedicated to St Olave certainly indicates an Anglo-Scandinavian influence[33]. The topographical similarity of the fortified enclosure (Fig. 1) to defences of approximate Danish date can also be observed

(for example Ipswich, Cambridge, Huntingdon). Again, it is necessary to concentrate these lines of discussion to the area under consideration; the implication (and that is all it is) must be that Anglo-Scandinavian occupation is a possibility on the north bank of the river and thus provides part of the context for a discussion of the site.

This pre-Conquest context needs further amplification to include post-Danish but still pre-Conquest settlement. There seems little doubt that, by the time of King Edward the Confessor, any occupation of the north bank had been eclipsed by that to the south. Whether this was the case for all the 150 years from the reconquest of Edward the Elder to the arrival of Duke William is an open question. It is, moreover, a question which begs an examination of the relationship of the settlements on each bank one to the other[34] and brings the vexed topic of the location of *Northwic* to the fore[35]. Neither can be explored here but the north bank does seem to have been important in the pre-Conquest period, at least to the south of Stump Cross (Fig. 36). One indicator for this is the study of the landgable rents surviving from later medieval accounts. Carter summarises the methodology and plots the results (1978, 184–187 and fig.4). These indicate occupation along Magdalen Street and on the waterfront streets of Fishergate and Colegate. Quantification is difficult but the impression is of areas with at least as much value as areas south of the river. There is not, as yet, enough data to suggest relative occupation dates for settlements either side of the river although certainly the eleventh century seems to have been a period of expansion on the south bank (Carter *et al* 1974, 40 for the St Benedict's Street area; Ayers 1985, 65 for the area south of Tombland; Ayers 1987 for St Martin-at-Palace Plain). More fieldwork, especially in the light of the results of the 1985 excavation as discussed below, is necessary on the north bank to chart both expansion and contraction (if any).

By the twelfth century, expansion to the north-east of Fishergate is recorded with the construction of St Paul's church (Fig. 36) and Norman's Hospital. Documentary references to Fishergate itself do not occur until the thirteenth century and an outline of the documentary evidence relevant to the excavated site has been given elsewhere. Whatever the economic and social fortunes of the north bank area it seems clear that the waterfront streets remained densely populated. Indeed, development can be noted from the post-Conquest establishment of the (now lost) church of St Margaret Newbridge (Fig. 36) off St George's Street, the bridge itself being first recorded in 1253. The secondary effect of such developments on Fishergate is recorded by the excavation although, as has been noted, fishing probably played an important early role and riverside access was almost certainly always important (a large anchor was reputedly found during the digging of a cellar in St Edmund's parish in 1686: Campbell 1975, 4b, no. 40). Fishermen indeed, who formed a fair percentage of the provisions trades in the enrolled deeds (Kelly 1983, 25)[36], may well have remained important within the area. A list of Norwich trades in 1274 places *piscatores* first and the city supplied both local and more widespread markets (for example, Leicester Abbey) with fish (Campbell, 14a).

Topographical changes took place in the area in the sixteenth century with the dissolution of Norman's Hospital during the Reformation. This is reflected on Cuningham's map of 1558 which, while depicting the southern side of Fishergate as completely built up between the bridges, clearly indicates the entire area between Rotten Row and Cowgate (now Whitefriars) as open ground. The map also implies open ground north of the street west of Rotten Row although its inaccuracies are well known and it must be used with care (a detail, including Fishergate, is reproduced as plate I in Ayers and Murphy 1983; Fishergate lies to the left of the river in the centre of the picture, between the central and furthest bridges; the tower of St Edmund is drawn). Part at least of the 'void' area east of Rotten Row was developed *c.*1620 as the Children's Hospital or Boys' Hospital School, elements of which survived into the present century.

The excavation has to be viewed, therefore, within the context of an area which probably developed in the pre-Conquest period and remained, due to its riverside location, a populous neighbourhood throughout the medieval period. It was still populous before the Second World War (Frontispiece) but industry had already begun to make its mark in the nineteenth century and industrial buildings on the site have been recorded above. Major topographical changes have, however, taken place this century which have a bearing upon discussion of the results of the excavation.

Firstly, and most importantly, the line of the river has altered dramatically. Following the disastrous floods of 1912 the City Council deliberately widened the river in order to lessen the possibility of a repeat catastrophe. This widening was most dramatic in the central area and particularly so next to Fishergate (Fig. 37). Here the river was almost doubled in width, some four metres of the north bank being removed in the process. The effect upon the archaeological deposits can only be guessed at but it is a reasonable assumption that all post-medieval accretions to the riverbank will have gone and possibly some late medieval ones as well. The effect, of course, is the reverse of that normally expected in a medieval town (as evidenced at London, King's Lynn, Dublin, Hull and numerous other places: Milne and Hobley 1979). It also accentuated the curve of Fishergate, bringing the ends of the street close to the bridgeheads and, perhaps, re-creating in part an original situation.

The second topographical alteration has been the widening of the road on the south side of the street west of Hansard Lane. This has had the effect of removing some of the street frontage along this stretch of road and thus divorcing archaeological deposits from the original line of the street. The combined result is that the excavated site occupies an area that has been truncated in recent years to both the north and south. It remained, however, one of the first opportunities to excavate a site close to the waterfront on the north bank of the river.

IV. Results of the excavation

'This area, the medieval *Ultra Aquam*, is an archaeological wasteland. There is no reason why its archaeology should not be as rich and varied as that S. of the river ...' (Carter *et al* 1974, 55). The 1985 excavation has gone some way towards substantiating this statement. Although of limited scope and duration, the discoveries can be interpreted within the context outlined above and be seen both to illuminate aspects of that context and to suggest avenues of future research.

Topographically, the work suggests that Fishergate owes its alignment to a marsh, evidence for which was uncovered in Period I and which extended some 30m north

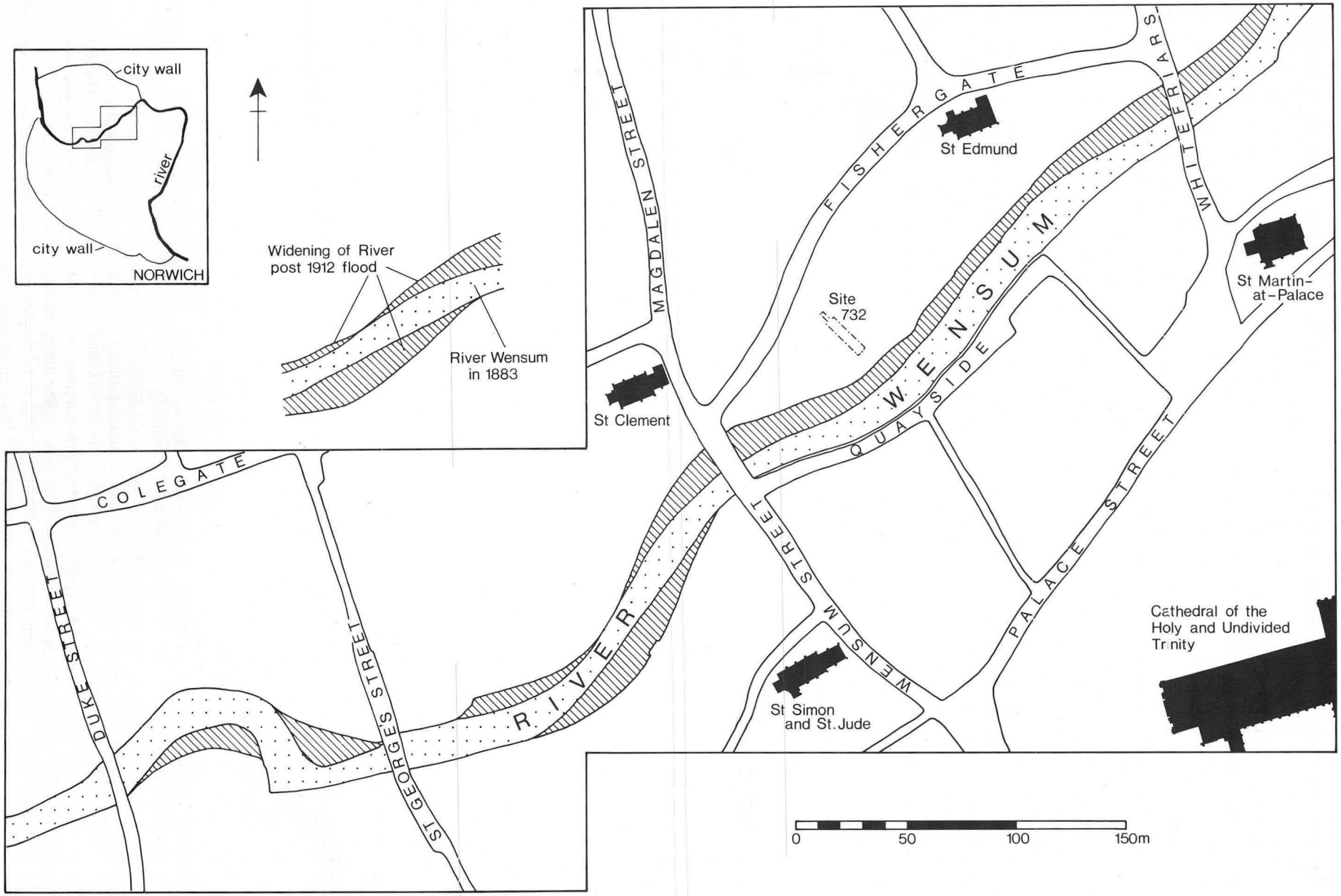


Figure 37 Map of the River Wensum in the central part of the city to show those areas of bank removed after the floods of 1912. Scale 1:2500.

of the present river line. More appropriately it also lay some 23m south of the medieval streetline, implying that, while Fishergate probably developed as a riverine street, it did so with room to spare for housing and warehousing between it and the river. Projecting the line eastward it also left room for the establishment of the church of St Edmund. This interpretation is, however, still based upon scanty evidence (the trench was, after all, less than two metres wide) and it is not yet convincing; a riverine street might be expected to develop *next* to the river unless the buildings preceded it. The Dalymond probably played a role in the development; its outflow must have been marshy and presumably took the form of a small creek north of the river. It is possible to see Fishergate developing in two halves, as oblique lines from each river crossing (now Fye Bridge and Whitefriars' Bridge) to a suitable crossing point on the Dalymond, thus leaving a gap between the street and the marsh to the south. If the Dalymond outflow was near St Edmund it may be under Hansard Lane, the creek developing as a lane (a similar situation has recently been uncovered by excavations immediately adjacent to the church of St Botolph, Billingsgate, London where an inlet of Late Saxon date was filled in but 'its position was preserved by a conspicuous property boundary': Youngs *et al* 1983, 191).

This suggestion, that Fishergate developed in two halves via alignments from the bridges to a Dalymond crossing, is interestingly reinforced by a consideration of the environmental evidence. This implies that the marsh, far from being wet, by the tenth century was above the water table and probably consisted of grassland. If so, the divorced nature of the street line *vis-a-vis* the waterfront can only be explained by the Dalymond creek acting as the principal access to the foreshore, a role it may have been forced into adopting anyway as the implied bend in the river from the surviving topography may well have made much of the Fishergate bank too steep to use for shipping. Utilisation of the surface of the marsh deposit (in its urban topographical context) therefore becomes a more complex activity to understand.

Such utilisation probably started in the tenth century (dating is considered above). The surface was partly covered by timbers (Period II: Fig. 4), at least one wickerwork fence was erected (there were presumably more) and a gully was cut into the underlying deposits. This gully, and some slightly later ditches, are impossible to interpret given the limited area of the excavation but it could have been suggested that they were associated with drainage, perhaps 'boxing' areas in the manner of Fenland dykes, were it not for the environmental data which indicates that the water table was too low for aquatic vegetation to become established in these ditches. As it is the most that can be deduced is that they could be dividing up areas of land for possible quasi-agricultural purposes such as stock control. The deposition of timber and the erection of wickerwork fencing is, however, similar to the techniques observed on the Courts site south of the river in 1981 (Ayers 1983, 24–25 and Ayers 1987) although the Fishergate horizontal timbers were larger than the brushwood located south of the river. While the quantity of data is still slender the larger timbers from this earlier site (tenth century as opposed to eleventh century) may imply a more rudimentary, less sophisticated approach to the problems of foreshore colonisation (the contemporary foreshore at New Fresh Wharf, London, was overlain by even larger timbers: Miller 1977).

This colonisation, of open land apparently kept fairly clean of refuse and perhaps of little foreshore value, was not universal (Fig. 4) and this may also indicate a more specialised function. The timbered area could be seen as a localised consolidation, possibly for a structure, within an area of generally open land. The sample is, of course, absurdly small for such a generalisation and was never intended to provide data for such an interpretation. The results do, however, highlight the need for more largescale work.

The timber and gully levels were sealed by a thick homogeneous deposit (Fig. 5), again similar to deposits observed at the Courts site (Ayers 1987, fig. 16, context *1005*) and at the Whitefriars Car Park site in 1979 (also south of the river, Ayers and Murphy 1983, fig. 9, contexts *30*, *46* and *55*). As before, however, this deposit appeared to be earlier than those encountered on the south bank.

A further attempt at colonisation seems to have been made thereafter with the deposition of a layer of crushed chalk (Fig. 5). This is an improbable deposit in a waterfront location (confirming the environmental evidence of earlier phases mentioned above) and it is possible that it was situated inside a building. The surface terminated adjacent to a line of possible post-holes which may have formed some of the vestigial remains of a timber structure. The excavation was clearly too constrained to allow further interpretation although the relationship of the putative floor (averaging 0.20m above OD) to present-day river levels in the city centre (mean water level is 0.23m OD) is of interest. This absence of a margin in such a location possibly lends credence to estimates of a rise in water level in the later medieval period (it must be remembered, however, that continual infilling of the foreshore would confine the river more closely and accentuate any observed rise).

Although further linear features of unknown function were recovered (Fig. 6) the major development with topographical implications to be recovered from the site was the construction of a walled feature (Figs 6 and 8) at the southern end of the excavated area. As before the very small area uncovered makes interpretation difficult although it is possible to say that the feature did not extend to the west but rather to the south and east. Dating is also problematical although a fourteenth-century date would not be improbable. Two possibilities are suggested by this structure: either it formed part of a riverside wall or was the footing for a building. The former is perhaps the less likely as it would be reasonable to expect a riverside wall to run westward to the boundary; the latter seems more probable especially given the numbers of deposits with charcoal and burnt deposits in this area, notably layer *183* between the two walls of the feature. Certainly the south section also conveys the impression of a hollow structure subsequently destroyed and infilled, possibly analogous to the removal of a building (Fig. 8). It is possible to postulate a riverside building with a wharf beyond rather in the fashion excavated at Seal House, London (Schofield 1981, 26, fig. 26) and as probably existed in front of the waterfront arcade at Hampton Court, King's Lynn (Pantin 1962–3, 180, fig. 67).

The possibility that such a structure existed serves to underline the paradoxical nature of the discoveries. The *in situ* material evidence summarised here (and detailed in Chapter 2) appears, at first glance, to constitute waterfront development in a similar manner to that already observed

elsewhere in the city (Ayers and Murphy 1981; Ayers 1987). However, the addition of environmental data and topographical inference contradicts this view and implies a more complicated urban riverside development, clearly influenced by the river but not necessarily always *of* the river as could be argued elsewhere. That such a contradiction is implicit in the results of such a small excavation emphasises the importance of future work in this area. It is becoming more clear than ever that theories of urban development should not be based upon assumed universal responses to similar situations.

The stone walls were the latest features to be excavated archaeologically on the site and the development of the area thereafter has to be followed in the documentation or by analysis of the standing buildings. The work demonstrated, however, that survival of archaeological deposits in the Fishergate area is good, providing the opportunity to augment other sources of information concerning broad urban development.

V. Site usage

A consideration of the different types of utilisation to which the site was put needs to consider the type of area it occupied prior to urban development. The excavation was unexpectedly successful in recovering environmental data which give a good indication of the changing local conditions over the past 10,000 years or so. These data have been summarised above but it is worth restating that peat formation under reedswamp began in the early Flandrian, and that, following a period of non-deposition, there was renewed peat development of uncertain, but probably later prehistoric, date. By the historic period, however, that is, during the first millennium AD, the swamp or marsh was drying out and becoming open grassland. This condition appears to have been that which existed when early direct human use was made of the area, probably in the tenth century.

This direct use took the form of foreshore colonisation although it has been noted above that the methods employed may have been aimed at stock control and grazing facilities rather than commercial waterfront development. Indeed, the environmental data would tend to support the former idea with evidence for grassland and the apparent presence of herbivore coprolites. The interesting point here is that such utilisation of the area would help to explain the apparent dislocation between the street and the waterfront. In a commercial waterfront situation it could be expected that street frontage buildings would have been built close to wharfage facilities. This was clearly not the case on Fishergate where, at the earliest phase, there was probably a gap of some 23m between the street and the edge of the marsh/grassland. In other words the situation is more akin to a non-riverine situation, the waterfront area in this instance developing as backland areas of frontage properties. Clearly, as emphasised elsewhere, more fieldwork is necessary but the combination of evidence from the 1985 site implies such a development rather than one encompassing commercial wharfage.

Such wharfage may have developed at Water Lane and indeed this area was where fishermen subsequently landed their catches. Fishing must be considered an important activity from an early period as the excavation recovered fish-hooks and lead weights as well as a number of large flint nodules with natural holes in them, an assemblage made more startling by the general lack of stone on the site. It is likely that these too could have acted as weights. Large bone needles may also have been used for fishing. The range of fishbones from the site is quite large, with herring predominating, although there is nothing to indicate that the assemblage represents the fishing industry itself. Rather it would seem to imply domestic debris. Shellfish were also common, particularly oyster, mussels and whelks.

Much of this environmental evidence came from slightly later periods on the site when the area seems to have been given over to a rubbish dump. The environmental summary above noted the presence of abundant organic refuse, with remains of bedbug, fleas and rats, as well as human intestinal parasites and coprolites of dogs and pigs, and concluded that the assemblage represented a 'foul rubbish tip'. It is possible to view such a development as an inevitable consequence of urban growth, the grazing of beasts between the river and a proto-urban settlement being replaced by dumping as the settlement grew and the pressures of population became increasingly manifest. While this observation is perhaps unsurprising, it is still a little startling in terms of implication. The north bank area of the settlement was still only using the waterfront in an *ad hoc* fashion, rather than directly exploiting the river frontage. This could be taken to emphasise the probable importance of creeks like the Dalymond.

However indirect the utilisation of the site was, the various refuse assemblages do indicate considerable Late Saxon activity nearby. Much of this was of an industrial character. Bone working, particularly that of antler, was obvious from both finished objects and discarded working material; iron working primarily involved smithing with some probable cupellation or refining; weaving, tanning and leather working were all represented in the finds assemblage.

Evidence for trading activity is less conclusive. Sherds of imported Carolingian pottery have already been mentioned although their number is very low (five only). A sceat of probable Mercian provenance can be dated to the early eighth century but it is a sole find in a later context. Of tenth-century trade there is little sign although, by the eleventh century, the number of imported pottery sherds rises considerably, implying Rhenish trade[37]. Seven fragments of German lava were recovered, generally from Late Saxon contexts while hones seem to have been imported from Norway. As usual there is enough evidence to suggest trade, not enough to substantiate claims of extensive contact.

By the end of the eleventh century it seems that the first attempt to build on the area was undertaken, a post-built structure with a chalk floor occupying the southern part of the site. The water table must still have been low to enable such a building to be erected. The excavation trench was too circumscribed to admit of sufficient evidence to suggest a function for this building although the lack of charcoal, ash and other debris could be taken to imply that the structure was more likely to be associated with industry or commerce than domestic activity. Its location, at some remove from the street and presumably close to the contemporary river, would endorse such a conclusion. Nevertheless, by the twelfth century, it would appear that the character of the site was changing. Whereas the earlier deposits yielded finds suggestive of industrial and some commercial activity, the early medieval layers were char-

acterised by more domestic items. A key and two fragments of keys were discovered together with needles, dress fittings, a strap end and a buckle. Pottery fabrics still include some imported wares, usually from the Rhineland but also with probable North French fabrics, although increasingly imported wares decline in numbers. Local wares predominate, supplemented by other English fabrics, notably a small number from Essex. These might be associated with the acquisition of the site by the Abbots of Waltham Abbey in Essex.

It has not been possible to ascertain when the Abbots acquired the site although it could have been in their hands by *c.*1220. It is likely, therefore, that the latest activity excavated by hand on the site dates from their tenure. The buried barrel recovered in Period VI and used as a latrine could have been a facility on the Abbey property while the stone walls recovered at the extreme south end of the trench were almost certainly monastic undertakings. These structures appear to represent a building rather than a quayside wall, presumably fronting the river. It could have functioned as a warehouse but is perhaps as likely to have been a fish-house. The building postdates the rental of 1220 when it can be suggested that the messuage, although owned by the Abbots of Waltham Abbey, was occupied by Nicholas the Fisherman. Fishing was an important activity on and near the site until at least the thirteenth century (Fig. 30).

The archaeological deposits, together with the documentation (Fig. 30) suggest that, whatever the changing ownership of the site and the increasing evidence of domestic activity, parts of the property were still used for traditional industrial work. The location of two horncore pits in Period VI would imply a neighbouring horn workshop while the high numbers of other bones associated with the horn also suggest a possible tannery. The site was probably also exploited for its waterfront industrial potential with the location of such trades as dyeing, skinning and fulling known from the area. It is difficult to generalise given the restricted nature of the site but the available evidence, together with the patterns of later occupation, would suggest domestic occupation on Fishergate itself, backyard craft activity south of the buildings and waterfront-related structures at the river. A good economic mix.

The later medieval and post-medieval occupation is some of the most difficult to trace. While it is possible to follow the immediate post-Reformation descent of the property, it is much less easy to isolate activity on the site. It is likely, but impossible to prove, that life continued much as before, the (unexcavated) street frontage becoming increasingly built up, the (destroyed post-1912) river frontage developing in a similar way, and the central yards gradually infilling with outbuildings associated with trade and industry. Weaving and cloth finishing were probably trades of importance, given the density of known weavers in the general area. By 1760 a dyer occupied the site and, although he was followed by a bricklayer in 1763, a woolcomber lived there in 1806. An alehouse stood on part of the site by the late eighteenth century, known as the Dyers' Arms (subsequently the Dyers or the Jolly Dyers).

A change of emphasis was initiated early in the nineteenth century by the foundation of a boot and shoe factory on part of the site by a French refugee, David Soman, in 1802. The gradual expansion of this business over much of the area, with shoe manufacture being eventually replaced by a box manufacturer, has been outlined above. This industrial growth has two interesting historical links. Firstly, it seems clear from the cartographic evidence (Fig. 32) that (prior to the Second World War), development was largely confined to the rear of the street frontage, thus maintaining a traditional approach to urban infill in the city. Secondly, the establishment on the site of the important early modern Norwich industry of shoemaking replaced probable use of the site by the important post-medieval Norwich industry of clothmaking, which in turn seems to have replaced important medieval activities of leather and bone working and fishing. All in all, the site provided a neat microcosm of local industrial development. The present redevelopment, which necessitated the excavation, has now replaced industrial buildings with offices and houses, currently the two largest growth areas for buildings in the city centre. Thus the site continues to act as a barometer of urban development within Norwich.

VI. Conclusions

The 1985 Fishergate excavation was a very limited investigation. As such it did not reveal details of building types or enable a comprehensive overview of tenement development. The research design formulated for the excavation did not expect to recover such data; rather, as has been outlined above, it sought some indication of local topographic development and a broad chronological sequence. Both objectives met with success. The evidence for urban expansion in the area is still sketchy but it is now possible to suggest ways in which the settlement grew on this part of the north bank while the environmental data have supplied unexpected information on the natural history of the pre-urban site. A broad chronological sequence has also been established, the evidence pointing to a Middle Saxon settlement of some importance nearby with little sign of discontinuity of urban life in successive centuries.

In brief, therefore, the excavation indicates that the north bank of the River Wensum close to Fye Bridge was an area of significance at an early period in the history of the city. The excavation was the first such project to be undertaken in this area and has demonstrated that future work here must be a priority. The consideration of topographical and other indicators tends to emphasise the pre-Conquest importance of the north bank while the environmental data from the riverside can contribute greatly to a better understanding of urban growth. The project has shown that a small but carefully selected investigation can indicate major potential elsewhere in the vicinity. Urban historians and archaeologists now need to build on the results of the 1985 work as and when opportunities become available.

November 1988

Sources consulted

	NRO	
Ale House Recognisances	Case 14	
Doquet Book to Norwich Deeds	Case 3f)	
Index to Doquet Book	Case 4	
Friendly Society Records	Case 21e)	
Kirkpatrick Notes	Case 21f)	
Iters. Book of Pleas	Case 17b)	
Leet Rolls of Ultra Aquam	Case 5l)	
MS Index to Deeds 1378-1509	Case 3f)	
MS for St Edmund		
Landgable 1397 in Domesday Book	Case 17b)	
1474 in Chamberlain's Book	Case 18a)	
16 and 17 c	Case 18d)	
Liber Albus	Case 17b)	
Norwich Court Rolls	Case 1	
Lease Books	Case 22 +) 77 c-d	
Town Clerk's Deeds		
City Engineer's Deeds		
Norwich Consistory Court Wills		
Private Deeds for St Clement and St Edmund		Case 4g)
Topographical Reconstructions of Norwich Survey		
Waltham Abbey Cartularies		British Library
Rentals		P.R.O.
The Tillett Scrapbooks		MS 384 T 136 Γ
Assessments, etc.		
Window Tax		
Hearth Tax		
(Printed sources are itemised in the bibliography)		

Endnotes

1. See s.v. 'Norwich area' in Rigold and Metcalf 1984, 257.
2. For a definition of the various series and types, see Steward 1984, 5–26.
3. Metcalf 1978, 12–19 under Series J.
4. Hill and Metcalf 1984, especially 128, but also 133 and probably 129 and 127.
5. Banbury; Repton.
6. Unpublished but see Tillyard 1983 for an example.
7. BL Cotton Tib. C ix f120d. and printed Richardson 1960, 257.
8. Blomefield III, 477, though Richardson 1960, 257, gives 1189 and says the Pope released him from the vow the following year.
9. See the whole chapter 'Jews and the Land' in Richardson 1960, 83–108; also Roth 1949, 105–108.
10. BL Cotton Tib. C ix f227d.
11. BL Cotton Tib. C ix f120d.
12. BL Cotton Tib. C ix f235d.
13. BL Cotton Tib. C ix f227.
14. BL Cotton Tib. C ix f144d.
15. NRO Case 1 Roll 15 m 37d.
16. NRO Landgable Records 1570, 1626 Case 18d.
17. NRO Case 1 Roll 2 m 33. Saxthorp to Stanhard abuttal.
18. NRO Case 1 Roll 10 m 20.
19. NRO Case 1Roll 12 m 35.
20. PRO SC12/6/64.
21. NRO NCM St Clement's Private Deeds Case 4g).
22. NRO NCM Case 1 Roll 25 m 70. Waltham Abbey's Fybriggate (Magdalen Street) property in St Clement had become Edmund Wood's by 1552 (Roll 23 m 24).
23. NRO NCM Liber Albus Case 17 b) f.133d.
24. NRO NCC Will Flack 469.
25. NRO NCM Landgable list of 1549 Case 18d).
26. Roll 12 m 29d Redham to Albon – abuttal.
27. It may have been Gough's factory and Miller and Marshall's adjoining premises that were refered to in an Eastern Daily Press article on January 25th, 1961. Here, 'L.M.N.', writing about 'The Norwich Poor' narrated the story of Alice who went to work in the box factory on Fishergate at the age of thirteen. The article includes odd details about the building ('three flights of a spiral, iron staircase') and much detail about the working conditions.
28. St Edmund's Shoe Factory should not be confused with *St Edmund's Mill*, which stood to the east and south of St Edmund's church in Fishergate, and was owned by the shoe-making firm Sextons. It is shown on Goad's map of 1897 but not as redrawn as Fig. 30
29. The sites (including excavations) are:
    22N – Sovereign House, Botolph Street – building site 1966.
    23N – Sovereign House, Botolph Street – building site 1967.
    85N – 8 Magdalen Street – building site 1964.
    86N – 114–116 Magdalen Street – building site 1963.
    168N – 79–87 Magdalen Street/8–12 Cowgate – Norwich Survey excavation 1974.
    173N – St Crispin's Road underpass – road works 1972/3.
    237N – 20–24 Colegate – Norwich Survey trial excavation/building site 1972.
    256N – near St George's Bridge – in buildings near bridge 1898 or before.
    266N – St Mary's House, St Crispin's Road – building site 1974.
30. Marginal note by Hudson in Castle Museum copy of Hudson 1889, p.86 from Rot.Cart.II Ed.3.
31. Hearsay which the writer has not been able to verify.
32. St Martin-at-Oak was itself probably sub-divided (along with part of St Mary Coslany) to form the parishes of St Olave and St Mary Coslany (Carter and Roberts 1973, 463). With reference to St Clement, Blomefield states that 'all the tithes of Gildencroft, except the third part of them ... belong to the rector of St Clement's, as well as those of the Great-garden, late the old site of the friars-preachers [*i.e.* the Dominican site on Colegate]' (1806, 455, n.5).
33. Streetnames ending 'gate' were still being coined at the beginning of the twelfth century and neither St Olave (or Olaf) can predate the 1030s.
34. Campbell, for instance, suggests that most of the burh could have been south of the river with part of it to the north in order to cover the bridges (1975, 4b, n.40).
35. Oscillating comment (Green and Young 1963; Baggs 1963; Carter 1978; Green and Young, revised edition, 1981) would currently seem to favour the south bank. The writer favours the north bank (Ayers forthcoming).
36. It must be remembered that the enrolled deeds record those engaged in land *transactions*, not necessarily one and the same as the actual occupiers of the various properties.
37. The apparent lack of overseas trade in the tenth century, with an observed growth in the eleventh century, supports the views of Hodges (1982) and is in keeping with conclusions drawn from the 1981 Magistrates' Courts site material (Ayers 1987, 168).

Bibliography

Anon 1947 — *The Leaf and the Tree: a history of Boulton and Paul Ltd* (Norwich)

Armitage, P.L., 1982 — 'A system for ageing and sexing the horn cores of cattle from British post-medieval sites' in Wilson, R, Grigson, C. and Payne, S., *Ageing and Sexing Animal Bones from Archaeological Sites*, Brit. Archaeol. Rep. 109, 37–54

Atkin, M.W. forthcoming — 'Norwich: the origins and development of a regional centre' in Biddick, K. (ed) *Beyond Urban and Rural Archaeology: Connecting Town and Country*, Papers in Medieval Studies, Univ. of Toronto

Atkin, M., Ayers, B.S. and Jennings, S., 1983 — 'Thetford-type Ware Production in Norwich', *E. Anglian Archaeol.* 17

Atkin, M.[W.], Carter, A. and Evans, D.H., 1985 — 'Excavations in Norwich 1971–1978 Part II', *E. Anglian Archaeol.* 26

Ayers, B.[S.], 1983 — *Digging under the Doorstep* (Norwich)

Ayers, B.S., 1985a — 'Norwich: the growth of a Saxon Port' in Herteig, A. (ed), *Conference on Waterfront Archaeology in North European Towns No.2 Bergen 1983* (Bergen)

Ayers, B.[S.], 1985b — 'Excavations in the north-east bailey of Norwich Castle, 1979', *E. Anglian Archaeol.* 28

Ayers, B.[S.], 1987 — 'Excavations at St Martin-at-Palace Plain, Norwich, 1981', *E. Anglian Archaeol.* 37

Ayers, B.[S.] forthcoming) — 'Pre-Conquest development in Norwich Over the Water: an archaeological and topographical inquiry'

Ayers, B.[S.] and Murphy, P., 1983 — 'A Waterfront Excavation at Whitefriars Street Car Park, Norwich, 1979', *E. Anglian Archaeol.* 17, 1–60

Baker, C.A., Moxey, P.A. and Oxford, P.M., 1978 — 'Woodland continuity and change in Epping Forest', *Field Studies* 4, 645–669

Baker, J. and Brothwell, D., 1980 — *Animal Diseases in Archaeology* (London)

Baggs, A.P., 1963 — 'The Location of Northwic', *Norf. Research Committee Bull.* 15

Bascombe, K.N., 1976 — 'Documentary Evidence for an Excavation at Waltham Abbey 1969–71', *Med. Archaeol.* XX

Bayley, J., 1982 — 'Non-ferrous metal and glass working in Anglo-Scandinavian England: an interim statement', *PACT 1982* 7, 487–496

Bayley, J., 1989 — 'Non-metallic evidence for metal working' in Mariatis, Y. (ed.), *Archaeometry: proc. 25th international symposium* (Amsterdam)

Beazley, O.B., forthcoming — 'Excavations in the church of St Martin-at-Palace, Norwich, 1987/88', *E. Anglian Archaeol.*

Berggren, G., 1981 — *Atlas of seeds and small fruits of North-west European plant species. Part 3*, Swedish Museum of Natural History (Stockholm)

Bersu, G. and Wilson, D.M., 1966 — *Three Viking Graves in the Isle of Man*, Soc. Medieval Archaeol., Monograph ser. No.1 (London)

Blackburn, M., 1984 — 'A Chronology for the Sceattas' in Hill, D.H. and Metcalf, D.M. (eds), *Sceattas in England and on the Continent* (Oxford), 165–74

Blake, E.O. (ed), 1962 — *Liber Eliensis* (Camden Soc. 3rd Ser. xcii)

Blomefield, F., 1806 — *An Essay towards a Topographical History of the County of Norfolk*, IV (Norwich)

Boessneck, J.A., Müller, H.H. and Teichert, M., 1964 — Osteologische Unterscheidungsmerkmale zwischen Schaf (Ovis aries Linné) und Ziege (Capra hircus Linné), *Kühn-Archiv* 78, 1–129

Bourdillon, J. and Coy, J., 1980 — 'The Animal Bones' in Holdsworth, P. (ed.), *'Excavations at Melbourne Street, Southampton, 1971–76'*, Counc. Brit. Archaeol. Res. Rep. 33, 79–121

Burgess, E. and Burgess, W.L., 1904 — *Men who have made Norwich* (Norwich)

Calendars of Close Rolls (London)

Calendars of Feet of Fines (London)

Calendars of Letters and Papers of Henry VIII (London)

Calendars of Patent Rolls (London)

Caley, J. (ed), 1810 — *Valor Ecclesiasticus*, Record Commission I, 435

Campbell, J., 1975 — 'Norwich' in Lobel, M.D. (ed), *Historic Towns* (London)

Carter, A., 1978 — 'The Anglo-Saxon Origins of Norwich: the problems and approaches', *Anglo-Saxon England* 7, 175–204

Carter, A. and Roberts, J.P., 1973 — 'Excavations in Norwich — 1972. The Norwich Survey: Second Interim Report', *Norfolk Archaeol.* XXXV, pt.IV, 443–468

Carter, *et al*, 1974 — 'Excavations in Norwich — 1973. The Norwich Survey: Third Interim Report', *Norfolk Archaeol.* XXXVI, pt.I, 39–71

Cartledge, J., 1983 — 'Mammal Bones' in Ayers, B. and Murphy, P., 'A Waterfront Excavation at Whitefriars Street Car Park, Norwich, 1979', *E. Anglian Archaeol.* 17, 30–32

Cartledge, J., 1987 — 'Mammal Bones' in Ayers, B., 'Excavations at St Martin-at-Palace Plain, Norwich, 1981', *E. Anglian Archaeol.* 37, 111–113

Clapham, A.R., Tutin, T.G. and Warburg, E.F., 1962 — *Flora of the British Isles* (2nd ed) (Cambridge)

Cohen, A. and Serjeanston, D., 1986 — *A Manual for the Identification of Bird Bones from Archaeological Sites*, Univ. of London, Dept. of Extra-Mural Studies

Coles, B.P.L. and Funnell, B.M., 1981 — 'Holocene palaeoenvironments of Broadland, England', *Spec. Publs. Int. Ass. Sediment* 5, 123–131

Cozens-Hardy, B. and Kent, A., 1938 — *Mayors of Norwich* (Norwich)

Dallas, C., 1978 — 'The Middle Saxon Pottery' in Rogerson, A. and Adams, N., 'A Saxo-Norman Pottery Kiln at Bircham', *E. Anglian Archaeol.* 8, 40–41

Dallas, C., 1983 — 'The Post-Roman Pottery' in Johnson, S., 'Burgh Castle: Excavations by Charles Green, 1958–61', *E. Anglian Archaeol.* 20, 104–108

Dallas, C., 1993 — 'The Middle and Late Saxon Pottery' in Darling, M.J. and Gurney, D. 'Caister-on-Sea: Excavations by Charles Green, 1951–55', *E. Anglian Archaeol.* 60

Darby, H.C., 1952, 3rd edition 1971 — *The Domesday Geography of Eastern England* (Cambridge)

Deacon, J., 1974 — 'The location of refugia of *Corylus avellana* L. during the Weichselian glaciation', *New Phytologist* 73, 1055–1063

Dodwell, B., 1974 — *The Charters of Norwich Cathedral Priory* (Roll Society)

von den Driesch, A., 1976 — *A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum Bulletin 1 (Harvard)

Dugdale, W., 1830 — *Monasticon Anglicanum VI* (London)

Edwards, J., 1896 — *The Hemiptera-Homoptera of the British Islands* (London)

Erdtman, G., 1960 — 'The acetolysis method', *Svensk. Bot. Tidskr.* 54, 561–564

Fisher, I., 1985 — 'The Iron Ore' in Atkin, M. 'Excavations on Alms Lane (Site 302N), *E. Anglian Archaeol.* 26, 219

Fisher, R.A., Corbet, A.S. and Williams, C.B., 1943 — 'The relationship between the number of species and the number of individuals in a random sample of an animal population', *J. of Animal Ecology* 12, 42–58

Fowler, R.C., 1907 — 'The Abbey of Waltham Holy Cross' in Page, W. and Round, J.H. (eds), *The Victoria History of the County of Essex* (London), II, 166–172

Fowler, W.W., 1888 — *The Coleoptera of the British Islands. Vol.2: Staphylinidae* (London)

Galloway, P., 1976 — 'Notes on descriptions of Bone and Antler Combs' *Med. Archaeol.* 20, 154–156

Garmonsway, G.N. (trans. and ed.), 1953 — *The Anglo-Saxon Chronicle* (London)

Godwin, H. and Tallantire, P.A., 1951 — 'Studies in the post glacial history of British vegetation. XII. Hockham Mere, Norfolk', *J. Ecol.* 39, 285–307

Goodall, A., 1982 — 'Objects of Copper Alloy' in Coad, J.G. and Streeten, A.D.F., 'Excavations at Castle Acre Castle, Norfolk 1972–77' *Archaeol. J.* 139, 235–239

Goodall, I.H., 1980 — 'The Iron Objects' in Wade-Martins, P., 'Excavations in North Elmham Park 1967–1972, Vol.2', *E. Anglian Archaeol.* 9, 509–516

Goodall, I.H., 1982 — 'Iron Objects' in Coad, J.G. and Streeten, A.D.F., 'Excavations at Castle Acre Castle, Norfolk 1972–77', *Archaeol. J.* 139, 227–235

Goodall, I.H., 1984 — 'Iron Objects' in Rogerson, A. and Dallas, C., 'Excavations in Thetford 1948–59 and 1973–80', *E. Anglian Archaeol.* 22, 76–107

Grant, A., 1982 — 'The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates' in Wilson, R., Grigson, C. and Payne, S., *'Ageing and Sexing Animal Bones from Archaeological Sites'*, Brit. Archaeol. Rep. 109, 91–108

Green, E.B. and Young, R.M.R., 1963 — *Norwich: the growth of a city* (Norwich)

Green, [E.]B. and Young, R.M.R., 1981 — *Norwich: the growth of a city*, revised edition (Norwich)

Gregory, A.K., 1979 — 'A Romano-British Bronze Bucket from Burgh Castle', *Norfolk Archaeol.* XXXVII

Greig, J.R.A., 1981 — 'The investigation of a medieval barrel-latrine from Worcester', *J. Archaeol. Sci.* 8, 265–282

Greig, J.R.A., 1982 — 'The interpretation of pollen spectra from urban archaeological deposits' in Hall, A.R. and Kenward, H.K. (eds), *Environmental archaeology in the urban context* Counc. Brit. Archaeol. Res. Rep. 43, 47–65

Greig, J., 1984 — 'The palaeoecology of some British hay meadow types' in Van Zeist, W. and Casparie, W.A. (eds), *Plants and Ancient Man. Studies in palaeoethnobotany*, 213–226 (Rotterdam/Boston)

Grigson, C., 1976 — 'The craniology and relationships of four species of Bos.3 Basic craniology: Bos taurus L. Sagittal profiles and other non-measurable characters', *J. Arch. Sci.*, 3, 115–136

Hall, A.R., Jones, A.K.G. and Kenward, H.K., 1983 — 'Cereal bran and human faecal remains from archaeological deposits — some preliminary observations' in Proudfoot, B. (ed), *Site, Environment and Economy*, Symposia of Assoc. for Environmental Archaeology No.3 Brit. Archaeol. Rep. International Series 173, 85–104

Hall, A.R. and Kenward, H.K., 1990 — 'Environmental evidence from the Colonia: General Accident and Rougier Street', *Archaeology of York* 14/6, 289–434, CBA (London)

Hall, A.R., Kenward, H.K., Williams, D. and Greig, J.R.A., 1983 — 'Environment and living conditions at two Anglo-Scandinavian sites', *Archaeology of York* 14/4, 157–240, CBA (London)

Hansen, V., 1927 — 'Biller VII, Bladbiller og Bønnebiller, *Danmarks Fauna* 31 (Copenhagen)

Hansen, V., 1951 — 'Biller XV, Rovbiller 1', *Danmarks Fauna* 57 (Copenhagen)

Hansen, V., 1965 — 'Biller XXI, Snudebiller', *Danmarks Fauna* 69 (Copenhagen)

Harden, D.B., 1984 — 'The Glass' in Rogerson, A. and Dallas, C., 'Excavations in Thetford 1948–59 and 1973–80', *E. Anglian Archaeol.* 22, 116

Haslam, J., 1982-3 — 'The Development and Topography of Saxon Cambridge', *Proc. Cambridge Antiq. Soc.* LXXII, 13–29

Herteig, A.E., 1985 — *Conference on Waterfront Archaeology in North European Towns No.2, Bergen 1983* (Bergen)

Hills, C. and Penn, K., 1981 — 'The Anglo-Saxon Cemetery at Spong Hill, North Elmham, Part II', *E. Anglian Archaeol.* 11

Hodges, R., 1982 — *Dark Age Economics. The Origins of Towns and Trade AD600–1000* (London)

Hudson, W.H. (ed), 1889 — *The Streets and Lanes of the City of Norwich: a memoir by J. Kirkpatrick* (Norwich)

Hudson, W.H., 1898 'On an ancient timber roadway across the River Wensum at Fye Bridge', *Norfolk Archaeol.* XIII, 217–232

Hudson, W.H., 1892 Leet Jurisdiction in the City of Norwich, *Selden Society* 5

Hudson, W. and Tingey, J.C., 1906 and 1910 *Records of the City of Norwich* (Norwich)

Hurst, J.G., 1957 'Saxo-Norman Pottery in East Anglia Part II', *Proc. Camb. Antiq. Soc.* Vol.L, 29–60

Hurst, J.G., 1976 'The Pottery' in Wilson, D.M. (ed.), *The Archaeology of Anglo-Saxon England*, 283–348

Jacobs, J., 1893 *The Jews of Angevin England* (London)

Jennings, J.N., 1955 'Further pollen data from the Norfolk Broads. Data for the study of post-glacial vegetational history XIV', *New Phytol.* 54, 199–207

Jennings, S., 1981 'Eighteen centuries of Pottery from Norwich', *E. Anglian Archaeol.* 13

Jennings, S., 1985 'The Pottery' in Davison, A., 'Excavations on 49–63 Botolph Street' and in Atkin, M., 'Excavations on Alms Lane', *E. Anglian Archaeol.* 26

Jones, G.G., 1984 'Animal Bones' in Rogerson, A. and Dallas, C., 'Excavations in Thetford 1948–59 and 1973–80', *E. Anglian Archaeol.* 22, 187–192

Jones, G.G., 1989 'The Animal Bones' in Blockley, K., *'Prestatyn 1984–5: An Iron Age and Romano-British Industrial Site in North Wales'*, Brit. Archaeol. Rep. 210, 211–221

Jones, G.G., 1993 'Animal and Bird Bone' in Dallas, C., 'Excavations in Thetford by B.K. Davison between 1964 and 1970', *E. Anglian Archaeol.* 62, 176–191

Jones, G.G. forthcoming (a) 'Animal Bones' in Yeoman, P.A., 'Amersham, Mantles Green' (Records of Bucks)

Kelly, 1908 *Kelly's Directory*

Kelly, S., Rutledge, E. and Tillyard, M., 1983 *Men of Property: an analysis of the Norwich Enrolled Deeds 1285–1311* (Univ.of East Anglia)

Kenward, H.K., 1978 'The analysis of archaeological insect assemblages: a new approach', *Archaeology of York* 19/1, 1–68, CBA (London)

Kenward, H.K., 1979 'Five insect assemblages' in Carver, M.O.H., 'Three Saxo-Norman tenements in Durham City', *Med.Archaeol.* 23, 60–7

Kenward, H.K., Hall, A.R. and Jones, A.K.G., 1980 'A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits', *Sci. and Archaeol.* 22, 3–15

Kenward, H.K., Hall, A.R. and Jones, A.K.G., 1986 'Environmental evidence from a Roman well and Anglian pits in the legionary fortress', *Archaeology of York* 14/5, 241–288, CBA (London)

Kilmurry, K., 1980 *'The Pottery Industry of Stamford, Lincs. c.850–1250'*, Brit. Archaeol. Rep. 84

Kloet, G.S. and Hincks, W.D., 1964 *A checklist of British insects*, 2nd edn (revised), *Part 1: Small orders and Hemiptera*. Royal Entomological Society of London (London)

Kloet, G.S. and Hincks, W.D., 1977 *A checklist of British insects*, 2nd edn (revised), *Part 3: Coleoptera and Strepsiptera*, Royal Entomological Society of London (London)

Krwzinksi, K., Fjelldal, S. and Soltvedt, E., 1983 'Recent palaeoethnobotanical work at the Medieval excavations at Bryggen, Bergen, Norway' in Proudfoot, B. (ed), *Site, Environment and Economy*, Symposia of Assoc. for Environmental Archaeology No.3, Brit. Archaeol. Rep. International Series 173, 85–104

Lambert, J.M., Jennings, J.N., Smith, C.T., Green, C. and Hutchinson, J.N., 1960 *The Making of the Broads: A reconsideration of their origin in the light of new evidence*, Royal Geographical Society Research Series No.3 (London)

Lawrence, D., 1980 'Evidences of Animal Domestication at Çayönü' in Çambel, H. and Braidwood, R.J., *'The Joint Istanbul — Chicago Universities Prehistoric Research in Southeastern Anatslia I'* (Istanbul)

Le Quesne, W.J., 1965 Hemiptera (Cicadomorpha). *Handbooks for the identification of British insects* 2, Part 2(a), Royal Entomological Society of London (London)

L'Estrange, J., 1888 *Calendar of Norwich Freemen 1317–1603* (London)

Lindroth, C.H., 1974 *Coleoptera: Carabidae. Handbooks for the identification of British insects*, 4, Part 2, Royal Entomological Society of London (London)

Lipman, V.D., 1967 *The Jews of Medieval Norwich* (London)

Locker, A., 1987 'The Fish Bones' in Ayers, B.[S.], 'Excavations at St Martin-at-Palace Plain, Norwich', *E. Anglian Archaeol.* 37, 114-117

Lübeck, 1980 *Archäologie in Lübeck* — catalogue of an exhibition held at the St Annen-Museum, Lübeck, 22nd June – 5th October, 1980

MacGregor, A., 1982 'Anglo-Scandinavian Finds from Lloyds Bank, Pavement, and other sites', *The Archaeology of York* Vol.17, no.3

MacGregor, A., 1985 *Bone, Antler, Ivory and Horn*

MacPhail, R., 1983 'Soils' in Ayers, B. and Murphy, P. (1983), 46

Margeson, S. and Williams, V., 1985 'The Artefacts' in Ayers, B.[S.], 'Excavations within the North-East Bailey of Norwich Castle, 1979', *E. Anglian Archaeol.* 28, 27–48

Mellor, M., 1976 'The Pottery' in Rogerson, A., 'Excavations on Fuller's Hill, Great Yarmouth', *E. Anglian Archaeol.* 2, 169–96

Metcalf, D.M., 1966 'A coinage for Mercia under Aethelbald', *Cunobelin* 12, 26–39

Metcalf, D.M., 1978 'Chemical analyses of English sceattas', *Brit. Numis. J.* 48, 12–19

Miller, L., 1977 'New Fresh Wharf — 2, The Saxon and Early Medieval Waterfronts', *London Archaeol.* 47–53

Milne, G. and Hobley, B. (eds), 1981 *'Waterfront Archaeology in Britain and Northern Europe'*, Counc. Brit. Archaeol. Res. Rep. 41

Moore, P.D. and Webb, J.A., 1978 *An illustrated guide to pollen analysis* (London)

Morris, C., 1984 *Anglo-Saxon and Medieval Woodworking Crafts — the Manufacture and use of Domestic and Utilitarian Wooden Artefacts in the British Isles, 400–1500 A.D.* (University of Cambridge)

Murphy, P., 1985a 'The cereals and crop weeds' in West, S. 'West Stow: The Anglo-Saxon Village. Vol.1', *E. Anglian Archaeol.* 24, 100–108

Murphy, P., 1985b — 'The Environmental Reports' in Evans, D.H. and Carter, A., 'Excavations on 31–51 Pottergate (Site 149N)', *E. Anglian Archaeol.* 26, 66–7

Noddle, B.A., 1980 — 'The Animal Bones' in Wade-Martins, P., 'Excavations at North Elmham Park, 1967–72', *E. Anglian Archaeol.* 9(2), 375–412

Osborne, P.J., 1974 — 'An insect assemblage of early Flandrian age from Lea Marston, Warwickshire, and its bearing on the contemporary climate and ecology', *Quaternary Research* 4, 471–486

Osborne, P.J., 1980 — 'The late Devensian-Flandrian transition depicted by serial insect faunas from West Bromwich, Staffordshire, England', *Boreas* 9, 139–147

Pantin, W.A., 1962–3 — 'The merchants' houses and warehouses of King's Lynn', *Medieval Archaeol.* VI–VII, 173–181

Payne, S., 1973 — 'Kill off patterns in sheep and goats: the mandibles from Asvan Kale', *Anatolian Studies* 23, 281–303

Payne, S., 1985 — 'Morphological Distinctions between the Mandibular Teeth of Young Sheep, *Ovis*, and goats, *Capra*', *J. Archaeol. Sci.* 12, 139–147

Payne, S. and Bull, G., 1988 — 'Components of variation in measurements of pig bones and teeth, and the use of measurements to distinguish wild from domestic pig remains', *Archaeozoologia* 2, 27–66

Pennington, W., 1970 — 'Vegetation history in the north-west of England: a regional synthesis' in Walker, D. and West, R.G., *Studies in the vegetational history of the British Isles*, (Camb. Univ. Press) 41–79

Petch, C.P. and Swann, E.L., 1968 — *Flora of Norfolk* (Norwich)

Pipe Rolls (Pipe Roll Society)

Rackham, O., 1980 — *Ancient Woodland: Its history, vegetation and uses in England* (London)

Richardson, H.G., 1960 — *English Jewry under the Angevin Kings* (London)

Rigold, S.E., 1960–1 — 'The two primary series of sceattas', *Brit. Numis. J.* 30, 6–53

Rigold, S.E., 1966 — 'Addenda and Corrigenda', *Brit. Numis. J.* 35, 1–6

Rigold, S.E. and Metcalf, D.M., 1984 — 'A revised check-list of the English finds of sceattas' in Hill, D.H. and Metcalf, D.M. (eds), *Sceattas in England and on the Continent* (Oxford)

Roesdahl, E., *et al*, 1981 — *The Vikings in England* (exhibition catalogue) (London)

Rogerson, A., 1976 — 'Excavations on Fuller's Hill, Great Yarmouth', *E. Anglian Archaeol.* 2, 131–245

Rogerson, A. and Dallas, C., 1984 — 'Excavations in Thetford 1948–1959 and 1973–1980', *E. Anglian Archaeol.* 22

Roth, C., 1949 — *A History of the Jews in England* (Oxford)

Rutledge, E. and Rutledge, P., 1978 — 'King's Lynn and Great Yarmouth. Two Thirteenth Century Surveys', *Norfolk Archaeol.* 37, 92–114

Rye, W.W., 1903, 1915 — *Calendar of Norwich Deeds 1285–1341* (Norwich)

Rye, W., 1910 — *Calendar of Norwich Deed Enrolled 1377–1509* (Norwich)

Rye, W., 1913 — *Norfolk Families* (Norwich)

Sandred, K. and Lindström, B. forthcoming — *The Street-Names of the City of Norwich*

Saunders, H.W., 1930 — *Introduction to the Obedientiary and Manor Rolls of Norwich Cathedral Priory* (Norwich)

Scaife, R.G., 1980 — *Late Devensian and Flandrian palaeoecological studies in the Isle of Wight*, Unpubl. Ph.D. thesis of the Univ. of London, King's College, Dept. of Geography

Scaife, R.G., 1982 — 'Pollen analysis' in Mills, P., 'Excavations at Broad Sanctuary, Westminster', *Trans. of the London and Middlesex Archaeol. Soc.* 33, 345–365

Scaife, R.G., 1986 — 'Pollen in human palaeofaeces; and a preliminary investigation of the stomach and gut contents of Lindow man' in Stead, I., Bourke, B. and Brothwell, D. (eds), *Lindow Man. The body in the bog*, (British Museum Publication) 126–139

Schofield, J.A., 1981 — 'Medieval Waterfront Buildings in the City of London', in Milne, G. and Hobley, B. (eds), *'Waterfront Archaeology in Britain and Northern Europe'*, Counc. Brit. Archaeol. Res. Rep. 41, 24–31

Shotton, F.W. and Osborne, P.J., 1965 — 'The fauna of the Hoxnian Interglacial deposits of Nechells, Birmingham', *Philosophical Transactions of the Royal Society of London*, Series B, 248, 353–378

Steward, I., 1984 — 'The early English denarial coinage, *c.*680–*c.*750' in Hill, D.H. and Metcalf, D.M. (eds), *Sceattas in England and on the Continent* (Oxford), 5–26

Stuiver, M. and Pearson, G.W., 1986 — 'High-precision calibration of the radiocarbon time scale, 500–2500 BC', *Radiocarbon* 28, 805–838

Tanner, N.P., 1984 — *The Church in Late Medieval Norwich 1370–1532* (Toronto)

Taylor, R., 1821 — *Index Monasticon* (London)

Tebble, N., 1976 — *British Bivalve Seashells* (Edinburgh)

Tillyard, M. with Kelly, S. and Rutledge, E. ed. Priestley, V., 1983 — *Men of Property: an analysis of the Norwich Enrolled Deeds 1285–1311* (Norwich)

Tite, M.S., Freestone, I.C., Meeks, N.D. and Craddock, P.T., 1985 — 'The examination of refractory ceramics from metal-production and metal working sites' in Philips, P. (ed.), *The Archaeologist and the Laboratory*, Counc. Brit. Archaeol. Res. Rep. 58

Turner, J., 1962 — 'The Tilia decline: an anthropogenic interpretation', *New Phytologist* 63, 73–90

Wade, K., 1980 — 'The Pottery' in Wade-Martins, P., 'Excavations in North Elmham Park 1967–1972', *E. Anglian Archaeol.* 9, Vol.II, 413–477

West, S., 1963 — 'Excavations at Cox Lane (1958) and at the Town Defences, Shire Hall Yard, Ipswich (1959)', *Proc. Suffolk Inst. Archaeol.* XXIX, Pt.3

Wheeler, A., 1978 — *Key to the Fishes of Northern Europe* (Warne)

Wheeler, A. and Jones, A., 1976 'Fish Remains' in Rogerson, A., 'Excavations at Fullers Hill, Great Yarmouth, *E. Anglian Archaeol.* 2, 208–224

White, 1896 *White's Directory of Norfolk*

Wilkinson, D., 1987 'Continental Pottery' in Ayers, B.[S.], 'Excavations at St Martin-at-Palace Plain, Norwich 1981', *E. Anglian Archaeol.* 37, 80–88

Williams, D., 1977 'The Plant Macrofossils' in Armstrong, P., 'Excavations in Sewer Lane, Hull', *E. Riding Archaeol.* 3, 18–32

Williams, V., 1987 'Coins and Tokens', Stone Objects' and 'Bone, Antler and Ivory Objects' in Ayers, B.[S.], 'Excavations at St Martin-at-Palace Plain, Norwich, 1981', *E. Anglian Archaeol.* 37, 62–63, 71–73 and 100–106

Winters, W., 1877 'Historical Notes on the MSS of Waltham Abbey', *Trans. of the Royal Hist. Soc.* VI, 231–251

Wiseman, J., 1986 *A History of the British Pig* (London)

Yonge, C.M., 1949 *The Sea Shore* (London)

Youngs, S.M., Clark, J. and Barry, T.B., 1983 'Medieval Britain and Ireland in 1982', *Medieval Archaeol.* XXVII, 161–229

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