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EXCAVATIONS AT BRANCASTER 1974 and 1977

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Norfolk Archaeological Unit, Norfolk Museum Service, 1985

Excavations at Brancaster 1974 and 1977

by John Hinchliffe with Christopher Sparey Green

with contributions from
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Cover Illustration Aerial view of the Saxon Shore fort from the east, 24 June 1976.
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Gillian Andrews wishes to express her thanks to the following - Peter Hayes and Susan Miller for their assistance in sorting and recording the pottery; Jane Bevan who prepared the diagrams; the staff of the Castle Museum, Norwich, for their help and access to material in their store; all those who have contributed by discussion and advice, especially P.Arthur, Miss C.Cartwright, Miss M.Darling, C.J.S.Green, Dr S. Johnson, Dr K.Knowles, Miss M.Nation, Dr D.Peacock, R.Perrin, Miss V.Rigby, Mrs V.Swan and Miss M.Woodhuysen. The work of the Central Excavation Unit computer staff in devising pottery programs has been much appreciated. Tony Gregory of the Norfolk Archaeological Unit kindly read the manuscript and gave much useful advice. Gillian Andrews is especially grateful to Dr Christopher Young for his invaluable criticism, guidance and encouragement throughout.

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AUTHOR'S PREFACE

The excavations at Brancaster in 1974 and 1977 generated a considerable volume of data and material. For this reason the production of the report and archive has been a long process and involved the work of many people, as is evidenced by the list of contributors. I am grateful for the forebearance of those specialist contributors whose work was submitted some considerable time prior to the appearance of this volume. The authors of the pottery and animal bone reports have asked me to point out that these reports were completed in substance before 1981 and hence do not take account of information which has become available since that time.

Since the commencement of the programme of work leading to the production of this report there have been further shifts in attitude to the publication of the results of archaeological excavations, most recently expressed in the report of the Joint Working Party of the CBA and DoE 'The Publication of Archaeological Excavations' (1983). I am grateful to the Editorial Committee for their recognition that although this report does not conform in a number of aspects to 1984 requirements it has been impractical for a number of reasons to attempt a major revision of its structure.

John Hinchliffe
February 1984

I. SUMMARY

The fort at Brancaster, identified as the Branodunum of the Notitia Dignitatum, is conventionally regarded as the most northerly of the system of Shore forts which formed the backbone of the coastal defences of South-East Britain in the third and fourth centuries A.D. Although the interior of the fort has been little explored, aerial photography indicates the presence of substantial internal buildings. Crop-marks also demonstrate that on either side of the fort are extensive areas of settlement characterised by a network of ditched enclosures and associated trackways. Excavations to the west of the fort were undertaken in advance of housing development in 1974 (by the Norfolk Archaeological Unit) and 1977 (by the Central Excavation Unit).

The excavations demonstrate that the enclosure system was initially laid out to a regular plan. The ditches defining the enclosures were subsequently subjected to frequent clearance, redefinition and realignment. The effects of cultivation had undoubtedly led to the erosion of evidence for structures within the enclosures but the quantity of domestic rubbish in the fillings of the enclosure ditches indicates that these are essentially 'house plots'. Ceramic evidence suggests that occupation of the area began before the end of the second century A.D. and continued through the third century. Activity in the fourth century seems to have been greatly reduced, at least in the part of the excavated area closest to the fort where the principal west-to-east trackway which forms the spine of the settlement here had gone out of use. Later occupation may have been concentrated further to the west.

The dating evidence for the settlement area indicates that it predates the Shore fort which even if it is, as seems likely, an early element in Saxon Shore defences cannot be realistically dated to the second century A.D. It is suggested that the external settlement areas relate to a hitherto unidentified military establishment of the second century, possibly on the site of the later Shore fort. The evidence of surface finds of coins and metalwork indicate that occupation within the Shore fort continued throughout the fourth century A.D. Occupation of any substance after the end of the fourth century remains unestablished.

II. INTRODUCTION

by Derek A. Edwards, Christopher Sparey Green and John Hinchliffe

THE SITE

The Shore fort at Brancaster, situated between the present villages of Brancaster and Brancaster Staithe, occupies a slight elevation overlooking the salt marshes (Fig. 1). The site has been identified as the Branodunum of the Notitia Dignitatum which lists its garrison as the Equites Dalmatae Branodunenses. Stone-robbing (Appendix 3) and agricultural operations have removed all visible traces of the fort's structures and defences, although an impression of the fort platform remains, emphasised by the natural erosion gullies which flank it to the east and west.

The unimpressive character of the remains has perhaps contributed to the comparatively scant attention the site has received from excavators. Previous work on the site has been largely confined to the investigation of the much denuded defences with only minimal investigation of the fort interior (Warner 1851, 9-16; St. Joseph 1936, 444-60). More recently, fieldwork within and outside the defences has produced a wealth of finds illustrating both the length of occupation on the site and the damage resulting from cultivation (Appendix 4).

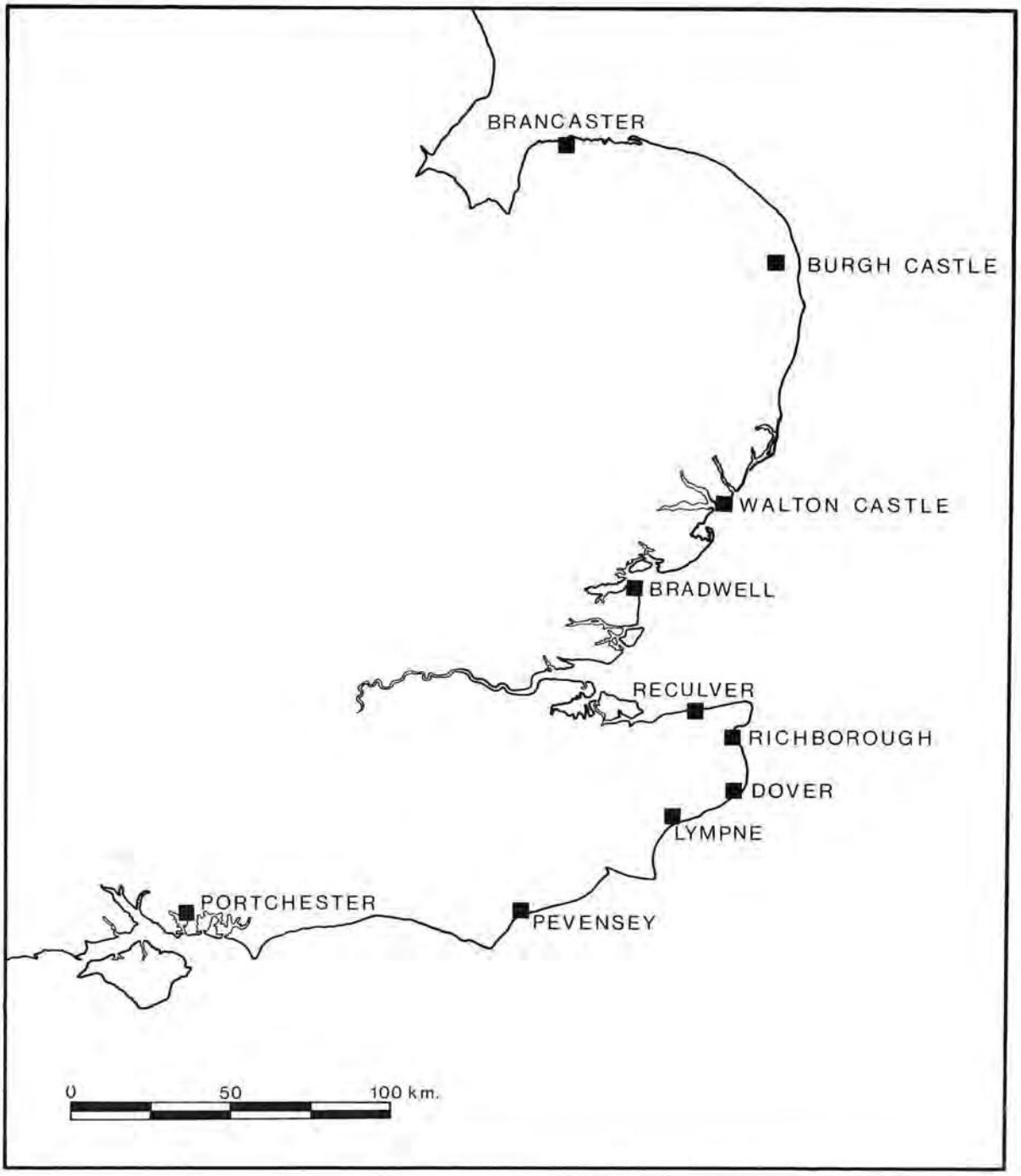


Fig.1. The forts of the Saxon Shore.

THE SHORE FORT
(Fig.2)

In plan the fort is a roughly square enclosure measuring 175 m east to west and 178 m north to south, enclosing an area within the ramparts of 2.56 ha. The rounded corners are furnished with internal square turrets contemporary with the construction of both wall and rampart. Examination of the west and east gates has indicated the presence of flanking guard towers, although the poor preservation of these structures makes interpretation difficult. Gaps in the northern and southern defences indicate the position of the other gates, but nothing is known of their character. There is no evi-

dence for projecting bastions, either as additions or original features.

Within the defences the principal feature, visible both as a crop-mark and a rubble spread, is the principia, facing the north gate and fronting on to the via principalis. To the north-east of the principia crop-marks indicate the presence of a rectangular structure lying on the opposite side of the via principalis. Immediately to the north of this structure is another, aligned not on the defences of the Shore fort but conforming to the alignment of the external settlement areas on either side. The interior of the fort has yielded a number of loose finds (Appendix 4).

THE EXTRA-MURAL SETTLEMENT
(Fig.2)

A comprehensive aerial reconnaissance programme carried out by Derek Edwards of the Norfolk Archaeological Unit has not only provided details of the internal arrangements of the Shore fort, but has revealed the presence of extra-mural settlement areas characterised by a network of ditches forming a massive complex of trackways and enclosures to the west and east of the fort (Edwards 1976). The total area of recorded crop-marks is 23 ha, the bulk of which lies east of the fort. The main axis of the settlement is a west-to-east trackway which, on either side of the Shore fort, intersects at right-angles with a narrower track running north to south. These trackways form the framework for a network of rectangular and sub-rectangular enclosures apparently interspersed with further tracks and lanes, most noticeable in the north-east part of the complex.

Further crop-marks indicate the presence of another west-to-east ditched trackway to the south of the Shore fort, interrupted opposite the south gate. This interruption in all probability represents a junction with a road running southwards from the fort. In the south-west angle of this junction is a small double-ditched rectangular enclosure on the same orientation as the fort. To the north of the fort, on a slight elevation bordering the marsh, is another rectangular enclosure (or possibly two adjoining enclosures) again defined by double ditches and enclosing an area approximately 75 m by 85 m.

GEOLOGY

The site is situated on the Pleistocene gravels and loams of the north Norfolk coastal plain. The subsoil encountered in the 1974 and 1977 excavations was sand with numerous angular flint fragments. In the western part of the area this was sealed by a capping of red-brown clay.

THE EXCAVATIONS

Both excavations were undertaken in advance of housing development in the field immediately to the west of the Shore fort, Site 1002. The 1974 excavations were directed by Christopher Sparey Green of the Norfolk Archaeological Unit; the 1977 excavations were directed by John Hinchliffe of the Central Excavation Unit of the Department of the Environment. Prior to the 1974 excavations, a geophysical survey of the eastern part of the development area was carried out by Alistair Bartlett of the Ancient Monuments Laboratory. This survey forms the basis of the plot of features shown to the west of the fort in Fig.2.

(This introduction is a modified summary of a fuller account published prior to the 1977 excavations (Edwards and Green 1977) to which the reader is referred).

III. THE 1974 EXCAVATION
by Christopher Sparey Green

The excavations continued for a period of nine weeks during April, May and June 1974.

INTRODUCTION

The 1974 excavations took place in the field to the west of the Shore fort, and were confined to three areas in the western half of the field which was the first to be developed for housing (Fig.2). Unfortunately, no information was available about the Romano-British layout of this part of the site, but the east-to-west road and flanking enclosure system, revealed by aerial photography and geophysical survey in the eastern half, was thought to extend into this area.

Area 1 was cleared to locate the east-to-west road and any features that might flank it at this point (Fig.3). The original trench was later extended to the north of the road to investigate the structural remains adjoining it. Area 2 was positioned to investigate the southern edge of the road and to pick up linear features leading towards it from Area 3; operations were restricted by the need to avoid proposed building sites and the features revealed could only be sectioned at selected points. Area 3 was cleared during road building operations, and with the co-operation of the contractors it was possible to plan the features that were exposed and to section them at certain points.

AREA 1
(Figs.4 and 7)

The first excavation consisted of a 95 sq m hand-stripped trench with a machine-cut extension of 100 sq m to the north. Clearance of this first area by hand revealed two east-to-west ditches, north of which lay a complex of eighteen post-holes and post-bases with associated occupation deposits. These were the only structural remains encountered in any of the three areas.

Of the two ditches (20 and 21) the latter was the more substantial and, from its contents, the earlier. The ditch had steeply-sloping sides with a V- or narrow U-shaped base (Section a: Fig.7; plan: Fig.4). The basal fill (28) consisted of dirty sand and a lens of sand and clay, the upper fill (21) of dark grey-brown sandy soil. Occupation material was concentrated in 28, and the lower part of 21; the numerous unabraded pottery sherds including samian and coarse ware are dated to the early third century A.D. Animal bones occurred throughout the fill and, in the base, quantities of oyster shells. Other finds included a bronze bell, box-flue tile fragments and pieces of coal (bell: Fig.29, No.10).

Ditch 20 was of similar profile, filled with dark grey-brown soil containing animal bones and unabraded pottery of the late third and early fourth centuries. Other finds included a Colchester derivative brooch and a fragment of a pipe-clay figurine, both presumably residual (brooch: Fig.28, No.3). A small amount of gravel in this ditch fill may represent scattered metalling from the road which presumably lay immediately to the south. No metalling survived in situ, but a thin scatter of gravel was present in the base of the topsoil in this area.

North of ditch 21 three small features (23, 74 and 26) were noted on the surface of the natural clay, each consisting of a patch of darker soil containing chips of flint, chalk and tile. They were only 2 to 3 cm deep and, if they were post-holes as their position and size suggested, they represented only the final trace of features almost totally ploughed away.

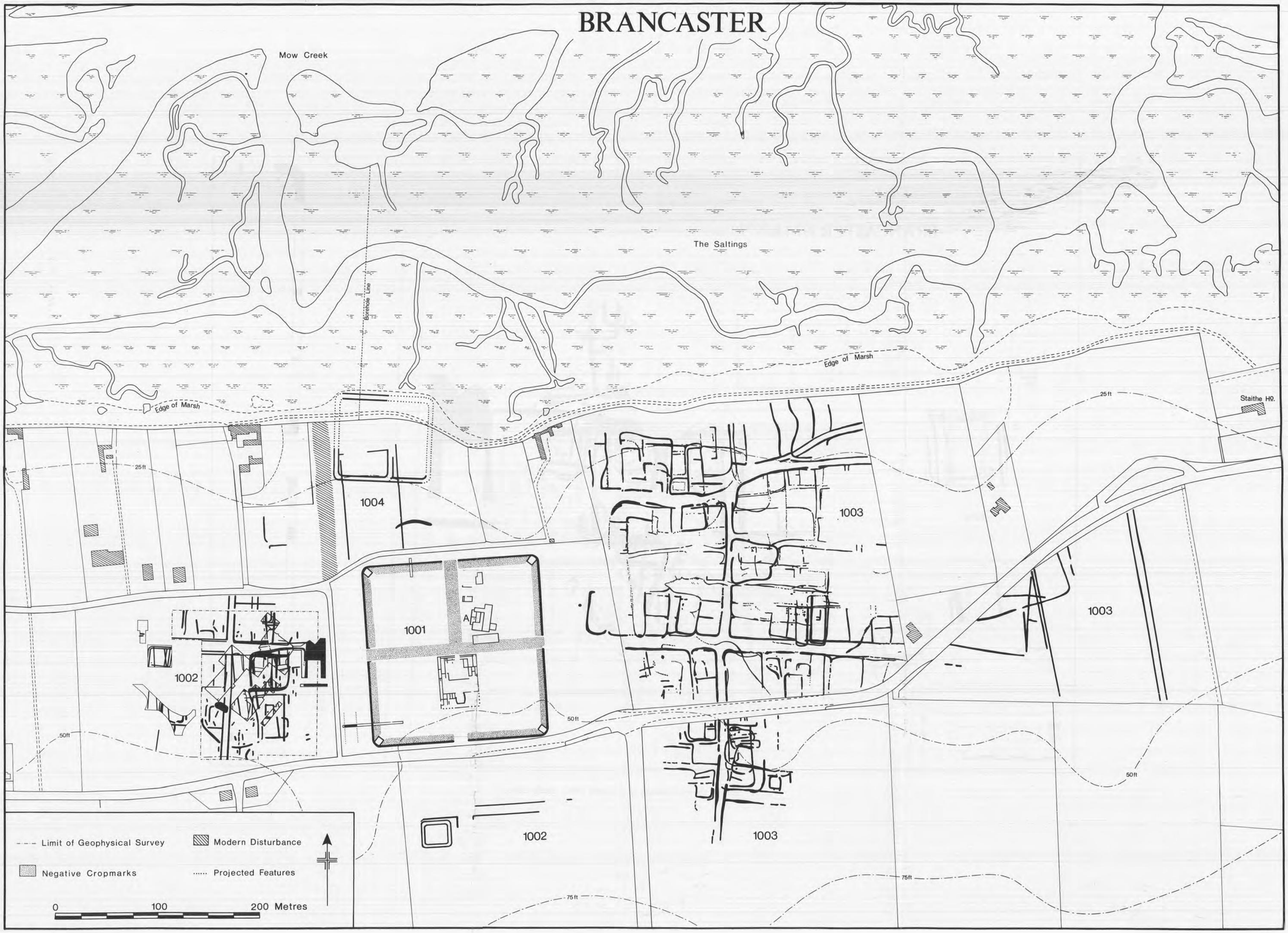


Fig.2. The Shore fort and settlement areas at Brancaster - the evidence of aerial photography and excavation. Scale 1:2,500.

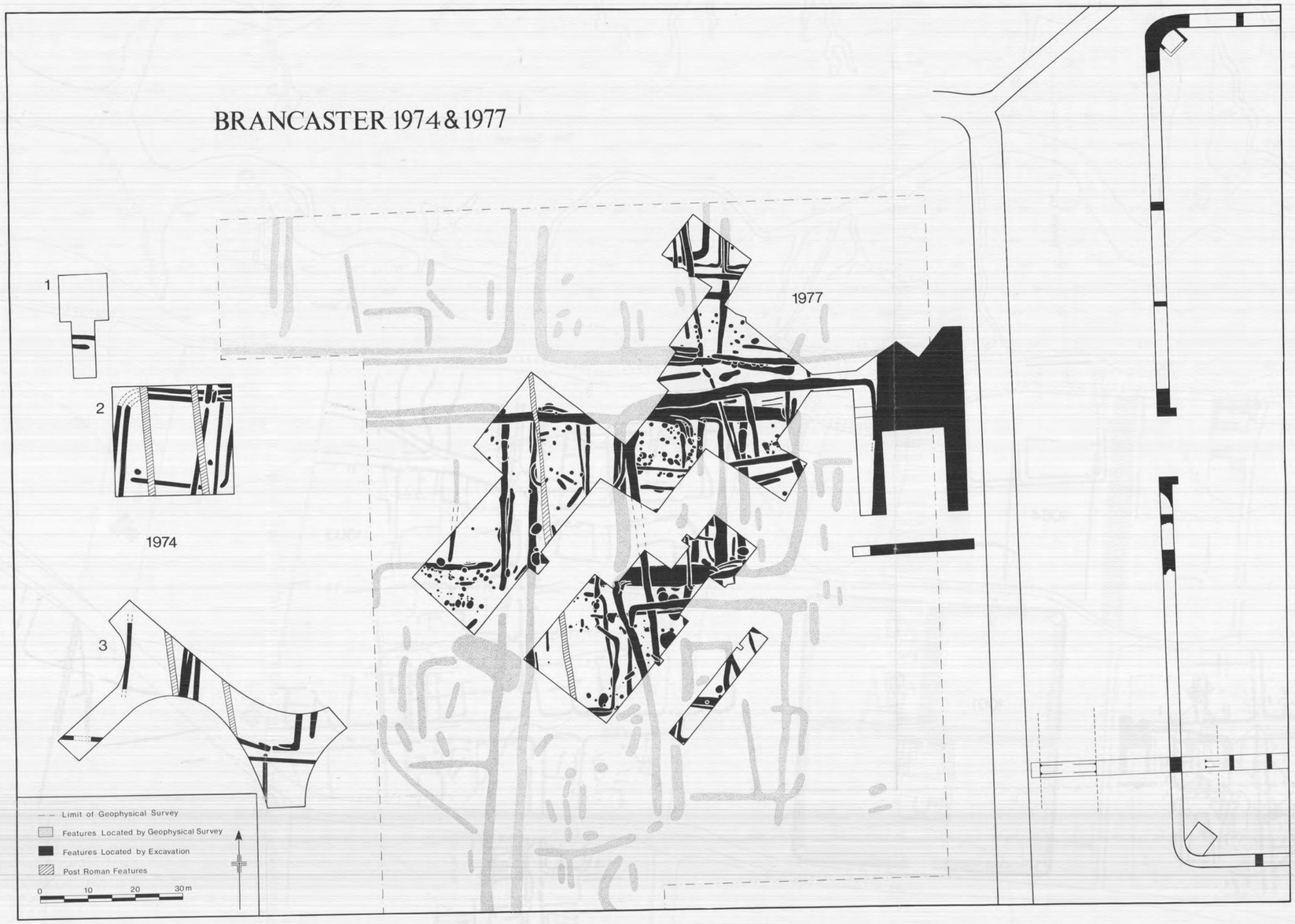


Fig.3. Plan of the excavations of 1974 and 1977. Scale 1:800.

BRANCASTER
1974
Area 1

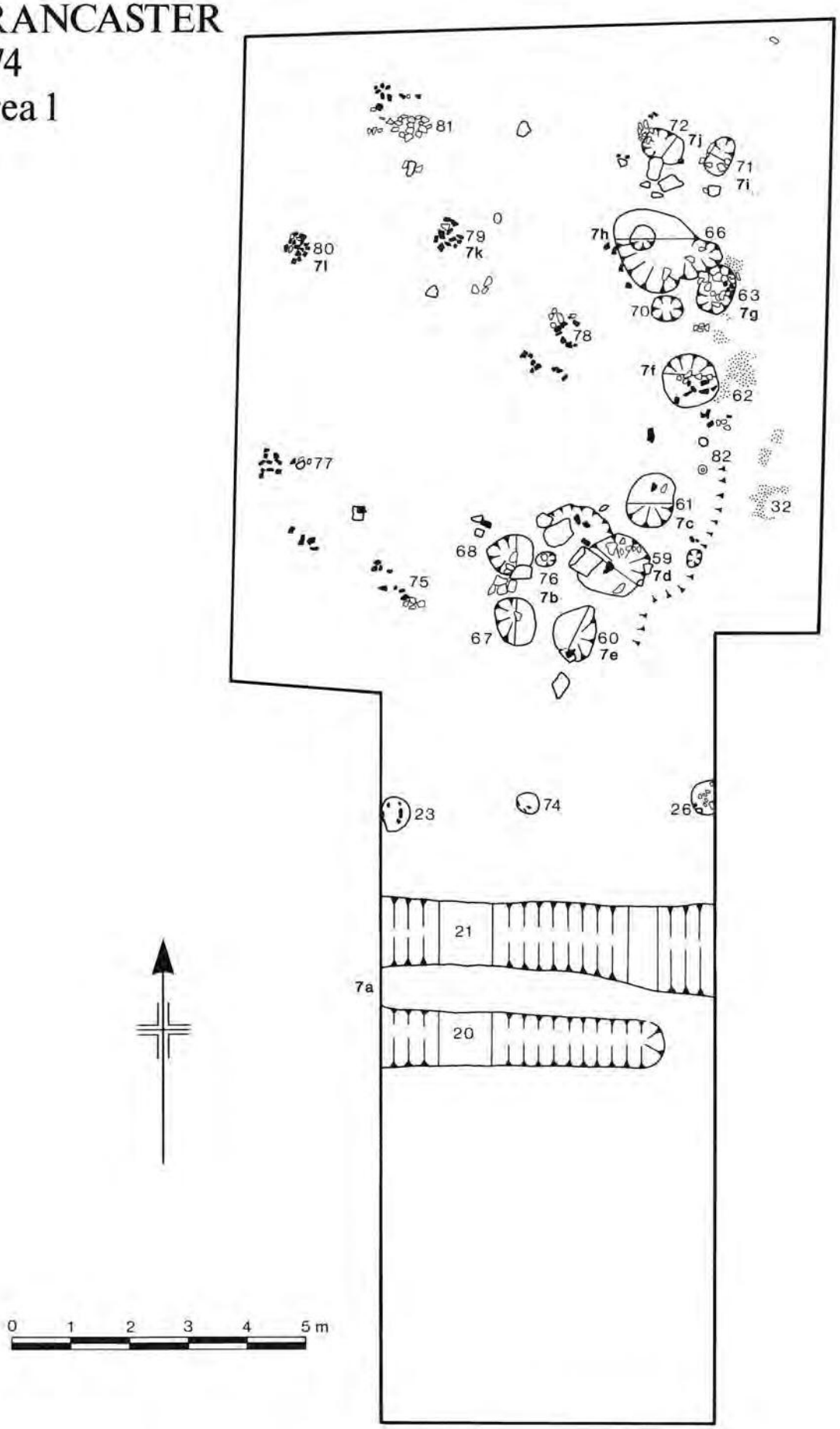


Fig.4. The 1974 excavations: Area 1. Scale 1:100.

The rectangular northern extension to the excavation revealed a spread of occupation debris and rubble which covered a roughly oval area 11 by 8 m, corresponding with the area within which the majority of the structural features shown in Fig.4 were located. The deposit consisted of 10 to 25 cm of dark grey soil containing lumps of chalk, flint, tile, brick and Roman pottery. The pottery ranged in date from the second to the fourth centuries; the sherds are comminuted and include fragments of samian, shell-gritted ware, Oxfordshire Colour-Coated Ware and mortaria. Other finds include pieces of coal and a fragment of a shale palate.

Adjoining this deposit on the east was a thin scatter of metalling (32). Elsewhere the occupation deposit was surrounded by a thin spread of lighter grey-brown soil containing only a few finds, the most notable of which are fragments of a lava quern and a possible pilum point. These deposits were ill-defined, especially on the western side, and may have been damaged by recent agricultural activity, as was suggested by vague furrows in the archaeological levels and the apparent scattering of some stone settings in them.

The structural features within the general area of the occupation fell into two main categories: shallow hollows which had probably served as post-holes; and six groups of stones, perhaps bases for timbers. The twelve post-holes in the eastern half of the occupation spread consisted of irregular rounded scoops in the natural 7 to 36 cm deep (Fig.4). The normal fill consisted of dark grey-brown soil, a little occupation material, and quantities of stone and tile, which in the case of 62, 63 and 71 appeared to be packing for uprights. Feature 62 contained a fragmentary tile with the stamp of Cohors I Aquitauorum, and 66 yielded another with a possible graffito (Fig.40, Nos.140 and 142). The irregular outline of some holes, especially 66, 68 and 76, suggested that they had been recut. Amongst the structural features two pottery vessels had been set in small pits (82), both vessels dating to the fourth century A.D.

The six stone footings consisted of small platforms of clunch, brick and flint, closely packed in some cases, more scattered in others, as if disturbed by cultivation. Unlike the post settings to the east, none of these footings was associated with any excavation in the natural.

The Structural Remains in Area 1

The northern extension of Area 1 appeared to have reached the limits of the occupation deposit on all sides, but the observed limits may be partly the result of the plough erosion of a more extensive deposit. The ten post-holes on the east of this deposit form a pattern, with two groups of four pits to north and south, flanking two single pits (61 and 62) and two pottery vessels (82) lying in the intervening gap. The complete plan is not immediately clear, but the axis of the structure could lie on an east-to-west line. The position of features 61 and 62 in relation to the metalling 32 suggest a doorway, in which case the post-holes could have formed part of an exterior wall, and the shallower bases on the west internal roof supports. The putative external wall would, thus, have been carrying any outward thrust, the stone bases simply taking vertical pressure. On this hypothesis, at least part of the building lay outside the western limits of the excavation. The post-holes could have formed the base of an eastern gable with a central door-way.

No further excavation was carried out in this region to the north of the presumed east-to-west road. However, a pipe trench cut alongside the north hedge of the field, some 30 m north-east of Area 1, cut through two pits (33 and 34; not illustrated). Their shape and dimensions were uncertain, but the dark grey-brown sandy fill contained many pieces of unabraded pottery, including Much Hadham Colour-Coated Ware, mortaria and coarse wares of the late third and fourth centuries. The coarse ware included a sherd of Dorset Black-Burnished Ware.

AREA 2
(Figs.5 and 8)

Area 2, to the south-east, comprised 550 sq m, initially stripped by machine. Clearance by hand revealed ditches around the four sides of the excavation, those on the east and west aligning approximately with features previously observed in Area 3 (Fig. 3). Unlike Area 1, there were no occupation deposits or structural remains other than two possible hearths; the ditches also contained far fewer finds.

Excavation of the ditch system was limited to those areas not intended for house building. The ditch sections rarely allowed the phasing of ditch construction with any certainty, and only a tentative sequence of enclosure layout can be put forward.

The Main Enclosure Boundaries

The major boundary ditches lay on the western and northern sides of the area, those on the western side comprising two parallel cuttings within the limits of the excavation (section a: Fig.8, a). The innermost ditch (36) had an irregular U-shaped profile, the lower fill (35) consisted of grey-brown sandy soil; the upper darker fill was soil containing a lens of ash, charcoal flecks, flint fragments and pottery. The lower fill con-

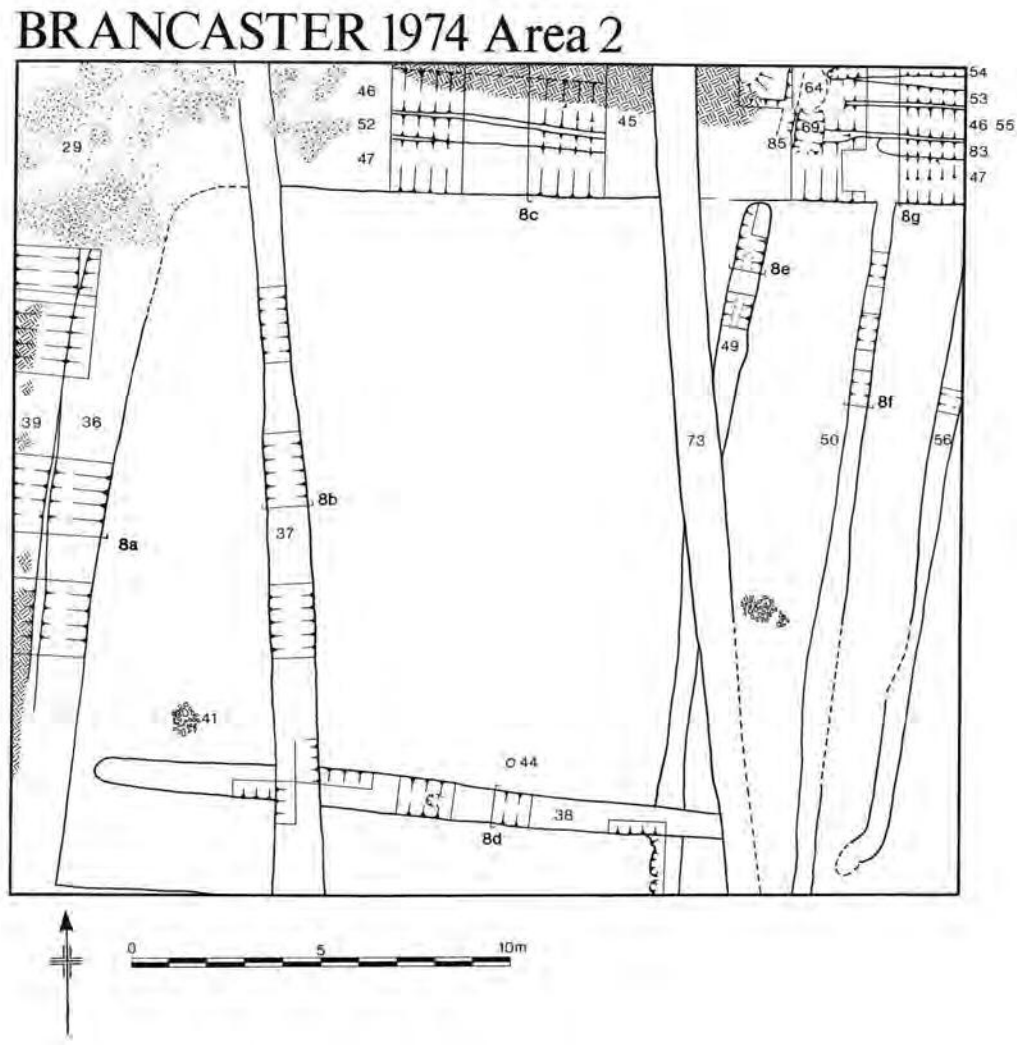


Fig.5. The 1974 excavations: Area 2. Scale 1:200.

tained a second-century trumpet brooch, fragments of coal and part of a sandstone quern; the upper fill produced sherds of shell-gritted ware, and Nene Valley and Oxfordshire Colour-Coated Wares.

To the west, and partially beneath the section, lay a parallel ditch (39) of similar profile and fill to 36. The upper fill was sealed by an intermittent deposit of brown loamy soil stretching along the top of the ditch. The fill produced sherds of Nene Valley Ware, and a mortarium of the late third or fourth century, a pair of tweezers, and amongst other animal bones a complete ox skull from the base of the ditch. The relationship of these two ditches was not clear, but the clay in the top of 39 was similar to the surface of the natural and might represent spoil from the cutting of 36.

Excavation of the north-west corner of the area was not possible, but the inner edge of ditch 36 was traced round to meet the corresponding edge of 47. Here an irregular area of metalling (29) sealed the outer ditch, but also extended partially over the inner. From the surface of 29 part of a fourth-century mortarium was recovered, with other objects, including an iron knife and fragments of coal.

East of the metalling, four sections revealed a complex of ditches with many recuts. A triple ditch consisted of a narrow and steep-sided ditch re-cut at least once and, to the north, a broader cutting (section c: Fig.8). The first phase of the narrow trench (52) was filled with clean sandy soil and some lenses of red/brown loam. The upper fill was cut on the south by 47, a similar, shallower feature. To the north, 46 was filled by a darker grey-brown loam. These three features were sealed by 30, a band of dark grey-brown soil, which may represent a conflation of their upper fills. That part of this deposit overlying 46 was sealed by 5 to 10 cm of brown clay and flint (45). From the upper fill of 30 a coin of Iulia Domna was recovered.

Further east 52 seemed to merge with 47, and the remaining two ditches were cut by two separate features (64 and 69). Within this complex the earliest feature appeared to be 46, which here contained in its base a lower fill of grey-brown sandy soil (55). The oval pit 69 cut 55 at right angles, and was filled with a slightly darker sandy soil. The fill included a sherd of Dorset Black-Burnished Ware of the late third or fourth centuries. Both these features were cut by 64, a circular pit, filled with dark grey-brown soil. In the base of this was a slight trace of a trench (85) continuing the line of 49 northwards. The fill of 64 was indistinguishable from 30, but tip lines of small stones in this layer over the inner ditch 47, suggested that not only was 30 at this point indeed the upper fill of this ditch, but that this upper fill overlapped 64.

To the east of this point, five or possibly six recuts of the boundary ditches could be recognised (section g: Fig.8). Ditches 46 and 84 were the earliest, overlapped by the upper fills of 53 and 83. The latter, and 54, appeared to terminate on the west in the region of 64 and 69. Ditch 46 continued without interruption from the west, but consisted here of a steep-sided trench, containing a cleaner sandy deposit with a lens of clay in the base. The upper fill of sandy loam was sealed by traces of a clay layer similar to 45.

To the south the upper fill was cut by 30, and on the north by 53. Ditch 84, on the south side of this complex, was a flat-based cutting, with a sloping south side and a somewhat similar fill to 36, sealed by a layer of clay. On the north side this had also been cut away by 30, while further west it appeared to have been totally removed, unless a slight ledge on the south was a remnant of this (section c: Fig.8). Ditch 47 was complicated by the presence of a possibly earlier cut (83) between it and 46. This was filled with grey-brown sandy soil very similar to that in 47, but containing slightly more small flint fragments. To the west 83 seemed to come to a butt end before reaching 69.

Ditches 53 and 54 to the north were slighter features; the former was filled with dark grey-brown sandy soil. The upper fill extended south over 46, and northwards merged with the upper fill of a similar feature 54. Both of these slight features appeared to terminate at 64.

The Interior of the Enclosure

Within the angle formed by the two ditch complexes just described, three slighter north-to-south ditches, and one east-to-west ditch were investigated. In addition, the area was traversed by two parallel ditches of medieval or Post-medieval date.

The east-to-west ditch (38) was U-shaped in section at the western end and was filled with very dark grey-brown soil; 6 m from the west end there was a lens of ashy soil and charcoal 15 cm from the surface. Then, 9 m from the west end the ditch suddenly became deeper, with the charcoal lens between 20 and 35 cm deep (section d: Fig.8). The relationship of the east end with 49 could not be resolved, but on the surface 38 appeared to cut 49 and be cut by 73, a later field boundary (plan: Fig.5). The butt end lay opposite and 3.5 m from the south end of 56. The ashy deposit in 38 contained a quantity of pottery, including fragments of a mortarium, Nene Valley Ware, shell-gritted ware and Dorset Black-Burnished Ware of the late third and fourth centuries. Other finds included a bronze strap-end of late second- or third-century type (Fig.30, No.15). South of 38 the north edge of another parallel ditch was traced along the south edge of the excavation for 4 m from its junction with 36 but was not sectioned.

Of the north-to-south ditches on the eastern side of Area 2, 56 terminated to the south opposite the end of 38, but the northern end and the junction with the northern boundary complex lay outside the excavation. This shallow U-shaped trench contained grey-brown sandy soil. To the west two further parallel boundaries of similar profile and fill (49 and 50) butted against 47 and thence continued southwards outside the excavation. The north end of 49 lay opposite 64 and 69, which cut the north boundary ditches, while its southern end was cut by 38. A scatter of stones between these two ditches may represent traces of another hearth containing ashy soil, third-century pottery and a brooch of third or fourth century date (Fig.38, No.5). The parallel ditches crossing the site from north to south (37 and 73) contained Post-medieval material and were part of the more recent field pattern.

AREA 3
(Figs.6 and 9)

The contractor's excavations to the south and south-east revealed a further complex of boundary ditches seemingly on the same alignment and part of the same enclosure as those in Area 2. Two groups of ditches, an irregular pit and the continuation of the two Post-medieval boundaries were revealed.

The most north-westerly of the north-to-south ditches (18) was observed at two points approximately 8 m apart in the roadworks as a round-bottomed gully (shown only on Figs.2 and 3). The brownish sandy fill contained some charcoal flecks, part of a sandstone rubber and one sherd of possibly prehistoric pottery. Although approximately on the line of 36 to the north, the fill and profile were dissimilar. Approximately 14 m to the south-west a similar feature on an east-to-west alignment was also observed in the contractor's excavations. Three more ditches ran parallel to and on the east of 18, their alignments apparently matching those of 49 and 50 in Area 2. Two of the three ditches (3 and 15) converged to the south, the former being the earlier of the two with a V-cut profile; the upper fill contained samian ware of the late-second century. Ditch 15 had a more rounded profile. Traces of an earlier and slighter feature (13) also survived. To the east 12 had a similar fill and profile to 15 but converged with the latter to

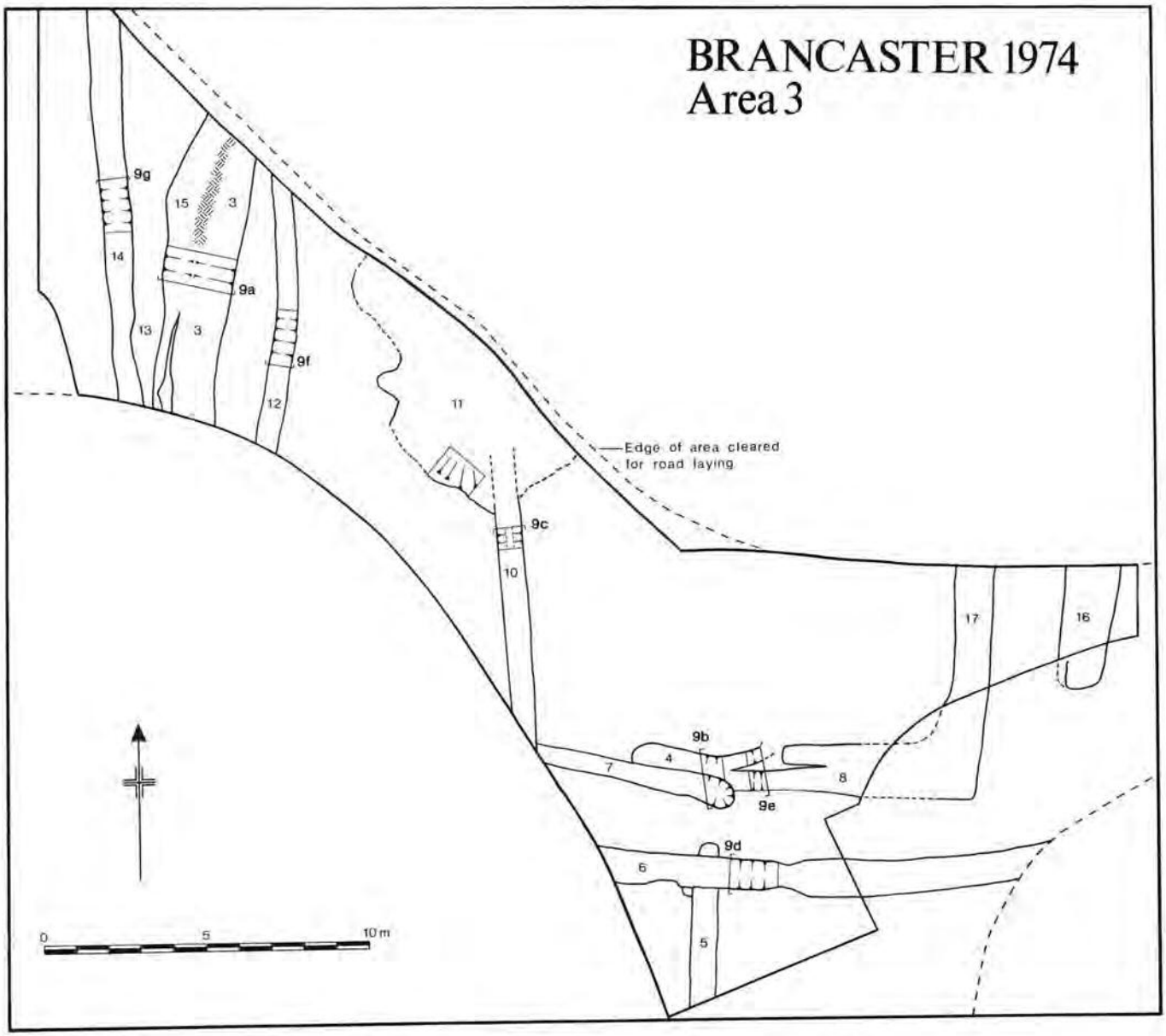


Fig.6. The 1974 excavations: Area 3. Scale 1:200.

the north. The Post-medieval boundaries 10 and 14 passed either side of these ditches, continuing the line of those on Area 2. Ditch 10 cut an irregular pit (11) which on its western edge was 30 cm deep and contained some Roman occupation debris.

To the south-east a complex of features included at least three east-to-west ditches (4, 7 and 8) forming a complex butt-ended junction. Ditch 4 appeared to be an extension of 8, later cut by 7, all three features varying little in fill or section. To the east 8 merged with another before returning northwards as 17 parallel to and 3 m from a butt-ended ditch 16. South of the complex a north-to-south ditch 5 came to a butt end 1 m from the corresponding end of 7, perhaps to form an entrance. This had been later cut by 6, another shallow ditch running approximately parallel to, and 3 m from, 7 and 8. A further 40 m south-west of this area another isolated exposure in the contractor's excavation revealed a north-to-south ditch approximately on the line of 12.

COMMENT: THE ENCLOSURE SYSTEMS IN AREAS 2 AND 3

The irregular and frequently recut outline of the ditches and the similarity of their

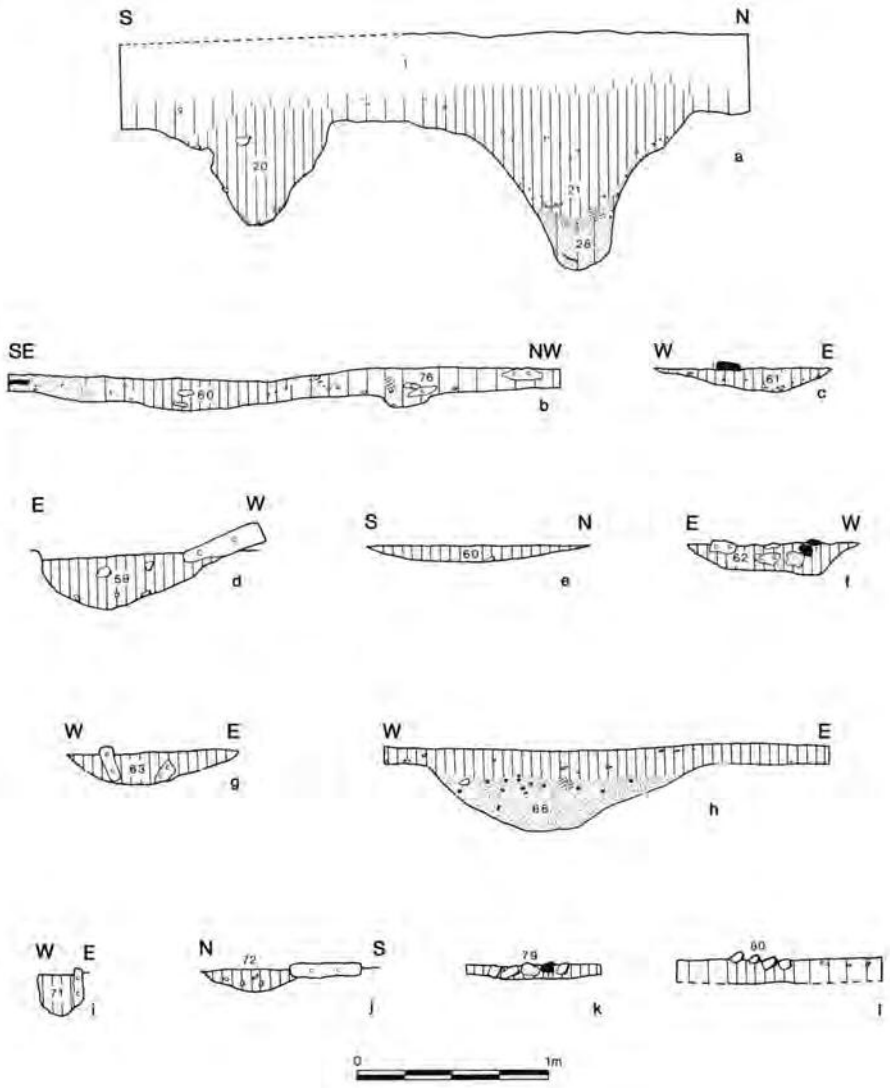


Fig.7. The 1974 excavations: sections of features and adjacent deposits in Area 1. Scale 1:40.

fills, coupled with the limited area of the complex exposed, creates difficulties in phasing and interpretation. Presumably all the features had originally acted as ditches flanking hedge lines or fences, even though some features, such as 21 and 52, seemed remarkably narrow and vertically-sided for ditches exposed in a sandy subsoil. The pairing of many ditches implies that they bounded paths or tracks rather than they were single boundaries recut on different lines. Similarly the butt-ends of ditches leaving short gaps of 1 or 2 m indicated that there had been narrow entrances interconnecting paths and/or enclosures. The placing of such entrances in the corners, as between 38 and 56 in Area 2 and 7 and 5 in Area 3 implies suggests some use for stock, allowing the easy herding of animals into the corners of enclosures and thence into adjoining areas or tracks, although the presence of hearths within the excavated enclosure shows that there was also human occupation. Gaps such as that between 38 and 36 might rather suggest the existence of a hedge along the eastern side of 36, which was not breached by the insertion of 38 within the enclosure.

The ditch system in these two areas represents only a small portion of the system extending into the western part of the extra-mural settlement. In general terms, Area 2 revealed the complex north-west corner of a major enclosure facing north on to the main east-to-west road, while Area 3 traced a south-east corner of a slighter enclosure.

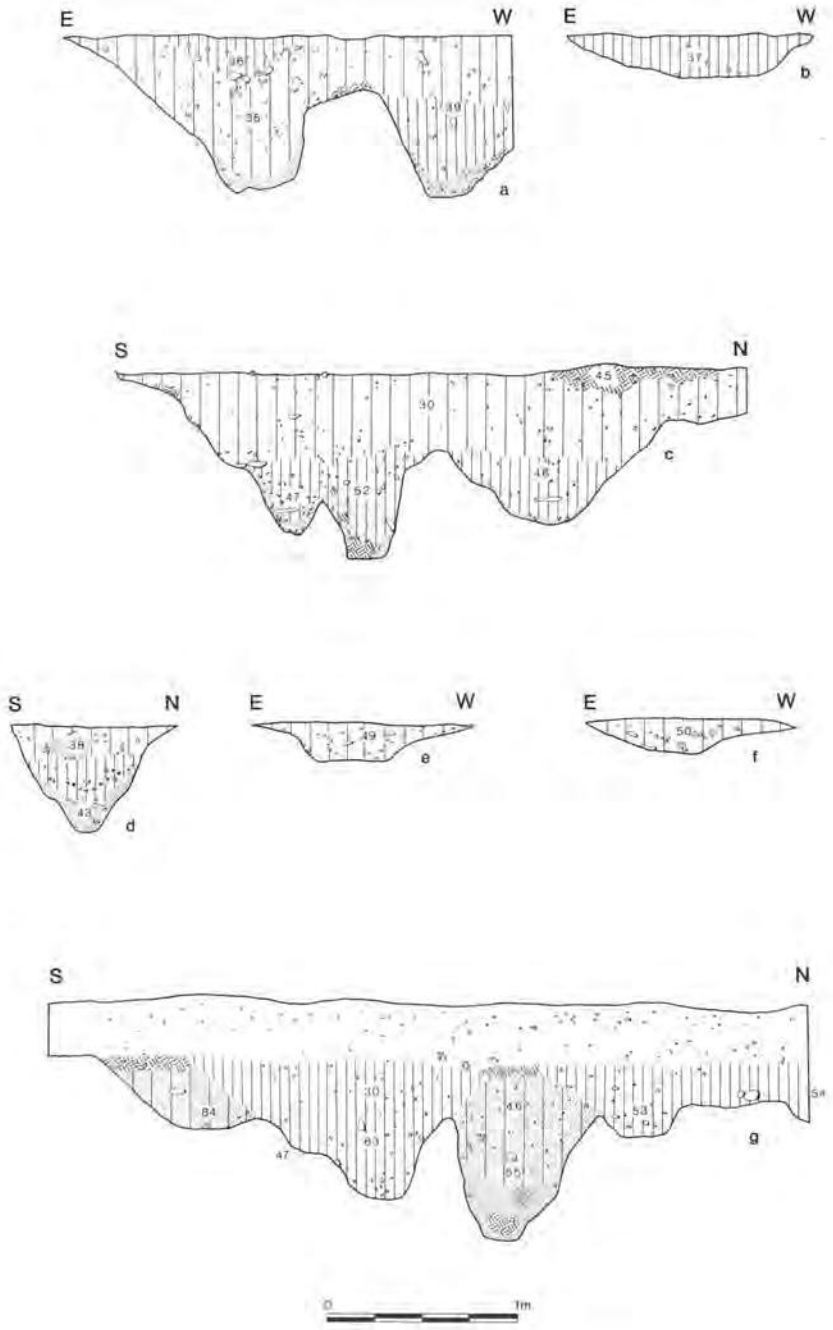


Fig.8. The 1974 excavations: sections of features in Area 2. Scale 1:40.

The differences in the scale of these major features suggests that they do not belong to the same enclosure. In particular no trace of the continuation of the major western ditch (36 and 39) was picked up in the roadworks in Area 3. Some links between the two areas were indicated by the slighter ditches on the east side of Area 2 and those to the south; together they would seem to form the north-west corner, west side and south end of an enclosure perhaps 25 by 75 m with a double-ditched track down either side at least. The more substantial ditches in Area 2 would then form part of an earlier enclosure subdivided by 38 and 56 to form an area 20 by 18 m in its north-west corner, with an entrance to the south-east with one or two hearths within it. The clay and gravel areas sealing the north and west sides may then relate to the levelling of this system and the creation of the later enclosure, since the clay overlying 46 respected its

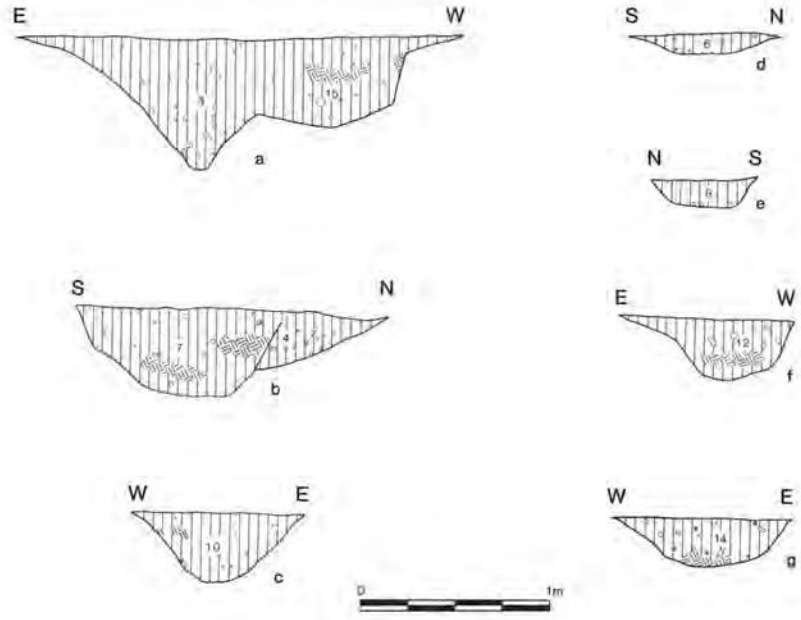


Fig.9. The 1974 excavations: sections of features in Area 3. Scale 1:40.

north-west corner (85, 64 and 69).

No structural remains or dense occupation debris existed, so the ground within both phases of enclosure can be presumed to have been open. What occupation debris was derived from both phases belonged to the later third or fourth centuries. Rich deposits of earlier finds as in 21 in Area 1 were entirely absent.

The enclosures in size and layout are unlikely to have been arable but more suited to garden plots or paddocks. In view of the nature of the later garrison such enclosures may have been used to corral the spare mounts and young animals in course of training. With a unit nominally 1,000 strong up to 4,000 horses may have been maintained in the vicinity of the fort.

The tile stamp (Fig.40, Nos.140 and 142)

The COH I AQ stamp was certainly in a reused context as packing material for the posts of the fourth-century building in Area 1. Such stamps were in use during the third century for the most part (Hassall 1979, 265). Without fabric analysis little can be said of the origin of the stamped tile, but macroscopic examination did show the presence of quartz and flint fragments which would support a local origin rather than one in Derbyshire, the nearest certain posting for this unit during the late second century. The form of the lettering is unusual, if not unique, on a tile stamp and the implement used has more the appearance of a branding iron than the normal (?) wooden block stamps.

Both the knowledge of the unit's movements and the use of a stamp in tile making, even if of an unusual pattern, would support a date in the late second or third centuries for its manufacture. These and the other fragments of flue tile were presumably derived from the renovation or demolition of the fort bath building or other major heated building at some later date.

The discovery of these tiles is the first occasion on which evidence has been obtained of a unit stationed on the coastal defences of Britain other than those listed for

the fourth century occupation of the Saxon Shore forts (Hassall 1979). The composition of the unit is uncertain, but there is no reason why it should not have been a part-mounted unit since specific reference to the cavalry was usually only included in diplomas for the eques of the Aquitainian units (Birley 1976). In view of the responsibilities of any unit on this coastline, at least an element of cavalry would have been desirable.

IV. THE 1977 EXCAVATION
by John Hinchliffe

Excavations took place between June and September 1977. The following account represents a synthesis of data contained within the site archive, according to Central Excavation Unit practice (Jefferies 1977).

INTRODUCTION

The area investigated in 1977 lay between the principal area examined in 1974 and the Shore fort (Fig.3). The advanced state of the housing development, and the fixing of drain levels in particular, meant that excavation beneath the sites of projected houses would have involved considerable extra cost. It was, therefore, necessary to avoid areas designated for housing blocks, which resulted in the irregular excavation plan shown in Fig.10. This arrangement was not entirely satisfactory from an archaeological viewpoint, but the area sampled by excavation was felt to be sufficient to establish the character of the settlement, its dating and sequence. In addition the geophysical survey carried out by the Ancient Monuments Laboratory, prior to the 1974 excavations, enabled major features to be linked across unexcavated areas (Fig.2).

The bulk of the ploughsoil was cleared from the excavated areas by a JCB 6C excavator, with the exception of one area measuring 14 m by 5 m in the central part of the site where the ploughsoil was excavated by hand to establish:

i. An accurate determination of the level to which the plough had penetrated.

ii. The effect of ploughing on the archaeological levels, in particular to determine whether there was any remaining relationship between occupation-derived material contained within the ploughsoil and features below.

The ploughsoil was removed in this central area in 5 cm spits, the surface being cleaned at the base of each spit and every fragment of pottery, tile, glass, charcoal, bone, shell and chalk plotted. Two distinct horizons of ploughsoil were distinguished. The lower horizon represented three or four years of wartime deep ploughing whilst the upper reflected the depth of annual ploughing up to 1973 when development of the site commenced. The present day ploughsoil was 20 cm deep whilst ploughing in the last war had penetrated a further 15 cm.

A marked contrast in the distribution of material in the two ploughsoil horizons was observed. In the case of the upper ploughsoil no pattern could be distinguished and the effect of many years ploughing had been to mix thoroughly material derived from archaeological levels. In the lower horizon, however, a tentative relationship between material in the ploughsoil and features below was apparent. What was also noticeable was the tendency of material contained within this lower horizon to be aligned along the apparent direction of ploughing, an indication of lateral movement. The original provenance of none of this material could be regarded as certain, however, and there was no instance of material being encountered in either of the ploughsoil horizons which was not encountered in archaeological deposits beneath. Although the area investigated entirely by hand was relatively small in comparison with the total area excavated, it

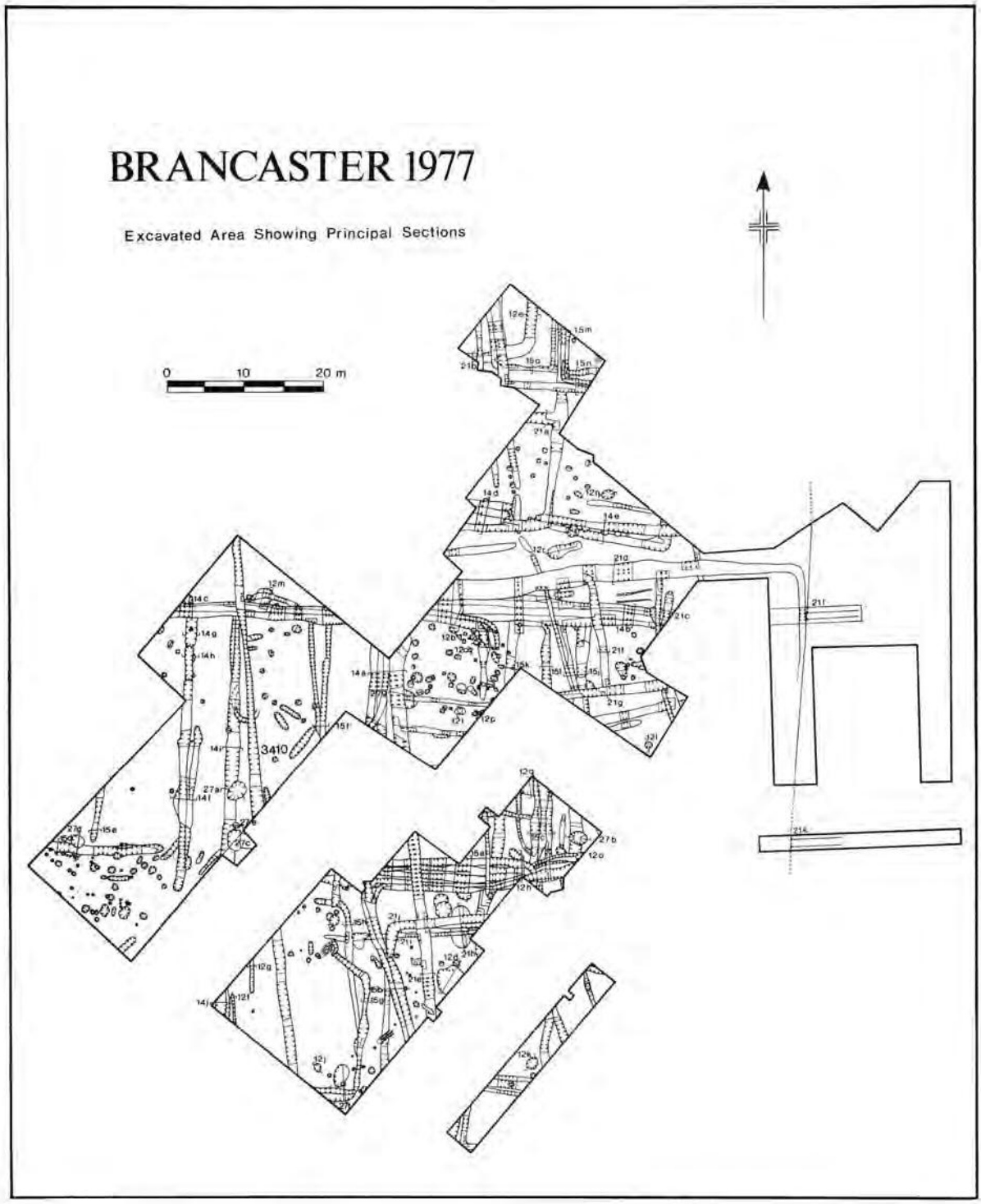


Fig.10. The 1977 excavations: excavated features. Scale 1:800.

seems unlikely that any critical element in the archaeological evidence was lost through the use of machinery in the removal of both horizons of ploughsoil. It should also be pointed out that a rough calculation of cost would indicate that manual removal of the ploughsoil was nine or ten times more expensive than removal by machine.

PREHISTORIC ACTIVITY (Periods 1-3)

Prehistoric activity in the area was indicated by the presence of flint artefacts and

pottery sherds in the fillings of many of the Romano-British features and within the ploughsoil. A scatter of features within the excavated area can also be assigned to the Neolithic, Bronze Age and Iron Age periods (Fig.11). It is interesting to note that neither aerial photography nor field-walking had given any indication of the presence of prehistoric occupation on the site and only the coincidence of these features with those of the Romano-British settlement led to their detection. (Beaker sherds were found on the site in 1973, and these are described in Appendix 2).

Neolithic (Period 1: Fig.11)

Four small pits or post-holes: (716, 1010, 1097 and 1235; sections a, b and c: Fig.12) - grouped together in the centre of the excavated area all produced sherds of Neolithic vessels in their fillings (p.62, 66). The area to the north and east of the features was largely occupied by substantial Romano-British ditches which may well have removed other associated features. It is, therefore, not possible to determine the function of the four small pits, but the quantity and size of the pottery fragments recovered from them would suggest they relate to a domestic occupation, albeit temporary.

Bronze Age (Period 2: Fig.11)

A small length of shallow gully (104), largely cut away by a later Romano-British enclosure ditch produced two Beaker sherds (p.66) and no later material and may, therefore, be assigned to this period. A number of Beaker sherds were also recovered from later features and from ploughsoil. Occupation within the Bronze Age was represented by a large shallow hollow (701: section d: Fig.12), found against the section in the south-east part of the excavated area. The upper filling of this feature had been disturbed by a Romano-British feature (297) but the lower filling (541) contained a number of sherds of collared urn. Numerous sherds of collared urn and other contemporary material were also scattered in the lower ploughsoil horizon in the same vicinity (p.67-68). The function of the feature is unclear.

Iron Age (Period 3: Fig.11)

At the north-western extremity of the excavated area a ditch (3360) was encountered which would appear to be the corner of an Iron Age enclosure. The ditch, which was 1.5 m wide and 0.5 m deep (section e: Fig.12), turned through almost ninety degrees within the excavated area and contained within its filling a number of sherds of flint-gritted pottery including one decorated with small triangular stamp impressions (No.36, p.70). Some 20 m to the south of this ditch was a grave (2449), largely destroyed by the later Romano-British trackway ditch, but containing at its western end the remains of a human skull and two sherds of material in a similar fabric to that from the filling of ditch 3360 (skull: Archive).

Further evidence of Iron Age occupation was provided by a scatter of pits across the excavated area. Seven pits in all produced sherds of Iron Age material which seems to form a coherent group (p.70-71). Of these pits, four (760, 1695, 860 and 867) were quite substantial, steep-sided and flat-bottomed, two (860 and 867) having the appearance of being deliberately backfilled with relatively clean redeposited sand subsoil (section h: Fig.15). A small circular pit (11) produced the largest group of Iron Age sherds. Other features producing solely Iron Age material were two small pits or hollows (1212 and 1003).

A number of other pits which produced no dating evidence whatsoever, but which would appear to be stratigraphically early, may be tentatively assigned to this period (356, 933, 1644, 2479, 2697, 2734, 3265, 3269 and 1301; sections k, m, n, o, q and r: Fig.12). It is interesting to note that if these pits are assigned to the Iron Age there

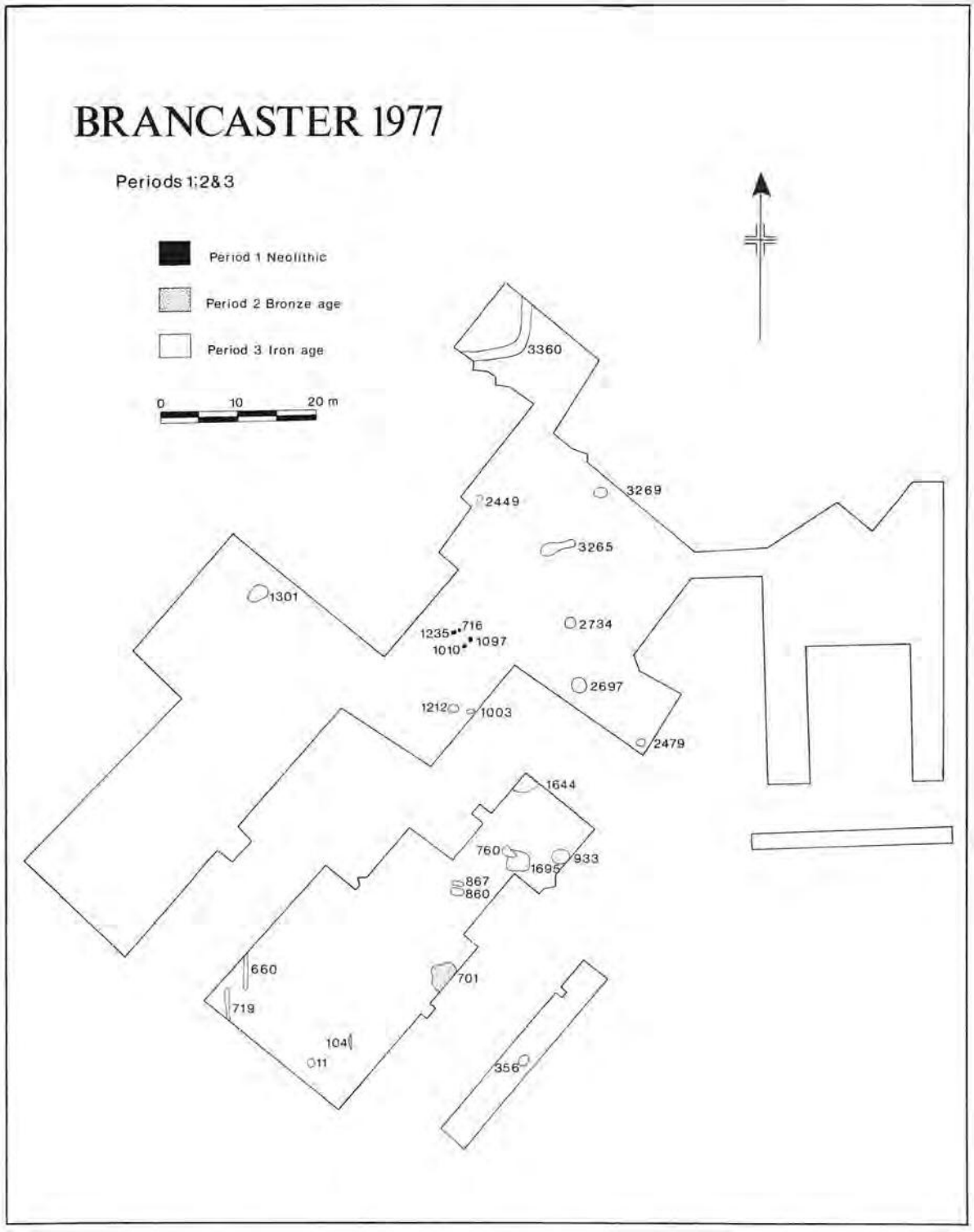


Fig.11. The 1977 excavations: Periods 1, 2 and 3. Scale 1:800.

are rather more pits of this period within the excavated area than there are pits relating to the Romano-British occupation. The majority of the Iron Age pits were also confined to a zone across the centre of the excavated area with pits 1301 and 11 as outliers to the west.

Two shallow gullies (660 and 719: sections f and g: Fig.12), lying in a corner of the excavated area in the south-west part of the site may also belong to the Iron Age

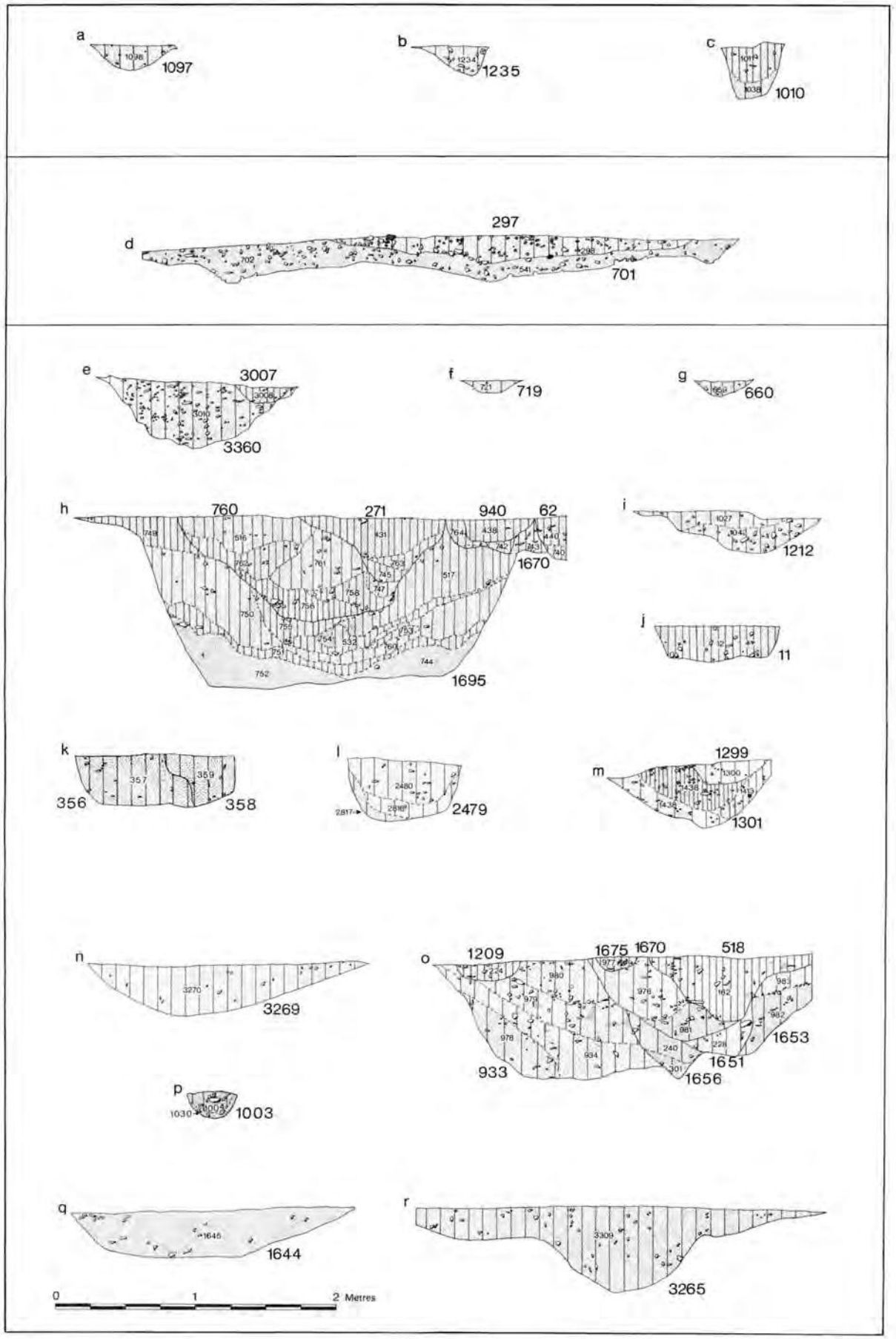


Fig. 12. The 1977 excavations: sections of prehistoric features. Scale 1:40.

period. The only find from the filling of 660 was a small flint-gritted sherd, but the two gullies do run alongside the ditch of the Romano-British north-to-south trackway. This may, however, be merely coincidental.

Comment

It would clearly be unjustifiable on the basis of the evidence recovered from the excavation to argue for continuity of occupation from the Neolithic period onwards. It is clear, however, that the site had seen occasional human activity at various times in the prehistoric period. The full character of this occupation is unclear as the scatter of prehistoric features lying within the excavated area may well relate to nuclei outside it. The character of the Iron Age features in particular might suggest an undetected settlement, a farmstead for instance, in the vicinity.

THE ROMANO-BRITISH SETTLEMENT (Period 4: Phases 1 to 8)

The primary feature of the settlement area investigated was a trackway defined by ditches running west-to-east towards the west gate of the Shore fort. The original width of the trackway was c. 10 m and although the ditches on either side had been periodically recut (Fig.14) the same overall alignment had been maintained. This alignment was slightly different from that of the fort (Fig.2). A north-to-south trackway at right-angles to this trackway intersected with it some 140 m west of the fort gate. This second trackway was rather narrower, measuring c. 5 m between its ditches. Only part of the north-to-south trackway south of its intersection with the west-to-east trackway lay within the excavated area, but its continuation northwards was clearly demonstrated by the geophysical survey (Fig.3). The ditches of the north-to-south trackway within the excavated area each showed one principal recutting.

The area intersected by the trackways was further subdivided by ditches into a number of rectangular enclosures which had undergone considerable rearrangement, redefinition and subdivision during the period of occupation. Although a sequence could be established in the ditches and their recuttings at different points within the excavated area, it is not possible to link these together into an overall and comprehensive sequence for the whole site. It would furthermore be illogical to attempt to tie every ditch or gully and its recuttings into an absolute phase by phase sequence as much of the recutting was clearly localised and at no time after its inception does there appear to have been an overall re-planning of the settlement area.

No such precise sequence, furthermore, can be established on the basis of the dating evidence provided by the pottery recovered from the site, partly in view of the lack of good comparative dated groups from the region and also in view of the character of the site itself; the bulk of material was recovered from the fillings of ditches. The recutting of virtually all the ditches excavated obviously increases the likelihood of contamination by residual material. It was also clear that there were very few instances of material having been deliberately dumped into the ditches; they had filled as the result of the silting-in of soil from upcast and the surrounding area in general. Such a filling will contain much residual material which is likely to reflect, in terms of dating, the most intensive period of earlier occupation in the immediate vicinity rather than the actual date of deposition. This is most clearly demonstrated in the case of the medieval ditch (Fig.3) which produced only a few sherds of medieval material, the remaining pottery being derived from the Romano-British occupation.

It is, however, possible to establish a broad sequence for the principal features on the site, through which the development of the settlement can be traced. There were five principal cuttings (one original cut and four subsequent redefinitions) of the ditches of the west-to-east trackway (sections: Fig.14), and elsewhere on the site, most not-

ably around the principal enclosure to the south of the trackway (section a: Fig.15), a similar number of recuttings could be distinguished. It is considered worthwhile, therefore, to postulate a broad sequence for the principal features within the excavated area, which is described below and expressed in Figs.13 and 16-20. It must be stressed, however, that this is primarily an aid to expressing the apparent overall sequence on the site and that the division between one phase and the next is an arbitrary one, the overall development of the site being a more or less continuous process.

Phase 1 (Fig.13)

The west-to-east trackway was defined by ditches 3297 and 3298 and by ditches 3099 and 1136 (sections e, d, b and c: Fig.14). It was not possible to establish with certainty whether this trackway predated the north-to-south trackway in view of the considerable recutting at their point of intersection. Ditch 3297 turned to the north against the eastern limit of the excavated area. The north-to-south trackway was defined by ditches 1104 and 2937 on the west and ditches 2366 and 183 on the east (sections g, f, i and j: Fig.14). There was a gap forming an entrance into the enclosure to the west of the trackway, just to the south of its junction with the west-to-east trackway. An enclosure 35 m square was created in the south-east angle of this junction by the excavation of ditch 1651 on the south and ditches 97 and 2164 (sections a and k: Fig.15) on the east. This enclosure was subdivided north-to-south by ditch 1427 which formed an enclosure measuring 11 m by 35 m against the trackway (section f: Fig.15). This lay-out would appear to have been modified by the extension of the larger enclosure eastwards by the excavation of ditches 1670 (section a: Fig.15), 309 and 3090 (section j: Fig.15). This lengthened the total enclosure area by c. 9 m and the whole was now subdivided north-to-south by ditch 1334 (section a: Fig.14) 8 m to the east of ditch 1427.

To the west of the north-to-south trackway another rectangular enclosure is suggested by ditch 2931 (section d: Fig.15) whose line approximates to that of ditch 1651 on the opposite side. This enclosure would appear to have been subdivided north-to-south by ditch 2930, 11 m west of the north-to-south trackway (section e: Fig.15). This ditch occupies an equivalent position to ditch 1427 on the opposite side of the trackway.

To the south of ditch 1651, another enclosure was suggested by ditches 121 and 401 (sections b: Fig.15 and h: Fig.21). It is interesting to note that this enclosure, like that to the west and unlike the enclosures to the north, did not share its ditches with another enclosure, a margin being left around its exterior. The geophysical survey indicates that ditch 401 continued some distance eastwards before turning south to form an enclosure 30 m across (Fig.3).

Phase 2 (Fig.16)

The southern ditch of the west-to-east trackway was recut as ditches 3100 and 1761 (sections b and c: Fig.14). The northern ditch of the trackway was recut as ditch 3300, turning northwards as ditch 3354 to divide the earlier enclosure bounded on the east by the northern extension of ditch 3297 (section d: Fig.14 and m: Fig.15). The line of ditch 3300 eastwards beyond its turn to the north was continued by six substantial post-holes cut into the filling of the earlier ditch (section e: Fig.14). Further subdivisions of this northern area were represented by ditches 3351 and 3355 (section n: Fig.15 and a: Fig.21). The arrangement of three slots (3356, 3357 and 3390) to the west of ditch 3354 would also appear to belong to this phase (sections m and o: Fig.15).

The ditches of the north-to-south trackway were recut; on the west as ditch 2938, retaining the earlier entrance, and on the east as ditches 2367 and 777 (sections f, i and j: Fig.14). The dimensions of the enclosures to the south of the main trackway within the excavated area would appear initially to have remained the same, the eastern bound-

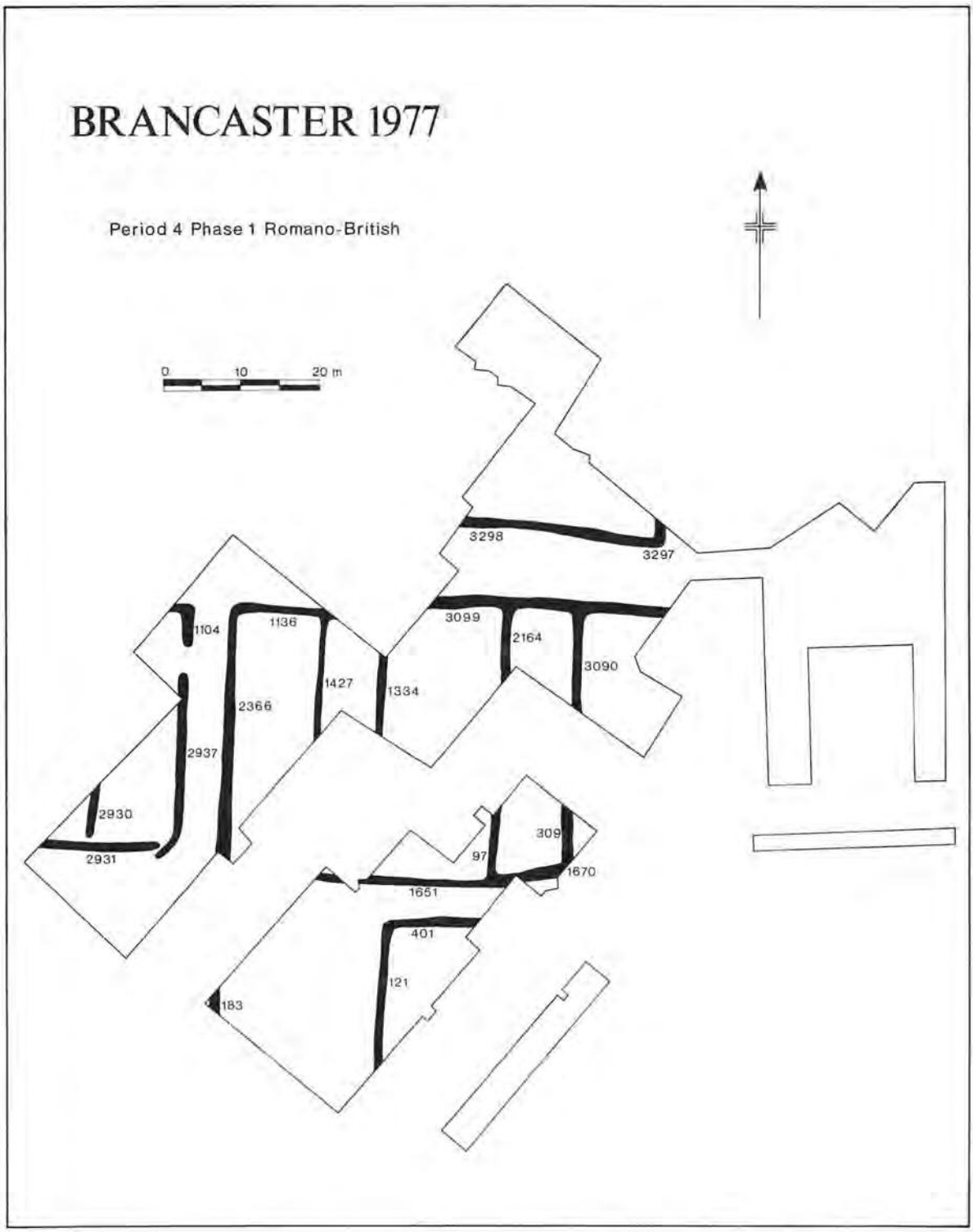


Fig.13. The 1977 excavations: Period 4 Phase 1. Scale 1:800.
For locations of all sections - see Fig.10.

ary ditch being recut as ditches 307 and 3089 (section j: Fig.15), the latter butt-ending some distance from the southern trackway ditch. The southern boundary was recut as ditch 62 (section a: Fig.15) and the north-to-south dividing ditch was recut as ditch 1056 (section a: Fig.14). The eastern enclosure was subsequently reduced in area by the excavation of ditches 3091 and 81 on the east side (sections l and c: Fig.15).

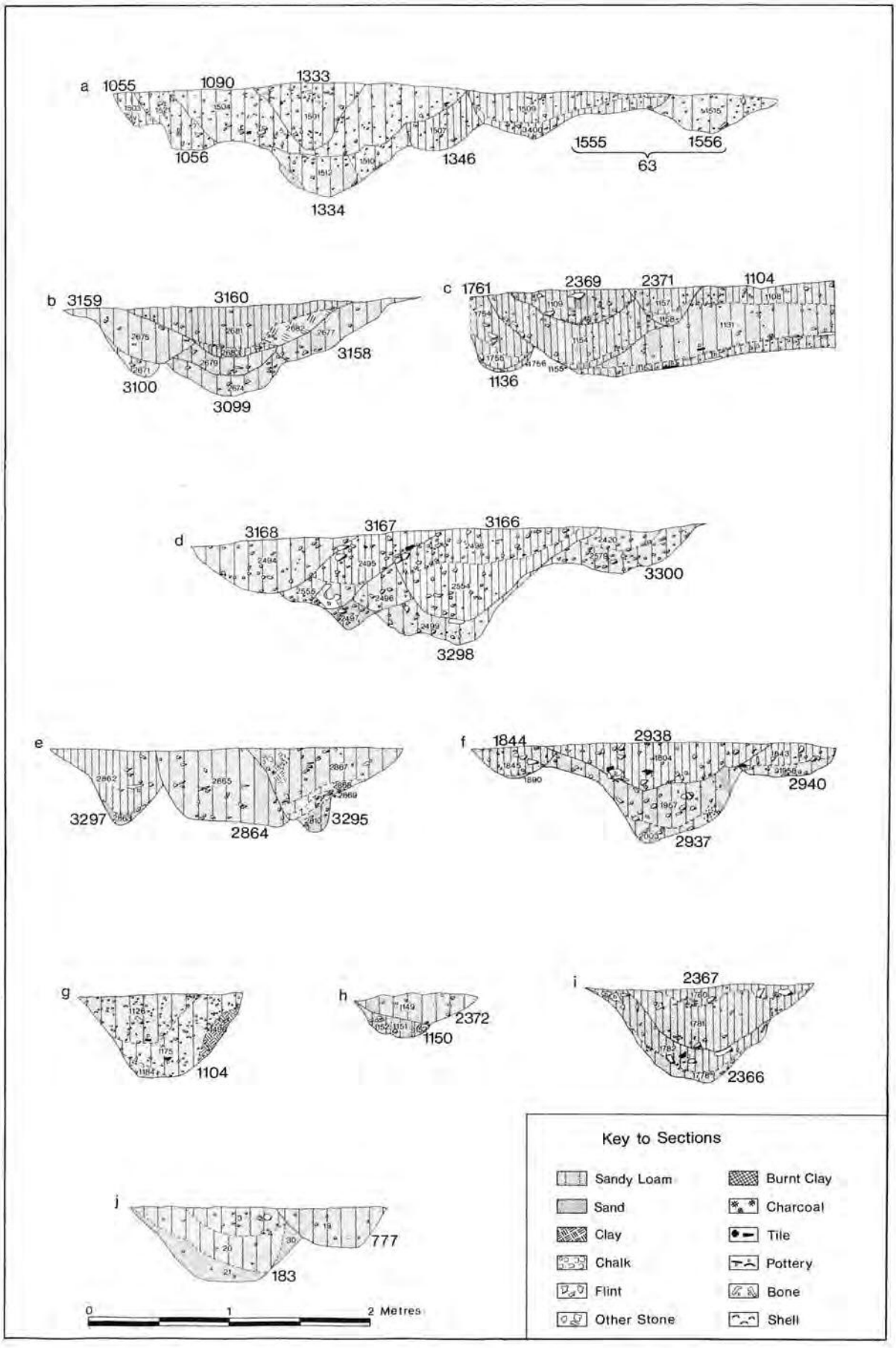


Fig.14. The 1977 excavations: ditch sections. Scale 1:40.

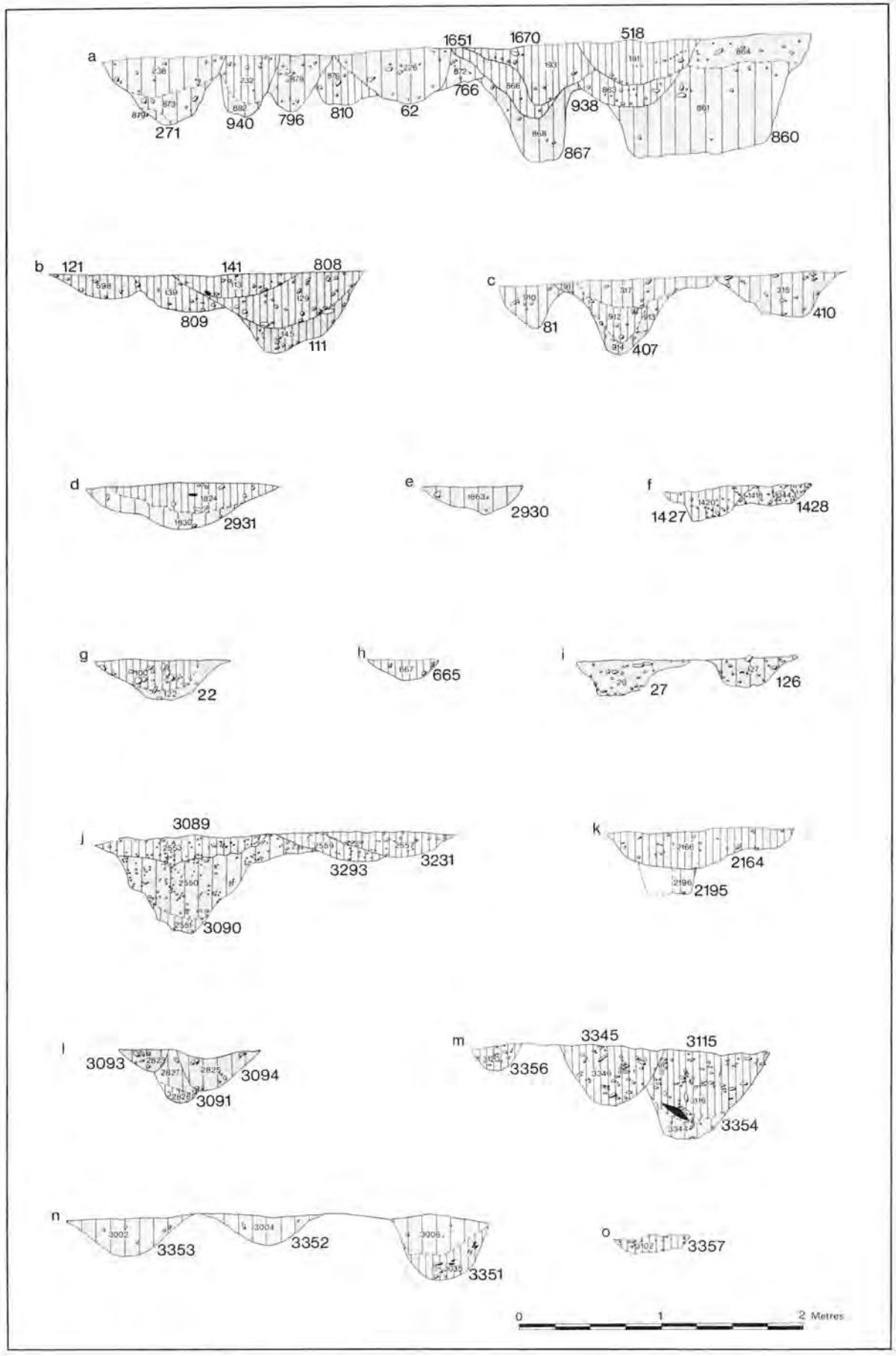


Fig.15. The 1977 excavations: ditch sections. Scale 1:40.

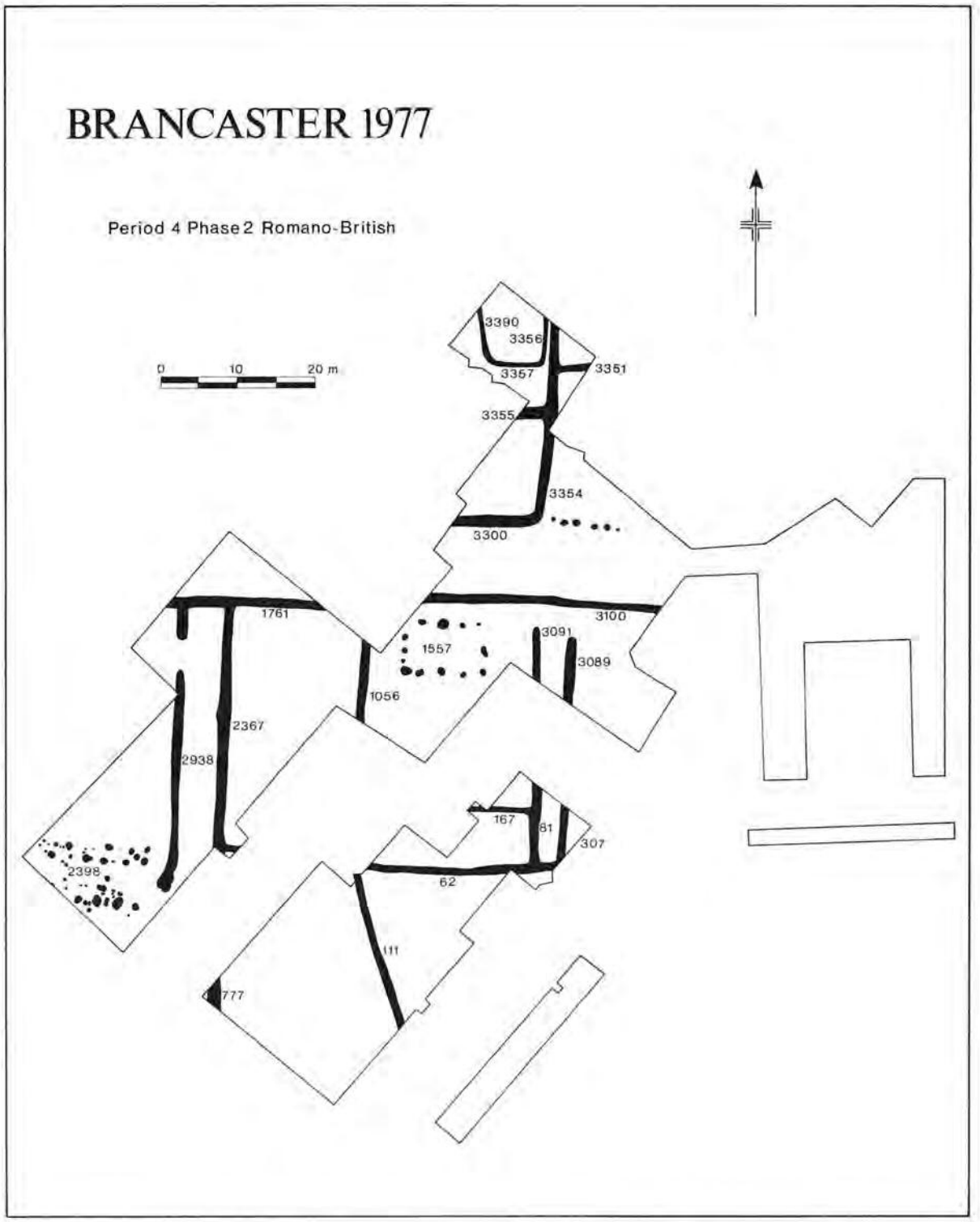


Fig.16. The 1977 excavations: Period 4 Phase 2. Scale 1:800.

This enclosure was further subdivided by a west-to-east ditch (167) which met ditch 81 at right-angles 7 m to the north of ditch 62. Within the area thus defined to the north of ditch 167 was a structure (1557) indicated by substantial post-holes and which is tentatively assigned to this phase (p.32). The termination of ditches 3089 and 3091 some distance short of the trackway may have been in order to facilitate access to structure 1557 from the east. To the west of the north-to-south trackway, another substantial timber structure (2398) would also appear to belong to this phase.

Further south the Phase 1 enclosure was replaced by another with ditch 62 as its northern boundary, its western side being defined by ditch 111 (section b: Fig.15) which was off the general alignment.

Phase 3 (Fig.17)

The southern ditch of the west-to-east trackway was recut as ditches 2369 and 3159 (sections c and b: Fig.14), running across the entrance to the north-to-south trackway. The northern ditch of the west-to-east trackway was recut as ditches 3166 (section d: Fig.14) and 3295 (section e: Fig.14), making an entrance 3 m wide at the point where the Phase 2 ditch (3300/3354) had turned northwards. To the north of this entrance the corner of an enclosure defined by ditch 3352 (section n: Fig.15), was cut partially along the line of the earlier ditch 3354 (Phase 2). South of the west-to-east trackway, the entrance in the west side of the north-to-south trackway was blocked by a short length of ditch (2372; section h: Fig.14), suggesting that although this trackway may have gone out of use at this time the adjacent enclosure to the west was still in use.

The eastern enclosure of the principal pair lying to the south of the trackway within the excavated area was redefined by ditches 1346, 940 and 407/3093 (section a: Fig.14 and a, c and l: Fig.15), the latter ditches reinforcing the line established in the previous phase by ditches 81 and 3091. The original eastern limit of the enclosure represented in the previous phase by ditches 3089 and 307 would appear to have been abandoned by this time. On the south side of the enclosure, ditch 940 turned southwards, apparently forming the eastern margin of an enclosure whose western limit was marked by ditch 809, recutting the earlier ditch 111 (section b: Fig.15).

Phase 4 (Fig.18)

The southern ditch of the trackway was recut as ditches 3158 and 2371 (sections b and c: Fig.14). The northern trackway ditch was only partially recut (ditch 3167: section d: Fig.14) replacing the Phase 3 ditch 3166, the entrance between this ditch and ditch 3295 to the east being retained. To the north, ditches 3388 and 3353 (section n: Fig.15) would appear to represent an enlargement of the Phase 3 enclosure defined by ditch 3352. The probable eastern limit of an enclosure to the north-west of the entrance was defined by ditch 3359, butting short of the trackway ditch as ditch 3249. The enclosure lay-out to the south of the trackway was retained, ditch 1090 recutting 1346 on the west, ditches 410 and 3094 replacing ditches 407 and 3093 on the east and ditch 271 recutting ditch 940 to the south (section a: Fig.14 and c, l and a: Fig.15). The enclosure to the south was redefined by ditch 808 (section b: Fig.15) on the west and ditch 1676 on the east.

Phase 5 (Fig.19)

The northern trackway ditch was partially recut as ditch 3168 (section d: Fig.14). The line of the Phase 4 ditches 3359 and 3249 to the north was taken up by ditches 3387 and 3251 a little to the east. The southern ditch of the trackway was recut as ditch 3160 (section b: Fig.14), this recut apparently being confined to the eastern length of the ditch within the excavated area. This ditch formed the northern boundary of the enclosure to the south of the trackway whose western boundary was recut as ditch 1333 whilst the southern ditch was recut as 518 (section a: Fig.14 and a: Fig.15). On the east the area of the enclosure was increased by the cutting of a new boundary ditch on this side (3172). The dimensions of the enclosure as redefined were 38 m by 33 m. Two parallel gullies (1551 and 1552; sections: Fig.23), in the central part of the excavated areas have the appearance of foundation trenches and may indicate a structure (3405) at this point, replacing structure 1557 (p.36).

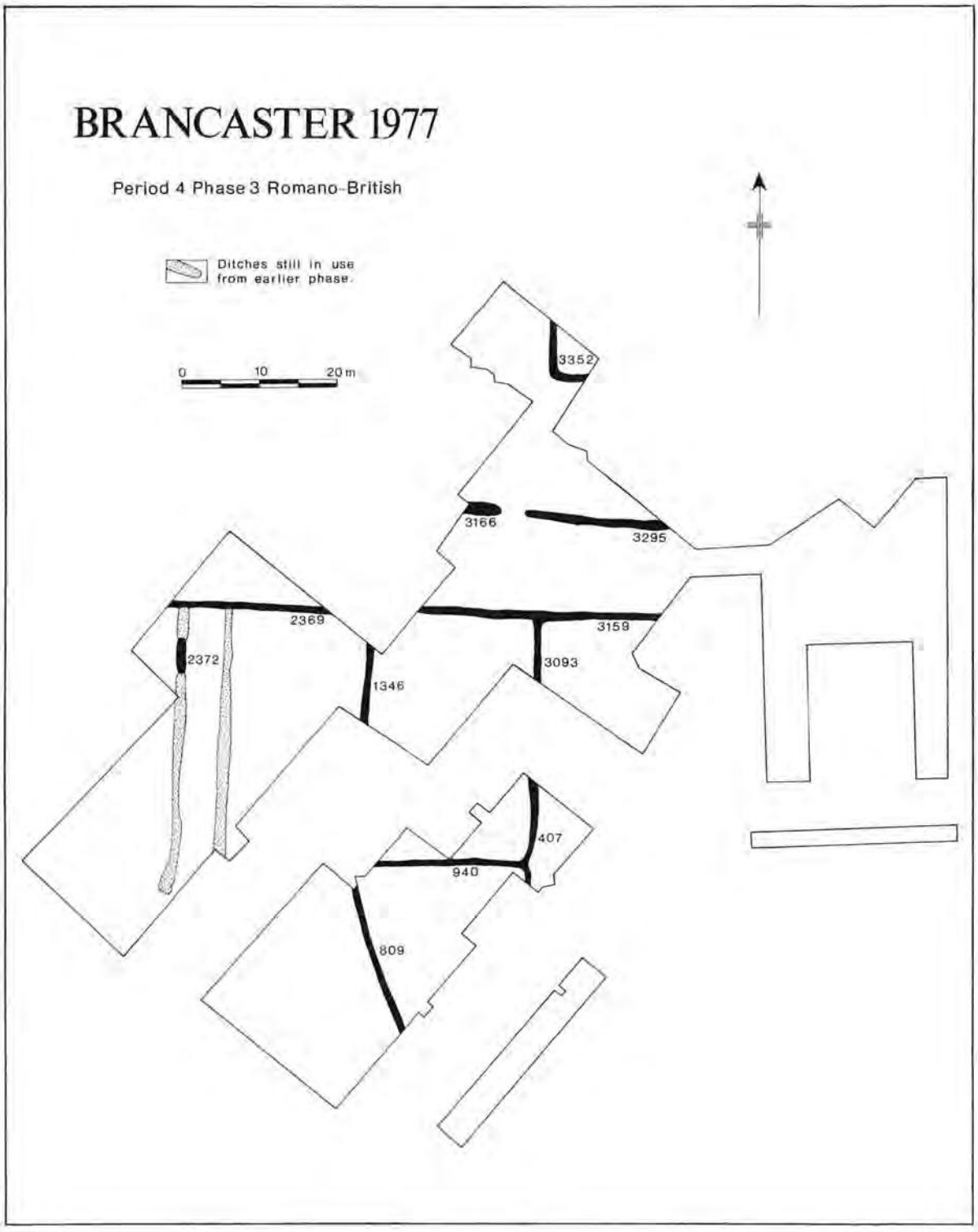


Fig.17. The 1977 excavations: Period 4 Phase 3. Scale 1:800.

The ditch forming the western boundary of the major enclosure (1333) was extended southwards as ditch 141 (section b: Fig.15), following the line of the earlier ditches forming the western side of the enclosure to the south. The eastern boundary ditch of this enclosure was not recut, ditch 518 to the north running directly west-to-east without any turn to the south like its predecessors. It is unclear whether this southern enclosure was still in use at this time.

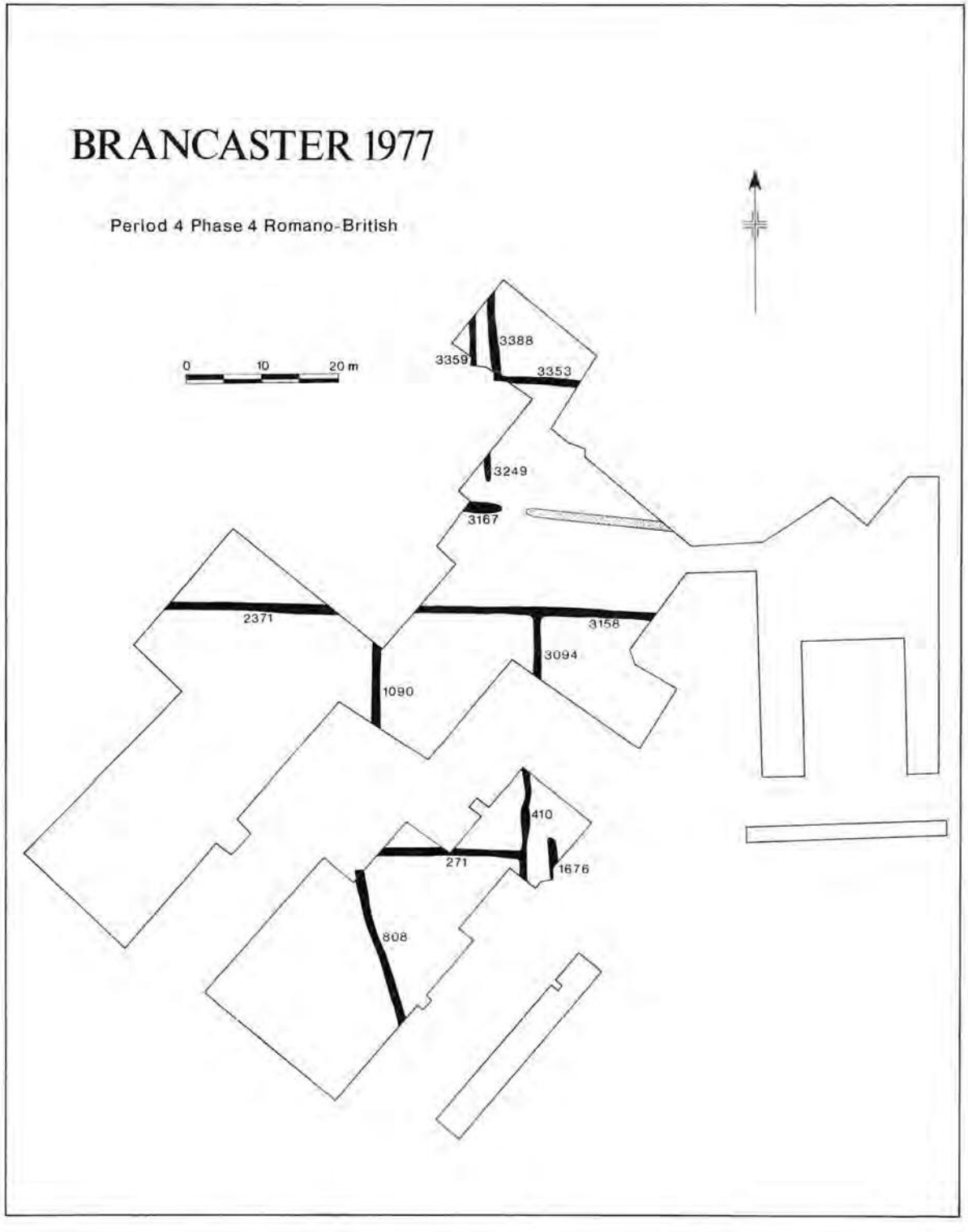


Fig.18. The 1977 excavations: Period 4 Phase 4. Scale 1:800.

Phase 6 (Fig.20)

At the eastern end of the site a very broad feature was detected, running north-to-south. The full width of the feature could not be determined as it extended beyond the limits of the excavation, but it was at least 22 m across. The earlier ditches of the west-to-east trackway could not be traced across it and were presumably cut, indicating that the trackway was no longer in use. Unfortunately, the building plan severely

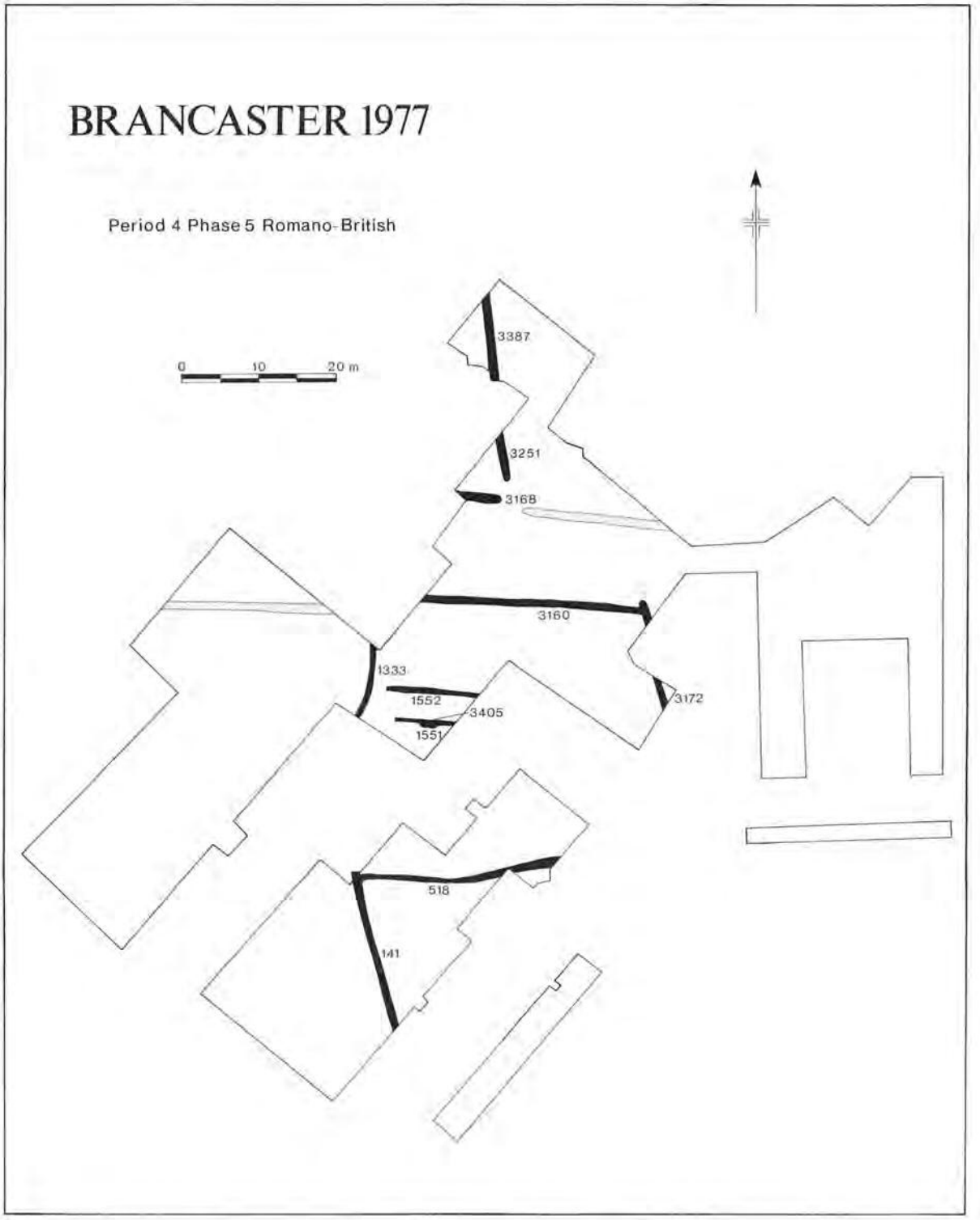


Fig.19. The 1977 excavations: Period 4 Phase 5. Scale 1:800.

restricted any examination of the intersection with the trackway. The situation at this point was further confused by a general deepening of the overburden, presumably due to down-slope soil movement, and the presence of an in-filled hollow way, complete with cart ruts, heading towards the Shore fort. This feature is presumed to be medieval.

The edge of the linear feature (3401) was marked by little more than a steepening of the overall incline, though its alignment did not conform to the overall slope which ran

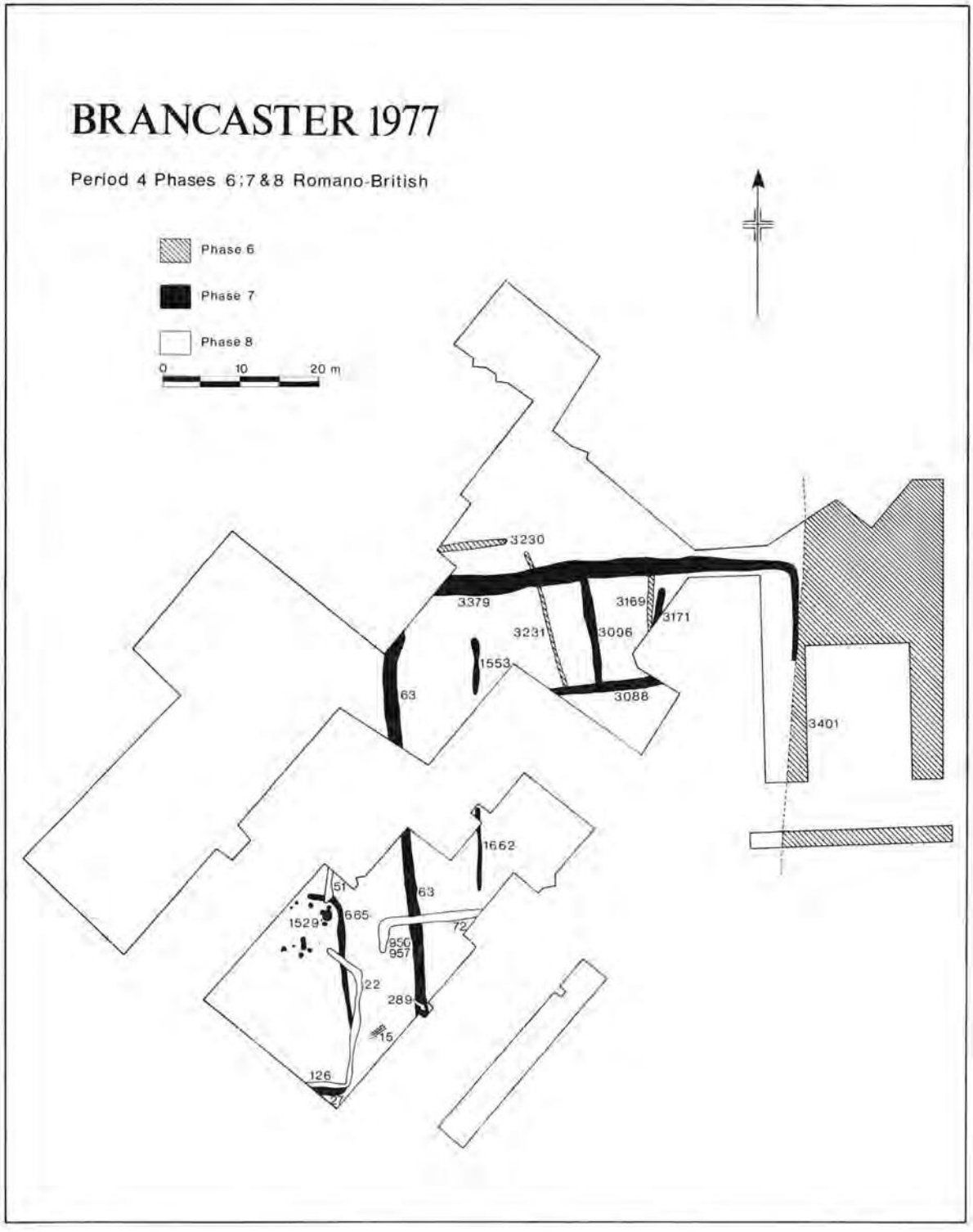


Fig.20. The 1977 excavations: Period 4 Phases 6, 7 and 8. Scale 1:800.

south-west to north-east. The filling of the feature, where sampled in the sondages indicated in Fig.10, consisted of horizontal layers of sandy loam, interspersed with thin horizons of sandy silt. The depth was slightly over 1 m below the base of ploughsoil (section I: Fig.21). Material from the filling would seem to indicate a date in the second half of the third century though the feature would appear to have filled in over a long period of time so any dating must be tenuous. A machine-dug trench to the south of the main area also located the feature, confirming that it was in fact linear.

Interpretation of the feature must be tentative, the principal justification for regarding it as man-made and Romano-British in date being its apparent relationship to other features. It is certainly respected by the principal Phase 7 enclosure (Fig.20). The feature may be interpreted as an addition to the defences of the Shore fort but such a broad, shallow ditch would not form much of a barrier. It clearly was not interrupted outside the west gate of the fort and would, therefore, have severed direct vehicular access between the settlement and the fort.

Also assigned to this phase are three linear gullies (3230, 3231 and 3169) which cut across the west-to-east trackway, but are themselves cut by the principal Phase 7 enclosure. Two of these shallow gullies (3230 and 3231, section j: Fig.15) appear to be related and perhaps formed an enclosure, although they were not traced in adjacent excavated areas. Their relationship to the west-to-east trackway clearly indicates that it had gone out of use at this time. The third gully (3169) of similar dimensions also cut the southern trackway ditch and was cut by the Phase 10 enclousre.

Phase 7 (Fig.20)

The principal feature of the later phases within the excavated area was an enclosure 50 m across, defined on its northern side by ditch 3379 and on the west by ditch 63. These ditches had clearly been subject to recutting, but much of it would appear to be localised (sections d and e: Fig.21). There would appear to have been no realignment or overall recutting of the enclosure ditches. No southern limit was established by excavation, the north-south length being at least 55 m.

Unlike the earlier features of the Romano-British settlement the enclosure was directly parallel to the Shore fort and seems to represent a marked change in the character of occupation. The eastern boundary of the enclosure apparently respected the Phase 6 feature 3401 (section 1: Fig.21). This ditch could not be traced beyond the point indicated in Fig.20 and it seems possible that beyond this point feature 3401 was regarded as the eastern boundary of the enclosure - the Phase 7 ditch was certainly not present in the west-to-east trench to the south.

Ditches 3096 and 3088 (sections f and g: Fig.21) indicate some internal division of the enclosure at its northern end. The former, running north-to-south, was approximately central to the enclosure whilst the latter, which appeared to have been recut, did not emerge in the excavated area to the west and may have turned northwards to the east as ditch 3171 (section c: Fig.21). Two lengths of gully (1553 and 1662), aligned north-to-south, shallow and perhaps originally continuous, also suggest an internal division of some kind. The function of these ditch arrangements is uncertain.

To the west of the principal enclosure ditches 665 and 27 (sections h and i: Fig.15) appeared to form part of another. At its northern end ditch 665 turned westwards before butt-ending, enclosing within the angle a scatter of post-holes and a hearth tentatively interpreted as the site of a structure (structure 1529: p.36).

Phase 8 (Fig.20)

The western enclosure of Phase 7 was redefined by ditches 22 and 126 (sections g and i: Fig.15), in part recutting ditches 665 and 27. The eastern boundary of the enclosure was shortened, ditch 22 swinging north-west before butt-ending very much in the manner of its predecessor. This ditch would appear to relate to ditch 956/957, with which it apparently makes an entrance. This latter feature would appear to be an extension beyond the western boundary of the principal Phase 7 enclosure of ditch 72, a deep steep-sided ditch (section h: Fig.21) whose profile is untypical of the remainder of the Romano-British ditches. It is possible that ditch 72 is simply a further division

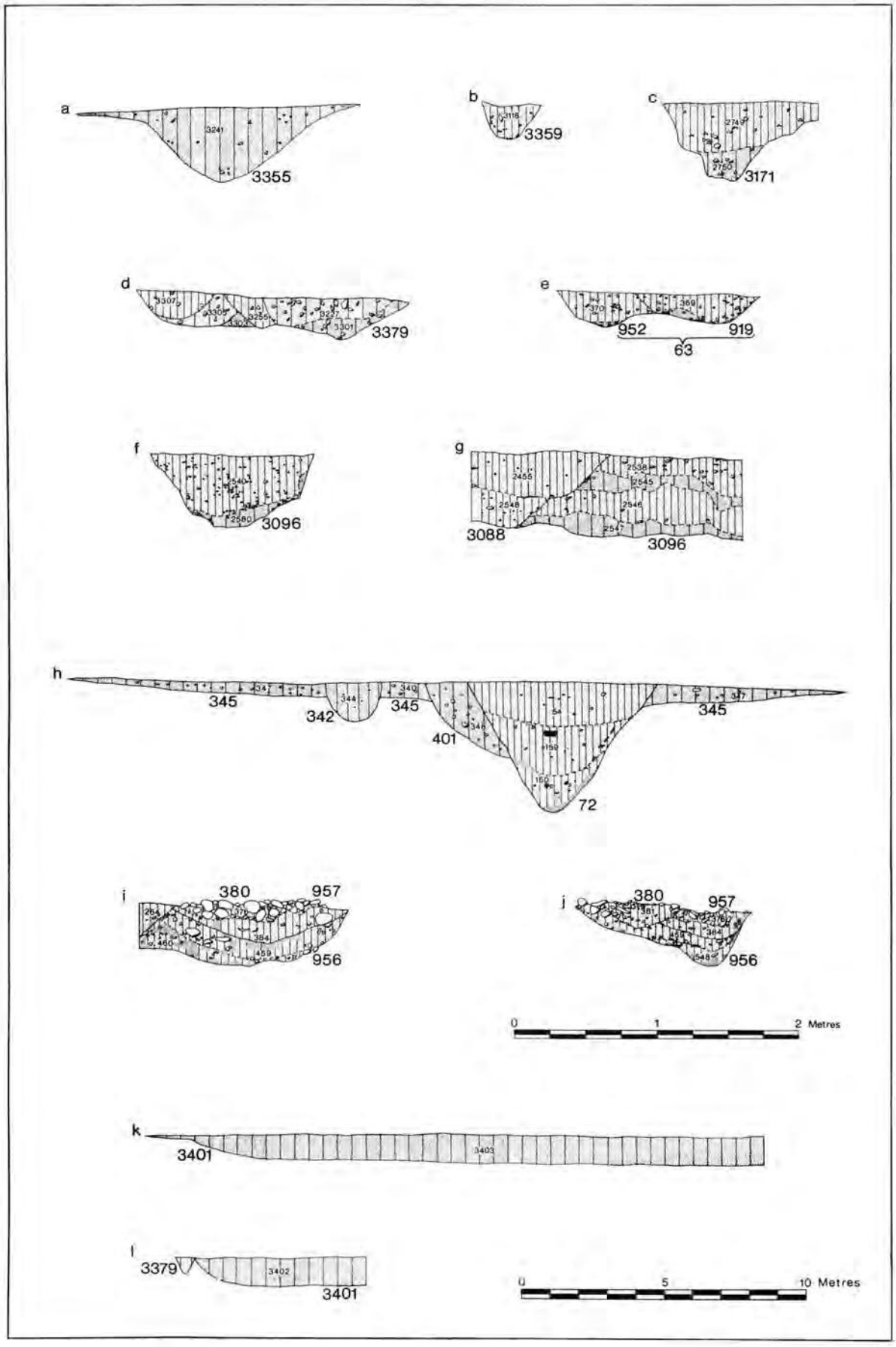


Fig.21. The 1977 excavations: ditch sections. Scale 1:40.

of the Phase 7 enclosure, although it was certainly cut at a time when ditch 63 had filled to a fairly high level. It is interesting to note that ditch 72 is, in fact, a recutting of the Phase 1 ditch 401 which was presumably still a recognisable feature at this time - an indication of the compressed chronology of all the features in the Romano-British occupation.

In the upper filling of ditch 956/957 was a mass of compressed chalk rubble (380/382; sections i and j: Fig.21). This material seems likely to have had a structural origin, although the manner in which it followed the angle of the ditch in which it was deposited would argue against its being a foundation in situ.

Cut into the upper filling of the Phase 7 ditch 63, and hence associated with the final phase of activity on the site, was an oven or kiln (289; Fig.22; Plate XI). This key-hole-shaped feature was composed of puddled compacted chalk with a shallow stoke-hole (891) at the southern end. The flue tapered as it ran northwards and there was evidence of burning on the base and sides of the flue, though this was fairly slight and insufficient to suggest intensive use. Whatever the function of this feature it would appear to have been positioned to take advantage of the shelter afforded by the silted-up ditch. There was no associated debris of any kind.

To the west of this feature, overlying the Phase 1 ditch 121 and probably assignable to this latest phase was what was probably a corn-drying oven (15; Fig.22; Plate X). This consisted of a stone-lined flue with a base composed of tegulae laid end-to-end. At the north-western end, adjacent to the stoke-hole, the oven had subsided into the filling of the earlier ditch and part of the upper platform of tiles, heavily burnt unlike the lower tiles, had survived the ploughing. The filling of the flue between the two layers of tiles was composed largely of burnt chalk. No trace of carbonised grain was found.

The final feature to be assigned to the final phase of Romano-British activity is a short length of ditch (51) running north-to-south and butt-ending within the excavated area. It may relate to ditch 956/957 and 22.

STRUCTURES IN THE ROMANO-BRITISH SETTLEMENT

There can be no doubt that the evidence for structures on the site had been gravely affected by ploughing. It is likely that all trace of structures whose construction did not entail deep penetration into the subsoil had entirely disappeared. The paucity of structural remains within the excavated area is not so much an indication that the area was never intensively occupied as a reflection of the insubstantial nature of many of the structures within the enclosures. The fillings of the ditches of Phase 1 to 5 throughout the excavated area contained quantities of material derived from occupation, and there was no evidence of the intensifying of such material in ditches adjacent to structures for which evidence survived.

In all, there was evidence for four recognisable structures within the excavated area. All were certainly of timber construction.

Structure 1557 (Phase 2: Figs.16 and 23: Post-hole sections: Fig.23)

A number of substantial post-holes formed a rectangle 10.5 m by 6 m (Plate VII). The north and south sides of the structure were marked by two parallel lines of five post-holes (one in the north-west corner is presumed to lie outside the excavated area). At the west end, two post-holes filled the gap between the corners whilst on the east an oval hollow (1282) occupied an equivalent position and may relate to the structure. The post-holes varied in form, but were generally circular, steep-sided and flat-bottomed (Fig.23). Several contained within their filling substantial quantities of flint, chalk,

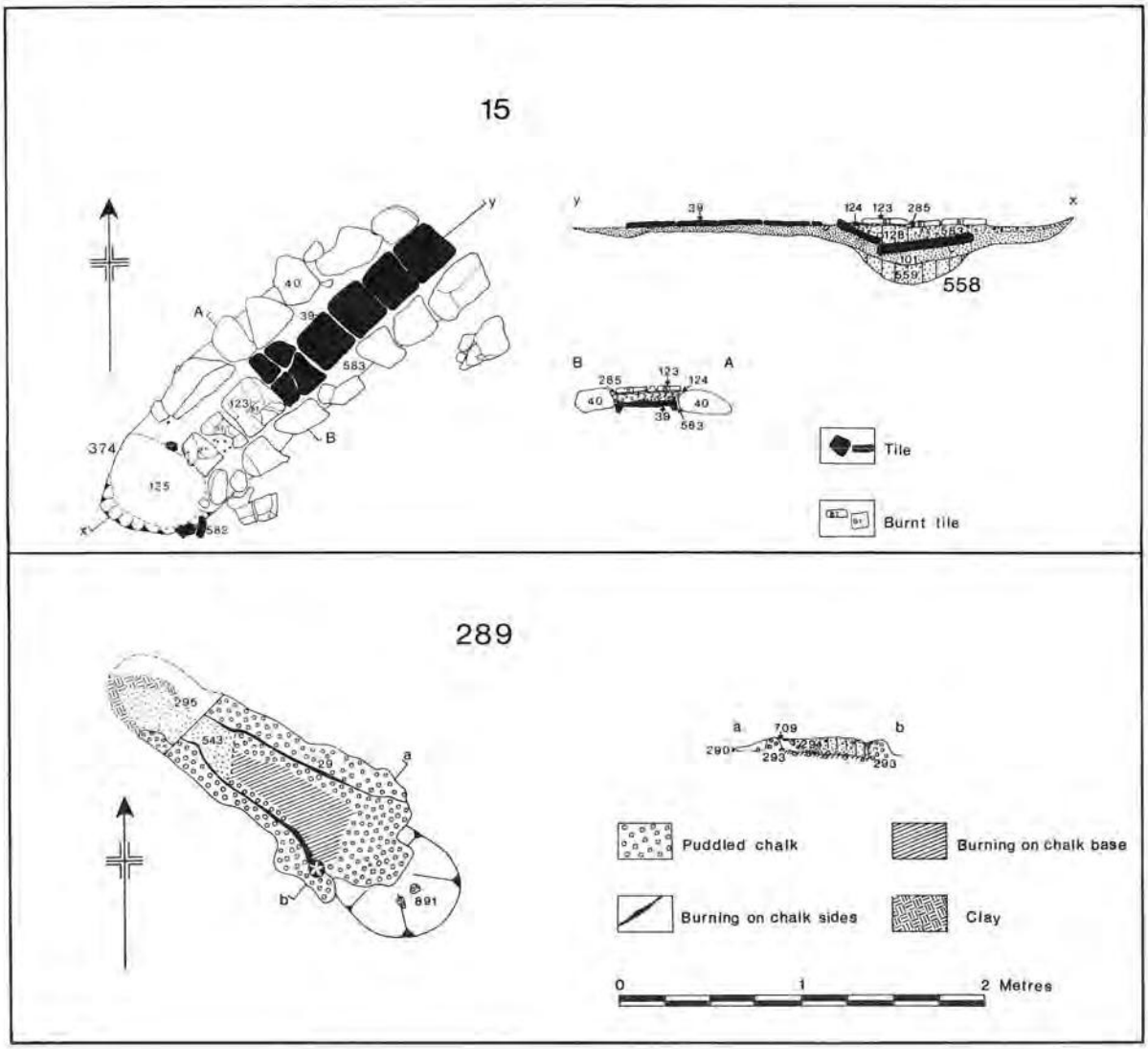


Fig.22. The 1977 excavations: features 15 and 289. Scale 1:40.

tile and mortar fragments. In four of the post-holes (1240, 1012, 1360 and, most notably, 2204 (Plate VIII) a clear post-pipe was visible - there would appear to be some variation in the size of post used. One post-hole, 1360, had been recut (1341).

There was no clear indication of an entrance into the structure although the lack of post-holes in the east side might suggest access to the interior was from this end. A scatter of post-holes lay around and within the structure, but none would appear to relate directly to the structure nor, in terms of any meaningful pattern, to one another. Two of the post-holes (1360 and 1240) contained fragmentary infant burials in their upper filling.

Structure 2398 (Phase 2: Figs.16 and 24: Post-hole sections: Figs.24 and 25)

The structure was defined by two lines of five substantial post-holes (one in the south-west corner is presumed to lie outside the excavated area) forming a rectangle 5.5 m by 12 m. Several of the post-holes showed a clear post-pipe in their fillings and, in three cases, a post-pad was provided at the base of the pit. In one case (2046) this was in the form of a number of small stones, in another (2388) one substantial stone, and in

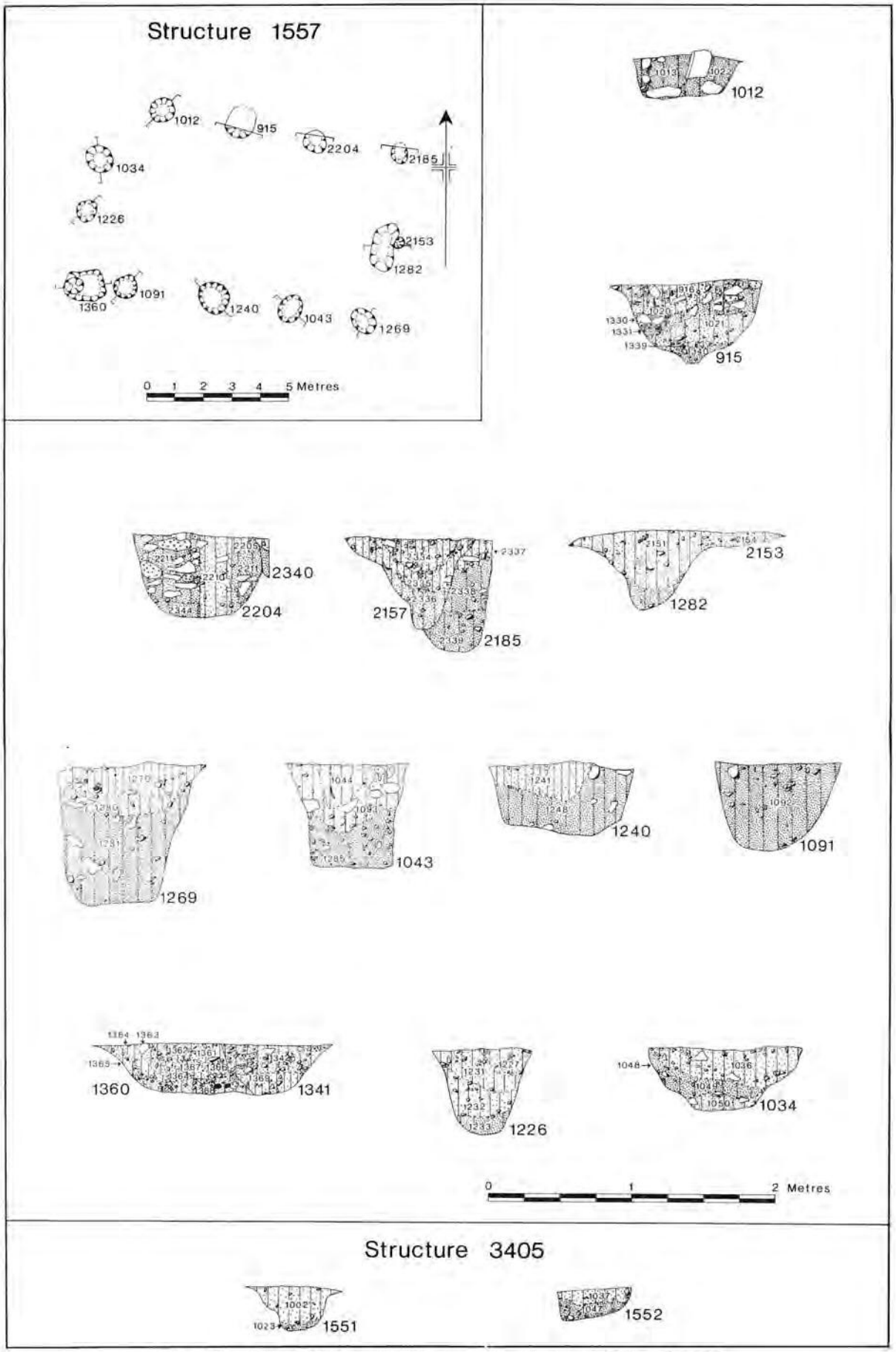


Fig. 23. The 1977 excavations: structures 1557 and 3405.
Scale plan 1:200, sections 1:40.

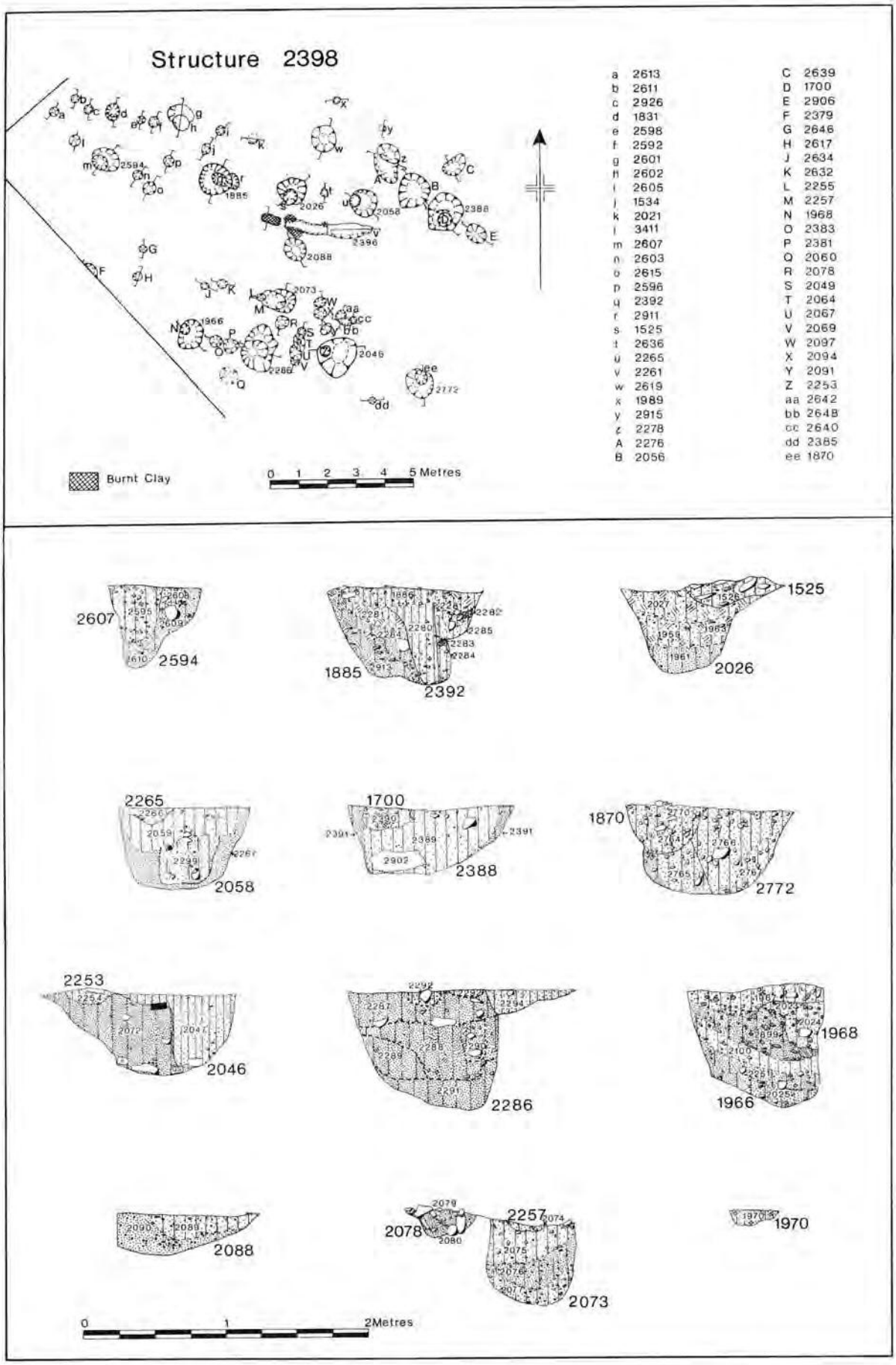


Fig.24. The 1977 excavations: structure 2398 pit sections.
Scale plan 1:200, sections 1:40.

the third (2286) a complete quern (Plate IX). Two post-holes (2073 and 2088) across the centre of the structure may represent part of the original structure.

The structure had been subject to periodic reconstruction. All the major original post-holes had had slighter post-holes inserted into their upper filling, whilst to the north of each line of major post-holes was a straggling line of slighter post-holes. These extended only half way along the northern line, where the post-holes cut the upper filling of the Phase 1 ditch 2931, and did not extend beyond post-hole 2046 in the southern line. It is unclear whether these post-holes represent some form of additional support for the original structure, or relate to a later structure of slighter construction is uncertain.

The structure overall is clearly similar in size and character of construction to structure 1557. The packing of post-hole 1885 contained a Severan coin.

Structure 3405 (Phase 5: Fig.19: Sections: Fig.23)

The structure was indicated by two parallel linear gullies, 1551 and 1552, running west-to-east 4 m apart. The length of the gullies was uncertain as both ran out of the excavated area to the east. Their western ends were obscured by the Phase 7 ditch 63. Gully 1551 was on average 65 cm wide and 30 cm deep with steeply sloping sides and a rounded bottom. Gully 1552 was rather more vertical-sided and flat-bottomed with an average width of 60 cm and a depth of 25 cm. The filling of neither gully showed any traces of post-pipes or packing and if the gullies are regarded as structural they must be seen as slots, somewhat weathered, for timber beams. The interpretation of these features as indicative of a structure at this point is somewhat tentative, but their form and situation within the site does tend to support such an interpretation. The presence of an inhumation burial (1031) adjacent and parallel to gully 1551 would also perhaps reinforce a structural interpretation, the burial lying under the eaves of the structure.

Structure 1529 (Phase 7: Figs.20 and 26: Sections: Fig.26)

Two linear scatters of post-holes defined an area 5 m across containing within it a hearth 209. The form of the structure is unclear - it was possibly sub-rectangular. The post-holes varied somewhat in shape and depth; a number contained the remains of packing in the form of large flints and tile fragments. The structure would appear to bear a close relationship to the Phase 7 enclosure ditch 665 which curved around it to the north. The successor of this ditch (22: Phase 8), butted against the structure which was presumably still in use. Also spatially associated with the structure was an oval pit (464).

ROMANO-BRITISH PITS

There were very few pits associated with the Romano-British occupation and those which were encountered were apparently fairly late within the sequence of occupation. The pits displayed little uniformity and their function is unclear. On a site of this kind it is unlikely that the pits were dug specifically for the disposal of rubbish and their form argues against their being quarries. Some of the pits had certainly been used for the disposal of rubbish at stages of their in-filling and the somewhat larger sherd size exhibited by the pottery in the pit fillings, when compared to that from the ditches, does suggest a different pattern of deposition.

Pit 1740 (Fig.27)

Pit 1740 was a circular feature 1.5 m in diameter which had ultimately developed a weathering cone measuring 2 m across. The pit was cut through the filling of the

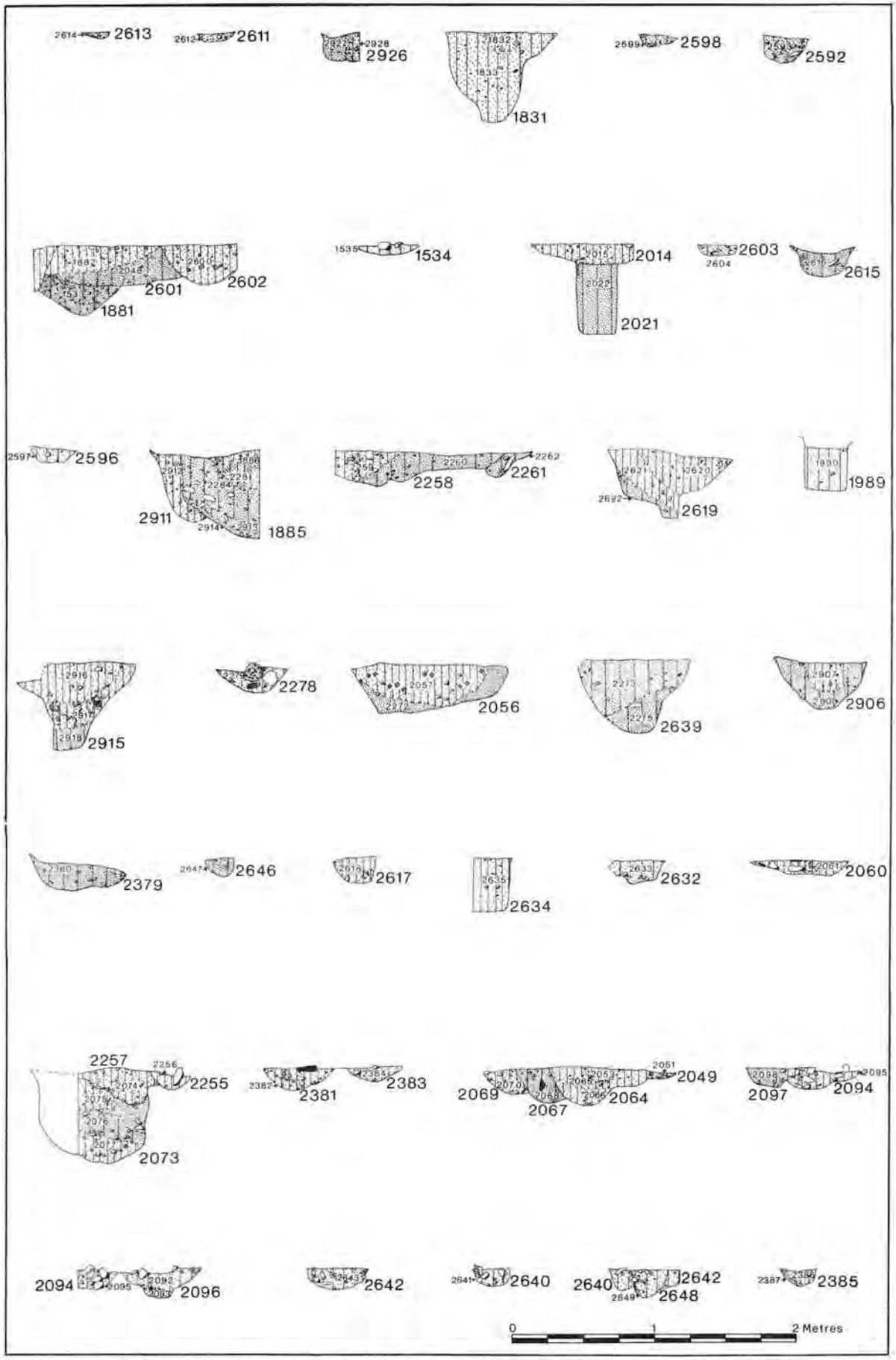


Fig.25. The 1977 excavations: structure 2398 pit sections. Scale 1:40.

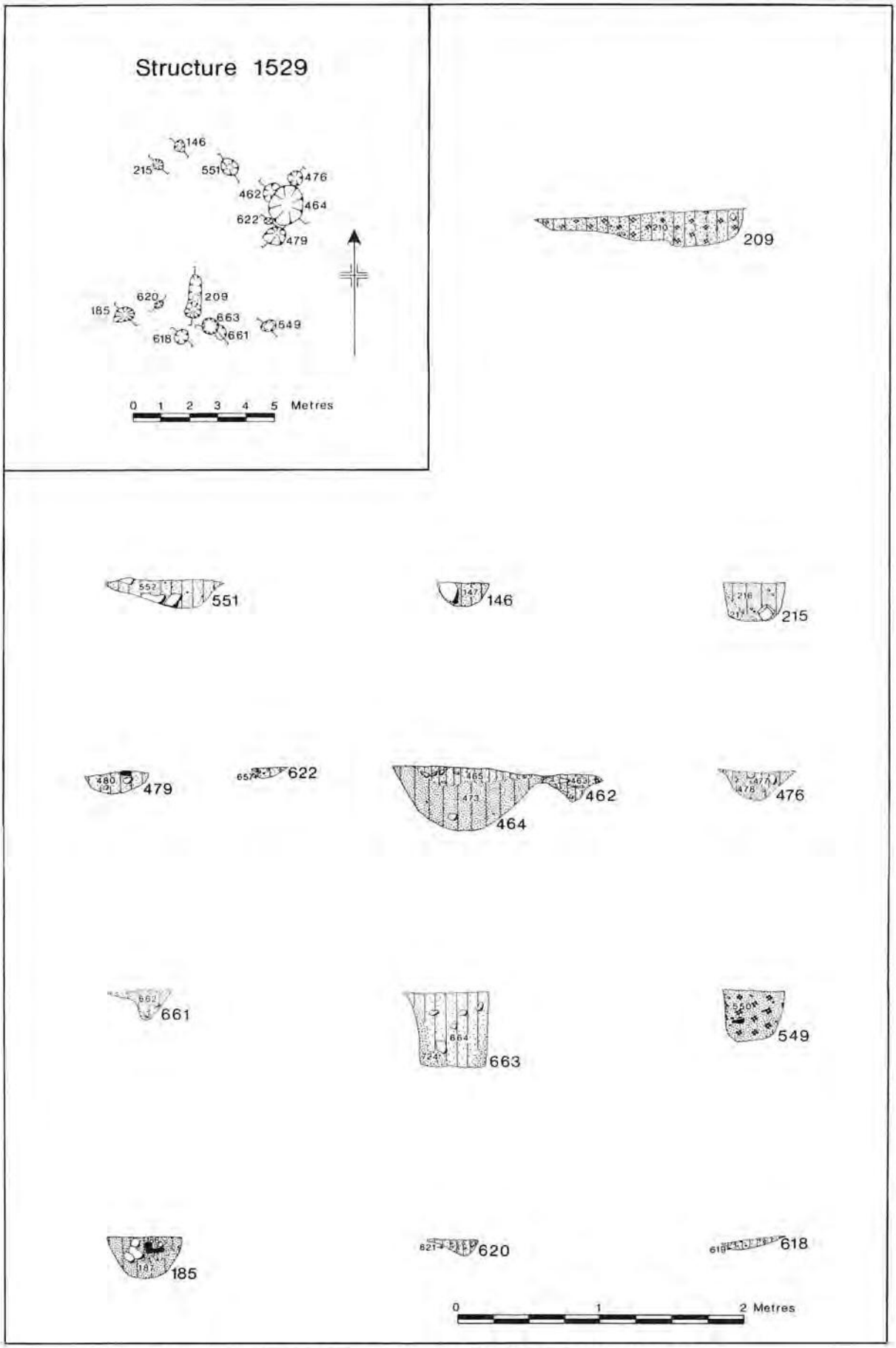


Fig.26. The 1977 excavations: structure 1529 pit sections.
Scale plan 1:200, sections 1:40.

north-to-south trackway ditch 2367 (Phase 2). The steep sides of the pit had collapsed, leaving a marked 'overhang' on the east side, at a time when very little accumulation had taken place at the base of the pit. The filling thereafter would appear to have been in the form of a gradual silting-in of occupation soil. The three upper layers of the pit (1741, 1751 and 1758: Fig.27) were, however, different in character and seem to represent deliberate dumping of rubbish. Layer 1751 was notable for the very considerable number of oyster shells which it contained. Pottery from these upper layers would suggest a date in the later third century. The surviving depth of the pit was 1.8 m.

Pit 91 (Fig.27)

Pit 91 was a flat-bottomed pit originally 1.5 m square which had developed a weathered profile due to the collapse of the upper part of its vertical sides, the collapsed natural sand forming a substantial part of the pit's filling. Very little occupation debris was recovered from this filling and the function of the pit was clearly not for the disposal of rubbish. Such pottery as was recovered would indicate a third-century date. The pit cut enclosure ditch 309 (Phase 1). The depth of the pit was 1.8 m.

Pit 1570 (Fig.27)

Pit 1570 was a large, circular pit with an irregular profile, 3.2 m in diameter and 1.4 m deep. The pattern of filling would appear to be very similar to that of pit 1740, with the upper three layers (1925, 1940 and 1941) containing quantities of domestic refuse. These layers may indeed represent a recutting of the upper part of the pit specifically for the disposal of rubbish. The pit cut the filling of the north-to-south trackway ditch 2366 (Phase 1) and was cut by pit 1926 (below). Pottery from the layers of refuse would suggest a third-century date.

Pit 1926 (Fig.27)

Pit 1926 was a small, flat-bottomed, sub-rectangular pit measuring 1.2 m by 75 cm. It was 60 cm deep and adjacent to pit 1570. The filling contained a quantity of animal bone, shell and potsherds including many large fragments of pottery. It would appear to be a genuine 'rubbish pit', dug for that purpose. If the upper filling of the adjacent pit 1570 was likewise recut for the disposal of rubbish, then pit 1926, which itself appears to have been recut (Layer 1932: Section e: Fig.27), may simply represent a further recutting of 1570, this point within the settlement having been established as a convenient place for rubbish disposal. The pottery recovered would suggest a date in the later third century.

Pit 1900 (Fig.27)

Pit 1900 was a subrectangular pit with steep-sloping sides and a rounded bottom. It measured 1.5 m by 1.45 m and was 85 cm deep. The pit cut enclosure ditch 2931 (Phase 1). The filling was of layers of fairly uniform sandy loam. Material recovered from this filling indicates a date in the second half of the third century.

Pit 114 (Fig.27)

Pit 114 was a roughly-square pit (1.8 m by 1.8 m) cutting through the fillings of a number of features, including enclosure ditch 126 (Phase 8). Its depth was 1.1 m. The filling was layers of loamy sand containing just a little pottery and bone, the former suggesting a date c. A.D. 300.

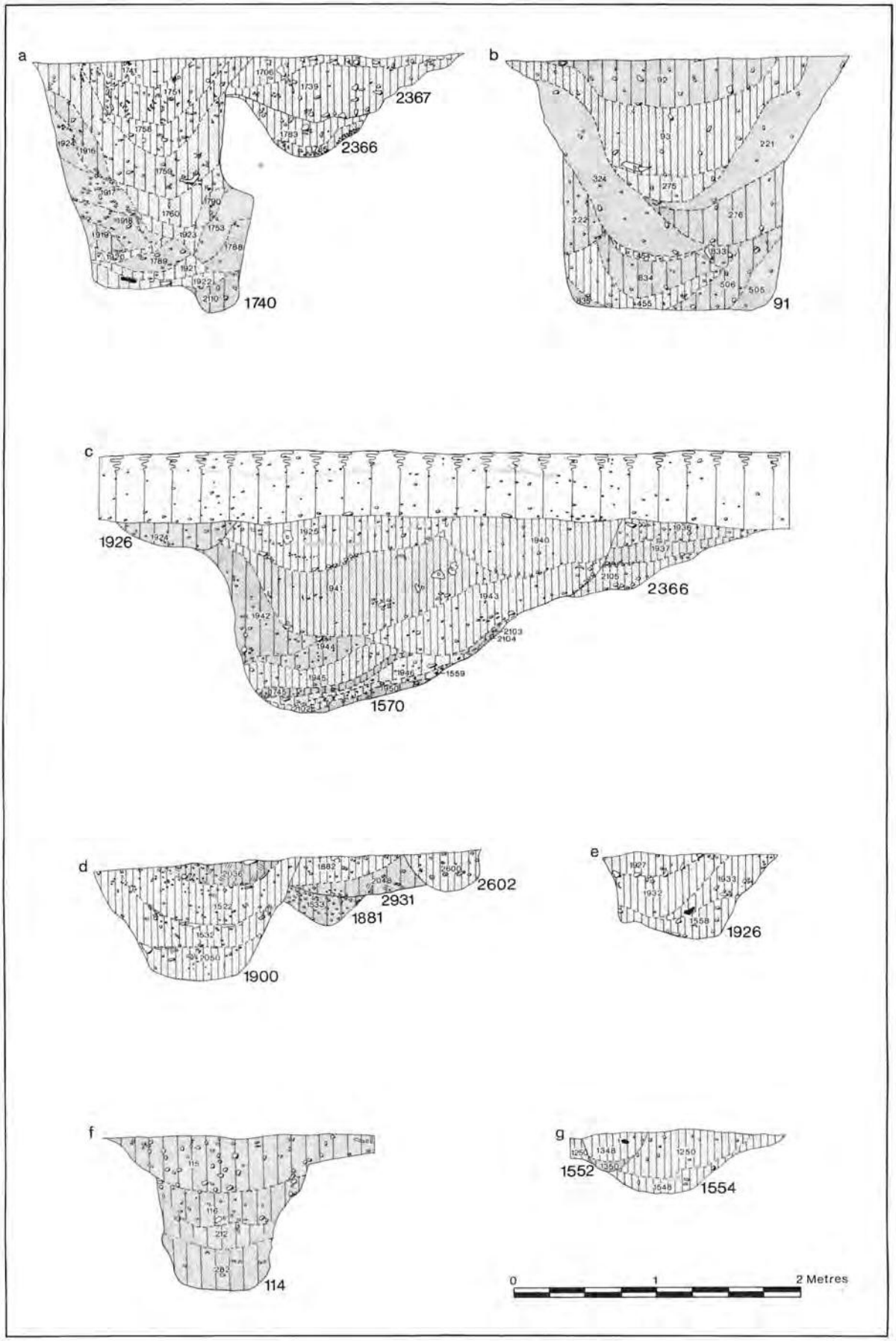


Fig.27. The 1977 excavations: pit sections. Scale 1:40.

Pit 1554 (Fig.27)

Pit 1554 was a large, ovoid feature whose upper filling was cut by gully 1552 (Structure 3405) and the late enclosure ditch 63. The pit was 45 cm deep with a rounded bottom and measured 3 m by 1.8 m overall. The little pottery recovered from the filling would seem to indicate a date in the late third century.

V. THE FINDS FROM THE 1974 AND 1977 EXCAVATIONS

For the purposes of this report finds from both excavations have been listed together. Finds from the 1974 excavations are prefixed by the reference 1002.BRC followed by the context number. Finds from the 1977 excavations are prefixed by the site code (13) followed by the context number and Ancient Monuments Laboratory number.

THE COINS FROM THE 1974 EXCAVATIONS
by Christopher Sparey Green

1. (1002.BRC.30) IVLIA DOMNA. Denarius. RIC IV pt I Septimius Severus 555. A.D. 196-211. Unworn. Context 30 (upper filling of boundary ditch, Area 2).
2. (1002.BRC.Unstratified) MARCUS AURELIUS. Sestertius. RIC III Antoninus Pius 1308. A.D. 152-153. Worn. From the ploughsoil.
3. (1002.BRC.Unstratified) Barbarous Radiate. Third century. Corroded. From the ploughsoil.

THE COINS FROM THE 1977 EXCAVATIONS
by Peter Curnow

1. (13.222.773435) Late first/early second century (?DOMITIAN). Sestertius. From the filling of Pit 91.
2. (13.2111.773887) HADRIAN. Sestertius. A.D. 117-138. From the ploughsoil.
3. (13.1342.773615) FAUSTINA I (Posthumous Issue). Sestertius. Rev. ?[AUGUSTA]. A.D. 141-161. From the filling of post-hole 1341 (Structure 1557; Phase 2).
4. (13.100.773325) FAUSTINA II. Sestertius. Rev. HILARITAS S C. RIC 1642. A.D. 161-180. From the filling of ditch 49.
5. (13.711.773493) SEPTIMIUS SEVERUS. Denarius hybrid. Rev. PR [INC.I] VENT. A.D. 200-202. From the ploughsoil.
6. (13.2281.774118) JULIA AUGUSTA. Denarius. Rev. VENUS FELIX. RIC 646. A.D. 196-202. From the filling of post-hole 1885 (Structure 2398: Phase 2).
7. (13.54.773380) ELAGABALUS. Denarius. Rev. VICTOR ANTONINI AUG. A.D. 218-222. From the filling of ditch 72 (Phase 8).
8. (13.1007.773880) GALLIENUS. Antoninianus. Rev. PAX AUG. RIC 256. A.D. 259-268. From the ploughsoil.
9. (13.2696.774156) CLAUDIUS II. Antoninianus. Rev. ? [VIRTUS AUG] . RIC 109. A.D. 268-270. From the filling of ditch 3377 (Phase 7).

THE SMALL FINDS FROM THE 1974 AND 1977 EXCAVATIONS
by Christopher Sparey Green and John Hinchliffe, with contributions by Sarnia Butcher and Donald Mackreth

Objects of Copper Alloy
(Figs. 28-31)

1. (13.1741.773737) Circular harness fitting with enamel inlaid decoration. In Fig.28 A = white with blue decoration and red centre; B = green with white centre within blue circle; C = blue with white central 'flower'.

A central stud at the rear is provided for attachment; cf.Richborough I (Bushe-Fox 1926, plate XIII, no.10): from the upper filling of pit 1740.

2. (13.3227.774116) Penannular brooch: from the upper filling of ditch 3379 (Phase 7). Sarnia Butcher writes:

A penannular brooch of maximum diameter 30 mm. The surface metal shows white on both front and back, except for a yellow patch at the point where the pin attachment seems to have rested. Milliprobe analysis by Justine Bayley confirms the presence of tin on the surface in both the white and yellow areas. The ring is of flat section and its upper surface is ribbed. The terminals are probably cast although they have a groove at the sides, perhaps reminiscent of terminals formed of the end of the ring being turned back upon itself. Their decoration is faintly zoomorphic; diagonal grooves suggesting eyes and ears, and a moulded snout. The pin which is of different coloured metal (now with a green patina) is flattened at one end where it is wrapped round the ring. Milliprobe analysis detected copper (only) in the pin.

There has been much discussion of the typology of zoomorphic penannular brooches and their antecedents, particularly as a type-fossil of the post-Roman period (Fowler 1960; Kilbride Jones 1936 and 1937; Savory 1956). There is a parallel for the present example from Lydney (Wheeler and Wheeler 1932, fig.14, no.38) which must date from the fourth century, and another from Birdoswald (Richmond 1931, fig.4, no.3D) in a deposit dated A.D. 369-83. Other parallels from the studies already cited would fit in with this date although the type as a whole goes back to the first century (cf. Hod Hill, Brailsford 1962, fig.11, nos.E16-E17) but at that stage the animal features had not emerged.

3. (1002.BRC.20) Brooch, Colchester derivative. From the filling of boundary ditch 20, Area I (Late third or early fourth century). Donald Mackreth writes:

The spring was held to the body by means of an axis bar through the coils which passed through the lower hole of a plate projecting behind the head of the bow. The chord passed through an upper hole in the same plate which was carried over the head and formed to look like the hook on a Colchester type brooch. The wings are plain and have a curved section in order to seat the spring. The bow tapers towards a foot, now missing. The hook-like moulding lies on a ridge which runs down the bow and dies out into a groove. On either side of these elements the surface of the bow is sharply concave. This brooch appears to be closely related to a type which has a main distribution area in Suffolk, Essex and Herts, but with outliers further north, west and south, cf. Camulodunum (Hawkes and Hull 1947, 311, pl.xci.41) and Verulamium (Wheeler and Wheeler 1936, 207, fig.44, nos.22). The imitation hook is more carefully modelled on the present specimen than is usual on the main type. The date is slightly problematical in that the type was clearly in being very soon after the Conquest; it is the commonest type at Camulodunum (Hawkes and Hull 1947, fig.44, nos.36, 37, 44 and 51 in Period IV, A.D.49-60) and is the only Colchester Derivative in the remarkable collection from Skeleton Green, Puckeridge, Herts (Partridge 1981, fig.69, no.25, 139-140). There is also a silver example from the La Tène cemetery at King Harry's Lane, St.Albans, dated by the other objects in the grave to c. A.D.35-55 (information from Miss V.Rigby to whom I am grateful). It would appear that there is a strong possibility that the type had begun to evolve before the Roman Conquest, but it is not clear how long it lasted. I suspect that none was being made by A.D.75.

4. (1002.BRC.35) Trumpet brooch: from the filling of boundary ditch 35, west side of enclosure, Area 2 (fourth century). Donald Mackreth writes:

Of standard form, the head is plain apart from a groove around the expansion itself. The central ornament consists of a central moulding with four 'petals' above and below, and the whole is separated by flutes from a pair of cross-mouldings where the rest of the bow joins this central element. The lower bow has a groove down each side and a central arris, and tapers to a foot-knob consisting of three mouldings. The spring, now missing, was held to the body of the brooch by a lug

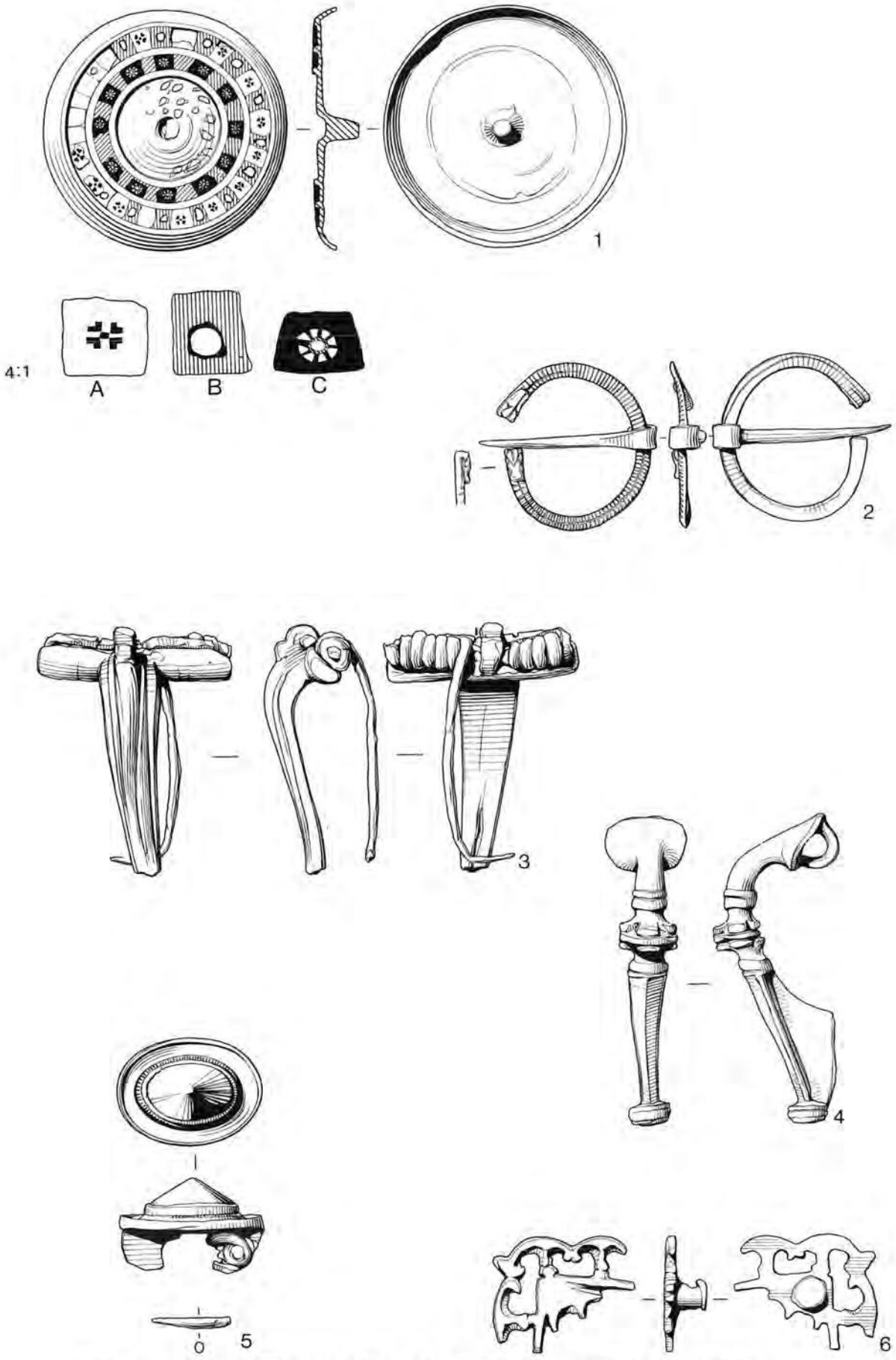


Fig. 28. Objects of copper alloy 1-6. Scale 1:1, except 1 A, B and C: 4:1.

cast on behind the head of the bow.

The Trumpet was once regarded as being the second-century brooch par excellence, but it is now known that the type had fully developed before the last quarter of the first century A.D. Dateable examples of any kind of brooch are usually hard to find. In the present case, the Roman fort at the Lunt, Baginton, Warwicks., has produced two brooches which demonstrate this early development (Hobley 1967, 110, fig.19.9; Hobley 1973, 66, fig.19.8). The second of these is very like the present specimen, but both of the Baginton brooches have a lower bow which follows through the curve of the upper part, whereas the normal lower bow is either straight, as in the Brancaster example, or displays a recurve. Whether this is a characteristic which may be used to distinguish between 'early' and 'late' brooches has yet to be established.

5. (1002.BRC.50) Plate brooch: from the filling of boundary ditch 50, subdividing enclosure, Area 2. Donald Mackreth writes:

An oval plate with a raised border and central boss in which is set a conical piece of dark coloured glass. In the zone between the border and boss is a series of stamped crosses occupying the outer half of the available space. Each stamp leaves a relieved cross set diagonally in a square. Around the central boss is a step with a beaded top. The whole of the front metal face of the brooch is gilded. The pin is fastened to the brooch by an axis bar through the three coil, internal chord spring and a single pierced lug behind the plate.

Such brooches are fairly common and are generally regarded as being fourth century (Bushe-Fox 1949, 121, plate XXXI, no.63; Bushe-Fox 1928, 42, plate XVII, no.9), but well dated specimens are rare. Two were found at Zugmantel (Saalburg Jahrbuch, Bericht des Saalburg Museums, 1972, XXIX, 110, 1132, 1133, taf.29), which, on coin evidence, was judged to have been abandoned about the middle of the third century. However, one coin of the earlier fourth century seems to have been found (Saalburg Jahrbuch, Bericht des Saalburg Museums, 1972, XXIX, 10, n.13) which places a little doubt on the closed nature of the brooches found, except that, with two specimens and the unlikelihood that brooch finds should outnumber coins, a date as early as the middle of the third century or even before, may be accepted for the start of the type. The type runs into the fourth century although it is not clear how far. Gilding is specifically a late characteristic and persists to the end of the fourth century, if not beyond (Clarke 1979, 263).

6. (13.1512.773687) Part of an openwork belt fitting with fixing stud on the back: from the filling of ditch 1334 (Phase I).
7. (13.2778.773897) Strip with incised circular decoration: the central perforation is presumably for attachment to wood or leather: from the filling of ditch 2366 (Original cutting of the eastern ditch of the north-to-south trackway; Phase I).
8. (13.1294.773611) Bracelet of twisted wire with hook (broken) and eye fastening: cf. Richborough 4 (Bushe-Fox 1949, plate XLIX, no.177): from the filling of ditch 2371 (third recutting of the southern ditch of the west-to-east trackway; Phase 4).
9. (13.2187.773876) Bracelet of twisted wire with hook and eye fastening: from the filling of ditch 2342 (Phase 6).
10. (1002.BRC.21) Bell with loop for suspension and iron clapper: (cf. Kenyon 1948, 260, no.7): from the upper filling of boundary ditch 21, Area I (third century).
11. (13.1806.773722) Ligula with decoration at the base of the scoop: cf. Winterton (Stead 1976, fig.110, no.99): from the rubble spread 1805.
12. (13.54.773321) Ligula: from the filling of ditch 72 (Phase 8).
13. (1002.BRC.39) Pair of tweezers with ring for attachment to chatelaine: from ditch 39, the main boundary ditch, west side of enclosure, Area 2.
14. (13.2231.773905) Nail cleaner: Milliprobe analysis by Justine Bayley indicates that the white surface coating on the metal was apparently a tin-base metal, though whether this is tin or a tin/lead cannot be said for certain. From the filling of ditch 3160 (Phase 5).
15. (13.2778.774155) Toilet implement with two zones of incised decoration at the base:

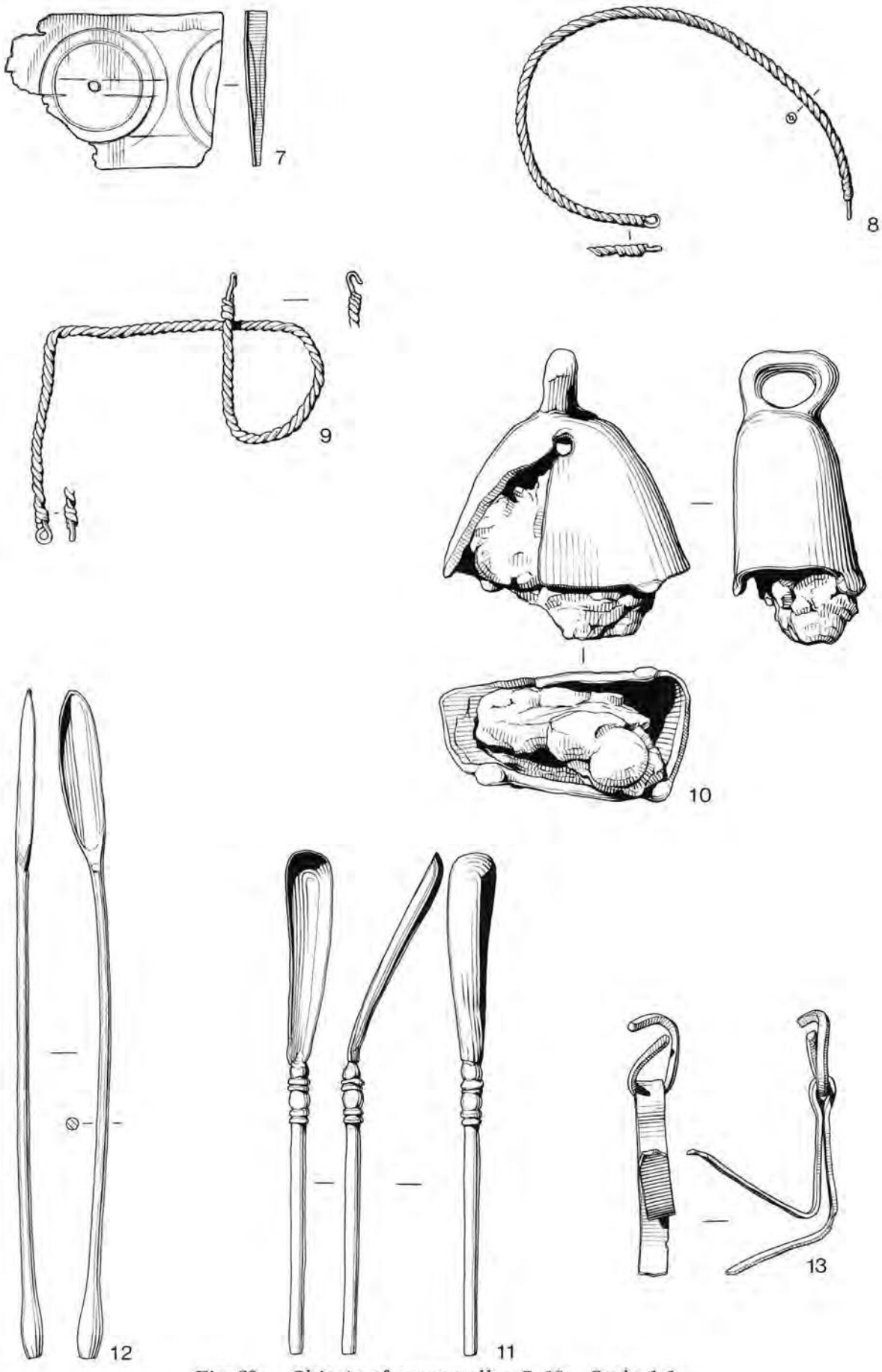


Fig.29. Objects of copper alloy 7-13. Scale 1:1.

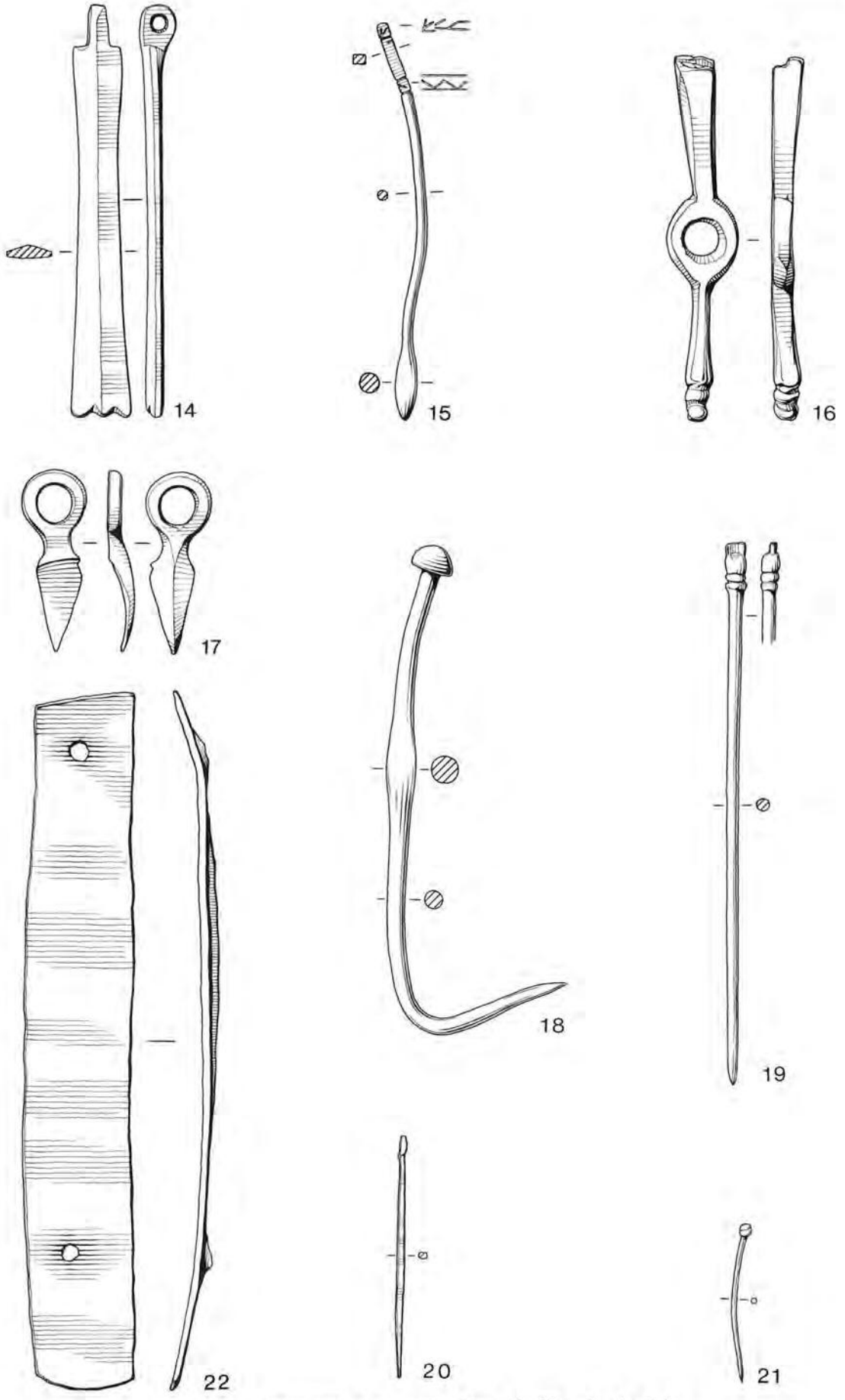


Fig.30. Objects of copper alloy 14-22. Scale 1:1.

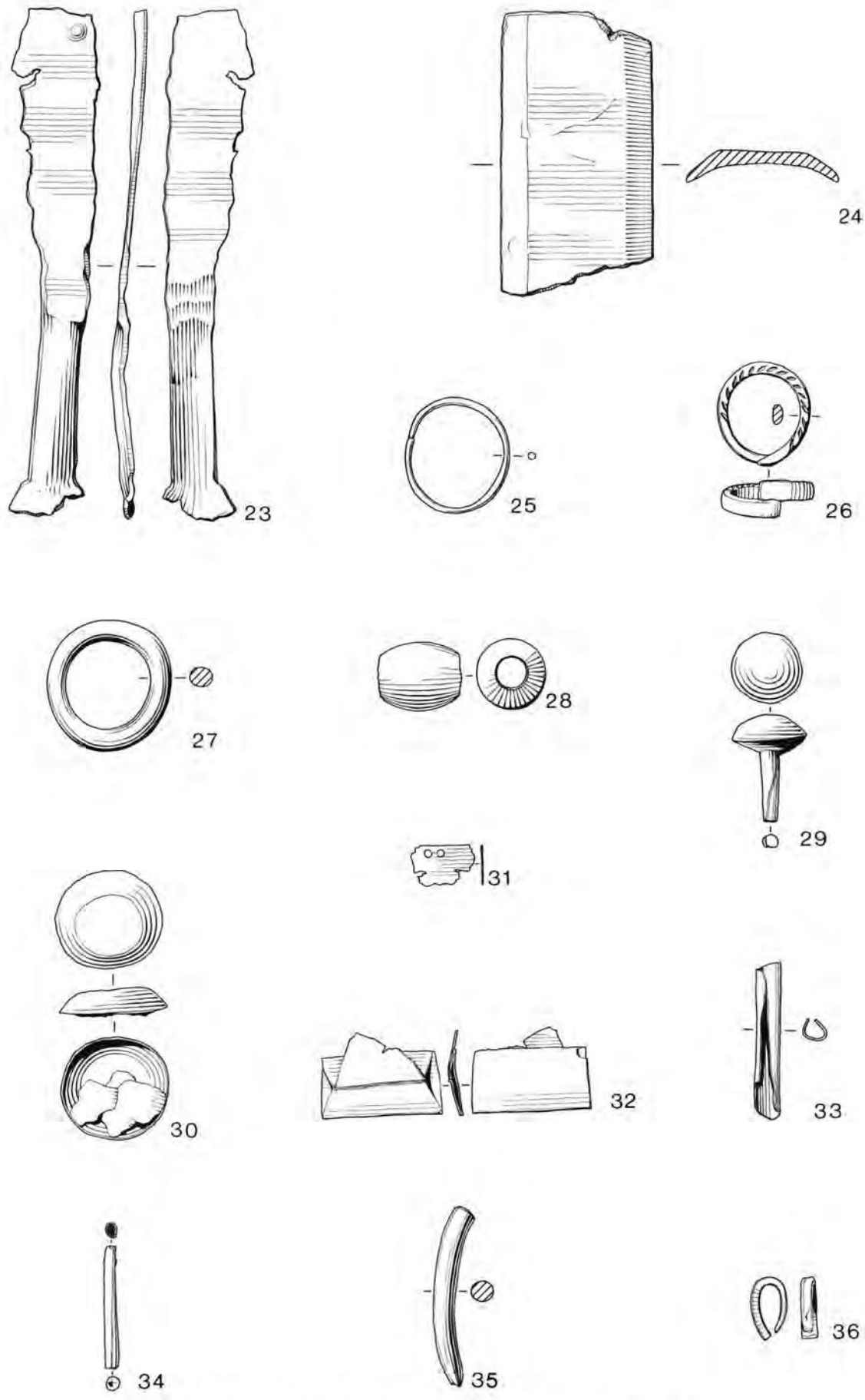


Fig.31. Objects of copper alloy 23-36. Scale 1:1.

from the upper filling of pit 1570.

16. (1002.BRC.38) Strap-end less the split and rivetted end for attachment to leather: parallels at Cramond (Rae and Rae 1974, 194, no.5) and Newstead might suggest a second or third century date.
17. (13.2917.774124) Nail cleaner with loop at one end and a short, curving leaf-shaped blade: cf. Winterton (Stead 1976, fig.110, no.104): from the middle filling of ditch 2931 (Phase I).
18. (13.2129.774014) Dome-headed pin with bulbous thickening on the shaft. An example from Winterton (Stead 1976, fig.106, no.76) has a similar head. From the upper filling of ditch 3401 (Phase 6).
19. (13.3217.774013) Stylus: from the upper filling of ditch 3300 (Phase 2).
20. (13.1007.773909) Pin, square in section: from ploughsoil.
21. (13.1258.773596) Pin, with twisted spherical head: from the upper filling of ditch 1104 (western ditch of the north-to-south trackway; Phase I).
22. (13.1007.773899) Strip, perforated at either end for attachment to wood or leather: from ploughsoil.
23. (13.1804.773723) Strip, somewhat damaged: ? apron mount cf. Longthorpe (Frere and St.Joseph 1974, fig.28, no.46): from the upper filling of ditch 2938 (recutting of the western ditch of the north-to-south trackway; Phase 2).
24. (1002.BRC.Unstratified) Simple moulded applique strip: from the ploughsoil, Area I.
25. (13.1007.773904) Finger ring: from the ploughsoil.
26. (13.1007.773903) Spiral finger ring or possibly ear-ring with slashed decoration: cf. (for ear-ring) Longthorpe (Frere and St.Joseph 1974, fig.32, no.77) and Wroxeter 3 (Bushe-Fox 1916, plate XXI, fig.1, no.8): from the ploughsoil.
27. (13.54.773376) Solid ring, ? from harness: from the filling of ditch 72 (Phase 8).
28. (13.2111.773907) Melon-shaped bead with longitudinal ribbing: from the ploughsoil.
29. (13.1007.773908) Head of pin: from the ploughsoil.
30. (13.1714.773724) ? Stud with lead or solder attached to the interior surface: from the filling of medieval ditch 1104 but presumed to be derived from the Romano-British occupation.
31. (13.2119.774035) Fragment of lorica squamata: cf. examples from Ham Hill (Webster 1958, plate XLc, no.105) and Chester (Droop and Newstead 1931, plate XLVIII, no.83): from the upper filling of ditch 3401 (Phase 6).
32. (13.1007.773898) Folded binding: from the ploughsoil.
33. (13.54.773341) Fragment of tube formed of a folded strip: from the filling of ditch 72 (Phase 8).
34. (13.64.773329) Thin tube, possibly a lace tag: from the filling of ditch 51 (Phase 8).
35. (13.160.773347) Curving rod, tapering at one end - possibly a buckle pin: from the lower filling of ditch 72 (Phase 8).
36. (13.3179.774153) ? Ear-ring: cf. Hod Hill (Richmond 1968, fig.57, no.35): from the filling of ditch 3360 (Period 3 - Iron Age).

Objects of Iron
(Figs.32-6)

Missile heads (Nos.37-45) Missile heads recovered from the site can be divided into two categories on the basis of their form. Both had apparently been designed to fit wooden shafts and possessed tapering points square in section. The first group (Nos. 37-39) had broad, square-sectioned heads tapering quite sharply, with a broad socket projecting immediately from the base of the head to take a shaft c. 10 mm in diameter. The second group (Nos.40-45) possessed narrower, more gently tapering points, a neck of solid metal beneath the head and a narrower socket - generally c. 5 mm in diameter. In some cases, most notably in 40, 42 and 45, the tapering sides of the head had linear indentations.

37. (13.1741.773767) Ballista bolt: cf. Longthorpe (Frere and St.Joseph 1974, fig.41, no.9) and Hod Hill (Richmond 1968, fig.58, no.AIb): from the upper filling of pit 1740.
38. (13.1007.773960) Ballista bolt: from ploughsoil.
39. (13.54.773352) Ballista bolt: from the filling of ditch 72 (Phase 8).
40. (13.1371.773651) Ballista bolt/arrowhead: from the filling of gully 1552 (Phase 5).
41. (13.814.773604) Ballista bolt/arrowhead: from rubble spread 813.
42. (13.1267.773741) Ballista bolt/arrowhead: from lower ploughsoil horizon.
43. (13.2389.774038) Ballista bolt/arrowhead: from the filling of post-pit 2388 (Structure 2398; Phase 2).
44. (13.2119.773976) Ballista bolt/arrowhead: from the upper filling of ditch 3401 (Phase 6).
45. (13.1267.773740) Ballista bolt/arrowhead: from lower ploughsoil horizon.
46. (13.135.773642) Spoon bit: from the filling of ditch 809 (Phase 3).
47. (13.2039.774114) Bit: from the middle filling of ditch 2937 (Phase 1).
48. (13.66.773447) Bit: cf. Hofheim (Ritterling 1913, taff.XX, no.33): from the filling of ditch 518 (Phase 5).
49. (13.47.773685) (?) Awl: from ploughsoil.
50. (13.2111.773952) Socketed spearhead, fractured across the blade: cf. Longthorpe (Frere and St.Joseph 1974, fig.40, no.5): from ploughsoil.
51. (13.2230.773951) Dagger with tanged hilt: from the filling of ditch 3158 (Phase 3).
52. (13.1007.773931) Tip of (?) dagger: from ploughsoil.
53. (13.47.773715) Cleaver blade with tang: from ploughsoil.
54. (13.1165.773587) Part of a socketed cleaver blade: from the filling of post-hole 1189.
55. (13.13.773974) Cleaver blade with tang: from lower ploughsoil horizon.
56. (13.1.773306) Fragment of cleaver blade: from ploughsoil.
57. (13.47.774064) Knife blade with tang: from ploughsoil.
58. (13.2119.773996) Fragment of knife blade: from the upper filling of ditch 3401 (Phase 6).
59. (13.47.773665) Fragment of knife blade: from ploughsoil.
60. (13.1.773338) Fragment of knife blade: from ploughsoil.
61. (13.3002.774062) One blade of a pair of shears: cf. Winterton (Stead 1976, fig.118, no.179): from the filling of ditch 3353 (Phase 4).
62. (13.1751.773716) Razor: from the upper filling of pit 1740.
63. (13.1025.773591) Folding razor with socketed handle of copper alloy.
64. (13.1268.773809) Folding razor: from lower ploughsoil horizon.
65. (13.1263.773613) Blade of folding razor: from upper ploughsoil.
66. (13.711.773492) Part of sickle with tanged handle: from ploughsoil.
67. (13.455.773529) Stonemason's chisel: from the lower filling of pit 91.
68. (13.2600.774154) Flesh-hook, double-pronged with spiralling twisted shaft, square in section: from the filling of post-hole 2602 (Structure 2398; Phase 2).
69. (13.1268.773760) Awl, square in section, with bone handle: from lower ploughsoil horizon.
70. (13.211.774078) Part of the head of a small hammer: from ploughsoil.
71. (13.2535.773991) Cattle goad: to take shaft 10 mm in diameter: from the filling of ditch 3168 (Phase 8).
72. (13.3179.774111) Calthrop: cf. Wroxeter 2 (Bushe-Fox 1914, fig.8, no.2): from the filling of ditch 3360 (Phase 3 - Iron Age).
73. (13.445.773452) Key with square shaft terminating in ring: from the filling of gully 1662 (Phase 7).
74. (13.1802.773738) Key with round shaft and square-sectioned handle, turned over at the end to form a simple ring. A collar of two rings separates shaft and handle: from the filling of ditch 2938 (recutting of the western ditch of the north-south trackway; Phase 2).
75. (13.1268.773785) Key with round shaft widening out into a square-sectioned handle,

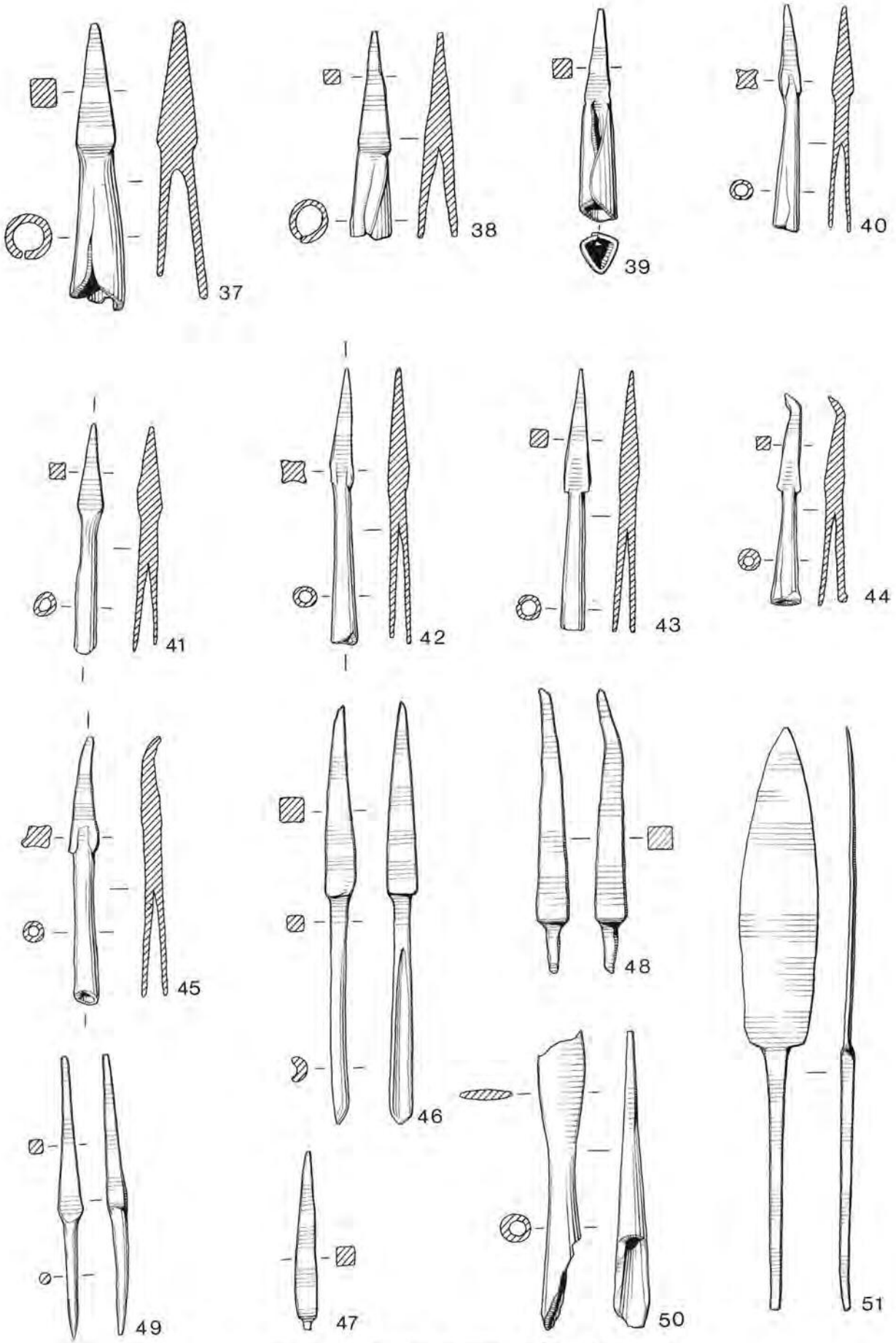


Fig.32. Objects of iron 37-51. Scale 1:2.

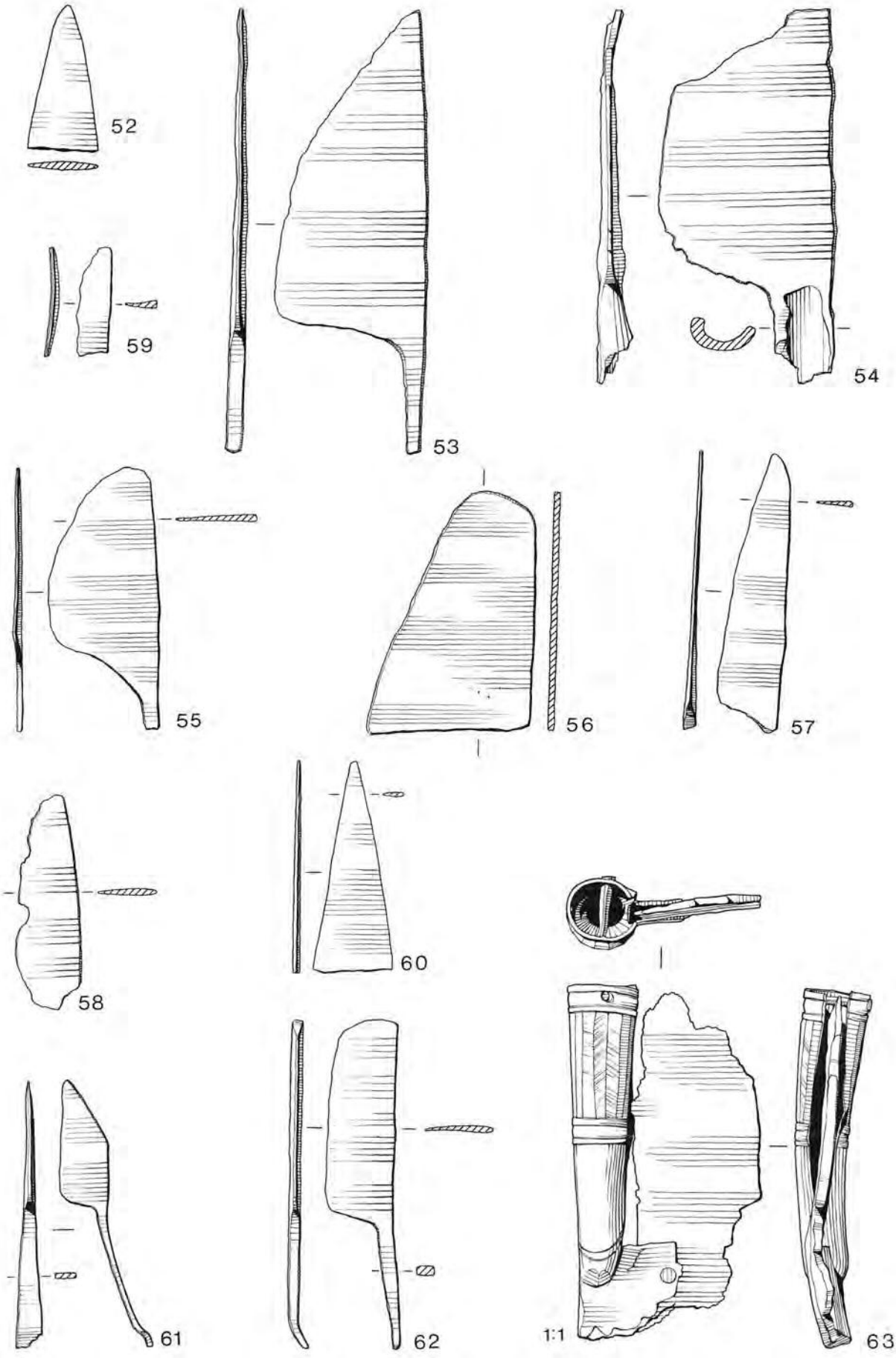


Fig.33. Objects of iron 52-63. Scale 1:2, except 63 1:1.

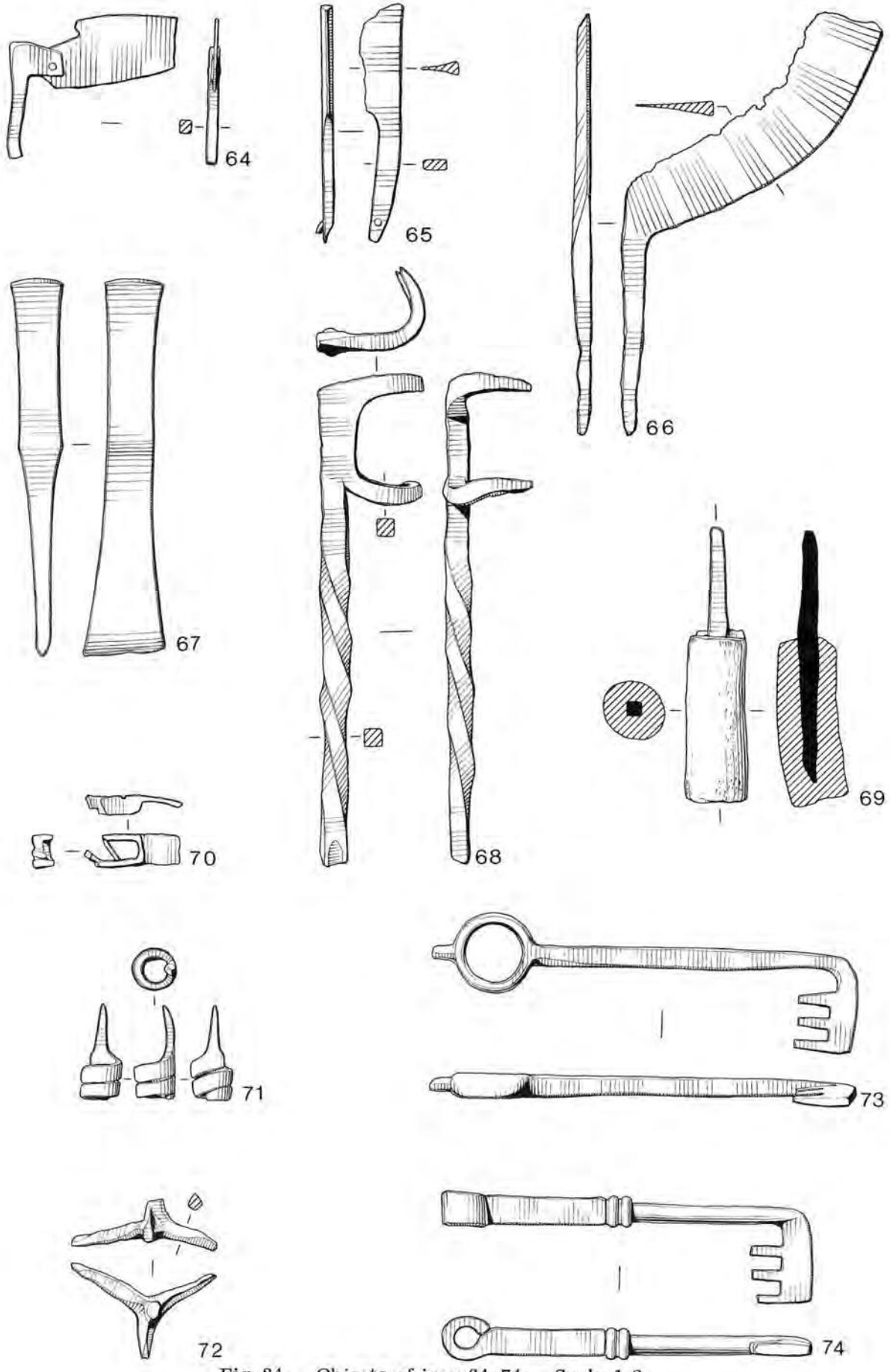


Fig.34. Objects of iron 64-74. Scale 1:2.

turned over at the end to form a simple ring: from the lower ploughsoil horizon.

76. (13.1264.773649) Small key with square-sectioned handle terminating in a ring (broken): from upper ploughsoil.
77. (13.1007.773831) Stylus, round in section, decorated with four zones of inlay. Milliprobe analysis indicates that the decoration at the head of the implement, consisting of three narrow rings of inlay with a fourth, broader band encroaching on the collar was of brass. There were two similar zones of brass inlay, each composed of three narrow rings, further down the body. The other zone, 7 mm broad, of criss-cross decoration 20 mm above the collar is of inlaid silver: from ploughsoil.
78. (13.2660.774043) (?) Stylus: from the filling of ditch 3088 (Phase 7).
79. (13.1007.773831) (?) Stylus: from ploughsoil.
80. (13.3264.774122) Part of a (?) handle consisting of an apparently solid rod 4 cm long and just under 10 mm in diameter attached at right angles to a tube 15 mm in diameter showing no signs of curvature within its surviving length (3 cm). The rod terminates in a solid ring 2 cm in diameter: from the upper filling of ditch 3298 (Phase 1).
81. (13.54.773340) Sidelink from a bit consisting of a flat upright plate tapering at each end to terminate in two roughly oval plates, each pierced centrally by a square hole for attachment. The holes are each 4 mm across: cf. Rogerson 1977, fig.61, no.1: from the filling of ditch 72 (Phase 8).
82. (13.1897.773810) (?) Latch-lifter: cf. Hofheim (Ritterling 1913, taff.XIX, no.39): from the upper filling of ditch 2931 (Phase 1).
83. (13.384.773446) Link from a double-link horse bit: from the lower filling of ditch 72 (Phase 8).
84. (13.2886.774071) Ring, possibly a penannular brooch lacking the pin, consisting of a single rod twisted round so that the terminals adjoin: diameter 2.5 cm: from filling of ditch 3379 (Phase 7).
85. (13.2916.774125) Oval ring, round-sectioned: from the upper filling of ditch 2931 (Phase 1).
86. (13.1007.773887) Strip, 25 mm wide with surviving length of 14 cm, pierced by two circular perforations 8 mm in diameter, one at the point of fracture: from ploughsoil.
87. (13.157.773356) Strip with attached barb: from the upper filling of ditch 51 (Phase 8).
88. (13.2159.773857) Strip, 2 cm wide, perforated by two square holes 7 mm across: from the upper filling of ditch 2360 (Phase 7).
89. (13.724.773546) Strip, terminating in a circular plate with a central perforation: 5 mm in diameter, surviving length 9 cm: from the packing of post-hole 663 (Structure 1529; Phase 7).
90. (13.2129.774015) Broad strip with small central perforation (8 mm across) terminating in an oval loop: surviving length 7 cm: from the upper filling of ditch 3401 (Phase 6).
91. (13.162.773449) Strip, with central circular perforation at the point of fracture, tapering down to a narrow tang: from the filling of ditch 518 (Phase 5).
92. (13.3205.774106) Irregular strip, folded over upon itself: from the upper filling of ditch 3298 (Phase 1).
93. (13.1342.773643) Rod, rectangular in section tapering to a point at one end, turning through ninety degrees at the other, where it has fractured: from the filling of post-hole 1341.
94. (13.257.773430) Rod, roughly square in section, fractured where it turns at one end: from the filling of pit 472.
95. (13.2119.774000) Tapering strip, triangular in section - possibly a knifeblade: from the upper filling of ditch 3401 (Phase 6).
96. (13.3205.774110) Object consisting of a tapering solid rod turning through ninety degrees and becoming octagonal in section: from the upper filling of ditch 3298 (Phase 1).

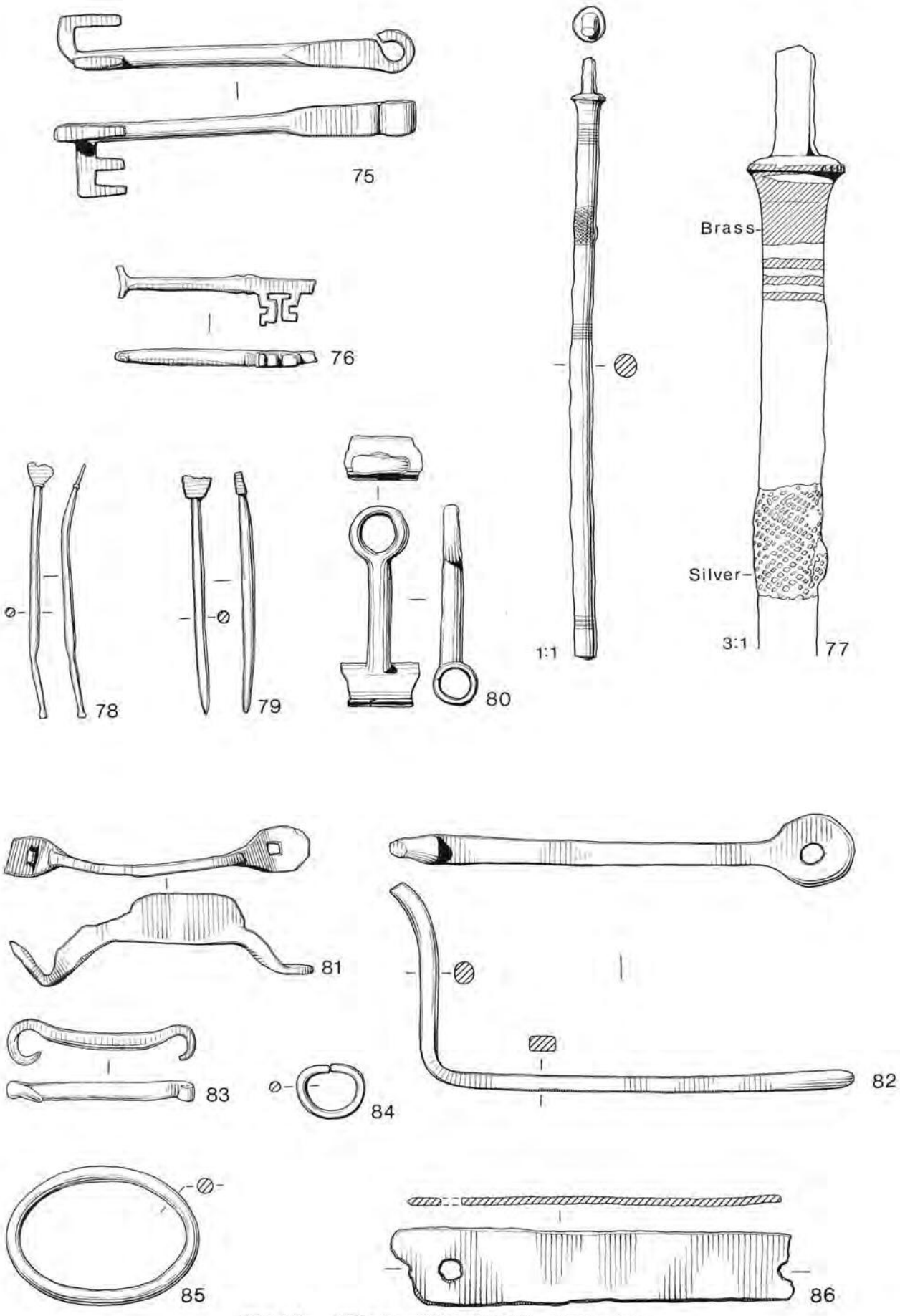


Fig.35. Objects of iron 75-86. Scale 1:2.

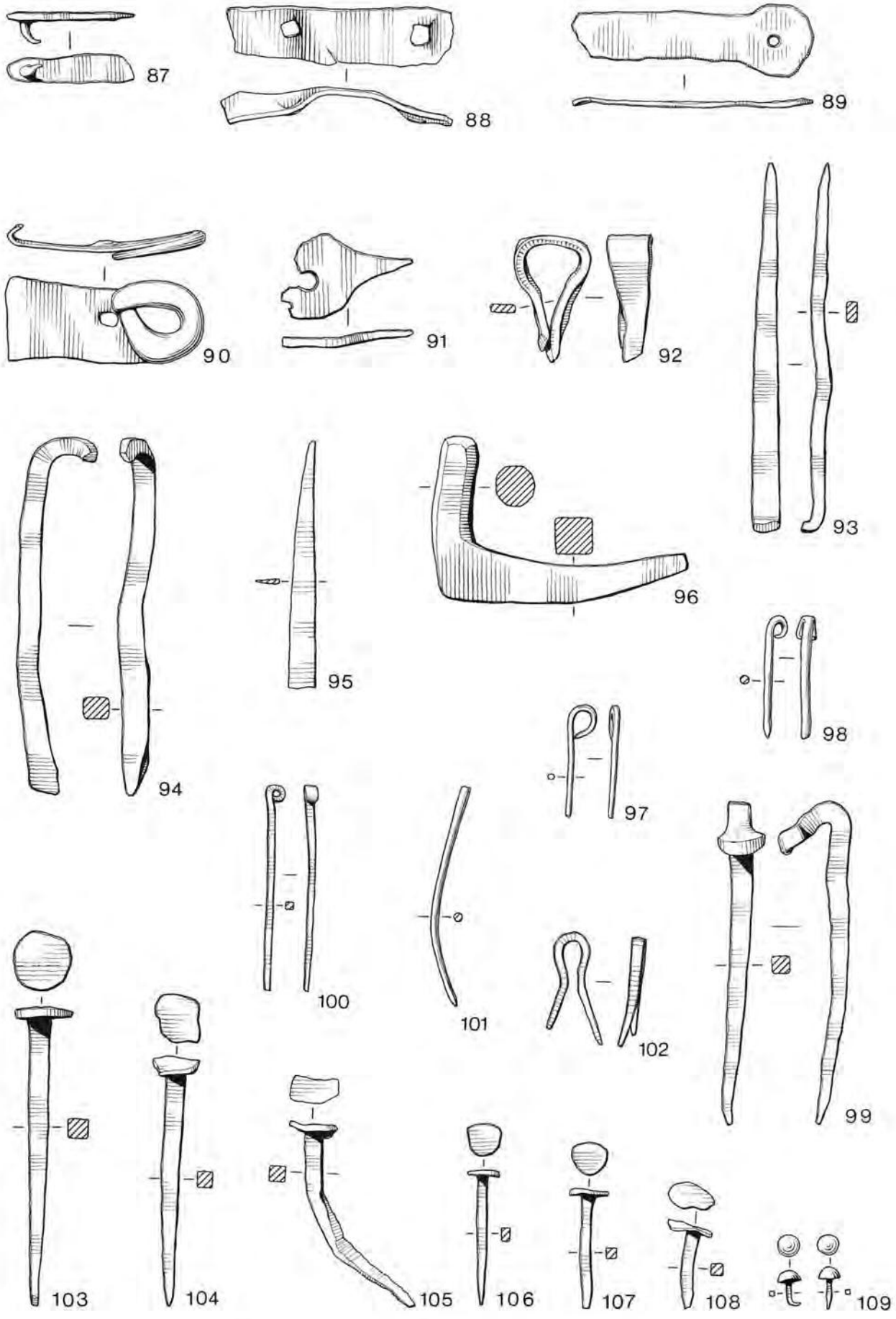


Fig.36. Objects of iron 87-109. Scale 1:2.

97. (13.2119.773976) Pin turned over at the end to terminate in a loop: from the filling of ditch 3401 (Phase 6).
98. (13.2389.774052) Pin turned over at the end to terminate in a loop: from the filling of post-pit 2388 (Structure 2398; Phase 2).
99. (13.257.773429) Square-sectioned pin, flattened out at the end to form the head: from the filling of pit 472.
100. (13.2121.773997) Square-sectioned pin, turned over at the end to terminate in a tightly looped head: from upper filling of ditch 3401 (Phase 6).
101. (13.2039.773910) Pin, lacking head: from the filling of ditch 2937 (original cutting of the western ditch of the north-to-south trackway; Phase 1).
102. (13.1109.773569) Ring-staple: cf. Longthorpe (Frere and St.Joseph 1974, fig.44, no.46): from the filling of ditch 2369 (second recutting of the southern ditch of the west-to-east trackway; Phase 3).
103. (13.718.773503) Flat-headed nail, square in section: from chalk rubble surface 712.
104. (13.577.773489) Flat-headed nail, square in section: from the filling of ditch 72 (Phase 8).
105. (13.118.773349) Flat-headed nail, square in section: from the lower filling of pit 35.
106. (13.439.773476) Flat-headed nail, rectangular in section: from the filling of ditch 940 (Phase 3).
107. (13.460.773466) Flat-headed nail, square in section: from the lower filling of ditch 72 (Phase 8).
108. (13.253.773432) Flat-headed nail, square in section: from the upper filling of ditch 602.
109. (13.460.773466) Two dome-headed nails, square in section: from the lower filling of ditch 72 (Phase 8).

Objects of Bone

110. (13.2446.773967) Spherical-headed pin: from the filling of ditch 3159 (second cutting of the southern ditch of the west-to-east trackway; Phase 3).
111. (13.29.773317) Spherical-headed pin: from the filling of ditch 27 (Phase 7).
112. (13.1892.773762) Pin with ovoid head: cf. Fishbourne 2 (Cunliffe 1971, fig.68, no. 24); Shakenoak I (Brodribb, Hands and Walker 1968, fig.37, no.16); Jewry Wall (Kenyon 1948, fig.91, no.8) from the upper filling of ditch 2938 (recutting of western ditch of the north-to-south trackway; Phase 2).
113. (13.173.773369) Spherical-headed pin (broken): from the upper filling of ditch 407 (Phase 3).
114. (13.439.773458) Pin (broken) with smoothly finished ovoid head: cf. (Frere 1970, fig.13, no.9): from the filling of ditch 940 (Phase 3).
115. (13.85.773537) Spherical-headed pin (broken): from the upper filling of ditch 1676 (Phase 4).
116. (13.1007.773917) Pin (broken) with cylindrical head decorated with a zone of incised crosses: from ploughsoil.
117. (13.2111.774157) Head of pin, rectangular in form with decoration similar to No. 110: from ploughsoil.
118. (13.2774.774049) Roughly made peg with waisted body: from ploughsoil.
119. (13.731.773507) Metatarsal of sheep with circular performation 10 mm in diameter through the centre. A similar example from Winterton (Stead 1976, fig.122, no. 205) is described as a 'netting needle or bobbin'. From the filling of ditch 518 (Phase 5).
120. (13.2264.773942) Whittled bone with incised grooves: from the filling of gully 2934.
121. (13.2057.775892) Plate with incised grooves down either side. There would appear to be two perforations at the point of fracture. The object tapers from a width of 3 cm to 25 cm at the point of fracture; the flat under-surface suggests attachment

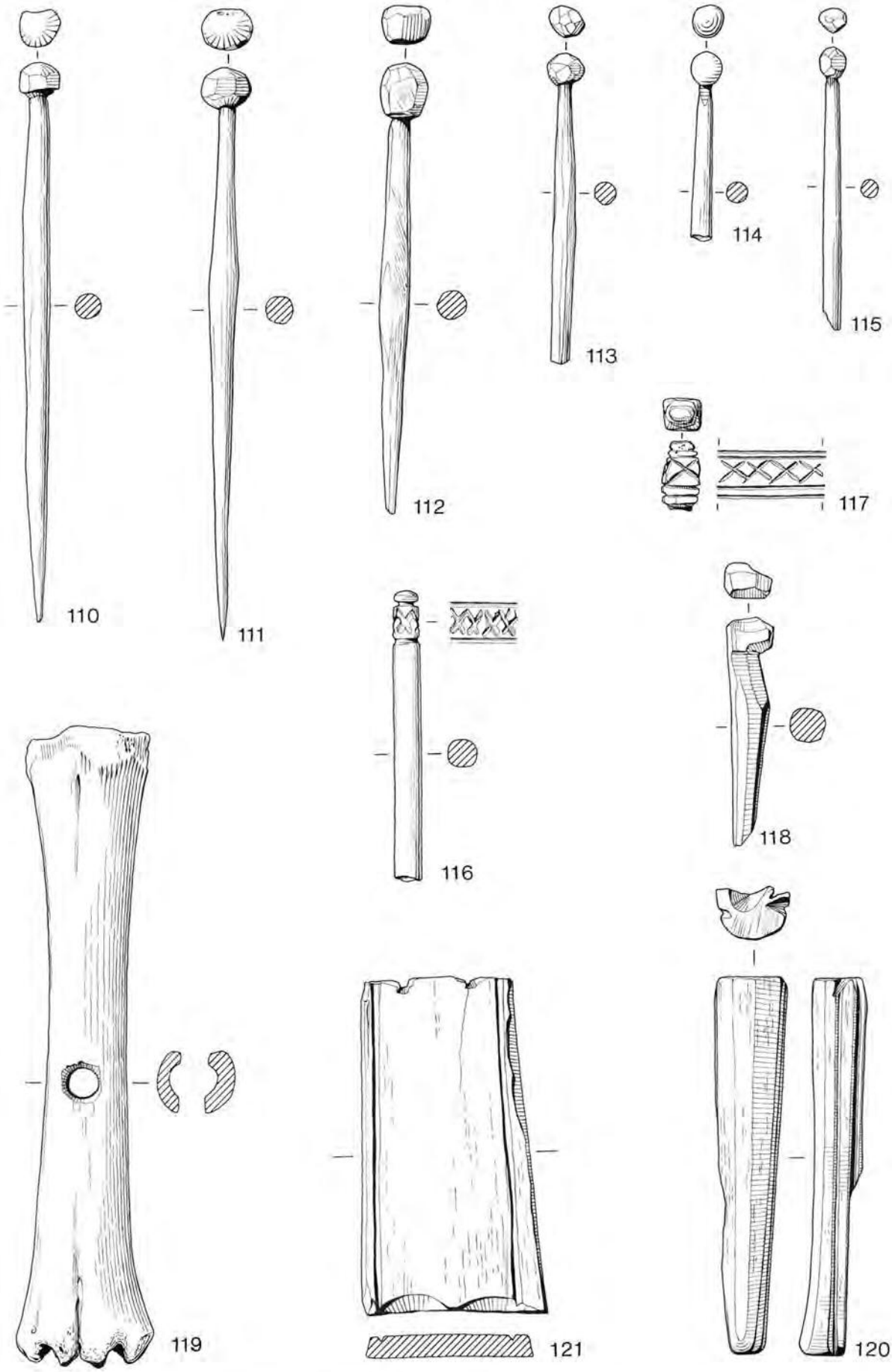


Fig.37. Objects of worked and utilised bone 110–121. Scale 1:1.

on this side. From the filling of post-hole 2056 (Structure 2398; Phase 2).

122.(13.1007.774117) Object of worked bone. A hole has been drilled in the centre of one side, whilst the opposite side has been sawn through longitudinally: from ploughsoil.

123.(13.164.773368) Fragment of worked bone decorated near one end with a zone of incised lattice decoration. Part of a (?) handle: from the filling of ditch 271 (Phase 4).

124.(13.55.773323) Fragment of worked bone decorated near one end with a zone of incised lattice decoration: part of a (?) handle; from the filling of ditch 72 (Phase 8).

125.(13.20.773318) Boat-shaped bone object (broken). A groove 10 mm deep has been cut into the flatter side, at which point the object has fractured. From the filling of ditch 183 (original cut of the eastern ditch of the north-to-south trackway: Phase 1).

126.(13.1007.773966) Flat disc with central perforation: (?) bead: from ploughsoil.

127.(13.47.773688) Spindle whorl: from ploughsoil.

128.(1002.BRC.21) Crudely carved bone splinter, possibly a rough-out for a hair pin: from the filling of boundary ditch 21, Area 1 (early third century).

Objects of Jet

129.(1002.BRC.27) Polygonal facetted jet bead: from occupation layers adjacent to building in Area I.

130.(13.1007.773919) Plate with circular perforations: from ploughsoil.

Objects of Fired Clay

131.(13.2111.773916) Part of a pipeclay female figurine: cf. Brampton (Green 1977, fig.36, no.239).

132.(13.1371.773633) Pottery face mask. The mask is finely moulded, with classical features and was clearly manufactured as a separate item before being attached to the (?) neck of a vessel. The fabric is WW3: from gully 1552 (Phase 5).

133.(13.1273.773827) Pottery face mask attached to the neck of a flagon: from the filling of ditch 2342 (Phase 3).

134.(13.1845.773782) Part of a grotesque face fashioned on the side of a Grey Ware vessel (Fabric RW10). The eye, nose and beard are applied lumps of paste, whilst the nostril and mouth have been incised into the surface of the pot: from the filling of gully 2934.

135.(13.2746.774036) Part of a mask presenting convincing reproduction of a long-eared owl. The mask has been applied to the shoulder of a Grey Ware vessel of Fabric RW10: from the filling of ditch 3171 (Phase 7).

136.(13.256.773985) Spindle whorl made from a sherd of an amphora, form Dressel 30. Diameter 6 cm: from the filling of post-hole 255.

137.(13.2127.774018) Spindle whorl made from a sherd of samian ware: Diameter 36 mm: from the upper filling of ditch 3401 (Phase 6).

138.(13.1276.773865) Spindle whorl made from a sherd of coarse ware (Fabric RW10): The hole in the centre is 7 mm across: from the base of the lower ploughsoil horizon.

139.(13.3032.774087) Fragment of a biconical spindlewhorl (Iron Age type) with slashed decoration on the exterior: from the filling of ditch 3387 close to where it cuts Iron Age ditch 3360. Ditch 3387 is itself assigned to Phase 8.

140.(1002.BRC.62) Fragment of large tile in a hard, pale red sandy fabric with at least one angular flint inclusion. The slightly concave surface illustrated has been faintly scored with a wavy keying pattern and then stamped with a raised die C H I Λ Q, the first three letters being fragmentary but certainly identified. From the form of the letters, especially the A, each letter seems to have been bent from a strip of metal and then attached to some backing. The stamp seems nearer a branding iron than a normal tile stamp where the letters and frame, if any, are inset, the resultant im-

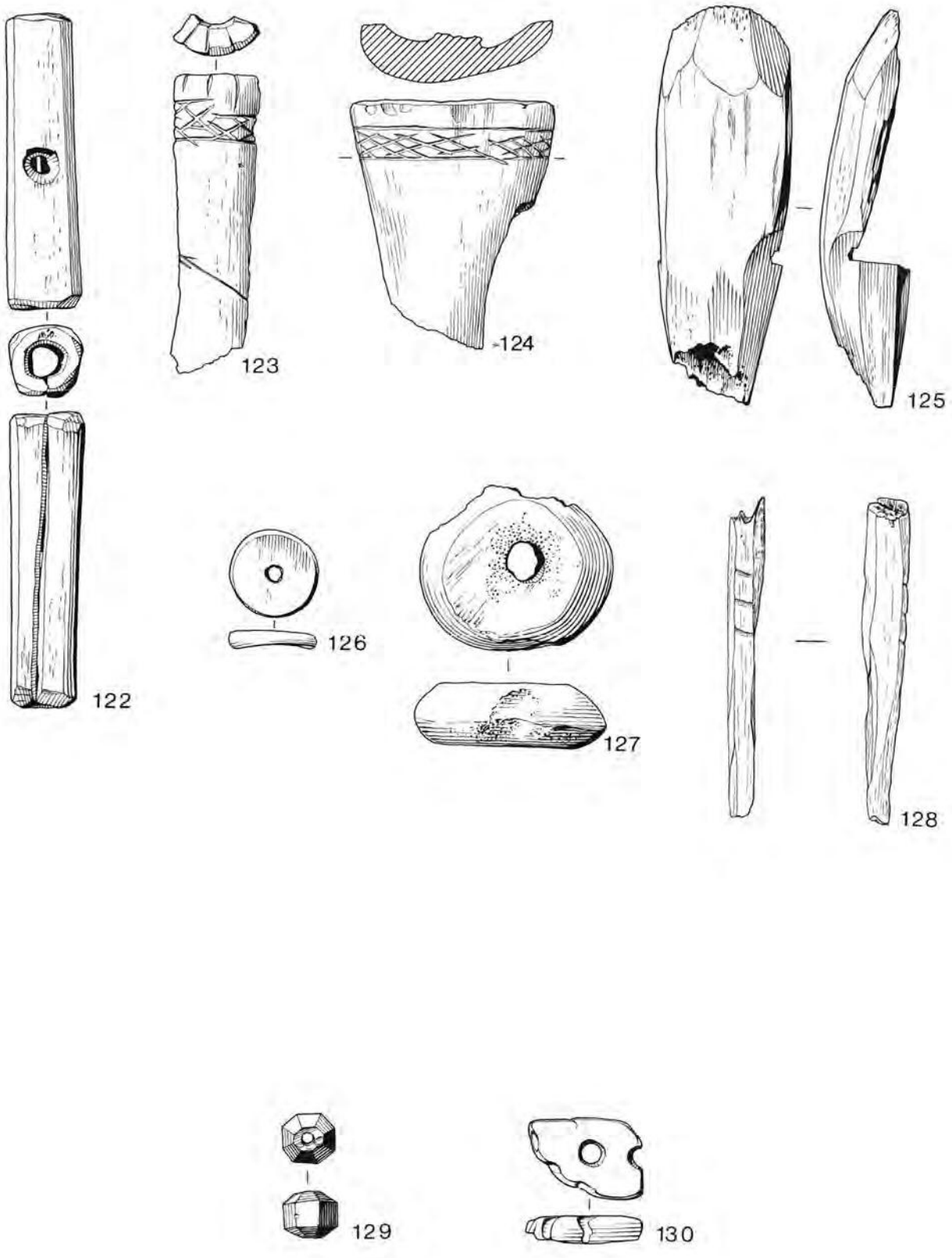


Fig.38. Objects of worked and utilised bone 122-128 and jet 129-130. Scale 1:1.

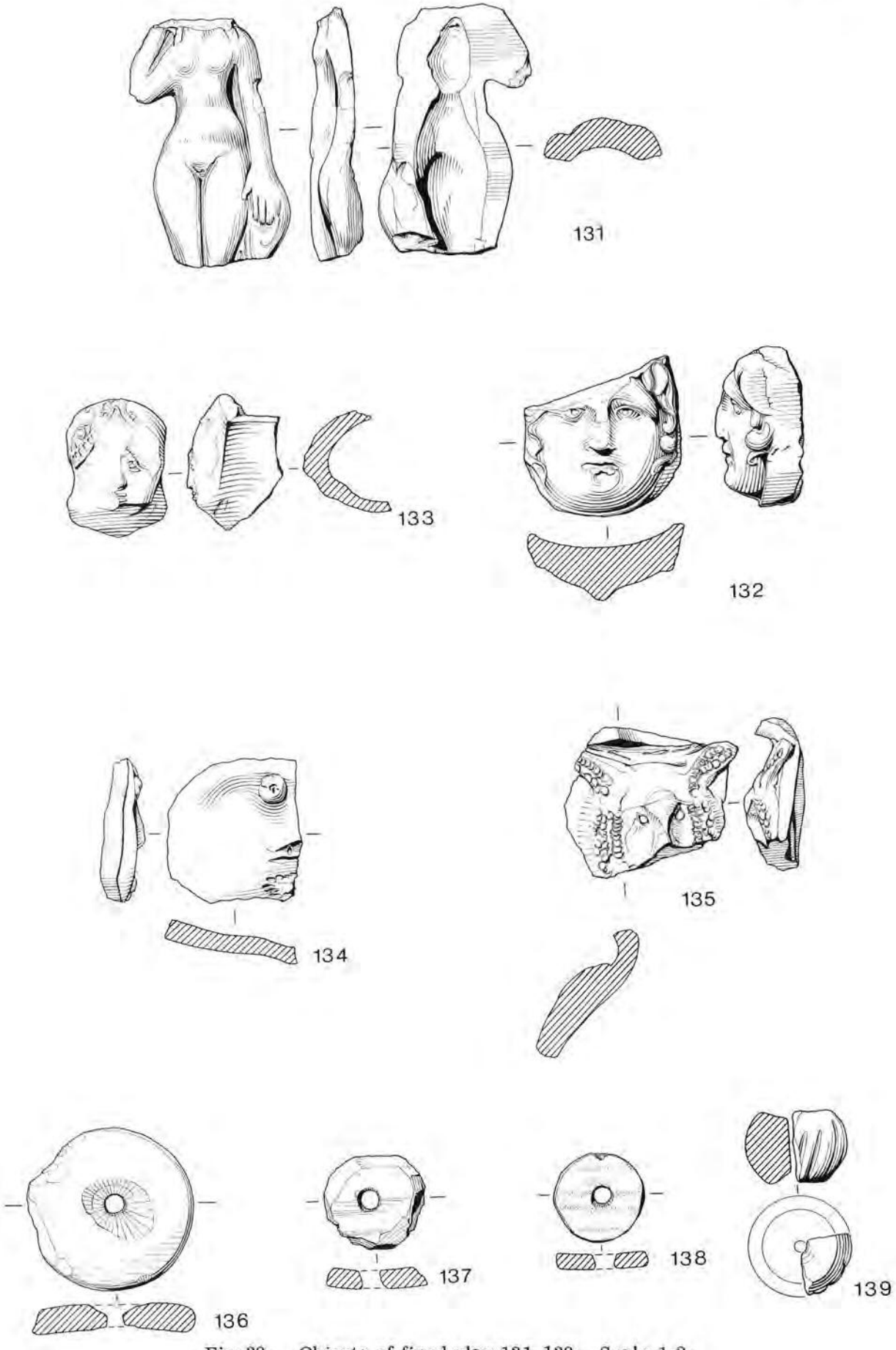


Fig.39. Objects of fired clay 131-139. Scale 1:2.

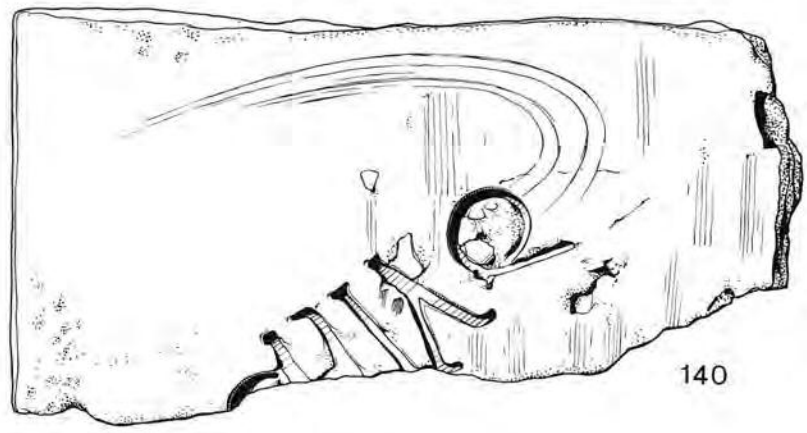


Fig.40. Objects of fired clay 140-142. Scale 1:2.

pression consisting of letters raised above a ground inset in the tile surface. Tile Stamps of Cohors I Aquitanorum have not previously been recovered in Norfolk or elsewhere in Britain, but other inscriptions attest the unit's presence at Carrawburgh and Brough on Noe, Derbyshire (Wright, Hassall and Tomlin 1975, 288, no. 25). From the packing of post-hole 62, late Roman structure, Area I.

141. (13.1526.773780) Fragment of tile with identical stamp to 140, confirming the reading given above: from the filling of ditch 2938 (Phase 2).

142. (1002.BRC.66) Corner of tile in a hard red fabric with traces of graffito. The marks, traced with a finger, do not seem to form part of a regular keying pattern and may represent the last letters of two lines of inscription, the lower part of a P in the upper, an S in the lower. From the packing of post-hole 66, late Roman structure, Area I.

Objects of stone

143. (13.193.773372) Figurine of chalk, phallic in form, with crudely incised human features. Similar objects are known from a number of pre-Roman sites; a very similar example has been recently found in an Iron-Age context at Wetwang Slack, East Yorkshire - a site which has produced a series of such objects (J.Dent, pers. comm.). From the filling of ditch 1670 (Phase 1).

144. (13.55.773333) Chalk lump with a crudely cut 'waist': possibly a weight: from the filling of ditch 51 (Phase 8).

145. (13.64.773438) Chalk lump with central perforation 1 cm in diameter: possibly a weight: from the filling of ditch 63 (Phase 7).

146. (13.2591.774024) Lower stone of a quern: found reused as a post-pad in post-pit 2286 (Structure 2398; Phase 2): Carstone (Lower Greensand) - Spilsby Sandstone (identification: Dr.F.W.Anderson).

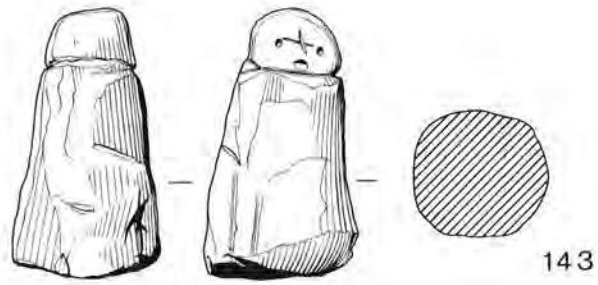
147. (13.207.773486) Fragment of the lower stone of a quern: from the filling of hollow 471: Oolitic limestone - Lincolnshire Limestone, probably from Weldon (identification: Dr.F.W.Anderson).

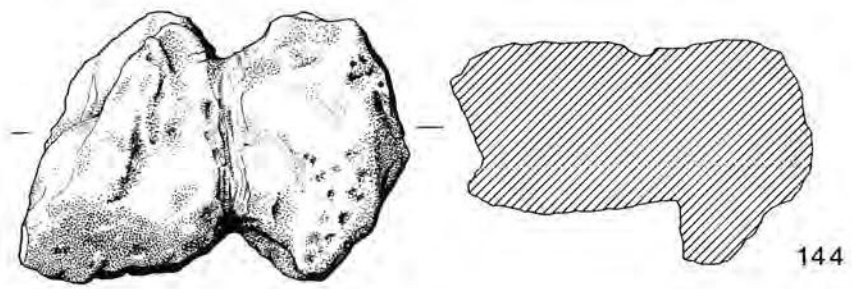
THE PRE-IRON AGE POTTERY FROM THE 1977 EXCAVATIONS
by Dermot Bond

All the pre-Iron-Age ceramic material is illustrated (Fig.43-45) with the exception of five plain bodysherds. The fabrics are of a homogeneous sandy clay, probably locally derived, with more or less crushed flint inclusions. Some of the Beaker sherds have been sand-tempered and are only sparsely flint gritted.

Neolithic

1. Two sherds of a large heavy, round-bottomed bowl. The fabric is hard with much large flint grit. The surfaces are light brown, although the interior is discoloured by burning which may have caused the cracking which occurs in the sherds. The core is grey. The vessel is decorated with degenerate cord impressions which are confined to a zone above the base by a plain zone delineated by twig smoothing. From small pit/post-hole 716.
2. Body sherd of a heavy bowl similar to (1). The fabric contains much large flint grit. The surfaces are brown with a grey core. Like (1), the sherd has been burnt. Decoration is in the form of diagonal rows of degenerate maggot impressions - the sherd is possibly from the same vessel as (1). From small pit/post-hole 716.
3. Body sherd of a steep-sided round-bottomed bowl. The fabric is hard and flint-gritted. The interior and exterior are light brown with a grey core. The sherd is decorated with horizontal rows of (presumably) bone-end impressions. From small pit/post-hole 716.





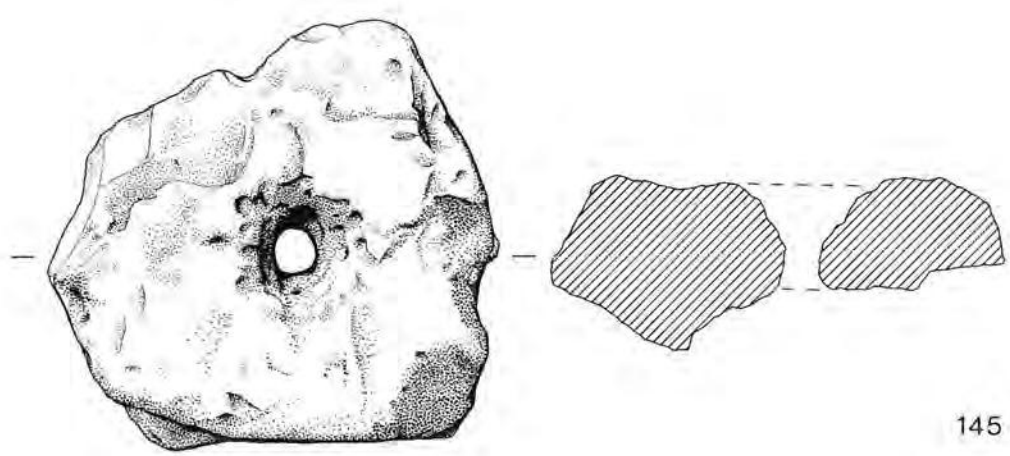


Fig.41. Objects of stone 143-145. Scale 1:2.

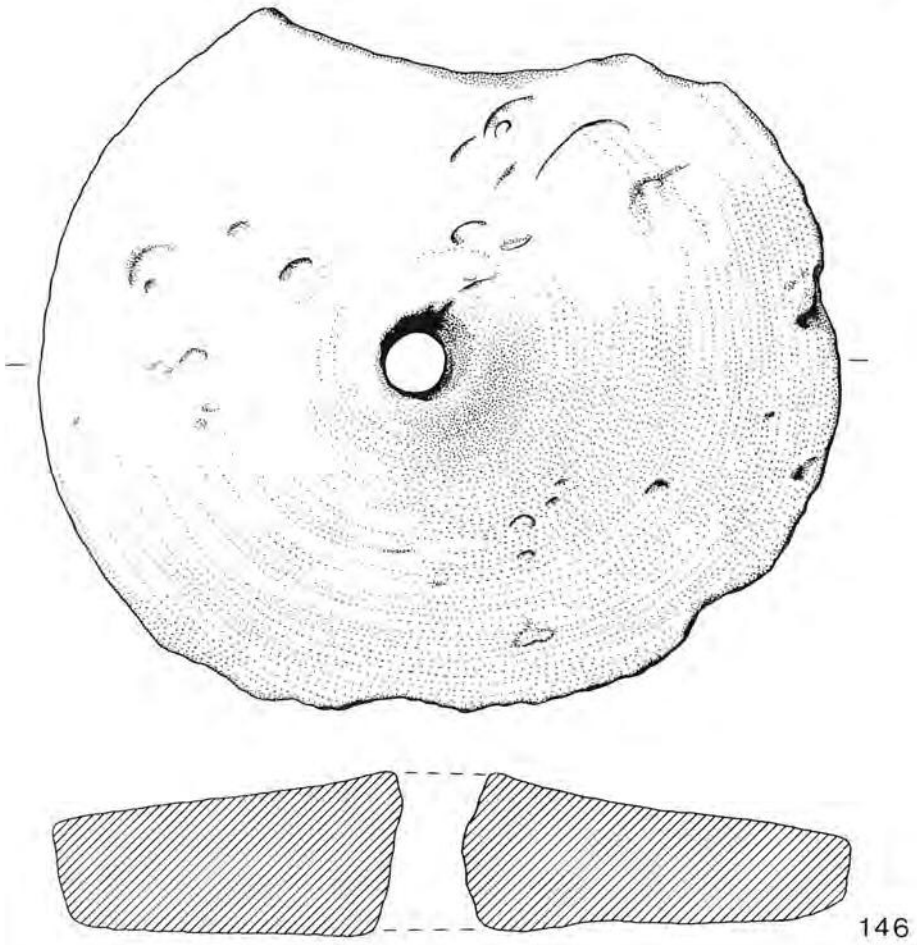


Fig.42. Objects of stone 146-147. Scale 1:4.

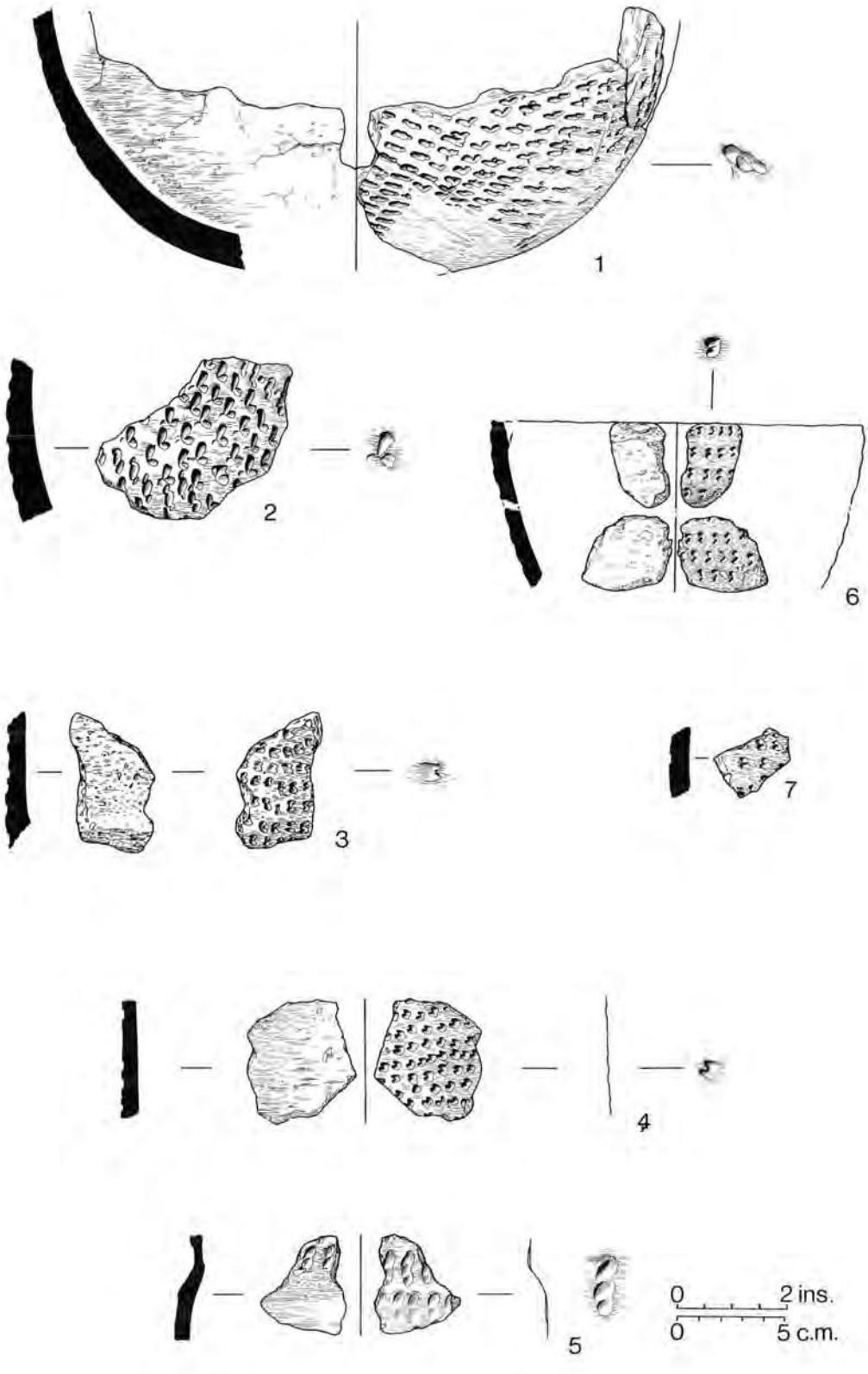


Fig.43. Neolithic pottery 1-7. Scale 1:3.

4. Body sherd of a steep-sided, thin-walled vessel similar to (9) with a hard flint-gritted fabric. The exterior is light brown, the internal light grey with a black core. The sherd is decorated with horizontal rows of bone-end impressions. From small pit/post-hole 716.
5. Fragment of the upper body, shoulder and neck of a jar in a heavily flint gritted fabric. The exterior is light brown, the inner brown to grey with a black core. The vessel is decorated with horizontal rows of vertical maggot impressions on the exterior of the neck and body and on the inside of the neck. From small pit/post-hole 716.
6. An abraded body sherd and simple rim of a smallish bowl with a hard flint-gritted fabric. The surfaces are light brown with a grey core. The vessel is decorated with horizontal rows of bone-end impressions. From small pit/post-hole 716.
7. An abraded body sherd, possibly from a large bowl with a hard flint-gritted fabric. Both surfaces are light brown with a grey core. The sherd is decorated with horizontal rows of bone-end impressions. From small pit/post-hole 716.
8. Body sherd of a medium-sized bowl with a hard flint-gritted fabric. Both surfaces are light reddish-brown with a grey core. Impressed horizontal zones of short vertical lengths of whipped-cord decoration give the surface a ribbed zonal effect. From small pit/post-hole 716.
9. Body sherd of a tall, steep-sided jar with a fairly hard flint-gritted fabric. The exterior is reddish-brown, the interior and core light grey. The vessel is decorated with zones of crudely impressed bone-ends of varying depth, arranged horizontally at the top, vertically over the remainder of the sherd. From small pit/post-hole 1097.
10. Abraded body sherd of a steep-sided vessel with many large flint grits. The fabric is light grey with reddish exterior. The sherd is decorated with horizontal rows of short vertical lengths of cord impressions. The interior is stick-smoothed. From small pit/post-hole 1010.
11. Very abraded body sherd with flint-gritted fabric. The surfaces are reddish-brown with a grey core. The sherd is decorated with horizontal lines of bone-end impressions. From small pit/post-hole 1235.
12. Body sherd of a large bowl, possibly the same vessel as (1), with much burnt flint grit. The surfaces are grey-brown with a grey core. The sherd is decorated with horizontal rows of short oblique cord impressions. From the ploughsoil in the vicinity of 716, 1097, 1010, 1235.
13. Two sherds of a bowl with an everted rim with a hard flint-gritted fabric. The surfaces are reddish-brown with a grey core. The vessel is decorated with cord impressions in a herringbone pattern on the rim and both surfaces. From the ploughsoil in the vicinity of 716, 1097, 1010, 1235.

Beaker

14. Abraded body sherd in hard, reddish-brown fabric with a grey core and some small flint grits. The sherd is decorated with irregular horizontal impressions varying in form from oval to triangular. From gully 104.
15. Abraded body sherd in heavily burnt medium flint-gritted fabric. The fabric is grey with a light brown exterior decorated with incised horizontal lines. From gully 104.
16. Two body sherd from the upper part of a vessel in a hard light brown sandy fabric with a grey core and small flint and grog inclusions. The exterior is decorated with rather clumsy comb impressions. From the ploughsoil; residual in context.
17. Two body sherds in a sandy fabric with grog and a little small flint inclusions. The exterior is reddish-brown, the interior and core grey. The exterior is decorated with horizontal rows of comb impressions. From the filling of Romano-British ditch 1090; residual in context.
18. Body sherd of a globular beaker in a fairly hard sandy fabric with grey core and

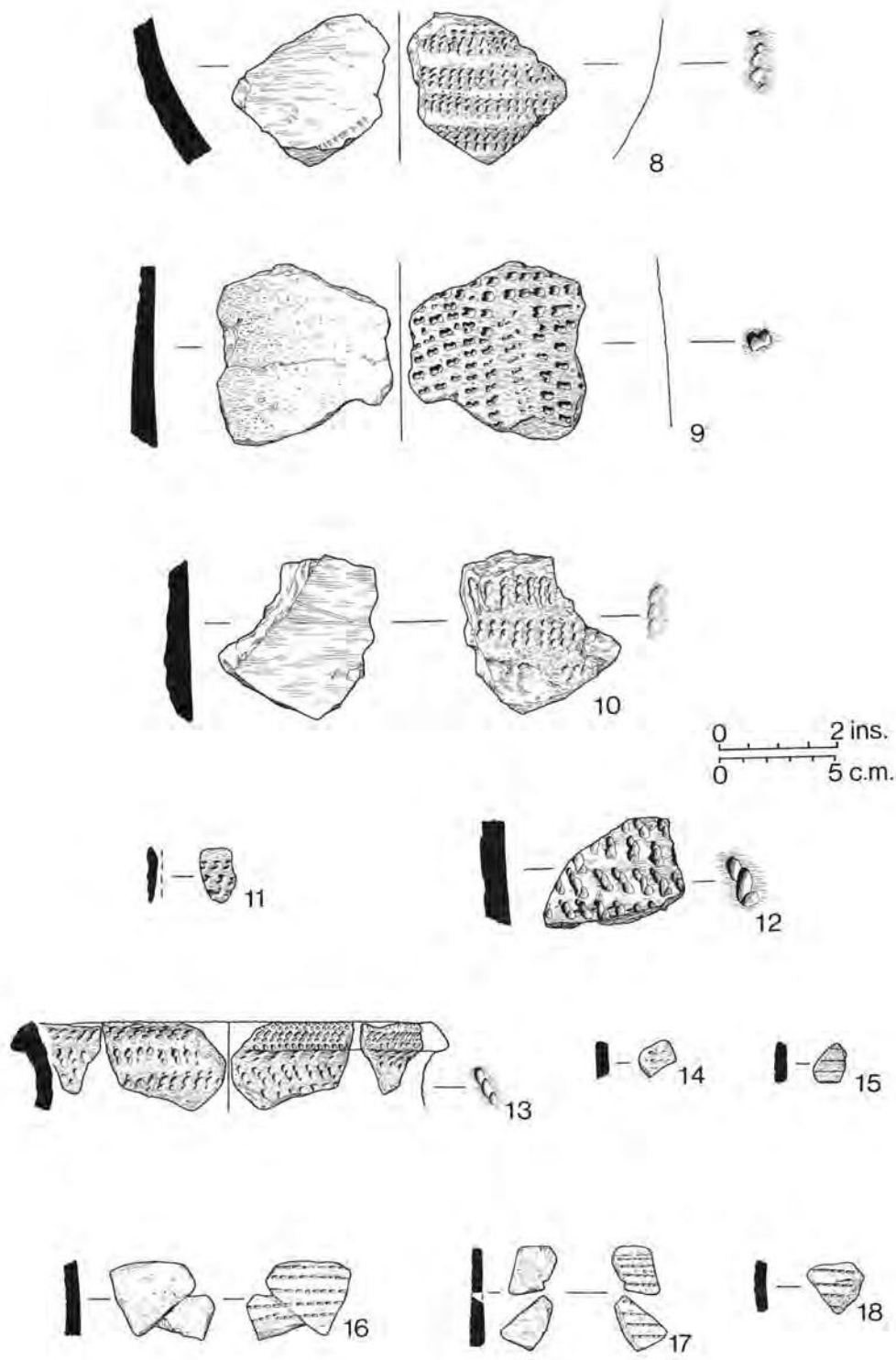


Fig.44. Neolithic and Beaker pottery 8-18. Scale 1:3.

reddish-brown exterior. There is some small flint grit. The outer surface is decorated with horizontal rows of comb impressions. From the filling of Romano-British ditch 62; residual in context.

Bronze Age

19. Twenty-five sherds from the rim, collar and body of a collared urn in a hard, light

brown fabric with a grey core containing much large flint grit and grog. The top of the rim is decorated with short lengths of whipped-cord impressions as is the upper part of the body through here in a herringbone pattern. The main area of decoration on the collar consists of filled triangles of whipped-cord ornament separated by similar horizontal zones. At least part of the body was undecorated. Sherds from this vessel were scattered in the lower ploughsoil horizon over pit 701 and in its upper filling.

20. Small abraded sherd representing the bottom of the collar and top of the body of a collared urn. The fabric is reddish-brown with a grey brown exterior lightly tempered with sand and small flint grits. The sherd is decorated with a worn herringbone pattern of whipped cord. From the lower filling of pit 701.
21. Small slightly pinched-out flat base sherd in hard grey, lightly flint-gritted fabric. The sherd appears to have been burnt. From the lower filling of pit 701.
22. Two sherds of a vessel with a flat slightly pinched-out base in a hard fabric with a little flint grit and grog. The colour is reddish-brown to dark grey internally with a grey core and grey-brown exterior decorated with a herringbone and impressed-chord pattern. From the base of topsoil over pit 701.
23. Two sherds slightly fire-blackened on their lower sides. The fabric is light brown with a grey core and slight flint gritting. The sherds are decorated with an impresed-cord zig-zag. From the base of topsoil over pit 701.
24. Sherd from a vessel with a flat slightly pinched-out base, similar to (22). The fabric is hard, reddish-brown with a grey core and sparse flint grit. The sherd is decorated with a few random incisions. From the base of ploughsoil over pit 701. Other sherds residual in context.
25. Part of the collar and upper body of a collared urn in a hard sandy fabric with flint grit and grog inclusions. The surfaces are light brown with a grey-brown core. The vessel is decorated with an impressed herringbone pattern of short lengths of whipped cord. From the filling of Romano-British gully 22; in the vicinity of pit 701.
26. Plain slightly inverted rim of a small vessel in a hard light brown fabric with a little flint grit and grog inclusions. The vessel is similar in form and fabric to (25). From lower ploughsoil horizon; in the vicinity of pit 701.
27. Applied lug on a simple rim. The fabric is light brown with a dark grey core and some small flint gritting. The sherd is decorated with faint cord impressions around the edge and on top of the lug. This is an extremely unusual sherd, but the fabric is similar to that of the flat base sherds. The surface texture closely resembles that of the collared urn (19). From the ploughsoil, in the vicinity of pit 701.
28. Cordon with part of the vessel body in hard light brown fabric with a little fine flint gritting. It is decorated with a short length of fine impressed cord on the upper edge of the cordon. From ploughsoil, in the vicinity of pit 701.

Discussion

The Neolithic Pottery. The highly decorated, heavily flint-gritted pottery from the site falls into the general late Neolithic Mortlake style, forming a homogenous group. Differences in decorative technique between bone and cord impressions of various kinds are not reflected in the fabric or shape of the vessels, some of which are highly typical e.g. Nos.5 and 13 (Figs.43 and 44). Idiosyncracies such as the decoration on the heavy base, No.1 (Fig.43), are to be expected.

The Beaker Material. The Beaker sherds also make up a consistent group in terms of the various schemes which have been advanced for East Anglia. All would be included in Clarke's East Anglian Series (Clarke 1970) in terms of shape, fabric, colour and decoration, or in Lanting and van der Waals Step 3 (Lanting and van der Waals 1972; see also Appendix 2).

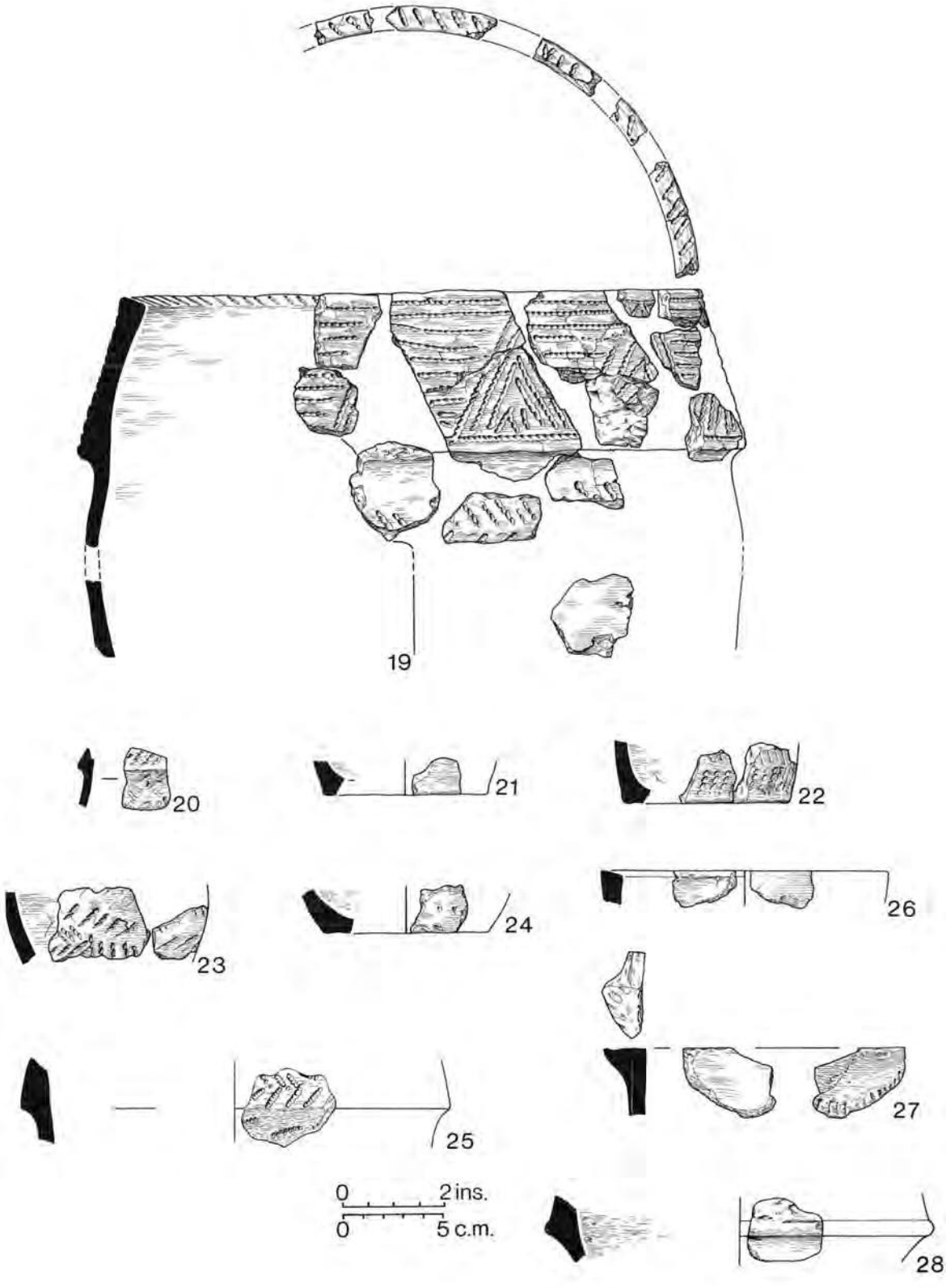


Fig.45. Bronze Age pottery 19-28. Scale 1:3.

The Bronze Age Pottery. The domestic collared urns may all belong to Longworth's Primary Series (Longworth 1961). Certainly the most complete vessel (No.19; Fig.45) fulfills an adequate number of formal and decorative trait requirements. Two other vessels (Nos.20 and 25; Fig.45) may also be fitted into this category. The flat pinched-out bases are more problematic, but given the Fengate influence in the Primary Series, it is possible that these may be classified with the latter group.

A Comment on the Pre-Iron Age Pottery
by Frances Healy

The Peterborough ware assemblage from contexts 716, 1010, 1097 and 1235 emphasises the affinity of East Anglian Peterborough wares with those of the Midlands and the south of England, rather than with the distinctive Peterborough wares of the Yorkshire Wolds (Manby 1975).

Finds of collared urn, like the sherds from context 701, are rare, though perhaps less so than the literature would suggest. Collared urn was the dominant pottery style on an occupation site in West Row Fen, Mildenhall, Suffolk (Martin 1977), and was present in the second millennium bc ditch system of the Newark Road subsite, Fengate, Cambridgeshire (Pryor 1980, 102). As yet unpublished Norfolk examples have been found on settlement sites at Hunstanton (Site 1396), Spong Hill, North Elmham (Site 1012), and Hockwold-cum-Wilton (Site 5364).

Collectively, the Brancaster Neolithic and early Bronze Age finds seem to form part of a late third and early second millennium bc extension of settlement towards the present north Norfolk coast, where traces of earlier Neolithic activity are slight (Healy forthcoming, maps).

THE IRON AGE POTTERY FROM THE 1977 EXCAVATIONS
by John Hinchliffe
(Fig.46)

29. Rim: burnished externally and internally in a hard, dark grey fabric. From pit 11.
30. Body sherd of carinated vessel in a light reddish-brown fabric with small flint inclusions. The piece is reminiscent of a sherd from Warham (Gray 1933, fig.3, no. 16). From pit 11.
31. Body sherd: decorated with two parallel tooled lines: reddish-brown fabric with small flint inclusions: the interior and exterior are dark grey and the sherd is burnished externally. From pit 11.
32. Base of vessel in hard grey buff fabric with many flint inclusions, some up to 5 mm across. From pit 11.
33. T-shaped rim: dark brown-grey fabric with small flint inclusions. From the upper filling of pit 1695.
34. Rim: decorated with short vertical slashes: light grey fabric with small flint inclusions: interior and exterior are dark grey. From the filling of pit 867.
35. Body sherd: decorated with vertical finger-nail impressions in a dark grey fabric with small flint inclusions. From shallow hollow 1003.
36. Body sherd: decorated with small triangular stamp impressions: dark grey fabric with small flint inclusions. Decoration of this kind is known from Dragonby (Elsdon 1975, fig.18, no.17) and Mucking (Elsdon 1975, fig.14, no.16 - stamps arranged in a row). From ditch 3360.
37. Bead rim of vessel: fine, hard dark grey fabric with a few small flint inclusions: traces of a red slip remain beneath the rim. From hearth 209.
38. Body sherd of carinated vessel with a horizontal zone of diagonal finger-nail impressions along the carination: dark grey fabric with small flint inclusions. From gully 1427.

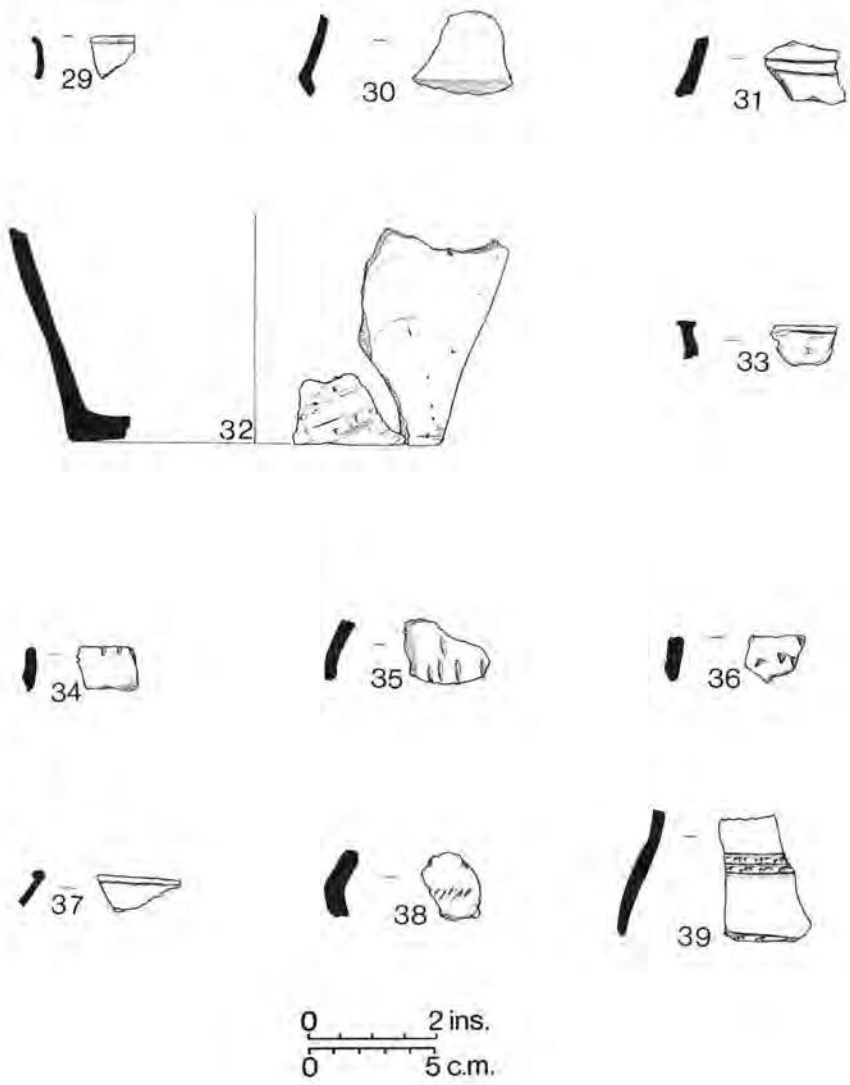


Fig.46. Iron Age pottery 29-39. Scale 1:3.

39. Body sherd of (?) carinated vessel decorated with two zones of tooled lines emphasised by dots arranged in short lines of three imitating rouletting (?applied with a three-pronged implement): dark grey fabric with a lighter grey core and some small flint inclusions. The decoration has some affinity with rouletted material from South Lincolnshire (Elsdon 1975, figs.16 and 17), but it has been pointed out (Elsdon 1975, 31) that the use of dotted decoration to emphasise tooled lines is almost unknown in that region. The technique is better known in the lower Thames region (Elsdon 1975, 21). The closest comparable material is from Warham where pottery decorated with tooled lines is known (Gray 1933, fig.5). Other sites producing similar material are Wisley, Surrey (Lowther 1945, fig.2, nos.24-26) and Arminghall (Clark 1936, fig.7, no.15). From ploughsoil.

THE ROMANO-BRITISH POTTERY FROM THE 1974 AND 1977 EXCAVATIONS

by Gillian Andrews with contributions by Joanna Bird, Brenda Dickinson, Kay Hartley and Joe Jefferies

INTRODUCTION

General Remarks

Approximately 260 kg of pottery were recovered, most of which came from the area

excavated in 1977. Only 30 kg were recovered from the 1974 area, and due to its slightly different character it is considered separately below.

The 1977 pottery ranges from the second- to fourth-century in date and it has not been possible to date any of the ditch phases more precisely. A sample (57%) of the stratified pottery, from contexts which best illustrated the physical development of the site, was examined in detail in an attempt to establish a dated sequence for the ditch phases. In every phase however, the pottery was extremely mixed. This is undoubtedly due to the intensive recutting of the ditches which must have resulted in frequent disturbance of material within them. The homogeneous character of all the stratified pottery has meant that it can all be treated as one group; the unstratified material (32%) is not significantly different and has been included in the type series and discussion sections.

Taken together the evidence of the samian (p.82) and the mortaria (p.122) indicates a starting date for occupation of c.A.D.170-80, although the mortaria alone would equally well fit with an occupation beginning in the early third century. Dating other wares is difficult, due to both the lack of comparable dated groups from the area and the lack of major published kilns groups for Nene Valley Wares, the most substantial group of imported British wares at Brancaster. Despite these difficulties, however, it would appear that although a number of fine ware types date from the mid-second century onwards, the majority of types represented date from the second or third quarter of the third century. This, with the evidence of the mortaria, suggests that occupation began early in the third century and it is likely that it was at its most intensive from the second or third quarter of the third century until its end. The evidence for fourth century occupation is discussed below.

Occupation in the 1974 area can be divided on the pottery evidence into two phases, the first producing pottery of early-to-mid-third century date, and the second of later third- to fourth-century. The types represented in both phases were almost all found in the 1977 area, suggesting that occupation of both phases overlaps with that of the 1977 area. For this reason vessels from the 1974 area have been included in the type series. Like the pottery from the 1977 area, nearly all of the material came from ditches, and many of the Phase 2 ditches had undergone considerable recutting, which must again have resulted in frequent disturbance of the ditch deposits. Nevertheless, there do appear to be significant differences in the types and fabric present in the two ditch phases suggesting an earlier date for Phase 1.

The first phase is represented only by one ditch, ditch 21, Area 1, which produced markedly larger and less abraded sherds than other features from the 1974 excavations. A date of early-to-mid-third century is suggested by those types to which a date could be ascribed (types 47.2, 98, 144) and the associated samian. This material constitutes only a small amount (4 kg) of the stratified pottery from the excavations however, and the remaining 16 kg of stratified pottery all comes from Phase 2. Whether this Phase 2 occupation continued from Phase 1 without a break or not, cannot be said with any certainty, but the presence of later third- and fourth-century types, particularly from the Nene Valley and Oxford industries (discussed on p.86 and types 54, 57, 58, 59.2, 64.2 and 69) none of which was found in Phase 1, emphasises the essentially later date of Phase 2. Full details of fabrics and forms present in these two phases can be found in the archive.

Although Phase 2 occupation overlaps with occupation of the 1977 area, it is likely that activity here continued for rather longer. This conclusion is based largely on the quantities of Oxford Wares present in these two groups of material. Twenty-five per cent of the fine wares and nine per cent of the mortaria from Phase 2 are of Oxford Ware, compared to the less than one per cent of either fine ware or mortaria from the 1977 material. Analysis of the distribution of Oxford Wares (Young 1977, 64-68 and

133) has shown that penetration into East Anglia was slight in the third century and that only in the fourth century did Oxford products reach East Anglia in any quantity. In mid fourth-century levels at Burgh Castle, Oxford Wares constitute a third of the colour-coated pottery (S.Johnson pers.comm.), at Caister on Sea (Higgins 1972) they were found in some quantity in a late fourth-century group, and fourth-century levels within the fort at Brancaster itself (St.Joseph 1936 and unpublished Norwich Museum records) have also produced significant amounts of Oxford Wares. It would thus appear that Oxford Wares were reaching East Anglia and Brancaster itself, in some quantities, but at a date later than the occupation of Phase 1 in the 1974 area, and the intensive occupation of the 1977 area. This is likely to have been in the fourth century when occupation on any scale was apparently only in the 1974 area (Phase 2).

Terminal dates for occupation can be suggested on assessment of both the Oxford Wares and mortaria evidence. The mortaria would suggest a date pre-400 for the end of occupation in both areas, and possibly earlier in the fourth century, as only a small number of vessels (25%) were of this date (p.122). Mortaria of fourth-century date were found in the 1977 area, but when these are considered in the light of the lack of Oxford Ware, it would appear that any fourth-century activity on the site was not intensive. Likewise fourth-century mortaria were recovered from Phase 2 of the 1974 area, but here their association with Oxford Colour-Coated Ware suggests more permanent activity well into the fourth century.

Comparison of the differences between the 1974 Phase 2 and 1977 pottery has been made in the discussion sections. The small size of the Phase 2 1974 sample has meant that no statistical break down of individual vessel types within form or fabric groups has been possible. The 1974 Phase 1 material has not been included in the comparison due to the small amount of pottery recovered and its total similarity in character with much of the 1977 material.

Methods of study and presentation

All the pottery, including the samian and unstratified material, was sorted into fabric groups and within them into types where possible. It was then quantified by weight, sherd count, and equivalent vessel where applicable. These data were then sorted by computer, and catalogues of the pottery quantified and arranged by context, fabric and form were produced. These catalogues formed the basis of all subsequent statistical analysis and, with the pottery, they form the archive.

A Note on Pottery Quantification
by J.S.Jefferies

The computer-based recording system used by the Central Excavation Unit allows for the pottery record format to be tailored to a particular need. The records at Brancaster (as at most CEU sites) use three different measures of quantification. These are :-

i. Sherd count.
ii. Sherd weight.
iii. Equivalent vessels (calculated as percentage of rim present - bases are not measured).

It has been shown (Orton 1975) that of those measures, iii. is the most likely to give a good estimate of both relative proportions of different pottery types in one context and valid comparisons between one context and another. An equivalent vessel count does have the disadvantage that it is not suitable for comparing each fabric as a whole as it does not include body sherds.

The original analysis was done with all three measures (these are available in the site archive) and in almost all cases where fabric groups are tabulated against form groups the percentage figures are very similar for each measure. In the case, however, where form groups are expressed in terms of the total pottery assemblage (Table 11), the above does not apply and there are marked discrepancies between various measures. The percentage of mortaria, for example, is fifteen per cent when expressed by weight and only three per cent expressed as equivalent vessel. The opposite trait is shown by beaker sherds.

This effect is to be expected if one attempts to compare very different vessel types together. Further evidence of this effect was shown when the coefficients of linear correlation for each fabric at Brancaster were calculated (weight v. equivalent vessel) and compared with similar coefficients taking some account of vessel size (weight/diameter v. equivalent vessel).

The size of the sample at Brancaster precludes a more detailed examination of these measures, and where discrepancies are slight, only the values for sherd weight are reproduced in this report and only when marked differences are noted are all the figures shown.

THE SAMIAN WARE
by Brenda Dickinson and Joanna Bird

Eleven kg of samian ware were recovered from the 1977 area representing five per cent of the total pottery. Of this sixty-two per cent was Central Gaulish and thirty-eight per cent East Gaulish. Two kg were recovered from the 1974 area, over seventy per cent of which was East Gaulish. The samian from Phase 1 in this area, associated with early-to-mid-third-century coarse ware, consisted of five sherds from Central Gaul and nineteen from East Gaul and dated predominantly late second-to-mid-third century. Due to the mixed character of the pottery from all other ditch deposits (in the 1977 and 1974 Phase 2 areas) the samian has not been published in any stratigraphic sequence. All the potters' stamps and decorated sherds have been published (all stated contexts are 1977 unless otherwise stated) as has a quantified summary (by count) of all plain and decorated vessels recovered (Tables 1 and 2). The twenty-four sherds from the 1974 area Phase 1 have been included in these summaries. Decorated sherds marked with an asterisk are illustrated on Figs.47 and 48. All forms are Dragendorff (unless otherwise stated).

Abbreviated references:

D	Déchelette 1904
O	Oswald 1936
O & P 1920	Oswald and Pryce 1920
Rogers	Rogers 1974
S & S 1958	Stanfield and Simpson 1958

Potters' Stamps
by Brenda Dickinson

S1. [C·A·R]·I·M A· Form 79 etc. by Carus ii of Lezoux, where the stamp (1a) is known. It appears at sites such as Ilkley and South Shields, but was used on form 27. c. A.D. 155-185; Context 1882.

S2. [BANV]IM Form 37, Central Gaulish, with a mould-stamp retr. (Banuus die 2a). Although Banuus worked at Lezoux, the bowl is unlikely to have been made there, because the fabric and glaze are too orange. It could, however, be from either the Terre-Franche kilns at Vichy where his stamped moulds occur, or from Lubié where his bowls have been found. The Apollo (D.55) has apparently not been

recorded for him, but the rosette (here unusually across a bead-row within the panel), is on a signed bowl from York. c. A.D. 160-190; Contexts 1927 and 2514.

S3. CELS[IAM] Form 31 by Celsus ii of Lezoux, where the stamp (2a) is known. It also occurs at Bainbridge and Stanwix and was used on forms 31R and 79R. c. A.D. 160-190; Context 2111.

S4. MA[RTINI] Form 33 stamped with die 2a of Martinus iii of Lezoux, where this stamp is known. It also occurs at Carrawburgh and was occasionally used on form 79. One of Martinus's other stamps is in the cargo of the Pudding Pan Rock wreck. c. A.D. 160-190; Context 1.

S5. [M·]ARTIN Form 33 by Martinus iii of Lezoux (die 7a). This particular stamp is known from Catterick and was used on forms 79, 79R and 80. c. A.D. 160-190; Context 1957.

S6. PO·TITIANI Form 31R by Potitianus ii (die 2a). There are many examples of this stamp from Lezoux and it also appears at Chesters (presumably after A.D. 159). Potitianus' forms include 31, 79 and 79R. c. A.D. 160-190; Context 1787.

S7. ALB[ILLI·MA] Form 31 almost certainly by Albillus i of Lezoux. Only one other example of this stamp (1b) is known, but his others appear at sites in the north of Britain reoccupied c. A.D. 160. There are also examples noted from the Corbridge Pottery Shop. He also made form 79, and his range will have been c. A.D. 160-195; Context 2623.

S8. A[or]V Form 33, Central Gaulish. The piece is stamped, off-centre, Antonine; Contexts 54, 93 and 469.

S9. [M]ART(I)M Form 33 by Martius iv of Lezoux, where the stamp (1b) is known. This potter's work is consistently in mid- or late-Antonine contexts. Context 1007.

S10. CAVPIVS] Form 31R stamped with die 4a of an East Gaulish potter, Caupius i. To judge by his orange fabrics and glazes and by the distribution of his work, Caupius probably worked at one of the Argonne factories. This particular stamp occurs at Chesterholm. c. A.D. 150-200; Context 47.

S11. AL·BV·SA Two form 31 by Albusa of Lezoux, where the stamp (1a) appears many times in a late-Antonine kiln. It is probably his only stamp and he used it on forms 31, 31R, 33 and 79. c. A.D. 170-200; Contexts 1027 and (1974) C21.

S12. M·AXMIIMI Form 31R and form 31 by Maximinus i of Lezoux (die 2a). This stamp was used on forms 79, 79R and 80 and occurs in a grave at Sompting, Sussex, together with stamps of Rheinzabern potters and a little-worn coin of Geta as Caesar (Ainsworth and Ratcliffe-Densham 1974). c. A.D. 180-200; Contexts 384, 577, 589 and 1897.

S13. [SEVERI]ANVS Form 31R by Severianus ii, die 4b. A Rheinzabern potter, with this stamp known only from the kilns there, apart from two previous British records at Lower Halstow and Verulamium. Severianus ii used consistently late forms, such as 32 and Ludowici Tb. c. A.D. 180-240; (1974) C46.

S14. CR^SIACVSF Form 31 (Sa) by Crassiacus of Rheinzabern (die 1a). There is no site-dating for this potter, but his regular use of this stamp on form 32 and the form of the Brancaster piece itself suggest a date c. A.D. 180-260; Context 1802.

S15. Form 31, East Gaulish, with an unidentified stamp. Late second or third century; Context 1006.

S16. Form 31 (Sa), East Gaulish. The stamp is almost certainly illiterate. Late second or third century; Context 1758.

Decorated samian
(Figs.47 and 48)

D1. Form 37, Central Gaulish, with a wavy line below the ovolo and a double festoon in a panel with a beaded border. Hadrianic-Antonine rather than later; Context 1953.

D2. * Form 37, Central Gaulish, with panelled decoration: (a) a line (D.737); (b) (upper half) Cupid (D.236), (lower half) a mask (D.694); (c) a small, fan-shaped leaf, perhaps a partial impression of a bird's tail. This appears on a bowl from Middlewich

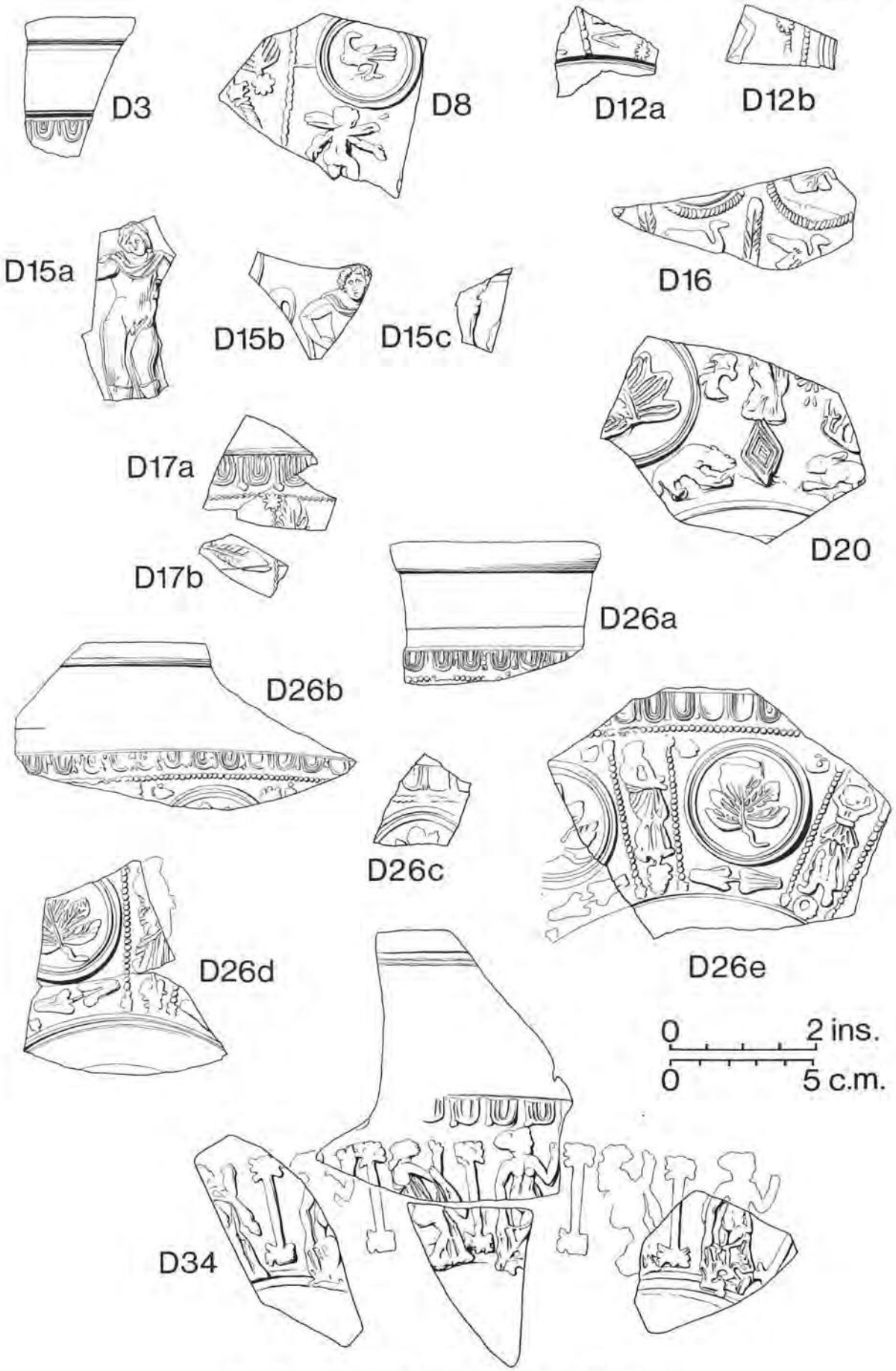


Fig.47. Decorated samian ware. Scale 1:1.

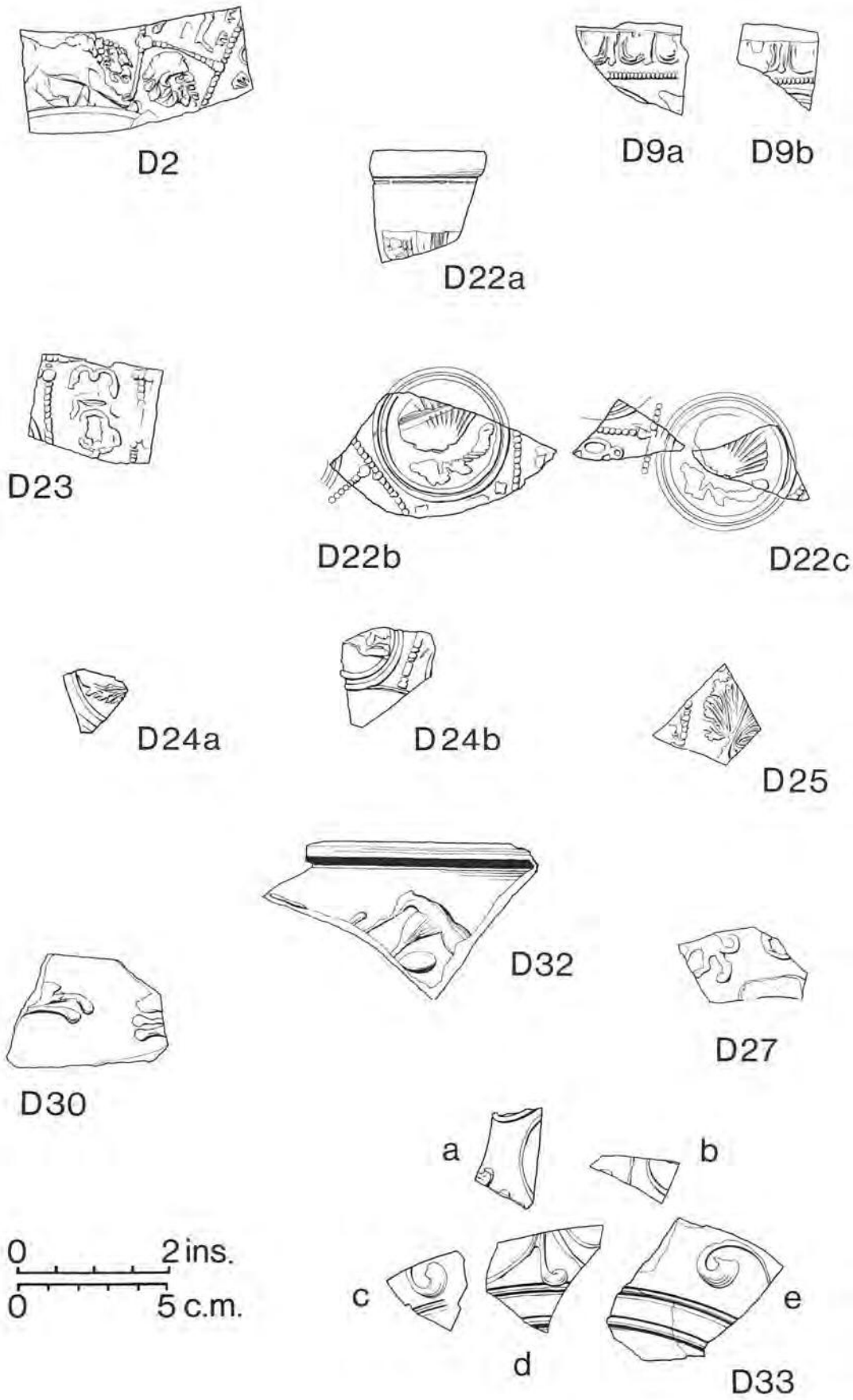


Fig.48. Decorated samian ware. Scale 1:1.

in the style of the Cerialis ii-Cinnamus ii group of Lezoux, and the Cupid is on a bowl from Baldock by one of these potters. c. A.D. 140-170; Context 58.

D3.* Form 37, East Gaulish. The ovolo is one used, though rarely, at Trier and appears there on a mould signed by Cocus iv and stamped by Comitialis. The stamp in question does not occur at Rheinzabern and seems only to have been used on bowls with decoration in the style of the Trier potteries. If this Cocus is the potter who also worked in the Argonne, which seems likely, Comitialis' activity at Trier must predate that at Rheinzabern, and this piece should belong to the period c. A.D. 160-180; Context 1.

D4. Form 37, Central Gaulish, with panelled decoration with neat borders and spindles. Perhaps by Advocisus or Divixtus i. c. A.D. 150-190; Context 2111.

D5. Form 37, Central Gaulish, with double medallion with a warrior (D.117) used at Lezoux in the Hadrianic and Antonine periods. This particular piece belongs to the period c. A.D. 150-190; Context 897.

D6. Form 30(?), with an ovolo (Rogers, B156) used at Lezoux by Iullinus ii and Mercator iv. c. A.D. 160-190; Context 2806.

D7. Form 37, Central Gaulish, with panelled decoration. The ovolo (Rogers, B103) was used at Lezoux by several potters, such as Priscus iii and Advocisus, in the period c. A.D. 160-190; Context 158.

D8.* Form 37, in the style of Banuus of Central Gaul. The bird (O.2296A) in a double medallion is shown on S&S 1958, pl.139, 3, with the rosette; the corded border is on pl.139, 7, the corded column on pl.140, 12. The Cupid is indistinct, but probably a variant of O.433. Very worn inside. c. A.D. 160-190; (1974) C21.

D9.* Forms 37, Central Gaulish, with an ovolo (Rogers, B103) and lozenge (Rogers, U30) used on a bowl from Lezoux in the style of Priscus iii. The lozenge appears on a mould from Lezoux (Roanne Mus.) with stamps of both this potter and Clemens ii. c. A.D. 160-190; Context 2692 and 2481.

D10. Form 37, with an ovolo (Rogers, B153) used at Lezoux by Iullinus ii and Mercator iv. The Victory in the double medallion (D.475) is on a bowl in Iullinus's style from Newark. The striated spindle does not seem to be known for either potter. c. A.D. 160-190; Contexts 2862 and 3264.

D11. Form 37, Central Gaulish. The ovolo is blurred, but is probably one used, with a similar corded border, by Iullinus ii (S&S 1958, pl.125, 6); the Venus is probably the one on pl.125, 5. c. A.D. 160-190; (1974) C58.

D12.* Form 37, Central Gaulish. See Potters' Stamps No.S2 above.

D13. Form 37, Central Gaulish, with bands of rouletting instead of moulded decoration (O.&P. 1920, pl.LXXV). (?) Antonine; Context 1958.

D14. Form 37, Central Gaulish. The ovolo is similar to Cinnamus ii ovolo 1, but the centre is rather more defined than usual. The square beads are characteristic of Casurius ii and Do(v)eccus i, Mid-to-late Antonine; (1974) C1.

D15.* A large jar, presumably Déchelette form 72, Central Gaulish, with a combination of appliqué figures and barbotine scrolls. The former include two different figures of youths (one Déchelette 1904, tome ii, 197, 20; the other is apparently unrecorded). Both were moulded from the same clay as the body of the vessel, and they have finger-marks showing that they were applied under some pressure. The clay used for the barbotine scrolls is different from the body clay and contains less iron. The chronology of the appliqué jars is not entirely clear, but the piece is Antonine, probably after A.D. 165. Context 826 and 1217.

D16.* Form 37, East Gaulish, in Argonne fabric. The festoon (Fölzer 1913, taf. XXVIII, 451, but with a faint line inside), the divider and the crane are on two moulds and a bowl from Lavoye (Chenet and Gaudron 1955, fig.62 I, 59B and 63, 6 respectively). The detail in the festoon has not been identified. c. A.D. 150-200; Context 897.

D17.* Form 37, East Gaulish. The fabric suggests origin in the Argonne, and the ovolo with narrow core supports this (cf. Chenet and Gaudron 1955, fig.54 bis). The long-bladed leaf is on a bowl from Avocourt (Chenet and Gaudron 1955, fig.63,

II). No close parallels for the rosette or the other leaf have been noted. c. A.D. 150-200; Contexts 1741, 2692 and 3057.

D18. Form 37 with a medallion with a seated Cupid (D.261) used at Lezoux mainly by Paternus v and his associates. c. A.D. 160-200; Context 1714.

D19. Form 37, Central Gaulish, with a seated figure (unidentified). c. A.D. 160-200; Context 2121.

D20.* Form 37, Central Gaulish. The mould was made by a somewhat incompetent mould-maker, several of whose details appear to be derived by surmoulage from ones used at Lezoux by members of the Paternus v group. However, the piece is not by any of the better-known members of the group, none of whom used medallions in a freestyle scene. The figure-types are: Pudicitia (D.540), harpy (O.862A), bear (smaller than D.807) and hare (smaller than D.950A). The rosette is a smaller version of one used by Paternus. There are apparently no parallels for the lozenge (similar to Rogers, U17) and the leaf. A date c. A.D. 160-200 is almost certain; Context 2111.

D21. Form 37, with panelled decoration. The small, double medallion with striated border and the leaf (Rogers, H167) were both used at Lezoux by Do(v)eccus i c. A.D.165-200; Context 2111.

D22.* Form 37, with some panels divided horizontally. The ovolo (Rogers, B160) was used at Lezoux by Do(v)eccus i, who also used the shell (Rogers, U76) and the cup (Rogers, T14) on bowls from Chesters and London (GH) respectively (S&S 1958, pl. 148, 25; 149, 35). The dolphin (D.1057) is on an unstamped bowl from the former Chabrol-Janelle collection clearly by this potter. c. A.D. 165-200; Contexts 897 and 1704.

D23.* Form 37, slightly burnt, with a panel with a composite motif (Rogers, Q6) used at Lezoux by Do(v)eccus i, whose characteristic beads are on the bowl. The motif appears on a stamped bowl of his from the Brougham cemetery. c. A.D. 165-200; Context 1134. cf. No.24 below.

D24.* Fragments from a Central Gaulish panelled bowl, probably from No.23 above. Double medallions contain a leaf (Rogers, H16) used by Do(v)eccus i on a bowl from Silchester (S&S 1958, pl.147, 6), and a small stag (D860?), on a bowl from Malton in the style of this potter. The heavy-beaded border also suggests the work of Do(v)eccus. c. A.D. 165-200; Contexts 260 and 1132.

D25.* Form 37, Central Gaulish. The leaf in the panel (Rogers, H15) was used by several Lezoux potters, but the piece is mostly likely to be by Do(v)eccus i, in view of the type of beaded border, c. A.D. 165-200; Context 181.

D26.* From 37, Central Gaulish, with panels: (a) double medallion with a leaf (Rogers, H59); (b) Pudicitia (D.540) over a mask; (c) = a, with opposed leaves (Rogers, J63) below the medallion, probably as on a; (d) dancer (D.210) over a beaded circle (Rogers, E54). All these and the ovolo (Rogers, B160) were used on bowls either stamped by, or in the style of, Do(v)eccus i of Lezoux, the ovolo and circle from Carlisle, the Pudicitia from Highbridge (Somerset), the mask from Leicester, the smaller leaves from Duston? (S&S 1958, pl.147, 6), the rosettes in the corner of panel (c) from London (Rogers, 10) and the dancer from Quimper. The leaf in the medallion is on a bowl from Corbridge, unstamped, but clearly by this potter. c. A.D. 165-200; Contexts 1, 47, 1727, 1838, 1840, 1841, 1843 and 1958.

D27.* Form 37, East Gaulish. The only clear detail in the freestyle scene is a dog (Ricken and Fischer 1963, T138a), used by several of the earlier Rheinzabern potters. The other animal is perhaps a bear (Ricken and Fischer T61a etc.). c. A.D. 170-200; Context 1787.

D28. East Gaulish, with a clumsily-moulded freestyle scene. The only identifiable details are a cockerel (Fölzer 1913, taf.XXVIII, 385) and, probably, an acanthus (Fölzer 1913, 386?). Both were used at Lavoye. Second half of the second century. Context 1007.

D29. Jar, Central Gaulish, with 'cut-glass' decoration. This type was made at Lezoux in the second half of the second century; Context 1802.

TABLE 1. SUMMARY OF SAMIAN FORMS

Central Gaul

* See sections - Potters' Stamps and Decorated samian	Hadrianic-Antonine	140-170	Mid-Antonine	155-185	150-190	160-190	160-195	165?-195	Antonine	Mid- to late-Antonine	160-200	165-200	170-200	180-200	2nd century	Second half 2nd century	Later 2nd century	Later 2nd + century
18/31R			1															
18/31R or 31R									1									
30						1*												
30 or 37									5	7								
31			6			2*	1*		15	48			1*	1*			2	1
31R						1*				50				1			1	
31 or 31R										1								
33						2*			6*	8*								
33 or 46									1									
35/36										1								
36			1						1	8								
37	1*	1*			2*	6*			4*	6*	3*	5*					1	
38									1	2								
38 or 44										3								
45										5								
45?										5								
46									1									
72										1								
79				1*						6							1	
79/80										1								
79 or Ludowici Tg										2								
Curle 15									2	2								
Curle 15 or 23			2						1	8								
Curle 21										1						2		
Curle 23			1						1	8								
Bushe Fox 84									1									
Dechelette 72								1*										
Ritterling 13															3			
Jar fragments																2		
Mortaria													31				3	

TABLE 2. SUMMARY OF SAMIAN FORMS

	East Gaul											Central or East Gaul		
	Antonine	160-180	150-200	170-200	180-220	180-240	180-260	Late 2nd-to-early 3rd century	Late 2nd-to-mid-3rd century	200-275	3rd century	Mid-3rd century	Later 2nd century +	Late 2nd-to-early-3rd century	Late 2nd-to mid-3rd century
30 or 37	1								1		1				
31	2						1*	3	43				2	3	4
31R	1		1*			1*			27						
32									9						
33	1							1	20						
35									1						
36								2	7						
37		1*	3*	1*	1*	1*		2	3	1*					
38								1	7		1				
38 or 44									1						
43?									1						
43 or 45									9						1
45									15			1[1]	1	1	
45?									1						
54									1						
72									1						
79									1						
Curle 21								2	1						
Curle 23									1						
Ludowici SMb									1						
Ludowici SMb or SMc									1						
Walters 79								1							
Flagon/Narrow Moulded Vessel									2						
Platters									2						

1 Argonne Ware

* See sections - Potters' Stamps and Decorated samian

D30.* Form 37, East Gaulish, burnt. The decoration is freestyle, with a stag (Ricken and Fischer 1963, T106) and dog (Ricken and Fischer 1963, T130) used at Rheinzabern by potters such as Cerialis v and Comitialis. c. A.D. 180-220. Context 36.

D31. Form 37, East Gaulish, burnt, with an ovolo (Ricken and Fischer 1963, E46) used at Rheinzabern by Iulius viii and Lupus iv. c. A.D. 180-240. Context 1802.

D32.* Form Ludowici SMb, East Gaulish, with decoration en barbotine on the upper wall (O&P 1920, pl.XII). This type was made both at Rheinzabern and Trier. Its presence at Niederbieber is conclusive for a late second- or third-century date; Context 92.

D33.* Jar of form 54, East Gaulish, with decoration en barbotine. (cf. O&P 1920, pl. LXXIX). Late second- or third-century. Contexts 711, 814 and 826.

D34.* Form 37, in the style of Iulius viii or Iulianus iii of Rheinzabern. The ovolo (Ricken and Fischer 1963, E17) Taf.209, 10, the Venus (Ricken and Fischer 1963, M47), robed figure (Ricken and Fischer 1963, M246), and column (Ricken and Fischer 1963, 0210) on Taf.209F. c. A.D. 200-275, according to Karnitsch (1959). (1974) C3.

Discussion

The samian ware points conclusively to a starting date in the mid- or late-Antonine period. Only three sherds (see D1 and D2) are earlier and are presumably survivals. There is otherwise no material which is necessarily earlier than A.D. 170. The Central Gaulish ware includes a high proportion of gritted mortaria (form 45 etc.) and decorated bowls in the style of Do(v)eccus i, one of the later Lezoux potters.

Occupation in the early third century is certain, in view of the high proportion of East Gaulish ware, even though precise dating for this is not easy. Two unstamped cups of form 33 almost certainly date well into the third century, and the presence of late forms such as 32 and Ludowici SMb makes it likely that occupation continued at least until the end of samian production. All the samian, except the fragments noted above, could fall in the range c. A.D. 170-260.

Also worthy of note is the number of dishes of the Curle forms 15 and 23. They were never particularly common forms and the proportion at this site is higher than usual.

Much of the material (not individually noted) shows considerable erosion of the glaze, but the fabric is in good condition.

THE COARSE WARES
by Gillian Andrews

Introduction

Wherever possible reference has been made to published fabric descriptions. Sherds from all of the large but unprovenanced fabric groups were thin-sectioned by Dr.David Williams and, in addition, some were selected for heavy mineral analysis. All thin-section and heavy mineral analysis results incorporated in the text are his. All other fabrics have been described according to the conventions detailed by Peacock (1977b, 29, 30). The descriptions result from an examination of the fabrics both at life size and 20 x magnification. A magnetised needle was used to identify inclusions of iron ore, and dilute hydrochloric acid to identify shell, limestone etc. The following characteristics were recorded:

1. Colour. Munsell colour chart numbers have been referred to, together with free descriptive terms.
2. Hardness.

3. Feel.
4. Visual texture.
5. Inclusions: Identification has been based on Peacock's (1977b, 30-32) 'Key to Identification of Common Inclusions in Pottery'. In practice some difficulty was experienced while using the Guide. Inclusions of a calcareous nature were easily identified, although a distinction between limestone and calcite often could not be made. Of the inclusions which have no reaction with acid, certain kinds were consistently and relatively easily identified: mica, flint, iron ore, grog. Where a distinction between quartz, quartzite and feldspar could not be made with confidence, these inclusions have been recorded as sand. It should not be assumed, therefore, that the inclusions recorded in a fabric are the only inclusions present. Frequency of inclusions is indicated on a three point scale - abundant, moderate, sparse. The following terms are used to indicate the size of inclusions: very fine - up to 0.1 mm; fine - 0.1-0.25 mm; medium - 0.25-0.5 mm; coarse - 0.5-1.00 mm.
6. Surface treatment.

Fabric names are used where possible. Where a fabric cannot be assigned with certainty to a source or has no distinctive features by which it can be easily described, it has been given a number prefixed as follows:

WW - White Ware fabrics
CW - Colour-Coated Ware fabrics
OW - Oxidised fabrics
RW - Reduced fabrics
M - Mortarium fabrics

Both fabric names and codes are cross-referenced to the original fabric numbers in the archive.

Fig.49 shows the relative amounts of each of the main ware groupings. 'Other imported wares' (p.84) are included in the fine ware figures. The amount of samian recovered is discussed above (p.74).

All East Anglian kiln and settlement sites mentioned in the fabric descriptions and discussion sections are shown in Fig.67.

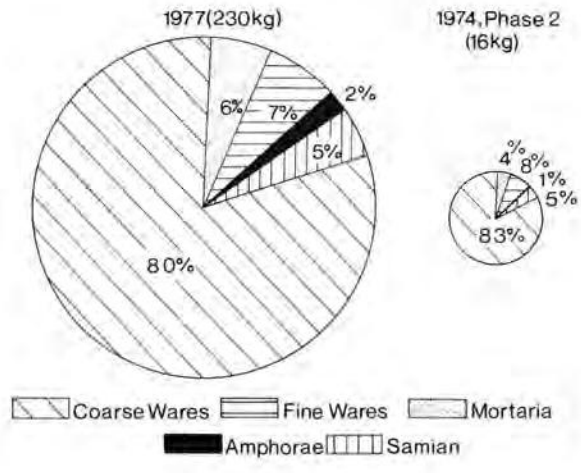


Fig.49. Relative amounts of the main ware groups at Brancaster as percentages of the total groups.

THE IMPORTED WARES

The Amphorae

The amphorae sherds were examined by Dr. Peacock. Four fabrics were distinguished:

i. Dressel 20; Spanish type. Hard pinkish-buff fabric; type 73.
ii. Dressel 20; Spanish type. Hard red fabric with white slipped surface; type 73.
iii. Dressel 30; South Gaulish. Orange or pinkish-orange soft smooth fabric. See Peacock (1978); type 74.
iv. 'Hollow-foot amphora'. Hard orange-red (2.5 YR 5/8) fabric: See Peacock (1977a, 297); type 75.

Other Imported Wares

1. Pompeian Red Ware. Three sherds from a platter; type 72 in Peacock's (1977c, 154) fabric 3, for which he suggests a source in the Auverne of Central France.
2. and 3. Rhenish Ware. This is discussed by Greene (1978, 18, 19). Both the Central Gaulish and Trier varieties are represented.
At least two beaker forms were found, see types 44 and 45.
4. (?) Rhenish White Ware (WW1). A bowl, type 63 in a fairly hard, off-white (10 YR 8/2) fabric, smooth with smooth fracture. Inclusions are moderate, well-rounded very fine sand grains. Fulford (pers.comm.) suggests a Rhenish source.

THE COLOUR-COATED AND WHITE WARES

All the White Wares are in fine fabrics and are painted, except for one, WW2, an unpainted, coarse sandy fabric.

Fig.50 shows the relative amounts of the main fine ware fabrics recovered from the 1977 and 1974 Phase 2 areas. These percentages have also been given in brackets after the fabric headings, figures for the 1977 material being given first.

Colchester Colour-Coated Ware (13%, less than 1%)

Hard smooth fabric with a smooth fracture, irregular at x 20. Core colour varies from red to light orange (hue 2.5 YR or 5 YR, chroma 6 or more, value 5 or more). Inclusions are moderate fine and very fine quartz (some medium), sparse fine red and very fine black iron ore. Colour coats vary from reddish-brown to greenish-black or black.

Forms represented are: a jug, type 43; beakers, types 47, 50 and 51; bowls and lids, types 61 and 62.

Nene Valley Wares (83%, 66%)

1. Colour-Coated Ware. Two types are represented:
a. (CC1). Hard, smooth fabric, with a fracture appearing irregular at x 20. Core colour varies from white, buff or pink (5 YR to 10 YR value 7 or 8 Chroma 3 or 4), to pale orange (7.5 YR 8/6). Some have grey or white patches. Inclusions are moderate quartz, some medium, but mainly fine and very fine, sparse very fine mica and sparse fine black and red iron ore, although occasionally the black iron ore is moderate in frequency. Small irregular voids also occur. Colour coats vary from dark grey to brown to reddish-brown and the finish varies from matt to slightly metallic in appearance.
Most common forms represented are: beakers, types 46, 47, 48, 50 and 51, and shallow bowls and dishes, types 64-71. Other forms are: a jug, type 43, a narrow-

mouthed jar, type 54; bowls, types 56-58; Castor Boxes and Lids, types 61 and 62.

b. (CC2). The same as (a) but distinguished by its light grey (N7/) core, and very dark grey (N3/) colour coat.

Most common forms represented are shallow bowls and dishes, types 65 and 68. Other forms are: a flagon, type 41; a beaker, type 49.

2. White Ware (WW). Hard smooth white, buff or pink (5 YR value 7 or 8 Chroma 3 or 4, 7.5 YR 8/4) fabric, with a smooth fracture, irregular at x 20. Thin sectioning shows a groundmass of quartz grains, average size 0.05 mm-0.20 mm, and a sparse scatter of larger grains up to 0.40 mm across, together with a few inclusions of iron ore. Characteristic is painted decoration, red or reddish-brown (2.5 YR), and occasionally vessels appear to have a whitish (10 YR 8/4) slip.

Three vessel forms occur; a flagon, type 40; a beaker, type 53; a jar with frilled rim, type 55.

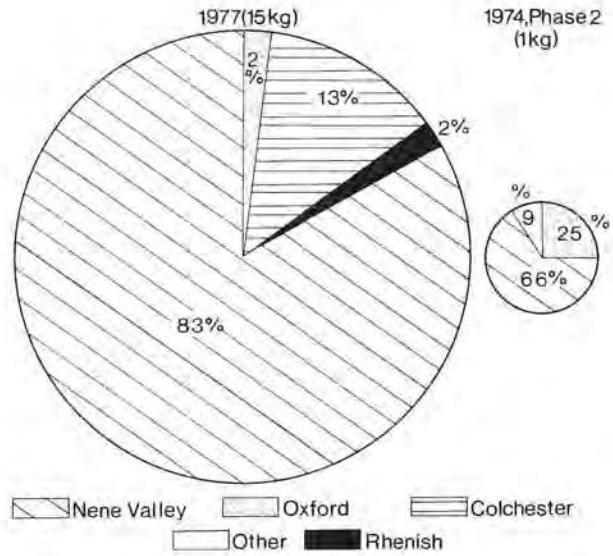


Fig. 50. Relative amounts of the main Colour-Coated and White Ware fabric groups at Brancaster as percentages of the total fine ware groups.

Oxford Wares (2%, 25%)

1. Colour-Coated Wares. See Young (1977, 123-184).
   Three bowl types are represented, types 59, 64 and 67.
2. Parchment Ware. See Young (1977, 80-92).
   One bowl form is represented, type 60.

Other Wares (less than 1%, 9%)

Hadham Ware. A hard sandy fabric, red or light red (2.5 YR) in colour with distinctive strongly-burnished finish. For fuller discussion and description see Greene (1978) and Orton (1977, 37).

One bowl form is represented, type 59.

CW1. One beaker sherd, type 52, in a hard pink (5 YR 7/6) fabric with a light grey (2.5 Y 7/2) core: the fracture is smooth, and inclusions are moderate very fine quartz and a scatter of coarse red and black iron ore. Traces of a reddish-orange slip survive. Kilns producing Colour-Coated pottery are known in Suffolk, e.g. Pakenham,

(Smedley and Owles 1959) but none of the Brancaster sherds resembled their products, although comparison was made macroscopically only.

CW2. Miscellaneous Colour-Coated Wares. Twelve sherds, mainly burnt or abraded, which could not be assigned to other groups.

WW2. A large handled flagon, type 42 in a hard cream (10 YR 8/4) fabric with a rough feel and irregular fracture. Inclusions are moderate fine and medium quartz with a scatter of larger grains up to 0.2 mm in size, also sparse fine red iron ore and very fine mica.

WW3. Miscellaneous White Wares. Eleven abraded sherds which could not be assigned to fabric groups.

Discussion: The Colour-Coated and White Wares

As can be seen from Fig.50 the Nene Valley was always by far the most important supplier of fine ware fabrics to Brancaster. Although as noted above (p.72), large published kiln groups from the Nene Valley are lacking, many of the vessels published here accord well with products known from kilns at Sibson (Hartley 1960) and Stibbington (Wild 1974) of mid-third and late third/early fourth-century date respectively. Some types are probably rather earlier than this however.

Colchester products seem to have been of less importance. Forms which can be matched at Colchester (Hull 1963) are dated from the mid-second to fourth century, but competition from the Nene Valley industry probably meant that the Colchester products became of even less importance in the later period. This would certainly explain their absence from Phase 2 of the 1974 area which, as discussed above (p.71-3), is likely to have been occupied at a date later than the 1977 area.

Oxford products were only recovered in any quantity from the 1974 excavations (see Fig.50) and, as discussed above (p.71-3), at Brancaster they are likely to be of fourth-century date. Comparison of the fine wares from the 1977 and 1974 Phase 2 areas shows that in the later period at Brancaster, Oxford wares were competing significantly in a market previously dominated solely by Nene Valley Wares. The proximity of the Nene Valley industry must have always meant that they were relatively scarce in West Norfolk however, and the same must be true of Much Hadham products, of which only one vessel was found (a bowl, type 59.1) in unstratified material from the 1974 excavations. This, like the Oxford Ware, is probably of fourth-century date. A different supply pattern emerges from the east of the county, where in a mid-fourth-century group from Burgh Castle, the Colour-Coated Wares were made up of equal quantities of Nene Valley, Much Hadham, and Oxford Wares (S.Johnson pers.comm.), although here these wares made up thirty per cent of the total pottery.

Only Rhenish Ware (from both Central Gaul and Trier), of the other fine ware fabrics was recovered in any quantity, and this was only from the 1977 area (2% of the fine wares). The beaker forms represented (Types 44 and 45) are unlikely to be later than the mid-third century.

The majority of the mortaria, the other specialist ware, seem to have been imported from the same sources as the fine wares (p.122-123). Again the Nene Valley was the most important supplier, but mortaria from Colchester, the Oxford region, and the Rhineland are also found.

Table 3 shows the relative amounts of fine ware vessels from the 1977 area. There

TABLE 3. RELATIVE AMOUNTS OF FINE WARE VESSELS FROM THE 1977 EXCAVATIONS AS PERCENTAGES OF THE TOTAL FINE WARE VESSEL GROUP

	% Weight	% Count	% Equivalent Vessel
Flagons/Jugs/Narrow-mouthed Jars	8	7	12
Beakers	48	62	63
Bowls	2	2	2
Shallow Bowls and Dishes	34	19	15
Boxes and Lids	8	10	8
Total	100 (3 kg)	100 (177)	100 (20)

was too little fine ware pottery from Phase 2 of the 1974 ware to present in this way, but the vessel types found in this phase are discussed at the end of the section.

Beakers are the most common fine ware type represented in the material from the 1977 excavations. The earliest form is probably the cornice-rim beaker, type 46, which, in both the Nene Valley and Colchester (Hull 1963, fig.107, 391) industries, seems to have emerged in the mid-second century, and to have achieved a widespread distribution through to the fourth. The bag-shaped beaker, type 47, also seems to be an early form, and similar vessels were being produced at Colchester from the mid-second century onwards (Hull 1963, fig.107, 392) and at Sibson in the mid-third (Hartley 1960, fig.4, 2). The indented beaker series (see types 49 and 50) also appears to have emerged in the mid-second century, although the types represented here are rather later in date. Gillam (unpubl.) in a discussion of products from Kiln A at Water Newton has suggested a late second/early third-century date for types similar to type 49, with an everted rim, and a date some time in the second quarter of the third century for the change to funnel necks (type 50). After this date the form becomes increasingly elongated in proportions. The vessels represented here by type 50 would be mid-third century onwards in date. Certainly on Hadrian's Wall type 49 seems to have disappeared by the mid-third century (Gillam 1970, types 92 and 93) while type 50 is present from the mid-third into the fourth century (Gillam 1970, types 53 and 54). Types similar to 50.1 and 50.2 were being produced at Sibson in the mid-third century, and Stibbington in the later-third century (Hartley 1960, fig.4, 4 and 4.5). Beakers of type 51 seem to be of later third- or fourth-century date. Type 51.1 and 51.2 is an unusual form which can be matched at the Colchester kilns (Hull 1963, fig.89, 4) as can type 51.4 (Hull 1963, fig.89, 3). Type 51.4 is similar also to vessels being produced by the Oxford industry (Young 1977, type C23) dated 270-400, and a similar vessel is found in a late third/early fourth-century context at Verulamium (Frere 1972, fig.133, 1117). Type 51.3 was being produced at kilns at Chesterton in the fourth century (Hartley 1960, fig.4, 6) although it was probably introduced earlier. It is commonly found in later third/early fourth-century contexts at Verulamium (Frere 1972, fig.133, 1115 and fig.134, 1133, 1135 and 1136).

Dish and bowl forms seem to be mainly of later third- or fourth-century date, types 64, 65, 66, 67, 69 and 71 all being made at Sibson (Hartley 1960, fig.3.6, 3.7, 3.8, fig.4.16) or Stibbington (Wild 1974, fig.8, f, g, h, j). Type 67.1, with barbotine decoration is probably third century rather than fourth (Hartley 1960, fig.4, 7) and similar vessels are known to have been made by the potter Indixivixus (Dannell 1973) although the fabric of the Brancaster vessel does not exactly parallel these. Dishes of types 69 and 71 are both found in the Great Casterton villa destruction deposit (Gillam 1951, fig.8, 35 and fig.10, 40) of the later fourth century, and may be of a later date at Brancaster.

Other types similar to vessels found at Great Casterton are the bowls types 57 and 58 (cf. Gillam 1951, fig.8, 15 and 16 and fig.9, 24).

The White Ware bowl (type 63), possibly from a Rhenish source, is an oddity, and almost certainly a survival. Vessels of similar form from the Rhineland (see Gose 1950, taf.16, 241 and 18, 260) are of late first-century date, and a bowl of similar form and fabric was found at Milecastle 48 on Hadrian's Wall in a context dated 120-140 (Gillam 1970, type 192).

Other forms are more difficult to parallel. The flagon, type 41, is similar to forms being produced at Oxford c. 240-350 (Young 1977, type C4) and the jug, type 43, is also likely to be of this date. Castor boxes and lids, types 61 and 62 seem to have been produced from the late second-to-late fourth centuries with little variation in form.

The fine wares, thus, span a period from the mid-second to fourth centuries, with a preponderance of vessels from the 1977 area being mid-to-late third century. The later date of the 1974 area Phase 2 suggested particularly by the presence of Oxford Ware vessels (types 59.2 and 64.2) is also indicated by the Nene Valley Ware vessels found in this area. Over 50% (by count and equivalent vessel, see Table 3) of the fine ware forms from the 1977 excavations were beakers, whereas only one recognisable type (type 46) was found in the Phase 2 material of the 1974 area. The scarcity of Colour-Coated beakers has been noted in other late groups (Darling 1977, 24). In contrast the forms occurring in the Phase 2 material are likely to be later Nene Valley forms, bowls and dishes types 57, 58, 69 and a jar type 54. Types 54 and 57 are only found in the Phase 2 material.

The differences between these two groups of material thus give indications at least of changing supply patterns in the later-third and fourth centuries.

THE REDUCED AND OXIDISED WARES

Table 4 shows the relative amounts of the main coarse ware fabrics found in the 1977 and 1974 areas. The order in which they are given is that of the fabric descriptions which follows. The relative quantities are also given in brackets after the fabric heading, the first figure being for the 1977 material, the second for the 1974 Phase 2 material.

Nene Valley Grey Ware (2%, 1%). Hard smooth fabric, light grey (N6/, N7/, or 10 YR 7/1, 6/1). Sometimes with a very dark grey (N3/) core and white margins. The fracture is smooth, appearing irregular at x 20. Inclusions are moderate fine and very fine quartz with a scatter of medium grains, and sparse fine black iron ore. Burnishing is almost universal and gives vessels a bluish-grey or whitish appearance.

The most common vessel forms are dishes, types 137, 141, 145, 157 and 158. The only other form is a bowl, type 114.

Black-Burnished Ware Category 1, BB1. Dorset. (2%, 2%). For a full description and discussion of this ware, see Williams (1977a).

Forms represented are: jars, type 105; shallow bowls and dishes, types 144, 145, 147 and 158.

Black-Burnished Ware Category 2, BB2. (8%, 4%). This ware has most recently been discussed by Williams (1977a), to whom a sample of Brancaster BB2 sherds were sent for analysis. The sherds are well burnished and have been slipped. The surface colour varies from pinkish-grey to light-grey. The fabric is reasonably homogeneous, which suggests a single source for all the sherds. Heavy mineral analysis produced a suite characterised by a high tenor of zircon combined with almost equal amounts of tourma-

TABLE 4. RELATIVE AMOUNTS OF REDUCED AND OXIDISED FABRICS AT BRANCASTER AS PERCENTAGES OF THE TOTAL COARSE WARE GROUPS

	1977 %	1974 Ph.2 %
Nene Valley Grey Ware	2	1
BB1	2	2
BB2	8	4
Dales Ware	*	*
Shell-Gritted Ware	3	9
RW1 and OW1 ? Shouldham	50	33
RW2 and RW3 ? Brampton	3	1
RW4, 5 and 6 Micaceous fabrics	3	3
RW7, 8 and 9 'Jar fabrics'	3	1
RW10 'Sandy grey wares'	20	37
RW11	4	7
RW12-20	1	*
OW2-10 Other oxidised wares	1	2
Total	100 (179 kg)	100 (13 kg)

*less than 1%

line and garnet, and moderate amounts of rutile and kyanite, which agrees well with an analysis of a large group of BB2 vessels shown to have been made at Colchester (Williams 1977a, group XII). A similar origin for the Brancaster BB2 is likely. Some difficulty was experienced in distinguishing BB2 bodysherds from those of fabric RW11 (see p.93).

Vessel forms represented are: jars, type 105; shallow bowls and dishes, types 137, 138 and 153.

Dales Ware (less than 1% both areas). Of 'classic' shell-tempered type as defined by Loughlin (1977), type 108.

Shell-Gritted Ware (3%, 9%). Soft, smooth dark-grey (N3/) fabric often with red or dark-red (2.5 YR) surfaces which can be internal or external only. At other times the surface can be mottled grey/red in appearance. The fracture is irregular, and as well as abundant shelly inclusions - mainly coarse, with some up to 2.5 mm in length - there are sparse fine and medium-black iron ore and sparse fine quartz and mica. This fabric would appear to be in the general tradition of later Roman Shelly wares discussed by Sanders (1973).

Jar forms predominate, types 99 and 100. Other forms represented are: a dish, type 141; and a lid, type 162.

RW1 and OW1 ?Shouldham (51%, 33%). Both these fabrics appear to come from the same source, possibly Shouldham, as discussed below.

RW1. Hard, rough fabric, very dark grey (N3/) throughout, with a moderate amount of quartz and the odd fragment of flint. Irregular fractures have a 'granular' appearance. Thin sectioning shows small fragments of chalk and flint and a scatter of sub-angular quartz grains, average size 0.20 mm-0.50 mm, together with some quartzite and argillaceous material. The vessel forms in fabric 1 and the fabric itself bear a striking resemblance to the products of the Shouldham kiln twenty-five miles south of Brancaster and it was, therefore, decided to conduct a heavy mineral analysis to establish if there was any connection between the two sites. Sherds from two vessel forms

common to both Brancaster and the kiln site were selected, a grooved bowl, type 150, and a rusticated jar, type 100. The results of the analysis are shown in Table 5. The heavy mineral assemblage from the two Shouldham kiln samples is characterised by a fairly high tenor of zircon and a moderate amount of garnet and tourmaline and small amounts of both pyroxene and epidote. Such a suite of minerals seems likely to be derived from the local drift deposits (Boswell 1916, 90), rather than the Gault or Lower Greensand of the Shouldham area, as epidote appears to be lacking in these latter deposits (Rastall 1919). The two Brancaster samples are petrologically very similar to those from Shouldham, and it is quite possible that the Brancaster pots were made at the Shouldham kiln or in that area. However, glacial drift deposits are fairly widespread in Norfolk, and without a more detailed study of these particular types of wares, an alternative source to Shouldham for the Brancaster samples cannot at this stage, be ruled out.

Recent excavation at Pentney in west Norfolk has revealed two kilns producing vessels similar in fabric and form to vessels in fabric RW1, although initial petrological examination of the Pentney material in thin section does not suggest a close match. The similarity of the products from Pentney and Shouldham would make the term 'Nar Valley Ware' now seem appropriate.

TABLE 5. HEAVY MINERAL ANALYSIS OF POTTERY FROM BRANCASTER AND SHOULDHAM

	Zircon	Tourmaline	Garnet	Pyroxene	Rutile	Kyanite	Andalusite	Staurolite	Epidote	Apatite	No. grains counted
1. Brancaster (RW1) Jar type 100	49.8	13.4	14.6	7.1	0.4	1.3	1.3	0.3	5.3	6.5	255
2. Brancaster (RW1) Dish type 150	47.5	16.7	19.4	3.6	0.7	2.9	0.8	0.5	5.8	2.1	339
3. Shouldham kiln Jar type 100	58.4	9.7	14.5	4.0	2.4	0.8	1.6	0.6	4.8	3.2	478
4. Shouldham kiln Dish type 150	59.5	9.8	13.4	4.5	1.5	1.2	1.5	0.9	6.2	1.9	533

The most common vessel forms found are: jars, types 100, 102, 106; bowls, types 114, 119, 120, 127, 128, 131, 132; and shallow bowls and dishes, types 133, 137, 138, 139, 140, 141, 142, 146-153, 156, 157 and 159. Other forms found are: a flagon, type 82; bottles, type 84; narrow-mouthed jars, types 85 and 88; beakers, types 94 and 95; storage jars, type 99; a lid, type 160. Cheese press fragments were found, but no form could be reconstructed. Burnishing is very common, except on jars, and can give a slip-like appearance to the surface. Jars are frequently decorated with thin oblique lines of rustication (Thompson 1958, Type III). Burnished line decoration, rouletting and stabbed decoration are also commonly found on vessels in this fabric.

OW1. A fabric very similar to the last, an observation confirmed by thin sectioning. The difference is the colour, which is generally reddish-yellow (7.5 YR), sometimes with dark grey (N4/) patches. The sole vessel form represented is a storage jar, type 99, and it would appear that this fabric was from the same source as the last, but that different firing conditions were needed to produce these larger vessels. Together these fabrics form by far the most significant part of the total assemblage (p.98 and Table 9).

RW2 and 3 Brampton (3%, 1%).

RW2. Hard smooth grey (N4/ or N5/) fabric, with a finely irregular fracture. Inclusions are abundant fine and very fine quartz and sparse very fine black iron ore. This fabric, and the forms found in it, bear a close resemblance to products of the Brampton Kilns thirty miles south-east of Brancaster (Green 1977) and this is suggested as the source area. Where the designation of 'Brampton' could not be made with certainty sherds were coded as a fine 'sandy grey ware', (RW10 below). For a petrological analysis of the Brampton Kiln products see Williams (1977b). Surfaces are generally burnished, and burnished line decoration is common. Stabbed decoration also occurs.

Vessel forms represented are: bottles, type 76 and 84, a jar, type 101; bowls, types 114 and 120.

RW3. Hard grey (N/4) fabric with a harsh feel and hackly fracture. Inclusions are abundant fine and very fine quartz grains and moderate very coarse flint particles, up to 0.5 mm across. This extremely distinctive fabric was found to be visually very similar to kiln material from Brampton (unpublished, Norwich Museum).

Only one vessel form is represented - a jar, type 100.

Other grey wares. These fall into four groups:

1. Micaceous fabrics

RW4, 5 and 6. (3%, 3%). A group of three fabrics all with a high mica content. Highly micaceous fabrics are a feature of certain kilns on the Suffolk/Norfolk border, eg Homersfield (Smedley and Owles 1959) and Wattisfield (Moore 1936). None of the Brancaster fabrics or forms found in them is precisely paralleled there, although no petrological analysis was undertaken to confirm this.

RW4. Fairly hard, smooth fabric, grey (N5/ to 10 YR 5/1) core, sometimes with brown (7.5 YR) margins. Less common is a uniform grey (10 YR 5 or 4/1 or 2). Fractures are smooth, appearing irregular at x 20. Inclusions are moderate fine quartz and moderate fine mica. Surfaces are generally burnished, sometimes subsequent to the application of slip.

Bowls and dishes are the only forms found, types 122, 126, 136, 147 and 154.

RW5. Fairly hard, smooth, light grey (2.5 Y Value 5 or more, Chroma 2) fabric, with a dark grey slip (N3/) on both surfaces. The fracture is smooth, finely irregular at x 20, and inclusions are sparse fine and very fine quartz, and moderate very fine mica.

Vessel forms represented are: a beaker, type 91; a jar, type 109; a bowl, type 130; a dish, type 133.

RW6. One vessel, an indented beaker, type 93, in a hard, slightly rough fabric (except area on shoulder burnished), with a finely irregular fracture. The core is light grey (10 YR 7/1) and both surfaces have a slip, dark grey (N/3) exterior, light grey (N5/) interior. Inclusions are moderate mainly fine, very fine, some medium and coarse sub-angular sand, very fine mica, and sparse very fine black iron ore.

2. 'Jar Fabrics'

RW7, 8 and 9. (3%, 1%). A group of three fabrics, the most important product in each case being the jar, type 100.

RW7. Hard rough fabric, with dark grey (5 Y 3/1) core and reddish-brown (5 YR 5/3) margins. Fractures are hackly and have a granular appearance. Inclusions are abundant very coarse and coarse rounded and sub-angular pink quartz, moderate fine and medium quartz and sparse fine black iron ore.

Type 100 is the only form found.

RW8. Hard, fairly smooth fabric with characteristic orange core (5 YR Value 4 or 5, Chroma 4 or 6) and dark grey surfaces, (10 YR 4/1). Thin sectioning showed a moderate amount of quartz sand, average size 0.10 mm, and a sparse scatter of larger grains up to 0.70 mm across, together with flecks of mica.

Other than type 100, forms represented are: bottles, type 84; dishes, type 155.

RW9. Hard fabric, with a harsh feel and hackly fracture. Grey in colour (10 YR 4/1 or N4/), sometimes with a reddish-brown core (5 YR Value 4 or 5, Chroma 4 or 6). Inclusions are moderate medium and coarse, and sparse very coarse angular and sub-angular quartz sand, and sparse very fine rounded black iron ore. A reddish-orange slip (2.5 YR 4/4 or /6) which covers the interior and exterior is common.

Other than type 100, forms represented are: a flagon, type 83; a jar, type 112; two bowls, types 121 and 131; a dish, type 135.

3. RW10 (20%, 37%)

A group of fabrics which includes material from a variety of sources for reasons explained below. Originally an attempt was made to sort this group into separate fabrics. However, heavy mineral analysis of a sample of sherds proved this to be a fruitless task, as sherds which looked extremely similar even at x 20 were shown to have very different mineral suites, and it was found impossible to relate these differences back to the sherds as a basis for sorting. Consequently this group contains pottery from several sources.

There are several kiln sites producing these wares in the area, and the sites at Witton fifteen miles north-east of Norwich, and Hevingham eight miles north of Norwich produced pottery superficially similar to the Brancaster material. Thin sections and heavy mineral analyses of sherds from both sites were made for comparison with the Brancaster sherds, but there was no conclusive correlation between any of the results. Thin sections of the Brancaster sherds generally showed frequent sub-angular quartz grains, average size 0.05-0.20 mm or 0.10-0.20 mm, together with frequent flecks of mica. Sometimes a little flint and the odd grain of plagioclase feldspar were present. The thin section of the Hevingham sherd also contained plentiful sub-angular quartz grains, but the average size range is slightly higher than that of the Brancaster samples, 0.10-0.50 mm. The Witton sample had a smaller size of quartz, ground mass under 0.10 mm, and a sparse scatter of larger grains, average size 0.20-0.30 mm. The results of the heavy mineral analyses appear below in Table 6 - the Witton sherd produced too few grains for a reliable reading.

TABLE 6. HEAVY MINERAL ANALYSIS OF POTTERY FROM HEVINGHAM AND BRANCASTER

	Zircon	Tourmaline	Garnet	Pyroxene	Rutile	Kyanite	Andalusite	Staurolite	Epidote	Apatite	Anatase	No.grains counted
Hevingham Kiln I	62.1	-	10.6	4.3	0.8	3.8	2.6	0.8	2.6	9.6	2.8	127
Brancaster RW10 (1)	29.5	16.4	38.8	-	0.5	2.1	3.2	0.7	5.6	3.2	-	167
Brancaster RW10 (2)	71.8	4.2	14.2	2.9	0.3	3.1	2.1	0.2	1.2	-	-	273

All RW10 fabrics are hard, fairly rough and the colour varies from grey to dark grey (10 YR 4/1 to 6/1 or N4/ to N6/). Sometimes greyish-brown (10 YR 4/1) or reddish-brown (5 YR) core or margins are found.

RW10 Sandy grey wares comprise one of the most important coarse ware fabric groups found on the site (see Fig. 51) and a wide range of vessel forms are represented: bottles and flagons, types 76, 77 and 84; narrow-mouthed jars, types 85, 86, 87 and 89; a beaker type 92; jars, types 100, 102-105, and 107; bowls, types 114-116, 118, 120, 122, 123, 125 and 129; shallow bowls and dishes, types 135, 136, 141, 143, 145, 147, 153, 155, 157 and 158; lids, types 160 and 163; a cheese press, type 164.

Vessels are frequently burnished, while decoration is not common, being mainly restricted to burnished line decoration of various kinds, although stabbed and slashed decoration do occur.

4. RW11-20

Grey wares with no outstanding characteristics which were, however, consistently distinguished and sorted and are, therefore, described separately. All are less then 1%, except RW11.

RW11 (4%, 7%). A fairly hard fabric, with a finely irregular fracture. Grey (N/4 or N3/), frequently with greyish-brown margins. A thin section showed it to be characterised by well-sorted quartz grains, in the size range 0.10-0.20 mm. Vessels generally have a black or very dark grey surface and are well-burnished, giving them the same 'silky' quality frequently attributed to BB2 (Williams 1977a). Considerable difficulty was in fact experienced when processing, in distinguishing between the two.

The range of forms is quite distinct and includes: a flagon, type 81; a narrow-mouthed jar, type 86; a beaker, type 92; jars, type 101, 103; bowls types 114, 117, 119 and 123; dishes, types 141, 145, 147, 153, 157 and 158. It was only when a body sherd could be referred to a specific type, however, that it could be allocated to the RW11 group or to BB2 with certainty.

RW12. A hard fabric, slightly rough (except where burnished) with a finely irregular fracture. The core is grey (10 YR 4/1-7/1) and both surfaces are covered in a dark grey (N3/) slip. The exterior is generally burnished. Inclusions are abundant fine and very fine quartz, and sparse very fine black iron ore.

There is a variety of forms including: a beaker, type 96; jars, types 109 and 111; bowls, types 114, 115, 120 and 127; dishes, types 136 and 149.

RW13. A very hard, smooth fabric, with grey (N5/) surfaces and orange (5 YR 6/6) core. The fracture is finely irregular, and inclusions are moderate fine and medium quartz, with a scatter of very fine grains, and sparse fine and medium red iron ore. The surface is generally burnished.

Two vessel forms are found: a bottle, type 84; a bowl, type 118.

RW14. Sherds from three vessels, all bowls type 124, of a fairly hard slightly rough fabric, grey (N4/ or N3/), two examples having red (2.5 YR 5/8) margins. The fracture is smooth and the only visible inclusions are moderate very fine quartz with a scatter of fine grains, and sparse very fine mica.

RW15. Fairly hard fabric with distinctive orange (2.5 YR, red) core and narrow dark grey (N3/) margins. The fracture is irregular and inclusions are sparse medium quartz, with a scatter of coarser grains, sparse fine red quartz and sparse very fine black iron ore. Both surfaces are covered with a black slip which is highly burnished, giving a very glossy appearance.

Only one vessel form is found - a bowl, type 144.

RW16. One form - a poppy-head beaker, type 90, in a soft, smooth grey (N5/ to N3/) fabric, sometimes with greyish-brown (5 YR 4/1) margins. Inclusions are sparse very fine quartz, very fine mica and sparse fine red iron ore.

RW17. One vessel - a lid, type 161, in a hard, rough fabric which varies from dark grey (N3/) to light grey (10 YR 7/2). The fracture is irregular, and inclusions are moderate fine quartz, moderate coarse and very coarse grog, and sparse coarse limestone or calcite.

RW18, 19, 20. Miscellaneous grey wares, represented only by body sherds. Descriptions can be found in the archive.

Other Oxidised wares (2%, 2%)

None of these oxidised wares has been assigned to source. The majority are represented by one sherd or one or two vessels only (OW4, OW5, OW6, OW7, OW8) or by body sherds to which no form could be ascribed (OW9 and OW10). All of these are highly distinctive and were easily sorted.

Considerable difficulty, however, was experienced in characterizing the remainder and it was finally decided to sort into a 'coarse' (OW2) and a 'fine' (OW3) group, based on the predominant sand inclusion size. Both these groups, therefore, probably comprise vessels from more than one source.

OW2. 'Coarse' oxidised wares. Fairly hard, rough orange (2.5 YR or 5 YR Value 5 or more, Chroma 8) fabrics, with an irregular fracture. Inclusions are moderate quartz, mainly fine, some medium, sometimes with sparse very fine black iron ore and/or fine red iron ore, and sparse very fine mica.

Four recognisable vessels were found: flagons, types 79 and 80; a jar, type 100; a beaker, type 97.

OW3. Fine oxidised wares. Soft, smooth pinkish-buff fabrics (5 YR Value 6 or 7, Chroma 6 or 8) with finely irregular fracture. Inclusions are moderate fine and/or very fine quartz and usually sparse very fine mica. Occasionally, there are sparse coarse yellowish-white lumps which do not react with acid.

Two flagons were found in this fabric, types 76 and 78.

OW4. Fragments of three beakers, type 98, in a hard, rough (except where burnished) fabric with a finely-irregular fracture. Colour is pink (5 YR 7/6), occasionally with white margins. Surfaces are pinkish-buff 7.5 YR 7/6 or buff 10 YR 7/5. Inclusions are moderate fine and very fine quartz, sparse fine red iron ore, and sparse coarse and very coarse white lumps which do not react with acid. The bodies are burnished, which has produced a series of horizontal light-brown smears on the surface.

OW5. One vessel, a pie-dish, type 157, in a soft, smooth bright orange (2.5 YR 5/8) fabric with a finely-irregular fracture. Inclusions are moderate fine and very fine sand, sparse very fine red iron ore and mica, and sparse coarse and very coarse grog, up to 4 mm across.

OW6. One sherd, a pedestal base, type 165, in a fairly hard, smooth dark orange (2.5 YR 4/6) fabric with a pale brown (2.5 Y 7/2 or 6/2) core. Finely irregular in fracture, visible inclusions are moderate very fine and mica.

OW7. One jar sherd, type 113, in a hard, pink (5 YR 7/6) fabric, slightly rough, and with an irregular fracture. Inclusions are moderate fine and very fine white and pink quartz, sparse fine black and red iron ore, and sparse very coarse grog.

OW8. One sherd only - a coil built base - of a highly distinctive reddish-brown (5 YR 4/3) fabric, hard and harsh to feel with a very irregular fracture. The inclusions are moderate mainly medium, some coarse, sparse fine black iron ore, and sparse coarse and very coarse flint, up to 10 mm across. There are also very coarse yellow inclusions which do not react with acid and which have partially trailed through the fabric to give it an irregular banded effect.

OW9 and OW10. Miscellaneous oxidised wares, represented only by body sherds. Descriptions can be found in the archive.

Discussion: The Reduced and Oxidised Wares

As can be seen from Table 4, by far the most important supplier of coarse wares to the 1977 area at Brancaster was the industry possibly situated at Shouldham, which produced a wide range of forms (p.90). These products were supplemented by a very similar range of products from other, presumably local, suppliers. Of these, only the kilns at Brampton can be named with any certainty. Of the wares travelling longer distances, Nene Valley Grey Ware, BB1, BB2 and Dales Ware have been found, although only BB2 is present in any quantity. It is interesting to note that none of the latter fabrics have previously been plotted on distribution maps of the area (Williams 1977a, figs.1 and 2, and Loughlin 1977, fig.4) although the presence of Dales Ware has been correctly predicted (Loughlin 1977, 108).

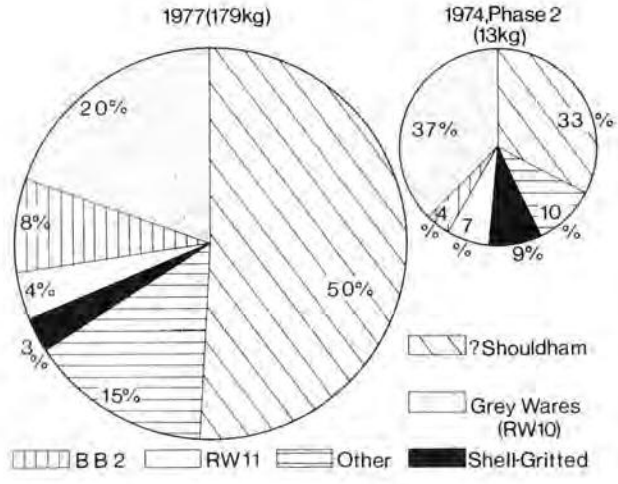


Fig.51. Relative amounts of the main reduced and oxidised fabric groups at Brancaster as percentages of the total coarse ware groups.

Evidence for a somewhat different marketing pattern emerges from the 1974 phase 2 material (Table 4 and Fig.51). Shouldham products, although still numerous had more competition from other sandy grey and Shell-Gritted Wares, and BB2 vessels seem to have ceased being of any importance. Shell-Gritted Wares are found in many pottery assemblages in Norfolk from the late-second century onwards (T.Gregory pers.comm.) and they increase in quantity in the later-third and fourth centuries. Excavations at Scole (Rogerson 1977, 193) in particular have shown this pattern of supply. The greater proportion of Shell-Gritted Wares found in the Phase 2 1974 material would thus appear to be consistent with its later date.

Table 7 shows the relative amounts of vessel types occurring in the 1977 area. A similar anaylsis has not been made of the 1974 Phase 2 material due to the relatively

small amount of pottery recovered, but types found in this area are noted as appropriate.

One of the most interesting types is the jar, type 100, and the related storage jar, type 99. Type 100 appears in a wide range of fabrics and with many rim variants, and is almost always decorated on the shoulder, most commonly with rustication of 'Icenian' variety, generally attributed to the third century or early fourth century (Thompson 1958, Type III). The late use of this decoration in East Anglia, found elsewhere in Britain in late-first/early-second-century contexts, has often been taken as an indicator of cultural backwardness amongst the Iceni (Atkinson 1929, 202-3). Recently, however, Swan (1981, 147) has suggested that this style of decoration evolved from the stabbed and slashed decoration which has a long ancestry in the East Anglian potters' repertoire. Rustication produces a ridged effect very similar to decorative slashing, and it seems far more probable that it is to this type of decoration that 'Icenian' rustication owes its origins, rather than to the much earlier rusticated tradition, which in any case was never popular in the area. Rustication is the decorative motif most commonly found on jars of this form, but stabbing, slashing, rouletting, combed decoration and grooving also occur. The impression gained is that a number of local workshops were supplying these jars, as they are found in a variety of fabrics (Table 8) each being associated with particular decorative motifs. Jars in 'Shouldham' fabric are decorated with stabbing (Type 100.10), grooving (100.6 and 100.7), rouletting (100.8 and 100.9) and rustication over grooving (100.4) as well as simple rustication (100.1, .2, .3, .5). Rouletting and rustication over grooving only occur on jars in this fabric. Jars in fabric RW10 are

TABLE 7. RELATIVE AMOUNTS OF COARSE WARE VESSELS FROM THE 1977 AREA AS PERCENTAGES OF THE TOTAL COARSE WARE VESSEL GROUP

	% Weight	% Count	% Equivalent Vessel
Flagons/Bottles/Narrow-mouthed Jars	2	2	3
Beakers	1	2	3
Jars	35	37	47
Storage Jars	4	1	1
Bowls	19	17	17
Shallow Bowls and Dishes	37	39	27
Lids and Miscellaneous	2	2	2
Total	100 (50 kg)	100 (2054)	100 (195)

TABLE 8. RELATIVE AMOUNTS OF DIFFERENT FABRICS IN JARS TYPE 100 FOUND ON THE 1977 AREA

	%
RW1	66
Shell-Gritted	11
RW10	8
RW9	7
RW8	4
RW4	2
Brampton	2
RW7	*
Total	100 (13 kg)

* Less than 1%

decorated with combed decoration (100.15), stabbing (100.16) and rustication (100.14) and it is only on jars of this fabric that slashed decoration (100.17 and 100.18) occurs. Jars in fabric RW9 are decorated with a distinctive 'spidery' and more raised rustication, frequently in more than one band (100.11) and it is only in this fabric that stabbing and rustication occur together. Combed decoration is also found (100.12). Multiple stabbed decoration only occurs on vessels in fabric RW8 (100.13). Undecorated jars of this form also occur in Shell-Gritted Ware (100.20), Brampton fabric RW3, and RW7. Many of these jars have traces of sooting and burning and were presumably used as cooking vessels. In contrast, jar types 101.1 and 101.2, although evidently in the same tradition as type 100, are much finer vessels with highly burnished, well-finished surfaces and were presumably put to different use. Jars of type 100 never seem to have been burnished. It is interesting to note that although the type 100 jar is found in a wide variety of fabrics, the larger storage jar, type 99, is found in only two fabrics - 'Shouldham' and Shell-Gritted Ware. Again, 'Shouldham' products are more numerous, but a fairly local source for the Shell-Gritted jars is perhaps indicated.

Type 100 is by far the most important jar form and of the 1977 material over eighty per cent of the jars are of this form. Only one other jar is found in 'Shouldham' ware, (type 106) other jars being of BB1 and BB2 (4% each, type 105) Dales Ware (type 108) and presumably local grey and oxidised wares (types 102, 103, 107 and 109-113). Both these BB1 and Dales Ware jars are likely to be of later third century in date. The 1974 Phase 2 material produced fewer jar types and, apart from type 100, only types 102, 103, 105 and 108 are found.

A similar predominance of one form is found in the bowl group, of which over sixty-five per cent of the 1977 material are of type 114, although this type encompasses a greater variety of form than type 100. Unlike the jars of type 100, however, 'Shouldham' products are not the most important, over fifty per cent being in grey ware fabrics, RW10 and 11. A further twenty-five per cent of these bowls are in 'Shouldham' wares and the remainder are in a variety of less common grey ware fabrics such as Nene Valley Grey Ware and Brampton. Other bowl forms of importance are types 116 (10%) and 119 (9%), none of the other types being found in significant proportions. The predominance of vessels of type 114 in grey ware fabrics other than 'Shouldham' ware is true also for the bowl group as a whole (Fig.52). Possibly this reflects a difference in use - the coarser 'Shouldham' fabric being preferred for cooking and kitchen use, and the finer grey fabrics being preferred for table ware. Types found in the Phase 2 1974 material in addition to type 114 are 116, 119, 120 and 124.

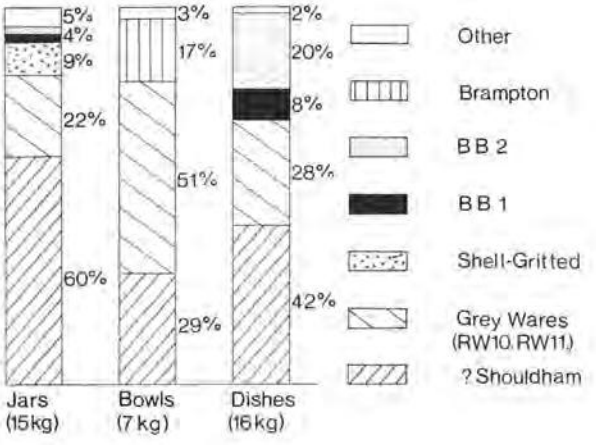


Fig.52. Relative amounts of different fabrics in the main coarse ware vessel types from the 1977 excavations.

Quite a wide variety of forms are found in the shallow bowl and dish group, although only a few types were found in any quantity. Vessels of BB1 and BB2 (types 137, 138, 144, 145, 147, 153 and 158) are more numerous than in other vessel groups (Fig.52) and clearly inspired many local copies. Dating of these Black-Burnished Ware vessels would suggest a predominantly third-century date (cf. Gillam 1970, types 225, 227, 228, 234, 313 and 329) although type 147.1 (cf.Gillam 1970, type 228) is late third- or fourth-century and type 158.1 (cf.Gillam 1970, type 329) is found in both third- and fourth-century contexts. Type 153.1 is probably late second-century (cf.Gillam 1970, type 234). The BB2 dish with rolled rim (types 137 and 138) in both BB2 and other fabrics constitute twenty-five per cent of the total, and straight-sided dishes of types 157 and 158 in BB1 and other fabrics are also important (20%). An interesting group in 'Shouldham' fabric is represented by types 150 and 151 which constitute fifteen per cent of the total. Dishes of this form are only found in 'Shouldham' fabric at Brancaster, although they are found elsewhere in the county, particularly on eastern sites, in other fabrics. None of the other wide variety of forms is found in significant numbers and 'Shouldham' and other grey ware fabrics are represented in almost equal quantities (Fig.52). A similarly wide range of dish forms was found in the Phase 2 1974 material.

Beaker forms are few and mainly imitate vessels of Colour-Coated Wares as noted in the type series. The rouletted Beaker, type 98, is very similar in both fabric and form to a vessel from Caister on Sea (Higgins 1972, fig.3.11) found in a context dated 200-280, and two similar vessels have been found at Hacheston (P.Arthur pers.comm.). The poppy-head beaker sherd is second-century.

Neither flagons and bottles nor narrow-mouthed jars are present in any quantity (Table 7) and appear in the same range of fabrics as other types, although, as expected, a larger number of flagons and bottles are in oxidised fabrics.

Analysis of the coarse wares would suggest that for much of the third century the principal source of these wares was the industry at 'Shouldham' which seems to have provided a limited range of basic vessel shapes in some quantity. These products were supplemented by a similar range in a variety of grey ware fabrics. There is evidence from Phase 2 of the 1974 area that in the later third and fourth centuries this pattern of supply altered and that, although the same range of forms remained in vogue the products of the grey ware and Shell-Gritted industries became of more importance.

THE MORTARIUM FABRICS
by Kay Hartley

East Anglian fabrics

M1. A rather soft, fine-textured, brownish fabric tempered with fine grit; abundant, small-sized trituration grit composed of black, grey and white flint, transparent and slightly pinkish quartz, and opaque red-brown material; types 166, 170.

M2. A fine-textured cream fabric; types 169, 170.

M3. Soft, fine-textured, drab cream fabric, not as yellowish as M4 and paler than M2; type 170.

M4. A fine-textured, yellowish-cream fabric with an almost greenish tinge; type 169.

These four fabrics differ only in colour and themselves contain minor colour differences; all are associated with the same trituration grit. Some of the colour differences may represent only minor differences in the clays or even in the firing, and all of these clays will undoubtedly be from East Anglia.

Photo: Derek Edwards TF 7844/G/AAE12

Plate I. The Shore fort and crop-marks to the east, 4 July 1973.

Photo: Derek Edwards TF 7844/AFA/ACP22

Plate II. The 1974 excavations in progress to the west of the Shore fort, 10 July 1974.

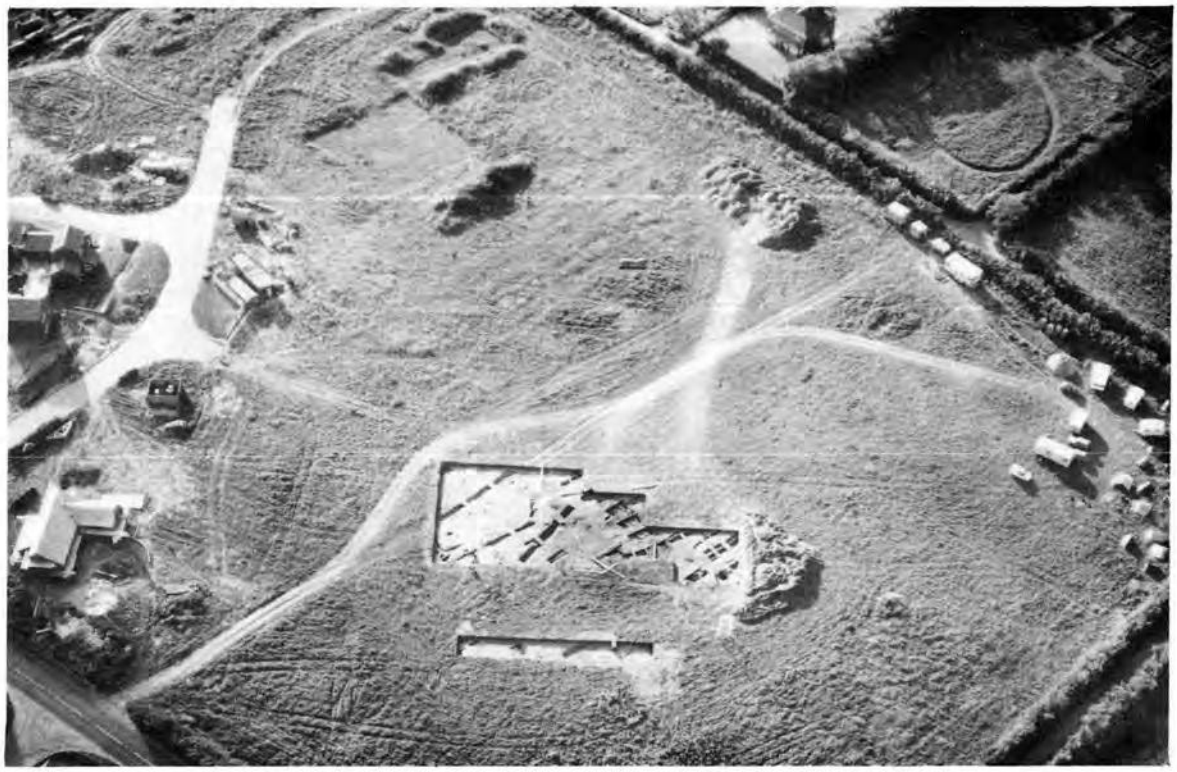


Photo: Derek Edwards TF 7844/AKZ/AHJ7

Plate III. The 1977 excavations: south-west area from the south-east, 21 June 1977.

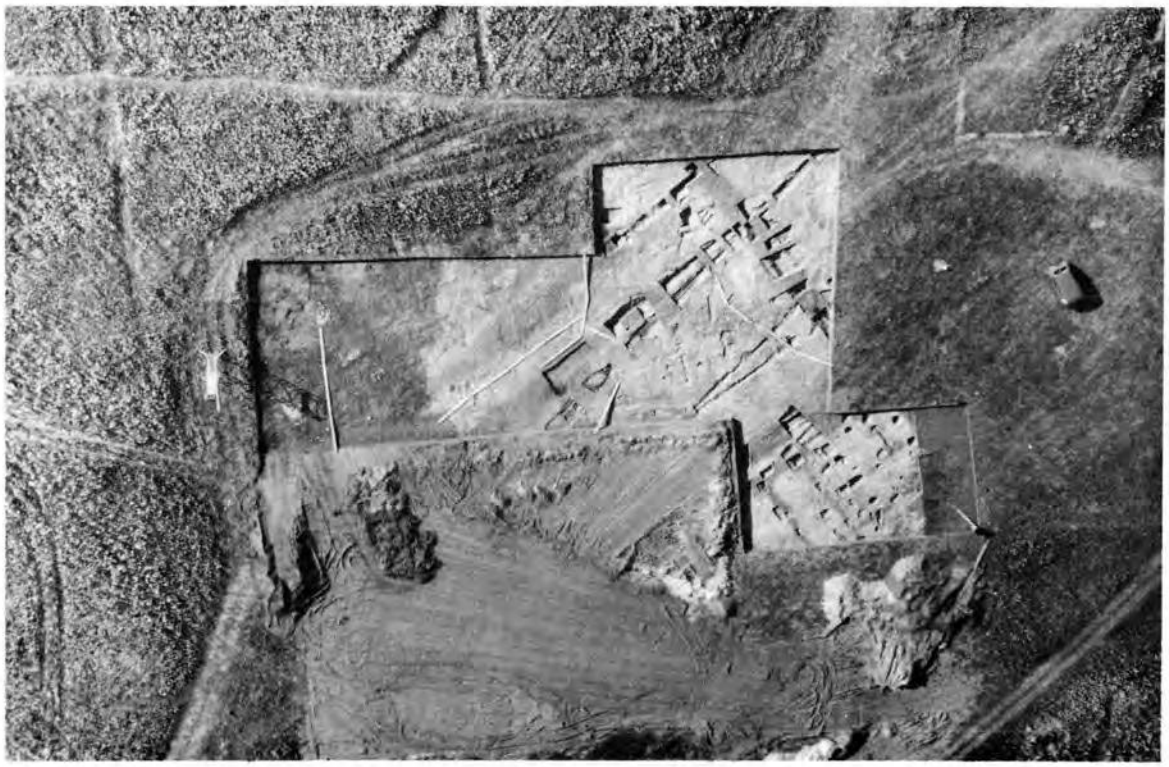


Photo: Derek Edwards TF 7844/ALN/ALR17

Plate IV. The 1977 excavations: near vertical view of the central area. The area shown in Plate III has been backfilled, 5 August 1977.

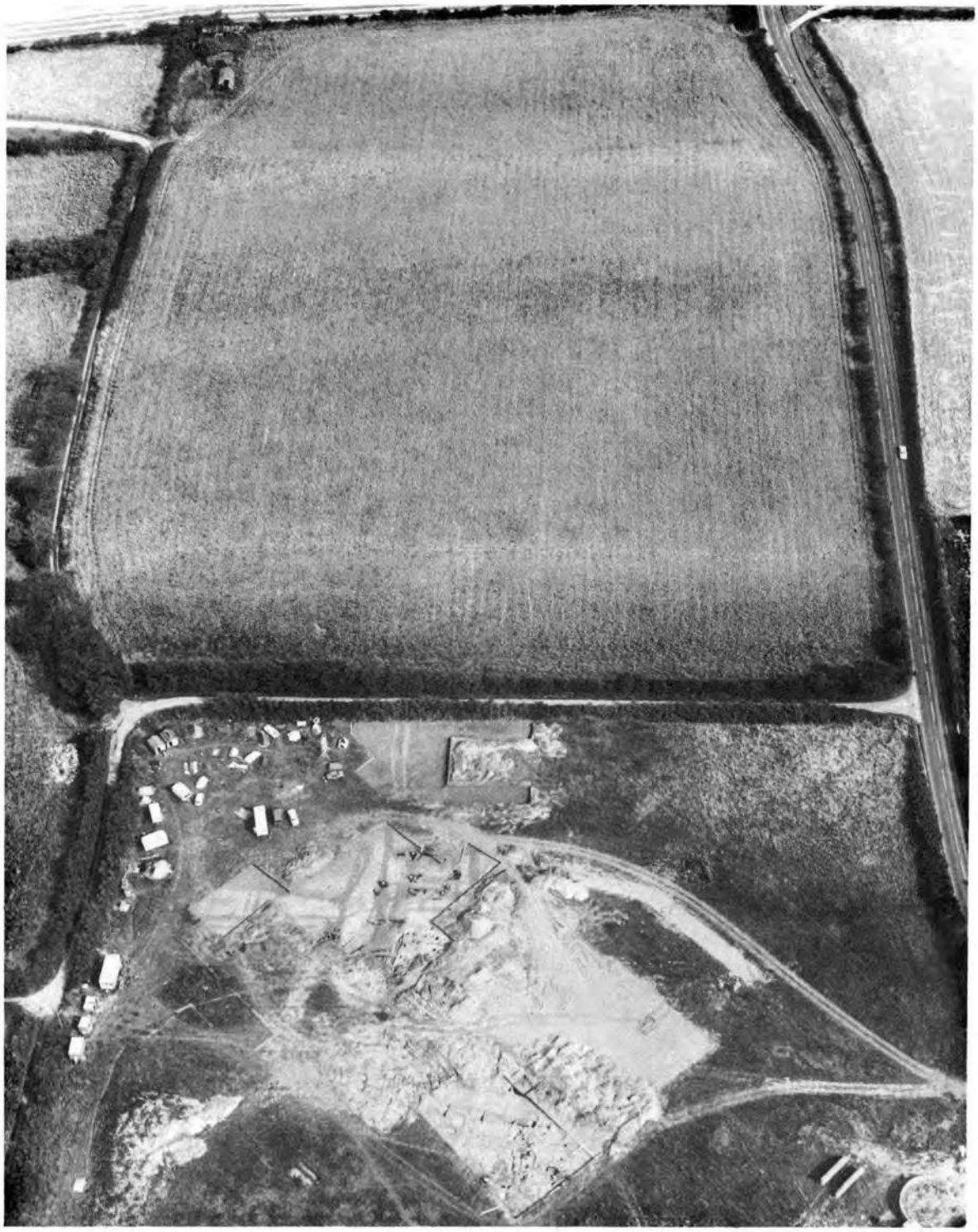


Photo: Derek Edwards TF 7844/AJE/ALZ1

Plate V. The 1977 excavations: the final stages of excavation from the west, with the Shore fort in the background (compare with Plate I), 9 September 1977.

Photo: Dermot Bond
Plate VI. The 1977 excavations: the central part of the site cleared, showing Phase 7 enclosure ditches superimposed on the west-to-east trackway.

Photo: Dermot Bond
Plate VII. The 1977 excavations: the central part of the site. The post-holes of structure 1557 are visible.

Photo: Dermot Bond
Plate VIII. The 1977 excavations: section of post-hole 2204 (structure 1557).

Photo: Dermot Bond
Plate IX. The 1977 excavations: quernstone (No.146) utilised as a post-base in post-hole 2286 (structure 2398).

Photo: Peter Addison
Plate X. The 1977 excavations: structure 15 (?corn drier).

Photo: Dermot Bond
Plate XI. The 1977 excavations: structure 289 (?oven).

Plate XII. The most complete bovine skull recovered from the site, in which the frontal bones are intact, indicating that in this individual at least the animal had not been slaughtered by pole-axeing. The caudal part of the frontal bones have been chopped through in removing the horns (chop-marks are indicated by an arrow).

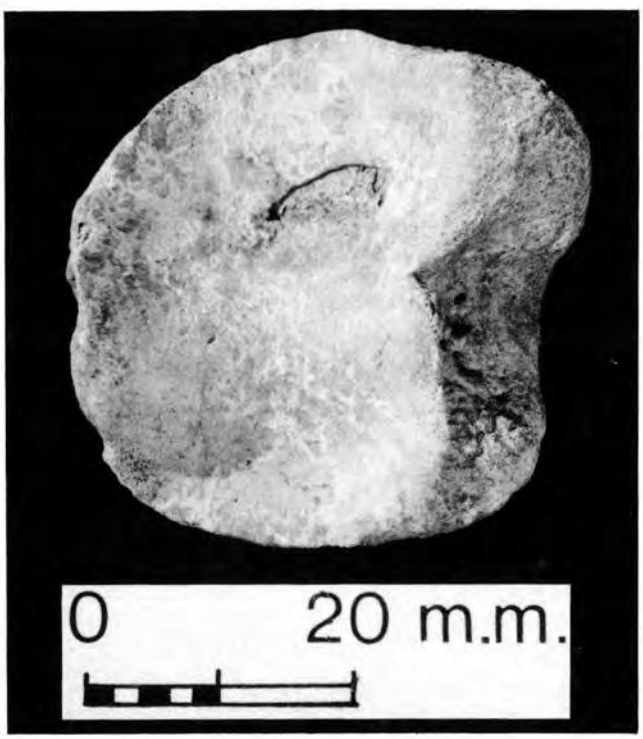


Plate XIII. A bovine second phalanx (viewed from above). A lesion is visible on the proximal articular surface.

Plate XIV. A pig skull (caudal view). The left side of the squamous part of the occipital bone has been depressed as the result of trauma.

Plate XV. A pig skull (dorso-lateral view). The two loci of healed trauma can be seen.

Plate XVI. A horned sheep skull.

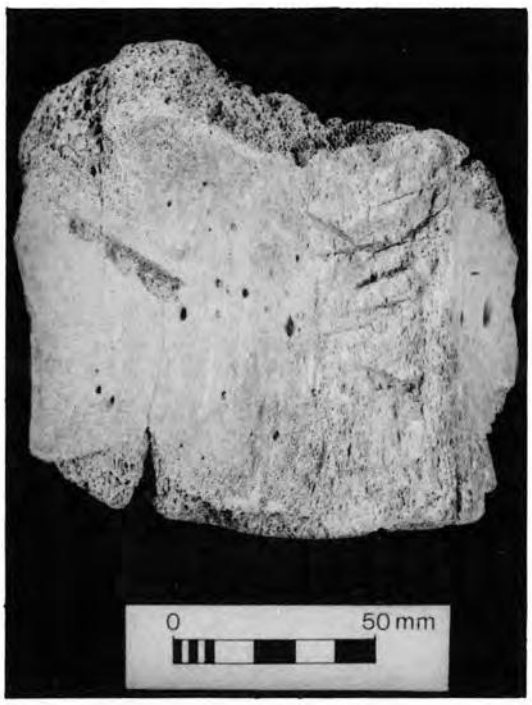


Plate XVII. The centrum of a whale vertebra. Numerous chop-marks can be seen, possibly the result of butchery.

Plate XVIII. Roman tile bearing the impression of a domestic cat's paw.

Photo: Edwin Rose CBJ 31
Plate XIX. Brancaster church: south wall of chancel.

Photo: Edwin Rose CBJ 35
Plate XX. Brancaster church: close-up of stonework in south wall of chancel.

Plate XXI. Gold ring set with cornelian intaglio representing the bust of an emperor in profile (Fig.85, No.1).

Photo: David Wicks CKR 5

Plate XXII. Gold ring with bezel engraved with two busts, one bearded (male) and the other unbearded (female) confronting each other (Fig.85, No.2).

M5. A very hard, fairly fine-textured, brown fabric with thin grey core in places and a self-coloured slip; the clay has been tempered with very fine gritty particles. The trituration grit is exactly similar to that used with the above fabrics; type 167.

M6. A fine-textured, cream fabric with pink core, with tiny crystalline quartz and quite largish calcareous inclusions. No certain trituration grit survives; type 194.

M7. Probably East Anglia. Similar in colour to M4 but much harder; flint trituration grit, mostly white; type 171, 172 and 173.

M8. A reddish-brown, slightly micaceous fabric with dark grey core; perhaps sometimes self-coloured, but the single rim sherd has an extremely thin cream slip which in no way conceals the true colour of the fabric. The trituration grit is mostly flint with a little quartz and red-brown material; type 194.

M9. A hard, grey fabric with some tiny quartz particles in the tempering; no trituration grit survives on the two fragments in this fabric. Mortaria in reduced fabrics are extremely uncommon and virtually unknown before the late third century or outside East Anglia. Such mortaria are known to have been produced at Homersfield, Suffolk and, no doubt, elsewhere in East Anglia; types 194 and 195.

M17. Represented only by three body-sherds (two probably from the same vessel). Probably East Anglia. A slightly micaceous, pale buff-cream fabric with buff-cream and pink core and transparent and pinkish quartz and flint trituration grit.

M18. Represented only by two base sherds. A rather coarse, slightly micaceous, dark grey fabric with some quartz tempering; mostly quartz trituration grit. Late-third- or fourth-century date.

M19. Represented only by a body-sherd. East Anglia? An extremely hard, buff-cream fabric (almost a stone ware), which is basically fine-textured, but coarsened by the addition of quite large quartz fragments; quartz trituration grit; a tan-coloured slip almost certainly applied to the exterior only. The exterior has been deliberately smoothed despite large fragments of quartz which have torn little pockets out of it.

M21. Represented by two joining sherds from a mortarium with incomplete rim-section in a fabric roughly similar to M5, but with traces of cream slip. The two fragments are too burnt for an accurate description of the original fabric, but it can be attributed to East Anglia. This is an unusual form and it cannot be restored with any certainty. The fabric and the surviving rim-section indicates a date in the late third or fourth century.

Fabrics M5-21 are more uncommon fabrics probably all produced in East Anglia. Closely similar fabrics to many produced in East Anglia were also produced at various times in Kent and the Surrey-Sussex region, but it is highly unlikely that Brancaster was ever supplied by workshops in either of these areas.

Rhineland fabrics

M11. A very hard, off-white, basically fine-textured fabric usually coarsened by the addition of much quartz tempering, often with a buff slip; it can have a pink core. It is usually associated with fine concentric scoring on the internal surface combined with an overall covering of tiny quartz grit which sometimes continues underneath the bead; types 175, 176.

This is one of the most readily identifiable mortarium fabrics imported from the Rhineland.

M10. Probably the Rhineland. A fine-textured, cream fabric with pink core almost to the surface, with little tempering. The whole of the interior is covered with small quartz grit, similar to that used with Fabric M11; but M10 is softer and the pink core far more extensive than is ever normal with M11. There does, however, seem to be slightly more difference than one would associate with a mere difference in firing; type 174.

Nene Valley fabrics

M12. Castor-Stibbington area of the lower Nene Valley. A.D.220/230-400+. A hard off-white fabric occasionally with pink or grey core; the clay is usually tempered with fine, red-brown and quartz particles and there is often a brownish-buff slip. The trituration grit is composed of grey-black ironstone or iron slag occasionally with some haematite. A few mortaria, apparently in this fabric, have sandwich cores or are slightly sandier than the norm; these differences may indicate different firing techniques, but there would also be minor differences in the clays available; types 168, 178-187, 189 and 190.

M13. A pinkish-buff to pinkish-brown fabric of sandy texture and usually with a pale grey core. This fabric may be hard or soft-fired and does not appear to have a surface slip. Some of the mortaria in this fabric have solely ironstone or iron slag grit, while others have a mixture of ironstone (or iron slag), quartz, ?flint and haematite; types 177, 182, 183, 185, 186 and 188.

Oxford fabrics

M15. Cowley, Headington, Sandford etc Oxford (Young 1977). c. A.D.110-400+. Slightly sandy, off-white fabric with cream-to-buff slip with very distinctive, mixed transparent, pinkish and brownish quartz trituration grit; type 192. (A.D.240-300).

M16. Dorchester, Cowley, Sandford, Baldon etc (Young 1977), Oxford. c. A.D.240-400+. A fine textured, slightly micaceous, orange-brown fabric, sometimes with a grey core, and a thin cream or white slip; abundant trituration grit identical with that for Fabric M15; type 193.

Other fabrics

M14. An area not far from Swanpool, Lincs. Fourth-century date. A rough-textured, orange-brown fabric with grey core; the fabric contains a little chalk. One ironstone and one quartz trituration grit survive on the single piece represented. This piece was examined by Miss Maggi Darling who considered that, despite the general similarity, it was not a Swanpool product; type 191.

M20. Probably Harston, south-west of Cambridge. Body-sherd only in soft, fine-textured, pale pinkish-brown fabric with white quartz trituration grit and slight traces of a red-brown slip. A kiln producing pottery including mortaria in this distinctive fabric has been recently excavated at Harston, south-west of Cambridge by Mrs Joyce Pullinger (Pullinger and Young 1981). The ware appears only to have been produced in small quantity, probably in the early fourth century.

THE TYPE SERIES (OR CATALOGUE OF COARSE WARE POTTERY TYPES)

Each vessel type encompasses a considerable degree of variation in size, decoration and fabric, and the vessels published here were selected to illustrate this. The pottery was classified in this way in order that all the variants of any type could be studied at one time. It was hoped that this approach might reveal significant patterns in

terms of site use, trade or dating. Each of the variants is, however, distinguished by its sub group number, so that any variant can be uniquely identified as necessary.

Parallels have not been quoted within the descriptions, except where there is a similarity with another vessel in the series or the vessel is not illustrated.

The type numbers referred to here are cross-referenced to the original form numbers in the archive.

The Colour-Coated and White Wares

Bottles, Flagons and Jugs

Type 40: Flagon or bottle with flaring mouth and square-cut rim; Nene Valley WW.
41: Flagon with slightly cupped disc rim, below which double handles are attached; Nene Valley CC2.
42: Large flagon with everted rim, below which handles are attached; WW2.
43: Jug with pinched spout and flaring mouth: 43.1, Colchester, 43.2, Nene Valley CC1.

Beakers

Type 44: Globular beaker with everted rim; Rhenish Ware, Trier.
45: (Not illustrated) beaker rim sherds in Rhenish Ware (both Central Gaulish and Trier) belonging to types illustrated by Greene (1978, fig.2.3, nos.4 and 5), A.D. 150-250.
46: Beaker with cornice rim: 46.1, (Not illustrated) with decoration 'en barbotine', Colchester; 46.2, Nene Valley CC1; 46.3, Nene Valley CC1; 46.4, with body decorated 'en barbotine', Nene Valley CC1; 46.5, with band of cream painted decoration, Nene Valley CC1.
47: Bag-shaped beaker: 47.1, with decoration of abstract motifs 'en barbotine', Colchester; 47.2, Nene Valley CC1; 47.3, with decoration 'en barbotine', Nene Valley CC1.
48: Beaker with groove beneath rim which may belong to one of the preceding types; Nene Valley CC1.
49: Indented beaker with insloping everted rim; Nene Valley CC2.
50: Indented beaker with funnel neck: 50.1, with parallel bands of rouletting, Colchester; 50.2, Nene Valley CC1; 50.3, with applied scale decoration between the indentations, Nene Valley CC1.
51: Beaker with long neck and bulbous body: 51.1, and 51.2, decorated with narrow parallel indentations, Colchester; 51.3, decorated with white barbotine scrolls over the colour coat, Nene Valley CC1, 51.4, decorated with rouletted bands, Nene Valley CC1.
52: Beaker with straight neck and beaded rim which may belong to one of the preceding types; CW1.
53: With long neck with applied frilled zone, and bulbous body decorated with bands of red paint; Nene Valley WW.

Narrow-mouthed jars

Type 54: With flared rim, grooved on outer face; Nene Valley CC1.
55: With finger-tip frilled rim; Nene Valley WW.

Bowls and dishes

Type 56: Bowl with single groove beneath incurving plain rim; Nene Valley CC1.
57: Large bowl with bead rim; Nene Valley CC1.

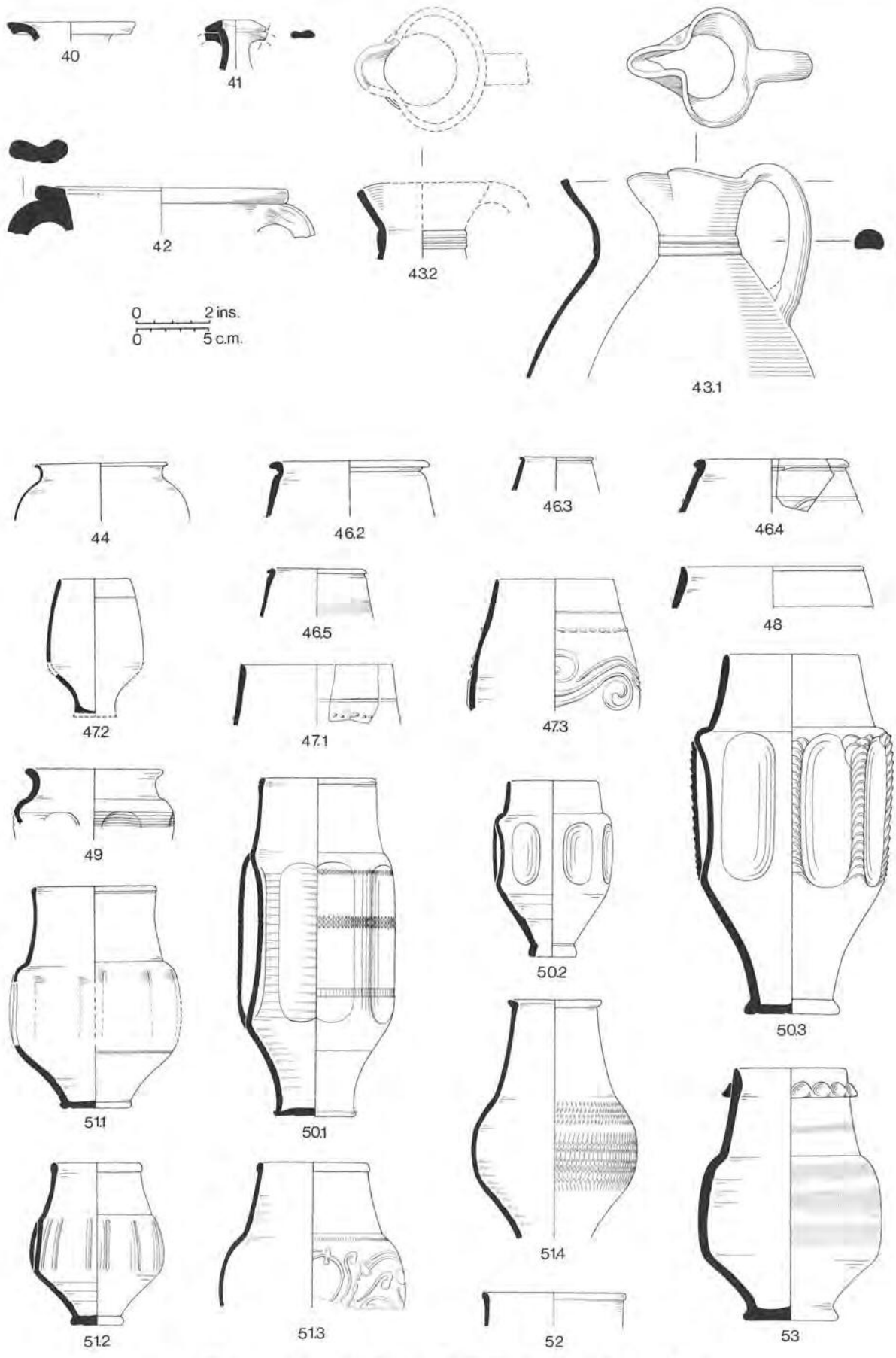


Fig. 53. Romano-British pottery 40–53. Scale 1:4.

Type 58: Necked bowl; Nene Valley CC1: 58.1, 58.2.

59: Necked bowl: 59.1, with traces of burnished decoration, Much Hadham Ware; 59.2, (not illustrated) Oxford Colour-Coated Ware, Young (1977) type C75, 325-400+.

60: (Not illustrated) Miniature wall-sided bowl in Oxford Parchment Ware, Young (1977) type P35, 300-400+.

61: Castor box lid: 61.1, Colchester; 61.2, Nene Valley, CC1.

62: Castor box: 62.1, Colchester; 62.2, Nene Valley CC1; 62.3, Nene Valley CC1; 62.4, Nene Valley CC1.

63: Bowl with pronounced down-turned flange; ?Rhenish White Ware 1 (see 'Imported wares').

64: Bowl with projecting flange presumably derived from the samian Dr.38 form: 64.1, Nene Valley CC1, 64.2, (not illustrated) Oxford Colour-Coated Ware, Young (1977) type C51, 240-400+, 64.3, (not illustrated) as 64.2, but with painted decoration on the flange, Young (1977) type C52, 350-400+.

65: Shallow bowl with bead rim, presumably imitating Dr.31: 65.1, Nene Valley CC1; 65.2, Nene Valley CC2.

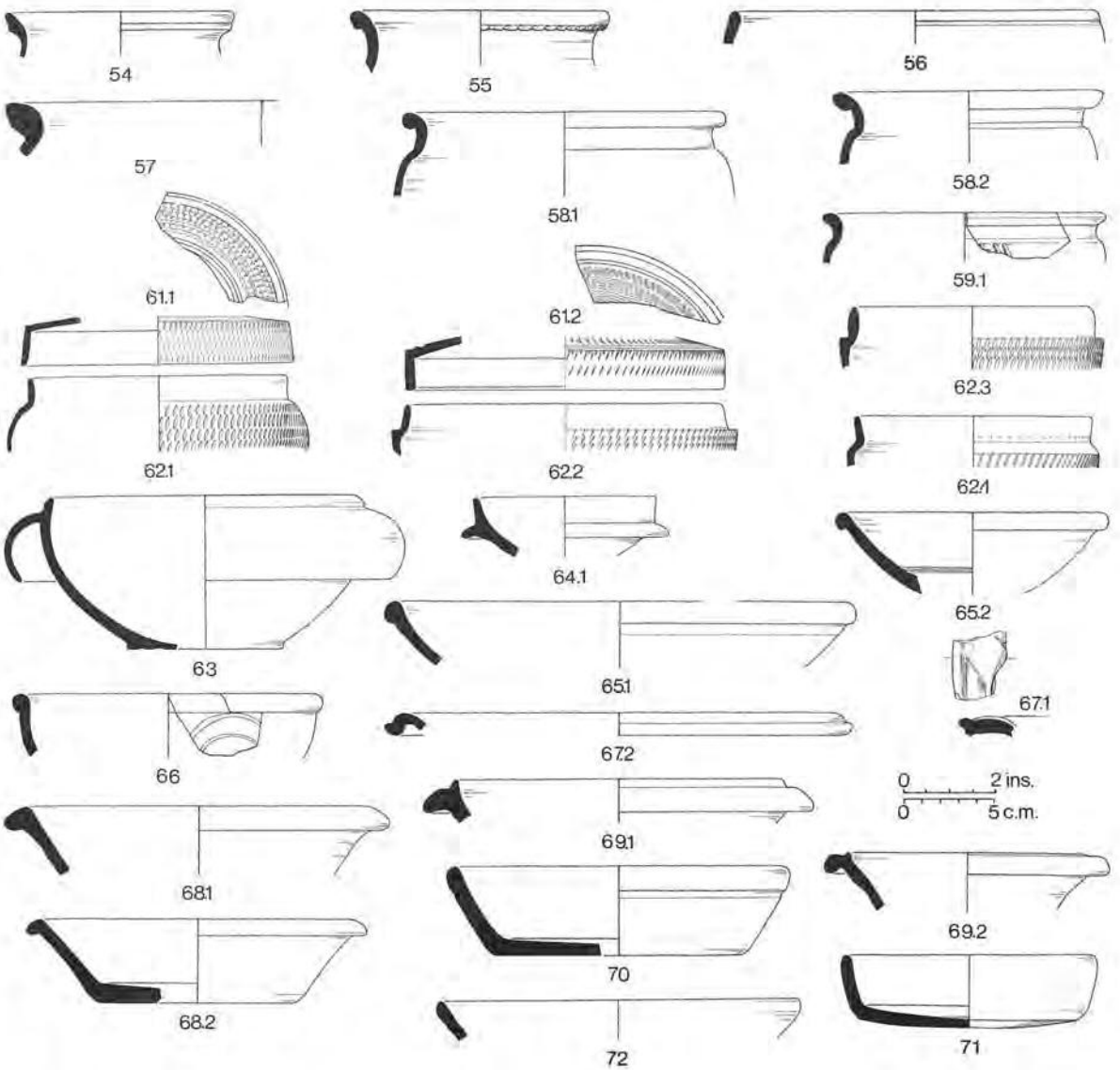


Fig.54. Romano-British pottery 54-72. Scale 1:4.

Type 66: Small bowl with cream painted arches; Nene Valley CC1.
67: Shallow bowl derived from Dr.36: 67.1, with barbotine decoration, Nene Valley CC1; 67.2, Nene Valley CC1; 67.3, (not illustrated) Oxford Colour-Coated Ware, Young (1977) type C49, 240-400+.
68: Dish with out-turned rim; 68.1, Nene Valley CC1; 68.2, Nene Valley CC2.
69: Dish with flange and bead rim; Nene Valley CC1: 69.1, 69.2.
70: Dish with single groove beneath plain rim; Nene Valley CC1.
71: Dish with plain rim; Nene Valley CC1.
72: Platter; Pompeian Red Ware, of first-century date (Peacock 1977c).

The Amphorae

(None is illustrated)

Type 73: Globular amphora, Dressel 20. This form was used for transporting olive oil, and originates along the Guadalquivir River between Seville and Cordoba. It has a wide date range between the mid-first to third centuries. Two fabrics are represented (p.84).
74: Flat based amphora, Dressel 30. This form is South Gaulish in origin and was used to transport wine. The main floruit was in the late second century (Peacock 1978).
75: 'Hollow-foot amphora' (Peacock 1977a). Late third or fourth century.

The Reduced and Oxidised Wares

Bottles and Flagons

Type 76: Bottle or flagon with bead rim: 76.1, OW3; 76.2, RW2; 76.3, RW10; 76.4, RW10.
77: Bottle or flagon with wide flaring mouth and single groove beneath rim; RW10.
78: Bottle or flagon with cupped mouth and flange rim; OW3.
79: Large flagon with hammer-head rim with pronounced grooving; OW2.
80: Flagon with cupped mouth, and grooved hammer-head rim; part of a handle remains; OW2.
81: Bottle or flagon with wide cupped mouth grooved externally; RW11.
82: Bottle or flagon with wall-sided mouth, grooved twice on exterior; RW1.
83: Flagon with disc rim, one handle, cf. type 41, in Colour-Coated Ware; RW9.
84: Large bottle with everted rim: 84.1, RW10; 84.2, RW8; 84.3, RW1; 84.4, with a cordon at the base of the neck, RW1; 84.5, and 84.6, as 84.4, but with stabbed decoration on the cordon, RW2.

Narrow-mouthed Jars

Type 85: Narrow-mouthed jar with everted rim: 85.1, rim grooved on outer edge, RW10; 85.2, with coarsely frilled rim, RW10; 85.3, rim decorated with finger-tip frilling, RW10; 85.4, 85.5, and 85.6, as 85.3, RW1; 85.7, with cordon at base of neck, RW1.
86: Narrow-mouthed jar with rolled rim: 86.1, RW10; 86.2, RW11.
87: Narrow-mouthed jar with slightly hooked rim, and cordons on shoulder; RW10.
88: Coarse narrow-mouthed jar with flange rim; part of one handle attached; RW1.
89: Narrow-mouthed jar with everted rim; evidence for at least one handle; RW10.

Beakers

Type 90: Rim of a poppy-head type beaker; RW16.
91: Beaker with a cornice rim (cf. type 46 in Colour-Coated Ware); RW5.
92: Bulbous-bodied beaker with small everted rim and cordon on shoulder; 92.1, RW10; 92.2, RW11.

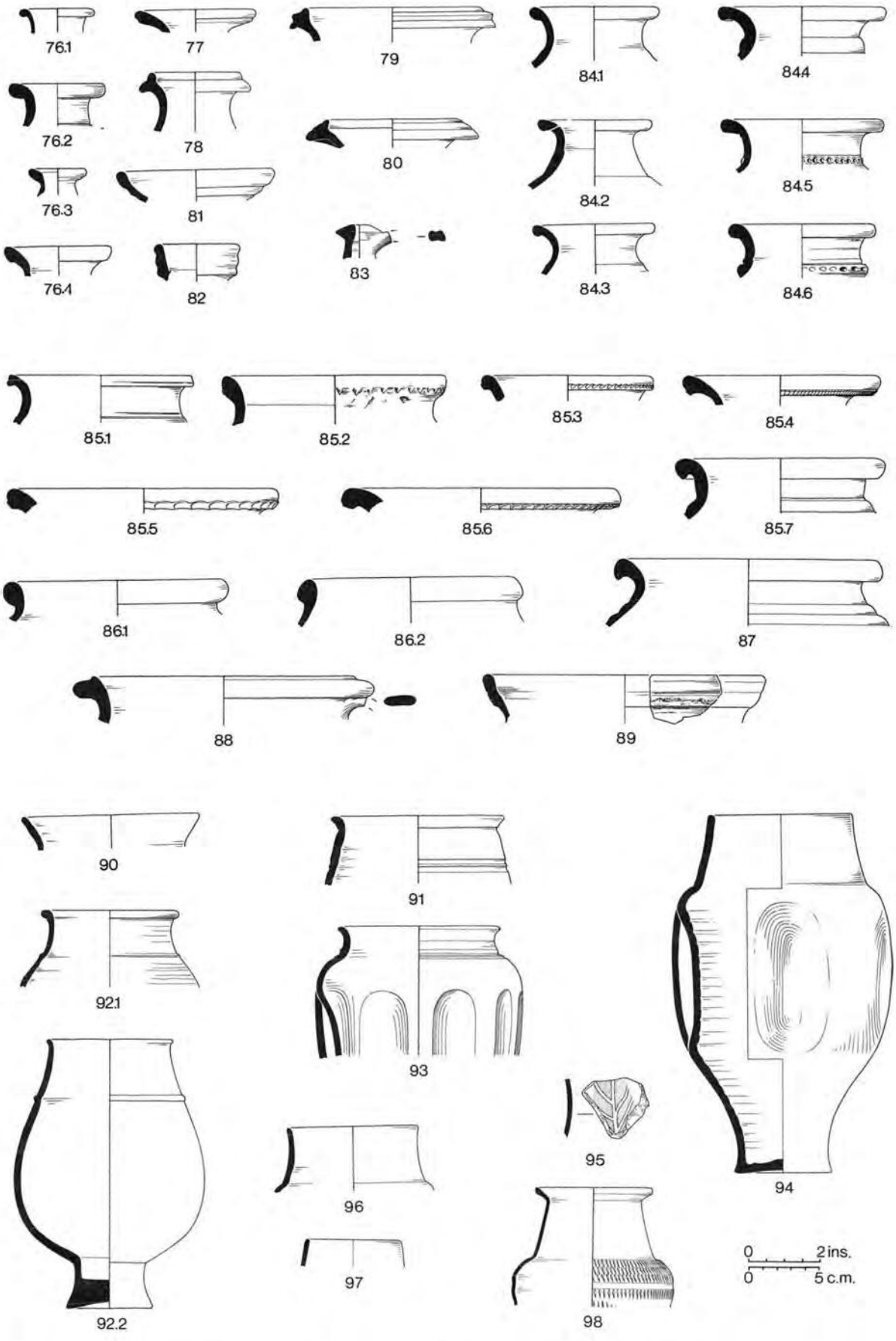


Fig. 55. Romano-British pottery 76-98. Scale 1:4.

Type 93: Indented beaker with everted rim presumably imitating Colour-Coated types (cf. type 49); RW6.

94: Indented beaker with funnel neck (cf. type 50 in Colour-Coated Ware); RW1.

95: Sherd with burnished 'leaf-shaped' decoration; this form of decoration occurs commonly on indented body sherds; RW1.

96: Beaker with out-curving funnel neck; RW12.

97: Beaker with plain rim (cf. type 47 in Colour-Coated Ware); OW2.

98: Beaker with everted rim, long neck and bulbous body decorated with rouletted bands (cf. Colour-Coated type 51); OW4.

Jars

Type 99: Storage jar with everted rim: 99.1, OW1; 99.2, OW1; 99.3, storage jar with flaring rim, RW1, 99.4, storage jar with rolled rim, RW1, 99.5, with cordon at base of neck, OW1; 99.6, with lid seating, OW1; 99.7, Shell-Gritted Ware; 99.8, Shell-Gritted Ware.

100: Necked jar very similar in form to type 99, the majority of examples being in a related fabric, RW1. Despite the similarity in form, however, examples of type 99 are always much coarser vessels, (average diameter 30 cms, rather than an average of 14 to 16 cms for type 100) and in oxidised wares rather than the reduced wares of type 100: 100.1, with oblique lines of rustication, RW1; 100.2, with two oblique lines of rustication, RW1; 100.3, with oblique lines of rustication, RW1; 100.4, with oblique lines of rustication over a series of parallel grooves, RW1; 100.5, with oblique lines of rustication, RW1; 100.6, with a series of parallel grooves, RW1; 100.7, as above, RW1; 100.8, with parallel bands of rouletting, RW1; 100.9, with a single band of rouletting, RW1; 100.10, with a line of stabbed decoration on the shoulder, RW1; 100.11, with a line of stabbed decoration on the shoulder and parallel bands of oblique rustication, RW9; 100.12, with a series of parallel grooves, RW9; 100.13, with parallel lines of stabbed decoration, RW8; 100.14, with oblique lines of rustication, RW10; 100.15, with parallel lines of grooved decoration, RW10; 100.16, with parallel lines of stabbed decoration, RW8; 100.17, with slashed decoration, RW10; 100.18, with lines of slashed decoration, RW10; 100.19, with grooved decoration on the shoulder, Shell-Gritted Ware; 100.20, Shell-Gritted Ware; 100.21, (not illustrated), RW7; 100.22, (not illustrated), RW3.

101: Necked jar, similar to type 100, but finer, more finished vessels. 101.1, decorated with grooves and combed wavy lines on an unburnished zone, RW11; 101.2, with burnished decoration, RW2.

102: Necked jar with rolled rim: 102.1, RW10; 102.2, with groove on shoulder, RW10.

103: Necked jar with bead rim: 103.1, with grooves on underside of rim and on shoulder, RW10; 103.2, RW10; 103.3, RW11.

104: Miniature example of type 103; RW10.

105: Jar with everted rim; 105.1, with burnished latticing, BB1; 105.2, BB1; 105.3, with vertical burnished lines, BB2; 105.4, with burnished latticing, BB2; 105.4, with horizontal burnished lines, BB2; 105.6, RW10.

106: Small jar with upright everted rim; RW1.

107: Jar with exaggerated everted rim; RW10: 107.1, 107.2.

108: Lid seated jar with everted rim; Dales Ware: 108.1, 108.2, 108.3.

109: Jar with slightly everted rim, grooved externally: 109.1, RW5; 109.2, RW12.

110: Jar with long neck, and slightly everted mouth; OW2.

111: Jar with long neck and flange rim, crudely decorated with vertical burnished strokes; RW12.

112: Jar with stubby everted rim and lid seating; RW9.

113: Jar with incurved grooved rim; OW7.

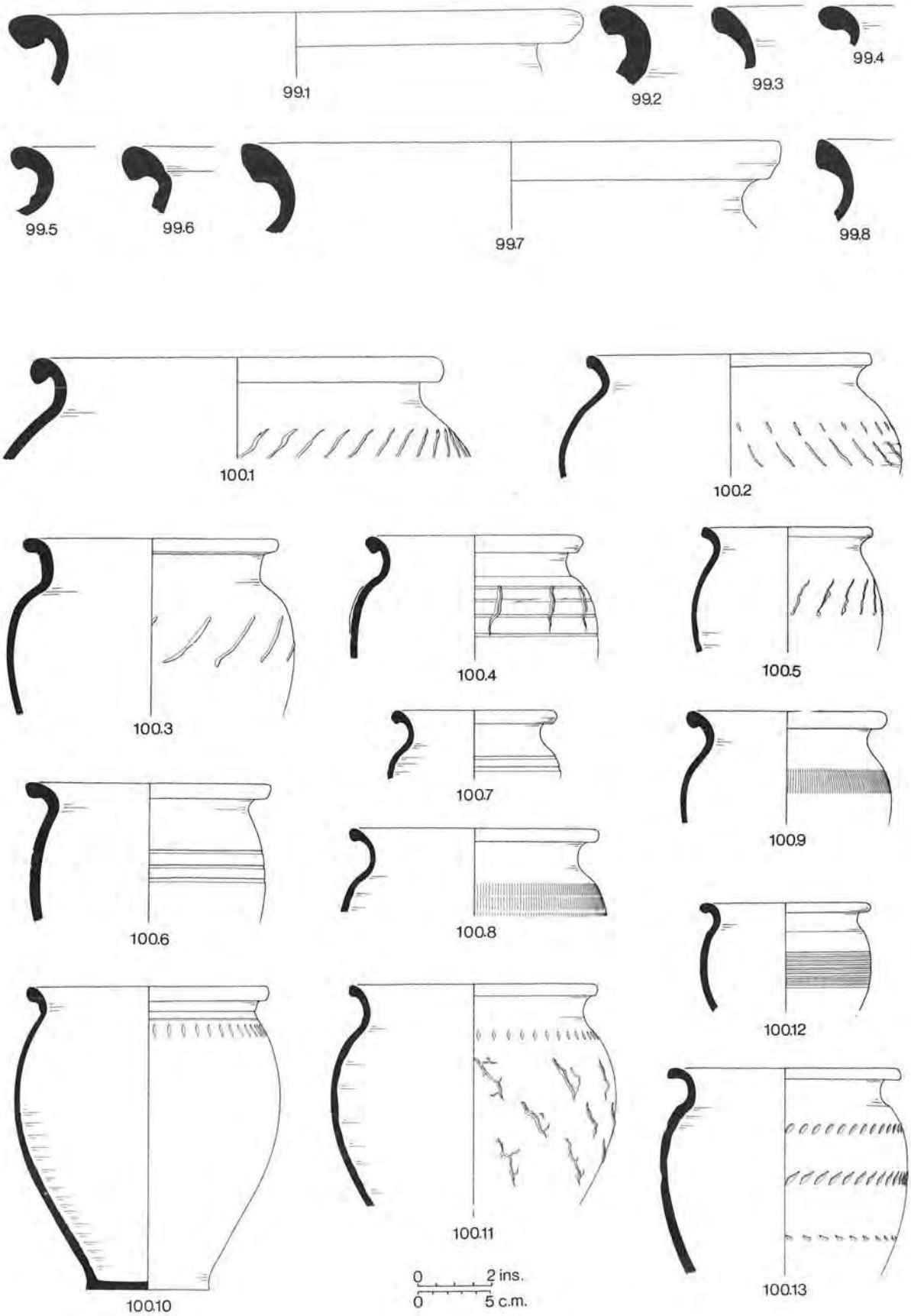


Fig.56. Romano-British pottery 99-100.13. Scale 1:4.

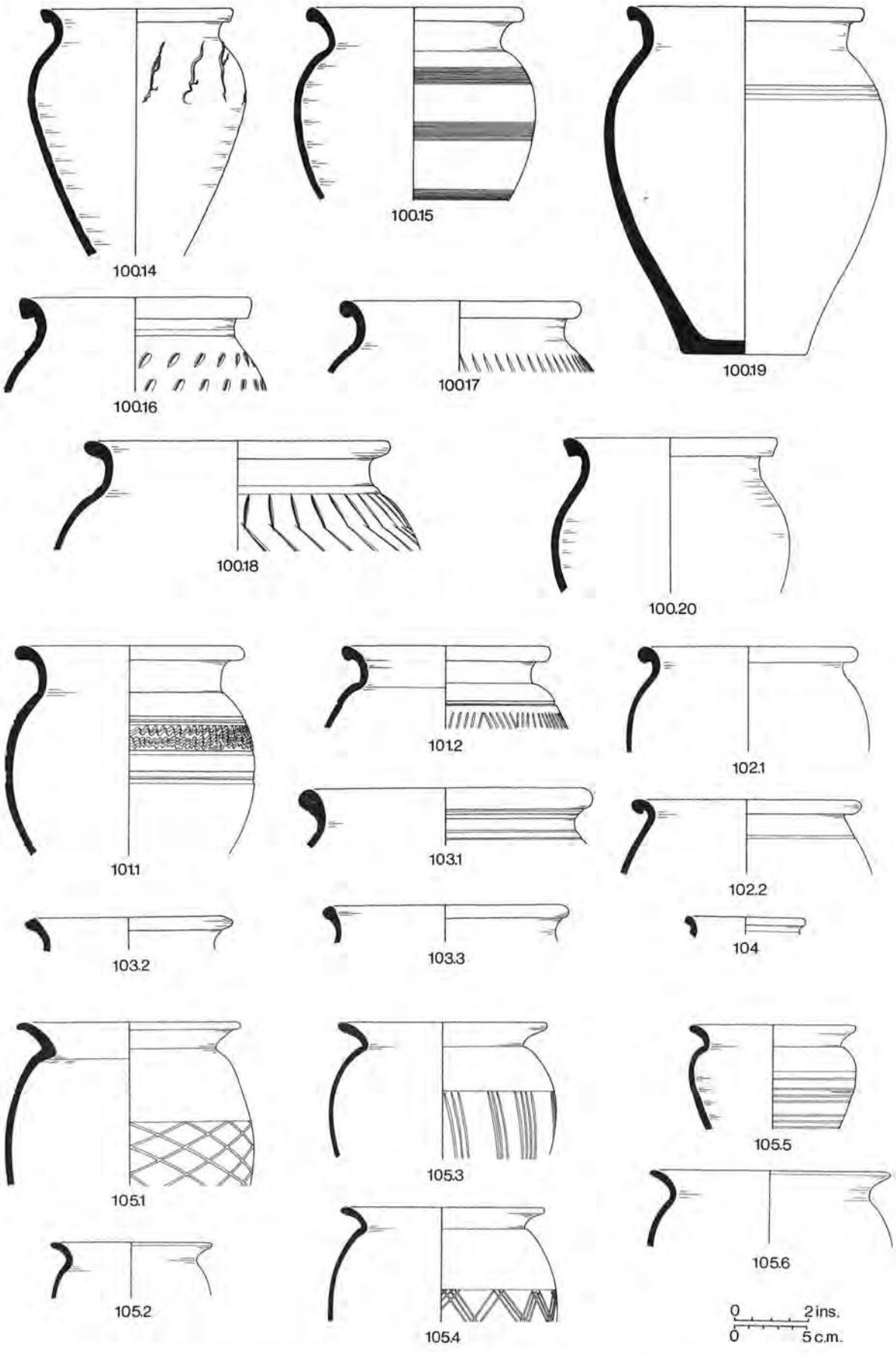


Fig. 57. Romano-British pottery 100.14–105. Scale 1:4.

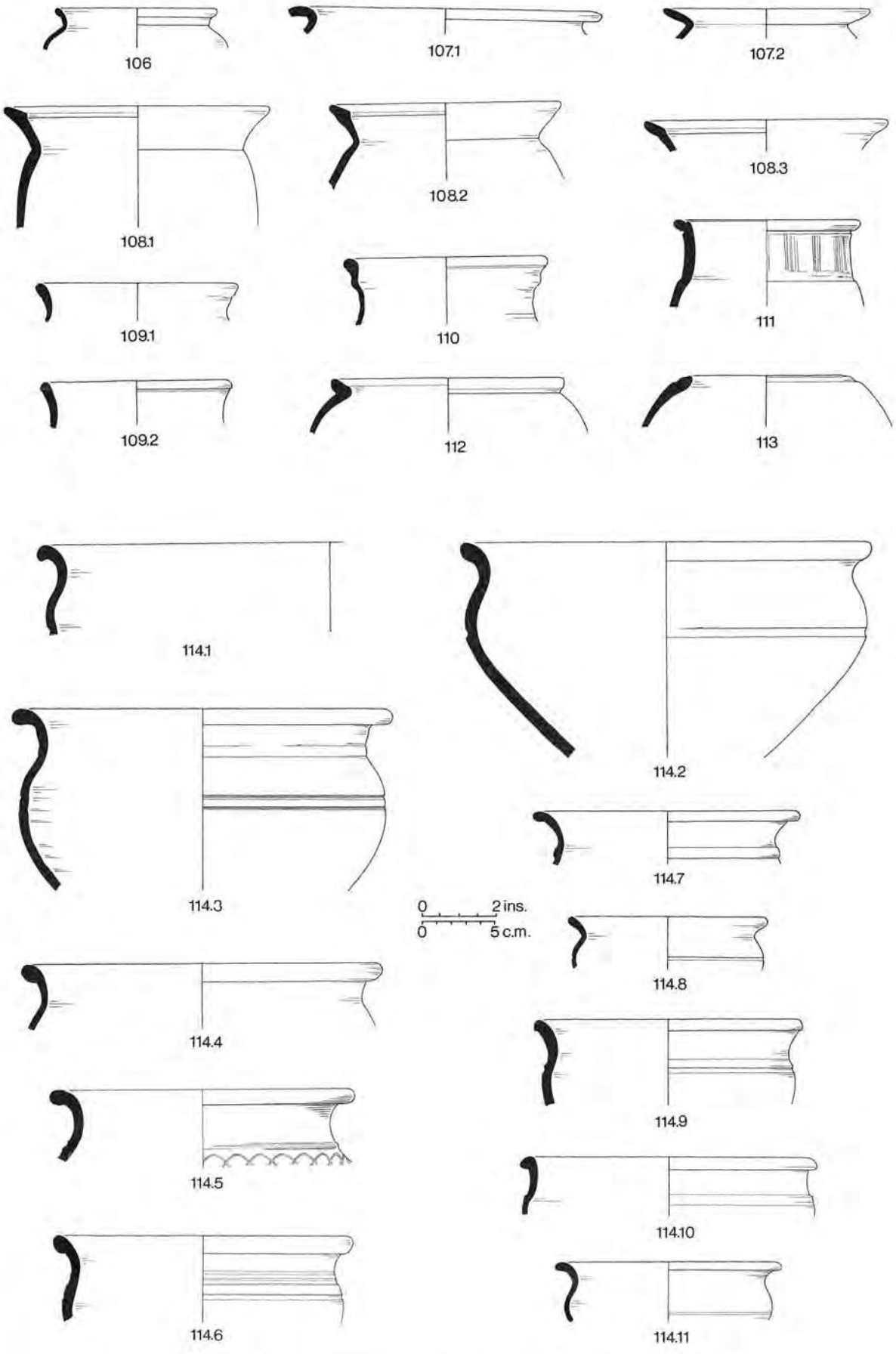


Fig.58. Romano-British pottery 106-114.11. Scale 1:4.

Bowls

Type 114: Necked bowl, generally with girth grooves, sometimes with cordon on the shoulder: 114.1, RW10; 114.2, RW10; 114.3, RW10; 114.4, RW10; 114.5, with burnished wavy line decoration, RW10; 114.6, RW10; 114.7, RW10; 114.8, RW10; 114.9, RW10; 114.10, RW10; 114.11, RW10; 114.12, RW10; 114.13, RW10; 114.14, RW11; 114.15, RW11; 114.16, with burnished wavy line decoration, RW11; 114.17, RW11; 114.18, RW11; 114.19, RW11; 114.20, RW11; 114.21, RW2; 114.22, with burnished wavy line decoration, RW2; 114.23, RW2; 114.24, RW1; 114.25, RW1; 114.26, RW1; 114.27, RW1; 114.28, Nene Valley Grey Ware; 114.29, RW12; 114.30, RW15.

115: Miniature examples of type 114: 115.1, RW10; 115.2, RW10; 115.3, RW10; 115.4, RW12; 115.5, RW12.

116: Bowl with everted rim; RW10: 116.1; 116.2, with girth groove; 116.3; 116.4, with burnished decoration.

117: Miniature example of type 116; RW11.

118: Bowl with S-shaped profile: 118.1, RW10; 118.2, RW10; 118.3, with grooved line decoration, RW10; 118.4, RW10.

119: Bowl with stubby everted rim: 119.1, RW1; 119.2, RW1; 119.3, with girth groove, RW1; 119.4, RW1; 119.5 with girth grooves RW11.

120: Bowl with bead rim: 120.1, RW1; 120.2, with groove, RW1; 120.3, RW1; 120.4, RW2; 120.5, RW10; 120.6, decorated with grooves and burnished wavy line, RW12.

121: Bowl with everted rim, decorated with horizontal burnished lines; RW9.

122: Bowl with everted rim with burnished groove on inner edge: 122.1, RW4; 122.2, RW10.

123: Bowl with stubby everted rim and lid seating: 123.1, RW10; 123.2, RW11.

124: Deep bowl with everted rim and lid seating: 124.1, with zone of stabbed decoration beneath the rim, RW14; 124.2, with band of rouletting.

125: Bowl with everted bead rim and lid seating; RW10.

126: Bowl with upright rim and lid seating; RW4.

127: Carinated bowl with slightly everted thickened rim, grooved on exterior: 127.1, RW1; 127.2, RW12.

128: Bowl with incurving rim, grooved externally; RW1.

129: Bowl with insloping rim, ridged externally; RW10.

130: Bowl with upright slightly cupped rim, thickened externally; RW5.

131: Bowl with upright plain rim, decorated with zone of rouletting: 131.1, RW1; 131.2, (not illustrated) RW9.

132: Bowl with upright rim, very similar in form to the Castor Boxes in Colour-Coated Ware (cf. type 62).

Shallower bowls and dishes

Type 133: Dish with incurving sides and small bead rim: 133.1, RW1; 133.2, RW1; 133.3, with grooved decoration, RW1; 133.4, as above, RW1; 133.5, RW5.

134: Dish with straight sides and small bead rim; RW1: 134.1, 134.2.

135: Dish with hammer-head rim: 135.1, RW9; 135.2, RW10; 135.3, RW10.

136: Dish with small triangular rim: 136.1, RW4; 136.2, RW4; 136.3, RW4; 136.4, RW10; 136.5, RW12.

137: Dish with rolled rim: 137.1, BB2; 137.2, BB2; 137.3, BB2; 137.4, Nene Valley Grey Ware; 137.5, RW1; 137.6, RW1; 137.7, RW1.

138: Shallow dish with rolled rim: 138.1, BB2; 138.2, BB2; 138.3, RW1; 138.4, RW1; 138.5, RW1.

139: Very shallow dish with rolled rim: 139.1, RW1; 139.2, RW1; 139.3, with groove internally, RW4.

140: Shallow dish with incurving sides and large rolled rim; RW1.

141: Dish with out-turned rim: 141.1, RW1; 141.2, RW1; 141.3, RW1; 141.4, RW1; 141.5, RW10; 141.6, RW11; 141.7, RW11; 141.8, Shell-Gritted Ware;

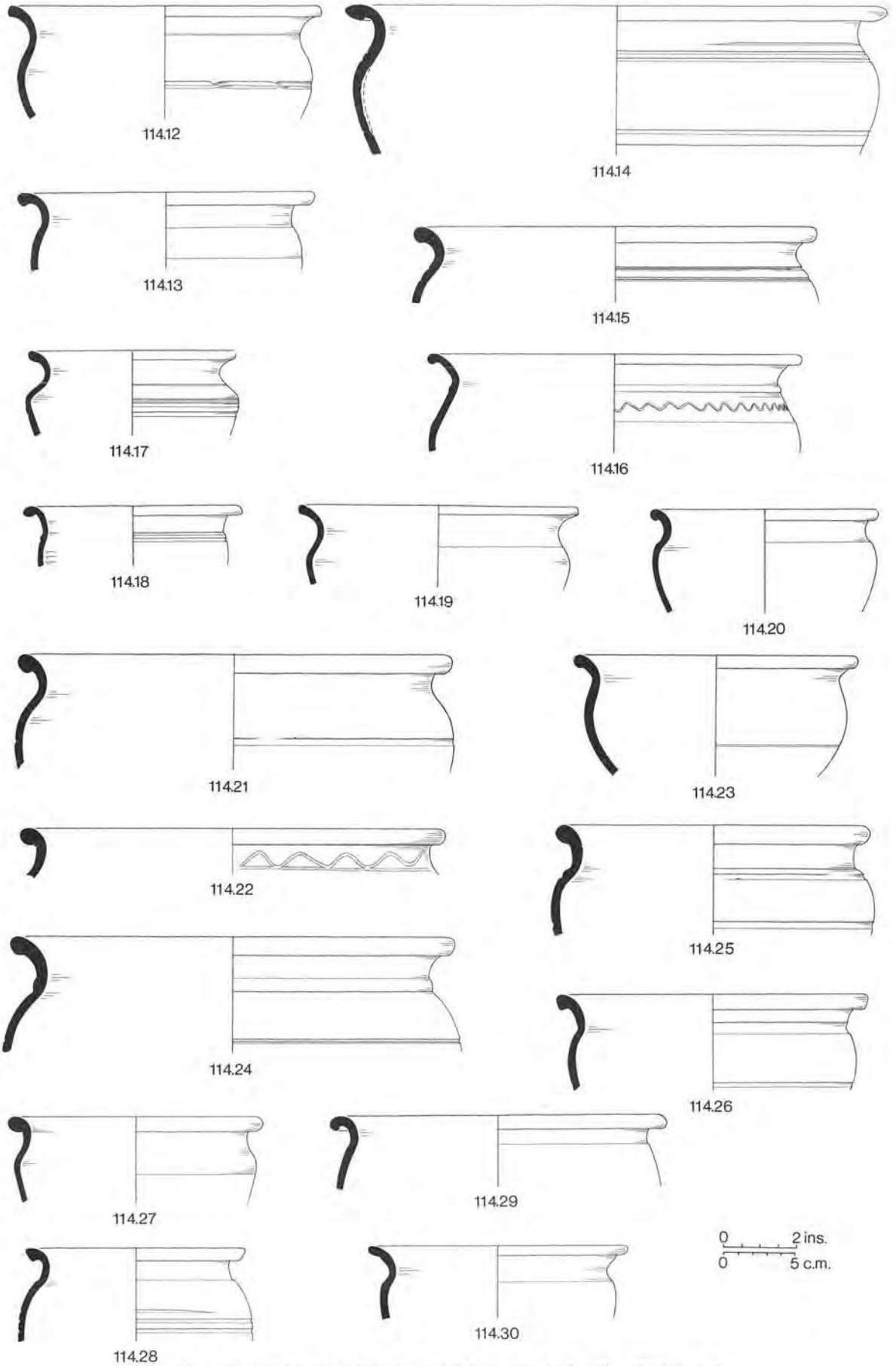


Fig.59. Romano-British pottery 114.12-114.30. Scale 1:4.

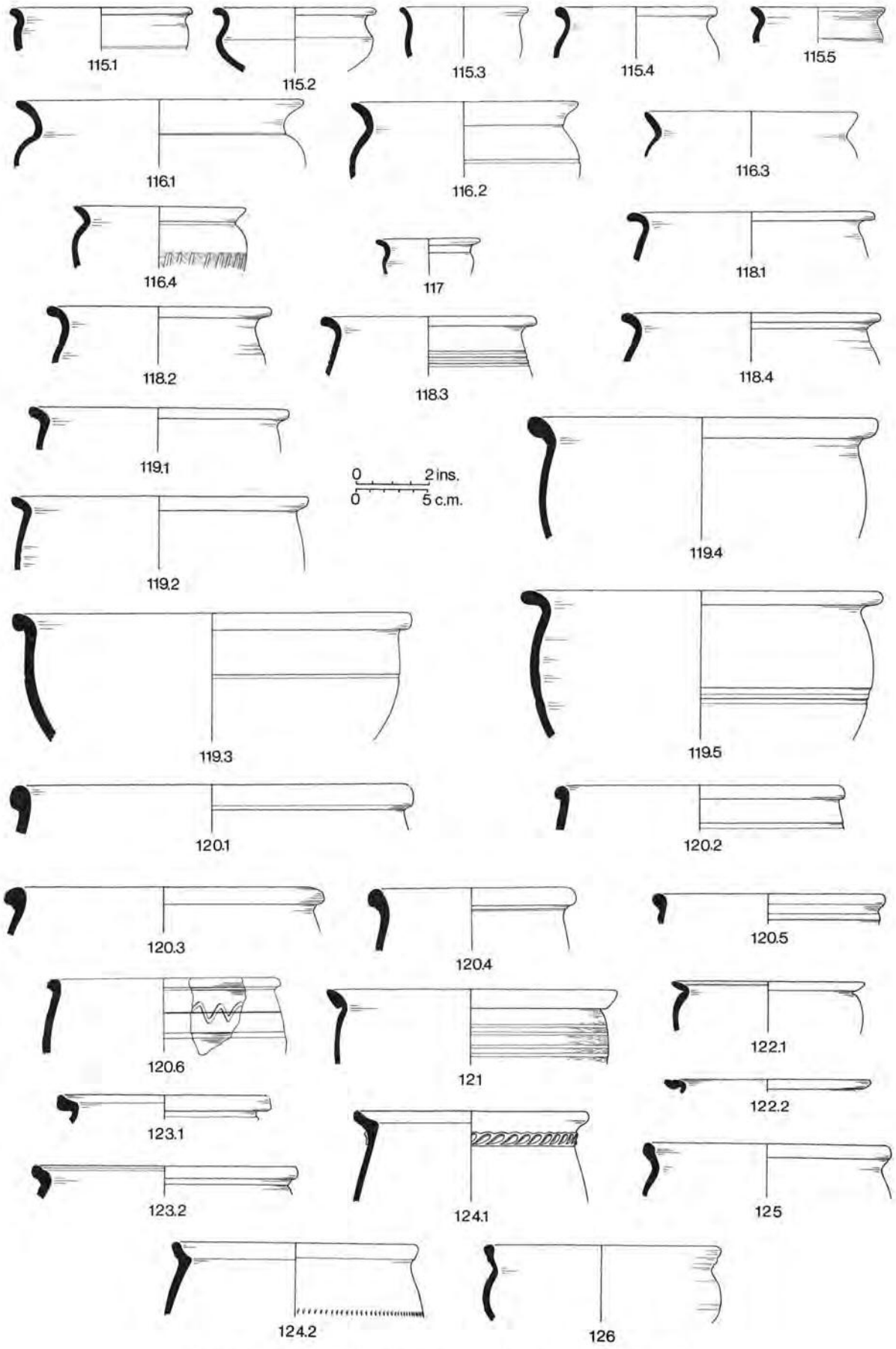


Fig.60. Romano-British pottery 115-126. Scale 1:4.

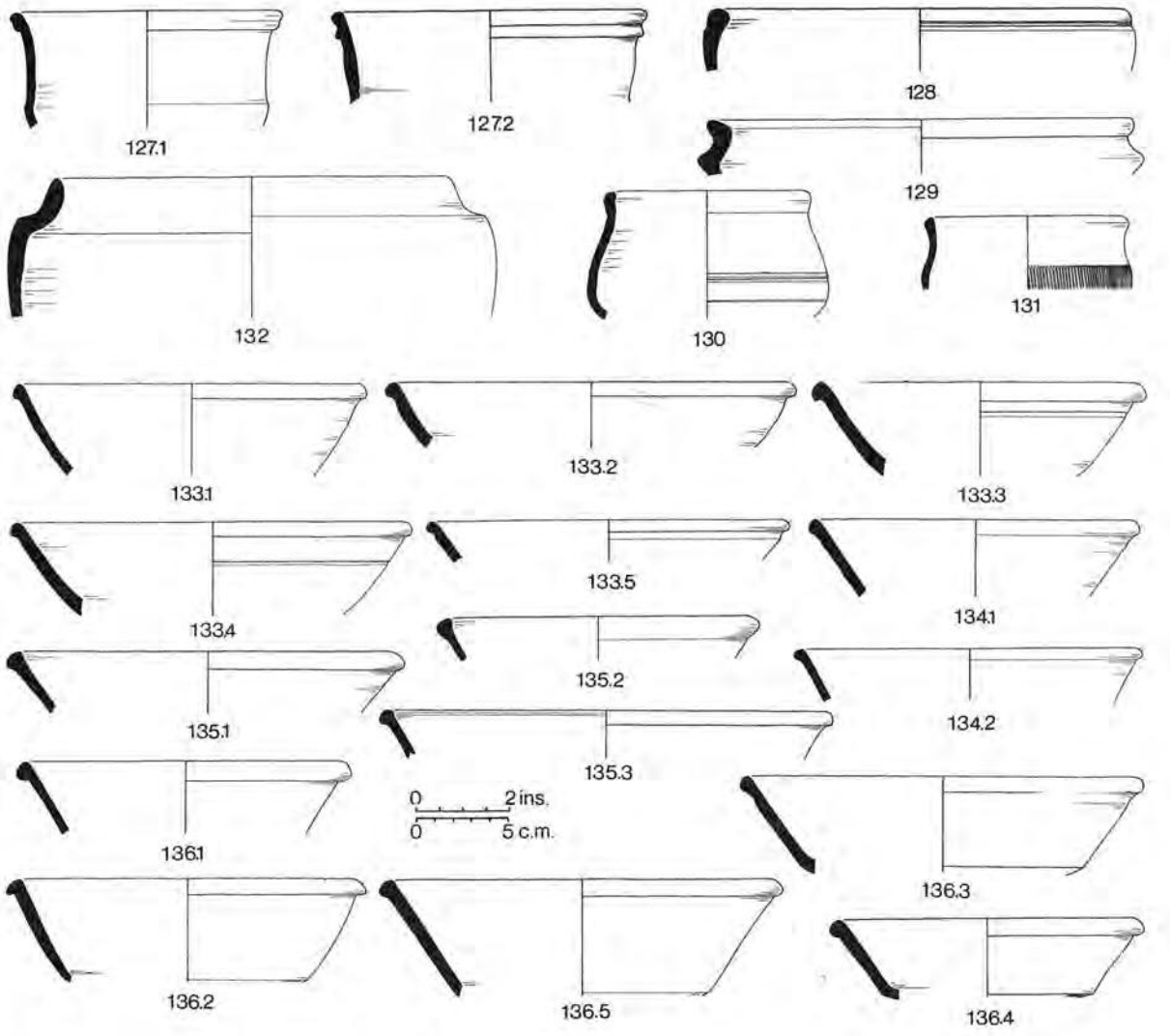


Fig.61. Romano-British pottery 127-136. Scale 1:4.

Type 141: (cont.) 141.9, with incised line decoration, RW4; 141.10, (not illustrated) Nene Valley Grey Ware.

142: Shallow dish with out-turned rim; RW1.

143: Dish with rolled rim grooved on inner edge; RW10.

144: Bowl with flat grooved rim; BB1: 144.1, 144.2.

145: Bowl with bead and flange rim: 145.1, with burnished arc decoration, BB1; 145.2, Nene Valley Grey Ware; 145.3, RW10; 145.4, RW10; 145.5, RW11; 145.6, RW11.

146: Coarse bowl with down turned rim, grooved on inner edge; RW1.

147: Bowl with high bead and flange rim: 147.1, with burnished arc decoration, BB1; 147.2, as above, BB1; 147.3, BB1; 147.4, with combed wavy line on the flange, RW4; 147.5, with burnished wavy line on the flange, RW4; 147.6, with burnished line decoration internally, RW1; 147.7, with groove, RW1; 147.8, with burnished wavy line, RW1; 147.9, with burnished wavy line and groove, RW11; 147.10, RW10.

148: Deep bowl with bead and flange rim, decorated with burnished lattice; RW1.

149: Bowl with crude bead and flange rim: 149.1, RW1; 149.2, RW1; 149.3, RW12.

150: Shallow bowl, rim and body decorated with grooving; RW1: 150.1, 150.2, 150.3, 150.4.

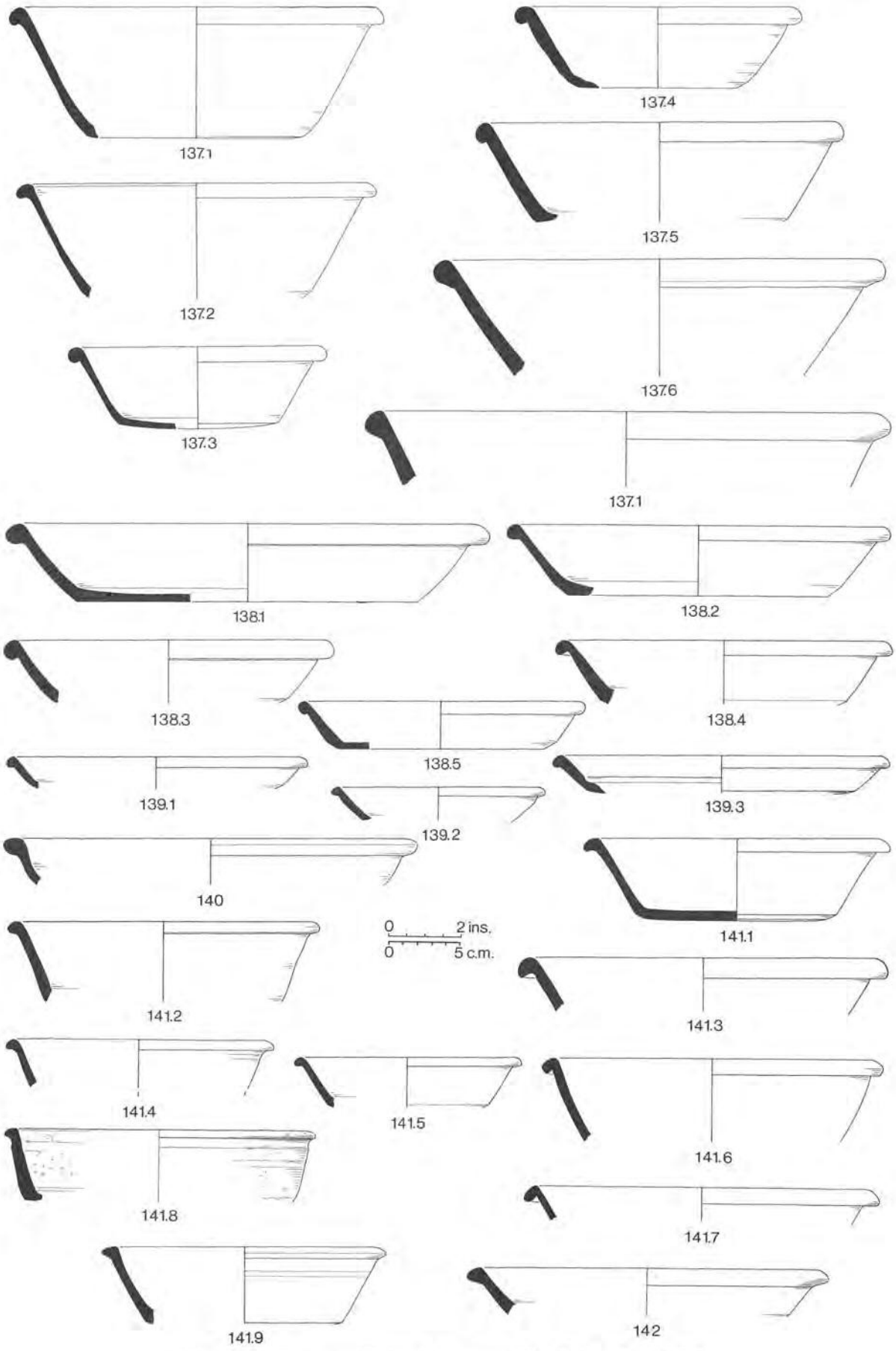


Fig.62. Romano-British pottery 137-142. Scale 1:4.

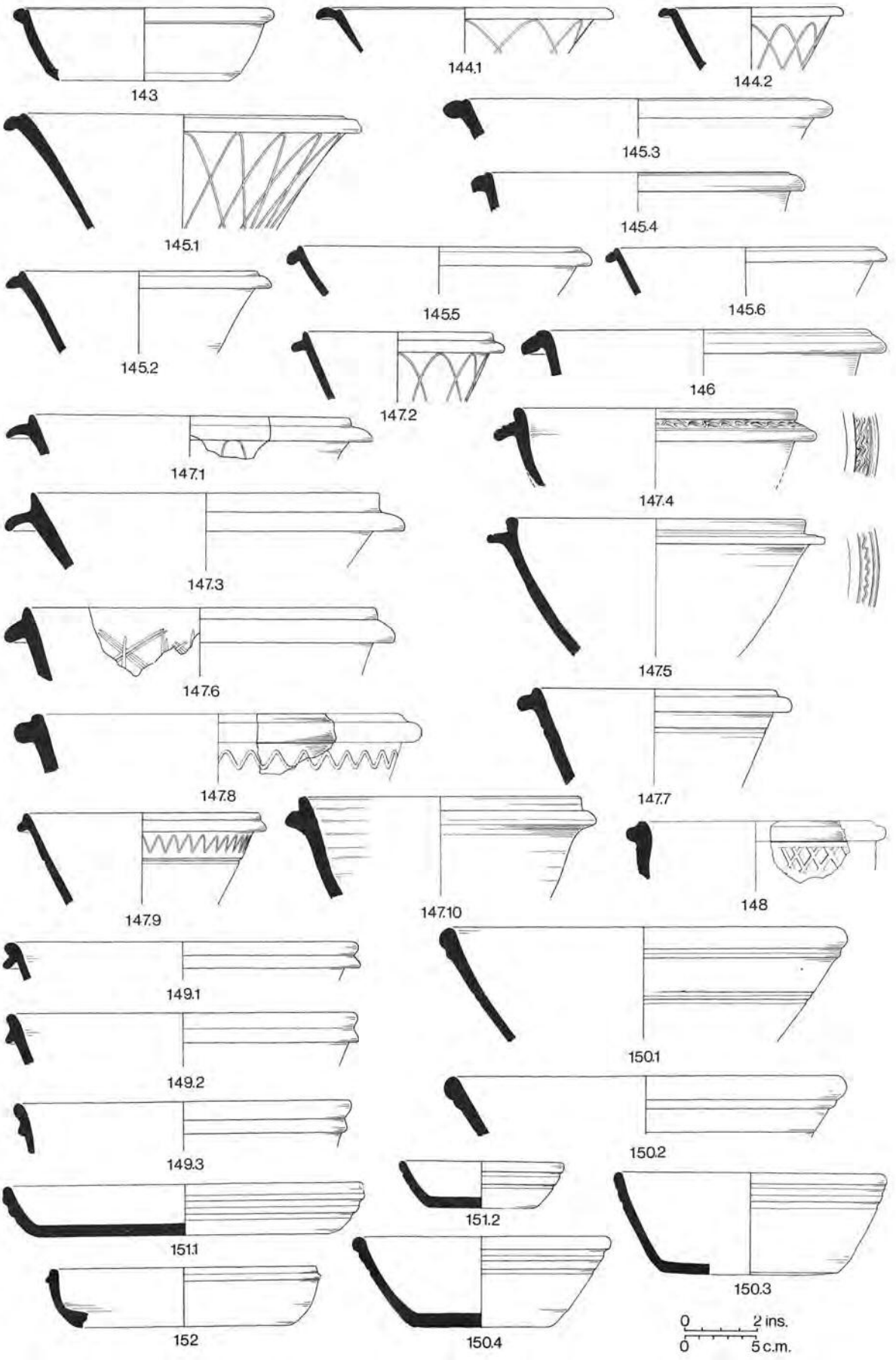


Fig.63. Romano-British pottery 143-152. Scale 1:4.

Type 151: Dish of similar form to type 150; RW1: 151.1, 151.2.
152: Dish with small flange beneath the rim; RW1.
153: Dish with sloping sides and groove beneath the rim: 153.1, BB2; 153.2, RW11; 153.3, RW11; 153.4, RW11; 153.5, RW11; 153.6, RW10; 153.7, RW10; 153.8, RW10; 153.9, RW10; 153.10, RW10; 153.11, RW1.
154: Shallow dish with groove beneath the rim; RW4.
155: Dish with out-bent rim: 155.1, RW8; 155.2, RW11; 155.3, RW10; 155.4, RW10.
156: Dish with out-bent rim and foot ring; RW1.
157: Dish with sloping sides: 157.1, RW11; 157.2, RW11; 157.3, RW11; 157.4, RW1; 157.5, RW10; 157.6, Nene Valley Grey Ware; 157.7, OW5.
158: Dish with straight or incurving sides: 158.1, BB1; 158.2, RW10; 158.3, RW10.
159: Burnished sherd from the base of a dish or bowl. This decoration occurred quite frequently on base sherds, although it could not be assigned to a specific form; RW1.

Lids and Miscellaneous
Type 160: Lid with groove or indentation above the rim: 160.1, RW1; 160.2, RW10; 160.3, RW1; 160.4, RW10.
161: Lid with square-cut rim; RW17.
162: Lid with plain rim; Shell-Gritted Ware.
163: Lid with frilled rim; RW10.
164: Cheese press base; RW10.
165: Base of vase or tazza; OW6.

The Mortaria
by Kay Hartley

Type series and report combined.

Type 166: A mortarium with deep, vertical or near vertical collared rim, with grooves at top and bottom of the collar; the spout has been formed by a simple finger depression on the rim. This profile was developed from a more elaborate one with well-formed spout, made by Acceptus and others in the Colchester potteries c. A.D.160-200 (Hull 1963, fig.64, nos.2, 4-6). Potters using similar clays were working in the same tradition on a smaller scale in other parts of East Anglia. The Colchester potteries were working on a large scale in the second half of the second century, but they, too, must have been working on only a small scale in the third and fourth centuries.

The precise production area for the Brancaster mortaria cannot be determined, but it would certainly be in East Anglia where the basic form was popular c. A.D. 170-270. This version of it is undoubtedly of third-century date, c. A.D.210-270. M1.

Type 167: A mortarium with vertical rim and a single groove at top and bottom; the collar is much shallower than in type 166 though in essentials it is similar. It may have been made on a small scale at Colchester (Hull 1963, fig.94, no.50), and elsewhere in East Anglia in the third century. Only two other examples are known to me, from Colchester (above) and Canterbury. Probably third century rather than earlier. Heavily worn. M5.

Type 168: A mortarium with clumsy sloping collar, grooved at top and bottom; the bead has been broken and turned out to form the spout. This basic form was commonest in the Mancetter-Hartshill potteries in Warwickshire in the late second centurn and the third century; it was rarely used in the lower Nene Valley. Probably third century rather than later. M12.

Type 169: Type 169.1 and 169.2 have a convex collar with a wide, shallow groove in the

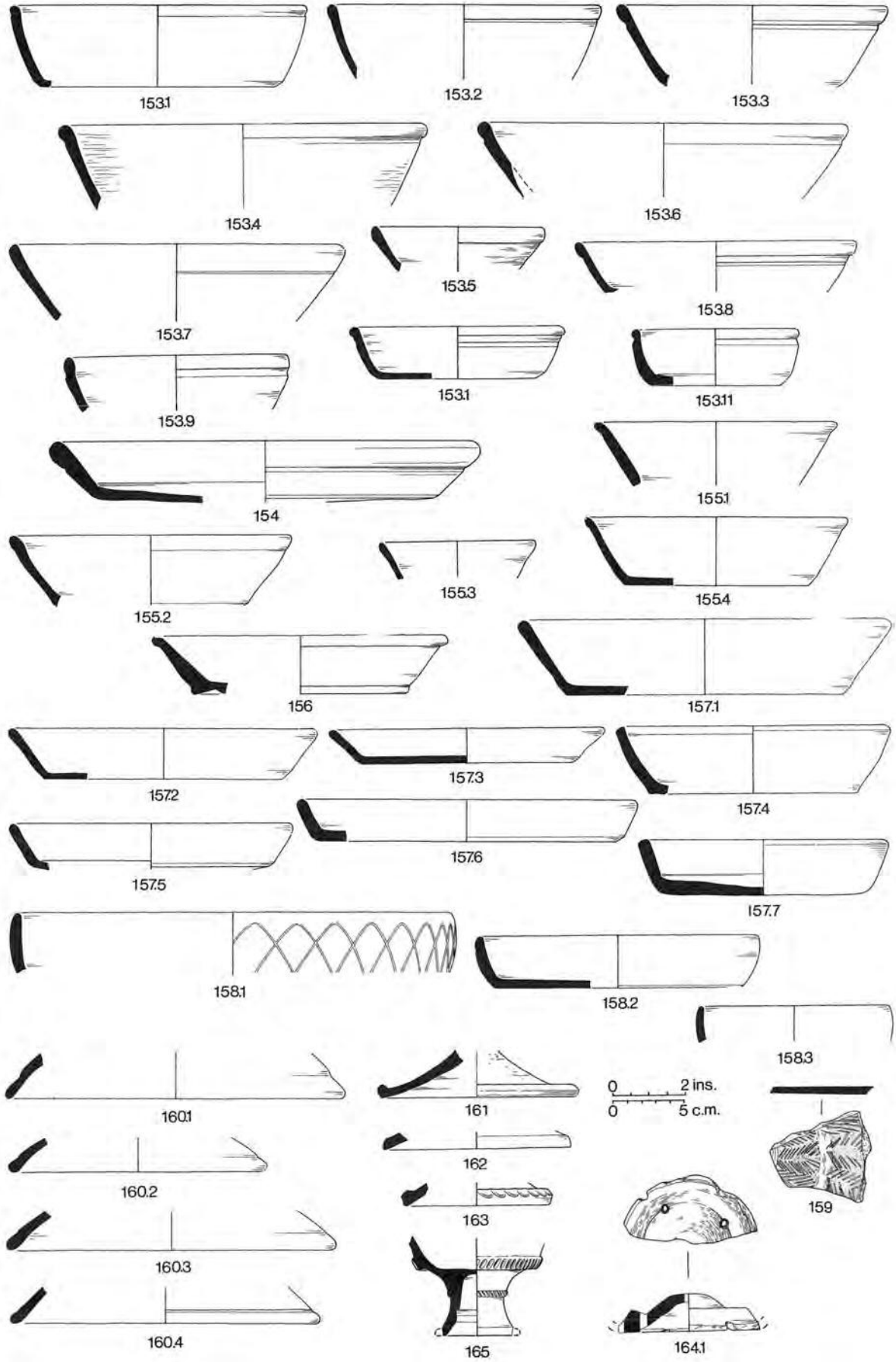


Fig.64. Romano-British pottery 153-165. Scale 1:4.

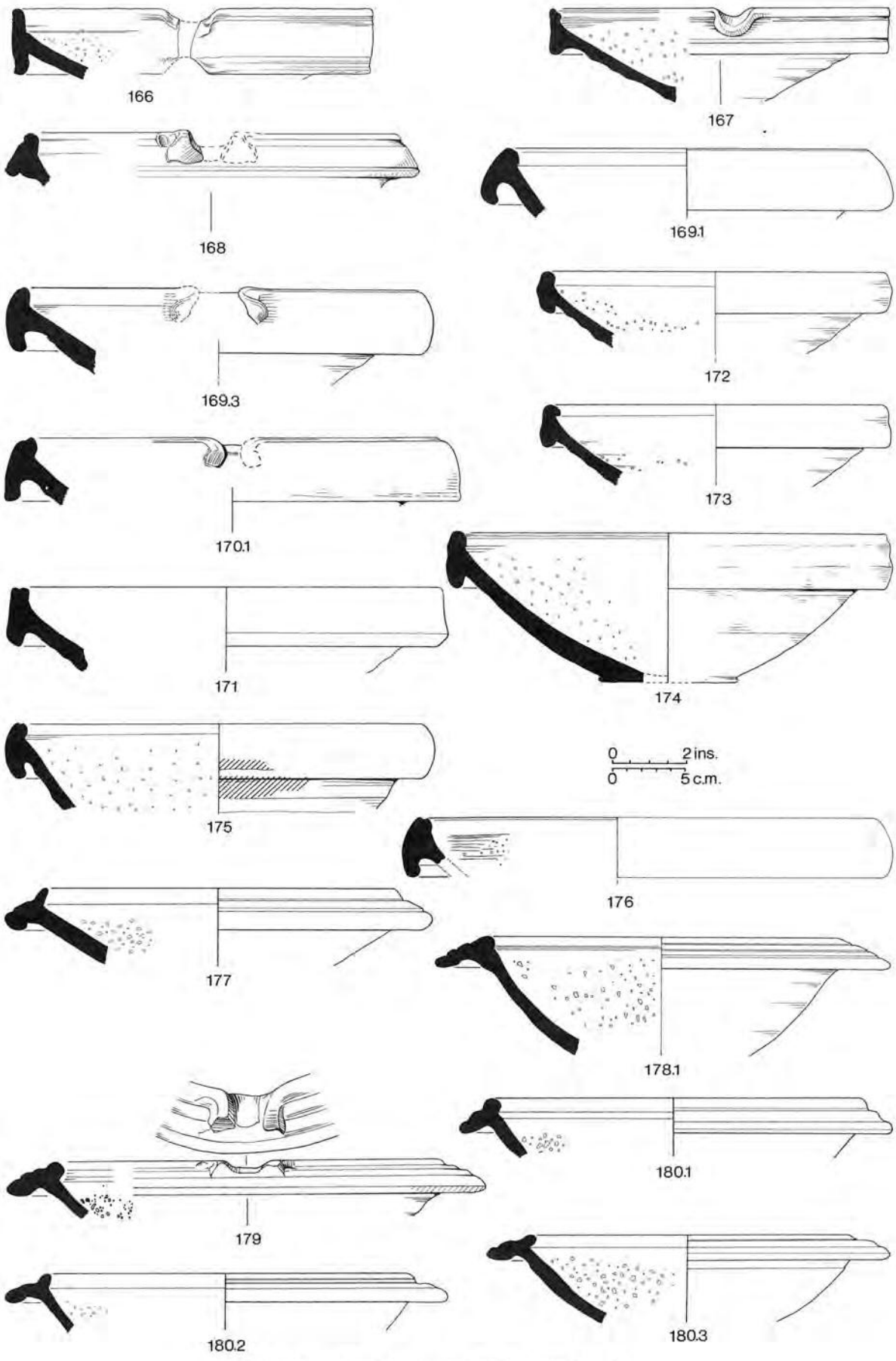


Fig.65. Mortaria 166-180. Scale 1:4.

Type 169: (cont.) top of the bead. It was certainly made at Colchester (Hull 1963, fig. 89, no.9), but probably in other parts of East Anglia too. Type 169.3 (Hull 1963, fig.87, no.13) lacks the groove and has a straighter collar; it may be marginally later than 169.1 and 169.2. 169.1, c.A.D.180-260. M4. 169.2, (not illustrated); c.A.D. 180-260. M2. 169.3, c.A.D.200± -280. M2. (Note basic similarity to types 175 and 176).

Type 170: The slight, though still neatly finished-off spout is certainly later than c. A.D. 190. The form is close to type 169.3, but the bottom of the collar is more out-turned; this type also can be matched at the Colchester kilns (Hull 1963, fig. 89, no.14). 170.1, c. A.D. 200-270. M2. 170.2, (not illustrated); A.D. 200-280. M3. 170.3, (not illustrated); type 169 or 170. M1.

Types 169 and 170 are variations on a form which came into production at Colchester in the second half of the second century (Hull 1963, fig.87, no.1). The minimum work on the spout and its shallowness, with part of the bead still in position when viewed from the inside, are all indications of late date. It is difficult to give a final date for the production of these mortaria, but M.R.Hull found the maximum number of types 169 and 170 in kiln 32, which he dated c. A.D. 250. They were probably mainly produced in Colchester and other sites in Essex, but they could also have been produced in some of the workshops further north in Norfolk and Suffolk.

Type 171: A mortarium with a rather clumsy, straight-sided collar, turned in slightly at the bottom. Similar mortaria have been found at Rapsley (Hanworth 1968, fig. 19, no.36 in Period III, A.D. 200-220), and at Fishbourne (Cunliffe 1971, fig.75, no.5 in a group dated A.D. 150-280). This form, which was never stamped, was initially imported from the Rhineland where collared mortaria were very popular, but the varying fabrics in which such forms occur very strongly indicate that some imitations were made in Britain. The fabric and grit of the Fishbourne example point to it being an import while the fabric of the Rapsley one suggests manufacture in East Anglia or less probably in southern England. The grit used in the type 171 specimens would fit well with manufacture in East Anglia. No close parallels have been noted from Colchester. c. A.D. 160-260.

A worn mortarium with traces of rough internal concentric scoring. M7.

Type 172: Types 172 and 173 are probably from one workshop. None of types 171-173 is represented at Colchester, but the flint grit used suggests that they were made in East Anglia rather than being imported. A.D. 180-260. M7.

Type 173: A close parallel is recorded from Richborough (Bushe-Fox 1949, no.515, in a deposit not later than A.D. 275-300). A.D. 180-260. M7.

Type 174: A form closely related to types 169.3, 170 and 173, but with the overall gritting up to the bead and the fine concentric scoring normal in types 175-176. A.D. 150-260. Worn and burnt before fracture. M10.

Type 175: A mortarium with slightly more curved collar than types 174 and 169.3, but its main difference lies in the collar rising above the lightly defined bead; the internal surface of the Brancaster examples are covered with fine quartz grit up to the bead, combined with fine, internal concentric scoring. A.D. 150-260. M11.

Type 176: This form differs from type 175 only in having a thicker, heavier rim (Bushe-Fox 1949, no.511, not later than A.D. 275-300). However, type 175 does occur in other fabrics, but exact facsimiles of type 176 occur only in this fabric and the type may have been made at only one workshop. It was clearly made at the same workshop as the Brancaster type 175 mortaria and it is reasonably certain that type 176 was always imported from the Rhineland where the collared forms were very popular c. A.D. 150-260. Type 175 was imitated in Britain at Colchester and possibly elsewhere (Hull 1963, fig.98, nos.2-3; the spouts illustrated differ from the normal Rhineland one). Types 175 and 176 first appear in Britain in Antonine deposits and continue to appear in the third century. It is difficult to set a final limit to this trade, but it seems possible that it was permanently affected by the Frankish invasions of Lower Germany in the mid-third century.

It is now known that mortaria stamped by Verecundus were imported in the

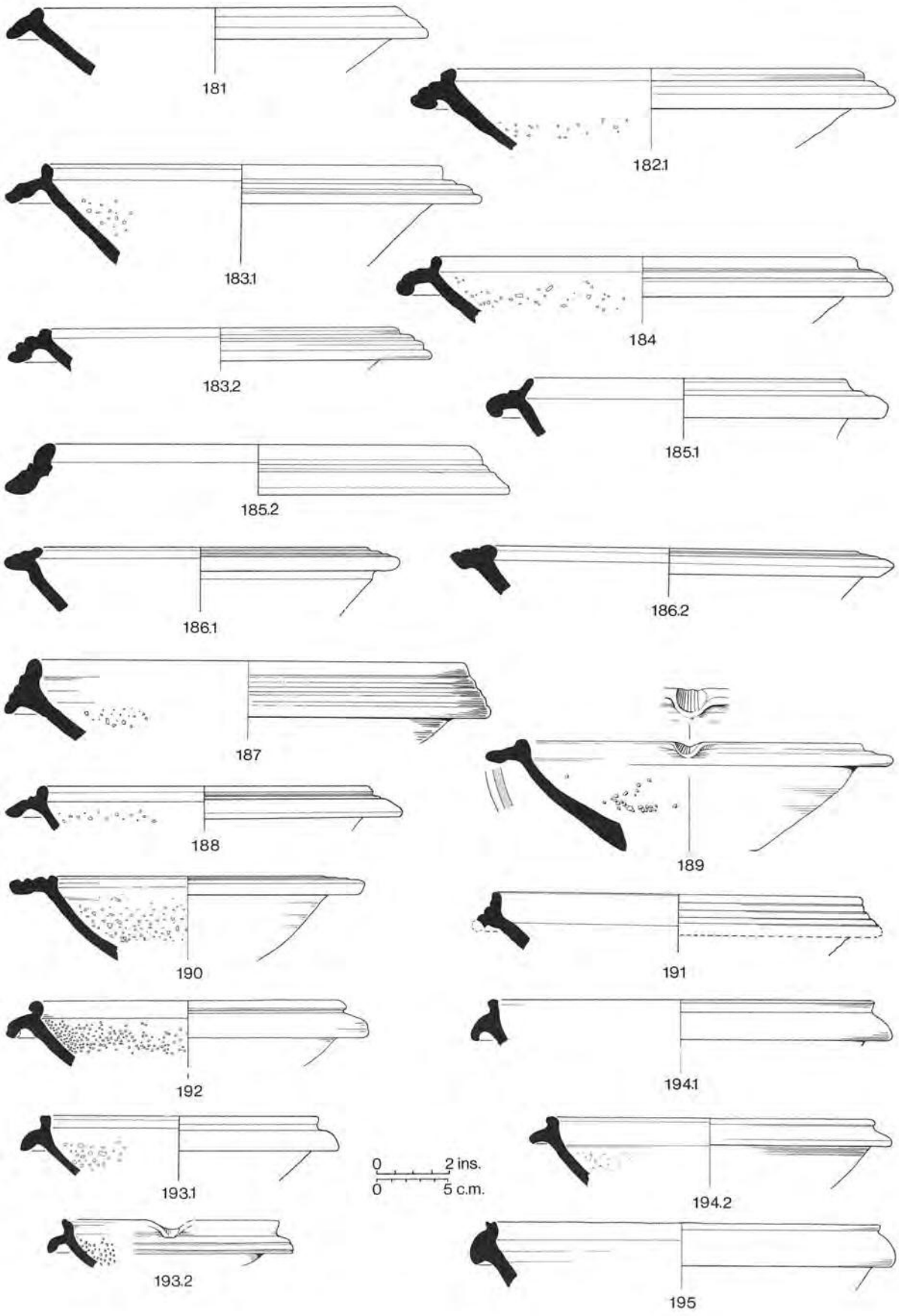


Fig.66. Mortaria 181-195. Scale 1:4.

Antonine period from a workshop at Soller, Kr.Düren in Lower Germany. This workshop also produced collared forms of various types but the trituration grit when used seems to have been quartz. Until the workshop and its contents are published we cannot know for certain that types 175-176 were made there (publication forthcoming by Frau Dkr.D.Haupt of the Rheinisches Landesmuseum in Bonn). However, mortaria identical to type 176 are amongst the pottery found in a Roman wharf in London; it had clearly been in the process of being imported at the time of breakage. The mortaria also included vessels which are certainly from the Soller workshop (Hobley and Schofield 1977, 62). A.D.150-260. Slightly burnt. M11.

Type 177: A near hammer-head form with the rim divided into three zones, the central one being the widest. This is reminiscent of type 168 but it is probably unrelated and perhaps later in date. A.D.250-400. M13.

Type 178: A true reeded hammer-head rim with the bead somewhat inturned to complete the hammer-head profile; the distal bead is folded sharply under. Two spouts survive, one made by breaking the head and turning it outwards, the other (on a variant) is a finger depression. The four 'reeds' are sharply defined. c.A.D.250-350. M12. 178.1, worn. 178.2, (not illustrated) variant - the four 'reeds' are less sharply defined. Worn and slightly burnt, probably after fracture. This is technically a second with warped rim.

Type 179: Similar to type 178, but without the right fold under the distal bead. The spout is preserved on both fragments, one with broken bead, the other with a finger depression. c.A.D.250-350. M12.

Type 180: A reeded mortarium divided into three zones with prominent, upright bead. No spout survives. c.A.D.230-350. M12. 180.1, burnt. 180.2, incorporating features of types 180 and 181. Probably third century. 180.3, incorporating features of types 180 and 181. This is technically a second with fine, transverse cracking on the flange. Probably third century.

Type 181: A weakly reeded hammer-head in three sections, with prominent bead. The central reed tends to be wider than the others. No spout survives. Probably late third or early fourth century. M12.

Type 182: A reeded hammer-head with four well-defined sections, slightly convex, with prominent bead and often rather bunched-up flange. Late third century to early fourth century. 182.1, M12. 182.2, (not illustrated) M13.

Type 183: In some ways similar to type 182, but with curved, wider, reeded flange, the bead is too upright and prominent for this type to be described as a hammer-head. Third or early fourth century. 183.1, M12. 183.2, probably burnt. M.12. 183.3, (not illustrated); probably M13.

Type 184: A distinctive form with upright bead and wide, down-curved flange with broad, channelled grooves between the reeds. This type can be paralleled in mortaria from a kiln at Stibbington. Late third or fourth century. M12.

Type 185: A slightly concave, reeded-rim hammer-head mortarium. Probably late third or fourth century. 185.1, M13. 185.2, with wavy line incised on flange; M12.

Type 186: An unusual, reeded hammer-head type with short, thick flange. Probably fourth-century. 186.1, probably M12, but with unusual sandwich core of grey and pink. 186.2, M13.

Type 187: A mortarium with a near vertical, reeded collar; the spout has been formed by breaking the bead and turning it out over the flange. Late third to early fourth century. M12.

Type 188: A mortarium with very prominent bead and a short, partly reeded flange. A.D.250-400. M13.

Type 189: A mortarium with ortho-flange; the spout has been made with a finger depression. There is a band of reddish-brown paint beneath the rim - probably a casual brush stroke. Late third to fourth century. Worn M12.

Type 190: A mortarium with reeded ortho-flange. Probably fourth century. M12.

Type 191: A reeded form with very high bead; the form and the thinness of the section are closely reminiscent of mortaria made at Swanpool, Lincolnshire in the late

third and fourth centuries. The fabric, however, is considered to differ slightly and it is likely to be either an imitation, perhaps produced by a migrant from Swanpool or, to have been produced in an area relatively close to the Swanpool workshops where their traditions would be influential. Fourth century. M14.

Types 192 and 193 are products of workshops in the Oxford region which have been closely studied by Dr.C.J.Young (Young 1977), and the forms quoted are his, but it should be remembered that their workshops produced such a variety of forms that it is often not possible to quote an exact parallel.

Type 192: Rim-section incomplete but generally similar to M21. Burnt. Fabric M15. A.D.240-300.

Type 193: Fabric M16. 193.1, Young form WC7.3 (Young 1977). 193.2, a white-coated mortarium (WC7) but generally similar in form to M22.19 and M22.4 (Young 1977).

Type 194: A mortarium with upstanding bead and tiny, neatly-formed flange. This form is more reminiscent of a small segmental bowl than a mortarium (other bowl forms were occasionally used for mortaria eg Drag.38), but the potters concerned may have been influenced by some of the current mortarium forms used in the Oxford potteries (eg Young 1977, WC 7.3). A comparable mortarium has been noted at Colchester (Hull 1963, fig.100, no.4), and others which may be of the same basic type (Hull 1963, fig.87, nos.6-10), which seem to have been dated too early. This form was certainly made at Homersfield in Suffolk, but in a reduced fabric like Fabrics M9 and M18 (Smedley and Owles 1959: reporting was made difficult by the various dates given to the pottery. It is still very unlikely that the mortarium on fig.32, i, is later than the early third century at the latest though there are difficulties involved; fig.32, j, is, however, in the same general category as type 194, Brancaster). It is fairly certain that such mortaria were also being made in other small workshops in East Anglia in the late third century and the fourth century. No closely similar mortaria have been recorded outside East Anglia. 194.1, M9, but surface discoloured possibly by burning or overfiring. 194.2, M8. 194.3, (not illustrated) M6.

Type 195: An unusual wall-sided form with a groove in the bead, with some similarity to a form recorded from the Oxford potteries (Young 1977, fig.20, M11.3). Probably made in a small workshop in East Anglia. Late third to fourth century. M9.

Details of other rim and body fragments not noted in the Type Series can be found in the archive. All fabrics have however been described in the fabric series (p.98).

Note (with reference to types 166 and 169 to 173): Some potters working in Canterbury and probably elsewhere in Kent in the Antonine period and possibly the early third century, were working in a similar tradition and using a similar clay to Colchester and Essex potters. But examination of Kentish mortaria shows that this production was on a small scale and most unlikely to have competed in any way in the East Anglian market.

General Comments

Mortarium sherds with complete rim-section or with some distinctive feature (usually fabric) give a minimum of eighty-five vessels but a possible total of 108. An approximate total of ninety-five may reasonably be accepted for present purposes. The general difficulty of assessing third- and fourth-century mortaria often makes close dating impossible. The Brancaster mortaria fall within the range A.D. 150/200-400. None of the mortarium forms represented are likely to have been stamped, a fact which militates against any date earlier than A.D. 170/180, but they could, probably equally well, fit with an occupation beginning in the early third century. On present dating approximately twenty-five per cent of the sample belongs to the fourth century, which might suggest an earlier terminal date than 400, but the dating of the Nene Valley mortaria in particular, is too difficult to permit this to be more than conjecture.

The Brancaster market was clearly dominated by the local potteries in the Lower Nene Valley (sixty-one per cent). These potteries were of more than local importance only in the third and fourth centuries when their mortaria were widely distributed though on a very small scale. Presumably they were traded with the Colour-Coated Ware. One may assume that Brancaster was one of their larger markets. In contrast the prolific Oxford potteries provided only 3.1 per cent of the total. It is not surprising that the Rhineland provided between six and seven per cent of the mortaria since potteries there are known to have exported a considerable quantity to south and south-east Britain in the period c. A.D. 150-250.

The figures for the Brancaster mortaria suggest that 26.3 per cent were supplied by workshops in East Anglia, some of which would certainly be in Suffolk and Essex. There is now sufficient evidence from Brancaster, Hacheston and Homersfield to show that small East Anglian workshops were making mortaria alongside their other products in the late third and fourth centuries. The Colchester potteries were of decreasing importance after the second century and were probably of no importance outside East Anglia after c. A.D.250. With the exception of Ellingham and Brampton, for brief periods in the second century, the small workshops were only ever of local consequence. It was precisely this type of workshop which rarely made mortaria in most of Britain in the third and fourth centuries. The presence of the Saxon Shore forts may well have been a factor in their continued production in small East Anglian workshops.

TABLE 9. RELATIVE AMOUNTS OF POTTERY FROM KNOWN SOURCES AT BRANCASTER AS PERCENTAGES OF THE TOTAL GROUPS

	1977 %	1974 Ph.2 %
?Shouldham	40	27
Nene Valley	11	9
Colchester	3	*
Brampton	2	2
Oxford	*	2
BB2	4	1
BB1	2	2
Dales Ware	*	*
Total	62 (143 kg)	43 (7 kg)

* Less than 1% 100% = 230 kg 100% = 16 kg

SUMMARY: THE SOURCES OF THE POTTERY
by Gillian Andrews

Supply of pottery to Brancaster in both the third and fourth centuries seems to have been dominated by two major industries (Table 9). As far as coarse wares were concerned, the industry represented by fabric RW1, possibly situated at Shouldham, was the principal supplier, while the Nene Valley industry provided the bulk of specialist wares - mortaria and fine ware vessels (Table 10), presumably reflecting ease of access to Brancaster by waterborne transport. Both of these industries seem to have experienced increased competition in the later third and fourth centuries, although both still remained dominant.

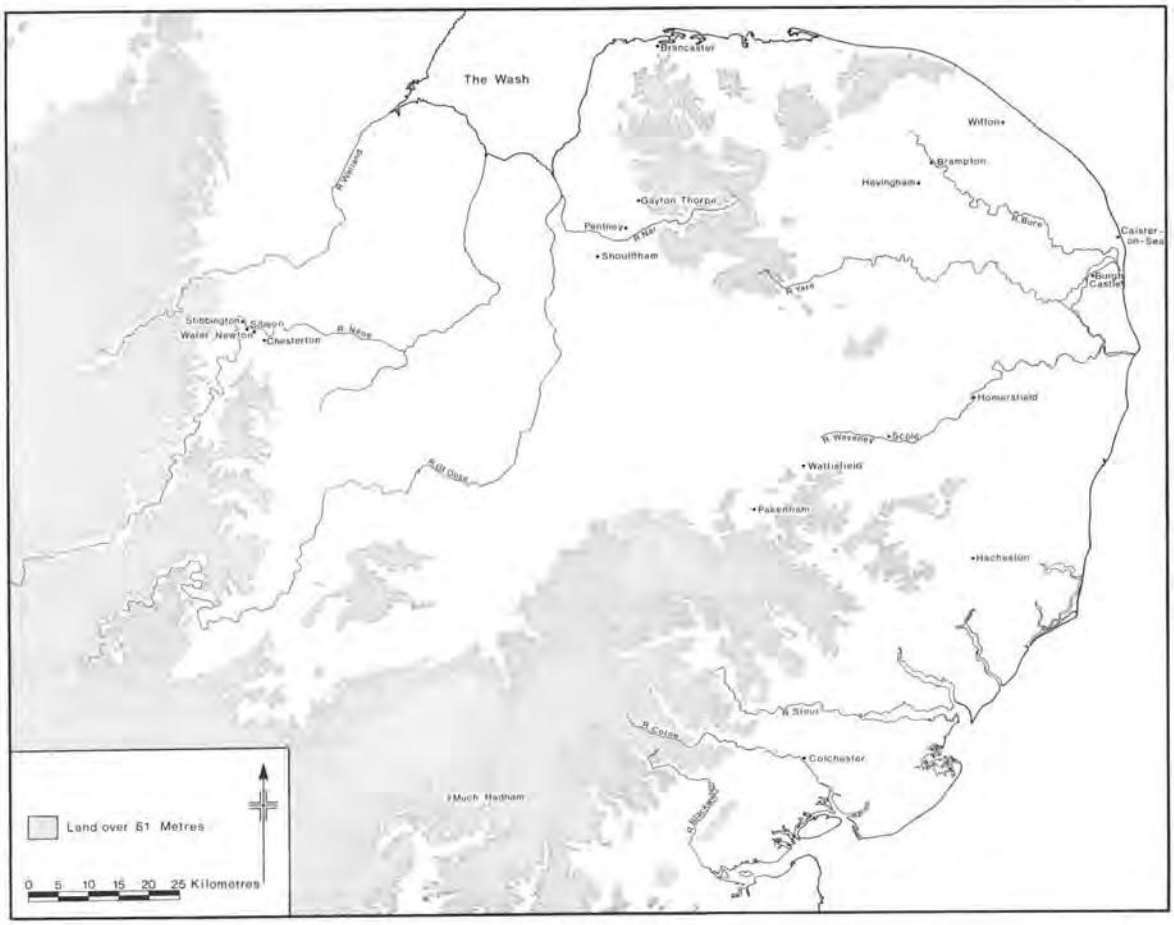


Fig.67. Map showing East Anglian kiln and settlement sites and the known sources of other British wares found at Brancaster.

Table 11 shows the relative amount of vessel types present and the wares in which they appear. Third- and fourth-century levels at other Norfolk sites, particularly Brampton (Green 1977) and Scole (Rogerson 1977) have produced a similar range of fine ware and coarse ware types, but apart from Brampton grey ware the fabrics of these coarse ware vessels are quite different from those found at Brancaster. Mid-fourth-century pottery from excavations in the Shore fort at Burgh Castle is also of a rather different character. Again there is little similarity with coarse ware fabrics found at Brancaster, and Colour-Coated Wares form thirty per cent of the total assemblage at Burgh compared to only ten per cent of the Phase 2 1974 material. This may reflect a later emphasis in date or possibly differences in supply to military and civilian sites.

Certainly there would seem to be little similarity in the marketing patterns of coarse wares between sites in the east and the west of the county, and significantly the only large group of pottery available for comparison in the west, from third century levels at the villa at Gayton Thorpe, was of a very similar character to the Brancaster material (Atkinson 1929). Here also the majority of the coarse ware was very close in fabric and form to Shouldham kiln material, and heavy mineral analysis (of a jar, type 100) produced an assemblage fairly close to that of both the Brancaster and Shouldham material.

Pottery found at Brancaster thus reflects Brancaster's location in West Norfolk on the Wash, with the bulk of the wares either coming down the River Nene or from the immediate West Norfolk hinterland.

TABLE 10. RELATIVE AMOUNTS OF WARES FROM THE NENE VALLEY FOUND ON THE 1977 AREA AS PERCENTAGES OF THE TOTAL NENE VALLEY WARES

	% Weight	% Count	% Equivalent Vessel
Reduced ware	13	13	11
Fine ware	51	78	72
Mortaria	36	9	17
Total	100 (22 kg)	100 (1304)	100 (21)

TABLE 11. RELATIVE AMOUNTS OF VESSEL TYPES FROM THE 1977 AREA AS PERCENTAGES OF THE TOTAL VESSELS FOUND. THE FINAL TWO COLUMNS SHOW THE PROPORTIONS OF VESSEL TYPES ACCORDING TO WARE GROUPINGS, BY WEIGHT

	% Weight	% Count	% Equivalent Vessel	% Fine Ware	% Coarse Ware
Flagons/Jugs/ Narrow-mouthed Jars	2	2	5	17	83
Beakers	3	6	8	74	26
Jars	30	35	41	*	99
Storage Jars	3	1	1	-	100
Bowls	16	16	16	*	99
Shallow Bowls and Dishes	31	35	26	6	94
Mortaria	15	3	3	-	-
Lids etc	*	2	*	-	-
Total	100 (61 kg)	100 (2301)	100 (221)		

*Less than 1%

AN UNUSUAL (?) TATING WARE VESSEL
by Richard Hodges

During the Brancaster excavations part of a tall necked pitcher with a bead rim and upright attached spout was recovered from the ploughsoil (Fig.68). The spout has a narrow hole at its internal junction with the wall of the pot and a beading around the top. The vessel has black, burnished surfaces that show signs of finishing. It has a grey core with some prominent quartz-sand c. 0.5 mm across as well as some limestone inclusions up to c. 0.5 mm across. It is hard fired and clearly unlike any Saxon or med-

Fig.68. (?) Tating Ware vessel. Scale 1:4.

ieval English fabric. In thin-section (T-SP.245) it has a brown optically anisotropic clay matrix with a scatter of sub-angular quartz-sand ranging from c. 0.01 to 0.5 mm across; there are prolific inclusions of fine-grained limestone in sizes approximately the same as those of quartz-sand. Plagioclase felspars and iron ores are also present.

This is an unusual vessel. The specimen bears many resemblances to the Hamwih class 14 Black Wares, a tradition of potting across northern France in the early medieval period (Hodges 1977). However, the tall neck, the bead rim and the form of the spout are unlike any Black Ware vessel known from Hamwih or elsewhere. The closest parallel for the form of the neck and rim is undoubtedly Tating Ware, the typically tin-foil decorated pitchers of later eighth- and early ninth-century date. The form of the Brancaster spout differs, however, from true Tating Ware spouts which are wire-cut.

Recent research on Tating Ware has shown that in England there are Frankish variants of these predominantly Rhenish vessels, probably made by the Black Ware potters. The strap handle from North Elmham Park and the vessel from Old Windsor, Berks., are probably Frankish imitations, though each has tin-foil decoration (Hodges 1981, chap.7, section 3). Other Frankish variants are known from Hamwih and Wharram Percy, N.Yorks (Hurst and Hodges 1976). The thin-section analysis suggests the Brancaster vessel to be different from any other yet examined. Its prolific limestone inclusions suggest an origin in northern France.

In conclusion, this is a unique piece, but it contributes to the growing evidence about Black Wares, a major French potting tradition in the Carolingian period, as well as the subject of Tating Ware. The absence of tin-foil in this case complicates our definition of Tating Ware, though in view of the number of undecorated Tating Ware vessels from Dorestad it seems correct to use form as well as decoration to identify this ware. It is thus a further example of this specialist ware, evidently made for specialist trading (discussed in Hodges 1981) and, together with those from North Elmham and West Dereham, the third of this 'tradition' to have been found in Norfolk.

THE WORKED FLINT FROM THE 1977 EXCAVATIONS
by Dermot Bond

The site produced only a limited quantity of flint artefacts. Five of these have been chosen for illustration (Fig.69). The major source of raw material was pebble flint occurring in the natural gravel.

1. Class B1 core with two parallel striking platforms. The majority of the flake scars are narrow. From pit 3269.
2. Class C core with three striking platforms and relatively broad flake scars. From ditch 513.
3. Scraper with a steep end retouch made on a pebble. There is slight flaking on the sides and some working on the triangular proximal end. From gully 1866.
4. Ridged tertiary flake with slight retouch on both edges. Damaged. From the ploughsoil.
5. Thin serrated blade. From ditch 3355.

In addition to the above, two other cores were present. A class B2 (Clarke 1960) and a flaked pebble. The flakes produced included blades and short squat forms. Distinct tool types were represented by three end scrapers, one patinated after working, a heavy chopping tool made on a large broken pebble, four serrated flakes, three blades,

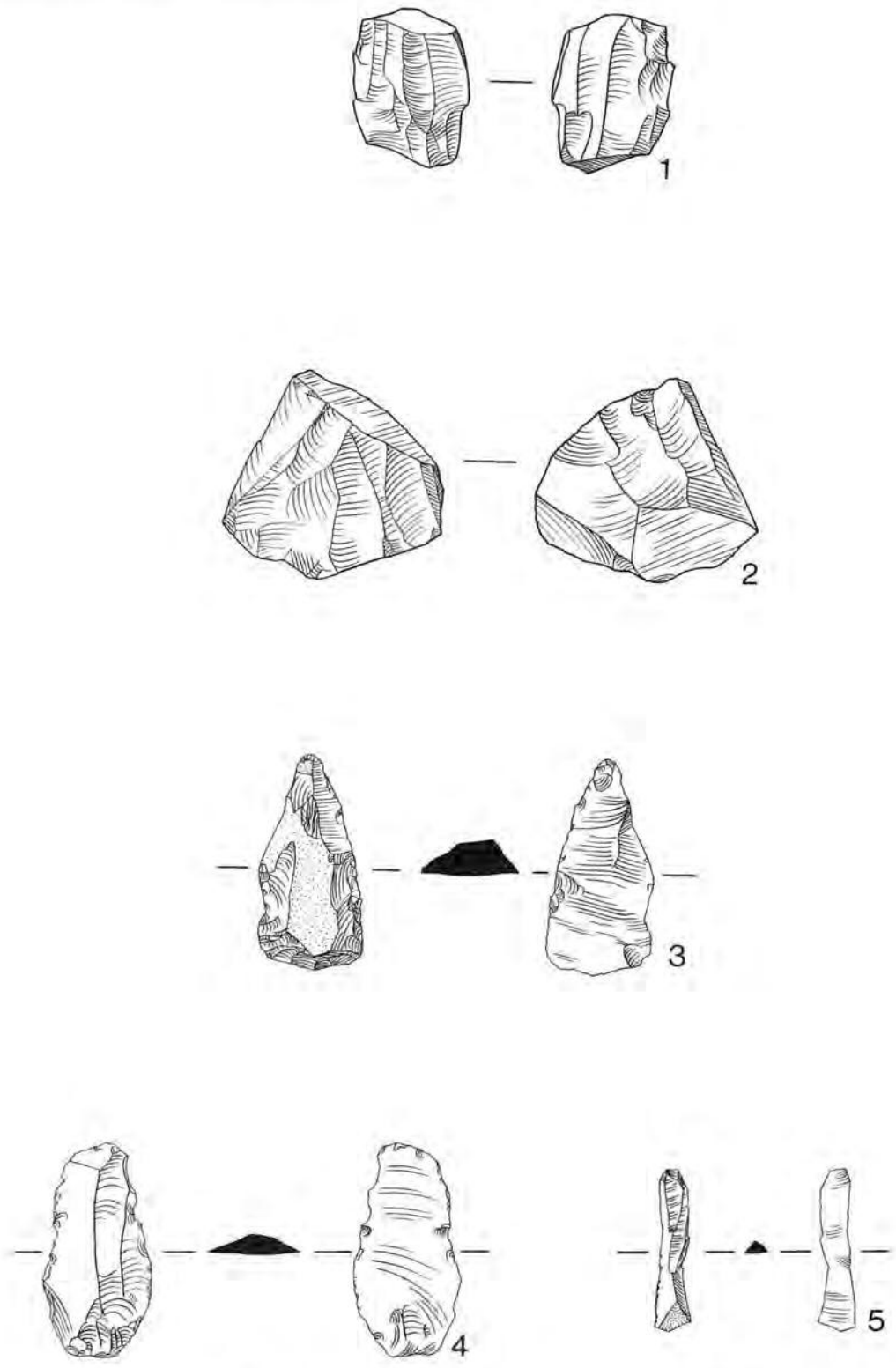


Fig.69. Worked flint from the 1977 excavations. Scale 1:2.

nine utilised and thirteen waste flakes. There was a possible unfinished projectile point.

Given the size of the sample it is not possible to draw other than general conclusions. Both broad and narrow flakes are present, but the former are in the majority which would seem to indicate a flint industry contemporary with the range of pre-Iron Age ceramics recovered from the site.

COAL FROM THE 1974 EXCAVATIONS
by A.H.V.Smith

Introduction

Seven samples of coal from Roman levels in the extra-mural settlement of the Shore fort were analysed for evidence that might indicate the source of the coal. Reflectance measurements were made on a suitably prepared portion of each coal sample in order to determine the rank of the coals and spore analyses were made to determine their approximate geological age of the coals. A knowledge of where coals of the approximate age and rank outcrop may suggest the possible source.

Samples

Details of the samples are as follows -

Context	Location	Amount of coal
21	Area 1 early third century boundary ditch	1 piece $\frac{1}{2}$ in^3
24	Area 1 occupation level, third-fourth century	Approx. 10 g (incl. 1 piece $<\frac{1}{2}$ in fusain/Charcoal)
27	Area 1 occupation level, third-fourth century	1 piece $\frac{1}{2}$ in^3
58	Area 1 occupation level, third-fourth century	4 pieces $\frac{1}{2}$-$\frac{1}{4}$ in^3
29	Area 2 metalling over north-west corner of enclosure	3 pieces $\frac{1}{2}$ in^3
30	Area 2 fill of enclosure ditch	1 piece $\frac{1}{2}$ in^3
35	Area 2 fill of enclosure ditch	1 piece $\frac{1}{4}$ in^3

Where samples comprised more than one piece of coal, composite samples were prepared from the individual pieces in each sample for analysis.

Results of analyses

The samples comprised unaltered bright coal, with the exception of sample 24. This sample consisted of pieces of unaltered coal, pieces of coal affected by heat showing vacuoles due to devolatilisation (low temp. char) and a piece of charcoal.

The average maximum reflectance of each sample and the volatile matter content (d.a.f. basis), estimated from the reflectance, are shown in Table 12 together with the age of the coal based on the evidence of the spores. Unfortunately, only four samples yielded assemblages of spores and these were poorly preserved. No spores could be isolated from the other samples despite the fact that microscopic observation showed spores to be present in these coals. The reason for this is not clear.

Source of coals

The scatter of reflectance values suggests that the coals are from more than one seam or from different localities of the same seam.

TABLE 12. RANK AND AGE OF COAL SAMPLES

Context No.	Av.Max R_o %	Vol. Matter % (d.a.f. basis)		Ages of coals from spores
21	1.01	34.5	range 33.0 - 36.0	No spores recovered
24	0.99	35.0	33.5 - 36.5	Middle Coal Measures
27	1.07	33.0	31.5 - 34.5	No spores recovered
29	1.01	34.5	33.0 - 36.0	No spores recovered
30	1.01	34.5	33.0 - 36.0	Middle Coal Measures
35	0.99	35.0	33.5 - 36.5	Middle Coal Measures
58	1.06	33.0	31.5 - 34.5	Mid.Coal Meas.below Ryhope marine band in Durham or equiv. horizon elsewhere

Coals of the appropriate age (where known) and rank, outcrop in the western part of the Durham coalfield and probably in the South Wales coalfield from the area of the east crop near Pontypool, although actual reflectance values of the outcropping coals in the latter locality have not been measured. There is a slight possibility that coals of Middle Coal Measures age having a reflectance of c. 1.0% outcrop near Barnsley in the Yorkshire coalfield, but this is inferred from trends established from deep mined coals in the area.

Finds of coals at sites situated on, or near, both the South Wales and the Northumberland/Durham Coalfields suggest that the Romans were extracting coal in both areas. Unfortunately, most of the coals found at these sites were collected before the advent of the reflectance method of ranking coal so that it is not known whether there are differences in the reflectance values of coals from these coalfields. The few measurements that are available from coals which almost certainly came from the South Wales coalfield indicate a slightly lower rank (R_o c. 0.9%). This kind of evidence could help to decide the source of the coals found at Brancaster. However, in the absence of such evidence, it seems reasonable to assume that the coals under investigation were brought by sea from the Tyne area.

VI. ZOOLOGICAL EVIDENCE

THE ANIMAL BONES FROM THE 1974 EXCAVATIONS
by Gillian Jones

The bones are from the common domestic animals, the only unusual find is from a goose (Table 13). An early group and a small part of a later group came from freshly-buried closed contexts, near to areas of occupation. The minimum number of individuals is probably near to the actual number represented. The rest, from the late timber structure and enclosure ditches were in a more sparse and general scatter of debris. With these the minimum number is, therefore, an underestimate.

Bones from all the main parts of the skeleton were found, except in the case of dog and pig; with these animals most of the remains were from the skull region.

Cattle

The jawbones studied are from at least four immature (up to about five years) and ten mature animals. The long bones are from immature and mature animals in more equal proportion; of individuals represented by late-fusing epiphyses, five were mature

and four were immature. By looking at the parts of bones which fuse early in life, it appeared that most (seven fused to one unfused) had been kept for more than a year (Harcourt 1974b).

A late third- or early fourth-century mandible has the second premolar absent and the third molar with only two pillars; in another (fourth century) the third pillar is much reduced; five normal lower third molars have been observed. These tooth irregularities are common in Roman material. Noddle (pers.comm.) suggested that they are either congenital - if so it may be evidence of inbreeding, perhaps to favoured sires - or a result of nutritional shortage at an early stage.

One rib, probably of cattle, shows a growth of extra bone; it does not appear to have been fractured.

Horse

Horse bones are well represented; they are of the small size usual on Roman and earlier sites. The metacarpal (Table 11) gives an estimated height of $12\frac{1}{2}$ hands. There is evidence of one young horse (distal radius unfused), a male of about nine years (a well preserved mandible) and an old animal (very worn teeth).

Sheep

One skull fragment is of a hornless sheep. There was no evidence that goats were present. The mandibles are from at least three mature and six immature animals, none of the latter having died in their first year of life (first molar in wear).

In one mandible (second or third century) the second premolar was absent and the fourth premolar was larger than usual, being more nearly divided into two pillars.

Pig

Pig remains are few and include a mature and a sub-adult pig (lower third molar in partial wear).

Dog

All the dog bones are from the later period. They consist of most of the skeleton of a two- or three-month old puppy and parts of the skulls of two adult dogs, one of medium size and one quite large (Table 14).

Goose

The only bird bone is a goose radius of about the size of a grey lag gander. It was kindly identified by Mr.D.Bramwell. It could well be from a domestic bird but, with the proximity of the saltmarshes, it is as likely to be evidence for fowling. Goose bones were found at Portchester (Eastham 1975) and Shakenoak (Marples 1972).

Marked Bone

Six cattle scapulae had been cut on the glenoid cavity and/or spine; similar cuts were probably made when the front limb was removed. Half the ribs have knife or chopper marks.

Evidence of bone working comes from a proximal end and a distal end of cattle metatarsal, probably parts of the same bone, which had been sawn through leaving a useful

shaft section 11 cm long. The saw used was about 3 mm thick, judging from the 'lip' remaining on each of these bones. Saw marks were also observed on a cattle pelvis.

Two pieces of the proximal end of a fourth-century cattle metacarpal had weathered in quite different ways, one to the usual 'chalky' texture and one to a paler, harder 'ivory-like' texture. It has been suggested that the latter condition might arise from roasting (Coy 1975); the bone seems to have been split from the back just below the articulation and there are small cuts on the 'ivory-like' part; there is no burning.

TABLE 13. ANIMAL SPECIES IDENTIFIED FROM 1974 EXCAVATIONS

	Cattle	Horse	Sheep	Pig	Dog	Goose
Second and third century						
Minimum number of individuals	3	1	3	1		
Fragments	68	2	22	3		
Late third and fourth century						
Minimum number	11	5	7	4	3	1
Fragments	231	20	47	8	4	1

TABLE 14. MEASUREMENTS OF ANIMAL BONES FROM 1974 EXCAVATIONS

		Cattle	Horse	Sheep
Horn core	basal circumference	113; 176		
	length	102		
Humerus	d.w.	75; 77		
Radius	p.w.	73		28
Femur	t.l.-m.s.w.-d.w.	325-34-89		
Tibia	d.w.	57	64	26; 26; 26; 27
Astragalus	lat.l.-med.l.-d.w.	60-55-36		
		69-62-45		
Metacarpal	t.l.-p.w.-m.s.w.-d.w.	197-x-40-56	231-x-28-x	121-23-12-24
	p.w.	52; 54; 55		
Metatarsal	p.w.	44		
	d.w.	58		
1st Phalanx	t.l.	58-66		
		(7 specimens)		
	d.w.	23-32 (7)		
	t.l.-p.w.-d.w.		89-49-41	

d.w. = distal width
p. = proximal
t.l. = total length
m.s. = mid-shaft
lat. = lateral
med. = medial

Dog
maxilla premolar and molar tooth row 67; 68 (a pair)
mandible " " " " 77

THE ANIMAL BONES FROM THE 1977 EXCAVATIONS

by Roger Jones, Peter Langley and Sheilagh Wall

Introduction

The animal bones from the 1977 excavations came from a broadly even distribution throughout the excavated area to the west of the Shore fort. The deposits producing animal bones span a period from the Bronze Age to the Post-Roman period. The bone remains have for the purposes of assessment been divided into the following groups: Beaker, Bronze Age, Iron Age, earlier Roman (Period 4; Phases 1-5), later Roman (Period 4; Phases 6-8) and Post-Roman. No animal bone was recovered from the Neolithic features. The largest collection of material was contained in the earlier Roman group.

The context of the Roman material, derived as it is from features relating to an area of settlement outside a Shore fort, cannot be described as exclusively civilian or military. Davies (1971, 123-4) considers, however, that the primary food source to the army would have been locally-derived produce, and hence the Roman military diet would probably not have differed significantly from that of contemporary civilians. Our results have, therefore, been compared with other Roman sites in Britain of both civilian and military character.

Method

The animal bone was recovered by hand-picking. Some trial sieving was also carried out at an early stage, in the hope that remains of the smaller vertebrates might be recovered, but as these trials did not yield any bones, no large-scale on-site sieving policy was adopted. Bulk-soil samples for sieving were only taken after 'small bones' had been noticed during excavation. Ultimately, this method was only used twice for deposits relating to the earlier Roman period. Bones recovered during sieving are treated in a separate section, and have not been included in the main tables. The bones were examined at the Ancient Monuments Laboratory, identifications being carried out by comparisons with the reference osteological collection housed there.

For the method of recording see Jones (1978) which describes the semi-automatic recording device used. The standardized method involves recording a number of attributes for each bone including species, anatomy, measurements, fragment size, gnawing, butchery, pathology and ageing information. Data recorded on punched paper tape was processed by computer using the Honeywell Timesharing Service (now Geisco), and archival catalogues of detailed non-metrical and metrical listings, including primary statistics were compiled. Catalogues for the entire site (see archive), and for subdivisions by archaeological phase have been produced, (stored at the Ancient Monuments Laboratory). Further analysis of this sub-divided data was aided by computer tabulation programmes (Jones 1978), which produced tables of various aspects of the non-metrical data. The metrical information was displayed graphically using a micro-computer (Research Machines 380Z) to aid analysis.

The basic unit used for comparisons is the number of fragments. Bone weights and minimum numbers of individuals (MNI) have not been calculated.

Results

The subsoil of the site was, on the whole, sandy, well drained and somewhat acidic, but in spite of the acidity, preservation of the bone was fair, though the bones were brittle. Many bones had a black, mottled surface; erosion or pitting, which may have obscured surface details, was not uncommon. Despite the large sample recovered, compara-

tively few measurements could be recorded due to the fragmentary nature of the material.

Only a single identifiable fish bone was recovered, from one of the sieved samples. This general lack of fish bones may be due to their fragility and poor survival. One might have expected fish to constitute an important part of the diet on this coastal site, and use of marine resources is evident from the study of the molluscs (Bond, archive). The bird bones are considered in a separate section at the end of the main bone report. Apart from a few amphibian bones, the rest of the bones were mammalian, and came from the following species. The domestic animals were cattle (Bos sp., domestic), sheep (Ovis sp., domestic), goat (Capra sp., domestic), pig (Sus sp., domestic), horse (Equus sp., domestic) and dog (Canis sp., domestic). The wild species found were shrew (Sorex sp.), red deer (Cervus elaphus), roe deer (Capreolus capreolus), rabbit (Oryctolagus cuniculus), hare (Lepus sp.), rat (Rattus sp.), mouse and whale.

Of the 9,837 bones recovered from the site 9,767 (99.3%) were mammalian, of which 2,735 (27.8%) were identified to species. Not all elements identified osteologically could be unequivocally assigned to species. The problems inherent in distinguishing between sheep and goat bones are well known (Boessneck 1969). These two species were originally recorded as 'ovicaprid' unless definitely identifiable as goat. Only one certain goat bone was found, and in view of this, all further analyses consider this group as if it were entirely composed of sheep bones. However, it should be borne in mind that a small quantity of goat may be present, especially among the smaller fragments, where the necessary features for sheep/goat distinctions might have been absent. Identifications of small bone fragments may be equivocal, and two categories have been created to deal with these: 'cattle-sized' and 'sheep-sized'. The highly fragmented nature of the Brancaster bone assemblage has necessitated frequent use of these terms, the inclusion of which increases the number of identified bones to 5,697 (58%). As the total number of horse bones is small, in comparison with cattle, it seems reasonable to assume that most of the 'cattle-sized' bones would indeed have come from cattle. Similarly most of the 'sheep-sized' bones are assumed to have come from sheep, as other likely candidates (goat, roe deer, pig and dog) occur in much smaller quantities. These groups (cattle with 'cattle-sized' and sheep with 'sheep-sized') have, therefore, been combined for certain analyses.

A comparison of the total number of bones recovered from each phase is shown in Fig.70. A brief consideration of the bone assemblages from the different archaeological periods of the site is given below, but as the bulk of the material came from the Roman period, the rest of the report will be concerned mainly with this, unless otherwise stated.

Beaker

The number of skeletal elements for each species is shown in the archive. Only eleven bones were recovered from the Beaker phase (0.1% of the total bone recovered from the site), of which nine could be identified. As well as cattle and sheep, there is evidence for the presence of dog on the site at this time, as four bones (of both cattle and sheep) showed signs of canid gnawing. Four bones (a radius and a rib of both cattle and sheep) also showed signs of butchery in the form of knife-cuts and chop-marks, suggesting that the bone remains were food refuse.

Bronze Age

The number of skeletal elements for each species is shown in the archive. Of the 155 bones recovered (1.5% of the total bone recovered from the site) fifty-seven (36.7%) were identified. As well as cattle and sheep, pig and horse were recovered from this phase. Though no dog bones were found, their presence was suggested by canid gnaw

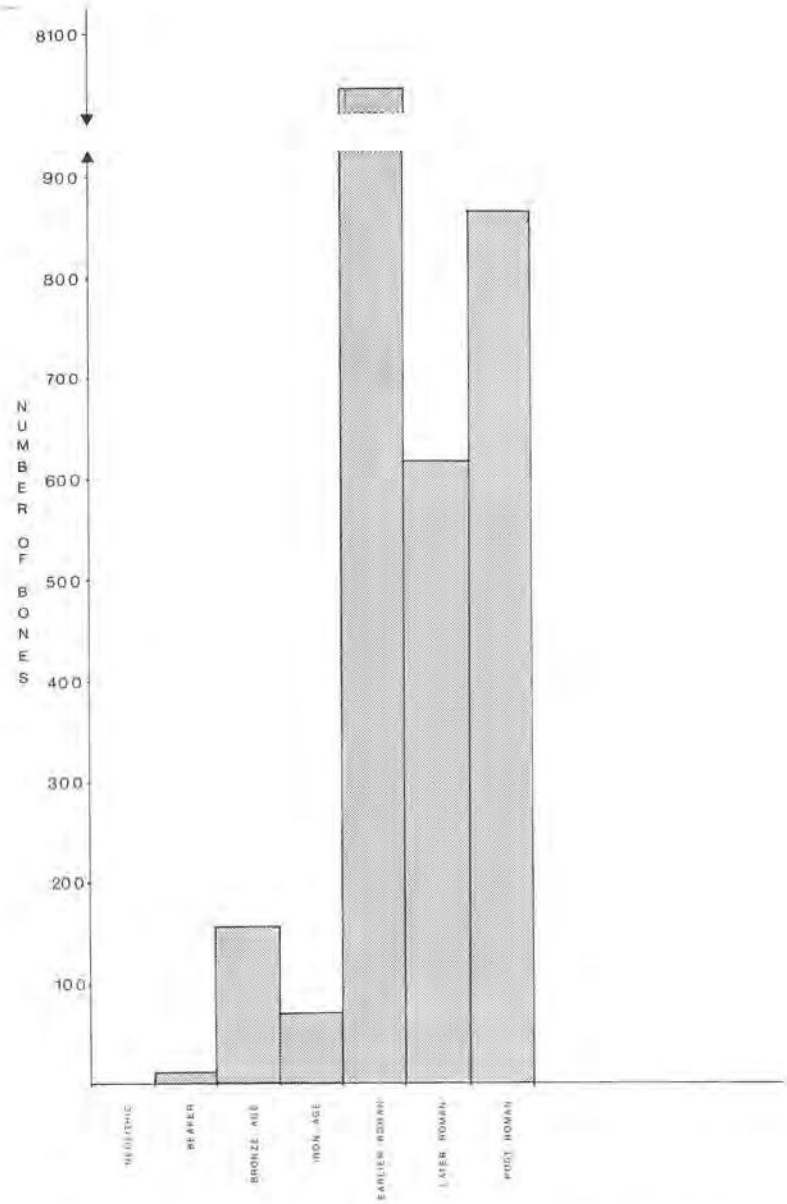


Fig.70. Histogram of the number of bones recovered from the different phases.

marks on five bones, all of cattle. Signs of butchery were present in the form of chop marks (on eleven limb bones of cattle and sheep) and knife marks (on six bones: cattle vertebrae and sheep limb bones).

Iron Age

The number of skeletal elements for each species is shown in the archive. Of the seventy-one bones recovered (0.7% of the total bone recovered from the site) forty-one (37.8%) were identified. Four species were represented: cattle, sheep, horse and dog. Evidence for dog was also present in the form of three gnawed bones (one each of cattle, sheep and horse). Butchery marks were recorded: chop marks on four cattle and two sheep bones, and knife cuts on two cattle bones). No significance can be attached to the absence of pig due to the small sample size.

TABLE 15. THE MAMMAL SPECIES AND PARTS OF THE SKELETON FROM THE EARLIER ROMAN PHASE

	Cattle	'Cattle-sized'	Sheep	Goat	'Sheep-sized'	Pig	Horse	Dog	Whale	Red Deer	Roe Deer	Hare	Rat	Indeterminate Mammal	TOTAL
Skull	118	115	23	1	18	13	3	4	-	-	-	-	-	114	409
Antler	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Mandible	165	28	88	-	15	19	3	3	-	-	-	-	-	7	328
Scapula	117	62	29	-	25	5	3	5	-	-	-	-	-	5	251
Humerus	38	34	36	-	14	8	4	4	-	-	-	-	1	1	140
Radius	56	18	46	-	28	2	9	7	-	-	-	-	-	-	166
Ulna	24	12	11	-	2	3	5	2	-	-	-	-	-	-	59
Metacarpal	100	-	41	-	2	2	6	-	-	-	-	-	-	-	151
1st Phalanx	100	-	31	-	2	7	8	-	-	1	-	-	-	-	149
2nd Phalanx	72	-	6	-	-	-	6	-	-	-	-	-	-	-	84
3rd Phalanx	54	-	7	-	-	2	1	-	-	-	-	-	-	-	64
OS Coxae	49	120	31	-	18	5	5	-	-	-	-	-	-	-	228
Femur	40	32	12	-	14	5	7	4	-	-	-	-	-	-	114
Patella	9	1	-	-	-	-	1	-	-	-	-	-	-	-	11
Tibia	48	19	53	-	22	-	3	1	-	1	2	-	-	1	150
Fibula	-	-	-	-	1	-	-	1	-	-	-	-	-	-	2
Calcaneum	31	2	7	-	2	-	4	-	-	-	-	1	-	-	47
Astragalus	35	3	7	-	-	-	4	-	-	-	-	-	-	-	49
Metatarsal	105	1	70	-	6	-	9	-	-	-	-	-	-	-	191
Atlas	18	7	1	-	1	-	3	-	-	-	-	-	-	-	30
Axis	8	7	-	-	2	-	2	-	-	-	-	-	-	-	19
Cervical vertebra	12	87	7	-	14	-	1	-	-	-	-	-	-	-	121
Thoracic vertebra	17	146	11	-	19	-	2	-	-	-	-	-	-	1	196
Lumbar vertebra	17	159	9	-	24	1	-	-	-	-	-	-	-	1	211
Vertebra	5	-	-	-	-	-	-	-	6	-	-	-	-	-	11
Sacral vertebra	-	25	1	2	-	1	-	-	-	-	-	-	-	-	29
Rib	124	894	115	-	293	5	-	5	-	-	-	-	-	7	1443
Indeterminate fragment	-	1	-	-	-	-	-	-	-	-	-	-	-	3360	3361
TOTAL	1362	1773	642	1	524	77	90	36	6	3	2	1	1	3497	8015

Roman

The Roman period of the site was divided into two periods of occupation (Period 4; Phase 1 to 5 and Period 4; Phases 6 to 8). The number of skeletal elements from the different species for the earlier Roman period is shown in Table 15. Of the 8,015 bones recovered (81.6% of the total bone recovered from the site) 4,654 (56.5%) were identified.

The number of skeletal elements for the different species recovered from the later Roman period is shown in Table 16. Of the 630 bones (6.4% of the total bone recovered from the site), 374 (59.4%) were identifiable.

In order to decide whether these two groups could be amalgamated for analysis, the two periods were compared statistically by means of contingency tables. Three criteria were used to test for differences between the two periods. These were: number of bones from each species, fragmentation, and butchery, (see archive for statistics). Though the data are crude and ignore such factors as sampling bias and differential bone deposition and preservation, it seems fair to infer that there was no significant difference in butchery and fragmentation of both cattle and sheep from the earlier and later periods. (Significance was assumed when a particular value of chi-squared (X^2) compared to a probability of 0.5 or less). Thus, these topics are considered for the Roman phase as a whole.

On the other hand the species composition showed highly significant differences between the two periods. A drop in the number of cattle bones occurred with an accompanying rise in sheep and pig numbers from the earlier to the later Roman periods. The significance of this will be discussed in a later section.

Post-Roman

The number of each skeletal element from the different species is shown in the archive. Of the 865 bones recovered (8.8% of the total bone recovered from the site), 455 (52.6%) were identifiable. This bone assemblage represents a heterogenous collection from a large time span including mixing from other phases, largely Roman, and no firm conclusions can be drawn.

Fragmentation, Butchery and Carcase Utilisation

The bone fragmentation pattern that we see in an excavated archaeological bone assemblage is the result of a complex interaction of processes. The main components are butchery practices, which are considered here under three categories. These are 'primary butchery': the slaughter and initial carcass preparation of the animal for distribution and transport; 'secondary butchery': further butchery involved with preparation of meat for cooking and eating - that is mainly carving, and 'tertiary butchery': other practices such as splitting the long bones for marrow.

Further processes occur which are concerned with carcass uses other than food production, but nevertheless affecting the bones, and not always easily distinguishable from butchery, such as marks from skinning, horn removal and glue making. These could be included in the 'tertiary butchery' category, though some (skin and horn removal) might more logically be included in the first category, as they would have been made at an early stage in the carcass preparation.

Gnawing animals (mainly dogs on this site) and burning may further affect the bones. Certain bones may be used as the raw material for making objects, such as pins and combs. The final fragmentation pattern will be influenced by the method of disposal.

TABLE 16. THE MAMMAL SPECIES AND PARTS OF THE SKELETON FROM THE LATE ROMAN PHASE

	Cattle	'Cattle-sized'	Sheep	'Sheep-sized'	Pig	Horse	Dog	Indeterminate Mammal	TOTAL
Skull	4	6	2	3	3	-	1	6	25
Mandible	11	3	10	-	3	1	-	1	29
Scapula	5	5	5	5	2	-	-	1	23
Humerus	2	-	2	-	2	-	-	-	6
Radius	-	1	8	-	1	1	-	-	11
Ulna	2	1	-	-	-	1	-	-	4
Metacarpal	7	-	5	-	-	-	-	-	12
1st Phalanx	5	-	-	-	-	-	-	-	5
2nd Phalanx	1	-	-	-	-	1	-	-	2
3rd Phalanx	1	-	-	-	-	-	-	-	1
OS Coxae	2	8	2	-	-	1	-	-	13
Femur	3	2	1	-	-	-	-	-	6
Tibia	2	1	6	2	4	-	-	-	15
Fibula	-	-	-	-	-	-	1	-	1
Calcaneum	1	-	-	-	-	-	-	-	1
Astragalus	1	-	-	-	1	-	-	-	2
Metacarpal	2	-	6	-	-	1	-	-	9
Atlas	1	-	-	-	-	-	-	-	1
Axis	1	-	-	-	-	-	-	-	1
Cervical vertebra	1	3	-	3	3	-	-	-	10
Thoracic vertebra	-	13	-	4	1	-	-	-	18
Lumbar vertebra	-	12	1	4	1	-	-	1	19
Sacral vertebra	1	-	-	-	-	-	-	-	1
Rib	-	85	18	51	11	-	1	-	166
Indeterminate fragment	-	-	-	-	-	-	-	247	247
TOTAL	53	140	66	72	32	6	3	256	628

The bones may also have been crushed and spread on the fields as fertilizer, a practice possibly in use by the Romans, who may well have been aware of the value of calcium and other nutrients in bones. Refuse may have been thrown into pits or ditches - recent work suggests that these have differing preservation properties, the nature of which will depend upon the type of site (Griffiths 1978). The bones may be broken to a greater or lesser extent before being buried. Subsequent occupation may further disturb the rubbish. Penultimately, edaphic factors will affect bone preservation, the manner of which will also depend partly on the bone matrix condition, for example whether or not the bone had been cooked. This is a subject which has not yet received much attention; though Coy (1975) has put forward a hypothesis to explain the variety of bone textures found in archaeological assemblages in terms of cooking techniques. Finally, excavation and transport to the laboratory for study will inevitably take its toll, to an extent

dependant on the bone condition.

In order to interpret the bone assemblage, we must separate the effects of these various factors. To attempt this, a number of attributes for each bone fragment have been recorded. These are: skeletal element, part of bone (proximal, midshaft or distal), size of fragment, position and type of butchery marks, and gnawing (severity and causal species). It was hoped to determine from this how the carcass was butchered and its subsequent utilization: for this purpose a number of aspects of the data were analysed. These were:-

1. The relative proportions of the different skeletal elements. From this it was hoped to show whether there was any selection of particular parts of the anatomy which might indicate whether animals were butchered on site, or transported there as dressed carcasses, and whether any selection was occurring for specialised industry (eg horn or bone working, fat extraction or tanning).
2. Analysis of overall fragmentation pattern. The range in fragment size of each bone is displayed graphically. Pie diagrams (Figs.72-76) show the proportions of bones from the different fragment-size categories, as well as the part of the bone present (ie proximal, midshaft or distal).
3. The overall butchery pattern was displayed graphically to show the percentage of chop and knife marks respectively on proximal, midshaft and distal parts of each bone.
4. A detailed analysis of the position and type of butchery mark made on individual bones was described and illustrated by diagrams. The interpretation of this shows how the carcass was dismembered. This is compared with modern practice (Rixson 1976a and b and MLC 1977) and with other Roman sites where a similarly detailed analysis has been carried out (Grant 1975, and Maltby 1979).
5. An indication of the contribution of butchery to overall fragmentation at Brancaster was gained by comparing fragmentation of cattle, sheep and pig with horse and dog. We consider that the latter two animals have not been butchered or eaten at this site.

The method of derivation of figures for constructing the diagrams is given below, with definitions of the butchery descriptions used. These may seem obvious, but the distinction between natural fractures and butchery marks is not always clear cut. Data for the diagrams are given in the archive. The analysis is mainly confined to cattle and sheep, as there is insufficient pig bone for a detailed study. As mentioned above, bone from earlier and later Roman periods was combined for this analysis, as statistical tests showed no significant difference in the attributes considered. A brief comparison is then made with the other occupation periods of the site.

Terminology. The type, position and direction of any butchery marks on the bone were located relative to the bones' position in a live standing animal. The terms chopped, knife-cut and sawn are based on experimentally-produced marks and are defined as follows:-

Chopped is the mark resulting from a heavy sharp implement slicing through the bone, similar to the mark left by a modern cleaver.

Knife-cut is the mark resulting from a light, sharp, thin-bladed instrument. The mark has a distinct 'V-shaped' cross section and does not usually penetrate the bone cortex. A similar mark can be made with a modern hand-held knife.

Sawn is the mark which exhibits parallel ridges on the cut surface of the bone. (Seven sawn bones were recorded, all from the earlier Roman period, but these are not considered further, as it has not been possible to ascertain whether they were

the result of butchery or bone-working).

Split is used to describe bones which may have been split open, perhaps for marrow extraction. The term is imprecise, as a certain degree of splitting always occurs with chopping and there is no definite way of telling it from naturally broken bone. This can be a rather subjective description: we have used it to describe fractures that seem to us to be the result of artifical processes, but where no unequivocal butchery marks can be found.

Methodology and interpretation. The relative proportions of skeletal elements for cattle, sheep and pig are shown in Fig.71 as a number of fragments against skeletal elements. Numbers for cattle and sheep include 'cow-sized' and 'sheep-sized' fragments respectively - but vertebrae and ribs are not included.

This shows up a number of similarities and differences between the three species. For cattle, sheep and pig, all body parts are represented, this suggests that for all three species, on-site butchery was occurring, with no significant removal of parts after carcass preparation. Paucity of representation of certain bones may be due to their small size and, hence, reduced recovery and survival (eg phalanges, calcaneus and astragalus). Over representation of other parts, such as the skull and os coxae of cattle may be attributed to their much fragmented state, together with comparative ease of recognition of even small fragments of these bones compared with small fragments of limb bone shafts, which may be very difficult to assign to a particular bone.

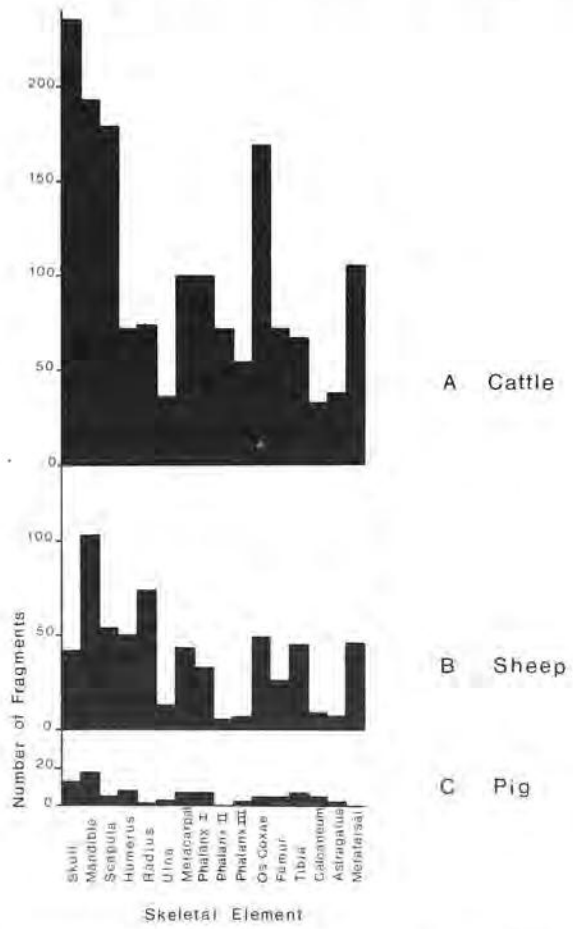


Fig.71. The relative proportions of the various skeletal elements for the three main domestic food species (cattle, sheep and pig) for the earlier Roman period.

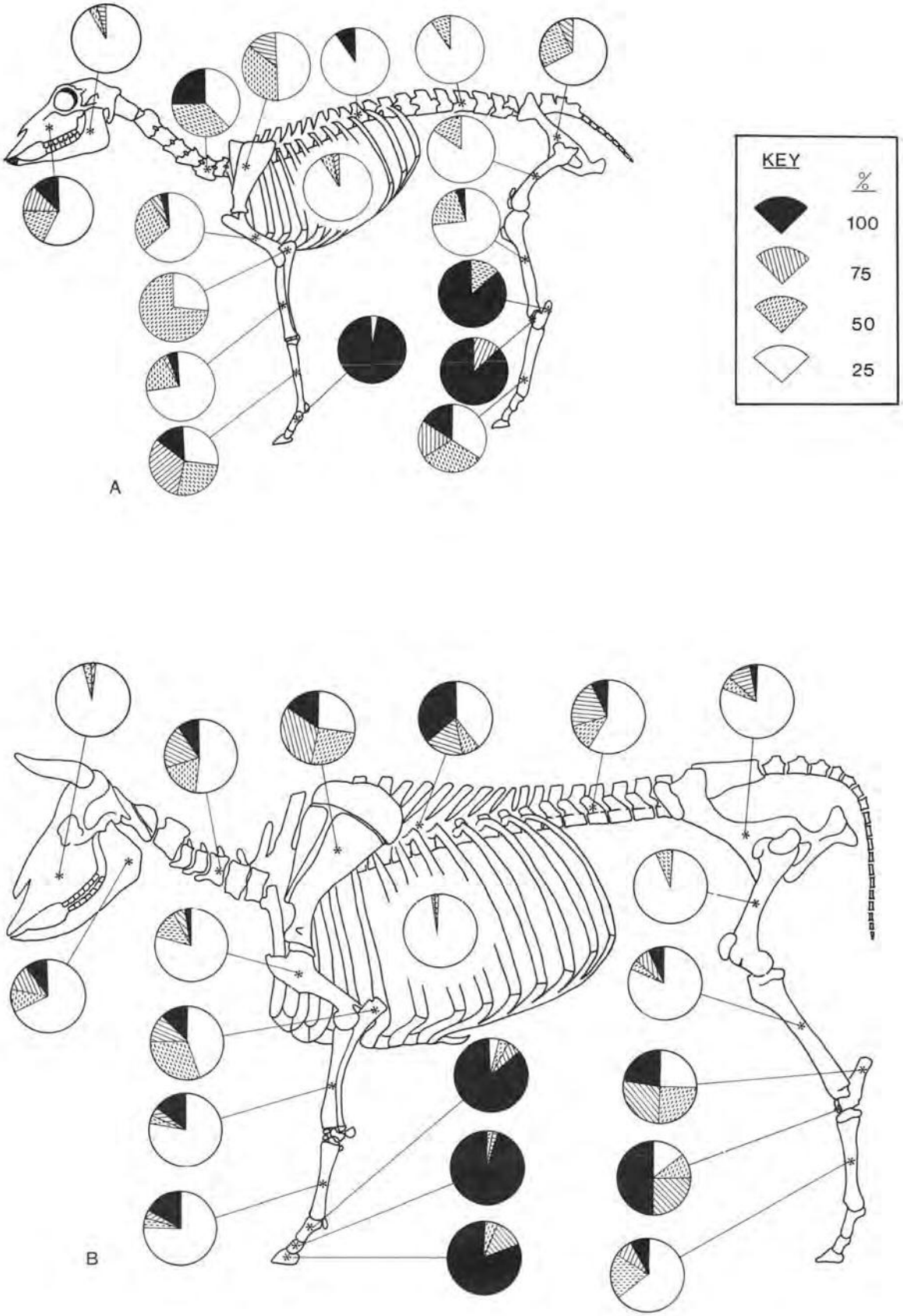
Overall fragmentation pattern. For the diagrams, cattle and 'cattle-sized' fragments are combined, as are sheep, goat and 'sheep-sized' fragments. For each skeletal element, the number of fragments in the different size categories is expressed as a proportion of the total number of fragments for that bone, and this figure is converted into degrees for the pie charts. A similar procedure is carried out for the different sized fragments coming from different areas of the bone - proximal, midshaft and distal - but this time any whole bones are obviously excluded, and so the size categories are as follows: twenty-five per cent and less, fifty per cent, and more than seventy-five per cent but less than one hundred per cent. A final diagram is constructed using figures for fragments which are proximal, midshaft, distal or whole. In Fig.72 we see that the skull and ribs of cow and sheep are represented almost entirely by very small fragments. In the vertebrae of cattle, there does not appear to be a significant difference in treatment over the different parts of the spine, whereas in sheep, there are more large portions of cervical than of lumbar and thoracic vertebrae. The

vertebrae of sheep seem to have been more fragmented than those of cattle. Although the skulls of both are very fragmented, the mandibles of both species have a greater proportion of larger fragments. Looking at the forelimb, sheep scapulae seem to be more fragmented than those of cattle. The humerus, radius and ulna are all more fragmentary in cattle than sheep, and the metacarpal is markedly more so, whereas the phalanges exhibit a similar pattern, being nearly all whole bones in both cases. (Fore and hind limb phalanges are treated together, and for sheep, first, second and third phalanges are treated as one group, because of the small numbers involved). Now looking at the hind limb, the os coxae of both species are mainly in small fragments, though there are more sheep bones in the fifty per cent size fragment-size category than there are of cattle. The femur and tibia again show a similar pattern, but there is a slightly higher proportion of larger fragments in the smaller animal. The calcaneus and astragalus show the most marked differences, both of which are nearly always recovered whole in sheep, but are fragmented to various degrees in cattle. The metatarsals also show a differing pattern similar to that described above for the metacarpal. Thus, within a species, there seem to be certain similarities between the fore and hind limbs. In both sheep and cattle, the scapula and os coxae and humerus and femur are somewhat different, whereas the radius and tibia, and metacarpal and metatarsal patterns are remarkably similar. Similarities and difference also occur between the two species. Similar fragmentation patterns are seen in the skull, mandible and rib, and to a lesser extent in the major limb bones, and in the phalanges. Differences are apparent mainly in the calcaneus and astragalus and metapodials (metacarpals and metatarsals). It is probable that the similarities between the two species are due to certain common practices in butchery, together with survival abilities common to certain bone structures regardless of size. The differences might be explained by there being a slight variation in the loci and type of 'primary' butchery between the two species, as well as differences in 'tertiary' practice - that is, bones that are entirely waste in sheep may have been utilised from cattle. This is discussed more fully in conjunction with the butchery.

Figs.73, 74 and 75 show the relative proportion of bones in the different size categories for proximal, midshaft and distal fragments respectively. Vertebrae are only considered from the midshaft category. In all three diagrams, much greater differences than those exhibited in Fig.72 are apparent between the fore and hind limb of the same animal, and between the two species. In Fig.73, we see that for both species, where the proximal epiphysis of humerus, femur, and tibia occurred, these were small sized fragments, and they rarely had much shaft attached. Proximal parts of calcaneus and metapodials of sheep often had much of the rest of the bone attached, whereas the same bones of cattle could come from a variety of fragment-sized categories. A similar picture emerges from an examination of midshaft and distal fragments. These three diagrams need to be interpreted with greater caution than Fig.72 because of the obvious reduction in sample size necessitated by this further subdivision. This could exaggerate differences especially in a bone like the scapula, where estimation of size category may be complicated by the irregular shape of the bone.

Fig.76 shows the proportion of bones which come from proximal, midshaft and distal areas of the bone. It is apparent that the majority of fragments recovered came from the midshaft region of the bone, with the exception of the smaller bones, many of

Fig.72 (opposite) Overall comparison of the fragmentation pattern of cattle and sheep: pie diagrams for A. sheep and B. cattle show the proportion of different sized fragments for the various skeletal elements. Figures used are for earlier and later Roman phases combined for cattle and sheep bones only ('cattle-sized' and 'sheep-sized' are not included).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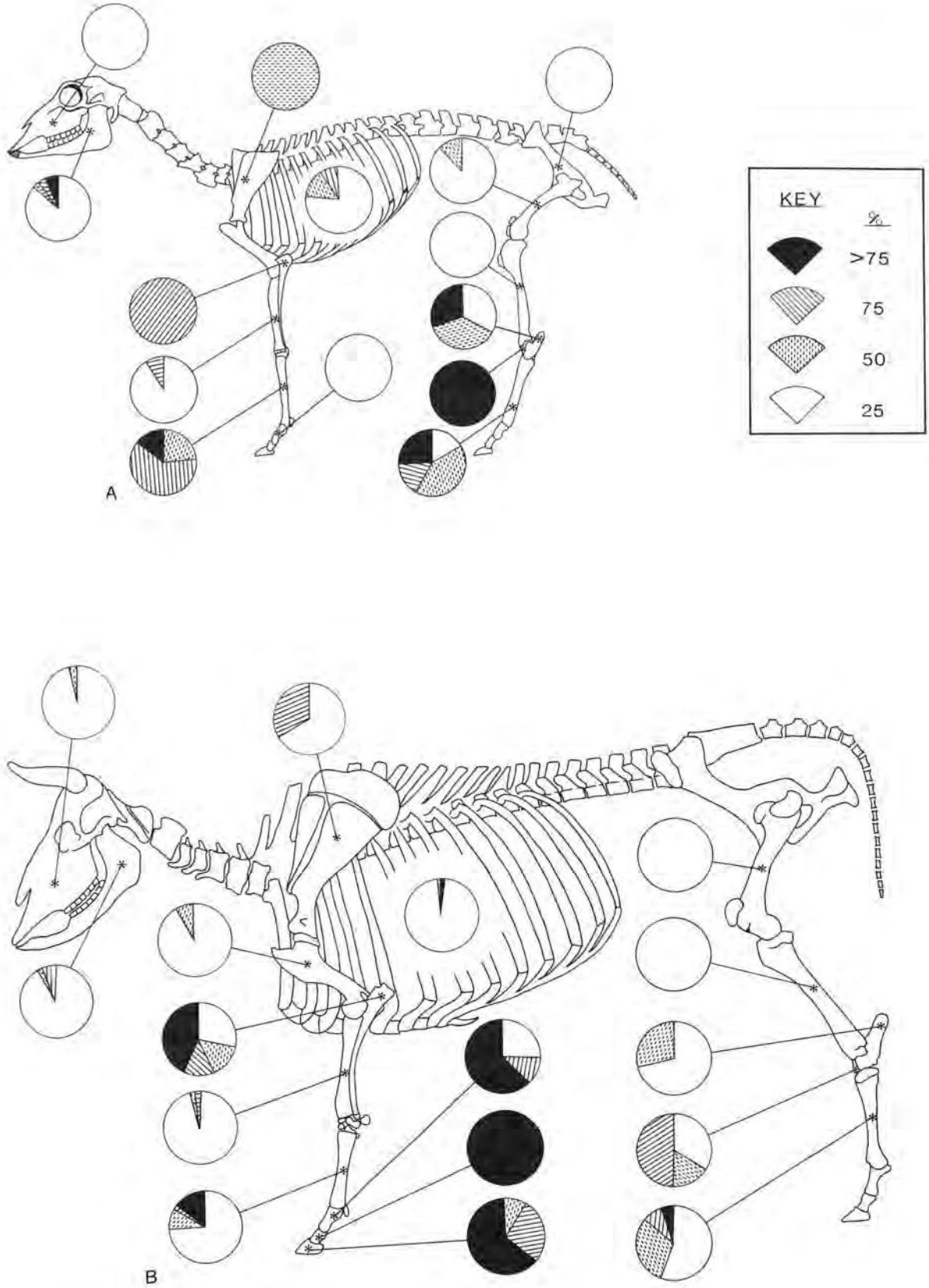


Fig.73. Comparison of the fragmentation pattern for cattle and sheep: proximal fragments only. Pie diagrams for A. sheep and B. cattle show the proportion of different sized fragments from the proximal part of the bone for the various skeletal elements. (Figures for cattle and sheep include 'cattle-sized' and 'sheep-sized' respectively).

which were found intact (eg sheep calcaneus, astragalus and phalanges, cattle astragalus and phalanges). The proportions of proximal and distal fragments vary from bone to bone, but for each bone element, are similar between the two species.

Overall butchery pattern. As for the previous diagrams, cattle and 'cattle-sized' and sheep and 'sheep-sized' are considered together. The number of whole bones was added to each of the numbers for proximal midshaft and distal fragments respectively (that is whole bones are counted three times). The numbers of chop and knife marks found on proximal, midshaft and distal parts of each bone are expressed as a percentage of the total number of fragments from that part of the bone. Certain parts of certain bones have been combined for ease of presentation on the diagrams. These are:- radius and ulna, distal calcaneus and astragalus. With the exception of the first two cervical vertebrae (atlas and axis). The vertebrae are treated in their anatomical groups viz all other cervical, thoracic and lumbar, and they are not divided into proximal, midshaft and distal. Each bone on the diagrams has been arbitrarily divided into proximal, midshaft and distal portions, and then shaded according to the percentage of butchered bones occurring, but the proximal and distal butchery will include a large amount on the actual joint articulations, which cannot be shown on the diagrams. Figs.77 and 78 give an overall view of the butchery practice for cattle and sheep respectively. Chop marks are, on the whole, more common than knife marks, and cattle show a higher general incidence of butchery than sheep. The chop marks represent major dismembering points, but knife marks are more likely the result of severing ligaments, meat removal or skinning. The cattle skull and first cervical vertebra are chopped - presumably to remove the head, whereas on sheep, this is done with a knife. The cattle mandible is chopped and knife-cut, while the sheep mandible is virtually free from butchery. The thoracic vertebrae of cattle are often chopped, whereas those of sheep are occasionally knife-cut. The ribs of both species are butchered in the midshaft region suggesting they were removed whilst still attached to the vertebrae as 'chops'. Considering the forelimb, major severence points in cattle occur at the distal scapula and distal humerus, whereas in sheep the midshaft scapula and midshaft radius are the most heavily-chopped areas. The midshaft metacarpal is often chopped and knife-cut in cattle, whereas in sheep, this bone has proximal knife cuts only. On the hind limb, it would appear that the femur was separated from the pelvic girdle by chopping - in cattle nearer the proximal end of this long bone than in sheep. The calcaneus and astragalus are chopped in cattle but knife-cut in sheep, and in each animal, the metatarsal is butchered in a similar fashion to the metacarpal. It would seem that a large cleaver was used to dismember cattle, whereas sheep joints were more often separated with a knife, and though cattle metatarsals were often butchered in the midshaft region, possibly for marrow extraction, the sheep skeleton was not utilised below the metapodials. This study is meant to complement the detailed analysis of butchery (see below) which in itself gives a qualitative account of how the carcass was utilised. The diagrams give a quantitative overall picture and it is hoped to use this method comparatively with other sites in the future.

Detailed butchery analysis. Composite diagrams to illustrate the major butchery practice for cattle and sheep are given in Figures 79A and B respectively. The interpretation of these is given below.

Cattle. All the skulls were very fragmentary and so it was not possible to determine whether pole-axing was used as a method of killing the animals. However, on the most complete skull, the frontal bones were intact (Plate 12). The fragments most frequently recovered were from the occipital and frontal regions which are the most robust parts of the skull. The horn cores have been removed from the skull by chopping, usually with part of the frontal bone attached. Knife-cuts occurred on the maxilla above the second molar and also on the frontal bone (Plate 12). These could have been made in removing the skin from the skull prior to removal of the horns. It appears at Bran-

caster that the skin was removed from the head, and above the phalanges, though not all of this need necessarily have been used. The occipital condyles have been chopped through, as have the cranial articular processes of the atlas vertebra. It seems that the head was severed from the body between the skull and atlas vertebra. In a few cases, the skull might have been split along the sagittal plane in a similar manner to the sheep skulls (see below). There are knife-cuts on the basilar part of the occipital bones in a mediolateral plane. The stylohyoid bones also have knife-cuts on both sides. These could both have resulted from removing the tongue.

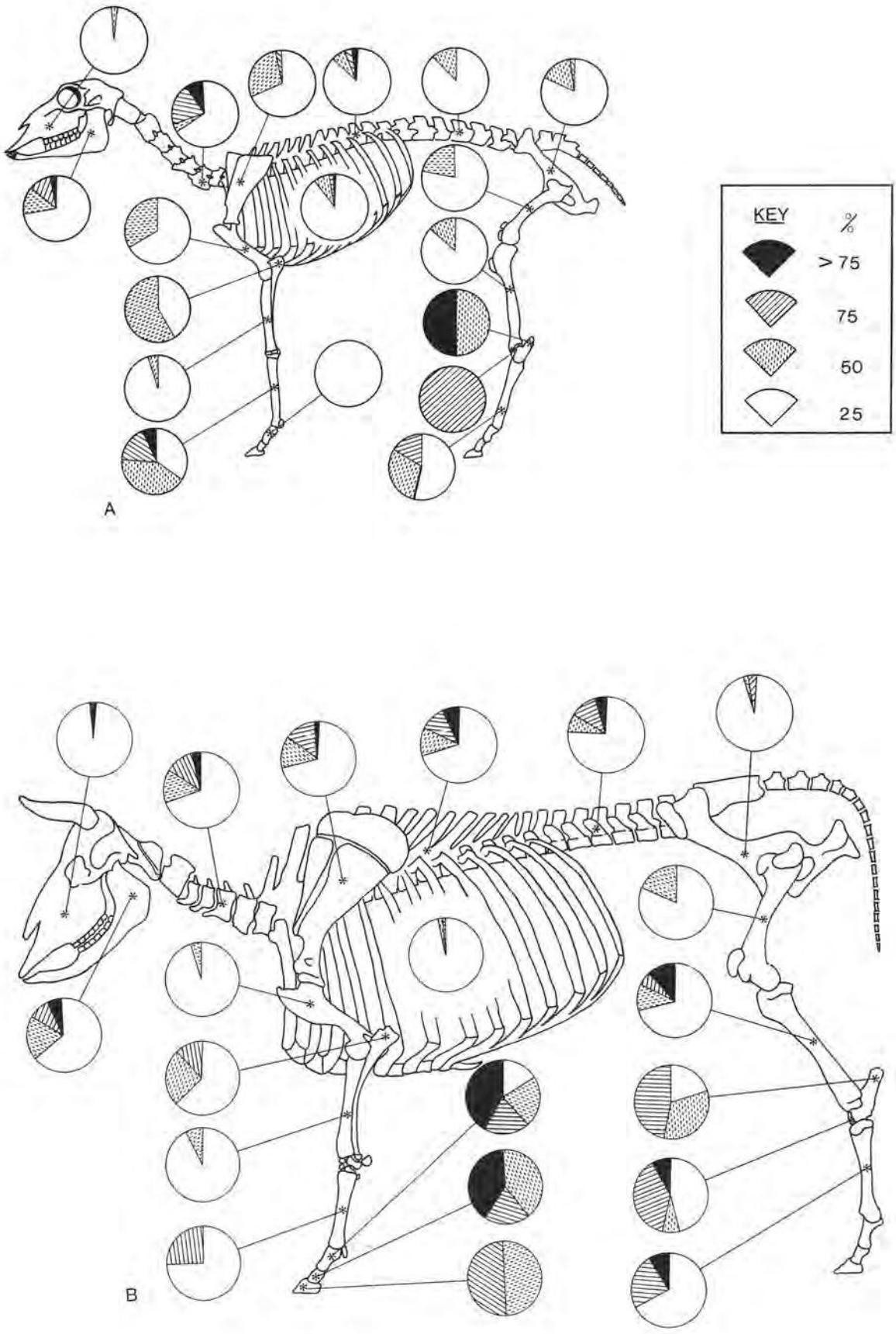
There are knife and chop marks on the buccal surfaces of the mandible which has usually been fragmented so as to remove the condylar and coronoid processes above the mandibular foramen from the rest of the mandibular ramus viz: the tooth bearing portion: this would have separated the mandible from the skull, leaving the upper part with the articulation in situ. This was probably done in order to remove the cheek meat and, possibly, also the tongue. Where the anterior end of the mandible has survived, this has been cut or chopped in the region of the diastema. On one skull, a possibly corresponding chop mark on the dorsal surface of the incisive bone was noted. Both of these could have been to separate the mandibles from each other and again, to remove the skin and/or meat.

That the occipital condyles of the atlas vertebra were invariably chopped through has already been mentioned. One axis vertebra and another cervical vertebra have been chopped through along the sagittal plane, though the majority have remained whole. The thoracic vertebrae were not split in this way, but often the neural spine had been chopped through where it joins the neural arch. Occasionally, the body of the vertebrae was chopped through transversely and one or other transverse process chopped off. The ribs were often cut or chopped from both dorsal and ventral aspects, but not particularly at the articulation. The lumbar vertebrae were occasionally split sagittally and the transverse processes chopped off. Others were chopped through the centrum from the ventral surface and the spines cut from the ventral and dorsal surface parallel to the spinal column.

The proximal end of the scapula was rarely preserved. One bone, on the medial aspect, had knife-cuts near the proximal end, possibly incurred in removing this fore limb from the body. On the lateral side, the acromion process of the scapula spine had often been cut through in a manner suggesting meat being sliced off from the blade. It is conjectured that this might have occurred after cooking as found at Portchester (Grant 1975, 392). The distal joint surface (glenoid cavity) invariably displayed chop marks. Sometimes the coronoid process had been chopped through on either side of, and parallel to, the blade of the scapula.

The proximal humerus rarely survives, and so butchery corresponding to that of the distal scapula has not been recorded. The distal humerus, however, was invariably butchered. The distal condyles of the trochlea and capitulum had been chopped through and/or there were knife-cuts on the distal diaphysis mediolaterally on the anterior surface, either side of the radial fossa.

Fig.74 (opposite) Comparison of the fragmentation pattern for cattle and sheep: midshaft fragments only. Pie diagrams for A. sheep and B. cattle show the proportion of different sized fragments from the midshaft part of the bone for the various skeletal elements. (Figures for cattle and sheep include 'cattle-sized' and 'sheep-sized' fragments respectively).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The proximal radius and ulna possess chop marks in varying places which might correspond to those on the humerus. Sometimes the olecranon process of the ulna has been chopped off, whilst on other individuals the anterior proximal radius and the trochlear notch of the ulna have been chopped. In others the radius and ulna are chopped or split in the midshaft region. It is thought that this might be a secondary butchery process. The distal radius is often chopped through.

One metacarpal was chopped in the midshaft region. Another was cut across the distal condyles on the anterior surface in a position consistent with that of marks on the phalanges. The first phalanx invariably had knife-cuts on all surfaces, presumably a result of separating the metapodials from the phalanges, and possibly in skinning the animal. (Fore and hind phalanges were not studied separately).

The os coxae was chopped through the acetabulum or through the adjacent shaft of the ilium. The head of the femur has been chopped through in most cases, consistent with butchery on the ox coxae. The distal femur and proximal tibia rarely survived and when they did, were in a very fragmentary state. The midshaft of the tibia was chopped through and the distal epiphysis has usually survived intact.

The calcaneus was chopped posteriorly above the groove for the Archilles (calcaneal) tendon. Sometimes, the distal articulation was chopped through. The astragalus was often chopped through in various positions, and had mediolateral knife-cuts across the anterior aspect. Centroquartals were usually found whole. The metatarsals were sometimes chopped proximally or through the midshaft and one was split longitudinally similar to the method used in Saxon times presumed to be for marrow removal (Grant 1976, 272-273). One was sawn just below the proximal articulation probably to use the midshaft section for bone working.

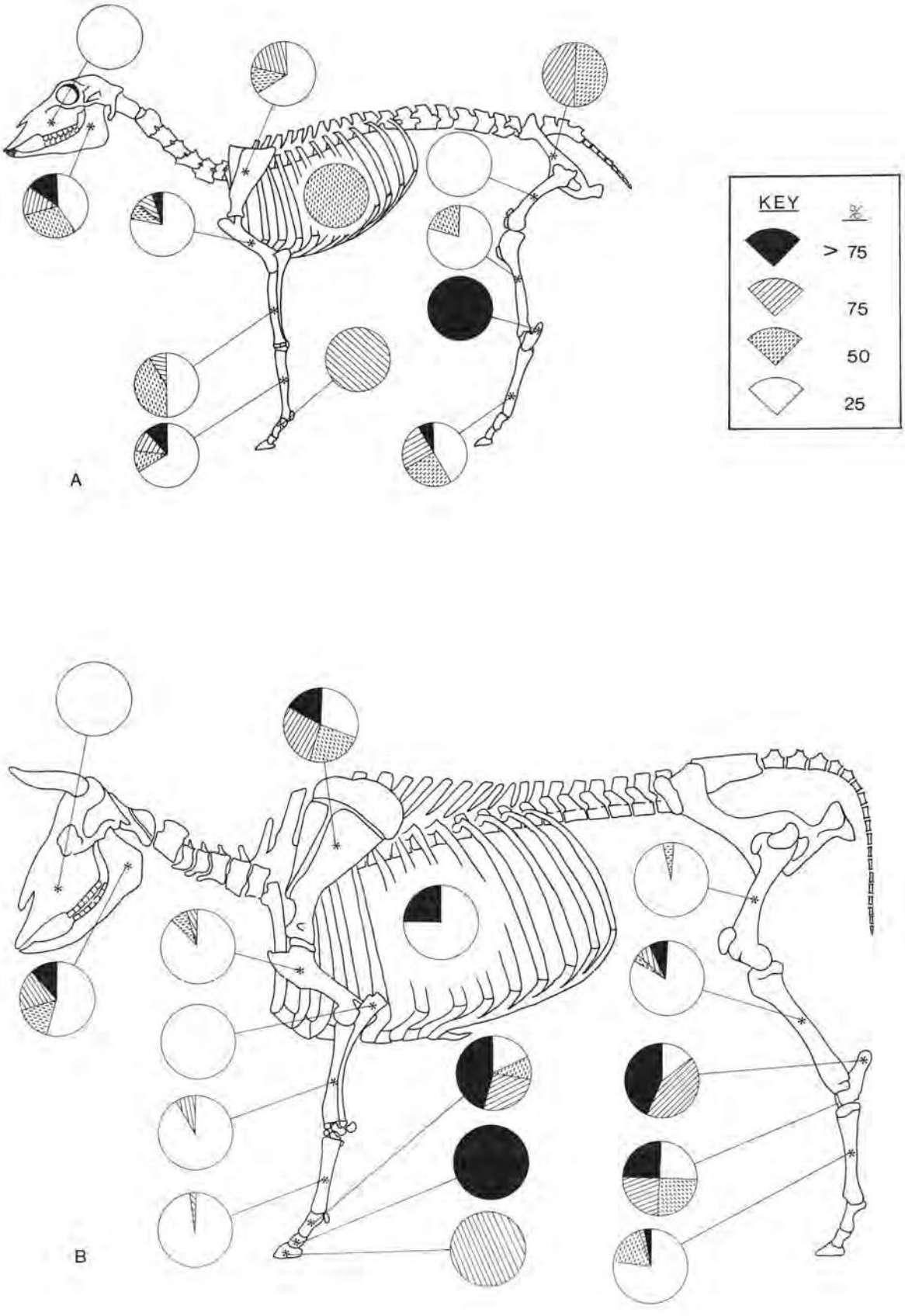
Sheep. The skulls have been split along the sagittal plane. The parietal and frontal bones were the most commonly surviving fragments. The animals had their horn cores removed or, in a few cases, were naturally polled. Knife-cuts were observed on the basilar part of the occipital bone in a mediolateral direction similar to those described for cattle. Possibly, the occipital condyles were chopped through, but the only surviving fragments from this skull region were much eroded, and it was not possible to be definite about interpretation. Mandibles were cut near the diastema. The atlas vertebra was split sagittally and had knife-cuts dorsally on the caudal articulatory process, possibly due to removing the atlas from the skull. On the cervical vertebrae the transverse processes were chopped through. The body of one was also chopped.

The neural spines of the thoracic vertebrae were chopped. The ribs had chop marks and knife-cuts, usually on the internal surface.

On the distal end of the scapula, there were knife-cuts on the lateral aspect of the glenoid cavity. There are also holes through the distal scapula (cf. tibia, see below) whose purpose is unclear.

As for cattle, the proximal humerus was rarely recovered. However, butchery

Fig.75. (opposite) Comparisons of the fragmentation pattern for cattle and sheep: distal fragments only. Pie diagrams for A. sheep and B. cattle show the proportion of different sized fragments from the distal part of the bone for the various skeletal elements. (Figures for cattle and hseep include 'cattle-sized' and 'sheep-sized' fragments respectively).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was noted on the distal humerus where either the lateral midshaft was chopped or the distal articulation chopped through mediolaterally from the posterior surface.

The proximal articulation of the radius was chopped off or there were midshaft chops on the medio-posterior surface.

On the os coxae the acetabulum was chopped through. Holes were also observed on some specimens. Chop marks were seen on the caudal ischium, possibly the result of separating the two halves of the pelvic girdle, working from the ventral side of the animal. No butchery was noted on the femur. The proximal tibia rarely survived, but lateral chop marks were found on the midshaft. A hole through the distal end of the shaft was frequently observed, and similar holes have been noted elsewhere by the authors in deposits from various periods and on a Roman sheep at Staines (Chapman, in press). It is possible that this might have been used for hanging the joint. However, legs of lamb may be seen in butchers' shops today hanging from the Achilles' tendon, which suggests that it is unnecessary to put a hook through the bone for this purpose, and so these holes in the archaeological specimens may have had some other function.

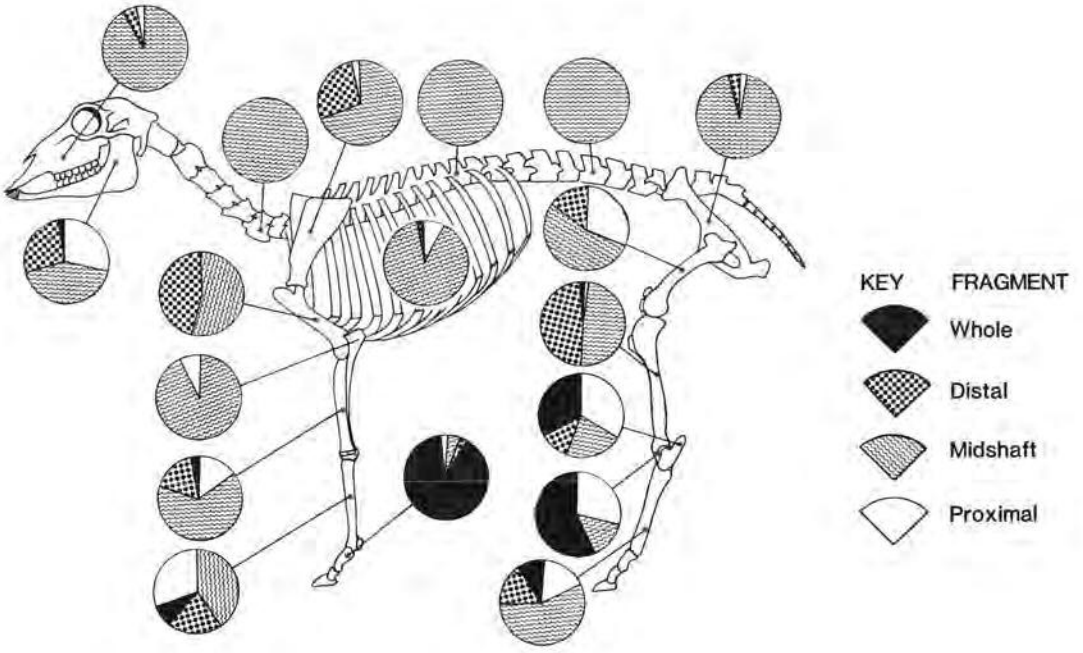
The distal articulation of the calcaneus was chopped through, and knife-cuts on the astragalus laterally and dorsally were observed, similar to those described for cattle. Knife-cuts occurred on the proximal metapodials which may be from skinning.

Pig. Very little butchery was recorded from pig. Of particular note, the spine of the scapula was sliced through in a similar manner to cattle (see above). This did not however occur on sheep. The spine of the pig scapula bends back on itself in such a manner that it might impair easy removal of the meat without cutting the bone, as can be done on sheep, where the spine is virtually at right angles to the blade. The scapula also had distal knife-cuts similar to those described for sheep. The distal articulation of the humerus was chopped through as was the midshaft tibia.

Comparisons with other sites. Butchery at Brancaster was compared with that at Exeter (Maltby 1979) where bones from a number of sites within the city have been studied including both military and residential areas and covering a time span from A.D.50 to the early fifth century and at Portchester Castle (Grant 1976), a military fort. Similar butchery implements were in use at all three sites.

Cattle. At Portchester, evidence for pole-axing of cattle was found, but the skull material from Exeter, like that at Brancaster, was very fragmentary, which Maltby (1979, 38) interprets as deliberate smashing for removal of the brain. At all three sites, the horn cores had generally been removed with a portion of skull attached. This could have prevented damage to the horn sheath and allowed the entire horn to be utilised. Marks on the mandible and skull are again similar, indicating removal of the jaw and possibly also the tongue. At Brancaster, as at Portchester, the head was removed from the body between the skull and the occipital condyles. At Exeter, vertebrae from the earlier Roman deposits were not split, whereas at Portchester they were split sometimes sagittally, sometimes at right angles to the spinal column and sometimes along both planes. Grant (1975, 392) suggests that this might be due to a difference in but-

Fig.76. (opposite) Comparison of the fragmentation pattern for cattle and sheep: pie diagrams show the proportions of fragments from the different parts of each skeletal element, proximal, midshaft, distal or whole. (Figures are for earlier and later Roman phases combined and cattle and sheep include 'cattle-sized' and 'sheep-sized' fragments respectively).



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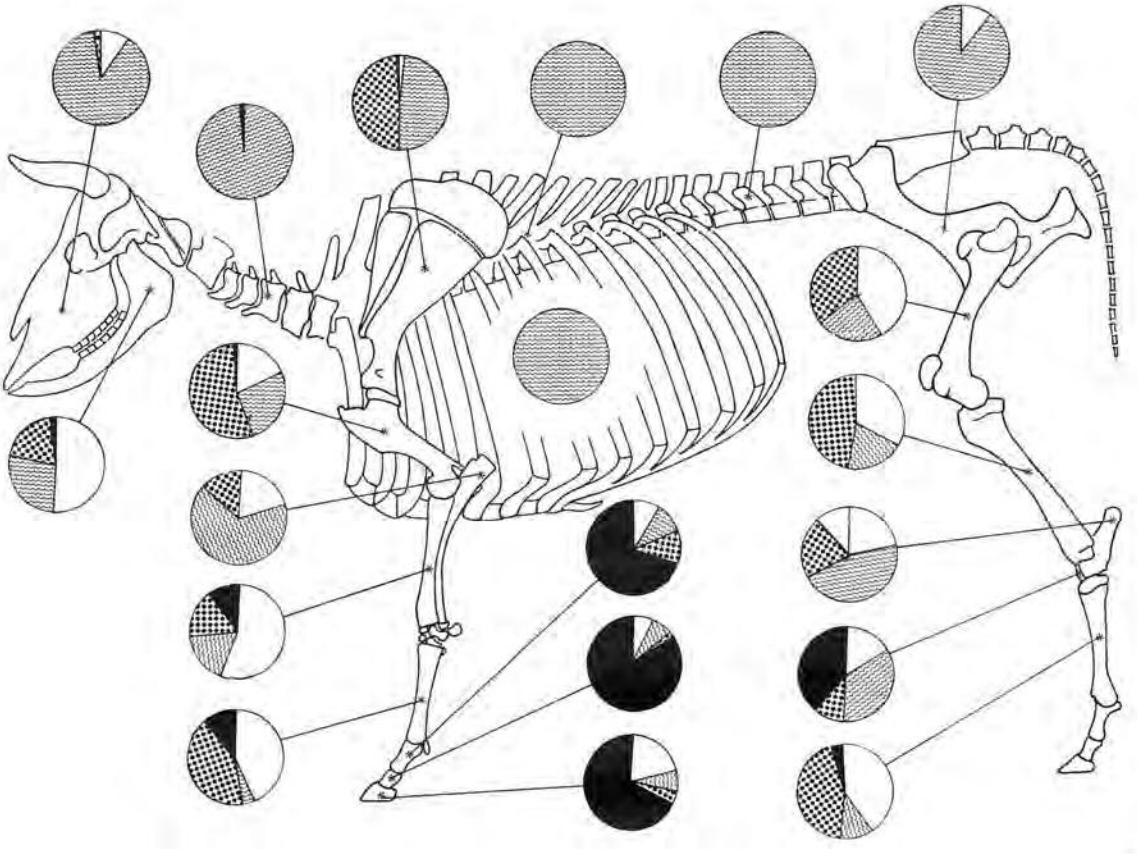

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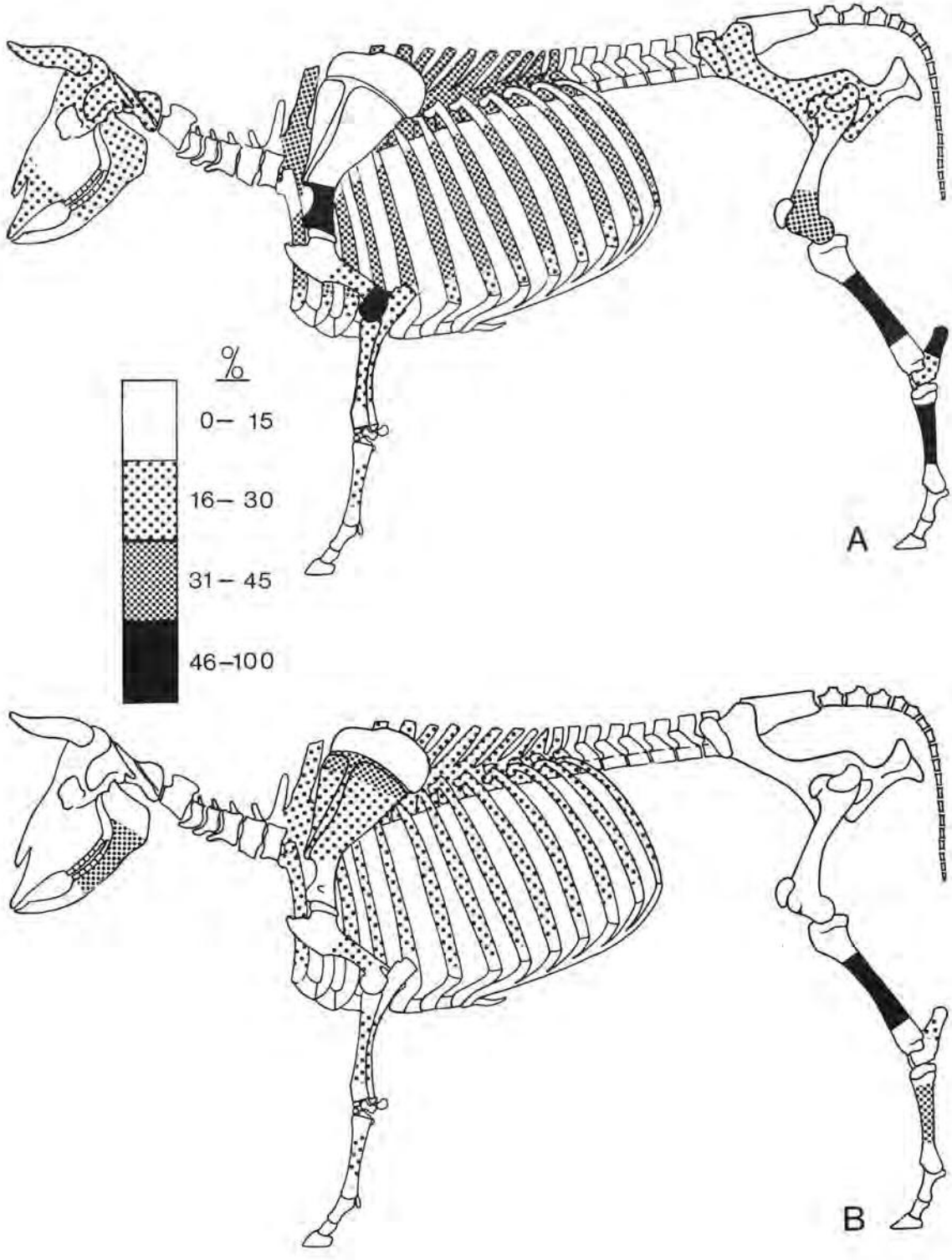


Fig.77. Butchery analysis of cattle: A. chop-marks and B. knife-cuts. Occurrence of butchery marks is expressed as percentages of the number of bone fragments present. For this purpose, each bone has been arbitrarily divided into three sections, proximal, midshaft and distal. (Figures used are for the earlier Roman phase only, and include 'cattle-sized' fragments).

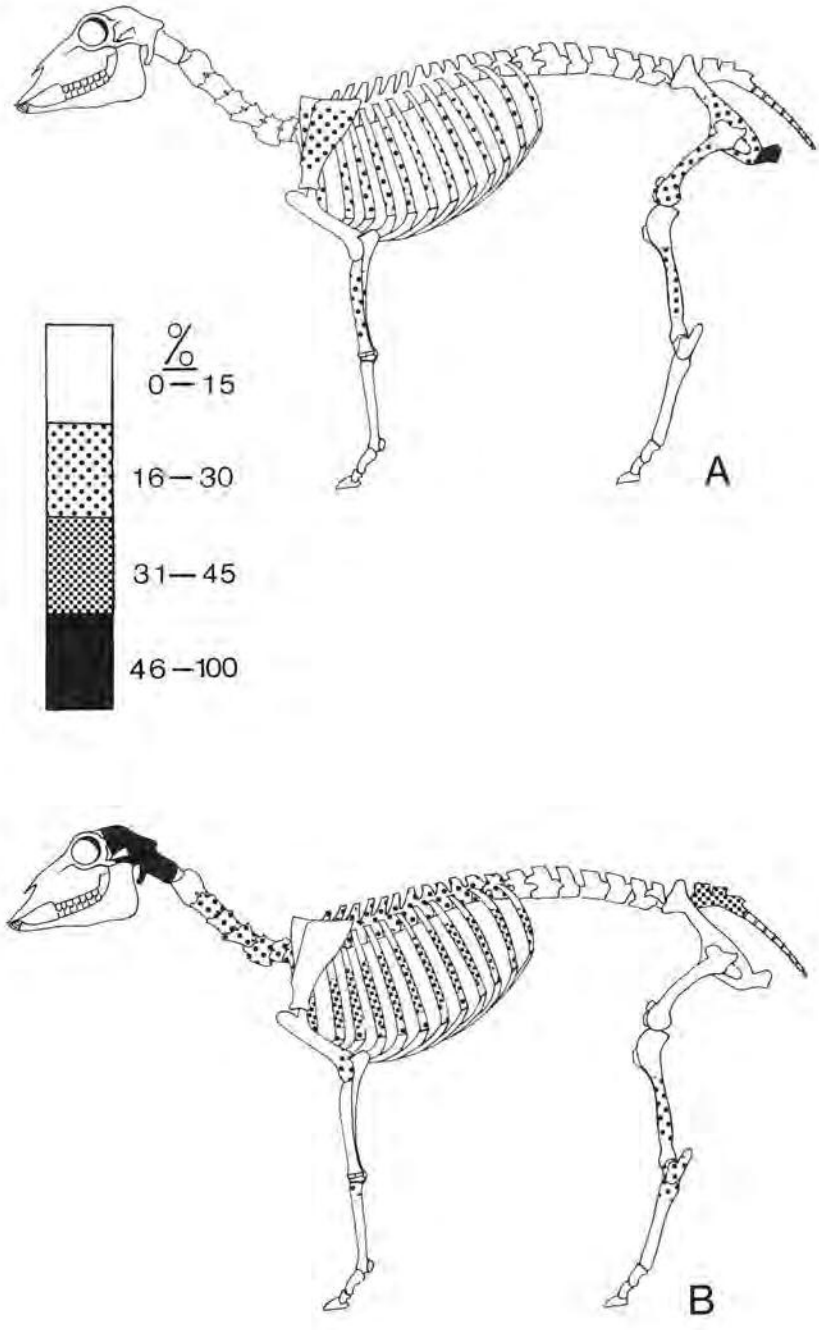
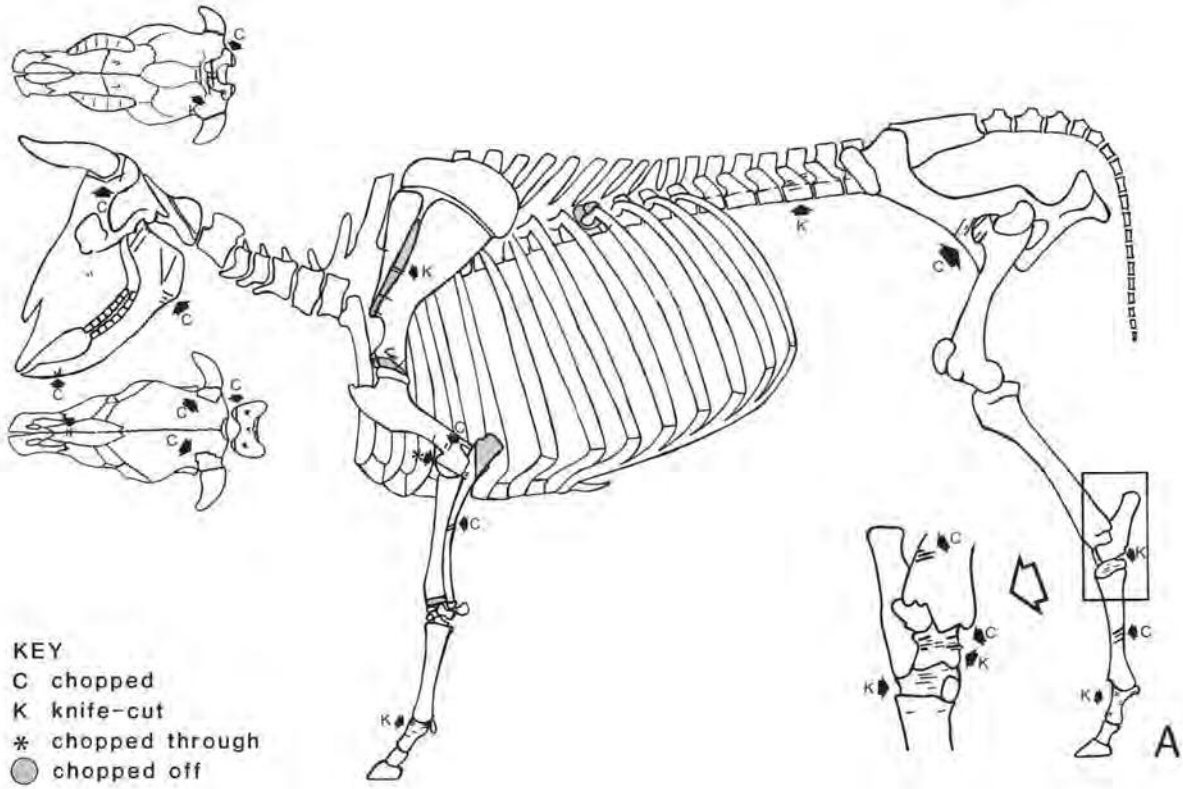


Fig.78. Butchery analysis of sheep: A. chop-marks and B. knife-cuts. Occurrence of butchery marks is expressed as percentages of the number of bone fragments present. For this purpose, each bone has been arbitrarily divided into three sections, proximal, midshaft, and distal. (Figures used are for the earlier Roman phase only, and include 'cattle-sized' fragments).

chery technique between animals for immediate consumption and those for storage or transport. At Brancaster, the majority of the vertebrae were entire, but occasional sagittal or transverse splits did occur, and on the thoracic vertebrae, 'chops' seem to have been cut through the distal ribs and the articulatory processes for the ribs on the vertebrae. Marks on the ribs also occur at Portchester and Exeter. At both these sites, the authors consider the fore-limb to have been removed from the body between the distal scapula and proximal humerus. At Portchester, the glenoid cavity itself is butchered, as at Brancaster, whereas at Exeter it is more often broken at the point



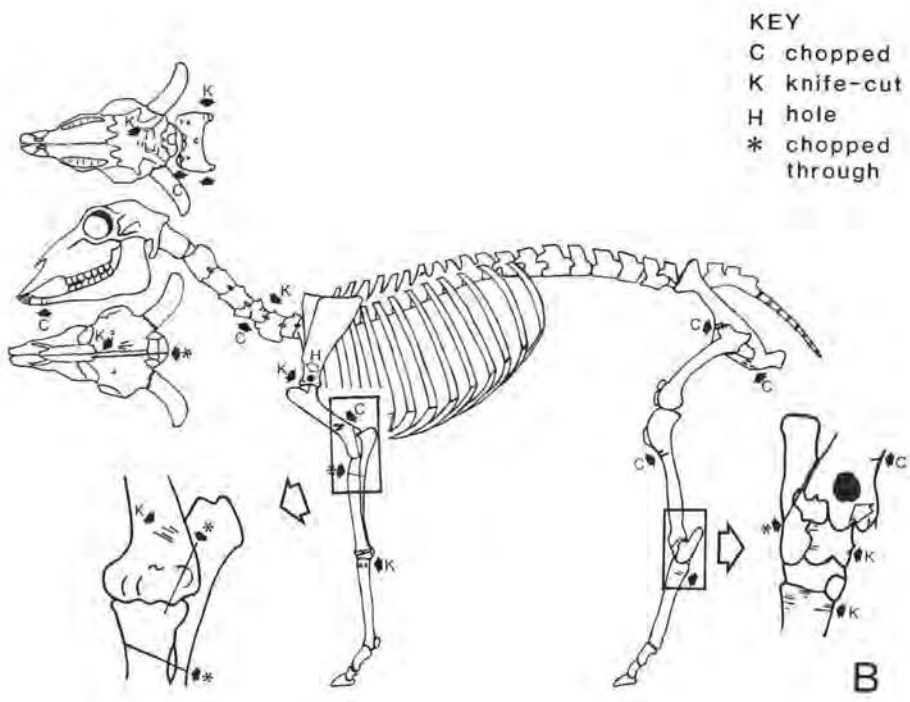


Fig. 79. Diagrammatic summary of types of butchery mark on: A. cattle, B. sheep.

where the spine begins. This is also an area of heavy butchery on the Brancaster bones, but it is quite possible that the limb would have been separated between the proximal scapula and the body, by cutting through the musculature, as this is the easiest way to remove a fore-limb. In modern practice, the carcass is first quartered, and then the limb removed between the humerus and the radius and ulna, after which, the humerus and scapula are removed from the trunk of the carcass before they themselves are separated.

From all three sites, cuts at the elbow joint - notably on the distal humerus - are probably the result of removing meat rather than severing the joint, and the distal radius is often chopped through; this could be for the removal of marrow (Maltby 1979, 39) or for separating the metacarpal from the radius.

The hind limb, seems to have been severed from the body at the hip joint, as evidenced by marks on the proximal femur corresponding with those on the acetabulum from all three sites. The tibiae from Brancaster and those from Exeter were always very fragmentary. There is evidence from all three sites that the legs were severed again above the metapodials, and that the latter were often broken in the midshaft region presumably for marrow extraction. Knife-cuts on phalanges occur at Brancaster and Portchester and seem to result from severing the foot from the rest of the limb, or skinning, but these marks are rare at Exeter.

Sheep. Sheep skulls were chopped through along the sagittal plane at all three sites, presumably in order to remove the brain. But apart from this, not enough information was available to build up a picture of butchery practice at Portchester (Grant 1975, 392). At Exeter, Maltby (1979, 53) suggests that the scapula and humerus comprised a single joint, as the distal humerus was a common severance point. The meat from the radius may have formed a separate joint or have been used in stews, and the distal radius was a common butchery point, where the feet of the animal were severed from the rest of the carcass. The midshaft tibia was commonly chopped, and today many leg joints of lamb are broken off at roughly the same point. These observations seem to hold true for the Brancaster sheep carcasses also.

Comparison with modern butchery practice. It is difficult to determine exact butchery technique from bone remains. Present day butchery practice for cattle is to hang up the carcass, split it down the body's axis, then quarter it. Each quarter is then further butchered on a table, by removing the limb in sections, working from the distal end of that limb. However, it seems that this was not so in Roman times. When dealing with an entire carcass, as was probably the case with this archaeological material, it is more likely that the whole limbs were removed from the complete carcass, perhaps while it was on the ground, and then each limb further butchered, possibly on a table, as this would be a more manageable way of handling the carcass. The limbless carcass would then be further butchered, as has been recorded for Roman material in London (Armitage 1979) by chopping off the ribs through the transverse processes of the thoracic vertebrae. This could be done either on the ground or on a table. The vertebrae could then be separated into sections, either by chopping, or by separating the ligaments between a pair of vertebrae with a knife. It seems unlikely that the present day practice of boning a joint occurred in Roman times. However, the occasional finds of entire bones could be attributed either to such a butchery technique or to the bones in question having come from a carcass which was not eaten for some reason.

Statistical Analysis of Fragmentation. A series of X^2 contingency tests was done in order to determine whether there were differences in the overall fragmentation patterns of different species (cattle, sheep, pig, horse and dog). Comparisons were made of all possible pairs of species for the distribution of bones amongst the six fragment size categories previously mentioned. The results are set out in Table 17 in rank order:

TABLE 17. STATISTICAL COMPARISON OF OVERALL FRAGMENTATION PATTERNS FOR THE FIVE MAJOR DOMESTIC SPECIES FOUND ON THE SITE (CATTLE, SHEEP, PIG, HORSE AND DOG)

Species Combination	X^2 Value	Significance at 0.5% probability level
Sheep/Pig	8.39	Not significant
Horse/Dog	9.38	Not significant
Pig/Dog	17.9	Significant
Cow/Pig	19.53	Significant
Pig/Horse	21.06	Significant
Sheep/Dog	25.06	Significant
Cow/Horse	32.88	Significant
Cow/Dog	58.3	Significant
Sheep/Horse	52.89	Significant
Cow/Sheep	82.68	Significant

The level of significance was taken at the 0.5% probability level.

From this it can be seen that those groups which were not significantly different at a probability level of 0.5% are sheep and pig (similarly sized food animals) and horse and dog (non-food animals dissimilar in size). All other combinations of species showed significant differences at a probability level of 0.5%. From this we conclude that the main cause of the differences in fragmentation pattern between species is due to butchery. However, butchered animals also differ significantly, depending on the size of animal involved. This was exemplified by X^2 contingency tests on sheep, cow and pig to elucidate butchery differences. The different combinations of pairs of species were compared for a. knife and chop marks b. per cent of knife marks c. per cent of chop marks. The results of these show that overall butchery patterns differ between cow and sheep as do the chop-marks, but there is no significant difference in the percentage of bones with knife marks. The results from tests between sheep and pig, and cow and pig must be treated with caution as the total number of pig bones is so low. No significant differences were detected in the latter tests. Nevertheless, from looking at the rank order (see archive) it appears that sheep and pig are more similar than cow and pig, as might be expected from their similarity in size.

These tests show the effect of differential survival: though dog and sheep are similarly-sized animals, they are fragmented in significantly differing manners because sheep are butchered and dogs are not. A similar comparison may be made between cow and horse. Despite their size differences, horse and dog do not differ significantly in their fragmentation pattern. A major factor in this difference is the presence or absence of butchery. However, this is not necessarily the only factor: differential preservation of the bones within a species has been studied by Brain (Grant 1976, 384) the maturity of the individual animal will also affect bone preservation. For example, the epiphyses of dogs fuse relatively early in life (Silver 1969, for a comparison of age of fusion data in the domestic animals). Thus, one might expect differential survival between this and an animal with later-fusing epiphyses, as for example, there might be more uniform preservation of bone which is fully adult. Late-fusing epiphyses such as the proximal humerus are less likely to survive. This is compounded by these same bone parts often being of a more porous nature than other, early-fusing, epiphyses. Similarly, animals kept for reasons other than food production are likely to be kept to a greater age and, thus, horses might generally be older than cattle, and a similar argument to the above apply. Also the ages at which food animals reach optimum meat yields vary. One might expect wild food animals to show a different pattern again; a group for hunted animals might have a different age structure, and a

wild animal carcass might not have been utilised in quite the same way as a domestic animal of a similar size. For example, a red deer caught on a hunting expedition might be preliminarily butchered for transport and only the more valuable parts bought back to the site. However, the latter instance is entirely conjectural for this site, as there was too little deer bone for any comparison to be made with the other mammals.

To test some of the above hypotheses, X^2 tests were done on the distribution of fragments between proximal, midshaft and distal fragments, and whole bones, for all possible combinations of the five species under consideration. Significant differences occurred between all combinations of species except sheep and pig (see archive).

Finally, the pie diagrams in Fig.80 illustrate the overall similarities and differences: note the similarities between all the food animals, especially sheep and pig when compared with horse and dog. The latter two animals were not eaten at this site, as has already been stated, but this is not invariably the case. Cramm considered horses to have been eaten at the Roman site of Hockwold, and, indeed, to have been third in importance to cattle and sheep, being a more important food source than pigs. He infers this from the fact that horse bones are indiscriminately mixed with the bones of the usual food animals (Salway 1970, 14). The authors have observed butchery marks on other Roman material: on dogs from Dorchester and horses from Penrith (in preparation). The former seemed to be marks from skinning, while the latter were consistent with meat-eating. Harcourt (1974a, 171) states that there is much evidence and informed opinion to support the use of the dog as a food animal. Literary evidence suggests that horse would only have been eaten in dire circumstances. Tacitus writes that the troops of Germanicus, shipwrecked on inhospitable shores in A.D. 16, ate horsemeat because there was no other supply of food (Davies 1971, 139).

A similar observation on differential fragmentation between species has been made by Griffiths (1978), who looked at the range of average fragment sizes and noted that the more heavily utilised species are more uniform in their fragmentation than the less heavily, more randomly fragmented species. This he attributes to post-butchery carcass utilisation, processes such as boiling of smashed bones for stock or marrow extraction.

Discussion. In summary, considering the food animals, the larger meat-bearing bones are more fragmented than the smaller, non-meat-bearing bones. This distribution pattern can probably be largely attributed to butchery practices, which may also account for the differences apparent between cow and sheep: as the cow is a larger animal, bones would have to be cut up into smaller pieces for easy handling during transport and for cooking. The sheep carcass, on the other hand, is small and manageable, and so the bones are more likely to survive whole. Take, for example, the calcaneus and astragalus: these were nearly all whole bones from sheep, whereas in cattle less than half the calcanei and less than one quarter of the astragali were whole. These bones in cattle were also heavily butchered, presumably in jointing the carcass. Other bones are more likely to be fragmented due to their fragility - possible examples are the ribs and skull, although the skulls may have been smashed to extract the brain. Interpretation of fragmentation patterns is thus complicated by the presence of butchery, and fragmentation due to other causes. The latter, such as bone condition and disturbance might better be examined by reference to faunal remains of non-food animals such as dog and horse. A useful comparison can be made between these two non-food domestic animals and food animals of a similar size, with the caveat that differences may also reflect factors other than butchery, though not unrelated to food production, for example, population age structure.

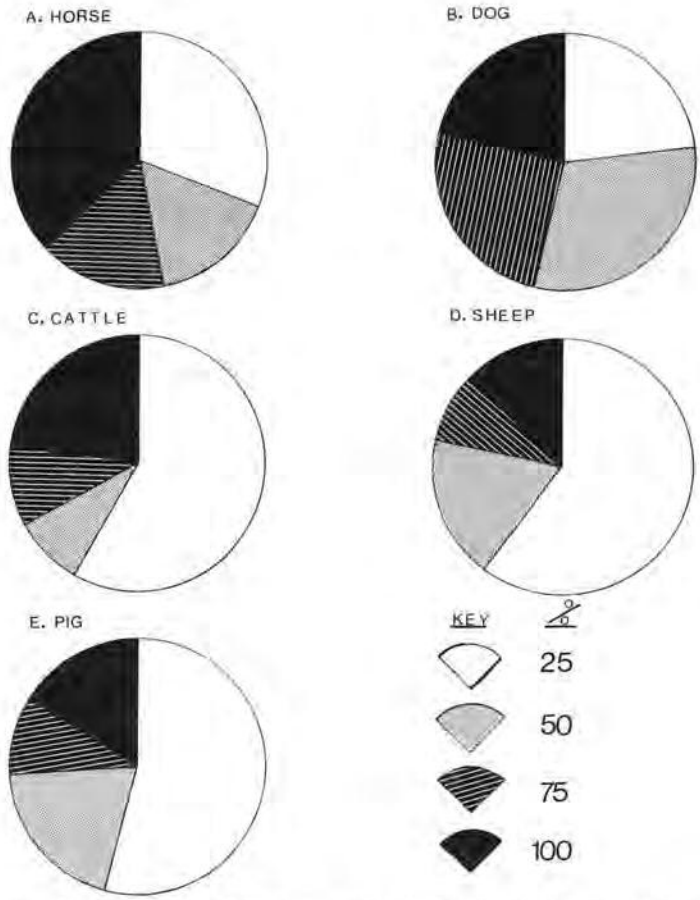


Fig. 80. Overall fragmentation patterns of the five major domestic species present on the site (horse, dog, cattle, sheep and pig). Pie diagrams show the percentage of bones of different sized fragments as a fraction of the total for all skeletal elements. (Figures used are for the combined earlier and late Roman phases).

Age at death

There are two methods by which the age of an animal at death can be determined. These are first, the state of epiphyseal fusion of the long bones and second, tooth eruption and wear of the mandibles. The first method exploits the fact that the epiphyses of all different long bones of a mammal fuse at different periods in its life, and these are constant within a prescribed range for different species. The actual fusion dates are, however, dependant on various environmental factors such as plans of nutrition and breed. For this reason, actual data derived from modern animals (Silver 1969) are not quoted as they are misleading. Nevertheless, it is assumed that the order of fusion will not have changed and so, instead of assigning actual ages to the animals, they are grouped into age classes (Chaplin 1971, 128-130) in Table 18. The results are expressed as a percentage of unfused bones to the total number of bones for each age class. This has been done for cattle and sheep, but there was not sufficient data for pig. Recently, doubts have been cast on this method by Watson (1978), who states that data derived this way are misleading for a number of reasons. The fusion dates are not fixed points but ranges. For simplicity these ranges are not usually taken into account and, by amalgamating bones into age groups, it is hoped that any discrepancies will be eliminated - but they may equally well be exaggerated. For the purpose of age estimation we make the assumption that more bone is destroyed in antiquity than is recovered during excavation and so each bone probably represents the remains of a single individual. A bias might have been operating among certain bones to select either mature or immature bones. For example, recovery of immature metapodials might be favoured if the mature

TABLE 18. AGEING DATA: EPIPHYSEAL FUSION OF LIMB BONES OF CATTLE AND SHEEP (EARLIER AND LATER ROMAN PHASES COMBINED)

		CATTLE			SHEEP		
Age Group	Bone and epiphyseal	No. fused	No. unfused	% in age group	No. fused	No. unfused	% in age group
1	Humerus (d) Radius (p)	30	0	1.6	16	4	
2	Meta-carpal (d)	57	7		12	4	
	Tibia (d)	32	9	15	33	3	13
3	Meta-carpal (d)	39	20	33	17	6	26
4	Humerus (p)	3	1		0	1	
	Radius (d)	14	5		4	7	
	Femur (p)	10	8		2	1	
	Femur (d)	4	8		1	0	
	Tibia (p)	6	1		0	2	
	Ulna	5	0		1	2	
	Calcaneum	7	14	43	6	1	50

bones were preferentially used for bone working; and immature bones are probably less often recovered because the texture of growing bone is more porous than that of mature bone and is, consequently, more rapidly destroyed, though the extent to which this occurs remains unknown. Other important points to bear in mind are that the sexes may mature at different times, and castrates will further confuse the issue. This means that in considering ovicaprid material, where sheep and goat have not been separated, there is the possibility that we are dealing with up to six groups with slightly different, probably overlapping, ages and so any interpretation must of necessity be tentative.

In the second method, use is made of the assumption that the order of tooth eruption within a species is constant, and the degree of attrition increases the longer a tooth has been erupted. Again, the actual ages of tooth eruption will be dependant on several factors and the degree of attrition will be influenced, both directly and indirectly, by various environmental parameters. For example, the quantity of sand in the soil will directly affect attrition rate by its abrasive action on the occlusal surfaces of the teeth, and lack of calcium in the diet may cause the teeth to be softer than normal, and hence to wear down faster. For these reasons, development stages are again used rather than actual ages.

Data relating to teeth are complex and can be displayed in several ways, either considering individual teeth or whole mandibles. Maxillae are not used as insufficient comparative work has been carried out on them and this would, in any case, merely duplicate data derived from the mandibles. The results for ages derived by both methods are displayed graphically in Fig.81 for cow and sheep. The good correlation between the histograms for ages derived from bone and tooth data for both cattle and sheep may be fortuitous, but we suggest that it offers hope for the relatively simple age determination methods used.

The overall picture seems to show that for both sheep and cattle, the majority of animals killed were mature or sub-adult. A histogram of deaths in a 'natural' population might be the opposite to that seen here. The evidence can be interpreted in a number of ways but the decision as to which is the correct one must await further discoveries. The absence of younger animals could be because the majority of meat was import-

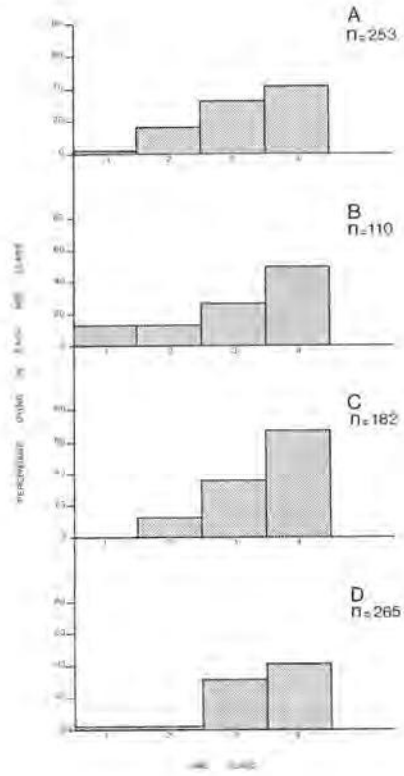


Fig.81. Histogram of the age at death or slaughter for the populations of cattle and sheep from the earlier and late Roman phases of site occupation.

A. Percentage of cattle dying in each of the four age classes (see text) as calculated from the epiphyseal fusion of the long bones.

B. Percentage of sheep dying in each of the four age classes (see text) as calculated from the epiphyseal fusion of the long bones.

C. Percentage of cattle dying in each of the four age classes (see text) as calculated from the tooth eruption and wear in the mandibles.

D. Percentage of sheep dying in each of the four age classes (see text) as calculated from the tooth eruption and wear in the mandibles.

ed from elsewhere - perhaps by sea, as salted carcasses, but more likely 'on the hoof', as the fragmentation analysis indicates that whole animals were butchered on the site (p.155). Alternatively, the remains of meat eaten on the site may represent only a selective portion of the slaughtered animal stock, and the younger, perhaps choicer, carcasses may have been consumed elsewhere - perhaps within the fort at Brancaster.

Uerpmann (1973, 316) considers that, in prehistoric times, the optimal slaughter ages for animals reared for their meat would have been approximately: pig one-and-a-years, cattle two-and-a-half years and small ruminants one to two years. The Brancaster data give the ages at which the maximum numbers are slaughtered as, at least three years (age class 4) for sheep and at least two-and-a-half to four years (age classes 3 and 4) for cattle, from the limb bones, and at least two years (age class 4) and at least two-and-a-half to three years (age classes 3 and 4) respectively, from the teeth. This suggests that the primary purpose for which both species was kept was something other than meat production. These could be milk or draught for cattle, and milk or wool for sheep. One should bear in mind that earlier cultures would have made maximum use of their stock. Sheep destined for the meat market would most likely have been kept until at least one fleece had been obtained from them. Cows would be used for draught purposes, as well as oxen, and Columella recommended that they were allowed to calf only every other year, so as not to weaken them unduly (White 1970, 277-278). The paucity of pig remains does not permit a similarly detailed analysis, but as might be expected, the majority of pig bones came from immature animals.

Metrical Analysis

Where possible, measurements were taken on all identified mature bones. The points of measurement followed those of Jones (1978) and where comparable, the one corresponding with those given by von den Driesch (1976) are indicated. The standard number of measurements per bone ranges from one to twenty, depending on the complexity of the bone element. These same measurements are made on all bones recorded at the Ancient Monuments Laboratory, and in the near future, computer analyses will

TABLE 19. WITHERS HEIGHT ESTIMATES OF THE DOMESTIC MAMMALS FROM THE EARLY ROMAN OCCUPATION PHASE

Species	Anatomy	N	Range
Cattle	humerus	1	109.1
	radius	6	108.8-124.3
	metacarpal	11	108.9-123.6
	metatarsal	12	116.1-121.8
Sheep	radius	1	62
	metacarpal	4	59.3-69.2
	calcaneum	4	52.8-60.3
	metatarsal	10	61.8-65.4
Horse	radius	2	124.2-146.5
	metacarpal	2	119.9-135.6
	metatarsal	1	124.4
Dog	humerus	1	27.9
	radius	1	29.1

N = number of bones in sample

facilitate comparison of sets of bone measurements from various sites and periods throughout the country. Unfortunately, the previously-mentioned fragmentary nature of the Brancaster bone assemblage did not allow many measurements to be taken. At least one measurement could be taken on 47% of the fully identified bones.

Measurements of bones can give us information on a variety of topics. Firstly, they can give us an indication of the size of the animals. Where complete long bones survive, an estimate of the beast's withers height can be obtained. Multiplication factors used here are those of Fock (1966) and Matolosi (1970) for cattle, and Teichert (1974) for sheep. Estimates were only possible in a few cases as not many bones survived entire. These are given in Table 19.

Secondly, they allow an easy means of inter-site comparison and comparison with modern breeds. Some measurements of cattle bones were compared directly with those from other Roman sites (Table 20). These indicate that the cattle from Brancaster were within the size range already established for cattle of the Roman period in Britain. However, there are not any individuals as small as the lower size range as seen at Exeter, or as large as those in the upper size range as at Portchester. The cattle at Exeter seem to be exceptionally small, whereas at Portchester, the large sample might mean that the extremes of the range are represented, which may not always be found on smaller excavations such as that at Brancaster, simply because they would have been rarer, and their chances of survival and recovery concomitantly smaller due to the laws of chance.

The sheep are compared with those excavated by Pitt-Rivers (1888) from Woodcuts and Rotherley and also with the measurements of some modern breeds which he gives (Table 21).

Thirdly, it is hoped that any polymorphism will become apparent when measurements are displayed graphically as scatter diagrams or histograms. This, if present, could be attributable to the presence of different sexes if the degree of sexual dimorphism is sufficiently large and/or the presence of different 'breeds'. As analysis of various cattle metapodial measurements gives an indication of two, possibly more, peaks -

TABLE 20. COMPARISON OF SELECTED CATTLE MEASUREMENTS FROM BRANCASTER WITH THOSE FROM OTHER ROMAN SITES, AND WITH MODERN BREEDS

Site/Breed	Bone	Measurement	N	Range (mms)
Brancaster	Humerus	Distal breadth	12	64.4-90.4
Corstopitum	"	" "	61	47-80*
Exeter	"	" "	6	63.1-74.3**
Chillingham bull	"	" "	1	53*
Chillingham cow	"	" "	1	64*
Shorthorn cow	"	" "	1	76*
Brancaster	Radius	Total length	6	253-289
Exeter	"	" "	5	243-274**
Chillingham bull	"	" "	1	273*
Chillingham cow	"	" "	1	252*
Shorthorn cow	"	" "	1	305*
Kerry cow	"	" "	1	249*
Brancaster	Metacarpal	Total length	11	178-202
Corstopitum	"	" "	87	164-203*
Exeter	"	" "	5	166-194**
Chillingham bull	"	" "	1	202*
Chillingham cow	"	" "	1	179*
Shorthorn cow	"	" "	1	225*
Kerry cow	"	" "	1	183*
Brancaster	Metacarpal	Distal width	41	49.4-70.8
Corstopitum	"	" "	116	47-73*
Exeter	"	" "	30	44.8-57.3**
Chillingham bull	"	" "	1	44*
Chillingham cow	"	" "	1	54*
Shorthorn cow	"	" "	1	65*
Brancaster	Tibia	Distal width	20	49-68.6
Corstopitum	"	" "	78	45-68*
Exeter	"	" "	9	49.7-63.3**
Portchester Castle	"	" "	143	50-69**
Gadebridge Park	"	" "	13	44-60**
Chillingham bull	"	" "	1	49*
Chillingham cow	"	" "	1	50*
Shorthorn cow	"	" "	1	65*
Brancaster	Metatarsal	Total length	2	213-223.5
Corstopitum	"	" "	67	181-244*
Exeter	"	" "	15	190-219**
Portchester Castle	"	" "	108	183-240**
Gadebridge Park	"	" "	3	208-254**
Chillingham bull	"	" "	1	222*
Chillingham cow	"	" "	1	205*
Shorthorn cow	"	" "	1	255*
Kerry cow	"	" "	1	212*

* After Meek and Gray (1910)

** After Maltby (1979)

N = number of bones in sample

TABLE 21. COMPARISONS OF SELECTED SHEEP MEASUREMENTS FROM BRANCASTER WITH THOSE FROM OTHER ROMAN SITES, AND WITH MODERN BREEDS

Site/Breed	Bone	Measurements	N	Range (mms)
Brancaster	Humerus	Distal breadth	13	25.3-33
Corstopitum	"	" "	10	22-28
Exeter	"	" "	23	23.9-30.1
Stonham Aspal	"	" "	2	29-30
Brancaster	Metacarpal	Total length	4	122.5-143
Corstopitum	"	" "	11	106-126
Exeter	"	" "	3	112-127
Cranborne Chase	"	" "	11	109-137
St.Kilda ewe	"	" "	1	107
White faced heather ewe	"	" "	1	111
Highland horned ewe	"	" "	1	113
St.Kilda ram	"	" "	1	112
Hampshire down ewe	"	" "	1	139
Dorset horned ram	"	" "	1	136
Brancaster	Tibia	Distal breadth	31	23.2-27.7
Corstopitum	"	" "	14	15-18
Exeter	"	" "	51	12.3-29.2
Stonham Aspal	"	" "	2	26-27
Brancaster	Metatarsal	Total length	10	137-145
Corstopitum	"	" "	10	108-128
Exeter	"	" "	3	112-127
Cranborne Chase	"	" "	5	119-126
St.Kilda ewe	"	" "	1	116
Highland horned ewe	"	" "	1	128
St.Kilda ram	"	" "	1	124
Dorset horned ram	"	" "	1	147
Hampshire down ewe	"	" "	1	150

N = number of bones in sample

though these are by no means definitive and no attempt was made to validify them statistically. Even if these are real peaks, they do not tell us much. Interpretation of such data must remain tentative as there is as yet no definitive way of ascertaining whether sex or 'breed' is the main governing factor in any particular case. If it seems likely that the metrical separation represents the two sexes (and possibly also castrates), the ratio between them may tell us something about husbandry practises and indicate what was the main animal product. For example, where sheep are kept for wool, castrated males (wethers) may well predominate, but a higher proportion of females would suggest that milk was the primary product.

Meat yields have been estimated by two methods. Firstly we can work out from the proportions of species represented the amount of meat which each would have contributed to the diet, by adjustment with factors to allow for the size discrepancies between the species. We have multiplied the number of fragments by the factors given in Grant (1975, 383) in Table 22. From this, it is obvious that cattle contributed the largest proportion of meat, followed by sheep and then pig. Secondly, a more detailed method has been devised by Noddle (1973) for cattle. She has estimated from modern data, the

TABLE 22. THE RELATIVE CONTRIBUTION OF THE MAJOR DOMESTIC FOOD SPECIES TO THE DIET

	No.of fragments	% after figures adjusted for meat yield
Cattle - early Roman	3,132	94.4%
late Roman	193	88%
Sheep - early Roman	1,169	4.9%
late Roman	138	8.7%
Pig - early Roman	103	0.7%
late Roman	32	3%

TABLE 23. ESTIMATED CARCASS WEIGHTS OF CATTLE

Bone	Brancaster (Early Roman)			*Other Romano-British Sites		
	N	Mean CW (kg)	Range of CW (kg)	N	Mean CW (kg)	Range of CW (kg)
Humerus	12	156.1	144.8-176.8	4	154	146-168
Calcaneus	4	163.24	154.1-182.3	2	155	-
Metatarsal	6	162.94	155.1-173.9	12	167	157-187
Astragalus	15	163.67	160.9-168.2	14	166	-

*data after Noddle (1973)

weight of meat that an animal could have yielded. A revised version of this method by Noddle et al. (forthcoming) has been used to give estimates for the dressed carcass weights of the Brancaster cattle. These are compared with those from two other Romano-British sites in Southern England given by Noddle (1973, 386) in Table 23.

Pathology

We will probably never have a complete picture of the state of health of ancient domestic stock. Some information can be gleaned from ancient texts, and in his summary of Roman veterinary medicine, Walker (1970) describes diseases which can be recognised as having modern counterparts. This is complemented by the study of any signs of disease, injury and anomaly amongst the animal bone assemblages from archaeological sites. Of course, only a limited spectrum of diseases will affect the bone, and then often at a late stage in their progression. It is possible that sick animals would often have been killed before they were so ill that their nutritional state was adversely affected, once it was clear that they were not likely to recover. Columella recommends that sick goats be slaughtered and the flesh salted. This habit must have been an important factor in exposing the populace to serious disease from infected meat (Walker 1970, 329).

Any pathological changes in the bones from Brancaster were examined in detail with the aid of radiographs.

Dental diseases and anomalies were the most commonly observed pathological changes. Several examples of malocclusion of teeth were noted, the most common being of the cattle permanent fourth premolar. Calculus was also quite common in both

sheep and cattle maxillae and mandibles. The formation of calculus may enhance the development and progress of periodontal disease, as food particles can more easily lodge between the teeth and gums and hence infection set in. Examples of periodontal disease were most common in sheep mandibles, and these are still common today.

A recent study of dental abnormality and changes in skeletal structure of 481 adult culled ewes (Richardson et al. 1979, 521) showed only two with normal buccal morphology. The remainder showed a range of abnormalities, but body condition did not appear to be adversely affected by dental disease, a point worth bearing in mind when considering the supposed effects of disease on the general health of animals from archaeological sites.

Three examples of dental abnormalities in sheep mandibles from the Brancaster remains are described below:-

One jaw shows a recession of the bone around the second and third molars on the buccal side. At its deepest point, this is 12 mm below the bone on the lingual side, reaching almost to the roots of the third molar. Radiography demonstrates that the bone in this region is structurally different from the surrounding bone. The surface of cortical bone of the ramus directly below this 'resorption' shows a small degree of minor pitting. This may once have been more severe.

The second mandible shows pathological bone changes in the alveolus of the third molar and on the lateral and medial external cortical surfaces of the ramus. The changes exhibited are more severe on the medial surface. The alveolus of the third molar is greatly enlarged possibly as a result of ulceration of the roots of the third molar. The changes noted in the bone on the lateral aspect of the ramus are along the dorsal margin and appear as a slight porosity and increase in thickness of the cortex. This change is local to the third molar. On the medial aspect of the ramus the changes are similar though more massive, covering a larger area, from the dorsal margin almost to the ventral margin. The thickness of this lesion is also greater than that on the lateral side.

The condition of the alveolus together with the condition of the ramus are conducive to there having been an ulcer in this area and the infection of the medial surface and tooth root would probably have been more severe. There is also slight crowding of molars one and two with consequent malocclusion.

A third mandible showed pathological changes very similar to those first described, but the lesion is associated with the fourth premolar. The medial and lateral surfaces of the ramus are affected to the same degree. The second premolar is missing, though from radiographic analysis it is not possible to say whether this is congenital absence or antemortem loss. In modern bovids, it has been noted that when the permanent second premolar is absent, the deciduous tooth has often been present, but lost antemortem (Andrews and Noddle 1975, 142).

A dog jaw showed antemortem loss of all three incisors and the canine. The alveolar cavities had been infilled with cancellous bone.

The next common group of conditions was of arthritis and similar complaints. A cattle metatarsal shows pathological changes on two areas of the bone and possibly also a third. Firstly, a moderate degree of exostosis on the proximal anterior, proximal lateral and proximal medial aspects. The degree of bone

growth in these areas has been sufficient to join the fused second and third tarsal bones and the centroquartal (now broken off) to the proximal articular surface of the metatarsal. Radiography demonstrates that both the fused second and third tarsal have become attached by extra bony growth only at their periphery. As a modern comparison, a similar condition is produced by an inflammation (arthritis) of the tarsometatarsal joint known as tarsitis (Greenough et al. 1972, 289). The Brancaster animal would probably have shown some degree of lameness and the joint would probably have been enlarged. A similar instance has occurred at the Iron Age site of Winklebury Camp (Jones 1977, 66) and also at the Roman site of Portchester (Grant 1975, 403).

The second bone change occurs on the diaphysis towards its distal end, wholly on the lateral and partly extending to the anterior aspect covering an area measuring 68 mm by 27 mm and 6 mm high. Radiography demonstrates that this bony addition is superior to the outer surface of the cortex. This change is probably periosteal in origin and is possibly the result of some form of trauma.

The third area of pathological change is also on the diaphysis at the proximal end on the dorsal surface lying to either side of the vascular groove. The changes are exactly similar to those described at the distal diaphysis, though the size of the lesion is smaller measuring 30 mm long, 20 mm across and 2 mm high. Alteration to the course of the vascular groove has been caused by this, and the last described pathological change. The three changes occurring on this bone may all have been caused by some form of trauma, though the fusion of the tarsal bones to the proximal metatarsal may have been caused by many factors, including infection. A cattle second phalanx (Plate 13), displays a massive lesion on the proximal articular surface of sufficient proportions to destroy the articulation. At the centre of the affected area there is a circular depression approximately 20 mm in diameter. On the medial side of the lesion the newly-formed bone is eburnated indicating firstly that there was some movement of the joint and secondly that the orientation of the foot had been altered so that the affected digit would have been rotated medially and posteriorly. The accompanying digit may also have been involved.
The lesion at the proximal articulation may be considered as consisting of two parts, the outer area extending around the perimeter of the articular surface and partly down the diaphysis and a second depressed area in the centre of the joint, containing many perforations into the meduallary bone. Another specimen of this bone displays a wide fissure measuring 10 mm by 3 mm in the centre of the lateral proximal articular surface. It is unlikely that this would have caused any disability.

On a dog femur, a slight lip of extra bone has formed around the anterior surface of the head. Eburnation is frequently observed in specimens of this kind but none is apparent here. It is unlikely that this small amount of lipping could have produced lameness.

A final group is of injuries due to fracture or trauma. Only one notable instance occurred. This was a pig skull. (Plates 14 and 15). There is extensive fracturing to the left squamous part of the occipital bone, the parietal bone and the squamous part of the temporal bone. The fractures are centred around two loci, one between the occipital, parietal and temporal bone, and the other between the parietal and temporal bones immediately caudal of the zygomatic process of the frontal bone. All of the fractures are well healed.

Clearly, the animal survived these injuries and there are knife marks on both frontal bones so the animal's carcass was utilised. Resulting from these injuries the left wing of the nuchal crest (viewed posteriorly) has been depressed ventrally by 20 mm and medially by approximately 4 mm. The zygomatic arch and opening of the auditory meatus have moved rostrally approximately 5 mm compared with the position of those on the right side. There is no damage to the bone immediately surrounding the cranial cavity and, therefore, the brain cannot have been lacerated by broken edges of bone from this fracture. That is not to say, however, that the brain did not suffer damage in other ways. The damage to the caudal frontal sinus of the left side is severe. The maxillary sinus entering the zygomatic process of the temporal bone is badly distorted.

The second locus, caudal to the zygomatic process of the frontal bone shows four radiating fractures at right angles to each other. The surface of the cranial cavity in this area shows four pits. In this area the thickness of bone is much less than it is more caudally, and there seems to have been some penetration into the cranial cavity. It is possible that at this point the brain may have been damaged at an area close to the sylvian fissure in the lateral side of the left cerebral hemisphere. Damage to the soft tissues in this area would have occurred and hearing on the left side may have been affected as the bone in the area of the cochlear is badly distended. It is likely that these injuries would have affected the external appearance and possibly also the behaviour of this animal when alive. This condition has often been observed in pig skulls from archaeological sites and it is usually attributed to fighting between boars that have, perhaps, been closely penned (von den Driesch 1975, 421-423).

Sieved samples

Only two samples yielded small animal bones. Both came from earlier Roman deposits. The first was from a ditch and only contained several frog bones. Frogs are not scarce in Britain today and are quite common in certain archaeological deposits such as waterlogged fills of wells and ditches. The Romans probably used various portions of this animal's 'interior' for remedies and charms (Toynbee 1973, 216).

The second sample was from a pit which may have functioned as a cess-pit. The only fish bones from the site came from this sample: an eel (Anguilla anguilla) vertebra and ten fin-rays (indeterminate species). As well as some indeterminable fragments, two species of small mammal were found. Shrew was represented by a humerus and an ulna. This animal is common over much of England. One immature tibia from a mouse was also found.

Bird bone. The excavations yielded a comparatively small sample of bird bones. Eight species were recognised, including both domestic and wild representatives, and these are listed below, in taxonomic order.

Species list
Black-throated diver (Gavia arctica)
Domestic goose (Anser anser)
Domestic duck/mallard (Anas platyrhynchos)
Buzzard (Buteo buteo)
Domestic fowl (Gallus sp.)
Woodcock (Scolopax rusticola)
Rock dove/feral pigeon (Columba livia)
Raven (Corvus corax)

Of the seventy bones present, sixty-one (87%) could be fully identified. No bird bones were recovered from the Beaker, Bronze Age or Iron Age periods of the site. The majority of the bones (64) came from the earlier Roman period, the remainder coming from the later and Post-Roman periods (two and three bones, respectively). The number of each skeletal element from the different species present is shown in Table 24. The high percentage of identifiable bird bone in comparison with that of mammals indicates that, although a much smaller quantity, it was in better condition than the mammal bone assemblage. This could be attributed to a number of causes such as differential deposition, recovery and survival.

Considering first the domestic animals, Zeuner (1963, 451) considers that the British fowl had not had a long history before it was encountered by the Romans, and Caesar in his Gallic Wars writes that the Britons would not eat this bird. It would seem that this was soon changed, however, as chicken remains have invariably been found wherever bird bones have been studied from Roman military sites in the provinces of Britain and Germany (Davies 1971, 130). As well as being eaten, poultry would have been kept for their eggs. Zeuner (1963, 448) considers that this would have been the primary reason for their initial domestication, and egg shells have been found at Hoffheim and Vindonissa (Davies 1971, 131). It was not possible to take many measurements on the fowl bones, but those taken have been compared with those for Roman fowl from several sites given in Macready (1976) whose ranges they fall within. As only one tarsometatarsus was recovered (a male), the sex ratio could not be determined. According to Columella, this would have been between 1:3 and 1:5 cock:hen, depending on the breed (White 1970, 328). Evidence of butchery occurred on three bones which had knife cuts on the diaphysis. Macready also found three bones with knife cuts (all humeri) in her

TABLE 24. THE BIRD SPECIES AND SKELETAL ELEMENTS FROM THE 1977 EXCAVATIONS (ALL PERIODS)

	Domestic fowl	Domestic goose	Domestic duck	Black throated diver	Buzzard	Woodcock	Rock dove/ feral pigeon	Raven	Indeterminate species	TOTAL
Skull	-	1	-	-	-	-	-	1	-	2
Coracoid	2	-	-	-	-	-	-	-	-	2
Furcula	1	-	-	-	-	-	-	-	-	1
Humerus	2	-	-	-	-	*1	-	2	-	5
Radius	*3	-	-	2	-	-	-	-	1	6
Ulna	1	-	-	2	-	1	1	4	1	10
Carpometacarpus	-	-	-	1	-	-	-	3	1	5
Os Coxae	-	-	-	-	-	-	-	-	2	2
Femur	*2	1	2	-	1	-	-	-	-	6
Tibiotarsus	*5	-	1	2	-	-	-	*5	*4	17
Fibula	1	-	1	-	-	-	-	-	-	2
Tarsometatarsus	1	-	-	2	-	-	-	1	-	4
Phalanges	-	-	-	6	-	-	-	-	-	6
Synsacrum	-	-	-	2	-	-	-	-	-	2
TOTAL	18	2	4	17	1	2	1	16	9	70

*All bones are from the early Roman period, except for one bone in each of the numbers which are asterisked.

study of the Roman fowl from Wicken Bonhunt. She contrasts this situation with that of Fishbourne, where Eastham (1971, 391) records that many bones show signs of having been cut at the joints as in carving, and Macready (1976) suggests that the inhabitants of the Villa at Fishbourne were, perhaps, more fastidious.

Caesar writes that geese, also, were not eaten by Britons before the Roman Conquest, up until which they were either considered sacred or kept as pets (Toynbee 1973, 263). It is generally considered that the species which has been domesticated is the grey-lag, our only indigenous goose. It is easily tamed and readily adapts itself to captivity. Geese have often been recorded from Roman sites (Davies 1971, 130), representing as much as a quarter of the birds eaten at one German site, Valkenburg. One bone of grey lag goose was the only bird bone to be found during the 1974 excavations (p.130). Columella (White 1970, 327) says that geese can be reared with very little trouble and are worth keeping for their goslings and feathers, but they need plenty of water and grass. These requirements would have been amply satisfied by a salt-marsh habitat. The one measurable specimen was slightly smaller than specimens from Wicken Bonhunt.

Ducks were eaten in Roman times, but may have been considered as low-class food as is the opinion expressed by Trimalchio in the Satyricon by Petronius. (Toynbee 1973, 273). They are quite commonly represented on archaeological sites of the Roman period. The duck bones found were similar to those of mallard - the most numerous and widely distributed of our resident waterfowl - and those measurements which it was possible to take, fell within the range of archaeological specimens from Wicken Bonhunt. Delacour (Eastham 1971, 391) noted that though it is known the Romans built large aviaries where mallard were bred and fattened, the earliest literary reference to a distinct breed of duck is in the twelfth century. The Fishbourne bones have a larger size range than the mallard, suggesting domestication was taking or had taken place. Dr.Bramwell has also noted that ducks from the Roman period are similar to, but larger than the mallard. He thinks they may have taken wild duck eggs and hatched them under fowls (1971).

Rock dove and feral pigeon today constitute a single species. Semi-domesticated dove-cote pigeons, which were free to find their own food, would have played an important part in rural economies. From the earliest times, there must have been contact between dove-cote birds and wild rock doves, leading to inter-breeding and assimilation of populations. Rock dove/feral pigeon have been found on other Roman sites - for example Waddon Hill (Davies 1971, 130), Silchester and Caerwent (Fisher 1966, 38). No matter what the status of this species it is certain that it would have been eaten.

The woodcock would also have been caught as food. The typical habitat of this bird is deciduous woodland, with a combination of dry ground for nesting, wet areas for feeding and open spaces. This area might once have provided such a habitat for this forest wader though it no longer breeds there today.

The remaining birds are less likely to have been food remains. The raven is now rare in Britain, though it was widespread up until the early nineteenth century. Thus, in Roman times, it would have been much more common and has, indeed, been found invariably on Roman sites (Fisher 1966, 38 and Davies 1971, 130). There are many references in the literature, including Pliny's Natural Histories, to ravens having been tamed and taught to talk by the Romans (Toynbee 1973, 273-275) so it is possible that these birds were kept as pets. Bramwell, noting the abundance of ravens amongst Roman poultry, considers that they may have been killed as marauders of poultry (1975, 208). Elsewhere, (Bramwell 1971) he suggests that they were kept as a deterrent to hawks which must have been a constant threat. Indeed, Columella advocates that birds of dark plumage be kept, one of the reasons for this being that the more conspicuous

white birds make them easy prey for hawks and eagles (White 1970, 323). Ravens from Portchester Castle were found as skeletons in pits and Eastham (1975, 414) considers the possible interpretation that they were kept as pets or mascots. Four of the Brancaster bones may also have come from a single skeleton. There is evidence that some, at least, of the individuals had been utilised by man, for meat or feathers, as there was a chop mark on one ulna. Measurements taken were compared with archaeological specimens from Wicken Bonhunt as no modern reference material was available. They were of a similar size.

The densest concentrations of buzzards are where the habitat is diverse. Maps of past breeding distributions show that as late as 1800, the buzzard bred throughout the British Isles (Sharrock 1976, 455) though they no longer occurred in the Brancaster area. Other Roman sites on which buzzards have been found include Colchester, Haddington in Scotland and possibly the Villa at Folkestone's East Cliff in Kent (Fisher 1966, 37) and Exeter (Maltby 1979, 73).

The seventeen bones of the black-throated diver all come from the same context and almost certainly represent a single individual. This is now one of our rarest birds. It breeds in summer freshwater haunts in north-west Scotland, and overwinters at sea or in estuaries, or sometimes on lakes or in man-made waters near the coast. Thus, Brancaster is within its present winter range and this bird would probably have died in winter or during a spring or autumn migration. It is recorded from Baynard's Castle (Bramwell 1973) and Exeter (Maltby 1979, 73) but otherwise, is rare or unknown in archaeological bone assemblages. Other divers have occasionally been recorded - for example the great northern diver (Gavia immer) from Roman Portchester, and Broch of Ayre in Orkney and the red-throated diver (Gavia stellata) from a Fife cave (Eastham 1975, 412). The Portchester Castle bird is also an almost complete skeleton, and Eastham suggests that it was accidentally bagged on a wild fowling trip and thrown straight into a rubbish pit, as the flesh of the diver is reputed to be extremely unpalatable. That divers found on archaeological sites of various periods were probably not eaten is also the view held by Fisher (1966, 38) who vouches for their unpalatability from personal experience. However, a butchered bone of a great northern diver was recovered from Saxon Southampton (Bourdillon and Coy 1980, 46).

In conclusion, the bird bone evidence indicates that several domesticated species were kept for food, and these were supplemented to a greater or lesser extent by wildfowl taken in the vicinity. Certain other species recovered may be incidental from the food point of view, but represent the habitat of this area in Roman times, which included species once more widespread than they are today.

General Discussion and Conclusions

The faunal evidence is first considered systematically, before drawing some general conclusions about the site economy.

Cattle. Though there is much information in the ancient literature on Roman husbandry practice in Italy, this should not be applied without reservations to the interpretation of Romano-British material. Environmental conditions and native techniques established before the Roman invasion would have influenced husbandry practices here. White (1970, 276-277) considers that the main purpose for keeping cattle was for draught - meat would have been a secondary product, and cow's milk was rarely drunk in Italy. The temperate climate of Britain might have allowed cattle to be kept as dairy animals, and meat, largely beef and veal, would have been a regular constituent of military rations (Davies 1971, 126).

Most individuals recovered from Brancaster were horned, but hornless cattle were

also present. Jewell (1962) describes two types of cattle from the Roman period in Britain: the small 'Celtic ox' which played a dominant role in the early Iron Age, and a larger type, possibly imported, though both are slender-boned beasts. These may both be represented at Brancaster as indicated by the measurements (Table 20).

The majority of the animals were mature, with a smaller percentage of very young animals than was found for sheep. This suggests that the primary purpose of cattle was for draught or milk, rather than meat production; but which of these was the more important cannot be determined, as it was not possible to separate the sexes.

Sheep. The sheep are of the gracile type commonly found on Romano-British sites, somewhat similar in build to the present-day Soay breed. Though generally horned (Plate 16), a few polled individuals occurred. These were of two types: those with a smooth flat frontal bone, and those with a rudimentary horn bud. It is open to conjecture which of the following three possibilities these animals represent: a different breed, the females of a single breed where the males alone bear horns, or an occasional individual in a population where both sexes are normally horned. A hornless sheep skull fragment is also noted by Jones (p.130). The majority of sheep were killed when sub-adult or mature, but with a small percentage of deaths in the very young age group. This suggests that the primary purpose for which they were kept was something other than meat production - for instance, wool or milk. White (1970, 301) considers that the primary product of sheep in the Roman period would have been wool, followed by cheese and milk though the meat would, of course, have been eaten, perhaps especially from surplus young animals. Columella suggests that they should be sent to the butcher 'before they have begun to graze, since it costs very little to send them to town, and when they have been disposed of, a substantial profit is made out of the milk from their mothers' (White 1970, 303). However, it is most likely that there is a bias against the survival of bones of such young animals due to their fragility and porous texture.

Goat. Only one definite goat bone, a horn core, was recovered. Although, because the bone assemblage was highly fragmented, it is possible that any smaller fragments of goat have not been distinguished from the remains of sheep (p.133), the paucity of remains suggest that this animal cannot have contributed greatly to the site economy.

Pig. Very few of the bones recovered were from mature animals, which severely limited any metrical analysis. It is likely that the majority of the bones were of domestic pig, although occasional wild boar might be present. These were larger animals than the domestic pig at that time. One metatarsal compares favourably in size with that of a zoo-bred wild boar in the reference collection. Davies (1971, 128) states that wild boar was frequently taken - (it was found at fourteen of the thirty-three Roman sites he reviewed) - and he consider that it may have been hunted as much for sport as for food; for example, an altar to Silvanus was set up in Weardale 'In fulfilment of his vow for capturing a boar of outstanding fineness, which many of his predecessors had been unable to bag'. As the pig is a single purpose animal, with the only useful products being meat and lard and possibly hide, it can be culled at the economic optimum kill-age for meat yield - when sub-adult, at the point when the maximum food-input/growth ratio has been reached in contrast to the multipurpose animals such as cattle and sheep where slaughter patterns are necessarily more complex. The pig is a prolific breeder and so only a few adults need be kept to ensure a steady population replacement. Pig meat was popular with the Romans, as evidenced by the space devoted to pork recipes in Apicius (King 1978, 225). Though there is no archaeological evidence to support this, pigs may have been castrated to make them more manageable and as the meat of uncastrated males is reputed to have a poor flavour (Uerpmann 1973, 316).

Horse. The horse bones found were generally less fragmentary than those from most of the other domestic animals on the site. Data from modern animals given by

Silver (1969) was used for assigning ages to the bones. The ages given below are modern age equivalents: actual ages of ancient stock are not known. The majority of the bones were from mature animals; of the forty-seven bones on which ageing information was recordable, only three were immature. The latter were from animals under three to three-and-a-half years of age. Of the remainder, two were about five years and four were over five years, the rest being at least nine months to three-and-a-half years, depending on the bone. Ageing information also came from the state of eruption and wear of the teeth in mandibles and maxillae. Only six individuals retained sufficient teeth in situ for age assessment. These give the following ages: two are older than two-and-a-half years, one is four to five years of age and the remaining three are at least three-and-a-half to four years. The size of the animals have been compared with examples of modern breeds given by Pitt-Rivers (1888), as well as with those of horses from other Roman sites. Wither's heights were estimated using Kieswalter's method. These are given in Table 19. No large horses are represented and the bones are generally about the size of, or smaller than, an Exmoor pony ($11\frac{1}{2}$ hands) though some were nearer the size of a New Forest pony (12 hands), and possibly a slightly larger form is also represented. The same range of horses occurred at Corstopitum (Meek and Gray 1910, 84), but at Pitt-Rivers' excavations at Rotherley and Woodcuts, all the horses were of the small type cf. the Exmoor pony (Pitt-Rivers 1888, 217), as were those in the Brancaster bones studied by Jones (p.130). The Roman horses from Exeter were larger - probably from animals of 13-14 hands (Maltby 1979, 62) as were those at Hemel Hempstead (Harcourt 1974b, 259). A third metatarsal from a post-Roman context had been sawn through the shaft just below the proximal epiphysis in a similar manner to the specimen described by Maltby (1979, 362). This was undoubtedly a preliminary to working the bone. Cannon bones of sheep and cattle are often used for making bone objects, as was the case at Brancaster, and these two examples provide evidence for such a process on horse bones.

The absence of butchery marks on the Brancaster horse bones suggests that they were not eaten, nor their bone marrow extracted though, as at Exeter, their use as an occasional food source cannot be discounted. This is not invariably the case, and Pitt-Rivers (1888, 217) concluded that the horses at Rotherley and Woodcuts had been used for food, because many of the bones had been split longitudinally as if to obtain the marrow, and at these sites horse was the third most common animal. On sites where horse does not appear to have been eaten, it is not usually found in such large quantities.

The Romans are known to have had large horses for military use (Bokonyi 1974, 262-263) but none fitting this description was found at Brancaster. As well as cavalry, horses were used for breeding mules and sometimes for traction and working corn-mills. Though horse meat was not eaten, other products from the dead animals were used, such as the skins and tails, which were used for leather and decoration (Toynbee 1973, 185).

The ageing data, with very few immature animals, support the view that the horse was kept primarily as a working animal.

Dog. A total of thirty-seven dog bones was recovered, the majority of which came from the earlier Roman period, but with three from late and four from post-Roman contexts respectively, and a single bone from the Iron Age. Measurements of the bones have, where possible, been compared with those of modern breeds in the reference collection. The dogs seem to have been of at least three types. One was rather smaller than a miniature poodle, but slightly larger than a toy poodle, another is tenatively judged to be about the size of a border collie, though no complete long bones have survived and there is a possible third intermediately sized animal. Height calculations were only possible on two bones, a radius and a humerus. These gave withers height estimates of 29.1 cms and 27.9 cms respectively. These are near to the

lower size limits of dogs from Roman sites given by Harcourt (1974a, 166). Though the quantity of dog bones recovered from Brancaster was not great, they give an indication of the variability which is typical of dogs in the Romano-British period. Dogs in Roman times would have had a variety of uses. Possibly their skin, and meat, was utilised, but there is no evidence for this at Brancaster. Hunting dogs were used, and certain British breeds were prized in Rome. Sheep dogs were also known, as were house dogs, and there is some evidence for the occasional use of dogs for draught purposes and in performing acts (Toynbee 1973, 102-122). Pet dogs or lap dogs were kept, and it is likely that the smaller dogs found at Brancaster fit this category. One radius and humerus were very short and bowed; similar specimens from Corstopitum were likened to the modern Dachshund (Meek and Gray 1910, 122). Small dogs should not be automatically considered of no use as working animals. The Welsh Corgi, for example, was used by the cattle drovers as it could snap at the beasts' heels and be quick enough to avoid being kicked (Godwin and Toulson 1977, 10).

Cat. Though no bones of this animal were found, a cat had left is paw impression on one of the tiles found at the site (Plate XVIII; p.174). Domestic cats, though not common, have been recovered from Roman sites in this country - from Lullingstone and Wroxeter (Toynbee 1973, 90), Exeter (Maltby 1979, 64) and Silchester (Jones 1892, 288) and they have been recorded as early as the Iron Age (Harcourt 1979, 154).

Deer. Two species of deer were found: red and roe. Both species are indigenous and quite common in suitable woodland habitats, and also moorland in the case of red deer. All the deer bones came from the earlier Roman contexts and these animals were presumably hunted for food. Davies (1971, 128) says that venison was clearly a common delicacy, the former has been recorded from thirty-one and the latter from seventeen of the Roman military sites reviewed by him. The antlers were also used for making objects: an iron awl found on the site had its handle fashioned from an antler tine, probably of red deer, another worked fragment of red door antler was found, and a third was sawn off at the base ready for working.

Rabbit. A single rabbit mandible was found in an earlier Roman ditch deposit, but the possibility that it arrived there by burrowing cannot be discounted. It was once thought that when Caesar referred to hares in Britain, it may actually have been rabbits which he saw; however it is now generally agreed that this animal was introduced by the Normans (Sheail 1971, 17). Rabbit bones occasionally turn up on Roman sites, but in all cases they have been discounted as intrusive. While it is unlikely that they were widespread at that time, confirmation of the presence of rabbit in pre-Norman Britain may yet come from the meticulous examination of the archaeological contexts yielding small mammal bones, in the same way that the existence of black rat in Roman York has been established by Rackham (1979). This has also been done for the small mammal bones at Saxon Southampton where only a single rabbit bone (a butchered scapula) was found to be non-intrusive (Bourdillon and Coy 1979, 44).

Hare. Only one bone was recovered, a calcaneus, and it was not possible to ascertain whether the species represented was Lepus capensis (brown hare) or Lepus timidus (mountain hare). Hare bones have been found on several Roman sites (Davies 1971, 128) and doubtless they also supplemented the diet at Brancaster. Vegetius mentions this species in his description of the siege diet in Britain. 'The soldiers were worn out by...the unaccustomed food of the country. They...fed on wheat and barley and large quantities of meat and hare boiled without salt which upset their digestion'.

Rat. One humerus of an immature rat (Rattus sp.) was found in the floor of an early Roman ditch. It is not possible to distinguish the post-cranial elements of the black and brown rats (R.rattus and R.norvegicus, respectively), but the brown rat was not introduced into this country until the early eighteenth century (Barrett-Hamilton and

and Hinton 1910-1921). The archaeological context from which the Brancaster rat bone came was well sealed and stratified and it can be safely assumed that the animal did not enter by burrowing. Though the brown rat is known to burrow extensively, this is not an attribute of the black rat. The latter, together with the early date of the deposit, suggests this animal is, in fact, a black rat. Until recently, the black rat was thought to have been introduced into Britain in the Norman period, but Rackham (1979) has produced evidence from excavations at York for its introduction in Roman times. This could prove of considerable importance, especially in view of recent discussions on plague and the end of Roman Britain and subsequent plagues of the Anglo-Saxon period. A rat bone has also been found in an early tenth-century deposit in London, and though assumed to be from the black rat this, like the Brancaster bone, was of an immature post-cranial element (Armitage 1979).

Whale. Six fragments of vertebral centra from a whale were recovered from the earlier Roman period, but it was not possible to determine from which species these came. Chop marks were present on three of the fragments (Plate 17), which we consider to be the result of butchery, and conclude that the whale meat was eaten. Whale bones have occasionally been recovered from Roman sites: at Valkenburg, an auxiliary fort near the mouth of the Rhine (Davies 1971, 129-130) and at Bishopstone, where it was suggested that the proximity of the site to the sea makes it likely that a whale was stranded on the shore and part of the carcass taken up to the site (Gebbels 1977, 279). The same explanation is likely to apply to the Brancaster whale. Deliberate, often mass, strandings of whales are well documented for which various explanations have been hypothesised, including an ear infection having affected the sonar system (Matthews 1978, 178-182). Of course, the animal could have been washed up dead, in which case the flesh would probably have been putrid: the butchery suggests that the whale meat was utilised so a stranded live animal seems the preferable interpretation. In contrast to this, a whale vertebra of the Little Piked Whale (Balaenoptera acutorostrata) found at Saxon Southampton which had been used as a chopping block (deduced from the numerous incisions on the flat facets of the vertebra), was probably washed ashore as a carcass or even as a bone as there is no evidence for the flesh having been eaten (Holdsworth 1976, 45).

Occasional records of whale occur in the Roman literature and Porcupius relates how a whale stranded near the city of Constantinople was dragged to shore and killed by the local people (Toynbee 1973, 208).

Conclusion. The major contribution to the Brancaster bone assemblage came from food remains of the domestic animals. The excavated bone assemblage shows us the pattern of slaughter from which certain attributes of stock-breeding practice can cautiously be hypothesized. However, many unknown variables will have influenced the pattern we see, such as possible import of animals to the site or export of animals from the site for consumption elsewhere. This problem is discussed more fully by Uerpmann (1973).

If we look at the relative proportions of species found from the different phases throughout the time span of site occupation (Table 25), we see that there is a very slight increase in the proportions of pig and also of sheep from the earlier to later Roman phases with a concomitant decrease in the proportion of cattle. The numbers of horse and dog remain at the same low level throughout. The increase of horse in the post-Roman bone assemblage is probably not significant because of the mixed nature of that bone group. King (1978), in his comparative survey of all the major bone assemblages from Roman sites in Britain, has observed and interpreted the changes and trends in their species composition. These are firstly, a decrease in the number of sheep bones in late Roman times which he attributes to an increasing number of 'Romanized' deposits, viz villas, towns, and forts. He suggests that sites on which sheep are favoured are

TABLE 25. THE RELATIVE PROPORTIONS OF THE MAJOR DOMESTIC SPECIES

	Cattle		Sheep		Pig		Horse		Dog		Total identified bones
Period	No.of fragments	%	No.of fragments	%	No.of fragments	%	No.of fragments	%	No.of fragments	%	No.of fragments
Beaker	6	67	3	33	-	-	-	-	-	-	9
Bronze Age	45	76	8	14	3	5	1	2	-	-	59
Iron Age	18	44	21	52	-	-	1	2	1	2	41
Earlier Roman	3,132	69	1,169	26	103	2	93	2	36	1	4,533
Later Roman	193	52	138	37	32	9	6	2	3	1	372
Post Roman	304	67	114	25	13	3	17	4	4	1	452
TOTAL	3,698	67	1,453	27	151	3	118	2	44	1	5,466

continuing the Iron Age farming pattern or are on lowland dry light soils.

In support of this, Applebaum ascribed Romano-British settlement on the fringe of the Essex and Kent settlements to sheep rearing in the absence of liver fluke. The salt marshes of the Essex coast could support heavy sheep numbers because of the fine, extensive short herbage and the absence from disease given by salt water: the liver fluke does not thrive so freely under these conditions, and foot-rot is somewhat less troublesome in a salt-water than a fresh-water pasture (Trow-Smith 1957, 76). As the settlement at Brancaster was probably considerably 'Romanized' throughout its existence, the second of King's explanations is the most likely. He noticed an increase in pig in the second to fourth centuries AD which he interpreted as perhaps an indication of increased woodland usage or the establishment of orchards, while a more important part might have been played by political and cultural considerations. During the third century, money supply problems caused increases in the taxes levied which could in turn have led to taxpayers utilizing more, and marginal, land to maintain their living standard.

Despite the fact that a cavalry unit is known from literary sources to have occupied the Shore fort at Brancaster horse bones do not form a significant percentage in either the earlier or later phases of the Romano-British occupation. This might be because it is generally considered that horses from Roman forts would have been buried well outside the occupied area (Grant 1975, 383).

The animal kill-off patterns of domestic stock, with a paucity of younger animals, suggests that they might have been consumed elsewhere - perhaps shipped salted up to the Northern forts, as probably occurred in the nearby Fens (Salway 1970, 13-14) - with the meat eaten at the site coming from more mature animals which had been raised primarily for other purposes such as milk and wool production. Alternatively, the younger meat may have been consumed elsewhere on the site, for example, within the fort. In the Roman period, vast supplies of hides were needed - for tents, shields, protective clothing and harness. Gut might also have been required by the artillery, and wool was needed in quantity for uniforms. These commodities might also have been transported from this area. In addition, the surrounding salt-marsh habitat would have provided a natural reservoir of fish and fowl, which might free a large proportion of the domestic produce for use elsewhere. Unfortunately, the preservation on the site has provided an unquantifiable bias towards the larger animals, and so we can but guess at the extent of the contribution to the local diet of the commodities mentioned.

On the other hand, no major road led to Roman Brancaster, and though no large ships could have harboured here the possibility that Brancaster itself received supplies by sea can be entertained.

A NOTE ON ANIMAL FOOT-IMPRESSIONS ON ROMAN TILES

by Sheilagh Wall

A number of tiles from the site bearing foot-impressions of two animal species were examined. Petrological analysis by Dr.Williams at Southampton University indicates that these tiles were contemporary with others at the site, all of which are considered to be of local Roman manufacture. Identifications were based on those of modern animals given in Lawrence and Brown (1967). One print was of an ovicaprid and four were of dogs. The first of these tiles retains impressions left by both fore feet and the right hind foot of a walking dog which would have been quite a large animal. Another tile has impressions of the right fore and hind foot of a similarly sized dog, but the prints were too badly distorted for any measurements to be taken. A third impression is slightly smaller, and the last is of the right fore foot of a very small or juvenile dog. Finally, the foot impression of the right fore foot of a cat was found (Plate XVIII). The print is

small and may be from a small or young cat, but is almost certainly of the domestic and not the wild cat, Felis silvestris. A similar find has been made at Roman Silchester (Jones 1892) where the species in question is also considered to be domestic rather than wild, as the author thought it unlikely that the 'shy' wild cat would venture so near a human dwelling-place. Recently, Cram and Fulford (1979), in their reappraisal of the tiles with foot-prints from Roman Silchester, have shown that these can give information about the animals themselves and about the tile-making process. They note the general absence of wild animals (which might suggest the ground was fenced) and of pigs (obstreperous animals which are likely to have been kept in sties or woodland away from human settlements). They consider that the evidence indicates the proximity of a farm or stock-yard, suggesting that the tile makers themselves were, in addition, farmers. Many of the tiles had representations of more than one animal, which supports the case for workshops being close to or within a farmyard - perhaps the tiles were laid out to dry on the ground, but under cover to which animals had access. Though only a small sample, a similar explanation might be applied to the Brancaster tiles but a more plausible explanation is that the tile-making area was unfenced: wild animals are unlikely to be so near such an industrial centre. Measurements of the animal tracks are given, together with comparable measurements from Roman Silchester, and modern adult animals taken from Lawrence and Brown (1967) and Cram and Fulford (1979); see Table 26. They point out that shrinkage of clay on drying subsequent to the foot impression will have reduced the measurements, possibly by up to a tenth.

TABLE 26. MEASUREMENTS OF ANIMAL TRACKS FROM ROMAN BRANCASTER, WITH COMPARABLE MEASUREMENTS OF THOSE FROM ROMAN SILCHESTER* AND FROM MODERN ADULT ANIMALS*

		Track Length			Track Width		
		Range	Mean	N	Range	Mean	N
Sheep							
	Brancaster	40		1	28		1
	Silchester	24-47	31.5	24	11-30	20.8	29
	Modern	50-60			40-50		
Dog							
	Brancaster (fore foot)	40-75		3	37-70		3
	Silchester (fore foot)	31-67	49.1	14	28.69	48.9	21
	Modern	39.81			31-86		
Cat							
	Brancaster	28		1	25		1
	Silchester	23-50	29.1	7	23-44	28.8	12
	Modern (wild)	40-60			35-60		

*after Cram and Fulford (1979)

VII. DISCUSSION
by John Hinchliffe*

Within the areas to the west of the Shore fort examined in 1974 and 1977 the effects of cultivation had been to reduce the evidence to little more than a complex network of ditches. The material produced by the fillings of these features can only form the basis of a broad assessment of the nature and dating of the site. The particular interest of these features, first revealed by aerial photography, lies in their proximity to one of the forts of the Saxon Shore - a fact reinforced by the presence of military metalwork. The aim of both excavations was, therefore, to gain information as much about the Shore fort and its place within the Brancaster complex, as the features threatened by the housing development.

The most specific information relating to the fort provided by the excavations was the presence of the Cohors I Aquitanorum, attested by the stamped tiles. This is the first occasion on which evidence has been obtained of a unit stationed in the coastal system other than those listed for the fourth century dispositions of the Saxon Shore (Hassall 1979, 265). In broader terms the results of the 1974 and 1979 excavations provide information from which an overall interpretation of the site may be proposed. The following discussion is directed to this end.

The principal surviving characteristic of the Romano-British extra-mural settlement at Brancaster is the use of ditches to divide the occupied area into a series of enclosures and associated trackways. The primary function of the ditches would appear to be that of land division. They would also clearly have served as drains, but the site, being mostly on sand, is sufficiently well-drained without requiring ditches of this kind.

In spite of the paucity of evidence for structures - probably as a result of plough erosion - the function of the enclosures would not appear to be agricultural. The movement of stock, for instance, would have necessitated rather more entrances than are apparent at Brancaster, although the possibility of plank bridges cannot be discounted. The most likely interpretation of these ditched enclosures is as house plots, in which case the use of such substantial ditches between the plots still requires an explanation.

The substantial barrier provided by ditch, bank and possibly hedge suggests an intention to divide firmly, and this, with its apparent regularity, implies a system of allotment. This in turn begs the question of land ownership and tenure on which the evidence provides little help. Although the multiple recutting and realignment of the ditches which make up the framework of the Brancaster settlement tend to obscure the overall picture, there is little doubt that the settlement area investigated was, in origin, carefully planned.

In the original lay-out of the enclosure system (Phase 1: Fig.13), this planning is particularly clear in the area to the south of the west-to-east trackway. In the south-east angle of the trackway junction the primary enclosure created was 35 m square. This enclosure was subdivided by the definition of an enclosure flanking the north-to-south trackway representing almost exactly a third of the area of the major enclosure. On the opposite side of the trackway an almost identical enclosure was defined. The 35 m measurement recurs in later phases and it would also appear to be a significant dimension in the group of enclosures surrounding the equivalent trackway intersection on the eastern side of the Shore fort, plotted from crop-marks (Fig.2). The recurrence of this dimension is interesting, not only in that it reinforces the planning aspect of the

Footnote
*The author is grateful to have been able to draw on written comments on the site as a whole provided by Christopher Sparey Green.

lay-out, but also that it approximates to the Roman actus of 35.48 m (Dilke 1971, 82).

The division of relatively small plots of substantial ditches in a regular pattern suggests allotment to a number of separate owners/tenants rather than the subdivision of land for co-ordinated use. The question obviously arises as to what authority is performing the allocation, but whether civil or military it seems the Brancaster settlement, from the first, was a planned settlement.

Whether the function of the plots and their associated structures was primarily domestic or whether other activities were carried on within them is uncertain. The loss of occupation horizons and probably a great deal of evidence for structures precludes any firm conclusions. Certainly the two most substantial structures for which evidence survived were of similar form and presumably intended for a similar function. The quantity of domestic refuse from the fillings of the enclosure ditches leaves little doubt that the enclosures were certainly occupied.

The interpretative limitations presented by the eroded nature of the archaeology of the excavated area extend to consideration of the site economy as evidenced by the animal bones. More specifically one cannot establish the functional relationship between the settlement area examined and the fort area and hence it is not possible to gauge the extent to which the animal bone assemblage from the excavation reflects the particular demands of the military garrison.

It is clear from the animal bone evidence that complete animals were being butchered on site. The predominance of mature animals in the cattle and sheep assemblages indicates that these animals were not being exploited solely for meat or hide but that the cattle were being utilised as draught animals and/or for milk and the sheep for wool. To what extent these primary uses are related to the fort and settlement at Brancaster it is beyond the limits of the evidence to say. The comparatively small quantities of horse bones would seem to indicate either than the disposal of cavalry animals did not involve slaughter on site or that the cavalry did not form a significant part of the garrison before the settlement area examined was largely abandoned in the fourth century AD. It is interesting to note in this context that the horse bones recovered were those of small sturdy animals. Otherwise the economy of the site clearly involved some small-scale pig-rearing and the keeping of domestic fowl, supplemented by wildfowling and the exploitation of the site's coastal position as evidenced by the molluscan remains and the fragments of whalebone.

Although it has been possible to establish a sequence on the basis of stratigraphy within the area excavated in 1977, the nature of the deposits precludes any precise dating of individual phases. The bulk of the pottery was recovered from the fillings of ditches which had undergone considerable recutting. Material recovered from ditch fillings, even when there has been no recutting, must always be treated with caution for dating purposes in view of the likely manner in which it arrived in context i.e. the silting-in of occupation soil which will reflect all previous phases of activity in the vicinity. The smaller sherd size of pottery from ditches in comparison with that derived from the filling of the pits is an indication of this process.

The kind of multiple recutting to which the majority of the Brancaster ditches had been subjected undoubtedly had the effect of thoroughly mixing the material in the filling and substantially reducing, if not entirely removing, evidence for earlier definitions of the ditch line. For dating purposes, therefore, the pottery is best regarded as a single group reflecting the overall period of occupation. The destruction of earlier fillings by recutting may, however, introduce a bias towards the later periods in terms of quantity of material, although much of the earlier material in the upcast will undoubtedly find its way back into the ditch.

The general picture presented by the pottery from the 1977 excavations is of occupation commencing in the later part of the second century and continuing throughout the third century, with some fourth century material which may be derived either from the fort to the east or the activity represented by Phase 2 of the 1974 excavations to the west. A precise starting date for the occupation cannot be established in view of the poor survival of primary deposits as a result of the multiple recuttings. The large quantity of Antonine samian alone must indicate that the laying-out of the settlement must have taken place before the end of the second century - a conclusion reinforced by the numismatic evidence from the Brancaster site as a whole (Appendix 4).

The relationship between the Shore fort and the western settlement area remains uncertain, but the fact they are not aligned (Fig.2) suggests that they are unlikely to be contemporary in origin. The construction date of the Shore fort is uncertain. St. Joseph's excavations (St.Joseph 1936) indicated two distinct phases within the interior of the fort, the second being dated to the mid- to late-third century. The limited character of the excavations did not allow the excavator to ascribe a precise date to the construction of the fort.

A number of writers have pointed out the similarities between the Brancaster fort and the Shore fort at Reculver (eg Frere 1974, 211; Johnson 1979, 18). Both forts are virtually square, of similar size and plan and possess certain features - rounded corners, ramparts behind the walls and a lack of bastions - more reminiscent of forts of the Antonine period than the majority of forts of the Saxon Shore. Excavation at Reculver has confirmed its relatively early date (Philp 1969), perhaps A.D. 225-230, depending on the interpretation of an inscription referring to a consular governor named Rufinus (Richmond 1961, 224; Wright 1965, 220; Mann 1977, 15). One may infer a similar date for the Shore fort at Brancaster, particularly in view of the corresponding positions of this fort and Reculver - guarding the two principal maritime inlets into the East Coast, the Wash and the Thames Estuary.

If a date in the second quarter of the third century A.D. is postulated for the establishment of the Shore fort at Brancaster the misalignment of the fort with the external settlement may be explained by the latter preceding it by at least thirty years. Certainly the ceramic evidence from the 1977 excavations will hardly accommodate a starting date of A.D. 225. The circumstances which led to the establishment of this settlement must therefore be considered.

The two principal north-to-south Roman roads through Norfolk terminate at the coast at points to the west and east of Brancaster when a minor adjustment in the course of either would bring them directly to the site (E.Anglian Archaeol. 5, fig.1). Although surface finds from the Brancaster site include a couple of brooches of the first century A.D. (Appendix 4) these are best regarded as evidence of a continuation of the sporadic short-term activity (perhaps relating to seasonal exploitation of the coastal marshes) indicated by the prehistoric material found in 1977. It seems certain that at the time the roads were constructed, presumably in the second half of the first century A.D., there was no settlement of any significance at Brancaster. The roads may however have been linked by a minor coastal route represented in the later Brancaster plan by the west-to-east trackway.

The emergence of the Brancaster settlement is, thus, difficult to explain in the context of the principal communication system of the region in which it occupies an insignificant position. Many settlements of this period owe their emergence to their situation on a major route or road junction but this is clearly not the case at Brancaster. The coastal position of the site, and in particular its proximity to the inlet of Mow Creek (Fig.2), raises the possibility of its emergence being related to maritime trade; but here again the lack, on present evidence, of any major road link to the hinterland would

argue against this. Recent work on the coastal sediments (Murphy and Funnell: Appendix I) would suggest, furthermore, that the site was not easily accessible to shipping, other than shallow draft.

If the emergence of the civil settlement at Brancaster is, therefore, not linked primarily to economic factors, an alternative explanation has to be found. Consideration must be given here to the ordered way, outlined above, in which the settlement was originally laid out, which would imply some controlling authority. If this is the military authority then is there a military site at Brancaster which predates the Shore fort?

Military authority does not necessarily imply the presence of a fort, but in the absence of any other clear reason, such as the exploitation of a mineral resource under military regulation, a fort would appear to be the most likely focus for the settlement area. That is to say that the civil settlement at Brancaster was a vicus from the start, but not in origin relating to the Shore fort as we know it.

Given the nature of most of the archaeological deposits on the site it is not possible to draw any conclusions about the date of the establishment of a military presence. The metalwork does contain items of harness fittings, armour and weaponry, though not in large quantities (Appendix 4).

If there is an earlier fort at Brancaster, then its situation remains to be established. One possibility is a site to the north of the Shore fort where on a limited area of high ground on the edge of the salt marsh, material from the surface of the field has indicated occupation within a rectangular enclosure identified from crop-marks (Fig.2). The crop-marks show a rectangle measuring 80 m by 90 m defined by double ditches which would appear also to subdivide the enclosure north to south. The impression is of two enclosures, the first, measuring 80 m by 50 m, having an extension or annexe added to the east. The first enclosure is rather small for a fort of the presumed period and the two together present a somewhat unusual form, though the overall shape of straight sides and rounded corners and the fact that the alignment is the same as that of the civil settlement, do add weight to the possibility. Clearly only excavation can establish the true character of this feature.

An alternative position for the suggested earlier fort is beneath the Shore fort. The very limited excavations so far carried out within the Shore fort have given no hint of earlier fortifications, though neither have they revealed any extension of the civil settlement beneath the later fort. One would imagine that St. Joseph's principal west-to-east cutting, for instance, would have located the network of ditches which characterise the civil settlement had they extended over this area (Fig.2). It is clear from crop-mark evidence that the settlement area on the east side of the Shore fort has the same characteristics and the same alignment as that on the west and, although only further excavation can prove the point, there is a strong impression that the two areas are contemporary in origin. An explanation is, therefore, required for the apparent absence of features relating to the civil settlement in the area later occupied by the Shore fort, especially as the natural platform on which this is sited is perhaps the most obvious area for occupation. Was this gap occupied by an earlier fort?

Within the area of the Shore fort one or two buildings are known from aerial photographs, some of which, in the north-east part of the Shore fort are not aligned on its defences but reflect the alignment of the civil settlement (Fig.2). This relationship to the earlier alignment may, of course, be taken to indicate that these structures represent part of the civil settlement predating and underlying the later fort, but, as has been suggested above, it seems unlikely the settlement extended across this area. Little is known of the internal lay-out of Shore forts in general, so misalignment to the defences does not necessarily imply a difference in date. The relationship of these structures to

the settlement alignment would however suggest a different interpretation - that they relate to an earlier fort on whose alignment the lay-out of the civil settlement is based.

The largest of these misaligned buildings (Fig.2, A) measures 26 m by 23 m and it is interesting to compare it with the headquarters building at the fort at Brough-on-Noe erected in A.D. 158, which measured 26 m by 20 m (Collingwood and Richmond 1969, fig.13). If the single chamber on the east side of the Brancaster building were extended into a range (bearing in mind the possibility of distortion of the crop-mark evidence by stone-robbing), then the two buildings would be almost identical in plan. This similarity is particularly interesting in view of the epigraphic evidence for the presence of the Cohors I Aquitanorum at Brough-on-Noe in the Antonine period (RIB 283; Collingwood and Wright 1965) - the same unit attested at Brancaster by the evidence of stamped tiles (Fig.40, Nos.140 and 141).

A fort the size of Brough-on-Noe, centred on the building in question, could be accommodated within the area of the Shore fort and not be reached by the trenches of the 1935 excavations. The building, furthermore, lies precisely midway between the two principal crossroads of the civil settlement (235 m from each), which would seem to confirm its direct relationship with these external areas, particularly in view of their planned lay-out.

It is suggested, therefore, that the settlement adjacent to the Shore fort is a planned vicus associated with the construction of a smaller fort on the site of the Shore fort before A.D. 200. Johnson has recently pointed out that there is evidence for defensive measures being taken on a number of sites in the coastal areas of Britain and Gaul at this time (Johnson 1979, 22). It seems likely that the troubles of the province following Albinus' stripping of the British garrison in his unsuccessful bid for the Empire may have included coastal raiding on a hitherto unprecedented scale, perhaps the culmination of two decades of harassment attested by coin hoards on the southern and eastern coasts (Frere 1978, 211). Certainly the situation in the late second century was conducive to such activity and few opportunities to take advantage of similar periods of insecurity were to be missed over the next two centuries.

In summary, the following sequence is postulated:

(i) In the late second century A.D. a fort is established at Brancaster in response to coastal raiding. On either side of the fort settlement areas are laid out in an ordered fashion.

(ii) In the second quarter of the third century the original fort is replaced by a larger Shore fort on the same site as part of a defensive system for the east coast of which Reculver forms the other principal element. The greater size of the Shore fort dictates a different alignment from the earlier fort in order that it may be fitted upon the level plateau defined on either side by the north-to-south gullies. The settlement areas, although undergoing continual redefinition of their enclosures, retain their original alignment.

(iii) At some stage, probably in the second half of the third century A.D., the large 'quarry ditch' (Phase 6; 3401) located in the 1977 excavations is created. This ditch apparently blocked off the west gate of the fort and hence isolated the settlement area examined in 1977. Although the ditch cannot be precisely dated it is tempting to see its creation being associated with the rebuilding work in the interior of the fort indicated by St.Joseph's excavations (St.Joseph 1936, 448) dated by him to the mid- to late-third century. A context for these works may be provided by the change of garrison from the Cohors I Aquitanorum to the Equites Dalmatae of the Notitia Dignitatum (assuming the former's presence on the site was not

merely confined to the suggested late second century fort).

(iv) In the fourth century the ceramic evidence indicates that the settlement area examined in 1977 has been largely abandoned after the severance of the west-to-east trackway. Part of the area is occupied by enclosures of uncertain function relating directly to the Shore fort in terms of their alignment. Nine missile heads (Fig. 32, Nos.37-45) were recovered, generally from later contexts, in the 1977 excavations. If, in the fourth century, this area was largely cleared, the presence of these objects might indicate that they were fired from the western defences of the fort. The route represented by the west-to-east trackway may have been diverted to the south of the fort and may be represented by the length of double-ditched trackway indicated by the crop-marks (Fig.2). The fourth century occupation represented by Phase 2 of the 1974 excavations may be explained by its proximity to the return of the route to its original line beyond the (?) abandoned zone.

(v) The numismatic evidence from the site as a whole (Appendix 4), together with certain of the metal objects indicate that occupation continued throughout the fourth century and probably on into the fifth. The presence of the Tating Ware sherd and the Saxon brooch (Fig.68; Appendix 4, No.17), both found in the ploughsoil, give only a hint of later activity.

Without further excavation within the Shore fort the sequence outlined above must clearly be regarded as speculative. The inconclusive nature of the results of the 1974 and 1977 excavations lies in part in the restraints imposed by the housing development, but more particularly in the effects of cultivation which had reduced the archaeological evidence to little more than a complex of ditches. The loss of structural evidence precludes any conclusions being drawn about the functional relationship between the external settlement and the fort. Given the limitations of the evidence it may well be that the Brancaster site as a whole may only be better understood in the light of further work on areas of better preservation in and around the complex sites of the other forts of the Saxon Shore.

APPENDIX 1. A PRELIMINARY STUDY OF THE HOLOCENE COASTAL SEDIMENTS

by P. Murphy and B. M. Funnell

INTRODUCTION

The present form and recent development of the complex of sandflats, marshes, creeks, shingle ridges and dunes along the coastline of north Norfolk have been extensively studied (Steers 1960), though relatively little attention has hitherto been given to earlier phases in the development during the Holocene of this coastline. There is, however, no doubt that major changes have taken place in the coastal environment since the Roman period when the Saxon shore fort at Brancaster was occupied. The purpose of the present report is to describe the results of a preliminary examination of the sediments underlying Brancaster Marsh made during the summer of 1978 in an attempt to provide some information about the nature of the Roman coastline at Brancaster.

Brancaster Marsh extends northwards for some 900 m from the edge of the upland to the shingle ridge and dune system now occupied by the golf course. It is drained by small, incised creeks emptying eventually into the main channel of Mow Creek. Southwards from Mow Creek for some 165 m the marsh surface is at 2.84 to 3.00 m O.D., a level thought to be between Mean High Water Neaps and Mean High Water Springs. The surface is firm and relatively dry, with a vegetation cover of the late Aster community (Chapman 1960). Further south is a reed-bed nearly 90 m across. Between this reed-bed and the coastal path the vegetation is lower, with grasses, rushes, Triglochin, Cochlearia officinalis, Plantago maritima and Armeria maritima.

METHODS

Thirteen Hiller auger holes were sunk in the area between Mow Creek and the cropmark 1004 (Edwards 1976, 258). This auger could not penetrate more than a few centimetres into consolidated sand and gravel deposits, so at one point (Hole 5) a powered 'Minuteman' borer was used to examine the deeper sediments. Chalk, overlain by over 5 m of sands and gravels was just reached at a depth of 8 m below the present surface.

Small sediment samples (approximately 100 g) were taken at 30 cm intervals from auger holes 5 and 12 and also from the basal sands for the recovery of Foraminifera. These were extracted by the method of Funnell (West 1977, 415).

Molluscs and seeds have not been examined in detail since the samples obtained were too small to provide statistically reliable assemblages of these macrofossils, though where conspicuous concentrations were encountered numerically important taxa have been identified.

RESULTS

Sediments

An interpretation of the section revealed is given in Fig.82.

The uppermost deposit in all auger holes was an intertidal mud. Generally the mud contained only a trace of sand, but in several holes it was coarser towards the base of the deposit; in particular the lower sediments in hole 10 contained significant quantities of sand and pebbles. The mud varied in colour from greyish-brown to grey and black (10 YR 4.5/2; 4.5/1; 2/1) reflecting variations in its oxidation state. The upper aerated layer included large quantities of fine fibrous roots and, beneath the reed-bed, abundant Phragmites remains. Shells of Hydrobia ulvae, Scrobicularia plana and Littorina sp. were present in small numbers throughout the deposit and in concentrations towards

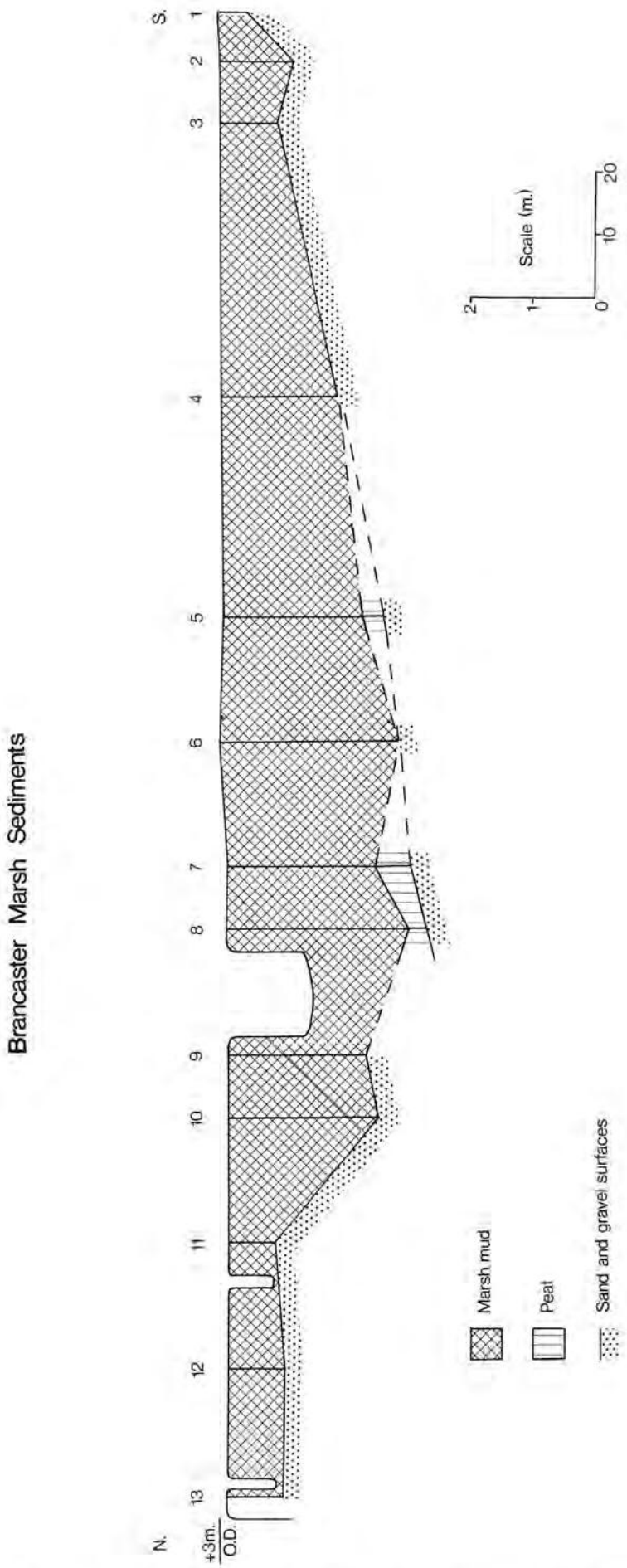


Fig.82. Interpretation of sediments recorded in auger holes in a line southwards from Mow Creek (Fig.2).

the base of the mud in auger holes 8 and 9. Foraminifera were abundant.

In auger holes 5, 7 and 8 the mud overlay black peat and organic loam layers up to 50 cm thick, resting on a sand surface between - 0.34 and + 0.39 m O.D. A sample from bore 7 was of brushwood peat, containing Alnus fruits and wood fragments. This peat, like the Judy Hard peat (Godwin and Godwin 1960, 74) rests on sand though it was at a higher level, (-0.25 to + 0.75 m O.D. compared with -3.00 to -0.40 m O.D.). The two peats may be of approximately the same date despite this difference in levels. The Judy Hard peat covers the Boreal-Early Atlantic transition. The more recent Harbour Channel and Lower Golf Club peats rest on intertidal clays and the Upper Golf Club peat, though resting on sand is covered by recent dune sand. (Godwin and Godwin 1960).

In all auger holes the basal sediments were sand and gravels. These are thought to be of two types. The coarse sand at the base of hole 9 is clearly a marine deposit; it produced shell fragments of Ostrea edulis and Cerastoderma sp. with specimens of the foraminifers Ammonia beccarii and Elphidium williamsoni, which are characteristic of the open coast. The form of the upper surface of the sand in auger-holes 9-13 suggests that the basal sand in these holes may be part of a small spit or barrier beach. By contrast samples of the basal sand in bores 1-8 produced no biological remains. The surface of this sand slopes regularly downwards to the north and could have been interpreted as a Holocene beach profile were it not for the fact that it is partly overlain by the alder-brushwood peat, which is believed to be of Boreal/Atlantic age. If this assumption is correct the basal sand in holes 1-8 must pre-date the local postglacial marine transgression, and a soliflucted periglacial or glacial origin for this sand seems possible.

The belt of low vegetation, noted above, between the reed-bed and the coast path has been interpreted on the basis of air photographs as part of a vegetation-mark reflecting the presence of a double-ditch forming the northern boundary of a rectangular ditched enclosure (1004; Edwards 1976). Indeed it was in the hope that a stratigraphic relationship could be established between these ditches and the marsh sediments that this particular part of the marsh was selected for study. However, although probes were made into the marsh mud at 1 m intervals from auger hole 1 southwards to the coast-path, no evidence for these suggested ditches was found. The firm underlying sand and gravel surface sloped regularly up to the path.

Foraminifera

Arenaceous salt marsh foraminifers were found throughout the intertidal mud of auger holes 5 and 12. Two species dominate the assemblages present and earlier hopes of estimating past tidal levels from the composition of the assemblages have not been realised during this preliminary investigation. The two species mainly represented are Trochammina inflata and Jadammina macrescens. Jadammina is more common at depth in the mud, Trochammina in the upper part (Table 27). The ratio probably changes with tidal level, but no significant changes in sea-level can, however, be inferred during the period of mud accumulation.

DISCUSSION

On the basis of this preliminary investigation the following sequence of events may be suggested, although future investigations may modify the present interpretation of the sediments:

1. Deposition of soliflucted sand and gravel under periglacial or glacial conditions.
2. Formation of alder brushwood peat on this inclined sand surface.
3. Submergence of these peat and sand layers during the local Flandrian marine transgression.

Appendix 1

TABLE 27. FORAMINIFERA FROM HOLOCENE MUD

Depth in cm	Hole No. 12		Hole No. 5	
	Total No.	% Trochammina	Total No.	% Trochammina
0 - 30	250	48	84*	90
30 - 60	122	79	22	91
60 - 90	172	13	21	71
90 - 120	-	-	9	89
120 - 150	-	-	46	30
150 - 180	-	-	44	16
180 - 210	-	-	-	-
210 - 220	-	-	9	11

*Elphidium williamsoni and Ammonia sp. also present.

4. Development of a small spit or barrier beach moving shore-wards possibly over the peat and any intertidal mud formed in phase (3).
5. Continued accretion of intertidal mud and the development of the modern salt-marsh.

In the absence of direct or inferred dating evidence for the later phases of this sequence it is impossible to say whether the sand bank thought to be present beneath holes 9-13 was in existence during the Roman period. Before the later intertidal marsh mud was deposited, however, the evidence is that there was no great depth of water. The marsh mud extends only to a depth of about 0.0 m O.D., approximately 0.3 m below mean tide level. Consequently a large stretch of peat and sand would have been exposed on the shore at low tide before the marsh mud began to accumulate. The water would not have been more than 3.0 m deep even at Mean High Water Spring Tides, and generally considerably less. Deeper water could however have been present further seawards before the emplacement of the suggested sand-bank.

In the absence of creeks or channels crossing the intertidal mud flats, the coast immediately to the north of the site would have been unsuitable for craft with a deep draught; small boats capable of reaching the shore at high tide would have been beached, whilst larger vessels would have had to anchor offshore. More extensive augering would be required to determine whether such channels were formerly present.

Acknowledgements

We are grateful to the National Trust for permission to work on Brancaster Marshes, to John Gater for assisting with the Hiller augering, to Derek Edwards for determining the levels of the marsh surface and to Laurie Cartwright for assisting with the Minuteman augering.

APPENDIX 2. A BEAKER FIND FROM BRANCASTER
by Andrew J. Lawson

The find was made in 1973. By this time development in the field to the west of the fort had already started. Mr. Andrew Ward, then a schoolboy, collected a quantity of prehistoric pottery from an area that was being stripped by machine (the exact location is not known). The sherds were handed to Mrs. Aitchison, Mr. Ward's schoolmistress at Scarning, who took them to Norwich Castle Museum where they are now stored (Acc. No. L.1983.16). The sherds comprise parts of two vessels; they are shown in Fig. 83.

1. Beaker, almost complete, but fragmentary; barrel-shaped with sinuous profile, everted rim and slightly protruding foot; dull orange/brown surfaces, black core; hard fabric with fine flint and sparse grog filler. Above the belly the exterior surface is raised into fine horizontal ridges. The grooves between are decorated with oblique finger-nail impressions, the overall effect looking like impressed cord. A narrow undecorated zone divides the body. Below the belly horizontal rows of oblique finger-nail impressions are divided by contiguous horizontal finger-nail impressions. The lower decoration is less well executed than the upper.

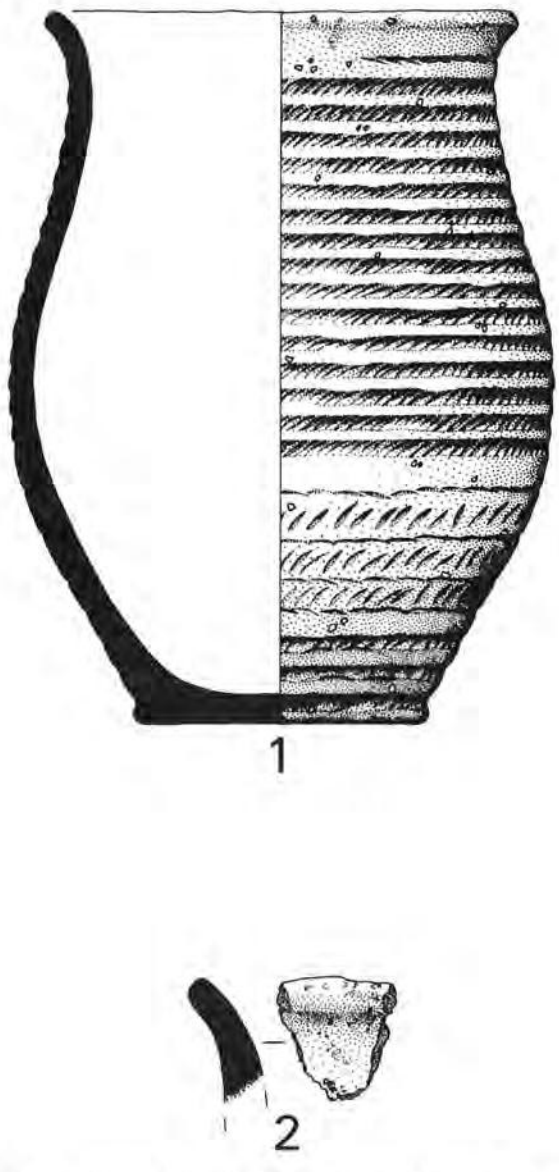


Fig. 83. Beaker material found in 1973. Scale 1:2.

2. Flaring rim of Beaker or bowl; surfaces orange/buff, core black; hard fabric with fine flint and grog filler; undecorated.

The sherd of vessel no.2 is of a Beaker fabric, but is otherwise undiagnostic.

The Beaker, No.1, is an example of the East Anglian Group as defined by Clarke (1970, 146-152). Although the decorative technique is unusual, 'the simple linear motif suggests the strong archaic tradition of the East Anglian province of the European Bell Beaker group, and Barbed-Wire influence.' (Clarke 1970, 147). Although with Clarke's chronology a date in the seventeenth century b.c. might be suggested for this vessel, reconsideration by Lanting and van der Waals (1972, 38 and 44) suggests a date in the nineteenth century (i.e. Step 3), while radiocarbon dates for the Dutch group (AOO) which serves as a prototype for the East Anglian series are even earlier (Lanting, Mook and van der Waals 1973, fig.2).

APPENDIX 3. A NOTE ON THE DEMOLITION OF THE WALLS OF THE ROMAN FORT

by Edwin J.Rose

Sir Henry Spelman, in his Icenia, written around 1600, stated that the walls were standing to a height of twelve feet (Spelman 1698, 147). Blomefield, writing in the 1770's, stated, 'The ditch is visible and was also walled in, many stones yet appearing on the north side... Many parts of its walls were carried away, and used on the foundations of the great malthouse (some years past) in the town, and are said to have been nine feet thick.' (Blomefield 1805 X, 298). This malthouse, generally accepted to have been the largest in Britain, stood at Brancaster Staithe and was visited by Samuel Woodward in 1829 (Woodward 1829, 74). He stated that it bore the date 1747 and had Dutch gables, a style more suited to 1747 than to 1770, the date formerly suggested for the demolition of the walls by R.R.Clarke and St.Joseph (1936, 445). The latter date was probably an assumption based on Blomefield's date of writing.

The Rev.H.Lee-Warner states that in 1848 he constructed 'the gable of a large barn at Thorpland from the loose debris of the ashlar of the Roman Brancaster, where it had once faced the bastion of the Porta Decumana... the so-called sugar stone of these blocks was pronounced by the late Dean Buckland to be the Druids Sandstone and probably to have done duty as a monolithic enclosure before the Roman occupation' (Lee-Warner 1884, 179). One might assume from this that Lee-Warner found the stone blocks lying on the site, but it was around 1848 that the Great Malthouse was demolished, and it has been suggested by Rainbird Clarke (hand-written notes in the Sites and Monuments Record) and others that the stone was that which had been used in its construction.

The barn still remains, in the farmyard of Thorpland Lodge near Fakenham. Its south gable wall is composed of large blocks of stone, black in colour, one with a central hole as if for the insertion of some fitting. The gable has collapsed in recent years and been roughly rebuilt, and here the stone is of a speckled light grey colour.

On the exterior of all reasonably accessible buildings in Brancaster village and Staithe only two examples of this stonework have been found, although sherds of a Spanish globular amphora and 'fragments of millstones' were found built into the walls of Rectory Cottage, Burnham Deepdale [1]; it has been suggested that these came from the site of the fort. The examples of stonework are the barn behind Staithe House which has a few stone blocks in its flint walls; this barn is near to the site of the malthouse and is probably that referred to by St.Joseph (1936, 445): and the more major example of the parish church. The south chancel wall is almost entirely constructed of stonework identical to that at Thorpland, mixed with flint and some reused limestone fragments (Plates XIX and XX). Set in the wall are portions of two round-headed windows, apparently Saxo-Norman, which the stonework surrounds but also covers their blocking, suggesting either a post-Norman refacing of the wall or reuse of Roman material at two periods. The east wall was rebuilt in 1832 but retains some of this stonework in its basal courses. The north chancel wall dates from 1832; a section was removed for an organ chamber in 1907; but some of the stonework remains at the wall's west end. Some of the stone blocks have also been reused in the north aisle north wall as a course between two windows dating from the early fifteenth century.

The stonework shown in St.Joseph's plates (St.Joseph 1936, pls. 1 and 2) appears to be the same material as the stonework in these buildings, although the blocks excavated cannot now be traced in order to confirm this.

The stonework in the barn, church, and Thorpland barn has been examined by Mr. P.Cambridge of the School of Environmental Studies, University of East Anglia, who confirmed that it was all of the same origin. Analysis of a sample showed it to consist

of a fine-grained sandstone of loose composition without any mineral inclusions. This made it difficult to locate its origin, but Mr.Cambridge was certain it was not an East Anglian material. Professor B.Funnell, who also examined the sample, suggested that it might belong to the Hythe Beds of Kent (i.e. 'Kentish Rag') otherwise a Continental origin is possible. A sample was also sent to the Department of Mineralogy, British Museum (Natural History); Mr.D.T.Moore described it as a porous coarse-grained quartz arenite with a few chert grains and some lithic fragments of quartzite, but with no distinctive minerals or fossils. He also suggested the Hythe Beds or a similar source in South-East England as its origin. Further analysis by Mr.Cambridge revealed crystals of mica and a very few of kaolinised feldspar. On this basis he suggests as another possible provenance the Aislaby beds of east Yorkshire.

We find, therefore, that alone of the Saxon Shore forts, Brancaster was selected for a cladding of stone brought at least from the Kent area and possibly from Europe. Why this should have been so is a matter for conjecture. Kentish Rag is recorded as used in Roman buildings in Essex, and for medieval buildings in Ipswich, but has not been recorded, to the writer's knowledge, in Norfolk.

REFERENCE

1. Amphorae sherds identified by Tony Gregory.

APPENDIX 4. SURFACE FINDS
by Christopher Sparey Green and Tony Gregory

The collections of the Norfolk Museums Service and several private collections contain material from the interior of the fort and the fields around. Although these are predominantly surface finds and in some cases the precise findspot is unknown they are important to the overall picture of the site and are, therefore, included here. Of particular significance is the large group of copper alloy objects collected by Gordon Howell from the field immediately east of the fort, which forms the bulk of this appendix. All collections, however, have made invaluable contributions to our knowledge of the site, and the authors would like to record their gratitude to the owners and donors of the material, who have made this study possible.

Objects in, or donated to the Norfolk Museums from the principal collections are denoted as follows:

JB	-	J.Bunkle, from within the walls of the fort
AH	-	A.Holmes, from the fields immediately east, south-east and south of the fort
GH	-	G.Howell, from the field immediately east of the fort
TR	-	T.Robinson, from within the fort
KLM	-	King's Lynn Museum
NCM	-	Norwich Castle Museum

Each entry in the following catalogue is followed by a KLM or NCM accession number, where appropriate.

THE COINS
(Fig.84)

Five groups of coins are recorded from Brancaster, the first two of which are derived from the fort site, the others from the extra-mural areas east and west of the fort. No assessment of these finds has been carried out since the report on the 1935 excavations, so the recent addition of several new collections provides a timely opportunity to update the record of coin loss and compare this with other Shore forts (Reece 1980).

The first group comprises sixty-four coins recovered up to 1935 and listed in the excavation report of that year (St.Joseph 1936, 452-3). The second is a group of seven found by Jack Bunkle during cultivation of the fort site up to 1972 and eight found up to 1975 by Tony Robinson while field-walking the same area. These two small collections were examined by one of the writers (C.J.S.G.) and may possibly include some in Mr. Bunkle's possession which were counted in the 1935 catalogue. However, at least three were of emperors absent from the 1935 list so it has been assumed that all seven were new finds.

The third group comprises the twelve from the excavations west of the fort (p.41).

The fourth is the collection of eighty-seven coins found by Alan Holmes while using a metal detector in 1980-1 on the fields east and south-east of the fort. This group has been examined by Tony Gregory, as has the fifth group, a metal-detector collection from the field immediately east of the fort assembled by Gordon Howell. All five groups are recorded here in table form: detailed identifications of the excavation finds appear on p.41 and the Holmes and Howell collections are included in Tables 28 and 29 (microfiche).

The complete site coin list may be compared, on one hand with the fourteen sites

studied by Reece (1972) which go some way to providing a norm for Romano-British coin lists, and on the other hand with the coins from Richborough, Portchester and Lumpne (Cunliffe 1968, 1975 and 1980 respectively). Compared with the 'norm' there are four significant peaks, Periods VIII (A.D.193-222), XII (A.D.294-317), XIIIa (A.D. 317-330), and XIIIb (A.D.330-348) followed by an unusually rapid fall-off from XIV onwards (A.D.348-402).

The Period VIII high consists of twenty-eight denarii and one sestertius: this is not an unusual proportion for the time, but the possibility of a hoard of denarii must be considered. It is unfortunate that the individual locations of these coins, all from the fields east and south-east of the fort, are not recorded. The peaks in XIIIa and XIIIb are probably distortions caused by the exceptionally careful and systematic metal-detecting of the fields east and south-east of the fort, which has led to the recovery of large numbers of small coins which in most collection methods, including unsieved excavation, are under represented. The Period XII peak, and the rapid fall-off in XIV and XVa seem valid and significant.

Of equal interest are comparisons with other Saxon Shore forts (Fig.84): the two forts which have no occupation before the Saxon Shore system, Lympne and Portchester, have coin lists beginning abruptly in Period X (A.D.259-275), and show unusually high coin losses in Period XII, and end in Periods XVa and XVI respectively. Brancaster shares with Richborough an earlier start, but its Period VIII peak, if not a hoard, suggests second-century occupation culminating in some exceptional episode of coin loss. From Period X onwards, Brancaster compares better with Lympne and Portchester, all showing a Period XII peak, and tailing off after XIIIb, without the massive Period XVI coin losses of Richborough.

The proportions of coins would suggest an early start for coin loss at Brancaster, probably some time during the middle of the second century A.D., certainly well before Portchester or Lympne, and during a comparative lull at Richborough. This confirms the conclusions drawn from the defensive plans of Brancaster and Reculver, but it is by no means certain that the early coins indicate the occupation of a fort on the site. For the sake of consistency, if we were to argue for a garrison at this time on the basis of the coins, we should perhaps also argue for a much earlier occupation on the basis of the two early brooches (Fig.85, Nos.5 and 6). That, however, seems unlikely on present evidence, and so the nature of both the first-century and the second-century occupation remains uncertain.

Table 30 shows some striking differences between the intra-mural and extra-mural coin lists in Period XI (A.D.275-294) when intra-mural coin finds exceed the extra-mural, Periods XII to XIIIb (A.D.294-348) when the extra-mural predominate, and XVa and XVb (A.D.348-378) when the intra-mural finds are again in the majority. This is probably not a fair comparison since the intra-mural finds number only seventy-nine, compared with 675 certainly found outside the fort; further, there is always some doubt as to the exact findspot of some of the early coin finds, attributed here to the interior of the fort, but not always with complete certainty. Putting these objections to one side momentarily, one would argue for a movement of the centre of economic activity or coin loss from the fort in the late third century, to the extra-mural area (particularly the eastern part which produced the majority of the coins) in the first half of the fourth and back to the fort around the middle of that century. This is an attractive picture implying prosperity in the extra-mural settlement in the decades after the disturbances attendant upon the end of the Gallic and British Empires, followed by a contraction in the years of increasing Germanic pressure on the coast. This, however, is a dangerous over-simplification, not only in view of the statistical problems of sample size, but also of the lack of excavation evidence from the eastern part of the extra-mural area which has produced the majority of the coin evidence. Those coin finds could as easily

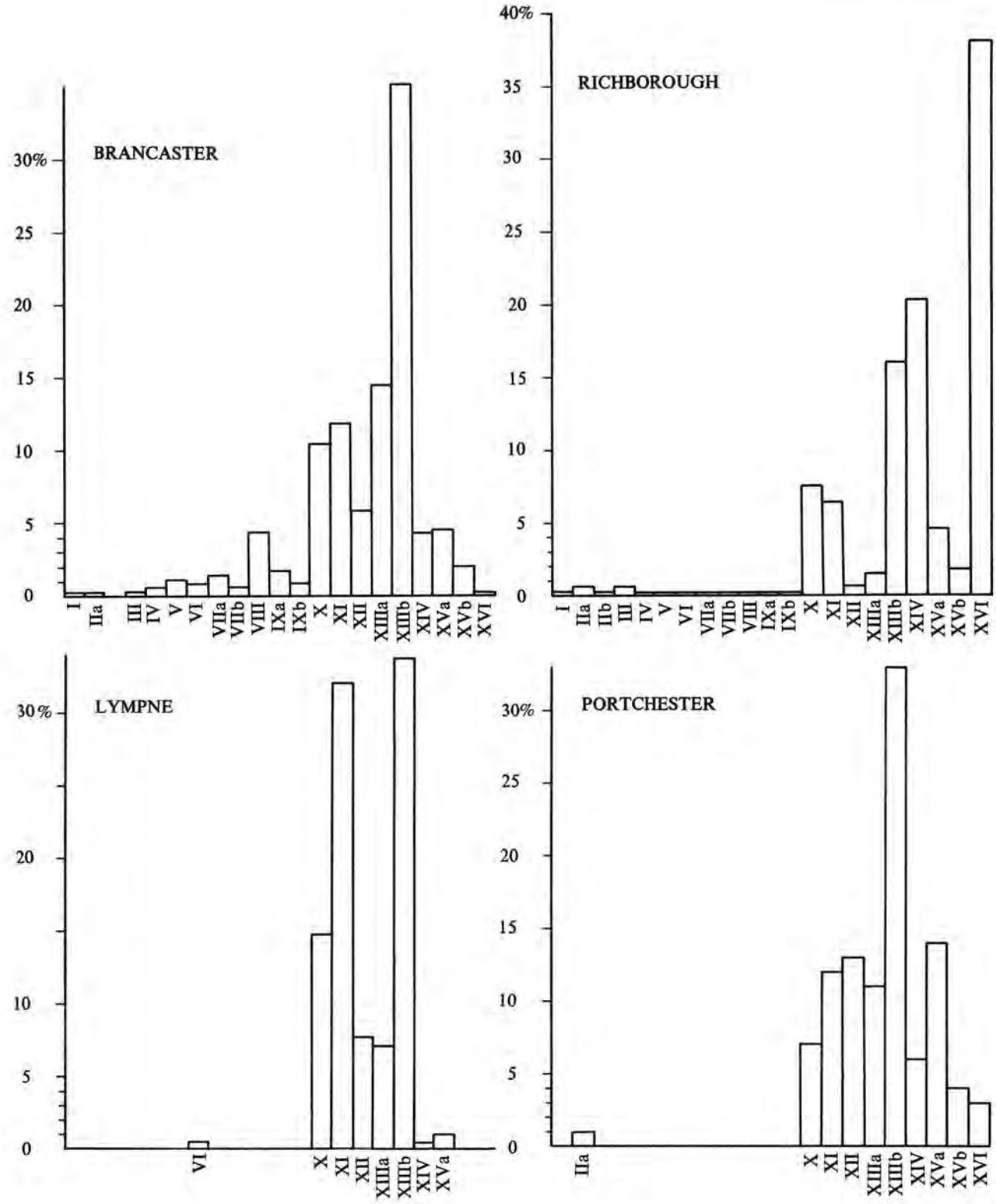


Fig.84. Histogram of coins from Brancaster and other sites for comparison.

Appendix 4

TABLE 30. BRANCASTER COIN FINDS BY NUMBER

Period	Intra-mural: to 1935	Intra-mural: JB and TR	Extra-mural: Excava-tions	Extra-mural: AH	Extra-mural: GH	Total
I (to A.D.41)	1	-	-	-	-	1
IIa (41-54)	1	-	-	-	-	1
IIb (54-69)	-	-	-	-	-	-
III (69-96)	-	-	1	-	1	2
IV (96-117)	-	-	-	-	4	4
V (117-138)	-	-	1	-	7	8
VI (138-161)	1	-	1	2	2	6
VIIa (161-180)	-	-	2	1	6	9
VIIb (180-193)	-	-	-	-	4	4
VIII (193-222)	1	-	3	-	25	29
IXa (222-238)	-	-	1	-	11	12
IXb (238-259)	-	1	-	-	5	6
X (259-275)	7	2	2	8	57	76
XI (275-294) (including barbarous radiates)	18	2	1	12	57	90
XII (294-317)	-	-	-	10	34	44
XIIIa (317-330)	5	2	-	17	78	102
XIIIb (330-348)	10	2	-	39	202	253
XIV (348-364)	2	-	-	4	25	31
XVa (364-378)	4	4	-	3	21	32
XVb (378-388)	10	2	-	-	2	14
XVI (388-402)	-	-	-	-	1	1
Total	60	15	12	96	542	725
Unident.	4	-	-	1	34	39
TOTAL	64	15	12	97	576	764

represent the reverse of the proposed model if the area was kept fairly clean and coins looked after. In that case, the predominance of coins of the first half of the fourth century east of the fort might represent the abandonment of the settlement and its conversion to arable, coins being incorporated in night-soil from the fort which was then spread over adjacent fields.

TABLE 31. BRANCASTER COIN FINDS AS PERCENTAGES OF TOTAL IDENTIFIABLE

Period	Intra-mural %	Extra-mural %	Site %
I	1.3	-	0.1
IIa	1.3	-	0.1
IIb	-	-	-
III	-	0.3	0.3
IV	-	0.6	0.6
V	-	1.3	1.1
VI	1.3	0.8	0.8
VIIa	-	1.4	1.3
VIIb	-	0.6	0.6
VIII	1.3	4.4	4.2
IXa	-	1.9	1.7
IXb	1.3	0.8	0.8
X	12.0	10.3	10.4
XI	26.7	10.1	11.8
XII	-	6.5	5.8
XIIIa	9.3	15.0	14.4
XIIIb	16.0	37.3	35.0
XIV	2.7	4.4	4.2
XVa	10.7	3.8	4.5
XVb	16.0	0.3	2.0
XVI	-	0.2	0.1

OBJECTS OF GOLD
(Fig.85, Pls.XXI and XXII)
by Martin Henig

1. Gold ring with oval bezel: triangular shoulders with carination below, and the lower part of the hoop faceted. This is a splendid piece of gold jewellery, ornamented with a dotted surround to the bezel and shoulders, each cut with a pelta and three vine leaves in relief. The ring is set with a gemstone (cornelian).

In general form the ring dates to the third century (Marshall 1907, form E xxxii; Henig 1978, 38 f. and Fig.1 type viii). The shoulders can in fact be compared with the open-work (opus interrasile) design of vine and pelta on a ring from Luxembourg (Henkel 1913, no.256). A ring in Vienna, of somewhat different shape but also dating to the third century, is ornamented with vine leaves both on the shoulders and around the bezel (Zwierlein-Diehl 1979, no.1236, pl.166).

While the ring is worthy enough of superlatives, the intaglio, damaged though it is, also deserves the greatest attention. Gems cut in the third century are not especially common, for interest was now shifting from the carving of small stones to the colour and texture of jewellery as a whole (Henig 1981). Most of the material consists of gems cut in cursory style (e.g. the silver ring Fig.85, No.3 above); intaglios engraved for official purposes are, needless to say, extremely rare.

However, our gem, despite a certain provincial naïvete in style, must belong to this second group. It shows the cuirassed bust of an emperor in profile to the left. He has a laurel wreath tied at the back with a ribbon, although a break across the stone has largely removed them. The emperor's beard and moustache appear to be somewhat

straggly, but this may be the result of the rather linear style, epitomised by long straight grooves cut with the lap-wheel. Richter publishes a number of third-century Imperial portraits on gems, but none is especially close although a bust of Claudius Gothicus or Postumus in the British Museum shows a similar use of the lap-wheel (Richter 1971, no.590). Fortunately coin portraits are exceedingly numerous: risking the displeasure of numismatists for whom an RIC number might seem essential, I here cite J.P.C. Kent's volume on coins (1978) with its excellent plates by Max and Albert Hirmer. The earliest portrait possible is that of Macrinus (Kent 1978, no.411, A.D. 218). His beard is not at all unlike that of the ruler on our gem, but his neck is too short. Moreover, the ring is not likely to be so early and if, as seems certain, both rings belong together, we can rule him out.

To find again such hirsute features we have to look to the Gallic Empire when a concious effort was made to revive the relative stability of the Severan age. We can probably ignore Postumus (Kent 1978, no.506) for his thick neck and concave nose do not correspond to the well-proportioned lines of the emperor on our gem. Victorinus (Kent 1978, no.518) is scarcely less heavy of build. Tetricus I, on the other hand, has thinner features and a beard of very nearly the right shape (Kent 1978, nos.520, 521). Dr. C.E.King of the Heberden coin room, Ashmolean Museum, cites an irregular radiate from Easton Grey, Wiltshire (ms. list no.117) which is even more convincing. If Tetricus was intended the signet must have been cut between A.D.270 and A.D.273, the date at which Aurelian forced him to abdicate. A final, but rather too tempting possibility is Allectus (Kent 1978, no.574); the long neck is right, but the beard is too neat and the sideboards altogether too thick.

This is the second seal of official interest of later third-century date from Britain. The bronze 'cube' from Kingscote which has been dated to the 270's or 280's (Henig 1977) displays on one face the head of Sol Invictus. He is clean shaven, but the linear cutting is remarkably close.

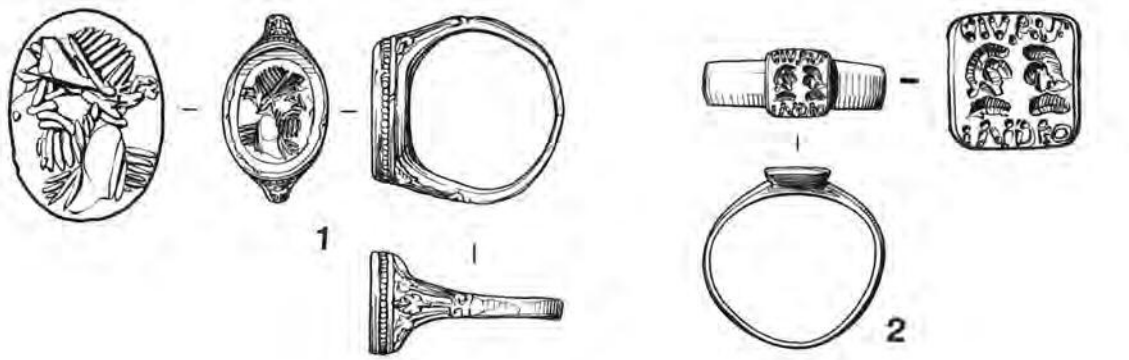
It may be objected, of course, that the cutter of the Brancaster gem was only approximating to the type of a Gallic Emperor. Even so he must have had a particular commission in mind: ring and gem, far beyond the range of what the average citizen might afford, are surely below the jewelled magnificence required in court circles? The ring might well have been bestowed on the commander of a regiment in the Imperial army as a sign of authority.

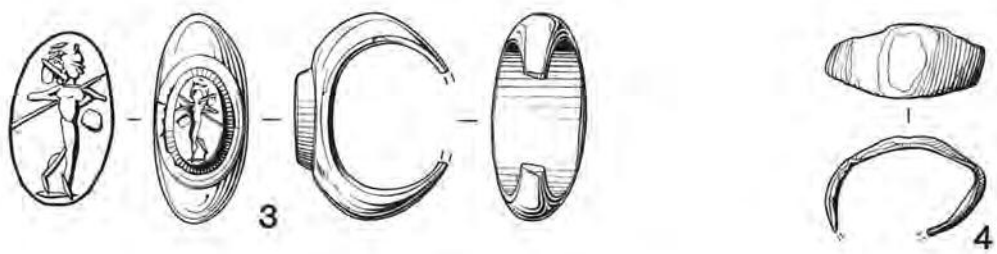
The stone and ring were probably made either in Britain or in one of the other frontier provinces of north-western Europe. (Found at Brancaster: NCM 76.94(93)).

2. Gold ring: ribbon hoop with three longitudinal facets and raised rectangular bezel.

The bezel is engraved with two busts, one bearded (male) and the other unbearded (female) confronting each other. The type is a regular betrothal/marriage motif, here engraved in a distinctive manner making considerable use of the vertical drill especially for hair and drapery. Noses are the most prominent features of the physiognomy. Above the busts is inscribed VIVAV (i.e. Vivas) and below them IN DEO, which gives the ring a Christian connotation. (Sherlock (1980) discusses the same legend on a silver spoon from Caistor St.Edmund). Again the vertical drill is used, here to terminate the letter strokes instead of serifs.

The ring has already been published many times. It was first noted by S.Woodward in a communication to Archaeologia (1830, 361) published in 1831 but read the year before when it was stated that it had been found in the previous year - 1829. The ring is cited with a figure of the bezel in the Proceedings of the British Archaeological Association (Fitch 1880, 115) and again with the same cut in VCH Norfolk I, 304f. J.M.C.





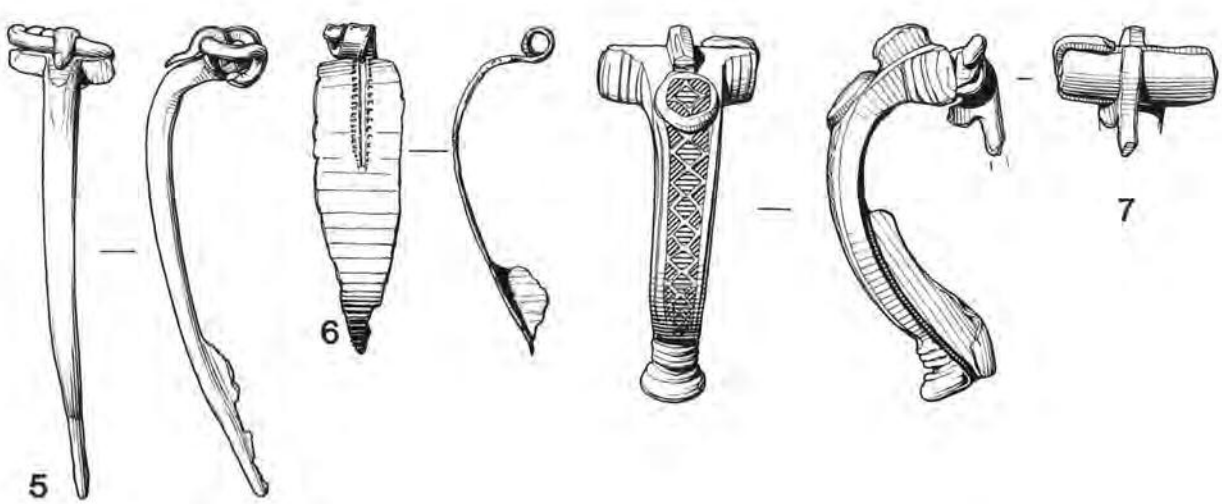


Fig.85. Finger-rings of gold 1-2, and silver 3-4; copper alloy brooches 6-7. Scale 1:1, except impressions of rings 1 and 3, and detail of ring 2 which are 2:1.

Toynbee includes the ring in her study of Christianity in Roman Britain (1953, 19 and pl.iv, 6) drawing attention to the crudity of the heads and suggesting that the legend might be a secondary feature, engraved on the presentation of the ring to a Christian.

The legend is CIL VII, 1307. Other references are Clarke 1960, 129 and 230, pl. 39; Henig 1978, 94 and 280 no.790, pl.lviii; Thomas 1981, 131.

The ring form is a common one in the fourth and fifth centuries, occurring in gold, silver and bronze. Some examples have lateral facets along the hoop. A bronze ring from Richborough has a rectangular bezel engraved with a Chi-Rho flanked by alpha and omega and along the hoop IVSTINE VIVAS IN DEO (Toynbee in Cunliffe 1968, 98f, pl. xlii no.160); examples of silver rings include one found outside Caistor St.Edmund with a male head and the blundered legend V[IV]AS IN DEOI (found 1984), two from Fifehead Neville with the Christian monogram; one from Droitwich with a bird and three in a hoard from Amesbury, the most interesting of which from our point of view has two pairs of confronted heads in a mannered style, clearly provincial. (Henig 1978, 280 f, nos.795-803). Gold rings include the famous example found in or near Silchester and now in the Vyne, with a bust of 'VENUS' on the bezel and the hoop inscribed SENICIANE VIVAS IIN DE (O) (Toynbee 1953, 19-21, fig.6d; Henig 1978, 280, no.789), one from Suffolk with an octagonal bezel engraved with a Chi-Rho (Sotheby sale catalogue, 17 April 1980, 9, no.14) now in the British Museum, and a ring from Great Stanmore, Middlesex, with confronted male and female busts. This is now only known from a drawing (Gough's Camden, 1806, vol.I, pl.cxx, vol.II, 108 f; Henig 1978, 280 no.791). It appears to be in considerably more regular style than the Brancaster ring. (Also see Cleveland 1850, 190 for gold ring with oval bezel from Piercebridge, Co.Durham, engraved with confronted busts).

Amongst comparanda from elsewhere we may cite the following gold rings: in the British Museum is one with a simple hoop, rectangular bezel with confronted busts and the legend 'SPERATU(S) BENERIAE" (Marshall 1907, 35 no.208, pl.v); another ring, also in the British Museum has a hoop composed of seven circular medallions and a bezel showing husband and wife and a cross (Dalton 1912, 21, no. 127); a ring in Dumbarton Oaks with simple hoop but bezel like the last inscribed in Greek to Aristophanes and Vigilantia (Ross 1965, 48-50, pl.xxxix, no.50); a simple ring from Carhaix, Finistère with confronted busts of man and woman on the bezel inscribed 'SABINE VIVAS' (Deloche 1900, 67, no.lvii). Finally, what seems to be the closest parallel, a ring from a little treasure from Trivolzio, Pavia, with a longitudinally-facetted hoop and stylised confronted busts (Degrassi 1941, 306f, fig.2C). Degrassi wished to date the hoard to around the middle of the fifth century. This may, of course, seem to be too late for Brancaster, but only because, in the context or Roman Britain, scholars have been notoriously reluctant to allow Romanitas to survive the magic year 400 (or 410); Painter (1977, 62) writing about the Amesbury rings, assigns them to the fourth century A.D., but I would prefer to date them some decades into the fifth century.

The recent recognition of a monogram ring from Richborough, still of rectangular-bezel type but clearly very late Roman or 'Merovingian' (Henig 1976, 242f, pl.xxxix, a) is also highly suggestive of a lower dating for other rings of the same general class.

Professor Charles Thomas's work (1981) which so eloquently suggests the survival of a British population and of Christianity in the lowland area of Britain - and we must not forget the partial survival of the name, Branodunum (Thomas 1981, fig.44) - should make us better able to accept that the Brancaster ring may have been made after the severing of political (though hardly of cultural) ties with the Central Empire early in the reign of Honorius. In this connection it is worth pointing out that the Thetford treasure (Johns and Potter 1983) is evidence for a flourishing goldworking tradition in late Roman

Gaul or Britain and there is no reason why such workshops need have ceased manufacture while there were Roman provincials keen to acquire rings to wear. (NCM 76.94 (105)).

OBJECTS OF SILVER
(Fig.85)
by Martin Henig

3. Silver ring: somewhat flattened hoop (now incomplete) expanding towards bezel. There is a slight thickening at the shoulder. The ring is set with a gemstone (cornelian) which stands proud of the bezel. It has a flat top and bevelled sides.

Compare ring with Henkel 1913, 58 and pl.xxi no.425 (from the Rhine near Mainz) and no.426 (Cologne); Henig 1978, 38 and fig.1 ring type x. Early third century A.D.

The elongated shape of the gem is also a familiar third-century feature (Henig 1978, 32).

The intaglio depicts Mars Gradivus marching right, holding a spear in his right hand and a trophy over his left shoulder. Below his feet is a ground line. The type is very common even in Britain (cf. Henig 1978, nos.70-74; app.13, app.29. app.71, app.98). Our gem is engraved in a summary and rather slapdash manner corresponding to Dr.Maaskant-Kleibrink's 'Incoherent Grooves Style' (Maaskant-Kleibrink 1978, 326 ff. especially nos.982 and 983 for Mars Gradivus and 1034 for the shape of the gem and spindly grooves of the cutting).

Apart from gems it is apposite to cite a bronze plaque showing Mars Gradivus from the Saxon Shore fort of Burgh Castle (Morris 1949, 116).

The type would, of course, have had special relevance for a soldier to whom Mars, especially when conceived as a youthful, active god, was the ideal exemplar. (Private possession. Found during building work west of the fort).

4. Silver ring: hoop expanding towards the bezel which is undifferentiated from it. Shape resembles Henig 1978, fig.1, type V (Henkel 1913, 235-6, pl.XVIII, nos.353, 354, pl.LXXX from Annecy in Savoy from a hoard dating to the reign of Alexander Severus). Early third century A.D. (NCM 86.984(24).GH).

OBJECTS OF COPPER ALLOY
(Figs.85-92)
5-16. Roman Brooches
by Donald Mackreth

5. Colchester: two coils of the six-coil bilateral spring are missing. The chord is held by a plain hook with a pointed end. Each wing is plain as is the bow which has a rounded front and a flat back. Most of the catch-plate is missing, but there seems to be a trace of a rectangular piercing.

There are no particular features present to tell whether the brooch should be early or late in the series save that the bow has a curved profile: those which have a high kick at the top and a nearly straight bow are early in the sequence. On the other hand, the size of the piece and the absence of any decorative trick belonging to what seem to be late Colchesters, suggest that the likely manufacturing range is c. A.D.20-40 with the possibility that the whole range could be carried back a few years. The item could, however, have survived in use until c.55-60. From 1935 excavations, cutting A (NCM 81.936).

6. Nauheim Derivative: now distorted so that the form of the bow and its decoration is hard to see; half the four-coil spring is missing. The bow is thin in section and appears to be lanceolate in shape. On the upper part and down the centre are three grooves. That on the left has a series of rectangular punch marks along it, that on the right, round ones. It is not clear if there are any marks down the central groove.

The use of punch marks might show that this brooch has some affinity with one of the more numerous sub-divisions of decorated Nauheim Derivatives, but, as they seem to have been carried out singly rather than by using a toothed tool (cf. Brodribb, Hands and Walker 1972, 72, fig.30, 126), there is no real case for insisting on the relationship. Without any dated parallels, only the general date range for the type can be offered; c. A.D.45-c.80/90. There are no good grounds for placing this piece in pre-Conquest times. (NCM 86.984(13), GH).

7. Headstud: the hinged pin is mounted on a rolled sheet metal tube held by a cast-on flap behind the wings which has been bent up round the tube. In one end of the tube is the surviving end of a wire loop. Each wing has five steps running up to the bow. On the head of the bow is a crest with a longitudinal ridge lying in a hollow along its top. Immediately below the crest is a nearly circular stud with five recesses for enamel. The central one is filled with a mid-blue enamel and around it are four vesica shapes, filled with a discoloured enamel, lying on the periphery of the circle. Below the stud, the bow has a slight step down each side with, down the middle, rectangular recesses set lozenge-wise with infilling triangles on each side. A mid-blue enamel survives in some lozenges and a trace of red can be seen in three triangles. The foot of the bow is finished with three cross-mouldings and the two-part foot knob is separated from these by a flute.

There is no easy parallel for this brooch. Its design is close to a well-defined group which is similar in virtually all respects except that its members have enamelled ornament on the wings (e.g. Stead 1976, 198, fig.99, 12; Painter and Sax 1970, 165, fig.3, 13, 14). Stepped wings, as on the present example, belong to another major group which lacks the crest and has a cast-on loop (e.g. Bushe-Fox 1916, 24, pl.XVI, 10), but has the same arrangement of enamel-filled lozenges and triangles down the front of the bow. There is another closely related group which differs in having solid lozenges on the bow (e.g. Neal 1974, 125, fig.54, 17). The precise relationship of the present brooch to these others is not explicit, but could be described as standing more or less at the head of the typological developments leading to these groups, if the casting of a flap on the back of the head is the first step to the casting of a closed cylinder behind the wings. The writer has not hitherto noted the technique of the cast-on flap, possibly because the detail would usually be obscured by corrosion.

As for the date of the brooch, the Headstud, as a developing type, was established by A.D. 75 as five specimens from 'The Lunt', Baginton, Warks. show (Hobley 1973, 65-9, fig.19, 1, 4, 6, 9 and one unillustrated). All five were found together in a pit. These are all at an earlier typological stage than those groups which have already passed under review, but the main style is becoming fixed (Hobley 1973, 66, fig.19, 9). Even if it is a matter of chance that a fully developed Headstud has not yet come from a dated context earlier than c.75, the relatively large number of developed forms found at Newstead (Curle 1911, 318-323, pl.LXXXV, 3, pl.LXXXVI, 17-22) shows that they belong to the latter part of the first century and run into the second. (JB).

8. Unclassified: the spring is housed in a cylinder with an open back and held in place by an axis bar which runs through the pierced ends of the case. Along the top of the case, and facing forward, is a step. The bow is basically rectangular in section with a concave cross-flute top and bottom set off from the ends by a flat face. Between the flute, and stopped next to it by a cross-moulding, is a central recess which has at least

two circular depressions. The recess is bordered on each side by a cable moulding divided from the flat side faces of the bow by a groove. Between the bow and the top of the foot is a concave face separated by a step from the rest of the bow and, further, by a projecting plate possibly with a squared-off front. The foot has a median arris with a convex surface on each side finished at the bottom with a moulding. The catch-plate is almost cylindrical with a narrow slot on the right and is stepped up from the base of the foot.

There are details in the design which reveal that this brooch stands near the beginning of the development leading to the Crossbow Type: the profile, the basic form of the foot, but, above all, the projecting moulding with a concave surface beneath at the base of the bow. A few of the type are found in Britain, but dating here is very much at a premium: one from Caerleon was dated c.220 (Wheeler and Wheeler 1928, 164, fig.14, 17). On the Continent, the general type is commonly found along the Rhine and is there dated to the end of the second century and the beginning of the third (Böhme 1972, 24, taf.13-4, 490-611). Although the collection from Niederbieber is relatively small, the numbers of the present type represented there is so small that, as that site was not occupied until A.D.190, it is possible that the range should be moved back to lie in the second half of the second century with a few surviving in use into the early third century (Gechter 1980, 590, 600, fig.5, 4-5). (NCM 86.984(7), GH).

9. Unclassified: the spring with an internal chord is housed in a spring-case with an open back and is mounted on an axis bar which passes through the ends of the case. Above the spring-case is a knob with a basal moulding. Along the front of the case is a step. The bow has three facets down the front, three cross-mouldings at the top, and a boldly projecting plate near the bottom. Beneath the plate, and running back to the foot, is a concave surface in the profile with a step at each end. The foot has a median arris with a suggestion of facets on either side. The foot tapers outwards towards the bottom and has a rounded toe. There are traces of tinning or silvering.

The brooch is, in some senses, a proto-Crossbow. The bow section and the form of the lower bow can easily be paralleled on early Crossbows proper (Böhme 1972, 94-8, tafln.16-20, 698-805) although the foot is not finished off with the forward-facing moulding which is to be found on these. In fact, the foot recalls that of the earlier Augenfibel (e.g. Böhme 1972, 71, taf.1, 5). In general, brooches similar to the present example are dated from the middle of the second century into the third century (Böhme 1972, 24). However, the presence of the knob on the head is a distinct forerunner of the same feature found in the Crossbow and is also to be found on related brooches which have divided bows and a more primitive version of the moulding at the foot of the bow, but with the foot of the Brancaster brooch. Divided bow brooches are held to run to a later date than the versions with solid bows. In the present case, the profile of the bow and the presence of the knob indicate a move towards the early Crossbow while the foot harks back: the date is perhaps the latter part of the second century into the third century. Good parallels are rare in Britain and none provides a better indication of dating than is offered by the numerous examples found on the Continent. (JB).

10. Crossbow: the wings, the knob on the top, and one of the brackets in front of the wings are missing. The base of the knob once mounted in the head survives and consists of a tube with a beaded wire wound round it. The surviving bracket, when viewed from above, consists of two voided curls of a scroll with a terminal leaf. The front of the leaf has a hole running through it. The bow is short and well curved with a trapezoidal section. Down the front face was a zone of ornament made up of pairs of leaves in 'V' formation lying between grooves. The decoration is now only visible at the ends of the zone. The bottom end of the bow has a piece of beaded wire around it above a short moulded section joining the foot. The latter has four 'C' motifs on each side rising from a chamfer with an extra volute at the bottom. Down the centre is a repeat of the leaf

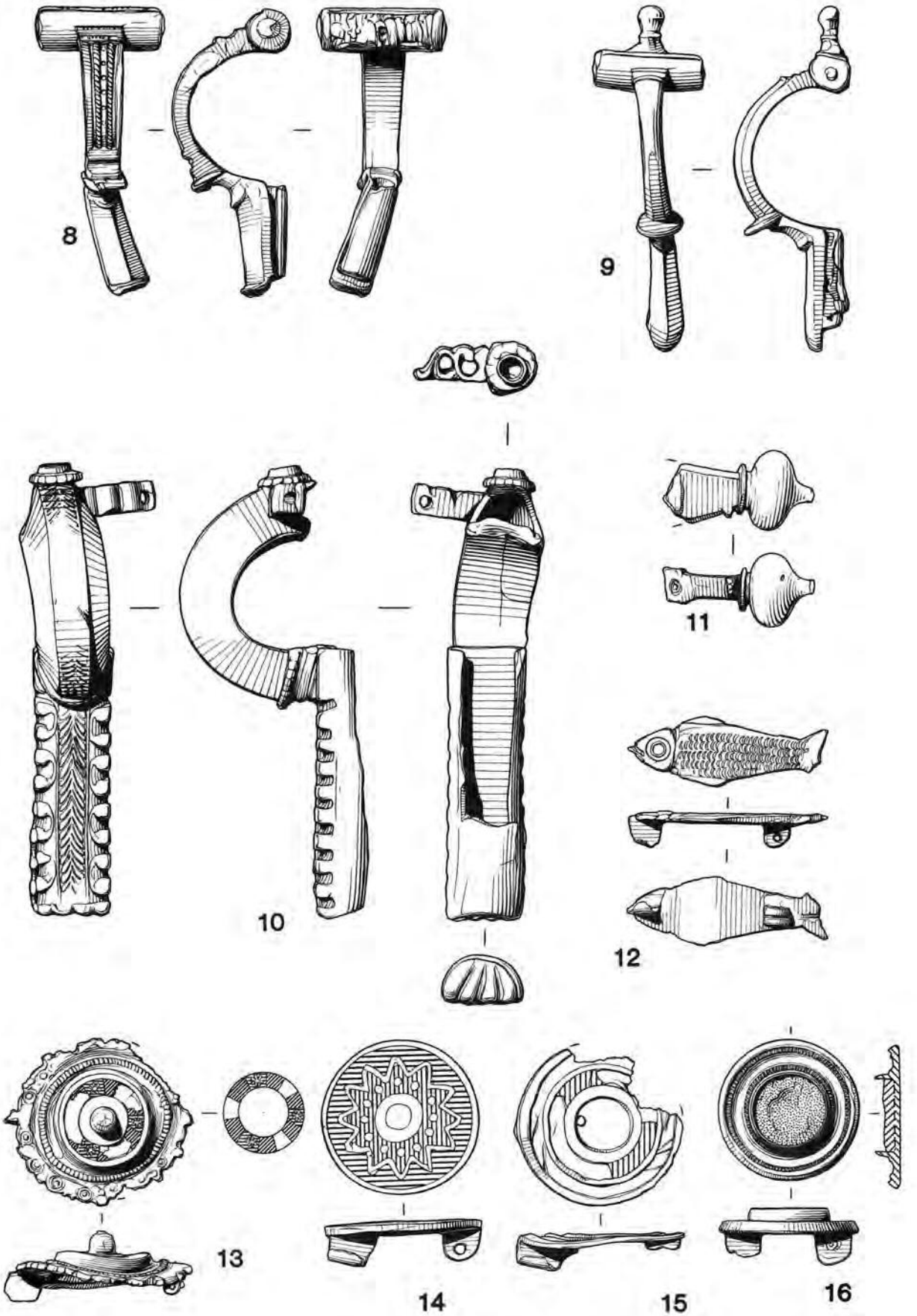


Fig.86. Copper alloy brooches. Scale 1:1.

decoration on the bow. The almost semi-circular surface under the foot has three grooves radiating from the back.

There are signs of considerable wear on the exposed edges such as the front of the bow, the sides and leading edge of the foot. The surviving wire at the base of the missing top knob is also worn which suggests that, even in a damaged state, the brooch still had a use to its owner.

The manufacturing technique is of some interest. It was built up from a set of separately made fragments: three hollow knobs, each with wire bound round their bases; tubular wings, six or eight-sided in section; two brackets; the hollow bow with the wire round the lower parts; the foot cast in one with the lowest section of the bow below the wire. The foot was cast with a single plate behind which was then bent and cut to form the slot and catch. The red colour of the metal suggests that it is of almost pure copper and that the whole was once gilded. If the base metal is copper, the process used for applying the gold was almost certainly mercury-gilding, not the application of leaf gold, and that the brooch was designed to look like solid gold from the beginning.

The group to which this brooch belongs, Keller's type 5 (Keller 1971, 41-52, abb. 11), is usually made from sheet metal and frequently bears traces of having been gilded. Where there is an element of doubt, a test should be made to determine whether the base metal of the brooch is essentially pure copper as opposed to a copper-tin or copper-zinc alloy.

Keller's dating (1971, 35, 41-2) is ambiguous: his arguments are typological and, therefore, as he places such brooches later than others, there has to be shift forward in date. While the layout of his types conforms with the available coin-dating and provides every appearance of being an inexorable progress, the coin-dating which he presents for his type 5 does not fit the chosen path and is absent for his type 6 (Keller 1971, abb.12). It is possible that the datings available to him are to a large measure distorted, as there are few brooches of either type 5 or 6 compared with the numbers which may be assigned to his earlier types, and they occur at a time when coinage is beginning to fail as a constant dating medium. What is clear is that the type belongs to the second half of the fourth century and most may centre on 375 and run later than the pure date-range offered by coins may suggest; such a date would well fit the example from the Lankhills cemetery, Winchester (Clarke 1979, 260, fig.32, 278).

There is, however, one feature of the Brancaster brooch which may help to arrive at a more satisfactory indication of date: the foot of the brooch is, in proportion to the rest, long. Keller's system relies to some measure on proportions and it can be seen that the exemplars for his types 5 and 6 display a short foot for 5 and a long one for 6 (Keller 1971, abb.11). A search through examples of each type reveals that such extremes do not apply uniformly, but it can be argued that the elongation of the foot of the brooch in proportion to the span of the bow is a progressive one and, at the very least, a long foot should be later than a short one. As has been said, dating is at a premium at the end of the fourth century, but the Stilicho diptych shows fairly convincingly what the proportions of foot to bow were at c.400, even if the brooch itself appears to be a type 6 (Strong 1976, 165, pl.241). It is suggested that the Brancaster specimen not only belongs to the second half of the fourth century, but is most probably later than 375 and, as there is no evidence that Keller's types 5 and 6 are, to a large extent, mutually exclusive, could well be c.400 or later. On the basis of the degree of wear which the brooch exhibits, it was probably in use in the early fifth century. If the brooch is made from copper and had been gilded as this would indicate, the absence of traces of gold may be due to the object having been stripped during its useful life. (JB).

11. Crossbow: only the right-hand wing survives. It has a flattened 'onion'-shaped knob at the end rising from a prominent narrow moulding. The back of the wing is half-round, the top and bottom faces flat. The front has a moulding next to the knob with cross-cuts on the front, and then it tapers forward to meet the bow. At the end nearest this is a step up on top probably forming the edge of a platform for the brooch's central knob. Behind, can be seen the end of the axis bar for the hinged pin, and, on the forward part, is what appears to be a ring-and-dot ornament which, in this position, must have been made after the brooch had been broken.

Only a fragment is present from which to determine the full type and the date. The most recent classification of Crossbows used specimens from coin-dated graves. The result is reasonably consistent for the first four of the six defined types, although not enough recognition is given to hybrid types and the series is assumed to be mono-linear (Keller 1971, 31-45, 52-3). With only the wing to use in establishing to which of Keller's types it is best suited, some doubt must reside in the outcome. The closest fit seems to be type 4 which Keller dates to A.D.350-80 (1971, 35; 228-68, tafln.12-46 passim). (NCM 86.984(48), GH).

12. Zoömorphic: in the form of a fish, the catch-plate is hidden behind the mouth and the two lugs for the hinged pin are behind the end of the body. The head is well modelled with a partly open mouth and a large ring-and-dot for the eye. The head is set off from the body by a shallow depression. The body is shaped with a slight curve and a dorsal and ventral fin. The impression of scales is given by five rows of small C-shaped stamps, but it is not clear whether or not these were made in the mould or on the castings. The tail is plain except where one row of scales continues too far and has a shallow 'V' along the back edge; the lower point is now missing.

The remarks made here are confined to representations of fish: to introduce other forms of life would muddy the water. The writer has recorded no dated specimens from Britain. In fact, fish are rarely used as a form for brooches. One from Augst is merely given the date-range of the first to the third century (Riha 1979, 202, taf.67, 1742). One came from each of the fort sites at Saalburg and Zugmantel and both are assigned to the middle of the second century (Böhme 1972, 43, taf.26, 1053-4), but this is more or less a standard date given to enamelled brooches, and often to unenamelled ones and rests upon no sure foundation other than the detail that they are not characteristic, save for some bird forms, of the first century and are not to be expected in the third. (NCM 86.984(20), GH).

13-16. Plate brooches:
13. The hinged pin was held as in brooch 12. The centre of the brooch is a raised circular platform which has on its top a recessed annulus once filled with enamel and millefiore glass. Of the latter, three panels in dark blue with a discoloured star motif survive. These seem to have alternated with another, probably also millefiore, and each to have been separated from any other by solid masses of red enamel. In the centre of the platform is a boss rising from a reserved field and around the base of this is a double annular flute divided by a beaded ridge. Round the periphery of the brooch is a ring-and-dot ornament fitting into a scalloped edge to the brooch plate, each scallop divided from its partners by a small squared-off projection.

Parallels are hard to find as the brooch belongs to a major family in which a large repertoire of ornament is used, each item using only a few motifs. The link here with the rest of the school is the scalloped edge with the ring-and-dot decoration. Because of the diversity of the group, dating can be difficult but tends to lie in the second century: a late second-century example has been found at Chichester (Down and Rule 1971, 113, fig.5.12, 228K), but dated British specimens are uncommon. There is a suggestion that the school came into being at the end of the first century (Riha 1979, 187, taf.

60, 1597) and, as these remarks are being confined to simple forms with similar borders and the number of useful examples is limited, the date-range would appear to run from, perhaps, the last years of the first century to near the end of the second. (NCM 86.984(22), GH).

14. The spring was once mounted on a single pierced lug. The plate is flat and circular and is recessed for enamel. That in the outer zone is mid-blue and separated from the next zone by a reserved chevron strip. In the base of each point is a small reserved dot set in the discoloured enamel of the central zone. The centre of the brooch seems to have a small circular recess, again with discoloured enamel.

The design of the brooch, coupled with its spring-fixing arrangement, shows that this is British in manufacture and examples are not to be expected on the Continent. The type does not occur in great numbers and those which the writer has recorded all come from southern England, but it is likely that this is due to the bias of the samples seen. None is dated in this country satisfactorily and much will depend upon the dating of the style of the spring mounting: see the discussion after brooch 12. (NCM 86.984(15), GH).

15. The spring, now missing, was fitted between two pierced plates, which carried an axis bar through the coils, joined by a raised ledge across the top. The plate itself is damaged, flat and has two annular recesses for enamel around a central circular recess. Traces of a discoloured enamel survive only in the central zone. (NCM 86.984 (40), GH).

16. The spring was held as in brooch 14. The circular plate still bears traces of gilding. In the centre is a raised boss with remains of an orange enamel set in it. No original surface is left of the enamel. Between the boss and the raised border is a flute with a step on each side bearing a series of close-set cross-cuts giving a beaded appearance.

The type of spring-fixing arrangement on brooch 15 would seem to be a specifically British style and, although it is not the same as that on brooch 16, the design on the front of the plate bears a resemblance to the earlier versions of that, so that it seems advisable to associate the two together in a single discussion. The designs are simple, consisting entirely of concentric rings of enamel which is usually missing. The use of millefiore does not seem to have been proven on British brooches and this serves to separate Continental brooches from these in the frequent cases in which the manner of holding the pin is not shown or described.

However, it should not be assumed that the enamelling itself was always simple. In the case of those like brooch 15, it is clear that colours could alternate around the rings and, in common with the progenitors of brooch 16, the central cell seems always to be found empty, although the predecessors of brooch 13 can be seen to have had a paste gem in this position and the same may have applied to those like brooch 11.

No.16 belongs to a numerous and well-defined type in which the plate may be round or oval, is always gilded where the surface is well-preserved, with a tinned or silvered back and usually further decorated with applied stamps. Here, these are absent, being replaced by cross-cut sunken mouldings. The design from which this style grew is usually enamelled like 15 in simple zones and may be oval or round. It is not only the single lug for the spring which unites the series, but also the use of paste intaglios (Atkinson 1916, 35, pl.IX, 34; Winchester, excavations, M.Biddle, unpublished). Dating for the early enamelled series is difficult: one from Richborough is, by implication, third century or earlier (Bushe-Fox 1949, 117, pl.XXIX, 4B); another from Kidlington, Oxon., was found with what might be called a hoard of brooches in what is an equivocal context, but the rest would normally be dated to the second century even if

the actual deposition might have been later (Hunter and Kirk 1954, 59, fig.26, 1, pl.III). The gilded series is even more difficult to date in Britain despite the growing numbers: the only useful specimen is that from Fishbourne, dated to the later third or early fourth century (Cunliffe 1971, 106, fig.40, 43). One must turn to the Continent for an inkling of the true date: the three from the combined collections from Saalburg and Zugmantel must have been lost before 260 (Böhme 1972, 110 (+1133), taf.29, 1132, 1134) and one from Augst was found with third-century pottery (Riha 1979, 88, taf.13, 309). Although sometimes thought to be a fourth-century type, the meagre evidence points to the third century and, if the connection with the second-century enamelled series is to be trusted, it is likely to belong to the first half rather than later. (NCM 86.984(47), GH).

17. Saxon Brooch
by Andrew Rogerson

17. Very small cruciform brooch of Åberg's group II with iron spring coil. Grooved decoration occurs on the knobs which are cast in one with the head-plate, below the bow, and on the foot. The whole of the front surface shows moderate signs of wear.

When broken off the missing iron pin was pointing away from the catch-plate within which there is no iron corrosion. The brooch may, therefore, have been lost or discarded rather than attached to a garment and buried in a grave.

Åberg (1926) dated his group II to the first half of the sixth century, while Reichstein (1977) suggests a date in the last third of the fifth. The cast knobs indicate a late development, and if Reichstein's dating is acceptable then this piece may have been made c. A.D.500. (NCM 86.984(17), GH).

18-25. Bracelets and pins
by H.E.M.Cool

18. Rectangular section, widest to wrist, band; both ends broken, one end tapering towards terminal; at one end upper surface is decorated with double ring and dot and three vertical grooves, remainder of surface decorated with central horizontal groove with flanking edge nicks. Incomplete.

This is a fragment of a multiple unit bracelet. These bracelets had a decorative scheme divided into three zones. The zones behind each terminal were identically decorated with one motif while the central zone that divided them was composed of two or more motifs. All that remains is one of the zones behind a terminal and the beginning of the central zone. Multiple unit bracelets were primarily a fourth-century form but like the light bangles they may have developed in the late third century. (NCM 86.984 (19), GH).

19-20. Three-strand cable-twist bracelets of oval section; right-hand twist.

Both bracelets 19 and 20 are of a type which was in use throughout the Roman period in Britain and it is not generally possible to date an individual example more accurately. There are grounds for believing, however, that penannular cable-twist bracelets were primarily a fourth-century form (Cool 1981, 125). Neither of these two retain their terminals, but they do have the large section size that is characteristic of the penannular examples of this bracelet type. We may very tentatively suggest, therefore, that Nos.19 and 20 are fourth century in date. (19: found within the fort, NCM 371.957; 20, JB).

21. Rectangular-sectioned, narrowest to wrist, band with upper edge decorated by widely-spaced grooves; one end broken, the other a side-by-side overlap terminal.

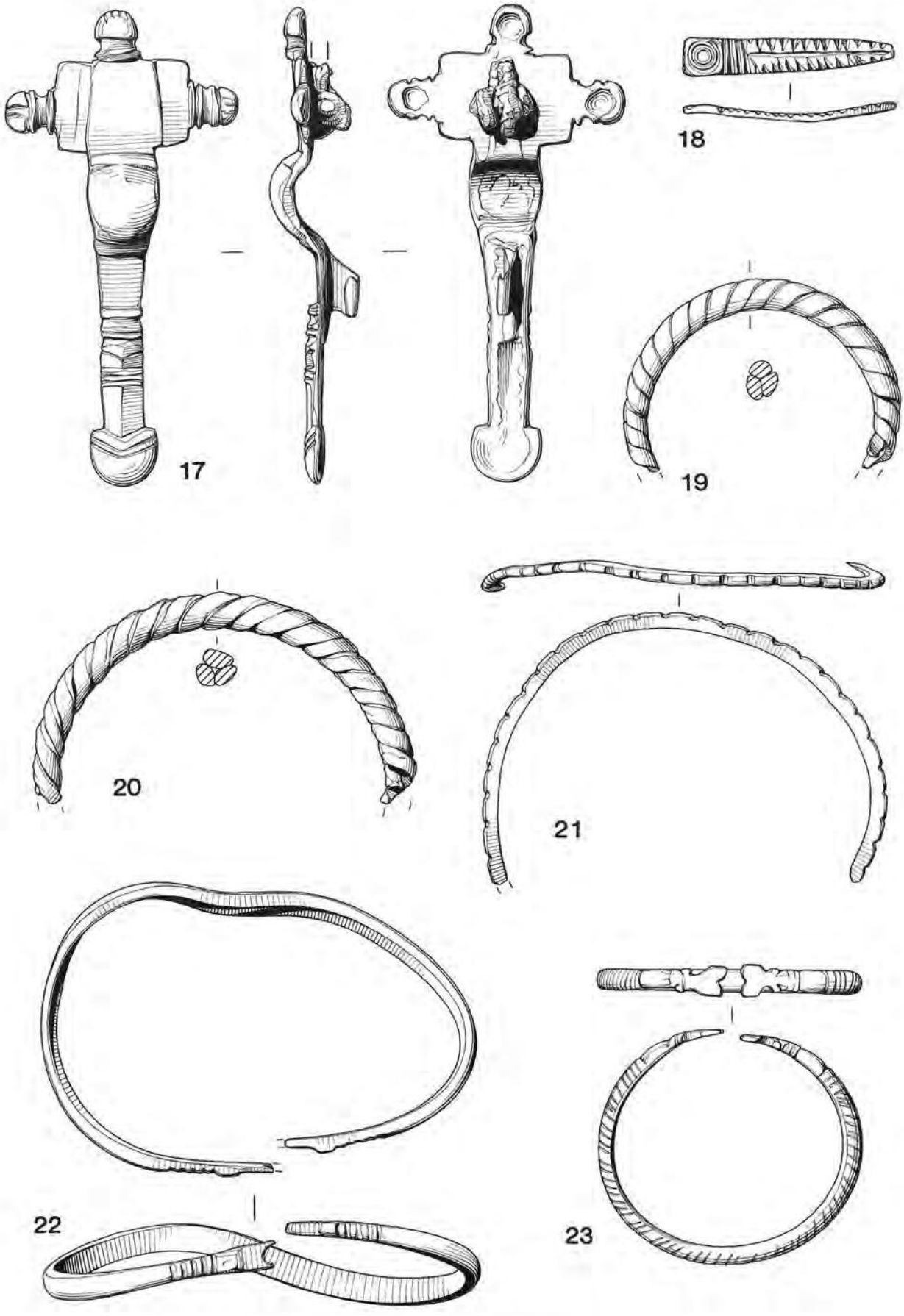


Fig.87. Copper alloy brooch 17 and bracelets 18-23. Scale 1:1.

Such ribbed light bangles, decorated with a wide variety of motifs, were the dominant bracelet form of the fourth century. There are slight indications that they developed in the late third century (Cool 1983), but the most likely period of use would have been the fourth century. (JB).

22. Rectangular-sectioned band: curved upper surface; worn widest to wrist; broken hook-and-eye terminals; a square raised block and unit of vertical grooves are positioned behind each terminal. A fourth-century type, but penannular bracelets decorated this way are occasionally found in earlier contexts. (NCM 4.960, found inside the fort).

23. D-sectioned band: tapering to penannular terminals consisting of expanded plates with scooped edges; a low rectangular block behind each terminal; hoop decorated with diagonal grooves. The precise form of these terminals does not seem to be paralleled elsewhere, although similar expanded terminals are found on the fourth-century Schlangenkopfarmringe of Central Europe (Lâ nyi 1972, abb.58). Normally the penannular bracelets of this type found in southern Britain have straight-edged or tapering and rounded terminals. A fourth-century type, although penannular bracelets decorated in this way are occasionally found in earlier contexts. (JB).

24. Pin with flattened spherical head; broken shank has expansion part-way down. (JB).

25. Pin with onion-shaped head; shank has expansion half-way down. (JB).

26-29. Copper alloy rings
by Martin Henig

26. Copper alloy ring; hoop of rounded section, grooved on either side of the bezel which is circular and not engraved.

The ring may be compared with an example from Gadebridge Park (Neal 1974, 146-7, fig.65, no.255), associated with coins of the first half of the fourth century. This has a flattened hoop with notched decoration flanking the rounded bezel. Rings found in a grave at the Lankhills cemetery, Winchester (Clarke 1979, 319 and fig.98, nos.565, 570) belong to Clarke's Type B. Like our ring they have rounded hoops with grooving, but the bezel consists of a simple projection. A date after the middle of the fourth century is proposed.

A more substantial ring from Rheinzabern is grooved around the hoop; its circular bezel was set with a metal intaglio. Henkel (1913, 91 and 245, no.976) assigns it to the fourth century.

Unlike 3 above which belonged to a person of some standing in the community, this ring is the sort of trinket worn by the poor - but still romanised - element in society. (JB).

27. Copper alloy ring: flattened hoop expanding towards the bezel. Type XIII (Henig 1978, 39 and fig.1). Slightly crushed. It contains an oval intaglio of glass paste imitating nicolo which stands 2 mm proud of the bezel (shape F2). The device is a figure of Victory in profile to the right holding a wreath. Compare Henig 1978 223 no.309 and nos.306-8, 310-11 where Victory stands on a globe. Late second or third century AD. (NCM 86.984(4), GH).

28. Copper alloy ring: notched moulding at shoulders. Circular bezel contains enamel, now greenish in colour but possibly originally white with rayed-circle inset. For the type see Dudley 1967, 22-3, fig.8, no.13 and Neal 1974, 136-7, fig.60, no.115. Late second or third century AD. (NCM 86.984(8), GH).

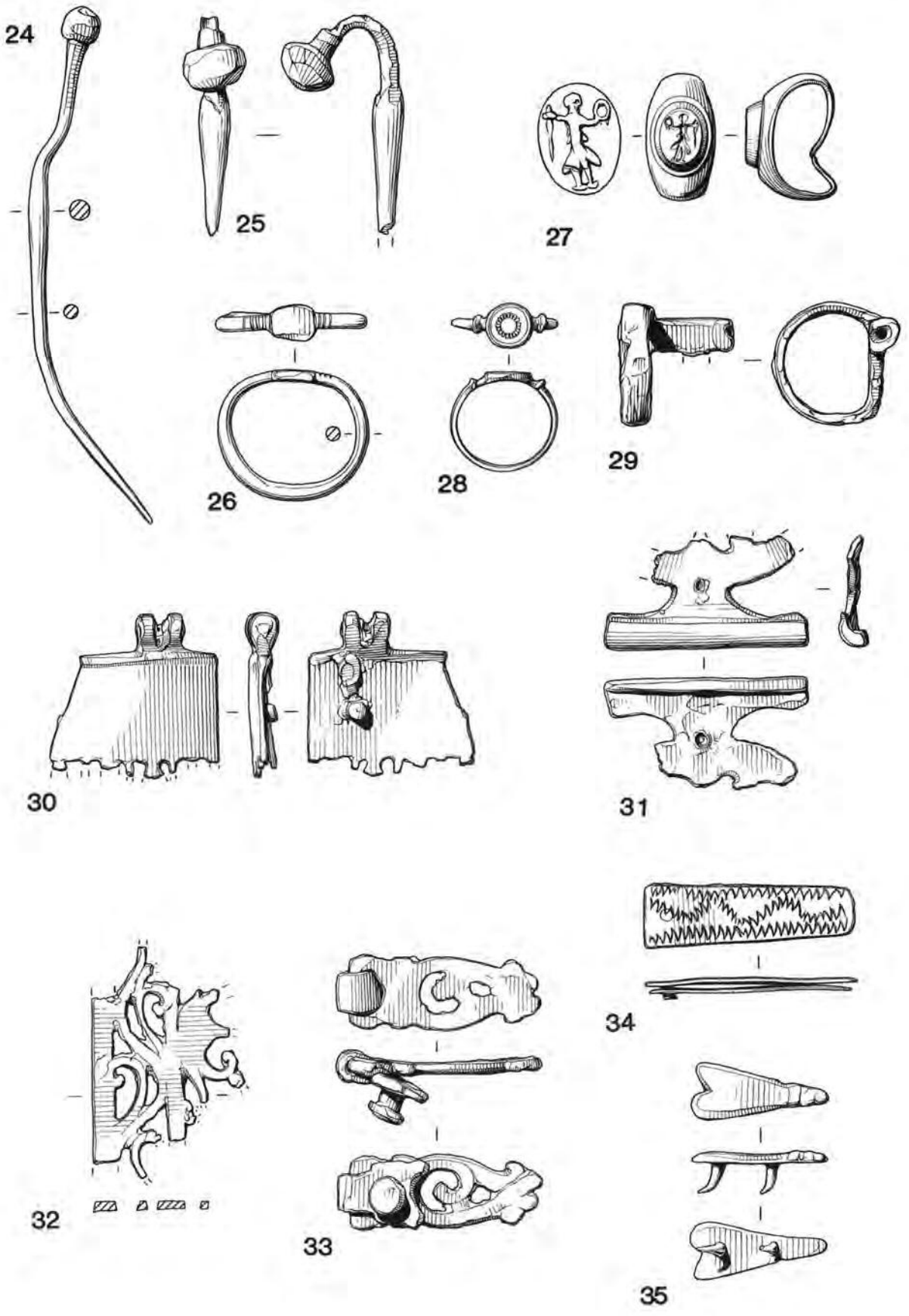


Fig.88. Copper alloy pins 24-25; finger-rings 27-29; strap- and belt-fittings 30-35. Scale 1:1, except impression of ring 27 which is 2:1.

29. Copper alloy key-ring with wards missing. (NCM 86.984(32), GH).

For the remaining copper alloy objects, parallels are not extensively quoted since only the most obvious sources have been checked. In general, however, they find closest comparison with material from second-and third-century sites, particularly in the German limes. This does not indicate a specifically German connection, but rather that the best groups of dated metalwork of the period are from that part of the frontier. It is very clear that the finds, particularly the large collection from east and south of the fort, do not show any particular emphasis on the fourth century. The familiar chip-carved buckle-plates and zoomorphic buckles, belt stiffeners, and rosette-mounts so characteristic of late military contexts are absent.

30-52. Strap- and belt-fittings

30. Part of buckle-plate: wide plain border between leading edge and zone of open-work decoration. The remains of an iron pin run through the loops of the surviving hinge, and there is a broken fixing stud on the back of the plate. Open-work buckle-plates occur widely on German fort sites (Oldenstein 1976, nos.431 and 1104 which he relates to the third century 'Numerum omnium' types). Military. (NCM 86.984(44), GH).

31. Part of open-work buckle-plate: a small hollow behind the tubular hinge would allow the buckle tongue to turn on the hinge-pin. cf.Oldenstein 1976, fig.31, 33 and nos.650-3. Military. (NCM 86.984(49), GH).

32. Part of open-work mount: possibly part of a buckle-plate, almost certainly from a set of belt-fittings. For similar pieces of late second-to-early third-century date cf. Oldenstein nos.428-433, hinged belt-end plates, and 788-795, plates with fixing spikes on rear. Military. (NCM 86.984(34), GH).

33. Hinged belt-end plate, small free-swinging tag decorated with open-work curvilinear ornament: smaller plate with rear fixing stud may be complete or may be the end of a larger, probably double-studded, open-work plate. (NCM 86.984(26), GH).

34. Strap-end: made up of two thin sheets held together at one end only by a rivet. Upper face decorated with rocked-tracer ornament. (NCM 86.984(50), GH).

35. Mount: in shape of an insect. (Found on the building site west of the fort: private possession).

36. Domed mount decorated with concentric circles and central boss, and remains of iron pin. Rear face not well finished. (NCM 86.984(14), GH).

37. Domed flower-shaped mount with remains of iron pin. Rear face not finished. (NCM 86.984(35), GH).

38. Mount with central boss: ends of fixing studs expand in one direction only. Generally third-century on the German limes. Military. (NCM 86.984(27), GH).

39. Part of open-work peltaform mount. (NCM 86.984(39), GH).

40. Open-work mount with lipped decoration. (NCM 86.984(1), GH).

41. Lozenge-shaped mount: crescentic expansion on at least one end. Central hole through lozenge, and faint scratching on the surface around the hole suggest that something, possibly a decorative plate, is missing. Rear face of crescent better finished than rear face of lozenge. (NCM 86.984(43), GH).

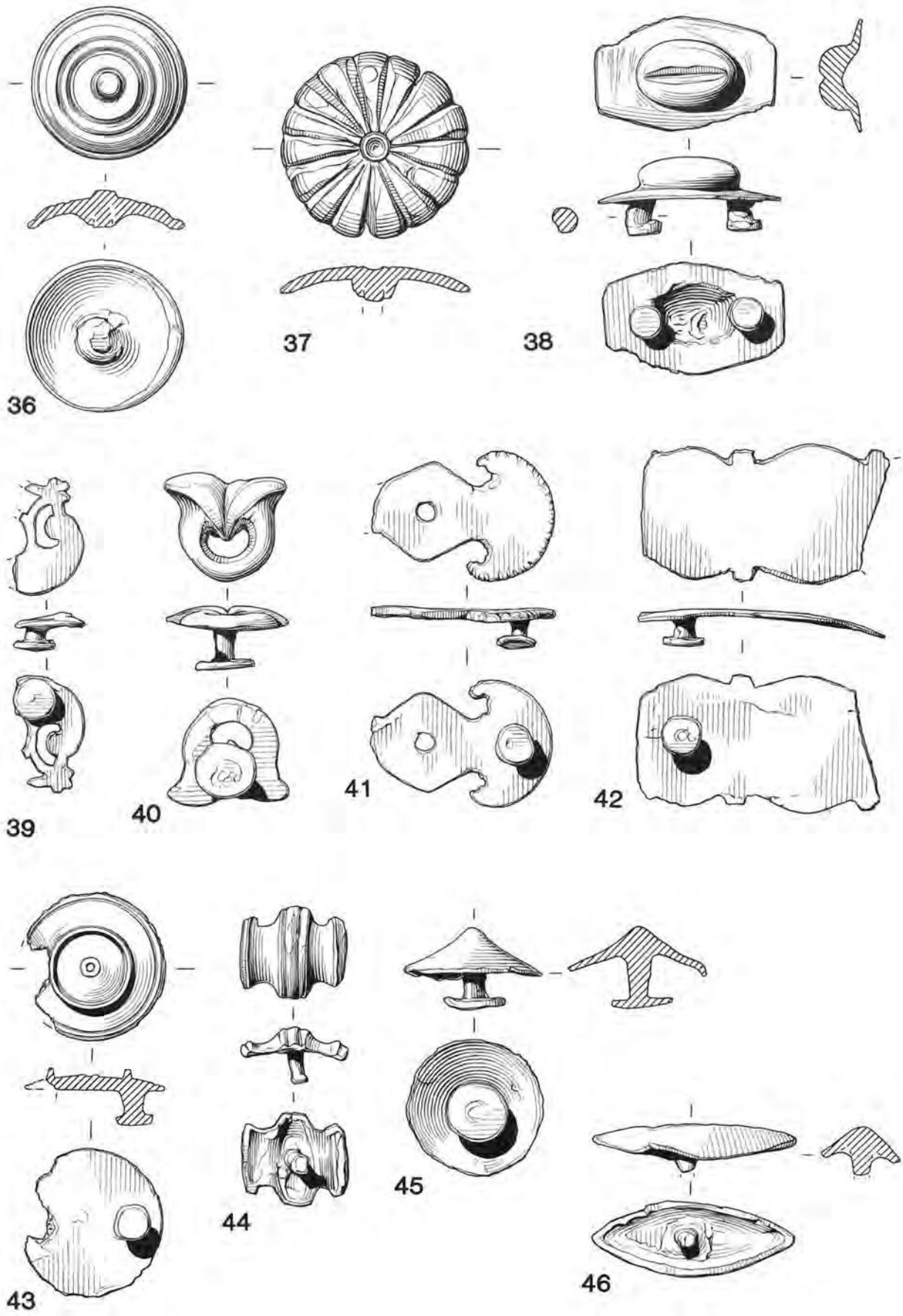


Fig.89. Copper alloy strap- and belt-fittings 36-46. Scale 1:1.

42. Middle and end of flat mount. (NCM 86.984(46), GH).

43. Circular mount: central area defined by high rib. Compares closely with a group of late second-early third-century mounts from Germany (Oldenstein 1976, nos.542-557) except that these have central hollow bosses. ?Military. (NCM 86.984(42), GH).

44. Strongly ribbed mount: fixing stud is plain pin with end burred over. (NCM 86.984 (41), GH).

45. Conical mount. (NCM 86.984(28), GH).

46-48. Pointed oval mounts each with a single fixing stud: examples of this shape from German forts usually have two studs (Oldenstein 1976, nos.715-24), but a single-studded example was found in a late third-early fourth-century context at Verulamium (Frere 1972, fig.38, no.101). (NCM 86.984(3), GH).

49. Tubular union for two crossing straps: back plate appears originally to have covered the whole of the back of the object. (NCM 86.984(31), GH).

50. Pendant: possibly part of a hinged strap-end. Sunken field, probably originally contained enamel. However, no trace of enamel survives and the presence of a hole through the pendant which appears to be a casting flaw, would have made it almost impossible to enamel. (NCM 86.984(10), GH).

51. Heart-shaped plate with attachment holes: possibly for stitching plate to leather rather than pinning it. Rocked-tracer ornament. (NCM 86.984(18), GH).

52. Three-way strap distributor. Although somewhat similar to the martingale of recent horse harness, this piece is perhaps too slight for that use. Moreover, the breast bands on ancient horse harness seem to have been simple straps encircling the lower part of the neck without any third strap passing down between the legs. A use as horse trapping is, however, still possible, perhaps as a link with the head harness (see harness illustrated in Vlad et al. 1979, 15-40).

It has been suggested that those examples with projecting horses heads (Cunliffe 1968, pl.XLVII, 208) were bucket mounts, the head acting as a hinge for a handle, but this clearly cannot be the case in this type with the two rings placed above the head. A similar example with anthropomorphic decoration occur at Richborough (Bushe-Fox 1926, 46, pl.XV, no.29). (JB).

53-68. Various objects of copper alloy.

53. Scabbard mount. (NCM 86.984(6), GH).

54. Rectangular plate of thin metal with repoussé dots and ovals. There is no sign on the surviving part of the plate of any means of attachment. (NCM 86.984(37), GH).

55. Plate with suspension- or attachment-hole within expansion of one edge. It is not quite clear whether the short edges are finished or neatly chiselled off. The former is most likely, in which case the piece would be asymmetrical. (NCM 86.984(30), GH).

56. Rectangular-sectioned tube with pelta-based open-work decoration and punched ring and dot on one face. The other three faces are plain apart from a single punched ring and dot. A similar piece from Shakenoak (Brodribb, Hands and Walker 1978, fig.41, no.238) but with geometric open-work, was found in a mid-fourth-century context. (NCM 86.984(2), GH).

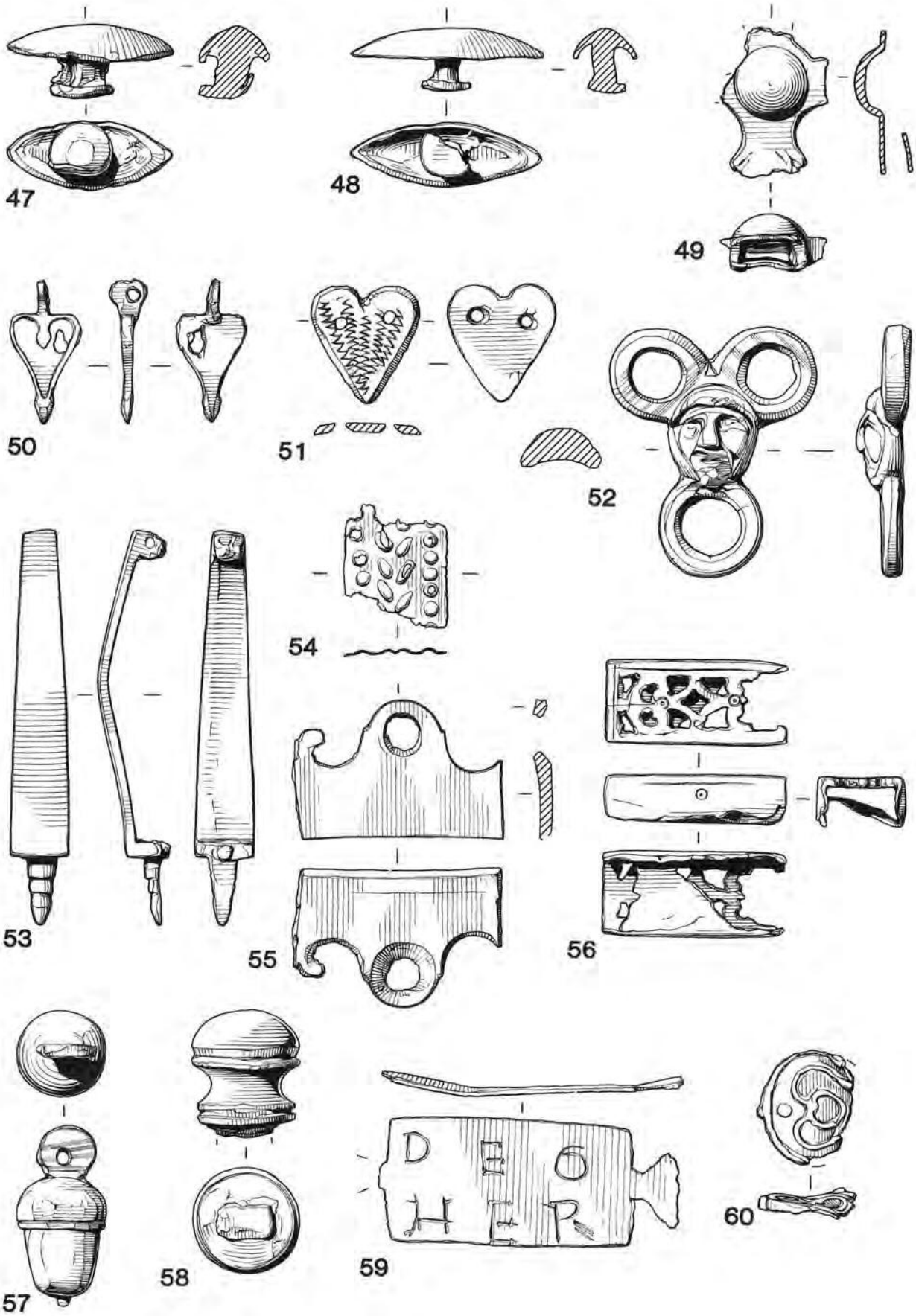


Fig.90. Copper alloy strap- and belt-fittings 47-52; other objects of copper alloy 53-60. Scale 1:1.

57. Acorn-shaped pendant with clear file marks on suspension loop. Very similar to an example from Richborough (Cunliffe 1968, pl.XLVII, no.215) which is identified as a steelyard weight. (NCM 86.984(9), GH).

58. Large knob with remains of rectangular sectioned shank. (NCM 86.984(45), GH).

59. Plaque with ansate terminals, one broken off. Traces of solder on the reverse suggest its attachment originally to some metal object. The inscription DEO HER has been incised on the panel (Wright and Hassall 1974, 461, no.2, pl.XLIIA). The plaque was presumably attached to a dedication to Hercules or a statue of that god, an entirely appropriate offering on a military site, but as yet no temple structures have been recognised here or elsewhere round the fort from surface finds or air photographic information. Similar plaques, but to Silvanus and Mars, were recovered from two temple sites at Colchester (Hull 1958, 239-40, pl.XXXVII). (Surface find approximately 100 m southwest of the fort's west gate: NCM 323.974).

60. Fragment of seal-box lid; scant traces of enamel survive around the low relief decoration. (NCM 86.984(38), GH).

61. Seal-box lid: decorated with two concentric circles of enamel; outer circle red, with six reserved dots, inner circle bears traces of blue around a central reserved dot. It is curious that some of the outer circle has broken away in a cruciform pattern. It is possible that this represents a third zone of decoration, but it is more likely the result of the way in which the enamel was applied. (NCM 86.984(12), GH).

62. Mount or tack of thin metal: turned down around edges to form hollow cap. Incised decoration on head. The general type is paralleled at Straubing and Niederbieber (Oldenstein 1976, nos.509, 512). (NCM 86.984(21), GH).

63. Knob with spiked top: probably complete. Traces of solder on the underside, around a central circular recess, suggests that it was fixed to a flat surface, rather than to an iron shank which is more normal. (NCM 86.984(33), GH).

64. Bell: metal tapers towards the lower edges which are deliberately bent under. The rectangular shape may be the result of distortion caused by bending the edges under. A similar bell was found at Richborough (Bushe-Fox 1926, pl.XIII.15. (NCM 86.984(36), GH).

65. Ligula: possibly a spoon for removing ointments from narrow-necked vessel or more likely a medical instrument, one end a 'Volkman' spoon for lancing boils or cleaning wounds, the other a probe. (JB).

66. Socketed spear-head: leaf-shaped with very blunt edges and traces of flashes beneath the blade on either side of the hollow socket which retains a grey substance internally, possibly solder. The surfaces are heavily patinated; there are slight traces of filing or scoring on blade and the exterior of the socket. Such an object is unlike the functional projectile points of the Bronze Age and this object is more likely to be a fragment of some lifesize sculpture such as an imperial portrait or an effigy of Mars set up in the Principia. (Surface find from the fort interior: KLM 264.980).

67. Plain bronze tweezers: traces of longitudinal filing. (NCM 86.984(23), GH).

68. Double-sided boss, projecting from a thick disc. One bears a crude lion's or bear's head, while the other bears a badly battered face, of which a pointed chin and vague curls

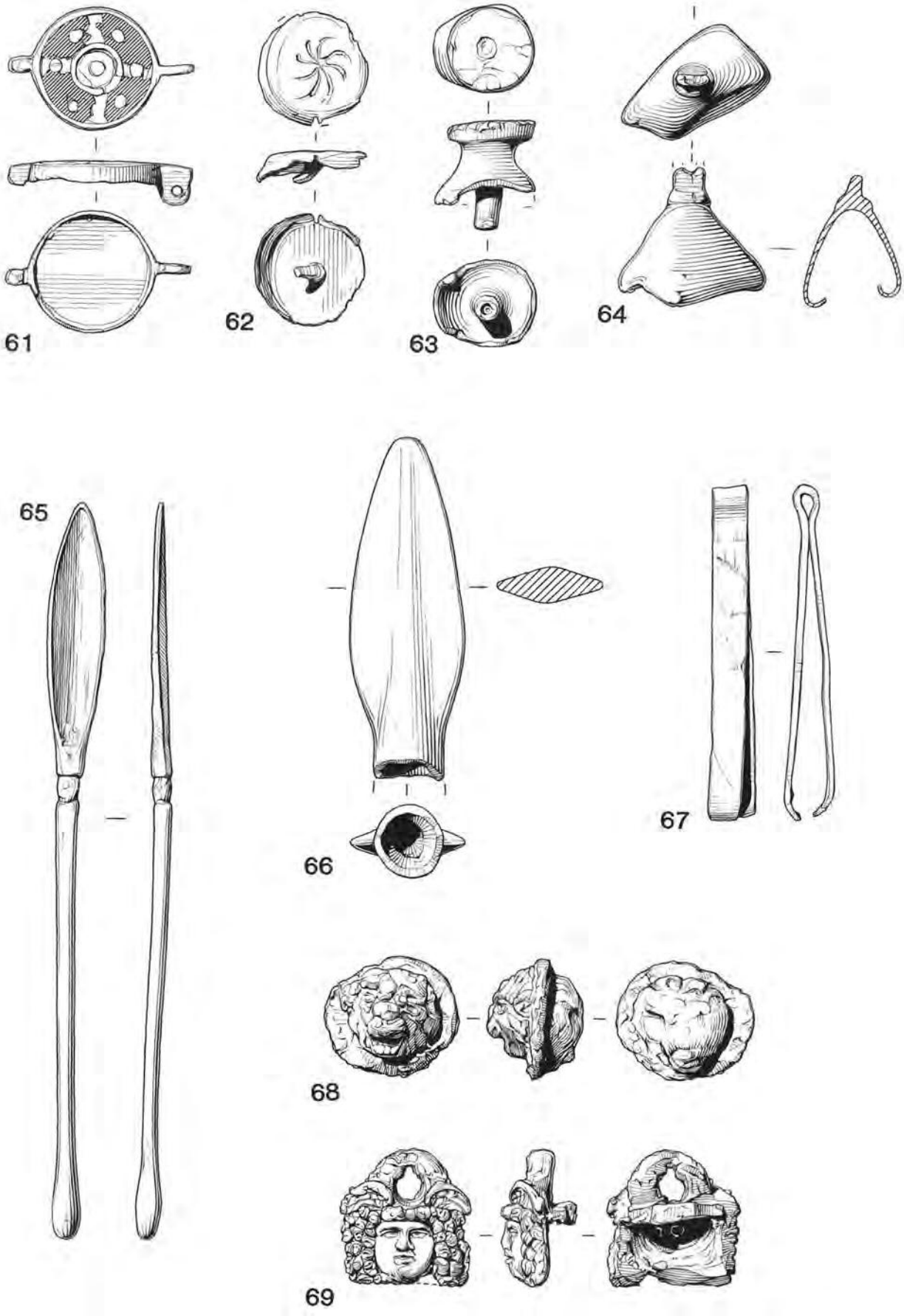


Fig.91. Copper alloy objects 61-68; copper alloy vessel fitting 69. Scale 1:1.

are still visible. (NCM 86.984(16), GH).

69-72. Metal vessel fittings

69. Handle escutcheon: from a metal or wooden vessel with metal fittings; in form of winged head framed in tight, stylised curls, topped by a semicircular loop in which a handle would have swung. The handle has worn a deep narrow notch in the underside of the loop. The rear of the face is hollow with traces of solder, and a horizontal projection which probably rested on the top of the vessel rim. (NCM 86.984(5), GH).

70. Rectangular sheet: one edge missing; six surviving holes, probably originally one in each corner and one along each edge, five of which are filled with rivets of rolled sheet - the normal way of repairing large splits or small holes in thin cauldrons, throughout the first millennia BC and AD. (NCM 86.984(51), GH).

71. Clip made from folded sheet: a common means of repairing splits in the rim of thin metal vessels in the Roman period. (NCM 86.984(29), GH).

72. Jug lid with stylised duck in front of traces of broken hinge. (JB).

Objects of Lead
(Fig.92)

73. Square block; marked on one large face with an impression of a hollow-ended circular punch. (NCM 86.984(11), GH).

74. Square block; one large face marked with at least nine impressions of a small, hollow-ended punch, surrounding a single impression of a large plain one. (NCM 86.984(11), GH).

75. Square block: one large face bears a well-defined frame, and the other large face a much less well-defined one. (NCM 86.984(11), GH).

76. Plumb-bob or steelyard weight: slightly facetted body, with iron loop and remains of iron axial rod appearing through the body opposite the loop. (NCM 86.984(25), GH).

77. Plumb-bob with iron axial rod which emerges at one end as a loop and at the other as a spike. A similar example from Richborough (Cunliffe 1968, pl.XLVIII, no.217) is double-looped. (NCM 86.984(52), GH).

78. Steelyard weight with remains of iron hook. (NCM 86.984(53), GH).

OBJECTS OF IRON
(Fig.93)

79 & 80. Two axes: one 10.5 cm long and 2.5 cm wide at the butt, the other 15 cm long and 3.5 cm wide at the butt. The first has an oval shaft hole 12 mm by 22 mm, the second a sub-rectangular aperture 19 mm by 32 mm. In both, the cutting edge is parallel to or even slightly angled back towards the handle; the first has a more marked curve in the angle of the butt to the shaft, and the flattened butt suggests that the tool was intended for use as axe and hammer. (Both surface finds within the fort, 79: NCM 179.954 and 80: JB).

Several similar axes have been recovered from late Roman sites, but normally under unsatisfactory conditions. In Norfolk one from Caistor St.Edmund was found with human remains and coins of the late-fourth and fifth century in building 4 (Myres and

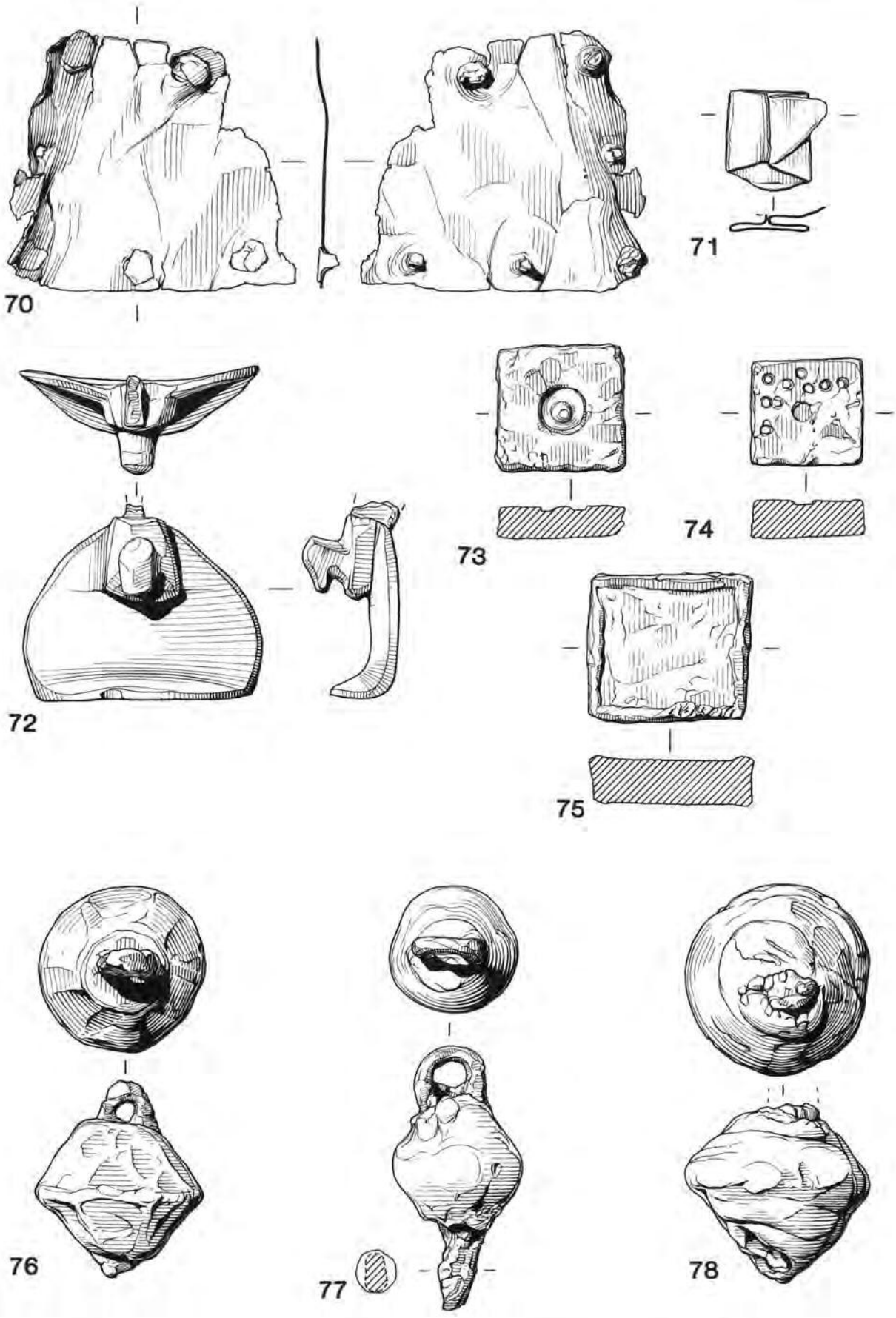


Fig.92. Copper alloy vessel fittings 70-72, and lead objects 73-78. Scale 1:1.

Green 1973, 41, fig.64.1) and a second found by metal detector on the Romano-British settlement site at Brettenham (unpublished, private possession). Other unstratified examples come from Coldharbour Common near March and the Thames at Brentford (Potter 1981, 98, fig.9, no.12; London Museum A19539). The only examples from Saxon Shore forts are two from Richborough and one from Oudenburg in Holland. As at Brancaster the former were from the topsoil and had presumably been incorporated in the later occupation levels (Cunliffe 1968, 154, pl.LXI, 341, 342). However, the Oudenburg find was from a Late Roman grave (Mertens and Van Impe 1971, 149, pl.XL, grave 122, 4). An example from the backfilled nineteenth-century excavations inside Binchester fort could have derived from the Saxon cemetery on the site (Grew 1980, 361; Webster and Cherry 1979, 236). The most interesting and best documented discovery is from South Cadbury where an axe of this type was found interleaved between road metalling levels in the 'Arthurian' phase south-west gate associated with a sixth century Saxon buckle (Alcock 1971, 230, fig.21e; Alcock 1972, 104 and pl.79). In this case the butt is extended to create more of a hammer head.

The find-spots at Caistor, South Cadbury and Oudenburg imply military use and, at the former sites, loss in battle. However, such an implement is really no more than a wood axe and lacks the exaggerated curve and forward-angled blade of the true throwing axe which should have an angle of at least 115° between the axis of the head and the handle. The Brancaster axes and these comparanda are, thus, of the undeveloped Salin form 1a which is little different from a late Roman woodworking tool (Salin 1957, 23). The fully developed throwing axe or francisca only occurs in later, Saxon graves in this country; this name should not be applied to these earlier implements.

The earliest reference to the throwing axe describes it as a bipennis (Sidonius Apollinaris Carmina V). The bipennis is properly the double-bladed axe used in the Roman world as a sacrificial implement and as part of the fasces. As a weapon it was wielded by the mythical Amazons and does not figure in the archaeological record save perhaps as decorative or votive objects. Yet when the term francisca appears, this is also described as a bipennis, the word applied to the mythical battle axe here being loosely applied to a single-bladed weapon (Isidore, Orig.Lib. 18c, 6 & 9 and Lib. 19; Hincmarus, Vita S. Remigii, Gesta Regum Francorum C10). Salin's suggestion that the two wings (penna) of the bipennis are the two points at either end of a single blade is unconvincing; perhaps to Late Classical writers the only conceivable battle axe which, as a projectile, could land edge-on, must have had two opposed blades.

The present axes, if indeed weapons, would only have been suitable in hand-to-hand combat, but perhaps later in the 'arms race' between Roman and barbarian, the Franks developed their design and use as projectiles which could penetrate heavy armour at greater range and more effectively than spears or arrows. From the similarity to Roman tools the initial development may have been amongst the Imperial forces; as with the so-called Germanic equipment such weaponry need not be barbarian in origin but simply widespread in use and later adaptation.

81. Sledge hammer: of square section; possibly chamfered at the corners of either face. Heavily corroded with traces of cloth remaining, the latter suggesting it was derived from a previously undisturbed context, perhaps as part of a hoard in a sack. (From the interior of the fort: KLM 21.981).

82-84. Three tanged, triple-bladed arrow heads: of the type usual in the Roman army from the first-to-third centuries A.D. (Davies 1977). (Surface finds from the field east of the fort: NCM 244.981, AH).

85-87. Single-edged knives: of a common late-Roman type. (85 and 86: JB, 87: Surface find from the field immediately east of the fort: NCM 244.981, AH).

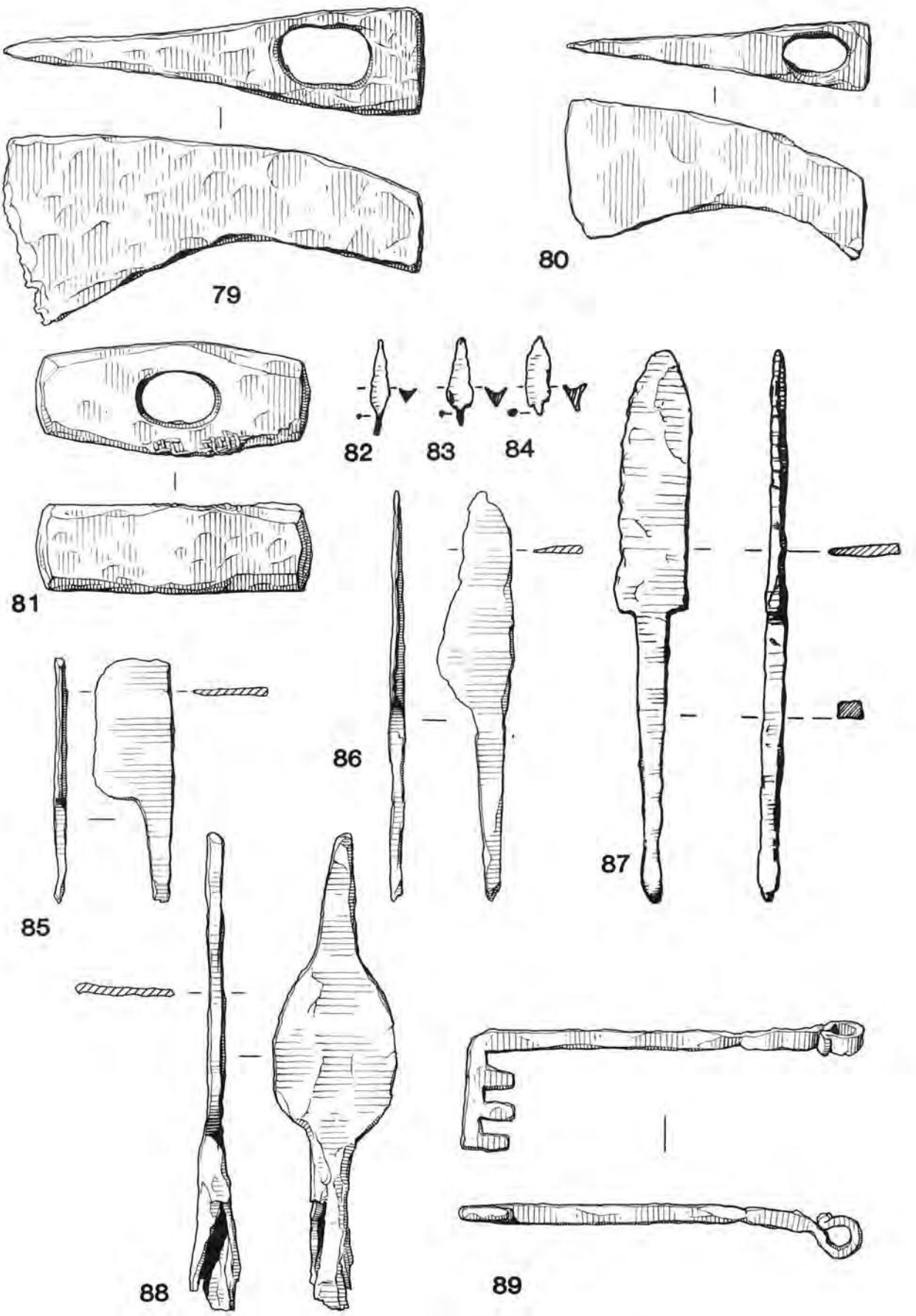


Fig.93. Iron objects 79-89. Scale 1:2.

88. Socketed finial or spear head: 'pear'-shaped blade 175 mm long overall and 45 mm wide. Like others of this pattern the edges are blunt; if a projectile point these must have served as ceremonial or practice use for cavalry or infantry (Scott 1980, c.f. Cunliffe 1968, pl. LVIII, 279). (Surface find from the fort interior: KLM 25.974, TR).

89. Latch-lifter. (Surface find within the fort: Private possession).

OBJECTS OF BONE AND ANTLER
(Fig.94)
by Stephen Greep

90. End-piece from a double-sided composite comb: with ring-and-dot ornament either side of the retaining plate (now missing) both front and back. Composite combs such as this belong to the late Roman - early Medieval periods although the shaping of the ends and ring-and-dot ornament perhaps suggest a date in the late Roman period for this example. Probably fourth century. (Surface find from within the fort: KLM 25.974, TR).

91. Hair-pin: oval-shaped flat-sectioned head. Probably late Roman. (A find from the 1935 excavations not then published: NCM 81.936).

92. Hair-pin: of type B.1 (c.f. Greep forthcoming) with an oval head. A common late Roman type c. A.D. 150/100-400. (An unpublished find from the 1935 excavations, Cutting A, refuse pit A: NCM 81.936).

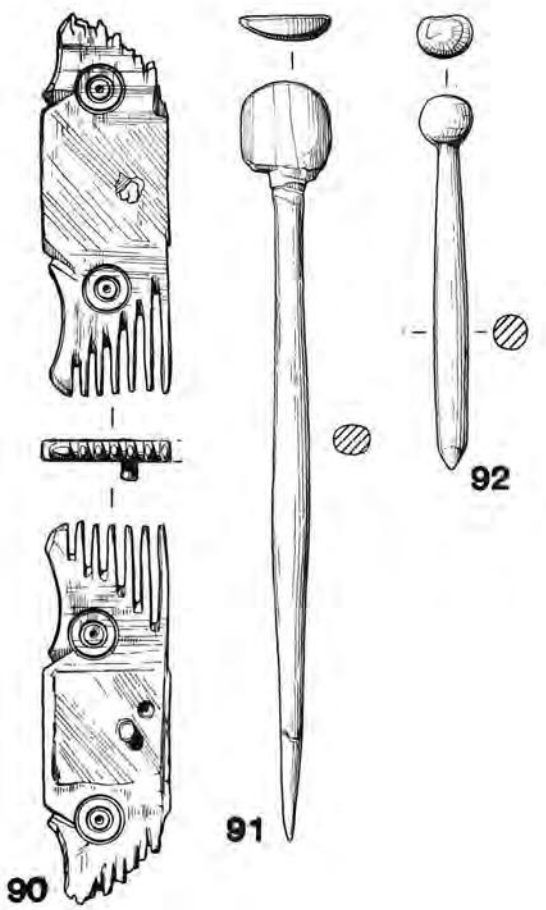


Fig.94. Bone and antler objects 90-92. Scale 1:1.

THE POTTERY

Museums in Norfolk and private collections all contain quantities of pottery both from the fort and surrounding fields. There is nothing remarkable amongst it, except a few examples of Dales Ware and Mayen Ware: otherwise it contains the usual types of a second-to-fourth century assemblage. The samian ware has been examined by Brenda Dickinson and Brian Hartley, whose remarks form the basis of the following notes. None of the samian ware can be provenanced any more closely than in and around the fort.

Stamped samian ware

MARTIVS, f31, Lezoux, Late Antonine (KLM 25.974).
PRIMANVS, f33, Lezous, Late Antonine (KLM 25.974).
ATILIANI OF, around rosette, probably Curle 23, Lezoux, Late Antonine (KLM 25.974).
TITVRONIS, f31, Lezoux, Late Antonine.
IVVENIS FE, ?f32, Rheinzabern, late-second to early-third century.

Decorated samian:

One scrap of central Gaulish f37, Antonine (NCM 162.949).
One sherd of f37, Trier, no parallel for ovolo, A.D. 200-250 (NCM no number).
One sherd of f37, Rheinzabern late-second century, third century (KLM 25.974).

Plain samian:

Central Gaulish - the following forms are represented:
31, 31R, 33, 36, 45, 46, 78/80, Lud. Tg, Curle 23.
Uncertain enclosed jar. All Antonine.

East Gaulish:

Trier: form 45, unidentified mortarium, both third century.
Not attributed: forms 31, 32, 36, 45, late-second to early-third century.

DISCUSSION

The surface collections include both civil and military objects ranging in date throughout the Roman period. The presence of two early brooches (Fig.85, Nos.5 and 6) is surprising, particularly in view of the absence of any other contemporary material. The relatively early start in the mid-late second century A.D. suggested by the coin lists is supported by the quantities of late second century samian, which surely exceeds what would be expected of a 'normal' Saxon Shore fort starting in the mid-late third century A.D.

The military finds are not sufficiently closely dated to allow any chronological refinement within the second and third centuries. Nor do they shed any additional light on the garrisoning of the fort: the arrow heads do not necessarily indicate a unit of *sagitarii* since the bow was also used as secondary armament by other units (Davies 1977). The strap-distributor (Fig.90, No.52) is of a type widely found on both civil and military sites; if it is a horse-harness fitting then it would accord well with the Brancaster cavalry garrison.

It is interesting, however, that they are largely of the second-third-century types so familiar from the German *limes* and that the later styles, the chip-carved and zoomorphic belt-furniture, are absent. This is not to say, however, that late occupation of the fort was impoverished, since two of the most remarkable finds, the crossbow brooch, Fig.86, No.10, and the VIVAS IN DEO ring (Fig.85, No.2) may both have been lost in the early years of the fifth century A.D. The former is a magnificent example of a

brooch worn by someone of high rank in the late garrison: such brooches were almost official insignia, as suggested by their illustration in the Notitia Dignitatum.

The silver ring No.3 and gold ring No.1 (Fig.85) accord well with a military context of the third century. The latter is particularly significant and is likely to have been the signet of a commander of the earlier Aquitanian unit. Its loss is surprising in view of its use as a seal and authority for documents and orders - it would almost be equivalent to the key or code for a tactical nuclear weapon. However, if the portrait is that of a Gallic or British emperor, as seems likely, it may have been lost or hidden in the disturbed times at the termination of either the Gallic or British Empire and more likely the former.

Ring 3 is equally interesting, but for its domestic and religious overtones. As with the crossbow brooch, its date of use and loss could run well into the fifth century and tokens the presence of wealthy and Romanised occupants even at that late date and the continuation of Christian marriage customs, if not simply booty.

Amongst the ironwork, the only objects that are necessarily military are the pear-shaped spear head, which is not strictly a weapon having never been sharpened, and the arrow heads. The axes have already been discussed and the point made that they could have been either weapons or tools. If weapons they are examples of the earlier hand-held armour-piercing axe and like other late Roman military equipment need not token a barbarian presence. If simply wood-cutting implements they could have been, with the sledge-hammer, part of a tool-hoard disturbed by ploughing from the late Roman levels and originally contained in a cloth container.

The Saxon brooch (Fig.87, No.17) is at the moment the only evidence for the immediate post-Roman use of the site. Without a large range of dated material, it is futile to try to guess its significance here.

There are several outstanding questions raised by this material which can only be answered by excavation in the fort and in the eastern extra-mural area. By what means did items of military equipment arrive on the extra-mural settlement? Since most of them are broken they were presumably brought as rubbish, but does this indicate the dumping of fort rubbish in disposal areas within the extra-mural settlement, the incorporation of rubbish with manure and spread over the settlement in a phase when it was used as arable fields, or perhaps, most attractively, a scavenging and reclamation service by inhabitants of the extra-mural area clearing and sorting fort dustbins? Evidence for recycling metal would be particularly interesting in this connection.

Why is there an apparent absence of recognisably fourth-century non-ferrous metal? This is particularly odd in view of the relative preponderance of coins of the early fourth century A.D. and the occupation in the rest of the century suggested by the continuing coin list. Is it possible that distinctively fourth-century types such as chip-carved and zoomorphic belt-furniture were used by specific military units not represented here and that other troops continued to use the earlier types?

This then leads on to the problem of the end of Brancaster in general. The site coin list continues strongly into the 380's, and both the gold ring No.2 (p.195) and the crossbow brooch No.10 (p.200) possibly continue in use into the fifth century. In view of this the absence of distinctively late pieces among the other metalwork is probably a matter of lack of recognition, and more detailed work on this group and similar finds from other sites is needed to clarify the problems of dating.

APPENDIX 5: CONTENTS OF MICROFICHE

The following are included in microfiche in this volume:

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Fiche 2 Site Plans: Sheets 7-12
Fiche 3 Site Plans: Sheet 13/Site Sections: Sheets 14-18 (Nos.1-89)
Fiche 4 Site Sections: Sheets 19-24 (Nos.90-198)
Fiche 5 Site Sections: Sheets 25-30 (Nos.199-325)
Fiche 6 Site Sections: Sheets 31-36 (Nos.326-434)
Fiche 7 Site Sections: Sheets 37-42 (Nos.435-539)
Fiche 8 Site Sections: Sheets 43-47 (Nos.540-633)
Fiche 9 Specialist Reports: Industrial Residues by F.W.Anderson and Justine Bayley
Metallurgical Material by Prof.R.F.Tylecote
Glass by Dorothy Charlesworth
Replaced Organic by Carole Keepax
Worked Bone Objects by Sheilagh Wall
Mollusca by Julie M.Bond
Fiche 10 Samples of the archive: Context catalogue
Context catalogue with object summary
Object catalogue
Pottery catalogue
Bone catalogue
Fiche 11 Table 28: Coins found east and south of the fort by A.Holmes
Table 29: Coins found in field east of the fort by G.Howell

Copies of the archive on microfiche will be deposited with the Historic Buildings and Monuments Commission, the National Monuments Record and the Castle Museum, Norwich (which also retains the original paper copies).

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