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EXCAVATIONS AT HILL FARM, GESTINGTHORPE, ESSEX

East Anglian Archaeology 25
Archaeology Section, Essex County Council 1985

EAST ANGLIAN ARCHAEOLOGY

Frontispiece: Mr Cooper with part of his collection at Hill Farm, 1983.

Excavations by Mr H.P. Cooper on the Roman Site at Hill Farm, Gestingthorpe, Essex

by Jo Draper

with major contributions from
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Photo: Jeff Hopson

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Acknowledgements

The author would like to thank all those who have written specialist reports for this site; Jeany Poulsen who assisted with the report; Sue Heaser, David Honour and Chris Boddington of the Department of the Environment drawing office who drew the small finds; Christopher Chaplin who drew the contour survey and other site plans; Gill Marsh who drew most of the coarse pottery; Kirsty Rodwell who drew the samian; and thanks are also due to the Department of the Environment post-excavation department, especially Pamela Clarke. I am very grateful to Mr and Mrs Cooper for their hospitality at Hill Farm and most grateful to Mr Cooper for discussing the site with me so often and allowing me to use all his notes on the site.

Mr Cooper writes 'First and foremost I should like to thank members of the Ancient Monuments Board — Professor S.S. Frere, Professor R. Cramp and Dr J.K. St Joseph — for their wise judgement in scheduling the area after their visit to the site and Hill Farm 'Museum', thereby making this report possible. No private individual could possibly produce such a report on his own without proper laboratory facilities or a drawing office. I would also like to express my appreciation for all the kindness and encouragement shown to me during the early years of excavation by the late M.R. Hull, Curator of Colchester Museum, and the late Major J.G.S. Brinson, sometime President of Essex Archaeological Society. I should like to say a special word of thanks to Mr Herbert Crack of Sudbury for helping me for many years, particularly with photography and excavation. Also my thanks to Mr Jack Lindsay, Mr F. Searl, Mr B. Burrows, Mr I. Brown and the late Mr D. Kitchener; and to Sonia Hawkes for introducing me to Professor Frere which led to objects from the site being published and ultimately to this report. I am grateful to the late Mr Charles Gardiner of Upper Yeldham Hall for giving me the ploughshare (No. 307) found on his farm. I would like to express my thanks to Jo Draper for the very pleasant and understanding way in which she has worked with me on this report: her knowledge of farming has made it much easier for us to work together. Last but very far from least, I would like to thank my wife for her continuous encouragement and patience for the thirty years or more during which I have been excavating the site; and my son, Ashley, for his continued and expanding interest not only in the archaeological aspects of the farm and area, but in its whole history and ecology.'

Many of the finds are in the possession of Mr H.P. Cooper at the following address: Hill Farm, Gestingthorpe, Halstead, Essex CO9 3BL. For further specialist information, please contact: J. Chaplin, c/o Historic Buildings and Monuments Commission, Fortress House, 23 Savile Row, London W1X 2HE.

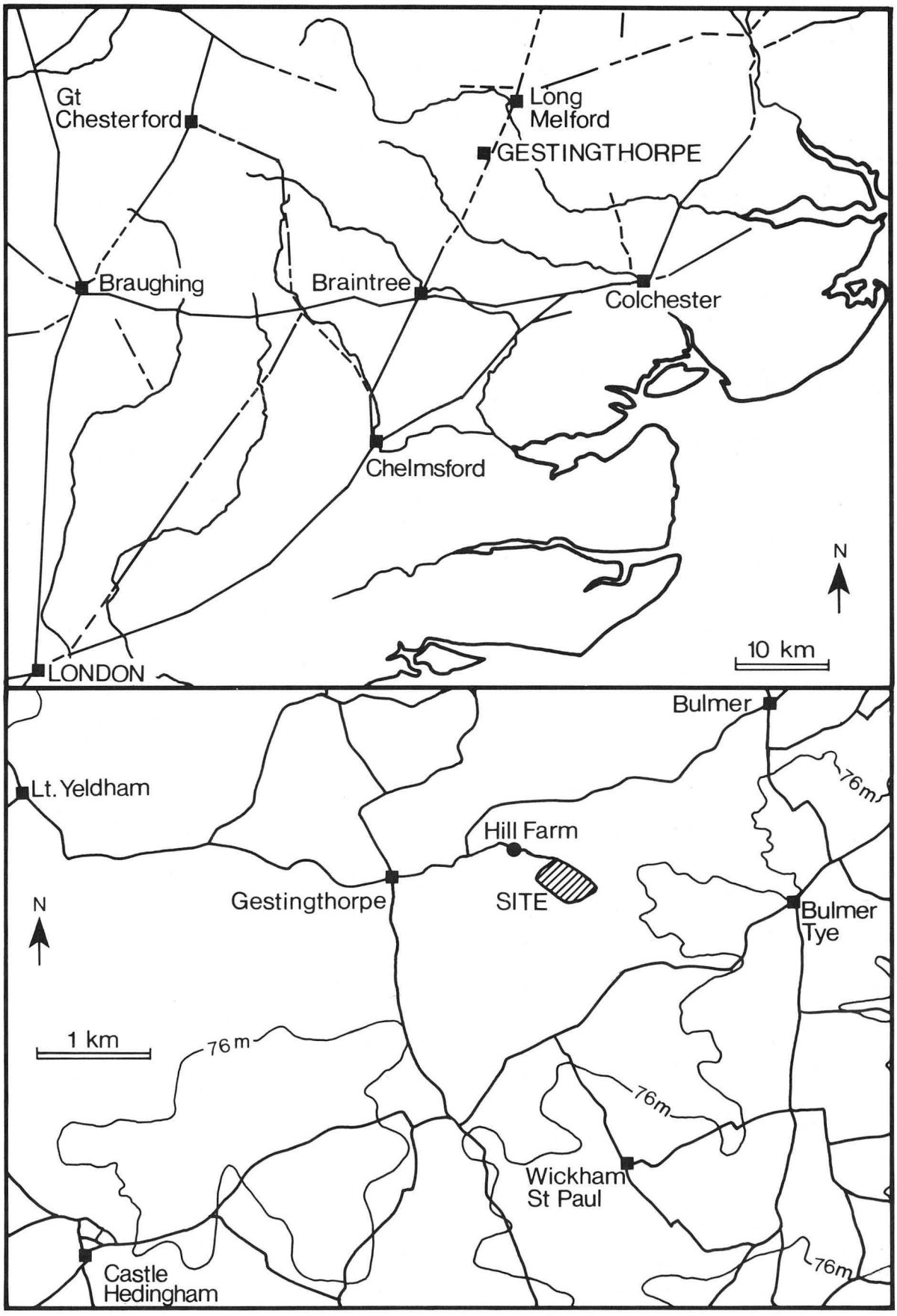


Fig. 1 Site location plan showing Roman road system based on O.S. *Roman Britain* (4th edition 1978).

Part 1
Introduction
by S.S. Frere

This volume contains the report of a very interesting Roman site which was discovered and investigated by a landowner at Gestingthorpe in Essex under his own auspices. The work extended sporadically over more than twenty-five years, during which, not unnaturally, realization of the need for more detailed records and improved technical methods gradually took shape — a situation which tends to occur where enthusiasm has only limited access to experienced guidance. It is not infrequent for similar work undertaken by small, dedicated but isolated groups to remain inadequately published or even completely unrecorded. The long list of contributors to the present volume makes apparent that the preparation of the Gestingthorpe report has been made possible only by a considerable expenditure of public funds on the part of the Department of the Environment, and some explanation of the reasons behind the decision to undertake an official publication is called for. These reasons lie partly in the present state of knowledge of Roman rural archaeology in Essex and partly in the evolution of public policy.

The lack of good building stone in many parts of East Anglia has — until the comparatively recent past — resulted in a much greater reliance upon timber, half-timber and cob construction in rural buildings than is to be found in most other regions of the country. To this tendency the Roman period was no exception, and this fact in conjunction with the long history of intensive agriculture in the region has had an unfavourable effect upon our knowledge of Roman rural establishments in Essex. Their state of survival is bad, and the remains are correspondingly hard to excavate. Moreover excavation itself depends on the skill and devotion of individuals; but until the post-war period Essex has lacked a strong tradition of field archaeology. Even today our scanty knowledge of Romano-British rural settlement in the county depends heavily on the work of two or three eighteenth and nineteenth-century figures, whose methods and records left much to be desired. Rosalind Dunnett's account (1975, 94-119) of rural economy in the territory of the local civitas was greatly hampered by the fact that no villa or settlement had ever been completely excavated, while the lack of stratigraphical record made any reconstruction of the history of the countryside impossible to achieve. In this situation any new light on an important rural site, particularly information about the sequence of development and character of occupation, was valuable, and its publication was to be desired.

In the long term, of course, this unsatisfactory situation can be ameliorated only by proper archaeological organisation which ensures that excavations on a sufficient scale are undertaken by supervisors of skill and experience, who have access to modern post-excavation facilities in the drawing-office and laboratory. The introduction of regional archaeological units during the last fifteen years has resulted in a great advance; but continued success depends upon recognition by society as a whole that such objectives are worthy of financial support on a sufficient scale. At present, the availability of finance fluctuates not only with the general economic climate but also with the differing policies of successive governments.

Archaeological discovery by large-scale excavation is, however, only one of the methods of preserving knowledge of the country's cultural heritage, though an attractive one to those interested in the advance of knowledge. Another means now widely in vogue in official circles is to attempt to preserve sites in unexcavated and undamaged condition for study by future generations. This is an objective of obvious value, provided that the steps taken to prevent damage are in fact effective and lasting. At present official policy appears more successful in preventing instant damage or destruction by constructional developments than in halting the slow insidious destruction caused by annual ploughing; for even an agreement to limit the depth of cultivation cannot stop the slow inexorable erosion and drift of soil downhill. But damage by unskilled or too small-scale excavation can of course be prevented.

In the 1970's, partly as a result of public pressure, the Government greatly increased the funds available to what became known as Rescue Archaeology. County units were established and a great effort was made to encourage publication. Today the pendulum has unfortunately swung the other way, and resources are much diminished; but in 1974, when the site at Gestingthorpe was scheduled under the Ancient Monuments Acts as a site of national importance, the Department of the Environment had the resources and the will to secure the publication of an excavation which had not been financed by them, but which the act of scheduling brought within their responsibility. We should applaud the decision while regretting that it would probably not have been possible to take it today.

One of the great strengths of British archaeology lies in its popular interest and in the prominent part which has always been played in discovery, excavation and scholarship by the non-professional practitioner. If some of the work has occasionally fallen below the highest professional standards, this disadvantage has been more than outweighed by the broad basis of popular interest and support which the system has generated. More often, and especially where professional colleagues have been prepared to advise and assist when the need arises, knowledge has been gained which would otherwise not have been available; the results of just such a fruitful co-operation are apparent in this volume.

The Roman site at Gestingthorpe was discovered in 1948 by Mr H.P. Cooper on his own land, and for over a quarter of a century he carried out small-scale exploration as opportunity arose and as further signs of occupation came to light in various localities on the farm. A brief report (to 1960) was published in 1963 (VCH 1963, 133-4). The great potential interest of the site gradually

became more and more apparent through the wealth and quality of the finds unearthed. These were carefully preserved at Hill Farm, which virtually took on the character of a site museum. At length, in 1974, the site came up for scheduling by the Ancient Monuments Department. Since a decision to schedule would involve the cessation of further exploration in the interests of preservation, the site was visited by members of the Ancient Monuments Board (among whom the writer was included) for a discussion with Mr Cooper. He readily acknowledged the desirability of scheduling and the need for a full report on his work to be published. Assistance, however, would be required in the writing of the latter for, as he pointed out, he lacked facilities, and indeed the time and experience, needed for preparing a full archaeological account. The Department therefore undertook to provide a research assistant to draft the report, and a large number of experts in their several fields were persuaded to undertake specialist accounts of the various categories of finds.

The resulting report is presented below. If it is apparent that some of the structural detail is less certain or less extensive than might be desired, and if (as is inevitable in piecemeal excavations extending over so long a period) some of the details of findspots have been mislaid, yet a general picture of the nature of the establishment emerges; the shortcomings of the site record are in the long run amply balanced by the full range of the specialist reports which makes Gestingthorpe a significant type site.

The variety and richness of the bronze finds are notable, as is the very lengthy coin list. Both are uncharacteristic of villa sites and are more suggestive of a rural religious centre with its periodic market fairs — an interpretation supported by the presence of some model tools of votive type as well as by other slightly exotic finds and by the hints of occasional visits by military personnel. There is interesting and unusual evidence for both bronze-working and iron-working on the site; the former with its associated statuette-manufacture is again consistent with a temple complex where there is likely to be a frequent demand for votive offerings and for souvenirs. The iron objects with their unusual proportion of components are also perhaps more indicative of a market than of a working household. Nevertheless, indications of a farming economy are not absent, notably in the carbonized grain; domestic occupation is evidenced not only by the pottery and querns but by the character of Building 1 itself. This structure, however, is not likely to be the main dwelling of a villa establishment. Its position on the contoured plan seen in Figure 2 emphasises its probable subsidiary character within an establishment scattered over many acres. Yet fieldwalking might have been expected to detect traces of any more sizeable dwelling, had one existed on the plateau above.

Should we then take seriously the hints that the site may have possessed a religious character? Had a substantial masonry temple of Romano-Celtic or any other kind existed, it would again be surprising that no surface traces have been detected. In topographical terms the focal point of the site is undoubtedly the crest of the promontory projecting south-west from the plateau (Fig. 2), some 80m south-east of Building 1, and it may be significant that here was recovered a model votive axe in bronze as well as two iron axeheads, all as surface finds. A self-consciously primitive shrine in timber, or a sacred grove, might well have occupied this position, undiscoverable save through large-scale excavation but forming the focus of a wide area of scattered buildings — some no doubt inhabited by the permanent staff of the shrine — and of seasonal gatherings combining religious and mercantile character. The long history of occupation from Belgic times to the fourth century, but with a detectable decline in the second half of that century, would suit this explanation well, although it is not of course inconsistent with a pattern of occupation frequently found in villas also.

We shall not fully understand the character of Roman Gestingthorpe until excavation is resumed on a large scale; the ephemeral character of the remains of several of the structures will require investigation using the utmost skill. In the interim we may be satisfied that the site is protected, and that the present report has made available a substantial, informative and stimulating body of information.

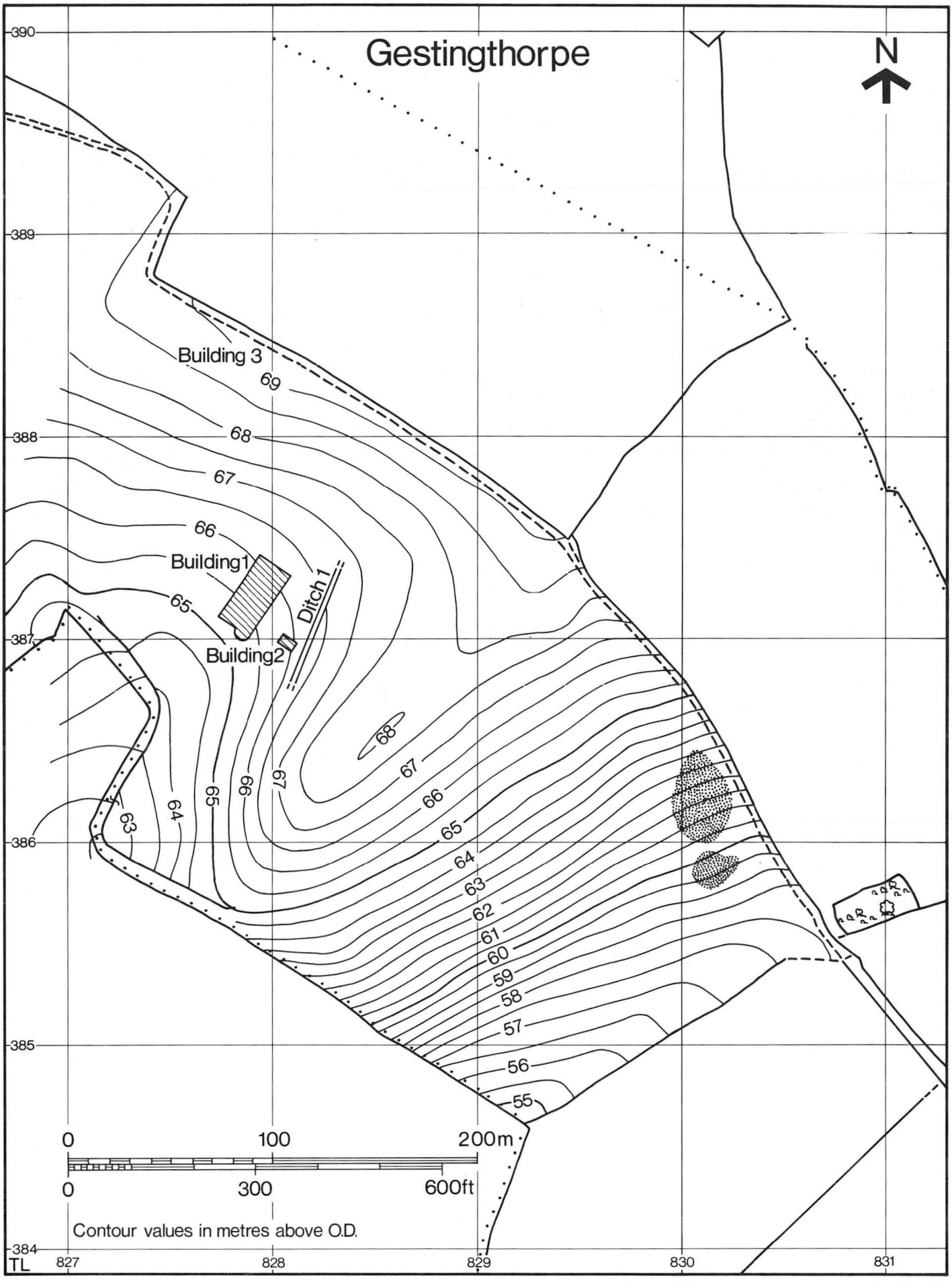


Fig. 2 Contour survey with the main features plotted. The dotted line at the top and bottom is the parish boundary. Large areas of black soil indicated by stippling.

Part 2
The Site

I Introduction

Roman masonry buildings were discovered at Hill Farm, Gestingthorpe, Essex (Fig. 1 : TL 927388) in 1948-9 when Mr Harold Cooper, the farmer and excavator, deep-ploughed part of his land for the first time. Before this, ploughing had disturbed the area only to a depth of about 0.15m. Masses of tile and building rubble were brought to the surface of Court Field (O.S. 130; Fig. 3). Court Field was joined with the field to the south-east in 1948-9, when the double hedge between them was removed; this hedge is indicated on Fig. 3. In 1948 and 1950, a total of twenty tons of tile and flint were removed from the field. Mr Cooper was not content with the local explanation that this was the debris from a brickyard (brick and tile kilns are still functioning three quarters of a mile (*c.* 1.2km) to the south-east at Bulmer) and took some of the tiles to the late M.R. Hull of Colchester Museum, who identified them as Roman. Mr Cooper started to excavate the site in 1949, and continued up to 1975, repeatedly walking the fields involved when conditions were suitable, recording field-drain trenches, excavating trial holes in many areas, and fully excavating the masonry buildings and some of the ditches revealed by trial trenches.

Occupation debris, including roller-stamped tile, beads, coins, tile, iron slag and pottery have been found by field-walking in a radius some one-third of a mile (*c.*500m) wide around the site. Mr Cooper has continued to field-walk an increasing area over recent years.

The main Roman buildings (Fig. 2, 1 and 2) were on the side of a small spur protruding from an undulating plateau. The slopes in this area are gentle, but it seems likely that at the top of the slope, for example in the area of Building 3 (Fig. 2), there has been considerable erosion probably increased by ploughing. The nearest stream is some three quarters of a mile away (*c.* 1.2km) to the south.

The site is quite close to the presumed line of the Roman road from Chelmsford *(Caesaromagus)* to Norfolk. This is Margary's Peddar's Way (Margary 1955, 224-5, no. 33a), which has been traced to the north of Braintree. It has been postulated that Long Melford was on the junction of two Roman roads, Peddar's Way and another running east-west. However, there is an eight mile (13km) gap from the north of Braintree to Long Melford, and it is in this gap that Gestingthorpe occurs (Fig. 1). It is difficult, therefore, to know how close this site is to a Roman road.

In Mr Cooper's possession is a large collection of coins, formed in Gestingthorpe in the late nineteenth century by local purchase (Publicans Collection, Table 3). Among this collection are fifty Roman coins, many of which doubtless came from the Hill Farm site when it and the surrounding area were land-drained in the late nineteenth century. There are also several Greek and Republican coins in the collection, which by their nature and condition could not have come from the site.

The Roman site at Gestingthorpe has never shown up on aerial photographs, even those taken specifically after the site was known, including some by Dr J.K. St Joseph in 1953. The site has been flown almost every year since and even in the drought of 1976 nothing showed. Many similar sites both in the immediate locality and across Suffolk and Essex must have been destroyed since the second World War, and particularly in the last five years, with the enormous increase in the power of tractors, ploughs and sub-soilers.

The site is some distance from any medieval occupation. It is interesting to note that the parish boundary makes a long narrow loop around the area of this Roman site, including it in Gestingthorpe parish (Fig. 2).

II Geology

by the late F.W. Anderson

The site is on the boundary between the Cretaceous (Chalk) and Tertiary (Eocene). Here the Eocene is very thin, there are Thanet Beds, sands, clays and marls, and a red shelly sand near Sudbury. The glacial deposit (Contorted Drift) at Sudbury is a brown stony loam with chalky seams and large boulders of quartzite, grit, schist, gneiss, granite, basalt, chalk and other rocks. There are no local sources of iron ore: if this were being used in large quantities on the site it must have been imported from some distance.

III Publication history

The excavations were described at some length in Lindsey (1958, 12-32, 65-74). At this time only parts of the site had been excavated, including the baths area. There is a summary of the work to 1960 (VCH 1963, 133-4). The bronze moulds from Building 2 were published in 1970 (Frere 1970), and were also illustrated and discussed by Brown (1976, 28-30 and pl. 23). The linch pin (No. 205) was published by Mr Cooper in 1969 (Cooper 1969a) and in the same year the ivory corner piece (No. 438) was published (Cooper 1969b). A chapter on Roman Gestingthorpe has been included in a recent local history by Ashley Cooper (1982, 19-26).

The site was scheduled as an Ancient Monument by the Department of the Environment in 1974 (Essex No. 180), and Valerie Shelton-Bunn was employed by the Department to undertake the preliminary sorting and card-cataloguing of the finds and to produce descriptions of features excavated. Jo Draper was employed during 1979-80 to produce this site report which was submitted for publication in 1980.

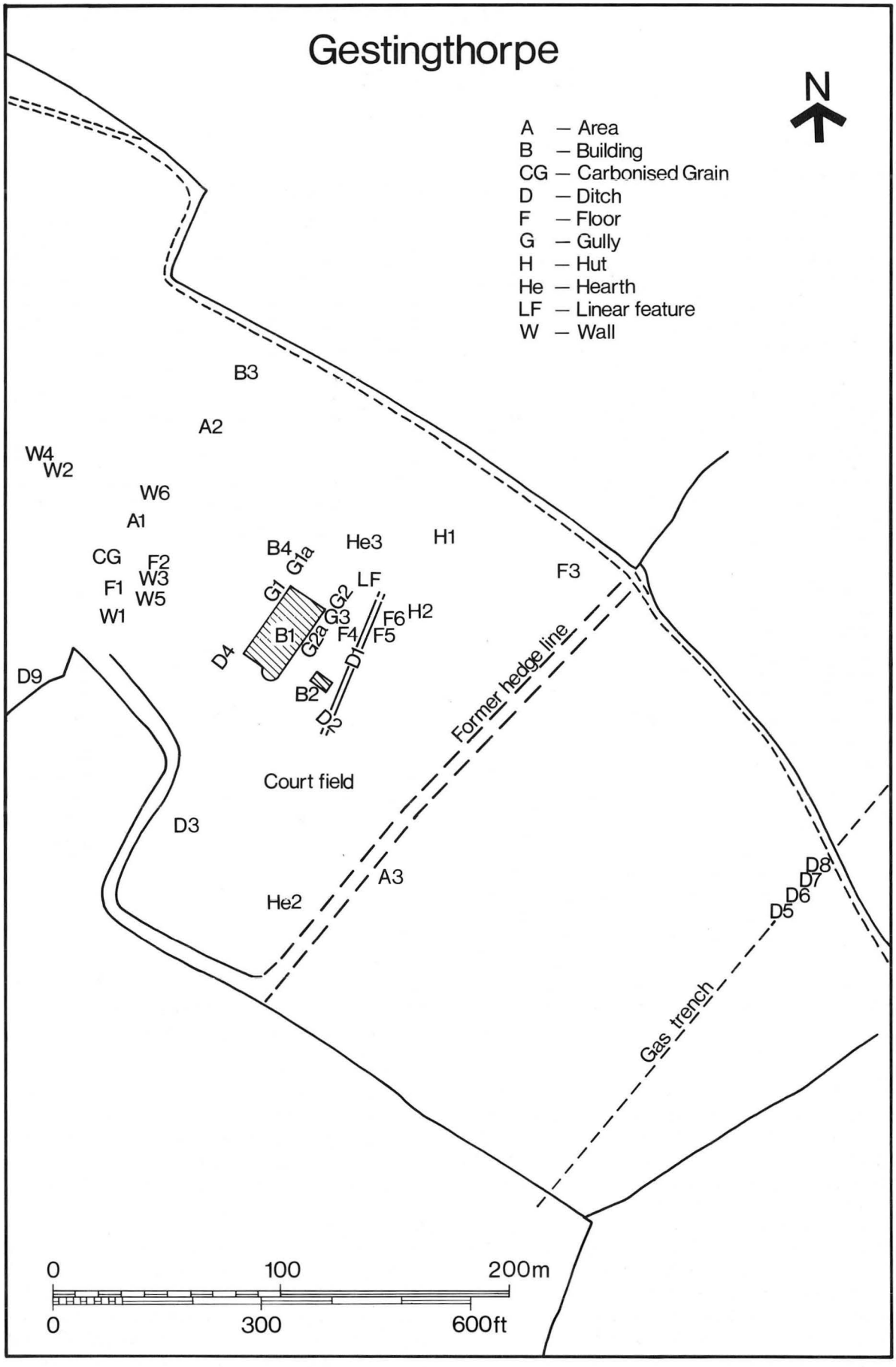


Fig. 3 Roman features plan: Court Field was west from the former hedgeline.

Part 3
The Excavations

Introduction

The Gestingthorpe Roman building complex was investigated over a long period of time in a manner dictated by the cropping programme and the time available to the excavator. The archaeological evidence was obtained in a variety of ways and it is convenient to consider this under a number of headings:

I Building 1 — The villa.
II Yard and gullies around Building 1.
III Features north-west of Building 1.
IV Building 2.
V Ditches 1 and 2.
VI Ditches 3 to 9.
VII Floors 4, 5 and 6.
VIII Building 3.
IX Hearths 2 and 3.
X Features recorded from field drains.
XI Miscellaneous features.
XII Magnetometer Survey.

For reference a catalogue of finds follows each part.

The excavation section is concluded by a general discussion of the date of the excavated features (XIII) and of the technological aspects (XIV).

I Building 1 — The villa (Figs 2-4, 6; Pls I-IV)

The largest masonry building on the site, the villa (Building 1), was excavated during the period 1953-68 and was finally backfilled in 1972. The building was not completely cleared internally, nor were floors removed, so that in some areas interpretation is unsure.

The villa was approximately 36m long by 18.40m wide, and was orientated north-east to south-west (Fig. 4). The outer walls had been substantially robbed, but a 10m stretch on the east side survived (Pl. 1) showing that the footings had been of flints set in yellow mortar. Elsewhere the robber trenches contained only the yellow mortar. The wall footings were 0.80m wide and 0.20-0.25m deep. A 1.50m wide gap in the footings at the north-west corner must represent an entrance. There was a concentration of pottery (now lost) immediately outside this entrance.

The original structure was almost certainly aisled. A row of large post-holes was found along the south-western side (Fig. 4). This row, of which the complete number may not have been revealed, was composed of post-holes *c.* 1.20m in diameter at the top, and *c.* 1.35m deep, all *c.* 4.00m from the south east wall. The two at the north-western end were smaller than the others. Layer 8 was the fill of one of these post-holes. Another row of posts may be inferred on the opposite side of the building which was not fully excavated.

In its final form the two narrow ends of the building were divided into rooms. It seems likely by analogy with other aisled buildings that these divisions were subsequent to the original structure (Smith 1964: Richmond 1969, 64-8), and indeed the internal walls at the north-eastern end (Rooms 7-11) were butt-jointed to the main outer wall, which reinforces this interpretation. Whereas the outer footing was 0.80m wide, all the partition footings were 0.50-0.60m wide, which suggests that they carried a lighter loading than the outer wall. It is unclear whether or not the walls at the south-west end were butt-jointed.

Rooms 1-4 (Fig. 4)

The south-west end of the building was divided into three rooms (1-3) with a semi-circular apse (Room 4) to the south-west of Room 3. This end of the building was not totally excavated. Rooms 1 and 2 were not investigated below the destruction rubble, while Rooms 3 and 4 were more completely examined. The semi-circular wall of Room 4 had footings 0.75m deeper than any of the others except Rooms 5 and 6, and like Room 5 (p. 8) it contained a hypocaust. The basement floor of Room 4 was *c.* 0.20m below the level of the floor in Room 3, and was composed of *c.* 80mm of *opus signinum*. Six *pilae* bases, with only one tile of each remaining, were found towards the centre of the room, but there were indications that the hypocaust had covered the whole floor. A tile-lined channel was found in Room 3 running at an angle of 60° to the north-east walls; it then turned to approach Room 4 at right angles, and presumably passed through the dividing wall to channel hot air to the hypocaust in Room 4 (Pl. IV). The stoke-hole was not located. Wallplaster, mostly painted red, was found in this area.

Rooms 7-11 (Fig. 4)

The north-west end of the building was divided into five rooms (Nos 7-11). The two outer rooms and the central room were wider than the other two, possibly to make the inner walls of Rooms 7 and 11 coincide with the line of the aisle posts. The cross wall was stepped at the partition wall of Room 11 suggesting that an aisle post was incorporated as part of the structure. However, no post was seen during the excavation. The rooms at this end were fully excavated, but no floor levels were found. Disturbed soil extended for 150mm below the bottom of the wall footings (p. 9). No wallplaster was found at this end of the building. Room 7 produced a cooking pot with a lid *in situ* (No. 486), and another with a broken tile across the mouth (No. 487). These were found with two-thirds of the pot below the bottom of the footings, suggesting that they had originally been buried beneath the floors. In a similar position in Room 9 was a cooking pot (No. 488) with a dish used as a lid (No. 489). They were all presumably used for storage. A coin of AD 275 was found in Room 9, and a coin of AD 296 with the pots in Room 7. Just outside the postulated entrance in Room 7, an iron door hinge (No. 235), and a bronze-headed key (No. 140) were found (listed under Building 1, yard and gullies, p. 9).

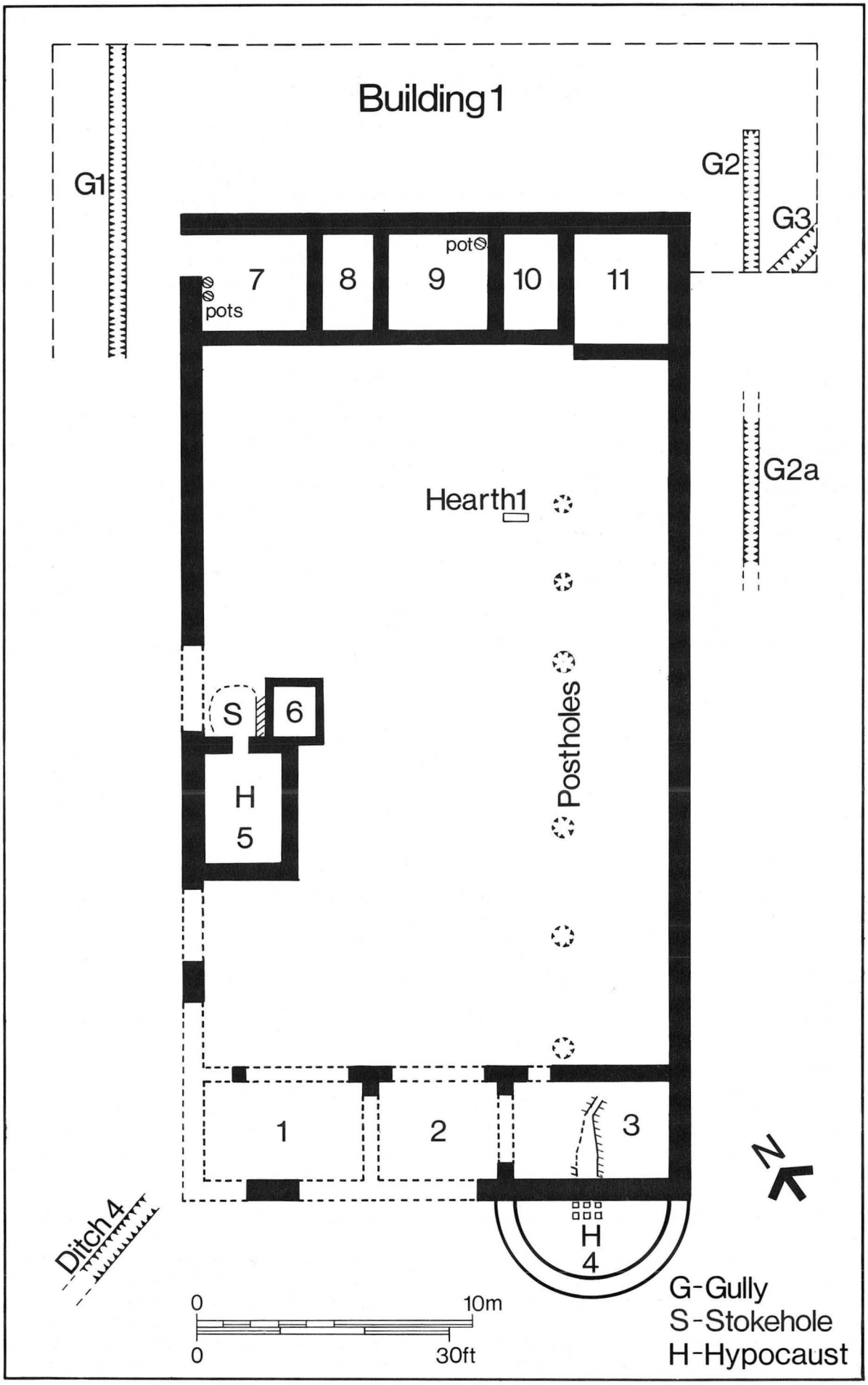


Fig. 4 The villa and associated features. Scale 1:200.

Rooms 5-6: The bath block (Fig. 4)
The first part of the villa to be found and excavated was the baths area which was sectioned by a field drain in 1949. Room 5 was attached to the outer wall of the villa, and its other three walls were of mortared flint *c.* 0.60m wide like the other partition walls, but standing to *c.* 0.45m in places. A large sarsen block (p. 75), found dragged out of the building by the plough some 3-4m towards Room 7, was probably part of a wall of Room 5. The width between the two plastered faces of this block varied from 0.35 to 0.39m suggesting that at least part of the superstructure had walls of that width. The room was *c.* 4.30m by 2.60m with a floor of *opus signinum c.* 0.15m thick with the bases of hypocaust *pilae* still *in situ*. The fill of Room 5 included a quantity of painted wallplaster (red, blue, grey and yellow) and nine coins ranging from Constantine to Arcadius. There were also fragments of moulded *opus signinum* possibly from a bath.

A channel of tile led through the north-east wall to a stoke-hole which covered an area of *c.* 3m². This channel was floored with tile which was not removed, but a small hole dug at its north-east end showed that, at this end at least, the tiles sealed an ashy layer *c.* 0.20-0.25m thick. Above the tiles were black ash, broken tile, an *Urbs Roma* coin of *c.* AD 340 and pieces of lead, one of which may be from a water-tank (No. 148). What may have been a gravel path *c.* 2.00m wide leading to the stoke-hole from the north-east was located in two places by trial trenches (Pl. II). However, this had the appearance of destruction rubble.

There was a fan of six *imbrices* in the stoke-hole beyond the north-east wall of Room 5. Two of those *imbrices* led through the stoke-hole wall up to the wall of Room 6 which was disturbed at this point. Presumably more *imbrices* originally continued the channel into the room. Room 6 (Pl. III), 1.70m by 1.50m, had walls of tile set in mortar with between two and four courses surviving. The floor of the room was hard white clay and was at the same level as the basement floor in Room 5, so that the floor level in Room 6 must have been much lower than that in Room 5. The area between Rooms 1 and 5 was not completely excavated as it was waterlogged.

The north-west wall of Room 6 ran parallel to the stoke-hole wall (Pl. III) and the two appear to have been built separately. On the robbed south-west wall was a large stone which had been set in lime-based screed, with a possible pivot hole in the top (p. 75). The south-west wall of Room 6 must have run parallel to part of one of the walls of Room 5, but it is not clear if these walls were of one build or two.

Other features
Some 0.75m to the north-west of Room 7 was a patch of flint cobbles *c.* 2.40m by 1.00m. Traces of similar cobbling were found elsewhere in this area by trial trenches. Located also only in trial trenches was a floor of white clay in the eastern part of the 'nave'.

Situated 6.30m to the south-west of Room 11, and 4.20m from the south-east wall was what appeared to be a trench hearth, orientated north-west to south-east and measuring 0.90m by 0.30m. It was 0.45m deep and the fill was entirely burnt. It is not clear whether this filling was burnt *in situ* or whether it was burnt material deposited in the hearth. The sides of the trench were fired hard, like brick. A 'bridge' of burnt clay was found across the hearth close to one end (Pl. V).

Earlier building
There seems to have been an earlier building beneath Building 1. This was not excavated, but merely noticed incidentally during the excavation of Building 1. It was thought to have been rectangular, orientated north-east to south-west like Building 1, and to have been considerably smaller than Building 1. This earlier building had evidently been burnt, as much burnt material including burnt samian, burnt chevron-decorated daub (Nos 439 and 440) and traces of burnt wooden beams were found. The decorated burnt daub can be paralleled at Verulamium (Waugh and Goodburn 1972, 160-2) where chevrons were found along with other patterns on burnt daub from Boudiccan or Antonine fires. The burnt samian suggests that the fire here occurred during or shortly after the last quarter of the second century (p. 85-6). This dating is reinforced by the two coins of Antoninus Pius (AD 138-161), found in association with this phase. One was found at a low level when the fill and sides of one of the large post-holes collapsed during excavation.

The magnetometer survey possibly indicates the area of the earlier building (Fig. 6.D: p. 19): it may be the burnt daub which is showing on the survey. If this is the earlier building, it is to the south-west of Building 1, but on an identical orientation.

Dating
It appears from the samian evidence and particularly from the burnt samian (p. 85-6) that the earlier phase of Building 1 was destroyed by fire in, or shortly after, the last quarter of the second century. It is difficult to be so clear about the date of construction: if, as seems likely, the roller-stamped flue tiles (No. 441) were used in the early building, a late first-century date is the earliest possible. The two mid-second century coins associated with this phase fall within the assumed period of use of the building.

The later phase, therefore, must have been constructed after the last quarter of the second century. Possibly it was built immediately after the fire. Coins of AD 296 and AD 275 were found in the floors of Rooms 7 and 9, along with complete buried pots (Nos 486-490) probably dating to the second half of the third century (p. 94 for discussion of pottery dating). It is not certain whether these pots were deposited after the rooms had been created at this end of the building, since it is possible that they were in the earlier floor which must have covered the whole of this area. Thus it is impossible to date the division of this end of the villa.

The clearest dating for any part of the later phase comes from the baths area (Rooms 5 and 6) where a coin of *c.* AD 340 was found in the stoke-hole, and thirteen coins from the middle to late fourth century were found in Room 5.

It is difficult to estimate the date when the villa went out of use. There is a pot (No. 491) from the destruction rubble which is probably fourth century. No material can be dated later than the early fifth century.

Finds

Layer 1 — Destruction of Phase 2 in the 'nave'. Nos 138 (bronze); 197 and 201 (iron); large puddle of lead with impressions, probably from rush matting (missing); and in Room 6 No. 491 (pottery).

Layer 2 — Fill of the rooms at each end of the building, but probably including material from Phase 1. Finds: Room 5 No. 334 (glass); Room 6 No. 442 (tile); Room 7 Nos 5, 112 (bronze); 149 (lead), 362 (bone), 486, 437 (pottery). Room 9 Nos 488 and 489 (pottery); Room 8 No. 490 (pottery); stone p. 75; and tile p. 80-1. Nos 149, 362, 487 and 488 found together with a coin of AD 275. Nos 488 and 489 found together with a coin of AD 275.

Layer 3 — Fill of stoke-hole: Room 5 No. 148 (lead).

Layer 4 — Debris from Phase 1: seen only in the 'nave' as a distinct layer. No. 391 found on first floor beside hearth.

Layer 5 — Dark soil sealed by layer 4. Coin p. 22.

Layer 6 — Level including burnt wattle and daub; destruction of Phase 1. Nos 90 (bronze); 439, 440 (daub); 453, 459, 470, 472, 478, 484 (samian) p. 84. Nos 439 and 440 from the west corner, sealed by layer 4.

Layer 7 — The area (*c.* 0.60m wide) excavated around the building. Nos 12, 99 and 109 (bronze). No. 12 found along east wall.

Layer 8 — Large post-hole fill (No. 282 (iron)).

Unstratified: Area of Building 1 — Nos 56 (intaglio); 89 (silver); 128, 141 (bronze); 264 and 289 (iron); samian p. 84; bronze ring of twisted wire p. 33 after entry No. 64; and mortaria list p. 94.

Other finds not located: bone; bone pins, more than twenty in and around the area; coins, more than sixty in and around the area; window and vessel glass, with a concentration of window glass outside the south-east corner of the feature; two iron keys; iron nails, *c.* two hundred, the post-holes producing particularly large examples; metal fragments; oyster shell, some from layer 2; pottery including samian and colour-coated wares; tile, from layers 1, 2 and 3; and a few shrivelled grains of carbonised wheat in the hypocaust, Room 5.

II Yard and gullies around Building 1
(Figs 3 and 4)

Yard

The area around Building 1 was not completely excavated, although a narrow strip around the building and an area *c.* 11.50m by 27.50m at the north-west end was examined between 1963-67. Over this latter area there was a layer of occupation or destruction debris (layer 1) which was *c.* 0.60m thick beside Building 1, and *c.* 0.45m thick 6m away from the building. Halfway down this layer were patches of flint and tile cobblings, much disturbed and hardly distinguishable from the layers above and below. This possible cobbling was *c.* 0.20m higher than the base of the wall footings for Building 1, and the disturbed soil beneath the cobbles continued for some 0.15m below the wall footings and indeed continued under the building itself (p. 6).

When these upper layers were removed two shallow gullies (Fig. 4, G1 and G2) were seen to the north-west and south-east of the yard area. These were cut into the natural clay virtually parallel to Building 1. These may have been cut through the upper layers.

Gully 1 (Figs 3 and 4, G1)
Located *c.* 2.00m north-west of Building 1, this was *c.* 0.30m wide and 0.10-0.15m deep.

Gully 2 (Figs 3 and 4, G2)
Located 1.40m south-east of Building 1, this continued for *c.* 3.00m beside the building and then petered-out. It was *c.* 0.30m wide and 50mm deep at its south-west end.

Gully 2a (Figs 3 and 4, G2a)
Located *c.* 9.00m south-west along the building from, and a possible continuation of, Gully 2. This was *c.* 1.25m wide and at least 0.50m deep. It is not clear whether this gully was cut through the 0.30m of occupation debris which was found on either side. A 5m length was excavated, but it probably continued along the building. Gully 2a contained the statuette mould (No. 428) and a part of a conical crucible (No. 435).

Gully 3 (Figs 3 and 4, G3)
This may not relate to Building 1 as its orientation was different from that of the building. Its west end was *c.* 5.00m from the east corner of Building 1, and it was found *c.* 0.45m below present ground surface, and was 2.50m wide and 1.80m deep. It is not clear whether Gully 3 cut through the 0.30m of occupation debris found on either side. The fill was very dark and contained a large amount of ash at all levels. The lower 0.60m was waterlogged and difficult to excavate. The pottery from Gully 3 is probably of fourth-century date (p. 96).

Coins

Eight coins were found in a straight line parallel to, but 0.50m away from the external north-east wall of Building 1 (Table 2). There could have been a gully alongside this wall which was not noticed during the excavation and which would account for the coins being in a straight line. This group consists of a potin coin of the early to mid-first century BC, two coins of *c.* AD 270 and five coins of *c.* AD 335. Apart from the British coin they must all relate to the second phase of Building 2.

Finds

Occupation debris over the whole area — Nos 9, 102, 106, 114, 117, 132, 140 (bronze); 235, 244, 247 (iron); 357 (glass); 414 and 485 (pottery). No. 140 from outside north-west corner of Building 1, on cobbling; and No. 235 on cobbling outside north corner of Building 1, close to entrance.

Gully 1 — No. 190 (iron), c. 400m from north corner of Building 1.

Gully 2 — Nos 205 (iron); 308, 310 (glass); 438 (ivory). No. 205 from the south end, 3m from east corner of Building 1, on natural; and 308, 310 and 438 found together, *c.* 3.60m from the east corner of Building 1.

Gully 2a — Nos 428-431, and 435 (mould and crucible).
Finds not located: bone; eleven coins; window glass; iron nails; a few fragments of wallplaster; pottery; and an oyster shell. Coins listed in Table 2.

Gully 3 — Nos 534-551, 588 (pottery).
Finds not located: bone, several coins, iron nails, samian, oyster shell, and a small amount of tile.

General area of Building 1, yard and gullies — Nos 41 (bronze); 181, 233, 241, 243, 299, 300 (iron); 317 (glass).

Finds not located from all layers: bone — at least thirty bone pins in occupation debris; coins (Table 2); iron nails; metal fragments; oyster shell; plaster and mortar; pottery including samian; quern fragments; and tile.

III Features north-west of Building 1
(Fig. 3)

Gully 1a (Fig. 3, G1a)
A trial box excavated in 1959-61, 3.00m to the north-west of the yard, at the end of Building 1, located Gully 1a. This was on the same alignment as, and was possibly

a continuation of, Gully 1 which ran along the north-west side of part of Building 1 and the yard (p. 9). Gully la was *c.* 0.25m wide, 50-100mm deep, and was traced for 4.60m before it petered-out.

Building 4 (Fig. 3, B4)

Overlying Gully la, but possibly not sealing it, was a roughly rectangular 'floor'; 50mm thick composed of flint, tile and gravel (layer 2) covering *c.* 12m², petering-out towards the edges. No surrounding walls were found it is possible that this was a yard, rather than a floor. It was overlain by *c.* 0.25m of occupation debris (layer 1), and the similar layer beneath it (layer 3) was over Gully la. It is not clear whether Gully la was cut through these layers or not.

At one point the eastern edge of the floor was touched by a cutting 0.50m deep orientated north-south. Only one side of the cutting was located, and this was traced for 5.50m in length and 3.00m in width. The cutting was flat-bottomed. Where it was close to the floor much flooring material was found in the fill, which otherwise consisted of rubble, black soil and occupation debris. The floor and cutting comprise Building 4, of which there is no plan available. Over the whole area of Gully la and Building 4 was a layer of dark soil (layer 1) containing occupation material including three worked bone or antler pieces (Nos 387, 399 and 400). The cutting fill (layer 5) was similar to layer 1 and it is not clear whether it was cut through layer 1 or not. Material which may be from the cutting fill or from layer 1 is listed under layer 4.

Building 4, on the evidence of the coins, samian, and other finds appears to have been in use during the late second and third centuries: the cutting fill produced fourth-century pottery.

Finds

Gully la — No finds.

Building 4

Layer 1 — Occupation material over the floor, etc. Nos 151 (lead); 186, 202, 203 (iron); 387, 399, 400 (bone); 498 (pottery).
Not illustrated: fragment of a bronze pin.
Finds not located: bone; barbarous radiate coins found 0.10-0.15m above the first floor; iron nails; window and vessel glass; metal fragments; and pottery.

Layer 2 — The floor. Nos 142 (pewter); 297 (iron); 372 (bone).
Not illustrated: fragment of thick lead sheet; two perforated pottery bases; and a fragment of a combed box tile.

Layer 3 — Beneath the floor.
Finds not located: as layer 1 except for the coins.

Layer 4 — Either the cutting fill or layer 1. Nos 188, 210, 249 (iron); 447, 450 and 499 (pottery).
Not illustrated: fragment of roller-stamped tile as No. 441.
Finds not located: bone; barbarous radiate coins; iron nails; window and vessel glass; metal fragments; pottery; and tile.

Layer 5 — Cutting fill. Nos 27, 45, 57, 85, 87, 91 (bronze); 159, 169, 195, 217, 239 (iron); 314, 315 (glass); 418 (jet); 444, 462, 471, 473, 500-502 and 573 (pottery).
Not illustrated: a bracelet fragment (p. 33 after No. 55); blue glass bead (p.68 after No. 348); two fragments of whetstones (p. 75 after No. 424); fragment of a Hertfordshire Puddingstone quern (p. 75 after No. 427); two circular discs made from pottery; and a piece of roller-stamped tile (see entry for No. 441).
Finds not located: as layer 1, apart from the coins, but including two pieces of unworked antler.

IV Building 2 (Fig. 3, B2; Pl. VI)

Building 2 was excavated in 1950 and backfilled in 1952. It was small and rectangular (*c.* 5.00m by 8.00m) defined by narrow (0.45m) dry flint foundations. These foundations (*c.* 0.23m deep) included a small amount of tile, and many of the flints had plaster adhering to them, suggesting that they had been re-used from a demolished building not far away. If this is so, the demolished building must have had dry flint walls with plaster on them, as Building 2 seems to have had, since no mortar adhered to the flints.

Building 2 was orientated north-west to south-east and was probably divided into two rooms of equal size since, although no partition was found, the floors in the two halves differed. In Room 1 (north-west) the floor was made of red, black, yellow and white tesserae (all ceramic) — too disturbed to reveal any pattern — pushed into sandy soil, with some tile repairs. Room 2 (south-east) had a floor of chalk and mortar with fragments of red tile. The disturbed flooring and *c.* 0.12m of occupation debris over it form layer 3. A small amount of wallplaster was found in the *c.* 0.20m of destruction rubble within the building (layer 2).

A cobbled yard 2.00-3.00m wide was found by trial trenches on the north-west and south-west sides, and the other sides seem to have had some sort of surfacing for the same distance. The yard and *c.* 30mm of occupation debris over it comprise layer 5. The destruction layer of the building (layer 1) overlay the yard to a thickness of 0.18-0.20m.

Earlier phase

Sealed beneath the floor of Building 2 (layer 3) was a layer of very dark soil containing occupation debris (layer 4). From within layer 4 in the east corner of Room 2 and sealed by the floor, came a pot (No. 492) which probably relates to this earlier phase (p. 94). This layer apparently continued outside the area of the building (layer 6) sealed by the yard. Layer 7 was a mixed layer beneath layer 1 (the destruction level over the yard), probably consisting of part of layer 5 (the yard) as well as layer 6 (the dark soil). The dark soil layers (4, 6 and 7) were the only ones in this area to contain samian, and these layers sealed a row of post-holes outside the south-east wall of Building 2. These post-holes were on a more east-west alignment than Building 2, and may have continued into the unexcavated area beneath that building. To the west of Building 2, beneath layer 6/7, there were about fifty stake-holes haphazardly arranged over an area of *c.* 12m². These may have been cut through layer 6/7 and the cobbling layer 5.

It seems likely that the post-holes and layers 4, 6 and 7 represent an earlier building beneath Building 2, but since the samian found in these layers cannot be located it is difficult to be precise about dating. The nature of the buildings or building, let alone their function is impossible to define, but they may bear some relationship to the earlier phase of Building 1.

Discussion of Building 2 and 'bronze' working

The superstructure of Building 2 was almost certainly timber founded on the dry stone footings. These footings are too narrow, besides lacking the strength of mortar, to have supported a stone building. The roof was probably

red tile, since complete and fragmentary *imbrices* and *tegulae* were found in and around the building, particularly in a small depression immediately to the north of it. A little window glass was found around Building 2. To judge by the coins found, the building was probably of the fourth century AD.

Despite the lack of hearths both in and, as suggested by the magnetometer survey (p. 19 and Fig. 5), around the building, this small structure seems to have been used by a bronze worker. The most significant evidence for this is the crucibles (Nos 433, 434 and 435a) found outside the south and east corners of the building. There are also the fragment of clay mould (No. 432); fragments of bronzes, possibly intended for re-use (many of these fragments cannot now be located); and blobs of bronze-casting waste (p. 63 for analysis) all found in the western corner of Room 1.

The analysis of some of the pieces of bronze from Building 2 shows that it is debris from bronze working and bronze-casting (p. 64 for discussion of the crucibles). The late fourth-century dolphin buckle (No. 16) found on the wall footing in the west corner has the appearance of being unfinished, since casting ridges still exist. It seems probable, however, as it has the buckle plate attached, that it was a carelessly finished article in circulation, rather than an object necessarily made at Gestingthorpe. No. 116 is more clearly unfinished and was found in Room 1, layer 3.

Other evidence for bronze working from the site as a whole includes substantial parts of a clay mould for a bronze statuette (Nos 428-431) and a sprue cup found in Gully 2a around Building 1, along with a base of a conical crucible (No. 435). This mould has been published by Frere (1970) who states that 'the proportions of the central part of the body indicate that the original statuette was *c.* 14½ or 15ins (370-382mm) high' and that it may have represented Bacchus or a Satyr, since it has an ivy chaplet; and that it may date from the second or third century AD.

The ladle (No. 160) from Ditch 1 was probably used for pouring metal, and it has been suggested (p. 41) that some of the trinket jewellery, and perhaps the steelyard (No. 137) were made on the site.

Thus, despite the lack of hearths, there is substantial clear evidence for bronze working, and specificially for the casting of a bronze statuette, on the site; and it seems likely that the craftsman worked in Building 2. However, it is very difficult to date this activity. Building 2 seems to have continued in use until the later fourth century, on the evidence of coins and the dolphin buckle — which is still a useful indicator of date even if it was not manufactured on the site. Unfortunately the trinket jewellery which was perhaps made on the site, and the statuette, would all seem to be earlier, perhaps third century AD. If it is thought that the dolphin buckle *was* made on the site it would seem to be necessary to postulate two periods of bronze working, one in the third century and the other late in the fourth.

The bronze working evidence, consisting of parts of moulds for one statuette and one other object, parts of three crucibles and a small amount of scrap bronze and debris from casting and working could, presumably, result from a very few weeks work by one craftsman. However, if trinket jewellery was indeed manufactured on the site the case is very different, since the bulk of the material would have been sold and would, therefore, leave little evidence on site.

Finds

Building 2

Layer 1 — Destruction level of Building 2 over the yard. Nos 330 and 331 (glass); found just outside and halfway along the north-east wall.
Finds not located: bone; iron nails; pottery; tile; and carbonised wood.

Layer 2 — Destruction level within the walls of Building 2.
Finds not located: as layer 1.

Layer 3 — Disturbed floors and occupation within Building 2.

Room 1 — Western corner. No. 432 (clay mould).
Not illustrated: fragments of bronze waste; part of the rim of a bronze vessel with slag (p. 64 for analysis of slag); and other pieces from Room 1, layer 3.

Room 1 layer 3 — Nos 59, 62, 116, 120 and 124 (bronze).
Not illustrated: a complete tile from the north corner of the floor in Room 1 (p. 80).
Find not located: many fragments of bronze; a little plaster; and pottery, including colour-coated ware.

Room 2 layer 4 — No. 492 (pottery).
Finds not located: bone; iron nails; wallplaster; oyster shell; pottery including samian; tile; and carbonised wood.

Layer 5 — The yard and occupation debris over it. Nos 72 (bronze); 220 (iron); 332 and 347 (glass). No. 72 found on the yard by the north wall; 220 and 347 found near the east corner of the building; 332 found near the north-east corner of the building.
Not illustrated: complete *tegula* from beside the centre of the south-west wall (p. 80); and fragments of bronze-casting waste from on the yard surface outside the west corner. For analysis of one of these pieces see p. 64.
Finds not located: bone; bronze scraps and bronze-casting waste from near the west corner; pottery; and tile.

Layer 6 — Dark soil beneath the yard.
Finds not located: as layer 4 above.

Layer 7 — A mixture of layers 5 and 6. Nos 419 (jet); 433, 434, 435a (crucibles); 493 (pottery). Nos 433 and 434 found together outside the south corner; 493 found outside the east wall of Room 1.
Finds not located: as layer 4 above.

No specific layer — Nos 16, 73 (bronze); and 390 (iron). No. 16 found on the west corner of the wall; 390 found on top of the destruction rubble of the north-east wall.
Not illustrated: chunk of bronze, for analysis p. 64.
Finds not located: three coins of Constantinian date; and bone pins.

V Ditches 1 and 2 (Figs 2 and 3; Pl. VII)

Ditch 1 (Figs 2 and 3, Dl; Pl. VII)

Ditch 1, running north-south to the east of Building 2, was located by trial trenches and then completely excavated between 1954-56. It was approximately 2.50m wide, U-shaped and seemed to be butt-ended, 1.10m deep in the central part and shallower at each end. Since the ground level also dropped towards the centre, it could not have functioned as a drainage ditch, with the centre so much lower than the ends. No stratigraphy was observed in the ditch: the finds have been divided into layers 1 to 4 arbitrarily by depth in the ditch. The fill was dark, becoming darker towards the bottom.

Trenches were dug beyond the northern end of Ditch 1, but no features were found, only the same dark soil containing many artefacts found in many areas of the site (e.g. Area 1, p. 16). Towards the northern end of the ditch there was, 0.30m to the west, Floor 4 (p. 13); and 6.00m to the east, Floor 5 (p. 13). Further to the north it was difficult to see the west bank of the ditch

where it merged with the yard of Building 2. To the south, just before it terminated, Ditch 1 was cut by, or cut another ditch, Ditch 2 (Fig. 3, D2) which was only traced for about 1.00m either side of Ditch 1.

The material from Ditch 1 shows a very wide date range, from the early brooches, e.g. No. 11 which is probably before AD 70 and No. 4 which dates from the first century AD, to late Roman glass (No. 313), glass beads (Nos 335 and 336) and a fourth century bracelet (No. 39). However, much of the datable material is probably of the second or third century, including the millefiori stud (No. 15); and a brooch (No. 10); bronze rings (Nos 58, 60 and 64); glass (Nos 311 and 312); and the military bronze strap-mount (No. 98). All variations of date come from all levels in the ditch so that it is difficult to be clear about any sequence. A coin of Antoninus Pius (AD 138-161) was found in the bottom of the ditch. Certainly some of the early material could be residual, but this still leaves problems. Of the twenty-one iron tools from the site, fifteen are from Ditch 1, and twelve of those are from the vicinity of Floor 4. North of Floor 4 was the iron ladle (No. 160) possibly used for pouring lead, a chisel (No. 163) and an awl (No. 168). Beside Floor 4 were; a hammer (No. 152), smith's tools — a chisel (No. 154) and a punch (No. 156) — and a smith's or leather-worker's punch (No. 158), and possibly the handle of another tool (No. 294). Immediately to the south of Floor 4 were two more chisels (Nos 164 and 165), another possible chisel (No. 166) and a punch (No. 157). No. 155, a chisel which may have been used for metal working, probably came from this area. There were also many keys and knives. The smithing 'buns' and smithing slag, and the plate of cast steel (p. 63) were found in the area of Floor 4.

These tools must reflect activity in the buildings around the ditch. It is difficult to understand why they were discarded. W.H. Manning suggests that they are too mixed a group of tools to be linked to any one trade; their deposition may have resulted from the clearing of rubbish which had accumulated in a barn, which was then dumped together in the ditch. If this is so, the tools must all be of broadly similar date.

Further ditches parallel to and on either side of Ditch 1 show on the magnetometer survey (Fig. 6, E and F; p. 19). Ditch 1 does not show on the survey.

Ditch 2 (Fig. 3, D2)
Ditch 2 either cut, or was cut by, the southern part of Ditch 1. It was traced for *c.* 1.00m either side of Ditch 1, and was *c.* 1.40m wide and 0.60m deep. Beneath the topsoil on either side of the ditch was a dark layer containing artefacts; the relationship of this layer to the ditch was not clear. A ditch which may be parallel to Ditch 2 shows on the magnetometer survey (Fig. 6, G; p. 19).

Finds

Ditch 1

The finds from Ditch 1 came from the following contexts:

Layer 1 — Upper 0.30-0.35m.
Layer 2 — 0.25-0.30m of fill below layer 1.
Layer 3 — 0.25-0.30m of fill below layer 2.
Layer 4 — 0.10-0.15m of fill beneath layer 3, on the bottom of the ditch.

Finds are listed by area along the ditch, as this seems to reveal more possible groups of material, particularly amongst the iron tools:

North end — layer 1 — Nos 13, 207 and 281 (iron).
North end — layer 2 — Nos 10, 65 (bronze); 178, 187, 206, 221, 234 and 258 (iron).
North end — layer 3 — Nos 189, 214 and 224 (iron).
North end — layer 4 — No. 167 (iron).
To the north of Floor 4 — No. 160 (iron).
To the north of Floor 4 — layer 2 — Nos 86 (bronze); 163, 168, 175 and 182 (iron).
To the north of Floor 4 — layer 3 — Nos 218, 259 and 260 (iron).
To the north of Floor 4 — layer 4 — No. 402 (antler).
Beside Floor 4 — layer 2 — Nos 152, 154, 156, 170, 293, 294 (iron); and 389 (antler).
Immediately south of Floor 4 on the shoulder of the ditch — layer 1 — Nos 157, 165, 166 and 193 (iron).
South of Floor 4 — layer 3 — Nos 212 and 213.
South part — layer 2 — Nos 198 (iron); 335, 336 (glass — found together); 397, 403 (bone); 404, 525, 527 and 529 (pottery).
South part — layer 2 — Nos 11 and 105 (bronze).
Not illustrated: eleven iron hobnails found together.
South end — layer 1 — Nos 4, 39, 71 and 101 (bronze).
South end — layer 2 — Nos 20, 129, 131 (bronze); 358 (glass); 405 (antler).
South end — layer 3 — Nos 64, 123 (bronze); 200 (iron); and 466 (pottery).
Central part — layer 1 — Nos 34, 67, 110 (bronze); 379 and 382 (bone).
Central part — layer 2 — Nos 50, 61, 98 (bronze); 232 (iron); 310, 311, 312 (glass); 313 and 528 (pottery).
Not illustrated: fragment of a bronze pin.
Central part — layer 3 — Nos 96 (bronze); 204 (iron); and 421 (stone).
South part — layer 1 — Nos 55, 70, 76, 79, 82, 107, 136 (bronze); 338-345 (glass); and 393 (bone).
Not illustrated: another bronze *ligula* as No. 82.
South end — layer 4 — No. 530 (pottery).
Near Building 2 — layer 2 — Nos 30 and 63 (bronze).
Near Building 2 — layer 3 — Nos 58 and 60 (bronze).
Near Building 2 — layer 4 — No. 402 (antler).
Layer 1 — no closer location — Nos 14, 75, 80, 83, 115 (bronze); 137 (lead); 139 (bronze); 346 (glass); 423 (stone).
Layer 2 — no closer location — Nos 15 (bronze); 88 (silver); 388 (bone); 526 (pottery).
Possibly from Ditch 1 or the area around — Nos 81, 104, 108 (bronze); 153, 155 and 196 (iron).

Finds from Ditch 1 not located: a fragment of an antler of 2.15m estimated span; bone; coins; iron nails; pottery including colour-coated; and tile.

Ditch 2 — Finds not located: bone; pottery; and tile.

VI Ditches 3 to 9 (Fig. 3)

Several other ditches were found in other areas of the site, although none was so completely excavated as Ditch 1. There are indications of further ditches still on the magnetometer survey (Fig. 6).

Ditch 3 (Fig. 3, D3)
Ditch 3 was found by a field drain in 1952 in the south-west part of the field to the north-west of Hearth 2. An area *c.* 2.50m by 3.00m was excavated showing that the ditch was U-shaped, 1.80m wide and 0.60m deep, running north-east to south-west. No stratigraphy was observed.

Ditch 4 (Fig. 3, D4)
Ditch 4 was found in a field drain cutting in 1955, to the south-west of Building 1. 3.00m² was excavated, showing that Ditch 4 was *c.* 2.50m wide and at least 0.90m deep.

Ditches 5-8 (Fig. 3, D5-8)
A gas pipe-line trench was mechanically excavated (south-west to north-east) to the south-east of the main

excavated areas, in what is now part of Court Field, but until 1948 was a separate field (O.S. 129). The gas trench cut across four ditches (Nos 5-8). Ditches 5-7, which interconnected, were 0.75m, 1.20m and 1.20m deep respectively and were between 1.50m and 3.00m wide. All three were U-shaped and it is not clear whether they cut one another or were contemporary. The ditches must run north-west to south-east since the gas trench cut across them at right angles.

Ditch 8, some 4.00m to the north-east of Ditch 7, was 6.50m wide and only 1.30m deep, suggesting that the gas trench cut across it at a much greater angle and that, therefore, the alignment of Ditch 8 was different from those of the others. These ditches were not relocated although the gas trench sliced across the whole width of the field and beyond.

Ditches 5-8 were found within black soil marks which are shown stippled on Figure 2. They did not show on the magnetometer survey (Fig. 6).

Ditch 9 (Fig. 3, D9)
A drain dug in 1955 in the field to the south-west of Court Field located a ditch which appeared to run parallel to Ditch 3.

Finds

Ditch 3 — Nos 531-3 (pottery).
Finds not located: bone, iron nails; and tile.

Ditch 4 — Not illustrated: Antonine samian (list p. 84).
Finds not located: bone; five or six illegible coins; iron nails; oyster shell; pottery; and tile.

Ditches 5-8 — No finds.

Ditch 9 — No finds.

VII Floors 4, 5 and 6 (Fig. 3)

Floor 4 (Fig. 3, F4):
A patchy triangular area of flint and tile *c.* 0.10m thick found towards the northern end of Ditch 1 was excavated in 1955. It extended for some 4.50m along Ditch 1, *c.* 0.30m away from the lip of the ditch. The floor or yard petered out towards the edges and no further structure was seen. Floor 4 (layer 2) overlay *c.* 0.15m of dark soil (layer 3) and was itself overlain by *c.* 0.40m of dark soil containing artefacts (layer 1). Beyond Floor 4 the two dark soil layers were recorded as one (layer 4).

Many finds were recovered from Ditch 1 alongside Floor 4, including the iron ladle (no. 160), many tools (Table 8), worked bone and several iron keys. About twelve radiate coins were found scattered 0.10-0.15m above Floor 4. A military bronze strap mount (No. 100) of the second or third century was found in layer 4.

Floor 5 (Fig. 3, F5)
Another floor or yard found on the eastern side of Ditch 1, also towards the northern end, was excavated in 1955. It covered an area *c.* 2.00m by 6.00m orientated north-north-east to south-south-west. Floor 5 was composed of gravel *c.* 0.15m thick (layer 2), and like Floor 4 it overlay *c.* 0.10m of dark soil (layer 3) here containing artefacts, and was itself overlaid by 0.35-0.40m of a similar dark soil (layer 1). Again these layers continued beyond Floor 5 where they were recorded as one (layer 4). Eight or nine radiate coins were found 0.10-0.15m above Floor 5.

Floors 4 and 5 may relate to timber buildings, perhaps as floors or as external yards. Both would seem to be earlier than the later third century since several radiate coins were found in the layer over the floors. It is difficult to be certain whether Ditch 1 would have been open at this time, but it seems likely, and it is from the fill of Ditch 1 in the area of Floor 4 that much of the evidence for the industrial character of the area comes (p. 12).

From the area of Floor 4 came the plate of cast steel (p. 63); smithing slag and smithing 'buns' (p. 62).

Floor 6 (Fig. 3, F6)
A trial trench in 1952 to the north of the gravel floor or yard (Floor 5) found another possible floor. Floor 6 consisted of large, closely fitting flint nodules in an oval area 1.50m by 3.60m, *c.* 0.15m thick in the centre. No other features were seen. Some finds were made in the ploughsoil above Floor 6, but they cannot now be located.

Finds

Floor 4

Layer 1 — Dark soil below ploughsoil and over Floor 4. Nos 113 (bronze); 182, 192 and 296 (iron).

Layer 2 — Floor 4. Nos 179 and 226 (iron).

Layer 4 — Dark soil in the area around Floor 4. Nos 8, 26, 51, 100 (bronze); 143 (lead); 174, 176, 211, 215, 223, 291 (iron); 409, 411 and 427 (stone).
Not illustrated: a piece of iron bar; smithing slag and smithing 'buns' (p. 62); and a plate of cast steel (p. 63).
Finds not located (from all layers): bone; bronze fragments; pottery; tile; and iron nails.

Floor 5 — Finds not located (all layers): bone; iron nails; pottery; and tile.

VIII Building 3 (Figs 2 and 3, B3)

Tesserae and building debris were seen in the north corner of Court Field in 1958, and a trial trench 1.00m square revealed a dry flint footing 0.50m wide. When the area was ploughed it was possible to see marks which could have been the lines of robbed wall footings.

In 1972 Mr Cooper invited the Sudbury and District Historical Research Group to investigate the building. They excavated two trenches each 3.30m by 4.50m with a 0.60m baulk between them. The wall footing which Mr Cooper had found was located in the western trench running roughly north-north-east for some 1.80m. Patches of flint rubble were found to the west of this wall, and to the south of the trench an area of painted wallplaster was found face down. There was no flooring beneath the plaster, merely disturbed soil containing tile chips, charcoal flecks and chalk nodules. This layer was not bottomed. The eastern trench produced *tesserae*, a glass bead (No. 348), window glass, and a coin of Constantine I, but no features.

Since Building 3 is towards the top of the hill it has been eroded and possibly damaged by the plough; the wall footing was only 0.25-0.30m below present ground surface. The footing was insubstantial and un-mortared, suggesting that, like the other buildings on the site, Building 3 had a superstructure of wood. Tiles were found suggesting that the roof was tiled. No floor levels were found. It is notable that, despite the flimsy nature of the footings, painted wallplaster and window glass were found, suggesting a building of some sophistication.

Small *tesserae* were also found here and nowhere else on the site. The lack of surface finds in this area, in particular coins, is strange and may be due to erosion. If the single coin found during the excavation may be used as an indicator, Building 3 was in use during the fourth century, although the brooch (No. 7) found on the surface near Building 3 dates from the first half of the first century AD.

The magnetometer survey clearly shows a building in this area with two rows of massive posts (Fig. 6, L), and it seems likely that the walls found during excavation are part of that building. If so Building 3 was a similar construction to Building 1, but rather smaller.

Finds

Building 3 — No. 348 (glass).
Not illustrated: a coin of Constantine I, AD 335-337; red tile *tesserae* (12mm square); chalk *tesserae* (10mm square).
Finds not located: window glass; large iron nails; wallplaster painted pink, grey and green; coarse pottery; oyster shell; one white *tessera* (38mm square); tile fragments of both *imbrex* and *tegula*; and fragments of carbonised wood.

Surface finds near Building 3 — No. 7 (bronze).
Not located: many other small *tesserae*.

IX Hearths 2 and 3

Hearth 2 (Fig. 3, He 2; Fig. 5; Pl. VIII)
In 1961 trial trenches were dug into a dark patch of soil (*c.* 6m²) which was visible in the south-east corner of Court Field. Just below the ploughsoil, burnt red material was found. The trial trench was enlarged to expose Hearth 2 and Mr Cooper asked Mr Bryan Blake (then of Colchester Museum) for advice on the excavation. Mr Blake's report is summarised below and his plan is the basis for Fig. 5. Hearth 2 was constructed of local boulder clay and measured about 0.60m by 0.90m. Parts were fired red and parts were still yellow-brown, as indicated on Fig. 5. The floor included several tile fragments. Fig. 5, la-3 shows the possible construction sequence. There were two post-holes (on the section line) which could have supported a bar across the fire.

A fragmentary tile found just outside the 'throat' may have been used to block it, and an ox scapula with one edge burnt, found in the same position, may have been used to clean the hearth out.

Around the hearth other features were excavated. 1.20m to the north-west was a patch of tile fragments with unfired clay *c.* 0.60m by 0.60m, and there was another similar patch which measured 0.60m by 0.45m immediately to the south of the hearth. Both these areas are visible on Pl. VIII and appear to be flooring.

1.20m to the south-west of the hearth was a dish-shaped pit 1.50m in diameter and 0.45m deep (to the left of the spade on Pl. VIII). It contained charcoal, and clay burnt red and yellow, with lumps of unburnt clay towards the top. There seemed to have been an earlier feature beneath this pit whose eastern edge ran close to the south-west edge of Hearth 2.

It is difficult to know what this hearth could have been used for other than for domestic purposes since there was no evidence in the form of slag, off-cuts, etc., to suggest industrial use; and in any case a square hearth is not a suitable shape for producing the high temperatures needed for most industrial purposes.

Anomaly K on the magnetometer survey (Fig. 6) may be associated with Hearth 2.

Quantities of pottery from the area of Hearth 2 probably date from the later fourth century (p. 92).

Hearth 3 (Fig. 3, He 3)
Hearth 3, in the north-western part of the field to the north-east of Building 1, was a circular hollow *c.* 1.80m in diameter, *c.* 0.60m deep in the centre, filled with clay burnt red, and sand. No finds were associated with this feature which could relate to the industrial activity on the site, although it is some distance from the main area of activity which seems to centre on Ditch 1 and Building 2. Indications of other hearths were found on the magnetometer survey (Fig. 6, H and J).

Finds

Hearth 2 — Nos 17 (bronze); 173, 177 (iron); 386 (bone); 504-524 (pottery).
Not illustrated: samian (list p. 84 after No. 484).
Not located: antler; animal bone; iron nails; pottery; and small quantity of tile.

X Features recorded from field drains

A field drain *c.* 0.60m wide and 0.30m deep dug, along the north-western side of the field in 1951, cut across several Roman features. These are described from south to north.

Wall 1 (Fig. 3, W1)
This was constructed of dry flint, *c.* 0.60m wide and 0.20m high. It produced no dating material, but was probably Roman.

Floor 1 (Fig. 3, F1)
Comprising compact chalk nodules *c.* 80mm thick, this extended for some 6.50m along the trench, petering-out at either end. No surrounding wall or other feature was observed. Under the floor were 0.12-0.15m of soil overlying the natural clay. Modern ploughsoil reached to within 60-80mm of the floor. Floor 1 lay within a dark patch of soil of some 0.60 hectare in area, visible on the surface. Some pottery and tiles were recovered from the layer immediately above Floor 1, but these cannot now be located. The late M.R. Hull identified the pottery as dating before AD 200. Some samian was found.

Carbonised grain spread (Fig. 3, CG)
Within the black soil mark, an enormous area containing quantities of carbonised grain was encountered. This extended for *c.* 3.50m along the trench, and trial trenches demonstrated that it continued for at least 3.50m and either side of the trench. Modern ploughing had disturbed the top of this spread, which was *c.* 0.10m thick (layer 1), and overlay *c.* 0.15m of dark soil (layer 2) beneath which was the natural clay. There was about one grain to every square centimetre of soil along with other fragments of burnt material, and taken in conjunction with the huge area (*c.* 475m²) an enormous amount of grain must have been burnt. Since the grain was threshed and cleaned (p. 98) perhaps this represents a grain store which burnt down.

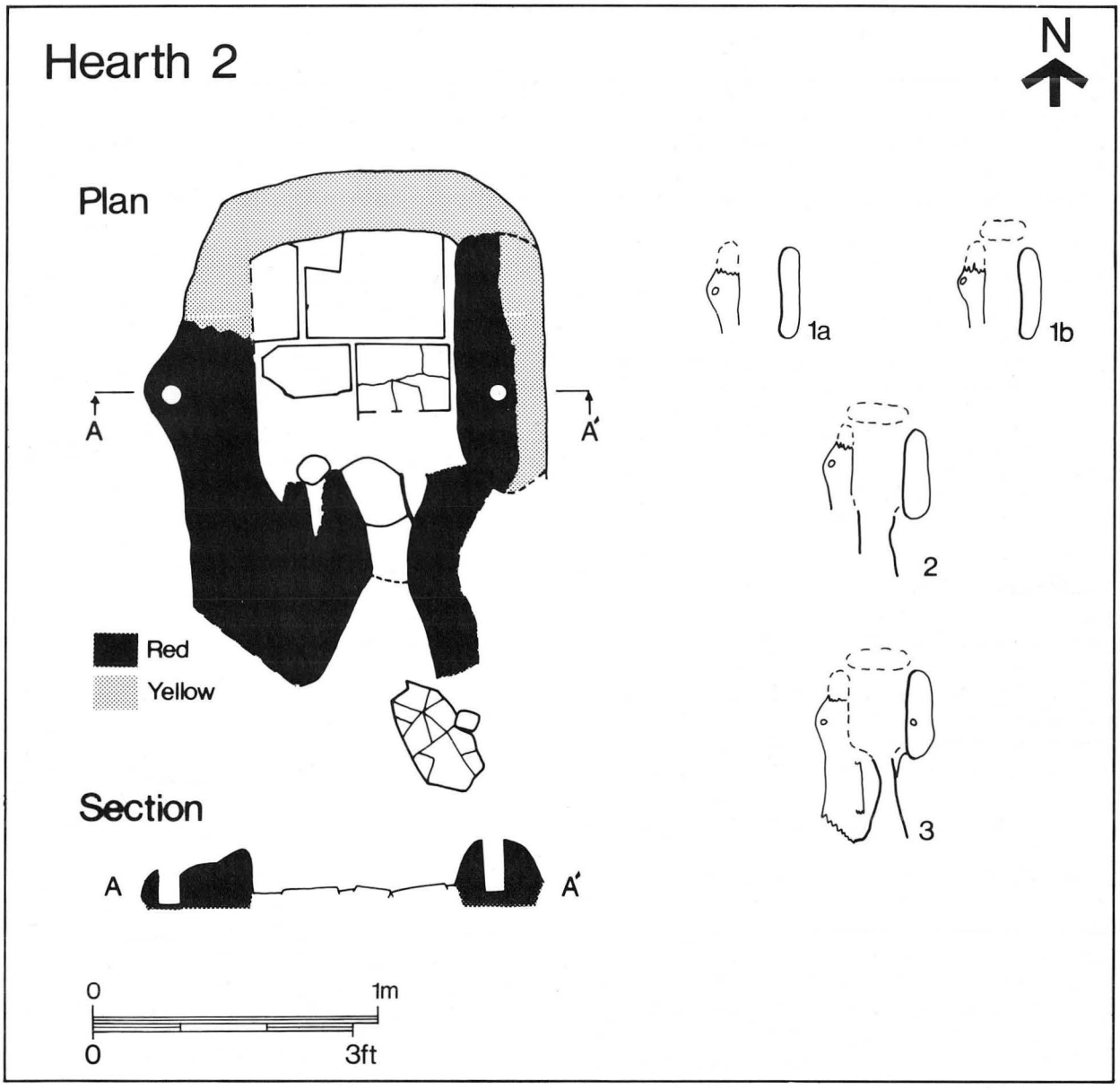


Fig. 5 Hearth 2: Plan and section as excavated on the left, and conjectural development plans on the right.

Wall 2 (Fig. 3, W2)
North of the carbonised grain spread, another dry flint wall similar in size and construction to Wall 1.

Wall 4 (Fig. 3, W4)
A further wall located beyond the end of the field drain when it was extended in 1970, of similar construction and size to the others. This drainage trench crossed an area of significant activity on the magnetometer survey (Fig. 6, N and P).

Wall 5 (Fig. 3, W5)
A field drain running north-west to south-east to the north-west of Building 1, cut across two apparently Roman features.

At the south-west end was Wall 5, a dry flint wall *c.* 0.30-0.40m wide and *c.* 80mm high. It was traced for *c.* 1.00m, and was orientated roughly north-north-west to south-south-east.

Floor 2 (Fig. 3, F2)
Further to the north-east, Floor 2 was located *c.* 0.60m below the present ground surface, consisting of close-set tile fragments and a few flints. This possible floor was traced for *c.* 0.90m by 1.00m. Two bronze fibulae were found in the topsoil in the area of Floor 2, but they cannot now be traced.

Wall 3 (Fig. 3, W3)
Found by a trial trench between Wall 5 and Floor 2. 0.90m of dark occupation soil overlay one remaining course of a dry flint wall, *c.* 0.60m wide. 2.00m of the wall was excavated. No finds were made during the excavation, but a bronze fibula (No. 5) of *c.* AD 40-60 was found on the spoil-heap, and the jet inlay (No. 420) was found by field walking in the area of Wall 3.

Finds

Carbonised grain spread — Carbonised grain sample (p. 98).
Not illustrated: fragments of three Hertfordshire Puddingstone querns (entry for No. 427).
Finds not located: Constantinian coins; iron nails; pottery; tile; more querns; samian; and carbonised wood.

North of the carbonised grain spread — No. 463 (pottery).

Immediately south of the carbonised grain spread — Nos 552 and 553 (pottery).

XI Miscellaneous features

Area 1 (Fig. 3, A1)
A circular area *c.* 9m in diameter was excavated in 1953 in the north-western area of the field. The stratigraphy was merely *c.* 0.45m of disturbed topsoil above *c.* 0.45m of black soil containing many artefacts. Beneath this was the natural clay. Towards the top of the black soil was a concentration of tile.

The finds from Area 1 range in date from the mid-first century brooch (No. 1) to a late Roman bracelet (No. 37) and nail cleaner (No. 77) and fourth-century coins. Most of the other bronzes are probably second or third century; and most of the samian is Antonine, with only one piece earlier. All finds were from the black soil layer. The late M.R. Hull identified some pottery (now lost) from this feature as Belgic.

Area 2 (Fig. 3, A2)
Another circular area *c.* 6.00m in diameter was excavated to the north-east of Area 1. The stratigraphy was identical to that of Area 1.

Area 3 (Fig. 3, A3)
This area, in the south-eastern part of the field to the north-east of Court Field, was not excavated, but many finds have been made on the surface. The possible association of the model axe (No. 145) and the two full-size axes (Nos 161 and 162) is interesting.

Linear Feature (Fig. 3, LF, Pl. IX)
To the north of Ditch 1 was a very enigmatic linear feature. A trial trench located a sharply defined linear feature 40mm wide and 200mm deep, cut into dark occupation soil (layer 1) which was 0.30m thick. Below layer 1 was a 100mm layer containing small pebbles and fragments of tile (layer 2), and beneath this was the natural subsoil which was discoloured by leaching of the material above. The trench was extended and another linear feature was found, crossing the first at right angles. Both these linear features had a light-coloured fill which showed clearly against the darker soil around. The first linear feature was traced for some 2.50m and then terminated abruptly. Otherwise the limits of these features were not defined.

An analysis of the linear feature fill (layer 4) and the dark occupation layer (layer 1) was carried out by the Ancient Monuments Laboratory in 1960:

'Results of ignition tests and visual examination;

1.	Organic matter	—High
	Iron	—Medium
	Found	—Fragments of charcoal, fired clay, and other occupation debris.
4.	Organic matter	—High+
	Iron	—Medium
	Found	—Fragments of debris similar in *nature* to that of 1 but far less in quantity.

Discussion: Although both samples are high in organic matter (suprisingly 4 contains more organic matter, if anything) and cannot be distinguished on that basis or by the iron content, it is clear that the *nature* of their organic material must differ. It seems most likely that in 1 it is largely charcoal, while 4 probably contains much 'fresh' organic matter concentrated by drainage and other natural factors. The preliminary conclusion is that 1 represents an ([?] ancient buried) occupation level, and 4 ([?] later drainage) channel of some kind, cut through 1, and subsequently silted up.'

No finds were made in any layers. The linear features were obviously not geological since they cut into an occupation soil and contain quantities of organic material. Drainage channels do seem the likeliest explanation, but the proportions of the features and their clear-cut nature are very odd. They may be Roman.

Burnt Areas
Deep ploughing in the field to the north-west of Court

field revealed, over an area of about two acres (0.8 ha), a number of burnt areas. Ten of these, all some 9.00m or more apart, were excavated. All were 0.45-0.60m in diameter, and 0.30m below present ground surface, consisting of carbonised material with a few flints cracked and discoloured by heat. The ground beneath was burnt red. No finds were associated with these features which may result from recent tree clearance in the field. These are not shown on the plan as their exact positions are uncertain.

Chalk Layers

Mention should also be made of several amorphous layers of chalk, thought originally to have been small heaps, found in several places in Court Field. These may have been intended for spreading on the fields, although if this was so the operation was not carried out, or they could be disturbed floors of timber buildings similar to Floor 3.

Floor 3 (Fig. 3, F3)

Isolated in the east corner of the field was an apparently roughly circular (2.45m in diameter) area of close-packed chalk nodules, at least 0.20-0.25m thick at the centre and petering out at the edges. A few fragments of pottery were found with this floor but they cannot now be located.

Huts 1 and 2 (Fig. 3, H1 and H2)

Also in the north-east corner of the field were indications of about twelve small buildings over an area of about 0.4ha. Two of these were excavated. Hut 1, excavated in 1962, consisted of a layer, 6.00m in diameter and 0.10m thick, of flint pebbles and tile fragments with carbonised wood and fragments of bone. All the finds were from this layer. Beneath the hut the natural sand was blackened. After these layers had been removed a post-hole 0.23m in diameter and *c.* 0.10m deep was seen, cut into the clean sand. This was not seen in the upper layers, but if it had been cut through those layers it would have been 0.40m deep.

Hut 2, excavated in 1953, was beyond the north end of Ditch 1 and was similar to Hut 1, being circular *c.* 6.00m in diameter, with a central post-hole but without the clear floor or occupation layer which Hut 1 had. Immediately beneath the ploughsoil was a layer of occupation debris, consisting of flint, chalk, tile, pottery and bone, some 0.18-0.20m thick.

Trial holes into several of the other small buildings have produced more bone pins, nails, pottery, etc., and fourth-century coins. Many fourth century coins have also been found by field walking in the area.

Other similar surface indications have been seen in the south-east part of the field, to the south and south-west of Hearth 2.

Finds

Area 1— Nos 1, 25, 28, 29, 31-33, 35, 36-38, 42-44, 46-49, 53, 54, 77 (bronze); 111, 171, 208, 216, 227, 237, 242, 245, 248, 250 (iron); 316 (glass); 410, 413, 415, 422, 424 (stone); 443, and 555 (pottery).
Not illustrated: fragments of two bronze bracelets (p. 33 following No. 55); whetstone fragment (p. 75 following No. 424); two quern fragments (p. 75 under entries 425 and 426); three iron hob-nails in bad condition; and decorated and plain samian (list p. 84).
Finds not located: animal bone; bone pins; bronze fragments; six Constantinian coins; window and vessel glass; iron nails; pottery; over five tons of tile; and carbonised wood.

Area 2— Nos 209, 236, 263 (iron); 333 (glass); 392 (bone); 412, 416 (stone); 437 (clay).
Not illustrated: samian (list p. 84) and two fragments of Puddingstone quern (list under No. 427); and mortaria sherds.
Finds not located: bone (including pins); bronze fragments; iron nails; pottery; tile; window and vessel glass.

Area 3: surface finds—Nos 78, 145 (bronze); 161, 162 (iron); 337 (glass); 554 (pottery).

Surface find near Floor 3—No. 84 (pewter).

Hut 1— Nos 130 and 133 (bronze).
Finds not located: bone; bone pin; two radiate coins; two other coins; twenty iron nails; pottery; tile; and carbonised wood.
Not illustrated: two fragments of lead—see entry for No. 148.

Area of Hut 1—No. 318 (glass).

Hut 2— Nos 144, 146, 147 (lead); 199 (iron); 408 (antler).

XII Magnetometer survey (Fig. 6)

by Alistair Bartlett

A magnetometer survey was carried out in March 1977 by the DOE Ancient Monuments Laboratory with the object of establishing the relationship of individual excavated features to the overall plan of the site.

The magnetometer used was a fluxgate gradiometer which measures the local gradient of the vertical magnetic field component and gives a continuous signal which can be plotted directly on a chart recorder. It has a short detection range and so responds only to near-surface magnetic anomalies. The site was surveyed on a grid of 30m squares with traverses plotted at 1m intervals. The plan shows the boundaries of the areas surveyed and an interpretation of the results. Magnetic anomalies are shaded according to their strength, and some of the main excavated features for which the location is known are marked in outline for comparison. The boundaries to some of the areas of weak magnetic disturbance are not always clearly defined. The initial chart from which the interpretation shown here is derived is reproduced in A.M. Laboratory Report No. G 10/77.

The variable subsoil of boulder clay and sand does not itself provide ideal conditions for the magnetic detection of archaeological features and the response from the survey varies according to the effects of human activity on the site. One measure of this variation is given by the value of magnetic susceptibility as determined from soil samples. Processes of burning or organic decomposition acting on naturally occurring iron oxides over a long period usually cause an increase in susceptibility in an area of past occupation, and the value was found here to be three times as high near the villa as in an undisturbed part of the site (22.5 and 9.5 x 10^{-6} emu/gm respectively; a.c. bridge readings). There was, therefore, strong magnetic disturbance near the villa (Building 1), but only an incomplete response from outlying ditches. Any feature containing material which has been directly burnt, such as a hypocaust or hearth, is likely to be strongly magnetic in itself and so may be detectable independently of local soil conditions. The survey shows no other focus of activity as strong as that around Building 1 although a number of other features were detected.

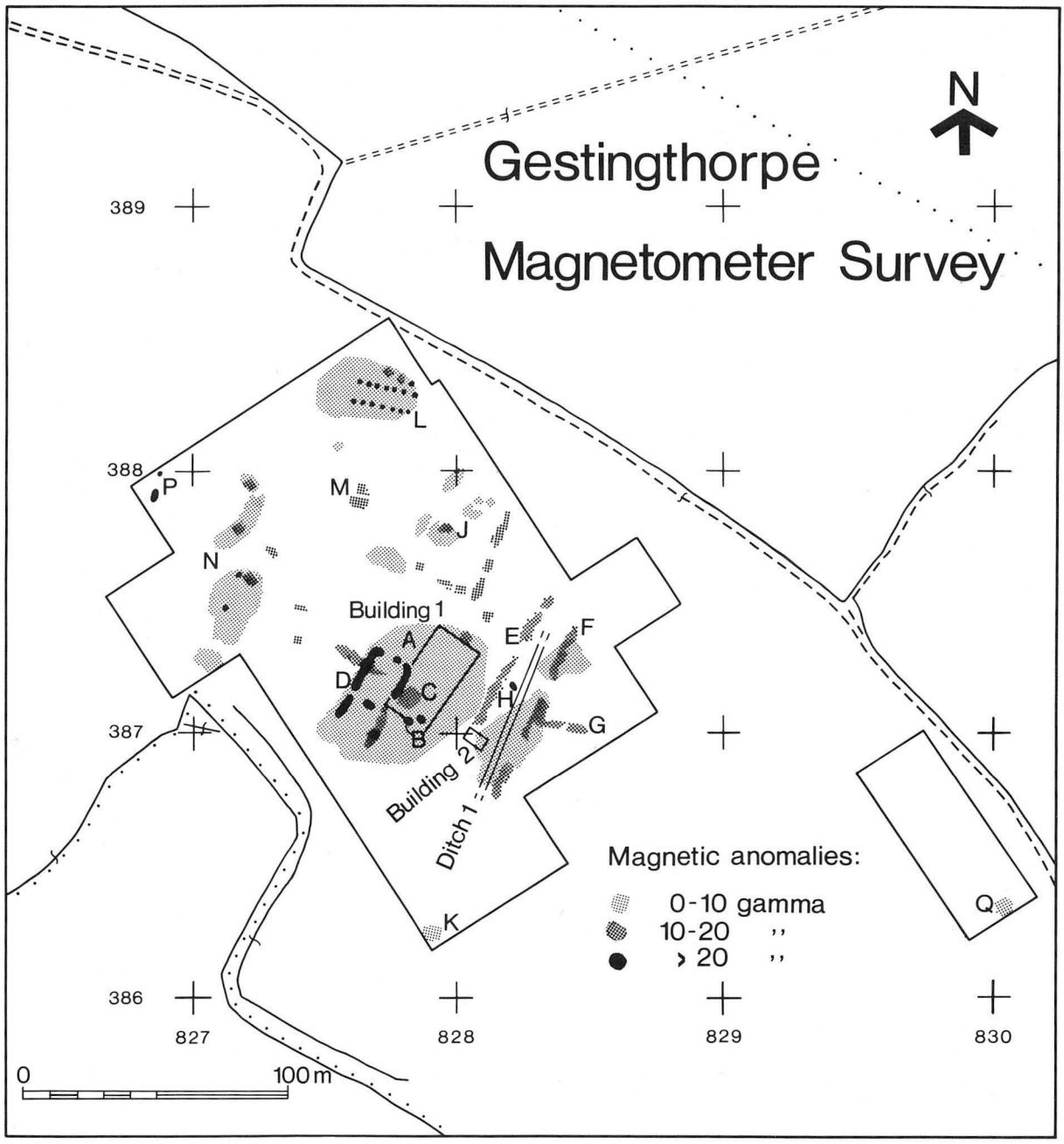


Fig. 6 Location of the 1977 magnetometer survey with an interpretation of the results. Features shown in outline are located from the excavation plan.

Building 1 lies in an area of irregular magnetic disturbance marked as an extensive weak anomaly on the plan (Fig. 6.A). The actual outline of the building is not visible, but it would be unusual for flint wall footings to give any direct response. Magnetic surveys usually indicate the presence of earth-filled features or burnt debris, but rarely building foundations as such.

Any redistribution of material caused by excavation and backfilling might also have obscured any distinct response from the building. No magnetic anomalies representing the gullies or post-holes associated with the building were identifiable, although such features were located elsewhere in the survey. There are, however, certain other magnetic anomalies within the building in positions which approximately correspond with excavated features. Two of them (Fig. 6.B) could represent remains of the hypocaust from the apsidal Room 4, and there is an anomaly of intermediate strength nearby which could indicate a spread of debris from the hypocaust in Room 5 (Fig. 6.C).

Alongside Building 1 to the west is a group of exceptionally clear and strong magnetic anomalies forming a rectangular outline (Fig. 6.D), which in plan and orientation is very similar to Building 1. The excavation produced evidence of burnt daub sealed beneath the floor of Building 1 which might indicate the presence of an earlier building on the site, and the anomalies could relate to this. Foundation trenches filled with burnt daub in quantity could produce anomalies of the strength observed, but if this interpretation is correct the survey shows that the two buildings are offset and that the later excavated villa overlies the earlier phase only at the south-west corner.

The correspondence between survey and excavation is not entirely clear for other features at the south end of the site, although quite good at the north. Two magnetic anomalies (Fig. 6.E, F) were detected, each roughly aligned with the excavated Ditch 1 to the south-east of Building 1. The anomaly in each case is intermittent, but they are both clearly present and neither can be identified with the excavated ditch which lies in a magnetically disturbed area between them. It may be that in the case of Ditch 1 the magnetic contrast between the fill and the surrounding subsoil which is necessary for detection has been disturbed by excavation, and that other ditches, not necessarily contemporary, were found in the survey. The transversely orientated Ditch G may be parallel to the excavated Ditch 2.

Building 2, in which bronze-working materials were found, falls in a comparatively little disturbed part of the site, but again the building was of relatively slight construction and would not necessarily be detectable in itself. No furnace or hearth was excavated and the survey confirms the lack of any such strongly magnetic feature nearby. Hearth 3 which was excavated at some distance to the north of Building 2 was found to contain burnt clay, and anomalies which could represent similar hearths occur at (H) and (J).

Various occupation remains have been found towards the east of the field (Huts 1 and 2, Floors 2 and 3). Magnetic activity which might be consistent with features of this kind is found mainly around Ditch F and near the anomaly (J), where additional fragmentary ditches are also visible. A hearth (Hearth 2) and other features were found towards the south-west of the field, and the anomaly (K) may be associated with these.

A particularly interesting feature of the magnetic response is the anomaly (L) which corresponds to the site of Building 3 at the northern corner of the area surveyed. This part of the field has not been extensively excavated, but trenches have shown the presence of *tesserae*, wallplaster and flint wall footings. Again the survey does not show the wall footings themselves, but does clearly show two rows of strong anomalies, probably representing post-holes capable of supporting a substantial aisled building. There is again an area of surrounding magnetic disturbance, but it is much weaker than for Building 1. The anomalies to the south at (M) may represent the occupation debris found in Area 2.

Both the survey and the excavation indicate one remaining area of significant activity. This is at the north-west side of the field where features including walls, floors and a layer of blackened soil containing carbonised grain were exposed in a drainage trench. The trench itself was not detected in the survey (deliberately backfilled modern excavations rarely are), but a series of disturbed areas was found at the approximate positions of the known features (N). Nothing was found of a strength to represent a surviving industrial kiln or hearth, nor a substantial building, but lesser buildings could well be present. The strongest anomalies found in this part of the site were at the far north-west corner of the survey (P).

To the east of the main settlement, colour changes in the soil indicated possible occupation and the detached area shown was surveyed to investigate. The area was found to be magnetically almost undisturbed with only a weak magnetic anomaly of uncertain significance (Q) at the far south-east end. Any ditches which may be present here would probably not be detectable so far from the villa and the magnetic activity associated with it.

XIII Discussion of general dating

The earliest pottery from the site, identified by the late M.R. Hull as Belgic, was found in small quantities over most of the site. This pottery has now been lost with the exception of one stratified sherd which is probably late Iron Age or early Roman (No. 570); two late Iron Age forms in Roman fabric (Nos 552 and 553); another sherd (No. 571) which may be Iron Age or Saxon; and a Dressel 1B amphora (p. 97). No features can be dated to this early period, but other finds include the two Iron Age coins (p. 22), the ring-headed pin (No. 90), and nine brooches ranging from the early first century AD to AD 75 (Nos 1-8 and 11). The findspots of these brooches were plotted in an attempt to localise the first-century occupation, but they were spread out across the site, and the only notable feature of the distribution is that none was found in or near Buildings 1 or 2. The potin coin, however, was found with a small group just outside Building 1. The earliest Roman coins amongst those which are certainly from the site are of Vespasian; and the samian series starts with a few Flavian pieces, although there is a gap for the late Flavian and Hadrianic period (p. 85). Although there must have been earlier buildings on the site to account for the finds, the earliest feature which can be securely dated is the earlier phase of Building 1, and even then it is the destruction of that

phase which can be best dated. It seems to have been destroyed by fire in or shortly after the last quarter of the second century (p. 85-6). It may have been constructed in the late first century (p. 8). The first phase of Building 2, which had samian (now lost) associated with it, may relate to this early phase of Building 1.

The later phase of Building 1 probably followed close on the destruction of the earlier phase. Pots and coins buried within the floors of this phase date from the second half of the second century. The baths area (Rooms 5 and 6) produced many fourth-century coins, and a storage jar (No. 491) from destruction levels also seems to be fourth century. Thus it seems likely that Building 1 existed in one form or another from possibly the late first century until the late fourth. The later phase of Building 2 was probably in use in the fourth century, and it is possible that a building in this position spans the same sort of date range as Building 1.

Two features on the site, Area 1 and Ditch 1, produced material ranging in date from the first to the fourth centuries. The buildings or yards beside Ditch 1, Floors 4 and 5, could be more closely dated however, since they produced third-century material.

Building 4, a rather enigmatic structure, contained material ranging from the early third to fourth centuries, and Building 3, on poor evidence, could be fourth century. Hearth 2 is much more securely dated to the later fourth century by quantities of pottery (p. 94). Thus there are many features which were either apparently constructed (Hearth 2, possibly Building 3, etc.) or still in use (Buildings 1 and 2, Ditch 1, etc.) in the fourth century. It is more difficult to be clear about the situation in the second and third centuries, although quantities of material testify to occupation throughout that period. The coins in particular are found in large quantities for the third century, particularly the irregular issues (p. 22), a pattern which continues into the early fourth century.

The latest object from the site is possibly the very odd decorated sherd No. 555 or the sherd No. 571 if it is not Iron Age. Otherwise there are many late Roman metal objects (e.g. buckles Nos 16 and 17; strap-ends Nos 18 and 19; glass Nos 328 and 329; etc.) but there is no material which need be later than the early fifty century AD. It seems that occupation on the site finished sometime very early in the fifth century. It is interesting to note that half a mile to the south of the site an area producing Roman and Saxon material (and indeed Deverel-Rimbury pottery) was excavated in 1958 (Blake 1960). No structural remains were discovered, but the Saxon pottery found ranges in date from perhaps the early sixth century onwards through that century (Myres 1969, 110).

XIV Discussion of the technological aspects

by Leo Biek

The role of technology in villa and settlement economy has been recently explored by Rahtz and Greenfield (1977), Branigan (1977) and Leech (1982), and is beginning to emerge more clearly as a significant component which has hitherto been inadequately appreciated. Against this background the activities at Gestingthorpe, considered as an economic unit, stand out by their quirkiness rather than reflecting any 'standard norm'.

It is unlikely that any of the glass vessels, shale or jet objects, stonework or mortaria were fashioned on site. On the other hand it is clear that the tiles and even the white brick could well have been produced locally—if not actually on site—and there is some evidence supporting local (coarse) pottery production. There is a definite possibility, though no evidence, that the leaden votive objects were local and clearly lead was freely used—and lost—on site, as is frequently the case. Bone and antler and possibly horn were evidently also worked.

What gives the site its technological character, however, is clearly the metalworking evidence. The ferrous tools are unusually plentiful and concentrated. Their thorough examination, and that of the other iron artefacts and debris, strongly suggests the presence of a smithy in the area around the northern end of Ditch 1. The first reaction, that the ironwork is not properly heat-treated, needs to be set against both the provincial and archaeological status of Gestingthorpe. It remains to be discovered whether areas nearer Rome or indeed the metropolis itself produced superior ironwork.

But the most important technological feature of the site about which too little is known for useful discussion is undoubtedly the intensity of the 'bronze working'. In the absence of excavated working areas it is difficult to assess; but the great range of alloys suggests a wide base and broad experience, and the statuette mould and conical crucibles add piquancy and an individual touch to the activity.

In the circumstances it is difficult to date this industrial effort. Most of it would appear to be third century, but some of it—particularly the 'bronze working'—could be later. Ditch 1 which held most of the iron tools is very difficult to date; indeed the only real certainty is that the whole group was found together. It is to be hoped that future work may bring further data to this most important way of considering villa economy.

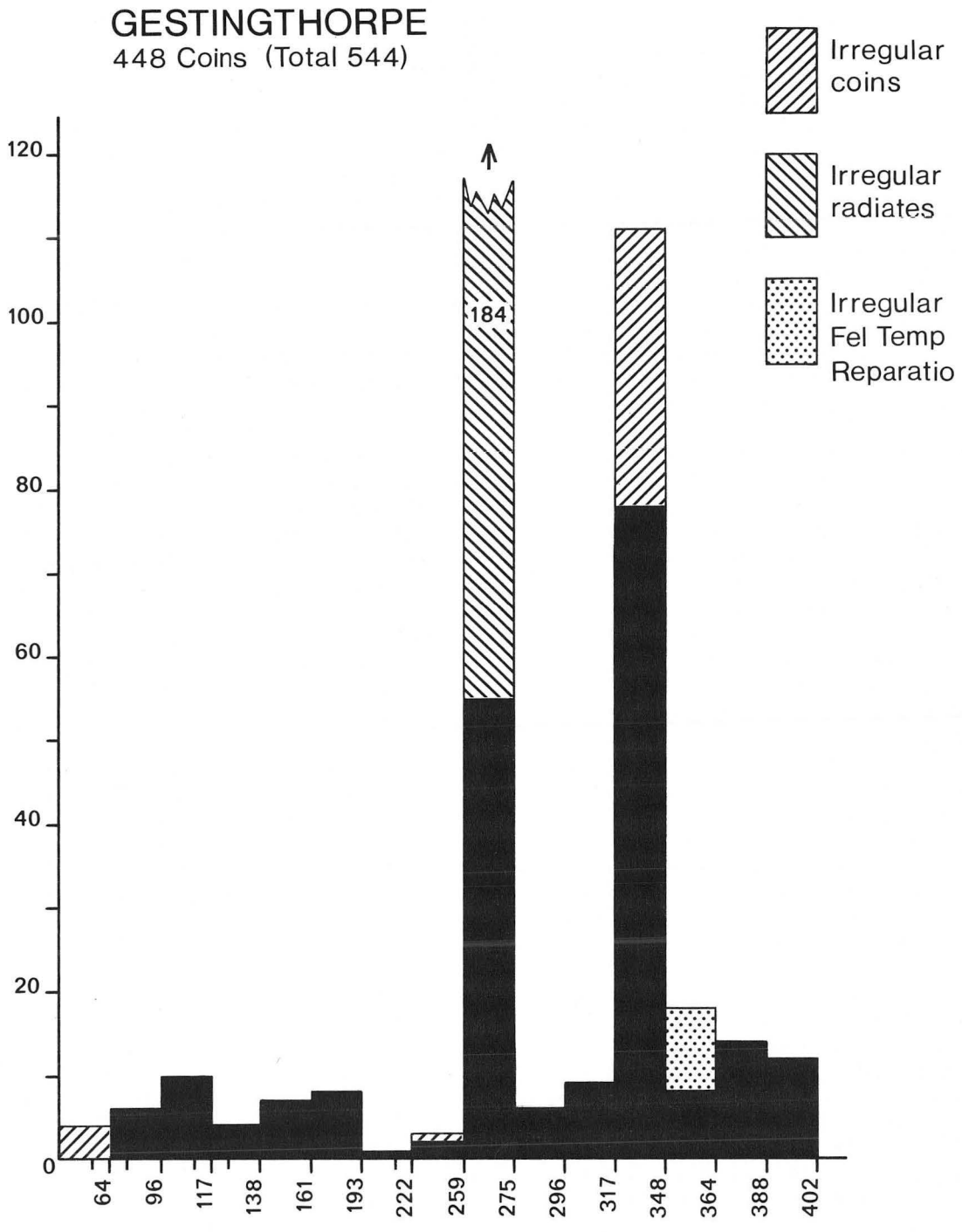


Fig. 7 Histogram of the Roman coins.

Part 4
The Artefacts

Introduction

Unless otherwise stated the objects are unstratified. Where stratified the feature and layer has simply been stated i.e. 'Hearth 2' rather than 'from Hearth 2'. If no layer number is given there is no stratification and the object is from the area of that feature. Many objects, particularly of iron, were too frail or fragmentary to recover during excavation. Much of the coarse pottery was returned to the trenches before backfilling. 'Not located' in the lists of finds after features indicates that the object either cannot be found, or that it cannot now be distinguished amongst the collection, e.g. a bone pin which may be among the unstratified bone pins, but cannot be identified. All the finds and site records are in the Hill Farm Museum.

I Iron Age Coins

by Francis Grew

Bronze Cunobelin (Mack 253)
Obv.: bearded head of Jupiter Ammon facing r. CUNOB
Rev.: lion crouching r. beneath tree; below, on tablet, CAM
Weight: 1.169g (18.040 grains) *c.* AD 10-40
(Published in Haselgrove 1978, 68).

Potin (Allen Class I, Type C)
Obv.: head facing l.
Rev.: butting bull r.
Weight: 1.144g (17.654 grains)
(?) Early to mid-first century BC perhaps *c.* 75-50
Published in Allen (1971, 145, fig. 31, C5) ; Haselgrove (1978, 46)
From the small group from Building 1 yard (Table 2, No. 1)

II Roman Coins

by Peter Curnow

In total 544 coins were available for inspection (Fig. 7). Many were in a totally corroded and/or fragmentary condition, probably including a high proportion of irregular pieces. This accounts for the large number which were incapable of reasonable identification. In addition to the total of Roman Imperial coins there were two British coins, an Alexandrian tetradrachm, and a Charles I rose farthing.

The way in which the assemblage was collected—by no means all the coins were the results of proper excavation—may have allowed a certain number of extraneous Roman coins to creep in—mainly first or second century. However these are unlikely to affect the overall patterns of coin loss. The total is a large one for a domestic site—villa, farmstead or the like—and the extent of the site combined with the lengthy and partial excavation must mean that there would have been an exceptionally large coin assemblage had the area been the subject of an area excavation. It would appear that the exact nature of the site has not been determined nor have all the buildings been elucidated. The finds might not, therefore, be purely domestic but connected with public, religious or commercial activity on one or more parts of the site. The lack of precise location for the coins means that only the overall pattern for the site can be suggested.

The first and second centuries are well and steadily represented with a number of coins exhibiting substantial wear indicating the considerable length of time during which they must have been in circulation. The third century radiate issues quite normally represent a peak of coin loss, but at Gestingthorpe this peak is a dominant feature. The exceptional number of irregular issues including many small and poor pieces is a feature of the site. Further, many of the indecipherable and fragmentary coins—of which there is a higher proportion than normal on comparable sites—are likely to be irregular radiate issues, thus taking the total even higher.

Whilst there can be no certainty in any deduction from this more than normal radiate coin loss it is possible that the site may have been used for other than domestic or farming activities: sites with religious, market or like activities sometimes produce both radiates and radiate copies in some profusion, and it is not impossible that such might be the case here.

The early fourth-century coinage, mainly House of Constantine I and containing a fairly high proportion of irregular pieces, is well represented and seems to indicate high activity not paralleled later. Although the later fourth-century coinage is present it cannot be represented as other than a relative decline of activity on the site generally.

The coins are listed according to the categories:
Table 1: Main body of coins
Table 2: Small group of coins from Building 1 yard
Table 3: Publicans collection of coins (Privately collected in the vicinity of Gestingthorpe)
Table 4: Recent coin finds
Table 5: More recent coin finds

The groups in Tables 4 and 5 were submitted on separate occasions after preparation of the main report.

The following abbreviations are used:
RIC: Roman Imperial Coinage: Vols 1-V Mattingly and Sydenham 1923-33; Vol. VI Sutherland (ed.) and Carson 1967; Vol. VII Sutherland and Carson 1966
LRBC: Late Roman Bronze Coinage, Parts I and II; Hill, Kent and Carson 1960

Table 1: Main body of coins

	Obverse	Date	Denom	Reference
				RIC II
1-2	Vespasian	69-79	Asses (2)	CF 497, CF 500 (pierced for suspension)
3	Uncertain (Claudian or Flavian)	1st cent.	As	- (1)
4-5	Trajan	98-117	Sest, Dup	- (2)
6	Hadrian	117-138	Dup	- (1)
				RIC III
7-9	Antoninus Pius	138-161	Den, Sest (2)	597, 891
10	Faustina I (Antoninus Pius)	138-161	As	- (1)
11	Faustina II (M Aurel)	161-180	As	- (1)
12	Lucilla (M Aurel)	161-180	Sest	1750
13	Posth M Aurelius (Commodus)	180-192	Sest	662
				RIC IV 2
14	Elagabalus	218-222	As	337 (pierced for suspension)
15	Severus Alexander	222-235	Ar Den (Plated)	—
				RIC V 1
16-19	Gallienus	259-268	Ant	159, 181, 193, + (1)
20-25	Claudius II	268-270	Ant	15 (2), 98, 104, 168, + (1)
				RIC V 2
26-30	Postumus	259-268	Ant	64, 80, + (3)
31-33	Victorinus	268-270	Ant	57, 61, 114
34-42	Tetricus I	270-273	Ant	86 (2), 100/1, (2) 104, 115, 141, + (2)
43-48	Tetricus II	270-273	Ant	248, 258, 270/1, 272, 277, 280
49	?Tacitus	—	Ant	- (1)
50-51	Carausius	286-293	Ant	41/2, 98 $\frac{S/P}{MLXXI}$
52	Diocletian (Carausius)	286-293	Ant	p.552 No. 9 $\frac{S/P}{MLXXI}$
53-57	Uncertain radiates	3rd cent.	Ant	Base silver part-coins (2), + (3)
58-217	Irregular radiates	*c.* 270	AE 3 (31) AE 4 (82) Minims (47)	

	Reverse type	Mint	Date	Obverse	Reference
218-219	GENIO POPVLI ROMANI	—	*c.* 300-305	—	- (2)
					RIC VII
220	SOLI INVICTO COMITI	Trier	313-315	CI	40
221-223	BEATA TRANQVILLITAS	Trier	320-324	CI (2)	368, 290
		Lyons	320-324	CI	131
224	SARMATIA DEVICTA	London	323-324	CI	290
					LRBC I
225-229	PROVIDENTALAE AVGG/CAESS	Trier	324-330	CI, CII (2), Cr	cf. 12, 22, 30, 34
		Rome	324-330	Cr	517
230-234	GLORIA EXERCITVS (2 Stds)	Trier	330-335	CI, H of CI	cf. 50, 61
		Arles	330-335	CI	373
		—	330-335	CII, H of CI	- (2)
235-242	Irregular GLORIA EXERCITVS (2 Stds)	—	*c.* 330-335	cf. H of CI	- (8) (AE 3 (5) cf. 49, cf. 238, + (3); AE4 (3))
243-249	Wolf and Twins	Trier	330-337	UR	cf. 51 (2), 65, cf. 76
		Lyons	330-337	UR	205 (2)
		Arles	330-337	UR	396
250-253	Irregular Wolf and Twins	—	*c.* 330-337	UR	- (4) (AE3 (2), AE4 (2))
254-259	Victory on Prow	Trier	330-337	C'opolis	52, 59
		Lyons	330-337	C'opolis	191
		Arles	330-337	C'opolis	372
		—	330-337	C'opolis	- (2)
260-261	Irregular Victory on Prow	—	*c.* 330-337	cf. C'opolis	- (2) (cf. 66, + (1) AE4)
262-263	Irregular uncertain	—	330-337	—	- (2) (1 Wolf and Twins or Victory on Prow, 1 Hybrid)
264-277	GLORIA EXERCITVS (std)	Trier	335-341	CII, CsII, CsII or Cn, Cn (3)	93, 94, cf. 94/5 131, 133 (2)
		Lyons	335-341	CII, Cn (2)	240-1, 244, 251
				CII, H of CI (4)	- (5)
278-285	Irregular GLORIA EXERCITVS (std)	—	*c.* 335-341	—	- (8) (AE3 (4), AE4 (4))
286-291	PAX PVBLICA	Trier	337-341	H	104 (3), 112 (2), 128
292	PIETAS ROMANA	Trier	337-341	Th	129
293-307	VICTORIAE DD AVGG Q NN	Trier	341-348	CsII, Cn (6), CsII or Cn	cf. 137, 140 (2), 148, 150 (3) cf. 158
		Lyons	341-348	CsII	266
		Arles	341-348	CsII, CsII or Cn	455, 455-7
		Rome		CsII or Cn	637-8
				CsII or Cn (3)	- (3)

Table 1: (cont.)

	Reverse type	Mint	Date	Obverse	Reference
					LRCB I
308-310	Irregular VICTORIAE DD AVGG Q NN	—	*c.* 341-348	—	- (3) (1 cf. 156)
					LRBC II
311	FEL TEMP RAPARATIO (Hut)	Trier	348-350	CsII or Cn	28-41
312-314	FEL TEMP REPARATIO (FH3)	Rome	352-354	CsII	677-9
		—	353-360	CsII	- (2)
315-320	Irregular FEL TEMP REPARATIO (FH3)	—	*c.* 353+	cf. CsII	(6) (AE3 (2), AE4 (4))
321-322	VICTORIAE DD NN AVG ET CAE	Amiens	351-352	Mg	(8)
		—	351-352	Mg or Dec	cf. 56
323-324	Irregular VICTORIAE DD NN AVG ET CAE	Amiens	*c.* 351-353	—	- (2) (AE3, AE4)
325-327	GLORIA ROMANORVM	Lyons	364-378	VI	—
		Arles	364-378	VI	cf. 525
		—	364-378	H of VI	—
328-333	SECVRITAS REIPVBLICAE	Lyons	364-378	Vn	cf. 292
		Aquileia	364-378	Vn (2)	999, 1031
		—	364-378	H of VI (3)	- (3)
334-339	VICTORIA AVGGG	Arles	388-395	TI	565/8
		—		VII, H of TI (4)	- (5) (1 ?Lugdunum)
340-341	SALVS REIPVBLICAE	—	388+	H of TI (2)	- (2)
342-345	Uncertain 4th cent.	—	- (4) (1(?) H of Valentian, 1 AE3, + 2 Minims)		
346-419	Uncertain	—	(74) (AE3 (24), AE4 (57), Minims (3)). These include a large number of badly corroded, fragmentary, and clipped pieces: all are untreated. The majority are irregular pieces but there are a certain number of regular coins of third and fourth century date.		

Table 2: Small group of coins from Building 1 yard

	Obverse	Date	Denom	Reference
1	—	—	British (Potin Coin)	—
2	Early 3rd cent.	*c.* 220	Plated Denarius (?Julia Maesa, Rev. uncertain)	—
				RIC V 2
3	Victorinus	268-270	—	61
4	Tetricus I	270-273	—	61, 146

	Reverse type	Date	Obverse	Reference
5-7	Irregular GLORIA EXERCITUS (2 Stds)	*c.* 330-335	cf. H of Constantine I	- (3) (1 small AE 3, 2 AE)
9-10	Irregular Victory on Prow	*c.* 330-337	cf. of Constantinopolis	- (3) (all AE4)
11	Irregular Victory on Prow (Hybrid)	*c.* 330-337	0/- Laur. bust. H of Const. I	- (small AE3)
12-14	Irregular Wolf and Twins	*c.* 330-337	cf. of Urbs Roma	- (3) (1 AE3, 2 AE4)
15	Irregular GLORIA EXERCITUS (1 Std)	*c.* 335-341	cf. H of Const. I	- AE4

Table 3: Publicans collection of coins

	Obverse	Date	Denom	Reference
				RIC I
1-2	M Agrippa (Tiberius)	14-37	Asses	32 (2) (one a Grade I copy, the other Grade I or II and countermarked)
3	Claudius I	41-54	As	69 (Grade II copy)
4	Antonia (Claudius I)	41-54	Dup	82 (Grade II copy)
				RIC II
5	Vespasian	69-79	Dup	cf. 473
6	Domitian	81-96	Sest	Uncertain
7-11	Trajan	98-117	Sest (2), Asses (3)	392, 575, 395, cf. 395, 575
12-14	Hadrian	117-138	Sest, Dup (2)	Uncertain, cf. 577 (but Obv. c.) +1
15	Antonius Pius	138-161	Sest	—
				RIC III
16	Faustina I (Ant Pius)	138-161	Sest	1108
17	M Aurelius	161-180	Sest	948
18	Lucilla (M Aurelius)	161-180	Sest	1767 (but Lucillae)
19	Commodus (M Aurelius)	161-180	Cup.	1614
20	Commodus	180-193	Sest	513
				RIC IV 3
21	Gordian III	238-244	Sest	292
22	Valerian	253-259	Ant	87
23-24	Gallienus	259-268	Ant	226, 256 VI
				RIC V 1
25-27	Claudius II	268-270	Ant	48, 103, 104
				RIC V 2
28	Posth Claudius II	270	Ant	261
29-30	Tetricus I	270-273	Ant	103-6, 136
31	Tetricus II	270-273	Ant	Virtus type
32	Irregular Tetricus II	*c.* 273	—	cf. 277
33-35	Irregular radiates	*c.* 273	—	(3)
36-37	Allectus	293-296	Ant	33 S/A Quinarius 128 MI

	Reverse type	Date	Mint	Obverse	Reference
					RIC VI
38-41	GENIO POPVLI ROMANI	296-297	Trier	Diocletian	170 a
		302-303	Trier	Diocletian	524 a
		c. 300-305	London	Diocletian	6 a
		301-303	Lyons	Maximian	108 b
42	SAC MONETA AVGG ET CAESS NN	305-306	Rome	Maximian	112 b
43	GENIO POP ROM	307	London	CI	88 b
					RIC VII
44	BEATA TRANQVILLITAS	321	London	CII	219
45	PROVIDENTIAE Avgg/Caess	320-324	?Rome	—	—
					LRBC I
46	SPES REIPUBLICAE	325-326	Trier	Fausta	36
47-48	GLORIA EXERCITUS (2 Stds)	330-335	Trier	CsII, Cn	64, cf. 75 (but Obv. 9.f)
49	Victory on Prow	*c.* 330-335	—	C'opolis	—
50	Irregular Victory on Prow	*c.* 330-335	—	—	—
51	PAX PUBLICA	337-341	Trier	H.	- 119
52	PIETAS ROMANA	337-341	Trier	Th	- 113
53	Irregular FEL TEMP REPARTIO (FH3)	*c.* 353+	—	cf. CsII	—
					LRBC II
54	SECURITAS REIPUBLICAE	364-375	Rome	VI	724
55-58	—	—	—	—	(4) (3 uncertain radiates +1)

Table 4: Recent coin finds

	Obverse	Date	Denom	Reference
1	Vespasian	69-79	Dup	—
2	Flavian	69-81	Dup	—
				RIC II
3	Trajan	98-117	Sest (AD 114-7)	661/663
4	?Trajan	98-117	Dup	—
				RIC III
5	Faustina II (Ant Pius)	138-161	Dup or As (AD 145-6)	1295
				RIC V 2
6	Victorinus	268-270	Ant	71
7-10	Tetricus I	270-273	Ant (4)	72, 86/7, 100, 136
11	Tetricus II	270-273	Ant	270
12	Irregular Tetricus II	*c.* 270+	Pietas Type	cf. 254
13	Uncertain radiate	*c.* 270+	?Claudius II	—
14-31	Irregular radiate	*c.* 270+	AE3 (3), AE4 (11), Minims (4)	—
32	?Irregular radiate	*c.* 270+	—	—

	Reverse type	Mint	Date	Obverse	Reference
					RIC VII
33	CAESARVM NOSTRORVM VOT X	?Trier	323	CII	cf. Trier 438
					LRBC I
34-35	PROVIDENTIAE AVGG	Trier	324-30	CI, CII	12, 32
36	PROVIDENTIAE AVGG	—	324-30	—	—
37	Wolf and Twins	Trier	330-5	Urbs Roma	51
38	Irregular Victory on Prow	—	330+	C'opolis	—
39	GLORIA EXERCITVS (2 stds)	Arles	330-5	CsII	393/4
40	Irregular GLORIA EXERCITVS (2 stds)	—	330+	- AE4 Size	—
41-43	Irregular GLORIA EXERCITVS (1 Std)	—	335+	- (3)	cf. 108, 126 + 1
44	FEL TEMP REPARATIO	Trier	353	CsII	76
45	Irregular FEL TEMP REPARATIO	—	*c.* 353	—	—
46-47	VICTORIA AVGGG	Trier	388-92	Arcadius	cf. 164
48-54	Uncertain irregular	—	—	- (7)	- (7)

Table 5: More recent coin finds

	Obverse	Date	Denom	Reference
1	AE very worn and corroded	1st cent.	—	—
2	Trajan	98-117	Dup of uncertain type	—
3	M Aurelius	161-180	Sest	—
4	Gallienus	259-268	Ant R/FIDES . . .N	—
				RIC V 2
5	Victorinus	268-70	PAX AUG pax l. with branch and sceptre	116-8
6	Tetricus II	270-3	[SPES PV] BLICA	272-4

	Reverse type	Date	Mint	Obverse	Reference
7	Victory on Prow	330-7	illeg.	[CONSTANTINOPOLIS]	—
					LRBC II
8	FEL TEMP REPARATIO Phoenix on pyre	348-50	—	Cn	33
9	[GLORIA ROMANORVM]	364-78	—	House of Val I	—
10	SECVRITAS REIPVPLICAE	364-75	—	VI	—
11	Uncertain AE4	?4th cent.	—	—	—
12	Uncertain minim	—	—	—	—
13	Uncertain AE4	—	—	—	—

Charles farthing, rose type

Tetradracham (Billon) of Alexandria

Charles farthing, rose type

Brooke, English Coins, 212

III Roman Brooches (Figs 8-9)

by S.A. Butcher

Analyses of most of the brooches have been carried out by Miss Justine Bayley of the A.M. laboratory, using semi-quantitative X-Ray fluorescence. The results are given in the description of each brooch; they are only an approximate guide to composition:

bronze = copper and tin
brass = copper and zinc
gunmetal = copper and zinc and tin

1 A small one-piece bronze brooch of 'Nauheim derivative' type. It has been bent backwards: the drawing shows the back of the brooch. *Area 1*

2 Iron brooch. An iron one-piece brooch of same general type as No. 1 above. W.H. Manning writes: 'This is one of the commonest brooch forms to be found in iron and is usually of first century AD date, being essentially an iron version of a common La Tène III type. Examples come from Camulodunum (Hawkes and Hull 1947, 308, pl. LXXXIX, 4; their Type II), Hod Hill (Brailsford 1962, 11), Maiden Castle (Wheeler 1943, 262, fig. 85,4), Rotherley (Pitt-Rivers 1888, 126, pl. CI, 6,8,9), etc.' *Surface find between carbonised grain spread and Wall 2*

3 Part of a gunmetal brooch with squashed cylindrical head. This contains a bar which might have been the axis for a hinge, although this type of head normally houses a spring. The rounded bow of the brooch is unusually thick; it is bent and broken off short of the foot, with no trace of a catchplate surviving. Where the bow joins the head there is a beaded ridge, and there are three shallow ribs below this with grooves down each side. It is possible that this is an unfinished brooch; perhaps a spoilt casting. The cylindrical head and beaded ridge both occur in the Langton Down type which generally spans the period from Augustus to Claudius (Butcher 1978, 216).

4 Bronze and gunmetal brooch of similar construction to the 'Thistle' type, but having the upper bow in the form of a lion. The spring was enclosed in a large cylinder. The lion's rear paws are rivetted to the cylinder while the front of its body and its forepaws are joined to a once circular plate which is rivetted to a broad flaring foot. The animal is summarily shown: the head is featureless and on the neck a few curved grooves suggest the mane. Cast head and spring bronze: catchplate and large disc gunmetal. A number of generally similar brooches from Normandy are illustrated by Dollfuss (1973, pls 21 and 22, 124-8); these demonstrate that the type is a regular variant of the 'Thistle' brooch. Brooches with a lion in place of the bow seem to be a Gallic product (*cf.* another group recently studied by Feugère (1977)). The date range of the present example is probably the same as that of the standard 'Thistle' brooches with separate plate; i.e. the first half of the first century AD. *Ditch 1, layer 1, south end*

5 Very small finely moulded gunmetal brooch of Hod Hill type with white metal (tinned) surface. It has a high knurled central ridge down the upper bow, flanked by broad flanges. The lower part is unusually broad with two cross-mouldings (one beaded) and the foot is a very small moulding. It has a small solid triangular catchplate. Similar but not identical brooches can be quoted from Vindonissa (Ettlinger 1973, taf. 10.3), Verulamium (Waugh and Goodburn 1972, fig. 30, 13) and Camulodunum (Hawkes and Hull 1947, pl. XCVII, 142). The date, from these and from the type generally, is *c.* AD 40-60, and the brooch may be of either Continental or British manufacture. *Wall 3*

6 A gunmetal brooch of Hod Hill type, almost complete but badly corroded, damaged and broken into two pieces. It has the typical flat head-plate, turned back to hold the axis of the hinge, although the bar and pin are missing. There are two sets of crude raised mouldings across the bow which define a rectangular panel showing traces of decoration. The lower bow is plain. Part of a centrally-placed catchplate survives at the back of the lower bow. This very crudely made brooch might be a local product, possibly unfinished.

7 Part of a leaded gunmetal bow brooch, probably of 'Colchester' type. The head is missing. The long narrow bow, of D-section, has a central groove flanked by fine engraved decoration, the lower part is plain and the foot is not differentiated. The catchplate has a large triangular opening which shows marks suggesting it was cut out after the brooch was cast. The Camulodunum dating for these brooches still stands; i.e. first century AD up to about AD 60 (Hawkes and Hull 1947, 309). *Surface find, Area of Building 3*

8 A leaded bronze 'Colchester B' brooch. In this type the spring is made separately and held on a lug behind the head by means of both the chord and a bar being passed through holes in the lug. In this example the spring and pin are missing. The lug continues as a crest which is then merged into a ridge running the length of the bow. The catchplate has a small triangular opening. This belongs to Type IV of Camulodunum (Hawkes and Hull 1947, 311) which was commonly found in contexts of *c.* AD 50-65. There is a close parallel from Verulamium (Waugh and Goodburn 1972, 114, fig. 29,6) from a deposit of *c.* AD 49-60. *Floor 4, layer 4*

9 Part of an openwork leaded bronze plate brooch in the shape of a wheel. The 'hub' is a raised disc containing a ring of enamel round a central enamel cell. The outer rim has knurled edges and appears to have contained a band of enamel. Part of the catchplate survives. The reverse of the central hub is concave, with a small raised ring in its centre. Miss Bayley has provided notes on the enamel: the central cell is red; the ring round it has millefiori florets of eight petals on a white background; the outer ring is empty. Wheel-shaped brooches are common in the second century; the nearest parallel to the present example is one from Cologne illustrated by Exner (1939, taf. 16, 4). The general type is widely distributed on the Continent and since there is no evidence that millefiori decoration was made in Britain at the time, this brooch is likely to be an import. *Building 1, yard and gullies, layer 1*

10 Bronze plate brooch in the form of a shield. The flat surface is divided into six triangular enamelled cells by metal divisions imitating binding. The stumps of the catchplate and two lugs survive on the flat back. The latter probably held a small spring, by analogy with similar brooches. Miss Bayley notes that the enamel of the two upper and two lower cells is mainly red, though it has blobs of other colours; the other two triangles were possibly clear green and there is no enamel left in the small central circle. Exactly similar brooches are known from Caerwent, Newhaven and Straubing (Walke 1965, taf. 95, 27). That from Newhaven was described by Mr M.R. Hull (Bell 1976, 290, no. 4): it was in a destruction deposit of the late Antonine period. Flat enamelled brooches imitating shields of different patterns have been found; for example those from Kenchester (Whiting 1938), Lydney (Wheeler and Wheeler 1932, 81, fig. 16, 42 and 43), and St Albans (Wheeler and Wheeler 1936, 209, fig. 45, 34). The last was in a deposit which included samian of AD 130-160, with earlier material. A date in the first two-thirds of the second century is suggested. *Ditch 1, layer 2, north end*

11 Brass with gunmetal pin. *Ditch 1, layer 3, towards south end*

12 Gunmetal with leaded bronze pin. *Building 1, layer 7*

13 Leaded bronze. *Ditch 1, layer 1, north end*

11-13 Three penannular brooches of differing types. No. 11 has the terminals flattened and coiled back over the ring. This type occurs on several sites in pre-AD 70 levels, e.g. Camulodunum (Hawkes and Hull 1947, 326, fig. 59, 5); Hod Hill (Brailsford 1962, fig. 11, E8); Fishbourne (Hull 1971, 106, fig. 40, 44). No. 12 has conical terminal knobs rather like those on some omega brooches.

14 Leaded bronze with gunmetal pin. A plain annular brooch with a pin similar to those on penannular brooches. *Ditch 1, layer 1 (no location)*

Stud (Fig. 9)

15 Millefiori stud (Front cover). A flat-topped circular leaded bronze stud with rings of millefiori decoration. A metal rod projects *c.* 8mm from the centre of the underside. The zones of millefiori are separated by reserved metal rings. The individual patterns are as follows: outer ring, florets

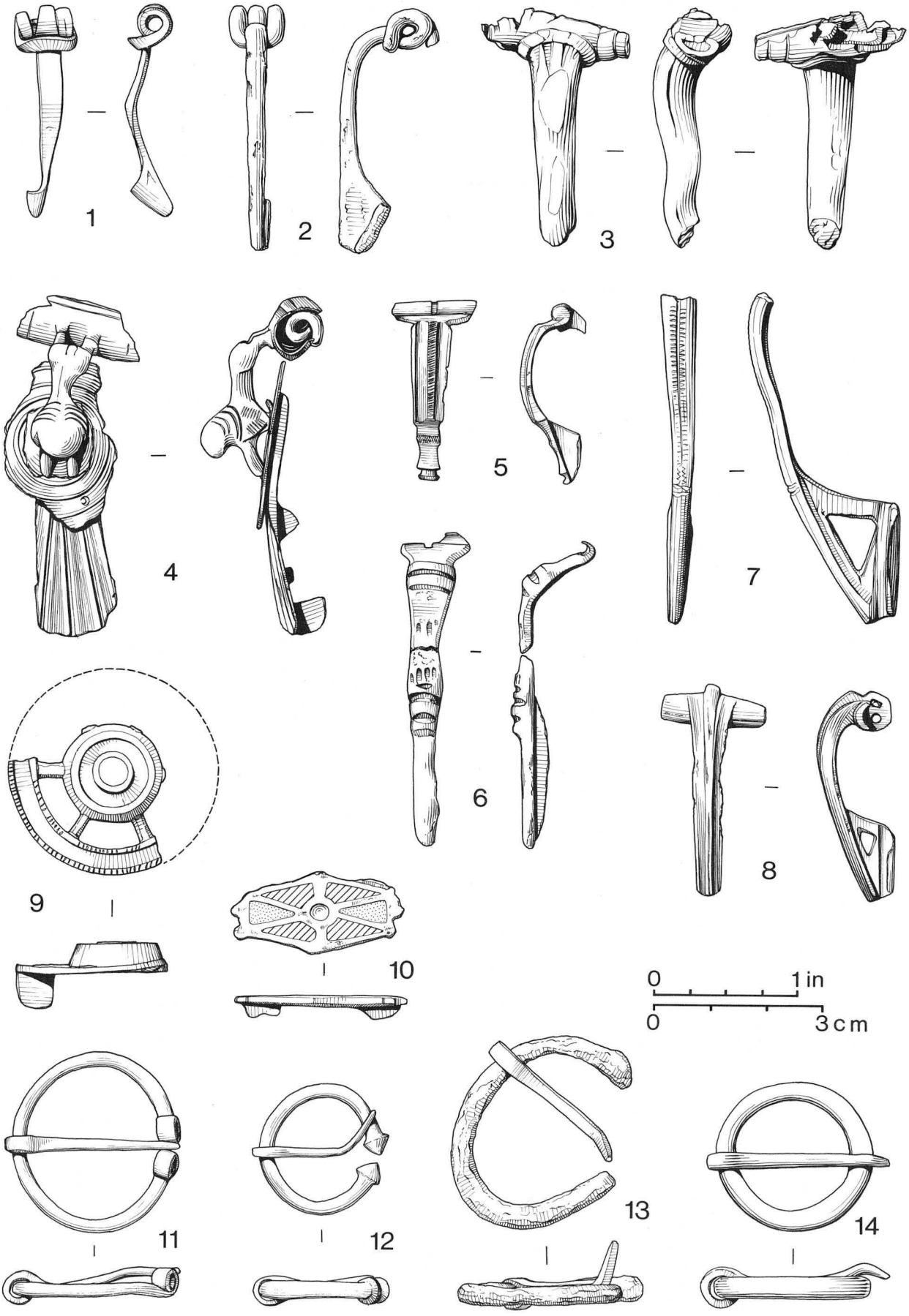


Fig. 8 Brooches: Nos 1, 3-12 and 14 bronze; Nos 2 and 13 iron; No. 9 bronze with enamel in the two inner rings; No. 10 bronze with red enamel including blobs of other colours in the upper and lower cells, and possibly clear green in the left and right cells. Scale 1:1.

consisting of eight white petals surrounding a red ring round a white centre on a blue field; inner ring, similar but blue petals on a white field; centre, two types of chequer alternating; three by three blue and white canes in red surround and five by five smaller blue and white canes in a blue surround. (Miss J. Bayley kindly confirmed the details of the patterns under the microscope). The millefiori patterns and the general design of the stud occur on finds from many parts of the Roman Empire; a recent discussion of a large stud from Colchester quotes examples (Butcher 1983). The present object shares the chequers with the Colchester stud but adds the florets; these also occur widely, for example on studs from Chepstow (British Museum) and Usk (National Museum of Wales); small studs from Newstead (Curle 1911, pl. LXXXIX, 9, 17 and 21) and elaborate studs from Pannonia (Sellye 1939, taf. VI, 17 and 30). The small amount of dating evidence available suggests that they belong to the later second and early third centuries. From the prong attachment they seem likely to have been ornaments for leatherwork and the finding of the present example amongst the bones of a horse's skull suggests that it was a bridle decoration. *Ditch 1, layer 2*

IV Bronzes and other non-ferrous metalwork (Figs 9-19)

by Martin Henig

The term 'bronze' is used traditionally and does not imply knowledge of the composition except where stated. Unless otherwise indicated the objects are 'bronze'. An iron bezel (No. 56) and Nos 111, 124, 130, 136, 137, 138 and 140 with iron components are included in this section, as are Nos 57, 88 and 89 which are silver. The lead and pewter are listed as Nos 142-151.

Buckles (Fig. 9)

16 Buckle (Pl. X): zoomorphic type with symmetrical horse-head ornament, and moulding between. Cursory work; rough chip-carved ornament for the manes of the horses, and casting ridges visible around the sides. Simple wrap-over buckle-plate. This buckle was published by Hawkes and Dunning (1962, 47, fig. 15e, Type 1B). Discussion of a fine buckle with buckle plate from Tripontium can be found in Hawkes (1973, 159). She concludes that the class was definitely made in Britain and is 'thought to have been worn by the military, possibly units of the Field Army, decanted as garrisons among the fortified towns and road stations of Lowland Britain, in and probably throughout the later fourth century A.D.' *Building 2*

17 Buckle with kidney-shaped plate: this had three rivets with incised ring decoration around each of them (central rivet now missing). Transverse groups of rilled lines around the edge. Late Roman 'Vermand' style. See Lydney (Wheeler and Wheeler 1932, pl. XXVIII, no. 132); Silchester (Boon 1960, 80, pl. III, no. A8) and Simpson (1976, 195-6, fig. 2, no. 2, Group II). There are buckles with ovoid plates from Lankhills (Clarke 1979, 270-2, fig. 34, nos 27, 122 and 481) dated to the second half of the fourth century, but these are not exactly the same as this one. *Hearth 2*

Strap-ends (Fig. 9)

18 Tag or strap-end: leaf-shaped with conical terminal; ornamented with three incised dots and rings. Incomplete. See Lydney (Wheeler and Wheeler 1932, pl. XXVIII, no. 129); Richborough (Henderson 1949, pl. XXXVI, no. 113) and Silchester (Boon 1960, 80, pl. III, no. A4). At Lankhills a similar example is described as a prototype of the Tortworth form (Clarke 1979, 280-292, figs 36 and 72, no. 128, dated *c.* AD 350-370). Late Roman 'Vermand' style. *Surface find, northern area of the site*

19 Strap-end type as No. 18: one ring and dot. Incomplete. *Surface find, northern area of the site*

20 Fragment of a strap-end: two rivet holes, light incised 'tracer' decoration. *Ditch 1, layer 2*

Later buckles (Fig. 9)

21 Large buckle: harness type; rectangular.

22 Strap-end buckle: tubular seating for pin with bronze sheet wrapped around it. Medieval, thirteenth century. See one from Dunchurch, Suffolk (Fingerlin 1971, fig. 75, no. 210): and London Museum (1940, 272, no. A20689, pl. LXXV, no. 6).

23 Spectacle buckle: central bar and one loop (the other loop is lost). Medieval, fourteenth century. See Southampton (Platt and Coleman-Smith 1975, no. 1775).

24 Buckle: D-shaped. Probably medieval.

Bracelets (Figs 9-11)

25 Bracelet: two strands of wire twisted together anti-clockwise. Incomplete. See Braintree (Drury 1977, 17, fig. 11, no. 4); Gadebridge (Neal and Butcher 1974, 139-140, fig. 61, no. 164) and Lankhills (Clarke 1979, 302, fig. 76, nos 108 and 111; Type Ala, *c.* AD 350-370). Bronze bracelets of twisted wire evidently imitate examples in gold dating from late Antonine times and through the third century (Comarmond 1844, pl. i, nos 1 and 2, and especially pl. iii, nos 5 and 6 (Lyons): Garbsch 1971, 139, no. 9, pl. 31, no. 3 (Kastell Vemania)). *Area 1*

26 Bracelet: three strands of wire twisted together clockwise. Incomplete. *Building 4, layer 5*

27 Bracelet: three strands of wire twisted together anti-clockwise. Almost complete. cf. Chilgrove 2 (Down 1979, 149-150, fig. 44) and Braintree (Drury 1977, fig. 11, no. 3).

28 Bracelet: three strands of wire twisted together clockwise. Fragment. *Area 1*

29 Bracelet: three strands of wire twisted together clockwise. Fragment. *Area 1*

30 Bracelet or bangle: wire hooked at ends; a short length of flat wire wrapped around at one point, as decoration. Compare Penn (1960, fig. 10, no. 6); and Verulamium (Wheeler and Wheeler 1936, 120, fig. 32, no. 35). *Ditch 1, layer 2*

31 Bracelet: loop at one end; three short lengths of wire wrapped around as decoration. *Area 1*

32 Very small bracelet (for baby) or large ring: overlapping ends wound around hoop. Compare Portchester (Webster 1975, 203, fig. 111, no. 24A); Gadebridge (Neal and Butcher 1974, 138, fig. 60, no. 152); Verulamium (Wheeler and Wheeler 1936, 124, fig. 36, no. 86); Chichester (Down 1974, 141, fig. 8, no. 16 (ring)); and in gold Comarmond (1844, pl. iii, no. 7) from Lyons. Also known in Saxon contexts (Faussett 1856, pl. XVI, 14 and 15). *Area 1*

33 Bracelet: flat piece of wire wound around it. Small fragment. *Area 1*

34 Bracelet: flat strip with notched ornament along both edges of one side and central undulating band. Fragment. *Ditch 1, layer 1*

35 Bracelet: central undulating band. Fragment. *Area 1*

36 Bracelet: flat strip with incised zig-zag upon it; broadens at end for perforation. Fragment. *Area 1*

37 Bracelet: strip with rectangular section; outer edge ornamented with zig-zag motif. Incomplete. Compare Gadebridge (Neal and Butcher 1974, 147, fig. 65, no. 246); Winterton (Stead 1976, fig. 103, no. 44); and Lankhills (Clarke 1979, 306, fig. 37, no. 141; Type D1h dated AD 350-370). *Area 1*

38 Bracelet: flat strip with incised decoration of vertical lines; broadens at end for perforation. Fragment. Compare Portchester (Webster 1975, 205, fig. 111, no. 28). *Area 1*

39 Bracelet: strip with herring-bone pattern of notches; end broadens out and is perforated. Fragment. Compare Lankhills (Clarke 1979, 310, fig. 37, no. 525, Type Ela, late fourth century). *Ditch 1, layer 1*

40 Bracelet: strip with incised decoration of notches on both edges of front side; part of hook at one end. Fragment.

41 Bracelet: strip with decoration consists of cross-hatching; two ring-and-dot motifs. Fragments. *Building 1, yard and gullies, layer 1*

42 Bracelet: strip with incised decoration consisting of groups

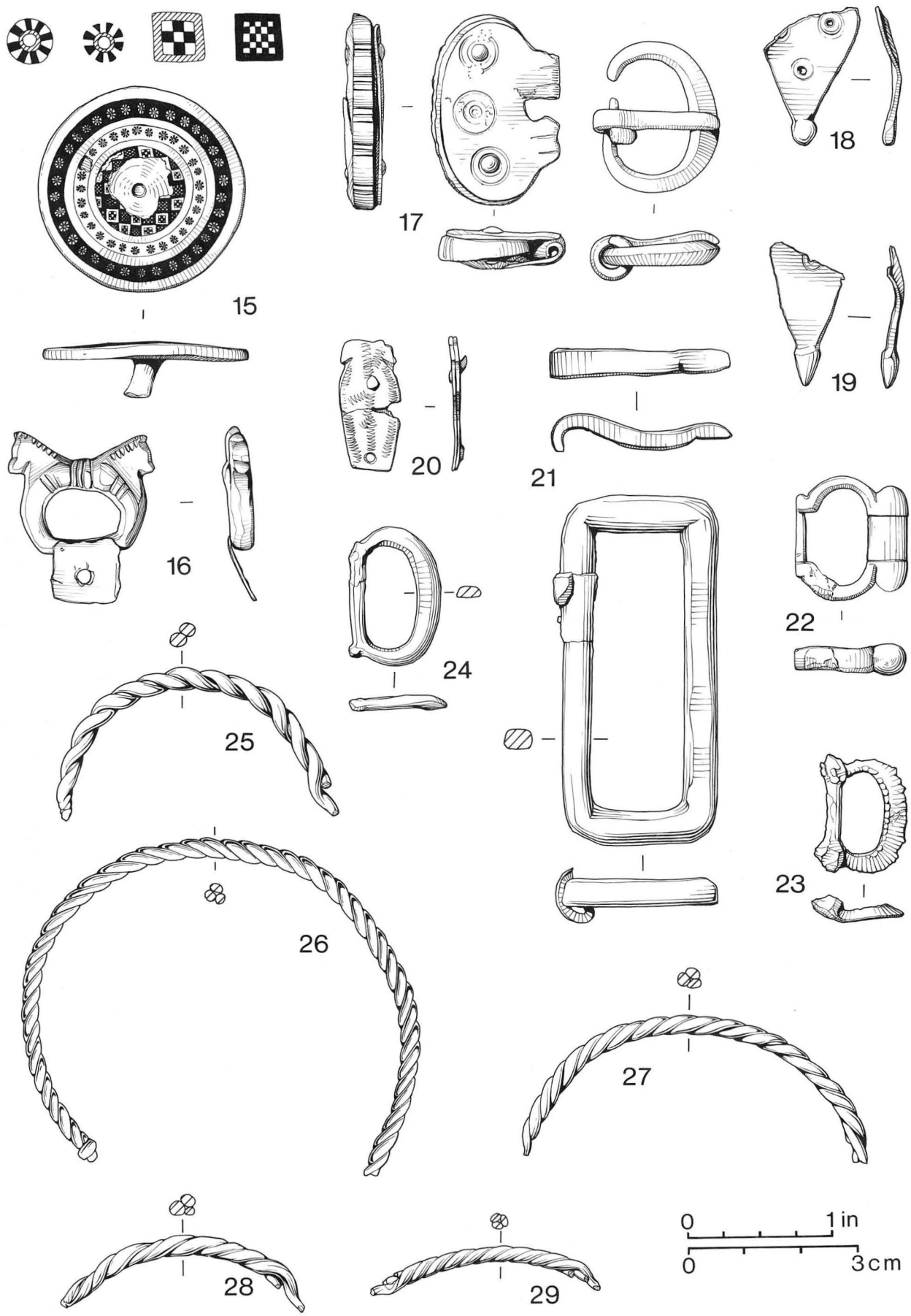


Fig. 9 No. 15 millefiori stud (black = blue; white = white; and cross-hatch = red: see cover); Nos 16 (Pl. XI) and 17 bronze buckles; Nos 18-20 bronze strap-ends; Nos 21-4 medieval buckles; Nos 25-9 bronze bracelets. Scale 1:1.

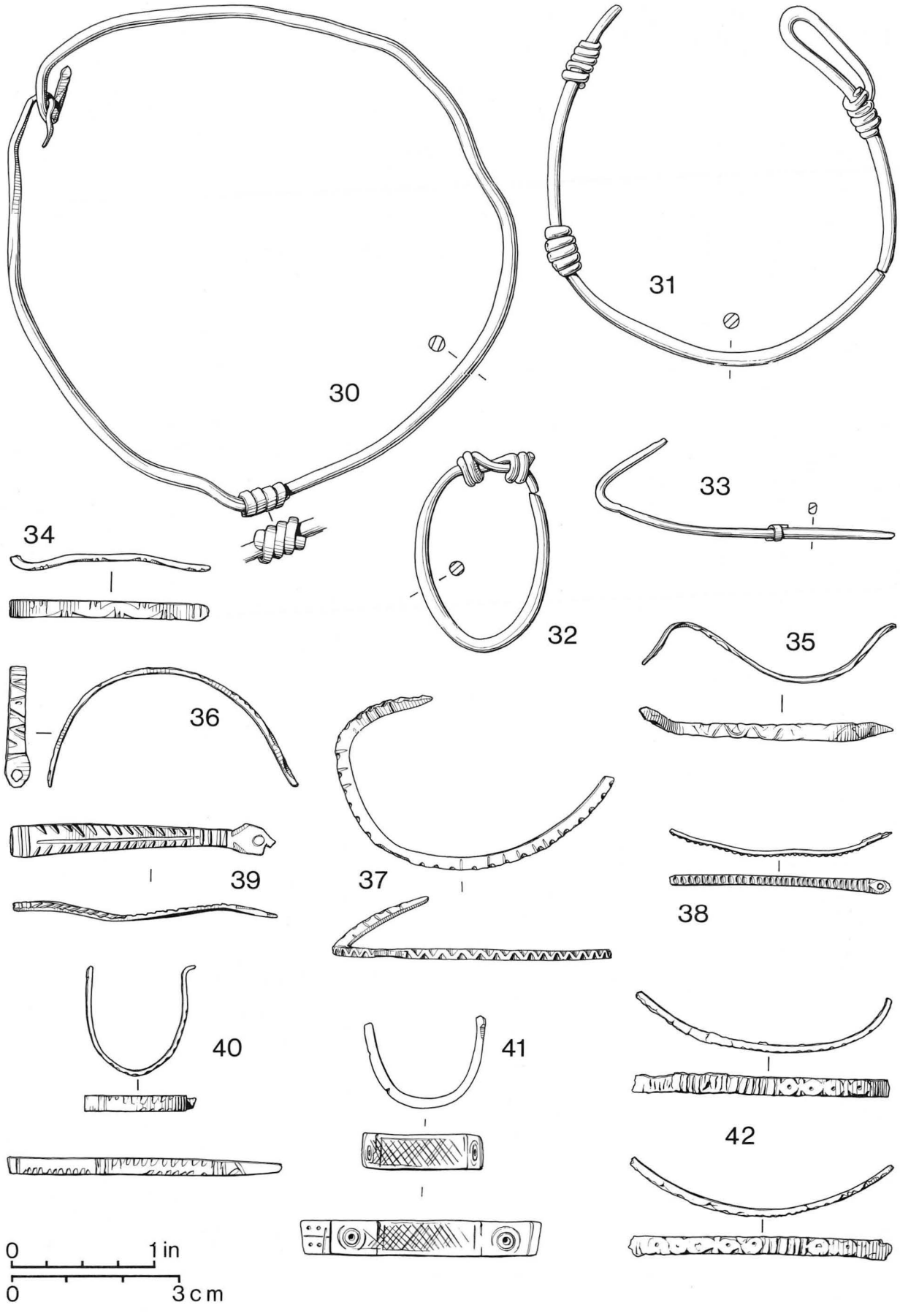


Fig. 10 Nos 30-42 bronze bracelets. Scale 1:1.

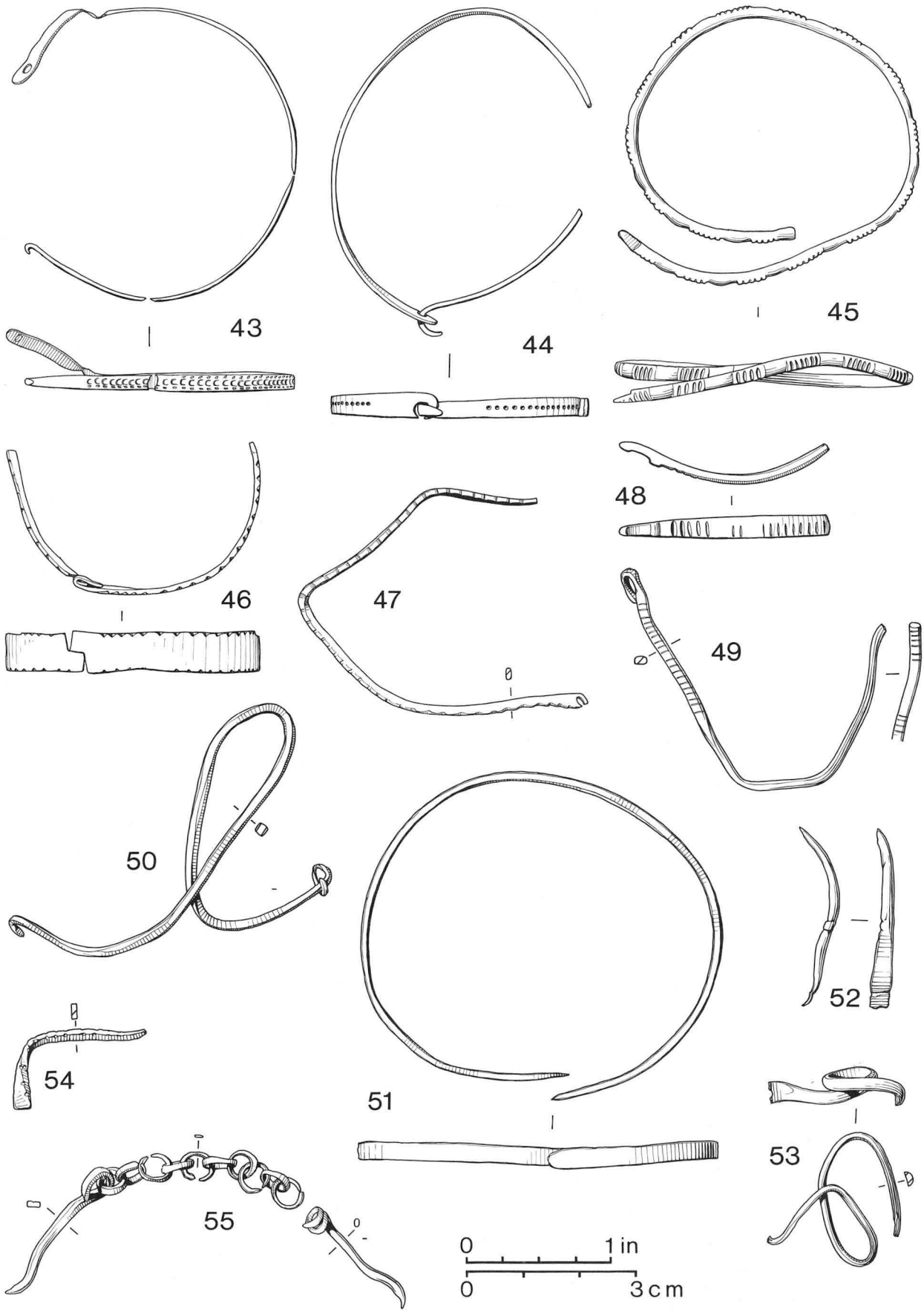


Fig. 11 Nos 43-54 bronze bracelets: No. 55 bronze chain. Scale 1:1.

of vertical lines separating bands of ring-and-dot motif. Incomplete. *Area 1*

43 Bracelet: strip with incised decoration of curves and dots; perforation at one end and hook at the other end. *Area 1*

44 Bracelet: broken. Decoration consists of a row of dots along front side; perforation at one end; hook at the other end. *Area 1*

45 Bracelet: rounded cross-section; ornamented with groups of notches. For decoration see Portchester (Webster 1975, 205, fig. 11, nos 29 and 30). *Building 4, layer 5*

46 Bracelet: ends only. Decorated with notches along both edges of front side; tongue from one end slots into pocket made by bending metal at the other end. Incomplete. *Area 1*

47 Bracelet: strip of rectangular section; notched on narrow outer edge; perforated at one end for hook. Incomplete. *Area 1*

48 Bracelet: strip with incised decoration of notches; hook at end. Fragment. *Area 1*

49 Bracelet: hook at one end; ornamented with vertical incised lines. *Area 1*

50 Bracelet: strip of bronze with square section; loop at one end into which hook is fastened. Complete but bent. *Ditch 1, layer 2*

51 Bracelet: flat strip; no decoration. *Floor 4, layer 4*

52 Possible bracelet: strip with fan-shaped terminal. Fragment. See Gadebridge (Neal and Butcher 1974, 139, fig. 60, no. 161).

53 Bracelet: strip broadens at one end for perforation. Not decorated. Incomplete. *Area 1*

54 Bracelet: Fragment. *Area 1*

55 Chain with links composed of single rings: two terminals remain, one attached to chain which evidently had two loops, although one has been straightened. Perhaps employed in jewellery, see Richborough (Henderson 1949, 125-6, no. 91, pl. XXXV) for another chain with S-shaped links supporting a pendant. *Ditch 1, layer 1*

Not illustrated: two bracelet fragments: one a corroded strip 30 mm long, 5 mm wide and 2 mm thick; the other square sectioned wire, with a slight anticlockwise twist, length 100 mm, thickness 15 mm. Compare Portchester (Webster 1975, 203-5, fig. 111, nos 25-7). *Area 1*

Not illustrated: bracelet fragment: a strip 15 mm long and 4 mm wide, with incised decoration of dots between a pair of parallel lines. *Building 4, layer 5*

Rings (Fig. 12)

56 Iron bezel (Pl. X): containing an intaglio of onyx: upper surface mottled pale blue and the lower colourless. Shape F2 or F4. Device, a lion mauling a buck onto whose back it has just leapt. Publ. Henig (1978, no. 630), citing parallels. Also note no. 637, probably a hunting dog with an antelope (Bath); and no. 638, a lion chasing a buck (Kirmington). Also see Henig (1976, 199, no. 1). The modelling of the two animals is rather schematic and the Gestingthorpe gem may be compared for style as well as subject with two stones in the Hague to which a late second or third-century dating has been assigned (Maaskant-Kleibrink 1978, nos 1014 and 1065). The width of the bezel (15 mm) also suggests a second-century ring form.

57 Silver signet ring with octagonal bezel (setting is missing): Simple groove runs around each of the concave shoulders; lower part of the hoop is lost. Type as Henkel (1913, nos 450-1); Marshall (1907, no. 1653 from Wittering, Northants); and a similar silver ring in the Dorset County Museum from Colliton Park (Accn no. 1937-70). Third-century form. *Building 4, layer 5*

58 Corroded bezel containing an intaglio: Justine Bayley writes 'the glass is an opaque pale blue. The colourant is almost certainly cobalt. The opacity is partly due to bubbles and partly to opaque white glass added (some distinct white patches can be seen). Device, a standing figure. Publ. Henig (1978, 133, no. 561), compare especially nos 557 (Sheepen Farm near Colchester) and 559 (Eccles, Kent). These very low quality intaglios seem to have been manufactured in Britain and represent the same sort of stylistic degeneration as the most devolved of the radiates. Third century. *Ditch 1, layer 2*

59 Ring with setting for stone, glass or enamel: Justine Bayley notes that the depression for the 'stone' had an undercut edge; nevertheless no trace of it remains. Slight carination at the shoulder. Over half the ring, including part of the bezel and hoop, is missing. For the type see Henkel (1913, nos 1198 and 1199); and there is one from Woodeaton (Kirk 1951, 22, no. 16, fig. 5, no. 13). Second or third century. *Building 2, layer 3*

60 Ring with bezel: containing traces of a red substance which Justine Bayley confirms was the original colour of the glass setting. Only the bezel and shoulders survive. Compare one from Nor'Nour (Butcher 1968, 21, no. 2, fig. 8) and Henkel (1913, no. 1200). Second or third century. *Ditch 1, layer 3*

61 Ring with prominent raised oval bezel and a hoop which broadens from point of junction: most of it is missing. Compare Henkel (1913, no. 1292). Third century. *Ditch 1, layer 2*

62 Part of a bezel of a ring with point of junction of hoop below: type as 61; interior of bezel rough. It is just possible that the ring is a cast-off from manufacturing process. Third century. *Building 2, layer 3*

63 Ring: octagonal externally. Compare one with nine facets in gold from Verulamium (Waugh and Goodburn 1972, 114, fig. 32, no. 25, pl. XXXVIIIa) and a bronze one from Wroxeter (Bushe-Fox 1914, 16, fig. 8, no. 27). *Ditch 1, layer 2*

64 Ring: octagonal with scalloped edges; ring-and-dot decoration. See Verulamium (Waugh and Goodburn 1972, 120, fig. 32, no. 27 without ornamentation); and Henkel (1913, no. 663) for general type. Third century. *Ditch 1, layer 3*

Not illustrated. Examined some years ago, but has now been lost: Ring made of two strands of looped wire, forming an elegant 'knot'; now straightened out. Length 27 mm. Compare Colchester (Hull 1958, 118, fig. 47, no. 4); London (Wheeler 1930, 100, fig. 30, no. 15); and Henkel (1913, nos 707-711).

65 Key-ring: simple hoop with attached rectangular bar at right angles containing a ward. For key-rings see Wheeler (1930, 102, fig. 30, no. 24). *Ditch 1, layer 2*

66 Ring: consisting of three loops of flattened wire. See Maiden Castle (Wheeler 1943, 266, fig. 86, nos 11-17); Henkel (1913, nos 690-1); and Dorchester, Oxfordshire (Kirk and Leeds 1954, 70, Grave 111 (h)). A late Iron Age type, but also found later. The Dorchester example comes from an Anglo-Saxon grave.

67 Ring: simple hoop with 'clip carved' zig-zag decoration. Hoop incomplete. *Ditch 1, layer 1*

68 Ring: simple hoop with similar decoration to 67. Also has incomplete hoop and could have been made from a fragment of bracelet.

69 Ring: simple hoop; ends not joined; ornamented with three groups of transverse dashes.

70 Ring: simple hoop; overlapping ends; diameter originally *c.* 16 mm. See Shakenoak (Brodribb, Hands and Walker 1971, 114, fig. 50, nos 112 and 113). *Ditch 1, layer 1*

71 Ring: type as last. *Ditch 1, layer 1*

72 Ring of simple type ('harness ring'): approximately square section but rounded externally. Compare Trentholme Drive (Wenham 1968, 96, no. 19) and Gadebridge Park (Neal and Butcher 1974, fig. 60, nos 121-8). *Building 2, layer 5*

73 Ring of simple type: as last but circular section. Compare Trentholme Drive (Wenham 1968, 96, nos 14 and 15); and Nor'Nour (Butcher 1968, 22, fig. 8, nos 18-21). Nos 72 and 73 might or might not be finger-rings. *Building 2*

74 Ring: slightly flattened. Would not seem to have been intended for wear; harness ring.

Toilet implements (Figs 12-13)

75 Small knife: loop at one end of the handle for (?) attachment to toilet set. Bent. *Ditch 1, layer 1*

76 Nail-cleaner: strip of metal with incised decoration on both sides; loop at end of handle and notch at working end. *Ditch 1, layer 1*

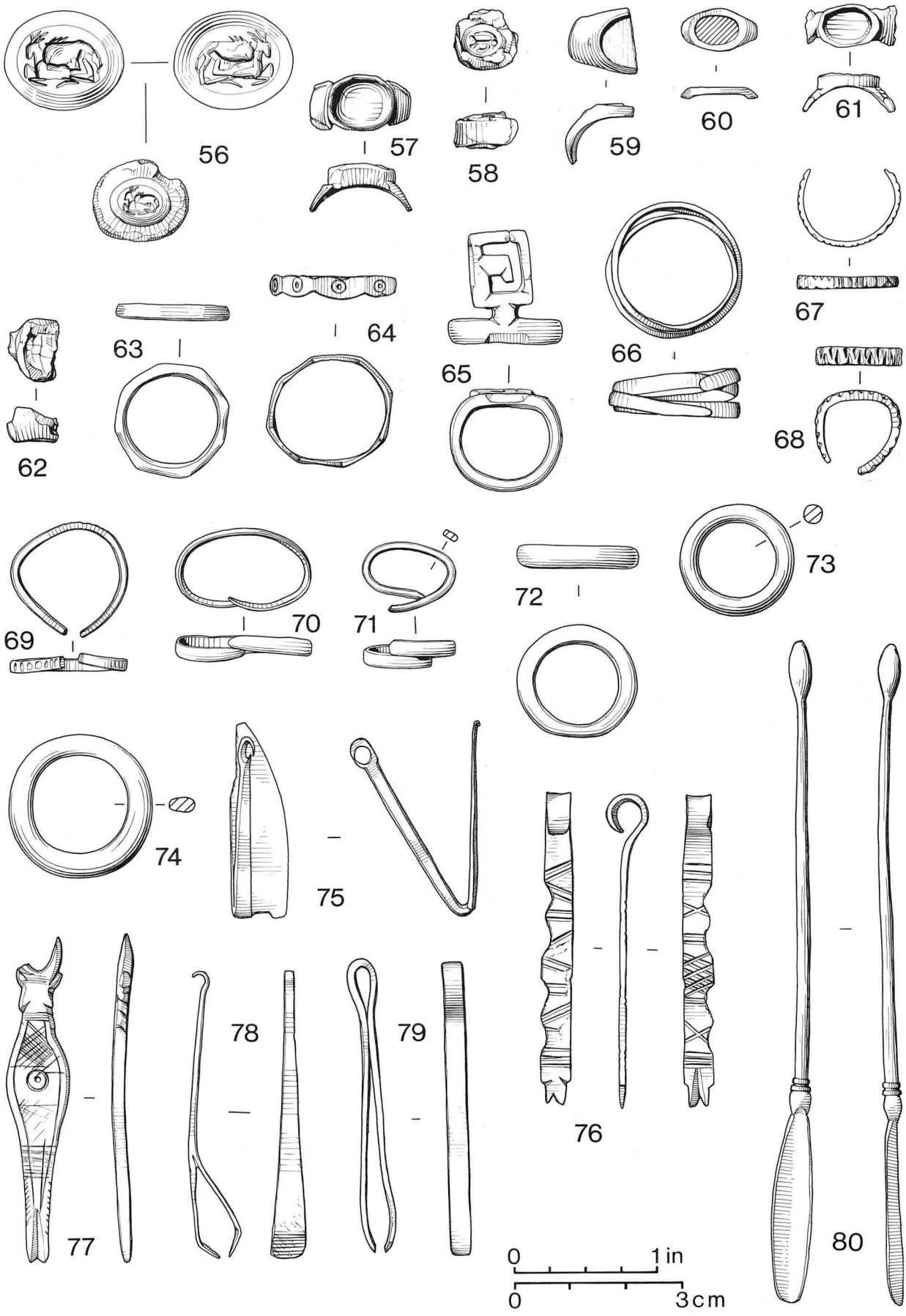


Fig. 12 No. 56 onyx intaglio in iron bezel (Pl. X); No. 57 silver signet ring; No. 58 bronze bezel with blue glass intaglio; No. 59 bronze ring; No. 60 bronze ring with remains of red glass setting; Nos 61-74 bronze rings; Nos 75-80 toilet implements. All scale 1:1 except the upper drawings of No. 56 which are scale 2:1; the right hand drawing is the impression.

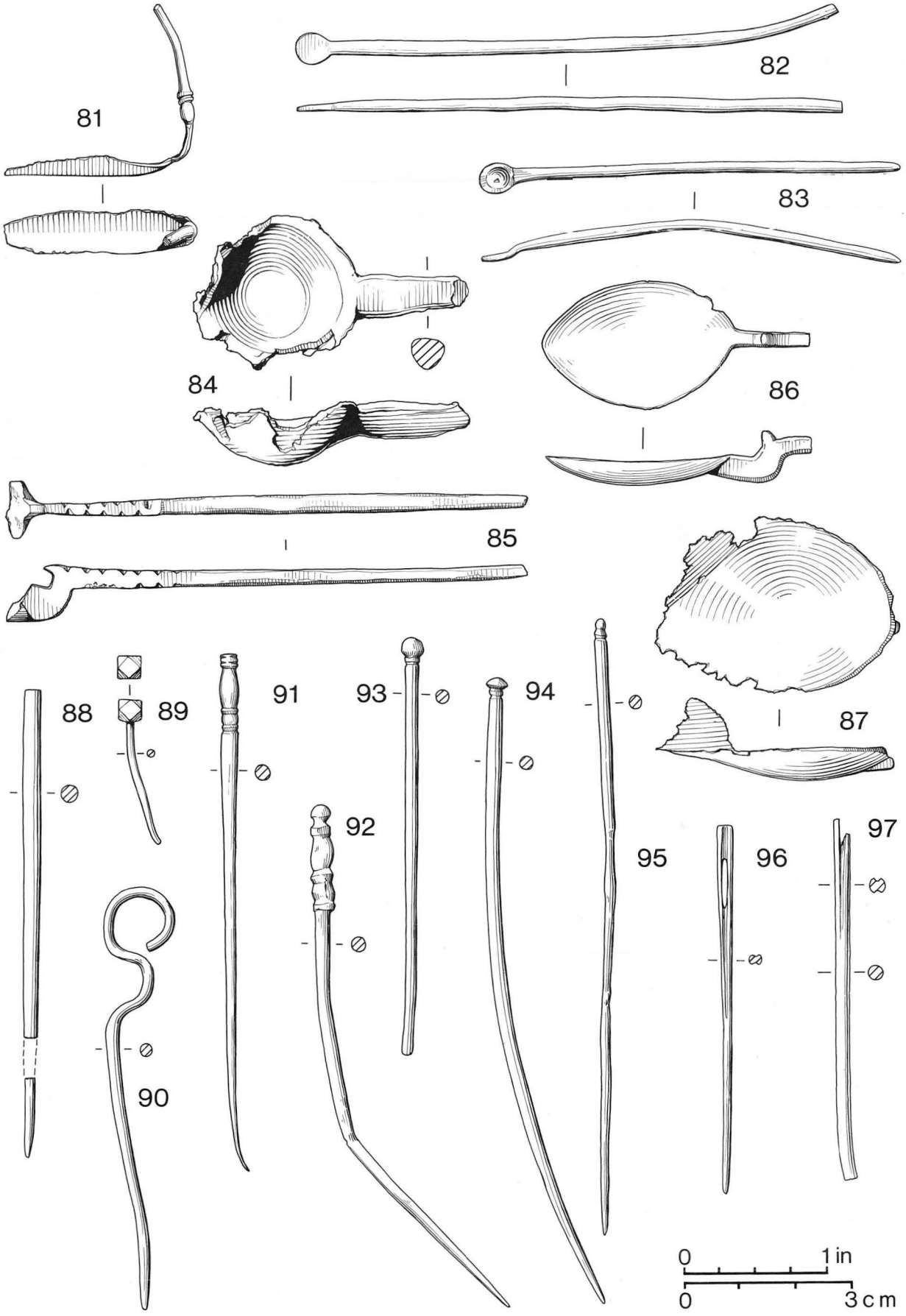


Fig. 13 Nos 81-3 bronze toilet implements; No. 84 pewter spoon; Nos 85-7 bronze spoons; Nos 88-9 silver pins; Nos 90-5 bronze pins; Nos. 96-7 bronze needles. Scale 1:1.

77 Nail-cleaner: ovoid body with broken ring at hand end; notch at working end; latched decoration and ring-and-dot on one face. For the type see Richborough (Henderson 1949, 130, no. 125); and Woodeaton (Kirk 1951, 25, no. 5, fig. 6, no. 10)). Late Roman form from which a 'Vermand' group cuirass strap is derived (Boon 1960, 80, pl. III, nos A1 and A2). *Area 1*

78 Tweezers: thin bar of metal curved at handle end (originally a loop); bifurcated at working end. *Near Area 3*

79 Tweezers: simple form consisting of a bent bar of metal. See Fishbourne (Cunliffe 1971, fig. 42, nos 61-6); and Chilgrove (Down 1979, 151, fig. 45, no. 17). *Ditch 1, layer 1*

80 Spathomele: spoon in form of a long narrow scoop; below it is a moulding; ovoid bulb at the end of the oval shaft. See Milne (1907, 58-61, pl. XIV) and Gadebridge Park (Neal and Butcher 1974, fig. 63, nos 196 and 197). Note also bone examples of this type from Gestingthorpe (Nos 397 and 398). *Ditch 1, layer 1*

81 Spathomele: spoon is long narrow scoop; below it is a moulding; most of round shaft lost. *Near Ditch 1*

82 Ligula: small circular spoon at one end; end of round shaft is missing. See Milne (1907, 77, pl. XVIII, nos 5 and 8); Old Winteringham (Stead 1976, fig. 110, no. 101); Gadebridge Park (Neal and Butcher 1974, fig. 63, nos 200-9); and Braintree (Drury 1977, 19, fig. 11, no. 12). *Ditch 1, layer 1*

Not illustrated: ligula: circular spoon at one end; end of shaft missing. Length 85 mm. As 82, but shaft straight. *Ditch 1, layer 1*

83 Ligula: type as Nos 81 and 82 but shorter. *Ditch 1, layer 1*

84 Pewter spoon: handle broken off. David Sherlock comments that bronze and silver circular bowls are generally dated to the first or second centuries AD, but one of lead or pewter was found in a third-century context in a Roman building near Gravesend, Kent (Johnston 1972, 136) and the Gestingthorpe bowl is similar to that one. *Surface find near floor 3*

85 Spoon handle: bowl broken off. David Sherlock comments that bronze handles with this kind of notched decoration are commonly found on Romano-British villas in third and fourth-century contexts. The missing bowl would have resembled No. 86 below. *Building 4, layer 5*

86 Tinned bronze spoon bowl: handle broken off. David Sherlock comments that this bowl is of a third or fourth-century shape. The tinning of bronze work in imitation of silver may have come in towards the end of the third century, concurrent with the debasement of the currency. The wear of the bowl edge indicates a right-handed user. *Ditch 1, layer 2*

87 Part of spoon bowl: handle missing. David Sherlock comments that this is a common late Roman type. *Building 4, layer 5*

Pins (Fig. 13)

88 Silver pin: in two fragments; shaft and point. *Ditch 1, layer 2*

89 Silver pin with faceted head (fourteen facets): shaft of circular section; point missing. For example in bronze see Maiden Castle (Wheeler 1943, 286, fig. 96, no. 8); Portchester (Webster 1975, 210, fig. 113, nos 50 and 51); and one from Colliton Park in the Dorset County Museum. There is a silver one from Lankhills (Clarke 1979, 316, fig. 89, no. 331) dated to *c.* AD 350-370. *Building 1*

90 Ring-headed pin: an Iron Age type dating from the first century BC. See Maiden Castle (Wheeler 1943, 270, fig. 87, no. 7); and Woodeaton (Brown 1970, 105-6, fig. 19b) mentioning twelve others from the site.

91 Pin: baluster with moulding above and below; tapering shaft. *Building 4, layer 5*

92 Pin: similar to No. 91 but form of mouldings different. Bent.

93 Pin: simple dome-shaped head; moulding below; shaft broken at end. See Braintree (Drury 1977, 19, fig. 11, no. 10).

94 Pin: flattened dome-shaped head; moulding below.

95 Pin: simple moulding at head.

Not illustrated: two fragments of shafts of pins: one 55 mm long from *Ditch 1, layer 2;* the other 40 mm long from *Building 4, layer 1*

Needles (Fig. 13)

96 Needle: *Ditch 1, layer 3*

97 Needle: broken at both ends; part of eye remains. *Building 4, layer 5*

Not illustrated: two needles: one 80 mm long and complete except that the top of the head is broken off; the other a fragment 40 mm long with the head broken off. Eight other pin or needle stem fragments also not illustrated.

Studs (Fig. 14)

98 Decorative strap-mount: peltate shape; two attachment studs at the back. See Richborough (Wilson 1968, 96, pl. XXXVIII, nos 128 and 129); and Oldenstein (1976, 178-184, pl. 53 especially no. 639 (Holzhausen)); device may be associated with auxiliary cavalry. *Ditch 1, layer 2*

99 Similar fitting to No. 98: slightly convex but otherwise the same shape; central arm is missing and only a single stud remains; rather larger. As Richborough (Wilson 1968, pl. XXXVIII, no. 130); and Oldenstein (1976, pl. 53, no. 637 (Feldberg)). *Building 1, layer 7*

100 Strap-mount: convex disc with two attachment studs on the concave underside. See Oldenstein (1976, 186, pl. 56, nos 686-694); and Fulham (Arthur and Whitehouse 1978, 58, fig. 7, no. 6). Perhaps auxiliary equipment. *Floor 4, layer 4*

101 Simple disc: with attachment stud. *Ditch 1, layer 1*

102 Disc: with boss on upper side and rectangular loop below, through which a strap might have been fitted. *Building 1, yard and gullies, layer 1*

103 Disc: with boss and loop; as last but similar.

104 Stud: with domed head and shank of square section. See Chichester (Down 1978, 299, fig. 10.35, nos 76-8). *Possibly from Ditch 1*

105 Stud: type as 104 but head rather flatter. *Ditch 1, layer 3*

106 Stud: broad flat head; type as 104. *Building 1, yard and gullies, layer 1*

107 Stud: as 104 but tinned surface. *Possibly from Ditch 1*

108 Stud: as 104. *Ditch 1, layer 1*

109 Nail: with round head and shaft of circular section. *Building 1, layer 7*

110 Small nail: with round head. *Ditch 1, layer 1*

111 Iron stud: capped with bronze sheet. *Area 1*

Other objects (Figs 14-18)

112 Bucket escutcheon: two perforations at the top, side wings and a 'swallow-tail' at the base. *Building 1, Room 7, layer 2*

113 Bucket escutcheon: composed of two sheets of metal joined together and perforated twice. *Floor 4, layer 4*

114 Scabbard chape: of rounded form with two crescentic openings on each side. Compare chape from second or third-century burial in Canterbury (Tatton-Brown 1978, 24, fig. 7); also Richborough (Wilson 1968, pl. XXXIV, no. 91); and see Oldenstein (1976, 112, pl. 19, no. 112 (Niederbieber)). Associated with auxiliary cavalry. *Building 1, yard and gullies, layer 2*

115 Tapered tube (Pl. X): made from rolled up bronze sheet; pierced by thirty-seven holes and supported at the wide end by a transverse bar with a ring and loop attachment. It has been suggested that the tube might have been useful in a tracheotomy for tetanus, but according to Aretaeus of Cappadocia, quoted by John Scarborough (1969, 140-1) tetanus was thought to be incurable. The object is rather similar to the 'needle cases' or 'brush-holders' found in Anglo-Saxon contexts pierced through the narrow end; e.g. Cassington (Leeds and Riley 1942, 65, fig. 15a); Finglesham (Chadwick 1959, 35-6); and cf. Gingell (1978, 90-1, fig. 21, no. 4). I am not certain of its use; it could have been worn as an amulet (Garbsch 1971, 138, no. 3, pl. 31, no. 2 (Kastell Vemania); and MacGregor (1976, 10-11 (York) for a hollow gold amulet of different form); and the piercings would have allowed it to serve as a pomander if the tube was filled with some aromatic substance. *Ditch 1, layer 1*

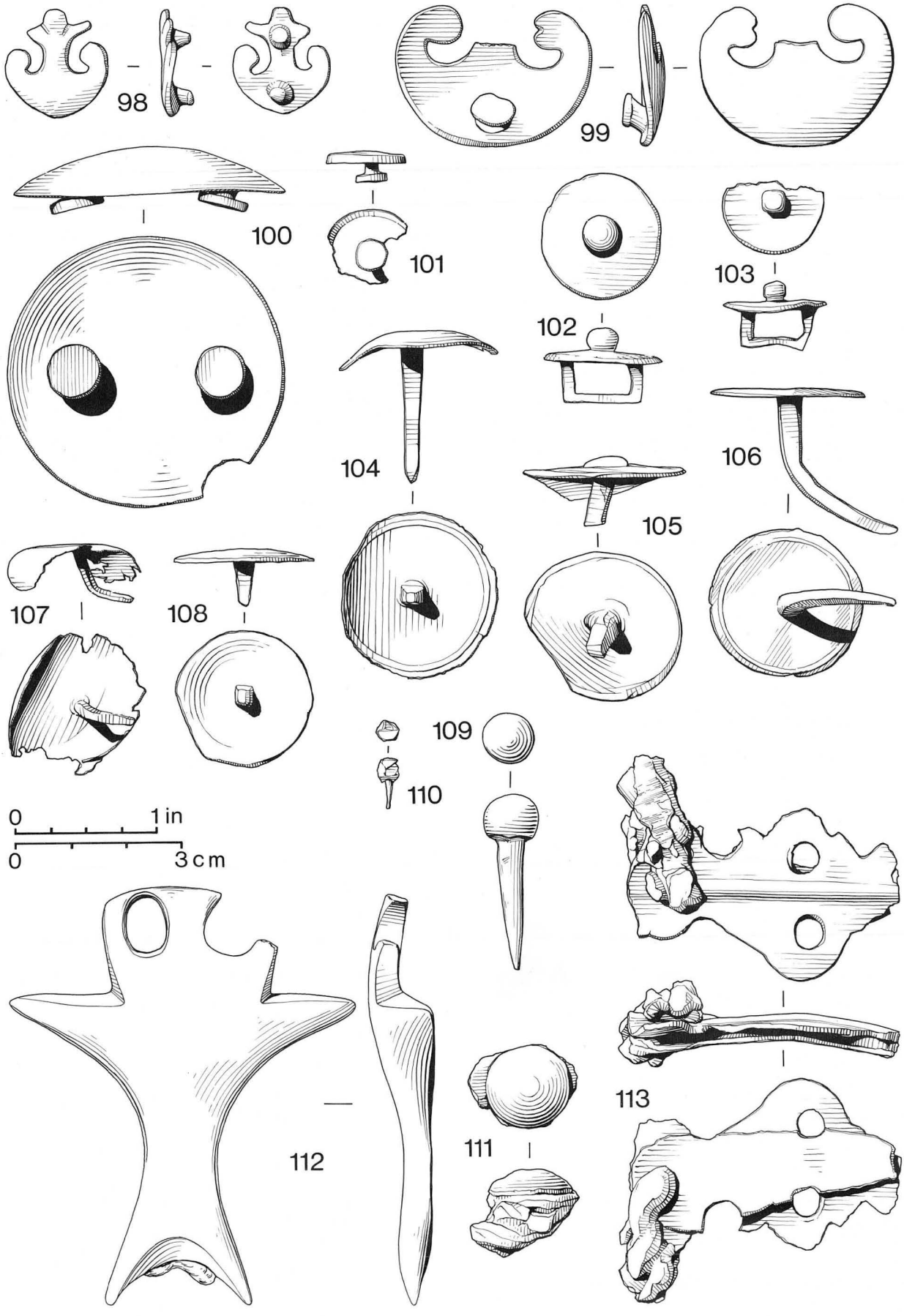


Fig. 14 Bronzes: Nos 98-9, 101-8 studs; No. 100 strap-mount; Nos 109 and 110 nails; No. 111 iron stud with bronze over; and Nos 112 and 113 bucket escutcheons. Scale 1:1.

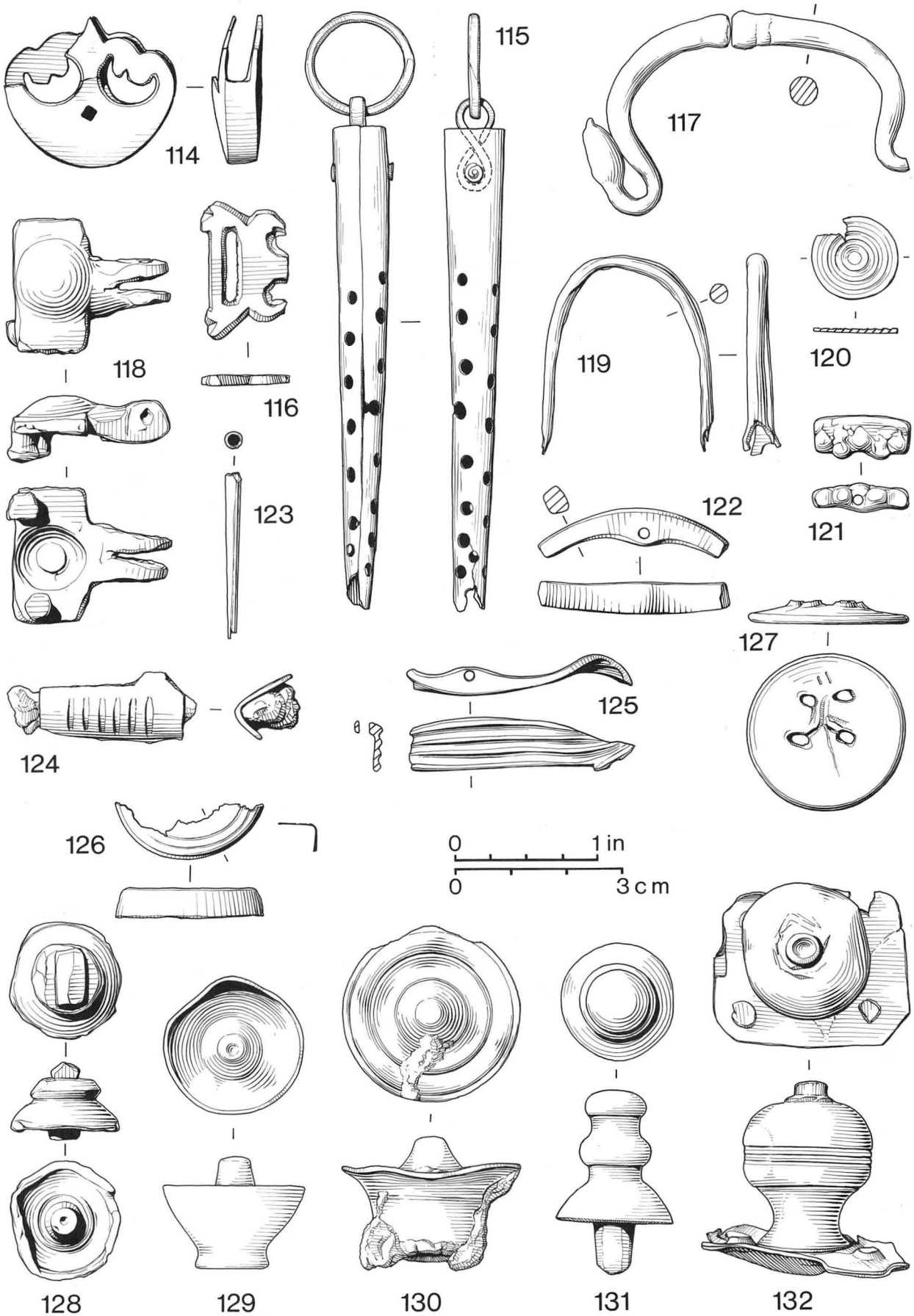


Fig. 15 Bronzes: No. 114 scabbard chape; No. 115 pierced bronze tube (Pl. XI); No. 116 (?) unfinished casting; No. 117 handle; No. 118 gilded fitting; Nos 119-127 miscellaneous objects; Nos 128-132 terminals. Scale 1:1.

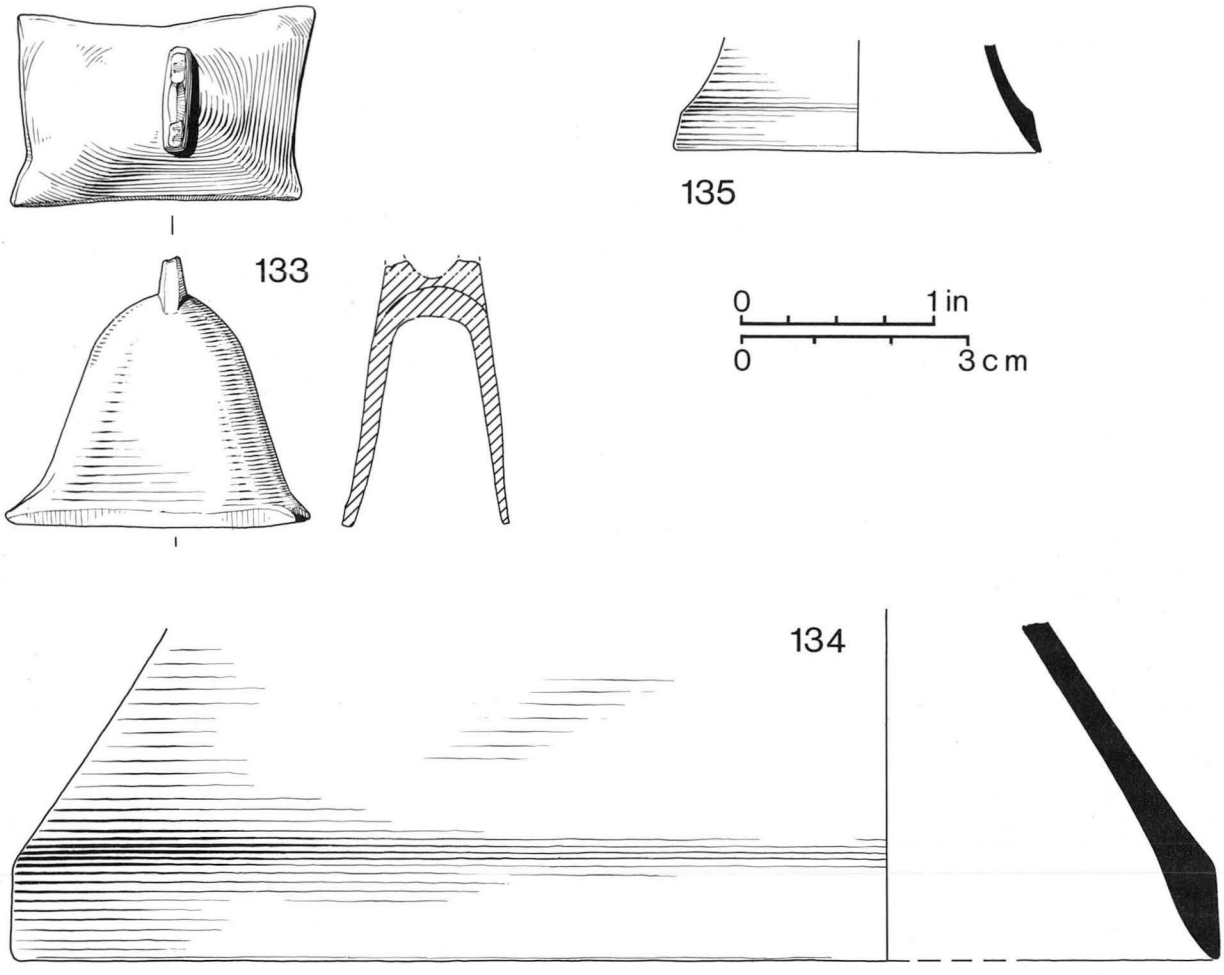


Fig. 16 Bronze bells: No. 133 Roman; Nos 134 and 135 possibly recent. Scale 1:1.

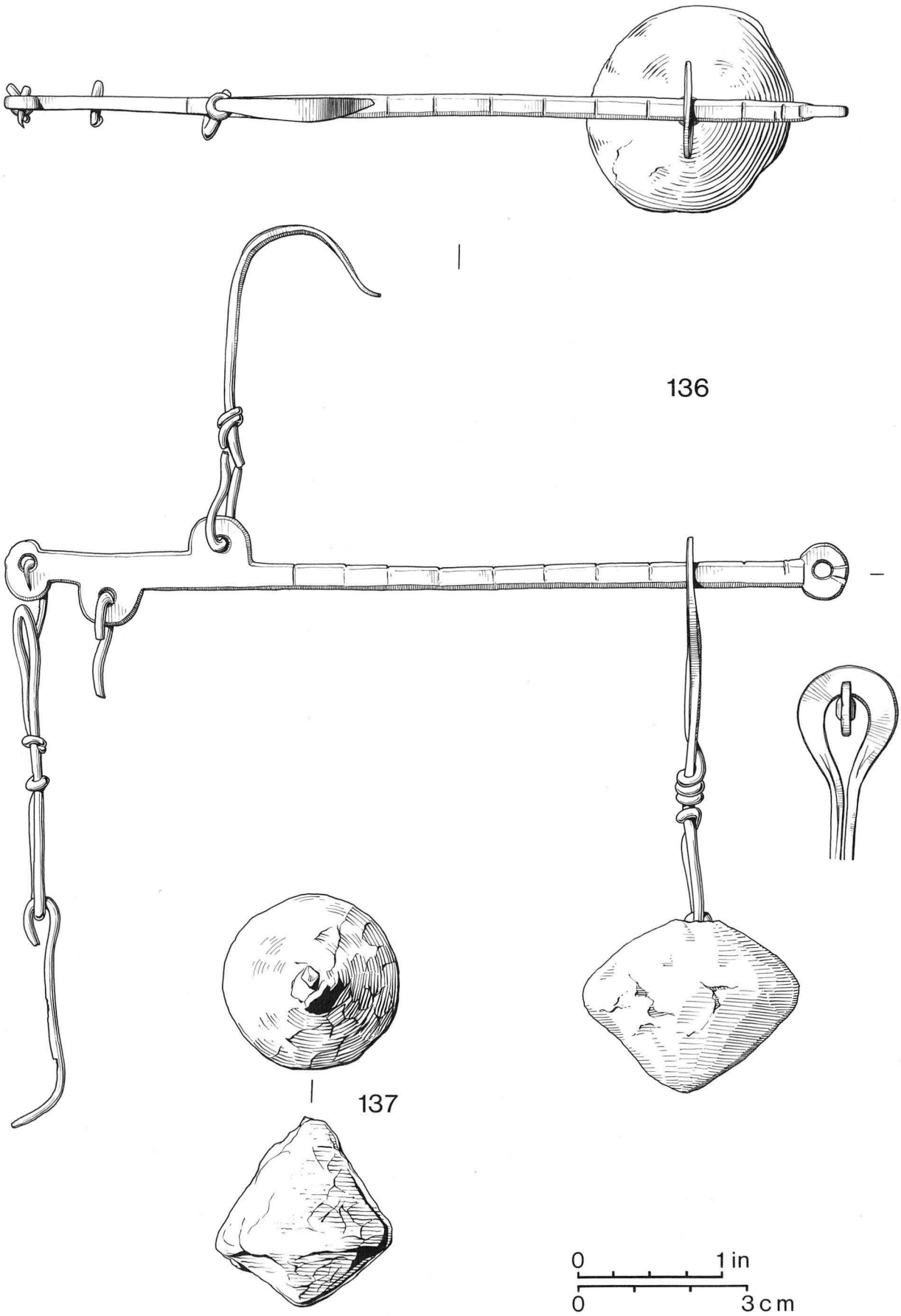


Fig. 17 No. 136 bronze steelyard with lead weight; No. 137 lead weight. Scale 1:1.

116 Casting: with elongated opening along one side. Its unfinished appearance is suggestive of a waster from bronze manufacture, but in size and general shape it somewhat resembles a bronze of unknown use from Shakenoak (Brodribb, Hands and Walker 1973, 112, fig. 55, no. 217). *Building 2, layer 3*

117 Loop handle: simple central moulding; ovoid terminals (only one survives). *Building 1, yard and gullies, layer 1*

118 Gilded bronze fitting with central boss: two studs at the back (probably for attachment to a leather belt, and a simple 'hinge' (?) for a pendant). See Oldenstein (1976, 255, pl. 45, no. 450), a bronze bar with hinge and pendant, and also for other belt fittings from Germany. None matches the Gestingthorpe example closely. Pendants for horse-harness were worn in late medieval times and these have similar hinged attachments (London Museum 1940, 118-122). They are often gilded. Thus although its function is fairly certain the Gestingthorpe example might be assigned to either of two quite different horizons. (?)Medieval.

119 Simple loop. *Western area of field*

120 Disc: ornamented with concentric rings, perhaps originally fixed to a belt. *Building 2, layer 3*

121 Object: one edge bears a moulding; transverse piercing; perhaps used as a bead. *Between Building 2 and Ditch 1*

122 Pierced object: use uncertain.

123 End of tube: very thin; perhaps part of a 'needle case'. *Ditch 1, layer 3*

124 Small piece of bronze sheet binding over an iron bar: simple notches have been cut on the sheet. Compare Shakenoak (Brodribb, Hands and Walker 1972, 69, fig. 30, no. 128) where a similar object is provisionally identified as part of a knife. *Building 2, layer 3*

125 Casing with ridges along upper face: perforation through the flange (perhaps for a rivet if the object was used as casing).

126 Circular casing: half only survives; possibly from a seal box.

127 Disc with four perforations: a surface find and perhaps recent button.

128 Terminal: with central projection and surrounding ridge. See Fishbourne (Cunliffe 1971, 112, fig. 46, no. 118). This type of knob was used with lock-pins. See Verulamium (Waugh and Goodburn 1972, 130, fig. 39, no. 117); also see Jewry Wall (Kenyon 1948, 262, fig. 88, no. 23) and Springhead (Penn 1960, fig. 10, no. 1). *Building 1*

129 Terminal: type as last but the sides are more markedly sloping. *Ditch 1, layer 2*

130 Terminal: central projection stands clear of rim; socket contains central spike and corroded iron from the handle. See Verulamium (Waugh and Goodburn 1972, 126, fig. 38, no. 105). *Hut 1, layer 1*

131 Terminal: consisting of a knob with baluster mouldings and spike. Compare Fishbourne (Cunliffe 1971, 112, fig. 46, nos 113 and 114); Winterton (Stead 1976, 214, no. 127); and Old Winteringham (Stead 1976, no. 130). *Ditch 1, layer 2*

132 Terminal: ovoid with a projection at the top and a central moulding attached to a rectangular plate composed of two sheets of bronze fastened together by rivets; chamfered corners. Compare Shakenoak (Brodribb, Hands and Walker 1973, 108, fig. 53, no. 186). *Building 1, yard and gullies, layer 1*

133 Bell with rectangular mouth: suspension loop on the top is broken. Compare Fishbourne (Cunliffe 1971, 112, fig. 46, no. 107); Chichester (Down 1974, 141, fig. 8.15, no. 24); and Verulamium (Waugh and Goodburn 1972, 126, fig. 37, no. 92). *Hut 1*

134; 135 Fragments from bells: surface finds to the north of the site. Perhaps post-Roman.

136 Steelyard: complete apart from one chain. Calibrations are visible on two sides of the bar; lead counter-weight; rounded on upper side; more pointed below. On the use of steelyards see Hill (1952, 51-5). Compare steelyards from Richborough (Henderson 1949, 131, pl. XXXVIII, no. 133); and Silchester (Boon 1974, fig. 34, no. 3). *Ditch 1, layer 1*

137 Lead counter-weight from a steelyard: stub of iron loop remains. See Verulamium (Waugh and Goodburn 1972, 124, fig. 37, no. 37) for one with a bronze suspension loop and also bronze casting. *Ditch 1, layer 1*

138 Short tapering rounded bar with bronze over iron, and iron at one end: unknown. It cannot be a mandrel because it is too soft. R.F. Tylecote writes 'possibly a pivot or more probably an ornament in which copper-base alloy has been cast round an iron core. It is clearly leaded to the extent of 5-10% Pb. It contains lots of fine delta phase and coarse shrinkage porosity. It is a cored, cast bronze with a dendritic structure and an equivalent tin content of 10-12%. The hardness is 92 HV 0.5. This confirms one's first impression based on the fine and delicate external workmanship, that it is a decorative rather than functional piece: it is far too soft to be a tool.' *Building 1, layer 1*

139 Knife with handle of hexagonal cross-section and narrow integral blade. Perhaps a scalpel (Milne 1907, 27, pl. V, nos 1 and 2). *Ditch 1, layer 1*

140 Key: head of bronze, but shaft of iron originally 60mm long and 30mm across possibly including part of the lock, now missing. The head is moulded (casting ridges are visible) and consists of a perforated tri-lobed element on a double rectangular base. Compare Richborough (Henderson 1949, 125, pl. XXXIV, no. 86); Harlow (Conlon 1973, 39-40, fig 8); Wroxeter (Bushe-Fox 1913, 29, pl. X, no. 1). There are three examples in the Dorset County Museum — 1902.2.3. from Dorchester Gasworks (Webster 1960, 79, no. 87); 1858.4.11 from Cheselbourne; and 1902.1.54 from an unknown site in Dorset; all of which have slighly different heads and iron shanks. *Building 1, yard and gullies, layer 1*

141 Strip of bronze: mouldings down edge; bronze-covered studs which have a little plaster adhering to the reverse, as has the strip. *Building 1*

Lead, pewter and model objects (Figs 18-19)

See also No. 136 bronze steelyard with lead weight; No. 137 lead weight; and No. 4 lead or pewter spoon.

142 (?)Base of a pewter vessel with foot-rim. *Building 4, layer 2*

143 Model axe-mattock/adze (p. 44, Pl. XI). *Floor 4, layer 4*

144 (?)Model sickle fragment (p. 44, Pl. XI). *Hut 2*

145 Model bronze axe (p. 44, Pl. XI). *Area 3*

146 Pencil-like length of lead. *Hut 2*

147 Sheet of lead ((?) tank) with impressions from rivets: centrally a small circular-headed iron nail with the shank broken off. *Hut 2*

148 Fragment of lead sheet: M.R. Hull suggested that this was part of a water tank, and since it was recovered from the stokehole fill of the baths, this seems very likely. *Building 1, layer 3, stokehole*

149 Fragment of lead sheet: with cut edges. *Building 1, Room 7, layer 2*

150 Fragment of lead sheet: with three broken edges and the fourth scalloped; possibly pierced for attachment obliquely across upper part. *Hut 1, layer 1*

151 Fragment of cut lead sheet. *Building 4, layer 1*

Not illustrated: nine other featureless pieces of lead.

General comments

The material from Gestingthorpe is of very mixed character. It is possible that some of the bracelets and rings, and also possibly the steelyard whose detail shows affinities with some of the bracelets, were made on the site, perhaps during the third century. Some of the objects are very late and approximate to items from the late Roman cemetery at Vermand, with its *terminus ante quem* of *c.* AD 407, excavated by Eck (1891). Thus our buckle (No. 17) is similar to his pl. 1, no. 10b; and the strap- ends with ring and dot (Nos 18 and 19) are similar

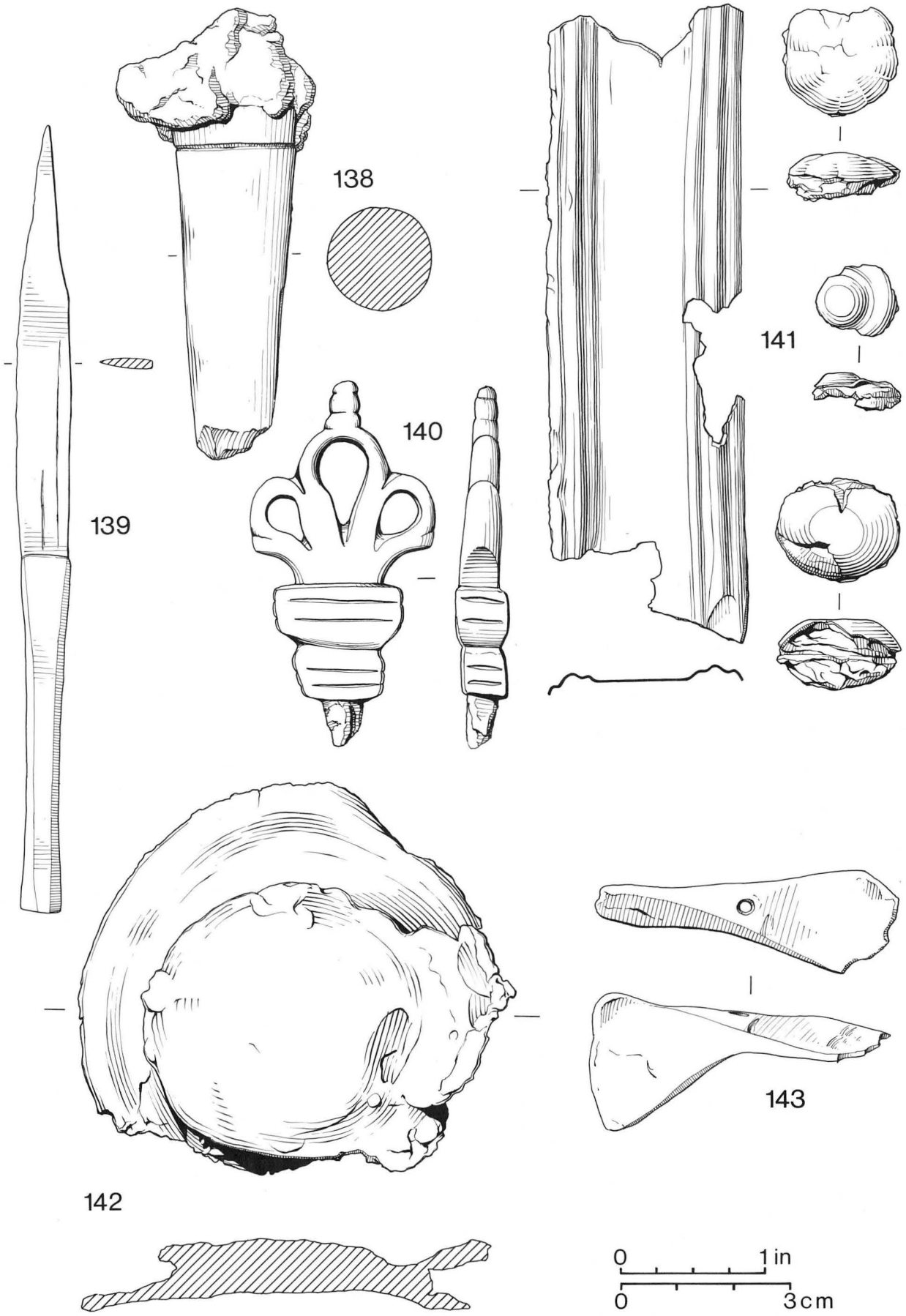


Fig. 18 No. 138 bronze and iron object; No. 139 bronze knife; No. 140 bronze key head; No. 141 bronze strip and studs; No. 142 (?) pewter base; No. 143 lead model axe (Pl. X). Scale 1:1.

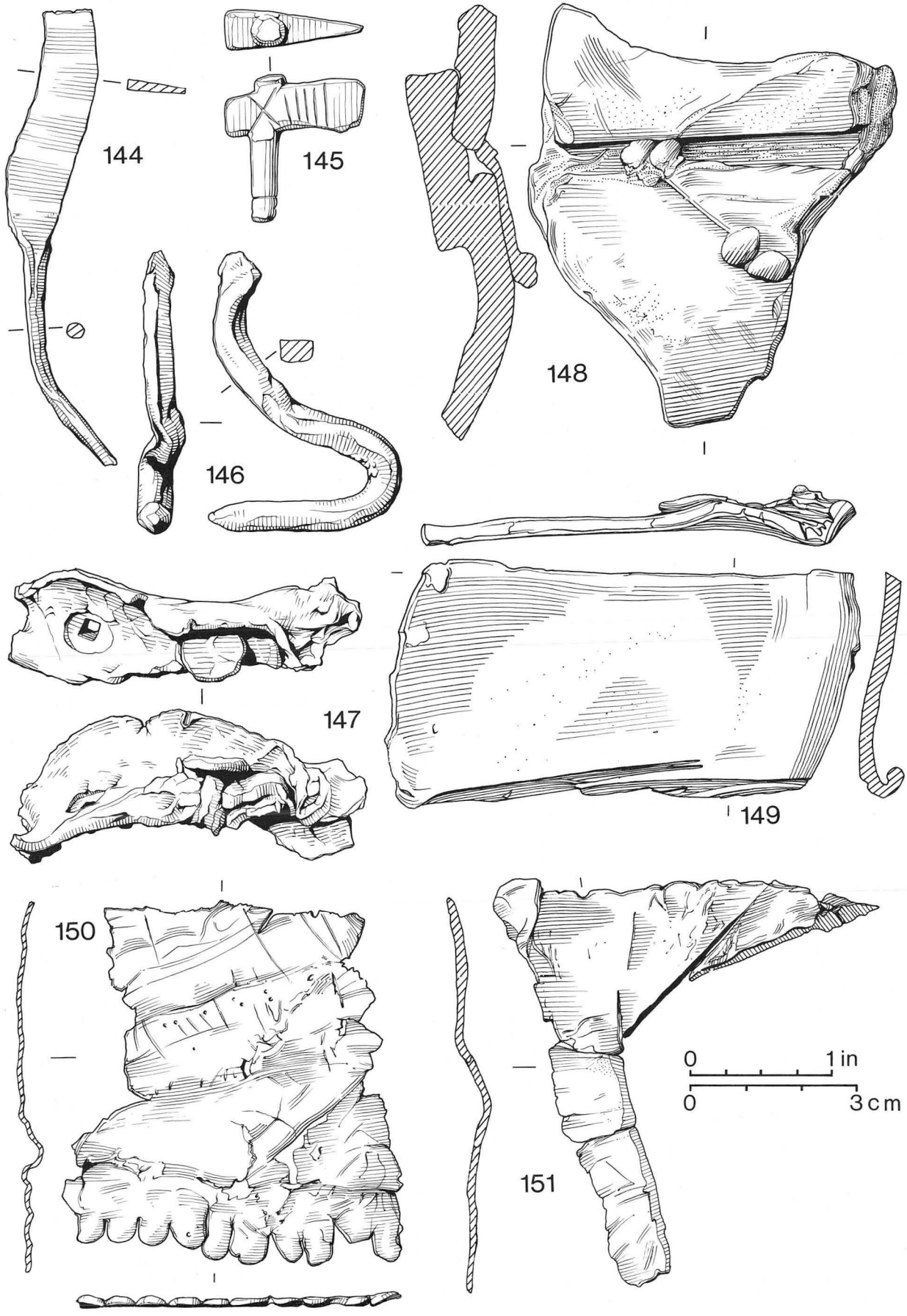


Fig. 19 No. 144 possible model sickle in lead (Pl. X); No. 145 bronze model axe (Pl. X); Nos 146-151 lead; No. 148 possibly part of lead tank. Scale 1:1.

to his pl. 1, no. 13. There are also many parallels with material dated to *c.* AD 350-370 at Lankhills cemetery, Winchester (Clarke 1979). The ring-and-dot and chip-carved traditions at Vermand and elsewhere in the Empire (e.g. Silchester, Richborough and Shakenoak in Britain, and in Bavaria (Keller 1971; note ring-and-dot on trinket (pl. 22) and another fine buckle with kidney-shaped plate (pls 34 and 55)) point to some occupation at Gestingthorpe in the second half of the fourth century.

There is a small quantity of military equipment from the site, but whether or not this represents a connection with a specific unit or merely the presence of an occasional passing soldier has not been revealed in the investigations. In any case it belongs to at least two distinct phases. The scabbard and belt fittings (Nos 98, 100 and 114) are second-third century, while the horse-head buckle (No. 16) must be fourth century.

V Model objects (Figs 18-19; Pl. XI)

by Miranda Green

Description

1. The lead models (Pl. XI)

There is one certain and one possible miniature object of lead from the site. The definite example consists of an axe-mattock/adze with a central perforation, presumably for the insertion of a separate shaft of lead, iron or wood (No. 143; Floor 4, layer 4). No trace of such a shaft survives. The item measures 52mm long by 24mm maximum width. The implement is constructed as an axe/adze with the two blades on planes at right-angles one to the other.

The second object is tentatively identified as a model sickle-fragment (No. 144; Hut 2). It has a flat, knife-shaped curving blade which is broken off about halfway along its length, and a round-sectioned handle which has a median crack and a missing tip.

Both the lead items are large and crudely-fashioned compared to most other British and Continental Roman models. Lead is an unusual, but by no means unknown, material for manufacturing miniature implements in Britain. A group of lead tool-models has been recorded from Chester (Hartley and Kaine 1954, 35-6, fig. 12, nos 2-5); a lead axe is known from the Springhead temple complex (Newstead 1928, 22, pl. XI, nos 1 and 2). Although the other more usual media for model production—silver, bronze and bone—are more aesthetically pleasing, it would have been both technologically more simple and less costly to produce a lead model (Green 1981). Casting would not have been necessary but the cold-worked end-product would naturally have presented a rougher, less-finished appearance than a bronze. Whilst the Gestingthorpe bronze model (considered below) would have been made by a professional bronzesmith, the two lead miniatures could have been produced by anyone reasonably competent with his hands, from two pieces of lead scrap.

2. The bronze axe-model (P. XI)

This object was a surface find (No. 145; Area 3). It measures 26mm long by 25mm wide. Thus the shaft is short in proportion to the length of the blade, implying the particular importance of stressing the latter element. The exterior or decorated surface of the blade faces right. There is incised ornament in the form of a diagonal (St Andrew's) cross at the junction of the haft and the blade and five vertical lines on the part of the blade nearest the haft. This handle projects about 2.5mm above the blade and it terminates at its lower end in two horizontal grooves running right round it. In addition, the rear of the haft bears three horizontal grooves.

A number of bronze axe-models are recorded from Romano-British contexts. The main distribution areas are eastern and south-eastern England (Green 1976a, fig. 1, no. 55). The axes occur either as items of jewellery—brooches or pins—or, as is the case here, as true models with no evidence for attachment or suspension. The nearest parallel in the general shape and proportions to our Gestingthorpe bronze appears to be an example from Richborough (Henderson 1949, pl. LII, no. 189). The marks on the axe-blade can also be paralleled. They appear to represent skeuomorphs of leather or cord bindings which might occur on a functional implement of metal and wood (though such thongs are more likely to have been necessary on Bronze Age or Iron Age rather than Romano-British axes). The crossed lines occur on several axe-models in Britain including the Richborough example cited above; other models from the same site (Henderson 1949, pl. LII, no. 190; pl. LIII, no. 195); Corbridge (Green 1978, 57, pl. 123); Hockwold (Norwich Castle Museum: Green 1976a, 63, fig. 2, no. 17); and Woodeaton (Ashmolean Museum: Kirk 1951, 32-4). The diagonal cross is relatively common; the vertical lines are paralleled, for instance, at Sarre (Kent).

Function and significance

The models from this site are members of a large, heterogeneous group of British and Continental Roman objects, which include wheels, weapons, and agricultural and other implements. About sixty axe-models are known from Britain. Model objects in general would appear to merit a ritual interpretation (for fuller discussion, see Green 1976a, 54-70; Green 1981); in some instances at least they may be offerings by devotees, whose occupations are represented by the models, to appropriate divinities. It is, of course, possible that the Gestingthorpe lead models are toys, but this is an extremely unlikely explanation in the case of the bronze axe from the site. There are a number of reasons for assigning a religious significance to models. First, the majority of British examples come from temples or graves (Green 1976a, 61, table II). Second, some Continental axe-models are inscribed with the names of deities (Staehelin 1931, 486). Third, the decoration on some models, including our bronze axe, may have significance. Whilst binding-marks may explain some motifs, the St Andrew's cross sometimes, as at Kirmington (information from Scunthorpe Museum) occurs in mid-blade, in a similar position to an incised swastika-symbol on a Woodeaton model (Green 1979, pl. 19, fig. 20). In addition the diagonal cross-sign occurs on other cult-objects including the ceremonial 'pole-tip' from Milton (Cambs) (Green 1975); the sacrificial knife from the temple site at Muntham Court (Worthing Museum: Burstow and Holleyman, 1957, no. 4, 101: Green 1976b, pl. XXV, g); bronze swastika-brooches from Tongres (Gallio-romeins Museum te Tongeren); and on figurines of the Hammer-God from Gaulish sites (Musée de Antiquitiés Nationales, St Germain-en-Laye).

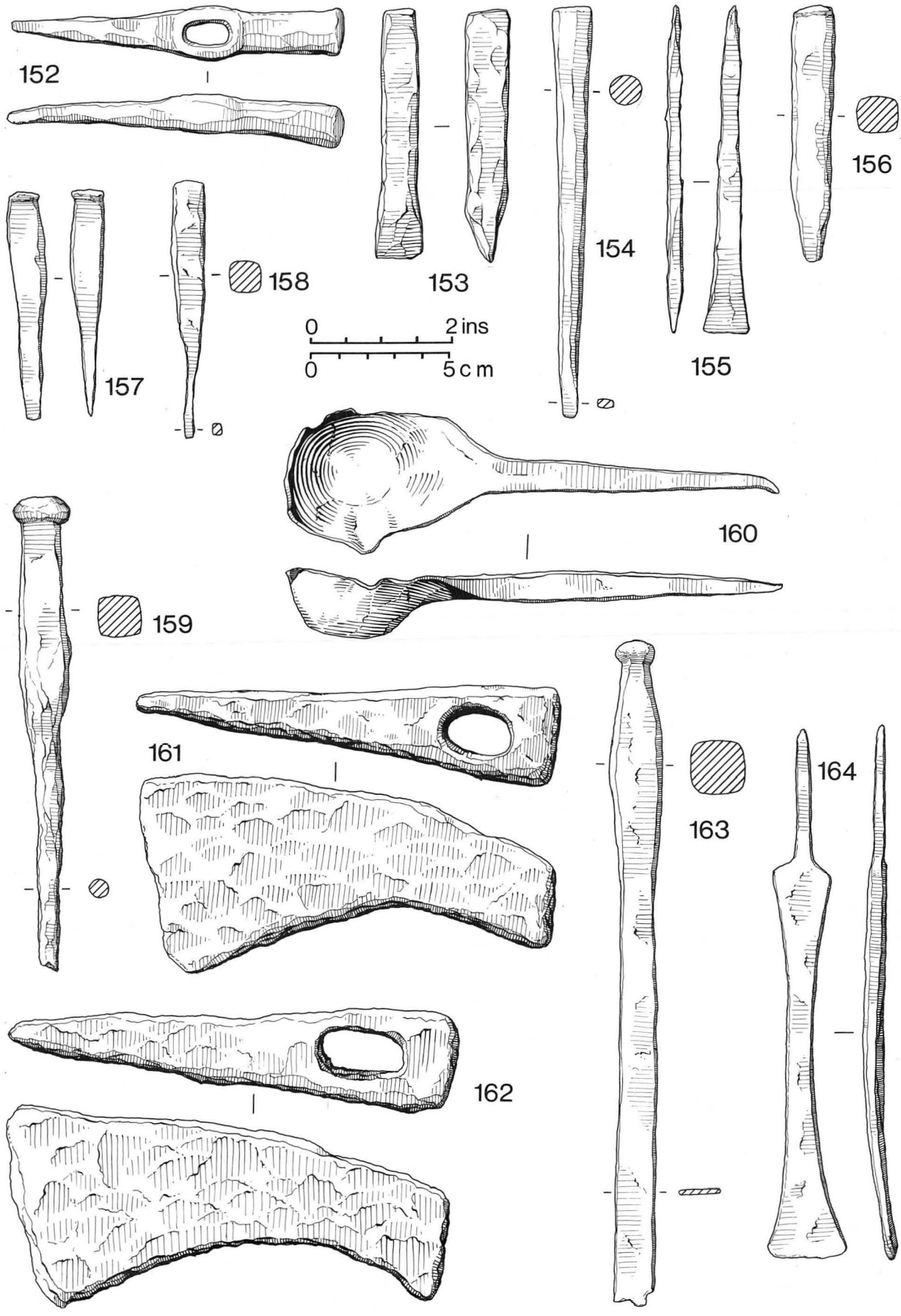


Fig. 20 Iron: No. 152 hammer; No. 153 smith's set or chisel; No. 154 smith's chisel; No. 155 tanged chisel; Nos 156 and 157 smith's punches; No. 158 punch; No. 159 possible punch; No. 160 ladle; Nos 161 and 162 axe heads; Nos 163 and 164 chisels. Scale 1:2.

Continental opinion is in favour of the interpretation of the symbol as being, in some way, significant (Röttlander 1971, 94-109). It is suggested that a solar interpretation may be merited (Hatt 1951: Green 1981). This would be appropriate since, in my opinion, the miniature axe originally may well have had solar symbolism; it is connected with the Hellenic Sky-God both in Minoan (Hawkes 1937, 145, 149, fig. 3) and classical Greece (Carapanos 1878: Blinkenberg 1911, 29, fig. 16). In its present Romano-British context, however, it is arguable that the axe-model may be a simple good-luck charm, an offering to any deity, though the Woodeaton axe-model noted above, with its swastika-motif, could be cited as evidence of a solar/celestial symbolism (Green 1984).

If the lead models are religious in function they are of interest, since they represent agricultural tools which are rare as miniatures in British contexts. An adze is recorded from Sussex (Manning 1966), and an adze-hammer from Chester (Grosvenor Museum, Chester, Acc. no. 598 R 1977). Only one sickle is known to the writer, a recent and unpublished find from Aylesbury (information from M. Farley, Buckinghamshire County Museums, Aylesbury). A number of bronze sickles come from the homogeneous group of multi-model graves from the regions of Cologne and Bonn (Röttlander 1974, 143-152). These cemeteries which have produced predominantly agricultural miniature implements and animal-figurines (notably reptiles and amphibians) are generally suggested as having contained offerings to the Thraco-Phrygian Lord of Heaven Sabazius (Manning 1966). However, in this instance, where crude, locally-made lead models occur on an Essex rural site, it seems far more likely that the possessors of such items were devotees of a local agricultural divinity rather than of an oriental mystery-cult virtually unknown elsewhere in Britain.

VI Ironwork (Figs 20-9)

by W.H. Manning
with metallographic examination by R.F. Tylecote

See Table 6 (Knives) and Table 7 (Chisels, punches and sets) for lists of the objects examined by R.F. Tylecote. See also iron brooches Nos 2 and 13, and iron knives with bone handles Nos 390 and 391.

152 Hammer: elongated eye; slightly domed face and narrow, almost pointed pane. An essentially similar hammer is known from The Lunt (Hobley 1973, 88, fig. 29, 23), and in a slightly variant form from the Eckford, Roxburghshire hoard (Piggott 1955, 27, fig. 6, E13). R.F. Tylecote writes: 'The pane consists of ferrite and slag with a hardness of 205 HV1. The face or head consists of ferrite and pearlite with a carbon content in the range of 0.1-0.2%. The pearlite is coarse and spheroidal and the hardness is 261 HV1. Since the hardness is too high for iron with 0.1-0.2% carbon, one must assume that the iron has an appreciable phosphorus content. What little carbon there is, is almost certainly accidental.' *Ditch 1, layer 2, beside Floor 4*

153 Smith's set or chisel: short, stout stem and slightly widened edge. See Manning (1972, 163, fig. 60.2) for a comparable example and details of similar ones. R.F. Tylecote writes: 'The edge of this chisel consists of two pieces of metal joined along the middle of the section. One has a high carbon content and the other hardly any. The carbon content of the former varies from 0.2 to 0.6% and has a Widmanstätten distribution of ferrite and martensite. Clearly it has fairly rapidly cooled from a very high temperature (1100°C) and, at a temperature of about 800°C when the ferrite was separating from the austenite, was quenched in water to give martensite with a hardness of 440 HV1. The low carbon half of the tool has a hardness of 177 HV1 and, as the carbon content is nearly zero, probably contains some phosphorus.' *Ditch 1*

154 Smith's chisel: narrow, mortice-edged blade. It would be suitable for chasing metalwork. R.F. Tylecote writes: 'The edge of this slender blade has been made by folding in such a way as to enclose some charcoal and slag in the centre of the fold. The edge consists of ferrite and pearlite which has been cold-worked to give a hardness of 230 HV1. The carbon content in this region is low, about 0.3%, but near the centre the carbon content rises to 0.8% giving pearlite with fine grained ferrite. The hardness in this region is 240 HV1, reflecting the higher carbon content but also absence of any work-hardening.' *Ditch 1, layer 2, beside Floor 4*

155 Tanged chisel: square-sectioned stem and slightly splayed blade. Possibly intended for metal working. R.F. Tylecote writes: 'The splayed edge consists entirely of ferrite with a good deal of slag, and some cementite in the grain boundaries. The grains are elongated; this has presumably been done above the recrystallisation temperature (700°C?) and the hardness is 124 HV1.' *Possibly from ditch 1*

156 Smith's punch: slightly battered head and a damaged chisel-edge tip. For an example from Verulamium see Manning (1972, 164, fig. 60.5). R.F. Tylecote writes: 'A piece from the side consists of 100% sorbite with a hardness of 193 HV1. The carbon content is about 0.6% and the uniform structure must have been formed by heating at about 700°C for an appreciable time, followed by slow cooling.' *Ditch 1, layer 2, beside Floor 4*

157 Smith's punch: short stem; battered head; narrow, chisel edge. A somewhat larger and more carefully made example came from Newstead (Curle 1911, 285, pl. LXIII, 7). R.F. Tylecote writes: 'A rectangular piece from the tip showed formation by folding over forming a poor medial weld line. The structure was ferrite and pearlite with a carbon content of 0.1-0.2% and the pearlite was spheroidal showing that it had been held for a short time at 600-700°C. The ferrite grains are heavily elongated indicating that it has been cold worked. The hardness is 290 HV1.' *Ditch 1, layer 2, immediately to the south of Floor 4*

158 Smith's or leatherworker's punch: stout, square-sectioned stem; narrow tapering, broken point. Similar tools come from Rotherley (Pitt-Rivers 1888, 137, pl. CV, 16); Casterley Camp, Wiltshire (Cunnington and Goddard 1934, 108, pl. XXXI, 14); London (Wheeler 1930, 76, pl. XXXIII, 1); etc. *Ditch 1, layer 2, beside Floor 4*

159 Punch or tool handle: square-sectioned handle ending in a domed head, with a tapering, broken stem. R.F. Tylecote writes: 'The head consists of uniform ferrite and pearlite with 0.1-0.2% carbon. The pearlite is spheroidal and the hardness is 153 HV1.' *Building 4, layer 5*

160 Ladle: deep bowl formed by dishing the plate-like end of the tapering tang. On one side of the bowl there is a distinct lip which almost certainly indicates that it was intended for pouring metal, probably lead, rather than for use in cooking. Ladles of this general type are not uncommon and examples may be quoted from Shakenoak Farm, Oxfordshire (Brodribb, Hands and Walker 1968, 104, fig. 35, 33); Caerwent (Newport Museum); Silchester (Reading Museum); etc. Most of these are more carefully made and were intended for culinary use. *Ditch 1, layer 1, to the north of Floor 4*

161 Axe-head: oval eye; backward curving edge. The concave back of the axe is sufficiently pronounced near the top as to produce an unusually wide poll. It is a good example of a common Roman type; cf. Manning (1972, 164, fig. 60, 7) for an example from Verulamium and details of others. R.F. Tylecote writes: 'The cutting edge seemingly consisted of a fairly unform pearlite which turned out on closer examination to be tempered martensite with a hardness of 515 HV1. While this hardness would be expected from the Migration Period it is quite unusual to see hardnesses as high as this in the Roman period. It must have

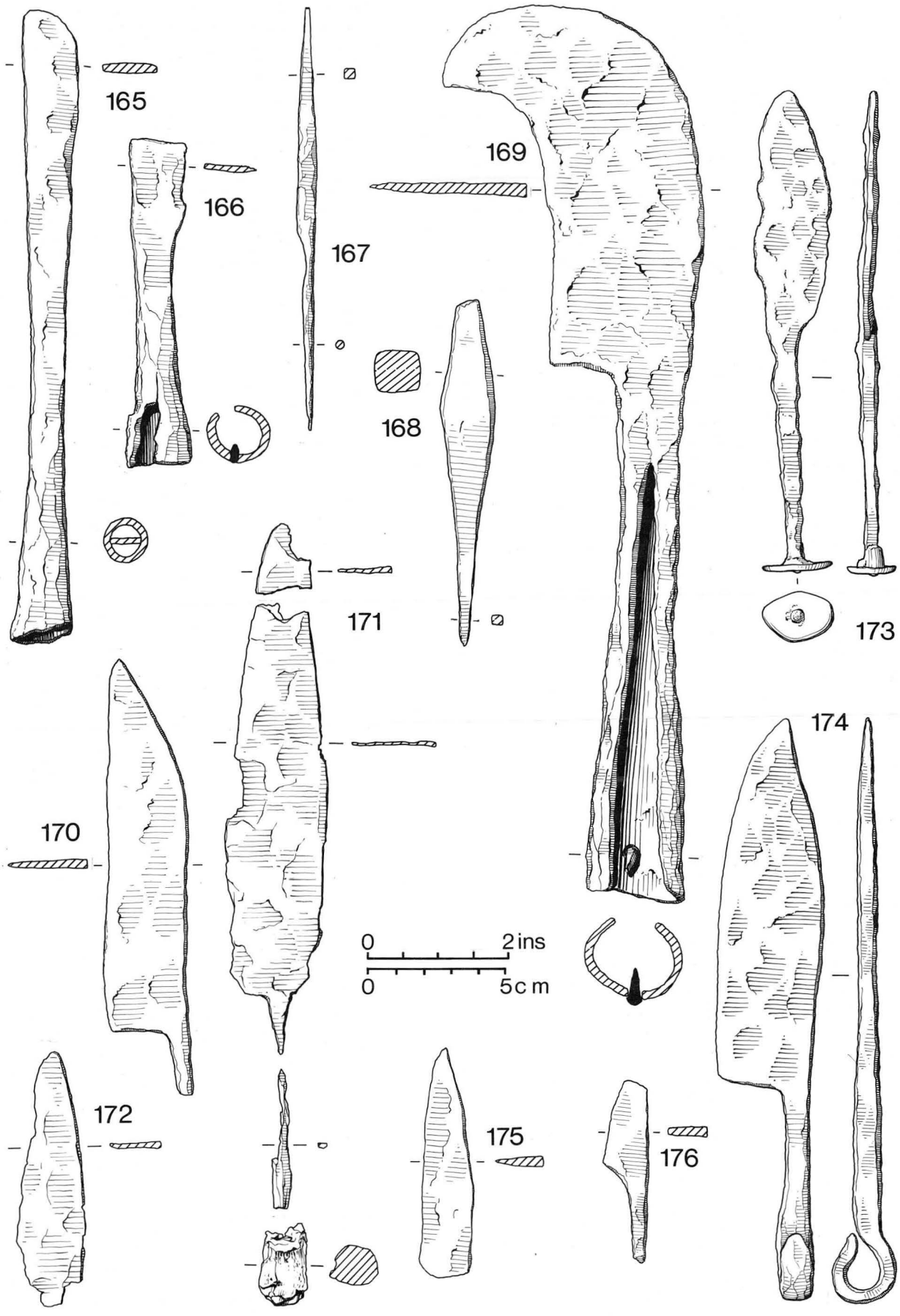


Fig. 21 Iron: No. 165 chisel; No. 166 tool; Nos 167 and 168 awls; No. 169 bill-hook; Nos 170-176 knives. Scale 1:2.

been evenly heated and efficiently quenched from above 700°C. This evidence must throw some doubt on a Roman origin.' *Area 3*

162 Axe-head: oval eye, square poll and backward curving edge. R.F. Tylecote writes: 'The edge contains equal amounts of ferrite and pearlite with a granular distribution. The structure of the pearlite is fine as a result of fairly fast cooling and the hardness is 210 HV1.' *Area 3*

163 Chisel: solid, moulded handle; long thin blade, damaged at its edge. Although the solid handle might suggest that it was intended to be struck with some force, the thinness of the blade makes this highly unlikely and it is probably a paring chisel with an unusually narrow blade. Although paring chisels are more commonly tanged, examples with solid handles are known from Verulamium (Manning 1972, 164, fig. 60.10); Caistor-by-Norwich (Norwich Castle Museum); and elsewhere. *Ditch 1, layer 2, to the north of Floor 4*

164 Tanged paring chisel: hollow-sided blade; splayed edge. A similar one is known from Camulodunum (Hawkes and Hull 1947, 343, pl. CV, 4). R.F. Tylecote writes: 'The splayed edge consists of two different steels welded along the centre of the section. The higher carbon steel consists of pearlite and ferrite with about 0.6% carbon and has a hardness of 250 HV1. The lower carbon side contains carbon in the range of 0-0.2%. In both cases the pearlite is lamellar to spheroidal and coarse showing that it has been slow cooled. The ferrite grain size is very coarse.' *Ditch 1, layer 1, immediately to the south of Floor 4, on the shoulder of the ditch.*

165 Socketed chisel: narrow, thin blade, damaged at its edge; probably a paring or firmer chisel. Similar chisels come from many sites, including Newstead (Curle 1911, 280, pl. LIX, 7 and 8); London (Painter 1961, 166, pl. L, 6); etc. *Ditch 1, layer 2, immediately south of Floor 4*

166 Socketed tool: thin but broken blade; probably a chisel. *Ditch 1, layer 2, immediately south of Floor 4*

167 Awl: square-sectioned tang; tapering round-sectioned blade. It is a common type; for an example from London (Wheeler 1930, 76, pl. XXXIII, 2). *Ditch 1, layer 4, north end*

168 Awl: pyramidal head with an illegible maker's stamp on one face; tapering, broken stem. Comparable tools come from Newstead (Curle 1911, 281, pl. LIX, 6), London (Wheeler 1930, 76, pl. XXXII, 10), and Cirencester (Corinium Museum), and are particularly common on the German *limes*. R.F. Tylecote writes: 'A piece from the head showed ferrite with a little pearlite and some slag. The hardness was 124 HV1 indicating a low phosphorus content.' (see also p. 58-60). *Ditch 1, layer 2, to the north of Floor 4*

169 Billhook: broad, strong blade; hooked at its tip; long, open socket with a nail near the mouth. It is an unusually good example of a not uncommon type with examples from Hod Hill (Brailsford 1962, 15, pl. VIII, G89); Caerwent (Newport Museum); etc. R.F. Tylecote writes: 'The edge consists mostly of pearlite with very slight surface carburization. The pearlite is spheroidised indicating a fair time in the temperature range 600-700°C. The hardness is only 270 HV1 showing that, unlike the axe-head (No. 161) above, it has not been hardened which seems a waste of an otherwise good blade.' *Building 4, layer 5*

170 Knife: the broken tang continues the line of the back which is straight for the greater part of its length before angling down to the tip; the edge is straight. It is a common type and similar examples are known from many sites, including the Gadebridge Park villa (Manning 1974, 169, fig. 72, 406 and 414); Rotherley (Pitt-Rivers 1888, 132, pl. CIV, 5); Woodcuts (Pitt-Rivers 1887, 71, pl. XXIII, 2); etc. R.F. Tylecote writes: 'The edge consists entirely of large equiaxed grains of ferrite with a hardness of 164 HV 0.5. This suggests an appreciable phosphorus content.' *Ditch 1, layer 2, beside Floor 4*

171 Knife: symmetrical blade; a much damaged tang which still retains a fragment of the bone handle; both back and edge are slightly convex, tapering to the tip; the edge has a distinct heel between it and the tang. It is an extremely common type which includes examples from Bokerley Dyke, Wiltshire (Pitt-Rivers 1892, 107, pl. CLXXVI, 12); Verulamium (Wheeler and Wheeler 1936, 219, pl. LXIV, 9); Richborough (Bushe-Fox 1928, 52, pl. XXIV, 74); Housesteads Milecastle (Manning 1976, 37, no. 121); etc. R.F. Tylecote writes: 'A piece of ferrite with a hardness of 153 HV1.' *Area 1*

172 Knife: originally the blade will have been similar to No. 171 being symmetrical about the line of the tang, with gently curving edge and back. Most of the tang is lost and the edge damaged.

173 Knife: long, centrally placed tang ending with a bronze washer. A fragment of the bone handle survives under the washer. The blade was probably symmetrical with curving edge and back, but whetting and corrosion have damaged the edge. It is an exaggerated form of the two preceding examples. Similar examples come from Lydney, Gloucestershire (Lysons 1813, pl. XXXIII, 2); Woodcuts (Pitt-Rivers 1887, 69, pl XXII, 4 and 5); Housesteads (Manning 1976, 37, no. 123); etc. R.F. Tylecote writes: 'A ferrite blade. The hardness in this case is 205 HV1.' *Hearth 2*

174 Knife: rod-like handle, looped at its end which continues the line of the back. The back is slightly sinuous, dropping to the tip; the edge, which is stepped down from the handle, is straight before curving up to the tip. The type is not uncommon in the major collections such as those from Silchester (Reading Museum), or Caerwent (Newport Museum), but fewer are published; a basically similar knife is illustrated from Bokerley Dyke, Wiltshire (Pitt-Rivers 1892, 107, pl. CLXXVI, 13). R.F. Tylecote writes: 'The edge has a ferrite and pearlite structure with about 0.2% carbon and a hardness of 240 HV1. The composition and structure are very uniform and the pearlite is spheroidal rather than lamellar. The high hardness and the low carbon suggest an appreciable phosphorus content.' *Floor 4, layer 4*

175 Knife blade: pointed tip fragment. R.F. Tylecote writes: 'A section through the blade shows very coarse ferrite with some intergranular corrosion. Contains no weld lines and very little slag. The hardness is 160 HV1.' *Ditch 1, layer 2, immediately to the north of Floor 4*

176 Knife: the back continues the line of the broken tang. The edge runs up towards the missing tip with an angled heel between it and the tang. R.F. Tylecote writes: 'The blade has been formed by folding over leaving a slaggy area in the fold. The structure is Widmanstätten ferrite and pearlite with a carbon content in the range of 0-0.4%. The hardness of the 0.4% area is 168 HV1.' *Floor 4, layer 4*

177 Knife: the back continues the line of the tang; the edge is damaged and the tip of the blade lost. R.F. Tylecote writes: 'The blade has been made by folding a thin sheet of low carbon steel with a carbon content of 0.15% over pure ferrite (Type D: Tylecote 1975). The border is slaggy and the carbon has diffused. The pearlite is spheroidal to near-divorced and the hardness is 153 HV1.' *Hearth 2*

178 Knife: the back is straight before angling down to the tip; the edge is more or less straight for its full length; the tang is set on the mid-line of the blade. It is a variant form of No. 170 above. R.F. Tylecote writes: 'A steel-cored blade of Type A. The core consists of ferrite and pearlite with a carbon content of about 0.5-0.8% and a hardness of 256 HV1. On one side there is pure coarse ferrite and on the other ferrite and pearlite. The pearlite is fine and non-lamellar indicating a fairly fast cooling rate through the 700-600°C range. (What a pity this blade was not heat-treated!).' *Ditch 1, layer 2, north end*

179 Knife: lacks most of the blade. R.F. Tylecote writes: 'The structure is a very uniform pearlite with ferrite grain boundaries. There are thick slag stringers, some running the whole width of the blade together with white lines indicating arsenic. In the thick areas of the blade the lamellar structure of the pearlite is resolvable, but in the thin section it is finer. At the edge the carbon content is about 0.6% and the hardness is 223 HV1.' *Floor 4, layer 2*

180 Knife: only the tip survives to suggest that it was originally comparable with No. 170 above.

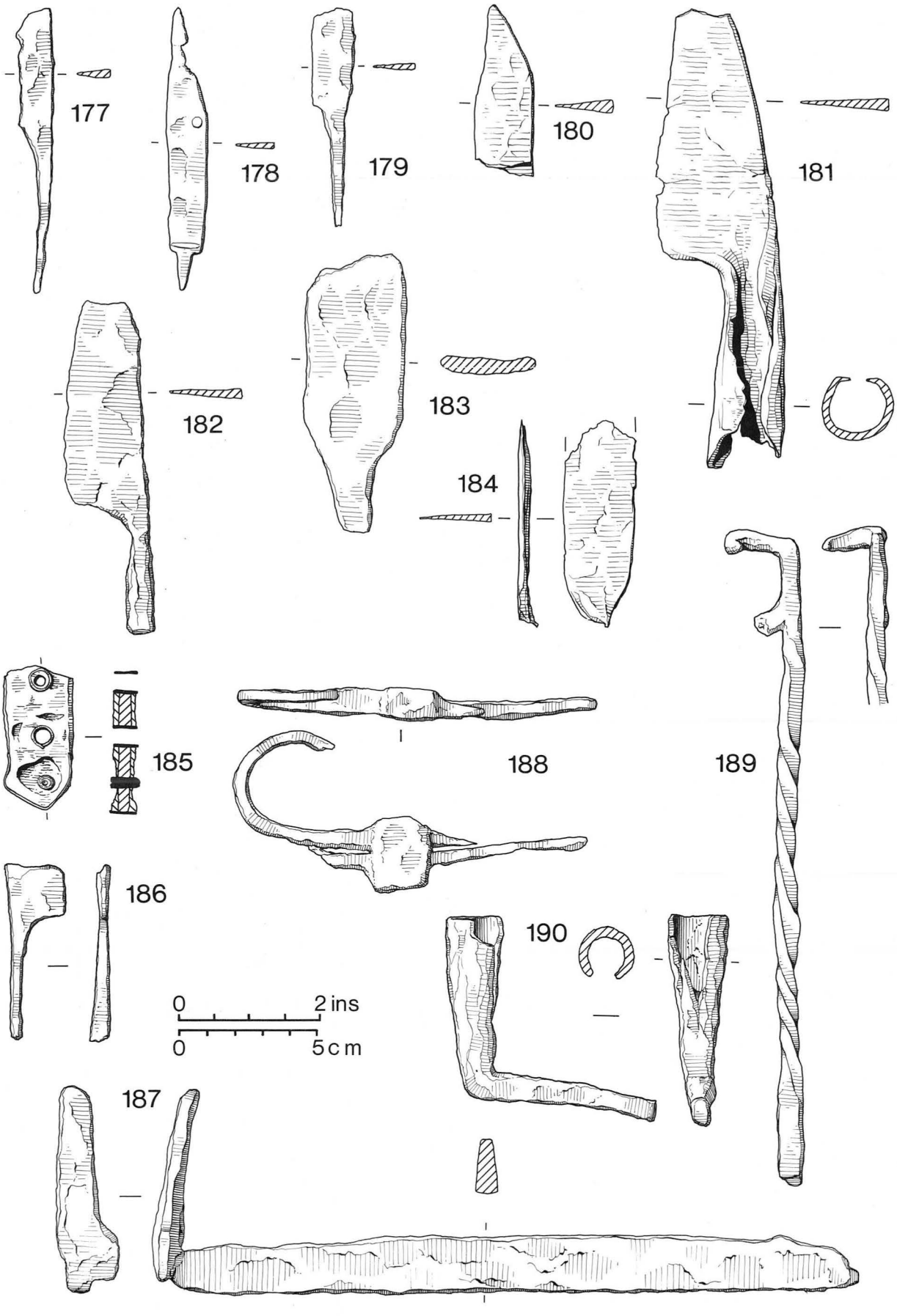


Fig. 22 Iron: Nos 177-184 knives; No. 185 knife handle with bronze rivets and edging; No. 186 possibly shears; No. 187 gridiron fragment; No. 188 cauldron chain junction; No. 189 flesh-hook; No. 190 wall candlestick. Scale 1:2.

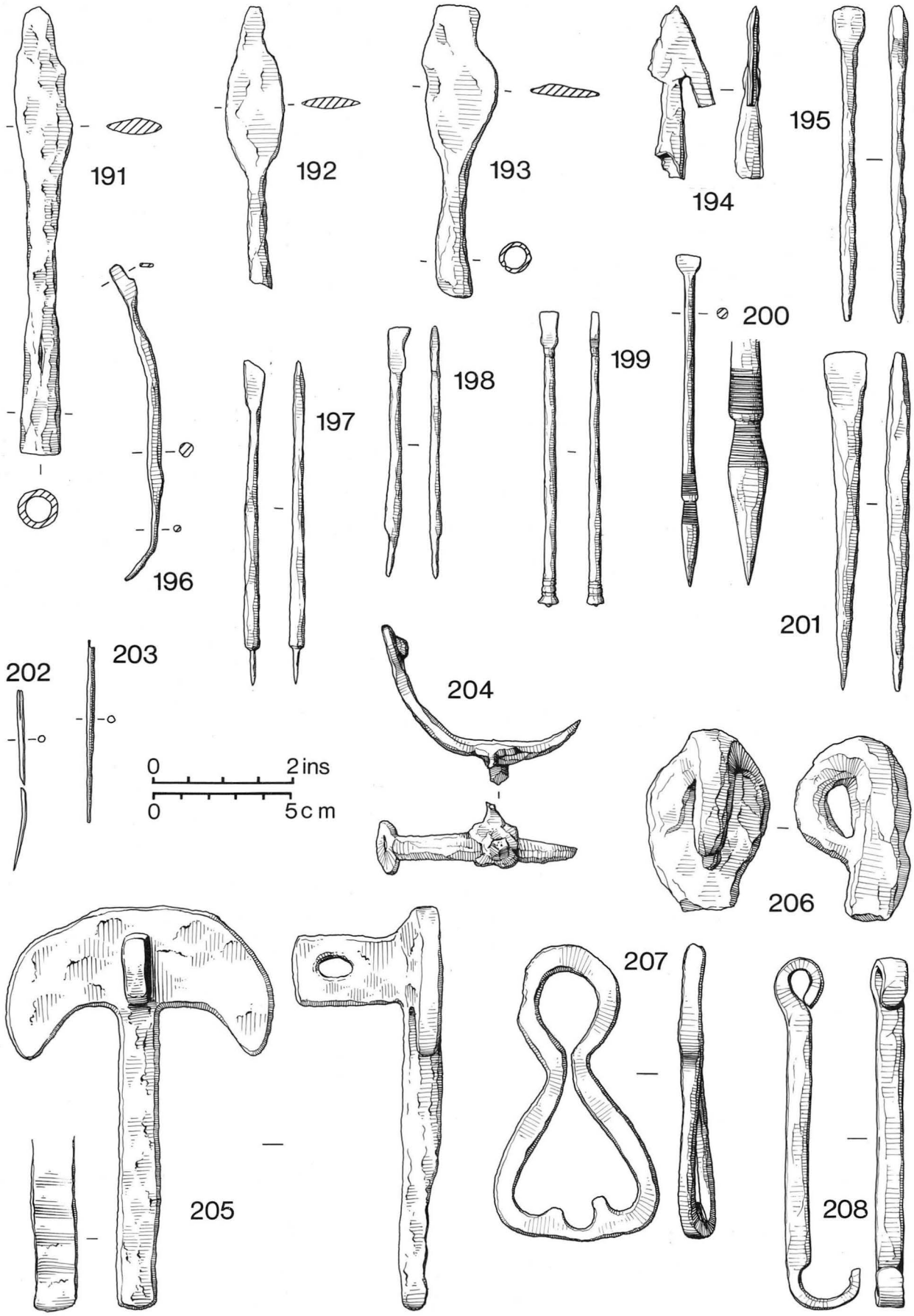


Fig. 23 Iron: Nos 191-3 spearheads; No. 194 medieval arrowhead; Nos 195-201 *styli*; No. 202 needle; No. 203 pin; No. 204 rivet-spur; No. 205 and 206 linch pins; No. 207 side loop from a curb bit; No. 208 link from a bit. Scale 1:2.

181 Knife: flanged socket; the back continues the line of the socket in an even curve to the tip. The straight edge is stepped down from the socket. A similar one comes from the Eckford, Roxburghshire hoard (Piggott 1955, 27, fig. 5, E11). R.F. Tylecote writes: 'Well rusted along one side. Seems to be mostly ferrite with a little spheroidised pearlite and slag. The hardness is 122 HV1.' *Building 1, yard and gullies, layer 1*

182 Knife: both socket and blade broken; the back continues the line of the socket, running slightly down; the edge, which is stepped down from the socket, has a slight convex curve. R.F. Tylecote writes: 'Consists entirely of fine grained ferrite and slag. The hardness is 159 HV1.' *Floor 4, layer 1*

183 Knife: fragment. *Ditch 1, layer 2, immediately to the north of Floor 4*

184 Knife: fragment.

185 Fragment of knife handle: originally with (?)bone plates on each face. The hollow bronze rivets and an edging of sheet bronze remain. L. Biek writes: 'The edging of sheet bronze probably indicates brazing during assembly (Biek 1967) and suggests that the object may be medieval.'

186 (?)Shears: fragment of the blade and arm; the slight widening of the arm suggests that it comes from a pair of shears rather than a knife. *Building 4, layer 1*

187 Fragment of a gridiron: consists of one side-bar, the stump of another and one leg. Gridirons of this general form are known from a number of sites including Newstead (Curle 1911, 274, pl. LIII, 2); Carlingwark Loch, Kirkcudbrightshire (Piggott 1955, 38, fig. 10, C71); and Silchester (Evans 1894, 154, fig. 21). *Ditch 1, layer 2, north end*

188 Cauldron-chain junction: fragment consisting of the remains of two double-hooks bound at their centres by a rectangular block. Only one hook and parts of the stems of the others survive. Although fragmentary there can be little doubt that this is part of the junction which linked the arms to the main chain in an elaborate cauldron hanger. The fact that it consisted of two rods and not four shows that it cannot be from the 'cage' which tops the chain of the late Roman hangers of the Great Chesterford type (Neville 1856, 4, pl. 3, 32). The closest parallels are undoubtedly the fragments of junctions from the Blackburn Mill, Berwickshire and Carlingwark Loch, Kirkcudbrightshire hoards (Piggott 1955, 45, fig. 11, B18; 32, fig. 8, C10). It should be emphasised that the junctions on the true Great Chesterford chains differ from these, and that a junction of this type does not necessarily indicate that it came from a chain as elaborate as the Great Chesterford one. *Building 4, layer 4*

189 Flesh-hook: twisted handle, broken at its end; two slightly curved teeth, one of which is broken. There are a number of flesh-hooks from London in the British Museum, one from Silchester (Reading Museum) and another from Brough-on-Humber (Wacher 1969, 99, fig. 41, 19). A variant form has a ladle bowl at the top of the stem (e.g. from Great Chesterford (Museum of Archaeology and Ethnology, Cambridge)), and it is possible that the present example was of this type. *Ditch 1, layer 3, north end*

190 Wall candlestick: L-shaped, the longer arm tapering to a chisel edge for driving into a wall or beam, the shorter forming a split socket for the candle. Although this form of candlestick cannot have been rare, few are published; a group of six from Silchester is in Reading Museum. *Building 1, Gully 2*

191 Spearhead: narrow, damaged blade without distinct shoulders, and a long socket. It is a good example of a common type; the Group 1 of the classification proposed in the Newcastle catalogue where the form is discussed in some detail (Manning 1976, 18). Spearheads from civilian contexts were probably mainly intended for hunting. R.F. Tylecote writes: 'Coarse ferrite with some grain boundary cementite. The carbon content is about 0.05% and the hardness 83 HV1, suggesting a very pure iron.'

192 Spearhead: damaged leaf-shaped blade without distinct shoulders, and a broken socket. This is an example of Group 2 in the Newcastle Catalogue where the type is discussed (Manning 1976, 19). R.F. Tylecote writes: 'Wrought iron. Hardness 133 HV1.' *Floor 4, layer 1*

193 Spearhead: damaged (?)leaf-shaped blade and a broken socket. R.F. Tylecote writes: 'Wrought iron with equiaxed grain size. The hardness if 99 HV1, again suggesting a pure iron.' *Ditch 1, layer 2, immediately south of Floor 4*

194 Socketed arrowhead: square-ended, deep-cut barbs, one of which is lost. Barbed arrowheads are known in Roman contexts but are extremely rare, and this is undoubtedly a medieval example.

195 *Stylus*: Type I with a simple eraser and a broken point which appears to have run straight into the stem. Iron *styli* have been discussed by the writer in relation to examples in the Museum of Antiquities in Newcastle upon Tyne where a simple division into four types has been proposed (Manning 1976, 34, fig. 10). Type I is the simplest form. *Building 4, layer 5*

196 *Stylus:* Type I with a simple eraser and a point which runs straight into the stem. *Area of Ditch 1*

197 *Stylus:* Type II with a simple, oblique-edged eraser and a plain point which is separated from the stem by a distinct shoulder. *Building 1, layer 1*

198 *Stylus:* Type III with a slightly shaped eraser and a point which is separated from the stem by a slight shoulder. *Ditch 1, layer 2, south part*

199 *Stylus:* Type IV with a shaped eraser with a slight cordon at its junction with the stem, and a series of grooves at the lower end of the stem above the junction with the now broken point. *Hut 2*

200 *Stylus:* small U-shaped eraser, and a large swollen point, decorated with spiral grooves on either side of the deep groove which divides the point from the stem. It is an unusual example of Type IV. *Ditch 1, layer 3, south end*

201 *?Stylus:* the stem tapers in a sharp point at one end with a wide blunt eraser at the other end. Although not conforming to the normal run of *styli* this is a more probable identification than as a chisel which, at first sight, it might appear to have been. *Building 1, layer 1*

202 Needle: now bent and broken with its head missing, although a fragment of the groove below the eye survives. Although iron needles are rarely found they were probably quite common in the Roman period. A number from the London Walbrook (where the conditions for the preservation of ironwork are exceptionally favourable) are in the British Museum. *Building 4, layer 1*

203 Stem of a pin or, less probably, a needle: fragment. *Building 4, layer 1*

204 Rivet-spur: one arm is broken, the other is complete and retains the rivet which held the leather strap; the prick is slightly broken, but the hook which rises above it is almost complete. This is the commonest form of Romano-British spur. It was originally discussed by Shortt (1959); additional examples are given in Manning (1976, 32, no. 97). *Ditch 1, layer 3, central*

205 Crescentic-headed linch pin: with a central peg, pierced at its end; the back of the stem is crudely rebated. For a short discussion of Romano-British linch pins see Manning (1976, 32, no. 98), where examples of this form are cited. *Building 1, Gully 1*

206 Spatulate-headed linch pin: turned-over loop on the head which is all that survives. For other examples of this type see Manning (1972, 174, no. 33). *Ditch 1, layer 2, north part*

207 Side-loop from a curb bit: has the characteristic figure-of-eight shape; the hole for the link is broken open, possibly being worn through. A complete example of this form of bit from Verulamium is given in Manning (1972, 170-1, no. 23). *Ditch 1, layer 1, north end*

208 Link from a bit: a bar of sub-rectangular section with turned-over loops at its ends, one of which is now forced open. *Area 1*

209 Fragment of a hub or nave ring: slightly tapering in thickness from one edge to the other. Manning (1972, 172, no. 32) gives an example from Verulamium. *Area 2*

210 Latch-lifter: with a loop-eye at the end of the flat handle; the tip of the curving blade is lost. Examples from

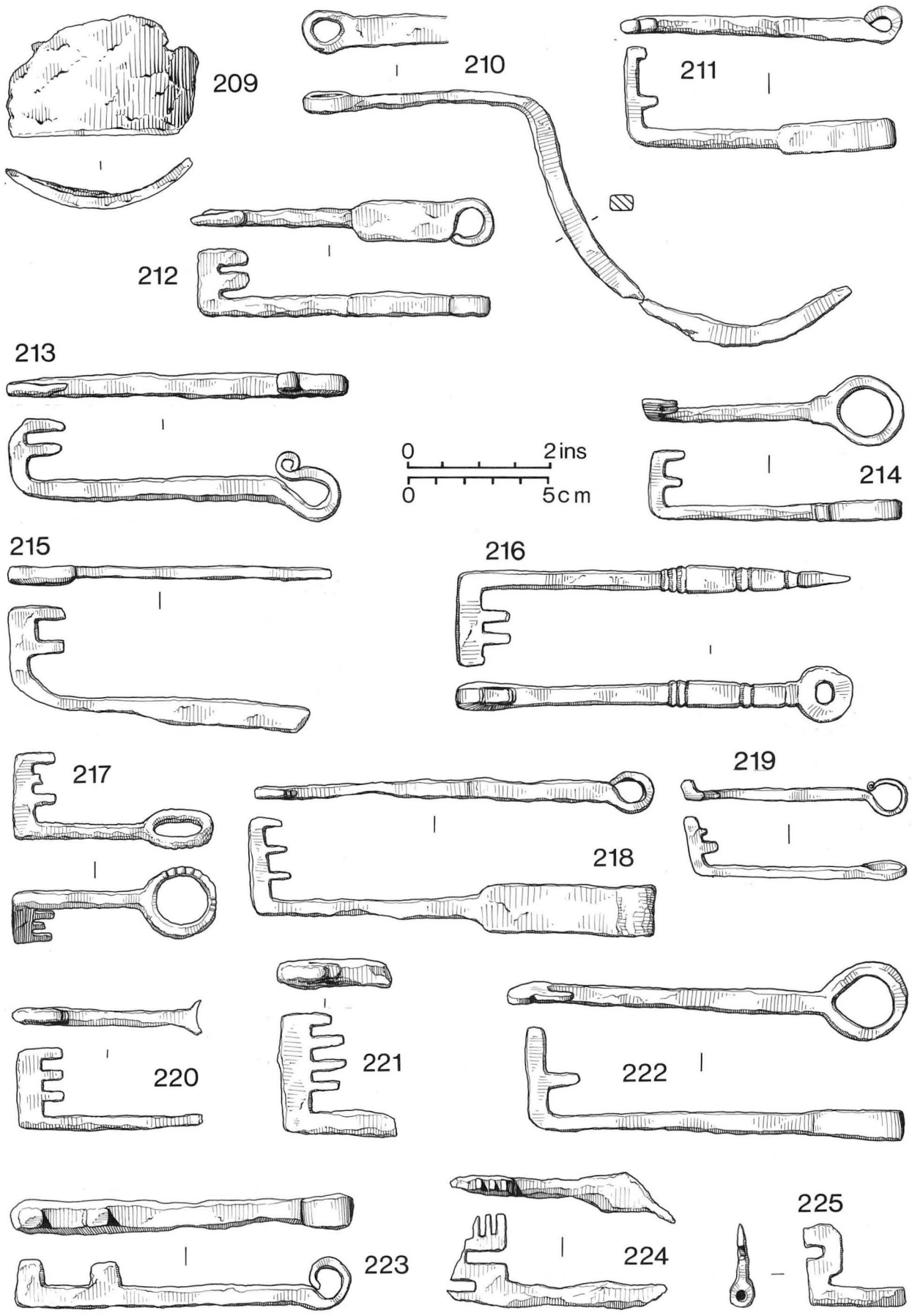


Fig. 24 Iron: No. 209 hub or nave ring; No. 210 latch-lifter; Nos 211-222 tumbler-lock lift-keys; No. 223 tumbler-lock key; Nos 224 and 225 lever-lock keys. Scale 1:2.

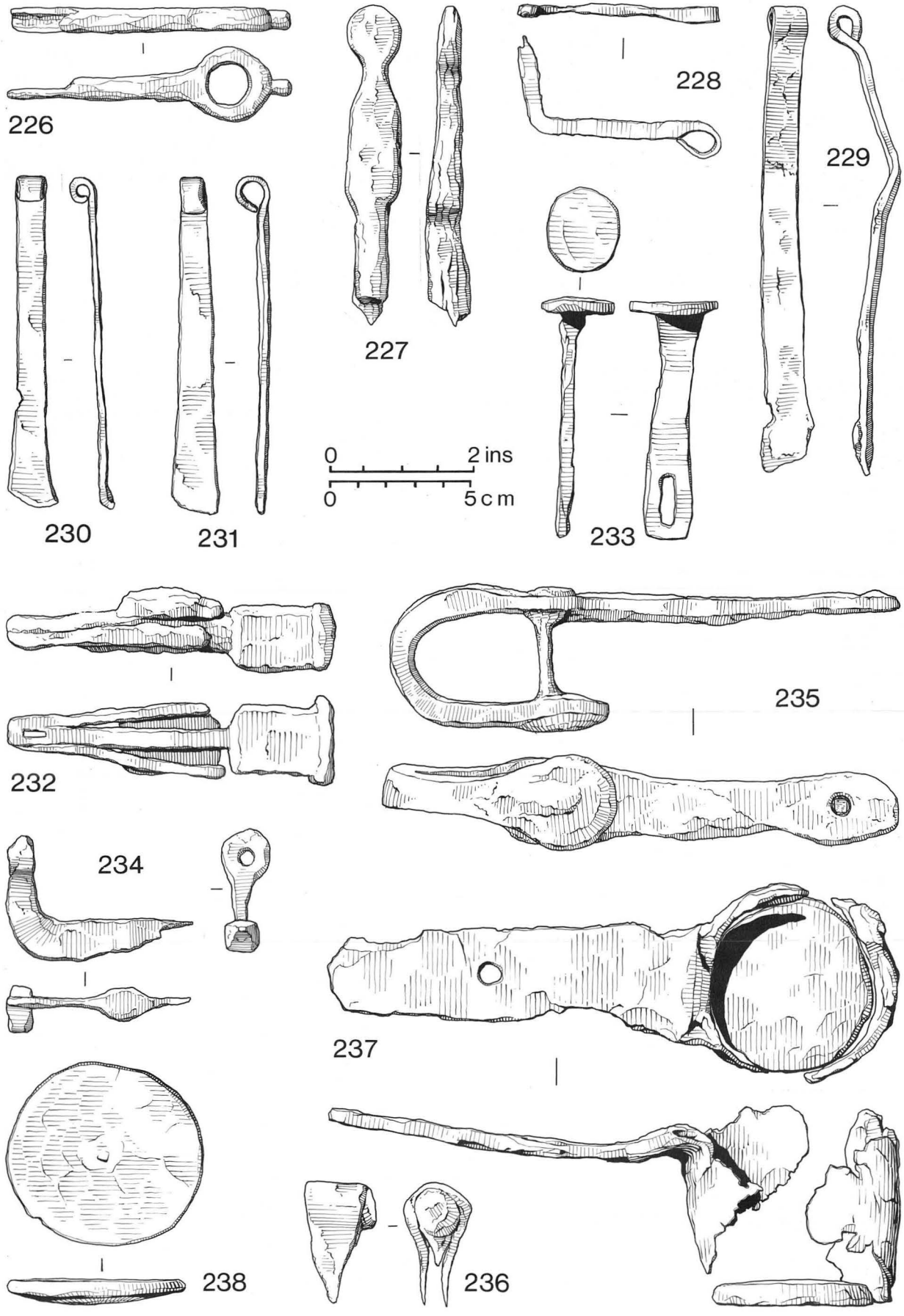


Fig. 25 Iron: No. 226 lever-lock key; Nos 227 and 228 possibly keys; Nos 229-231 barb-spring padlock keys; No. 232 barb-spring padlock bolt; Nos 233 and 234 possible padlock bolts; Nos 235 and 236 hinges; No. 237 pivot binding; No. 238 pivot base. Scale 1:2.

Verulamium appear in Manning (1972, 182, no. 73). *Building 4, layer 4*

211 L-shaped tumbler-lock lift-key: flat handle ending in a rolled eye, and with two teeth on the bit. This is the commonest of all Roman key types and examples come from many sites; the number of teeth may vary from two to four, but two is the commonest number. Manning (1974, 166, no. 388) gives examples from the Gadebridge Park villa and other sites. *Floor 4, layer 4*

212 L-shaped tumbler-lock lift-key: generally similar to No. 211 above. *Ditch 1, layer 3, south of Floor 4*

213 L-shaped tumbler-lock lift-key: lacking a distinct handle but with a scroll head of unusually delicate form; there are two teeth on the bit. *Ditch 1, layer 3, south of Floor 4*

214 L-shaped tumbler-lock lift-key: ring-head and two teeth on the bit. *Ditch 1, layer 3, north end*

215 L-shaped tumbler-lock lift-key: two teeth on the bit; the top of the handle is lost. *Floor 4, layer 4*

216 L-shaped tumbler-lock lift-key: handle decorated with simple mouldings and topped by an eye; the bit has three teeth, one of which is broken. *Area 1*

217 L-shaped tumbler-lock lift-key: ring-head decorated with notches on one edge; three teeth on the bit. *Building 4, layer 5*

218 L-shaped tumbler-lock lift-key: flat handle ending in a rolled eye; three teeth on the bit. *Ditch 1, layer 3, to the north of Floor 4*

219 L-shaped tumbler-lock lift-key: lacking a distinct handle but with a rolled head; the bit probably had three teeth but only two now remain.

220 L-shaped tumbler-lock lift-key: only a fragment of the ring-head survives; there are three teeth on the bit. *Building 2, layer 5*

221 L-shaped tumbler-lock lift-key: only the bit with four teeth survives. *Ditch 1, layer 2, north part*

222 L-shaped tumbler-lock lift-key: ring-head and damaged bit, only one tooth surviving.

223 Tumbler-lock key: simple rolled head; two short teeth set at right angles to the stem. This is the simplest form of tumbler-lock slide-key and it is exceptionally rare to find an example as basic as this. A wooden example together with its lock is figured by Flinders Petrie (1917, 59, pl. LXXV, 133); it comes from Egypt, and it is possible that tumbler locks as simple as this were normally made, together with their keys, in wood. *Floor 4, layer 4*

224 Lever-lock key: with the remains of an elaborate bit and a broken handle. For lever-lock keys in general see Manning (1972, 184, no. 79) and the examples cited there. The bit is typical of keys of this type, the notches at front and back being particularly characteristic; the number of notches in the lower edge is more variable. A very similar example comes from Verulamium (Wheeler and Wheeler 1936, 220, pl. LXVB, 28); others come from Fishbourne (Cunliffe 1971, fig. 58, 32); Richborough (Henderson 1949, 154, pl. LIX, 322); and Oldbury Camp, Wiltshire (Cunnington and Goddard 1934, 235, pl. LXXVIII, 10). They are common on the German *limes*. *Ditch 1, layer 3, north part*

225 Lever-lock key: only a fragment of the piped bit survives.

226 Lever-lock key: the bit is missing, but part of the piped stem and the ring handle with a terminal knob survive. *Floor 4, layer 2*

227 Fragment of a moulded head: possibly from a key.

228 Fragment with a loop-handle: possibly from a key.

229 Barb-spring padlock key: only the slightly tapering handle with its characteristic rolled-loop head survives; originally there will have been a square bit with one or more perforations set at right-angles to the broken end. For examples from Verulamium and other sites see Manning (1972, 184, no. 80). *Area 1*

230 Barb-spring padlock key: only the handle survives.

231 Barb-spring padlock key: only the handle survives.

232 Barb-spring padlock bolt: originally with four springs rivetted to the central tang, three of which remain; the head is a solid rectangular block with a flanged top. A basically similar piece comes from Maiden Castle (Wheeler 1943, 284, fig. 95,1); from Shakenoak Farm (Brodribb, Hands and Walker 1968, 102, fig. 34,2); from Verulamium (Wheeler and Wheeler 1936, 219, pl. LXVA, 16); etc. *Ditch 1, layer 2, central*

233 Barb-spring padlock bolt: lacks its springs; flat stem, pierced by a rectangular hole, with a flat disc welded to its head. *Building 1, yard and gullies*

234 Fragment: consists of a rod broken at one end with an expansion near the break, and bent through a right-angle at the other end; perforated disc at its top. Possibly part of the bolt of a padlock. *Ditch 1, layer 2, north end*

235 U-shaped drop-hinge: the curve of the 'U' is narrow and thick, the arms of unequal length with the shorter one having a discoidal end. A nail still runs between the two arms, and there is a nail hole at the end of the longer arm. In use it will have pivotted on an L-shaped staple which was driven into the door jamb. The type is briefly discussed in Manning (1972, 180). *Building 1, yard and gullies, layer 1*

236 Hinge fragment (?): consists of a U-shaped band with short tapering arms. It is possibly a simple drop-hinge. *Area 2*

237 Pivot-binding: consists of a much damaged, almost vertical-sided cylinder, with a flat, relatively wide strap on one side with a nail-hole through it, and a heavy base formed of an iron disc. It is an apparently unique variant of the more normal binding used on the pivots of heavy doors. In use it probably bound the massive wooden tenon which projected from the lower edge of the door, with the strap serving as an additional fastening on the underside of the door. The alternative, namely that it lined the pivot hole itself, is less likely but not impossible. The presence of the disc suggests that it was used for the lower pivot; it would have been irrelevant on a pivot set in the jamb. Bindings lacking the strap seen here are known from a postern gate at Silchester (St John Hope 1896, 426), and Caerwent (Newport Museum). *Area 1*

238 Pivot-base: consists of a slightly dished disc. *Area 1*

239 Pivot-block: solid rectangular plate with a roughly oval depression at its centre on one face. Although the majority of pivot-blocks are discoidal, a closely comparable example is known from the west gate of the fort at Rudchester (Manning 1976, 40, no. 153). *Building 4, layer 5*

240 Drop-handle: rectangular cross-section; the remaining fragment is probably somewhat over half of the original.

Rings (Figs 26-7)

Nos 241-9: rings of varying diameters. Most have rectangular or sub-rectangular sections. Such rings are very common and could have had many uses. Examples from Verulamium with references to a number of others are given by Manning (1972, 183, fig. 69, 127 and 128).

241 *Building 1, yard and gullies*

242 *Area 2*

243 *Building 1, yard and gullies*

244 *Building 1, yard and gullies, layer 1*

245 *Area 1*

246 *Unstratified*

247 *Building 1, yard and gullies, layer 1*

248 *Area 1*

249 *Building 4, layer 4*

250 Figure-of-eight shaped link: now broken. *Area 1*

251 W-shaped double hook.

252 S-shaped double hook.

253 U-shaped wall-hook: with a spike for driving into a wall or beam. For the type see Manning (1972, 184, nos 86-9). *Possibly near Hearth 2*

254 U-shaped wall-hook.

255 U-shaped wall-hook. *Possibly near Hearth 2*

256 (?)U-shaped wall-hook: now lacking the spike.

257 L-shaped wall-hook: with chisel ends. A common, but rarely published type with a multitude of possible uses.

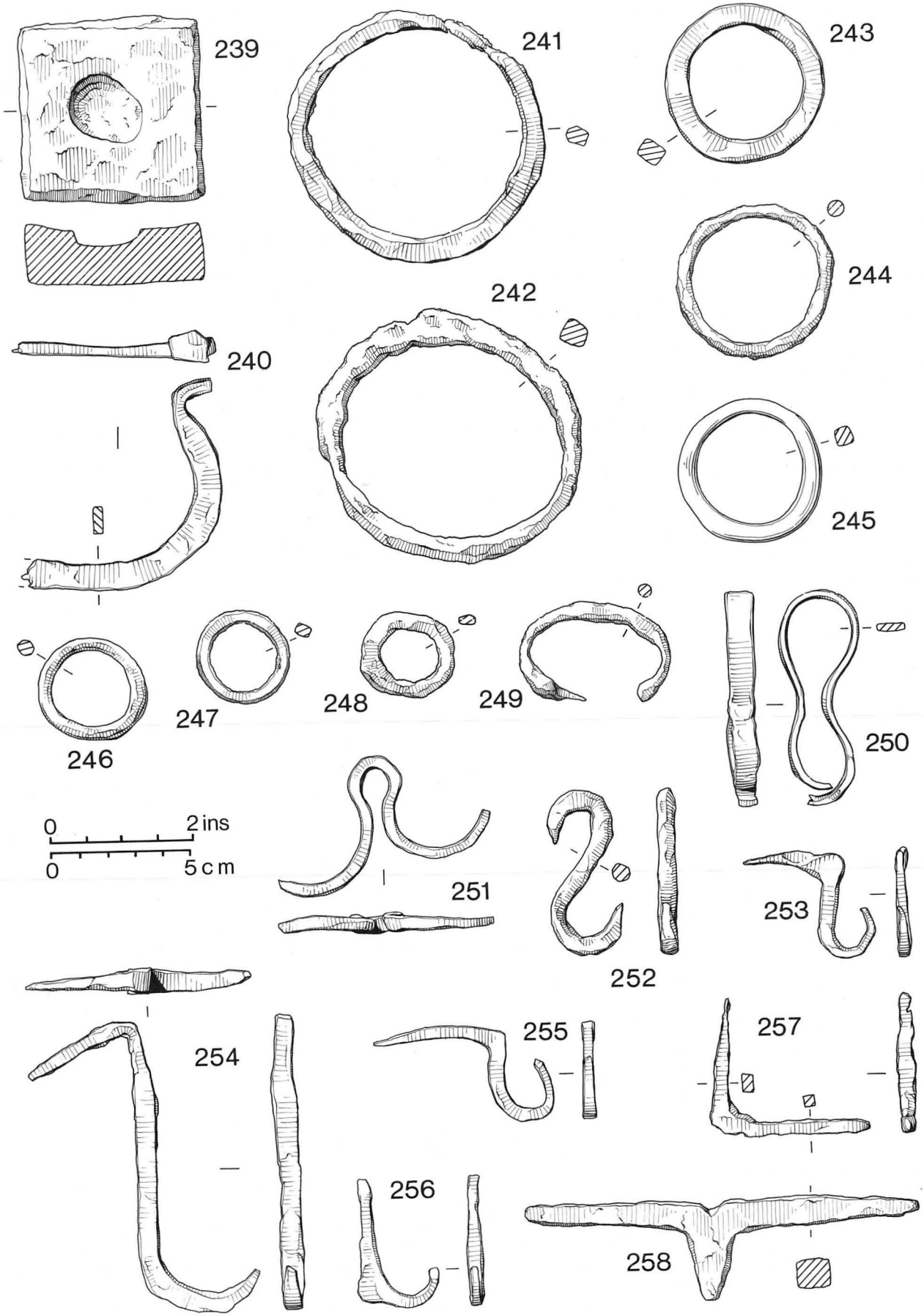


Fig. 26 Iron: No. 239 pivot block; No. 240 drop-handle; Nos 241-9 rings; No. 250 line; Nos 251 and 252 double hooks; Nos 253-7 wall-hooks; No. 258 'T'-staple. Scale 1:2.

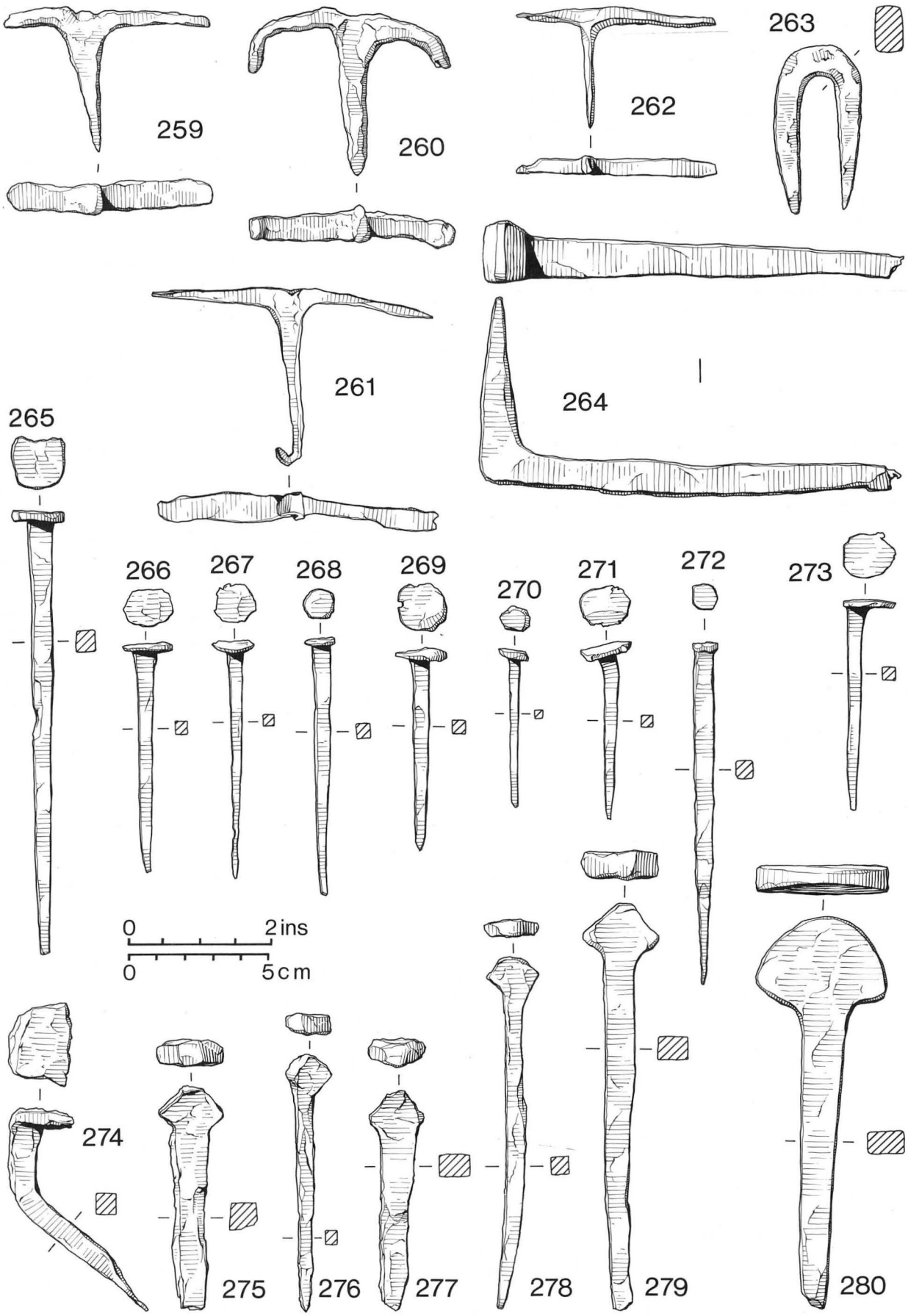


Fig. 27 Iron: Nos 259-262 'T'-staples; No. 263 joiner's dog; No. 264 joiner's dog or wall-hook; Nos 265-280 nails. Scale 1:1.

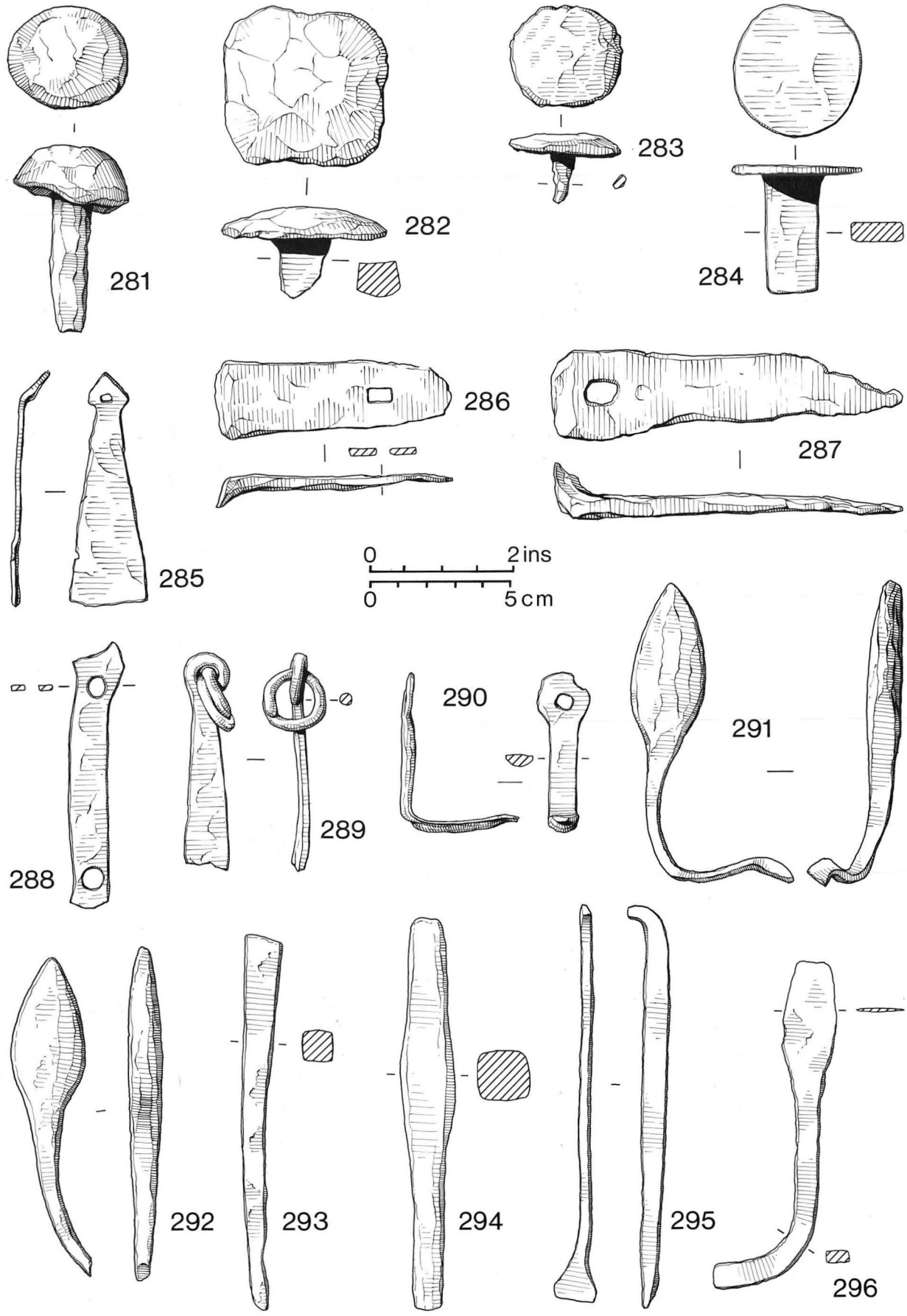


Fig. 28 Iron: Nos 281-3 tacks; No. 284 nail; Nos 285-8, 290 bindings; Nos 289, 291-3 and 296 objects; Nos 294 and 295 bars. Scale 1:2.

258 T-staple: with a broken stem. For the type see Manning (1972, 184, no. 82). *Ditch 1, layer 2, north end*

259 T-staple: with a chisel-edged stem. *Ditch 1, layer 3, north end near Floor 4*

260 T-staple: with curving arms. *Ditch 1, layer 3, north end near Floor 4*

261 T-staple.

262 T-staple: with one arm damaged.

263 Joiner's dog: with unusually wide, chisel-edged arms. For the type see Manning (1972, 184, no. 84). *Area 2*

264 L-shaped wall-hook or joiner's dog: the slight taper on the longer arm would tend to support the former identification but the fact that the arm is broken prevents certainty. *Building 1*

Nails (Figs 27-8)

The nails from Gestingthorpe which have been selected for illustration are typical of their type. As always the majority are of Class I with a smaller group of Class II; only a handful fall outside these categories, mostly those with large and essentially decorative heads. The classification followed here is that used by the writer in the Verulamium report (Manning 1972, 186). Over 4000 nails have been counted from the site.

265-73 Class I nails.

274 Nail: probably of Class I with a damaged head. Nails with their heads formed entirely on one side of the stem are known from a number of sites, but this is too damaged for it to be certain that it is not merely a broken example of the infinitely more common Class I.

275-80 Class II nails: narrow, triangular heads.

281 Large nail or tack: mushroom head. *Ditch 1, layer 1, north end*

282 Large nail or tack: slightly domed, almost rectangular head. *Building 1, layer 8*

283 Large nail or tack: flat head.

284 Large nail: flat, round head and broken stem.

Other iron objects (Figs 28-9)

285 Fragment of binding: tapering to a triangular tip with a nail-hole through it. Possibly part of an edge-binding from a chest.

286 Fragment of binding: with a single nail-hole.

287 Fragment of binding: with a single nail-hole.

288 Fragment of binding: with two nail-holes.

289 Fragment: consists of a tapering mount, broken at its lower end, with a turning-loop at its head through which passes a split-ring. Possibly from a bucket. *Building 1*

290 Binding: from the edge of a chest or allied piece with discoidal ends, one of which is now lost; pierced by nail-holes. The bar has a D-shaped cross-section.

291 Fragment: consists of a thin stem, broken at one end, with a flat, but thick lentoid head. Although this and the following piece are clearly related, their function is not obvious and no parallels are known to the writer. *Floor 4, layer 4*

292 Fragment: similar to No. 291.

293 Tapering bar: although at first sight it might appear to be a punch, the fact that it shows no sign of having been struck suggests that this is not the case. *Ditch 1, layer 2, beside Floor 4*

294 Fragment of bar: swelling at its centre; possibly part of a tool handle. *Ditch 1, layer 2, beside Floor 4*

295 (?)Tool: of uncertain function with a long stem, hooked at one end, and a small triangular blade. *Ditch 1, layer 1, immediately to the south of Floor 4, on the shoulder of the ditch*

296 Fragment: small leaf-shaped blade and a curving stem. *Building 4, layer 1*

297 Fragment: of uncertain function. *Building 4, layer 2*

298 Fragment: iron rod sheathed in bronze. *Building 4, layer 5*

299 Fragment: socketed tool. *Building 1, yard and gullies*

300 Curving spike: damaged and (?)broken at the blunt end. *Building 1, yard and gullies*

301 Spike.

302 Small, hook-ended bar.

303 Fragment: tapering strip, its ends bent upwards.

304 Fragment: rod bent into a flattened loop at one end.

305 Pennanular ring: tapering at its ends; with a small nail through its discoidal centre.

306 Ploughshare: of triangular outline with a flanged socket. The flanges extend for somewhat over half its length and are of unequal size. The blade is strengthened by having a V-shaped strip welded to the upper face, and there is a nail-hole through it almost at the tip of the space between the arms of the 'V'. R.F. Tylecote writes: 'This consists of ferrite with slag inclusions appearing end-on in the section. It is difficult to etch the grain boundaries which suggests a high phosphorus content and this is confirmed by the high hardness of 230 HV1.' *Found on the surface 100m to the north-west of the site on Woodfield (O.S. 131) along with Roman pottery*

307 Ploughshare: of symmetrical, triangular outline with inward-curving flanges which taper to the tip. R.F. Tylecote writes: 'This piece mainly consists of ferrite with a hardness of 109 HV1. Near one edge there is some pearlite and slag (associated) which raises the hardness to 145 HV1. I do not think this is intentional.' *Found on the Roman site near Upper Yeldham Hall*

Neither of these shares was found in a context which proves a Roman date, and although it is possible to compare them with Roman types both are forms which had a very long life. The share from Gestingthorpe is of a type (the symmetrical flanged share) which first appears in Britain in the Roman period, and examples of that date are known from London, Moorgate Street (Payne 1948, fig. 1,21), and Bucklesbury House (Manning 1964, 60, fig. 5F); and Frindsbury, Kent (Nightingale 1953, 156, pl. 1). But the present example differs from these in having the V-shaped reinforcement on the blade and the nail-hole. As it is of a type which in one form or another continued in use almost to the present century; a Roman date for it is questionable.

The Upper Yeldham share can also be paralleled in a Roman context in the Blackburn Mill hoard from Berwickshire (Piggott 1955, 47, fig. 12, B31), and from the Chedworth Villa (Goodburn 1972, pl. 14), but it too is of a type which continued after the end of the Roman period.

VII Further comments on iron objects

Nos 159 (Fig. 20) and 168 (Fig. 21)

by R.F. Tylecote with a reply by W.H. Manning

Two objects which may be related deserve further comment because they do occur on other European sites such as Augsburg, Germany and have been the subject of metallurgical examination by Schaaber, Müller and Lehnert (1977).

The first is the bi-pyramidal bar No. 168 (called an awl by Manning, p. 48) which is a familiar enough object found in Europe but larger in size with two long ends. This one has only one long end. The bar from Augsburg is similar and is 160mm long and weighs 112g while ours is 120mm long and weighs 110g, i.e. the same as that from Augsburg. There is no mention of a stamp on that from Augsburg. But if it was a standard object for smiths' use it is not surprising that they were standardised like the brass plate from Colchester.

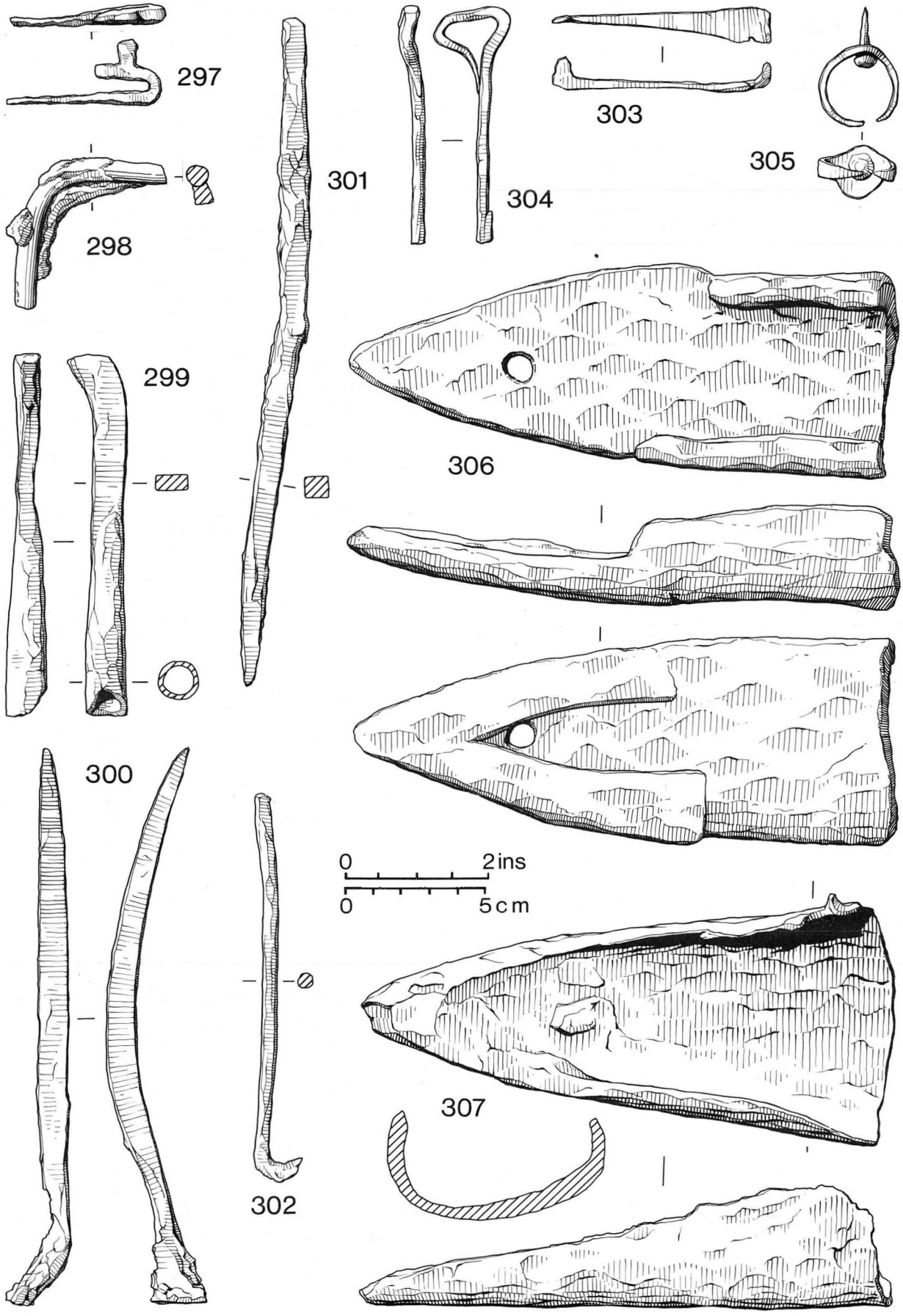


Fig. 29 Iron: No. 297 fragment; No. 298 iron rod sheathed in bronze; No. 299 socketed tool fragment; Nos 300 and 301 spikes; No. 302 bar; Nos 303-5 fragments; Nos 306 and 307 ploughshares (No. 307 being from Upper Yeldham). Scale 1:2.

While the Gestingthorpe bar is only ferrite with a hardness of 124 HV1, the bar from Augsburg had a carbon content varying from 0.8-1.2% consisting of a hyper-eutectoid steel with a hardness of 300 HV1 (i.e. it is in the annealed state).

The other object is No. 159 and has been identified by Manning as a 'punch' (p. 46). This looks like a currency bar which has had one of its ends 'mushroomed' to form a rounded head. It has its counterpart at Augsburg also (Doppelstachel no. 0.11.20) which is 131mm long and 76.3g in weight. The Gestingthorpe object is 115g and 170mm long and like that from Augsburg is ferrite and pearlite and has a head hardness of 153 HV1 with no work-hardening.

Schaaber has problems identifying the 'button-headed' bar, but thinks that, like the normal bi-pyramidal bars, it might have been an object of trade in *steel* and that the smith made tests to determine their quality by heating and quenching one of the thin ends to see if it would harden, and deforming the other end to see if it was ductile. In these tests he has some support in interpreting Pliny.

Reply to the comments of R.F. Tylecote by W.H. Manning

I am unable to agree with Dr Tylecote's comments on Nos 159 and 168. Number 168, which he would see as a bi-pyramidal 'currency bar' of a type well known from Southern Germany if not from Britain, is one of a group of tools, including awls and chisels, which have blunted diamond-shaped heads of varying degrees of regularity. Some also have small tangs at the top for mushroom-shaped wooden heads, a fact which confirms their use as tools, e.g. from Hod Hill, Dorset (British Museum 92.9-1.1286); Rheingönheim (Ulbert 1969, 53, taf. 48, 14); Aislingen (Ulbert 1959, 96, taf. 27, 33-5); and Hofheim (Ritterling 1913, 192, taf. XX, 18-22 and 24). All of these were awls, but the same form of handle is also found on chisels, e.g. from London (British Museum 1934.12-10.65: Wheeler 1930, 76, pl. XXXIII). Other tools with handles identical to that from Gestingthorpe but with chisel blades (which prevents even a superficial resemblance to the German 'currency bars') come from Great Chesterford, Essex (British Museum 1964.7-2.114) and Water Newton, Huntingdonshire (British Museum 82.6-21.83). In all of these the form of the handle is so similar to that under discussion as to leave no doubt of their functional similarity. The only question which might arise is whether the broken stem ended with a simple point, as was the norm, or with a slight, flat blade as in a tool from London (Wheeler 1930, 76, pl. XXXII, 11).

Maker's marks on iron tools are not uncommon where the conditions of burial have preserved the original surface, but they are found *only* on tools and weapons. In fact it is tools of this type which are perhaps most often found to be stamped, as with the chisel from London in the British Museum (referred to above), and with various awls from London (Wheeler 1930, 76, pl. XXXII, 10 and 11).

It should also be noted that the pointed bars of the type known from Augsburg and other German sites have two pointed ends, not one as here, an important functional difference, and that the Augsburg bar had a totally different composition to ours, as Dr Tylecote makes clear.

Turning to No. 159, I do not feel that a standard tool handle of this type demands an exotic interpretation as a form of currency bar, and the quoted parallel does not add conviction to Tylecote's argument. Mushroom heads of this type are often found on the handles of tools which are either to be struck or pushed with hand pressure, chisels being the obvious example, as with No. 163, or others from Silchester (Reading Museum), Hod Hill, Dorset (British Museum 92.9-1.1265), etc. However, the Gestingthorpe piece has a round-sectioned stem and is unlikely to be a chisel — hence my suggestion that it could have been used as a metal-worker's punch. But the alternative idea that it could be the end of a handle of a different type of tool remains equally valid. Such handles are commonly found, for example on the spatulate-bladed 'pokers' of La Tène III and early Roman date, the Iron Age examples of which have been discussed by Jacobi (1974, 101, 292, taf. 30 and 31), with Roman ones coming from Hüfingen (Revellio 1937, 44, taf. XIII, 15) and Felberg (Jacobi 1930, 88, taf. XXXV, 25).

VIII Metalworking

by R.F. Tylecote and Leo Biek

Although no quantitative idea could be gained of the activities on the site, examination of the available material raised a number of interesting issues. In the circumstances the results are considered in material groups.

Ferrous metallurgy (Iron working)

The most important component of this group of evidence is undoubtedly the unusual concentration of tools. These can be evaluated in two principal ways —(a) as products of the smith's craft and (b) functionally, in relation to their use by others. Clearly it is important, again, to bring both kinds of information together and this has been done where the iron objects are described, not merely traditionally as 'finds', but also—and in the same place—as so many individual reflections of the skill of their maker(s). In the circumstances we need to accept that, although the concentration may well be real and indicate the proximity of a forge, we cannot be absolutely sure and have no actual remains of a smithing hearth; and, furthermore, even if they all belong together, not all—or indeed not any—of them can be assumed to have been made by the *same* local (or any other) smith.

In all, thirty artefacts were examined, including a billhook and two ploughshares of uncertain date, but consisting mainly of pieces that could be expected to show some indication of the higher levels of smithing technique which one would find in the edge tools such as knives, axes and chisels.

The metallographic technique was the standard one of cutting a small V-shaped piece out with a fine hacksaw where the metal was soft, or removing it with a water-cooled abrasive cut-off disc when it was too hard. These sections were polished and etched in 2% Nital (nitric acid in ethyl alcohol).

The structures revealed are those of wrought iron or carbon steel. The metal may be clean or it may contain large amounts of slag of the fayalite-wüstite type. The carbon content of the wrought iron will be low but the

metal may contain appreciable amounts of phosphorus which will not be visible, but will be obvious by its hardening effect. Pure wrought iron (ferrite) will have a hardness as low as 80 HV1 but 1% phosphorus will raise the hardness to above 200 HV1.

The presence of carbon will first be revealed as grain boundary cementite (*c.* 0.05% C in the form of iron carbide), and then as pearlite which is a lamellar distribution of iron carbide and ferrite. The distribution and appearance of this phase will change with temperature and time. This allows estimates to be made of the method of production of the artefact. As the carbon content increases the hardness increases from 80 HV to 250 or 300 HV with 100% pearlite, i.e. with 0.8% carbon.

If the steel, as it is now, is quenched from a suitable temperature (800°C) into water or oil the pearlite will not appear, but another phase will form known as martensite. This has a distinctive structure and is much harder but more brittle. It may be tempered—that is, made less brittle—by controlled heating at low temperatures, i.e. at 100-500°C. This process is normally made evident by its effect on the etching characteristics; it causes the acid to darken the structure more rapidly than if it were untempered martensite.

As the tempering temperature and time increase, the martensite is converted to a resolvable dispersion of carbide particles—often spheroidal—in ferrite. This is known as 'sorbite'. The same structure may be obtained by heating pearlite at 600-700°C for many hours.

Smithing is normally carried out at 1100-1200°C when welds in wrought iron and mild steel are relatively easy to make. The solid solution of carbon in iron, only stable at such high temperatures, is known as austenite. If the metal is cooled rapidly from this temperature range a characteristic structure known as Widmanstätten is produced, where the ferrite separates from the austenite along crystallographic planes producing an acicular or feathery structure. The residual austentite changes to pearlite at 700°C and then the nature of the pearlite indicates the time-temperature behaviour at around this temperature.

When the smith heats iron for smithing, the iron is often oxidised and forms a detachable scale. The surface of the metal is enriched in certain elements such as arsenic, copper, nickel and tin, and when welded to another piece forms a 'white line' due to the ferrite-retaining properties of some of the elements, particularly the arsenic. Such lines indicate where the original weld was and the level of arsenic in the original metal. Enrichment can reach a value as high as 1% arsenic from an original value of <0.05% (Tylecote and Thomsen 1973).

Hardness is measured by an indentation test in which a pyramidal diamond indenter is pressed into the surface of the metal under controlled conditions of time and load. 'HV' stands for the Vickers hardness test; the numbers following these letters refer to the load applied in kg. The hardness figures before 'HV' are in kg/mm² and are here generally comparable irrespective of load.

Let us consider first the eleven knives which have been listed for convenience in Table 6. Remembering that a modern stainless steel knife has a hardness of 500 HV, one appreciates how poor techniques were in the Roman period. Only two of the eleven knives are true steels and neither of these has been heat-treated to obtain the best from the metal. The rest are low carbon steels and wrought irons. The latter contain sufficient phosphorus to harden them to some extent.

Table 6: Properties of knives

No.	Structure	%C	Hardness HV1	Zone
170	Ferrite + phos.	nil	164	1
171	Ferrite + phos.	nil	153	4
173	Ferrite + phos.	nil	205	3
174	Ferrite + spheroidal pearlite	0.2	240	1
175	Ferrite + phos.	nil	160	1
176	Ferrite + pearlite	0-0.4	168 (0.4%C)	1
177	Ferrite + spheroidal pearlite	0.15	153	3
178	Cored, Type A (Tylecote 1975) structure: pearlite and ferrite core	0.5-0.8	256	1
179	Pearlite + ferrite	0.6	223	1
181	Ferrite + pearlite + slag	0.1	122	5
182	Ferrite + slag	nil	159	1

No. 178 seems to be a conscious attempt to make a blade like those which were to become common in the Migration period, but unlike those it shows no attempt to harden the blade.

Similarly, an effort has been made to produce a good billhook in No. 169. The carburization is good and uniform; if this had been properly quenched and tempered it would have been more efficient and needed less sharpening.

The two axe-heads (Nos 161 and 162), although found together, differ greatly. One contains about 0.4% C but has been left in the unhardened condition, while the other has been quenched and tempered to give a good edge with a hardness of 515 HV1.

The two ploughshares (Nos 306 and 307) are nothing more than wrought iron; one (No. 306) has a high phosphorus content which makes it harder than the other and, therefore, a more serviceable tool.

The chisels and punches (Table 7) are generally better in quality and the average carbon content seems higher than that in the knives. If these tools had been used as drifts for making holes in hot metal, one would not expect the results of any beneficial heat treatment to be retained. But in two of them there is evidence of cold work, showing that they were either used in, or had been submitted to, cold deformation. One has been quench-

Table 7: Chisels, punches and sets: all from Ditch 1 (Zone 1)

No.	Object	Structure	%C	Max. Hardness HV1
153	Set or chisel (edge)	Ferrite + martensite	0-0.6	440
154	Smith's chisel (edge)	Ferrite + pearlite	0.3-0.8	240 (CW)
155	Tanged chisel (edge)	Ferrite	nil	124
156	Smith's punch (side)	Sorbitic	0.6	193
157	Smith's punch (tip)	Ferrite + pearlite	0.1-0.2	290 (CW)
164	Paring chisel (edge)	Pearlite + ferrite	0.6	250

CW = cold worked

Table 8: Provenance of significant ironwork

		ZONE 1			ZONE 2	ZONE 3		ZONE 4	ZONE 5	ZONE 6
Totals	**Description**	**Bldg 2**	**Ditch 1/ Floor 4**	**Hut 2**	**Bldg 4**	**Area 3**	**Hearth 2**	**Area 1**	**Bldg 1**	**Area 2**
17 (24%)	Tools	—	14 (82%)	—	1	2	—	—	—	—
14 (20%)	Knives, etc.	—	8 (57%)	—	2	—	2	—	2	—
18 (26%)	Keys and locks	1	11 (61%)	—	3	—	—	2	1	—
7 (10%)	*Styli*	—	3	1	1	—	—	—	2	—
7 (10%)	Domestic	—	2	1	3	—	—	—	1	—
7 (10%)	Horse and cart, hunting	—	4	—	—	—	—	1	1	1
70			45 (64%)		10 (14%)	4 (6%)		3 (4%)	7 (10%)	1 (1%)

hardened to give martensite with a hardness of 440 HV1. On the whole this is the best group of tools or implements. One wonders if they were made by the smith for his own use and represent his best workmanship while the knives were for sale to less discerning users.

Out of the thirty ferrous artefacts examined only two have been heat-treated. This is in keeping with other Roman evidence from sites such as Allen and Hanbury's at Ware (Tylecote in prep.), Winchester (Tylecote forthcoming a), Brancaster (Tylecote forthcoming b), Catsgore (Tylecote 1982), Chelmsford (Tylecote forthcoming c), etc., and is in marked contrast to post-Roman material at Winchester (Tylecote forthcoming a), Goltho (Tylecote 1975), Barton Blount (Tylecote 1975), Ramsbury (Haslam, Tylecote and Biek 1980), etc.

Perhaps the Roman consumer would not have been offered anything better in the way of knives and would, therefore, be used to such poor quality. But the knives examined do not seem to be well-worn so it is possible that they were quickly rejected by the consumer and thrown away to be replaced by something better. Some time ago the blade from a pair of shears from Silchester was shown to be merely wrought iron. At the time it seemed that the edge of the blade might have been carburized or work-hardened and that this had been corroded away. This is still a possibility, but now rather a remote one.

This represents the largest corpus of ironwork from one Roman site so far metallographically examined. It bears out the tentative conclusions reached on the basis of smaller groups of ironwork from many other sites. This is that edge tools were relatively poorly made and were more in keeping with the previous period rather than the Migration period. The Roman smiths clearly managed to carburize iron in the right places and use it intelligently; but rarely did they heat-treat it to get the optimum effect. Clearly, then, the principles of heat-treatment were not understood by many Roman smiths, if any.

There are not enough specimens to give any statistical significance to the available distribution data, but it is of some interest, nevertheless, to look briefly at the nature of the different groupings which appear. Taking first the bare data (Table 8), the overwhelming presence of tools (82%) in Zone 1 is clear, yet the knives are almost equally divided between it and the rest. But what is particularly revealing from this analysis is that the chief class of objects overall is not tools but locks and keys; two thirds of these come from Zone 1. In the other classes material is again equally divided between Zone 1 and the rest.

One's first reaction to this picture is to suggest that, apart from the tools, all the different classes of objects might well have been made on the site—somewhere in Zone 1. The significant tools, which on closer analysis in fact all come from Zone 1 (except for the two axe-heads from the surface of Zone 3 and a possible tool handle from Zone 2), could then be seen as a mixture of the smith's tools and his products.

Closer inspection of all the evidence makes it clear that all the tools had in fact seen some use, often a great deal, so that there can be no question of any being discarded from the start because they were found to be unsatisfactory. Some of the knives, again, appear to have been used but this time only *away* from Zone 1. Within Zone 1, by contrast, they are nearly all 'fresh', but most of them are also fragmentary, including most of the 'best' ones (Table 8)—almost as if the smith had decided to chop them up before use and add them to scrap he was going to reforge; but this can only be conjecture. Yet again, nearly two thirds of the keys were found in Zone 1 in a 'fresh' condition, and the rest from elsewhere had evidently been used and discarded.

Where provenanced, the remainder of the ironwork —rings, staples and hooks, odd fragments of tools— seemingly confirms the general picture. Over 4,000 nails were counted from all over the site, and one would expect this kind of establishment to be self-sufficient in these terms. There can be little doubt that there was a smithy somewhere in Zone 1.

Non-Metallic ferrous residues

The material includes several typical smithing 'buns', (one almost complete, about 100mm max. dia. and 40mm max. depth), together with a quantity of the usual fragmentary smithing slag in small pieces including some very dense bits reminiscent of smelting slag (cf. Bayley and Biek 1977), and one flattish fragment *c.*100mm max. dia. of furnace lining. All are from Floor 4, layer 4.

Only a few 'typical' specimens of the various kinds of 'slag' were available for examination, but although there was doubtless much more to be collected from all over the area there was no suggestion of the kind of massive mounds or large spreads of smelting slag which are normally associated with iron extraction. Dr Anderson comments that small amounts of concretionary masses of limonite in the Red Crag (Pliocene) of the Sudbury area could have produced ore for limited smelting—large supplies would have had to come from the Weald or the Canterbury-Dover region. But there is no evidence of any smelting on the site.

There is, however, one fragment of 'waste iron' which is almost certainly a product of the smelting furnace: a plate-shaped fragment of cast steel from Floor 4, layer 4.

This is rather an extraordinary piece. It weighs 650 g and it has a black shiny top surface with depressions in it. The black shiny surface is probably due to an iron oxide and/or slag and resembles that sometimes seen in or on nodules of carbonate ore or boxstones, but also that found in some (iron) corrosion products. The bottom surface looks as though it has solidified in contact with clay or sand. Inside these there is much uncorroded metal.

As the metal was quite hard, a piece was removed with a cut-off wheel and it was immediately obvious that it was a conglomerate of solidified drops of magnetic ferrous metal. After mounting and polishing and etching, it was clear that these drops varied somewhat in composition: from areas showing ferrite and pearlite and, therefore, containing about 0.5% C, to others containing ferrite, pearlite and some graphite, more resembling a low carbon graphitic cast iron. The hardness of such an area was 235 HV1. There are oxide films between the drops. These films are mostly the product of high temperature oxidation, but there seems to have been some penetration by corrosion.

It is very unlikely that this is a smithing product as it is completely devoid of a slag phase except on the surface. This would favour a smelting origin. We have found that if the fuel/ore ratio of a smelting operation is raised, it is possible to get cast iron which displaces the slag and falls to the bottom of a bloomery furnace (Tylecote, Austin and Wraith 1971).

It is doubtful whether the mean carbon content exceeds about 1.5%, so the 'casting' temperature must have been in the vicinity of 1350°C. This is somewhat higher that the normal bloomery temperature, but 1400°C has been observed near the tuyere in an experimental furnace. This temperature has been hot enough to dissolve some silicon, since this is the most likely graphitiser, and in view of the fine structure and fast cooling rate a graphitiser would seem essential.

At the time, this piece was unique; subsequently a very similar specimen found in a Roman pre-Boudiccan level at Colchester (Sheepen) became available for examination (Tylecote forthcoming d).

Although it is common to find a few odd pieces of indubitable smelting slag on a smithing site, in this case the 'plate' may have found its way to the smithy with a bloom. Since it would have seemed to be essentially metallic it may have been so regarded, and an abortive attempt may have been begun—but soon abandoned—to forge it like a bloom.

Overall, these considerations constitute a very good evidence for smithing, in the circumstances, and it is possible that one or both of the two areas indicated by the magnetometer survey, on either side of Ditch 1 (Fig. 6), may eventually on excavation prove to be the site(s) of the relevant hearth(s).

Copper-base metallurgy ('Bronze working')

The range of finds included metal-bearing lumps and off-cuts, mould fragments, parts of two types of crucible, and what would appear to have been crucible slag, of which a large amount was noted by the excavator. Both among the many objects, and with the off-cuts, were some part-finished and mis-cast pieces. In view of this, and of the profusion of metallic scrap, it is clear that there had been intensive 'bronze working' on the site.

One needs to accept that the corresponding fragments of crucibles and moulds—which would have been used only once—have been dispersed and 'lost' more effectively, and that the few remaining bits are not related to the *amount* of casting. All these finds clearly need to be considered together; they are concentrated in the area of Building 2, the so-called bronze worker's house, with a few fragments evidently discarded westward into nearby Gully 2a flanking the villa, rather than eastward into Ditch 1 which was apparently more linked to ironworking (see below).

In the following account, the term 'bronze' is used generally in the traditional sense; but where zinc has been sought and found this is stated, and other pieces in the group are genuine tin bronzes.

The bulk of the metallic material was examined in two groups (A and B). The first consisted entirely of scrap metal in the form of offcuts and droplets from hearths. The method of preparation and examination has been described elsewhere (Tylecote 1983). Where the structure of past 'bronze' is interpreted in terms of 'tin content' this should be seen as 'tin equivalent', i.e. tin + zinc.

A. Copper-base alloys

This is a representative collection of off-cuts and other scrap metal from the sample kept from Building 2.

1. A dilute copper-base solid solution, coppery in colour. It consists of fine recrystallised twinned grains with some slag and surface corrosion. The latter shows up the deformation markings which together with the hardness of 164 HV 0.5 are evidence of cold work. There is no lead or delta phase.
2. A piece of very yellow metal with a complex cross-section. It has a cored, cast structure with the cores distorted near the surface, suggesting superficial working. It contains no lead or delta phase and the hardness of 114 HV1 reflects its composition: it is zinc-rich and low in tin, i.e. a brass. It contains some slag.
3. A dilute copper-base solid solution with equiaxed grains and some slag. The hardness is 87 HV1 which suggests a homogenised bronze.
4. This appears to be a cast homogenised bronze with a good deal of lead and a considerable amount of delta phase. It contains some slag and the surface is very free from corrosion. The hardness is 86 HV1 which suggests no more than 8% of tin equivalent and a fairly fast cooling rate. There is no residual coring.
5. A piece of sheet. A dilute copper-base solid solution, probably an impure copper. It has a fine-grained worked structure with some slag and no lead. The hardness is 114 HV1.
6. A piece of rod or wire. This is a well worked piece with very fine grains, twinned and cold worked. It contains some slag, and another phase which looks like cuprous oxide, but no lead. The hardness is 114 HV1. The surface is free from corrosion. A dilute copper-base solid solution.
7. A dilute copper-base solid solution with equiaxed grains shown up by intergranular corrosion. It contains no slag, or delta phase and there is no residual coring so it has been well homogenised. The hardness is 108 HV1.
8. A piece of bent thin sheet metal. Copper-base solid solution with lots of slag and a small amount of delta phase. It consists of a fine-grained equiaxed structure with some residual coring but the low hardness of 61 HV1 is difficult to reconcile with the apparent existence of the delta phase. What is especially interesting about this piece is that it carries a grey surface layer which is evidently corroded solder, consisting essentially of lead and tin. This is confined to the inside surface, but the piece may originally have been flat.

B. Bronze casting waste

1. Single chunk of bronze. Weight 100g. Very badly corroded. Contains some slag but very little lead, if any. Tin content is 8% or less. The hardness is 68 HV1. *Area of Building 2*
2. Large chunk of bronze. Weight 130g. This suffers from some intergranular corrosion, but contains a good deal more tin than the previous specimen. Calculating from the quantity of the alpha-delta eutectoid this would contain about 13-15% tin equivalent. XRF analysis shows the presence of some zinc (order of 1%). It has a very coarse equiaxed grain structure and has been very slow cooled. The hardness is 110 HV1. Lead would seem to be absent. The eutectoid is very coarse with some large particles of alpha phase within it. The specimen is somewhat segregated. *Building 2, layer 7*
3. One of a number of small pieces broken from vessels or statuary was examined. A cored cast bronze with quite a lot of slag and possibly a small amount of lead in the form of 'rosettes' of lead and slag. It contains a little delta eutectoid and there are signs of some cold work. The hardness is 123 HV1. The tin content is in the region of 8-10%. *Building 2, layer 5*
4. A single piece of bronze which seems to have been part of a vessel or statue. It is very coarse-grained with a large amount of porosity. It contains some slag, a small amount of delta eutectoid and little lead, if any. It has been recrystallised after casting to give an equiaxed grain structure. The hardness is 88 HV1. The tin content is about 8%. *Building 2, Room 1 layer 3*
5. One of a number of small pieces with a fine-grained cast structure with cored dendrites. It contains quite a lot of delta phase and lead. The hardness is 54 HV1, owing to the high lead content. The tin content is probably no more than 8%. *Building 2, Room 1, layer 3*
6. One of a number of small pieces: it contains some delta eutectoid, some slag and a little lead. It has a very fine grain size and must, therefore, have been rapidly cooled. The hardness is 78 HV1. The tin content is in the region of 8-10%. *Building 2, Room 1, layer 3*

C. Clay casting mould (Fig. 38, Nos 428-431)

This is an investment mould with an integral runner bush or pouring gate (jet). It has three or more downgates leading into the mould cavity. The outer part of the mould is light in colour and there is a sharp division between it and the inner dark part. Examination of a section through the mould with a low-power microscope showed that the outer and inner investments were much the same apart from a few large voids in the latter. It seems that these voids originally contained some organic material such as chaff which had been burnt out during firing and so gave the reducing atmosphere suggested by the dark coloration. The large voids would increase the overall porosity of the inner layer which would improve the casting characteristics. Frere (1970, 266) does not agree with this view and implies that the outer layer was of an inherently different type with a *coarser* texture.

In order to maintain the clearly marked boundary between the light outer layer and the dark inner layer it would be necessary for the inner layer to be fired first before the outer layer was applied. The first firing would be that needed for melting or burning out the wax pattern and need not be at a very high temperature (<300°C).

On the inside surface there are the remains of chaplet holes suggesting that copper-base chaplets had been used to locate a heavy core. In places, the thickness of the total investment is no more than 8mm but it is mostly greater than this.

Frere states that the object cast was a statuette about 380mm high. if this is so, and the wall thickness about 5mm on average, then it would need two full crucibles of the size found to make a casting. Part of a second mould (No. 432) was also found on the site. *Building 1, Gully 2a.*

D. Crucibles (Fig. 38, Nos 433-5)

Two of these are conical, i.e. circular in plan with pointed ends, the latter unusually so. Pointed ends are just as efficient as the rounded ends but, even so, crucibles with such pointed ends as these are unusual. They would not stand up at all on a flat surface which would seem to be a positive disadvantage over the rounded bottom type. The nearest Roman crucible would be that from Great Casterton, and this has quite a different rim (Tylecote 1962, 133, fig. 31). Perhaps a closer parallel is the medieval crucible from Wadsley, Sheffield (Tylecote 1962, 133, fig. 31).

The capacity of such a crucible would be about 300cc which would make it possible to melt about 3kg of bronze. This puts it amongst the largest Romano-British crucibles found in this country. The wall thickness varies from 7 to 10mm. The ware is a uniform light grey colour. It has been thrown, as one can see from the grooves near the inside of the 'point', but it is quite clear that the pointed end has been made after shaping from the outside as no finger could get to the inside of the point. Maybe the whole crucible was finally turned upside down to make the point, as the top of the rim is relatively flat.

A fourth fragment (Fig. 38, No. 435a) is from a different kind of crucible, which had a flat circular base but showed similar surface deposits and had evidently been used to melt the same kind of alloy as the others. *Building 2, layer 7*

Comment

The pieces in Group A represent a very wide spectrum of alloys ranging from impure copper to brasses and tin bronzes. All these can be expected from the Roman period; the slag content suggests that they are all genuine and not modern unstratified material.

The pieces discussed in Group B are clearly scrap metal which is very likely the result of casting operations involved in the production of statuettes, represented by the mould. If so, it would seem that the statuettes were being made from a straight tin-bronze with 8-10% tin.

An investment process is the most reasonable for a statue, but it is possible that other types of moulding were being used. Clearly the investment was a two-stage one.

The crucibles are interesting with their very pointed ends. There are some unusual features about this site which suggest some individual enterprise.

IX Glass (Fig. 30)

by the late Dorothy Charlesworth

308-310; 320-1 There are a number of fragments of square bottles from the excavation. The most interesting is the fragment of base marked with an 'X' inside a circle (No. 308), a mark found for example at Verulamium (Charlesworth 1966, figs 11 and 12). The bottles date mainly to the period AD 60-130. *Nos 308 and 309 from Building 1, Gully 1 with No. 438; No. 310 from Ditch 1, layer 2, central; Nos. 320 and 321 unstratified.*

311 Eyelet handle in natural green glass attached to neck and shoulder of thin-walled bath flask. Second to third century. Isings (1957) form 61. *Ditch 1, layer 2, central*

312; 317; 319 Rim and two base fragments from a small bowl best known from a complete example found at Airlie (Thorpe 1948, pl. 63). Rim rounded in the flame, slighly thickened, straight

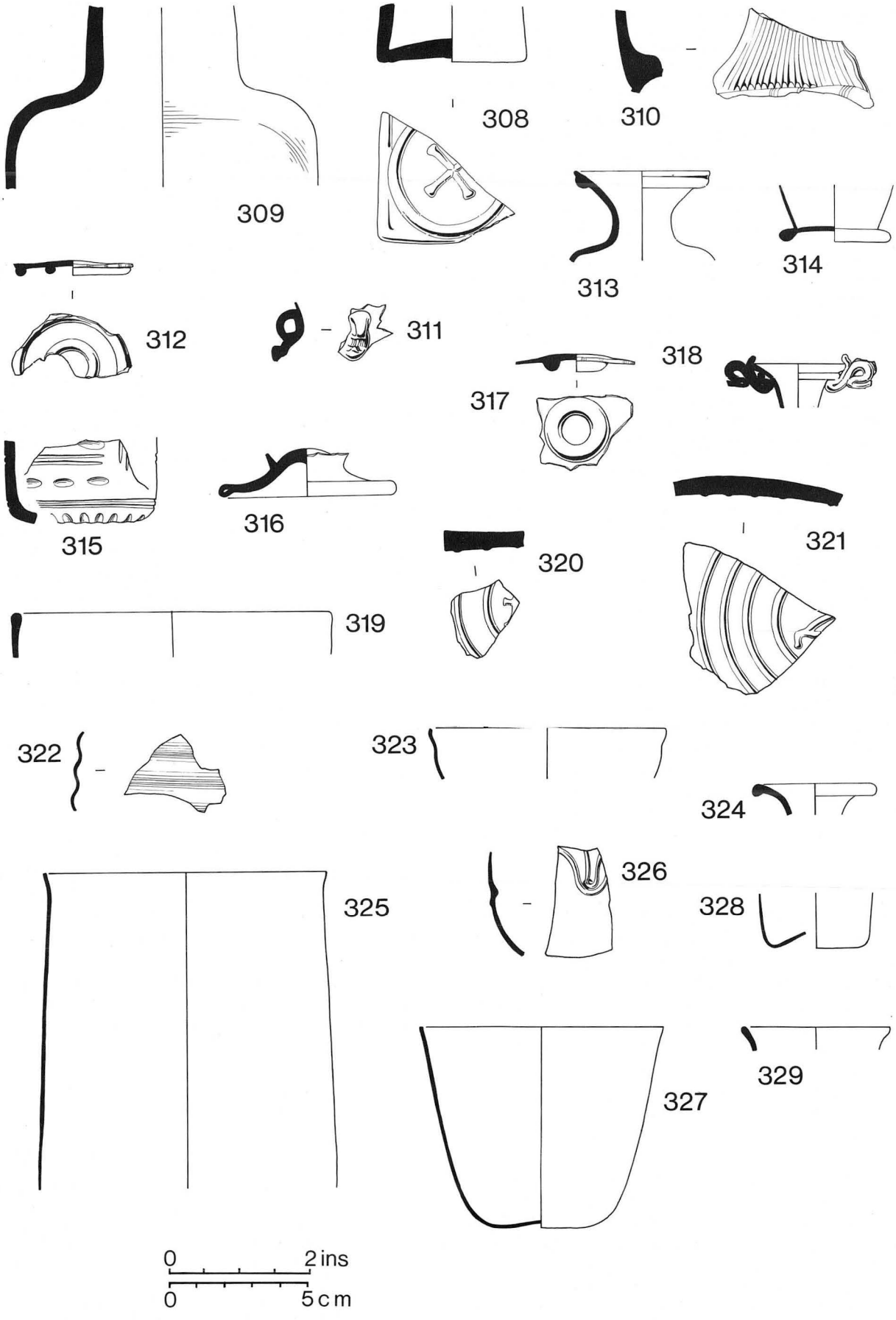


Fig. 30 Glass vessels: Nos 308-329. Scale 1:2.

side; one base with a double concentric coil base-ring, the other with centre coil ring only; all three pieces in colourless glass. Second to third century. This is one of the most common types of small bowl, apparently introduced in the Hadrianic period (Charlesworth 1971, 34-7). It is found in all the western provinces of the Empire and many examples were made in Cologne. Isings form 85b. *No. 312 from Ditch 1, layer 2, central; No. 317 from area of Building 1, yard; No. 319 unstratified.*

313 Part of the rim, neck and shoulder of a cylindrical flask in greenish glass with pinhead bubbles, striations and some small black impurities; rim rounded at the tip with trail below. There could have been a handle. Fourth century. *Ditch 1, layer 2, central*

314 Base in good colourless glass, ring formed from a secondary bubble shaped with pincers; tall narrow beaker. Second to third century. This base is also used in the fourth century, but the metal of this fragment suggests an earlier date. For a fourth-century example see Harden (1975, 373, no. 18). *Building 4, layer 5*

315 Fragment of a small colourless glass bowl with linear and facet decoration; one row of facets is cut on the edge of the base. Third century. Abraded. The general type to which this fragment belongs is probably a straight-sided bowl, possibly similar to Nos 312, 317 and 319, but it may not have the double concentric coil base-ring. A similar bowl decorated with facets only from Curium, Cyprus (Fitzwilliam Museum 1978, no. 104) and another with a different rim form from Montenegro (Cermanović-Kuzmanović 1976, 189, t. IV, 2) are possible parallels, but it is also possible that this is a fragment of a third-century cylindrical bottle. Many colourless, decorated examples are found. *Building 4, layer 5*

316 Base with green glass with ring formed from a secondary bubble, pushed in and shaped with pincers; pontil mark. Fourth century. This is a typical beaker or flagon base of the later fourth century. Isings form 109, 120 and 122(A). *Area 1*

317 See No. 312.

318 Abraded fragments of two-handled flask rim in colourless glass. Its poor condition may be due to the low quality of the metal. Tip of the rim rounded with a trail below and the upper sticking parts of the two handles fixed to it. Third to fourth century. *Area of Hut 1*

Unstratified glass

319 See No. 312.

320-1 See No. 308

322 Mould-blown fragment probably from a barrel-shaped bottle. Isings forms 89 and 128. The type is most common in the third century, but it appears occasionally from the late first century onwards. The use of colourless glass is exceptional.

323 Two fragments of rim in thin colourless glass, one with strain cracking more abraded than the other, from a small shallow bowl. Knocked off and polished. Second to third century.

324 Outsplayed rim folded down at the tip, from a flask or flagon. Colourless glass. Third century.

325 Three fragments of a large beaker in colourless glass with striations and pinhead bubbles. Fourth century (Harden 1975, 371, nos 11 and 12).

326 Fragment of a bulbous beaker in colourless glass with pinhead bubbles; glass thickens as it curves in towards the base, side decorated with an applied trail, drawn down to form a tear-drop shape. Fourth century. Isings form 96.

This form of decoration is not common on late Roman beakers, but develops on the Frankish cone-beakers. The shape is probably the fourth-century development of Isings form 96, which is found with a variety of different decorations. Two trailed fragments from Portchester are worth noting in this connection (Harden 1975, 371-3, nos 13 and 19).

327 Fragments giving a complete section of a beaker in thin greenish-colourless glass with pinhead bubbles and some striations; rim knocked off and lightly ground, base very slightly concave. Fourth century. The metal is typical of the fourth century and the shape also, but this piece is unusually straight-sided for a beaker of these proportions, broader and squatter than the normal funnel-shaped beaker.

328 Base in colourless glass with striations and pinhead bubbles. Fourth century. Isings form 106. Again the typical late fourth century metal from a funnel-shaped beaker.

329 Rim of beaker, greenish glass with pinhead bubbles, rounded in the flame. Late fourth century. Isings form 106. The rim finish contrasts with Nos 311 and 312 and may denote a date at the end of the fourth or even early in the fifth century. This is the rim type later used for the Frankish cone-beakers of which the late Roman funnel-shaped beakers are the prototypes.

X Glass beads and *tesserae* (Fig. 31)

by Margaret Guido

Beads

330; 331 These green translucent bottle-glass flat-sectioned beads are third or fourth century types, sometimes found in blue glass, but less commonly so in Britain than abroad. These examples are the only ones known to the writer with an opaque yellow line, and as this may sometimes have fallen out it would be wise to examine comparable beads under a lens, as this ornament may one day give a clue to the factory site. This type was not present in the very rich fourth-century assemblage from Lankhills, Winchester (Guido 1979), but there is a group from Ham Hill, Montacute, Somerset, of third to fourth century date which includes three undecorated examples (Taunton Museum). Perhaps these were used as pendant beads. *Both from Building 2, layer 1, outside halfway along north-east wall*

332 Translucent blue annular with white wave. A very long-lived type running from the late first millennium BC well into Saxon times, so undatable without a context. *Building 2, layer 5*

333 See No. 332 above. Not datable without a context. *Area 2*

Not illustrated: another similar to No. 332, but slightly larger. *Unstratified*

334 Very thin, bright translucent cobalt blue, drop-shaped and broken at one end. Probably wound. The pitting is caused by decay. Exact parallels not known. *Building 1, Room 5, layer 2*

335; 336 See also No. 337 and others. Segmented beads are a particularly common late Roman type, whether pinched or wound. Nearly always blue or green. Many come unstratified from Roman sites (Guido 1978, 91-3).

Not illustrated: another of two segments and two more of three segments, all translucent green, as are those illustrated. *Ditch 1, layer 2*

337 See Nos 335 and 336. Translucent emerald green, in four segments, perhaps broken at one end. *Area 3*

338-45 These are all late Roman types, though a few might be earlier. Some are small segments from broken segmented beads. For all see Guido (1978, 91-9). Note the hexagonal and pentagonal beads, and the small 'black' glass one which is unusual. The cube shaped bead No. 340, particularly in its colour, opaque turquoise like the tessera No. 357, is unparalleled to my knowledge from a Roman context in Britain. *All from Ditch 1, layer 1, scattered through the layer*

338 Double segment in translucent blue, see Nos 335-7 above.

Not illustrated: five single segments of blue; five single segments of sapphire and one green single segment.

339 Small globular bead in 'black' glass.

340 Opaque turquoise cube-shaped bead.

341 Translucent green.

342 Opaque green pentagonal bead.

343 Opaque darker green.

344 Opaque green hexagonal bead.

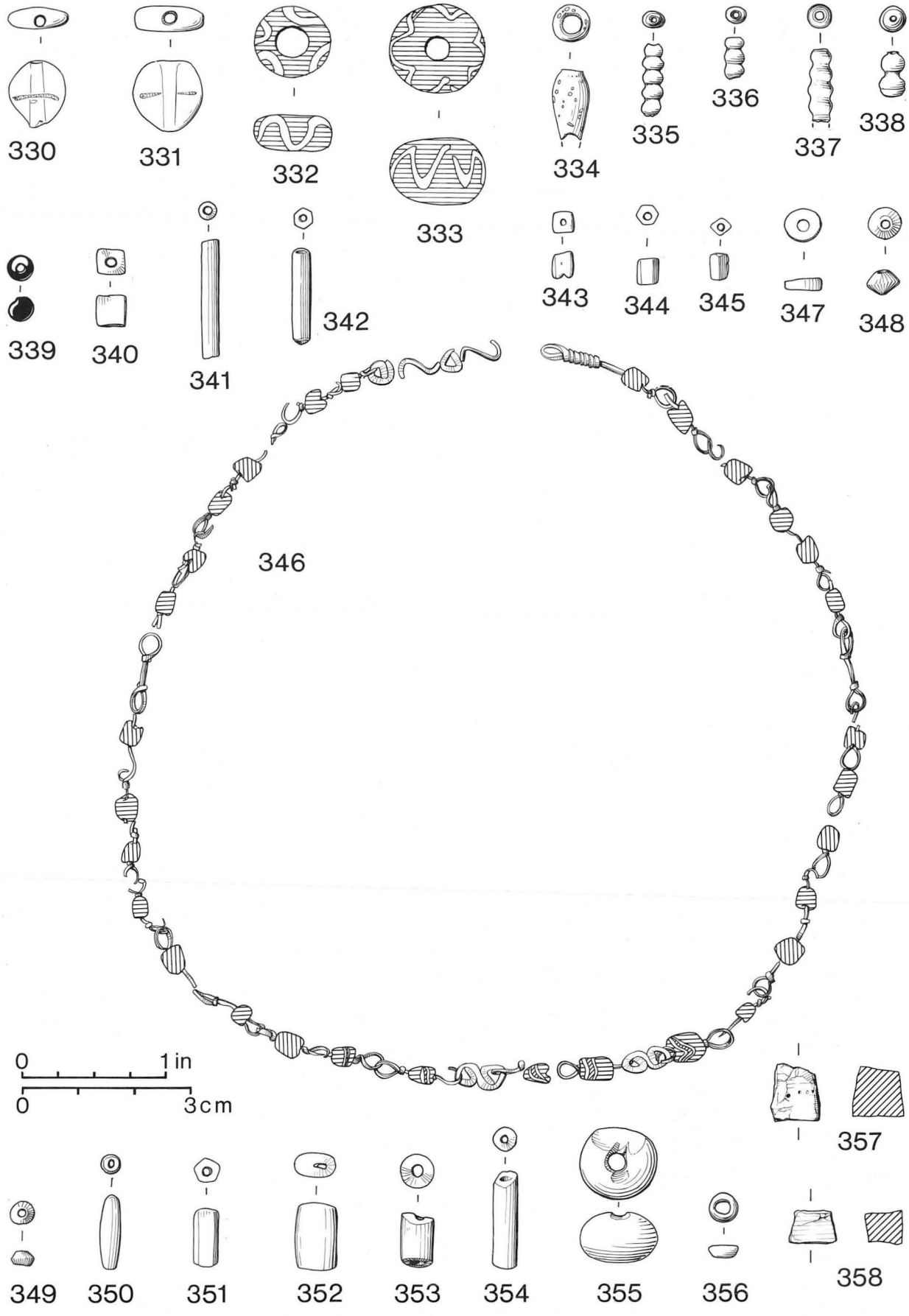


Fig. 31 Glass beads: Nos 330-345, 347-358; No. 346 bronze wire necklace with monochrome green (vertical shading) and blue (horizontal shading) glass beads, with five blue beads with white/red/white chevrons; Nos 357-8 *tesserae*. Scale 1:1.

345 Blue.

Not illustrated: a squarish-section blue bead with a white/red/white chevron, as the necklace No. 346 below.

346 A typical third or, more probably, fourth-century necklace, its component beads being chunky and squarish in section, monochrome blue and green with five blue beads with red in white bands or chevrons, common at that date. They are widespread in the Roman world, including an early fourth century one from Libya (Guido 1978, 98). *Ditch 1, layer 1*

347 Emerald green cylinder segments. These beads start in early Roman times, but become increasingly common. They are widespread in Gaul and northern Europe, and remained in use well into the Anglo-Saxon period (Guido 1978, 95). *Building 2, layer 5 (347); and unstratified*

348 Translucent blue biconical. This larger one is not unusual, and the smaller one (No. 356) is comparable, except in colour, to No. 349. *Building 3*

Not illustrated: translucent blue annular bead. This could be an earlier bead, being rather larger than the usual kinds of later beads of the Roman period. Diameter 11 mm; height 6 mm; perforation 6 mm diameter. *Building 4, layer 5*

Unstratified Beads

349 Very small translucent yellow biconical bead. A very common and widespread type in fourth-century graves at Lankhills, and many parts of the Roman Empire, including Gaul. Probably made both inside and outside the frontiers (Guido 1978, 97-8).

350 Long biconical opaque blue, probably second or third century AD.

351 Pentagonal translucent darker green. Perhaps late Roman.

352 Flattened section opaque dark green. Perhaps fourth century AD.

353 Cylinder, blue.

354 Cylinder, bright translucent blue (Guido 1978, 94-6).

355 Globular, mid-cobalt blue, translucent. Perhaps early rather than late Roman, but could be either.

356 Small translucent blue biconical. See No. 348 above.

Not illustrated: another as No. 350, but shorter; a cylinder like No. 351 but sapphire blue; part of another like Nos 355; another as No. 345 but smaller; another squarish blue like those in the necklace No. 346; another hexagonal as No. 344 but much larger (12 mm long, 5 mm across, perforation 2 mm); a cylinder in clear bright green (10 mm long; 4 mm diameter; perforation 1 mm); a triple-segmented opaque green bead; and one segment of a blue one.

Tesserae

357 Opaque turquoise. *Building 1, yard and gullies, layer 1*

358 Opaque blue. *Ditch 1, layer 2*

These *tesserae* may have been imported for glass bead making, for which there is so far no evidence from Britain, though it is common in Scandinavia in post-Roman times for glass to have been imported in this form ready to re-use. Probably these examples formed part of a mosaic pavement of late Roman date like one from Kingscote in Gloucestershire where the diadem and necklace of a 'Venus' figure were made with glass tesserae (Smith 1978). Other examples come from Fishbourne (Harden and Price 1971); Castleford (awaiting publication); and elsewhere.

XI Two glass *tesserae* (Fig. 31)

by Justine Bayley

The first piece (No. 357) was roughly cuboid (or cubic) with approximate dimensions 9 x 9 x 8 mm. It was of deep opaque, turquoise coloured glass. XRF (surface) analysis showed that the colour was produced by copper in the glass and the opacity was due to the presence of antimony. Small amounts of the following elements were also detected: silicon, potassium, calcium, iron, zinc, lead, arsenic, strontium and tin. These are mainly glass-forming elements and impurities in them or the copper. (N.B.—Elements lighter than silicon were not detectable under the analytical conditions used).

The second piece (No. 358) was also roughly cuboid and measured 9 x 7 x 6 mm. It was a less intense colour than the turquoise cube and of a true blue. It was fairly opaque, but the glass was less homogeneous than in No. 357, giving a slightly stripey effect with more or less opaque bands. The colour was due mainly to cobalt although small amounts of copper were also detected. Opacity was again due to the presence of antimony. Other elements detected were: silicon, potassium, calcium, manganese, iron, lead and strontium.

The glass was probably originally intended for use in a mosaic. Bright colours such as these were often made of glass as natural stones of similar hues were not generally available. Two almost identical cubes were found on the villa site at Sparsholt, Hampshire, and similar *tesserae* are known from a number of other sites.

XII Objects of worked bone and antler

(Figs 32-4)

by Stephen Greep

Pins (Figs 32-3)

Pins were the most abundant type of bone object recovered. In addition to the material listed below, forty-three stem fragments were found.

Pins with a spherical or ovoid shaped head and a swelling stem

The most common form of pin. It is Colchester Type 3 (Crummy 1979, fig. 1, nos 3 and 4) and Jewry Wall Type C (Kenyon 1948, fig. 90, 7 and 8). In addition to those listed here, seventeen other examples were found.

359 Broken.

360 Complete.

361 Truncated head. Broken.

362 Complete. *Building 1, Room 7, layer 2 with pots Nos 486 and 487*

Pins with a pointed or conical head defined by a series of grooves

It is Colchester Type 2 (Crummy 1979, fig. 1 no. 2) and Jewry Wall Type A (Kenyon 1948, fig. 90, 1-3).

363 Single groove. Jewry Wall Type Aii (Kenyon 1948, fig. 90, 2). Broken.

364 Single collar. Jewry Wall Type Ai (Kenyon 1948, fig. 90, 1). Broken.

365 Single collar as No. 364 above. Complete.

Flame or cone-headed pins with a single collar and a swelling stem

Jewry Wall Type Dii (Kenyon 1948, fig. 90, 11); Portchester Type b, where it is the most common type (twenty-seven examples; Webster 1975, fig. 116, 82-5); and Colchester Type 5 (Crummy 1979, fig. 1, no. 7).

366 Complete.

367 Complete.

368 Complete.

369 Broken.

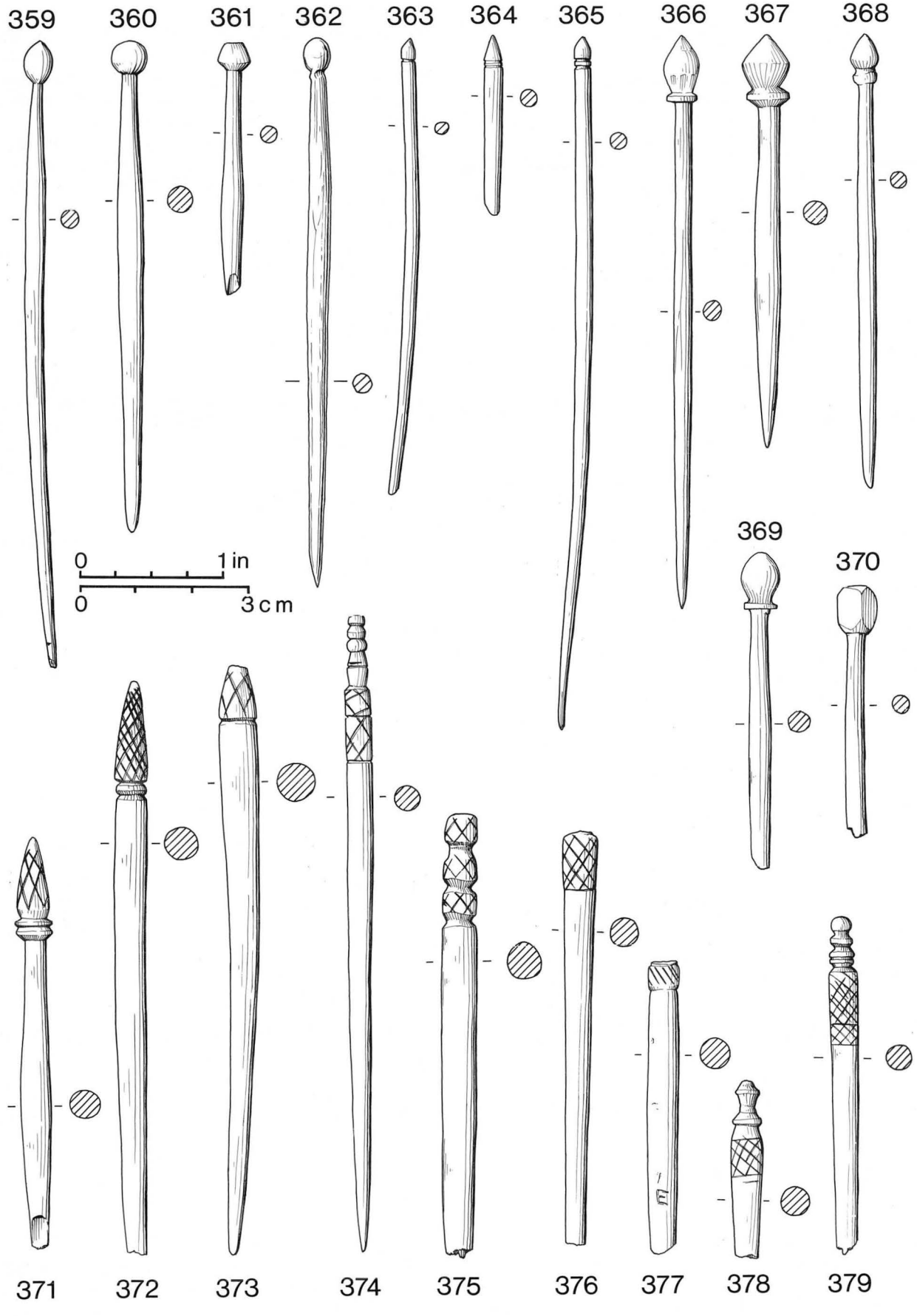


Fig. 32 Bone pins: Nos 359-379. Scale 1:1.

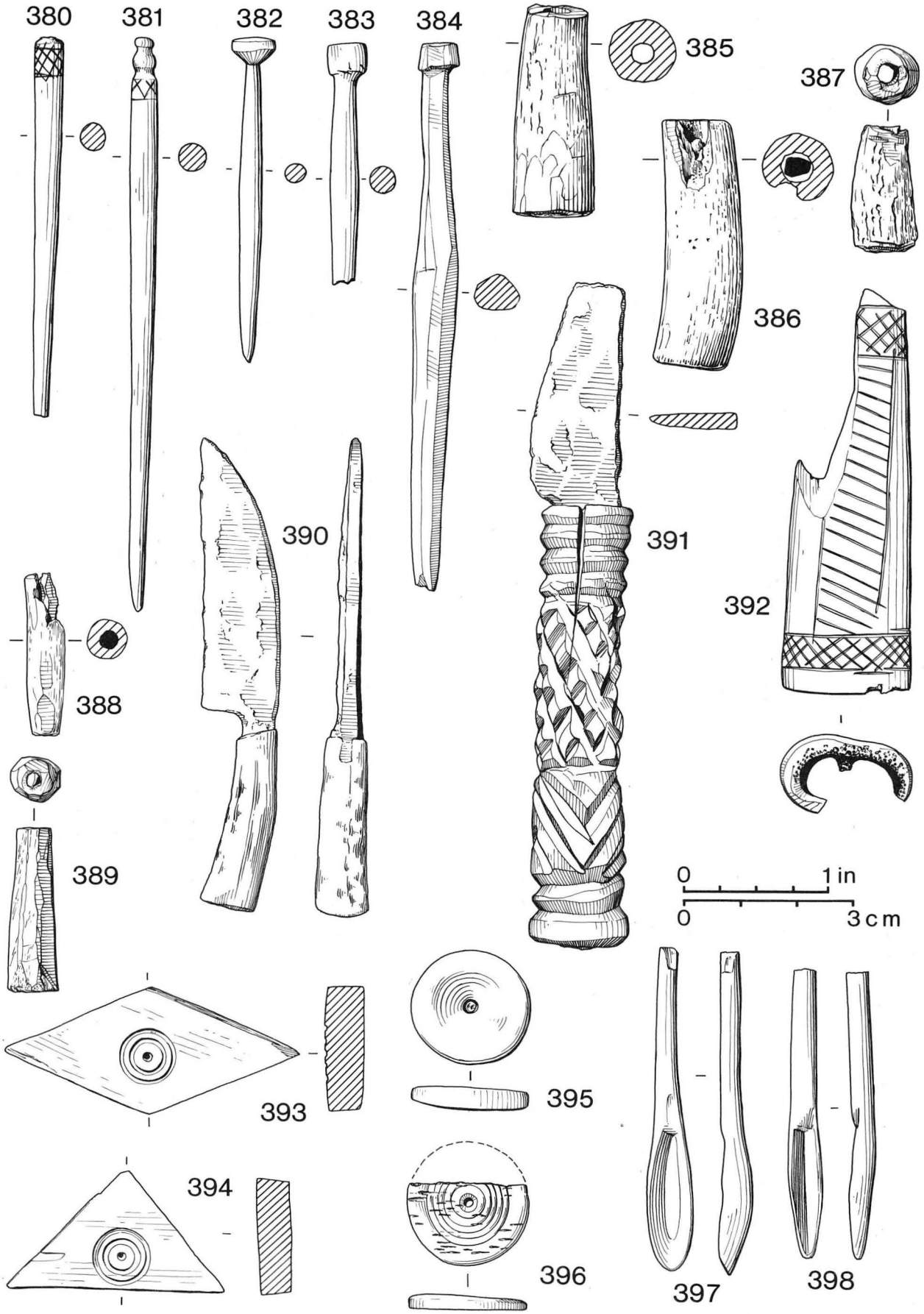


Fig. 33 Bone and antler: Nos 380-4 pins; Nos 385-9 antler handles; No. 390 iron knife with antler handle; No. 391 iron knife with bone handle; No. 392 handle; Nos 393 and 394 inlay; Nos 395 and 396 counters; Nos 397 and 398 spoons. Scale 1:1.

Pin with a cuboid faceted head and a swelling stem

370 A common type in bone, e.g. Colchester Type 4 (Crummy 1979, fig. 1, no. 5), Portchester Type d (Webster 1975, fig. 116, 88-90); in jet, (e.g. Lawson 1976, fig. 7, 65) and in bronze, e.g. Portchester (Webster 1975, fig. 113, 50-1), and Richborough (Henderson 1949, pl. LIII, 199 and 201). Broken.

Pins with heads with cross-hatching and cut mouldings

These types exhibit a wide variation and are difficult to parallel exactly.

371 Cone-shaped head with cross-hatching above two collars. Swelling stem, long. Broken.

372 Conical head with cross-hatched decoration and a single collar. Tapering stem. Broken. Cf. Northchurch, Hertfordshire (Neal 1977, fig. 12, 20). *Building 4, layer 2*

373 Cone-shaped head, broken, lightly decorated with cross-hatching similar to Nos 371 and 372 above. Tapering stem. Complete.

374 Head consisting of a series of mouldings above two zones of cross-hatching. Tapering stem. Complete.

375 Head composed of three oval sections, each with simple hatching. Tapering stem. Broken.

376 Simple, flat head with a series of lightly incised cross-hatched lines. Tapering stem. Broken. Cf. Scole, Norfolk (Rogerson 1977, 201, fig. 85.2).

377 Head, broken, decorated with a series of diagonal lines above a single groove. Tapering stem. Broken.

378 'Moulded' head with two single collars above a zone of cross-hatching. Tapering stem. Broken.

379 Rounded head and three collars above a zone of cross-hatched decoration. Tapering stem. *Ditch 1, layer 1, central*

380 Simple flat head. Broken. Decorated with a zone of cross-hatching. Tapering stem. Broken.

381 Simple 'moulded' head above a series of incised x's. Tapering stem. Broken.

382 Flattened, spherical head. Swelling stem. Broken. *Ditch 1, layer 1, central*

383 Roughly made with a squared head and swelling stem. Broken.

384 (?)Unfinished pin, the surface still displaying strong knife-cuts and the head crudely formed. Swelling stem. Broken.

Three other rough fragments were also found, possibly unfinished pins or waste fragments, suggesting that at least some pins were being manufactured at the site. It is interesting to note that although only twelve miles distant from Gestingthorpe, Colchester has produced less than a dozen examples of cross-hatched decoration of the same general type as Nos 371-380. This represents only about 1% of the total assemblage at Colchester. It is probably safe to assume that the majority of the Gestingthorpe pins are of local manufacture.

Handles (Fig. 33)

385 Handle formed of a fragment of red deer antler tine. The surface has been partially smoothed and both ends have been cut. One end has been hollowed out for 34.2mm. Complete. Plain antler handles of various sizes (e.g. Nos 386-390 below) are the most common form of handle found and served a large variety of tools such as knives, chisels, saws, etc. *Area 1, layer 1*

386 Tine fragment, one end hollowed out for use as a handle, with a fragment of the iron tang still *in situ. Hearth 2*

Not illustrated: Large tine fragment, both ends have been sawn and one has been hollowed out to a depth of 108.3mm. 127mm long, 40mm max. diam. *Hearth 2*

387 Tine fragment, 44.5mm long. The centre has been hollowed as Nos 385 and 386 above. *Building 4, layer 1*

388 Tine fragment, 57.9mm long. Knife-cut surface and the remains of an iron tang at one end. *Ditch 1, layer 2*

389 Tine fragment with knife-cut surfaces as No. 388 above. It has the remains of a (?)bronze tang of rectangular section and green staining at this end. *Ditch 1, layer 2, beside Floor 4*

390 Antler tine with saw marks at one end and hollowed as in the previous examples. The blade is still in situ. W.H. Manning writes: 'The back continues the line of the tang before curving down to the tip; the straight edge is stepped down from the tang. Comparable, but slightly larger examples come from Hod Hill, Dorset (Brailsford 1962, 15, pl. VIII, G91) and Kingsholm, Gloucestershire (Lysons 1813, pl. XIII, 2).' R.F. Tylecote writes: 'Almost all rust. There is a small area of residual ferrite and what looks like replicated sorbite.' *Building 2*

391 Bone knife handle highly decorated with deeply cut grooves forming a series of collars, inverted V's and diamond shapes. W.H. Manning writes: 'The tang runs for the full length of the handle to emerge as a flattened boss at its end. The blade is broken; what remains has a slightly concave back and an upward curving edge. Originally it will have ended in a distinctly up-curved tip. The type is known, with minor variations, from a number of sites including Newstead (Curle 1911, 281, pl. LX, 2, 7, 13) and Silchester (Reading Museum).' *Building 1, layer 4*

392 Bone handle of oval section. 72.5mm long. Decorated with an upper and lower zone of cross-hatching, between which runs a band of incised diagonal lines. Similar examples with two cross-hatched bands, but without the central hatching are known from a number of sites, e.g. Caerleon, Gwent (unpublished, National Museum of Wales, 56.214A F36); Silchester, Hampshire (unpublished, Reading Museum); Little Waltham, Essex (Drury 1978, fig. 62, 6.1); and London (unpublished, Museum of London). See also No. 390 for an iron knife with a fragment of bone handle surviving. *Area 2*

Inlay (Fig. 33)

393 Diamond-shaped piece of inlay decorated with a single ring-and-dot motif, cf. Lydney, Gloucestershire (Wheeler and Wheeler 1932, pl. 31, 147) and Owslcbury, Hampshire (Collis 1977, fig. 11, 4). *Ditch 1, layer 1, towards south end*

394 Triangular-shaped piece of inlay decorated with a single ring-and-dot motif, as No. 393 above, cf. Lydney, Glos. (Wheeler and Wheeler 1932, pl. 31A, 147; pl. 34B, 155); Owslebury, Hants (Collis 1977, fig. 11, 13); and for smaller, finer examples, Gloucester (Hassall and Rhodes 1975, fig. 28, 36, xviii); and Richborough, Kent (Henderson 1949, pl. LVII, h). *Floor 4, layer 4*

Counters (Fig. 33)

395 Gaming counter with a dished centre and plain reverse. Cf. Jewry Wall Type A (Kenyon 1948, fig. 91, 9-12). *Floor 4, layer 4*

396 Gaming counter with a series of four concentric rings on the obverse and a plain reverse side. Broken. Cf. Jewry Wall Type B (Kenyon 1948, fig. 91, 13-15). *Floor 4, layer 4*

Spoons (Fig. 33)

397 Spoon with a deep elongated bowl. A similar example from Caister-by-Norwich (unpublished, Castle Museum, Norwich, Accn No. 152.929). *Ditch 1, layer 2, south part*

398 Spoon as No. 397 above. 52mm long. Broken.

Other objects of bone and antler (Fig 34)

399 Fragment of (?) antler with a knife-cut surface, flat reverse side and a D-shaped section. It has a drilled perforation 7.1mm dia., now incomplete. Cf. Fishbourne, Sussex (Cunliffe 1971, fig. 67, 13), where a similar object is described as a pendant; and Woodcuts, Dorset (Pitt-Rivers 1887, pl. XLVI, 9). *Building 4, layer 1*

400 Section of a long bone, both of the ends are sawn. The surface has now been eroded, but it was possibly originally turned, and formed part of a hinge. Cf. Waugh and Goodburn (1972, 149 and 150). *Building 4, layer 1*

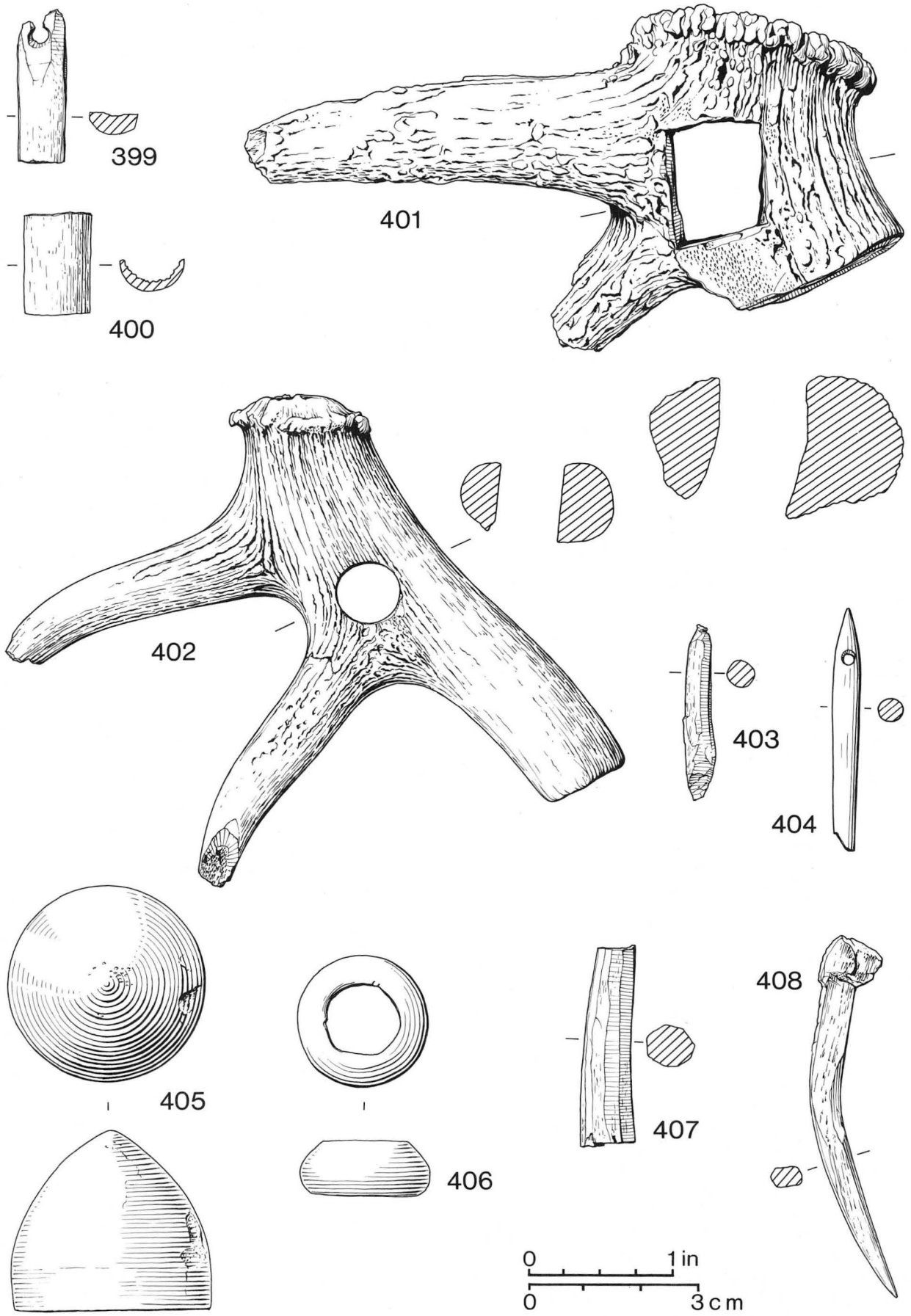


Fig. 34 Bone and antler: Nos 399, 401-2 worked antler; No. 400 (?) hinge; No. 403 worked bone; No. 404 needle; No. 405 turned antler cone; No. 406 bone ring; No. 407 worked antler; No. 408 cut antler. Scale 1:1 except Nos 401 and 402 which are scale 1:2.

401 Red deer antler. The burr and the brow and bez tines (now both snapped) remain, but the main beam has been sawn through. The surface is unworked but there is a rectangular perforation (29.5mm x 47.3mm) just above the burr. These types are normally interpreted as 'hoes' or 'rakes'. A discussion of these types is to be found in Bagshawe (1949); Stevenson (1950); Smith (1968); and most recently Rees (1979, 313-8). *Ditch 1, layer 4, to the north of Building 4*

402 Red deer antler. Smaller example than the last and probably from a younger animal. An oval perforation has been made near the junction of the brow and bez tines. The main beam has been cut and is now slightly hollowed. Both tines are now broken fairly near the tips and the surface of the main beam and both tines are smoothed. Cf. No. 401 above. *Ditch 1, layer 4, beside Building 2*

403 Knife-cut bone fragment. Probably a waste product. *Ditch 1, layer 2, south part*

404 Broken needle with a pointed head and a single round hole 2.3mm dia. A common type, cf. Jewry Wall Type A (Kenyon 1948, fig. 91, 1) and York (MacGregor 1976, fig. 9, 106). *Ditch 1, layer 2*

405 Turned cone made from antler. Probably some form of gaming counter although it seems unusually large for this. Similar but smaller examples are known from Caerwent, Gwent, (unpublished, Newport Museum, and unpublished excavations at Pound Lane, Caerwent). *Ditch 1, layer 2, south end*

406 Plain bone ring of D-shaped section. *Floor 4, layer 4*

407 Antler fragment, both ends sawn and a knife-cut surface.

408 Cut portion of antler tine, sawn from the beam and cut on the sides. Possibly worn towards the tip. *Hut 2*

In addition to the objects listed above, a number of antler fragments were found, seventeen of which display evidence of working, mainly sawn ends, whereby the tines have been removed. On one example the burr has been sawn off as well as the main beam and brow tine being sawn; another example has a saw-cut slot, 3.4mm wide (cf. Gadebridge Park; Neal 1974, fig. 69, 338).

Waste products such as these are common to sites of almost all types in the Roman period. They indicate that bone and antler working was normally a local industry. No. 384 provides evidence that some, at least, of the pins were of local manufacture and it is probable that most of the other objects have not travelled a great distance from their initial point of manufacture. **S. Greep 1979.**

XIII Jet and shale (Fig. 35)

by G. Lloyd-Morgan

The number of jet and shale objects from Gestingthorpe is unusually large for a villa site when compared with finds from other villas such as Gadebridge Park, Hertfordshire or Shakenoak, Oxfordshire; or from other much larger sites where the quantity of finds comes from a much wider cross-section of the local populace—as for example a civilian site such as Silchester or London; or from military sites such as Doncaster or the legionary base at Chester where there is some evidence for jet working on the site. (Lloyd-Morgan 1981). The richness of the Gestingthorpe material is not totally confined to objects of personal adjornment—there are some eleven examples of this—but does include the knife handle and a tantalisingly small fragment of jet inlay from some piece of furniture or similar item of general display. The handle with its silver binding is an extremely unusual piece which can be paralleled by an item from excavations at Cologne. It can only reinforce the conclusion that the occupants of the Gestingthorpe villa were people of some wealth and culture and were not averse to letting this be seen.

Bracelets

409 Jet bracelet fragment of roughly rectangular cross-section, with an elaborately decorated raised rib in the middle of the outer face, of almost diamond shaped cross-section. An unusual piece, for although a raised rib pattern is not uncommon, the elaboration and undercutting of this piece is hard to parallel. *Floor 4, layer 4*

410 Jet bracelet fragment of D-shaped cross-section. The curved outer surface is decorated with random dot-and-circle patterns. Although the simple form of the bracelet is well known, the use of dot-and-circle patterns is less common. One example with regularly spaced patterns comes from the collections of the Grosvenor Museum, Chester (no. 64.R.1976); another from excavations at Doncaster in 1970 within the Roman fort, in a third or fourth-century context (no. DT/QF S 209; Dr Paul Buckland, pers. comm.). *Area 1*

411 Shale bracelet fragment of roughly 'comma'-shaped cross-section, rather damaged on the narrow edge. A slightly unusual cross-section, which may have been produced accidentally during turning, rather than deliberately. *Floor 4, layer 4*

412 Small fragment of shale bracelet, roughly oval in cross-section. The outer edge is curved, the inner face is angular, producing a slight ridge. *Area 2*

413 Quadrant of a shale bracelet, with similar cross-section to No. 412 but more robust. The interior ridge is more pronounced and a little off-centre. *Area 1*

414 Quadrant of a shale bracelet. Similar white flecks in the shale, and similarities in diameter and depth suggest that this piece and No. 413 may be from the same bracelet. *Building 1, yard and gullies, layer 1*

415 Fragment of shale bracelet with originally a D-shaped cross-section of which only half now remains. *Area 1*

416 Fragment of shale bracelet, broken in similar fashion to No. 415 but with slightly broader cross-section. *Area 2*

Beads

417 Cylindrical multifacetted (?eight-sided) jet bead, slightly tapering towards each end.

418 Disc-shaped jet bead of well-known type with a plain polished face bearing a central (chuck) point and some spin marks. The double perforation suggests it came from a necklace of some elaboration. For similar beads from Silchester, Hampshire see Lawson (1976, 244, fig. 1, nos 6 and 7); and from Lydney Park, Gloucestershire (Wheeler and Wheeler 1932, 84, fig. 18, nos 76, 77 and 79). *Building 4, layer 5*

Pins

419 Fragment of jet pin, oval in cross-section, tapering to a point which is missing. *Building 2, layer 7*

Not illustrated. Upper fragment of jet pin, swelling slightly near centre. Length 27.3mm. Dia. 4.2-4.9mm. *Building 2, layer 7*

Other items

420 Fragment of jet plaque or inlay. The edge is indicated by a roughly drawn line and a notched border. Damaged. Inlay in jet or shale is much less commonly found than the decorative bone strips and cut outs which have been found on a number of sites. Two decorated pieces of jet 'inlay' were found during excavations at Dorchester-on-Thames in 1962-3 (unpublished). An edge piece of what was described as a 'tablet of shale' was found during excavations at Holt, Denbighshire (Grimes 1930, 128, fig. 56, no. 35). The thickness of the piece was not published, but the notched border decoration is related to the Gestingthorpe fragment. *Wall 3*

421 Jet knife handle with silver binding. The survival of handles of semi-precious materials is not very great in

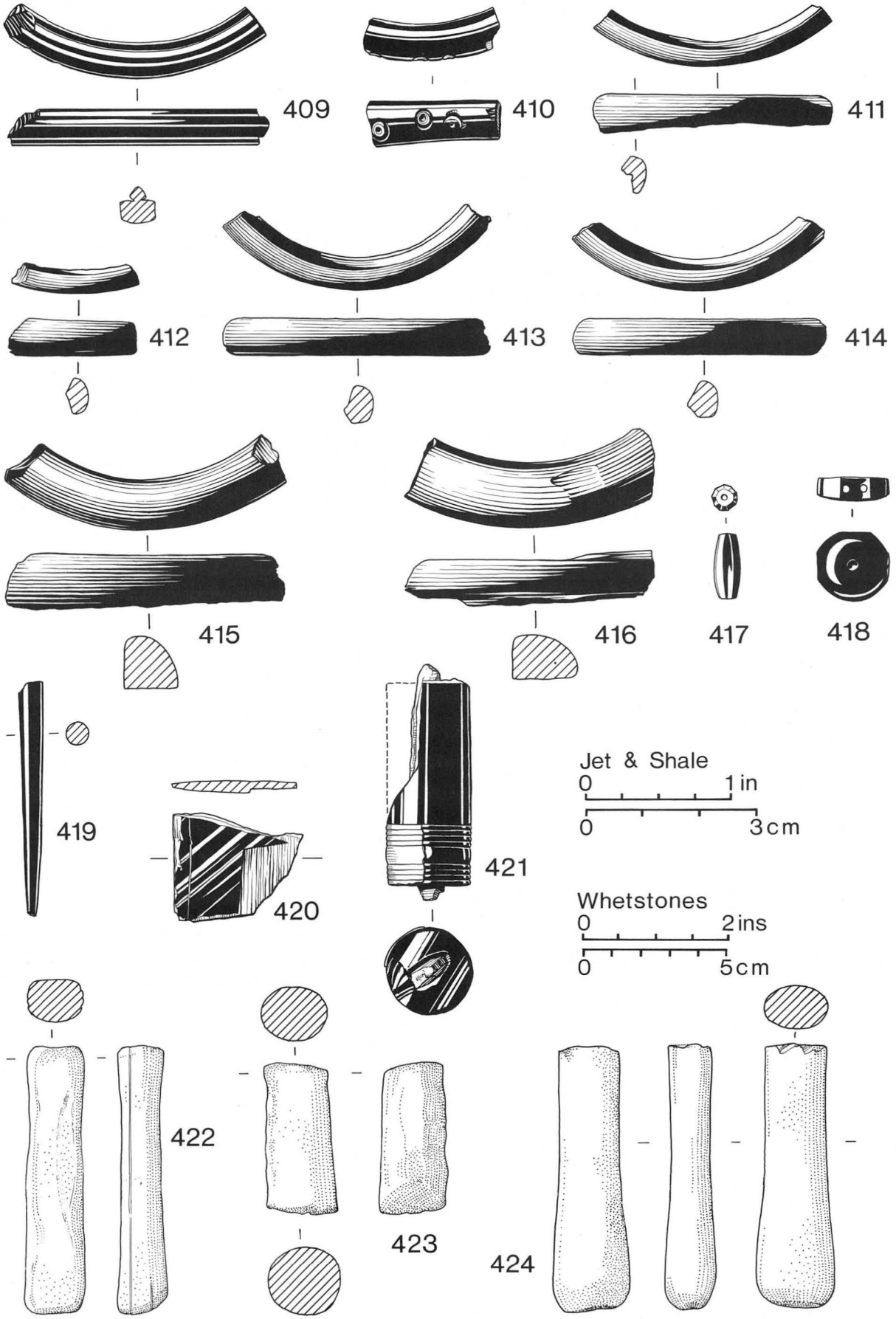


Fig. 35 Jet, shale and whetstones: Nos 409 and 410 jet bracelets; Nos 411-416 shale bracelets; Nos 417 and 418 jet beads; No. 419 jet pin; No. 420 jet inlay; No. 421 jet handle with silver binding and iron tang; Nos 422-4 whetstones. Nos 409-421 scale 1:1; Nos 422-4 scale 1:2.

Britain, though perhaps they are a little commoner in the more prosperous provinces of north-west Europe. Ivory and amber (van Buchem 1975, 212-3, afb. 4-7), with their attractive colouring and texture, were particularly suitable for carving into handles of intricate form and decoration, as well as being costly luxuries in their own right. Jet, although known more for its use in bangles, beads and other ornaments, was used less frequently for items which would be expected to withstand somewhat rougher use. The splitting off of part of the Gestingthorpe handle, despite the silver binding which capped both ends (though only one small fragment survives), possibly indicates the brittleness of jet when placed under stress, although it may equally or additionally be due to expansion of the iron during burial.

Although it has been suggested that the handle might have belonged to a mirror, there are virtually no parallels surviving from the north-west provinces for a non-metallic grip. A most unusual item from Cologne (Römisch Germanisches Museum no. 24,377) is a rectangular mirror stated to be of silvered bronze with an elaborately carved bone handle attached to one of the long sides. Unfortunately, it was not possible to inspect it in detail, though the mirror plate appears to slot into the top handle and is held by two rivets in a most unorthodox fashion (Fremersdorf 1928, taf. 121b).

The piercing of the Gestingthorpe handle to take the central iron rod suggests that it is more likely to have been a knife handle. A complete example with iron blade still intact and with the jet handle terminating in a carving of a seated child also comes from Cologne, (la Baume 1964, 305, 308, bild 292). Its overall length is 242mm, and the jet grip of about 140mm long is cracked or broken in several places along the slightly tapering shaft. There is no trace here of silver binding, though it is perhaps interesting to note another iron knife from Cologne which has an agate handle 68mm long, carved in the form of a panther devouring a calf's head, with gold binding which looks as if it might even be functional as well as aesthetically pleasing (la Baume 1971, 80 and 93, taf. 14.1, abb. 3, no. 5). In his discussion of the jet and shale items from Silchester, Lawson notes two pieces from Malton which may be handles similar to the Gestingthorpe piece, though he describes the Silchester fragments they parallel as spindles since they are not pierced for a tang (Lawson 1976, 272, fig. 14, nos 105 and 106).

The Gestingthorpe handle is, therefore, an important addition to the relatively few semi-precious knife handles known from Britain and the Continent, and a useful indicator of the wealth and taste of the inhabitants of the villa. *Ditch 1, layer 3*

XIV Other stone objects (Figs 35-7)

by Jo Draper
with geological identifications
by the late F.W. Anderson

Whetstones (Fig. 35)

422 Mica schist from the boulder clay. Scandinavian in origin but probably found locally in the drift. There is another of the same material, not well shaped and unstratified. *Area 1*

423 Sandstone, perhaps Carstone from the local Tertiary. *Ditch 1, layer 1*

424 Sandstone of uncertain origin, possible from the boulder clay. *Area 1*

Not illustrated: Fragments of others very similar from Area 1; 2 from Building 4, layer 5; and four others unstratified.

Querns and mortars (Figs 36-7)

425 Whole, unworn quern of Niedermendig Basalt from the Rhineland. There are fragments of at least seven others all unstratified except one from Area 1. Another stratified fragment may be from a mortar.

426 One quarter of a very close-grained sandstone quern which may be of Millstone Grit from Yorkshire. This one has been burnt. There are fragments of two others, one with a slight lip which is stratified and another from Area 1. *Unstratified*

427 Complete Hertfordshire Puddingstone quern. *Floor 4, layer 4*

Not illustrated: There are fragments of at least ten other Puddingstone querns, all similar. Five are unstratified; three are from the carbonised grain spread, layer 1; one is from Building 4, layer 5; and two are from Area 2.

Possible pivot stove (Pl. III)

A large lump of relatively soft Jurassic limestone, perhaps from Lincolnshire. Roughly shaped, *c.* 330mm high when upright, the top being *c.* 300mm by 260mm, but most irregular. There is a regular circular hollow 200mm diameter on the flat top, 30mm deep at the centre. The stone seems to have been used as a pivot possibly for a door. Originally set in screed, the dished top up, with one-third of the stone above the plaster. *Building 1, Rooom 5, layer 2, S 26*

Tesserae (not illustrated)

Many are local greyish chalk, some of which show signs of wear, and there is one in grey limestone which appears to be Carboniferous and is probably from the boulder clay. The majority are clay fired red or grey. All from Building 3.

Purbeck marble mortar (not illustrated as now lost)

Half a Purbeck mortar of the same general type as Beavis (1971, 188, pl. 1). It has now been lost. They seem to date from the mid-first to the mid-second century AD (Beavis 1971, 203-4).

Other stone

Not illustrated: a massive block of stone 1.00m high and roughly rectangular (450mm by 350-390mm) at the base, tapering very gradually to a point which seems to have part of the north-eastern wall of Building 1, Room 5 (p. 8). Originally plastered on the two longer faces, but now weathered off. One of eight or nine found in the area of Hill Farm (the others are larger) and the only one used in the building. Dr F.W. Anderson writes 'These sandstone slabs could have come from the Glacial Drift, but they are very like 'Sarsens'. As these were derived by the weathering of the Reading Beds, the lower beds of the London Clay and the Bagshot Sands, they could occur in the Sudbury area. Large blocks of Hertfordshire Puddingstone are sometimes found in association with 'Sarsens' so that it is possible that No. 427, etc., were made on the site from material occurring here.'

XV Ivory casket fitting (Fig. 39, Pl. X)

by Martin Henig

438 Ivory (identified by R.T. Jones of the Ancient Monuments Laboratory): corner piece from a box, slots in the back and sides; three rivet holes, one at the top and one just below the mid point. The front is carved in high relief and depicts a nude male figure of child-like appearance standing towards the front. He holds a thyrsus (the Bacchic sacred staff, with its pine-cone tip) in his right hand and unidentifiable object in his left hand. He stands upon a base line, below which is an animal's foot with four claws. Publ. Cooper (1969b, 48). Originally identified as Bacchus, but later designated as Cupid.

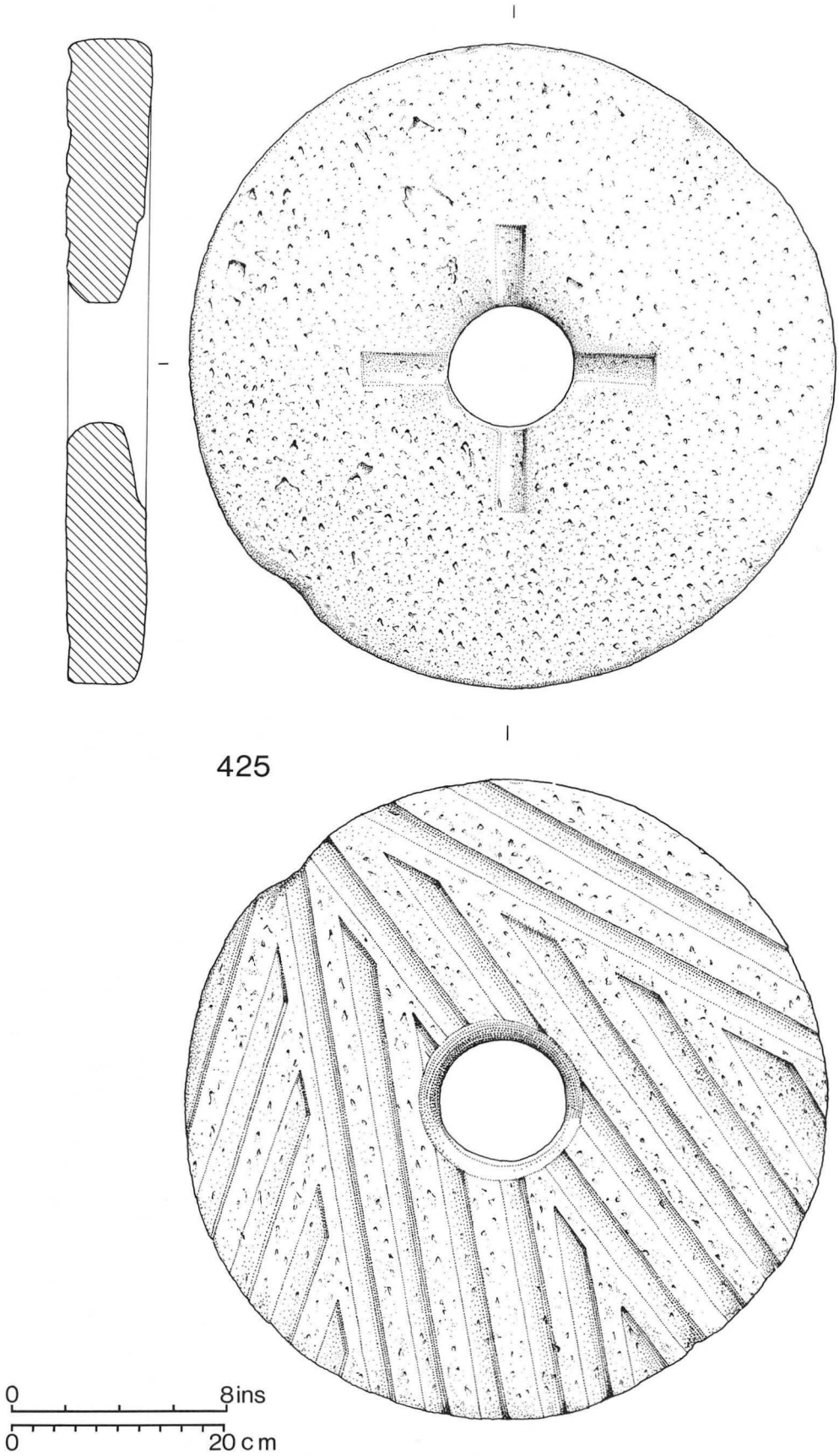


Fig. 36 Quern: No. 425 Niedermendig basalt quern. Scale 1:4.

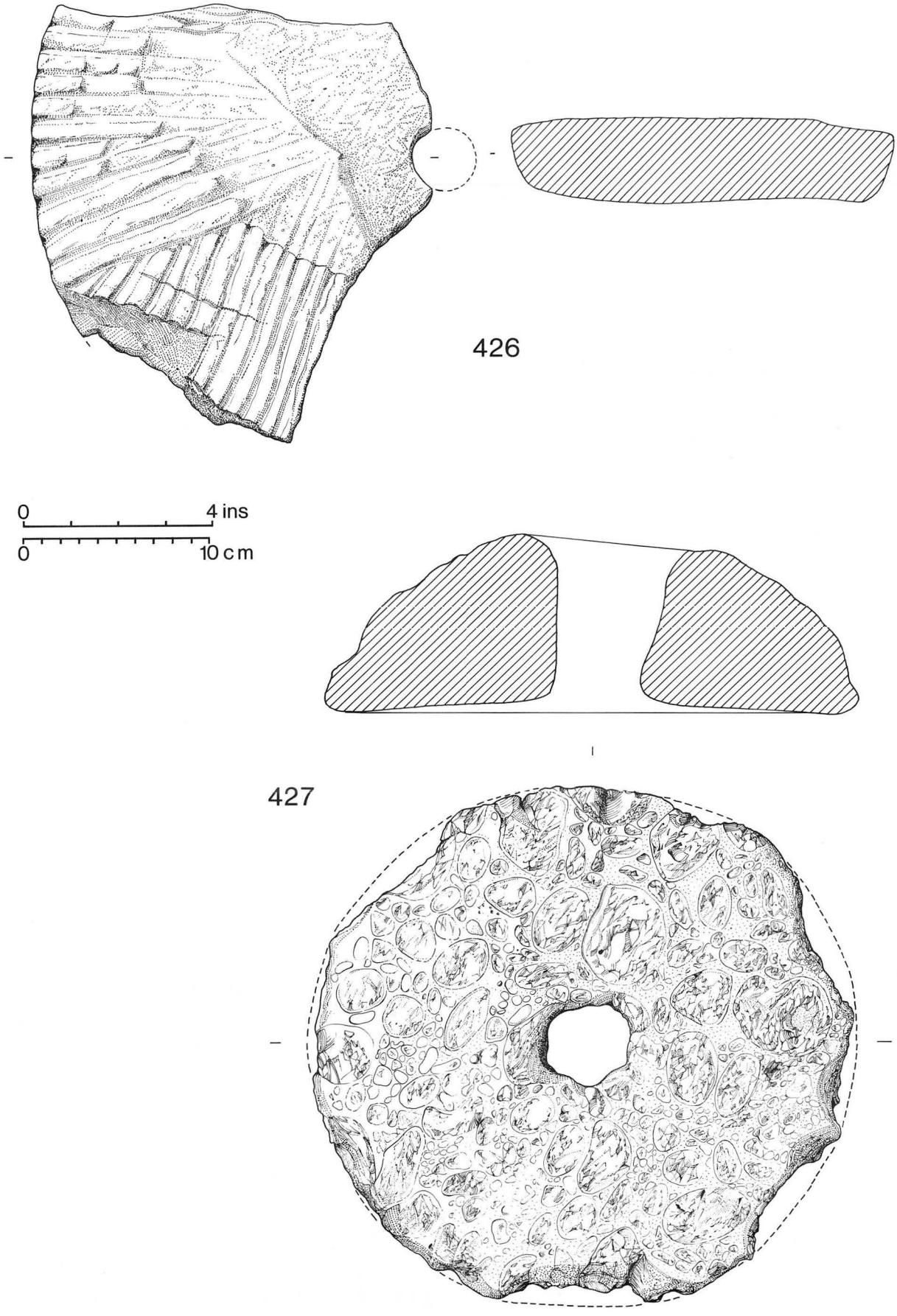


Fig. 37 Querns: No. 426 sandstone; No. 427 Hertfordshire Puddingstone. Scale 1:4.

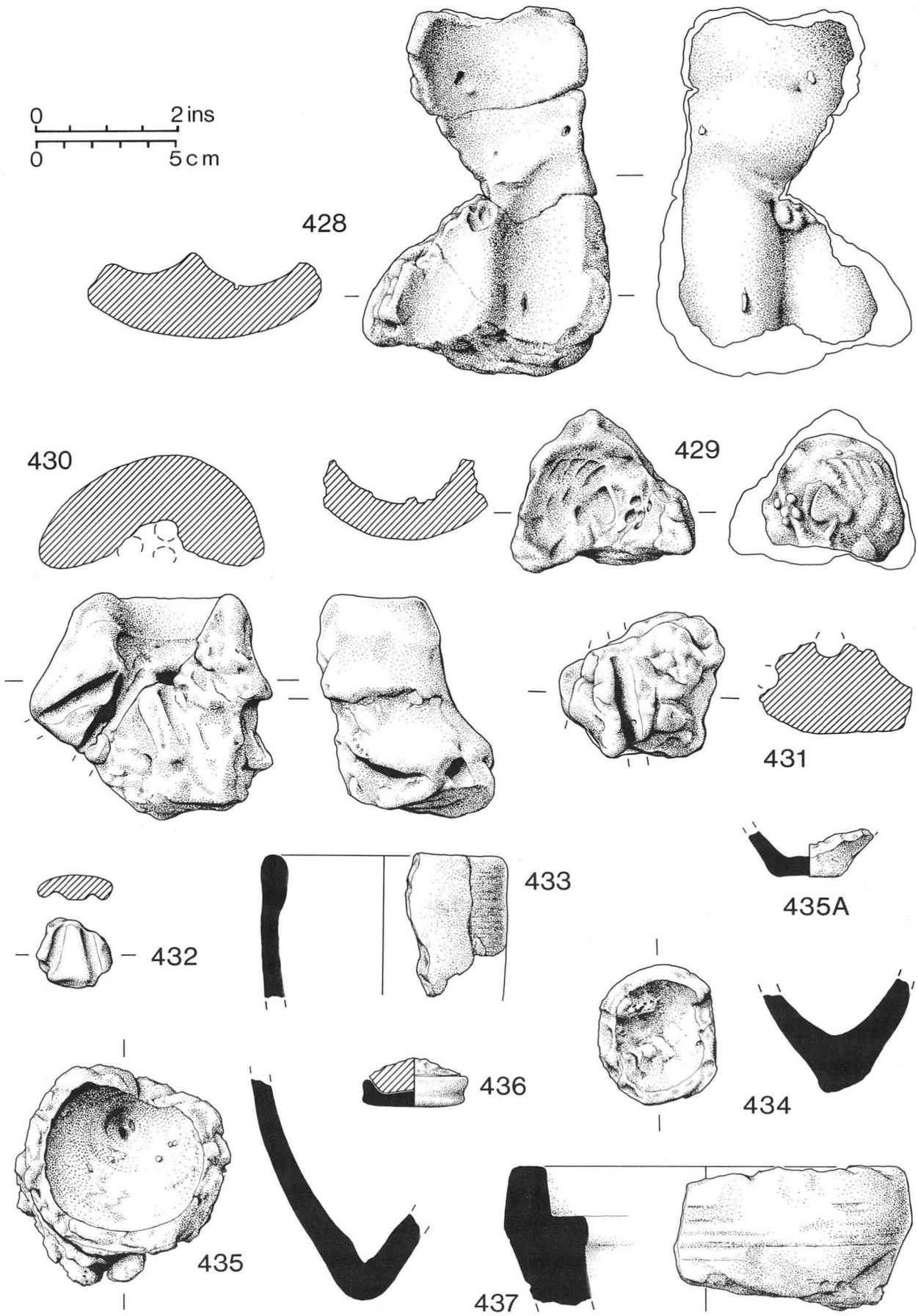


Fig. 38 Moulds, crucibles and other fired clay objects: Nos 428-431 statuette mould; No. 432 mould; Nos 433-5 crucibles; No. 436 pottery container; No. 437 'pipe'. Scale 1:2.

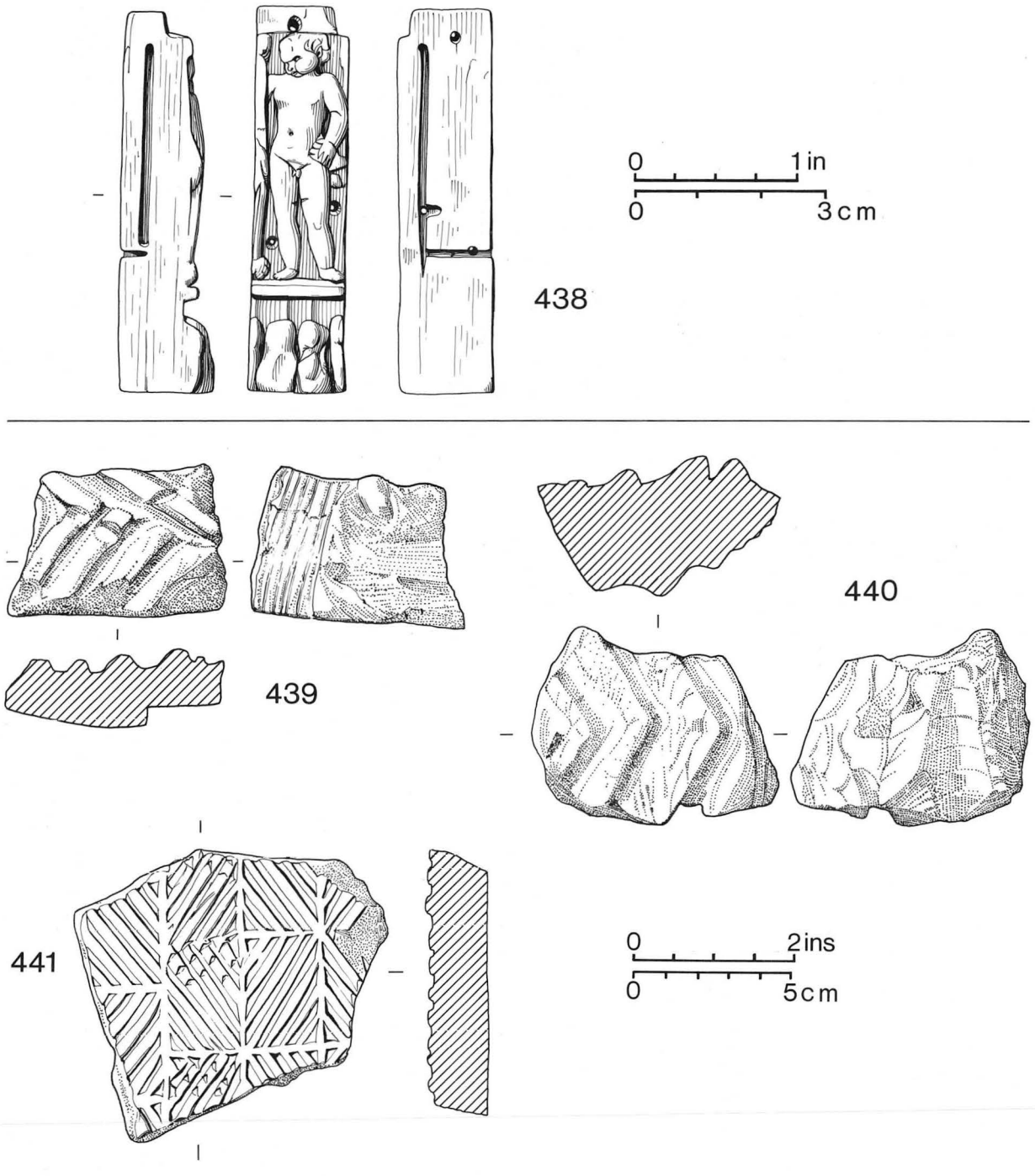


Fig. 39 Ivory, daub and tile: No. 438 ivory casket corner piece (Pl. XI); Nos 439 and 440 burnt daub; No. 441 roller-stamped tile. No. 438 scale 1:1 and 439-441 scale 1:2.

Both of these explanations would seem to be right, for Cupid was frequently conflated with the young Bacchus. Stuveras (1969, 29) suggests that Plato's reflections on Eros as a great and ancient god may have played an important role in identifying him with the image of the Divine Child, *Dionysos Pais*. The iconography is virtually identical with that of a bone carving from Egypt in the Benaki Museum, Athens (Marangou 1976, 68 and 123-6, no. 206, pl. 61a). Also, although it is not positively identified, an ivory in Oxford (Marangou 1976, pl. 60b) shows a youth holding a tambourine and a thyrsus, both suggestive of Bacchus-Dionysos. In addition, the relief may be compared with a bronze statuette from Pompeii, depicting a young Bacchus with a thyrsus (Walters 1915, pl. LIV). Presumably we have here a Graeco-Roman synthesis based on Hellenistic originals. Claw-feet are frequently found on ancient furniture, and were widely employed as terminals on objects of a small sort (Henig 1971). For another ivory corner-post of a casket with claw-feet, see Weitzmann (1972, 7-9, no. 2).

It remains to add that the Gestingthorpe casket fitting is a very important addition to the comparatively small number of ivory carvings from Roman sites in Britain including an ivory plaque from Caerleon showing a draped woman and a child with a basket on his head which may have ornamented the side of a casket (Toynbee 1964, 359, pl. LXXXIIb) and a recent find of an ivory votive from the Great Reservoir at Bath: a semi-circular block with two protuberances on one face, representing breasts (Henig 1984, 151 and 153, pl. 74). *Building 1, yard and gullies, layer 1*

XVI Stamp-impressed Daub (Fig.39)

by Jo Draper

439; 440 Burnt chevron-decorated daub; coarse grey to black fabric with large flint inclusions up to 5mm but mostly smaller: pimply surfaces: impressed chevrons on the front and wood impressions on the reverse. Can be paralleled with burnt daub from Boudiccan or Antonine fires at Verulamium (Waugh and Goodburn 1972, 160-2) where chevrons were found along with other pattens. It is suggested that the patterning may have been stamped or roller-stamped. *Building 1, layer 6*

XVII Roman Tiles (Figs 39-40)

by D.E. Johnston and D.F. Williams

Ten fragments of relief-patterned tiles were submitted for visual identification and for thin-section examination under the petrological microscope. In addition, two samples of plain Roman tile were submitted from the site, one in a red fabric and the other in a white fabric, together with samples of modern red-tile and nineteenth-century white brick, the latter known to have been made locally.

Visual examination showed that the relief-patterned fragments represent different parts of a single die and are from different tiles, some of them bearing double impressions. All the impressions were made by a single roller of die 12 (Group 5, 'Diamond and Lattice') according to the classification of A.W.G. Lowther (1948). The die was in good condition and the impressions crisp and clear. One irregularity on two of the fragments examined, should be noted; at one point the ends of diagonal lines in adjacent panels do not meet exactly. This feature was recorded by Lowther, without comment, at three points on the die.

Lowther recorded four examples of this die in London, none of them in a closely dated context, and no new examples have been reported since. Lowther gave a date bracket of AD 80-150, which cannot be shortened at present for this particular die. New examples of Group 5 confirm this early Roman date (Johnston and Williams 1979, 383). However, die 12 is not necessarily correctly placed in this Group, as the design is based on panels filled with diagonal lines, whereas in other designs of Group 5 the lozenge is the key element.

Four of the relief-patterned tiles were sectioned and all showed frequent inclusions of well-sorted subangular quartz grains, average size 0.05-0.20mm with a scatter of slightly larger grains, flecks of mica, and a little red iron ore. Due to the common nature of these minerals it is not possible to be specific about geological origins on this information alone. However, the size-range of the quartz content in the modern red-tile sample compared favourably with the Roman group; although the content of the modern sample was appreciably higher, it also contained flecks of mica. This may suggest the possibility of a fairly local origin for the Roman material, although a source further afield cannot be ruled out at this stage. Heavy mineral analysis was not attempted as this would have necessitated destroying the patterning on the Roman samples. Interestingly, a thin section of the Roman plain tile showed it to be texturally different from the above samples, for it revealed a clay matrix containing a groundmass of quartz grains 0.05mm and less in size, with a scatter of larger grains, average size 0.30-0.40mm, and a little mica. Further work obviously needs to be done to see if the sample examined is typical of the plain red tile from the site, and is likely to be of local manufacture. The above results from a small sample of Roman material from Gestingthorpe hint at different clay sources being used for relief-patterned and plain tiles.

The London specimens have not been examined, and in view of the uncertainty noted above we cannot say positively whether the maker of the relief-patterned tiles (and his roller) travelled from site to site using the local clays or whether the products were delivered from a single distant site. The possibility of different sources for the plain and relief-patterned tiles adds some slight support for the latter hypothesis.

In thin section the sample of Roman white tile contains a sparse scatter of subangular quartz grains, ranging in size from 0.10-0.60mm, and fragments of limestone. The locally made nineteenth-century white brick is also limestone-rich, and contains a similar size-range of quartz, although in greater proportion. A local origin is, therefore, feasible for the Roman sample.

Illustrated tile

441 Fragment of relief-patterned tile. Seven other fragments unstratified, and two others from Building 4, layer 5 and Building 1, Room 6, stokehole. *Unstratified*

442 Combed box tile. *Building 1, Room 6*

Tiles not illustrated

Slightly dished, roughly finished basically square (*c.* 230mm by 215mm by 35mm thick) tile. Building 2, Room 1, layer 3. Another similar tile from the hypocaust in Building 1, Room 4 survives.

A rectangular tile taken from the walls of Building 1, Room 6. It measures 410mm by 290mm by 40mm thick. One complete unstratified tile is rectangular with one end semi-circular (240mm long overall 80mm of which the curve, 190mm wide and 40mm thick). A fragment of another was also unstratified.

Complete *tegulae* were found in and around Building 1, and from Building 2, layer 5: of the five kept four are red (390-400mm by 290-300mm by 15-20mm thick) and one is white and larger (450mm

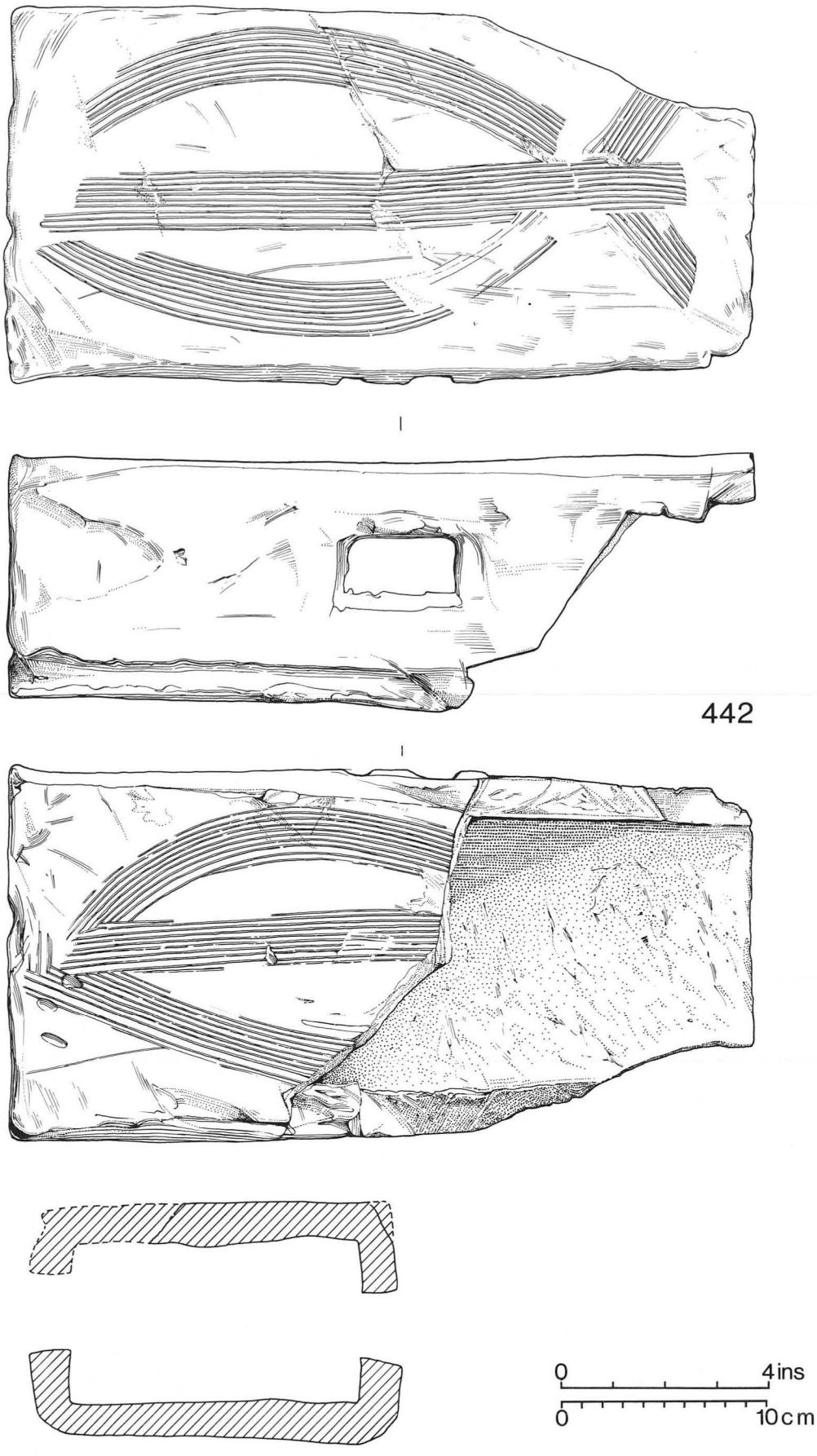
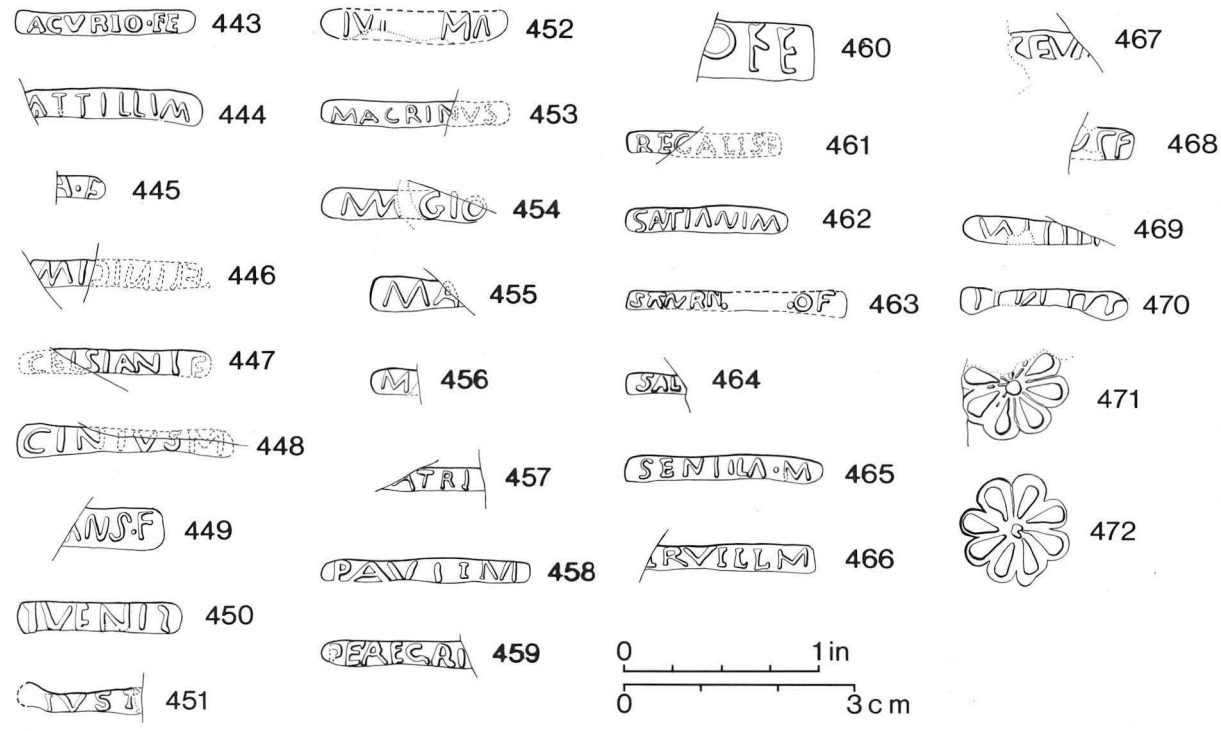


Fig. 40 Tile: No. 442 combed box tile. Scale 1:8.



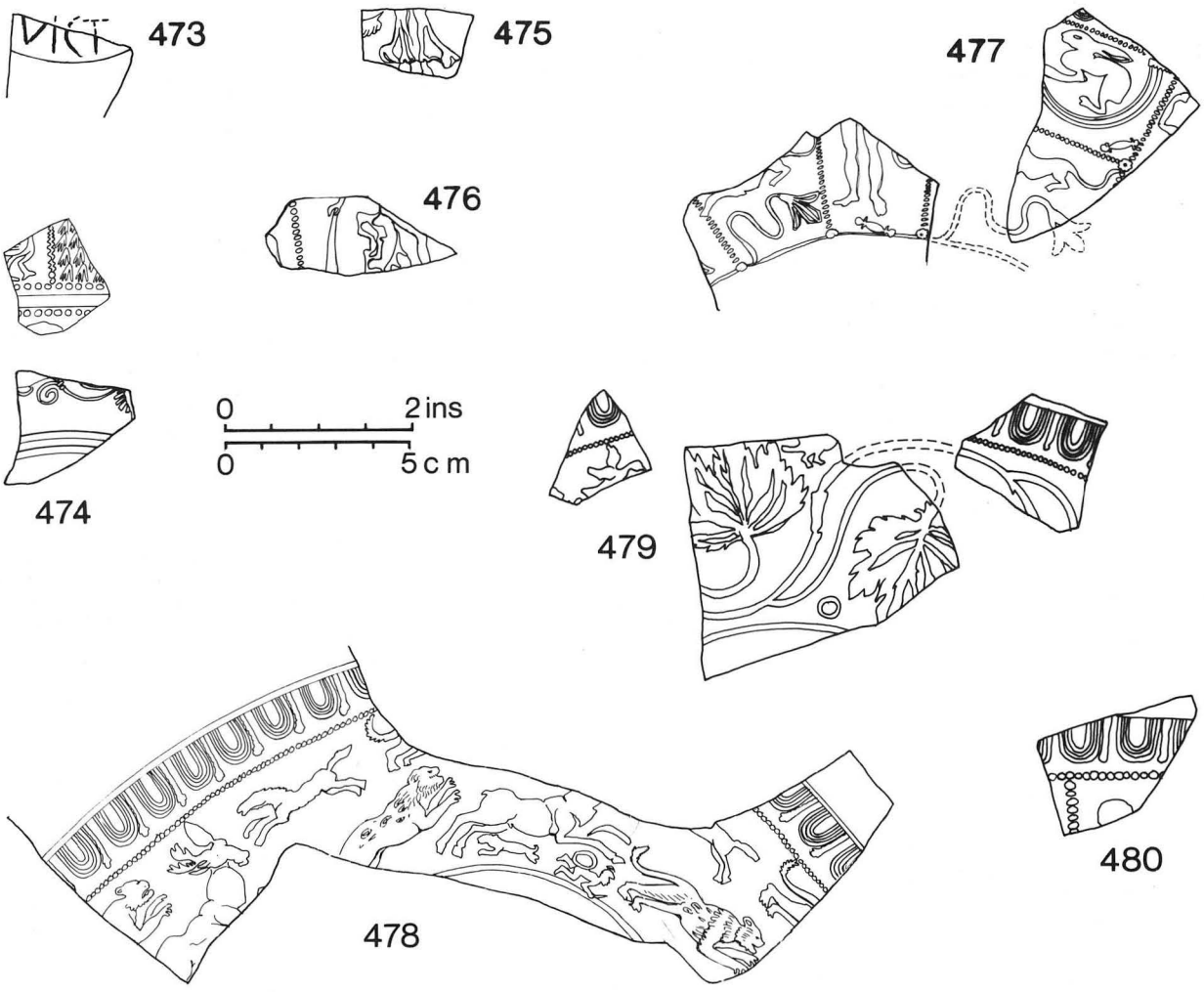


Fig. 41 Samian: Nos 443-459 stamps, scale 1:1; Nos 473-480 decorated samian, scale 1:2.

by 340mm by *c.* 20mm thick). Some of the fragmentary tiles have holes bored into them, and three examples have similar large oval marks made presumably with the fingers (Brodribb 1979). Three complete *imbrices* were also found and measures 390mm, 400mm and 330mm long, 150mm, 180mm across the base, and 90mm, 80mm and 80mm high respectively. Seven tiles have hobnail marks and five or six have animal prints, most possibly dog.

XVIII Samian ware (Figs 41-2)

by Warwick Rodwell

The potters' stamps

Information on die numbers, factories and dates of production has kindly been supplied by Mr B.R. Hartley, in advance of the publication of his *Index of Potters' Stamps on Samian Ware.* All stamps capable of illustration are shown on Fig. 41.

443 ACURIO Die 4a, form 46, stamped ACVRIO.FE. Lezoux, *c.* AD 150-180. *Area 1, layer 1*

444 ATTILLUS v Die 2e, form 33, stamped]ΛTTILLIM. (?) Lezoux, *c.* AD 150-180. *Building 4, layer 5*

445 AUCELLA Die la, form 31, stamped [AVCELL] A·F. Lezoux, *c.* AD 150-180.

446 BELINICCUS i Die lla, form 31, stamped [BELINIC] IM retrograde. Lexoux, *c.* AD 150-180.

447 CELSIANUS Die 8a, form 80, stamped [CE]LSIANIF. Lezoux, *c.* AD 160-195. *Building 4, layer 4*

448 CINTUSMUS i Die 5a, form 38, stamped CINTVSM. Lezoux, *c.* AD 160-190. A worn base, apparently cut down for re-use as a lid.

449 CONSTANS ii Die la, form 79, stamped [CONST]ΛNS·F. Rheinzabern, late second or third century.

450 IUENIS Die 2a, form 80, stamped IVENIƧ. Lezoux, *c.* AD 150-180. *Building 4, layer 4*

451 IUSTUS ii Die 2a, form 31R, stamped IVST[IMA]. Lezoux, *c.* AD 160-190.

452 (?) IUSTUS. Unidentified stamp, excoriated; form 31, apparently stamped IVS[TI(?)]M. Graffito 'III' cut on footring. Central Gaulish, mid to late second century.

453 MACRINUS iii Die 7a, form 33, stamped MACRIN[VS]. Lezoux, *c.* AD 160-195. Burnt black. *Building 1, layer 6*

454 (?) MAGIO. Unidentified stamp, a smudged impression; form Tx or 80, apparently stamped MΛGIO[. Central Gaulish, late second century.

455 MA. . . . Unidentified stamp; form 38. Central Gaulish, late second century.

456 MA. . . . Unidentified stamp; form 33. Central Gaulish, mid or late second century.

457 PATRICIUS ii Die 9a, form 42, stamped [P]ATRI[CIVSF]. Lezoux, *c.* AD 145-175. Slightly burnt.

458 PAUL(L)US v Die 4a, form 31, stamped PAVLIM. Lezoux, *c.* AD 160-190.

459 PEREGRINUS i Die 3a, form 18, stamped PEREGRI[И]. La Graufesenque, *c.* AD 70-90. Partly burnt. *Building 1, layer 6*

460 POLIO ii Die 2a, form 31 or 31R, stamped [POLI] OFE. Rheinzabern, late second or third century.

461 REGALIS i Die 4a, form 18/31, stamped REG[ALIS·F]. Lezoux, *c.* AD 150-180. Slightly discoloured by burning. Graffito 'I' incised on underside of footring.

462 SANTIANUS Die 3a, form 33, stamped SAИTIΛNIM. Lezoux, *c.* AD 150-190. *Building 4, layer 5*

463 SATURNINUS ii Die la, form 33, stamped SΛVRN.[INI].OF. Lezoux, *c.* AD 160-195. Surface find north of carbonised grain spread.

464 SAL. . . . Unidentified stamp, form 31; apparently stamped SAL[. (?) Central Gaulish, late second century.

465 SENILA Die la, form 33, stamped SENILΛ·M. Lezoux, *c.* AD 140-170.

466 SERULLUS Die la, form 33, stamped [SE]RVLLIM. Lezoux, *c.* AD 160-190. *Ditch 1, layer 3*

467 SEVERIANUS ii Die 3a, probably form 31R, stamped SEV[ERIΛNVSF]. Rheinzabern, late second or third century.

468 Unidentified stamp reading]VSF on form 31. (?) Central Gaulish, Antonine.

469 Illiterate stamp reading VVIIII[on form 79 or Tg. Central Gaulish, late Antonine.

170 Illiterate stamp on form 33. Probably East Gaulish and late Antonine. Burnt. *Building 1, layer 6*

471 Rosette stamp on dish, possibly Curle form 23. East Gaulish, late Antonine. *Building 4, layer 5*

472 Rosette stamp on dish, possibly Curle form 23. East Gaulish, late Antonine. Burnt. *Building 1, layer 6*

Not illustrated: Fragmentary rosette stamp on dish of uncertain form. Possibly Curle form 15; thick base, diminished footring. East Gaulish, probably late Antonine.

Graffito

473 Graffito cut after firing on the lower angle of the wall of a form 33. It reads]VICT[and is probably a name in the Victor group. Central Gaulish, Antonine. *Building 4, layer 5*

The decorated ware

474 Form 29. One sherd of upper zone showing a panel with a bird, 0.2250 (Oswald 1937), and one filled with arrows. One sherd of lower zone showing a running scroll. La Graufesenque, *c.* AD 50-65.

475 Form 78. Lower part of figure of Venus, 0.324. La Graufesenque, *c.* AD 70-90.

476 Form 37. Fragment of figure of Hercules sitting on a pile of rocks with hand on club, 0.757. Central Gaulish, Antonine.

477 Form 37. Two sherds of a panelled bowl: large hare in a festoon, 0.2117; small lion to left, generally similar to 0.1519, reserved; standing figure of Venus. The general scheme of decoration is paralleled by the work of Attianus, Drusus ii, etc. Lezoux, *c.* AD 130-160.

478 Form 37. Four sherds of a free-style bowl in the style of Cinnamus: his ovolo 2, lions, horses, deer, pigmies, etc; a common type, cf. Stanfield and Simpson (1958, pl. 163.66). Burnt. Lezoux, *c.* AD 150-180. *Building 1, layer 6*

479 Form 37. Eleven sherds of a bowl decorated with a continuous running scroll with large serrated leaves. Style of Sacer; his ovolo 3. The style is exactly paralleled in Stanfield and Simpson (1958, pl. 83.8). Lezoux, *c.* AD 140-160.

480 Form 37. Panelled bowl with Cinnamus ovolo 1. Lezoux, *c.* AD 150-180.

481 Form 37. Double-bordered ovolo with narrow central projection and tongue to the left; inverted, widely spaced impressions (two sherds). This seems to be as in Ricken (1948, taf. 261.10), which was employed by a series of potters at Rheinzabern, as was the tall frond. Late second or third century.

482 Form 37. Small fragment of a free-style bowl; from Rheinzabern. Dog running to left; traces of a basal wreath. Late second or third century.

483 Form 37. Fifteen sherds of a large but simple panelled bowl apparently embodying only a single-leaf motif; smudged ovolo, double-bordered with tongue to the right (possibly Ricken 1948, taf. 261.6). Probably from Rheinzabern or Trier, third century.

484 Form 37. Eight sherds of a bowl decorated in four horizontal bands, using motifs of the 'erste Sinziger Gruppe' (Fischer 1969). The upper-most contains a double-bordered ovolo with a corded tongue and trifid tip; the second, a row of vertical rope motifs shaped like inverted hockey sticks; the third band contains groups of concentric circles; and the lowest band comprises a series of corded arcades, under each of which hangs a spiral. The vessel is badly burnt and crazed so that nothing can be said about its fabric or original finish. Decorated ware from Sinzig is not common in Britain, and in view of the close proximity of Gestingthorpe to Colchester, the chances that this vessel is

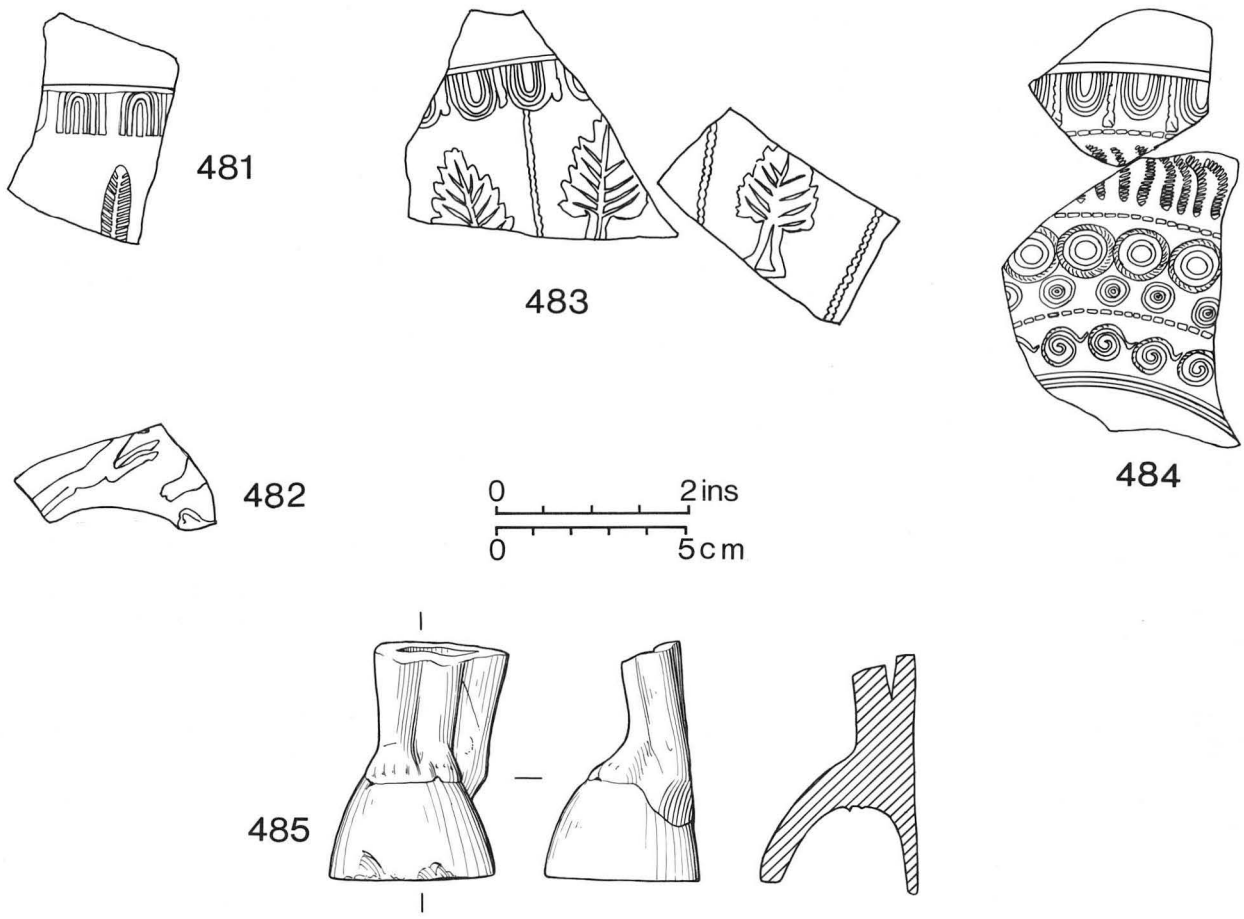


Fig. 42 Samian and pipe-clay: Nos 481-4 decorated samian; No. 485 pipe-clay Venus. Scale 1:2.

Colchester ware should be regarded as at least equal. Indeed, the resemblance to products of the ill-known Colchester Potter C is striking. Although the Gestingthorpe ovolo has not yet been recorded at Colchester, all the other motifs are typical of Potter C (Hull 1963, fig. 42). The coarse square-bead rows occur in all his work, as probably does the rope motif; for the two types of concentric circle see Hull (1963, fig. 42, nos 1 and 14); and also for the arcade with spirals (Hull 1963, fig. 42, nos 7, 8, 12 and 14). Date *c.* AD 160-200. *Building 1, layer 6*

Not illustrated: Panelled bowl, form 37, style of Cinnamus; his ovolo 2, *c.* AD 150-180. Hearth 2. Also eighteen sherds of forms 30 and 37, with fragmentary decoration. Central and East Gaulish, Antonine.

Plain ware found in stratified groups

Building 1

Form 45. Three large sherds including poorly moulded lion's head spout. East Gaulish, late Antonine.

Building 1, layer 6

Potters' stamps: Nos 453, 459, 470 and 472; also part of same vessel as No. 457.

Decorated ware:

Nos 478 and 484.

Plain ware: all burnt black:

Form Ritt. 12. S.G. Flavian.
Form 18 (2 examples) S.G. Flavian.
Form 27. Flavian or Trajanic.
Form 27. Antonine.
(?) Form 42. Antonine.
Form 31. Antonine. With trace of stamp beginning M . . . .
Form 33. Antonine.
Form 38. Antonine.

In several cases there are two or three substantial sherds from one vessel suggesting that the pots were intact when the fire took place. Furthermore, unstratified burnt sherds probably belong to these vessels. It is worth noting that some adjoining sherds are burnt both sides of the fracture on one face of the vessel, but burnt only on one side of the fracture on the other face. This provides clear evidence for suggesting that the vessels were intact when the fire started, but became broken during the conflagration: i.e. these pots were presumably in use in a building which was destroyed by fire. While it is clear that the fire cannot have taken place before the last quarter of the second century, it is instructive to note that some of the pottery in use at that time was a century or more old.

Area 1

Potter's stamp: No. 443

Plain ware:

Form 27. C.G. Trajanic-Hadrianic.
Form 33. C.G. Antonine.

Decorated ware:

Form 37. C.G. Antonine.

Area 2

Form 18/31. Burnt. Probably Trajanic.
Form 31. C.G. Early or mid-Antonine.
Form 33. C.G. Early or mid-Antonine.

Ditch 4

Decorated ware:

Form 37. C.G. Antonine. Rim and ovolo: double-bordered with a beaded tongue and rosette terminal. There are several possible identifications for this in Rogers (1974), of which the best is probably his ovolo B49, attributed to an un-named potter (Rogers 1974, 14).

Plain ware:

Form 27. Burnt. Second century.

Plain ware from unstratified contexts

Curle form 11: three sherds of one vessel. S.G. Flavian.

Form 18: seventeen sherds from nine vessels. S.G. Flavian.

Form 18/31: twenty-two sherds from 10+ vessels; four are E.G., the rest C.G. Mid-second century.

Form 18/31R: four sherds from three vessels. C.G. Hadrianic to early Antonine.

Form 27: fourteen sherds from 10+ different vessels; eleven are S.G., two are C.G., one (?) E.G. The earliest is early Flavian.

Form 31: 123 sherds representing at least sixty vessels. All may be C.G., except four sherds and one illegible fragmentary stamp which are E.G. Antonine, early to late.

Form 31R: thirty-one sherds, representing at least twenty-two vessels; five are E.G., the rest C.G. All Antonine.

Form 32: six sherds of four vessels. E.G. Antonine.

Form 33: ninety-one sherds, probably representing more than fifty vessels. Two are certainly E.G., otherwise C.G. and Antonine; one or two could be Hadrianic. One base has a fragment of a stamp with terminal letter 'O'.

Form 35: one sherd. S.G. Flavian.

Form 36: twelve sherds of 10+ vessels: two S.G. Flavian; one from Les Martres de Veyre, Trajanic-Hadrianic; five C.G., Antonine; four E.G., Antonine.

Form 37: one rim. C.G. Late Antonine.

Form 38: forty-four sherds from at least thirty vessels. Mostly C.G. and all Antonine.

Form 45: twelve sherds from 5+ vessels. Two E.G., the rest C.G. Late Antonine.

Form 46: three sherds, possibly from one vessel. C.G. Late Antonine. Déch. form 72: Rim (?)C.G. Antonine. Base E.G. Antonine.

Form 79: fifteen sherds, probably representing about ten vessels. C.G. Late Antonine.

Form 79R: one sherd. Late Antonine.

Enclosed vessels: fourteen sherds from two plain enclosed vessels, almost certainly Déch. form 72; one probably C.G., the others E.G. Antonine.

Four sherds from two vessels with cut-glass decoration. (?) E.G. Antonine.

Three sherds from an ink-well. C.G. Antonine.

Unidentified: some eighty-five sherds of unidentifiable form, mostly C.G.

Colchester ware

In addition to the decorated bowl, No. 484, which may be Colchester samian, there are six unstratified sherds from two vessels which are almost certainly Colchester ware: one is form 31 (Sb), but without rouletting in the base; and the other is form 38. Mid to late Antonine.

The condition of the samian pottery

Samian pottery collected from rural sites in Essex, especially those on clay soils, is seldom well preserved and Gestingthorpe provides a typical example of the kind of preservation encountered. Some sherds are in mint condition, with sharp fractures and a well preserved gloss: these will have been derived from features with a high humic content. At the other end of the scale there are sherds which are scarcely recognizable as samian at all: practically no trace of the once glossy red surface survives and the fractures are so rounded and smooth that they are indistinguishable from rims and footrings in a purely objective sense. Sherds in this condition are the result of direct contact with the natural clay. The majority of the samian from the site falls between these two extremes, and may be described as poorly preserved through being buried in a clayey soil.

The sharpness of the fractures, the degree of excoriation inside a vessel and the evidence of wear on the footring are all factors which are generally taken into account when considering the length of time for which individual vessels might have been in use, and when weighing the likelihood of residuality in a particular context. None of this can, however, be applied or tested at Gestingthorpe on account of the natural decay of samian in the ground. This problem, which is not perhaps widely enough appreciated, is common to most rural sites in Essex and other counties where heavy clay soils predominate. The alluvium of the Thames-side marshes preserved samian pottery in pristine condition, but the London Clay in the south of the county and the boulder clay over much of the rest of Essex are equally destructive.

When excavating samian it is common to find that sherds have softened through contact with the clay and now have the consistency of a soggy pink biscuit. The trowel may even cut through a sherd, and when lifted out of the ground the sherd will part company with its glossy slip. This remains as a coating on the clay, leaving the sherd featureless. Potters' stamps are frequently lost this way, and in extreme cases relief-moulded decoration will disappear too. During the drying out process clay-damaged samian regains some of its solidity and can be washed with care. Indeed, potters' stamps and intricate decoration can often be saved from total obliteration by allowing sherds to dry slowly but thoroughly; washing should then be in the form of the briefest possible rinse under a running tap.

General comments

As a collection of samian from a rural site in Essex, this material falls generally into line with other assemblages, particularly from villas and smaller sites. The points to note from the Gestingthorpe material may be summarised as follows: first, there is very little decorated ware of any period, and what there is belongs almost exclusively to the second half of the second century. Secondly, there is a large gap in material assignable to the late Flavian, Trajanic and Hadrianic periods. While it is normal for the Trajanic period, especially, to be less well represented than earlier and later periods, the phenomenon is particularly marked at Gestingthorpe. It is also remarkable that only one or two sherds can be attributed to the prolific factory at Les Martres de Veyre. Thirdly, it may be noted that no more than two or three sherds show evidence for having been repaired in antiquity (using lead rivets, straps, etc.) or trimmed down for re-use (as lids, stoppers, counters, etc.). Both these features are frequently to be observed, even in collections much smaller than this. Fourthly, the proportion of East Gaulish ware is generally low for sites in Essex; it is quite common for 10% or more of Antonine wares to be of Rhineland origin.

The above features serve to contrast the samian from Gestingthorpe with that from the 'small towns' of Essex, such as Chelmsford, Wickford and Great Dunmow.

There are several features of a more positive nature to which attention may also be drawn. Gestingthorpe provides another point on the distribution map of Colchester samian, certainly for plain ware, and almost equally certainly for decorated ware. The likelihood that the decorated bowl, No. 484, came direct from Sinzig is not great. The site also provides an example of the destruction of a domestic building by fire in or shortly

after the last quarter of the second century. The samian from late Antonine 'fire groups' in Essex is remarkably consistent and although Gestingthorpe contributes only a relatively small group it fits in well with the other known material (Rodwell 1975a). One difference however between Gestingthorpe and other sites in the group is that the burnt samian includes material of first century date, and serves as a reminder of the very long life which pottery in civilian use could, and frequently did, have (unless two fires are involved, which is less likely here). The phenomenon is well demonstrated at other sites in Essex, such as at Felmongers, Harlow, where a rubbish pit of the mid-second century contained a wide range of pottery and glass, some of it a century old, but all apparently deposited together.

XIX Pipe-clay Venus (Fig. 42)

by Frank Jenkins

485 This is part of a statuette of a free-standing nude female personage, in the act of arranging with her right hand a tress of hair which falls over her shoulder, while she holds in her left hand a *tunica* hanging down by her left leg. This is evidently an inferior copy of the Classical art-type of Venus Anadyomene, hence the personage portrayed by this type of clay statuette is generally assumed to be that goddess.

This statuette was produced in two clay moulds, one for the front and one for the back half. The resultant casts were then luted together while the clay was still plastic, and the two vertical joints were obscured by smoothing the clay over them. The surface of the whole statuette was then burnished. Finally, the figure was mounted on a separately made small, hollow, dome-shaped clay plinth and the joint was obscured by smoothing the clay with the fingers. As is usual with this type, the feet are roughly moulded and the toes are hardly indicated.

The fabric is not the finest quality pipe-clay, but is a well levigated white clay. Lacking any data derived from spectrographical analyses of the clays of the numerous Continental examples for comparison with this fabric, one can only rely upon a visual examination. This suggests that the statuette was made in one of the several *officinae* centred on Moulins-sur-Allier in central Gaul, which specialised in the mass-production of moulded clay statuettes of many types including that under discussion. Natural deposits of white clay of various qualities occur in that part of the valley of the Allier, and were exploited by the statuette industry in Roman times. From what is known of the dating of the industry, a date between AD 120 and 150 for the manufacture of this type is possible, and it was imported into Britain about that time, possibly before AD 150.

One unusual feature is that the top of the underside of the hollow plinth is incised in cursive ligatured lettering with what seems to be a personal name, presumably the name of the one who assembled the statuette after moulding or of the master potter. This may be read as 'LVBRI'. R.P. Wright reads 'LV B' and suggests comparison with Jenkins (1969, 320, no. 37).

This type of clay statuette is frequently found at the sites of temples of the Romano-Celtic type in Gaul. They were also used as offerings to the dead and were placed in domestic shrines. For the religious significance of these statuettes generally identified as of Venus, see Jenkins (1959). It is clear that this type was the most popular of all the clay statuettes imported into Britain and that they had a widespread distribution. *Building 1, yard and gullies, layer 1*

XX The other pottery (Figs 43-45)

by H.S. Toller

A large amount of pottery was recovered during the excavations, but much of it has not been kept. A sample was retained, but it seems likely that Roman grey wares, Iron Age and Saxon wares are under-represented. It cannot now be established whether Iron Age or Saxon wares were present in any quantity. The relative proportion of each ware in the sample probably does not represent that excavated, particularly since the more exotic wares like samian were kept whilst coarse wares were discarded.

Therefore, no quantitative analysis of fabric groups has been attempted. All the pottery which can be provenanced has been illustrated, along with several intrinsically interesting vessels. Unstratified white ware flagons and jars, and grey wares other than those illustrated have not been dealt with here in detail.

This report is divided into four parts; 1: description of the fabric groups and fabric types; 2: catalogue of pottery, summarised at level 4 (DOE 1975); 3: list of pottery groups and their evidence for date; and 4: discussion. References to Cam. type numbers refer to Hull (1963, 178-191).

Fabric groups

Each group is subdivided into types that probably have a common source. Description of each type takes the form:

1. Catalogue numbers of items included.
2. Visual fineness of fabric (very fine, fine, medium, coarse, very coarse); hardness of fabric (soft, soft/hard, hard, very hard); feel of fabric in fracture (smooth, rough, moderately rough, very rough, harsh).
3. Inclusions: frequency, size (fine 0.25mm; medium 0.25-0.50mm; coarse 0.50mm). Black and red inclusions are iron ore unless otherwise stated; white are calcareous.
4. Colour: stated as Munsell colours (Munsell 1975).
5. Comment.

A detailed archive catalogue has been deposited with the site records at Gestingthorpe.

Group A. Late Roman red-slipped ware (LRRSW)

Type 1: Much Hadham product. Nos 494, 507-520, 559.
Oxidised core and surfaces generally (494, 515, 557 reduced core); fine visual appearance; soft, occasionally soft/hard; smooth fracture (508, 518 rough).
Inclusions: abundant-sparse fine black; sparse fine mica (white); abundant moderately fine quartz (including white quartz).
Variable inclusions: sparse fine white, probably calcareous, often only evident after scraping fracture (510, 511, 517, 519, 520); sparse coarse and medium red (516, 518); sparse fine red (520, 494); moderate fine brown grog (519); sparse coarse quartz and coarse white (508).
Visible on surface: sparse medium black (516, 518); sparse coarse red (508); sparse medium red (510, 516); sparse medium brown grog (510); sparse coarse quartz (507, 517, 518); abundant fine mica (512, 518); sparse coarse light and dark brown mineral (519).
Colour: exterior 2.5 YR 5/8-6/8 or 5 YR 7/6 and 7/8 (brick reds), rarely 10R (grey) 5/8 (dark mustard); core 5 YR 7/6, 6/8 and 7/8 (terracotta) reduced 6/1 and 7/1 (grey); interior as exterior; slip 2.5 YR 6/6 and 6/8 (brick reds), rarely 5/2 (pale grey-brown) (burnt?) and 5 YR 7/8 (terracotta). All vessels probably originally slipped; many now weathered. Nos 569, 572, 580, 581, 584, 608, 619, 620, 622 also belong probably to this fabric type.

Type 2: Much Hadham product. No. 514.
Reduced core, oxidised surfaces; fine; hard; smooth.
Inclusions: moderate fine quartz; moderate fine black; abundant fine mica; sparse fine white; sparse coarse brown grog on surface.
Colour: 5 YR 7/8 (terracotta) 6/1 (grey), 7/8. Slip no longer evident.

Type 3: Oxfordshire product. Nos 499, 504.
Oxidised core and surfaces; fine; soft (504), soft/hard (499); smooth.
Inclusions: moderate fine quartz; moderate to sparse fine black; sparse medium and coarse red (10 YR 4/8); sparse fine mica.
Colour: 499; exterior 5 YR 8/4 (pink); core 8/3 (pink); interior 8/4 (pink) (Slip 2.5 YR 4/8 (terracotta)). 504: exterior 5 YR 7/6 (pale terracotta); core 7/4 (pink); interior 7/6 (pale terracotta) (Slip 10 R 5/8 (mustard)).
No. 587 also belongs probably to this type. There are also Oxfordshire mortaria from the site (p. 000).

Types 1 and 2 encompass the fabric range of the output of LRRSW of the Much Hadham kilns (Partridge 1975, 146: unpublished in detail, Hertford Museum). This fabric has yet to be defined in detail for the whole range of output, although a start has been made (Harden and Green 1978: Geddes 1977, 9). It is probable that a certain variety of texture and inclusions should be allowed for and the range of Types 1 and 2 does so. There may prove to be a certain amount of overlap between the fabrics of Much Hadham and Oxfordshire (Young 1977, 123), and also the fabrics of other producers of LRRSW, both known and unknown. Certainly some red-slipped bowls amongst the pottery from the Much Hadham kilns in Hertford Museum are similar to Oxfordshire products; although they may be imports to the site from Oxfordshire, the presumption must be that they are products of the kilns at Much Hadham. Therefore, if there is such an overlap, the attributions of Group A may be questionable.

However, the majority of Type 1 items corresponds with known Much Hadham products in Hertford Museum, and Type 3, presumably an Oxfordshire product, has no parallels there. Type 2 (No. 514) has no known parallel but Much Hadham fabric can be hard and micaceous.

Group B. Slip-coated fine wares, light-coloured core, almost iron-free body.

Type 1: Nene Valley product. Nos 531, 532, 535, 538, 539, 542, 554.
Light core, reduced surfaces; fine visual appearance; soft (531, 554), soft/hard (542) and hard; smooth.
Inclusions: moderate-abundant fine quartz; moderate-abundant fine black; sparse fine mica.
Colour: exterior 5 YR 3/1 and 4/1 (dark greys); core 5 YR 8/1 and 7.5 YR 8/2 (pale stone); interior 5 YR 3/1, 4/1, 4/2 (dark greys), 2.5 YR 4/2 (brown) and 7.5 YR 3/0 (grey).
Nos 577, 579, 583, 589, 596-604, 611, 613, 617, 626, 628 probably also belong to this fabric type.

Type 2: Nene Valley product. Nos 505, 543.
Light core, reduced surfaces, occasionally oxidised internally; fine; soft; smooth.
Inclusions: moderate fine quartz; sparse fine black; sparse fine mica.
Colour: exterior 5 YR 3/1 and 4/1 (dark greys); core 5 YR 8/1 (stone) and 8/4 (pink); (505) interior as exterior, ranges to 2.5 YR 5/4 (reddish brown).
No. 616 probably also belongs to this fabric type.

Type 3: Nene Valley product. No. 547.
Light core, reduced surfaces; fine; hard; smooth.
Inclusions: moderate fine quartz; abundant fine black; sparse fine red.
Colour: exterior 7.5 YR 4/0 (dark grey); core 5 YR 8/1 (stone); interior 5 YR 5/1 (grey).

Type 4: Probable import from lower Rhineland. No. 537.
Light core, reduced surfaces; fine; very hard; smooth.
Inclusions: moderate fine quartz; sparse fine black; sparse fine mica.
Colour: exterior 7.5 YR 4/0 (dark grey); core 7/0 (light grey); interior 4/0 (dark grey).

Type 5: Probable Nene Valley product. No. 533.
Light red core.
Inclusions: abundant fine quartz; sparse fine black; sparse medium quartz; sparse coarse white.
Colour: exterior 5 YR 3/1 (very dark grey); core 7/4 (dark pink); interior 3/4 (dark reddish brown).

Type 6: Probable imports from lower Rhineland. Nos 623, 627.
Light core, reduced surfaces; very fine; hard; smooth.
Inclusions: moderate very fine quartz; sparse fine black.
Colour: core white; surfaces reduced.

Type 7: Nene Valley equivalent to LRRSW/imitation samian. Nos 609, 610.
Light core, oxidised surfaces: oxidised version of Type 1.
Colour: exterior and interior 2.5 YR 5/6 (terracotta).

Types 1, 2 and 3 represent the normal range of fine wares from the Nene Valley (Young 1977, 41). Type 5 (533) is an instance of the light red core fine ware from the same area, discussed herein under Group C in connection with pentice-moulded beakers. These types of beaker were made in the Nene Valley from *c.* AD 250+ along with globular beakers, some fluted and often painted as No. 533. Their fabric can contain sparse coarse white and off-white inclusions, presumably limestone and more noticeable if only moderately hard fired as these beakers often are; and also rarely medium quartz. Type 5 is possibly, but not certainly, a Nene Valley fabric for these reasons. It could have been placed in Group C, but remains in B because of its obvious similarity to No. 542 (Type 1).

Type 6 represents imported fine wares from the lower Rhineland (Anderson 1980, 14-20: AD 120-250) with barbotine decoration of animals and scrolls. It was not studied in detail. It should be combined with Type 4, which is probably a similar import and not a product of the Nene Valley.

Type 7 is the equivalent from the Nene Valley of the late Roman red-slipped ware of the Oxfordshire potteries and elsewhere, although it is referred to usually as an odd type of 'Castor' ware, where that term is still used. It should be considered as another imitation of samian. It is represented here by two bowls, one rounded and one carinated.

Group C. Slip-coated fine-ware, medium to dark-coloured core, body richer in iron than Group B.

Type 1: No. 593.
East Gaulish 'Rhenish' ware (Trier); fine; hard; grey or light red, often with reduced margins; glossy surfaces.

Type 2: No. 590.
Central Gaulish 'Rhenish' ware (Lezoux); fine; soft/hard or hard; pink to light red; glossy surfaces.

Type 3: Colchester product. Nos 549-51.
Oxidised core and surfaces (reduced 551); fine visual appearance; soft (549), soft/hard (551) and hard (550); smooth.
Inclusions: moderate fine quartz; sparse fine black; sparse fine mica. (551 mottled white).
Colour: exterior 7.5 YR 6/4 (light brown) and 2.5 YR 5/6 (terracotta) (reduced 5 YR 4/0 dark grey); core 5 YR 7/6, 7/4 and 6/8 (pale to darker terracotta); interior 5 YR 7/6 (pale terracotta) and 2.5 YR 6/8 (terracotta) (reduced 5 YR 4/1, dark grey).

Type 4: Probably local or Colchester product. No. 548.
Reduced core and surfaces, oxidised margins; coarse visually; hard; rough.
Inclusions: moderate coarse and medium quartz; sparse coarse red and off-white.
Colour: core 5 YR 6/1 (grey); surfaces 5 YR 4/1 (dark grey); margins 5 YR 6/6 (light reddish brown).

Type 5: Probable Colchester product. Nos. 534, 536, 540, 541, 546, 588, 592, 606, 607, 616.
Reduced core and surfaces (534, 540, 546, 588. 606, 607); oxidised core and surfaces (536, 541); oxidised core and reduced surfaces (541,

592, 616); oxidised margins (540, 546). Fine; soft, soft/hard and hard; smooth.
Inclusions: moderate-abundant fine quartz; moderate-abundant fine black; sparse fine mica (all except 536, 540, 588); white (536, 606 only).
Colour: core 5 YR 7/1, 6/1 (light and darker grey), 7/4, 8/2, 8/4 (pinks); surfaces 5 YR 3/1, 4/1 (dark greys), 4/2, 4/3 (dark reddish grey-brown) (internally 2.5 YR 6/6 (pale terracotta) No. 536), margins 5 YR 7/6 (pale terracotta) (540, 546).

The following unstratified items also belong probably to this type: (slipped and/or roughcast) grey/pink core; 576, 591 (part only), red core; 578, 582, 586, 591 (part only), 605, 612, 614, 615, 595; also 624 and 625 with barbotine decoration. Grey/red/grey core: 585, 594.

Under this heading fall a variety of fabric types, all fine and difficult to distinguish except for Type 4 (No. 548). It is probably arbitrary to group them together as will become apparent. Type 1 has been distinguished on account of having sparse fine black inclusions. All three instances of this fabric are probably from Colchester, although the decoration of No. 549 is unknown there and has more in common with Oxfordshire beakers (Young 1977, fig. 55, C29.1). No. 549 may well be such a beaker. Both Nos 550 and 551 fall within the range of Colchester slip-coated fine wares.

It might be useful to attempt a description of Colchester ware at this point. It is visually fine with smooth fracture, and hardness ranging from soft to very hard, mainly soft/hard. Usual inclusions comprise: sparse or very sparse very fine mica; sparse to abundant mainly moderate fine black iron ore; and moderate fine clear and opaque quartz. Medium black iron ore and fine to coarse red iron ore can occur rarely. The chalky boulder clay of the area contains varying quantities of very fine white calcareous inclusions, rarely coarse, which are not often discernible at 25x magnification but give rise to a streaky effect if the fracture is scraped.

Colour of the core ranges from pink (5 YR 8/4) to dark grey (5 YR 4/1) with most common occurrences of grey, pinkish grey and light reddish brown (5 YR 6/1, 7/1-7/4, 6/2-4). It can also be light red and reddish yellow (2.5 YR 6/4-6/8; 5 YR 8/4, 7/6-7/8) with oxidised or reduced surfaces; if the surfaces are reduced, part of the core often is also, giving a red/grey/red or grey/red/grey sandwich. The surfaces are reduced in the main (5 YR 3/1), usually matt, rarely glossy; and rarely more oxidised internally, unlike products of the Nene valley, which are so commonly.

This description is based on a detailed study of the kiln material in progress. (Toller in prep.). It has been shown that there is a certain, small area of overlap in terms of colour, form and fabric between the fine slip wares of the Nene valley and Colchester; especially with beaker forms where the Nene valley fabric tends to be fine. The ramifications of this need not be explored here apart from one aspect: the origin of the pentice-moulded beakers of Type 5, Nos 534, 536, 540 and 541. The other illustrated item of Type 5, No. 546, can safely be attributed to Colchester, albeit with an unusual rim form only paralleled there in Kiln 32 (Hull 1963, fig. 97, 4).

Pentice-moulded beakers were made at Colchester in Kiln 25 along with 'melon' beakers, globular beakers with definite shoulders and vertical scored girth indents (Cam. 395 and 409; Hull 1963, 155, fig. 89, 3 and 4). They were slip-coated (Hull 1958, 249) and they were of 'a delicate red ware with a purplish colour-coat' (Anon 1953). Unfortunately the original wasters have not yet been traced, but to judge from similar examples of this form in Colchester Museum, the fabric would be similar to that described here as Type 5.

Both forms were also made in the Nene valley at Water Newton (Peterborough Museum, WA304 and 309). The fabric is similar to the Colchester fabric with generally not less than moderate fine black, more red, up to medium size and coarser white and off-white inclusions, if any. Core colour ranges 5 YR 8/2-4 (pinks), 7/3-6 (pink to pale terracotta); surface colour ranges 5 YR 3/1, 7.5 YR 3/0 (dark greys) to 2.5 YR 3/4 (dark reddish brown) and 4/4 (reddish brown) although the internal surface is often less reduced 5 YR 5/4 (reddish brown), 2.5 YR 4/2 (browny pink), 5/4 (reddish brown) and 5/6 (terracotta).

Type 5 can be ascribed tentatively to Colchester for the moment. However, as with all attributions this must remain an hypothesis to be tested in the future. There are probably unknown sources to be allowed for, as in the south-west of Britain (Bidwell 1979, 216, no. 212). Type 3 is of unknown origin, probably local.

Group D. Light coloured unslipped wares

Type 1: Nene Valley parchment ware with dark paint decoration. No. 618.

The collection includes two rim sherds of a parchment ware bowl, decorated with dark brown-to-grey paint: an imitation of Drag. 36 with the rim curved over and slightly beaded. Such a form is not present amongst the parchment ware repertoires of the potteries of the Oxford region and the New Forest; nor without an internal lip bead among the northern potteries (Gillam 1970, Types 298 and 299). A similar form, although with a cream slip, was made at Pakenham, Suffolk (Smedley and Owles 1961, fig. 38 d and e). The most probable known source is Water Newton where painted parchment wares of this form were produced from *c.* AD 230+ (Gillam 1970, 216: B. Hartley pers. comm.).

Type 2: White wares probably from Colchester and elsewhere. No. 629.

A significant quantity of unstratified white ware flagons and jars is present in the collection but is not dealt with here.

Group E. West Stow and allied wares

Type 1: No. 558.
Fine; soft/hard; smooth.
Inclusions: moderate fine quartz; sparse fine black.
Colour: core 5 YR 7/1 (pale grey); surfaces 5 YR 6/1, 7/1 (pale greys); burnished and micaceous externally.

Types 2 and 3: Nos 561 and 560.
Apparently both the same fabric.
Very fine; soft and soapy; smooth.
Inclusions: sparse fine quartz; abundant fine black; very sparse fine mica.
Colour: core and surfaces 5 YR 4/1 (dark grey); burnished surfaces externally.

Type 1 (No. 558) has been identified as West Stow ware with stamp R2.6 and dated to AD 75-110 (Rodwell 1978, 251-6, Group 4B, fig. 7.12, no. 79, 294). Type 2 (No. 561) has been placed within a sub-group of probable West Stow wares with stamp R3.1 of the same date (Rodwell 1978, 251-6, Group 4C, fig. 7.13, no. 97, 285). Type 3 (No. 560), has not been reported previously. In fabric it is similar to No. 561, but the fragmentary rosette stamp is comparable to those of a group of the early second century assigned tentatively to Colchester or Much Hadham (Rodwell 1978, 248, fig. 7.19, no. 1).

Group F. Grey wares

Type 1: Local coarse ware. Nos 489, 490, 493, 502, 506, 528 and 530.
Reduced core and surfaces: medium fineness; hard; rough fracture.
Inclusions: moderate-abundant fine black; abundant-moderate fine quartz; sparse-moderate medium quartz (506, 528); moderate-sparse fine white (528, 493, 502, 489); sparse-medium coarse white (489, 530); sparse mica (528, 530, 493, 502).
Colour: core 5 YR 3/1, 4/1 (dark grey), 6/1 (grey) and 7/1 (light grey), 10 YR 7/2 (528) (light grey); surfaces 5 YR 5/1 (grey), 3/1 (dark grey), 10 YR 6/2 (grey), 5 YR 6/3 (light reddish brown) (slightly micaceous surfaces 490); margins 5 YR 7/4 (pink) (506).

Type 2: Local coarse ware. Nos 486, 487, 492, 529.
Reduced core (oxidised 492), reduced surfaces; medium fineness; hard; rough fracture.
Inclusions: abundant fine quartz; moderate medium quartz (492, 529); sparse fine black; sparse fine white (486, 487).
Colour: core 5 YR 5/1 (grey), 6/1 (light grey), 5 YR 7/6 (pale terracotta) (492); surfaces 5 YR 4/1 (dark grey), 6/1 (grey), 7/1 (light grey), 6/3 (light reddish brown) (internally 492).

Type 3: Local coarse ware. Nos 491, 500, 501.
Reduced core and surfaces; medium fineness; hard or hard/soft and soapy (500); very rough and rough (501).
Inclusions: moderate fine quartz; moderate-sparse medium quartz; sparse coarse quartz; moderate-sparse fine black; sparse medium white (501); sparse fine white (491); sparse coarse white (501); sparse mica (501); sparse coarse grey grog (500, 501).
Colour: core 5 YR 6/1 (grey), 10 YR 6/1 (grey), 5 YR 7/2 (pink); surfaces 5 YR 6/1 (grey), 5/4 (reddish brown), 10 YR 5/2 (greyish brown).

Type 4: Local coarse ware. Nos 488, 495, 496, 497.
Oxidised core (reduced 488), reduced surfaces; medium fineness; hard and soft/hard (497); rough and smooth (497).
Inclusions: moderate-sparse fine quartz; abundant-moderate fine black; sparse medium fine white; sparse mica; surfaces can be micaceous (497); sparse coarse quartz (488).
Colour: core 5 YR 6/6, 6/1 (grey) (488) or 7.5 YR 6/4 (light brown) (497); surfaces 7.5 YR 3/0-4/0 (dark grey), 5 YR 6/1 (grey); margins 2.5 YR 5/0 (grey), 6/2-3 (pinks) (495 and 496).

Type 5: Probable local coarse ware. No. 503.
Reduced core and surfaces; medium fineness; hard; rough.
Inclusions: moderate fine quartz; moderate medium quartz; moderate fine black; very sparse quartz; very sparse coarse flint.
Colour: core and surfaces 5 YR 6/1 (grey).

Type 6: Finer coarse ware, unknown source. No. 498.
Reduced core and surfaces; fine visual appearance; soft/hard; rough.
Inclusions: abundant fine quartz; sparse fine black; sparse fine mica.
Colour: core 7.5 YR 6/0 (grey); surfaces 7.5 YR 4/0-5/0 (grey to dark grey).

Type 7: Finer coarse ware, probably from Much Hadham. No. 523.
Reduced core and surfaces, oxidised margins; medium fineness; soft/hard.
Inclusions: abundant fine quartz; sparse medium and coarse quartz; abundant fine black; abundant fine mica; sparse coarse red and white.

Type 8: Coarse ware, unknown source (Romano-Saxon). No. 555.
Reduced core and surfaces, oxidised margins; fine; hard; moderately rough.
Inclusions: abundant fine quartz; moderate medium white; very sparse coarse flint (occasionally very large).
Colour: core 2.5 YR 6/0 (grey); surfaces 7.5 YR 4/0 (dark grey); margins 2.5 YR 6/4 (pink).

Type 9: Coarse ware, unknown source (Romano-Saxon). No. 556.
Reduced core and surfaces; medium fineness; hard; smooth.
Inclusions: moderate fine quartz; sparse medium and coarse quartz; sparse fine black; sparse fine white.
Colour: core 5 YR 6/3 (light reddish brown); surfaces 2.5 YR 4/0 (dark grey), 5 YR 5/1 (grey).

Type 10: Finer coarse ware, possibly from Much Hadham (Romano-Saxon). No. 562.
Reduced core and surfaces; fine; soft/hard; smooth.
Inclusions: moderate fine quartz; moderate fine black; sparse fine mica; sparse medium white; sparse medium black.
Colour: core 5 YR 6/1 (grey); surfaces 5 YR 5/1 (grey).

Type 11: Finer coarse ware, unknown source. Nos 544, 545.
Oxidised core and surfaces; fine visual appearance; soft/hard; smooth and soapy.
Inclusions: moderate fine quartz; moderate fine black; sparse medium-coarse white and off-white (angular); sparse medium black.
Colour: core 5 YR 7/6 (reddish yellow); surfaces 5 YR 6/4-7/4 (reddish yellow).

Type 12: Very coarse ware, probably local. No. 524.
Oxidised core, reduced surfaces; coarse visually; hard; rough.
Inclusions: sparse medium black; sparse medium white.
Colour: core 2.5 YR 6/6 (pale terracotta); surfaces 2.5 YR 4/0 (dark grey).

'Romano-Saxon' pottery

Five unstratified sherds with 'Romano-Saxon' decoration have been included in Fabrics A1 (Nos 557 and 559), F8, F9 and F10 (Nos 555, 556 and 562). It is now apparent that such pottery was produced by several Romano-British pottery industries from *c.* AD 250 onwards without any direct stylistic link with Anglo-Saxon decorative tradition (Gillam 1979, 108-113). Those in Fabric A1 belong to the oxidised fabric attributed to East Anglia (Roberts 1982, 235) and can be linked here with other pottery produced at Much Hadham. Although a reduced core (No. 557) may not be typical of such pottery (Roberts 1982, 235), there can be no doubt that such colour was a minor but regular feature of the Much Hadham output.

The grey ware items are discussed subsequently. They may be Much Hadham products, but they are coarser than the fine grey wares produced there. Nos 556 and 562 are comparable with the normal East Anglian range, but No. 555 is exceptional. Dr Myres comments 'Nos 556, 557, 559, 562 are quite usual forms in Essex. No. 555 is an oddity and I know of no close parallels, but the bundles of vertical and horizontal lines giving a basketry effect are a definitely Anglo-Saxon feature and bring it clearly into the Romano-Saxon class; so do the worm-like 'S' forms, though I have never seen that motif used in quite that way.'

Grey wares

Only those items which can be linked with a context have been illustrated from the sample of the large amount that must have been recovered during the excavations. These have been grouped within twelve fabric types. They include the three grey ware sherds decorated in a 'Romano-Saxon' style (Nos 555, 556 and 562).

Types 1-4, of moderate coarseness and approximately similar constitution, can be grouped together. They probably represent locally produced coarse wares, although the herringbone decoration of Type 4 (Nos 495-7) may indicate a source at Colchester (Hull 1963, 167, fig. 94, nos 41 and 42). No connection need be sought for them with any BB2 industries (Williams 1977, 195-9). None need be dated earlier than AD 200. They comprise a standard range of later Roman coarse wares with undercut rim jars, plain and bead-rimmed bowls, and storage jars. Two jar bases of Type 1 (Nos 493 and 528) bear the graffito 'MAP' (Wright 1970, 314); these two graffiti are almost certainly in the same hand.

Type 5 only differs from 1-4 in having very sparse coarse flint inclusions, which is probably not significant. Type 6 is finer than the preceding, a bag-shaped beaker with a small bead rim with groove below, and decoration below a shoulder groove of burnished bands alternating with bands of curvilinear scored grooves.

Type 12 is represented by one incipient flanged rim bowl (No. 524) which is an oddity; it would be comparable with Type 3 were it not even coarser. The fabrics of the storage jars of Type 3 are themselves slightly dissimilar and both Types 3 and 12 may represent the lowest quality of local coarse wares. Romano-Saxon grey wares (Types 8-10) have been stated (Roberts 1982, 235) to be produced at Much Hadham (Partridge 1975, 146; unpublished in detail, Hertford Museum), Harston (Goodburn 1978, 447: Pullinger and Young 1982, 5, fig. 15.39), Inworth (D.R. Wilson 1972, 333: Going and Rodwell forthcoming) and Orsett (Rodwell 1975b, 31). The evidence for the last two locations is slender and indicates probably at most that such decoration formed a minor element of many later coarse ware production sites, often localised. Comparison was made at Gestingthorpe with a bowl sherd of fine grey ware from Much Hadham in order to assess the likelihood of any of the Romano-Saxon grey wares from Gestingthorpe having been imported from there. Only two types bore even rough comparison—Type 10 (No. 562) and Type 7, a standard later Roman copy of Dragendorff 36, a common form in later Roman red-slipped ware. Types 8 and 9 do not compare with the fine Much Hadham fabric (see p. 86-7). However, the range of quality in the Much Hadham grey wares means that Types 8 and 9 could have originated from there (C. Going pers. comm.).

Type 11, a fairly fine soapy ware, brown rather than grey, is probably an early Roman local oddity; no parallels are known.

Group G. Late Iron Age and early Roman shell-tempered ware No. 570.

Very coarse; soft/hard; very rough and laminar with shell temper; vesiculated on surfaces.
Inclusions: not recorded in detail.
Colour: core 5 YR 6/1 (grey); surfaces 5 YR 3 L/1 (very dark grey).

This fabric is typical of one common in the area of the Thames estuary for much of the first century AD; mainly jars with rim as No. 570 or with rim rebated for lid (Drury and Rodwell 1973, 79-80, 82, fig. 16, Fabric A, Kiln 1). Unfortunately, it cannot be dated accurately before or after AD 43 and this date probably had little importance here; No. 570 need not be dated earlier than AD 40-70 (Marsh and Tyers 1978, 556, fig. 234, Type IIA 10).

Group H. Late Roman shell-gritted ware
Nos 521, 522, 567, 568.

Medium-fine, laminar visual appearance; soft; soapy; harsh fracture.
Inclusions: abundant-medium fine quartz; abundant-sparse medium quartz; sparse coarse quartz; abundant fine black; sparse coarse white; sparse coarse flint; abundant-moderate coarse shell (up to 4 x 3mm).
Colour: core 5 YR 6/2 (pinkish grey), 3/1 (dark grey); surfaces 5 YR 7/3-4/1 (pink to dark grey), 5/4 (reddish-brown) (internal 7/3 (pink), 5/4 (dark pink).

This common late Roman coarse ware is probably under-represented here; examples of only three types survive (Sanders 1973, Forms 1A, 5C, and 6). It was manufactured in the south Midlands and elsewhere in south-east Britain.

Group I. 'Mayen' late Roman gritted ware
Nos 563, 564, 565, and 566.

Very coarse, heavily gritted, laminar visually; hard; harsh.
Inclusions: many coarse fragments of stone, up to 1 mm diameter: not recorded in detail.
Colour: core 10 YR 6/2 (greyish brown), 7/1-2 (light grey); surfaces 5 YR 6/2 (pinkish grey), 10 YR 6/3 (pale brown), 7/3 (very pale brown), (internally 5YR 5/2 (reddish grey), 10 YR 7/2, 8/3 (stone)).

In the original publication of this ware, one type of lid-seated jar from Gestingthorpe was noted (Fulford and Bird 1975, 176). In fact there are three varieties of lid-seated jar (Nos 563, 564 and 566) and one bowl (No. 565) present amongst the unstratified material; one (No. 566) is moderately distorted around the rim and might be called a waster. However, since a Continental source is assumed for this ware, it must be an instance of a marketed waster, rather than evidence of manufacture in Britain. Purchasers of these imported pots must have paid scant regard to the quality of the product.

The fabric appears to correspond with Fabric 1 (Fulford and Bird 1975, 173) rather than 2. It is not a stoneware, although it can be very hard, and it is noticeably laminar in fracture with abundant coarse inclusions protruding from the surface of the pot.

Group J. Handmade Saxon or Iron Age coarse ware
No. 571.

Coarse visually; soft/hard; soapy; rough.
Inclusions: not fully recorded; sand tempered with moderate vesiculations from organic temper.
Colour: core 5 YR 6/1 (grey); surfaces 5 YR 3/1 (very dark grey).

This small coarse vessel is the only possible example of Saxon pottery from the site. In itself, it cannot be taken as a definite indication of Saxon occupation. It may belong to the late Iron Age. Such fabrics occurred in the Iron Age at Winklebury, Hants, where Fabric Groups 5 (grass-tempered), 6 (shell) and 3 (flint and brown limonite) comprise 0.6, 4.5 and 39% in weight respectively of total pottery (Smith 1977, 89-90); and at Little Waltham (Drury 1978, 58, Fabric H, fig. 42, 16).

Group K. Very coarse ware
Nos 525, 526, 527.

Very coarse visual appearance; hard/soft to hard; very rough.
Inclusions: abundant fine and medium quartz; sparse coarse quartz; sparse very coarse sub-angular red (10 R 4/8) up to 2 x 2mm; moderate fine black; sparse fine mica; sparse medium white (No. 525).
Colour: core 2.5 YR 6/0 (grey), 6/6 (terracotta), 5 YR 7/6 (reddish yellow); surfaces 2.5 YR 5/6, 6/6, 6/8 (terracottas).

All three items have been finished by burnishing. No. 526 is irregularly facetted as if smoothed with a flat tool; No. 525 is burnished vertically on foot and stem, horizontally on bowl; and No. 527 has wipe marks converging on the spout externally and similar irregularly concentric marks inside.

No. 527, the funnel, is probably intact, although there is a possibility that part of the spout has been lost. No. 525 is slightly distorted; it was probably a lamp. No. 526 has slight sooting internally beneath the rim; there is no indication of the form of the lower body nor of function as a crucible. It may have been another lamp.

Group L. Early Roman coarse wares
Nos 552, 553.

Medium fine visually; hard; rough fracture.
Inclusions: abundant medium quartz; sparse coarse quartz; red/brown grog; flint; white; bright red angular mineral (No. 553).

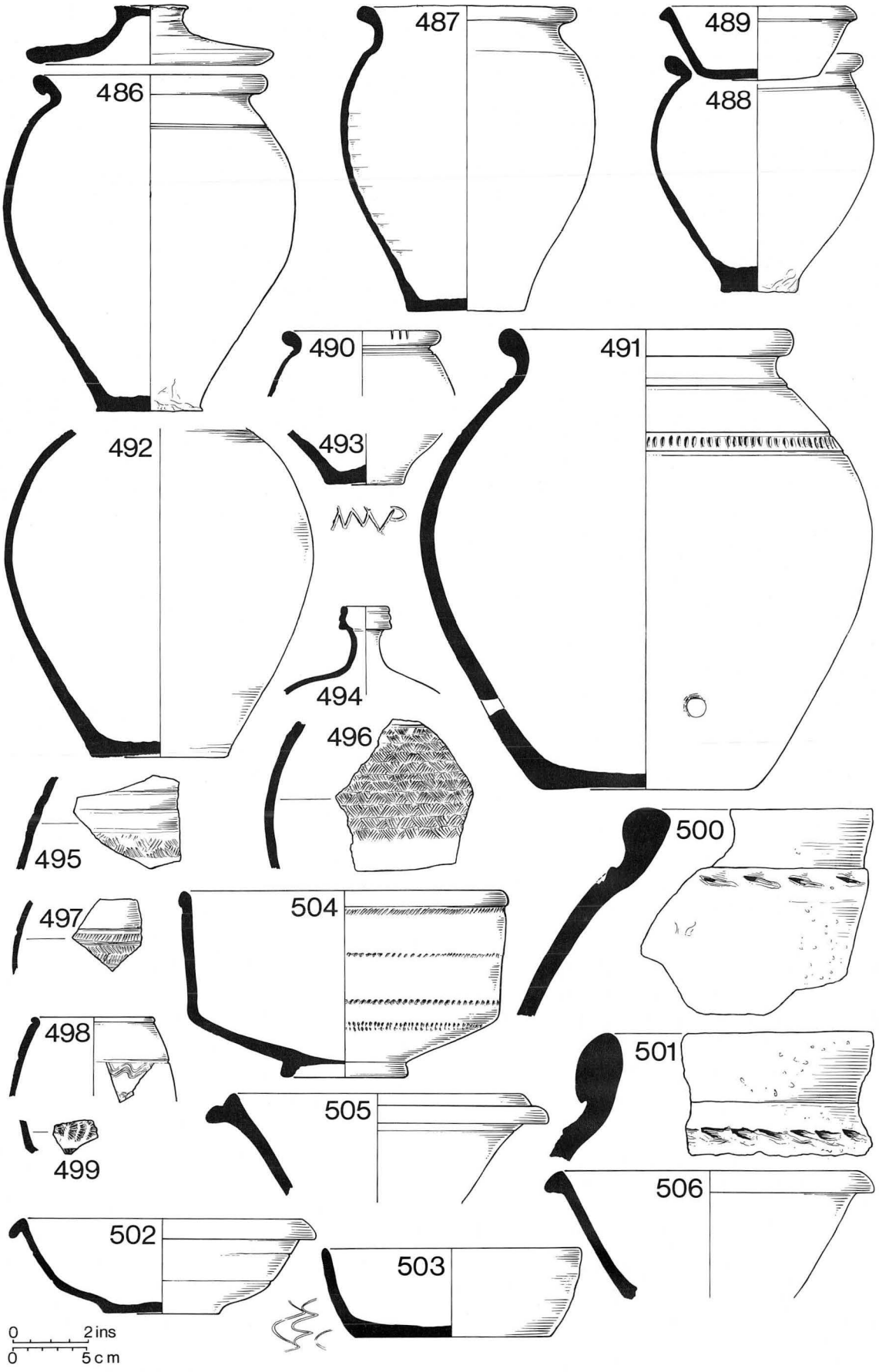


Fig. 43 Pottery: Nos 486-506. All scale 1:4, apart from the graffito No. 493 which is scale 1:2.

Colour: core 2.5 YR 6/0 (grey); surfaces 7.5 YR 5/2, 5/4 (browns) (internally 7.5 YR 6/2 (pinkish grey), 4/4 (brown)).

Cordoned, necked jars as Nos 552 and 553 are well fired early Roman copies of late Iron Age forms and can date as late as *c.* AD 70 but may well be earlier (Marsh and Tyers 1978, 565, Forms IIN and IIP; AD 43-70: Hawkes and Hull 1947, 259, pl. 75; Cam. 218, Periods 1 to 6, AD 10 to 65+).

Catalogue of pottery

Each entry takes the form: Catalogue number; fabric group and type; source. Comments and/or parallels in brackets.

MH = Much Hadham; NV = Nene Valley; Colch = Colchester.

Building 1

Room 7: layer 2

486 F2: local: AD 150+, probably not later than *c.* AD 325 (C. Going pers. comm.: Cam. 268: Hull 1958, fig. 69, nos 123 and 124).

487 F2: local: as No. 486, 3rd century.

Room 9: layer 2

488 F4: local: as No. 486, poss. originally burnished, probably not later than *c.* AD 320-25 (C. Going pers. comm.).

489 F1: local: partially burnished, 3rd century (Cam. 38).

Room 8: layer 2

490 F1: local: as No. 486, three grooves scored across rim.

Room 6: layer 1

491 F3: local: AD 250-400 (Cam. 280).

Building 2

Room 2: layer 4

492 F2: local: at least four shoulder grooves.

Layer 7

493 F1: local: rough wire-cut base with graffito 'MAP' (see No. 528).

Building 4

Layer 1

494 A1: MH: AD 240+ (Cam. 365: Hull 1958, fig. 62, nos 37 and 38).

495 F4: ?local: AD 225, 260-300+ (Hull 1963, 167, fig. 94, nos 41 and 42: Hull 1958, fig. 71, no. 148).

496 F4: ?local: as No. 495.

497 F4: ?local: as No. 495.

498 F6: Source unknown: horizontal burnished bands and scored decoration; no parallels known.

Layer 4

499 A3: Oxford: AD 340-400 stamped carinated bowl (Young 1977, 132, as C73, etc.).

Layer 5

500 F3: Local: later 4th century type of Cam. 273 (C. Going pers. comm.: Cotton 1958, fig. 95.4, 5).

501 F3: local: as No. 500.

502 F1: ?local: not datable, slightly burnished (Cam. 310).

503 F5: ?local: horizontal burnished bands, base scored internally, AD 120-400 (Cam. 40: Jones and Rodwell 1973, 22: Gillam 1970, 75-7).

Hearth 2

504 A3: Oxford: AD 300-400 (Young 1977, 166, C81).

505 B2: NV: AD 300-400 (Cam. 305: Hartley 1960, fig. 4, 16: M.G. Wilson 1972, Ver. 1194, 1206, 1225-6).

506 F1: ?local: burnished, poss. slipped (Cam. 38: Jones and Rodwell 1973, 22).

507-513 A1: MH: No. 509 only burnished, AD 350+ ((Geddes 1977, Type 17.1); and M.G. Wilson 1972, Ver. 1235 (Nos 507, 509, 510): Geddes 1977, Type 17.4; and Ver. 1231 (No. 513): Geddes 1977, Type 9; and Ver. 1244 (No. 508)).

514 A2: MH: late 4th century (Geddes 1977, Type 2).

515-9 A1: MH: late 4th century (Geddes 1977, Type 7 (No. 519): Geddes 1977, 8 (No. 515)): AD 310-315 (M.G. Wilson 1972, Ver. 1150 (No. 518)).

520 A1: MH: burnished, ?funnel-necked beaker.

521-2 H: late Roman shell-gritted ware: AD 310/315+ (Sanders 1973, Form 1A: M.G. Wilson 1972, Ver. 1159 and 1160).

523 F7: ?MH grey ware: 4th century (Cam. 317: as Young 1977, C47, O44).

524 F12: ?local: burnished or possibly slipped.

Ditch 1

Layer 2

525-7 L: ?local: undatable very coarse funnel and lamps.

528 F1: local: jar base with graffito 'MAP' (see No. 493).

529 F2: local.

Layer 4

530 F1: local: as No. 503 (Cam. 40).

Ditch 3

531 B1: NV: barbotined bag-shaped beaker, AD 190-250 (as Cam. 391 and 392: Anderson 1980, fig. 15.2).

532 B1: NV: probably barbotined flagon.

533 B5: NV: circular fluted beaker with paint circles similar to Ver. 1131 (M.G. Wilson 1972, 350); such beakers probably start *c.* AD 250 (Hartley 1960, 20), perhaps earlier, and continue to AD 325+.

Gully 3

534 C5: Colch: AD 270-345+ (Young 1977, C23: M.G. Wilson 1972, 348, Ver. 1117: Fulford 1975, 310, Type 15).

535 B1: NV: *c.* AD 180-400 (Cam. 308: Hartley 1960, 25, fig. 4, 18).

536 C5: Colch: as No. 534.

537 B4: prob. Cologne: AD 150-250 (Anderson 1980, fig. 8, 5).

538 B1: NV: AD 190-250 (Anderson 1980, fig. 15.2 with cornice rim).

539 B1: NV: 4th century but not datable accurately.

540-1 C5: Colch: as No. 534.

542 B1: NV: *c.* AD 250-325+, similar to No. 533.

543 B2: NV: AD 225-300 (Gillam 1970, Form 53).

544-5 F11: ?local.

546 C5: Colch: bead rim Cam. 392 (Hull 1963, fig. 97, 4).

547 B3: NV: AD 180-240+ (Gillam 1970, Form 80: Anderson 1980, 40, fig. 15.3), may have continued later (M.G. Wilson 1972, 356, Ver. 1205).

548 C4: ?local: horizontal red bands in slip on neck.

549 C3: ?Oxford or ?Colch: AD 270-360, weathered, slip uncertain, comb stamped in scored flutes (as Young 1977, C29).

550 C3: prob. Colch: bag-shaped beaker (as Cam. 391 and 392).

551 C3: prob. Colch: (Cam. 392 variant).

South of carbonised grain spread

552-3 L: local: AD 43-70, burnished externally.

Area 3

554 B1: NV: AD 275-400 (Hartley 1960, 26, fig. 4.9).

Area 1

555 F8: ?local: rough surfaces, S-stamped sherd.

Unstratified

556 F9: ?MH: burnished ext. (as Roberts 1982, Types A14 and A19).

557 A1: MH: burnished ext. (as Roberts 1982, Types A14 and A19).

558 E1: West Stow: burnished ext. (same pot as Rodwell 1978, 254, 284, fig. 7.12, no. 79).

559 A1: MH.

560 E3: prob. West Stow: (stamp as Rodwell 1978, 276, fig. 8.19, no. 1).

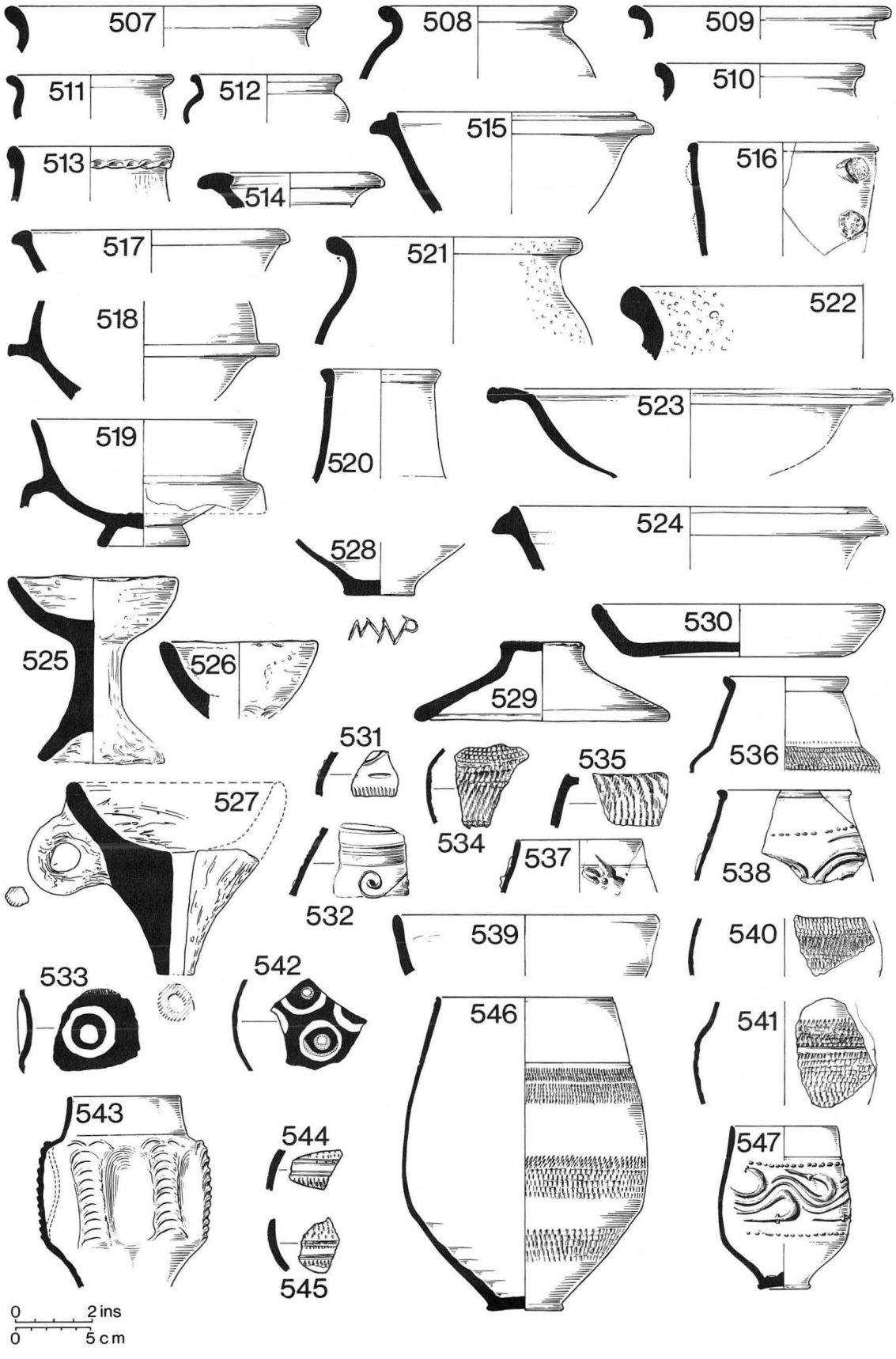


Fig. 44 Pottery: Nos 507-547. All scale 1:4, apart from the graffito No. 528 which is scale 1:2.

561 E2: prob. Colch. or MH: (same sherd as Rodwell 1978, 285, fig. 7.13, no. 97).

562 F10: ?MH: burnished ext. (as Roberts 1982, A10).

563 I: Mayen: (as Fulford and Bird 1975, fig. 1, 3).

564 I: Mayen: (as Fulford and Bird 1975, fig. 1, 4).

565 I: Mayen: *c.* 220 mm diameter (as Fulford and Bird 1975, fig. 1, 8).

566 I: Mayen: as No. 564.

567 H: LRSGW: (Sanders 1973, Form 6).

568 H: LRSGW: (Sanders 1973, Form 5C).

569 Prob. A1: MH: plain-rimmed cup (as Young 1977, C88).

570 G: Prob. local: Late Iron Age or early Roman *c.* 205 mm diameter (Marsh and Tyers 1978, fig. 234, IA10).

571 J: Prob. local: Saxon hand-made: poss. Iron Age.

572 Prob. A1: MH: Chris Going writes 'Sherd of a small round-bodied cup in a fine reddish orange fabric, probably from the Hadham kilns. A graffito scratched on the base after firing resembles a 'Chi Rho' monogram. Examination of the 'Rho', however, suggests its resemblance is coincidental, and was caused by accidental scratches and blemishes on the base. The graffito is thus probably an ownership mark.'

For Nos 573-575, which are mortaria, see p. 96. Nos 576-635 are not illustrated, and only No. 588 is stratified.

576 Prob. C5: Colch: slipped bag-shaped beakers.

577 Prob. B1: NV: Cam. 308 lid: see No. 628.

578 Prob. C5: Colch: roughcast and slipped bag-shaped beakers.

579 Prob. B1: NV: slipped Cam. 40.

580 Prob. A1: MH: Dragendorff 36-type bowl (as Young 1977, C49).

581 Prob. A1: MH: wall sherds, prob. flagon.

582 Prob. C5: Colch: as No. 583.

583 Prob. B1: NV: globular beaker body sherds (as Hartley 1960, fig. 5, no. 6: rouletted only).

584 Prob. A1: MH: flagon base.

585 Prob. C5: Colch: two slipped cornice rims (Cam. 391: as Anderson 1980, 9, Type 1).

586 Prob. C5: Colch: as No. 546.

587 Prob. A3: Oxford: pedestal bowl base as No. 504.

588 Prob. C5: Colch: 4th century AD: rim as Cam. 402 and 403 (Hull 1963, fig. 107). *Gully 3*

589 Prob. B1: NV: slipped beaker body sherds.

590 C2: Lezoux 'Rhenish' beaker body sherds.

591 Prob. C5: Colch: slipped beaker body sherds.

592 C5: Colch: bag-shaped beaker body sherds with scaled decoration (as Hull 1963, fig. 96, no. 3: and Smedley and Owles 1961, fig. 41, g).

593 C1: Trier: Cam. 342 (fluted) (Hull 1963, fig. 106).

594 Prob. C5: Colch: slipped beaker base (as Hull 1963, fig. 89, no. 3).

595 Prob. C5: Colch: globular beaker with pinched rim (as Hull 1963, fig. 89, no. 4; 'melon beaker').

596 Prob. B1: NV: bowl, painted: body sherds.

597 Prob. B1: NV: flagon or jar: body sherd.

598 Prob. B1: NV: beakers, painted: body sherd.

599 Prob. B1: NV: beakers, paint/barbotine: body sherds.

600 Prob. B1: NV: beaker, paint lattice: body sherds.

601 Prob. B1: NV: painted globular beaker (as May 1916, 125, pl. 44, Type 91 (decoration only)).

602 Prob. B1: NV: globular beaker with paint scroll (as Hartley 1960, fig. 4, no. 6).

603 Prob. B1: NV: slipped bead-rimmed painted bowl (as Hartley 1960, fig. 3, no. 6).

604 Prob. B1: NV: beaker bases as No. 607 (as Hull 1963, fig. 89, nos 3 and 4).

605 Prob. C5: Colch: bases as Nos 606 and 607.

606 C5: Colch: slipped, slightly beaded base (Cam. 391 or 392: as Anderson 1980, fig. 14, no. 1).

607 C5: Colch: slipped, stubby, rough cylindrical base (as Hull 1963, fig. 57, no. 7).

608 Prob. A1: MH: bowl with pedestal base (as Young 1977, C71).

609 B7: NV: bead rim bowl (as Young 1977, C69 (painted)).

610 B7: NV: as No. 603 but oxidised surfaces.

611 Prob. B1: NV: as No. 610.

612 Prob. C5: Colch: roughcast slipped Cam. 391 (as Anderson 1980, fig. 13, no. 1).

613 Prob. B1: NV: body sherds, multiple band-rouletted beaker.

614 Prob. C5: Colch: multiple band-rouletted beaker (Cam. 391: as Hull 1963, fig. 58, no. 8).

615 Prob. C5: Colch: Cam. 392 as No. 614.

616 B2: NV: Cam. 392 as No. 615.

617 Prob. B1: NV: slipped flanged pie dish (as Hartley 1960, fig. 4, no. 16).

618 D1: NV: Dragendorff 36-type bowl, painted parchment, not slipped (as Hartley 1970, fig. 3, no. 7).

619 Prob. A1: MH: ring-mouth flagon as No. 494.

620 Prob. A1: MH: cupped-disc mouth flagon, two handles (as Hull 1958, fig. 62, no. 47).

621 Prob. A1: MH: corrugated rim jar as No. 513.

622 Prob. A1: MH: facetted bead-rim beaker as No. 520.

623 Prob. B6: prob. Cologne: beaker body sherds decorated with barbotine animals.

624 Prob. C5: Colch: barbotine animals as No. 623; incl. long-snouted dog.

625 Prob. C5: Colch: barbotine scroll (as Hartley 1960, fig. 4, no. 6 (scroll only)).

626 Prob. B1: NV: as No. 623; barbotine scroll.

627 B6: Prob. Cologne: as No. 623: barbotine scroll.

628 Prob. B1: NV: Cam. 308; as No. 535.

629 D2: white ware flagons and jars.

630 F: grey wares.

Dating of groups

Building 1

Second phase floor (layer 2, Rooms 7, 8 and 9)

Cam. 268 jars probably do not run much beyond *c.* AD 325 (Going 1984, 48). The bead-rimmed dish (No. 488) is probably no later than *c.* AD 230-50. This group of coarse wares is probably datable to *c.* AD 220-60 (Nos 486-490: C. Going pers. comm.).

Destruction level (Room 6, layer 1)

No. 491 can be dated to AD 250-400 and is compatible with a fourth-century date for this level.

Building 2

Neither No. 492 or No. 493 can be dated closely typologically (AD 175+), but the correspondence of fabric with Nos 486-490 above might be taken to indicate a third-century date for these pots and the activities of the potter with graffito 'MAP' (Nos 493 and 528).

Building 4

Layer 2—post-AD 240 (No. 494), but need be no later than AD 300 (perhaps 270-300).

Layer 4—post-AD 340 (No. 499: Young 1977, 132).

Layer 5—later fourth century (No. 500).

Hearth 2—late Roman red-slipped wares (Nos 504, 507-519) (Geddes 1977, Types 2, 3, 7, 8, 9, 17: Young 1977, 166, C81); late Roman shell-gritted ware (Nos 521 and 522) (M.G. Wilson 1972, Ver. 1159 and 1160); and

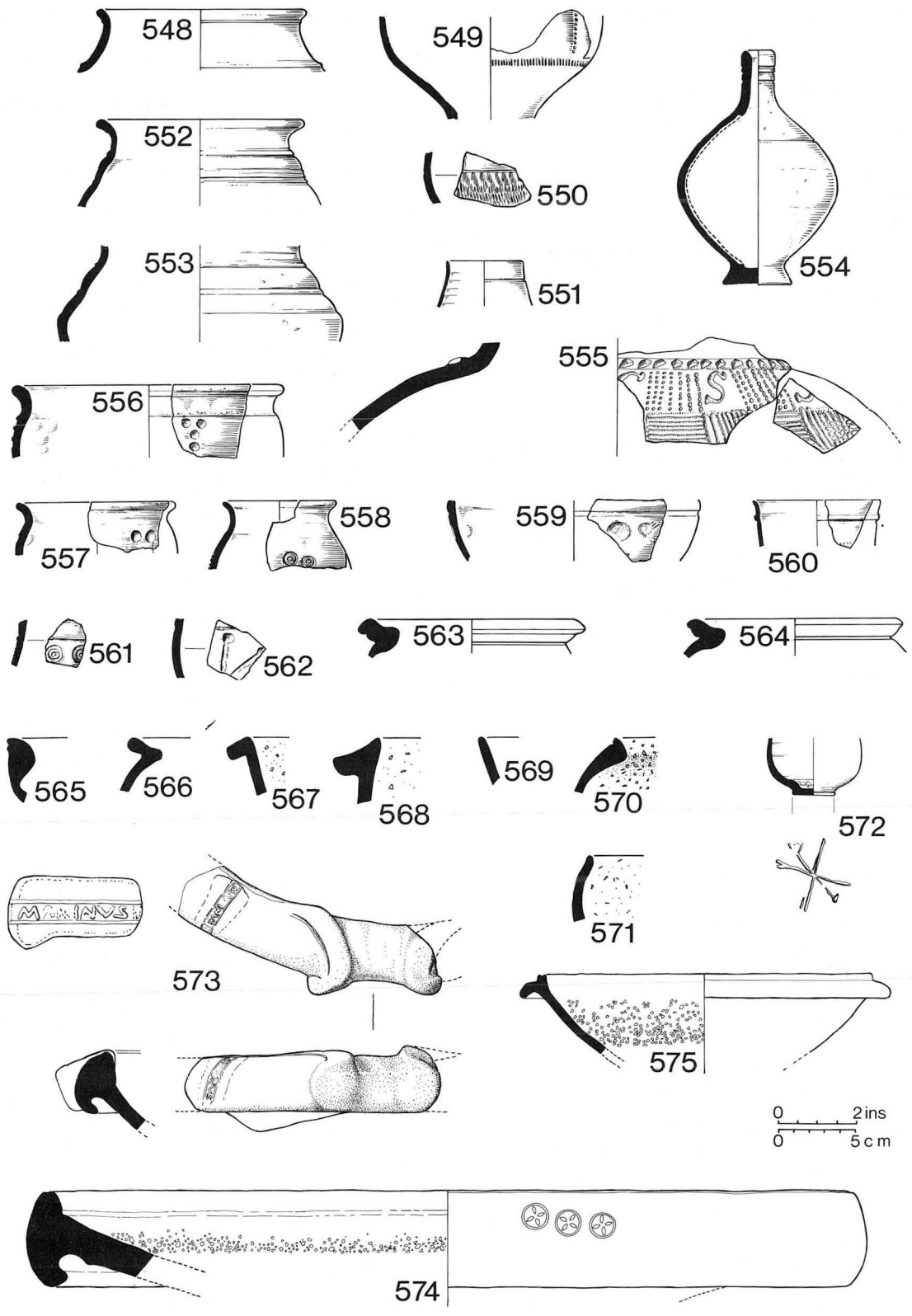


Fig. 45 Pottery: Nos 548-575. All scale 1:4, apart from the graffito No. 572 and the mortarium stamp No. 573 which are scale 1:2.

light-coloured core slipped wares from the Nene Valley (No. 505) indicate a date of AD 300+. The currency of these types throughout the fourth century and their parallels in Theodosian or later levels in the Verulamium theatre (Geddes 1977) suggest a later fourth century date for this hearth.

Ditch 1
If the graffito jar (No. 528) is comparable with Nos 486-490 on fabric grounds the same remarks apply here as for Building 2: otherwise late second century.

Ditch 3
c. AD 250+ (No. 533); need not be later than AD 250.

Gully 3
AD 270+ (No. 549), probably post-AD 300 (No. 588).

Discussion
There is little that can usefully be added to the description and catalogue. Any inferences from the incomplete sample must be unreliable. The absence of early Roman pottery in any quantity need not be taken to indicate lack of occupation of the site then; however, the wealth of later material probably does reflect greater activity in the third and fourth centuries. There is also a quantity of second-century material to reinforce other evidence for activity during that period.

XXI Mortaria (Fig. 45)
by Katharine F. Hartley

Summary table (Number of sherds in brackets)

?Colchester, but nearby sources in Essex possible. Fabrics A-H

c. AD 100-160	(Hull 1963, fig. 68, no. 3: approximate to Hull 1958, fig. 41, no. 11). (2)
c. AD 130-170	(Hull 1963, fig. 64, no. 10; fig. 94, no. 46). (2)
c. AD 160-200	Stamp of Martinus II (illus. as No. 573). (1)
c. AD 170-260	Collared mortaria (similar to Hull 1963, fig. 87, nos 1-4). Early examples can be stamped. (5)
c. AD 170-260	Wall-sided mortaria (similar to Hull 1963, fig. 5, no. 10; fig. 64, nos 3-6; fig. 65, nos 11-12). Early examples can be stamped. (8)
c. AD 200-280	Collared mortaria (Hull 1963, fig. 87, no. 13; fig. 98, nos 2-3). Stamped one illus. as No. 574, Fig. 45. (16)
c. AD 260-300	Uncommon, reeded, wall-sided mortarium (Hull 1963, fig. 100, 1-3). (1)
c. AD 200-300	Flanged mortaria of uncommon type (Hull 1963, fig. 89, 15; fig. 98, 5). (6)
c. AD 200-300	Uncommon, flanged mortarium (Hull 1963, fig. 68, no. 20). (1)

Essex or Suffolk. Fabric I (reduced)

c. AD 250-400+	Body sherds from two mortaria. From Area 2. (2)

Verulamium region. Fabric J

c. AD 140-200	(M.G. Wilson 1972, fig. 121, no. 778). (1)

Castor-Stibbington area of the lower Nene Valley. Fabrics K and L

c. AD 250-400+	Reeded, hammerhead mortaria. (6)
c. AD 300-400+	Reeded, hammerhead mortaria. (2)

Much Hadham, Herts. Fabric M

c. AD 250-400+	Colour-coated, imitation Dragendorff 45. (2)

Oxford region. Fabrics N, O and P

c. AD 240-300	(Young 1977, M17 and M18). (3)
c. AD 240-400+	(Young1977, variants of M22). One illus. as No. 575). (18)
c. AD 240-400+	(Young 1977, WC4.1). (1)
c. AD 300-400+	(Young 1977, C100). (3)

Illustrated mortaria

573 Fabric A, Colchester *c.* AD 160-200. Generally similar to Hull (1963, fig. 8, no. 3); stamped by MARTINVS II from a die similar to Hull (1963, fig. 60, no. 6). *Building 4, layer 5*

574 Fabric B, probably Colchester *c.* AD 170-260. Closely similar to Hull (1963, fig. 98, no. 3). The three circular motifs impressed on the collar are close to the spout and would be balanced by three others on the other side of the spout. These 'stamps' are decorative and not intended as a substitute for the potter's name although instances are known in south-west England of single circular stamps being so used. Only a very small number of mortaria made at Colchester were decorated in a similar way to this (mostly those made by Cunopectus), but it is a much commoner feature of mortaria made in the workshops at or near Oxford in the third and fourth centuries.

575 Fabric P, Oxford region *c.* AD 240-400+. (Young 1977, M22, but no close parallel).

Mortarium fabrics

Fabrics produced in East Anglia: A-G, probably at Colchester

A. Fine-textured, very slightly brownish cream fabric with a little quartz and red-brown tempering and flint with perhaps a little quartz trituration grit.

B. Soft, fine-textured, drab, greyish cream fabric, tempered with flint and quartz grit; trituration grit mostly flint with a little quartz.

C. As B, but cream in colour.

D. As B, but slightly yellowish cream.

E. As B, but pale brownish cream.

F. Cream fabric sometimes with pink core; similar to Fabrics A-E, but with notably more quartz tempering.

G. As Fabrics A-F, but a deep brownish cream in colour; very occasional chalk particle in tempering.

H. Slightly sandy, orange-brown fabric with greyish brown core and a little quartz and flint tempering; no trituration grit survives. ?Essex.

I. A reduced fabric, nearly black in colour with a very little fine quartz tempering and occasional chalk particle; transparent and whitish, quartz trituration grit with occasional flint grit.

Fabrics A-G are basically similar with slight differences in colour, some of which might result from differences in firing. Slightly differing fabrics were produced at Colchester at different periods in any case, so there is no reason why these fabrics could not be attributed to Colchester, but closely similar fabrics were also produced in small workshops in other parts of Essex and East Anglia. The position of Gestingthorpe, plus the fact that most of the mortaria can be readily paralleled at Colchester, suggests that most of the mortaria in these fabrics were made there. Fabric H is certainly from some small Essex workshop.

Mortaria in reduced fabrics like Fabric I were made in small local workshops, probably throughout East Anglia, in the period *c.* AD 250-400; they are virtually unknown outside East Anglia.

Fabrics produced at workshops outside East Anglia

J. Probably Verulamium region (including kilns at Verulamium, Brockley Hill and Radlett). A granular, pink-brown fabric, heavily tempered

with quartz grit: Nos 41-42 in the archive; probably one vessel, appears to be mostly reduced, but this will be accidental; flint and red-brown trituration grit.

K. Castor-Stibbington area of the lower Nene Valley. Hard, but slightly sandy cream fabric, sometimes with pink core or pink surface, and sometimes with brownish slip; a little quartz and red-brown tempering; black ironstone trituration grit.

L. Castor-Stibbington area of the lower Nene Valley. A hard, brown-buff fabric with a little black ironstone and red-brown tempering; black ironstone trituration grit.

M. Much Hadham, Herts. Hard, fine-textured but more granular than Fabric N, sometimes with purplish-grey core, and red-brown slip; trituration grit composed of flint and milky and pinkish quartz grit.

N. Dorchester, Baldon, etc. Oxford region. Soft, fine-textured, orange-brown fabric, occasionally with grey core; white slip; transparent, pink and brown quartz trituration grit.

O. Dorchester, Baldon, etc. Oxford region. As N but with red-brown, samian-like slip.

P. Cowley, Headington, Sandford, etc. Oxford region. Slightly sandy, off-white fabric occasionally with pink core and the same very distinctive transparent, pinkish and brownish quartz trituration grit as Fabrics N and O.

General comments

Fragments of at least eighty mortaria were examined. The summary table indicates the basic types represented, their sources and dates. Their overall date stretches from the first half of the second century into the fourth century, the vast bulk probably belonging to the third and fourth centuries. The practice of stamping mortaria was still common at Colchester in the period AD 170-200 and the presence of only one stamp suggests that few are earlier than AD 200.

Up to the mid-third century virtually all supplies of mortaria at Gestingthorpe were purchased locally, probably mainly from the Colchester workshops. There is little doubt that production at Colchester diminished after *c.* AD 270 and it is difficult to say how much, if any, production of mortaria continued in the fourth century, though there was certainly some production in small workshops in East Anglia. The mortaria at Gestingthorpe reflect this situation, for thirty-five of the thirty-six mortaria from sources outside East Anglia (43.7% of the total) fall within the period AD 240-400+; only one mortarium can be attributed to outside sources in the period AD 100-240.

XXII Roman amphorae

by Chris Going

Four sherds from different amphorae were preserved for study. Unfortunately, sherds lacking typological features had been discarded. The material is effectively unstratified and so dating is external. No sherds are illustrated.

A. Sherd including a handle stump and part of the carination from a Dressel 1B, in Peacock's Fabric Group 1 (Peacock 1971, 164). I am indebted to Dr David Williams for confirming by petrological analysis the fabric identification.

B-C. Two incomplete, abraded handles from Dressel 20 amphorae. Both are in a buff, sandy fabric with sparse-moderate mica flakes, of probably southern Spanish origin. One of the handles appears to have been sawn off. Presumably it was not necessary for the secondary purpose to which the amphora was put.

D. Cream slipped, pointed rim sherd in a fine pinkish buff fabric with a pale grey core and sparse, fine mica inclusions, probably of southern Spanish origin. The type resembles a Dressel 20.

Little can be said on the basis of this material. The Dressel 1B sherd is a fortunate discovery. As site finds, they are undoubtedly commoner than published distribution maps suggest (e.g. Rodwell 1976, 239, fig. 18). This vessel type was probably not imported into Britain after the late Augustan period, and other finds from the site could suggest that an Iron Age settlement lies in the immediate vicinity.

The Dressel 20 sherds are ubiquitous site finds of the first and, particularly, second centuries AD. The examples noted above are not closely datable.

XXIII Textile impressions (Pl. XI)

by Elisabeth Crowfoot

One curved fragment of pottery, two areas of impressions made by contact with textile, 7 x 22mm and 6 x 10mm overall. The larger impression is very clear, the smaller faint, but both are of the same textile, a half-basket weave (extended tabby), i.e. with single threads, probably in the warp, and paired threads thrown together in the weft, thread count 7/8 prs per cm, the latter count taken as 4 prs on 5mm. Despite the clarity of the impression, the grain of the pottery makes it impossible to see the spinning direction of the threads.

After tabby (plain) weave, half-basket weave was one of the most popular weaves used in Roman textiles. In the northern provinces, fabrics in this weave are usually woollens, but from finds further east it is clear it was also commonly used for heavy linens, including sacking, which might not have survived under the water-logged conditions necessary for preservation in Europe.

Allowing for shrinkage, reckoned at 5% in impressions on tile, the Gestingthorpe cloth would have been coarser than the woollen half-basket weaves, probably garment fragments, from English sites (Wild 1970, 46, table A, nos 5-9: Wild 1977, 9-10, 27, nos 12-19 and a recent find in a coin hoard from Lackford, Suffolk (unpublished)), and is perhaps more likely to come from a good quality flax sacking. Most of the impressions on tiles and pots so far recorded are tabby weaves, again either sacking, or perhaps from scraps of cloth used to wipe hands or surfaces while the pottery was being made (Wild 1970, table A, nos 30, 33, 35 and 63).

The sherd bearing the impression is a thick (15mm) body sherd possibly from a storage jar showing part of the curve of the body, but otherwise amorphous.

Internally dull brick red grading to buff externally; body regular with a little fine, slightly micaceous sand and occasional larger dark brown inclusions. *Building 4, layer 1*

XXIV Cereal finds (Fig. 3, CG: p. 14)

by Jane M. Renfrew

One seed sample and one soil sample were submitted for examination for seeds from this site. The seed sample consisted entirely of cereal grains: chiefly bread wheat with a small number of rye grains and a single barley grain as detailed below. The soil sample weighing 2lbs (0.9kg) when it arrived, was floated and produced 6.5oz (230g) of carbonized wood, but no seeds. The wood was in a fragmentary state, but seems to be of large pieces of timber rather than of twigs or sticks, and there was no bark preserved. It had been hoped that this carbon-rich sample would provide a number of seeds as well, but this was not the case.

The carbonized grain was in a good state of preservation and looked as if it had been charred under a slow, steady heat rather than a fierce blaze. There was no sign that the grains had oozed the tarry deposits which are characteristic of fierce burning. The grain sample was composed of ninety-seven grains of *Triticum aestivum*, free-threshing bread wheat; seven grains of *Secale cereale*, rye; and a single grain of *Hordeum vulgare*, hulled six-row barley. The following measurements were obtained from these grains.

Triticum aestivum (25 grains measured)

length	average	6.5	maximum	7.8	minimum	5.3mm
breadth	"	3.4	"	3.9	"	3.0mm
thickness	"	2.9	"	3.3	"	2.2mm

Secale cereale (7 grains measured)

length	average	5.9	maximum	6.9	minimum	5.4mm
breadth	"	2.8	"	3.2	"	2.2mm
thickness	"	2.8	"	3.4	"	2.2mm

Hordeum vulgare (1 grain measured)

length 6.0 breadth 2.9 thickness 1.8mm

This was clearly a sample of threshed and cleaned cereal grains: there were no traces of husks or of weed seeds present. It is not possible from a single sample to give an overall impression of the relative importance of each of the cereal crops represented for the inhabitants of the site as a whole, nor is there any way of ascertaining the cropping pattern: were these three species meant to be grown together as a type of maslin or mixed crop, or had they been mixed subsequent to their harvest, either accidentally during storage or on purpose during food preparation?

It is interesting to find bread wheat so well represented. It was a species of wheat known in the Iron Age in southern England, which grew to be the chief form of cultivated wheat in Britain in middle Saxon times and has held that position as the staple wheat crop ever since. As its name suggests its grains yield a flour which has a high degree of elasticity when made into dough, resulting in a light and palatable bread. It also has the merit of threshing freely from the ear, unlike the hulled wheats which it replaced, which were firmly retained by their glumes unless parched to make the husks brittle before threshing.

Rye was also known in southern England from the Iron Age; it became more popular in Roman times and is fairly frequently found in the later periods. The rye grains in this deposit were noticeably narrower than the wheat grains and were steeply keeled on the dorsal side. The apex of the grains was bluntly rounded in typical form for rye and the grains were generally shorter than the bread wheat grains. Rye can also be used for bread making, but unless it is mixed with wheat flour it makes very dense compact loaves.

A single grain of hulled six-row barley was found in this sample too. It belongs to the most common type of barley cultivated in Britain in prehistoric and early historic times, although nowadays the most widely grown form is two-rowed as this is preferred by the brewers. In the past, as in the Orkney Islands today, barley was used as much for bread-making as for brewing; it gives fairly solid but very tasty bread.

It would be wisest to conclude from the evidence of this single sample of carbonized cereal grains that the inhabitants of Gestingthorpe cultivated at least three cereal crops: bread wheat, rye and barley, and that they had very efficient means of removing chaff and unwanted weed seeds in their winnowing practices.

Another grain sample from the same area of the site was identified by Dr Hans Helbaek (1952, where the site is referred to as Halstead). The sample he examined contained a large number of spelt wheat grains: *Triticum spelta*; possible rye grains, oats, and chess grass *(Bromus* sp.). It is rather satisfactory that this sample is quite different from the one presently described since we have a fuller picture of the Roman agriculture at this villa site. It has been suggested elsewhere in southern England that the increased cultivation of spelt wheat in late Roman times was connected with the Roman corn tax, *annona*, where wheat was being exported from the Rhineland to feed the garrisons. Oats and chess grass were probably weeds of the wheat field, in this case not cleaned so carefully as the sample identified here.

XXV Examination of a possible pottery container fragment with residue (Fig. 38)

by John Evans, S. Elbeih and Leo Biek

436 Described by W.J. Rodwell as 'part of form 33, Central Gaul, first half of second century. A small base which has had the wall trimmed away for reuse as a stopper or other purpose. The potter's stamp, assuming there was one, has been lost.' (samian). It is shown in Fig. 38 upside down as found. It is much degraded by aggressive soil conditions of burial (p. 85) to a powdery yellowish-brown surface lacking all gloss except where covered by a concretion. Here a small but diagnostic area of gloss is preserved on the pottery and further traces of it are attached to the underside of the (loose) concretion.

In the light of other investigations of pot fragments and bases with residues of similar appearance that indicated a (secondary) use as pigment pots or palettes (Biek 1981), a detailed examination was thought worthwhile.

The appearance of the residue was that of a natural concretion consisting of 'soil' and black-flecked 'manganiferous' iron pan. A sample was examined by emission spectroscopy with the following results: the elements silicon, calcium, iron, aluminium and magnesium were the major constituents, with trace amounts of manganese, potassium, sodium, titanium, copper and nickel.

Anion analysis indicated the presence of carbonates and silicates with traces of phosphate. Solvent extraction of a sample only produced traces of humic acids. Differential thermal analysis indicated that the material had never been subjected to heat.

Evidently the residue really is a natural concretion and

no more. Presumably the pottery here offered enough drainage impedance, relative to its surroundings, to allow an adequately coherent micro-pan to form. In the circumstances (p. 85) it seems likely that all significant evidence of any contents could have been lost. It is clearly important not only to investigate such residues, but also to publish archaeologically negative findings. *Surface find*

XXVI Examination of pottery 'pipe' with sooty lining (Fig. 38)

by John Evans, S. Elbeih and Leo Biek

437 Slightly less than a quarter of a (regular) circumference remains, and there can be no certainty about the original 'pipe' cross-section. If one assumes a complete circle the joint detail is ambiguous. Although the drawing shows the (slightly) preferred variant, stacking would have been the other way up. Its texture is smooth, but the thickness and shaping indicate a relatively crude artefact. As was clearly the case for No. 436, so it seemed also possible here that this was part of something made for one purpose (e.g. carrying water) and used for another. In some respects the fragment is indeed reminiscent of a water-pipe or of a globular amphora. However, no exact parallels are known and for other reasons also, it is unlikely to be either. But the detailed examination of the thin black layer coating most of the concave surface has produced results of far-reaching importance—both in themselves, indicating what can be preserved and detected, and also in suggesting an origin or at least a use. These aspects make the fragment one of the most important recent finds of its kind.

The residue had the appearance of a black 'sooty' powder. Microscopic examination failed to discover any vegetable matter or other structured debris. Emission spectroscopy showed the presence of the usual range of earth elements. A sample of the order of 200 mg was removed for detailed microchemical analysis.

Preliminary investigation using infrared spectroscopy indicated a complex mixture of organic materials. The sample was thus extracted successively with a range of solvents, and the extracts so obtained separated by various chromatographic techniques. Compounds identified included long chain fatty acids, several dicarboxylic acids, amino acids, sugars and resin.

The major fatty acid was palmitic, but relatively substantial amounts of oleic were also detected. In addition, lower levels of linoleic, linolenic and stearic were found. This group of acids strongly suggests that at least part of the residue came from a vegetable oil, most probably olive oil. However the amino acids proline, hydroxyproline, alanine and glycine indicate the presence of an animal component such as pork fat. Furthermore, the (dicarboxylic) citric, tartaric, fumaric and malic acids point to a fermented material (i.e. alcohol), for instance wine.

The presence of resin could be original or the result of time and conditions of burial—it might give additional support to the suggestion of wine, which could have dissolved it from the lining of a container, or given rise to its formation. Although some sugars were detected, they were present at levels insufficient for identification.

It has been suggested (Evans and Biek 1980) that incompletely burnt traces of organic materials can be trapped and protected in charred foams resulting from (over-) cooking in pots. More flaky deposits exposed to direct flame, as in lamps, have so far given negative results, although recent work has shown that significant amounts can be extracted from underlying pottery.

The present results clearly indicate that diagnostic residues can also be preserved by a third route: in sooty condensates at some distance from a (necessarily larger) fire. One's first reaction is to link the fragment with a chimney (Lowther 1976) but, again, there are no published parallels showing adequate similarity in section or general design, or assembly, or indeed any data on any sooty deposits. Ultimately, nevertheless, by far the most likely interpretation sees it as part of one section in a stack of chimneys—set rather like a vertical water pipe—in a sophisticated form of cooker hood.

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Plate I Building 1: Outer wall.

Plate II Building 1: Outer wall foreground with the possible path or destruction rubble beyond.

Plate III Building 1: Room 6 from the north-west, with the stoke-hole in the foreground, and the possible pivot-stone middle ground right.

Plate IV Building 1: Room 3 foreground looking into Room 4, with the channel leading through the wall in the foreground.

Plate V Building 1: Hearth 1 with the 'bridge' across the north-west end.

Plate VI Building 2: The only photograph, taken some time after the excavation.

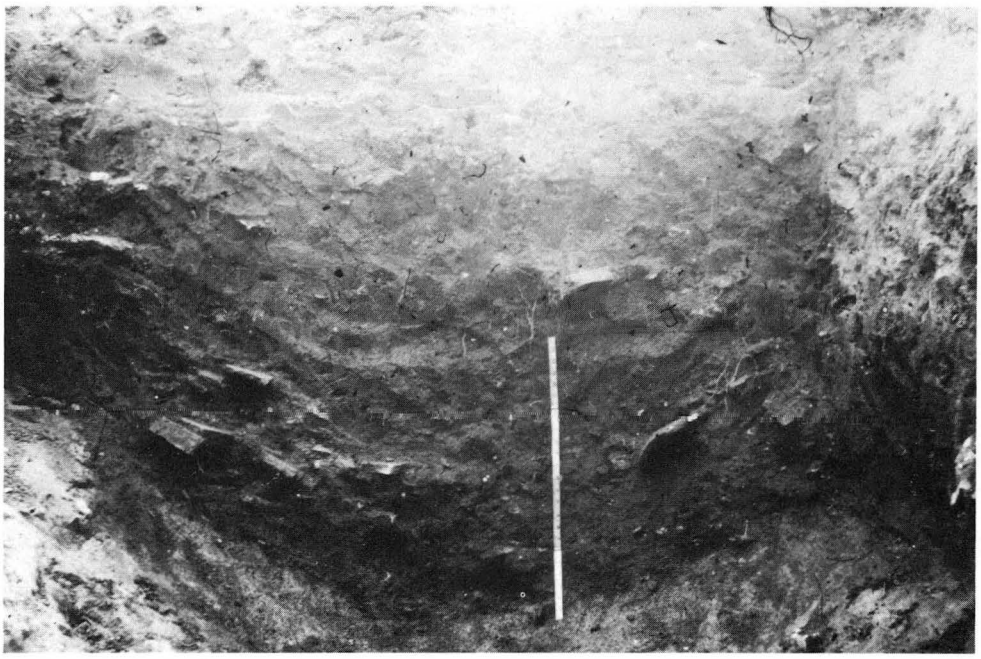


Plate VII Ditch 1.

Plate VIII Hearth 2: Looking north.

Plate IX The linear feature.

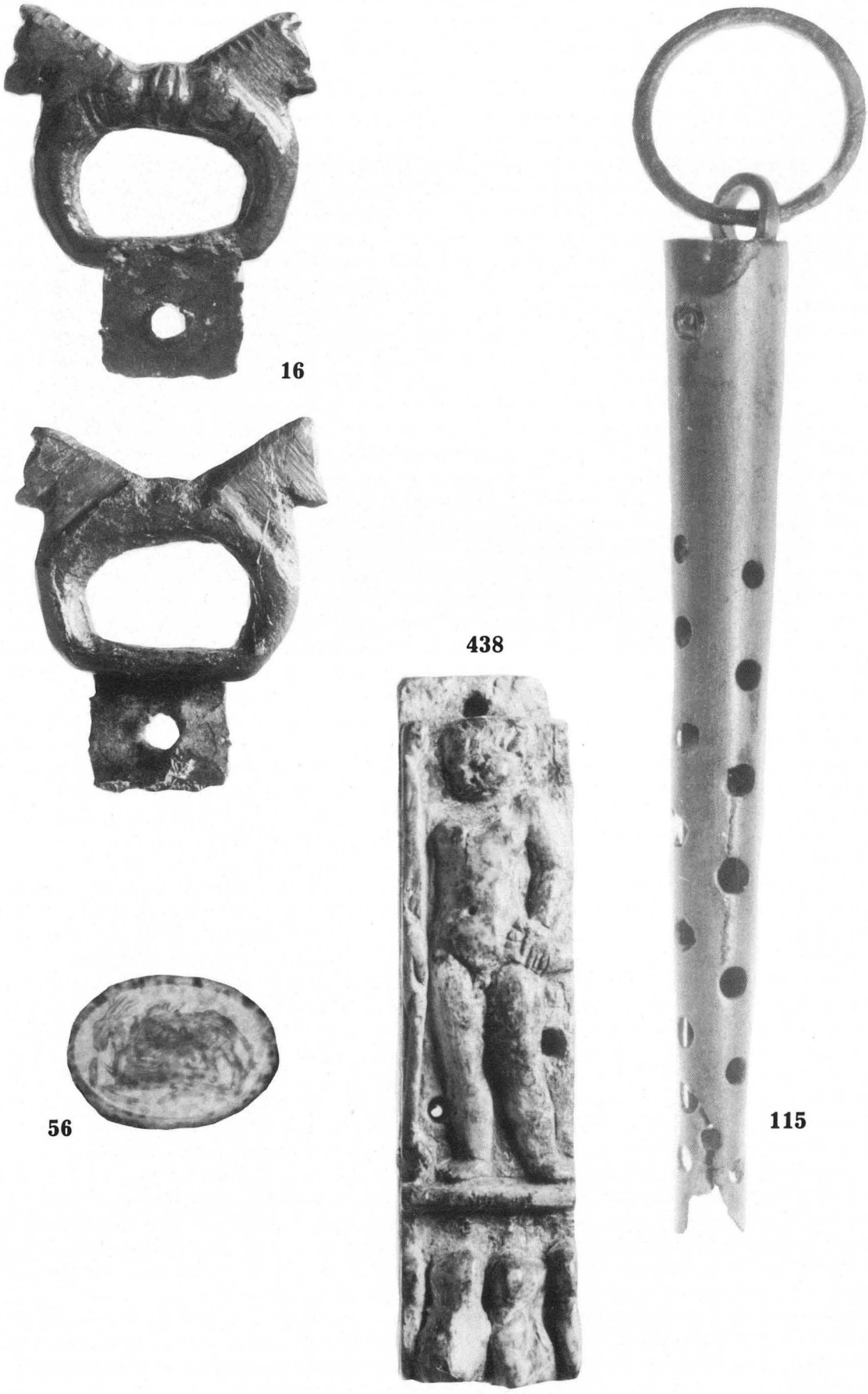
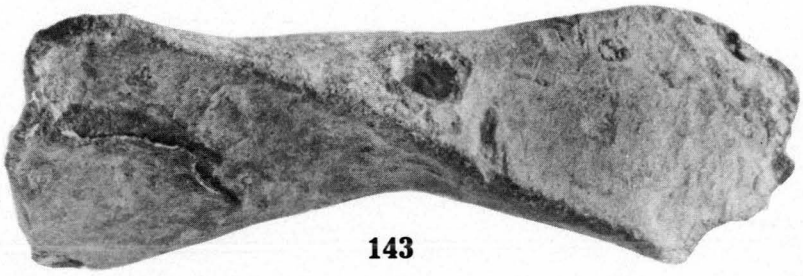


Plate X Bronze dolphin buckle No. 16; onyx intaglio No. 56; pierced bronze tube No. 115; the ivory corner piece from a casket No. 438. Nos 16, 115 and 438 scale 2:1; No. 56 scale 4:1.



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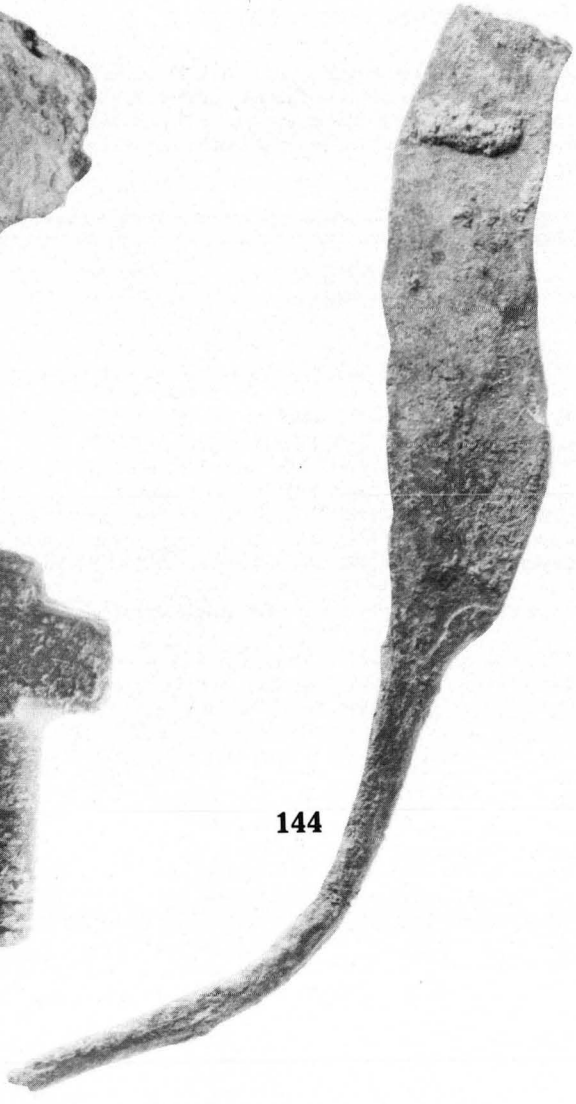

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Plate XI The model objects: No. 143 axe-mattock-adze in lead; No. 144 possible sickle; No. 145 bronze axe (both sides); textile impression on pottery. Nos 143-5 scale 2:1; pottery scale 3:1.

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