

Excavations at Springhead Roman Town, Southfleet, Kent

By Angela Boyle and Robert Early

OAU Occasional Paper Number 1

The Roman 'small town' of Springhead (NGR TQ 617713) lies immediately to the south of the A2 trunk road at Northfleet and approximately 3 km south-west of Gravesend, Kent. The geology comprises sands and gravels overlying brickearth. The surrounding area comprises level arable fields. The scheduled area is bisected by a railway which is aligned in a north-east - south-west direction. The area of the Scheduled Ancient Monument is considerably larger than that known to contain archaeological remains. The line of Watling Street, the principal Roman road through the settlement, was once thought to cross the scheduled area in a broadly east-west alignment, but it has been known for some time that the road makes a dog leg through the settlement before running a north-westerly course, and has now been located at Springhead Nursery, north of the scheduled area. Despite the odd configuration of Watling Street the settlement is essentially of a fairly simple linear type, with little evidence for structures more than c. 100 m from the major road. It is therefore unlikely that substantial structural remains relating to the Springhead Roman settlement are to be found in the western half of the scheduled area. It is however possible that archaeological features and finds relating to other periods, or to Roman farming, lie in this part of the site.

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with contributions

*by P. Booth, G. Campbell, C. Cropper, B. Dickinson,
N. Jeffries, N. Mitchell, F. Roe, C. Salter and R. Wilson*

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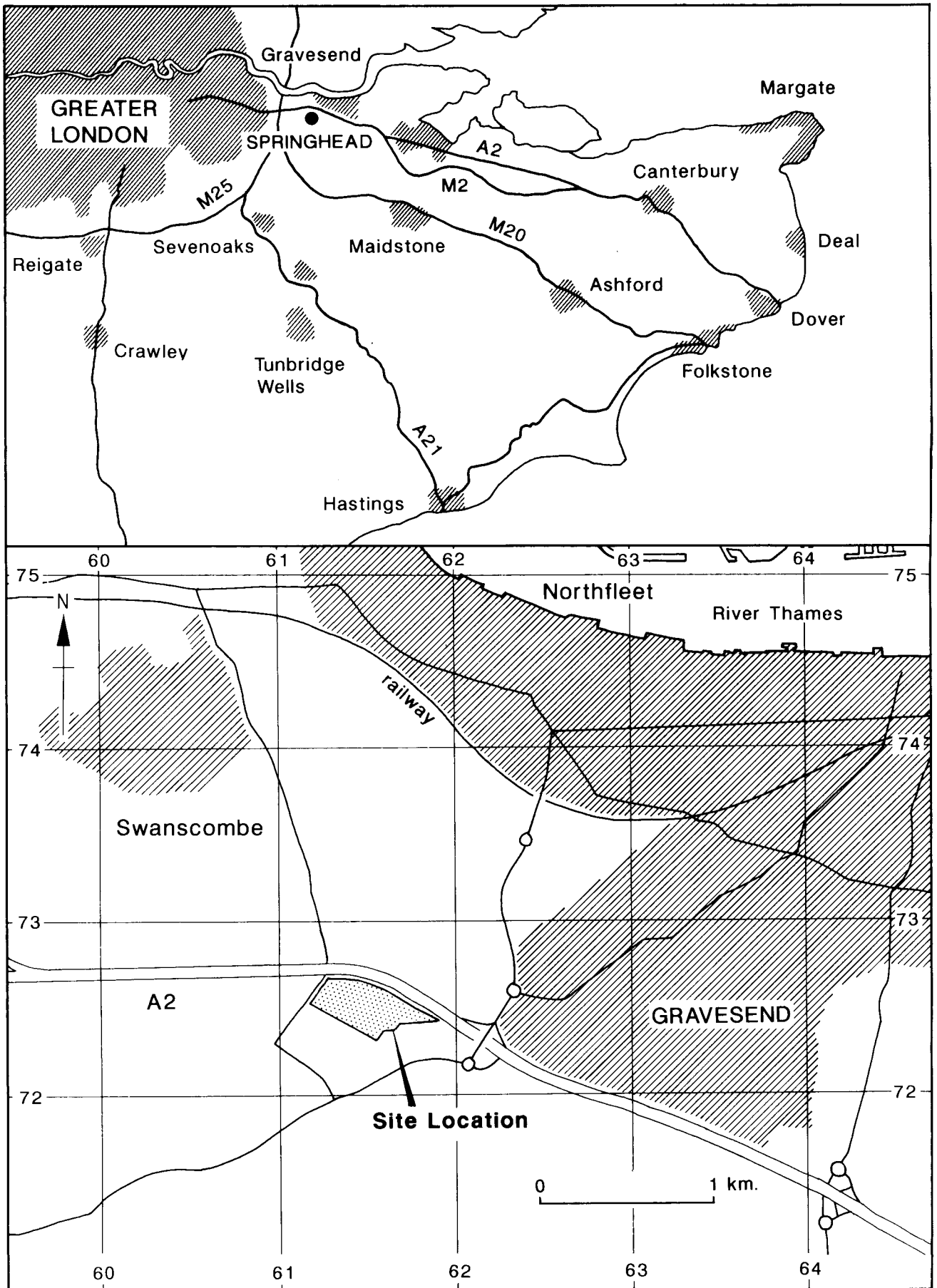


Figure 1 Location and geology

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SUMMARY

In Autumn 1994 the Oxford Archaeological Unit excavated approximately 860 m of cable trench on behalf of Seeboard plc. The cable trench passed through part of the Scheduled Ancient Monument believed to encompass Springhead Roman Town. This phase of work was preceded by a desktop assessment, a surface collection survey and a geophysical survey, and supplemented by a watching brief which ended in January 1995. Part of the excavated cable trench passed through the scheduled area to the west of the railway line and proved to be empty of archaeological deposits and features. The remaining length of trench ran east of the railway and immediately outside the southern limit of the scheduled area. Excavation in this section produced evidence for Roman activity dating from the 1st to the 4th century and characterised by ditches, gullies, pits (some containing metalworking debris), postholes, floor layers and a succession of road surfaces. Numerous finds of a wide variety of types and materials were recovered. The results suggest that the current Scheduling is inappropriate and it is therefore advisable that the results of this investigation are fitted into the wider framework of past investigations of the town.

INTRODUCTION

by A Boyle

Location and geology

The Roman 'small town' of Springhead (NGR TQ 617713) lies immediately to the south of the A2 trunk road at Northfleet and approximately 3 km south-west of Gravesend, Kent (Fig. 1). The geology comprises sands and gravels overlying brickearth. The surrounding area comprises level arable fields. The scheduled area is bisected by a railway which is aligned in a north-east - south-west direction. The area of the Scheduled Ancient Monument is considerably larger than that known to contain archaeological remains. The line of Watling Street, the principal Roman road through the settlement, was once thought to cross the scheduled area in a broadly east-west alignment, but it has been known for some time that the road makes a dog leg through the settlement before running a north-westerly course (eg Detsicas 1983, fig. 14), and has now been located at Springhead Nursery, north of the scheduled area (Smith 1991). Despite the odd configuration of Watling Street the settlement is essentially of a fairly simple linear type, with little evidence for structures more than c. 100 m from the major road (cf. Burnham 1987, 161-2). It is therefore unlikely that substantial structural remains relating to the Springhead Roman settlement are to be found in the western half of the scheduled area. It is however possible that archaeological features and finds relating to other periods, or to Roman farming, lie in this part of the site.

Project background

Seeboard PLC proposed to lay two 132 kv underground cables across the Scheduled Ancient Monument. Non-archaeological constraints dictated that the Seeboard cables must run to the south of the A2, and hence the cable trench had to cross the Scheduled Ancient Monument. The initial route of the trench ran along the northern edge of the scheduled area, immediately south of the A2. Geophysical survey was carried out on this original route on behalf of the OAU by Geophysical Surveys of Bradford (GSB) and the results are available for consultation in the archive. They also carried out work in the eastern triangle of the scheduled area. Subsequently the proposed route was changed though no further geophysical work was carried out. The excavated cable trench skirted the south-eastern edge of the scheduled area, crossed the railway embankment in a north-westerly direction and proceeded through the middle of its western portion (Fig. 2). The cables were laid in trenches 0.90 m wide and 1.35 m deep. Due to the length of the route each cable circuit was split into two sections and was connected at two joint bays which measured 15 m in length and 2.5 m in width. For the cable trench topsoil was stripped over the route to a width of 1.20 m. The joint bays were excavated to a width of 15.4 m by 2.9 m and a total depth of 0.15 m. The area of the trench which crossed the railway embankment was recorded during a watching brief in January 1995.

Given our existing knowledge of the area it was clear that the construction of this cable trench would involve the destruction, albeit on a relatively small

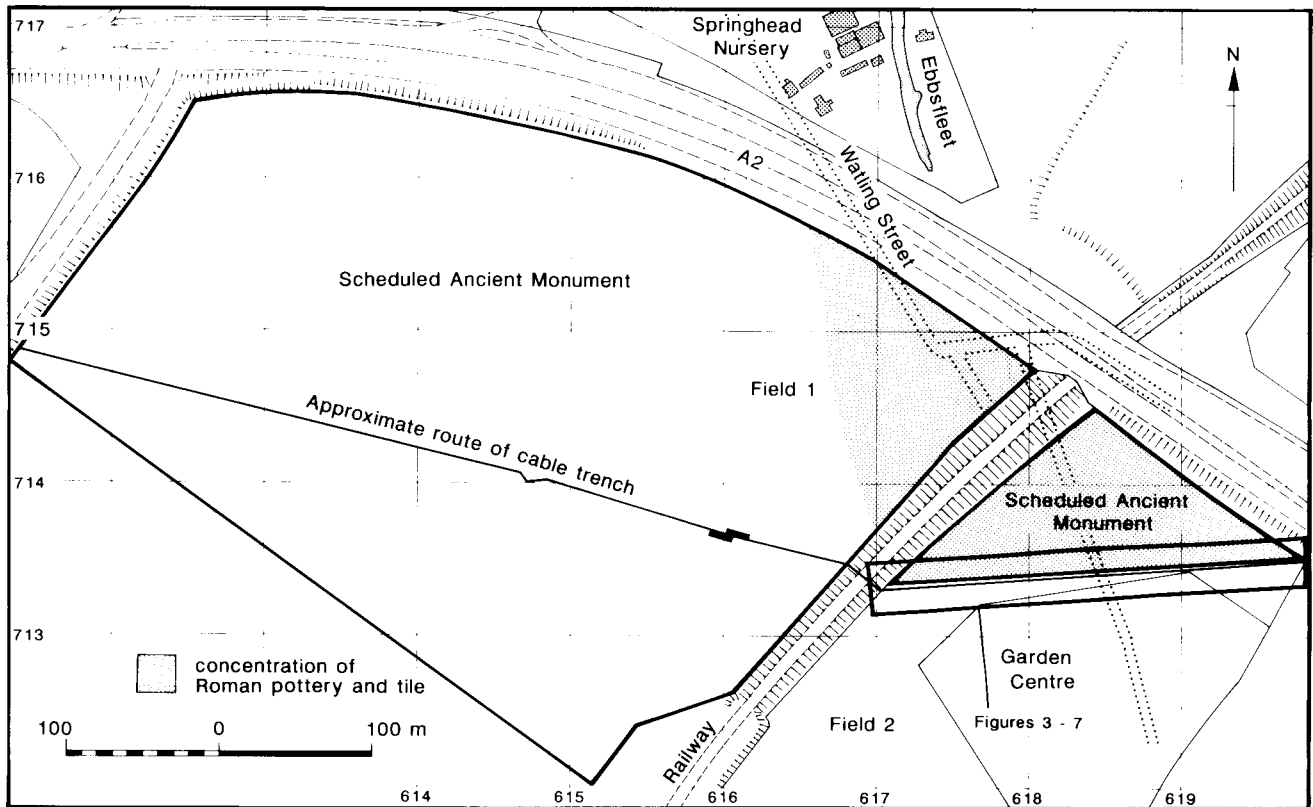


Figure 2 Plan showing the extent of the Scheduled Ancient Monument and the route of the pipe trench.

scale, of parts of the Roman settlement. As a result of these implications, a programme of archaeological investigation was recommended by English Heritage as an essential condition of the consent to carry out the work. The first phase of the project comprised a desktop assessment which summarised the results of previous investigations. The next phase was a fieldwalking survey of the scheduled area which was carried out during September 1993 and covered the entire area designated as a Scheduled Ancient Monument. Concentrations of Roman pottery and tile were located and these are indicated on figure 2. The finds were consistent with the established chronology for Springhead with fairly intensive Roman activity from the 1st to the 4th century AD. The geophysical survey was undertaken on the line of the original route which skirted the edge of the Roman settlement and followed the northern edge of Field 1. Two previously unknown buildings and a trackway were located along the northern edge of Field 1 while the southern edge of Field 2 was shown to contain a number of archaeological features including possible buildings, pits and a trackway.

Excavation methodology

The excavation was directed by Robert Early and the watching brief was carried out by Richard Brown. Topsoil was stripped under archaeological supervision to a width of 1.2 m and to a depth of 0.3 m by a 360° excavator. All archaeological features were excavated by hand. Where archaeological features were absent the

soil was mechanically removed under archaeological supervision down to the natural brickearth. The system of recording in operation was the single context system and each cut, layer and fill was assigned an individual number from a single continuous sequence. Each feature or deposit was fully excavated within the trench (except where depth restrictions prevented this), then planned and photographed.

ARCHAEOLOGICAL DESCRIPTION

by A Boyle

No attempt has been made to provide a detailed description of every context excavated though this information is available in the project archive. Selected contexts have been described, generally because the evidence allows for an interpretation of possible function, for example, in the case of the road or the metalworking pits. Other context groups are described because the pottery has been examined in detail and is representative of ceramic development within the assemblage (see Booth below). The majority of the remaining contexts which contained concentrations of finds are also described.

The surviving evidence for archaeological activity was concentrated in a length of cable trench measuring approximately 300 m which skirted the south-east edge of the Scheduled Ancient Monument to the east of the railway line. No archaeological activity was identified in the length of trench which passed through the

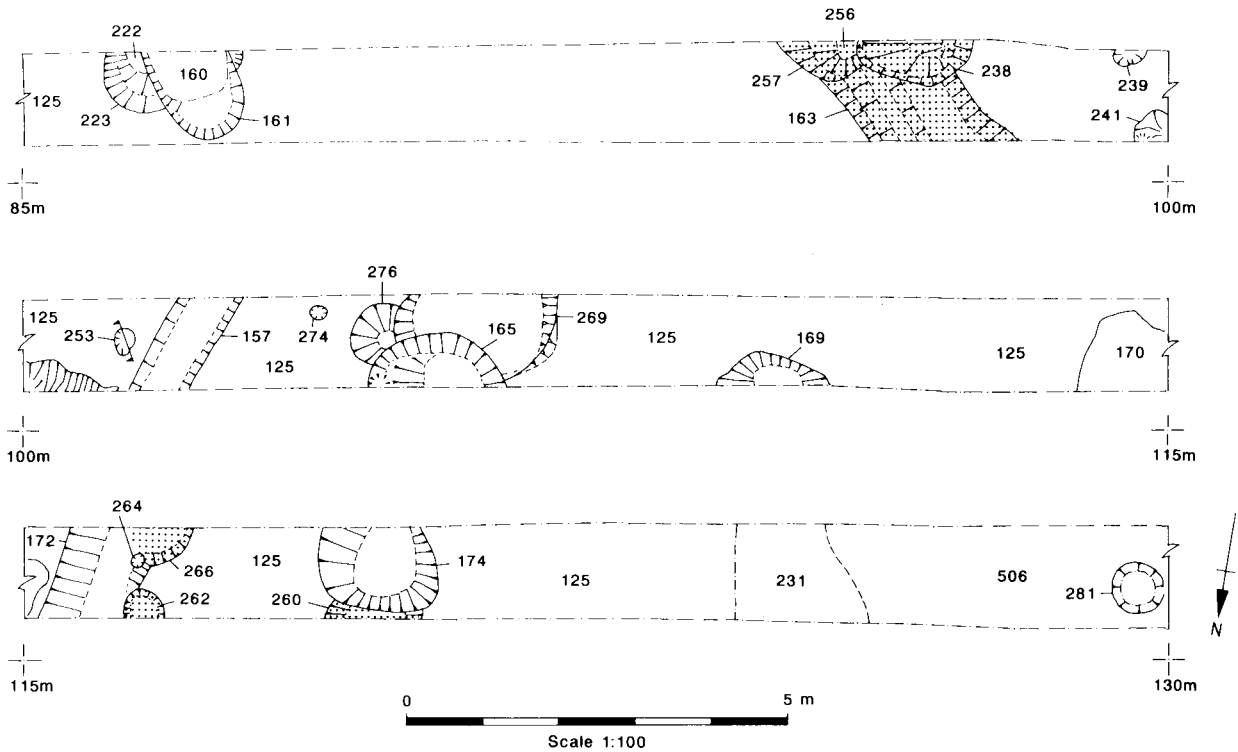


Figure 3 Trench plan.

western portion of the scheduled area. This is what would have been expected on the basis of the fieldwalking data.

The first forty metres from the east end of the trench are not illustrated on the plan. This stretch was not archaeologically sterile but those features which were identified could be seen at approximately 1.40 m below the ground surface. Thus the Roman ploughsoil or old ground surface, 112, which sealed virtually all Roman features and can be seen throughout most of the eastern portion of the cable trench, was sealed in this area by up to 1.10 m of colluvium, 122, alluvium, 118 and modern build-up (121, 120, 119 and 100). The reasons for this are topographical: the eastern field slopes upwards markedly towards the old railway line and consequently any features at the eastern end of the trench have been sealed by substantial amounts of hillwash. Excavation did not extend below a depth of 1.40 m for reasons of health and safety. Colluvial layers of Roman date have also been identified and these are discussed below.

A quantity of redeposited worked and burnt flint was recovered from a number of contexts in the eastern portion of the trench. The material has been dated to the Neolithic and Bronze Age.

The bulk of the features within the trench are of 1st and 2nd-century date although a small number have been assigned to the 1st century with a similarly small group at the end of the sequence in the late 3rd–4th centuries. Features of both early and late date appear on figs 3–7. The majority remaining are of 1st–2nd-

century date and include a proportion seen only in section. The limited number of features of both early and later date makes it difficult to interpret function. A small number of sherds were potentially of pre-conquest date although this could not be proven. The majority of the contexts were assigned to the 1st and 2nd centuries, while later Roman activity (that is, 3rd and 4th century) was restricted to a very small group of contexts.

The natural subsoil, 125, was a light red brown clay silt brickearth which was seen throughout the length of the trench. It was overlain by the earliest colluvial deposit on the site, 507, which was a friable light reddish brown silt which measured at least 0.32 m. The layer above, 509, was a mid brown clay silt which measured 10.5 m in extent and 0.20 m in thickness. A natural gravel deposit, 141, which extended for 2.5 m partially overlaid 125. It was in turn sealed by a colluvial deposit, 140, with a maximum thickness of 0.15 m. Further colluvial layers were also identified (113, 131, 175, 529). One of these may have overlain a possible ditch (531) although this could not be excavated due to depth restrictions.

1st-century activity

A small number of features could be securely dated to the 1st century. They include ditches (163, 401), pits (251, 316, 260, 262, 266), postholes (331) and colluvial layers (175, 520, 529) (Fig. 8, section 1). The majority are indicated on the plan of the trench (Figs 3–7). In many cases, however, only the earliest fills were of 1st-century date and the features continued in use for some time.

Excavations at Springhead Roman Town

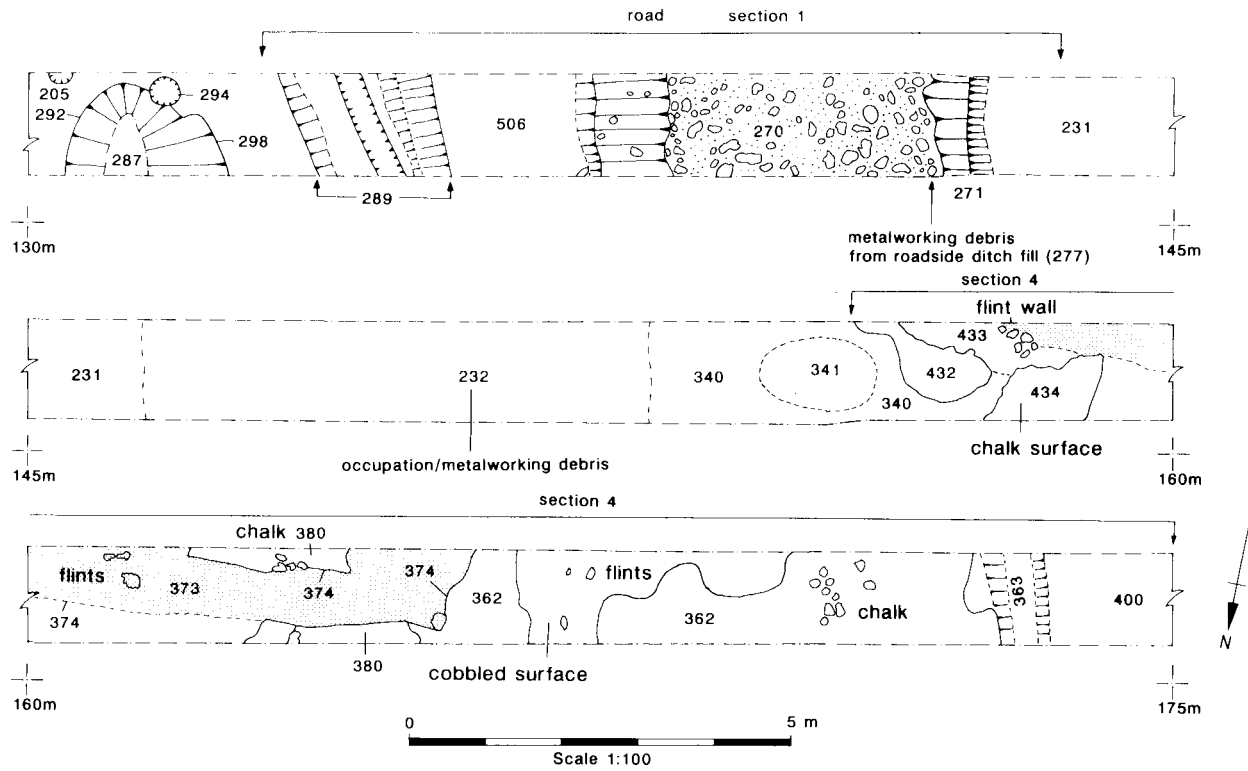


Figure 4 Trench plan.

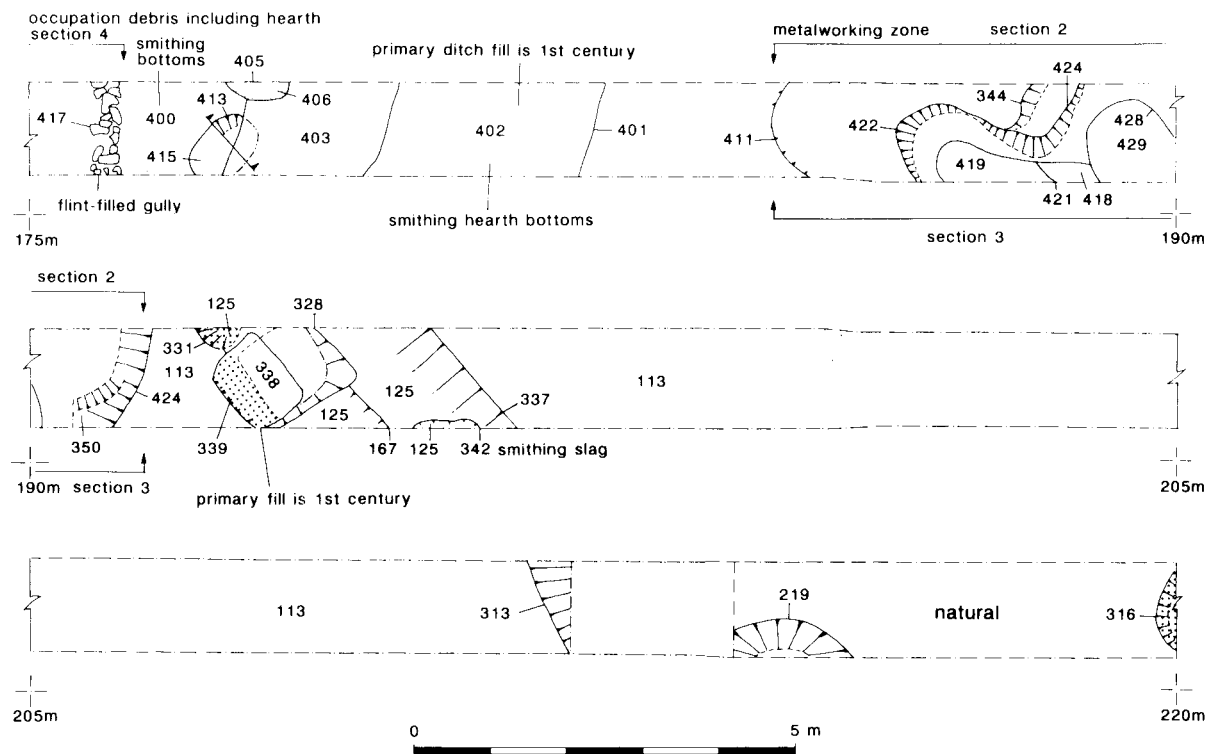


Figure 5 Trench plan.

This is so in the case of ditch 163 (Fig. 4) whose primary fill, 252, contained pottery of mid 1st-century date while the secondary fill was 1st-century and later. Pit 316 was filled by 217 which contained pottery of early (Neronian) date. It was sealed by a colluvial deposit, 140. Layer 369 contained pottery of the mid-late 1st century and was cut by a ditch which contained pottery of Flavian date (Fig. 9, section 4). In addition, the entire sequence of road building and use appears to date largely to the 1st-century.

Road development

A north-south aligned chalk road was identified at +133–143 m (Fig. 5 and Fig. 8, section 1). The pottery from the sequence of associated layers has been examined in detail (see Booth below). The primary roadside ditch 535 was not fully excavated due to depth restrictions. It cut through early colluvial layer 175. Ditch 535 was associated with the primary road surface, chalk layer 519 and gravel layer 511, which sealed early colluvial layers 529 and 520. Ditch 535 then began to silt up and the earliest *visible* fills 536 and 535 contain pottery of the 1st century. Over time a whole series of alternate chalk and gravel surfaces were laid down (518, 517, 539, 510, 521, 505, 504, 272, 270 and 296) and the road gradually moved in an eastwards direction. After the deposition of this sequence of layers, two further layers 295 and 291 were deposited. Finally a second ditch, 289, was dug. The sequence of fills within the ditch (288, 287, 286 and 277) contained pottery which was mostly Flavian in date. A single sherd from 277

may indicate that the upper silting of the ditch was a process which continued well into the 2nd century.

The succession of road surfaces were composed of alternate chalk and gravel layers with the exception of the uppermost metallised surface 270 which consisted of large flint nodules in a gravel and sandy silt matrix. This metallised surface had been sealed by the Roman ploughsoil 112 with no visible intervening deposits. Clearly then it went out of use sometime prior to the end of the 4th century. A single 4th-century coin was recovered from the lowest visible fill 534, of ditch 535 although this is likely to be intrusive.

The purpose of the ditches would have been to ensure that the road was well drained, to remove any surface water and to demarcate the 'road zone' as has been suggested elsewhere (Keevill and Williams 1996, 57).

Metalworking pits

A concentration of pits have been interpreted as the (?partial) remains of an industrial area due to the presence of extremely large quantities of metalworking debris (or slag) and associated iron objects including, most notably, a pair of blacksmith's tongs (see Salter below). The features were located at +185–192 m (Fig. 6). The relationships between the pits were extremely difficult to discern in plan and are best demonstrated in section (Fig. 8, sections 2 and 3).

Feature 411 was a large pit which was only partially excavated as it extended beyond the limit of the excavated area and in addition was cut by subsequent

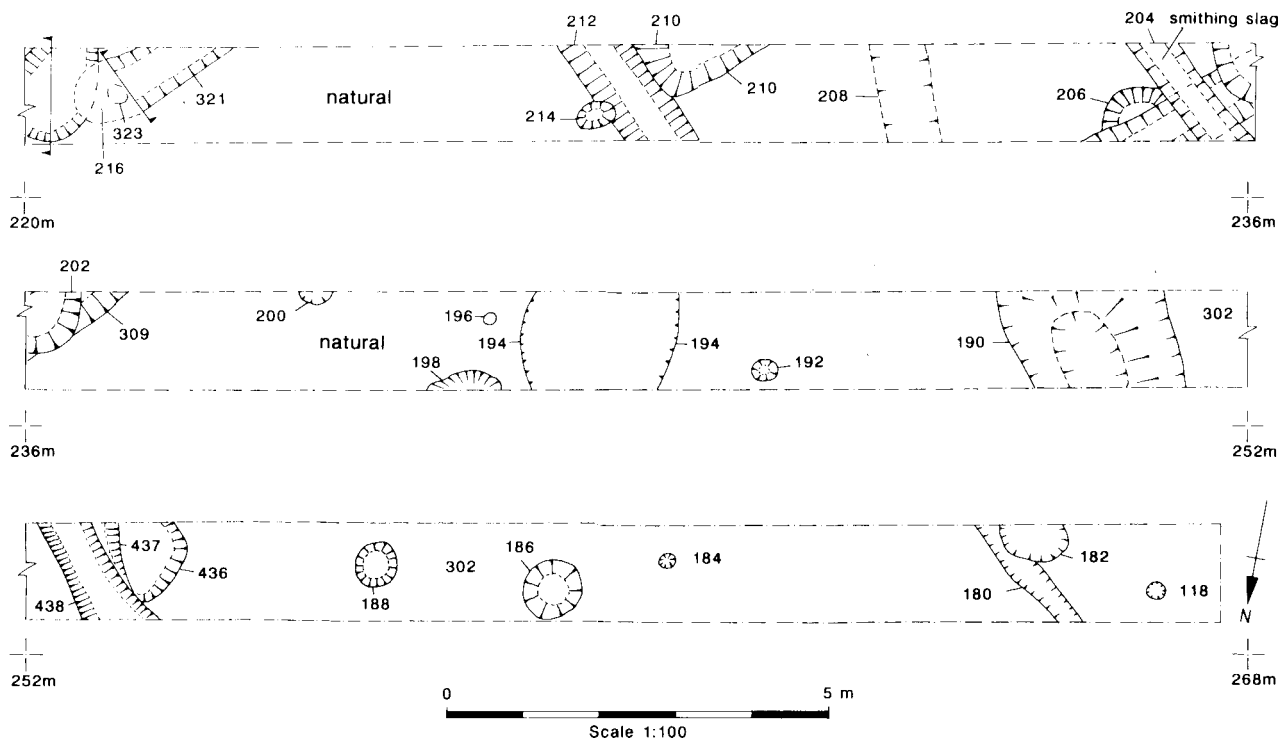


Figure 6 Trench plan.

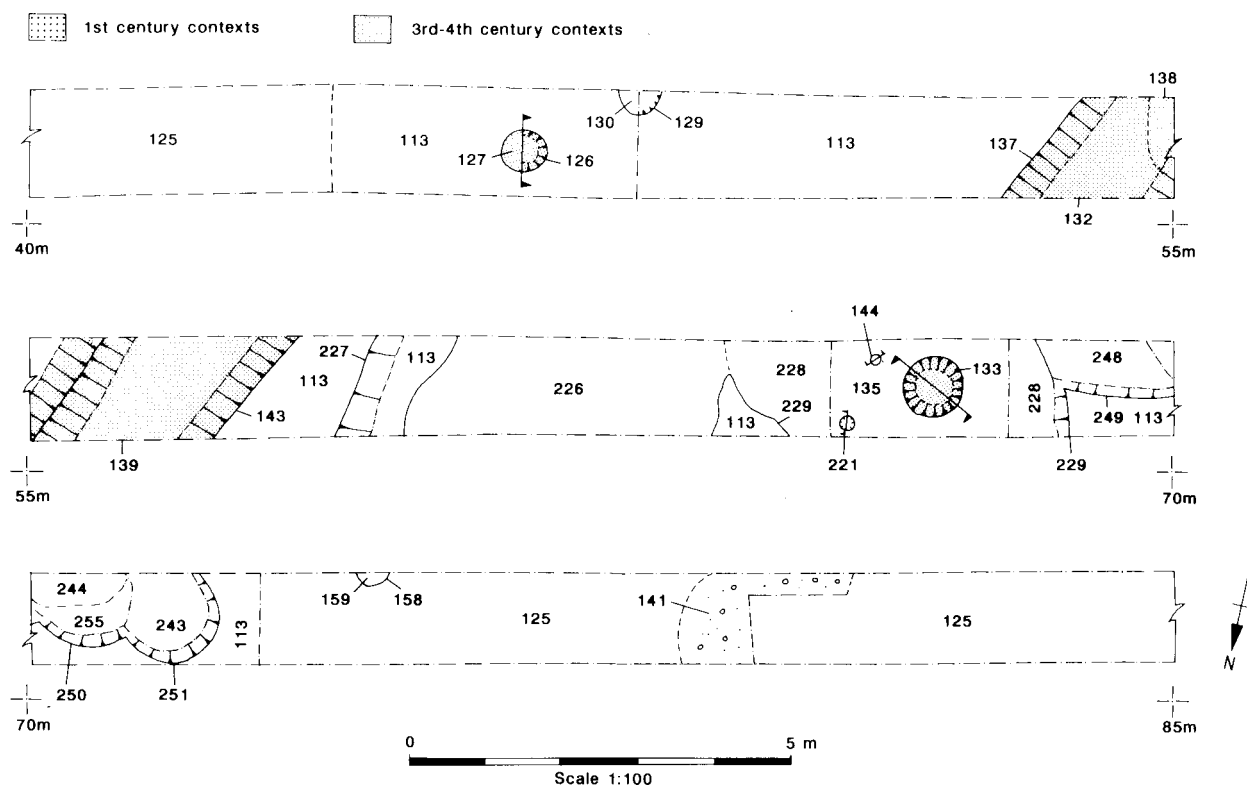


Figure 7 Trench plan.

features. It measured at least 2.40 m wide and 0.96 m in depth. The primary fill, 410, was a loose dark greyish-black silty sand with 5% charcoal inclusions. It had a maximum thickness of 0.60 m and contained a substantial quantity of slag. The pottery was of ?early 2nd-century date. In addition, a number of iron objects (Fig. 16.7) were present. These included tongs, a socketed cleaver, an iron rod, an iron bar, a possible set or punch and a possible knife tang. The secondary fill, 318, differed only in the proportion of charcoal present. It also contained a quantity of slag.

Pit 424 was a very large pit which was only partially excavated as it extended beyond the limits of the trench. In common with 411 it had steep sides and a flat base and measured at least 3 m in width and 1.10 m in depth. All four fills were clay silt with variable quantities of charcoal and chalk. Interestingly, the final fill of pit 424 was one of the few to contain pottery of the late 3rd-century. Pits 423 and 422 were also clearly related to metalworking activity (Figs 6 and 8) and may represent a slightly earlier phase.

A small pit 344 was located adjacent to pit 411 (Fig. 8). It was entirely devoid of finds and its profile differed markedly from those of pits 411 and 424. It had been cut by pit 424 sometime after it had completely silted up and may well relate to an earlier (?1st-century) phase of activity. Pit 167 was located at +193 m and had the same profile as 411 and 424 and contained slag. It was steep sided and flat bottomed. There were three fills (325, 324 and 166) and the upper two both contained pottery of the mid-late 2nd century. It is believed to

relate directly to the metalworking activity on the site. Further debris derives from a ditch fill 402, a layer of occupation debris 400 and a layer 342 (Fig. 9, section 4).

Metalworking debris has also been recovered in smaller quantities from a number of other isolated features and these are presumably derived from the main concentration. These include ditches (137, 204), a dump of material (230), roadside ditch fill (277), an occupation layer (232) and a rubbish pit (190) (see below).

Chalk floor layers and cobbled surfaces

A series of silt layers (356, 343, 435, 342, 355, 341 and 340) overlaid by a sequence of chalk floors (432, 358 and 434) was identified at +156–160 m (Fig. 5 and Fig. 9, section 4). Pottery from three of the silt layers was examined in detail (343, 342, 341) and a date in the 1st–2nd century was assigned. A possible flint path (358) which comprised a dense concentration of flint nodules may have been contemporary with the chalk floor (432). The silt layers and the first of the floor layers (432) were bounded on the eastern side by a north-south aligned linear feature (372) which was filled by flint nodules. To the west the entire sequence of layers was cut by a large ditch (374). Immediately west of the ditch a similar sequence comprising a series of silt (?dump) layers (369, 433, and 379) was overlaid by a cobbled surface (362) which extended for a distance of 14 m. The western edge of this layer was demarcated by a flint-filled north-south aligned linear feature (364).

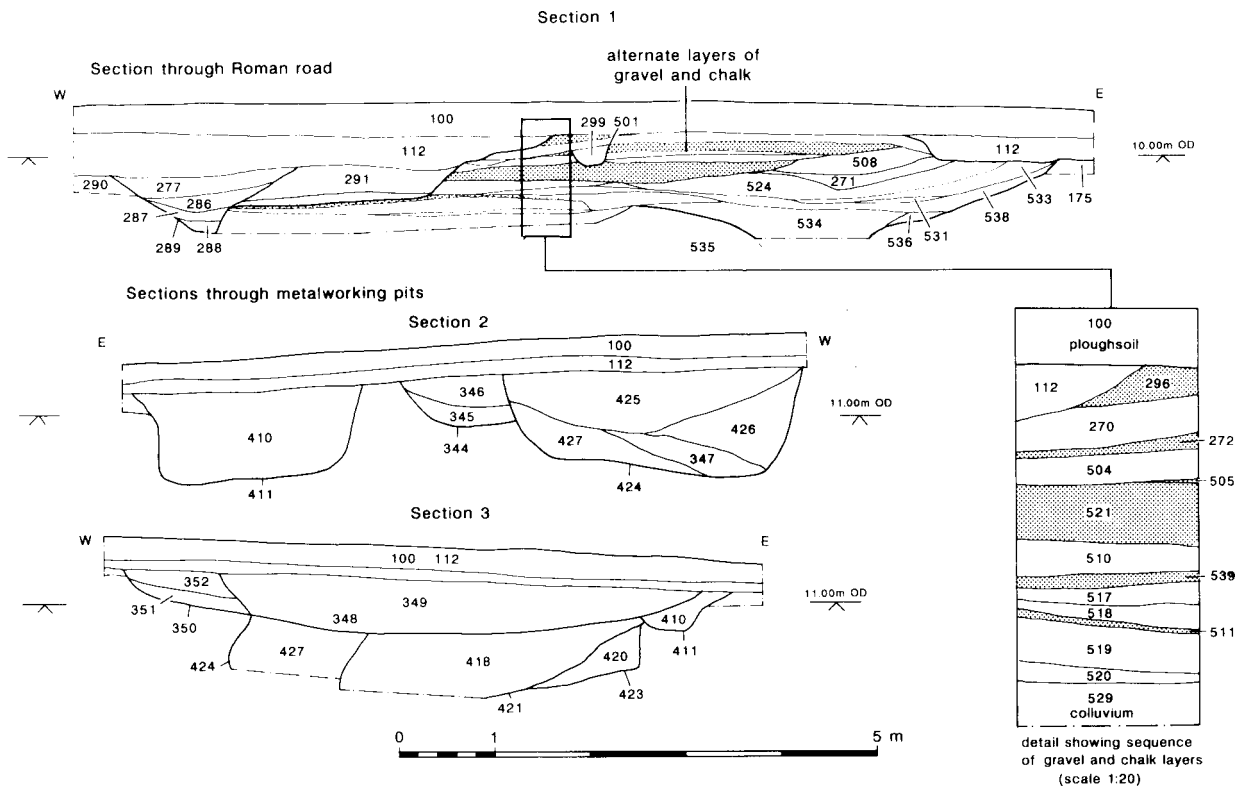


Figure 8 Section 1, Roman road; sections 2 and 3, metalworking pits.

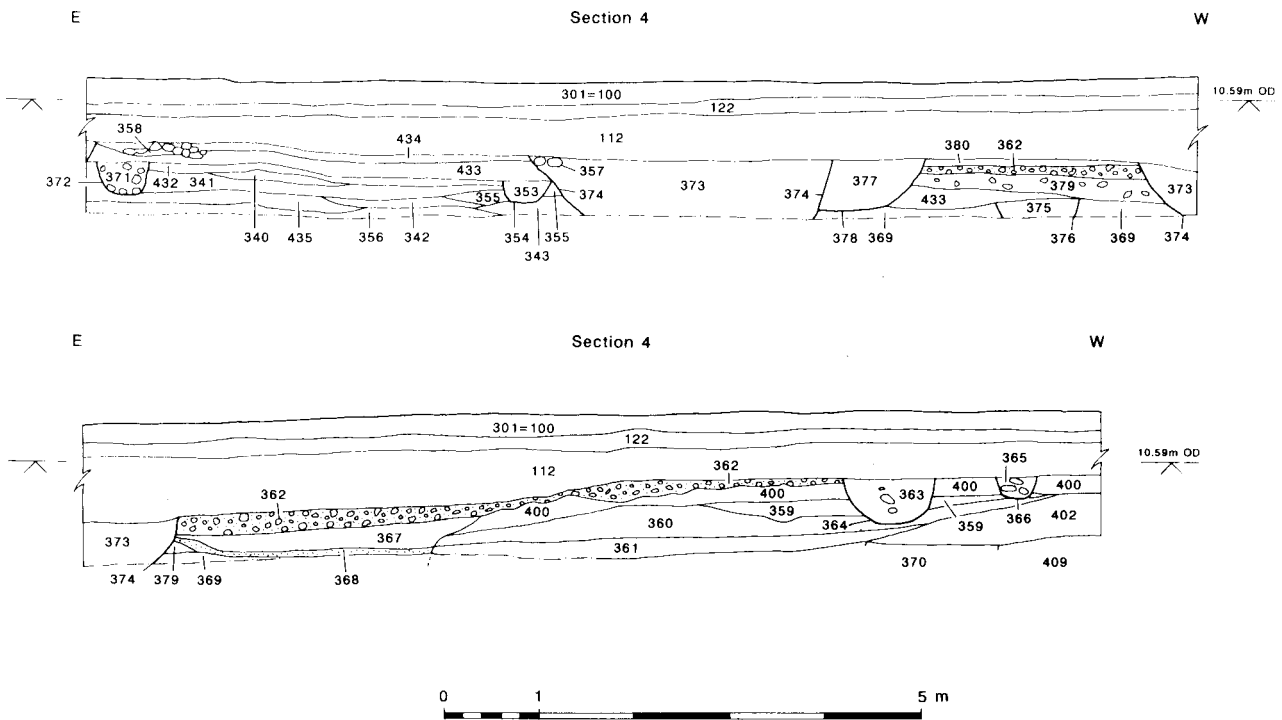


Figure 9 Section 4, cobbled surfaces and flint-filled gullies.



Plate 1 Road surface, uppermost layer

A smaller flint-filled gully (366) lay only 0.96 m to the west of 364. The dating of layers 343, 342 and 341 suggests that at least the lower levels of this sequence are all 1st-2nd century in date. A third flint filled gully (417) was located at +176 m.

If the flint-filled gullies did indeed bound the edges of the chalk floors and cobbled surfaces it is conceivable that they related to some form of structure. However, if this were the case mortar would be expected within the fills. An alternative is that they served as soakaways or drains.

Partial animal burials were recovered from four different contexts. The bones of a dog were present in pit fill 230 which was 2nd–3rd century in date. Fill 230 was overlaid by a dump layer 135 which produced late 2nd-century samian ware. An articulated dog skeleton was found in a pit excavated by Philp and Chenery to the south of the trench. Pit 354 (Fig. 9, section 4) contained an articulated sheep skeleton. This pit cut through a sequence of silt layers (343, 355, 341) and a chalk floor (432) and was sealed by a layer of silt (433) and a chalk floor (434). Pit 405 contained the partial articulated skeletons of two or three sheep. Although the pottery from the fill of the pit suggested a date in the mid 1st-century or later the pit was seen to cut through ploughsoil 112. Thus it must be either very late

Roman or post-Roman. The bones of two sheep and two lambs were recovered from pit 607. This pit was located in the westwards extension of the trench which was recorded during the watching brief (not on plan). The pottery was mid 1st century or slightly later and the pit was sealed by a probable Roman buried ploughsoil 603.

A probable hearth deposit 525 with chalk lining 526 was comprised of two fills, 280 and 527, which were sampled for environmental analysis (see Campbell below). The hearth was cut through layers 509 and 506 and contained a single sherd of 1st–2nd-century date. The layer above the hearth 514 was also sampled. It was of mid- or later-2nd century date.

Pits

Pit 190 was located at the extreme western end of the pipe trench (+249 m). It had steep sides and a flat bottom and measured 1.80 m in width and 1.04 m in depth. A sequence of 9 fills was identified (245, 236, 235, 234, 305, 225, 224, 304 and 189). The profile suggests that the pit had been recut twice and filled by 304 and subsequently 189. The pottery from the pit suggested a date range of mostly late 2nd-early 3rd-century date. A considerable quantity of material was derived from the fills and included over 300 g of fired clay, 150 g of tile, copper alloy objects, bone pins and a few fragments of human neonate skull vault.

Pit 194 was located immediately west of pit 190 (+ 243 m) and it was similar in profile to 190, measuring 1.90 m in width and 0.80 m in depth. The pottery from the fills (300, 303, 246 and 193) was Flavian in date. Other material derived from the fills included 544 g of fired clay, animal bone and two iron nails. Neither of these two pits was completely excavated as they extended beyond the limits of the excavation.

Pit 210 was located west of pit 194 (+ 228 m). It had sloping sides and a rounded bottom, measuring 1.50 m in width and 0.70 m in depth. The pottery from the two fills suggested an early 2nd–mid 3rd-century date range. Material derived from the fills included 208 g of fired clay, animal bone, 140 g of tile and a number of other artefacts. These included a copper alloy pin and brooch, a bone pin, a glass jar rim fragment (Fig. 18.9) and two vessel body fragments. Iron objects included a riveted strip, a possible stock bar fragment, five nails and possible hobnails. The edge of the pit was cut by a ditch, 212.

Pit 219 was located at +214 m. It had sloping sides and a rounded bottom, measuring 1.80 m in width and 0.52 m in depth, though it would appear that it had been truncated by ploughing. In addition the pit clearly extended beyond the limits of excavation. The pottery suggested an early-middle 2nd-century date. A small quantity of fired clay was also present. Pit 313 had an almost identical profile and contained no finds.

The upper fill 244, of large pit 250 contained pottery of the early-mid 2nd century. Pit 129 (fill 130) cut colluvial layer 113 and contained three sherds of the 2nd century or later. Fill 164 derived from two intercutting pits (267 and 268) whose relationship could

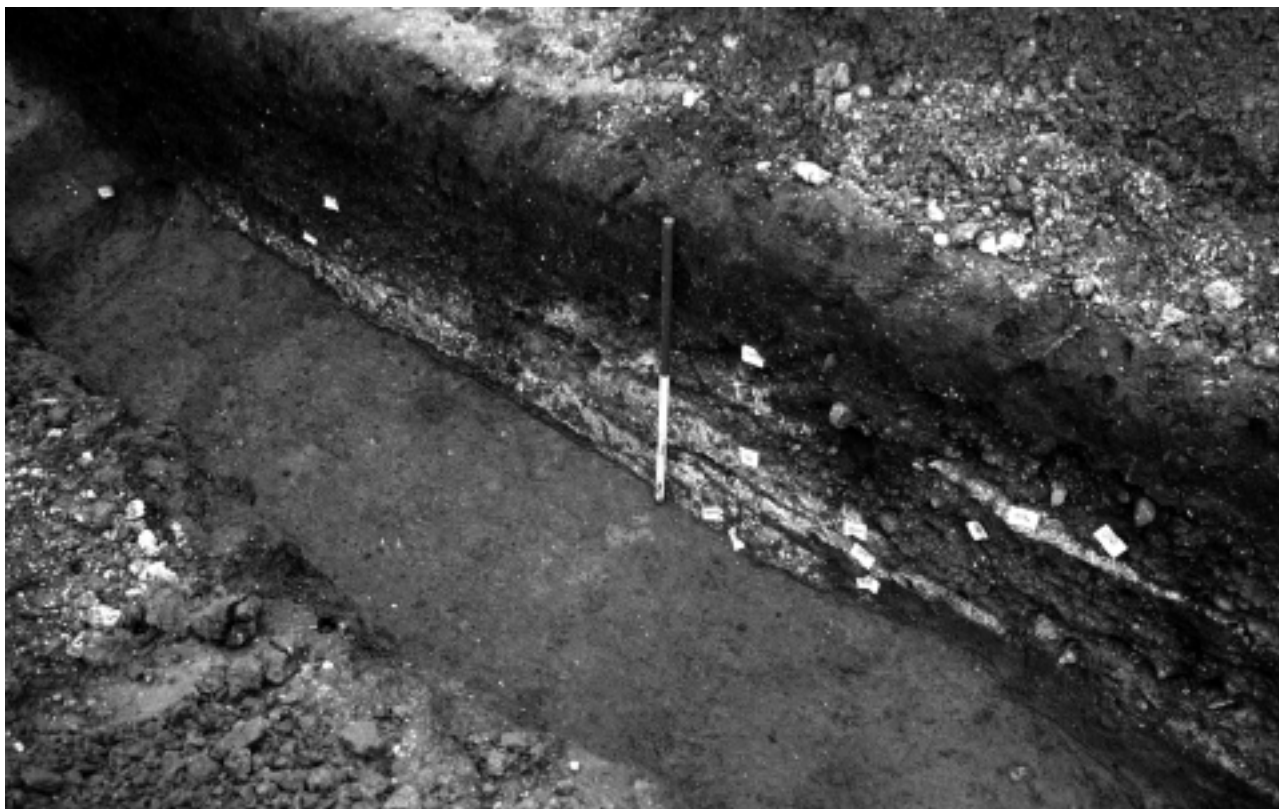


Plate 2 Section through road

not be discerned in plan. The pits were large and irregular and contained pottery of the late 2nd–3rd century. Pit 206 was filled by 205 and it cut layer 302 which was early 2nd century or later. Pit 613 was identified during the watching brief and was filled by 612 which contained pottery of late 1st–early 2nd century date.

Gullies and ditches

A shallow north-south aligned ditch 172 was filled by 171 which contained pottery of very late 2nd–3rd century date. Gully 204 was filled by 308 and 203. The primary fill (308) was mid–late 1st century or later and the secondary fill was later than c. 120 AD. Ditch 157 was filled by 156 and contained pottery of early–mid 2nd century date.

3rd- and 4th-century activity

A small number of later contexts (3rd–4th century) have been identified. For the most part these were concentrated in two small areas of the pipe trench at +50 m and +160 m (Figs 3 and 5). They included two adjacent parallel ditches 137 (fills 138 and 132) and 143 (fills 142, 136 and 139) which were incompletely excavated due to depth restrictions. Ditch 143 may have been earlier in origin and after silting it was cut by ditch 137. A number of pits, 126, 133, 378 and 405, also contained pottery of this date. However, pit 405 cut ploughsoil 112. Ditch 374 may be relatively late. Although it contains pottery of the late 2nd century it

cuts a pit containing pottery of the 3rd century. The primary fill 231 of pit 283 contained pottery of early–mid 3rd century date thus the samian ware was redeposited.

Virtually all of the Roman features were sealed by layer 112. The pottery from it suggests a date in the mid 2nd century or later although the material from it is rather more fragmented than the majority of the assemblage and is very likely to be residual. The alluvial layer 118, which seals 112, contains pottery of the late 3rd century or later.

An extension of the trench through the railway embankment was observed during a watching brief. Three pits (607, 608 and 613) all of 1st–2nd-century date were identified.

THE POTTERY

by P Booth

Introduction

Some 8600 sherds of pottery (c. 136 kg) were recovered in the excavation, the material deriving from c. 148 individual contexts. With the exception of a single sherd of early Saxon grass-marked pottery (5 g, unstratified) and three 20th century sherds (10 g, from topsoil, context 146) all the material was of late Iron Age or Roman date (hereafter abbreviated for convenience to 'Roman'). The great bulk of the pottery appeared to be dateable to the 1st–2nd centuries AD, although some activity probably continued on the site into the second half of the 4th century.

A post-excavation assessment of the pottery carried out in 1995 consisted of a rapid scan of the entire assemblage. The pottery was roughly quantified (producing the totals given above) and the range of major ware groups present in each context was noted, along with a 'spot date'. Individual noteworthy features of the pottery were also recorded but there was no consistent quantification of such characteristics at that stage. Subsequently, a limited number of groups was selected for more detailed recording and analysis. The selection of these groups was based on inherent criteria of size and date as well as site based factors such as their position in the stratigraphic sequence. The following discussion is based largely on the data derived from the more detailed recording, but also takes into account general conclusions drawn from the assemblage as a whole. All the samian ware was scanned, and all samian stamps were noted by Brenda Dickinson. Similarly a note was made of all four mortarium stamps in the assemblage, though only one of these fell within the groups selected for detailed recording. The pottery records of both assessment and detailed recording phases are contained in the project archive.

Methodology for detailed recording

Pottery from 24 contexts was recorded in detail. In approximate chronological order these were as follows: 252, an early (?mid 1st century) feature group; 217, another early (?Neronian) feature group; 529, 536 and 524, part of a sequence of (?1st century) deposits associated with the road; ditch 289 (fills 288, 287, 286 and 277), a roadside ditch, mostly Flavian 70–96 AD; pit 194 (fills 300, 303, 246 and 193), Flavian; a sequence of 'layers', 343, 342 and 341, of 1st-2nd century date; 410, a large pit group, ?early 2nd century; and pit 190 (fills 245, 236, 235, 234, 225, 224 and 189), mostly late 2nd–early 3rd century. The pottery from these contexts amounted to 3433 sherds, weighing 57.459 kg and totalling 39.07 EVEs, ie comprising c. 40% of the sherds and 42% of the weight of the total assemblage. Resourcing constraints precluded detailed examination of more groups, including any of late Roman date, nevertheless it was felt that the groups examined comprised a representative sample of most aspects of the assemblage.

The pottery was recorded using the system currently employed by the OAU on sites within the Oxford region and elsewhere. The material was divided into a series of fabric and ware groups (see below) and quantified by sherd count, weight and EVEs (Estimated Vessel Equivalents, based on rim percentages - more strictly rim-equivalents, see e.g. Pollard 1990, 76). EVEs were employed not only because of their general usefulness as a measure, but also to provide some comparison with the figures presented by Pollard (1988, 231–242 *passim*) for four groups from the 1950s–70s excavations, for which no quantified data otherwise exist. Vessel types were recorded in generalised terms and unusual decoration was also noted, though common decorative types were not. Most of the discussion of variations in fabric proportions is based

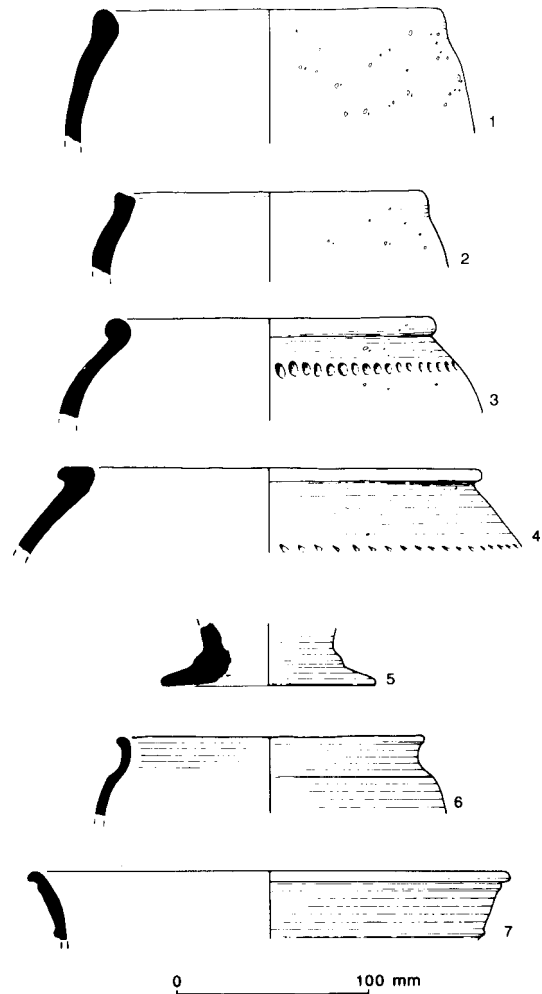


Figure 10 Pottery (scale 1:4)

on the sherd count figures. Discussion of the vessel types represented is based on the figures for EVEs.

Character and condition of the material

The pottery was generally in very good condition. Sherds were little abraded and surfaces were well-preserved. Surface deposits such as carbonised remains also survived, along with particular surface treatment features such as the use of 'pitch' on the rim and shoulder of some vessels. The average weight of the sherds recovered was quite high (c. 16 g, 16.7 g for the material recorded in detail). This figure reflects in part the presence of a fairly robust shell-tempered fabric which was one of the commonest components of the assemblage (but was not significantly inflated by such common distorting factors as large quantities of substantial amphora sherds, since these, though present, were relatively scarce). Despite this qualification, however, the high average sherd weight is another indicator of the quality of the assemblage as a whole. It cannot be claimed on present evidence that any of the groups present consisted of primary rubbish, but the condition and size of the sherds certainly suggests that

in many context groups there had not been extensive redeposition of material. It was felt that many of the context groups were potentially dateable within relatively narrow limits, another indicator that redeposition/residuality was not a major problem. There were of course context groups where at least some residual sherds were evident. The exact extent of residuality is uncertain, however, since many individual sherds (as opposed to groups) could not be closely dated. Subjectively, it appeared that later (ie 3rd–4th century) groups contained a relatively high proportion of residual material.

Fabrics

Fabrics were assigned to one of a number of major 'ware groups' with one or more principal characteristics in common, defined by letters (e.g. F = Fine Wares, O = Oxidised Coarse Wares etc). The system is organised hierarchically so that sherds can be recorded at one of several interrelated levels of detail. The primary level is that of the major ware group itself, the secondary level is that of the main subdivisions of the ware group (e.g. R30 = grey wares in which sand is the principal tempering agent, B20 = all BB2 fabrics) and a third level can be used to identify a specific fabric or ware source (e.g. F51 = Oxfordshire colour-coated ware). The fabric/ware codes used here represent an extension of the system as employed in Oxfordshire. Direct overlap with the Oxfordshire codes was avoided where it was not appropriate; many of the latter were clearly not applicable to Kent. Many of the codes for fine wares, amphorae, mortaria, black-burnished wares etc are, however, universally applicable. It should be noted that some of the ware codes used here, particularly those for reduced coarse wares, differ from those used in the report on pottery from the OAU excavations at Dover (Booth 1995).

Limitations of time meant that it was not possible to identify every sherd down to the level of individual fabric/ware. For many of the reduced coarse wares, for example, attribution was at the intermediate level of precision so that much (but not all) of this work could be done by eye. As far as possible, however, fine wares, amphora and mortarium sherds were assigned to specific fabrics. General ware groups could be used to subsume individual sub-groupings in cases of uncertainty. For example, sherds assigned to ware group Q50 were almost certainly either of Q51, Q52 or Q53, with the great majority thought likely to be of Q52. Since the distinction could only be made confidently with the use of the binocular microscope Q50 served to designate

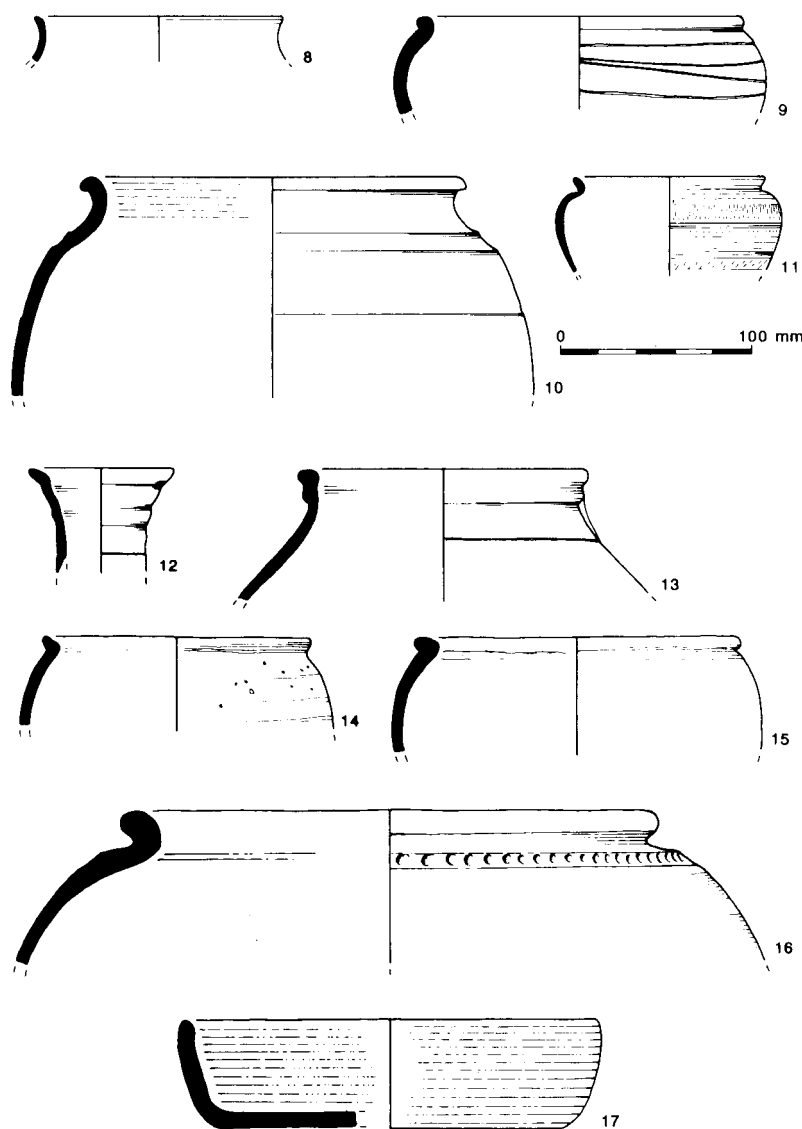


Figure 11 Pottery (scale 1:4)

white-slipped sherds which were not treated in this way. Ware group E80 subsumed a variety of grog-tempered fabrics, including probable 'Patch Grove ware' (53 E80 sherds were tentatively assigned to this type) and a few fragments of possible 'Native Coarse Ware' (Pollard 1988, 126). It should also be noted that the distinction between fabrics R30 (medium sandy Romanised reduced coarse ware) and B20 (BB2) was fairly arbitrary. The terminological difficulties have been discussed by Monaghan (e.g. 1987, 172). The designation B20 (BB2) has been used here only for vessels in the limited repertoire of forms commonly understood as forming the black-burnished ware range. Other sherds of very similar fabric have been rather unsatisfactorily assigned to R30.

Fabric descriptions

Only brief descriptions are given here, and widely-known fabrics are referred to by their common names.

Full descriptions, where appropriate, are contained in the excavation archive. The total number of sherds in each fabric (for the selected contexts only) is also given here and tabulated below (table 1).

S Samian ware.

- S20 South Gaulish samian. 52 sherds.
- S30 Central Gaulish samian (general - mostly Lezoux). 48 sherds.
- S31 Early (micaceous), Lezoux fabric. 1 sherd.
- S35 Les Martres-de-Veyre (Central Gaul). 6 sherds.
- S41 Rheinzabern (East Gaul). 6 sherds.
- F Fine wares (i.e. colour-coated, lead glazed, mica dusted etc., but not fine oxidised and reduced wares in the sense used by Pollard (e.g. 1988, 59–60))
- F40 Fine buff/white fabric, red-brown colour-coat, ?continental. 1 sherd.
- F50 Fine oxidised, red-brown colour-coat, source uncertain, probably British. 1 sherd.

A Amphora fabrics.

- A10 Buff-brown ?South Spanish Dressel 20. 2 sherds.
- A11 Buff-brown South Spanish Dressel 20. 14 sherds.
- A13 Fine buff ?South Gaulish (e.g. Pélichet 47 (Peacock and Williams (1986) class 27) etc.). 2 sherds.
- A20 Fine oxidised, source uncertain. 2 sherds.
- M Mortarium fabrics.
- M21 Verulamium region sandy white ware. 4 sherds (including 2 stamps).
- M29 Buff, fine, Kent/south Essex/Colchester group (Pollard 1988, 213, cf. Hartley 1982, 151, fabric 1B). 20 sherds (including 2 stamps).

W White wares.

- W10 Fine white wares, uncertain source(s). 7 sherds.
- W20 Sandy white wares, uncertain source. 2 sherds.
- W21 Sandy buff/white ware, Verulamium region. 64 sherds.

Q White-slipped fabrics, except mortaria. Mainly oxidised 'flagon' fabrics.

- Q43 Fairly coarse, oxidised, with clay pellets and quartz sand, white slip. 13 sherds.
- Q50 Fairly fine (usually) oxidised, cream or white slip, ?various sources. 102 sherds.
- Q51 Fairly fine, oxidised or reduced, fine white calcareous inclusions and occasional clay pellets, white slip. 155 sherds.

- Q52 Fine oxidised, moderate clay pellets, iron oxides and mica, with white slip (cf Dover fabric Q43). 49 sherds.
- Q53 Fine oxidised, sandy, white slip. 11 sherds.

C Calcareous tempered fabrics/wares.

- C10 Shell tempered fabrics, ?various sources but mostly local. 1017 sherds.

E Late Iron Age-early Roman 'Belgic type' fabrics.

- E20 Fine-medium sand tempered fabrics, here with glauconite inclusions. 19 sherds.
- E30 Medium sand tempered fabrics, ?various sources. 335 sherds.
- E80 Grog-tempered fabrics, ?various sources. 216 sherds.

O Oxidised coarse wares.

- O10 Fine oxidised wares, ?various sources. 93 sherds.
- O20 Medium-coarse sand tempered fabrics. 38 sherds.
- O50 Fine sandy oxidised wares. 2 sherds.

R Reduced coarse wares.

- R10 Fine reduced wares, ?various sources. 27 sherds.
- R16 'Upchurch type' fine reduced ware (Dover fabric R35). 295 sherds.
- R20 Coarse sandy reduced wares. 2 sherds.
- R30 Medium sandy reduced wares, ?various sources, but most probably local. 624 sherds.

B Black-burnished wares

- B20 Black-burnished ware category 2, all probably local. 203 sherds.

Fabrics and sources

The early Roman assemblage was for the most part dominated by shell- and sand-and-shell-tempered fabrics, with a moderate grog-tempered component in the 1st century. Very fine oxidised and reduced fabrics, plus oxidised and reduced white-slipped flagons, were a significant component of later 1st century assemblages. Reduced 'Romanised' sand-tempered wares became important from about the end of the 1st century, and very similar fabrics identified as BB2 were a significant component of some 2nd century and later assemblages. Oxidised wares were always relatively scarce. Apart from the local white-slipped fabrics there was a fairly limited range of fine and specialist wares, including samian ware, south Spanish (and possibly Gaulish) amphorae, Verulamium flagons and mortaria and other mortaria from regional sources such as Colchester.

Table 1 *Fabrics as percentage of numbers of sherds of selected groups*

Fabric	Context groups								Total	%
	Fill 252	Fill 217	Layers 529 etc	Ditch 289	Pit 194	Layers 343-341	Pit fill 410	Pit 190		
S20		6.2		0.7	1.8	3.1	0.7	1.1	52	1.5
S30						0.3		3.3	48	1.4
S31					0.1				1	+
S35						0.3		0.4	6	0.2
S41								0.4	6	0.2
F40						0.3			1	+
F50								0.1	1	+
A10						0.6	2.2		2	0.1
A11					0.1	1.4		0.1	14	0.4
A13				0.3	0.1				2	0.1
A20					0.1			0.1	2	0.1
M21					0.2	0.3		0.1	4	0.1
M29							5.8	0.3	20	0.6
W10			2.5	0.7	0.1	0.3	0.4	0.1	7	0.2
W20								0.1	2	0.1
W21			2.5	0.3	1.0	12.2	0.4	0.6	64	1.9
Q43					1.4				13	0.4
Q50				10.0	0.3	6.1	2.2	2.8	102	3.0
Q51					16.5			0.1	155	4.5
Q52		14.8	2.5	0.3	1.0	1.9		1.4	49	1.4
Q53								0.8	11	0.3
C10	45.9	42.0	32.5	43.1	48.3	32.5	28.8	12.5	1017	29.6
E20	2.7	22.2							19	0.6
E30	10.8	1.2	17.5	17.7	10.8	7.2	22.3	5.8	335	9.8
E80	40.5	3.7	35.0	15.1	5.4	3.6	4.3	4.5	216	6.3
O10				2.0	3.4	4.4	3.6	2.1	93	2.7
O20					0.1	2.2		2.1	38	1.1
O50								0.1	2	0.1
R10					1.2		0.4	1.1	27	0.8
R16		9.9	5.0	8.4	7.7	11.9	15.1	7.3	295	8.6
R20					0.2				2	0.1
R30			2.5	0.7		8.9	13.3	39.1	622	18.1
B20						2.5	0.7	13.8	205	6.0
Total sherds	37	81	40	299	934	360	278	1404	3433	

Excavations at Springhead Roman Town

Table 2 Vessel forms as percentage of EVEs of selected groups

Form	Context groups								Total EVEs	%
	Fill 252	Fill 217	Layers 529 etc	Ditch 289	Pit 194	Layers 343-341	Pit fill 410	Pit 190		
B flagons						5.5	4.3	4.3	1.47	3.8
BB large flagon						2.2	18.7		1.22	3.1
<i>B subtotal</i>						<i>7.7</i>	<i>23.0</i>	<i>4.3</i>	<i>2.69</i>	<i>6.9</i>
C jars	6.9			54.7	26.2	19.8	8.8	15.7	7.78	19.9
CB barrel shaped jar	50.6	6.0	50.0						0.53	1.4
CC narrow mouthed jar							3.5		0.14	0.4
CD medium mouthed jar	17.2	29.9		7.0	2.1				0.71	1.8
CH bead rim jar	19.5	20.9	50.0	6.5	18.1	16.1	43.1	21.3	8.29	21.2
CI angled everted rim jar					2.2	0.9	3.3	3.5	0.95	2.4
CK 'cooking pot' jar							1.3	9.4	1.55	4.0
CM wide mouthed jar							2.8		0.11	0.3
CN large storage jar					1.9	3.3	0.3		0.36	0.9
<i>C subtotal</i>	<i>94.2</i>	<i>56.8</i>	<i>100.0</i>	<i>68.2</i>	<i>50.5</i>	<i>36.8</i>	<i>66.1</i>	<i>50.2</i>	<i>20.42</i>	<i>52.3</i>
D uncertain jars/bowls		3.0			4.2	5.4	1.5	1.6	1.05	2.7
E beakers		13.4			4.5			2.5	0.93	2.4
EA butt beaker				7.0				0.9	0.30	0.8
ED globular beaker						7.9		1.4	0.23	0.6
EG carinated beaker				13.1			5.5		0.92	2.4
EH 'jar' shaped beaker				1.4					0.03	0.1
<i>E subtotal</i>		<i>13.4</i>		<i>21.5</i>	<i>4.5</i>	<i>7.9</i>	<i>5.5</i>	<i>4.8</i>	<i>2.41</i>	<i>6.2</i>
FA rounded cup								2.5	0.40	1.0
FB campanulate cup					1.7	6.0		6.0	1.44	3.7
FC conical cup						2.1		4.2	0.78	2.0
<i>F subtotal</i>					<i>1.7</i>	<i>8.1</i>		<i>12.7</i>	<i>2.62</i>	<i>6.7</i>
H bowls	5.7					1.1	1.0		0.19	0.5
HA carinated bowl						5.4	6.3		0.54	1.4
HB straight sided bowl						1.7			0.09	0.2
HC curving sided bowl								2.0	0.31	0.8
<i>H subtotal</i>	<i>5.7</i>					<i>8.2</i>	<i>7.3</i>	<i>2.0</i>	<i>1.13</i>	<i>2.9</i>
I uncertain bowls/dishes					0.8	0.6		0.3	0.16	0.4
IA straight sided bowl/dish					0.9	0.9	4.3	8.3	1.63	4.2
IB curving sided bowl/dish					0.7			0.4	0.14	0.4
<i>I subtotal</i>					<i>2.4</i>	<i>1.5</i>	<i>4.3</i>	<i>9.0</i>	<i>1.93</i>	<i>4.9</i>
J dishes								0.3	0.04	0.1
JA straight sided dish		26.9		3.3	10.3	3.2	5.3	4.5	2.39	6.1
JB curving sided dish				4.2	7.5	0.7	1.3	4.1	1.58	4.0
<i>J subtotal</i>		<i>26.9</i>		<i>7.5</i>	<i>17.8</i>	<i>3.9</i>	<i>6.6</i>	<i>8.9</i>	<i>4.01</i>	<i>10.3</i>
KA flanged mortarium							2.3	0.8	0.21	0.5
L lids				2.8	10.9	5.2	3.3	5.3	2.42	6.2
Z uncertain/unidentified							3.5	0.3	0.18	0.5
TOTAL EVEs in group	0.87	0.67	0.10	2.14	10.06	5.35	3.99	15.89	39.07	

The great majority of the pottery will have derived from relatively local sources, principally the nearby Upchurch and 'Thameside' industries, probably responsible for all the major coarse wares mentioned above, including such fabrics as BB2. No significant quantities of non-local coarse wares were noted, and Canterbury products, for example, appeared to be very scarce, though R20, O50 and possibly some O20 sherds may have been from this source. Most oxidised vessels were probably relatively local in origin. These included a number of fine pieces with white/cream painted decoration. Other non-local coarse wares were Alice Holt grey ware and (Dorset?) BB1, but these were present only in very small quantities in later Roman groups not subject to detailed recording.

Samian ware was the principal imported material, with South, Central and East Gaulish sources all represented. A single sherd of Lezoux 1st-century production was notable. There were only two small colour-coated sherds in the contexts recorded in detail, one in a fine white fabric, probably imported, the other an oxidised fragment, both with a brown slip. Neither was attributable to a specific source. Equally, only a very few sherds of possible imported colour-coated fabrics were present in the rest of the assemblage. These included a few pieces of Trier 'Rhenish' ware, one from a motto beaker. Other colour-coated fabrics were also relatively scarce, but included possible Colchester pieces. Oxfordshire colour-coated ware was relatively common in the few late Roman contexts, but Nene Valley products were very scarce there.

Most of the amphora sherds were of South Spanish Dressel 20 or South Gaulish wine amphora types (e.g. Pelichet 47). A few body sherds may have been from other sources. White-slipped flagon fabrics were mostly local in origin, but most white ware flagons were of Verulamium region origin (fabric W21), and mortaria from this source were also present (including at least two vessels with a FECIT counterstamp, contexts 232 and 278). Most other mortaria were probably of relatively local origin (i.e. Kent or south-east England). One herringbone stamp (from context 135, both rim form and stamp exactly paralleled at Dover (Hartley 1981, No. 365)) was assignable to Colchester. Probable imported pieces, not present in the re-recorded contexts, were noted during the assessment but were scarce.

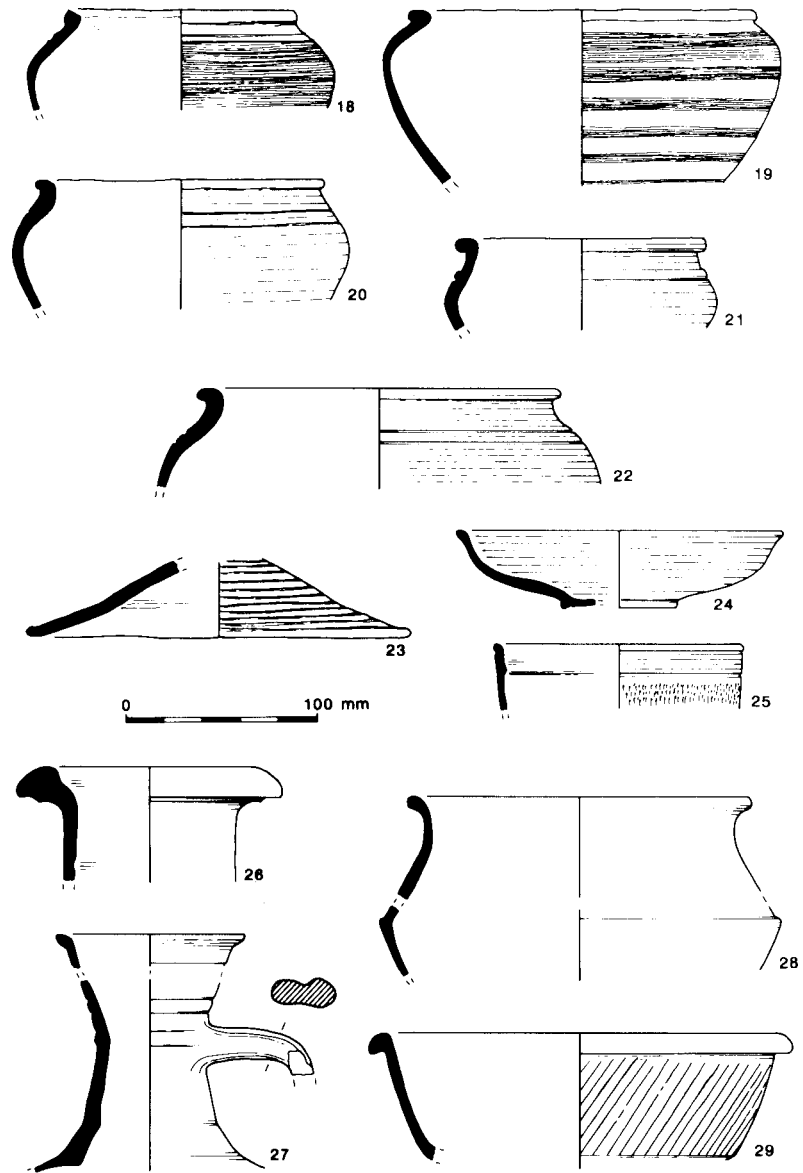


Figure 12 Pottery (scale 1:4)

Vessel forms

Vessel types were recorded in fairly general terms, relating to broad groupings of shapes suggestive of common functions. Time did not permit forms to be equated, for example, with the detailed typology of Monaghan (1987). The typology employed for earlier excavations at Springhead (e.g. Penn 1958, 86 etc) was not used here. Rim (and occasionally other) sherds were assigned to major vessel classes, and to sub-classes as appropriate. Rim forms were also recorded using the codes established in the OAU system, allowing a more detailed definition of individual vessels, but these data were not analysed systematically. The major vessel classes present (with their class codes) were flagons/flasks (B), jars (C), uncertain jars/bowls (D), beakers (E), cups (F), bowls (H), uncertain bowls/dishes (I), dishes

(J), mortaria (K), lids (L) and unidentifiable types (Z). The uncertain categories D and I are used for vessels where insufficient of the profile survived to allow an estimate of the height:diameter ratio on which a number of class definitions depend. The breakdown of the classes and sub-classes in terms of the main analysed groups is shown below (Table 2).

The EVEs totals for some of the earlier groups are too small to produce entirely reliable data, but the domination of the earliest group by jars (almost 95% of EVEs) is quite plausible for this period. Overall, jars totalled just over 52% of EVEs. From their high early representation they were already only c. 50% of EVEs in the Flavian pit 194. Their abnormally low representation in layers 343-341 appears to be a consequence of the correspondingly very high incidence of flagons in these contexts, which have skewed the figures for other types.

Bead rim forms of various kinds, including here examples with slight grooves or offsets for a lid seating, were much the most common individual sub-class and were important throughout the 1st and 2nd centuries. Of the remaining classes, only dishes constituted more than 10% of the assemblage, including examples in samian ware, such as forms 15/17 and 18. (Samian ware vessels also occurred in classes ED (form 67), FA (form 35), FB (form 27), FC (form 33) and HC (forms 31, 37 and 38)). Flagons, beakers, cups and lids all occurred at between 6% and 7%. Beakers may have been under-represented; despite the relative frequency of the characteristic 'Upchurch' carinated beaker class EG, small sherds could not always be assigned to this form even when it was likely that they belonged to it. Cups consisted almost entirely of samian forms. Lids occurred in C10, E30 and R30 fabrics, presumably mirroring the cooking vessels which they were intended to cover. A number of C10 and E30 lids were perforated. Mortaria were very scarce in terms of EVEs, and amphorae (with the possible exception of vessel No. 26, here recorded as a class BB large flagon) were not represented by rims at all. Amongst other relatively rare forms, class IA bowls/dishes are notably most common in the latest group, from pit 190. This simply reflects the growing importance of BB2, and the difficulty of distinguishing between the straight sided bowls and dishes characteristic of this fabric when only the rim and upper body wall are present.

Chronology

Assessment of the date of individual context groups was based initially on the established chronologies of fabrics such as samian ware and other fine and specialist wares. This was then augmented by consideration of more local fabrics, drawing principally on the work of Monaghan (1987) and Pollard (1988). The initial emphasis was on the date of recognisable vessel types rather than on fabrics, since some of the most important of the latter were in use for much of the period covered by the bulk of the assemblage (e.g. shell-tempered wares in the 1st-mid 2nd centuries) and did not have clear chronological significance. Some use was made of coarse ware fabrics

for dating, however. In very large groups the proportion of shell-tempered sherds was used as a guide: when these were very common a 1st-century date was considered more likely. Here, however, the (unknown) extent of residuality becomes a problem. BB2 was also a significant chronological indicator. Groups containing BB2 were assumed to date after at least AD 120, but not necessarily much after. In view of the relative proximity of some of the Thameside kilns to Springhead, a long time lag between the inception of particular lines of production and their appearance at Springhead would not be expected. Defining the upper date limit of groups characterised by BB2 was much more difficult, however, since many types are assigned to a broad date range (e.g. the common dish type 5E1 (in Monaghan's typology) dated 130/160-260/300). In the absence of other diagnostic 3rd-century types it is possible that some groups containing 3rd century BB2 are included amongst those assigned a "mid 2nd century or later" date range. The generally good group sizes did mean that it was also possible to use negative evidence with some confidence. Large groups with no BB2 were therefore assumed to be unlikely to date after the early 2nd century, or mid 2nd century at the latest.

On the basis of the assessment data, supplemented by that from the more detailed recording (which provided some refinement of dating, but no significant alteration to the chronological outline of the site), the approximate breakdown of the groups by ceramic date is as follows:

<u>Ceramic date</u>	<u>No. of groups</u>
Pre-Flavian	3
1st century	18
late 1st century	32
late 1st-early 2nd century	20
early-mid 2nd century	28
mid-late 2nd century	21
1st-2nd century	6
2nd century	4
late 2nd-3rd century	7
3rd century	2
late 3rd-4th century	4
4th century	2
post-medieval	1
Total	148

In most cases the group date is a terminus post quem, though for several of the larger groups the date range may be considered to be reasonably well established. On the basis of these figures 82% of all groups are assigned to the 1st and 2nd centuries. Even if some of the later 2nd-century groups should be considered to be later the scarcity of certain late Roman (i.e. late 3rd-4th century) groups is still clear. On present evidence late Roman activity is relatively restricted in extent (contexts 135, 142 and probably 148 and 425 being assigned to the late 3rd-4th century date range and 134 and 136 to the 4th century), with the four certainly late Roman contexts all located within 10 m of one another.

It is emphasised, however, that the above breakdown is based on ceramic dates alone. Examination of the stratigraphy indicates that there were some instances where groups dated to the 1st century were stratigraphically later than groups with later dates. This suggests that there are some problems with residual material, but the framework suggested by the more substantial groups seems to hold up well.

The chronological development of the assemblage

The date of the earliest activity on the site is uncertain. Of the many groups assigned to the 1st century AD, a few were considered to be potentially of pre-Conquest date, but this cannot be proved. The most significant of these was from context 252 (Fig. 10.1–7), a small group of 37 sherds, most if not all hand-made. These were largely in grog- or shell-tempered fabrics (cf. Pollard 1988, 39–40). There were four sherds in E30, a sand-tempered fabric group frequently also containing small shell inclusions, which was very common in later 1st-century groups, and a single sherd probably from a dish or bowl in a glauconite-tempered fabric (E20, No. 7), essentially a pre-Conquest tradition located in the Maidstone area (Monaghan 1987, 215). The shell-tempered sherds included rims of simple barrel-shaped or slightly more developed bead rim jars, the latter with impressed decoration on the shoulder. Parts of two pedestal bases and an everted rim jar were in grog-tempered fabrics. All the fabrics present in this group were in use after the Conquest period, and E30 may have been essentially a post-Conquest development (cf. Monaghan 1987, 222 and the description of fabric S3/6h (ibid. 248)) but the general character, and the total absence of Romanised fabrics and forms, suggests an early post-Conquest date at the latest.

A number of other groups had a similar composition to 252. These included 529, stratified beneath the sequence of roads on the site, but this group was small (only 23 sherds) and it is uncertain how much weight can be placed on the absence of Romanised fabrics, a problem encountered with other small groups of this nature. The overall chronology of the complex road sequence, however, in which only the very latest contexts appeared to be certainly datable to the early-mid 2nd century, suggests that a very early Roman date for its inception is quite likely.

Only one of the groups examined in detail, from 217 (81 sherds, Fig. 11.8–10), was of a distinct ceramic phase between these earliest assemblages and those certainly assigned to the Flavian period. This assemblage contained a high representation of shell-tempered sherds (34 out of 81) and also marked the latest appearance of the glauconite-tempered fabric E20 (Fig. 11.10). At the same time, Romanised fabrics

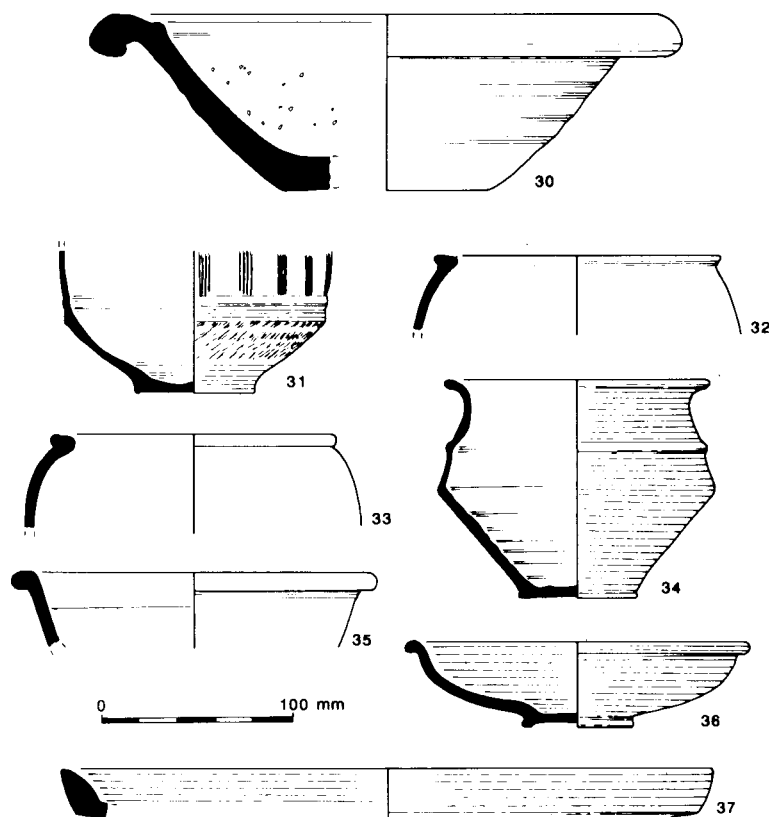


Figure 13 Pottery (scale 1:4)

appeared. 'Upchurch' fine reduced ware, the fine white-slipped fabric Q52 (including a beaker, Fig. 11.8) and South Gaulish samian of Neronian date were all present.

Two small context groups in the road complex, post-dating the early group 529 (see above), were examined and other groups in this sequence were scanned again to check their dating. Unfortunately there appears to have been contamination of some of these groups. That from fill 534 of an early ditch (535), for example, was essentially of later 1st century date but also produced a possible BB2 sherd and a ?4th century coin. The fills from ditch 289, on the west side of the road sequence, however, appeared to be of Flavian date except for the uppermost (277), which also contained a possible BB2 sherd. The latter, however, need not have been intrusive and probably indicates that the upper silting of the ditch was a process which continued well into the 2nd century. The ditch fill groups below 277 were similar to those already discussed in containing substantial quantities of ware groups C10, E30 and E80. White-slipped and fine oxidised and reduced fabrics were also present, together totalling c. 17% of the 171 sherds in the three lower fills. The single samian ware sherd from these fills was of Neronian to early Flavian date. It is possible that all these fills dated to the earlier part of the Flavian period. Jars were still the dominant vessel type here, comprising 68.2% of EVEs from this group.

Some developments in the pottery supply to the site are represented by the Flavian pit group 194 (934 sherds, Fig. 11.12–17, Fig. 12.18–25). The three main fills of this

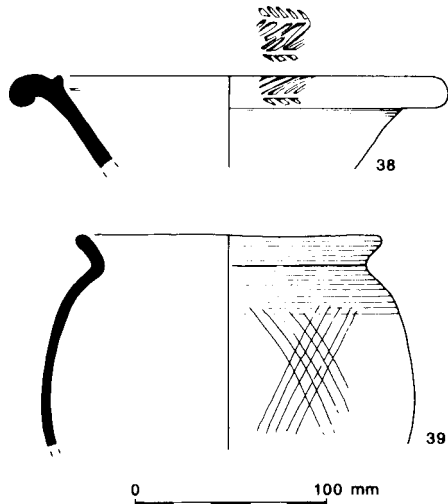


Figure 14 Pottery (scale 1:4)

feature consistently produced Flavian samian. The importance of E30 and E80 fabrics was reduced in comparison to ditch 189, but was still substantial, while the representation of shell-tempered C10 fabrics, at 48.3% of sherds, was higher than in any other feature group examined in detail. Fine reduced 'Upchurch ware' occurred at a level similar to that in ditch 289, while fine oxidised wares (e.g. Fig. 12.24) were slightly more common. Fully 'Romanised' sandy grey wares were still completely absent, however. The most distinctive characteristic of this assemblage was the high representation of fabric Q51, almost solely confined to this feature and amounting to 16.5% of the total sherds (although flagons only amounted to 7.7% of EVEs from this group). A further white slipped fabric, Q43, also occurred exclusively in this feature. While many of the Q51 sherds might have been from a single flagon (of Monaghan form 1E5), at least five different vessels were represented by base sherds from the primary fill (300) alone. The uppermost fill also produced a large handled jar (No. 13) in this fabric. A few sherds of amphorae and white wares, particularly the Verulamium region fabric W21, were also present, and sherds of Verulamium mortaria marked the first appearance of this vessel type in the sequence of studied groups.

A series of layers or fills (343–341, 360 sherds, Nos. 26–29), marked the next stage in the evolution of the Springhead ceramic assemblage. It is possible that these deposits were all of 2nd century date, but the first two might have been of the late 1st century, containing only South Gaulish samian, a very few sherds of the sandy reduced R30 fabrics and no BB2, whereas 341 must have been at least of mid 2nd-century date on the basis of samian and BB2. Overall, these deposits show the continuing decline of E30 and E80 wares (together c. 11% of the sherds in the three contexts) and the start of the decline of shell-tempered fabrics (46.7% of layers 343

and 342 combined, but only 18% of layer 341). Fine oxidised (e.g. Fig. 12.26) and reduced fabrics were well-represented, as were white-slipped fabrics, though the latter (e.g. Fig. 12.27) did not occur at the same level as in pit 194. Verulamium white ware (W21) was particularly common in the upper layer 341, though it is likely that many of these sherds came from a single large two-handled flagon or amphora (Fig. 12.26), which accounted for 18.7% of EVEs from this group. Dressel 20 sherds were also present in this deposit, and the samian ware included pieces from Les Martres-de-Veyre and a Lezoux form 33 of early to mid Antonine date. A single colour-coated sherd (F40) was also present here. This may have been a Rhineland product.

A pit group 410 (278 sherds, Fig. 13.30–37) presents some contradictory trends in terms of pottery supply. It must have dated after c. AD 120 on the basis of the presence of probable BB2 sherds, and certainly the associated ware group R30 was well-represented (c. 14% of sherds), but the group was possibly earlier than 341 (but not 342 and 343) discussed above. C10 fabrics amounted to 28.8% of sherds and E30 was 22.3%, the highest representation of these wares in any group. This might indicate a residual component in the assemblage, but these fabrics were still in common use at least as late as the early 2nd century. The samian from this group (two sherds only) was South Gaulish, and another 1st-century component might be represented by the large dish (Fig. 13.37) in R10, a fine, slightly sandy grey ware. This vessel imitated the fabric, form and finish of Terra Nigra. The great majority of the vessel forms in R30 fabrics were of bead-rim and related jars (e.g. Fig. 13.32–33, some with grooved (lid-seated) rims, continuing the tradition of these forms already well-established in E30 wares (e.g. Fig. 12.18–20), some examples of which were also present in this group. Indeed it was here that the separation of E30 and R30 wares was most difficult, and it seems that the former went through a gradual process of development in fabric (the progressive elimination of occasional grog and (particularly) shell inclusions), manufacture (the consistent use of wheel-throwing - most examples of E30 being hand-made) and firing (the achievement of harder, grey vessels), the end product of which was R30.

The final assemblage under consideration is another large group (1404 sherds, 15.89 EVEs, Fig. 14.38–39) from pit 190. The first two fills (245 and 236) might have been as early as the mid 2nd century, but subsequent ones had a terminus post quem of at least late 2nd century on the basis of Rheinzabern samian ware from 235. Overall a late 2nd-early 3rd century date seems likely for this feature. The developing pattern of supply of the major fabric groups is clear. Shell-tempered (C10) fabrics had declined to 12.5%, E30 to 5.8% and E80 to 4.5%, though not all sherds of the latter group were necessarily residual at this stage as 'Patch Grove' ware storage jars, represented here, may have continued in use into the early 3rd century (Pollard 1988, 212). Fine reduced 'Upchurch ware' was also in decline now, at 7.3%, as were fine oxidised fabrics (O10), while sandy oxidised fabrics (O20), possibly of Canterbury origin, made their first significant appearance. Relatively local sandy

reduced (R30) wares and the related BB2 were now the dominant coarse ware fabrics, with 39.1% and 13.8% respectively of the total sherds from the pit. Fine and specialist wares were in fairly short supply, except for samian ware, which totalled 5.2% of sherds but was particularly noteworthy for comprising 18.4% of the total EVEs from this feature. Central Gaulish material was represented in quantity for the first time here, and a smaller amount of East Gaulish material has already been referred to. Amphorae, mortaria (e.g. Fig. 15.38) and white wares were all poorly-represented, and white slipped fabrics totalled 4.9%. Amongst these, fabric Q53 appeared for the first time.

There was little in the repertoire of vessel forms in pit 190 which requires particular comment. At 11.3 g., the mean sherd weight for the group was rather less than the site average, with the result that vessels were more broken and less easily assigned to very specific forms rather than to general type classes. The BB2 jar (Fig. 15.39), from a middle fill (235) was typical of the better-preserved pieces, however.

Samian ware stamps

identified by B Dickinson (pieces from contexts recorded in detail are indicated with an asterisk)

1. BICO[or OICO[, form 27. South Gaulish. Flavian. Layer 343*
2. Domitianus 3b, on a flat dish. Rheinzabern. Mid-late Antonine. Context 135.
3. Matugenus ii 3c, form 15/17 or 18. La Graufesenque. c. 50–65. Context 231.
4. Modestus i 6b, form 27. La Graufesenque. c.50–65. Layer 342*.
5. Primus iii 12g, form 15/17 or 18. La Graufesenque. c. 65–80. Context 418.
6. Severus iii 7t, form 18. La Graufesenque. c. 70–85. Pit fill 246 (feature 194)*.
7. Sollemnis i 2b (a new die), form 31. Lezoux. c. 125–150. Pit fill 235 (feature 190)*.
8. Unidentifiable fragment, form 27. South Gaulish. Flavian. Context 244.
9. Illiterate, form 27. South Gaulish. Flavian. Layer 342*

Catalogue of illustrated vessels

Feature group 252, c. mid 1st century. All hand made. (Fig. 10.1–7)

1. Fabric C10. Type CB, barrel shaped jar.
2. Fabric C10. Type CB, barrel shaped jar.
3. Fabric C10. Type CH, bead rim jar with impressed decoration on shoulder.
4. Fabric C10. Type CH, bead rim jar with impressed decoration of shoulder.
5. Fabric E80. Base of pedestal jar, burnished externally.
6. Fabric E80. Type CD, medium mouthed jar, burnished externally.

7. Fabric E20. Probably type H, bowl, burnished externally.

Feature group 217, probably Neronian. (Fig. 11.8–10)

8. Fabric Q52. Type E, beaker.
9. Fabric C10. Type CH, bead rim jar with well-defined grooves.
10. Fabric E20. Type CD, medium mouthed jar.

Upper fill (277) of ditch 289, probably early 2nd century. (Fig. 11.11)

11. Fabric R16. Type EH, beaker, cf (roughly) Monaghan form 216.

Pit group 194, Flavian.

(Fig. 11.12–17, Fig. 12.18–22)

12. Fabric Q51. Type B, flagon. Fill 193.
13. Fabric Q51. Type C, jar, with scar for handle. Fill 193.
14. Fabric C10. Type CH, bead rim jar with lid seated rim. Fill 193.
15. Fabric C10. Type CH, bead rim jar. Fill 193.
16. Fabric C10. Type CN, storage jar with impressed decoration on rim. Fill 246.
17. Fabric C10. Type JA, straight-sided dish. Fill 246.
18. Fabric E30. Type CH, bead rim jar with combed surface. Fill 246.
19. Fabric E30. Type CH, bead rim jar with combed decoration. Fill 246.
20. Fabric E30. Type C, jar with slightly everted rim, similar to bead rim types. Grooves on shoulder and rough burnishing. Fills 193 and 246.
21. Fabric E30. Type C, jar similar to bead rim types with pronounced cordon on shoulder and rough burnishing. Fill 193.
22. Fabric E30. Type CD, medium mouthed jar with grooves on shoulder and rough burnishing.

Fill 246. (Fig. 12.23–25)

23. Fabric E30. Type L, lid, with spiral burnished line up vessel. Fill 193.
24. Fabric O10. Type JB, curving sided dish, with overall interior and exterior burnish. Fills 193 and 246.
25. Fabric R16. ?Type H, bowl, loosely of Monaghan (1987) form 4H1, with rouletted decoration below the finely burnished upper part. Fill 193.

Layer 341, c. mid 2nd century or a little later.

(Fig. 12.26–29)

26. Fabric W21. Type BB, large flagon or possible an amphora, though the rim form is not the same as the Dressel 2-4 types discussed by Castle (1978, Figs 1–3).
27. Fabric Q52. Type BB, large flagon.

28. Fabric O10. Type CF, carinated jar (or bowl), burnished overall.
29. Fabric B20. Type HB, straight sided bowl. Burnished overall internally and externally with superimposed oblique burnished line decoration.

Feature group 410, perhaps c. AD 120–140.

(Fig. 13.30–37)

30. Fabric M29. Type KA, flanged mortarium.
31. Fabric O10. Type HA, carinated bowl, with grouped vertical burnished lines above the carination and a zone of rouletting below.
32. Fabric R30. Type CH, bead rim jar.
33. Fabric R30. Type CH, bead rim jar with slightly lid-seated rim.
34. Fabric R16. Type HA, carinated bowl, finely burnished overall.
35. Fabric R30. Type IA, straight sided bowl or dish.
36. Fabric R16. Type JB, curving sided dish, finely burnished internally and externally.
37. Fabric R10. Type JA, straight sided dish/platter, finely burnished internally and externally.

Fill 235 of pit group 190, late 2nd-early 3rd century.

(Fig. 14.38–39)

38. Fabric M29. Type KA, flanged mortarium with stamp of irregular long oblique lines between borders of short oblique lines.
39. Fabric B20. Type CK, 'cooking pot' jar. Rim and shoulder slipped and burnished, with discontinuous burnished lattice below.

THE IRON OBJECTS

by C J Salter

Introduction

A total of 203 objects were X-rayed and examined. This did not include the majority of fragmentary and unidentifiable objects recovered by metal detector from the unstratified surface contexts, as this included much modern material. An additional 25 objects and fragments of iron were recovered from the 'slag' by the use of a metal detector. The majority of these additional pieces came from context 410, which clearly contained debris from a forge. All of the objects appear in the catalogue below, with the exception of the nails which are discussed briefly at the end of this section.

Catalogue of iron work

The numbers which appear in brackets are small finds numbers. These were not assigned in every case. The objects are listed in context order.

1. *Irregular fragment*: thick fragment, thickened at one end as if part of a loop. Ctx 130.
2. *Rod*: possible nail. Ctx 130.
3. *Rod*: possible nail shank. Context 130.

4. *Rod*: possible nail shank. Context 132
5. *L-shaped object*: two rectangular slots visible on x-ray, possible attempt to punch two holes through the metal close to the outer (convex) edge. If these holes had been completed the object would have looked very similar to a horse-shoe. Context 135.
6. *Sheet* (21): broken wide strip or sheet fragment, slightly curved about long axis, and at one end. One bright spot on x-ray suggests that there may be copper or lead alloy material in the corrosion products. Length 97 mm, width 58 mm, thickness 2 mm. Context 136.
7. *Strip* (27): broken curved thick strip with perforation punched through (now at break), and another 18 mm from the end with the unbroken rounded termination. Length 97 mm, width 40 mm, thickness 5 mm. Context 136.
8. *Finger-ring*: broad on one side with setting to take an oval stone, narrow on other, section thickness more or less constant. Context 164. (Fig. 16.10)
9. *Rod*: possible nail shank. Context 164. (Fig. 15.5)
10. *Rod*: possible nail shank. Context 164
11. *Ring* (57): split-ring of sub-rectangular section. Complete. Diameter 30–32 mm, section diameter 5.5 mm. Context 164.
12. *Socketed object*: pyramidal head, bent through 90° at mid-point and badly corroded, form is typical of a catapult bolt, though much longer, socket damaged but apparent diameter c. 16 mm. Length 136 mm. Context 166. (Fig. 15.3)
13. *Rod*: short length. Context 166.
14. *Irregular object*: possible cut marks. Length 23 mm, width 22 mm, thickness 9 mm. Context 171.
15. *Strip* (39): widening slightly along its length, bent at wider end, one definite perforation (nail hole) at the narrower end and a possible hole at the wider end. Strip may have been deliberately cut. Broken. Length 44 mm, width 44 mm, thickness 2 mm. Context 189.
16. *Curved strip*: shaped like tip of sickle, though no indication of cutting edge. Context 203
17. *Rod*: possible nail shank. Context 205.
18. *Riveted strip*: two rivets are probable hob-nails. Context 209.
19. *Hobnails/riveted strip*: three possible rivets. Context 209
20. *Bar* (49): rectangular section flaring slightly at one end, possible stock bar fragment. Length 148 mm, width 19 mm, thickness 3 mm. Incomplete. Context 209.
21. *T-clamp* (54): stem broken. Length 70 mm, Head 50 mm across the arms by 14 mm. Maximum stem section 8 mm by 8.7 mm. Context 209. (Fig. 16.9)
22. *Strip*: one end bent through 90°, other end broken and split (by corrosion?). Context 225.
23. *Strip*: widens from a flat rounded terminal to a wide rectangular section. Curved and broken at wide end. Context 231.
24. *Strip*: thicker at one end than the other, probably welded back on itself. Context 235.
25. *Bar* (45): fragment only, rectangular section. One end shows traces of cut marks from a set. Length

- 65 mm, width 12 mm, thickness 8 mm. Context 235.
26. *Bar*: round-section with slight curve at wider end. This curve was probably produced when the object was cut or broken at this end. Length 76 mm, section 12.9 mm by 11.7 mm at thicker end, and 8 mm diameter at thinner end. Stock or part of broken tool. Context 270.
27. *Wire*: curved fragment of round-section wire, possibly decorated with ribbing, possibly part of a curved pin. Context 270.
28. *Bar* (60): rectangular bar, thinned and splayed to form a wide strip object. The termination at wide end is clearly broken, whereas, it is not clear whether the narrow end represents the original termination of a tang, or a break. Possibly a tanged blade. Broken. Length 86 mm, width 35 mm, 'blade' thickness 3 mm, section at narrow end 13 mm by 5.4 mm. Context 270.
29. *Strip* (61): slightly curved with perforation (nail-hole) at one end and with edges folded back towards the middle of the strip at the broken end. There is a suggestion of work induced cracking at the perforated end. This could be an off-cut from piece of strip which has been re-used. Incomplete. Length 58 mm, width 38 mm, thickness 4 mm. Context 270.
30. *Brooch*: possible two piece T-hinge iron brooch. (Fig. 15.1). Context 282.
31. *Forge waste*: badly corroded. Context 318.
32. *Bar*: square-sectioned, bent through 90°, possibly part of heavy clamp or staple, or large nail. Context 322.
33. *Curved object*: rectangular section but the major axes of the section are perpendicular at either end. If this is a latch-lifter it is not a common form. It also could be a handle to a vessel. Broken at the narrow end. Context 343.
34. *Strip* (67): rectangular section, probably incomplete at both ends. There is a perforation at one end with a tapering slot part-through the thickness of the strip running towards the hole. It is not clear if this slot was part of the original form of the object or a results of corrosion. The object was slightly wider at the ends than the middle. The strip thins towards one edge. The form is not consistent with identification as a blade. Incomplete. Length 89 mm, width 28 mm, thickness 3.6 mm. Context 400.
35. *Strip/bar* (68): flattened-oval slightly uneven section. The object has unusually thick section. There is possible evidence of hot cutting at the ends. At one end there was a small protrusion which may be due to the cutting process, or to two pieces of metal corroding together. Almost certainly a fragment of stock-material. Length 68 mm, width 35 mm, thickness 12 mm. Context 400
36. *Tongs* (62) large with bowed jaws, arms of almost equal length. Overall length 476 mm, width across shut jaws 65 mm, length of jaw-gripping face probably 45 mm but tip of one jaw damaged. Context 410. (Fig. 16.7)
37. *Socketed cleaver* (94): back angled to socket. Single rivet hole in the socket with the rivet perpendicular to the plane of the blade. Manning (1985) type 6 cleaver. Overall length 260 mm, blade length 160 mm, maximum blade width 70 mm, blade-back thickness 12 mm, socket 31 mm by 37 mm. Context 410. (Fig. 16.11)
38. *Tapering bar*: possible drift/punch/drill bit head. The pattern of mineralised deposits on the surface of the object suggest that it had been wrapped in, or surrounded by, hay or straw. Context 410. (Fig. 15.6)
39. *Irregular bar*: tapering and bent at end. Cut piece of stock/scrap. Context 410.
40. *Rod*: circular section, tapering along its length. Context 410.
41. *Bar*: tapering from a broken/cut end to a round termination. Off-cut. Context 410.
42. *Sheet*: twisted up at one corner, suggestion of tapering section as if a blade fragment. Context 410.
43. *Strip fragment*: possibly burnt. Context 410.
44. *Strip*: twisted up at one end. Context 410.
45. *Rod fragment*: badly damaged by corrosion. Context 410.
46. *Bar*: slightly tapering and thick, probable cut fragment. Context 410.
47. *Bar*: thick, so badly corroded that the form of the section is now uncertain. Length 49 mm, maximum section dimension 17.3 mm by 17 mm. Context 410.
48. *Rod*: possible nail stem. Context 410.
49. *Strip*: one end with rounded termination, the other end broken. Length 51 mm, width 30 mm, thickness 3.3 mm. Context 410.
50. *Curved fragment*: irregular form. Length 76 mm, width 32 mm, thickness 8.6 mm. Context 410.
51. *Bar*: tapering and twisted at one end. Length 71 mm, width 19 mm, thickness 5 mm. Cut stock or scrap. Context 410.
52. *L-shaped fragment*: main body is a bar 58 mm long, 23 mm wide and 5 mm thick, with a much smaller short arm at right angles to the edge at one end. The arm is 12 mm long with a square section 8 mm across. The other end has been broken or cut. Possible slicker. Context 410.
53. *Irregular fragment*: length 41 mm, width 26 mm and thickness 8 mm. Context 410.
54. *Fragment*: heavily concreted piece of iron, possibly mineralised forge floor deposit. Context 410.
55. *Slagged iron fragment*. Context 410.
56. *Fragment* Context 410
57. *Strip fragment*. Context 410.
58. *Ten small fragments*. Context 410.
59. *Probable bloom or billet fragment*: length 35 mm, width 26 mm and thickness 37 mm. Context 410.
60. *Tool?* (70): bar gradually thinning towards both ends, but in the opposite planes. Possibly terminated by breaks, but only a little lost. Possibly a file but no indication of teeth remaining. Length 143 mm, maximum width 13.8 mm, thickness 9.7 mm. Context 418. (Fig. 16.8)
61. *Curving strip*: widening towards one end, possible knife or horse-shoe fragment. Context 419.
62. *Blacksmithing waste*: badly corroded. Context 420.
63. *Scrap fragment*: wedge-shaped, with possible incomplete cut mark. This shaped object would be

- difficult to work any further. Length 32 mm, width 24 mm and maximum thickness 10.6 mm. Context 425.
64. *Object* (75): irregular thick sheet, elbow-shaped with crystalline corrosion product. Incomplete. Length 78 mm, width 32 mm, thickness 4 mm. Context 425.
 65. *Blade?* (76): Thin-section slightly curved strip or sheet. Possibly tip of broad blade. Incomplete. Length 66 mm, width 27 mm, thickness 1.5 mm. Context 425.
 66. *Curved wire*: broken in part. Context 433.
 67. *Bar*: widened to flat rectangular section. Probably knife tang. Broken. Context 612.
 68. *Knife?*: possible tang and part of blade, though distinction between the two is unclear. Incomplete. Length 76 mm, width 17 mm, thickness 2.6 mm. Unstratified.
 69. *Joiner's dog*: one arm broken. Very common form on Roman sites. Length of arm 39 mm, width across back 39 mm, back section 7.8 mm by 4.1 mm. Unstratified.
 70. *Figure-of-eight chain link*: length 41 mm, width 17 mm, thickness 4 mm. Unstratified.
 71. *Clamp*: small clamp with wide, thick arms. Length across back 37 mm, width 25 mm. Complete. Unstratified.
 72. *Sheet*: irregular fragment. Unstratified.
 73. *Hold fast or nail head and washer*. Unstratified.
 74. *Strip* (13): possible blade fragment. Unstratified.
 75. *Rod* (13): possible nail shank. Unstratified.
 76. *Knife* (13): tang and part of blade. Length 45 mm, blade width 9 mm. Incomplete. Unstratified.
 77. *Knife/shears blade* (16): blade construction, with a heavy moulding rod running out from the tang along the back of the blade, is not normally found with Roman blades. This suggests that this object might be medieval or post-medieval. Broken. Overall length 100 mm, max. width 36 mm, blade thickness 2.4 mm, tang 10 mm by 6 mm. Unstratified.
 78. *Ring* (17): complete oval-shaped ring with sub-rectangular cross-section. External dimensions 41 mm by 32 mm, section 7 mm by 4.2 mm. Unstratified.
 79. *Lift key* (29): 'L'-shaped with a uniform rectangular-sectioned stem and a loop terminal. Two of the three teeth on the bit remain. In exceptionally good condition considering the thin tooth construction. Almost complete. Overall length 99 mm, width 49 mm, loop diameter 13.5 mm and 8 mm deep. Unstratified. (Fig. 15.2)

The assemblage is, in general, unremarkable, containing a mixture of domestic and craft artefacts. There were a number of notable objects, in particular a large pair of blacksmith's tongs (No. 36, Fig. 16.7, Pl.3) a pair of unfinished nails (No. 9), and a spearhead/bolt head (No. 12). There was a lack of specifically agricultural tools in this collection. This might reflect the urban nature of the site. The object that would seem to be associated with agriculture, the shears blade (no. 77), is

unlikely to have come from the Roman period. Although the unstratified topsoil layers did include material that was clearly Roman, such as the latch-lifter key (No. 79, Fig. 15.2), these layers contained much modern material such as woodscrews.

Iron working

Context 410 contained a primary dump from a general purpose forge (see report on metalworking debris below). It would seem that at some time in the late 1st-century or early 2nd-century the forge or its immediate environs was fairly cleared with large masses of debris including small lumps of forge floor being dumped in this context. This context also contained a large pair of blacksmith's tongs (Fig. 16.7, Pl.3). The tongs had bowed jaws with extended gripping faces, and arms of nearly equal length and were of very similar form to those in the Late Iron Age hoard from Waltham Abbey (Manning 1985). They were almost complete, and the damage that had occurred, the loss of the tip of one jaw, was clearly due to corrosion rather than deliberate damage.

Also from context 410 was a rectangular-sectioned object which tapered at both ends (No. 38, Fig. 15.6). The pattern of mineralised deposits on the surface of the object suggest that it had been wrapped in, or surrounded by, hay or straw. The identification of this type of object is not certain. Similar objects have been identified as the heads of pila or catapult bolts. Manning (1985, 27) suggests that they could be the heads of drills in which the bit has been broken off. The first suggestion is unlikely to be correct for this object given the nature of the context, even though a military object was recovered from a slightly later context (No. 12, 166). The lack of evidence of damage to the ends of the object, argues against Manning's suggestion. It is unlikely to have been a punch as most punches described in the literature have a metal percussion face, whereas this object must have had a wooden handle. Such a tool could have been a drift for enlarging holes in iron, or putting decorative surface finishes on metal objects. A metallographic sampling of the working tip might help elucidate the use to which it was put.

Further evidence for iron working comes from some of the, often overlooked, small sections of iron bar. If the preservation of the surface is sufficiently good it possible to see traces of cutting and other forging marks. On this site, although the preservation was not very good, some of these stock off-cuts could be identified, as could a number of pieces of waste iron, that is pieces of iron that have become too small, or too awkward to use, or have been slagged or burnt beyond use. The smith appears to have been using a wide range of different sized stock. The presence of a bloom or billet fragment, would suggest that the smith had access to primary metal as well as more heavily worked stock. The exact nature of the chemistry, and mechanical properties of the metal available on site is unclear without metallographic analysis, but a similar unpublished billet fragment from Carmarthen proved to be of a high carbon steel.

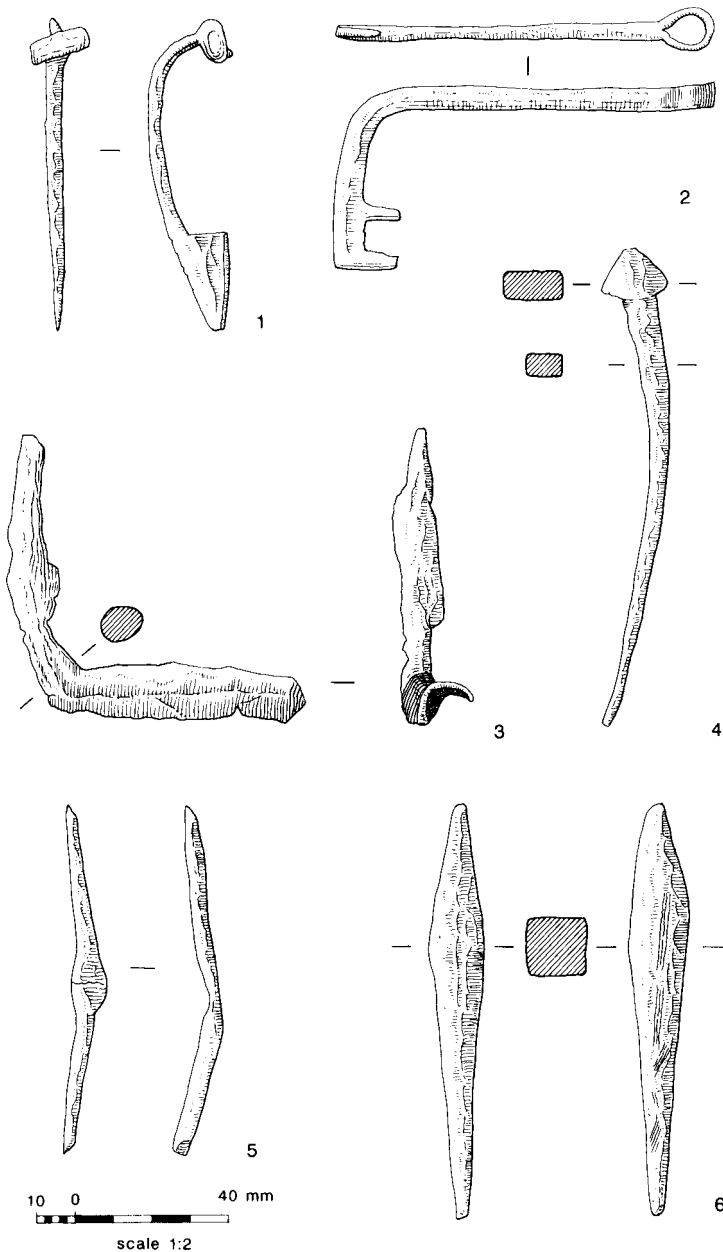


Figure 15 Iron objects 1-6, scale: 1:2

Leather working

An object which appeared to be part of a slicker (No. 52) was recovered from the slag of context 410. It consisted of a broad thick blade with one upstanding tang. The blade appears to have been broken or cut, removing up to a third of the blade and the second tang (if it existed). If the reconstruction is correct it would appear to parallel the examples from Hod Hill (Manning 1985, 39, Pl. 15) and from Asthall, Oxon. (Mould 1997, 84, Figs 4.4 and 11). Such items would have been used to scrape the fat and flesh from skins. However, Mould does suggest the possibility of interpreting these objects as rather heavy joiner's dogs. As a joiner's dog the shape of the object would be functionally inefficient.

Agricultural tools

The only definite example of an agricultural tool was the unstratified broken shear (No. 77). The form of this blade with a heavy strengthening moulding along the back of the blade is not a typical Roman form. It is more likely to have been later medieval or post-medieval. The surface layers were contaminated with other post-Roman material.

Military equipment

A bent and badly corroded socketed point with a pyramidal head (Fig. 15.3) bent at 90° to the socket was recovered from context 166. Its basic form is typical of Manning type 1 catapult bolt-heads (Manning 1985, 170-175). However, this example is much longer than most examples which are typically about 85-95 mm long. Most bolt-heads have been found on sites with a military context, such as Hod Hill (Manning 1985), Usk (Manning *et al* 1995) and Corbridge, which raises the slight possibility that this is a spearhead whose shape has been very severely modified by corrosion.

Transport

An object (No. 5) from context 135 appears from the X-ray to be part of an unfinished horseshoe, with the sites for two of the nail holes marked out but not fully punched through.

Locking mechanisms.

A well preserved L-shaped three tine key / latch-lifter (No. 79, Fig. 15.2) came from an unstratified context. This has many Roman parallels. However, it is not clear whether an object (No. 33) from context 343, was a latch-lifter or a vessel handle broken close to the point of attachment.

Knives

Four knives were found, three were only fragments, blade tip or tang and small part of the blade. The small knife (No. 76) with a handle of nearly the same width as the blade, which appeared to be nearly complete, was a metal detector find from an unstratified context.

Cleaver

A socketed cleaver with the back angled to the socket was recovered from context 410 (No. 37, Fig 16.11). The form is almost identical to the example of Manning's (1985, 123, pl. 57) type 6 cleaver, from 'Groveburst/

Grovehurst' example Q102, down to the single rivet hole in the socket with the rivet perpendicular to the plane of the blade. Manning thought that the 'Groveburst' example probably came from north Kent. The similarity of the two suggests that the British Museum example might have come from Springhead.

Personal items

A single T-hinge brooch with most of the pin missing was recovered from context 282 (Fig. 15.1). The brooch had a solid catch plate. As normal with iron brooches the form is rather simpler than the equivalent copper alloy, as it is very much more difficult to produce surface decoration by forging iron than it is by casting a copper alloy. The form mirrors the copper alloy examples from the same period, for example the Gussage All Saints phase 3 brooch 3016 in copper alloy with iron pin (Wainwright 1979, 111).

A piece of fine curved wire (No. 27) from context 270 appears on the X-ray to have surface decoration at one end. If this is not an corrosion artefact, it is likely that this was part of a decorative brooch or pin.

An iron finger ring designed to take a gem stone (No. 8, Fig. 16.10) came from context 164. The missing stone would have fitted on an oval bezel setting.

Structural fittings

A small range of structural fittings were recovered. These included one figure-of-eight link of a chain (No. 70) (Manning 1985, 139 and pl. 64), and two rings. One ring (No. 78), from an unstratified context was of an oval shape and of a welded form, whereas, (context 164, No. 11) was a split-ring of rounded shape. As isolated finds they give no indication of their possible use. Only one joiner's dog and

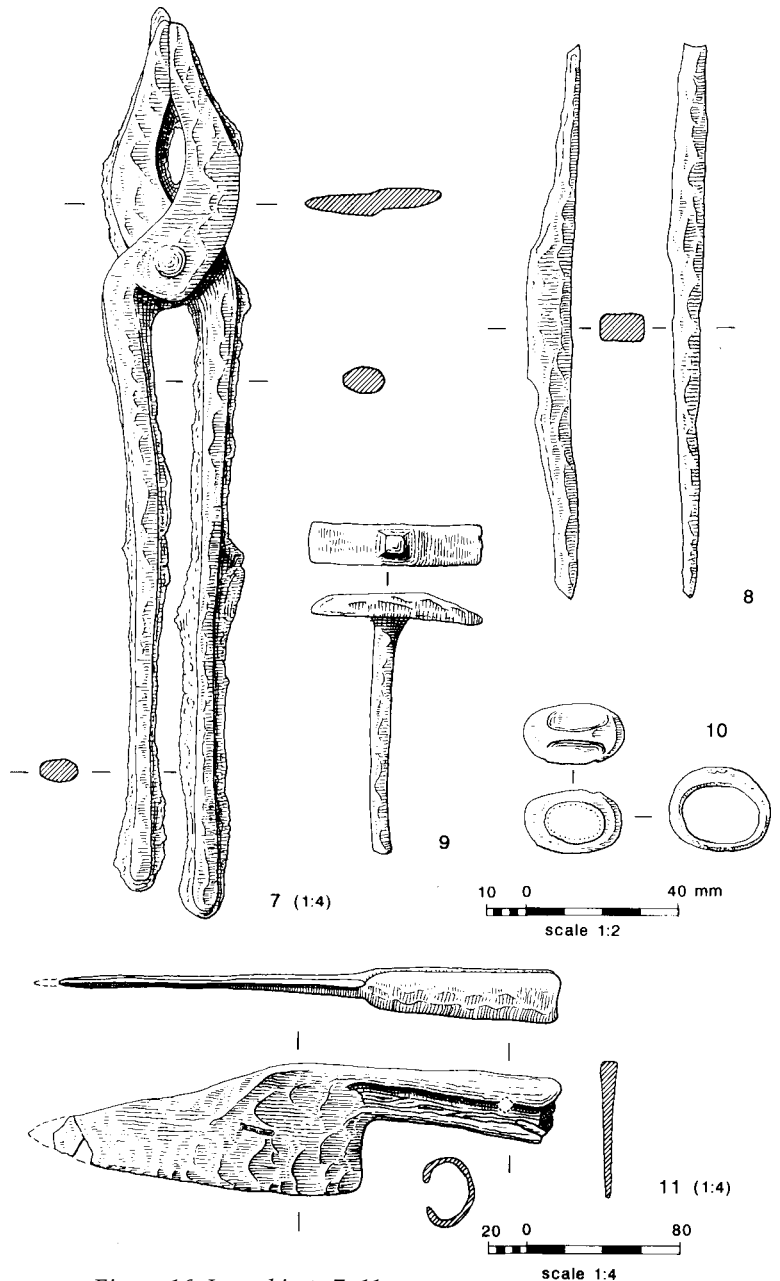


Figure 16 Iron objects 7-11



Plate 3 Metalworking pit 410 showing iron tongs in situ

relatively few other forms of clamps were recovered. Surprisingly no wall hooks, or looped spikes, which are often common on most domestic sites, were amongst this collection. Four strips had nail holes indicating that they had at one time been used as binding strips. No nails or rivets remained, and the fact that several of the strips were broken at the nail hole suggest that some of these might have been removed from their original setting, either through accidental damage or for re-use of the metal.

Nails

Timber nails were used to join structural and other timbers and furniture. One hundred and sixty six nails or fragments of nails were examined and of these 113 were classifiable. The majority of the classifiable nails (96) were of Manning type 1b, that is with flat, rounded or sub-rectangular heads. As with the Inchtuthill hoard (Angus *et al* 1962), these nails were relatively short, with a mean length of 57.7 mm with a standard deviation of 16.6 mm. Only two type 1b nails were longer than 100 mm. A number of the nails were longer than the thickness of the pieces of wood that they used to fix together, as the protruding ends had been bent around flat with the timber surface. The thickness of the timbers involved varied between 28 and 34 mm (Mean 30.6 ± 1.9 sample of 8 nails).

In addition to the complete and fragmented nails, there was the very rare find of a pair of unfinished nails. They were probably going to be of type 1b. A piece of rod had been drawn out in to points at either end, and then partially flattened and cut in the middle (Fig. 15.5). After cutting, the nails would have had their heads formed using a nail heading tool such as the one from Usk (Manning *et al.* 1995, 248–9). The tool used to produce most of the nails examined must have been smaller than the Usk example. Although the nails from Springhead were corroded it was possible to see the distinctive tapering shape produced by the heading tool on the nail stems just below the head of a number of the nails. Typically, this gave the nails a stem section which tapered down to around 4 mm square, and the angle of the taper was much more shallow than that of the Usk tool.

There were two Manning type 2 nails (context 135, Fig. 15.2), one Manning type 4 L-shaped headed nail, seven possible 'spike' type 5 nails (although these could easily be type 1b nails which have lost their heads due to corrosion). There was one large flat headed Manning type 7 nail. Two hollow-dome-headed nails were identified (Manning 1985, Type 8). Both were from undated contexts, one from context 112 (sf. 13), the other from context 409 (sf 98). These were probably used to tack textile or leather to timber. Manning (1995) suggests that they were used for upholstery. There were also two Cleere (1958, 58) type 6 nails.

Hobnails

Context 209 produced two pieces which appear to be fragments of a hobnailed sole (Nos 1–2). Unfortunately,

as the fragments are very small, one containing two hobnails and the other three, it is impossible to be certain if they were from footwear or upholstery.

Miscellaneous

This class contains those items which have no obvious function. Some of the them could have been more scrap or stock metal, especially those from context 410.

Table 3 Weight of metal-working debris by context number

Context	Copper working	Fired clay	Hammer scale	Hearth lining	Hearth lining/slag	Hearth bottoms complete	Hearth bottoms fragment	Smithing slag	Metallic iron	Metallic lead	Natural rock	Ore	Total
132						124.0							124.0
166								13.6					13.6
203								28.0					28.0
225						1135.0			1.9		8.9		1145.8
230								65.8					65.8
232								3.1					3.1
277						210.0							210.0
318					31.2	942.0	162.0	632.8	32.4		78.2		1878.6
324								83.0			60.8		143.8
342								28.0					28.0
400						685.0							685.0
402													44.5
410	5.4	57.2	11.1	751.5	1066.1	12637.1	44.5	3479.1	536.0	1.9	2.0		20324.4
419					176.1	768.0	1777.0	103.0	16.8				1471.2
420				13.5			407.3	33.9	11.8				59.2
425				53.2	62.2	952.0	190.2	578.2				49.0	1884.8
427					134.6								134.6
435											2.0		2.0
Total	5.4	57.2	11.1	818.2	1470.2	17453.1	2581.0	5048.5	598.9	1.9	151.9	49.0	28246.4

The two piece of wire could be interpreted as fragments of styli, but this is thought unlikely to the case. The sheet fragments could have served a variety of functions but none of the shapes were sufficiently distinctive to indicate their function. The likelihood is they were used as bindings. The X-ray of one object (context 136, No. 1) did have a bright speck suggesting the possibility of a use in association with non-ferrous metals.

THE METALWORKING DEBRIS

by C J Salter

Introduction

Iron-working produces a variety of different types of debris, some of which are characteristic of the type of process being carried out. Smithing bottoms, hammer-scale, waste or off-cut iron are characteristic of smithing operations, whereas tap-slag, and furnace bottoms were the product of smelting operations. Other debris types such as the small irregular lumps of slag, and the reaction products between the bulk slag are undiagnostic in that they only indicate that there was iron-working activity in the area. Material such as hearth-lining, and fuel-ash only indicate that some high temperature process had occurred. The process of distinguishing between smithing and smelting activity is further complicated by the fact that there are no clear cut morphological or chemical boundaries between many of the types of bulk slag. There is a continuous series of slags from vitrified hearth-lining through to furnace bottoms produced by smelting. It is only when the relative proportion of the various types of bulk and micro-slugs are considered that a true picture of what was happening on the site can be formed.

Table 4 Dimensions of smithing hearth bottoms
(n=50; n=51 for weight)

	Range	Mean	Deviation
Weight	77-1135	323.9	240.8
Length (mm)	60-152	94.9	23.8
Width (mm)	34-112	68.4	18.3
Depth (mm)	21-69	35.5	9.9

The majority of the material examined came from contexts dating from the late 1st century to the 2nd century AD, with the exception of the material from context 425 which had a 3rd-century date. The details and quantification of the bulk slag and the smaller slag fragments recovered from the soil samples are available for consultation in the archive. All the slag classifications given here were determined by visual examination, with the exception of the identification of the metallic iron. The metallic iron was identified either by eye during the first examination of each bag and the identification was then confirmed by the use of a small hand-held metal detector (the metal detector used was a DIY pipe and cable detector) or directly using the metal detector.

The summary table by debris type and context (Table 3) shows that the vast majority of the material came from context 410, a pit fill. This table also shows that the quantity of material recovered was not great, with the total weight of debris examined being just over 28 kg. By mass and volume, smithing hearth bottoms made up the majority of the debris (17.4 kg). Table 4 shows that the majority of the hearth bottoms were relatively small and of low mass. There was only one example which was large enough to be classified as a small furnace bottom (context 225). The soil sample from context 410 contained an appreciable amount of hammer-scale (11 g in a 1 kg sample). The only other soil sample that contained any hammer-scale was from context 225. The piece of unidentified metallic iron from context 410 was in poor condition, but it was possible to see that some fragments appear to have been off-cuts, short length of stock bar, and at least one sample could possibly have been a fragment of partially worked bloom or billet. These fragments did not occur in the quantities found at Heybridge (Starley 1996) or at Asthall (Salter 1997). Thus, overall, the metal-working debris clearly indicated the presence of a smith's forge on the site. That is, without considering the presence of the pair of blacksmith's tongs (Fig. 16.7) which derived from the same context (410) as the majority of the metal-working debris.

The presence of large amounts of hammer-scale, the un-abraded nature of much of the slag, and the quantity of metallic iron mixed with the slag, and the tongs, all indicate that this was a primary deposit of waste from a blacksmith's forge, *if not part of the forge complex itself*.

The debris and the fragments of iron do not indicate conclusively the sort of blacksmithing activity that was taking place. However, the size of the smithing hearth bottoms and the fragments of off-cut would suggest that most of the metal being processed was in the form of well-worked stock rather than raw blooms, or semi-finished billets, as the working of primary bloomery iron, which tended to be full of slag inclusions, would have led to the formation of larger hearth bottoms than would be the case when cleaner, more heavily worked stock was used.

Without analysis it is not possible to tell the sorts of metal that were being used at the forge. There appear to be several possible sources for the metal used, the Weald of Kent and Sussex, Essex and imports brought up the mouth of the Thames, and also from small-scale working along the greensand south of the North Downs. However, one fragment of material classified as hammer-scale (context 410) would suggest that steel was being used on the site. This material appears to have been a mixture of clay and other components, applied in a plastic condition to a blade. Sometimes finger prints are visible, and, as in this case, the material has been moulded around the back of the blade giving a distinctive straight edge. The blade and the clay covering have been heated to the point when the clay partially vitrifies, and a hammer-scale like surface forms between the blade and the body of the coating. The purpose of this clay covering is not certain, but it is likely to be used when quenching a steel blade. Its

purpose could have been to prevent the metal being carburized during heating prior to quenching, or to control the severity of the quench, or possibly to etch up the surface of the metal of a patterned blade. Allen (1979, 81) quotes al-Biruni's description of the Indian use of similar material. "In the process of quenching (the sword) they coat the flat of the blade of the sword with hot clay, cow dung, and salt, like an ointment, and clean the two edges with two fingers. They then heat it up by blowing so the ointment boils, and then they quench it. They then remove the coating from the surface of the blade and the damask appears". Such a technique would have worked equally well for a patterned blade incorporating steel as well as low-carbon iron. Whether the coating was to control the quench or to etch the metal, there would have been little point in using this technique unless there was some steel present in the blade.

There was no evidence of the use of coal for smithing on this site, although some of the material looked similar to that produced when the forge is coal-fired.

There was very little evidence for the working of other metals amongst this debris. Just a few fragments of baked clay that could have been part of a mould for casting metal, and one splash of a lead alloy.

Conclusions

The evidence would suggest that there was a small blacksmith's forge in the immediate vicinity some time during the 2nd century. The smith is likely to have been carrying out a mixture of light fabrication and repair activity. It is likely that the smith also occasionally cast copper or lead alloys. The forge may also be the source of the pair of unfinished nails from the late second century context (164).

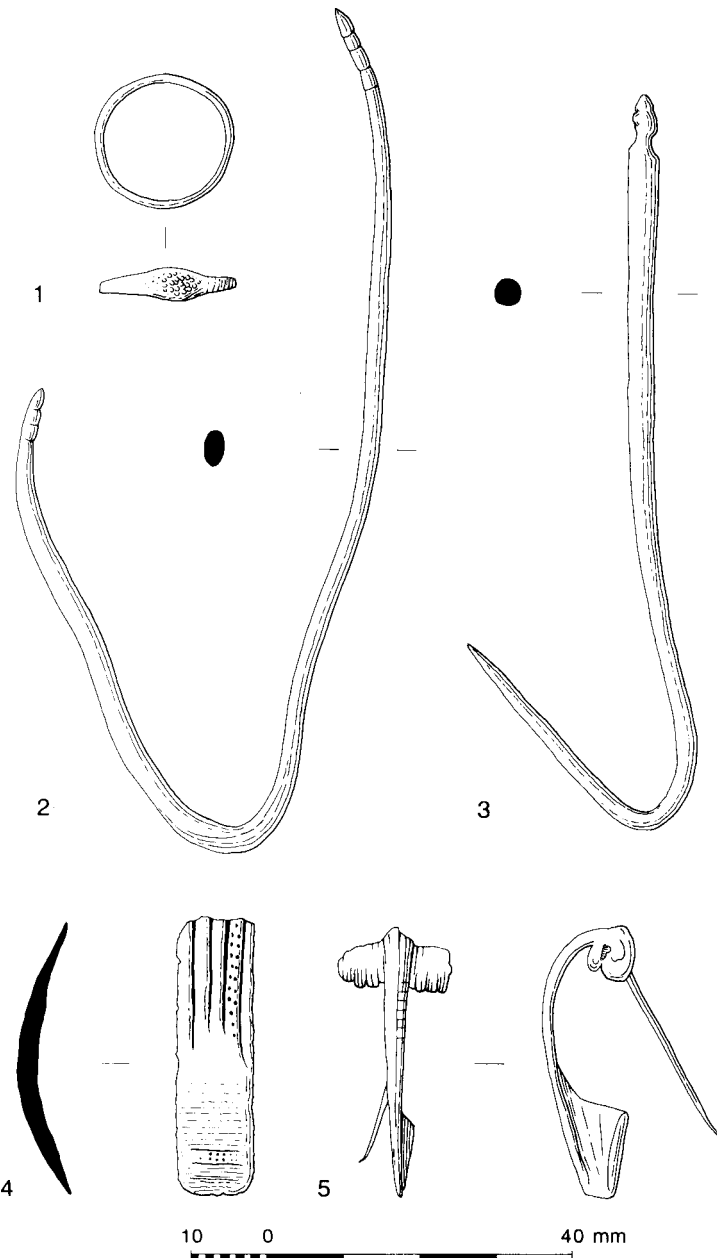


Figure 17 copper alloy small finds scale 1:2

NON-FERROUS METALWORK

by A Boyle

The numbers which appear in brackets are small finds numbers. These were not assigned in every case. The objects are listed in context order.

Copper alloy objects

1. *Bracelet* (33): circular cross-section, complete, though bent and distorted. Terminals decorated by group of three incised lines. Context 156. (Fig. 17.2)
2. *Chain* (69): length of chain comprising 50 oval links. Length 263 mm. Context 166.
3. *Stud* (35): small dome headed stud, stem has square

cross-section. Diameter of head 8 mm, length of stem 7 mm. *Strip* (40): fragment only, irregular and corroded, rectangular cross-section. Length 29 mm, width 3 mm, thickness 1 mm. Context 189.

4. *Pin* (48): complete though bent and distorted, very corroded, circular cross-section tapers towards tip. Decorated head. Length 96 mm, diameter 5 mm. Context 209 (Fig. 17.3)
5. *Fragment* (52): circular cross-section, slightly curved. Length 50 mm, diameter 3 mm. Context 209.
6. *Sheet fragment* (53): irregular fragment. Length 38 mm, thickness 1 mm. Context 209.
7. *Brooch* (55): ?Colchester, 6-coil spring, frontal hook, perforated catch-plate, plain bow, missing pin. Context 209.

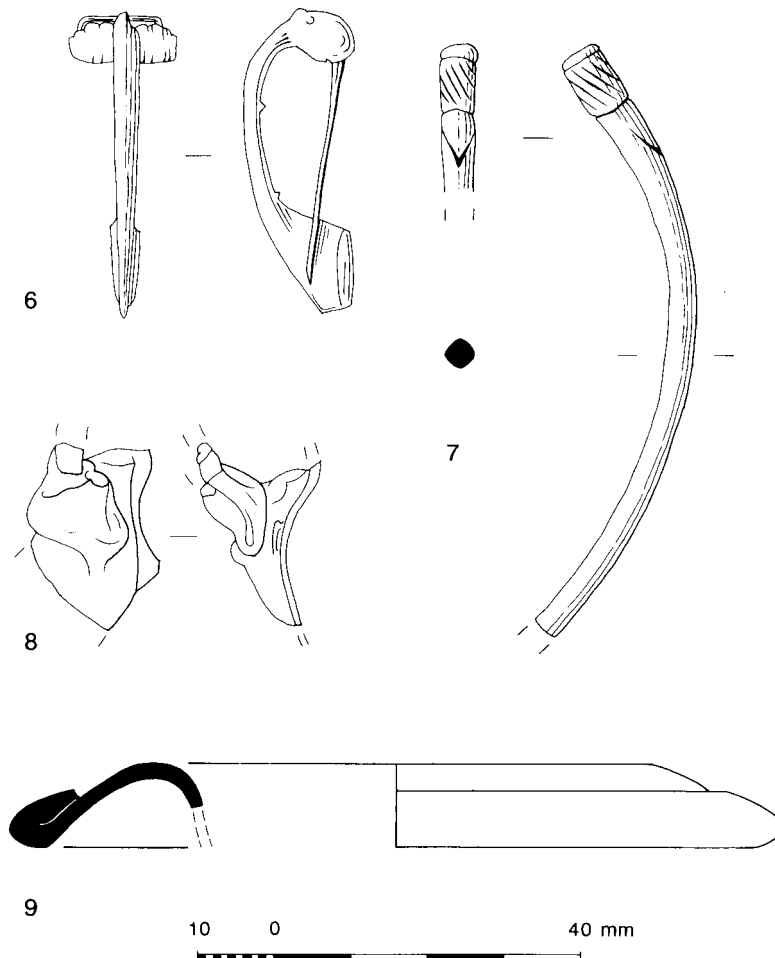


Figure 18 small finds scale 1:2

8. *Bracelet* (37): fragment only comprising flat rectangular strip, decoration comprises raised bands, grooves and incised circles. Length 35 mm, width 10 mm, thickness 2 mm. Context 224. (Fig. 17.4)
9. *?Tweezers*: strip fragment, wider end is curved slightly. Length 29 mm, width 8 mm, thickness 3 mm. Context 230.
10. *Brooch* (42): *?Colchester* type, 6-coil spring held in place by hook, solid catch-plate, decoration on bow comprises central moulding with incised lines. Context 235. (Fig. 17.5)
11. *Pin* (46): head missing, circular cross-section tapers towards tip. Length 84 mm, diameter 2 mm. Context 235.
12. *Brooch* (73): *?Colchester*, coiled spring, frontal hook, perforated catch-plate, missing pin. Context 324.
13. *Disc* (81): very corroded. Diameter 31 mm, thickness 12 mm. Context 341.
14. *Sheet fragments* (84): 3 irregular and corroded fragments. Context 342.
15. *Stud* (65): dome headed, stem has circular cross-section. Head diameter 8.5 mm, stem length 6 mm. Context 400.

16. *Bracelet* (64): fragment from penannular bracelet, circular cross-section, expanded terminal decorated by incised grooves. Length 40 mm, diameter 4.5 mm. Context 410. (Fig. 18.7)
17. *Strip fragment* (63): rectangular cross-section. Length 25 mm, thickness 1 mm. Context 412.
18. *Fragment* (71): flat irregular fragment, damaged and corroded. Length 13 mm, thickness 1 mm. Context 418.
19. *Perforated disc* (78): circular perforation, disc is folded in half. Diameter 31 mm, thickness 1.5 mm, diameter of perforation 4 mm. Context 425.
20. *Stud* (77): dome-headed stud, stem has circular cross-section. Head diameter 9 mm, stem length 8 mm. Context 427.
21. *Pin* (79): large spherical head, shaft has circular cross-section, missing tip. Length 36 mm, head diameter 9 mm, shaft diameter 3 mm. Context 524.
22. *Strap end* (2): strap with rounded end, decoration on one side comprises incised lines and diagonal 'nicks'. Distorted and bent. Length 97 mm, width 9 mm, thickness 1 mm. Unstratified.
23. *?Clasp* (5): possible clasp fragment. Unstratified.
24. *Fitting* (8): ring with flattened cross-section. Possible fitting. Diameter 16 mm, width of perforation 11 mm. Unstratified.
25. *Finger ring* (14): finger ring with rectangular cross-section. Expanded bezel is raised diamond shape, decorated with tiny raised circles. Diameter 18 mm, width 4 mm, thickness 1 mm. Unstratified. (Fig. 17.1)
26. *Finger ring* (19): finger ring with rectangular cross-section. Plain closed band. Diameter 13 mm, width 5 mm, thickness 1 mm. Unstratified.
27. *Vessel handle* (20): Curved handle with rectangular cross-section. Hinge for attachment to vessel. Length 86 mm, width 11 mm, thickness 7 mm. Unstratified.
28. *Neck-ring* (22): incomplete curved fragment, circular cross-section, thickening towards decorated end. Decorated at one end by two pairs of incised concentric lines with diagonal grooves in between. Length 70 mm, width 4 mm. Unstratified.
29. *Brooch* (23): *Colchester* type, six-coil spring and frontal hook for attachment. Raised central band running down bow of brooch, solid catch-plate, missing pin. Unstratified.
30. *Brooch* (24): *Colchester* type, six-coil spring and frontal hook for attachment, solid catch-plate. Unstratified. (Fig. 18.6)

31. *Sheet fragment* (28): irregular fragment, folded. Length 35 mm, width 23 mm, thickness 2 mm. Unstratified.

Lead objects

1. *Lead weight* (1): ovoid shaped lead weight with circular perforation. Length 25 mm, width 15 mm, thickness, 15 mm. Context 112.
2. *Waste fragment* (3): irregular fragment, possible casting waste or slag. Length 28 mm. Unstratified.
3. *Waste fragment* (4): irregular fragment, possible casting waste or slag. Length 30 mm. Unstratified.
4. *Waste fragments* (30): five irregular fragments, possible casting waste or slag. Unstratified.
5. *?Weight* (31): solid object with flanged head and base, circular cross-section. Length 25 mm, diameter 22.5 mm. Unstratified.
6. *Waste fragment* (32): very large, solid and roughly circular bloom of lead. Diameter 73 mm, thickness 31 mm. Unstratified.

BONE AND ANTLER OBJECTS

by A Boyle

The numbers which appear in brackets are small finds numbers. These were not assigned in every case. The objects are listed in context order.

1. *Bone pin* (7): incomplete bone pin, head end only. Decoration comprises two concentric rings immediately below pointed head. Length 22 mm, width 2 mm. Context 112.
2. *Worked antler* (26): antler horn, cut at one end. Surface is worn smooth and tip is polished. Context 136.
3. *Antler ?handle*: section of core, worked at both ends, small area of iron corrosion at one end, possibly indicating attachment to iron object. Surface is slightly smoothed. Length 65 mm. Context 136.
4. *Pin* (38): fragment only, plain and highly polished, circular cross-section and tapering end, head end is missing. Length 40 mm, diameter 3 mm. Context 189.
5. *Pin* (47): fragment only, missing head, circular cross-section, tapering towards tip. Length 29 mm, diameter 3 mm. Context 209.
6. *Worked antler*: core fragment, partially polished with possible cut marks. Context 230.
7. *Pin* (41): incomplete, missing tip, circular cross-section, tapers towards tip, pyramidal head with a single collar. Length 54.5 mm, diameter 3 mm. Context 235.
8. *Pin* (43): shaft fragment only, circular cross-section, tapers slightly towards end. Length 32 mm, diameter 3 mm. Context 235.
9. *Pin* (44): complete, flat head, circular cross-section tapers towards tip. Incised 'x' at head end. Length 96 mm, diameter 3 mm. Context 235.
10. *Sheep metapodial*: shaft has circular perforation at one end. Context 245.

THE WORKED STONE

by F Roe

The worked stone is predominantly Niedermendig lava. There are 22 pieces, nearly all now weathered and friable, but originally part of rotary querns and a small millstone. There is one weathered piece of Millstone Grit, also likely to have been utilised for a quern or millstone. In addition there are two quern fragments of Hertfordshire Puddingstone and one of Lower Greensand. The single whetstone fragment appears, on macroscopic examination, to be made from Kentish Rag, while a worked fragment of the local ironstone has a hollowed surface and so might have been used as a mortar.

Four of the utilised materials are from fairly local sources, but the Niedermendig lava and Millstone Grit were both acquired by long distance trade, despite the apparent availability of suitable local stone. Information on stone use for a further 22 Roman sites in Kent is summarised in the archive, following on from work by Black (1987) and publications by Philp (1963, 1968, 1973, 1976, 1991), Keller (1988, 1989) and a number of others. This summary indicates that the imported materials, both lava and Millstone Grit, were often used for millstones, though querns were also made. These millstones might be up to 950 mm in diameter, as the one of Millstone Grit from Keston (Philp 1991, 180). Possibly the imported materials were considered more suitable for such large scale grinding equipment, though the local greensand was also sometimes used, most notably at the Ickham mill site (Spain 1984a). A possible small millstone fragment of lava from Springhead (112, 72) is only c. 570 mm in diameter, but this may be a little large for manual operation. The Millstone Grit fragment (400) could also come from a millstone.

Niedermendig lava was the most frequently used quern or millstone material in Kent, having been recorded to date from some 70% of Roman sites in the area. It would no doubt have been convenient to transport such bulky items by sea from the Rhineland. Four of the fragments of upper stones from Springhead (433, 92; 88 & 89) have a raised rim around the circumference on the upper side of the quern. This feature is known on other lava querns of relatively early date, for instance from Colchester (Crummy 1983, 75) and Usk (Welfare 1995). Niedermendig lava appears to have been imported throughout the Roman period, and querns of 3rd and 4th century date are known for instance from Reculver (Philp 1968, 60). Estimated diameters for three of the less fragmentary querns from Springhead (433, sf 92; unstratified sfs 88 and 89) were about 430 mm, a typical size for Roman lava querns.

Millstone Grit was used on about half (52%) of the Roman sites in Kent, including large millstones from at least four sites. There were no less than three of these at Darenth (Philp 1973, 143). This stone may have been brought by boat down an east coast route, although a road journey would also have been possible. The piece from Springhead (400) indicates use in the area from at least the 2nd century.

Greensand was the most widely used local material in Kent during the Roman period, occurring on 62%

of recorded Roman sites. Much of this is likely to be Lower Greensand from the Folkestone Beds, with a known quarry site at East Wear Bay near Folkestone (Keller 1989). Typical products are thickset querns of Iron Age character, and quern manufacture here may have lasted from the late Iron Age until the end of the 1st century (Keller 1989, 199). The single piece from Springhead (433, sf 85) is from a late 1st-early/middle 2nd-century context, and so could have been made within the suggested time span for the use of the quarry.

Hertfordshire Puddingstone was used only sporadically in Kent, having been recorded from some 17–26% of Roman sites. A fragment was recovered from a posthole during the excavation of the Garden Centre (Philp and Chenery 1997, 14). Querns made from this tough conglomerate are of a somewhat different character to those discussed above, and the two fragments from Springhead (343, sf 87 and 433, sf 91) are from small, squat beehive querns of Iron Age type; an upper stone 255 mm in diameter may belong with a lower stone c. 300 mm in diameter. Again a relatively early date in the Romano-British period seems appropriate.

Ironstone, used at Springhead for a single hollowed object (341, sf 80), possibly a stone mortar, had been made into querns and rubbers in Kent since at least the Neolithic period. It may derive from carstone in the Lower Greensand Folkestone Beds (Dines *et al* 1969, 60), though ironstone also occurs in local Tertiary deposits (Dines *et al* 1954, 81).

Kentish Rag was used for just one whetstone at Springhead (400, 66), but whetstones made from very similar calcareous sandstone, and with the same distinctive cigar shape are very widely distributed on Roman sites throughout England.

There is an unusually large collection of evidence for the use of stone in Roman Kent, and the varied assemblage described here from Springhead appears to be entirely typical for the area in the early Roman period. There is a mixture of local materials with Iron Age antecedents, imported materials not found before romanization and even one local material that was widely traded outside Kent during the Roman period. Further work might elucidate more chronological detail for the use of these materials, both for imports and exports.

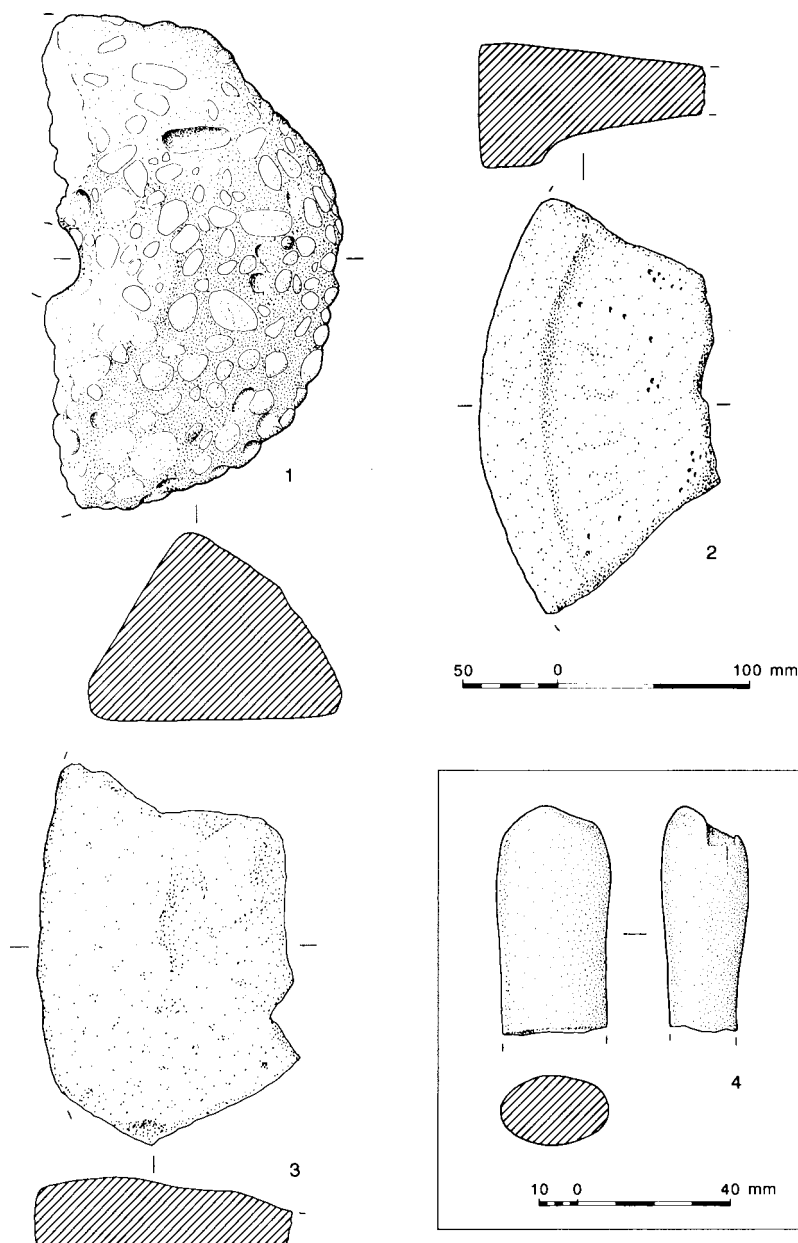


Figure 19 Worked stone

Coins by P Booth

A total of 11 coins were recovered, 3 from stratified contexts. One coin is possibly of Iron Age date. Two are of 2nd century date, one 3rd century and the remainder so far identified are 4th century. All but three were recovered by metal detector and are therefore unstratified. Two coins (one illegible) from context 341 included a denarius fragment dated c AD 164–169 and a further illegible coin derives from context 534. Context 341 is one of a series of dump layers overlain by a chalk floor and it dates from the early to mid 2nd century.

Table 5 Catalogue of worked stone

Context	SF	Object	Stone type	Context Type	Phasing
112	72	part of rotary <u>quern</u> or small <u>millstone</u> , central hole, probably upper stone, disc type, diameter c. 57cm, max th 6.9cm	Niedermendig lava	Roman ploughsoil/ OGS; seals all features	
166	-	1 small weathered fragment, probably from <u>quern</u>	Niedermendig lava	Pit fill	M - L2+
233	90	rotary <u>quern</u> fragment, disc type, weathered, max th 5.3cm	Niedermendig lava	Finds REC	
261	58	5 small, weathered fragments, probably from a <u>quern</u>	Niedermendig lava	Pit fill	L1 - E2
268	-	2 weathered fragments from rotary <u>quern</u> , disc type, worn, max th 2.4cm	Niedermendig lava	Pit fill	?M2+
341	80	fragment with concave, worn surface	carstone dark purple ironstone probably from Cretaceous Folkestone Beds	Dump layer	M2
341	86	4 weathered fragments from rotary <u>quern</u> , disc type, max th 3.5cm	Niedermendig lava	Dump layer	M2
343	87	half upper stone from small rotary <u>quern</u> , beehive type diameter 25.5cm, max th 10.5cm; probably belongs with 433, 91	Hertfordshire puddingstone	Dump layer	E - M2
371	-	1 weathered rotary <u>quern</u> fragment, disc type, max th 4.0cm	Niedermendig lava	?ditch fill	?not late
400	66	<u>whetstone</u> fragment, cigar shaped type, oval cross-section 2.8 x 2.0cm	Kentish rag	Layer D	M2+
400	-	1 weathered and probably burnt small fragment, could be from <u>quern</u> or <u>millstone</u>	Millstone grit	Layer D	M2+
425	74	3 small, weathered fragments, probably from <u>quern</u>	Niedermendig lava	Pit fill	?L3+
433	85	burnt fragment with two probable worked surfaces, perhaps from disc type rotary <u>quern</u> , max th 5.3cm	Greensand, probably from Lower Greensand Folkestone Beds	Silt layer between floors	L1 - E/M2
433	91	part of lower stone from rotary <u>quern</u> with central hollow for spindle and flat grinding surface, diameter c. 30cm, max th 7.6cm; probably belongs with 343, 87	Hertfordshire puddingstone	Silt layer between floors	L1 - E/M2
433	92	2 joining fragments from weathered rotary <u>quern</u> , upper stone, disc type, traces of raised rim round edge, diameter c. 43cm, max th 5.2cm	Niedermendig lava	Silt layer between floors	L1 - E/M2
-	88	fragment rotary <u>quern</u> , upper stone, disc type, raised rim round edge, traces of grooves on grinding surface, diameter c. 43 cm, depth at rim 6.85cm	Niedermendig lava	Silt layer between floors	L1 - E/M2
-	89	fragment rotary <u>quern</u> , upper stone, disc type, raised rim round edge, diameter c. 43cm, depth at rim 6.6cm; clearly belongs with SF88 though dies not join	Niedermendig lava	Silt layer between floors	L1 - E/M2

Context 534 is one of the fills of a roadside ditch presumably dug during the construction of a road surface. The coin might however be later, its size suggests perhaps an early 4th-century date. The numbers in brackets are small finds numbers.

1. (83): ?Dupondius or as, completely encrusted, probably 1st–2nd century. Context 341.
2. (82): Denarius, fragment only. Lucilla, reverse Concordia, c. AD 164–9. Cf RIC III (M Aurelius) 757–761. Context 341.
3. 9): Sestertius. Postumus, reverse Fides Militum,

AD 259–68. Cf RIC V pt ii, 124.

4. (11): ?Barbarous radiate, irregular and very worn, late 3rd century,
5. (93): ?Follis, corroded and completely illegible, early 4th century? Context 534
6. (18): AE3. Urbs Roma. AD 330–335. LRBCI, 51.
7. (12): AE3. VICTORIAEDDAVGGQNN (Constantius II). AD 341–6. LRBCI, 139.
8. (10): AE4. VICTORIAEDDAVGGQNN. AD 341–6.
9. (96): AE4. VICTORIAEDDAVGGQNN. AD 341–6. cf LRBCI, 447–450.
10. (15): AE3. SECVRITAS REIPUBLICAE (Valens).

AD 367–375. LRBCII, 1395.

11. (34): AE4. SECVRITAS REIPUBLICAE
(?Valentinian). AD 365–378.

The assemblage contains few surprises, except perhaps for the sestertius of Postumus, such coins being relatively rare as site finds in Britain. Of the four 4th-century coins assignable to mints, two were from Trier (nos 6 and 7), one probably from Arles (No. 9) and one from Siscia (No. 10).

LRBCI	=	Hill and Kent 1976
LRBCII	=	Carson and Kent 1976
RIC III	=	Mattingly and Sydenham 1930
RIC V pt ii	=	Webb 1933

Glass by C Cropper

The glass assemblage comprised a total of eleven fragments, seven of which are of a Roman date and four of which are post-medieval/modern. The latter, consisting of bottle and vessel fragments, came from contexts 112, 136, 146 and 514, and are all intrusive. These fragments have been recorded for archive purposes but do not appear in the published catalogue. The Roman glass comes from contexts dated from the late 1st century to the early/middle 3rd century, and none are out of place within this date range. The two bottle fragments (Nos 4 and 7) are of prismatic bottles common from the late 1st to early third century (Cool and Price, 1995, 184). This date range is echoed by the jar rim fragment from context 312. The handle (No. 1) is probably from a 2nd to 3rd century jug with a globular or piriform body. The remaining three fragments are from undiagnostic vessels.

Catalogue

1. *Lower handle, two strand ?chain, attached to convex body vessel fragment* (39): probably from a jug. Blue-green, slight iridescence and surface loss. A similar example came from Wymbush, Milton Keynes (Price 1987, 153–4, fig. 49, No. 245). Body th:1 mm. Context 189.
2. *Rim fragment of jar* (56): wide horizontal rim, bent out and down, edge rolled up and in. Blue-green, free blown. This vessel form was common and long-lived from the mid 1st century to the early 3rd century. Similar examples come from Colchester (Cool and Price, 1995, 109–112, fig. 7.4, particularly No. 772). D:c.110 mm. Context 312.
3. *Undiagnostic fragment from a vessel body* (25): slight iridescence and pitting. Slight yellow-green tint, free blown. Th:1.5 mm. Context 132.
4. *Prismatic bottle, body and corner fragment*, blue-green, mould blown. Th:1.5–3.5 mm. Context 164.
5. *Undiagnostic body fragment from a globular vessel* (50): slight blue-green tint, free blown. Th: 1 mm.
6. *Undiagnostic vessel body fragment* (51): green-blue, free blown. Slight iridescence and some surface loss. Th:1.5–2 mm. Context 209.
7. *Prismatic bottle shoulder fragment*, green-blue, mould blown. Slight iridescence and surface loss. Th: 4 mm. Context 359.

Tile by N Mitchell

Approximately 16 kg of tile, (127 fragments), in 8 fabrics, were recovered from 34 contexts. The majority of tiles in the assemblage have no diagnostic form remaining and may have originally been plain flat tiles or tegulae; they are listed here as 'flat tiles'. Fragments thicker than 40 mm but with no characteristic form are listed as 'brick' although it is possible that they are just very thick roof-tile.

The fabrics are described below with characteristics of forms noted in those fabrics.

1. Fabric 1: mid-orange, moderate large sub-angular quartz; tegulae are very regular in size at 22 mm thick with a very square flange, 42 mm high.
2. Fabric 2: dark red, with abundant large sub-angular quartz, occasional iron-stone; tegulae are 15 mm thick with a very square flange 42 mm high.
3. Fabric 3: mid-orange with abundant small quartz, moderate small black inclusions (?iron), frequent grog < 2 mm.
4. Fabric 4: mid-red with moderate large sub-angular quartz, moderate very large lime inclusions, up to 6 mm, 10%; flat tiles, thickness 30 mm.
5. Fabric 5: mid-orange with very sparse large angular quartz, voids from high firing, occasional iron stone 2 mm; tiles are flat and many are thick, possibly bricks.
6. Fabric 6: dull brown-orange, abundant small sub-rounded quartz, occasional grog, 1 mm; tiles are flat, average 26 mm thick.
7. Fabric 7: light greenish-white, sparse large sub-angular quartz, frequent lime-blowing, 10%; tegulae have chamfered outer corner of flange/tile body
8. Fabric 8: light pinkish-orange with sparse large white and rose quartz, occasional limestone and grog tempering, 2 mm; tiles are flat, 42 mm thick, possibly brick.

Tegulae are present in all but fabrics 4 and 5 and these must all have been accompanied by imbrices although these have only been retrieved in 3 fabrics. It is possible that all the fragments of fabrics 4 and 5 were plain roof-tiles or bricks but no mortar was noted on the surfaces of the larger pieces of any fabric to suggest the latter. Two flat tiles in fabric 4 have a circular combed ridging

Table 6 Number of tile fragments per fabric.

Fabric	Tegulae	Imbrex	Flat Tile	Brick', ie. > 40 mm thick
1	5	3	20	
2	1			
3	7	2	53	5
4			5	
5			5	7
6	1	1	7	
7	2		1	
8	1			1

effect while the reverse sides are sanded and rough which are either keying for mortar on the back of box-flue tiles or 'signatures'. No stamped or decorative pieces were found.

The bulk of the tile is from 2nd- and 3rd- century contexts, although flat tile in fabric 3 was also found in three contexts of late 1st-early 2nd-century date. Fabric 6, with fragments from seven contexts, all datable to the late 2nd/early 3rd century, is the group best showing a tight date range.

The assemblage is dominated by fabric 3, with 67 fragments, and is likely to include the earliest roof-tiles on site. The other seven fabrics show that different sources were available and are likely to have been in use while the production of fabric 3 continued. The presence of large limestone inclusions in fabric 4 can only provide the very broadest evidence for local manufacture and no correlation has been found with local pottery types.

The fired clay and daub by N Jeffries

The fired clay and daub assemblage comprised 724 pieces with a total weight of 17,886 g. A great deal of structural/wall clay was recovered. A total of four fabric types were identified on the basis of predominant inclusions and were grouped as follows:

- A. Reddish-brown coloured clay with moderate sub-angular quartz inclusions up to 0.1 mm in size.
- B. Orange-brown streaked clay with occasional sub-angular flint/gravel up to 5 mm and moderate sub-angular quartz inclusions up to 0.1 mm.
- C. Sandy brownish-buff clay with moderate/dense sub-angular and calcareous inclusions up to 1 mm.
- D. Code for identifying burnt daub from the above categories.

The geology of the local area is reflected in the make-up of these fabrics. The Boyn Hill gravel river terrace lies just to the north of the Roman town and this would appear to be the source for fabric B, with A and C extracted from the Thanet and Upper chalk beds respectively. Significant quantities of structural/wall clay were recovered from contexts 136, 189, 340–1, 359, 403, 410 and 414, although only two of these (contexts 403 and 414), a destruction level and a posthole fill respectively, relate to a possible structure. The wattle impressions show structural straw-thatch and timber, although the faces of some of the daub show narrower grooves made by a comb, and similar examples have been found in Verulamium (Waugh and Goodburn 1972). Fragments of 'Belgic Bricks' (Williams and Zeepvat 1994) were also present in the assemblage. Only a few examples had both rods and sails present, and the fragmentary nature of the assemblage made exact identification difficult when only one or the other was present.

The extraction from the above geological sources show chronological-related

occurrence patterns. It would appear that while fabrics A and B were used throughout the Roman occupation of the site, fabric C occurs only in contexts which are of 1st-2nd century date. The significance of this is limited but it does perhaps show a shift from one extraction source in favour of another.

There is evidence for industrial/construction practices in the assemblage. Some contexts do contain examples of curved or arch-shaped pieces which would seem to relate to oven/hearth structures, whereas others, specifically those in the 400's, do contain large pieces of clay with burning on one surface which would also suggest hearth/oven material. Only context 410 shows a specific industrial activity with one piece partially covered in residues from metalworking. Finally there are fourteen examples of structural clay that has been thinly plastered or painted white, and these occur mainly in contexts 400 and 403. Only future scientific analysis will be able to differentiate between the two.

The human bone by A Boyle

Age estimation of the infants was based on a combination of methods (Scheuer *et al* 1980; Black and Scheuer 1996). The regression equations of Scheuer *et al* (1980) allow the gestational age (from the first day of the last menstrual period) of perinatal infants to be estimated to within about two weeks using long bone lengths. The age estimates of the infants and the various measurements used to calculate them are detailed in table 7.

It was hoped that a detailed analysis of the likely age of the infant group might shed some light on the question of infanticide. An age of c. 40 weeks is taken to be representative of a full-term infant. In modern populations perinatal deaths (that is, stillbirths and natural deaths in the immediate post-natal period) have a fairly flat age distribution with no marked peak at full term. In contrast most Roman groups do have a very marked peak in deaths at around full term and this is believed to be indicative of infanticide because it does not reflect a 'normal' pattern of neonate mortality. It has been argued elsewhere that a pattern of clustering around 38–40 is suggestive of infanticide as it was generally carried out immediately after birth (Smith and Kahila 1992; Mays 1993). These remains range in age

Table 7 Infant ageing

Measurement	Skeleton 135	Skeleton 244	Skeleton 360	Skeleton 381	Skeleton 382
Age estimate based on maximum length of clavicle	30				
Age estimate based on long bone lengths	44.88+/- 2.12		39.02+/- 2.08	33.12+/- 1.88	37.31+/- 2.33

from 30–46 weeks with no clustering around 38–40 weeks. Therefore, one might conclude that a normal pattern of infant mortality is represented.

1. Skull vault fragment and ?right tibia. The tibia belonged to an infant aged approximately 42–46 weeks. The skull fragment is likely to belong to the same infant. Context 135
2. Small circular cut containing infant burial. Contents were largely destroyed by vandals. Skeleton in poor condition, skull, some vertebrae and eroded long bones present. Tooth crowns suggest neonate. Context 187.
3. Two conjoining fragments of skull vault, probable parietal, from a very young infant. Context 230.
4. Right clavicle. Maximum length of bone suggests an age of 30 weeks in utero. Context 244.
5. Two conjoining fragments of skull vault from a very young infant. Context 245.
6. Three fragments of skull vault from a very young infant. Context 342.
7. Left and right femur, right humerus. Long bone lengths suggest age of 37–41 weeks. Context 360.
8. Virtually complete skeleton in good condition. Long bone length suggests an age of 31–35 weeks in utero. Context 381.
9. Skeleton missing part of skull, most of torso and lower legs. Long bone length suggests an age at death of 35–39 weeks. Context 382.
10. Shaft of ?right humerus. Infant. Context 402.
11. Left and right femur, proximal ends only, of an infant/neonate. Context 425.
12. Skull vault fragment, neonate/infant. Context 435.

The remains derive from a variety of contexts which largely date to the main phase of activity in the 1st and 2nd centuries. The majority of the infants are represented by disarticulated individual bones. Only three of the contexts (187, 381 and 382) produced near complete infant skeletons. There appeared to be something of a concentration of remains within the sequence of cobbled surfaces and chalk floors, 342, 381, 382, 402 and 435 (Fig. 9, section 4). The disposal of infants in and around settlement structures was commonplace in the Roman period, and may have been more common at rural settlements and small towns. Infants are found both outside buildings where they usually lie within the foundation trenches of exterior walls, as well as inside where they were often sealed under floors (Philpott 1991, 97). The deposition of infants within rubbish deposits (245) can also be paralleled, for example at Poxwell, Dorset (Hurst and Wacher 1986, 71) and Radwinter, Essex (Hooper 1975, 376).

THE ANIMAL BONE

by R Wilson

Introduction and methodology

Few of the bones excavated previously from the settlement have been published (Frazer 1957, 103; King 1959, 53; MacDonald 1964, Appendix 3) so this moderately sized assemblage is of some interest. Bones collected from the excavations amounted to 2896 fragments but fewer than these were recorded or counted in the results due to the ways in which bones were recorded, e.g. 'losses' where newly broken fragments were reunited as one, or their data were eliminated from consideration in the results, e.g. where bone groups were 'unstratified' or poorly dated, or

Table 8 Frequency of fragments of animal species and other categories in dated group of animal bones.

Century	Normally		Collected		Bone 3th	Groups 4th	Total		Sieved Samples n
	1st n	%	1st - 2nd n	%			n	%	
Cattle	16	44	331	35	18	29	365	35	1
Sheep/goat	11	31	513 ¹	54	33 ²	52	557	53	4
Pig	7	19	82	8	8	13	97	4	-
Horse	1	3	17	2	3	5	21	2	-
Dog	1	3	3 ³	+	1	2	5	+	-
Cat	-	-	1	+	-	-	1	+	-
Identified	36		947		63		1046		5
Unident	51		1254		59		1364		102
Total	87		2201		122		2410		107
Don.Fowl	-		7		-		7		-
Other bird	-		3 ⁴		-		3		-
Fish	-		-		-		-		1 ⁵
Burnt frags.	2		59		-		61		13

Notes: 1. Excluding part skeletons of half a sheep, F533 (49 bones): and two sheep and 2 lambs, F6051, (43 bones).
 2. Excluding part skeletons of 2–3 sheep, F406 (66 bones).
 3. Excluding part dog skeleton, F230 (22 bones).
 4. Raven ulna and cf. Golden Plover tarsometatarsus, F400; and Magpie/Jackdaw humerus, F427.
 5. Plaice precaudal vertebrae, F514. Fish and bird bones identified by A. Locker

Table 9 Percentages of species fragments of 1st-2nd century bones according to feature type.

Feature type	Pit	Ditch/Gully	Layer/Dump	Post hole
Sample size (n)	504	130	291	18
	%	%	%	
Cattle	31	38	40	
Sheep	59	50	50	
Pig	9	5	10	
Horse	1	7	+	

Table 10 Percentages of skeletal element composition in 1st-2nd century feature groups.

Species	Sheep				Cattle		
Feature type	Pit	Ditch/Gully	Layer/Dump	Skeletons	Pit	Layer/Dump	Ditch/Gully
Sample size (n)	296	65	145	158	157	115	49
	%	%	%	%	%	%	
Head	42	43	41	15	47	30	
Foot	26	17	15	16	16	24	
Body	32	38	43	69	37	46	
Degradation	49%	49%	50%	17%	-	-	
Index							

Table 11 Mandible Wear Stages of cattle, sheep, and pig

Cattle	
1st century:	45
1st-2nd century:	13e, 34, 36, 39, 41, 42, 46.
Sheep	
1st century:	2x9 (pr?)
1st-2nd century:	3e, 2x4e, 5x8, 5x9, 2x9e, 4x10, 10e, 11, 11e, 14e, 19e, 20e, 22, 23, 23e, 24, 30, 3x32, 4x33, 2x33e, 3x34, 3x39, 40, 40e, 3x41, 42, 43, 2x47.
3rd-4th century:	8, 22e, 36
Pig	
1st-2nd century:	7e, 11, 17e, 21e, 23e, 26e.

Mandible Wear Stages (MWS) were determined following the method of Grant (1982, 91-108).

human bones misidentified as 'animal'. Methods of identification and compilation of results largely follow previous reports (Wilson 1978, 110-139).

Results

All of the domesticated species common in the Roman period were identified with the exception of goat. Three bones of wild birds occurred, and one of a marine fish from a sieved deposit (514). 43% of the fragments were identified. Table 8 shows the overall fragment number identifications and amalgamations of this data into dated groups. Bones from the 1st-2nd century group were sufficiently abundant to present fragment frequency results according to feature type in order to indicate something of the taphonomic patterning of bones, see Table 9.

Bones of sheep were abundant in the pits and would comprise even higher percentages if debris from more complete skeletons was counted. Bones from sheep and pigs were less common in the small sample from the ditches and gullies.

Bones from cattle and sheep were sufficiently abundant in the 1st-2nd century samples to group the skeletal elements into broad carcass categories of head, feet and body, Table 10. Percentages of these categories vary but, apart from the bones of the partial skeletons of sheep, little more than from comparable groups of Iron Age and Romano-British bones from the upper Thames Valley (Wilson 1978, Table XIII) and therefore do not indicate any atypical patterns of butchery, 'waste' utilisation or disposal or scavenging. Bones from the partial skeletons have relatively few but more complete crania and greater abundance of body bones, especially the vertebrae which amount to 28% of the latter group.

An index of bone degradation was calculated for each group of sheep bones in Table 10 (Wilson 1985, 81-84) and the percentages are relatively low for Iron Age and Roman sites, especially for the partial skeletons. Thus although there was destruction and loss of many skeletal elements, the more robust elements survived well, and there was very little damage caused by excavation, such as loose teeth from shattered crania.

Bone measurements

Few bone measurements were possible and the only useful information from them is that six cattle metapodials indicate that a greater proportion of cattle were cows and therefore breeding and dairy farming may have been important in the economy.

Partial skeletons

2nd century half sheep, Context 353. 49 bones excluding ribs of a polled sheep were recovered from the pit. Right side cranial bones survived, having been halved in the midline, the upper part at least being cleft from the rear. Some of the bodies and right sides of 17 vertebrae including some of the cervical and the sacrum survived, all having been chopped through the midline or left side. A few vertebrae indicated that chopping was from the rear of the carcass to the front, possibly downward on a carcass hung by the back legs. Chopping on one cervical and two lumbar vertebrae also indicate that the halved spine of the carcass had then been chopped into transverse sections from the ventral and lateral sides. Nine rib fragments articulating with the vertebrae survived. Some of the limb bones were recovered, mostly fragmented by old and new breakage, chop marks showing on a scapula and a tibia. Measurements of humerus (144 mm, dw 34), metacarpal (133 mm, dw 28) and metatarsal (143 mm, dw 27) indicated a moderately robust sheep with a shoulder height between 620 and 650 mm (Teichert 1975, 51–69). The sex of the animal could not be determined but it was skeletally mature with a Mandible Wear Stage (MWS) of 39 (Grant 1982, 91–108).

3rd–4th century, part articulated bones of 2–3 sheep, Context 406. 66 bones from different parts of skeletons difficult to assign to separate individuals. One sheep was polled and 2 mandibles showed MWS of 14 and 43 confirming epiphyseal evidence of the presence of both skeletally mature and immature individuals. There was no evidence of the sexes and measurements are of limited value except to indicate similar statures to the sheep above. Evidence of butchery limited to light trimming of the vertebral sides and knife cuts on pelvic fragments.

1st–2nd century, bones of two sheep and two lambs, Context 605. 43 bones in all. Including one horned sheep, mature individuals smaller in size than those above, and a pair of mandibles of a lamb with MWS of 12 and 12 est. Part of a cranium is divided in the midline.

1st–2nd century, bones of a dog, Context 230. Approximately 22 bones are from one dog but little can be deduced about it.

Mortality patterns

Table 11 gives the Mandible Wear Stages at which cattle, sheep and pigs died or were killed. Sheep mandibles are abundant and show that the 1st-century mortality pattern is similar to the Iron Age pattern found in southern Britain (Maltby 1981, 135–203) with a high proportion of sheep dying as lambs (MWS 3–11) but

presumably eaten. The cattle and pig samples of mandibles are small but indicate that few cattle were killed young while pigs were killed as immature animals.

The economic significance of the sheep mortality is uncertain although the slaughtering of the sheep indicates a greater emphasis on meat and milk production. The mortality patterns may have been influenced by marketing processes, as established elsewhere for the medieval period, but not yet for the Roman period (Wilson 1994, 103–115). It is not clear to what extent Springhead people should be regarded as consumers and producers, as Maltby (1994, 85–102) has discussed for Roman Dorchester and Winchester. Finally, the patterns of economic exploitation at Springhead may have been varied and possibly obscured by the ages at which animals were selected for sacrifices.

Ritual

It is possible some bones in the pits and other features were ritual deposits (Grant 1984, 227) but nothing apart, possibly, from the more complete skeletal remains of sheep described above, is recognisable as ritual.

Discussion

There is a high percentage of sheep bones present and this is more indicative of an Iron Age, 'native' settlement rather than a Roman small town (King 1989, 51–59). Another indication of pre-conquest activity is the mortality pattern of the sheep. Also the slight evidence of a predominance of cows over bulls/steers/oxen could be a continuation of the Iron Age tradition of dairy farming.

THE CHARRED PLANT REMAINS

by G Campbell

Seven samples of between 4 and 13 litres were taken from a variety of features during the excavation. These were floated onto a 0.5 mm mesh. The samples were then dried and scanned as to their content by the author. Three of the samples, two from a hearth 528 and one from occupation layer 514 produced reasonable assemblages of charred plant remains other than charcoal. These three samples were analysed.

Two of the samples produced large charcoal assemblages. The charcoal from one of these samples, taken from the lower fill, 410, of a 'metalworking' pit was chosen for study. One eighth of the > 4 mm charcoal and one sixteenth of the 4–2 mm charcoal from this sample was identified with the exception of fragments of less than 2 mm transverse section.

The results of the analysis of the charred plant remains are presented in Table 12 and those from charcoal in Table 13. Nomenclature follows Clapham, Tutin and Moore (1989) for the uncultivated plants, Miller (1987) for wheat, Zohary and Hopf (1994) for barley and Kislev (1988) for stone pine.

Results

The two samples from the hearth were broadly similar producing much badly preserved cereal grain, some weeds and a little chaff.

The dominant component in the sample from occupation layer 514 was wheat chaff, mostly from spelt wheat though some free-threshing wheat chaff was also recorded including one fragment that could be identified as hexaploid, that is, bread wheat. In addition a significant number of cereal sprouts were recovered from the sample, slightly more than the total number of cereal grains. None of this grain showed signs of germination. The sample also produced some weed seeds, mainly small grasses, three fragments of hazel-nut shell, and two stone pine nut shell fragments.

The charcoal sample although dominated by oak contained small amounts of other taxa.

Discussion

The three samples studied for charred plant remains probably derive from a number of different charring events and from a number of different sources. That the sample from occupation layer 514 contained material other than that derived from cereal processing is attested by the presence of hazel-nut and stone pine nut shell fragments. These latter items are probably from kitchen waste. Context 514 is described as a possible ploughsoil or occupation layer which was only seen in section. It measured 0.30 m in thickness and also contained pottery, bone and fired clay.

Crops and crop processing activities

The results indicate that both spelt wheat and bread wheat were present at the site. It would seem likely that both these crops were cultivated by the inhabitants although it is possible that bread wheat was only present as a contaminant of the main wheat crop, spelt.

The twisted, hulled barley grains in sample 1 indicates the presence of six-row hulled barley. This cereal is also likely to have been an important crop.

The large amount of wheat chaff associated with cereal sprouts in the sample from layer 514 probably represents the waste by-product or 'comings' (Fenton 1978, 394) resulting from the removal of the husks and sprouts from dried malted grain. This material may have been burnt in order to dispose of it, or may, have in turn been used as fuel to dry grain prior to grinding. This may account for the un-germinated wheat grain present in this sample.

Waste derived from the de-husking of malted grain or 'comings' has been identified from a number of other Roman sites in Britain: Bancroft villa, Buckinghamshire (Pearson and Robinson 1994) Catsgore, Somerset (Hillman 1982) and Alcester, Warwickshire (Pelling, *pers comm*). In each of these cases the assemblages were derived from an oven or corn drier and it was clear from the presence of germinated spelt grain that spelt was being malted. The assemblage from Springhead differs in that it was obtained from an occupation layer and in

that none of the grain had germinated. It can only be surmised that spelt was being used for brewing from the association of the sprouts with the spelt wheat chaff.

The absence of culm nodes in the samples would suggest that the earlier stages of crop processing i.e. threshing and winnowing either took place elsewhere on the site, in the fields, or at other locations.

Weeds

The weed assemblage from the site as a whole was rather small. However, it did include both species associated with base rich soils for example *Lithospermum arvense* (corn gromwell) and *Sherardia arvensis* (field madder) as well as *Rumex acetosella* agg. (sheep's sorrel) which is associated with circum-neutral to acid soils. This would suggest that both the chalk, and soils derived from the riverine gravels etc. were under arable.

Previous records from Springhead site include large numbers of *Atriplex patula* (common orache) (Penn 1957) and *Thymus serpyllum* agg. (wild thyme) (Matthews 1964) seeds. It seems likely that both finds are of modern origin, the former representing a rodent hoard and the latter accumulated by ants. The two seeds of *Fallopia convolvulus* (black bindweed) (Matthews 1968) found associated with a corn drier are unremarkable.

Stone pine (*Pinus Pinea* L.)

The two fragments of stone pine recovered from occupation layer 514 add to a growing number of records from Kent. Fragments of stone pine nut shell have been recovered from the second century site at Monkton (Robinson *pers. comm.*) and pine cone scales were recovered from a well at Lullingstone Roman villa (Doherty 1987). In addition there are well known records from London (see Kislev 1988).

Although the cones of stone pine are associated with ritual (Kislev 1988), the nut shells from Springhead and Monkton, and the pine scales from Lullingstone villa probably relate to culinary use. During processing, dried pine cones are bashed to extract the seeds. After this the cones are removed and the seeds are put into water to separate the empty seeds and cone scales (Kislev 1988). The material from the well at Lullingstone may represent the waste from this process.

Stone pine cones may have been imported in bulk into Britain as the evidence from the wreck near Toulon, France suggests (Kislev 1988) or they may have been imported as plugs in wine amphoras as was found in the ship wreck at Albenga in Italy (Kislev 1988). Cultivation of stone pine in Kent may also have been attempted. The wild trees grow in regions of calcium-rich soil (Kislev 1988). However whether the recent finds in Kent are from imported cones or from trees cultivated in Kent must remain open to argument.

Charcoal

The results of the analysis of the charcoal from the fill of the metal working pit might suggest that a variety of fuels were used in metal working. A previous charcoal

Table 12 Charred plant remains

TAXA	Common name	Sample	1	2	7
		Context	527	280	514
		No. of litres floated	4	10	8
<i>Pinus pinea</i> L. (nut shell fragment)	stone pine	-	-	-	1
<i>Silene</i> cf. <i>noctiflora</i> L.	night-flowering campion	-	1	-	-
<i>Silene</i> sp.	campion	-	-	-	2
<i>Vicia</i> / <i>Lathyrus</i> sp.	vetch or tare	3	2	-	-
Leguminosae (small) indet.	small legume	-	7	-	-
Umbelliferae indet.		-	7	-	-
<i>Polygonum aviculare</i> agg.	knotgrass	-	-	-	1
<i>Fallopia convolvulus</i> (L.) Löve	black bindweed	-	1	1	1
<i>Rumex acetosella</i> gp.	sheep's sorrel	3	2	1	1
<i>Rumex</i> sp(p).	dock	1	2	3	3
<i>Urtica urens</i> L.	small nettle	-	2	-	-
<i>Corylus avellana</i> L. (nut shell fragment)	hazelnut	-	-	3	3
<i>Lithospermum arvense</i> L.	corn gromwell	-	1	5	5
<i>Plantago media</i> / <i>lanceolata</i>	plantain	-	1	1	1
cf. <i>P. media</i> / <i>lanceolata</i>	plantain	2	-	-	-
<i>Sherardia arvensis</i> L.	field madder	-	1	-	-
<i>Valerianella dentata</i> (L.) Pollich	narrow-fruited corn salad	-	-	1	1
<i>Tripleurospermum</i> sp.	mayweed	-	-	1	1
<i>Leucanthemum vulgare</i> L.	ox-eye daisy	-	-	1	1
cf. Compositae (small) indet.		-	2	-	-
<i>Bromus</i> sp. (grain)	brome	-	1	-	-
<i>Avena</i> sp. (grain)	oat	1	-	1	1
<i>Avena</i> sp. (twisted awn)	oat	-	1	7	7
cf. <i>Avena</i> sp. (grain)	oat	-	-	1	1
Gramineae (large) indet.	grass	2	3	-	-
Gramineae (small) indet.	grass	10	4	25	25
cf. Gramineae (small) indet.	grass	-	-	1	1
<i>Triticum spelta</i> L. (grain)	spelt wheat	-	-	1	1
<i>T. spelta</i> L. (glume base)	spelt wheat	7	3	296	296
<i>T. spelta</i> L. (spikelet fork)	spelt wheat	-	-	2	2
<i>T. spelta</i> L. (rachis internode)	spelt wheat	-	-	4	4
<i>T. hexaploid</i> free-threshing (rachis)	bread wheat	-	1	2	2
<i>Triticum</i> sp., free-threshing (rachis)	free-threshing wheat	-	-	3	3

<i>T. cf. spelta</i> (grain)	spelt wheat	2	-	1
<i>T. cf. spelta</i> (basal node)	spelt wheat	1	-	-
<i>Triticum dicoccum/ spelta</i> (grain)	emmer or spelt wheat	2	3	3
<i>Triticum dicoccum/ spelta</i> (glume base)	emmer or spelt wheat	1	5	211
<i>Triticum dicoccum/ spelta</i> (spikelet fork)	emmer or spelt wheat	4	1	4
<i>Triticum</i> sp., free-threshing type (grain)	wheat	5	-	-
<i>Triticum</i> sp., cf. free-threshing type (grain)	wheat	-	1	-
<i>Triticum</i> sp. (grain)	wheat	14	-	29
<i>Triticum</i> sp. (glume base)	wheat	-	-	53
<i>Triticum</i> sp. (spikelet fork)	wheat	-	-	17
<i>Hordeum</i> sp. (hulled straight grain)	barley	2	-	-
<i>Hordeum</i> sp. (hulled twisted grain)	barley	2	-	-
<i>Hordeum</i> sp. (hulled grain)	barley	5	-	-
cf. <i>Hordeum</i> sp. (grain)	barley	-	3	-
Cereales indet. (grain)	cereal	26	35	30
Cereal size (embryo)	cereal	6	1	1
Cereal size (sprout)	cereal	-	-	68
Total number of items		107	95	783
Items per litre		26.8	9.5	97.9
IGNOTA		8	4	2

study at the site also identified oak and hazel. A single fragment of lime was also found (Balfour-Browne 1957, 102). This is somewhat surprising since lime charcoal is rarely preserved.

DISCUSSION AND CONCLUSIONS

by A Boyle and P Booth

Due to the circumstances of excavation and the obvious difficulty of interpreting features within a narrow trench this discussion will be limited to a brief summary of the results of the investigation. Little attempt has been made to fit the excavation into the broader picture of excavations within the Roman town because of the difficulties of interpretation. The reader is referred to the main general summaries (Penn 1965; Harker 1979; Detsicas 1983, 60–76; Burnham and Wachter 1990, 192–8). The main feature of the settlement is an important temple complex which probably provides the explanation for the town's location, growth and prosperity. Other aspects of the settlement include domestic buildings, industrial workings and a walled cemetery (Drewett *et al* 1988, 203).

In recent years the Springhead Excavation Group (SPEG) has continued to be active, observing ground disturbances in the area and undertaking limited fieldwork beyond the limits of the scheduled area. Recently the Kent Archaeological Rescue Unit

undertook an evaluation and excavation of an area south of the eastern triangle of the scheduled area that was subsequently developed as a garden centre (Philp and Chenery 1992, 1997). They uncovered a metalled road surface, part of a substantial masonry building, a corn-drier, a small enclosed cemetery and c. 200 pits, ditches, gullies and postholes. An evaluation carried out by the Canterbury Archaeological Trust in 1995, c. 100 m south-east of the eastern end of the cable trench revealed little of archaeological significance (CAT 1995). Geotechnical observations within the area had indicated the presence of at least 1.6 m of topsoil and colluvium above clay and gravel. A single layer located at a depth of 0.57–77 m was interpreted as the original ground surface associated with the Roman settlement. Observation of a Seeboard cable trench dug in a track which runs to the north of the A2 revealed a number of buildings and sections through the Roman road. The Oxford Archaeological Unit will be undertaking further work in the area south-east of the cable trench on behalf of Seeboard plc in the near future.

The excavations produced a limited amount of evidence for prehistoric activity in the form of the flint assemblage although all of the stratified material occurs in Roman features. A scatter of flint was found across the scheduled area during the fieldwalking survey but there were no concentrations of material. There are several prehistoric sites in the area. To the north in the Ebbsfleet valley, there are two important Scheduled

Ancient Monuments of early prehistoric date. Closer to Springhead, Philp and Chenery (1992, 1997) found prehistoric pottery and flintwork (most notably, a leaf-shaped arrowhead) to the south of the Scheduled Ancient Monument in their evaluation of the Garden Centre site while fieldwork undertaken by the Oxford Archaeological Work in connection with the Union Railway has located a Late Bronze Age settlement site in the field immediately north of the A2 (Mudd 1994). There is no reference in Penn's work to any deposits or finds of pre-Roman date from excavations although Harker states that 'a complex system of early ditches and pits has been found to underlie Roman levels' (Harker 1980). A sizeable assemblage of prehistoric worked flint was recovered during excavation of the cable trench. A detailed report on the material has been produced and is available for consultation in the archive.

The most important point to emerge from recent work is that the scheduling is clearly inappropriate: the results of both the fieldwalking and the excavation of the pipe trench indicate an absence of Roman activity in most of the scheduled area to the west of the railway embankment. In addition, this phase of work has shown that activity of Roman date extended southwards, beyond the limits of the eastern portion of the scheduled area. Of course this fact had already been highlighted by the results of the excavations in the Garden Centre (Philp and Chenery 1992). The site was scheduled as an ancient monument in 1954, encompassing the area of known archaeology, broadly speaking the triangle east of the railway, together with the area to the west where it was thought at the time that Watling Street ran. The Ordnance Survey still shows the line of the Roman road to cross this field, although fieldwork in the last twenty years has established that its true line runs across the Springhead Nursery to the north of the A2 (Harker 1980; Smith 1991). The line of Watling Street is shown on figure 2. The town was served by a number of side streets and lanes laid out in a haphazard manner (Burnham and Wachter 1990, 197), though not all are equally convincing (see eg Detsicas 1983, 63, on one of the side streets running north from the line of Watling Street). The most important of the minor roads appear to have been those bordering the temenos area on the south side of Watling Street. These were named 'Temenos Road West' or R4 and 'Temenos Road East' or R3 by Penn (1965, Fig. 1). Neither of these roads has been traced east of the railway embankment, and neither need have extended beyond the (unlocated) southern limit of the temple complex, but it may be suggested that the road located in the Seeboard trench was a continuation of one of them. A projection of the line of the 'Temenos Road East' aligns tolerably well with the road in the pipe trench. The original recording of the Temenos Road East does not easily allow reinterpretation, but Detsicas (1983, 192) implies that an early chalk surface some 2 m wide described by Penn (1958, 81) as a floor might have been a road surface. The later, more substantial roads, of flint and gravel and chalk and flint, perhaps with a gravel capping, were separated from the early surface by fairly

substantial clay deposits of Hadrianic date (*ibid*, 80). The extent of comparability between this sequence and that from the pipe trench is difficult to assess. The latter sequence may have begun fairly soon after the mid 1st century AD and there was no clear evidence for road surfaces later than about the middle of the 2nd century, although the top of the sequence had clearly been truncated by ploughing. Variations in details of construction and of width (the successive surfaces seen in the pipe trench were all from c. 4–5 m across, compared with c. 8.2 m and 7.6 m for the two principal surfaces of the Temenos Road East) may be of relatively little significance in sections some 150 m apart, but the apparent chronological differences may be more problematical. Nevertheless, a tentative equation of the cable trench road with the Temenos Road East can be suggested.

The importance of the former is in the evidence for its continual replacement over a period of a century or possibly longer. This was no ephemeral back street but a significant route through the southern part of the settlement. However, it is unclear if it simply served outlying parts of the settlement or if it led further beyond Springhead. The presence of an important north-south axis through this part of the settlement helps to explain the concentration of activity evidenced here in both the pipe trench and in the work of KARU in the Garden Centre site to the south (Philp and Chenery 1997) where a further section of road was identified. It probably represents an extension of the road identified in the Seeboard trench. One effect of this work is to alter the understanding of the morphology of the settlement indicated in the introduction, the introduction of a significant secondary road adding to the complexity of the settlement plan even if it did not extend beyond the margins of the site.

The discovery of the road is of some interest. It has been pointed out elsewhere (Keevill and Williams 1996, 61) that in spite of Margary's exhaustive study of Roman roads in Britain, few have been subjected to modern detailed excavation techniques and many have only been excavated as a secondary objective.

Metalworking

Evidence for metalworking was noted by Penn (1965, 115) immediately to the north of the A2: 'There was a thin chalk floor at this point on which were found considerable quantities of corroded bronze 'blobs''. These appear to have been from a bronze working establishment although no signs of a furnace or mould were discovered. A substantial tripartite building (B10) fronted on to Watling Street opposite the temenos and just north of Temenos Rd East (R3) mentioned above (Burnham and Wachter 1990, 197). Dating to the 2nd century it was almost certainly originally a shop. It underwent various modifications in the late 2nd or early 3rd century, in one of which a corn drier was inserted into one of the rooms. 'Largely ruinous by the end of the 3rd century it became the workshop of a blacksmith who laboured under a crude shelter erected in the shell' (Burnham and Wachter 1990, 197).

Therefore the metalworking activity in this area post-dates that within the cable trench. A number of partly worked pieces of iron, mostly unrecognisable, but clearly part of a blacksmith's stock were recovered. The area was extensively covered with baked clay and fragments of a crucible were discovered. Hammer scale was associated with this blacksmith's shop and the derelict Temple 1. Iron slag with furnace brick still attached has also been reported from a building on the north side of Watling Street (Penn 1969b, 257). In addition several badly corroded bronze objects have been discovered in the slag area and give the impression that bronze working took place there. Otherwise metalworking activity has not been well represented at Springhead.

Clearly then the unequivocal evidence of metalworking recovered from this excavation is of some considerable importance. It is noteworthy that the forge appears to have been in use during the 1st and 2nd

centuries whereas the evidence from the ruined temple is of a later, 3rd century date.

THE ARCHIVE

The archive has been microfilmed and is currently held by the Oxford Archaeological Unit. Detailed reports have been produced for all categories of artefact and these are available for consultation.

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Table 13 Charcoal from 'metal-working' pit, fill 410

TAXA	Fraction analysed Common name	No. of fragments		Weight in grammes	
		>4mm.	4-2mm.	>4mm.	4-2mm.
<i>Acer</i> sp.	maple	1	-	0.03	-
Pomoideae type	hawthorn, apple, whitebeam etc.	2	2	0.22	0.04
<i>Corylus</i> sp.	hazel	-	1	-	0.02
<i>Quercus</i> sp.	oak	47	22	4.50	0.24
<i>Fraxinus</i> sp.	ash	-	1	-	0.02
indeterminate root		-	1	-	0.01
indeterminate		4	1	0.12	0.03

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