Channel Tunnel Rail Link Union Railways (South) Limited

Project Area 330

WATERLOO CONNECTION, SOUTHFLEET, KENT ARC PHL 97, ARC NBR 98

DETAILED ARCHAEOLOGICAL WORKS ASSESSMENT REPORT

Volume 1 of 2 Text

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SUMMARY

As part of an extensive programme of archaeological investigation carried out in advance of the construction of the Channel Tunnel Rail Link (CTRL), the Oxford Archaeological Unit were commissioned by Union Railways (South) Limited to undertake detailed excavation of the site of Waterloo Connection to the south of Springhead Roman town, Southfleet, Kent. Included within this assessment are two phases of fieldwork (ARC PHL97, ARC NBR98).

The excavation at Waterloo Connection revealed a Romano-British cemetery spanning the mid 1st to at least the end of the 3rd century and possibly into the 4th century. The cemetery, which was almost completely excavated, was located alongside one of the Roman roads serving Springhead Roman `small town'. Almost the entire plan of the cemetery was exposed and excavated in detail. The extreme southernmost part of the cemetery was not investigated, although it is unlikely that this small area would have contained more than a handful of graves.

The cemetery comprised a minimum of 326 inhumation graves and 235 cremation burials. There was a high degree of intercutting of features and a number of bone spreads were identified which clearly represent disturbed graves. The inhumation burials were not well preserved and the majority of graves contained no trace of the skeleton. A small number survived as partially preserved skeletons or body stains only. In contrast cremated bone was well preserved. Men, women and children were all present amongst both inhumations and cremations. Additionally, the small size of some of the empty graves strongly suggests that many more children would have been represented. Many of the inhumations had been buried in wooden coffins which occasionally survived as stains, although more commonly they were represented by iron nails and fittings.

Cremation burials were most commonly placed in pottery vessels. A small number had been placed in wooden boxes and there was at least one casket burial. These are still quite rare in Roman Britain. Amongst the apparently unurned cremation burials, bone was often quite densely packed, suggesting that they may originally have been contained within organic containers which had subsequently decayed.

Perhaps the most interesting aspect relating to cremation burial was the identification of *in situ* cremation (*bustum* burial) where the body was burned on a pyre set over a pit and buried there afterwards. This type of cremation burial is rare in this country and may be an intrusive rite. Pits containing dumps of pyre debris have also been identified. These are distinguished from *in situ* cremation burials by the absence of burning of the natural subsoil. The dumps contained charcoal, burnt clay and small quantities of cremated bone.

Other features apparently related to the cemetery included a well or shaft, a cobbled surface or platform and possible boundary ditches. Postholes and grave markers were also present.

Pottery vessels represented the main category of grave goods although there were also small groups of glass beads and personal ornaments including brooches and bracelets.

Three broad periods of activity have been identified across the site: prehistoric, Roman and post-Roman, with most of excavated remains being assigned to the Roman period. Assessment of the pottery has led to the identification of five provisional phases of cemetery activity within the Roman period. The preliminary phasing is summarised as follows:

• Limited earlier prehistoric activity was represented by the recovery in later contexts of a small quantity of worked flint. (Period 1 - Prehistoric)

- A small number of pits and a length of ditch are probably of late Iron Age date and a small quantity of residual Iron Age pottery was recovered from later features (Period 1 Prehistoric)
- The hollow way was constructed at some point during the 1st-century and continued in use throughout the period of use of the cemetery and beyond. The well or shaft feature may have been dug at this time although a kink in the road may indicate that it was already present when the road was constructed. Boundary ditches may have been an early feature whether or not they related to the cemetery, as they were truncated by graves in subsequent phases of activity. (Period 2 - Roman)
- The cemetery was founded at some point in the 1st century AD, probably relatively soon after the conquest. The burials were dug through a Roman soil layer which survived later ploughing. (Period 2 Roman)
- The bulk of cemetery activity appears to date to the 1st and 2nd centuries AD, although more limited activity did continue throughout the 3rd century AD and into the 4th. (Period 2 Roman)
- There was a decline in the use of the cemetery during the mid/late 3rd-4th century. This may relate to a decline in the scale of activity at Springhead and in the region more generally (Period 2 Roman).
- The road continued in use during the post-Roman period. This is evidenced by the presence of medieval wheel ruts. (Period 3 Post-Roman)
- Medieval and post-medieval ploughing caused damage to the latest Roman burials, in particular shallow cremations. (Period 3 Post-Roman)

The key themes and ideas that have emerged as a result of the Fieldwork Events and the postexcavation assessment suggest that there is excellent potential to address most areas of research interest that were identified in the Fieldwork Event Aims and the Landscape Zone Priorities. The original Fieldwork Event Aims for the first phase of fieldwork (ARC PHL97) were defined prior to the discovery of the cemetery and therefore relate more specifically to Springhead Roman `small town'. Nevertheless they remain of direct relevance to the cemetery insofar as the burial evidence reflects the daily life, economy, social organisation, status and religious beliefs of the inhabitants.

Fieldwork Event Aims relating directly to the cemetery were defined prior to the commencement of the second phase of fieldwork (ARC NBR98) and may all be addressed by the existing evidence and further detailed analysis. There is excellent potential to refine and confirm the sequence and dating of activity on the site. Stratigraphy was well preserved across much of the site and there are a number of good sequences of intercutting graves. Datable stratified material is present in many grave assemblages, and more detailed analysis of datable material present in important contexts should help to resolve existing uncertainties. Integrated and detailed analysis of individual grave groups and spatial analysis of key classes of artefactual material, have the potential to shed light on details of the burial ritual, the spatial organisation and chronological development of the cemetery, possible social affiliations and the status of individuals and groups buried in the cemetery.

1 INTRODUCTION

1.1 **Project Background**

1.1.1 The Oxford Archaeological Unit (OAU) was commissioned by Union Railways (South) Limited (URS) to undertake detailed archaeological excavation at the site of Waterloo Connection, Northfleet, Kent, located 0.5 km to the south of the Roman town at Springhead (Vagniacis) and 200 m to the south-west of the scheduled temple complex (SAM KE 198), part of which falls within the same arable field in the angle between Station Road and New Barn Road (Figures 1-3). This work formed part of an extensive programme of archaeological investigation carried out in advance of the construction of the Channel Tunnel Rail Link (CTRL). The detailed excavation was undertaken following the unexpected discovery of Roman burials during a watching brief on cable diversion works for SEEBoard, in advance of construction of the CTRL.

Fieldwork	Туре	Code	Contractor	Date of fieldwork
Event				
Pepper Hill	Excavation	ARC PHL97	OAU	1.11.97-16.1.98
New Barn Road	Excavation	ARC NBR98	OAU	1.8.98-15.1.99
South of Station	Evaluation	ARC SSR98	OAU	19.1.98-23.1.98
Road				

Table 1: Waterloo Connection principal site: Fieldwork events

- 1.1.2 The archaeological work was carried out according to a Written Scheme of Investigation WSI prepared by Rail Link Engineering (RLE), and agreed in consultation with English Heritage and Kent County Council (KCC) on behalf of the Local Planning Authorities.
- 1.1.3 The archaeological evaluation, consisting of 10 trenches excavated on farmland adjacent to Station Road (B262) and south of the A2, Southfleet, on the opposite side of the valley to the cemetery, is assessed in detail in a separate fieldwork report (URL 1998).

1.2 Geology and Topography

- 1.2.1 The geology of the area comprises sands and gravels overlying brickearth. The site slopes gently down from south to north, towards Watling Street and Springhead Roman town, and drops away sharply to the west of the cemetery. The site is located in a field which was used for arable agriculture.
- 1.2.2 The site is centred on URL grid point 41904 52098 and NGR grid point TQ 6190 7210. The site was specified as detailed excavation for the cemetery and strip, map and sample for the remainder. The total excavated area was c. 0.99 ha in extent although the cemetery and associated features fell within an area of only c. 0.2 ha.

1.3 Archaeological and Historical Background

1.3.1 The cemetery lies in close proximity to the Springhead Roman complex which includes the site of the Roman 'small town' of *Vagniacis* (SAM KE 158) and a group of Roman temples. The nearest of the temples lies *c*.130 m to the north-east (SAM KE 198).

- 1.3.2 Springhead is mentioned in the Antonine Itinerary as *Vagniacis*, a name which is a combination of two British words probably meaning `a marshy place'. The ending `is' is normally taken to imply an estate so the name means `the estate of, or by, or at, the marshy place'. A number of early ditch systems, and pits said to be of a votive character, are known to underlie the Romano-British settlement. It seems likely, therefore that the site was of ancient sanctity before the creation of the Romano-British religious centre. It is well known that marshes, bogs, streams, rivers and springs indeed almost anything connected with water were often venerated in the Iron Age, a practice which was frequently carried through into the later period (Burnham and Wacher 1990, 192).
- 1.3.3 The discovery and excavation of the cemetery adds to a considerable and growing body of archaeological evidence relating to Springhead Roman town.
- 1.3.4 Evaluation in advance of CTRL construction works (ARC SSR98) established the presence of part of the periphery of the Roman town. The remains appeared to date from the 1st and 2nd centuries AD, and no later. There was no obvious evidence for a pre-Roman phase within the area of study. Test pits within the nursery and close to the slip road from the A2 indicated that well preserved stratigraphic sequences were present, although they were not affected by CTRL works. It appeared that the Victorian watercress industry had truncated archaeological deposits immediately adjacent to the Ebbsfleet river. Away from the river there was evidence of dry-stone building foundations stratified within colluvium and other archaeological deposits. although the majority of the evidence consisted of discrete archaeological features and deposits. Further concentrations of features have also been recorded on the higher ground to the north-east, which represent less dense activity of late Iron Age and Romano-British date. The evaluation recovered a large Roman pottery assemblage, and the indications were that other palaeo-economic and palaeoenvironmental remains were well-preserved.
- 1.3.5 Roman burials have previously been recorded in small numbers in and around Springhead, including a number in a walled cemetery found in 1801 some 350 m to the north-east, at the junction of New Barn Road and Watling Street (Rashleigh 1803; Jessup 1959, 14, 29-30).
- 1.3.6 Cremations and inhumations were located in 1921-2 in an area well to the south-east of the town (Wheeler et al. 1932, 91).
- 1.3.7 Excavation by the Kent Archaeological Rescue Unit (KARU) in the Garden Centre uncovered a small group of seven burials on the east side of a metalled road (Philp and Chenery nd, 8-12); three were cremation burials and four were inhumations. All burials were located within a four-sided ditched enclosure. All of the cremation burials and one of the inhumations appear to date from AD 70-100 on the basis of associated grave goods. The group may represent the cemetery of a single family group. Each of the cremation burials was accompanied by five pottery vessels. Animal bones which have been interpreted as food offerings were associated with three of the burials in the Garden Centre. The entire contents of one cremation burial had been deposited in a wooden box. Two of the inhumations had been buried in wooden coffins and one of them was accompanied by a wooden box.
- 1.3.8 Burials were also discovered in a SEEBoard pipe trench excavated in 1994 which ran across the eastern portion of the scheduled area (Boyle and Early nd). The remains of 12 neonatal infants were recovered from a variety of settlement contexts largely dating to the 1st and 2nd century. The disposal of infants in and around

settlement structures was commonplace in the Roman period, and may have been even more so at rural settlements and `small towns'.

- 1.3.9 For some years it has been known that a Roman road entered the Roman town of Springhead from a southerly direction. This road was located in both the 1994 OAU (Boyle and Early nd) and 1994 KARU excavations (Philp and Chenery nd) to the north of and within the Garden Centre, to the south of Watling Street. It has been tentatively interpreted as a continuation of Tenemos Road East or R3 identified by Penn (1965, Figure 1).
- 1.3.10 The cemetery at Waterloo Connection appears to be a good example of an urban cemetery flanking a main road, where it would be easily accessible but otherwise interfere least with agricultural and other domestic uses (Figure 2). It does seem to have been constrained in its spatial extent and did not develop in the typical ribbon-like manner along the side of the hollow way.

2 ORIGINAL PRIORITIES, AIMS AND METHODOLOGY

2.1 Landscape Zone Priorities

- 2.1.1 The area of study is located in the North Kent Plain Landscape Zone.
- 2.1.2 The Landscape Zone Priorities were set out in the WSI (URL 1997). A number of research aims were identified prior to the fieldwork, within the framework of the CTRL Research Strategy. They include the following themes:
 - Landscape Zone Priority 1. The effects of `urban' growth and decline at Springhead, and the adoption of Roman ways and organisation in general.
 - Landscape Zone Priority 2. The immediate pre-Roman/early Roman urbanrural landscape.
 - Landscape Zone Priority 3. Roman burial practice and ceremonial use in the environs of Springhead.

2.2 Primary Fieldwork Event Aims

Pepper Hill (ARC PHL97)

- 2.2.1 The aims of the Fieldwork Event, as stated in the WSI for Pepper Hill (URL 1997) were extremely generic as they were intended to apply to an archaeological watching brief on the periphery of Springhead Roman town and the discovery of the cemetery was not anticipated. Thus all the aims were defined with a view to furthering understanding of the settlement activity in and around Springhead.
- 2.2.2 For reference the Fieldwork Event Aims for the two Fieldwork Events are numbered as a continuous running sequence, as follows:
 - Fieldwork Event Aim 1. To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2. To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3. To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4. To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 5. To recover other palaeo-economic indicators known to be well preserved: (eg. animal bone, molluscs, charred plant remains) to establish the fullest possible picture of the urban economy.
 - Fieldwork Event Aim 6. To recover palaeo-environmental indicators to elucidate the interaction of the town within the local environment.

New Barn Road (ARC NBR 98)

- 2.2.3 The aims of the Fieldwork Event, as stated in the WSI for New Barn Road (URL 1997) were defined after the partial excavation of the cemetery in 1997, as follows:
 - Fieldwork Event Aim 7. To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8. To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9. To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 10. To recover data to enable palaeo-demographic and palaeo-pathological analysis to be undertaken.
 - Fieldwork Event Aim 11. To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12. To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 13. To establish the nature and date of occupation predating the cemetery.
 - Fieldwork Event Aim 14. To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

2.3 Fieldwork Methodology

2.3.1 Fieldwork was carried out in two main stages in accordance with the methodology specified in the WSI (URL 1997).

Phase I investigation - Pepper Hill (ARC PHL97)

- 2.3.2 Topsoil stripping of the cable easement (Figure 3), using 360 degree excavators fitted with toothless ditching buckets, commenced on 3rd November 1997. Over the following two weeks the entire easement was stripped (an area of approximately 3.5 hectares). The excavation of two cable easement sections R7 and R8 located to the south of Station Road and to the west of New Barn Road was archaeologically monitored. During the archaeological monitoring of the topsoil stripping operation between these sections an area of darker soil containing frequent pottery fragments was identified. The level of stripping was adjusted to ensure that any significant archaeological deposits in the area were not damaged by the stripping operation.
- 2.3.3 Careful examination of the stripped surface revealed a few areas of cremated bone either within or associated with *in situ* pottery vessels. While its interpretation as a Romano-British cremation cemetery was undoubted, its full extent and level of preservation was impossible to establish from the visible surface remains. A rapid inspection of the surface located 88 possible burials across the line of the easement covering an area approximately 40 m x 10 m. Traces of the contemporary ground surface appeared to survive as a Roman soil, which was cut by some burials, and which sealed others. The soil deposit was considered to be too disturbed by cemetery activity to justify sampling.

- 2.3.4 Excavation of the cemetery commenced on 10th November 1997 and after several weeks work it became apparent that it would be impossible to complete the excavation of the whole cemetery within the easement width before the cable trench was due to be excavated in early January 1998.
- 2.3.5 Following meetings with SEEBoard, KCC and RLE it was agreed that work would concentrate on clearing a 9 m wide strip across the cemetery, designated Area A (Figure 3). This strip corresponded to the 6 m width of the cable trench, and allowed for a 1 m wide batter on both sides and an additional 1 m wide 'buffer' on the north side. It was also agreed that work should continue on Area B (Figure 3). SEEBoard conceded that Area C (Figure 3), to the north of the cable trench, was no longer required as part of the construction work. Consequently OAU were instructed to terminate any further work in that area, apart from completing recording and lifting of burials already exposed. The area was then covered with geotextile and reburied.

Phase 2 investigation - New Barn Road (ARC NBR98)

- 2.3.6 Following the decision to rebury Area C, it rapidly became clear that the area would in fact be affected by construction work for the CTRL and that complete excavation of the remainder of the cemetery would be required. OAU was commissioned by Union Railways (South) Limited to carry out this work between August 1998 and January 1999 (ARC NBR98 - New Barn Road).
- 2.3.7 Due to the difficult weather conditions encountered through the winter months, polytunnels were erected over the excavation area to allow all-weather working.
- 2.3.8 Despite the presence of 24-hour security, the site was affected by the activity of metal detectorists immediately after the discovery of the cemetery. Cremation burials in particular were damaged.

Treatment of burials

2.3.9 All burials were excavated in accordance with OAU procedures for the excavation of inhumations and cremations, as detailed in the Project Method Statement and WSIs produced for each phase of the work.

Inhumation burials

- 2.3.10 All inhumation burials were assigned group numbers. Each individual context within the burial group was assigned a unique number from a continuous running sequence, for example grave cut, grave fill, coffin, coffin fill, skeleton, pottery vessel, hobnails. Detailed works, comprising 100% excavation, and single context planning at a 1:10 scale were undertaken for all inhumation burials. Where burials were particularly complex, a scale of 1:5 was deemed more appropriate. The fragile nature of the inhumations often necessitated their removal in soil blocks for laboratory excavation.
- 2.3.11 Bulk soil samples were recovered from all graves for the recovery of charred plant remains, human and animal bone and small artefacts. Where body stains survived they were planned and samples retained for phosphate analysis.
- 2.3.12 Longitudinal and transverse grave profiles were drawn at a scale of 1:10.

Cremation burials

2.3.13 All cremations were assigned group numbers. Each individual context within the burial group was assigned a unique number from a continuous running sequence, for

example grave cut, grave fill, wooden box, box fill, cremated bone, pottery vessel(s). Discrete deposits of cremated bone within a single cut were assigned individual numbers where they could be identified. Detailed works, comprising 100% excavation, and single context planning at a 1:10 scale were undertaken for all cremation burials. Where burials were particularly complex, a scale of 1:5 was deemed more appropriate. The fragile nature of some of the vessels containing deposits of cremated bone often necessitated their removal in soil blocks for subsequent excavation at OAU premises.

- 2.3.14 Longitudinal and transverse sections were drawn at a scale of 1:10.
- 2.3.15 All cremation burials were 100% sampled to enable full recovery of cremated bone, charred plant remains and small artefacts.
- 2.3.16 Initially all deposits of cremated bone were excavated on site in a series of 20 mm spits as recommended by McKinley and Roberts (1993, 6). Each spit was planned and the presence of clearly identifiable fragments was noted. Bone was identified by the OAU osteologist. Initial assessment of the cremations during the course of the excavation showed clear evidence of structured deposition, indicating that the cremated remains were sorted into body parts prior to deposition in the vessel (see Appendix 7.1, Table 7.3 for summary of results), thus justifying the continued detailed treatment of the cremation deposits. Pressure of time forced a modification to the excavation strategy, such that all complete or substantially complete vessels were lifted as a block for laboratory excavation, rather than being excavated on site. Vessels which were deemed to be less than 50% complete were not generally excavated in spits.

In situ cremation burials (busta burials)

- 2.3.17 *In situ* cremation burials were excavated in spits by quadrant to allow the osteologist to detect any patterns in the distribution of skeletal elements. This requires a view of the horizontal distribution in two directions. Any obvious layers were recovered as separate contexts while retaining the block system. A full record of the distribution in both plan and section at a scale of 1:10 was made after the excavation of each spit.
- 2.3.18 Potential *in situ* cremation burials were subjected to 100% sampling in order that the entire contents could be wet-sieved (to 1 mm fraction) and floated for botanical evidence, bone and small artefacts.

Pyre debris

2.3.19 These contexts were subjected to 100% sampling in order to ascertain the number of cremations represented and to be able to assess what was considered discardable material (cremated bone and pyre goods). Contexts were half sectioned or quadranted in order to determine the relationships between the different archaeological components within the fill. Small deposits were recovered as a single context. Large spreads of material were divided into blocks of equal size similar to those for the pyre sites, using spits of 0.05-0.10 m.

Other discrete features

2.3.20 All discrete features were excavated and planned at a scale of 1:10. Generally features were fully excavated, although features of low archaeological significance, including tree throw holes and quarries, were generally half-sectioned.

2.4 Summary of Excavation Results

- 2.4.1 Two phases of fieldwork were undertaken, from August 1997 to January 1998 and from November 1998 to January 1999, following the unexpected discovery of the cemetery during a watching brief on cable diversion works. The first phase of fieldwork revealed the southern part, the second phase the northern part, of a previously unknown Roman cemetery dating from the late 1st to the end of the 3rd/ early 4th century.
- 2.4.2 The section of the CTRL route between the cemetery and the temple site to the north-east was subject to a strip, map and sample excavation, but contained little significant archaeology apart from a number of quarry pits. These were generally located close to the Roman hollow way, extending northwards from the cemetery, and probably relate to the periodic maintenance of the road surface.
- 2.4.3 Limited earlier prehistoric activity is represented by the small worked flint assemblage, although all of the material was redeposited in later contexts. Some of the burnt unworked flint may be linked to incidental burning in Roman cremation pyres.
- 2.4.4 A small number of pits pre-date the cemetery and may be Iron Age in date. Some of these were sealed by a cobbled surface located on the western edge of the cemetery. This surface has been interpreted as a possible viewing platform for mourners or roadside shrine. A ditch on a north-south alignment, containing a dense concentration of burnt flint, produced pottery of late Iron Age date and may bear no relationship to the cemetery.
- 2.4.5 The cemetery measured *c*. 76 m (north-west south-east) by *c*. 23 m (north-east south-west) and was located immediately to the west of a Roman road, which survived as a metalled hollow way (sub-group 35) and formed the eastern boundary of the cemetery. It was identified as Tenemos Road East or R3 (Penn 1965) which has its origin in Springhead itself. The surface of the road was metalled with coarse gravel and exhibited well defined wheel ruts. An enigmatic shaft- or well-type feature was located immediately to the east of the hollow way.
- 2.4.6 The hollow way was aligned NNW-SSE and consisted of a wide, shallow, flatbottomed cut with gently sloping sides. At its base a compacted gravel surface (32) was identified. This was overlain by two silting layers (30 and 31). Six coins were found in the upper silting layer and these range in date from the 1st to the 4th century AD.
- 2.4.7 The cemetery was bounded to the north and west by a series of linear ditches and comprised approximately 561 burials, a mixture of cremation and inhumation. Current interpretation suggests that both rites may have been practised throughout the life of the cemetery, although more detailed study is required to confirm this. Other features included stakeholes and postholes which may have served as grave markers. At least one group of postholes formed a fence line. A square pit containing a substantial circular post-pipe filled with charcoal may also have been a grave marker although it was cut through a complex sequence of graves.

Inhumation burials

2.4.8 The cemetery contained approximately 326 inhumation graves. Bone preservation was very poor, with only 95 containing any skeletal material. Body stains were apparent in some cases. It was possible to determine body position in some cases.

The most common body position was supine extended but there was one prone and one quite tightly crouched skeleton. Further occasional crouched burials can be recognised.

- 2.4.9 A range of orientations appears to have been represented in all phase of activity. Clearly this issue is complicated because of the high proportion of empty graves which makes it impossible to determine at which end the head lay. It has been possible however, based on the presence of fragmentary human bone and body stains to determine orientation in 92 cases. The most common alignment was NNW-SSE with 22 examples aligned parallel to the hollow way, although a range of orientations appears in all phases of activity. The principal factor affecting orientation appears to been the road and cemetery boundary alignments.
- 2.4.10 The majority of inhumations were buried in wooden coffins which survived as coffin stains and were regularly associated with iron nails and coffin fittings including brackets. Many were accompanied by one or more pottery vessels and other grave goods were occasionally present. Two inhumations also appear to contain small wooden boxes held together with nails. These can be paralleled by an inhumation burial found in the Garden Centre (Philp and Chenery nd). Both examples from Waterloo Connection had been placed in the coffin and may have contained hob-nailed footwear. One box may have had a copper alloy drop handle.

Cremation burials

- 2.4.11 A total of 235 cremation burials were excavated. This is certainly an underrepresentation and many more are likely to be represented by general bone spreads due to the high level of intercutting. Moreover, shallow cremations in particular were prone to post-Roman plough damage. Cremation deposits were generally contained within pottery vessels although wooden boxes and a casket were also identified (wooden boxes were associated with burials excavated in the Garden Centre to the north (Philp and Chenery nd). One certain casket burial was associated with a samian DR. form 27 bowl and a deposit of cremated bone. The copper alloy lock plate is decorated with eight lion-headed studs and a substantial part of the locking mechanism also survives. The associated small iron nails indicate how thin the wood of the casket would have been. Casket burials are still relatively rare (Patridge 1981; Philpott 1991, 12) with fewer than 40 examples known in Britain.
- 2.4.12 Three other cremations in square or rectangular pits are likely to have been boxburials where the box was larger and undecorated. Many of the cremation burials were also accompanied by accessory vessels and other grave goods. A number of cremations appear to have been placed in organic containers without accompanying pots.

In situ cremation burials (Bustum burials)

2.4.13 An interesting variation in the cremation rite was a group which showed signs of burning of the brickearth in and around the cremation pit, as though the remains were burnt *in situ* in the pit, or perhaps on a platform set above it. Published accounts of Roman pyre sites are uncommon although burning on the sides of a cremation pit is relatively easily detected in excavation. This may suggest that it was a genuinely unusual practice in Britain. The absence of an obvious Iron Age predecessor together with the relatively frequent association with military sites such as Petty Knowes, Beckfoot, Herd Hill, Riseholme and Derby Racecourse suggests that it is an intrusive rite in Roman Britain (Philpott 1991, 49). Certainly it is a consistent feature of burial practice in extensive areas of the Continent.

- 2.4.14 There are at least twenty of these features and they appear to occur throughout Phases 1-4. Some are cut by later graves. For example, *in situ* cremation 11108 is cut by an inhumation, which was subsequently cut by inhumation 10862.
- 2.4.15 The features have scorched edges and contain substantial quantities of charcoal, burnt clay, burnt flint and cremated bone, measuring on average 1 x 0.50 x 0.30-0.50 m. Deposits of cremated bone were unenclosed though generally accompanied by an accessory vessel.
- 2.4.16 Undisturbed *in situ* cremation burials appeared to demonstrate an ordered deposition; the vast majority of the bone was on the surface above the fuel ash. It is not yet clear whether the bone was in anatomical order.

Pyre debris dumps

- 2.4.17 Pyre debris was found in the backfill of cremation graves, deposited over cremation graves, dumped into pre-existing features, as spreads, or deposited in apparently deliberately excavated features. The presence of pyre debris is indicative of the proximity of the pyre site even where none is found.
- 2.4.18 The following pits contained dumps of pyre debris comprising charcoal, burnt clay and small quantities of cremated bone: 1013, 1014, 1207, 10097, 10115, 10613, 10910, 11126, 11130, 11193, 11922, 11974, 12149. The absence of evidence for *in situ* burning distinguishes these from *bustum* burials.

Grave goods

- 2.4.19 The most common type of grave good associated with both cremation and inhumation burials was pottery. Other artefacts included personal ornaments such as brooches, bracelets and beads. A single worked bone object had been burnt so clearly it had been placed on the pyre. This is unusual amongst cremation burials in Roman Britain, as most surviving furniture was placed intact with the ashes (Philpott 1991).
- 2.4.20 The range of non-ceramic artefacts generally found with cremations in Britain is restricted. Items can include personal ornaments (brooches, bracelets, pins, finger rings, and beads), toilet equipment (notably mirrors, tweezers), shoes, coins, lamps and glass unguent phials. Less frequently included are items such as styli, belt fittings, textile and knives. The cremations at Waterloo Connection conformed to this pattern.
- 2.4.21 It is likely that worked bone artefacts are under-represented on the site due to poor preservation of this category of material. The single item which has survived almost certainly does so because it is burnt.

Funerary offerings

- 2.4.22 Cereal remains within a small number of the cremation deposits are likely to represent occasional cereal processing debris, which was present as residual material, or had perhaps entered the cremation pyres as kindling. However, pulses found in one deposit could represent funerary offerings placed on the pyre. This deposit also contained grape pips with some flesh still attached.
- 2.4.23 Both burnt and unburnt animal bone has been identified in a number of the cremation deposits. The burnt bone may have been deliberately placed on the pyre as a funerary offering. Small quantities of unburnt bone may be accidental inclusions.

Boundary ditches

- 2.4.24 A number of ditches have been identified and it is probable that these served to delimit the extent of the cemetery. They were clearly an early feature within the Roman period as they were truncated by graves in subsequent phases of cemetery activity. On balance it is likely that they initially served as boundary ditches for the cemetery, but were not maintained and rapidly silted up.
- 2.4.25 Although a small number of graves do encroach slightly on the ditches they do not extend entirely beyond the ditched perimeter. One feature which is an obvious exception is the cobbled surface located immediately to the west of the cemetery. An obvious focus of burial activity throughout the period of use of the cemetery, represented by successive intercutting of both cremation and inhumation burials, was located immediately south and east of the platform.

Cemetery organisation

2.4.26 The density of activity within the cemetery area was extremely high and there was therefore marked intercutting of features. The lack of linear organisation is a noteworthy feature. Organisation of Roman cemeteries in a linear or ribbon arrangement alongside Roman roads is a common feature. This cemetery was clearly never organised in this manner and there is strong evidence of nucleation in all phases. A similar sequence of events has been suggested for the Roman cemetery at St Bartholomew's Hospital, London (Bentley and Pritchard 1982-3). It is possible that space was at a premium and the cemetery may have been prevented from spreading along the length of the road, perhaps because of the presence of woodland, or good arable land. However it also appears from the intense concentration of burials that the location itself may have had specific religious significance, in which case the restricted extent may be explained by nucleation around that location.

2.5 Assessment Methodology

2.5.1 This assessment report was commissioned by URS following the specification for such reports produced by RLE, as discussed with English Heritage and Kent County Council (URS 2000). This specification follows national guidelines prepared by English Heritage and provides additional information regarding level of details required and formats. The production of the assessment report was managed by Stuart Foreman (Project Manager) and Angela Boyle (Team Leader). The majority of specialist work was undertaken by in-house experts, with the remainder of the work completed by external specialists.

3 FACTUAL DATA AND QUANTIFICATION

3.1 The Stratigraphic Record

The integrity of the stratigraphic sequence

- 3.1.1 The graves within the cemetery were densely intercutting and therefore there is a complex stratigraphic sequence. Relationships were in many cases difficult to establish, but sufficient clear relationships exist to be confident in the general sequence. The stratigraphy is supported by a great deal of artefactual evidence, mainly comprising pottery. Evidence of activity ranges from the earlier prehistoric to the post-medieval period although the bulk of the activity is Roman in date.
- 3.1.2 Shallow graves were particularly prone to damage especially from post-Roman ploughing which has caused damage to many vessels. For example, cremation burials were generally shallower than inhumations and consequently most cremation urns belonging to later phases were broken and incomplete. There was also some disturbance caused by metal-detector raiding early in the investigation.
- 3.1.3 The often intensive intercutting of graves has implications for residuality and intrusion. However, the provenance of the bulk of the artefactual material is undisputed as it derives from undisturbed primary burial contexts. Many of the pottery vessels are in a remarkably complete condition.
- 3.1.4 Preservation of many classes of remains varied considerably across the site. Human bone in particular survived only in a relatively small number of graves, concentrated in the central part of the cemetery. Elsewhere traces of bodies were visible only as stains in the soil; in many cases there was no trace surviving at all. Factors affecting preservation are at present unclear, and may relate to very localised changes in soil chemistry.

Paper and Digital Archive

- 3.1.5 A total of 3636 context records, 318 section drawings and 1141 plans were produced during the excavation. All plans have been digitised (1141 in total). Individual graves were planned at 1:10 or 1:5 depending on the level of complexity. These have also been digitised.
- 3.1.6 Datasets of the records and finds have been compiled although it is expected that the dataset will require further development, particularly at a sub-group level, when the requirements of the analysis are known. The updated archive index is listed in Table 2, which appears in section 3.5 below.

Provisional Phase Summary and Stratigraphic Groups

3.1.7 The activity on the site can be assigned to three periods: prehistoric, Roman and post-Roman. A further five phases of activity within the Roman period have been identified. Preliminary phasing has been carried out, based upon a combination of pottery retrieved from excavated features and the stratigraphic relationships between them. Much of the activity falls within the Roman period, phase 3. Phased burials are illustrated in Figure 5.

Period 1		Prehistoric
Period 2	Phase 1	1st century

Period 2	Phase 2	Mid/late 1st century-early 2nd
		century
Period 2	Phase 3	1st-2nd century (general)
Period 2	Phase 4	Mid/late 2nd-3rd century
Period 2	Phase 5	Mid/late 3rd-4th century
Period 2	Undated features	Probably Roman
Period 3		Post-Roman

- 3.1.8 Limited earlier prehistoric activity is represented by the assemblage of worked flint, although it was all redeposited in later features.
- 3.1.9 Sparse Iron Age activity was represented by a small quantity of Iron Age pottery recovered from 11 contexts. All of the material was redeposited in Roman or later contexts with one exception. A single pit (group 11115) contained 16 sherds (74 g) in a flint-tempered fabric. A north-south aligned linear ditch located immediately beyond the south-western limit of the cemetery may also be Iron Age in date.
- 3.1.10 Eight features have been interpreted as tree-throw holes, indicative of tree clearance within the excavation area. None of the tree-throw holes contained artefacts and all were located in the northern half of the cemetery.

The hollow way

- 3.1.11 The cemetery was bounded on its eastern side by a hollow way, which extended from Springhead itself. The road has provisionally been identified as Tenemos Road East or R3. The road changes its alignment markedly north of the cemetery, perhaps to avoid existing structures. Roman surveyors had great expertise in establishing the lines of Roman roads which frequently represented an almost perfect compromise between minimising the distance and maximising the ease of road construction and travel. It is not inconceivable that the hollow way has its origins in the Iron Age.
- 3.1.12 A small group of five coins was recovered from fill 10031 of the hollow way and range in date from the 1st to the 4th century. The 4th century coins are likely to relate to the continued use of the road after the decline of the cemetery.

The well or shaft

- 3.1.13 A large circular pit interpreted as a well or shaft (10415=10024) was located *c*. 2 m to the north-east of the hollow way, measuring 8 m in diameter and at least 4 m in depth. There is a suggestion that this feature pre-dates the hollow way as the latter kinks slightly around the western edge of the pit. For this reason the feature has been tentatively assigned to phase 1 although it clearly continued in use throughout the period of use of the cemetery. The feature was not completely excavated because of engineering depth restrictions. Its depth was tested to 4 m by a machine excavation and hand augering, without encountering natural deposits.
- 3.1.14 A sample from the lowest hand excavated fill (10447) produced a moderate concentration of wood charcoal and contained two fragments of unburnt human long bone. This deposit, which was c. 2.1 m below ground surface, may therefore have been deposited during the lifetime of the cemetery. The upper fills of the feature were relatively homogeneous and contained very few finds. The uppermost fill contained 1 worked flint, 16 sherds of 2nd century pottery and 3 coins: (Antoninus Pius ?138-161; Commodus 180-92; Constantine I, Vot XX, 322-5). Some deep pits or shafts excavated elsewhere appear to have been used as depositories for offerings, eg at East Hill, Murston (Payne 1893, 42) and Warbank, Keston (Piercy Fox 1967,

184-6). The location adjacent to the cemetery is suggestive of a possible ritual function in this case, but the evidence is inconclusive.

Inhumation and cremation burials

3.1.15 The following preliminary phasing has been defined on the basis of pottery spotdating modified where possible by preliminary analysis of the stratigraphic relationships. It is considered that this will be susceptible to considerable refinement following detailed analysis, including all available strands of dating evidence (in particular, radiocarbon dating using high precision techniques and statistical modelling). The phasing is at present limited by the very broad date ranges assigned to most of the pottery assemblages. At assessment stage it has rarely been possible to date grave groups within a century. In addition the stratigraphic sequence relies heavily on areas of intensely intercutting graves, and it is rarely possible to link spatially separate grave groups on stratigraphic grounds.

Phase 1 - 1st century

3.1.16 A total of 17 inhumations and 13 cremations have been assigned to phase 1 on the basis of stratigraphic relationships and associated pottery (see Table 1.2). At least three *in situ* cremation burials belong to this phase. The burials are concentrated predominantly in the southern half of the cemetery with two outlying burials in the northern half. A variety of alignments were seen.

Phase 2 - Mid/late 1st century-early 2nd century

3.1.17 A total of 24 cremations and 23 inhumations have been assigned to phase 2 on the basis of associated pottery. The burials are concentrated in the southern and central portions of the cemetery. A variety of alignments were seen. At least three *in situ* cremation burials belong to this phase.

Phase 3 - 1st-2nd century general

3.1.18 A total of 94 cremations and 42 inhumations have been assigned to phase 3 on the basis of associated pottery. Burials in this phase occurred throughout the cemetery. There was a single outlying inhumation burial at the northernmost extent of the cemetery and a marked concentration along the south-western perimeter. At least two *in situ* cremation burials belong to this phase.

Phase 4 - Mid/late 2nd-3rd century

3.1.19 A total of 14 inhumations and 5 cremations have been assigned to phase 4 on the basis of associated pottery. They are located in the southern and central portions of the cemetery. A variety of alignments were seen. At least one *in situ* cremation burial belongs to this phase.

Phase 5 - Mid/late 3rd - early 4th century

3.1.20 A total of five inhumations have been assigned to phase 5 on the basis of associated pottery.

Undated features - probably Roman

3.1.21 A number of quarry pits may relate to gravel extraction for maintenance of the hollow way.

3.1.22 A metalled surface made up of flint nodules measuring 15 x 5 x 0.30 m was located on the western edge of the cemetery beyond the boundary ditch. It may have served as a viewing platform associated with the funeral ritual or perhaps a roadside shrine. No dating evidence was recovered from this feature although it sealed a group of late Iron Age pits.

Period 3 - Post-Roman

- 3.1.23 Late Saxon activity in the vicinity is indicated by a copper alloy dress pin of 8th to 9th century date which was recovered from the topsoil.
- 3.1.24 Wheel ruts and potholes were identified in the upper levels of the hollow way along with medieval and post-medieval plough furrows which had caused damage to a number of shallow cremations. In addition, a small amount of medieval and post-medieval roof tile has also been recovered.
- 3.1.25 A total of four post-medieval coins were recovered from the topsoil. One 17thcentury copper farthing was found in a grave fill (sub-group 10862) and is clearly intrusive. A finger ring was recovered from the topsoil.

3.2 The Artefactual Record

Iron Age and Roman Pottery - Appendix 1.1

- 3.2.1 The assemblage comprised 25,479 sherds (192.123 kg) of Iron Age and Roman pottery. Some 85% of the pottery (by weight) derived from certain or probable grave-related material, i.e. cremation urns and vessels deposited as grave goods. These amount to approximately 450 vessels, ranging in date from the mid 1st to the mid 4th century AD, though the majority of the pottery, from both cremations and inhumations, appears to be of 1st-2nd century AD date.
- 3.2.2 Most of the vessels can be assigned to broad functional categories within the individual grave assemblages, the principal ones apart from cremation urns being liquid containers (flagons and flasks), drinking vessels (cups and beakers) and open plate-like forms (bowls and dishes). Miscellaneous vessels included further jars/bowls and specialist types such as the spouted infant feeder, of which five examples were found. These have a mid 1st-early 2nd century AD date range. The number of vessels in individual graves ranged from one to a (rare) maximum of six. Some vessels were probably imperfect at the time of deposition.

Samian Ware - Appendix 1.2

- 3.2.3 The assemblage comprised 396 sherds (13.15 kg) from 77 graves and a further 21 features of other types. It is estimated that approximately 200 vessels may have been represented. Plain forms comprised 99% of the material and this is clearly a highly significant proportion. At least 35 vessels (18%) were complete or nearly complete.
- 3.2.4 At present it is estimated that the material derived from South (53%), Central (40%) and East Gaul (7%) although this may be revised after cleaning of the material. The material is in poor condition, and several vessels are deteriorating.

Ceramic Building Material - Appendix 1.3

3.2.5 The entire assemblage comprising 4.449 kg was assessed (2.732 kg from ARC PHL97 and 1.717 kg from ARC NBR98). The material derived from a variety of contexts. Most of the tile is Roman, but a small amount of post-Roman (probably early post-medieval) roof tile is also present.

Fired Clay - Appendix 1.4

3.2.6 The total assemblage of fired clay comprising 18.023 kg was assessed (0.188 kg from ARC PHL97 and 17.835 kg from ARC NBR98). The material derived mainly from inhumation and cremation burials, in particular *in situ* cremation burials. The fired clay and daub assemblages appear to consist of daub used in funerary contexts and burnt natural soil which is likely to relate to the practice of *in situ* cremation.

Flint - Appendix 2.1

3.2.7 The assemblage comprised 902 pieces of worked flint and 441 pieces of burnt unworked flint. A total of 401 pieces of worked flint and 221 pieces of burnt unworked flint, weighing 5081 g was recorded. A total of 505 pieces of worked flint and 220 pieces of burnt unworked flint were simply scanned and not recorded. Much of the scanned worked flint consisted of small chips; many of which may in fact be natural.

Humanly Modified Stone - Appendix 2.2

- 3.2.8 Approximately 250 fragments of stone were recovered during excavation, however, the bulk of these were unworked gravel and pebbles.
- 3.2.9 There were three possible whetstones from contexts 10275 (grave fill), 724 (cremation pit fill) and 882 (grave fill). Additionally, seven small fragments of lava were recovered from context 10018, which was a naturally filled pit. Although the lava fragments were very small and showed no evidence of use, lava rotary querns and millstones were commonly imported and it is likely, therefore, that these fragments are all that remain of what were originally querns. No burnt stone was recovered.

Glass - Appendix 3

- 3.2.10 The glass assemblage comprised 31 fragments of vessel glass, 127 glass beads, 3 frit beads and 12 chips from either vessels or beads. The majority of the vessel glass came from two conical unguent bottles.
- 3.2.11 All of the vessel glass and beads have a 1st-early 3rd century date range.

Metalwork - Appendix 4.1

- 3.2.12 The metal assemblage excluding nails and coins consists of 1679 items of which 1584 are hobnails. There are also 46 personal ornaments (mainly brooches and bracelets), one mirror, four box fittings (including one comprising multiple studs and other fittings), two knives, and one bell. The other items are either iron coffin fittings or miscellaneous fragments.
- 3.2.13 This is predominantly a 1st to 2nd century assemblage with a single item of late Roman date. A single late Saxon pin came from the topsoil.

Coffin Nails and Fittings - Appendix 4.2

3.2.14 Nails were present in 207 inhumation burials and 65 cremation burials. The number of nails present ranged from 1-76. However, some of the graves contain less than 6 nails each and some of these nails may not have been *in situ*, having resulted from the disturbance of earlier graves containing coffins. The majority of the coffin nails do appear to have been *in situ* and over 5000 individual nails and fittings have been given object numbers, three-dimensionally recorded and separately bagged. An

analysis of nail sizes and types must await detailed examination and x-raying, most profitably in conjunction with the wood specialist. Some coffins were very substantial held together with coffin nails up to 150 mm in length.

- 3.2.15 Some of the nails associated with cremation burials are likely to come from boxes. Others, however, are likely to derive from coffins containing the body which had been placed on the pyre.
- 3.2.16 At least 22 coffin fittings have been recovered from 14 contexts (156, 667, 696, 701, 715, 876, 901, 957, 988, 1172, 1223, 1290, 10032, 12127).

Roman Coins - Appendix 5.1

3.2.17 Fourteen Roman coins were recovered, in very variable condition. The currently datable coins covered the period from the mid 1st century AD to the later 4th. Only one of the coins was found in a grave, 963, and it has been assigned a possible 4th century date. The remainder derived from fills of the hollow way and the well or shaft feature.

Post-Roman Coins - Appendix 5.2

3.2.18 The five post-Roman coins on this site consist of a silver shilling of Charles I (privy mark Crown, 1635-6), a copper farthing of William III, minted 1695-9, a 1722 copper halfpenny of George I, and two post-1860 bronze farthings. The shilling is probably a 17th-century deposit, no later than 1696-8. The two copper coins were probably deposited no later than their demonetisation in 1817. The bronze farthings were demonetised in 1960.

Worked Bone - Appendix 6

3.2.19 A single item of burnt worked bone was recovered from a cremation burial. It is likely to have been part of an inlay for an item such as a box or funeral bier.

3.3 The Environmental Record

Human Remains - Appendix 7

Cremations

- 3.3.1 Preservation of cremated bone is generally very good. A total of 235 deposits of cremated bone represent burials *per se*. The remaining deposits derive from pits containing dumps of pyre debris. Adults of both sexes as well as children have already been provisionally identified. The weight of the deposits was very variable. This is likely to be due in part to the intercutting of features although some at least may be deliberately deposited token deposits.
- 3.3.2 Both burnt and unburnt animal bone has been identified within a number of cremation burials.
- 3.3.3 At least one cremation burial within a vessel exhibited evidence of structured deposition. Many others have been excavated in spits and may well exhibit similar structure in their manner of deposition, although this analysis has not yet been undertaken. Detailed analysis of the bones in combination with the stratigraphic data may reveal patterns in the deposition of human remains in further cremations

Inhumations

3.3.4 Very poorly preserved bone fragments represented a total of 95 skeletons. Survival of bones was largely limited to skull vault, dentition and long bone fragments. Due to poor preservation it has only been possible to assign broad age categories to 46 of the individuals. The breakdown is as follows: ageing adult (1), adult (18), probable adult (14), 25-35 years (4), young adult (1), probable young adult (1), 18+ years (5), 12+ years (1) and subadult (1). A total of 6 probable males and 5 probable females were identified among the adult skeletons.

Charred Plant Remains - Appendix 8.1

3.3.5 The assessment of 320 samples for charcoal identified 23 potential samples which contained possible charred seeds and chaff. Assessment of 21 of those samples demonstrated that occasional cereal remains were present in six samples, with occasional pulses in two. Of particular interest was a deposit of grape pips, some with the remains of grape flesh still attached, recovered from a cremation deposit. It is likely that the grapes along with the pulses represent a funerary offering.

Charcoal - Appendix 8.2

3.3.6 A total of 320 samples, largely from Roman cremations, was assessed, and 213 of these produced identifiable charcoal. Six *taxa* were provisionally identified - *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel), cf. Salicaceae (willow, poplar), *Prunus* sp. (blackthorn, cherry), Maloideae (hawthorn, apple, pear etc.) and *Fraxinus excelsior* (ash). The range of *taxa* is limited possibly due to the deliberate selection of the most appropriate fuelwood for use on the funeral pyre. The preservation of charcoal was variable, with better preservation in the northern half of the cemetery. Low concentrations of charcoal in vessels might suggest sorting prior to deposition. High concentrations of charcoal were not surprisingly present in the *busta* burials.

Radiocarbon dating

3.3.7 A programme of high precision radiocarbon dating is proposed in order to refine the stratigraphic and artefactual dating. New techniques which allow for the dating of cremated bone and for short-lived charcoal are now available and these will be applied to approximately 20 samples. There are large quantities of both categories of material from the cemetery.

3.4 Archive Storage and Curation

3.4.1 All items and records from the Fieldwork Events that form the subject of this assessment report are listed in Table 2. No further work has been carried out on the material from the evaluation at South of Station Road (ARC SSR98) which has been fully reported on elsewhere (OAU 1998).

ITEM	NUMBER OF ITEMS OR BOXES OR OTHER	NUMBER OF FRAGMENTS/ LITRES	CONDITION (No. of items) (W=washed; UW=unwashed; M=marked; P=processed; UP=unprocessed; D=digitised; I=indexed)	
PEPPER HILL (ARC PHL 97)				
Context records	1406		Ι	

Table 2: Record of the archive

A1 plans	43		D
A4 plans	263		D
A1 sections	1		
A4 sections	219		
Small finds	1899		Р
Black and white films	35		Ι
Colour slide films	48		Ι
Flint (boxes)	4 size 3	493	W, M
Pottery (boxes)	23 size 1	9800	W, M; some left unwashed for
	29 size 2		residue analysis
	22 size 3		
	1 size 4		
	38 size 7		
	1 size 8		
Fired clay (boxes)	l size l	29	W, M
Stone (boxes)	1 size 4	215	W, M
Copper alloy (boxes)	1 plastic size 8 1 plastic size 4	18	Р
Iron (boxes)	29 plastic size 8		P
	1 plastic size 4		
Lead (boxes)	1 plastic size 8	2	P
Glass			
Slag (boxes)	1 size 4	2	Р
Shell	1 size 4	3	Р
Human bone (boxes)	12 size 1		W, M
	6 size 2		
	1 size 7		
Animal bone	1 size 3	81	Trace animal bone also present in
			cremation deposits, but not yet
			sorted separately. Detailed
			examination will be necessary to
Soil samples (101			P
buckets)			1
Soil samples (No	90		Р
contexts)	<i>y</i> 0		1
WATERLOO CONNE	ECTION (ARC NB	R 98)	
Context records	2230		I
A1 plans	84		D
A4 plans	751		D
A1 sections	8		
A4 sections	90		
Small finds	2039		р
Black and white films	49		I
Colour slide films	59		I
Flint (boxes)	3 size 3	886	W, M
. ()	1 size 2		· · · · · · · · · · · · · · · · · · ·
Burnt flint (boxes)	2 size 3	272	Р
Pottery (boxes)	15 size 1	19395	W, M
5 ()	49 size 2		,
	16 size 3		
	34 size 7		
Fired clay (boxes)	2 size 1	3595	W, M
	1 size 2		
CBM (boxes)	1 size 3	21	W, M
Stone (boxes)	1 size 4	10	W, M
	1 plastic size 4	1	P
Copper alloy	2 plastic size 8	63	Р
	1 plastic size 4		
Iron	31 plastic size 8	3300	Р
	1 plastic size 4	2	Р
Slag (boxes)	1 size 4	17	Р
Human bone (boxes)	1 size 1		W, M

	19 size 2		
	5 size 3		
	1 size 7		
Human	14 size 1		Р
cremations/residues	1 size 2		
(boxes)	2 size 3		
	1 size 3	377	W, M
	1 plastic size 4	190	Р
Soil samples (10L. buckets)			Р
Soil samples (No. contexts)	460		Р
SOUTH OF STATION	NROAD (ARC SSI	R 98)	·
Context records	58		
A1 plans			
A4 plans			
A1 sections			
A4 sections			
Pottery	1 size 4	45	
Flint and burnt flint	1 size 3	41	

Key to box sizes

391mm x 238mm x 210mm	0.020 m^3
391mm x 238mm x 100mm	0.009 m^3
386mm x 108 mm x 100mm	0.004 m^3
213 mm x 102 mm x 80 mm	0.002 m^3
110mm x 88 mm x 60 mm	0.001 m^3
600 mm x 241 mm x 225 mm	0.033 m^3
213 mm x 102 mm x 80 m	0.002 m^3
260mm x 184mm x 108mm	0.005 m^3
	391mm x 238mm x 210mm 391mm x 238mm x 100mm 386mm x 108 mm x 100mm 213 mm x 102 mm x 80 mm 110mm x 88 mm x 60 mm 600 mm x 241 mm x 225 mm 213 mm x 102 mm x 80 m 260mm x 184mm x 108mm

Conservation Requirements - Appendix 9

- 3.4.2 The relevant specialists have made recommendations for investigative conservation, retention and disposal. Investigative conservation requirements are set out in Appendix 9.
- 3.4.3 In general, specialists have recommended that material be retained until the implications of all CTRL archaeological projects are assessed and established. Within bulk finds categories, certain material that has no potential for further work could be discarded at this stage. This includes unworked stone and natural flint.

4 STATEMENT OF POTENTIAL

4.1 Stratigraphic Potential

- 4.1.1 The Fieldwork Event Aims and Landscape Zone Priorities relevant to the project are set out in sections 2.1 and 2.2 of this report. The site lies within the North Kent Plain Landscape Zone, as defined in the CTRL Research Strategy. All significant activity relates to the period 'Towns and their rural landscapes' sub-period i) (100BC AD410). The present section reviews the success of the fieldwork and post-excavation assessment in providing stratigraphic data to address the Fieldwork Event Aims so far, and the potential of the data to support further analysis relating to these aims. Aims considered in this section are those related to detailed understanding of the cemetery itself (Fieldwork Event Aims 7-13). Aims linked to understanding the cemetery in its wider context, and its relationship to Springhead Roman small town, are considered in section 4.6 below (Overall Potential).
- 4.1.2 The stratigraphic and artefact assessments emphasise the high potential of the data to address most of the primary Fieldwork Event Aims. The stratigraphic data, and the provisional phasing established at post-excavation assessment stage, provide evidence for a sequence of activity from the prehistoric through to the post-medieval period, but with the overwhelming majority of features and artefacts dating from the Roman period, in particular from the mid 1st century AD to the early 3rd century AD. A combination of stratigraphic and ceramic evidence, and the potential for high precision radiocarbon determinations, will provide excellent chronological data. The potential of the stratigraphic data is reduced by the very poor preservation of the unburnt human remains.
- 4.1.3 Truncation of the site was limited (see section 3.1 above) although the latest phases of burial, in particular shallow cremations, were affected by ploughing to some extent. Unauthorised metal detectorists also caused damage at an early stage in the first phase of fieldwork.
- 4.1.4 In order to fully realise the potential of the stratigraphic data to address the Primary Fieldwork Event Aims, it is recommended that further detailed analysis is undertaken, as discussed under the relevant aims, below:

Fieldwork Event Aim 7. To establish the chronology of the cemetery.

- 4.1.5 The assessment of pottery has led to the provisional identification of at least five phases of activity within the period of use of the cemetery. In summary form the following sequence of activity has been established:
 - Limited earlier prehistoric activity was represented by the recovery in later contexts of a small quantity of worked flint. (Period 1 Prehistoric)
 - A small number of pits and a length of ditch are of probable Iron Age date. A small quantity of Iron Age pottery was recovered, largely from later features (Period 1 Prehistoric)
 - It seems likely that the hollow way was established during the 1st-century AD and continued in use throughout the period of use of the cemetery and beyond. The well or shaft feature may have been dug at this time although a kink in the road may indicate that it was already present when the road was constructed. Boundary ditches may have been an early feature, whether or not they related to the cemetery as they were truncated by graves in subsequent phases of activity. (Period 2 Roman)

- The cemetery was founded at some point in the 1st century AD, probably shortly after the conquest. The burials were dug through a Roman soil layer which had survived later ploughing. (Period 2 Roman)
- The bulk of cemetery activity appears to date to the 1st and 2nd centuries AD although more limited activity did continue throughout the 3rd century and possibly into the 4th. (Period 2 Roman)
- There was a decline in the use of the cemetery during the mid/late 3rd-4th century. This may relate to a decline in the scale of activity at Springhead and in the region more generally (Period 2 Roman).
- The road continued in use during the post-Roman period. This is evidenced by the presence of medieval wheel ruts. (Period 3 Post-Roman)
- Medieval and post-medieval ploughing caused damage to the latest Roman burials, in particular shallow cremations. (Period 3 Post-Roman)
- 4.1.6 There is potential to refine and confirm this sequence of activity, the plan of the cemetery at different phases in its life span, and the dating of the phases. Stratigraphy was well preserved across much of the cemetery, but it is rarely possible to link spatially separate grave groups on stratigraphic grounds.
- 4.1.7 Figure 5 presents preliminary phasing of the site based on a combination of pottery spot-dating and stratigraphic relationships. It appears at this stage that there is no obvious coherent chronological pattern in the development of the cemetery. This picture is due in part to the broad date ranges assigned to the pottery at the assessment stage. Detailed integrated analysis, considering the full range of available evidence, has the potential to considerably refine the chronology of the cemetery and detect possible patterns. This aim would be further enhanced by an extensive programme of radiocarbon dating, as detailed in section 4.5.
- 4.1.8 Alternative approaches to phasing should also be considered. For example, consideration of the alignment and spacing of graves alongside the stratigraphy, artefactual evidence and radiocarbon dating may allow a more informative phase model to be constructed. In addition, samian ware of 1st-century date was more common in the northern portion of the cemetery. This is somewhat in conflict with the general phasing established on the basis of all pottery, and suggests that detailed consideration of samian distribution may provide a more reliable chronology for the early development of the cemetery. However, it is possible that this distribution reflects the status or affiliations of the individuals buried in that part of the cemetery rather than a chronological distinction.

Fieldwork Event Aim 8. To establish the spatial development of the cemetery as far as possible within the area of investigation.

Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.

- 4.1.9 The cemetery, which was clearly delimited by boundary ditches on all sides, was almost completely excavated. A small portion at the southernmost extent was not examined, but the alignment of the boundary gully in this area suggests that few additional graves would have been present here. Such a complete view offers a unique opportunity to examine the development and organisation of a Romano-British cemetery.
- 4.1.10 The cemetery is notable for its apparent lack of linear organisation and extensive intercutting of graves. The highly variable orientation of graves adds to the impression of organic development from multiple foci. However, a number of

obvious patterns can be discerned. Some of the earliest graves occur in a notable cluster in an angle of the western boundary ditch, immediately to the south-east of the cobbled platform. This area continued to act as a focus for both inhumations and cremations throughout the period of use of the cemetery. The density of burials in this area, from a very early period, is such that there is a high degree of intercutting, suggesting that the importance of the location to the users of the cemetery overrode any concerns over disturbance of the dead. Smaller clusters of burials occur elsewhere and might perhaps represent family groups. Evidence for family groups might be sought, for example, in the occurrence of men, women and children together, and the identification of common characteristics among discrete groups of burials. DNA analysis of samples from unburnt human remains may also contribute to the identification of genetic relationships (see paragraph 4.1.16 below). The alignment of the hollow way certainly had an influence on the orientation of burials, but does not appear to have been of primary importance. The other boundaries of the cemetery acted as a focus and influenced alignment in a similar way. The lowest density of burials occurs in the central part of the cemetery, including some gaps with no burials at all which, given the intensity of use elsewhere may be significant, perhaps indicating the site of memorials, trees or pyres.

- 4.1.11 There are distinct differences in the distribution of cremation and inhumation burials. Cremation burials occur predominantly in the burial focus described above and along the south-western boundary ditch. In contrast, inhumations occur across the entire cemetery area. *In situ* cremation burials are concentrated in a cluster in the centre of the cemetery. Since inhumation, cremation and *in situ* cremation burial all appear to be practised throughout the life of the cemetery, the spatial patterns observed in the different burial rites may reflect the preferences of different family or ethnic groups within the Springhead community. The *in situ* cremation burials in particular may represent an intrusive continental rite suggesting the presence of a foreign element in the population (See 4.6.43). However, comparison with other burial sites in Springhead suggests that there may have been a high degree of variability even within family groups (See 4.6.23). Further examination of this question has clear significance for understanding the diversity, origins and beliefs of the population of *Vagniacis*.
- 4.1.12 There is also a spatial dimension to the survival of skeletal remains. For as yet undetermined taphonomic reasons, bone and body shadows survive predominantly in the central part of the cemetery. Soil chemistry analysis may shed light on the factors involved in preservation, which may be connected with local variations in geology or the residual effects of aspects of funerary ritual on ground conditions.
- 4.1.13 Further detailed work is required to plot and analyse the spatial distribution of all classes of data in an integrated manner. This may be achieved by the use of the computer datasets in combination with CAD drawings and appropriate GIS software. As part of the analysis, detailed spatial information should be made available to specialists conducting analysis on key classes of artefacts and environmental evidence.

Fieldwork Event Aim 10: To recover data to enable palaeo-demographic and palaeo-pathological analysis.

4.1.14 <u>Inhumations:</u> Although preservation of the inhumation burials is generally poor, bone survived in 95 graves and 46 of these could be assigned to age and sex categories. Basic demographic parameters can therefore be identified for some of the group, which will provide useful evidence for limited comparison with evidence from cemeteries elsewhere.

- 4.1.15 The potential for palaeo-pathological analysis is severely limited by poor preservation. However, it may be possible to apply relevant scientific techniques, such as the identification of the DNA of the bacterium responsible for infectious diseases such as tuberculosis (Mays 1998, 197).
- 4.1.16 The genetic information in ancient DNA recovered from ancient skeletons may provide a means of studying relationships between populations and, on a smaller scale, relationships between groups or individuals in a particular cemetery though it should be emphasised that to date, success in this field has been limited. It may also provide an additional means of sexing skeletons.
- 4.1.17 The study of ancient DNA is still in its early stages and potential problems include poor survival in human skeletal material as well as contamination with modern DNA. Poor survival was a major problem until the development of the polymerese chain reaction technique (Mullis and Faloona 1987) which allow trace amounts of fragmented DNA to be amplified into quantities which can be studied. It should be emphasised that gross bone preservation is not necessarily an indicator of how well ancient DNA is likely to survive.
- 4.1.18 Samples from this assemblage were not collected under controlled conditions, (ie by staff in protective clothing), however, this should not present a problem because it is possible, if required, to remove contamination by chemical or physical pre-treatment of bone samples in the laboratory.
- 4.1.19 It is therefore proposed that a pilot study be undertaken on a small number of samples in order to assess the potential of DNA analysis for the entire inhumation assemblage.
- 4.1.20 It is proposed that this work would be undertaken by the Research Laboratory for Archaeology and the History of Art at the University of Oxford.
- 4.1.21 Stable isotope analysis can provide direct information on the past diets of humans. Specifically the carbon isotope ratio can tell us about the amount of marine versus terrestrial protein in past diets and the nitrogen isotope ratio can tell us about the amounts of animal versus plant protein in past diets. The protein portion of human bone, collagen is extracted for isotope analysis and it is possible to check if that collagen has been severely contaminated in the ground by soil carbon and nitrogen
- 4.1.22 Variations in diet may also be indicative of differences in status. Recent work undertaken by the University of Bradford on samples from Poundbury Roman cemetery revealed that those individuals buried in mausolea and lead coffins had a predominantly marine diet whereas those buried in wooden coffins did not (Richards *et al* 1998).
- 4.1.23 Although preservation of human skeletal material is generally poor in many cases dentition survives. It is proposed that a pilot study be undertaken on a small number of samples in order to assess the potential.
- 4.1.24 It is proposed that this work would be undertaken by the Paleodiet Research Group at the Research Laboratory for Archaeology and the History of Art at the University of Oxford.
- 4.1.25 <u>Cremations:</u> The assemblage of cremation burials is a large one and there are few of comparable size that have been excavated and analysed under modern conditions. Preservation of the cremated bone was very good on the whole and there is therefore high potential to recover palaeo-demographic information. Out of a total of 235

deposits of cremated bone, 182 are assignable to broad age categories, and 28 can be identified to sex. This sample is likely to provide a useful basis for comparison with similar evidence from other cemetery sites. No clear evidence for palaeo-pathology has been identified at assessment stage, but may become apparent during more detailed examination.

4.1.26 Because of the importance of the site to Roman cemetery studies, it is recommended that limited further recording and analysis is carried out on the inhumations, and that the cremations are subject to detailed analysis, in order to maximise the palaeo-demographic and palaeo-pathological information recovered. This would take the form of detailed examination of the larger or better preserved groups, and those with good artefact associations, in order to derive more detailed information than can be obtained from a preliminary assessment of potential. It is nevertheless clear that preservation conditions will severely limit the scope and value of the work in the case of the inhumations (4.3.1).

Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.

- 4.1.27 Structural features have been identified within the cemetery. These include the cobbled surface or platform and the well or shaft-like feature. No parallels have yet been identified for the platform. The marked concentration of burials clustered immediately to the south-east suggest that it may have had specific religious significance, perhaps as a roadside shrine, although no structural features were identified that would suggest the presence of a building on the site. There is no evidence of burning on the platform to suggest that it was used as a location for the process of cremation. On the contrary there are clear indications of *in situ* cremation burials elsewhere in the cemetery, and pyre debris appears to be concentrated in the central part of the site. Nevertheless the platform may have had a functional association with the funeral rite, perhaps as a viewing platform for mourners. Further research is required to identify parallels in the archaeological record or classical literary sources.
- 4.1.28 The well or shaft is of considerable potential interest but was unfortunately not fully excavated due to engineering restrictions and produced little material of any kind that might indicate its function. Some deep pits or shafts excavated elsewhere appear to have been used as depositories for offerings, eg at East Hill, Murston (Payne 1893, 42) and Warbank, Keston (Piercy Fox 1967, 184-6). It is believed that wells and shafts had ritual significance for Iron Age and Romano-British communities, sometimes being associated with death and the underworld. The Waterloo Connection feature produced no deposits that clearly point to such a function in this case (two fragments of unburnt human long bone from the lowest excavated fill could be disturbed material from the cemetery), but the location is suggestive. As no intrinsically datable finds were recovered from the lower fills (three Roman coins were residual in the uppermost fill), it is recommended that the human bones from the lowest excavated deposits are radiocarbon dated.

Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.

4.1.29 A number of possible grave marker holes have been identified and further detailed analysis may allow further examples to be recognised and possible spatial patterns to be discerned. Distinguishing such features will rely on careful study and classification of individual features based on form, location, distribution and content.

4.1.30 Both pyre debris dumps and *in situ* cremation burials have been identified. The *in situ* or '*bustum*' burials are particularly important as they are likely to be an intrusive rite in Britain and therefore potentially diagnostic of a foreign element in the population of Springhead (See 4.6.43 to 4.6.53).

Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.

- 4.1.31 Limited earlier prehistoric activity in the form of a small assemblage of worked flint has been recovered. All of the material was redeposited in later features.
- 4.1.32 A small assemblage of Iron Age pottery has been recovered, most of which was redeposited in later features. The only features that may be Iron Age in date are a small number of pits, sealed by the cobbled platform, and a ditch. The features are of value for indicating late Iron Age activity on the site, but the pits produced insufficient evidence to identify their function and there is too little pottery to be certain of the dating. A radiocarbon determination could confirm the suspected late Iron Age date, but otherwise the features have no potential for further analysis.

4.2 Artefactual Potential

Iron Age and Roman pottery - Appendix 1.1

- 4.2.1 The pottery assemblage has great potential for the realisation of all of the Primary Fieldwork Event Aims.
- 4.2.2 Pottery constitutes the most commonly occurring grave good type and in addition to being the principal dating medium for most deposits, it is of fundamental importance to the understanding of the cemetery.
- 4.2.3 The assemblage is one of the largest ever excavated from a cemetery in Roman Britain. Despite the poor condition of a number of vessels, largely a consequence of post-depositional factors such as intercutting of graves and post-Roman plough damage, it is of national importance, and the more significant for deriving from an almost completely excavated cemetery. The material is of importance at Fieldwork Event Aim level for refining the chronology of the site and the characterisation of the burial rite. It is also of importance at the Landscape Zone level for comparison with domestic assemblages from Springhead and for refining knowledge of products of the regionally important Thameside pottery industry. Nationally the analysis of the assemblage will make a significant contribution to cemetery studies, most particularly with regard to cemeteries associated with 'small towns'.
- 4.2.4 Detailed study of pottery groups within graves has the potential to identify spatial variations within the cemetery. A particular target for study will be the distribution of pottery vessels in relation to the different burial rites represented.

Samian - Appendix 1.2

4.2.5 The study and publication of this assemblage will be extremely valuable (see Fulford and Huddleston 1991, 43). It holds considerable potential for examining settlement activity at Springhead, its growth and decline, and the adoption of Roman ways. Samian ware is known to be a potentially sensitive indicator of Romanisation. The assemblage has a number of important characteristics with implications for interpretation of the cemetery, including an extremely low proportion of vessels with moulded decoration (1%). In addition, 1st century samian vessels are concentrated in the northern part of the cemetery. It is uncertain at present whether

this concentration has chronological significance or reflects social factors in the organisation of the cemetery.

- 4.2.6 Further study of the later samian vessels from the site, in combination with the evidence of other late grave goods could be expected to shed light on the end-date of the cemetery. Few cemeteries relating to small towns have been published before, and none on this scale.
- 4.2.7 Even allowing for the eroded condition of the pottery, few collections of so many samian vessels recovered from such a small area have survived in such a state of completion in Britain. Publication and illustration of this corpus will add much to our knowledge of the development and use of plain forms (see Willis 1997a, passim, for its potential value). The assemblage will also help to refine our understanding of site chronology and development, and may aid our understanding of regional trade with the Continent. "Given the 'primary status' of vessels from burials, they are of special importance, being chronologically useful and potentially revealing 'preferred vessels' for this type of practice," (see Willis 1997, 16 section 4.6; 24 section 5, Cemeteries).

Organic Residue Analysis

- 4.2.8 Consideration was initially given to undertaking a pilot study to establish the presence of organic residues within the pottery vessels. Since doubts were raised over the validity of such a sample it was decided to retain unwashed sherds from all vessels.
- 4.2.9 While no significant Roman funerary assemblage has been examined to date, the analysis of 131 vessels (210 sherds) from the Roman settlement at Stanwick, Northamptonshire (Evershed nd.) constitutes the largest study of organic residues in a Roman domestic pottery assemblage. If the assemblage from this cemetery was studied in the same way, the Stanwick assemblage could provide a base-line for comparative assessment.
- 4.2.10 An alternative, more selective approach would be to analyse sherds of identical vessel forms and fabrics from domestic deposits at Springhead and subject these to a similar study in order to examine the contrast between domestic and funerary vessel usage.
- 4.2.11 Residue analysis can help to identify the contents of vessels in general terms. This information could help, for example, to identify differences in function between different vessel forms deposited as part of the funeral ritual. Comparison with existing data from domestic assemblages could identify differences between domestic and funerary vessel usage. This could potentially contribute to a more detailed understanding of the burial rites represented.
- 4.2.12 The most commonly encountered organic residues in pottery correspond to degraded animal fats and these have proved very difficult to assign to particular species of animals with any degree of certainty. A new project at Bristol University is exploring approaches to the identification of fats present in archaeological pottery. This has provided promising results, differentiating between ruminant fats in Peterborough Ware and pig fats in Grooved Ware in the Walton Basin (Dudd and Evershed 1999). The analytical approach will combine a range of compositional criteria which have not previously been exploited to determine the origins of animal fats. The analytical strategy proposed is based primarily on the compositions of extractable acyl lipids.

4.2.13 If a large-scale residue analysis is envisaged, the study should be on a similar scale to that undertaken at Stanwick in order to provide a baseline for comparison between domestic and cemetery assemblages nationally. The size and stratigraphic integrity of this assemblage would justify analysis on this scale. While this does not clearly fall within the CTRL research strategy, it may be put forward as an additional research aim.

Ceramic Building Material - Appendix 1.3

4.2.14 The potential of the very small assemblage of ceramic building material is limited to providing information on the distribution of Roman tile fabrics in north Kent.

Fired Clay - Appendix 1.4

4.2.15 The fired clay assemblages have the potential, when combined with the stratigraphic evidence, to provide information on the funerary procedures which took place on the site, in particular the *in situ* cremation burials. During the process of assessment it was noted that some fragments had smoothed surfaces, or more rarely impressions, which suggested that they had formed part of structural features associated with the process of cremation.

Flint - Appendix 2.1

4.2.16 The assemblage consisted largely of debitage with very few retouched forms being recovered. Those recovered are generally undiagnostic (eg scrapers including several made on thermal blanks and retouched flakes). The flint was generally thinly spread over a large number of contexts with little focus for any activity. The assemblage is difficult to date, although a Neolithic or early Bronze Age date seems appropriate. Given the context it is likely that this material has been heavily disturbed and redeposited during extensive activity in the Roman period. Indeed it is likely that much of the burnt unworked flint is a by-product of the Roman cremation process; many of the burnt pieces are small gravel pebbles, which would have been burnt incidentally in cremation pyres, and will require no further work.

Humanly Modified Stone - Appendix 2.2

4.2.17 The deposition of two potential whetstones in grave and cremation pits fills may be of some significance. Tools such as these are very rare in funerary contexts and as such are of interest. They generally occur in less than 1% of graves in a cemetery (Philpott 1991, 189). It has been suggested that domestic artefacts and tools placed in these contexts may be representative of the deceased's occupation or an activity with which they were often associated (Philpott 1991, 187;189). No further work is recommended, other than to analyse the spatial distribution of the pieces.

Glass - Appendix 3

4.2.18 The vessel glass and beads have some limited potential for helping to refine the chronology of the cemetery. They may also help to indicate of the status and sex of the associated burial.

Metalwork (grave goods) - Appendix 4.1

4.2.19 The metalwork has a modest potential for helping to refine the chronology of the cemetery. It has a higher potential for helping to establish spatial variations within the cemetery and helping in the identification of ancillary features associated with specific burial practices. The occurrence of bracelets in two of the cremations is unusual and may help cast light on religious beliefs of the community. The brooches

have the potential to contribute to a regional synthesis of local patterns of brooch wearing. The distribution and frequency of hobnailed boots/ shoes within the cemetery may shed light on the significance and date of this practise.

Metalwork (coffin nails) - Appendix 4.2

- 4.2.20 The assemblage has high potential for furthering our understanding of burial ritual through the study of coffin construction. There is clearly great variation at this cemetery.
- 4.2.21 Numbers of nails ranged from single examples up to a maximum of 41 nails. There appear to be clusters of nail numbers around the low 20s and the mid 30s, possibly reflecting differing constructional techniques. Many of the nails exhibit clear evidence of wood grain in the corrosion product. Future detailed examination of the nails in conjunction with the detailed three-dimensional recording will allow timber thicknesses, coffin types/dimensions and constructional details to be identified.
- 4.2.22 The field records demonstrate that both rectangular and tapering wooden coffins were used. In a significant number of examples nails pointing downwards (i.e. lid nails) have been recorded. Lid nails have only rarely been recorded elsewhere, for example at Lankhills, Winchester (Clarke 1979).
- 4.2.23 In several instances the timber of the coffins survived as a shadow. There are also at least two examples where the dimensions of the coffin (2.5 x 0.55 m) and the nail configuration suggests that there was a separate compartment at one end of the coffin for grave goods, similar to an example excavated at Kelvedon in Essex (Rodwell 1988). Two coffins may also have contained boxes that housed grave goods.
- 4.2.24 Apart from coffin nails, there are very few structural fittings. Up to six of the coffins may have had corner brackets, although no significant numbers have been found in any single grave, suggesting that they may have been used sparingly to strengthen coffins rather than as a primary construction method.

Coins - Appendix 5

4.2.25 The Roman coins are most important for dating the contexts from which they derive, although none were from graves and some may be residual in much later or disturbed contexts. A high proportion of late Roman coins are present, which contrasts with the overwhelming chronological emphasis of the pottery from the site, which is earlier. However the assemblage is very small and, given the much greater frequency of late Roman coins than early Roman in the archaeological record, the predominance of late coins is not unusual. Most of the coins derive from the latest fills of major features such as the well/shaft and the hollow way and may indicate the date at which these features were finally silted up, after the abandonment of the cemetery. There is little potential for further analysis of the coins themselves, although they will clearly be of importance in establishing the site chronology, particularly in the late Roman period.

Worked bone - Appendix 6

4.2.26 The potential of the worked bone is limited because there is only a single item, probably because bone does not survive well on the site. The one item that does survive was clearly from an item placed on the pyre (i.e. it was burnt) and will thus help cast light on the ritual surrounding that particular burial.

4.3 Environmental Potential

Human Remains - Appendix 7

Inhumation burials

- 4.3.1 Preservation of the human bone from inhumations was generally very poor. For this reason there is only very limited potential for further work. In 22 examples the dentition is sufficiently well preserved to merit detailed recording. Two moderately well preserved skeletons require some cleaning prior to more detailed recording
- 4.3.2 There is potential for the application of a number of scientific techniques to the assemblage of inhumations. These are DNA, trace element and scientific analysis (see paragraphs 4.1.15-23). Otherwise no further work is recommended.

Cremation burials

- 4.3.3 The assemblage of 235 cremation burials is one of the largest excavated under modern conditions in this country and is therefore of national importance. Cremated bone from the site was generally very well preserved and most deposits were substantial. There is relatively high potential for the recovery of detailed demographic data (age and sex).
- 4.3.4 Assessment has recovered evidence for the structured deposition of burnt human bone within at least some of the pottery vessels. Evidence for structured deposition of cremated bone within vessels is very rare (McKinley pers. comm.). However, an example from Caerleon has recently been published (Evans and Maynard 1997). The identification of structured deposition is important for the study of pyre technology and ritual.
- 4.3.5 The occurrence of such a high number of *in situ* cremations is unparalleled in this country although large numbers of examples are known from the continent. Further analysis may shed light on the relationship of the region with the continent and the possibility that this represents an intrusive rite. One possibility is that this form of burial reflects the presence of a foreign element in the population of Springhead. It is recommended that all bone from *in situ* cremations should be analysed in detail in conjunction with contextual information in order to further our understanding of this particular funerary ritual.
- 4.3.6 Preservation of bone within the cemetery is extremely variable and worthy of further study to aid understanding of bone diagenesis. Although such a study lies outside the scope of the CTRL research strategy it is suggested as an additional aim. As a minimum measure in this respect it is recommended that samples from inhumation burials (and associated control samples) are retained for phosphate analysis.

Charred plant remains - Appendix 8.1

4.3.7 Generally the concentration of seeds and chaff is too low to offer any potential for detailed analysis. The one sample which produced grapes and pulses does merit closer examination in order to determine whether further remains survive in the deposit that might shed light on details of the funeral ritual.

Charcoal - Appendix 8.2

4.3.8 All cremation pit fills have been 100% sampled for flotation and wet sieving. Large quantities of charcoal have been recovered from many of them. The charcoal from

this site has high potential to add to our understanding of regional Roman cremation practices, continuity and change within burial practices over time, and variation between different forms of cremation ritual.

- 4.3.9 Further analysis of the charcoal will also provide an indication of the woodland cover in the vicinity of the cemetery during its period of use.
- 4.3.10 Charcoal may be used for radiocarbon dating, but samples will need to be carefully selected with advice from a radiocarbon specialist. Samples will by preference be selected from charred seeds or bone.

4.4 Conservation

Conservation of metal finds - Appendix 9

- 4.4.1 The metal finds have been x-rayed and packaged to archive standard. The conservation assessment has been carried out with reference to the relevant specialist assessments and with attention to variation in the state of preservation of materials. The large quantity of nails (*c*. 5000), having been recovered and processed in a systematic manner, have the potential to contribute to a better understanding of preservation mechanisms and iron technological development. It may also be worthwhile to compare and contrast preservation qualities between items recovered from cremations versus items recovered from inhumations. This type of conservation research is fundamental for devising improved mitigation strategies, but falls outside the CTRL Research Strategy and may be considered as an additional aim.
- 4.4.2 Investigative conservation of selected objects will enhance their potential for analysis, for example by clearing corrosion from surfaces in order to expose detail of decoration or manufacture. This will enhance the dating potential of the objects, and allow more detailed consideration of their likely sources and affinities, thus contributing to project aims regarding the establishment of a dated burial sequence, and understanding of patterns of contact and trade.

Conservation/ reconstruction of pottery

- 4.4.3 Apart from the samian ware no particular conservation needs are anticipated unless it is proposed that large numbers of vessels should be displayed. A significantly above-average amount of reconstruction work is likely to be required, but in the case of vessels not required for long-term display this can be carried out by the pottery specialists as an integral part of the process of detailed recording and analysis. The only area in which a conflict of interest might be anticipated is in the event of an extensive programme of residue analysis being undertaken. Long term removal of such sherds for analysis will definitely hamper the process of recording the assemblage.
- 4.4.4 The samian ware is generally in poor condition with some indication of deterioration. Handling and transport should be minimised and particular care taken to ensure that appropriate packaging is used for long-term storage. Further cleaning is required on some pieces, although this should be delayed until the scale and scope of any residue analysis programme has been determined.
4.5 Dating Potential

Radiocarbon

- 4.5.1 The chronology of the material culture of the Romano-British period is generally well understood, although sometimes within rather broad limits. The pottery, ceramic building material, coins and small finds assemblages from the cemetery offer a good range of well-dated types across the entire period of use of the cemetery.
- 4.5.2 However, some aspects of dating are problematic, for example the age of pottery groups when they were deposited is likely to very variable, particularly in a funerary context, where potentially quite a high proportion of 'antique' vessels might be expected. Some key burial groups, including the *in situ* cremations, and many individual burials, lack good artefactual dating evidence. In many instances the date range obtainable from the pottery and other artefacts is too broad to assist in phasing the burials. Dating would be particularly useful for the large number of cremation burials, which are currently assigned to the general phase 3 (Figure 7 and 8). In addition, key questions, such as the date at which the cemetery fell out of use, remain very uncertain due to the much smaller quantity of late Roman material recovered.
- 4.5.3 It is therefore proposed that a programme of radiocarbon dating is undertaken to improve the chronology of the site. Advice has been sought from the Scientific Dating Co-ordinator at English Heritage (A Bayliss). The programme would require both high precision dating and the AMS measurement of cremated bone and involves the application of newly developed statistical techniques (Bayesian modelling) to the results to substantially reduce the probable date range (Lanting and Brindley 1998).
- 4.5.4 It should be possible to establish the date of individual cremation burials to within a century or so by using high-precision measurements which would require 10-50 g of identified short-lived charcoal per burial.
- 4.5.5 It is likely that by submitting approximately 20 samples it will be possible to confirm both the start date and the end date of the period of use of the cemetery. If AMS measurements (on either bone or charcoal) are applied, this scale of programme would be required to counteract the effects of statistical scatter on the measurements. A similar number of further dates could be required to address specific questions, such as the chronological range of *bustum* burials within the cemetery, although samples will wherever possible be selected to address multiple aims. Dating might be desirable for discrete groups of graves, or to assess the chronology of identified ritual practices; dating may also be useful to date human bone from the well/shaft, and to confirm the date of suspected Iron Age features.

4.6 **Overall Potential**

4.6.1 Springhead was identified as a Key Study Area for Research Objective 2.4, Towns and their rural landscapes 100 BC-AD 1700 (sub-period i - 100BC - AD410), for the North Kent Plain Landscape Zone. Although the discovery of the cemetery was unexpected, the key themes and ideas that have emerged as a result of the fieldwork and assessment suggest that there is excellent potential to address most of the Fieldwork Event Aims and Landscape Zone Priorities.

4.6.2 This section reviews the success of the fieldwork and post-excavation assessment in providing data to address those aims related to placing the cemetery in its wider context, in particular its relationship to Springhead Roman 'small town' (Fieldwork Event Aims 1-6), and the potential of the data to support further analysis relating to these aims. Aims related to detailed understanding of the cemetery itself (Fieldwork Event Aims 7-13), are considered in section 4.1 above (Stratigraphic Potential).

Main research themes

4.6.3 The cemetery is a rich source of evidence for elucidating the status, population diversity and belief systems of the inhabitants of Roman Springhead, and potentially reflects changes in the size, composition and religious beliefs of the settlements' population over time. The site also provides a nationally unique data set on Romano-British burial practices.

Rarity

4.6.4 The cemetery can be justifiably described as unique in Roman Britain because of its size, its date range, the completeness of excavation and its relationship with the 'small town' of Springhead. The occurrence of both inhumation and cremation burials seen throughout the whole period of the cemetery's use, is very unusual and may be a phenomenon which is confined to the south-east. Few cemeteries with a direct relationship to a small town are known and even fewer are of a comparable size. Publication of any comparable data is a rarity.

Diversity

- 4.6.5 Questions relating to spatial, social and chronological patterning, together with detailed assessment of the inter- and intra-site traits and relationships of individual group contents may be posed of the existing evidence. However, in addition to these there is clear potential for further detailed analysis of other more specific, detailed aspects of funerary ritual, such as Roman coffin construction, structured cremation burials and the contents of the pottery vessels associated with both cremation and inhumation burials and surviving as organic residues.
- 4.6.6 Perhaps one of the most interesting aspects of this cemetery is the relationship of at least three distinct burial rites, carried out by the same social group. Rarely does the opportunity arise to examine the transitional period of burial on the same site. The relatively high incidence of burials of both cremations and inhumations containing pottery vessels, together with the frequent stratigraphic relationships which can be firmly established, should provide an ideal opportunity to examine the development of burial custom over time.

Group value

4.6.7 Full analysis of this cemetery has the potential to contribute to our understanding of the development and chronology of the associated settlement. A document published fifteen years ago defined priorities for the preservation and excavation of Romano-British sites (Society for the Promotion of Roman Studies 1985). It stressed that 'where a site is referred to by category or by name, it should be taken to include not only the obvious centre but also all associated structures and features': *eg* reference to Housesteads would include not only the fort but also the *vicus*, field systems, religious buildings, extra mural roads, burials, cemeteries and nearby native settlements. Most pertinently they argued that a high priority should be given to cemeteries, where it is known that a reasonable percentage of their total area can be excavated. In the case of Waterloo Connection the cemetery has been

almost completely excavated. The associated settlement is comparatively wellknown and many details of settlement in the rural landscape of the region are available from published sources and/or other CTRL fieldwork. The CTRL project therefore offers a potential framework for a broadly-based reconsideration of Springhead Roman 'small town' and its hinterland.

Comparative sites

4.6.8 A number of recently published excavation reports will be of particular value for comparisons with the cemetery at Waterloo Connection. These include the Eastern Cemetery of Roman London (Barber and Bowsher 2000) and a Romano-British cemetery on Watling Street (MacKinder 2000). Relevant assemblages which are as yet unpublished include the burial group at Westhawk Farm, Kent (Boyle in preparation) and other small burial groups along the route of the CTRL, which offer the potential to make comparisons between an urban cemetery, and rural burial practice. Relevant sites would include Boys Hall Balancing Pond, Beechbrook Wood and Pilgrims' Way. For comparative purposes the closest parallel is the cemetery at Ospringe, Kent, which is located c.50 km to the east of Waterloo Connection. It contains both cremation and inhumation burials and spans much of the Roman period, although late inhumations appear (superficially at least) to be better represented at Ospringe. The principal difficulty will be that the excavations were carried out in the 1920s and therefore the data has limitations (Whiting et al 1931). Comparison between the Waterloo Connection and the Ospringe cemetery is considered essential, although the associated settlement there is very poorly understood.

Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement

- 4.6.9 There can be little doubt that Springhead grew around, and because of, a major religious sanctuary, which was most likely associated with the springs and the marsh, and which was probably pre-Roman in origin.
- 4.6.10 However, the only evidence for pre-Roman activity at Waterloo Connection is a small group of intercutting pits, underlying the cobbled platform, and a single boundary ditch, which may have been late Iron Age in date. The feature identified as a well or possible ritual shaft may be pre-conquest in origin but the only evidence for this at present is the orientation of the early Roman hollow way, which appears to diverge from its alignment in order to avoid the feature.
- 4.6.11 It therefore seems certain that the cemetery came into use within a few years of the Roman conquest. Since there is no evidence for burial activity on the site in the late pre-Roman Iron Age, the appearance of the cemetery suggests that the Iron Age settlement at Springhead underwent a substantial change as a direct result of the conquest. Alternative models can be suggested to explain the appearance of the cemetery at this time. On present evidence the most likely explanation is the arrival of a new element in the population, who did not observe indigenous burial sites or customs. The diversity of burial practises observed from the earliest phase of the cemetery, perhaps supports the idea of an influx of newcomers from a range of ethnic backgrounds. The *in situ* cremations, in particular, may suggest the presence of a foreign element in the population. Thorough study of the distribution and characteristics of in situ cremations in continental and British contexts may offer clues as to the origins of this section of the cemetery population. However, personal or family preferences, perhaps related to identification with the new Roman regime, may offer an alternative explanation for the diversity of burial rites. Clearly,

refinement of the chronology of the different burial customs, and detailed characterisation and classification of burials, is of critical importance for understanding this period of rapid change.

4.6.12 Use of the cemetery appears to decline dramatically after the end of the 2nd century AD, but it seems to have continued in use, at a much reduced level, through to at least the early 4th century. Similar evidence for occupation at a reduced level (of population, or material culture, or both) in the late Roman period has been noted in the settlement of Springhead, which may be related to widespread retraction in settlement in the south-east of England from around the mid-3rd century onwards. However, caution has to be exercised in using the cemetery evidence to support this argument as the advent of Christianity offers a plausible alternative explanation for the decline of both the cemetery and the settlement in the late Roman period. The foundation and economic basis of the settlement seems, on present evidence, to have been based primarily on its status as a pagan religious centre. Again, refinement of the chronology of the cemetery is of critical importance for elucidating this very uncertain period (see also 4.6.26 below).

Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.

- 4.6.13 The excavations that form the subject of the present report have recovered important information relating to the rural-urban fringe of Springhead. As such, it seems reasonably clear that the work will have identified the extent of the Roman settlement on its south side. The cemetery can provide useful evidence for the chronology of the settlement, and for the status and composition of its population. Change through time may be apparent. Ongoing excavations to the north-west are expected to shed further light on the character of activity on the urban-rural fringe of the settlement, and in particular on its Iron Age origins.
- 4.6.14 It seems possible that the cemetery was the main one serving the inhabitants of *Vagniacis* for perhaps 250 300 years. It is also possible, given the likely status of the town as a focus of pilgrimage, that the cemetery also acted as a focus for burial for the surrounding region, if not further afield. Its location, less than 0.5 km southeast of the town, adjacent to a Roman road (also serving the town), is a classic one. Recent (as yet unpublished) geophysical survey on the supposed temple complex (SAM KE 198) 0.13 km to the north-east has cast doubt on its interpretation as a temple, and the possibility exists that this may in fact be a walled cemetery.
- 4.6.15 The section of the CTRL route between the cemetery and the temple site to the north-east was subject to a strip, map and sample excavation, but contained little significant archaeology apart from a number of quarry pits. These were generally located close to the hollow way, extending northwards from the cemetery, and probably relate to the periodic maintenance of the road surface.
- 4.6.16 No settlement activity has been identified in the vicinity. However, the hollow way is almost certainly a continuation of Temenos Road East or R3 which originates in Springhead. The alignment of the road changes quite markedly, perhaps to avoid existing structures which may predate the foundation of the town and more certainly the cemetery. A recent geophysical survey suggests the presence of an enclosure surrounding the temple site to the north-east of the cemetery (Kendall pers. Comm.), which may have been the principal factor affecting the road alignment. The pit or

well adjacent to the cemetery is also suggested as a possible reason for the alignment of the road.

4.6.17 The extent of the cemetery seems to have been constrained, perhaps by the presence of arable fields or woodland in the surrounding area. There is some evidence for tree clearance within the confines of the cemetery in the form of tree-throw holes. However, there is also evidence that a specific point within the cemetery, located immediately south of the cobbled platform, acted an important focus for burials and that the limited extent of the cemetery may in part have been due to a desire to bury the dead as close to that point as possible, rather than purely topographical constraints.

Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.

- 4.6.18 The pottery assemblage, while funerary in nature, can profitably be compared with the domestic assemblages recovered from Springhead itself, from rural settlements in the surrounding region and from comparable 'small town' sites in south-east England.
- 4.6.19 A number of fabrics have clearly been identified as deriving from beyond the immediate environs of the cemetery and indeed the region, which will shed light on regional trade patterns. The Verulamium industry was an important non-local source of white ware flagons to the site, for example.
- 4.6.20 The most unusual non-local British vessel was a handled tankard in Severn Valley ware, occurring well outside the normal distribution range of these vessels. Imported material consisted almost entirely of samian ware (an estimated 200 vessels are represented, from all the main sources, of which 35 have complete or near complete profiles) and Cologne colour-coated ware beakers. A single unparalleled flagon in an oxidised fabric of uncertain source was recovered.
- 4.6.21 The finds assemblages will also provide the principal source of evidence for the study of the economic orientation of the settlement, and its patterns of contact and trade. There is very good potential to achieve worthwhile results from such a study. Traded artefacts such as pottery, querns and millstones, glass and metalwork provide good evidence for sources of supply and trade routes, and for change in patterns of contact over time. The charred plant remains, including charcoal from the cremations, can provide limited information on exploitation of natural resources and the variety of foods available to the inhabitants.
- 4.6.22 Pottery and small finds specialist assessments emphasise the need for studies of patterns of contact and trade to be undertaken on an inter-site basis wherever possible, allowing the Waterloo Connection assemblages to be seen in the context of trading systems and supply sources evidenced at other sites such as Northumberland Bottom and Thurnham Villa, and the ongoing excavations to the north-west of Springhead.
- 4.6.23 There is potential for examining the status of the people buried Waterloo Connection, by integrated study of grave artefact groups and comparison with other urban and rural burial sites. On present evidence there is little suggestion of high status burials within the cemetery. The proportion of samian vessels with moulded wall decoration was exceptionally small (1%) in comparison with most assemblages

of samian. This may be because wealthier families were buried in private plots elsewhere in the settlement. Excavation by the Kent Archaeological Rescue Unit (KARU) in the Garden Centre uncovered a small group of seven burials on the east side of a metalled road (Philp and Chenery nd, 8-12). Three were cremation burials and four were inhumations. All burials were located within a four-sided ditched enclosure. All of the cremation burials and one of the inhumations appear to date from AD 70-100 on the basis of associated grave goods and the group may represent the cemetery of a single family. Each of the three cremation burials was accompanied by five pottery vessels. These are comparatively large groups of vessels. At the Waterloo Connection cemetery only one inhumation was buried with five vessels and one cremation was buried with six, while most burials contained only one vessel or none at all.

- 4.6.24 There are clear variations in the distribution of grave goods within graves. For example, pottery vessels may be placed both inside and outside coffins, hob nail boots were either worn or unworn.
- 4.6.25 Animal bones which have been interpreted as food offerings were associated with three of the burials in the Garden Centre. The entire contents of one cremation burial had been deposited in a wooden box. Two of the inhumations had been buried in wooden coffins and one of them was accompanied by a wooden box. The variability in burial rite apparent in this small 1st century group is of considerable interest for comparison with Waterloo Connection, particularly if it is a single family, as it would suggest that personal preference was more of a factor in the selection of burial rite than family or ethnic affiliation.

Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.

- 4.6.26 It has traditionally been argued that Springhead originated in the Iron Age, almost certainly developing initially around an important religious centre (eg Burnham and Wacher 1990). Although major religious functions and limited craft industrial and probably market functions can be ascribed to the settlement on the basis of current evidence, the extent to which it ever possessed a full range of urban characteristics is very much open to question. There is no convincing evidence for civil administrative or military-defensive functions, either in the cemetery or settlement evidence. It is possible to see the site as predominantly a religious complex, around which grew up a community servicing the needs of visiting pilgrims.
- 4.6.27 The origin of the Waterloo Connection cemetery at around the time of the Roman conquest suggests a major change in the make-up and social-economic orientation of the settlement at that time, possibly including an influx of foreigners (see 4.6.10). It also testifies to an increase in the range of pottery and other artefacts reaching the site through trade. However, the burial evidence suggests a community of unexceptional status: 99% of the samian assemblage consists of plain wares and there is little in the range of personal effects and other grave goods to indicate the presence of high status individuals. As noted above, it is possible that wealthier inhabitants were buried in private plots elsewhere in the settlement.
- 4.6.28 It is not completely clear that the decline in the cemetery and settlement are directly connected. Various factors, perhaps including the advent of Christianity, could be involved in the decline in the use of the Waterloo Connection cemetery, quite separately from issues affecting the settlement. However the decline seen in the use of the cemetery, probably beginning during the 3rd century, appears to mirror a decline seen in Springhead itself and a direct link seems more likely than not. Close

comparison between the cemetery and settlement pottery assemblages may elucidate this point.

- 4.6.29 Both cemetery and settlement are thought to continue in use, but at a reduced level (either in terms of population, or material culture, or both), until at least the early 4th century, but thereafter the evidence from the cemetery is restricted to a few late Roman coins found in silts filling the hollow way and the well/ shaft, which tend to reinforce the picture of dereliction. The settlement in the late 4th century has been characterised as 'little more than an agricultural village' (Burnham and Wacher 1990). The speed with which this decline took place is of crucial importance for identifying the processes involved. Dating of individual burials, and assessing rates of burial during the lifespan of the cemetery, have the potential to address this issue. The statements of potential for the stratigraphy and pottery emphasise the quality of material available to inform interpretation of Springhead's history during this very uncertain period. Further detailed study of the stratigraphic and finds data should refine present understanding of the abandonment of the cemetery. The small group of late Roman burials will require close examination and it is recommended that, where possible, they should be radiocarbon dated in order to establish their chronological range and the latest use of the cemetery. Methods of radiocarbon analysis now available offer potentially greater resolution than the artefactual dating for this period. The point at which abandonment occurred would be of considerable interest for the study of the late Roman period and the Romano-British to Anglo-Saxon transition.
- 4.6.30 It is possible that the perceived decline recorded in both settlement and cemetery reflects a real and widespread retraction in settlement, perhaps dating from the mid 3rd century, and attributable to general insecurity in the face of barbarian threats and internal political conflict. Further possible evidence for this may be present in the wider local settlement pattern of the south-east at this time. Nationally, the cemetery has high potential for contributing to study of the late Roman period. The mounting evidence for widespread decline in rural settlement and towns in Kent, and elsewhere in south-east Britain, contrasts with evidence for late recovery and development in other regions. The nature of the Roman decline in the province of Britain from c AD 350 is not well understood, and has been identified by English Heritage (1991, 36) as a national and regional research priority.
- 4.6.31 Evidence from small towns in the south-east of England consistently shows a similar pattern of decline in the late Roman period, in contrast to evidence for resurgence and continuity in other regions. It is perhaps more important at this period than any other to attempt to view Springhead in its wider local and regional context. Analysis of the pattern of prosperity and decline at groups of contemporary Romano-British sites in the region may be a very important indicator of change in patterns of settlement and general political and economic conditions at a regional level.

Fieldwork Event Aim 5: To recover other palaeo-economic indicators known to be well preserved: (eg. animal bone, molluscs, charred plant remains) to establish the fullest possible picture of the urban economy.

- 4.6.32 This aim has not been fully addressed by the fieldwork results as no settlement evidence was encountered and the burial evidence cannot be considered directly representative of normal economic activities.
- 4.6.33 Bone was generally not well preserved. A small assemblage of animal bone was recovered from the cemetery but most of the material appears to be related directly

to funerary ritual, for example, animal bone placed on the cremation pyre and subsequently burnt.

- 4.6.34 Charred plant remains were also poorly preserved and have limited further potential except insofar as the data sheds light on funerary practise.
- 4.6.35 Charcoal was well preserved and has the potential to provide information on woodland cover in the vicinity during the cemetery's period of use.

Fieldwork Event Aim 6: To recover palaeo-environmental indicators to elucidate the interaction of the town within the local environment.

4.6.36 See above.

Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

- 4.6.37 Only a small number of non-cemetery features were identified within the area of investigation. These included a Roman road, which survived as a metalled hollow way (sub-group 35) and formed the eastern boundary of the cemetery. It was identified as Tenemos Road East or R3 (Penn 1965) which has its origin in Springhead itself. A number of irregular features have been interpreted as quarry pits which are likely to relate to maintenance of the road surface.
- 4.6.38 A considerable area surrounding the cemetery has been investigated; the area to the north and west of the cemetery was subject to strip and sample excavation, and an evaluation was carried on the CTRL trace to the west (URL 1998). The absence of significant archaeological remains in both cases suggests that the area surrounding the cemetery was occupied by agricultural lands or woodland.
- 4.6.39 Assessment of the charcoal from the cremation burials has identified a range of taxa which may reflect woodland cover in the immediate vicinity of the cemetery. More detailed analysis from cremation burials belonging to the first phase of cremation burial may further enhance this information.

Landscape Zone Priority 1: The effects of 'urban' growth and decline at Springhead, and the adoption of Roman ways and organisation in general.

4.6.40 Recent excavations of 'small towns' in the south-east emphasise the extent to which such settlements originate, and in some cases reach their floruit, in the late pre-Roman Iron Age (eg., Elm's Farm, Heybridge, in Essex and Westhawk Farm, Ashford). A common theme is the location of such settlements around temple sites. Previous and ongoing investigations of the settlement at Springhead suggest a similar pattern. The evidence from Waterloo Connection, while not contradicting this pattern, implies a change in the make-up of the population of *Vagniacis* shortly after the conquest which is not clearly apparent from the settlement evidence alone.

Landscape Zone Priority 2: The immediate pre-Roman/ early Roman urban-rural landscape.

4.6.41 Inter-site studies will be of particular importance for addressing this research theme. The Fieldwork Events have produced little data which can directly further our understanding of the pre-Roman landscape. However, the establishment of the cemetery in the very early post-conquest period appears to represent a major change in the social and economic make-up and organisation of the Springhead settlement, presumably brought about directly as a result of the Roman conquest. A similarly dramatic change is also seen in high status rural centres in the region. Villas in the Thames-Medway region form an unusually dense and early group. Those investigated generally conform to a regional pattern in which the introduction of Romanised forms of building dates from the immediate post-conquest period, and they are often built over pre-existing Iron Age settlements. This apparent evidence for an early adoption of Roman ways and organisation in the small towns and villas of this part of Kent, is in contrast to the effect of the conquest on low status rural settlements where, at present, there appears to be little corresponding evidence for dramatic change at this time.

4.6.42 Within the CTRL project the late Iron Age to early Romano-British transition is better represented than any other period. Sites in the immediate hinterland of Springhead include investigations on the north-eastern edge of the settlement which have uncovered evidence for predominantly late Iron Age activity overlooking the settlement. Northfleet Roman Villa lies in the Ebbsfleet Valley to the north, and Northumberland Bottom lies only 2 km away to the south-east. Further evidence in the Springhead area has been recovered during the watching brief in CTRL project area 330, parallel to the line of Roman Watling Street (the A2). Further afield are Thurnham Villa and traces of several contemporary low status rural settlements such as Hockers Lane, Detling and South of Snarkhurst Wood, Hollingbourne. The diversity of data offers the potential for broad intersite comparisons, including a representative slice through the regional settlement hierarchy, in order to examine the relative status, role and composition of the various settlement types.

Landscape Zone Priority 3: Roman burial practice and ceremonial use in the environs of Springhead.

- 4.6.43 The Fieldwork Events have the very highest potential to enhance our understanding of Roman burial practice in the environs of Springhead. The value of the data is unfortunately greatly reduced by the poor preservation of the unburnt human remains.
- 4.6.44 At the time of the conquest the predominant burial rite among the La Tene III population of south-eastern England was cremation. The incoming army and administration also practised cremation. It was not until the mid 2nd century that there was a gradual movement away from cremation towards inhumation in response to changes which had affected Italy and the western provinces from the early part of the century.
- 4.6.45 In the south-east of England from the mid 1st to early 3rd century the great majority of cremations were carried out on pyres away from the final burial site, the bones collected together and placed in a pottery jar, less often a different type of pot, occasionally a glass vessel or a wooden casket. Organic containers are suggested in some cases by discrete piles of burnt bones. The cinerary container was then usually placed in an earth-dug pit, which was often oval, more rarely square or rectangular. More elaborate treatment could include lining with wood, stone slabs or a basket. Empty amphora or wooden boxes were also used.
- 4.6.46 There is little evidence for a clear-cut succession of cremations by inhumations at Waterloo Connection, and 1st-century inhumations, for example, are as common as cremations of the same date.
- 4.6.47 Much less common was cremation *in situ* where the body was burned over a pyre in a pit and buried on the spot. These are termed *bustum* cremations. Festus 29, defines the *bustum* as `*bustum proprie dicitur, in quo mortus est combustus et sepultus...ubi*

vero combustus quis tantummodo, alibi vero est sepultus, is locus ab urendo ustrina vocatur' ['a *bustum* is where the dead are burnt and buried in the same place....If burned in one place and buried elsewhere then it is called the *ustrinum'*] cited in Meiggs 1960, 457.

- 4.6.48 The presence of *in situ* or *'bustum'* burials is particularly important for interpretation of the Waterloo Connection site as they are likely to be an intrusive rite in Britain and therefore potentially diagnostic of a foreign element in the population of Springhead.
- 4.6.49 Only two Iron Age examples are known from Puddlehill, Beds (Whimster 1981, 154). Isolated examples of widely differing Romano-British date are known from lowland England at Silchester and East Hill, Dartford (Black 1986, 210). Philpott sees these cremations associated with military sites in northern England as a more coherent group. He defined two probable distinct traditions one in southern England usually having a separate container for the ashes and the other found regularly in military areas having a smaller barrow covering the ashes buried *in situ* at the pyre.
- 4.6.50 Burning on the sides of cremation pits is relatively easily detected in excavation and the scarcity of published accounts of this feature suggests that it has not been widely found in Britain. Absence of an obvious Iron Age predecessor, together with frequent military association, suggests that it is an intrusive rite in Britain.
- 4.6.51 Numerous parallels for *in situ* cremation can be found on the continent. Three cemeteries of the late 1st to early 2nd century AD, outside the auxiliary fort at *Asciburgium*, Lower Germany, have a total of 85 *busta* cremations. The pits there are rectangular and up to 3 m long and 2.2 m wide. The excavator considered that this form of burial was Gaulish in origin and has been recognised in Lower Germany as early as the Claudian period (Breeze and Rich-Gray 1978, 516). The rite was current at Krepfeld-Gellep in the 1st century AD (Pirling 1986, 54) and Wheeler cites further examples at Tongres, Nijmegen, Koln Lindenthal and other German and Gaulish sites (1985, 252). In Pannonia the *bustum* was a long-lived form of cremation although only one example was found at Gerulata Rusovce (Kraskovska 1976, 5-6).
- 4.6.52 On balance it appears that flat grave *in situ* cremation is not typical of mainstream native Romano-British burial practice and a continental origin is likely in the majority of cases. Although this form of burial has most commonly been associated with military sites in Britain, there is no clear reason to assume a military connection in the case of Waterloo Connection.
- 4.6.53 The *in situ* cremation burials have the potential to shed light on pyre construction and understanding of the funeral ritual. This may be achieved by detailed study of the charcoal, which will provide information on preferred fuels. Radiocarbon dating of the *in situ* cremations will determine whether this form of burial occurs throughout the use of the cemetery, as suggested by current evidence, or whether they in fact represent a limited phase of activity. As noted above, these features may represent an intrusive continental burial rite. A detailed record of the archaeologically detectable features of the ritual will therefore be particularly important for identifying continental parallels.
- 4.6.54 Detailed analysis of grave contents may identify other groups of burials with common features. Particular areas for further analysis will be the identification of funerary offerings. Potentially significant in this respect are the discovery of grape

pips in one grave. The animal bone from burial contexts should be examined in detail to establish whether they represent offerings of meat. Study of pottery residues has potential to shed light on what the vessels contained, either during their period of use or when they were utilised during the burial ritual.

- 4.6.55 It is thought that cremation was largely superseded by inhumation by the later 3rd century, although examples are occasionally encountered in the late 3rd and 4th century. There is a thin scatter in the south-east, particularly in East Anglia with occasional examples in Hertfordshire and Kent. Pollard's redating of the Ospringe pottery has brought to light several late 3rd or 4th century cremations (1988, 159, 161). Three examples found at Great Dover Street dating to the 3rd or 4th century (Wardle 2000, 27) and also 4th century cremation at the East London Cemetery (Barber and Bowsher 2000). A specific objective for further detailed analysis will be the identification of late Roman cremations, if present.
- 4.6.56 The scheduled temple site lies immediately to the north-east of the cemetery and its enclosure probably influenced the alignment of the road leading south from Springhead and therefore the position of the cemetery.
- 4.6.57 The distribution of burials within the cemetery suggests that it was focussed on a location of religious significance in its own right. This preoccupation with a specific location suggests that, in spite of the observed diversity in burial rites and the possible foreign element in the population, the users of the cemetery shared a broadly similar belief system. The significance of the principal burial focus identified within the cemetery is unknown and probably undetectable by archaeological means. It could be associated with the cobbled platform (perhaps a roadside shrine) or the well/ shaft (as noted above, deep pits or shafts found elsewhere were often used as depositories for offerings and may have been connected with beliefs surrounding death and the underworld).
- 4.6.58 The cemetery sheds some light on the ceremonial aspects of the landscape in the environs of Springhead, although the archaeological evidence from the temple and cemetery sites is not sufficiently specific to identify the cults involved. The discovery of human infant burials as foundation deposits in one of the Springhead temples makes it unlikely that the focus of the cults was purely classical in outlook (Burnham and Wacher 1998). The common practise of equating indigenous Celtic deities with those of the Olympian pantheon may have provided a mechanism allowing Celtic and Roman forms of religious expression to merge or exist side by side, smoothing the integration of immigrant groups into the community in the immediate post-conquest period.

4.7 Updated Research Questions

- 4.7.1 The following updated research aims and objectives are derived from the overall statement of potential set out in section 4.6 above. This section follows recent guidance from English Heritage regarding the formulation of updated project aims (English Heritage nd, 2-3). This recommends that it is helpful, when appropriate, to treat *aims* as major themes or goals to which specific *objectives* contribute, and that it is helpful, when appropriate, to think of aims and objectives as questions.
- 4.7.2 At the assessment stage, these necessarily emphasise the presence, absence and sufficiency of data to support further analysis of components of the archaeological record. Such further analysis would be undertaken with two primary objectives in view; to add to archaeological knowledge in the areas prioritised within the CTRL research strategy, including understanding how people lived in this region in the

past. Thus, in the interpretation and presentation of the results, more emphasis would be placed on the people of *Vagniacis* and their community. Aspects for consideration would include the following:

- What can be said about the size and structure of households?
- What can be said about daily life in the town (insofar as it is reflected in the burial evidence), considering aspects such as diet, standards of living, costume and personal adornment?
- How did people make their living, considering evidence for trade, crafts, occupations and how they provided or obtained their food, fuel and other necessities of life? What was the basis of the town's economy? Was it primarily a religious centre around which grew a community serving the needs of priests and pilgrims, or a fully developed town with a range of other urban functions?
- What were the main features of religious belief and practice, including attitudes to (for example) ancestors, infants, social inferiors, foreigners and their religious beliefs? Does the evidence suggest the merging of celtic and romanised forms of religious expression, or continuing separate identity? With which of these traditions were the people of *Vagniacis* mainly concerned? What attitudes did people have towards death and the afterlife? Can the advent of Christianity be detected in the archaeological evidence and if so, what was its impact on everyday life?
- How did people perceive and express their status, and their social and cultural identity? How should we interpret the introduction or adoption of different forms of burial and the adoption of romanised forms of religious expression? Does the choice of burial rite reflect community or family tradition or individual preference? Does the quality, quantity and range of personal belongings and grave offerings buried with the dead reflect their social or economic status or individual preference?
- What were the main political, economic and social factors that affected people's lives? What did the Roman conquest and occupation mean for the local British? Was there increased pressure to produce surplus, increasing prosperity and opportunity for some? How did civil war and barbarian raids in the late Roman period affect the inhabitants of *Vagniacis*?
- What was the effect of political change on population, social organisation and the local social hierarchy? Was there a change in the way the community was structured? Who lived where and with whom?
- Did the arrival of the Romans 'open up' the world for the local community? Did the local people come into contact with foreign culture, goods and beliefs? Did they travel more widely? Did they have more contact with other areas in terms of access to a wider variety of traded goods?
- Who lived or worked in the settlement in the late 3rd and 4th centuries? What was the standard of living of these people, in comparison with the towns occupants in its heyday?
- 4.7.3 *Updated Research Aim 1:* To refine and confirm the chronology of the site. The following objectives can be achieved by integrated, detailed stratigraphic analysis combined with detailed analysis of the pottery assemblage and other datable artefact assemblages. In addition it is recommended that a large programme of radiocarbon dating is carried out on cremated bone and charcoal from the cremation burials.
 - Objective 1: When was the cemetery founded? Gallo-Belgic derived dishes of 1stcentury date might indicate a very early conquest period, or possibly even earlier component within the assemblage.
 - Objective 2: Can the broad phases provisionally identified during the postexcavation assessment be more closely dated?
 - Objective 3: When did the cemetery go out of use?

- Objective 4: How does the decline of the cemetery relate to evidence for regional decline during the 3rd and 4th century?
- 4.7.4 *Updated Research Aim 2:* To contribute to detailed understanding of the practice of burial throughout the period of use of the cemetery and organisation and development of the cemetery through time. These objectives can be achieved by detailed analysis of individual grave groups, followed by classification of grave groups and spatial and chronological analysis of all classes of burial and artefactual evidence.
 - Objective 1: Characterise and classify all burials according to form, content and associated ancillary features, including: burial rite (*eg*, inhumation, cremation, *in situ* cremation), coffin and casket construction, grave goods and personal effects, offerings of food and drink, grave markers, status (*eg* as defined by number and quality of pottery vessels).
 - Objective 2: Can groups of burials be recognised within the cemetery on the basis of form, content or associated ancillary features?
 - Objective 3: Can evidence for grave markers be identified?
 - Objective 4: Consider possible explanations for, and significance of, a dense concentration of graves at a specific location in the cemetery.
 - Objective 5: Can burials within the cemetery be grouped spatially?
 - Objective 6: Can burials within the cemetery be grouped chronologically? In particular can late Roman burials be identified that would shed light on the latest use of the cemetery?
 - Objective 7: Characterise changing burial practice through time. Can examples of late Roman cremation burials be identified, for example?
 - Objective 8: To what extent does the preliminary phasing (based on pottery spotdating qualified by stratigraphic relationships) accurately reflect the development of the cemetery? Can an alternative approach be devised that will generate a more informative model of cemetery development?
 - Objective 9: Can the traditionally held association of gold-in-glass beads with the dispatch of 5500 Sarmatian cavalry to Britain under Marcus Aurelius (Boon 1977, 200) still be upheld?
 - Objective 10: What is the significance, if any, between grave goods that were placed on the pyre and those that were placed in the grave along with cremated human bone.
 - Objective 11: Is there evidence to indicate that status was inherited?
- 4.7.5 Updated Research Aim 3: Is in situ cremation burial a regional phenomenon or an intrusive rite suggesting the presence of a group of people from the continent forming part of the population of Springhead? Can this group be identified? This aim can be addressed by close analysis of the *in situ* burials at Waterloo Connection, radiocarbon dating of a representative selection and research examining British and continental parallels.
 - Objective 1: Characterise *in situ* cremation burial at Waterloo Connection.
 - Objective 2: What are the origins, chronological and geographical range of *in situ* cremation burial?
 - Objective 3: Compare and contrast *in situ* burials at Waterloo Connection with British and continental parallels.
- 4.7.6 *Updated Research Aim 4*: How and why did the cemetery develop where it did? This aim can be addressed by mapping and analysing the cemetery location in relation to known archaeological sites and topography in the environs of Springhead.

- Objective 1: What evidence is there for burial practice in the late Iron Age in the environs of Springhead? What are the likely reasons for a dramatic change in burial practice at the time of the Roman conquest?
- Objective 2: Is there evidence that the cemetery was laid out within pre-arranged boundaries, or did it expand organically from an original focus?
- Objective 3: What are the primary considerations affecting the location and organisation of the cemetery? Why is it so restricted in extent in contrast to the more typical linear organisation of Roman cemeteries?
- Objective 4: What influence did the proximity of the temple complex have on the location and development of the cemetery?
- Objective 5: What does the choice of location imply about the social composition and religious beliefs of the people buried in the cemetery?
- Objective 6: What evidence is there for other cemeteries in and around Springhead? Was this the main cemetery or one of several, perhaps serving the wider region as well as the town?
- 4.7.7 *Updated Research Aim 5:* What was the relationship of the cemetery to the Roman settlement and temple complex at Springhead? This aim can be addressed by detailed comparative study of archaeological data and artefact assemblages from the cemetery and settlement respectively.
 - Objective 1: To what extent, and in what particular areas, does the cemetery evidence reflect aspects of life in the settlement?
 - Objective 2: Are there any discernible relationships between social groups (including age groups, family groups, ethnic groups and the sexes), and the form and content of burials, which might reflect variations in the status of those groups.
 - Objective 3: What contrasts and similarities can be seen in the archaeological evidence from the cemetery and from elsewhere in Springhead Roman town? Can comparison and contrast with other burial groups within Springhead shed light on the social and economic status of the Waterloo Connection group?
 - Objective 4: To what extent is the establishment of the cemetery in the mid- 1st century AD an indicator of change in the settlement at the time of the Roman conquest?
 - Objective 5: How does the domestic pottery assemblage from Springhead differ from the funerary material in the cemetery? To what extent is the cemetery pottery a simple reflection of pottery in daily domestic use? A major handicap will be the lack of detailed work on the pottery from the excavation from the 1950s-70s although a small assemblage of material has been published recently (Booth in Boyle and Early, nd., 9-20).
 - Objective 6: To what extent does decline in the use of the cemetery reflect decline in the settlement? What factors are involved? What is the likelihood that separate factors affected the cemetery and town? Does the reduction in the quantity of material datable to the 3rd and 4th centuries in both town and cemetery reflect a general decline in population, wealth and urban functions as well as material culture?
 - Objective 7: Is the perceived decline in cemetery and settlement part of a regional pattern discernible at all levels of the settlement hierarchy, or a localised phenomenon perhaps resulting from the abandonment of pagan shrines and burial grounds following the rise of Christianity?
- 4.7.8 Updated Research Aim 6: What can comparison with other urban and rural cemetery sites tell us about the status and composition of the population of Springhead? This aim can be addressed by identifying and quantifying key indicators that are seen as reflecting social and economic characteristics of the

population (for example the presence of samian pottery as an indicator of social status), and comparing them with other contemporary cemeteries. Different levels of insight may be obtained from comparison with examples from within the region, in Britain as a whole and elsewhere in the Roman Empire.

- Objective 1: What indicators of social factors such as status, social identity, wealth age and sex, can be identified at Waterloo Connection, which will be useful for comparison with other sites.
- Objective 2: In terms of defining status, what is the significance of variations in both the numbers and types of vessels within cremation burials? For example, vessels were almost three times as common in cremation burials. What is the significance of the variable distribution of south, central and east Gaulish samian ware and the very low proportion of samian sherds with moulded wall decoration?
- Objective 3: What differences can be discerned between burial characteristics at Waterloo Connection and rural cemeteries in the region. To what extent do these reflect differences in wealth, status and social identity? The CTRL project offers an opportunity to study Romano-British burial practices spanning a range of settlement types. Small groups of rural burials or isolated examples have been excavated at several CTRL sites including Northumberland Bottom, Pilgrim's Way, Boys Hall Balancing Pond and North of Saltwood Tunnel.
- Objective 4: What differences can be discerned between burial characteristics at Waterloo Connection and cemeteries associated with Roman towns in the region, such as the recently published East London cemetery. The cemetery at Ospringe appears to be richer than Waterloo Connection in having a rather higher proportion of object-dated graves, a higher overall number of vessels per grave, and in the presence of glass as well as ceramic vessels. These differences make comparison of the two cemeteries highly desirable. Also in Kent, a small group of burials has recently been excavated at another small town site at Westhawk Farm, Ashford.
- Objective 5: How does the cemetery compare with large contemporary cemeteries outside the south-east, such as Trentholme Drive, York?
- Objective 6: How does the cemetery compare with near continental examples? Specific features suspected of being intrusive, including the *in situ* cremations, will need to be compared with cemeteries further afield, including examples in Gaul, Germany and Pannonia.

Additional aims

- 4.7.9 Additional research aims identified by specialist contributors that are beyond the scope of the original CTRL Landscape Zone Priorities and Fieldwork Event Aims are set out below. Consideration may be given to adding some or all of these to the project updated research aims, prior to the finalisation of the updated project design.
 - Research into the factors affecting the survival of metalwork, bone and other classes of evidence have the potential to contribute to the development of improved conservation measures and understanding of taphonomic processes.

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APPENDIX 1 - CERAMICS

1.1 Late Iron Age and Roman Pottery

by Paul Booth

Introduction

- 1.1.1 The large assemblage of Iron Age and Roman pottery was mostly recovered from the site by the hand excavation of graves and related features. A small proportion was recovered from sieved soil sample residues and the assemblage also includes a small quantity of Iron Age material which is largely residual. The Roman pottery comprises containers for cremated human remains in some graves, grave goods deposited within both cremation and inhumation burials, as well as other contexts. Pottery constitutes the most commonly occurring grave good type and in addition to being the principal dating medium for most deposits, it is of fundamental importance to the study of the cemetery.
- 1.1.2 The Fieldwork Event Aims that the material can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: to establish the origins and decline of the Roman settlement
 - Fieldwork Event Aim 2: to recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: to recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 7: to establish the chronology of the cemetery
 - Fieldwork Event Aim 8: to establish the spatial development of the cemetery as far as possible within the area of investigation
 - Fieldwork Event Aim 9: to establish if spatial variations exist within the cemetery in relation to burial practice
 - Fieldwork Event Aim 13: to establish the nature and date of occupation pre-dating the cemetery

Methodology

1.1.3 The total assemblage was scanned briefly and quantified by sherd count and weight for each context. Samian ware was noted in these terms but was additionally subjected to a separate specialist assessment (see Appendix 1.2). A note was made of both fabric (often in general terms, such as reduced coarse ware) and form for all vessels identified as cremation urns or grave goods. Canterbury Archaeological Trust fabric codes were used in some cases but CAT equivalents to local fabrics were not always easily identified and the lack of a hierarchical approach means that broad identifications often appropriate to assessment are not possible within this system. In due course it will be necessary to establish precise equivalencies between specific fabrics identified at Pepper Hill and those in the CAT fabric series. If necessary new fabric codes may need to be added to the latter. Where possible, vessel form was recorded in relation to Monaghan's typology of North Kent pottery (Monaghan 1987) and the dating of individual types presented therein was followed in most cases. Notes were also made of the approximate

degree of completeness of the certain and probable grave goods or cremation urns, together with a rough estimate of the degree of complexity involved in reconstructing vessels (see notes on condition under Provenance below).

1.1.4 A small number of grave assemblages were subject to full recording to test a modified version of the OAU's Roman pottery recording system which it is proposed to employ in further work on the assemblage. This makes allowance for the use of Canterbury Archaeological Trust codes for pottery fabrics, and of Monaghan's type codes, as well as incorporating a number of data fields additional to the standard ones, to take account of the particular analytical possibilities and challenges presented by a large cemetery assemblage.

Quantification

- Some 25,479 sherds (192.123 kg) of Iron Age and Roman pottery were recovered. This 1.1.5 total includes c. 2795 sherds (6.258 kg) of pottery recovered from sieved soil sample residues and also includes a small quantity of Iron Age material which is largely residual. Pottery was recovered from some 1075 contexts (561 from ARC PHL97 and 514 from ARC NBR98). Of these c. 456 were contexts assigned to individual vessels or fragments of vessels probably or certainly forming part of grave assemblages. These accounted for some 164 kg (c. 85%) of the total assemblage. The 456 'grave vessel contexts' do not include the fills of these vessels, which may in some cases have included further sherds derived from them, nor do they include general grave fill contexts. After further work some of the latter may prove to contain additional vessel fragments which can be assigned to grave assemblages. The 456 'grave vessel contexts' give an approximate indication of the number of vessels originally incorporated in graves (in some cases a single vessel may have been represented by more than one context), but this is not, and may never be, a precise figure because of factors of preservation and fragmentation discussed below (see section on Provenance). For these reasons the present (high) totals for sherd count are much less meaningful than would be the case with most domestic assemblages and produce a remarkably low average sherd weight (7.5 g), particularly when the existence of substantial parts of many vessels is remembered. Ultimately the most significant statistic, and one which is potentially much more readily recoverable from a cemetery assemblage than a domestic one, is the total number of vessels originally deposited in graves. It is likely that the final figure will be rather in excess of a 'guide' figure of c. 450, but much detailed work will be required both on the pottery and associated context records in order to arrive at a more nearly definitive total. Until this work is carried out all the quoted figures for vessel types etc must be regarded as provisional. Table 1.1 presents a breakdown by context for the total assemblage.
- 1.1.6 Pottery as potential grave furniture and grave goods, a total of approximately 450 vessels in all, was recovered from some 136 cremation burials and 103 inhumations. Of the 136 cremation burials with pottery some 88 had cremation urns, which in 29 cases were not associated with any further vessels. In broad functional terms the other vessel classes represented in cremation burials were liquid containers (flagons or flasks), of which there were 52; drinking vessels (cups, beakers and small jar/beakers), of which there were 68; open, generally plate-like forms (bowls and dishes), of which there were 49; and miscellaneous vessels, of which there were 26. This last group included some fragmentary vessels which might prove to belong to one of the other main functional categories but consisted mainly of vessels which were perhaps 'extra', potentially multifunctional jar or necked bowl forms. There were also three lids and a small

spouted 'infant feeder'. Drinking vessels and open forms and even the miscellaneous vessels could occur as multiple examples, and there was a single case of two flagons occurring in one cremation. The maximum number of vessels within any cremation burial (including the cremation urn) was six, occurring in groups 91 and 1180. In the former instance the vessels were an urn, a flagon, three small jar-like drinking vessels and an open dish; in the latter case the urn and flagon were associated with a beaker, a samian ware dish and two additional (uncertain) vessels.

- 1.1.7 The inhumation burials contained some 48 liquid containers; 65 drinking vessels; 41 open forms and 10 miscellaneous types. This last group included a samian ware mortarium of Dragendorff form 45 and no less than 4 further examples of the 'infant-feeder', Monaghan's type 13. Again multiple examples of vessels were present in some cases, including three instances of two flagons in one grave. The maximum number of vessels present in an inhumation grave was generally four, though one exceptional burial (sub-group 253) contained six vessels a flagon, a Drag 33 cup, 3 dishes (including two samian Drag 18/31s) and an additional jar of uncertain function.
- 1.1.8 The range of sources providing the pottery was generally unremarkable, most of the vessels being in a variety of locally produced fine and coarse fabrics. The fine fabrics included oxidised white-slipped flagons and 'Upchurch type' fine grey ware (OAU and CAT fabric R16). The latter was particularly common in a range of beaker types, including the characteristic carinated forms (Monaghan 2G), and for dishes (particularly Monaghan 7A1). Other North Kent or Thameside products included BB2 (CAT fabric R14), though this was relatively rare, and related sandy reduced wares (broadly CAT fabric R73). Coarsely-tempered wares, again largely of local origin, included early Roman shell-tempered and grog-tempered fabrics, often occurring as large jars used as cremation urns. Patchgrove ware was one such fabric used in this way. The most important non-local British source represented in the assemblage was the Verulamium industry, which was an important supplier of white ware flagons to the site (at least 14 examples). The most unusual non-local British vessel was a handled tankard in Severn Valley ware (context 10141, not from a grave although the vessel was almost certainly originally deposited in a grave which was subsequently disturbed), occurring well outside the normal distribution range of these vessels. Imported material consisted almost entirely of samian ware (33 vessels, from all the main sources, in graves) and Cologne colour-coated ware beakers.
- 1.1.9 In terms of vessel types the range was again fairly typical, though the proportions of general types are very different from those encountered in domestic assemblages, the Pepper Hill assemblage having a high representation of flagons and drinking vessels vis-à-vis jars. A few individual vessel types are noteworthy. The majority of local coarse ware vessel forms fall, as would be expected, within the scope of Monaghan's typology, but there were exceptions, such as Gallo-Belgic derived dishes of 1st-century date, akin to but distinct from his type 7B vessels. These might indicate a very early conquest period, or possibly even earlier, component in the assemblage. This is also hinted at by the presence of pedestal jars. Two examples of this distinctive form were noted, both used as cremation urns in groups dated mid to late and late 1st century (subgroups 11205 and 11994). The form, Thompson's type A5, is not noted as occurring in Kent (Thompson 1982, 65), but as other types of pedestal urn are common in North Kent, the presence of these vessels need not occasion surprise. Another form not paralleled in Monaghan's corpus was a hemispherical bowl, loosely imitating the samian ware form Drag 37, in a fine 'Upchurch type' fabric.

- 1.1.10 The relatively large numbers of flagons include a significant proportion of early ('Hofheim') types (Monaghan 1E). In terms of confident attribution of sherds to general vessel type, flagons are slightly over-represented in the figures given above because they can usually be identified on the basis of fabric alone. Base sherds in white (particularly Verulamium white ware) and oxidised white-slipped fabrics can be almost invariably identified as coming from flagons even in the absence of evidence for rim form. Related 'liquid container' vessels included a small flask in an oxidised fabric of uncertain source. This vessel was tall and slender with a very narrow pedestal base. Unfortunately the rim is missing, but on present evidence the piece is unparalleled.
- 1.1.11 Five examples of 'infant feeder' vessels were recovered, one from a cremation burial and four from inhumation burials. These were all in local fabrics and of Monaghan's type 13, which dates broadly from the mid 1st-early 2nd century (Monaghan 1987, 169). The purpose of these vessels has been much discussed, but their association in this cemetery appears to be with child burials in the case of all four inhumations (sub-groups 895, 1200, 11653 and 12115) and an interpretation as infant- (rather than baby-) feeders seems to be substantiated (cf Webster 1981; Crummy 1993, 270-273).

Provenance

- 1.1.12 The pottery derived from a variety of contexts and context types, of which graves were easily the most important, though the material from other cemetery features is also significant for understanding the whole range of aspects of the site. It is possible that a significant proportion of the latter material may originally have derived from burials in view of the extent of intercutting of graves. The chronological spread of graves containing pottery was from the mid 1st century to at least the early 4th, but with a strong emphasis on the 1st and 2nd centuries AD. The pottery spot dates (see Table 1.1) are supplemented by a limited amount of numismatic evidence. The pottery suggests that the use of the cemetery began very early in the Roman period. A small number of sherds are assigned to the middle and late Iron Age, but all appear to be residual in Roman contexts and there is at present no clear indication that the use of the cemetery commences in the pre-conquest period.
- 1.1.13 The chronological range of the groups with ceramic urns or grave goods has been provisionally tabulated under five broad phases (see Table 1.2). The date range categories are necessarily imprecise, particularly in those cases where vessel preservation is poor. In cases where several vessels are represented the given date range generally reflects the likely span of the latest piece, though in a few cases the point of intersection of different date ranges has been chosen (eg in a group with vessels dated late 1st-late 2nd century and late 2nd-mid 3rd century a date around the end of the 2nd century may be preferred), but this is a subjective assessment. It does not allow for the possibility that some vessels were heirlooms or had been reused and may have been grossly 'residual' (in terms of their manufacturing date) by the time they were deposited in the grave. Most of the defined date range categories are self-explanatory. The general 1st-2nd century group, into which the majority of pottery-dated graves (particularly cremations) fall, includes graves with poorly-dated or widely-dated vessels (often as a consequence of poor preservation), but also a significant number with vessels assigned quite securely to the 2nd century. While further work should allow some of the graves in this category to be reassigned to more precise chronological groupings a significant 2nd century component is likely to remain: burials of this date probably formed the majority of the pottery-dated graves.

- 1.1.14 In broad terms, therefore, the first three date range categories should represent a sequence, but because of an inevitable degree of overlap between the categories this will not always be the case (a grave containing a vessel dated AD 45-100 could, of course, quite easily be later than a grave containing a vessel dated AD 70-120, even without introducing the question of residuality). Nevertheless, it seemed useful to identify a late 1st-early 2nd century range which could be distinguished from the main group of undifferentiated 2nd (or 1st-2nd) century burials.
- 1.1.15 The figures for chronological range suggest a number of points of interest. Both cremation and inhumation burials can be assigned to the 1st century, though these formed a higher proportion of pottery dated inhumations than of cremations. The representation of the late 1st-early 2nd century date range was very similar in both cremation and inhumation burials. Thereafter a large majority of cremations were assigned to a general 1st-2nd century (or possibly later, in some cases) group, with the likelihood (see above) that many of these were of 2nd century date. While a small number of cremations were dated to the mid/late 2nd-3rd centuries the proportion of such burials was rather higher amongst the inhumations and the latter accounted for all the examples of pottery dated graves which could be assigned to the late 3rd-(mid) 4th centuries albeit that there were only five such burials.
- 1.1.16 The condition of the material was very variable and ranged from complete vessels to very badly fragmented sherds. The principal factors affecting this related to the physical characteristics of the graves and to soil conditions. Grave depths varied considerably. In deep graves the chances of relatively good preservation of vessels were high, but the extent of intercutting of graves, which in places was very considerable, was also a factor and it is almost certain that vessels broken and disturbed as a result of intercutting were redeposited and incorporated either in the fills of later graves or in the general layers which overlay the grave fills in some areas of the site. In addition, shallow graves were subject to damage, particularly from post-Roman ploughing, and many vessels were affected by this. In particular it is notable that very few cremation urns survive as intact (or even complete but broken) vessels only five urns were recorded in completeness categories A to C (i.e. more than 80% complete). The occurrence of relatively complete examples of the principal vessel classes in graves appears in Table 1.3.
- 1.1.17 It is notable that vessels from cremations are on average significantly less wellpreserved than those from inhumations. This can be explained only in part by the suggestion that earlier graves were most susceptible to damage from later activity in the cemetery area, since at Waterloo Connection there is little evidence for a clear cut succession of cremations by inhumations and 1st century inhumations, for example, are as common as cremations of the same date. It is more likely that cremation graves were on average less deep than inhumations and that their contents were thus more prone to damage, perhaps particularly from post-Roman ploughing. The effect of truncation (whether or not by ploughing) as an agency of destruction can be seen most clearly in the figures for open forms and (to a lesser extent) drinking vessels. These, the lowest or smallest vessels, and therefore the least likely to suffer from truncation of graves, are notably better preserved than more vulnerable, taller forms such as cremation urns and flagons.
- 1.1.18 Soil conditions, generally damp and clayey, were not particularly conducive to the good preservation of the pottery and many vessels had poorly-preserved surfaces. In addition a number of vessels, particularly some of the very thin walled ones, cracked and fractured during drying after recovery from site. A number of the fabrics encountered on

the site seem to have been particularly prone to crumbling, which is perhaps a reflection of the general characteristics of the soil rather than careless handling etc in the course of excavation. This last factor should not reduce the value of the assemblage, but it does mean that a significant amount of work is likely to be required in partial re-assembly of vessels in order to facilitate identification, recording and illustration (see also below).

One other characteristic of the assemblage which merits comment is the occurrence of 1 1 19 imperfect vessels in grave groups. Identification of such vessels was not always easy because of the numerous factors which could result in damage to vessels at, and subsequent to, their deposition in graves. Making due allowance for these factors, however, a number of imperfect vessels were identified. In some cases (the least certain) these consisted of complete vessels with a piece or pieces removed from the rim. At present none of the vessels in this category has been identified as definitely having been incorporated into the grave in a damaged condition, though this is certainly possible. Such identification will require very careful examination of the pottery in conjunction with the excavation records to determine the precise circumstances of discovery. The clearest manifestation was of vessels which had had holes made in them to render them non-functional in everyday terms. Most commonly this consisted of evidence for holes in the base, including one case in which the whole central part of the base of a samian dish had been removed. Again there were some ambiguous instances where vessels with very thin bases may have been damaged accidentally. Holes were also observed in the body wall of vessels, particularly closed forms such as flagons (and one flagon had an incised graffito in the form of a rough square). In total six 'imperfect' vessels were identified with some confidence, and a larger number of potential cases await consideration. It may be noted that in the recently analysed eastern cemetery of London as many as 23% of the pots from graves were damaged (Barber and Bowsher 2000, 122).

Conservation

- 1.1.20 No particular conservation needs are anticipated unless it is proposed that large numbers of vessels should be displayed. A significantly above-average amount of reconstruction work is likely to be required, but in the case of vessels not required for long-term display this can be carried out by the pottery specialists as an integral part of the process of detailed recording and analysis.
- 1.1.21 The only area in which a conflict of interest might be anticipated is in the event of an extensive programme of residue analysis being undertaken. Long term removal of such sherds for analysis will definitely hamper the process of recording the assemblage.

Comparative material

1.1.22 The most significant comparisons for the present assemblage are found almost entirely in a small number of other cemetery assemblages. Comparison with domestic assemblages at Springhead will be relevant, but principally to indicate the points of contrast between domestic and funerary material, although comparison of the range of fabrics and forms used will be of value. A major handicap here, however, is the relative lack of detailed work on the pottery from the 1950s-70s excavations at Springhead, for which the only accessible quantified data are presented by Pollard (1988, 231-242 passim). A relatively small assemblage from a SEEboard cable trench at Springhead has been reported by Booth (nd., 9-20), along with a small assemblage from the excavation at the Garden Centre (Philp and Chenery nd.) but otherwise quantified data are scarce.

- 1.1.23 The present assemblage is one of the largest excavated from a Roman cemetery anywhere in Britain and as such has few immediate points of comparison. The most similar, and in many ways the most significant, comparable assemblage is that from Ospringe, Kent, though this lies almost 50 km east of the present site, albeit directly linked by lying adjacent to Watling Street. The cemetery is comparable to that at Springhead in containing both cremation and inhumation burials and in spanning much of the Roman period, though late Roman graves appear (superficially) to be better represented at Ospringe. The principal difficulty with Ospringe is that the main excavations were carried out in the 1920s and, while well-published by the standards of the day (Whiting et al 1931), the data inevitably have limitations, though this is less the case with the pottery than with regard to understanding of the graves themselves. Again some pieces are republished by Pollard (1988, e.g. 112-117 passim). The Ospringe cemetery does appear to be richer than Waterloo Connection in having a rather higher proportion of object-dated graves, a higher overall number of vessels per grave, and in the presence of glass as well as ceramic vessels. Despite these differences detailed comparison of the two assemblages is highly desirable.
- 1.1.24 Other published cemeteries with large pottery assemblages are scarce. They include Westhampnett, West Sussex (Fitzpatrick 1997), though the principal cemetery here is of late Iron Age date, and the nearby St Pancras cemetery, Chichester (Down and Rule 1971, 53-126). The recently published east London cemetery is physically the closest examined major cemetery to Springhead and has produced some 200 vessels from grave contexts (Barber and Bowsher 2000, 121; see also Whytehead 1986). This assemblage is particularly important because of the quality of the analysis, and while the chronological emphasis of the cemetery is mainly in the late Roman period the 3rd century is particularly well-represented ceramically, which makes it of value for comparison with Waterloo Connection.
- 1.1.25 North of the Thames cemeteries with significant pottery assemblages occur in Hertfordshire and Essex, particularly at King Harry Lane, St Albans (Stead and Rigby 1989), though here the best known (cremation) cemetery dates entirely to the 1st century AD, and in the Baldock area (eg Westell 1932). In both cases more recent excavations have not been published in detail (cf Struck 1995). The principal cemetery publication from Colchester deals mainly with late Roman inhumations with low levels of grave goods (Crummy and Crossan 1993), though there is some attention given to earlier burials. The majority of earlier Roman burials producing pottery were recovered in the 19th century and though much information on them was collated by Hull the data have never been comprehensively synthesised, though some grave groups were published by May (May 1930; cf Crummy 1993). Sites such as Kelvedon, while excellently published, are again largely of later Roman date with relatively small pottery assemblages (Rodwell 1988, 114-120).
- 1.1.26 Moving further afield, the cemetery at Trentholme Drive, York (Wenham 1968), produced a large group of pottery and may be relevant for comparisons at a general level. Overall, there are a number of small groups from Kentish cemetery sites which may be useful with regard to individual vessels, but it is really from the larger assemblages that useful comparanda can be drawn, *ie* from those sites which allow comparison at the level of the assemblage rather than the individual grave group. For these purposes the most useful sites are clearly Ospringe and London, but the potential relevance of near Continental evidence should not be ignored and requires further consideration.

Potential for further work

- 1.1.27 As one of the largest groups of pottery from a cemetery excavation anywhere in Britain the present assemblage is of national as well as regional importance, though this is tempered somewhat by the poor preservation of some vessels. When considered in the context of 'small towns' in Roman Britain there are *no* published cemetery assemblages of comparable size deriving from recent excavations. The present assemblage therefore has the potential to make a major contribution to the study of pottery from cemetery sites in general, and from 'small town' cemeteries in particular. The value of the group is enhanced by the knowledge that the cemetery from which it derives was almost completely excavated.
- 1.1.28 Potential aspects of importance can be seen at several different levels. At the Fieldwork Event level, the pottery remains the principal dating medium for most graves and more detailed examination of fabrics and of individual vessel types (and their associations) in relation to the site sequence should allow further refinement of the chronology of the cemetery. In addition, as the most common grave good type the pottery can make a major contribution to the understanding of burial practices in the site. In this respect systematic classification of vessels and careful quantification of the use of 'imperfect' and deliberately damaged vessels will be very important.
- 1.1.29 At the broader, Landscape Zone level, the assemblage can be used as the basis for comparison with material from non-cemetery contexts at Springhead in order to assess the extent to which cemetery material is a simple reflection of pottery in daily domestic use. At a wider level examination of the cemetery sequence may allow refinement of the chronology of particular locally-produced vessel types, as well as adding new types to the repertoire of the North Kent pottery industries.
- 1.1.30 Comparison with other cemetery assemblages will enhance understanding of the present group and also make a significant contribution to the study of such assemblages at national level. Comparison with assemblages from London and Ospringe can be used to consider questions such as the identification of regional types of cemetery assemblage and status-related variation in cemetery groups.
- 1.1.31 Full recording of the entire assemblage is required. Detailed examination of material from sequences of intercutting graves may allow sherds of uncertain significance to be attributed to known grave groups, and the material from related general layers needs to be examined from the same perspective. As already stated the principal measure of quantification for such an assemblage is vessel count, and it is most important that this figure should be as reliable as possible, always allowing for the uncertainties introduced as a result of variable preservation of vessels.
- 1.1.32 A full catalogue of all the pottery from graves will be required. Current best practice in relation to publication of cemetery groups involves illustrating all appropriate material (the only exceptions might be where only very small (body) fragments of vessels were all that survived). To achieve this aim some reconstruction of vessels will be necessary, particularly in view of the extremely fragmented nature of some of them. This will be a significant undertaking in its own right.

Organic residue analysis

- 1.1.33 Consideration was initially given to undertaking a pilot study to establish the presence of organic residues within the pottery vessels. Since doubts were raised over the validity of such a sample it was decided to retain unwashed sherds from all vessels.
- 1.1.34 While no significant Roman funerary assemblage has been examined to date, the analysis of 131 vessels (210 sherds) from the Roman settlement at Stanwick, Northamptonshire (Evershed nd.) constitutes the largest study of organic residues in a Roman domestic pottery assemblage. If the assemblage from this cemetery was studied in the same way, the Stanwick assemblage could provide a base-line for comparative assessment.
- 1.1.35 An alternative, more selective approach would be to analyse sherds of identical vessel forms and fabrics from domestic deposits at Springhead and subject these to a similar study in order to examine the contrast between domestic and funerary vessel usage.
- 1.1.36 Residue analysis can help to identify the contents of vessels in general terms. This information could help, for example, to identify differences in function between different vessel forms deposited as part of the funeral ritual. Comparison with existing data from domestic assemblages could identify differences between domestic and funerary vessel usage. This could potentially contribute to a more detailed understanding of the burial rites represented.
- 1.1.37 If a large-scale residue analysis is envisaged, the study should be on a similar scale to that undertaken at Stanwick in order to provide a baseline for comparison between domestic and cemetery assemblages nationally. The size and stratigraphic integrity of this assemblage would justify analysis on this scale. While this does not clearly fall within the CTRL research strategy, it may be put forward as an additional research aim.

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1.2 Samian Ware

By Margaret Ware

Introduction

- 1.2.1 Samian ware was recovered from 98 contexts under controlled archaeological conditions. Apart from the great intrinsic interest of the assemblage *per se*, its study will contribute to our understanding of Roman burial practice, and the history of towns and their rural landscapes.
- 1.2.2 The Fieldwork Event Aims that the material can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.

Methodology

- 1.2.3 Samian ware is published in a standardised form across western Europe (see Bulmer 1980 and Webster 1996, *passim*). Consequently, the standardised terminology is used here. The recommended Canterbury Archaeological Trust Fabric Series reference numbers have not been used and would be unfamiliar to samian specialists generally. Table 1.4 provides a summary of the samian assemblage from all contexts. Table 1.5 presents the information recovered from a 5% sample.
- 1.2.4 The sample was selected manually (judgmental sampling) to give a fair representation of the collection and to determine its requirements for future study. Its selection was balanced by the range of fabrics, forms, condition and completeness of vessels, and by the range of specific characteristics represented (eg potters' stamps, graffiti, decoration).
- 1.2.5 A 5% sample of the contexts containing samian was selected, and this comprised also 5% of the total number of sherds recovered. The low figure of 5% was used for this sample because the overall catalogue is fairly detailed (an inevitable consequence of the nature of samian reporting); the material is relatively uniform; a very high proportion of the material is in need of washing/cleaning/conservation (see below) and cannot be catalogued accurately in its present state. Sherds from selected groups were retained in an unwashed state to allow residue analysis to be undertaken.

Quantification

- 1.2.6 The assemblage is summarised by context in Table 1.4. The assemblage comprised 394 sherds (12, 994 g) from 98 contexts (56 from ARC PHL97 and 42 from ARC NBR98) representing a total of 63 graves (35 from ARC PHL97 and 28 from ARC NBR98). It is estimated that approximately 200 vessels are represented. Of these 35 vessels (143 sherds) were complete or had survived in near-complete profile, composed of *c*. 143 sherds. These vessels were recovered in equal numbers from ARC PHL97 (18) and ARC NBR98 (17). The lesser weight of samian recorded from ARC NBR98 reflects the greater number of small sherds found in those contexts (*c*. 162, compared with *c*. 95 from ARC PHL97).
- 1.2.7 The proportions of South Gaul (SG), Central Gaul (CG) and Eastern Gaul (EG) samian ware are approximately 53%, 40% and 7% respectively. Revision of these figures will be necessary after the vessels have been properly cleaned.
- 1.2.8 The proportion of possible 1st-century (SG) material was far greater in ARC NBR98 contexts (the northern part of the cemetery; *c*. 74%) than in ARC PHL97 (the southern part of the cemetery; *c*. 11%) (see Figure 3). The proportions of later, CG samian from ARC NBR98 and ARC PHL97 were consequently the converse (*c*. 23% and c 75%). This was reflected also in the higher proportion of late 2nd- or 3rd-century EG samian from ARC PHL97 contexts (*c*. 14% compared to only *c*. 3% from ARC NBR98). This suggests potentially significant contrasts between the northern and southern parts of the cemetery, which might reflect chronology.
- 1.2.9 Plain wares (c. 99%) were by far the most common type. Discounting a single *appliqué* spout and all those plain forms with undiagnostic slip-trailed ornamentation (*en barbotine*), there were, at most, four fragments of moulded wall-decoration (c. 1%). This is an exceptionally small proportion compared with standard collections of samian ware normally recovered (see for example Ward 1998, *passim*). Bias was also clearly observable in the outstandingly large number of complete or near-complete vessels (see paragraph 1.2.6, above).
- 1.2.10 The apparently low proportion of vessels from Eastern Gaul (7%; cf Ward 1993, 16 etc) is more likely to reflect chronological changes at the cemetery site rather than changes in the availability of EG wares on the local market. Provision of information concerning other sources of dating evidence on the site would be helpful. Research into comparable collections elsewhere in Springhead could be revealing.
- 1.2.11 The quantity of material selected for sampling from five contexts consisted of 19 sherds (1285 g) which represented five vessels, weighing 1285 g (see Table 1.5).

Provenance

1.2.12 The assemblage was recovered from 98 contexts, 63 of which were individual grave groups. The remainder derived from road layers, a pit and ploughsoils. There are notable, and possibly chronological, differences between the samian from the northern and from the southern parts of the cemetery.

Conservation

1.2.13 The very poor condition of the assemblage is commented on in Tables 1.4 and 1.5. A total of 44% of all contexts contained samian ware that is in need of further cleaning by a conservator.

- 1.2.14 Where the material is unwashed, opportunity remains for further examination of residues within vessels.
- 1.2.15 The surface condition of several vessels is degrading, as for instance that in ARC PHL (1263). Handling appears to exacerbate the problem. The collection should be stored in its entirety and should be preserved intact. Nothing should be disposed of. This is in line with national recommendations (see Young 1980, 7, section 2.8.2).
- 1.2.16 Any further cleaning should be undertaken under the supervision of a qualified conservator.

Comparative material

- 1.2.17 Comparison can be made with samian ware from previous excavations at Springhead, including the temple sites. Particular attention should be paid to the comparative dating of the material and especially the potters' stamps. Comparison can also be made with the assemblage from Ospringe, Kent (Whiting *et al* 1931) and the small group from the SEEBoard trench (Booth nd).
- 1.2.18 Samian has been recovered from numerous other Roman cemetery sites in Britain. Comparison with other cemetery collections may shed light on the status of the Waterloo Connection cemetery. Appropriate cemeteries for comparison include Brougham, Baldock, Puckeridge, Dorchester/Poundbury, Cirencester, Cassington, Ancaster, Mucking, Winchester, Colchester, Canterbury, Ashton, Ilchester and the Eastern Cemetery, London. The samian collections from some of these sites (including Brougham) are as yet unpublished.

Potential for further work

- 1.2.19 The study and publication of this assemblage will be extremely valuable (see Fulford and Huddleston 1991, 43). It holds considerable potential to further our understanding of the settlement at Springhead, its growth and decline, and the adoption of Roman ways. Samian ware is known to be a potentially sensitive indicator of Romanisation.
- 1.2.20 The spatial distribution of different types of samian vessels may provide the most reliable chronological indicator for understanding the development of the cemetery. Preliminary assessment suggests that earlier material is concentrated in the northern part of the cemetery, and later material in the southern. This conflicts with the phasing derived from other pottery spot-dating, modified by stratigraphic analysis, which suggests the presence of graves in all parts of the cemetery from the 1st century. Further study of the later samian vessels from the site in combination with the evidence of other late grave goods could be expected to shed light on the end-date of the cemetery's use.
- 1.2.21 The presence of samian pottery is potentially a useful indicator of social status, and the very plain nature of the Waterloo Connection assemblage could suggest a population of lower status.
- 1.2.22 The assemblage holds possible potential also for our understanding of the early Roman urban/rural landscape. The assemblage holds the very greatest potential in regard to our knowledge of Roman burial and ceremonial use, not only in the environs of Springhead, but also in Roman Britain as a whole. Few cemeteries relating to small towns have been published before, and probably none on this scale. "Given the 'primary status' of vessels from burials, they are of special importance, being chronologically useful and potentially revealing 'preferred vessels' for this type of practice," (see Willis 1997, 16

section 4.6; 24 section 5, Cemeteries). The assemblage will assuredly help our understanding of site chronology and development, but it may also aid our understanding of regional trade with the Continent.

Additional research aims

1.2.23 Beyond the immediate scope of the CTRL research strategy, the assemblage will contribute considerably to the international field of samian studies, in which British scholars play a leading role (see Willis 1997, 17 section 5.3.1). Even allowing for the eroded condition of the pottery, few collections of so many samian vessels recovered from such a small area have survived in such a state of completion in Britain. Publication and illustration of this corpus will add much to our knowledge of the development and use of plain forms (see Willis 1997a, *passim*, for its potential value).

Statement of further work

- 1.2.24 Further analysis of the samian vessels will certainly be required. Careful examination of some fabrics will be required in order to complete the final samian report. Close inspection of fragments of moulded decoration and a lionheaded spout will be necessary. Graphite rubbings may be needed, and certainly will be needed for up to 19 potters' stamps.
- 1.2.25 The assemblage merits full analysis and publication. The published report should include comprehensive quantification and discussion of the collection, basic statistical work, full illustration, and detailed comment as appropriate. Illustration of the more complete vessels is extremely desirable (see for instance Bird 1986, 172 ff). Full publication will necessitate the careful identification of individual forms and fabrics and the refined dating of every vessel. Further work will therefore be needed on the four possible fragments of moulded decoration and one moulded mortarium spout (which will require photographing for publication; see Bird 1986, 178 ff).
- 1.2.26 Nineteen stamps require further detailed examination to confirm their identification. It is standard, and indeed essential, practice to approach Miss Brenda M Dickinson (University of Leeds) to arrange for precise identification and dating. Graphite rubbings of the samian stamps will be required and must be sent to her as soon as possible in order that identification may be completed well before the final samian report is finished. Their precise dating may then be incorporated into the final report.
- 1.2.27 Of the three graffiti, those from contexts ARC PHL97 (44) and (257) read only X. The third, a graffito incised on the base of a stamped SG dish from ARC NBR98 (group 10614) should repay expert attention from an epigraphist. Two foot-rings on which nicks had been cut and one dish with a circular hole cut through the centre of the base do not necessitate expert examination, but see Table 1.4, contexts ARC PHL97 (642, 643 and 663), ARC NBR98 (11222) respectively.

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1.3 Ceramic Building Material

By Susan Pringle

Introduction

- 1.3.1 The assemblage was recovered by hand excavation from a variety of contexts. The Fieldwork Event Aims which the analysis of this assemblage can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.
 - Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

1.3.2 All of the material has been scanned for the assessment using a binocular microscope. Ceramic building material has been divided by form, and fragments counted and weighed. The presence of distinctive fabric types has been noted, but no analytical work has been carried out on the fabrics from the site, as this task is more appropriately carried out in the analysis phase. Other information recorded includes the presence of combing, tally or signature marks, the presence or absence of glaze, and any complete dimensions.

Quantification

1.3.3 The entire assemblage comprising 4.449 kg and was assessed (2.732 kg from ARC PHL97 and 1.717 kg from ARC NBR98).

Roman building material

1.3.4 The Roman tile assemblage is very small, with only 3.54 kg of securely identified tile (2.58 kg from ARC PHL97 and 0.96 kg from ARC NBR98). Types represented are brick, roof tile (tegula and imbrex) and box flue tile. Such small quantities suggest that the material was not in primary destruction deposits, but was either residual, or had been dumped on the site as rubbish. Re-use as cobbles or for make-up or post-packing is also a possibility. No complete tiles, or complete dimensions, were noted.

Roman tile fabrics

1.3.5 Although detailed fabric work has not been carried out on the material from ARC PHL97 and ARC NBR98, the following distinctive fabrics were noted:

1. A hard, red fabric with some inclusions of medium quartz sand, and medium moulding sand. This is similar to the most abundant tile fabric from London (MoL fabric group 2815), much of which was probably produced at kilns in the Brockley Hill on Watling Street to the north of London (ARC PHL97 and ARC NBR98).

2. A red fabric speckled with fine black iron-oxide inclusions; fine black-speckled moulding sand. Similar to, but possibly slightly finer and harder than, MoL fabric 3060, which is thought to come from kilns at Radlett, Hertfordshire. It is, however, likely that similar clays were exploited by other tileries, and some of this production may have a Kentish source (ARC PHL97 and ARC NBR98).

3. A yellowish-white, clean fabric with moderate inclusions of colourless or rose quartz, similar to Mol fabric 2454 and CAT fabric 8. This is identical to tiles produced at the tile kiln at the Eccles villa north of Maidstone (ARC NBR98).

4. A fairly soft, fine, orange fabric, with fine moulding sand (ARC PHL97 and ARC NBR98).

5. A range of orange-brown fabrics, with varying amounts of quartz and iron-rich inclusions; some have cream silt or calcareous clay inclusions (ARC PHL97).

Post-Roman building material

- 1.3.6 Post-Roman material from the southern part of the site (ARC PHL97) comprised three fragments of peg or plain tile, of which two were in a red fabric with fine moulding sand (MoL fabric 2276). The third fragment was in an orange fabric with cream silty streaks and orange-brown and fine black inclusions. None was glazed, nor were any complete tiles, or complete dimensions, noted. Dating of this tile type is difficult, as peg tiles have changed little since the 13th century, but the absence of glaze suggests that these are unlikely to be earlier than *c*. AD 1400. A further two fragments of peg or plain tile were recovered from the northern part of the site (ARC NBR98), of which one was in a silty, sandy fabric speckled with fine black iron oxides, and the other was in an orange, slightly micaceous fabric with fine moulding sand (near MoL fabric 2276). Neither was glazed, nor were any complete tiles, or complete dimensions, noted. Dating of this tile type is difficult, as peg tiles have changed little since the 13th century, but the absence of glaze suggests that these are unlikely to be earlier than *c*. AD 1400. A further two fragments of peg or plain tile were recovered from the northern part of the site (ARC NBR98), of which one was in a silty, sandy fabric speckled with fine black iron oxides, and the other was in an orange, slightly micaceous fabric with fine moulding sand (near MoL fabric 2276). Neither was glazed, nor were any complete tiles, or complete dimensions, noted. Dating of this tile type is difficult, as peg tiles have changed little since the 13th century, but the absence of glaze suggests that these are unlikely to be earlier than *c*. AD 1400.
- 1.3.7 In addition, two fragments of brick in a sandy red fabric were recorded from the northern part of the site (ARC NBR98); this is similar to MoL fabric 3046 which has a date range of *c*. 1450 to *c*. 1700. One piece was over-fired.
Provenance

- 1.3.8 The post-Roman material from the southern part of the site (ARC PHL97) comes from two contexts only, (1003) and (1007).
- 1.3.9 The post-Roman brick and tile from the northern part of the site (ARC NBR98) comes from two contexts only, (10059) and (10290).
- 1.3.10 There are no good groups of ceramic building material, and the assemblage is very small and likely to be residual, so it is of little potential value. The tile fabrics may provide evidence of the distribution of the products of identifiable kilns.

Conservation

- 1.3.11 The condition of the material is fairly abraded, but there is no risk to its preservation. Further analysis may be needed on some of the material, so it should not be placed in long term storage until this has been carried out. There are no special requirements for long term storage, other than the use of robust packaging materials and a dry environment.
- 1.3.12 After full recording and quantification the majority of the material can be discarded. The following should be retained: samples of all the fabrics; tiles with distinctive markings, such as combing, tally marks, signature marks or stamps; the quantity retained is likely to be equivalent to between 10% and 20% of the assemblage.

Comparative material

1.3.13 The tile fabrics should be compared with the Canterbury Archaeological Trust's tile fabric type series, which could provide information on their sources and date ranges. Comparison with material from other Roman sites in north Kent would be informative, and one fabric is identical to tile produced at the Eccles villa, north of Maidstone. Some of the fabrics occur in London, which suggests that they may be travelling some distance.

Potential for further work

1.3.14 The tile fabrics provide evidence for the sources of the building materials used in the Roman and post-Roman periods, but the very small quantities present suggest that the material is unlikely to derive from structures associated with the cemetery.

Recommended future work

- 1.3.15 Comparison of the fabrics with those in the Canterbury Archaeological Trust and Museum of London type series, and describe fabrics.
- 1.3.16 Quantification (sort material by fabric and form and count and weigh each group; computerise data). The assessment data will be used as far as possible, but the groups will need proper quantification. Select material for illustration, if appropriate.
- 1.3.17 Further consideration could be given to the stratigraphic contexts from which the material derives, should more detailed stratigraphic analysis suggest significant concentrations in the material.

1.4 Fired clay

By Susan Pringle

Introduction

- 1.4.1 Fired clay was recovered by hand excavation from a variety of contexts in order to address the Fieldwork Event Aims.
- 1.4.2 The Fieldwork Event Aims which the an analysis of this assemblage can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.
 - Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

1.4.3 All of the material has been scanned for the assessment using a binocular microscope. The assemblage has been counted and weighed, and the presence of features such as original surfaces, impressions or tempering noted.

Fired clay

- 1.4.4 The total assemblage of fired clay comprising 18.023 kg was assessed (0.188 kg from ARC PHL97 and 17.835 kg from ARC NBR98).
- 1.4.5 Some of the fired clay scanned is likely to be natural soil that has been accidentally fired by contact with cremation fires. Some, however, has smoothed surfaces or, more rarely,

impressions which suggest that it formed part of some sort of structure or feature. No signs of wattle imprints or attached lime mortar were noted on any of the fragments, which suggests that the fired clay/daub was not destruction debris from clay and timber domestic buildings.

- 1.4.6 Fabric analysis has not been carried out, but two types were noted: a fine, orange brown, sandy fabric with fine mica, and a harder greyish brown fabric with inclusions of white flint flakes.
- 1.4.7 Much of the fired clay and daub was reduced and blackened, suggesting that it may have been burnt in anaerobic conditions. This is presumably a result of the nature of the procedures or rituals which were used for the cremation process.
- 1.4.8 The following features of interest were noted: smoothed surfaces (contexts 168, 597, 1177, 1701, 1703 and 1738), grass impressions (469, 556, 1322), perforations (samples <93> and <96>, context 586) have 3 mm wide holes running through them). The origin of these is uncertain; further examination is needed to assess whether these perforations are natural and due to worm or root action, or whether they are the result of human activity, either as impressions of some organic material incorporated into the daub, or deliberately formed with a twig or similar tool. The daub slab in which they occur has one smoothed surface and one quite rough, as though it may have formed part of the lining of a fire-pit or hearth.
- 1.4.9 One fragment of fired clay has a corroded iron object attached, possibly the remains of a nail (context 560).

Provenance

1.4.10 The provenance of the fired clay is also not clear at this stage, but as it is associated with a number of cremations and cremation burials it should be examined again when fuller stratigraphic information is available.

Conservation

1.4.11 The condition of the material is fairly abraded, but there is no risk to its preservation. Further analysis may be needed on some of the material, so it should not be placed in long term storage until this has been carried out. There are no special requirements for long term storage, other than the use of robust packaging materials and a dry environment.

Comparative material

1.4.12 A brief review of published sources suggests that fired clay has not been identified elsewhere as a component of burial ritual. This implies that further analysis of the Waterloo Connection material will be required in order to establish whether genuine fired clay structures were indeed present, or whether the fired clay is the result of incidental burning by contact with cremation pyres.

Potential for further work

1.4.13 The fired clay and daub is a potential source of information on the types of structure associated with Roman cremation practices.

Recommended future work

1.4.14 As noted in 1.4.13 above, further analysis of the contexts in which the fired clay occurred, and the spatial distribution of the material, will be required in order to establish whether it represents funerary structures or natural soil that has been incidentally burned through contact with cremation pyres.

APPENDIX 2 - LITHICS

2.1 Flint

By Philippa Bradley

Introduction

- 2.1.1 An assemblage of worked and burnt flint was recovered. The material was generally undiagnostic debitage with few retouched forms being recovered. The material was spread thinly across the site with only a few contexts producing more than 10 pieces of worked flint. The burnt unworked flints were slightly more concentrated, but this might be expected if the majority of this material relates to cremation ritual rather than any prehistoric activity.
- 2.1.2 The Fieldwork Event Aims which analysis of the material can be expected to contribute to are as follows:
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.

Methodology

2.1.3 All of the worked flint was briefly scanned and recorded, with information regarding dating, technology and general condition being noted. The burnt unworked flint that was boxed with the worked material was scanned and weighed; general notes on the condition of this material were also made. Any burnt worked flint found amongst the unworked material has been added to the worked flint database. Several boxes of worked and burnt unworked flint were simply scanned for worked items and were not recorded. These pieces totalled 505 and 220 respectively. Much of the worked material that was scanned consisted of chips, flakes and pieces of irregular waste. As noted above many of the chips may on closer inspection prove to be natural. A large quantity of natural flint was recovered and this material has been added to the database and discarded.

Quantification

2.1.4 A total of 401 pieces of worked flint and 221 pieces of burnt unworked flint, weighing 5081 g was recovered. In addition 505 pieces of worked and 220 pieces of burnt unworked flint was scanned only and not recorded. The flint is listed by context in Tables 2.1-2.4.

Provenance

2.1.5 The flint came from a variety of feature types and contexts including grave fills and the fills of cremation pots. There appeared to be no particular concentrations of material (see above), and the material was very abraded indicating that it had been redeposited.

Conservation

2.1.6 Much of the flint has suffered some post-depositional damage and from the general appearance of the material it is likely that much of it has been redeposited. Cortication is mostly light to medium; although a few pieces are more heavily corticated. The burnt unworked flint recovered was mostly very heavily calcined, and some of this material is beginning to disintegrate. However, there is little that can be done to stop this process. It is recommended that samples only of the burnt flint are retained. In general the flint is appropriately bagged and boxed for long-term storage, although some reorganisation is required. A great deal of natural flint was recovered which has been discarded during the assessment. It is therefore recommended that an initial task should be the revision of all of the box lists. This will result in a reduction in the overall total numbers of boxes.

Comparative material

2.1.7 The flint has generally limited further potential. It is a relatively undiagnostic group of mostly debitage. The flint was recovered from a large number of contexts and little focus for activity was identified. However, the flint does provide evidence for probable Neolithic or early Bronze Age activity, and as such provides useful background information regarding the use of the landscape in prehistory. Sites along the CTRL route will provide useful comparative material including any flintwork that came from surface collection prior to evaluation of the sites.

Potential for further work

2.1.8 As noted above the flint has very limited further potential. However, if the site is published a summary of the material should be included. It is suggested that this assessment is summarised for this purpose. The flint provides some evidence for probable Neolithic or early Bronze Age activity, and could contribute to general analysis at landscape zone level for the periods 'Early Agriculturalists' and 'Farming Communities'.

2.2 Humanly Modified Stone

By Ruth Shaffrey

- 2.2.1 The Fieldwork Event Aims which the assemblage can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.

- Fieldwork Event Aim 8: o establish the spatial development of the cemetery as far as possible within the area of investigation.
- Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
- Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
- Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
- Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.
- Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

2.2.2 All retained stone was examined.

Quantification

- 2.2.3 Approximately 250 fragments of stone were retained from the excavations but the bulk of these were unworked gravel and pebbles. The material is summarised in Tables 2.5-2.8.
- 2.2.4 There were three possible whetstones from contexts 10275 (grave fill), 724 (cremation pit fill) and 882 (grave fill). These are discussed further in the comparative material section. Additionally, seven small fragments of lava were recovered from context 10018, which was a naturally filled pit. Although the lava fragments were very small and showed no evidence of use, lava rotary querns and millstones were commonly imported and it is likely, therefore, that these fragments are all that remain of what were originally querns. No burnt stone was recovered.

Provenance

2.2.5 With the exception of the fragments of the lava, which comes from the Rhineland, the utilised stone, (the Greensand and the Ironstone) are probably from local sources.

Conservation

2.2.6 There are no conservation requirements. All unworked stone could be discarded.

Comparative Material

2.2.7 The deposition of two potential whetstones in grave and cremation pits fills may be of some significance. Tools such as these are very rare in funerary contexts and as such are of interest; they generally occur in less than 1% of graves in a cemetery (Philpott 1991, 189). It has been suggested that domestic artefacts and tools placed in these contexts may be representative of the deceased's occupation or an activity with which they were often associated (Philpott 1991, 187;189). Although the deposition of whetstones in such contexts is unusual, there are other examples. At Bourn, Cambridgeshire, a whetstone was found in one of the Roman barrows and hones in another (Liversidge 1977, 24) while whetstones have also been found in funerary contexts at Winchester (Jones 1978, 93; Ellis 197, 254), Burbage (Goddard 189, 90) and Malton (Robinson 1978 35, no 270; 36 no 293).

2.2.8 The fragments of lava which were recovered, although small, are almost certainly parts of querns or millstones, though they retain no original features and can add nothing to our understanding of the typology of lava rotary querns. The recovery of fragments of lava, which weathers easily and becomes very friable, is commonplace and indeed, many fragments have also been found in Springhead itself (Roe 1999, 29). Within the CTRL project, lava querns or evidence of lava querns has also been found at Thurnham ARC THM 98 (Shaffrey 2000) and Hurst Wood ARC HWD 98 (Shaffrey 2000). The presence of lava querns and fragments at Springhead and it's associated cemetery is unsurprising as lava querns have been found at sites across Kent and the local region. Examples include Darenth (Black 1987, 117; Payne 1897, 74) and Keston Roman Villa (Philp et al 1991, 179) where only fragments remain.

Potential for further work

2.2.9 No further work is recommended. This assessment report can be used for any further synthetic studies.

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APPENDIX 3 - GLASS

3.1 Glass

By Hilary Cool

Introduction

- 3.1.1 This assessment deals with the 17 fragments of glass and one frit bead from ARC PHL 97 and two frit beads and 153 glass fragments from ARC NBR98. Of these, 43 items (approximately 25%) came from sieved samples.
- 3.1.2 The Fieldwork Event Aims that the material can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.
 - Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

3.1.3 As the assemblage was small all the material was inspected. A basic archive catalogue following the guidelines set out by the Roman Finds Group and Finds Research Group (RFG and FRG 1993) was entered into an Excel spreadsheet. This records context, small find number (if assigned), independent date of the fragment, number of fragments, simple name and brief description of the fragments. This catalogue will provide sufficient information about the less diagnostic fragments for the full catalogue at the analysis stage, and the fragments themselves will not require further inspection.

Quantification

3.1.4 The glass is summarised according to broad category and site in Table 3.1. Table 3.3 provides the details of each fragment.

- 3.1.5 The vessel glass includes substantial portions of two conical unguent bottles (ARC NBR98 sf 814 and 1920) of 1st-2nd century date. It may be possible to refine the date of sf 1920 when it is reconstructed. There is also a fragment of a 1st-early 3rd-century square bottle as well as undiagnostic body fragments from colourless, yellow/green, blue/green and opaque turquoise vessels. The last mentioned is a most unusual piece (sf 949). The less diagnostic fragments are most likely to be of 1st-2nd-century date, and there is no 4th-century material present.
- 3.1.6 The beads are summarised in Table 3.2. Beads can have long lives as they are often reused. In general, however, this is an early to mid Roman assemblage. The large annular glass beads and the frit melon bead are 1st to mid 2nd century forms, while the gold-inglass beads, the polychrome biconical beads, the pentagonal green and yellow beads, and the short biconical blue beads all start to appear in the mid 2nd century. It is in the mid 2nd century too that the globular forms start to appear with some degree of regularity.
- 3.1.7 It should be noted that although many of the beads are common forms, some are most unusual. These include the conical blue bead and the opaque red biconical beads. The yellow-lined green pentagonal beads are also an uncommon find.
- 3.1.8 The chips of glass recovered from sieving could come from either beads or vessel glass. The more strongly coloured ones are most likely to come from beads. They cannot be usefully dated.

Provenance

- 3.1.9 The two conical unguent bottles were both recovered from grave fills and their contents could well have been associated with the burial ritual. The other vessel glass fragments could be accidental incorporations into grave fills.
- 3.1.10 All of the beads were found in burials. In three cases (sub-groups 10512, 10824, 11673) only a single bead was found and these could be accidental inclusions. In one cremation (sub-group 10851) and two inhumations (sub-groups 945 and 10522) groups of beads that had formed necklaces and bracelets were found, and these were clearly deliberate deposits forming part of the grave goods of the individual.

Conservation

3.1.11 The glass is chemically stable and needs no conservation input. The current packaging is adequate for long term storage. It is not normal practice to discard Roman glass.

Comparative material

- 3.1.12 The typology of Roman vessel glass is increasingly well understood and works of reference such as Cool and Price (1995) and Price and Cottam (1998) can be used to provide the appropriate national background for the vessels.
- 3.1.13 The standard work of reference on Romano-British beads (Guido 1978) will be of value in setting the bead assemblage in its national context. As this work tends to be heavily biased towards dating beads to the 4th century, the most useful *comparanda* for the Waterloo Connection will be in the few closely dated large assemblages of the 2nd and early 3rd century such those from the Fortress baths drain deposits at Caerleon (Brewer 1986) and the *vicus* at Castleford (Cool and Price 1998).

3.1.14 The most useful *comparanda* for both the vessels and the beads as grave goods are summarised in Philpott 1991. Amongst more recent work the eastern cemetery of London (Barber and Bowsher 2000) will be a valuable source of information, especially as it lies within the same area of Britain and was excavated and processed under similar conditions. This is especially important for small items such as beads which can be missed if sieving is not carried out.

Potential for further work

- 3.1.15 The potential of this assemblage can be considered from two aspects, those connected with the original Fieldwork Event Aims (see above) and new research aims suggested by the material itself.
- 3.1.16 It may be possible to refine the dating of the fragmentary conical unguent once it has been reconstructed. This will be of especial interest as it comes from a grave that is not dated by the pottery. This vessel may thus be of some value in helping to establish the chronology of the cemetery.
- 3.1.17 The difficulty of using beads as a dating tool has already been noted. However, in two graves where there is no pottery date, the groups of beads may be the best dating evidence there is. They would suggest a later 1st to mid 2nd century date for sub-group 945 and a later 2nd to earlier 3rd century date for sub-group 10851. Again therefore the beads may thus be of some value in helping to establish the chronology of the cemetery
- 3.1.18 The unguent bottles and the deliberately deposited bead necklace and bracelets will contribute, alongside the other grave goods, to the analysis of spatial variation within the cemetery.
- 3.1.19 None of the glass appears to have come from ancillary features and so it has no potential for helping to elucidate their role.
- 3.1.20 Prior to the late Roman period, it is unusual to find groups of beads which were definitely strung together to form a single ornament. The discovery of three such groups at this cemetery will therefore be of particular value to bead studies in general. Of especial interest is the necklace from sub-group 10522, a grave usefully pottery dated to the late 2nd to early 3rd century. This necklace has 109 beads of six different types. This necklace will undoubtedly be much cited as a well dated source of *comparanda* once it is published, especially as it contains rare forms not present in the only other large group of beads of that date from Caerleon.
- 3.1.21 The two groups of beads from inhumations (sub-groups 10522, 10851) both have goldin-glass beads. When initially studied, it was suggested that the introduction of gold-inglass beads could be associated with the dispatch of 5,500 Sarmatian cavalry to Britain under Marcus Aurelius (Boon 1977, 200). Further discoveries since suggest that this is unlikely but gold-in-glass beads continue to be used as evidence for the presence of the Sarmatians at Antonine military establishments (eg. Britnell *et al* 1999, 84). The publication of the gold-in-glass beads from this cemetery will, it is to be hoped, expose the Sarmatian connection for the fallacy it is. Those on the necklace from sub-group 10522 will be especially useful for this as the burial is independently dated by the pottery to very early in the lifespan of the bead type.
- 3.1.22 The two conical unguent bottles and the beads will be catalogued. The other vessel fragments will be tabulated as appropriate. The material should be catalogued according

to grave group in association with items of other materials where appropriate (the glass beads and the metal necklace fastener from sub-group 10522 for example) This work will be carried out after the conical unguent bottle has been reconstructed by the author.

- 3.1.23 A brief typological discussion placing the material in a chronological and regional/national context will be written. This will be done grave by grave so that the groups of beads that formed single necklaces or bracelets will be considered as single entities.
- 3.1.24 Material will be selected for illustration. It is suggested that both unguent bottles be drawn and a selection of the beads showing the different types present and the range within each type (*c*. 25-30 line drawings). It is strongly recommended that the bead groups be illustrated by colour plates in the final publication.

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Abbreviations

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APPENDIX 4 - METALWORK

4.1 Metalwork

by Hilary Cool

Introduction

- 4.1.1 This assessment deals with copper alloy and lead objects, and ironwork (excluding coffin nails which were recovered from a variety of contexts, but mostly from burials.
- 4.1.2 The Fieldwork Event Aims that the material can be expected to contribute to are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.
 - Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

- 4.1.3 The ironwork was selected and identified from an inspection of the X-radiographs. The copper alloy was assessed by inspecting the object (with inspection of the appropriate X-radiograph where appropriate). The lead was assessed by inspecting the object.
- 4.1.4 A basic archive catalogue following the guidelines set out by the Roman Finds Group and Finds Research Group (RFG & FRG 1993) was entered into an Excel spreadsheet. This records context, small find number (if assigned), material, count, simple name and brief description of the items. This data is summarised in Table 4.7.

- 4.1.5 The description of the brooches follow the nomenclature of Hattatt for the bow brooches (see for example Hattatt 1989, figs 154-230), and Fowler (1960) for the penannular brooch.
- 4.1.6 It should be noted that under count, the number entered for the hobnails is not always precise. Where large numbers (more than 50) have been assigned a single small find number, these have merely been quantified as 50+ or 100+, and precise quantification will be attempted at the analysis stage when the objects themselves are to hand. (Nails and hobnails were quantified and assessed separately from other classes of metalwork, see Appendix 4.2, below).
- 4.1.7 Basic context information and the pottery spot dating has been taken into consideration.

Quantification

- 4.1.8 The assemblage comprises 1683 objects (925 from ARC PHL97 and 758 from ARC NBR98). This total includes 90 objects recovered during sieving.
- 4.1.9 The metalwork under consideration here is summarised according to material in Table 4.1. As the assemblage is dominated by hobnails, these have been included as a separate category.
- 4.1.10 The metalwork is considered in more detail according to the generally accepted functional categories established by Crummy (1983). The range of items is limited, but the bias seems to be a direct result of what was being placed on the pyre and with the burials, rather than being the result of bias produced by excavating technique. The small fragments of copper alloy sheet recovered as part of the sieving programme suggest good recovery of small fragments.
- 4.1.11 As may be seen from Table 4.2, the personal ornaments and equipment category is dominated by hobnails from shoes. In only four cases are the hobnails corroded together preserving part of the nailing pattern (hobnail groups in Table 4.6). In the absence of substantial preservation of the nailing patterns it will not be possible to date them more closely within the Roman period.
- 4.1.12 Brooches and brooch fragments are relatively common, but as tabulated the brooches include fragments from the same grave which may prove to come from the same brooch after conservation. The most numerous brooch type is the Colchester Derivatives with a minimum of eight examples (ARC PHL97 sf 165, 1838; ARC NBR98 sf 928, 930-2, 1057, 1117, 1350, 1923-4). There are also four Nauheim Derivatives (ARC PHL97 sf 163, 1201; ARC NBR98 sf 958 and 1425) and a possible Hod Hill brooch (ARC NBR98 sf 1321). All of these would have been in use mainly in the mid to later 1st century with the Colchester Derivative brooches continuing in use into the 2nd century. There is one enamelled umbo brooch (ARC NBR98 sf 1204) of the 2nd century. A second umbonate brooch (ARC NBR98 sf 1951) will need investigative conservation before it can be more closely identified. The penannular brooch (ARC NBR98 sf 10126) is of a type that is not closely dated within the Roman period
- 4.1.13 The bracelets will all need investigative conservation before close identifications can be made. At present no examples of the very common late 3rd to 4th century types have been recognised. All appear to belong to types that were in use during the 2nd and 3rd centuries as well as the 4th. They include cable, torc-twisted, expanding and penannular bracelets.

- 4.1.14 Other personal ornaments are rarer. There is one rare finger ring form of possible 2ndcentury date which will need extensive investigative conservation before a precise identification can be made (ARC PHL97 sf 1334). The other finger ring is a late Roman form (ARC NBR98 sf 677). The third finger ring is modern (ARC NBR98 sf 10 from the topsoil). One pin head is not closely dated within the Roman period (ARC NBR 98 sf 926), the other (ARC NBR98 sf 13) is of late Saxon date. The necklace fastener is presumably late 2nd to early 3rd century date given the date of the beads it was associated with (see Appendix 3).
- 4.1.15 The only item of toilet equipment in the assemblage is a fragmentary mirror from an inhumation (ARC PHL97 sf 874).
- 4.1.16 The only tools are knife blades. There is one certain identification (ARC NBR98 sf 45) from the topsoil which may be of Roman date. There may also be a blade fragment from a cremation (ARC NBR98 sf 1159) though this will need investigative conservation to confirm the identification.
- 4.1.17 The fasteners and fittings are summarised in Table 4.3. The box fittings include multiple fragments from a box decorated with lion-headed studs (ARC PHL97 sf 332) and an isolated lion-headed stud (ARC PHL97 sf 1815) both from cremations. This type of stud is current during the late 1st and 2nd centuries. The other copper alloy fittings are less closely dateable within the Roman period. The iron fittings are probably associated with coffin construction (see Appendix 4.2).
- 4.1.18 The other items recovered are summarised in Table 4.7. The items identified simply as objects will need investigative conservation before they can be identified. Items such as the bell and the terminal (possibly from the lid of a small metal vessel) can be identified as Roman but not closely dated within that period. The other items are not independently dateable.

Provenance

- 4.1.19 Table 4.5 tabulates the metal items under consideration according to whether they were found in a particular grave. As can be seen by comparing Table 4.5 with Table 4.1, a high proportion (97.5%) was associated with graves, with relatively little being found in other contexts or in the topsoil.
- 4.1.20 The majority of the metalwork cannot be closely dated within the Roman period. Where a close date is possible it belongs to the 1st to 2nd centuries, and there is only one item (ARC NBR98 sf 677) that would conventionally be dated to the 3rd to 4th centuries. One interesting find from the topsoil (ARC NBR98 sf 13) indicates late Saxon activity in the vicinity as it is a dress pin of 8th to 9th century date.
- 4.1.21 It was not considered appropriate as part of the assessment to examine the precise contexts in detail to establish whether items associated with particular graves were deliberate inclusions such as grave goods, parts of the grave furniture etc., or just accidental inclusions in the fill. Some idea of the scale of the 'accidental inclusion' category may be gained by examining the numbers of hobnails in the graves. If there are less than 10 then accidental inclusion might be concluded. More than 50 certainly indicate the deposition of shoes in the grave or on the pyre. For numbers between 10 and 49 the status is less clear-cut but probably inclines towards the deliberate deposition of shoes. As can be seen from Table 4.6 over two-thirds of the graves with hobnails have them in sufficient numbers to suggest deliberate deposition. Therefore, though

some of the metalwork items found in the graves may be accidental inclusions, a high proportion are likely to be deliberate deposits associated with the funeral ritual.

Conservation

- 4.1.22 Full details of the needs for long term storage are itemised. Approximately 45 items have been selected for further conservation input to aid final analysis. The amount of input that will be required varies from air abrading selected areas on ironwork items (to establish details), to lightly cleaning surface soil from some copper alloy items (to aid illustration). The investigation of some areas where organic traces have been preserved by mineral replacement will also be needed. The precise work done will be decided after consultation with the conservator. None of this work should conflict with long term storage. The small find numbers of the selected items are as given below.
 - ARC PHL 97 2, 3, 8, 163, 165, 305, 874, 1092, 1334, 1753, 1805, 1815
 - ARC NBR 98 150, 262, 442, 677, 678, 681, 687, 767, 827, 829, 892, 926, 927, 930, 931, 932, 958, 1117, 1119, 1159, 1180, 1204, 1212, 1213, 1321, 1350, 1425, 1923, 1924, 1951, sample 221 and one item from context 10597
- 4.1.23 There are a very few items in the assemblage such as ARC NBR98 sf 10 and 11 that are obviously modern. These could be discarded but the rest of the assemblage should be retained.

Comparative material

- 4.1.24 A moderately large metalwork assemblage has been published from the excavations at Springhead (eg Penn 1958, 1960, 1963). Elsewhere in the region good metalwork assemblages have been published from Canterbury (see for example Blockley *et al* 1995) and Lullingstone (Meates 1987). The material from the CTRL excavations at Thurnham Roman villa will also provide useful comparanda, especially in the case of the brooches. All of these are non-sepulchral assemblages, but will be useful in helping to set this material in its local context.
- 4.1.25 On a national level Philpott's survey of Roman burial practice (1991) will be invaluable in providing a general background to grave furnishings.
- 4.1.26 To fully understand the grave furnishings associated with the cremation burials it will be necessary to compare the metalwork assemblage to assemblages from similar burials where the cremations have been processed under modern conditions, which guarantees full retrieval of pyre goods etc. There are at present relatively few of these published, but examples that do fulfil these conditions include a small cemetery at Each End Ash, Kent (Hicks 1998), the Eastern Cemetery, London (Barber and Bowsher 2000) and at Caerleon (Evans and Maynard 1997). It will also be possible to draw on information from the cremation cemetery at Brougham, Cumbria which is currently being worked upon by the author.
- 4.1.27 Earlier excavations where the cremations have not been processed by wet sieving will be of less value as comparanda, but it is likely that some useful information can be gained from sites such as Ospringe (Whiting 1921, 1923, 1925, 1926; Whiting *et al* 1931).
- 4.1.28 Several less common burial rites include the use of boxes decorated with lion-headed studs and the placing of bracelets with 2nd century cremation burials. For the former the study by Borrill (1981) will form the starting point. For the latter isolated occurrences at

sites such as Verulamium (Davey 1935) and Godmanchester (Taylor 1997) will need to be considered.

Potential for further work

- 4.1.29 The assemblage has the potential to address all of the Fieldwork Event Aims listed above (4.1.2).
- 4.1.30 The metalwork will be of limited value in helping to establish the chronology of the cemetery as relatively few items are closely dated. It does have a moderate potential, however. There is dateable metalwork in some graves which do not contain dateable pottery (290, 1123, 1340, 10595, 10741, 10824, 11008, 11330, 11502, 12046). In grave 10595 there is a late Roman finger ring whereas the pottery is late 2nd to early 3rd century, and so a later date might be suggested for it.
- 4.1.31 The range and number of finds recorded should help establish spatial variations within the cemetery and the identification of ancillary features associated with specific burial practices. There are, for example, 30 graves where shoes are likely to have been deliberately placed and 16 graves with brooches. Among the cremation burials there are both burnt and unburnt items. Uncommon burial rites such as *in situ* or *bustum* burial have also been identified. When the metalwork is studied in conjunction with all of the other contents of the graves, interesting spatial and other patterns may well emerge.
- 4.1.32 There are currently relatively few early to mid Roman cemeteries that have been excavated and published under modern conditions which guarantees full recovery of all the material. The publication of this cemetery including the metalwork component will thus be of national value, and will undoubtedly contribute to any future national synthesis.
- 4.1.33 It is very noticeable that the brooches from the cemetery are in the main 1st-century forms even when they are occurring with 2nd-century pottery (see for example subgroup 11584). In considering the Thurnham brooches it was suggested that a pattern *may* be emerging that suggests Kentish brooch use might have a slightly different chronology to the generally accepted one. It is possible that this can also be demonstrated at this cemetery. The brooches certainly have the potential to contribute to a regional study of brooch use in Kent.
- 4.1.34 Bracelets were found with two cremations (sub groups 57 and 11240). It is unusual to find bracelets in cremations as this was not a common ornament before the 4th century. Quite often when bracelets are placed with cremation burials they are also accompanied by other items which might suggest some form of ritual based in religious belief was being followed. The bracelets in these two cremations might thus have the potential to cast light on the beliefs of the deceased (or their relatives).
- 4.1.35 In order to fully extract the potential outlined above the following steps will be necessary.
- 4.1.36 The items detailed in 4.8 4.18 will be catalogued (approximately 50-60 items depending on how many of the brooch fragments are found to belong to the same brooch see 4.12) The hobnails will be tabulated. The material should be catalogued according to grave group in association with items of other materials where appropriate (the glass beads and the metal necklace fastener from sub-group 10522 for example) This work will be carried out after the investigative conservation has been completed.

- 4.1.37 A brief typological discussion placing the material in a chronological and regional/national context will be written.
- 4.1.38 The metalwork evidence will be integrated with other kinds of artefactual and stratigraphic data, to produce an overview of each grave group. This characterisation of differing burial rites will be used to contribute to a detailed understanding of the practice of burial throughout the period of use of the cemetery, and to an enhanced understanding of the organisation and development of the cemetery through time.
- 4.1.39 Material will be selected for illustration. It is anticipated that 35 line drawings will be required, together with a drawing of the box ARC PHL97 sf 332 which has several elements.

Bibliography

Abbreviations

RFG & FRG 1993 Roman Find Group and Finds Research Group AD 700-1700, 1993. The guidelines for the preparation of site archives and assessments for all finds other than fired clay vessels.

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4.2 Coffin nails, coffin fittings and hobnails

by Valerie Diez

Introduction

- 4.2.1 A large assemblage of coffin nails and coffin fittings was recovered from the cemetery by hand excavation and processing of soil samples. The locations of nails recovered by hand excavation were recorded in order to allow detailed study of burial practices as reflected by coffin and casket construction.
- 4.2.2 The Fieldwork Event Aims to which the analysis of the assemblage might be expected to contribute are as follows:
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 13: To establish the nature and date of occupation pre-dating the cemetery.
 - Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.
- 4.2.3 This assessment included axonometric reconstruction of selected coffins in order to evaluate the potential for further work.

Methodology

- 4.2.4 All the examples selected for reconstruction comprised at least 20 nails. Other aspects considered were coffin fittings, coffin stains, direction of the nails and the direction of any surviving wood grain.
- 4.2.5 During excavation, each nail was given an individual small find number and was three dimensionally recorded.

Quantification

- 4.2.6 In total, 3652 nails and 726 hobnails were recovered. The general quantification of coffin nails and hobnails appears in Table 4.1.
- 4.2.7 A total of 44 graves contained coffins and the number of nails varied from 20-59. Coffin fittings were recovered from 14 contexts. With the exception of a bracket and a fitting they were all confined to the southern portion of the cemetery.

Assessment of coffin fittings

4.2.8 Numbers of nails ranged from single examples up to a maximum of 41 nails. There appear to be clusters of nail numbers around the low 20s and the mid 30s, possibly

reflecting differing constructional techniques. It is often possible to determine coffin dimensions and in some cases the coffin corners are defined by clusters of nails (eg. 1088 and 10162); coffin stains are also present graves (eg. 1088 and 10862). Determining depth is slightly less straightforward and requires a large number of nails. Furthermore coffins would have collapse as they decayed leading to the movement of nails.

- 4.2.9 Many of the nails exhibit clear evidence of wood grain in the corrosion product. Future detailed examination of the nails in conjunction with the detailed three-dimensional recording will allow timber thicknesses, coffin types/dimensions and constructional details to be identified.
- 4.2.10 The field records demonstrate that both rectangular and tapering wooden coffins were used. In a significant number of examples nails pointing downwards (i.e. lid nails) have been recorded. Lid nails have only rarely been recorded elsewhere, for example at Lankhills, Winchester (Clarke 1979).
- 4.2.11 In several instances the timber of the coffins survived as a shadow. There are also at least two examples where the dimensions of the coffin (2.5 x 0.55 m) and the nail configuration suggests that there was a separate compartment at one end of the coffin for grave goods, similar to an example excavated at Kelvedon in Essex (Rodwell 1988). Two coffins may also have contained boxes that housed grave goods.
- 4.2.12 Apart from coffin nails, there are very few structural fittings. Up to six of the coffins may have had corner brackets, although no significant numbers have been found in any single grave, suggesting that they may have been used sparingly to strengthen coffins rather than as a primary construction method.

Pilot study for detailed analysis of grave furniture

- 4.2.13 Coffin dimensions of the sample assessed in detail appear in Table 4.2. The dimensions are quite variable, but these examples all seem likely to be the burials of adults.
- 4.2.14 Some evidence for the methods of construction has been recovered. Some of the coffins were made from planks. It is not possible however to determine how many. They were generally nailed along the whole length of the base, except in grave 1088, where all the nails tend to concentrate mainly in the corners. This may suggest the use of other means of joining, such as wooden pegging.
- 4.2.15 Evidence for lids was not present in any of the graves analysed for this assessment. If the lids were not secured to the sides of the coffins with nails, wood stains would be the only evidence of a lid ever being present.
- 4.2.16 Some of the inhumations contain some goods, mainly pottery vessels. They seem to be located both in and outside the coffin. Grave 1225 contained one pot, apparently located next to the feet of the body, as a cluster of hobnails were found directly above the vessel. Grave 10162 contained a vessel which had been placed inside the coffin. Grave 1088 contained two pots which had been placed outside the coffin at one end.

Potential for further work

4.2.17 The presence or absence of coffins may correlate with the presence or absence of other objects and features, and shed light on chronological variation, status and beliefs of

individuals and groups, and aspects of burial ritual through time. Studies of casket and coffin construction would be addressed as follows.

- 4.2.18 In a limited number of cases, three-dimensional plotting of coffin and casket linked finds (eg nails, fittings) would be undertaken, and the data would be presented as an axonometric drawing. A pilot study has been carried out for a selection of graves and an example axonometric drawing produced (Figure 6). This suggests that there is potential for elements of coffin construction to be determined, although the number of graves with sufficient nails is relatively limited.
- 4.2.19 In these cases and in others, evidence of casket and coffin construction would then be integrated with the detailed analysis of individual grave groups (finds, bone evidence, grave construction, environmental/animal bone etc). This would allow the identification of groups of similar burials, for the purposes of spatial and chronological analysis of distribution. It has been noted at assessment stage that the great majority of coffin fittings are restricted to graves in the southern area of the cemetery; there is likely to be a reason for this.

APPENDIX 5 - COINS

5.1 Roman Coins

by Paul Booth

Introduction

- 5.1.1 Fourteen Roman coins were recovered from the site. Coins were recovered in hand excavation but a number were located by metal detector used in conjunction with hand excavation. The use of the metal detector means that a fairly high rate of recovery of coins can be assumed, increasing their basic value as dating evidence.
- 5.1.2 The Fieldwork Event Aims which the assemblage can be expected to contribute are as follows:
 - Fieldwork Event Aim 1: To establish the origins and decline of the Roman settlement.
 - Fieldwork Event Aim 2: To recover the plan and a dated occupation sequence for all phases of that section of the Roman settlement (including the rural-urban fringe and immediate hinterland) affected by the CTRL, to further the understanding of the extent and character of the core Roman settlement, its interaction with its immediate environs, and changes through time.
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.

Methodology

5.1.3 All the coins were X-rayed and then examined briefly. The condition of the coins was very variable: full identification was occasionally possible with relatively little work, but in other cases close dating was not possible owing to the degree of wear, corrosion or encrustation. Coins were dated as closely as possible, and the need for further specialist cleaning in order to facilitate identification was also indicated where appropriate.

Quantification

- 5.1.4 Only one coin came from the 1997 excavation (ARC PHL97). All the rest were from the 1998 excavation (ARC NBR98). Only sf 1515 came from the backfill of a grave (962). The remainder came from the topsoil, the hollow way 10029 and the large pit or well 10415 which predated the hollow way.
- 5.1.5 The 14 coins (including surface and metal detector finds) can be broken down by approximate period and appear in Table 5.1.

Provenance

5.1.6 The assemblage is too small for detailed comment on chronological trends. The earliest coin, of Claudius I, is relatively unworn and is consistent with the use of the cemetery from the immediate post-conquest period, as suggested by the pottery. No later 1st- or early 2nd-century coins are present, but there are four coins of the mid to late 2nd century. The range of 4th-century material is unremarkable, except insofar as these coins are relatively common, while very few graves are clearly dated to this period. The latest coin is of the House of Valentinian and is dated *c*. 367-375. Only one coin derived from the backfill of a grave, however, so their relationship to the operation of the cemetery is still unclear. Most of the coins were recovered from silts filling the hollow way and the shaft/ well, which tends to support the impression of dereliction by the late 4th century.

Conservation

5.1.7 Nine of the 14 coins require specialist cleaning in order to improve their identification (though it is not certain, in one or two cases, that anything identifiable remains), but consolidation work is unlikely to be appropriate.

Potential for further work

- 5.1.8 The coins are most important for dating the contexts from which they derive. Regardless of the position of these features and deposits in relation to the rest of the cemetery the coins can still inform interpretation of the overall chronological development of the site. The coins which require cleaning (see above), plus a further three coins, will need more detailed examination to maximise the information recovered, particularly with regard to dating. Only two coins require no further examination at this stage. The records of these and the records for the remaining coins, updated in the light of cleaning and more detailed examination, can be used to refine understanding of the chronological sequence of the site. They can be compared with other assemblages from Kent, both from the various sites within the small town of Springhead and also with the cemetery assemblage from Ospringe, to determine the extent to which the pattern of coin loss observed at the cemetery is typical of the region.
- 5.1.9 The Ospringe cemetery produced a larger assemblage of coins (64) ranging across the whole of the Roman period, but as at Waterloo Connection very few of these (four, from a single grave) were clearly associated with burials (Whiting, Hawley and May 1931, 100).

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5.2 The Post-Roman Coins

Introduction

5.2.1 A total of five post-Roman coins were recovered, of which two were of 17th-century date, one was of 18th-century date, and two were 19th- to 20th-century. Corrosion ranged from moderate to heavy. The coins are summarised in Table 5.3. All were unstratified in the topsoil.

Potential for further work

5.2.2 The small assemblage of coins has no potential for further analysis.

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APPENDIX 6 - WORKED BONE

6.1 Worked Bone

by H.E.M. Cool

Introduction

- 6.1.1 The assemblage comprised 13 fragments almost certainly from a single item found in a cremation. The fragments were recovered by hand excavation.
- 6.1.2 The Fieldwork Event Aims that the material can be expected to contribute to are as follows:
 - Fieldwork Event Aim 3: To recover artefact assemblages (especially pottery) to elucidate the sequence of site development; provide information on trade and exchange within the local, regional and international economy, and the status and economy of the settlement.
 - Fieldwork Event Aim 4: To determine the origins and decline of urban functions within the settlement.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 8: To establish the spatial development of the cemetery as far as possible within the area of investigation.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.

Methodology

- 6.1.3 All of the fragments were inspected. A basic archive catalogue following the guidelines set out by the Roman Finds Group and Finds Research Group (RFG & FRG 1993) was compiled. This records context, small find number, material, number of fragments, simple name and brief description of the fragments.
- 6.1.4 Information about the nature of the context was available and has been taken into consideration.

Quantification

6.1.5 The bone appears to represent a single fragment of inlay, details of which are given in Table 7.1.

Provenance

- 6.1.6 The fragments came from a single cremation burial and were clearly placed on the pyre because they are burnt.
- 6.1.7 The scarcity of worked bone from the site presumably reflects the poor preservation of bone in general although cremated bone survived well. It may be assumed therefore that unburnt bone will not have survived but that worked bone items placed on the pyre should have, unless they were not collected for burial.

Conservation

- 6.1.8 The fragments are currently obscured by soil. They will need to be cleaned. Special care should be taken when cleaning to see if the fragments were originally stained or coloured in any way.
- 6.1.9 It is not normal practice to discard Roman worked bone objects.

Comparative material

6.1.10 The largest collection of bone inlays associated with cremation burial come from the Roman cemetery at Brougham Cumbria. These are currently unpublished but the report is available to the author as *comparanda*.

Potential for further work

- 6.1.11 The potential of the worked bone consisting as it does of a single item is limited. It cannot contribute to establishing the chronology of the cemetery because it is not independently dateable. It does, however, cast a little light on the funerary ritual as it was clearly placed on the pyre and then collected for burial. These inlays might be associated with boxes, but another possibility is that they were used to decorate the bier on which the body was laid.
- 6.1.12 In order to refine the identification of the piece it will need to be conserved and cleaned. A brief catalogue entry and discussion can then be written to form part of the overall entry for the objects from this grave. It should be illustrated with a line drawing.

Bibliography

RFG & FRG 1993 Roman Find Group and Finds Research Group AD 700-1700, 1993. The guidelines for the preparation of site archives and assessments for all finds other than fired clay vessels.

APPENDIX 7 - HUMAN REMAINS

7.1 Human Remains

By Angela Boyle

Introduction

- 7.1.1 All inhumations were hand excavated. In excavation cremation contexts were subject to 100% recovery as whole-earth samples and subsequently wet-sieved. Material from the >2 mm fraction were retained en masse.
- 7.1.2 The Fieldwork Event Aims to which the assemblage can be expected to contribute are as follows:
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 10: To recover data to enable palaeo-demographic and palaeopathological analysis.

Methodology

- 7.1.3 All cremated material was quantified by weight and scanned in order to determine age, sex, and potential for further analysis. Each deposit was recorded on a pro forma record sheet which includes context, context type, period, weight, identifiable fragments, age, sex, and minimum number of individuals. The >2 mm fraction was scanned with a view to determining whether or not it should be sorted for small fragments of human bone (for example tooth roots and/or portions of tooth crowns).
- 7.1.4 Inhumations and fragments of unburnt disarticulated material were examined to determine preservation, completeness, age and sex where possible, as well as potential for further analysis.

Quantification

7.1.5 Cremations and inhumations are summarised in Tables 7.1 and 7.2.

Inhumations

7.1.6 Very poorly preserved bone fragments represented a total of 95 skeletons. Due to poor preservation it has only been possible to assign broad age categories to 46 of the total. The breakdown is as follows:

Age category	Number of individuals
ageing adult	1
adult	18
probable adult	14
25-35 years	4
young adult	1
probable young adult	1
18+ years	5
12+ years	1
subadult	1

7.1.7 A total of 6 probable males and 5 probable females were identified among the adult skeletons. Survival of bones was largely limited to skull vault, dentition and long bone fragments.

Cremations

7.1.8 A total of 235 deposits of cremated bone represent burials per se. The remaining deposits derive from pits containing dumps of pyre debris. Broad age categories were assigned to 182 deposits and sex estimation to 28:

Age category	Number of individuals
ageing adult	4
adult/ adult?	134
Young adult	9
subadult	35

- 7.1.9 There were 1 male, 11 probable males, 2 females and 14 probable females.
- 7.1.10 At least 20 of the cremations were *in situ* or *bustum* burials.

Burnt and unburnt animal bone

7.1.11 The presence of unburnt animal bone in sub-groups 63 and 298 may be accidental as the absence of burning indicates that it was not present on the pyre. However, burnt animal bone has been identified in sub-groups 10474, 10943, 11017, 11779, 11800 and 11994; the fact that it is burnt clearly indicates that it was present on the pyre.

Provenance

- 7.1.12 The human bone derives from a minimum of 326 inhumation graves and 235 cremation burials. There was a high degree of intercutting of features, and some bone spreads were identified that clearly represent disturbed graves, although these are relatively few in number and do not affect the integrity of the overall phasing. Inhumation burials were not well preserved, and the majority of graves contained no trace of a skeleton. A small number survived as partially preserved skeletons or body stains only. In contrast, cremated bone was well preserved.
- 7.1.13 Some of the earliest graves occur in a notable cluster in an angle of the western boundary ditch, immediately to the south-east of the cobbled platform. This area continued to act as a focus for both inhumations and cremations throughout the period of use of the cemetery. The density of burials in this area, from a very early period, is such that there is a high degree of intercutting, suggesting that the importance of the location to the users of the cemetery overrode any concerns over disturbance of the dead. Smaller clusters of burials occur elsewhere and might perhaps represent family groups. The lowest density of burials occurs in the central part of the cemetery, including some gaps with no burials at all which, given the intensity of use elsewhere may be significant, perhaps indicating the site of memorials, trees or pyres.

Conservation

7.1.14 The material does not require any conservation for the purposes of long-term storage. Under the terms of the CTRL Act 1996, however, all human remains are to be reburied.

Comparative material

- 7.1.15 The CTRL project offers an opportunity to study Romano-British burial practices spanning a range of settlement types. Small groups of rural burials or isolated examples have been excavated at several CTRL sites including Northumberland Bottom, Pilgrim's Way, Boys Hall Balancing Pond, Beechbrook Wood and North of Saltwood Tunnel. These offer an opportunity to compare burial characteristics at Waterloo Connection with those of rural cemeteries in the region. This may suggest whether differences in wealth, status and social identity can be discerned. Non-CTRL comparative material from Kent includes the small assemblage of similar date which was recovered from Westhawk Farm, Ashford.
- 7.1.16 Further afield the recently published Eastern Cemetery, London will be particularly useful for comparison as it too was excavated under modern conditions. A total of 136 cremations and 550 inhumations ranging in date from the 1st to the 5th century were excavated with a focus in the 3rd and 4th centuries. There also appears to be evidence for cremation in relatively late contexts, when it is thought to have been generally superseded by inhumation. This is also the case at Waterloo Connection. The cemetery at Ospringe, Kent appears to be richer than Waterloo Connection in having a rather higher proportion of object-dated graves, a higher overall number of vessels per grave, and in the presence of glass as well as ceramic vessels. These differences make comparison of the two cemeteries highly desirable.
- 7.1.17 Outside the region, comparable cemeteries of similar date include Trentholme Drive, York.
- 7.1.18 Near continental cemeteries will provide useful comparative material for the study of potentially intrusive rites such as *in situ* or *bustum* burial, which is known from cemeteries in Gaul, Germany and Pannonia.

Potential for further work

Statement of potential

- 7.1.19 The Fieldwork Events have the very highest potential to enhance our understanding of Roman burial practice in the environs of Springhead, and the organisation and development of the cemetery through time. These objectives can be addressed by the detailed analysis of individual grave groups, followed by classification of grave groups, and integrated spatial and chronological analysis of all classes of burial and artefactual evidence. The value of the data is unfortunately reduced by the poor preservation of the unburnt human remains.
- 7.1.20 The evidence from Waterloo Connection will be of great benefit for refining our understanding of change in burial practice over time. In contrast to current models of cemetery development, there is little evidence for a clear-cut succession of cremations by inhumations at Waterloo Connection, and 1st-century inhumations, for example, are as common as cremations of the same date. A specific objective for further detailed analysis will be the identification of late Roman cremations, if present.
- 7.1.21 A group of at least 20 *in situ* cremations have been identified. The presence of the *in situ* or '*bustum*' burial rite is highly unusual in Britain, and is likely to be intrusive. It may be diagnostic of a foreign element in the population of Springhead. A detailed

record of the archaeologically detectable features of the ritual will therefore be particularly important for identifying continental parallels.

- 7.1.22 The *in situ* cremation burials have the potential to shed light on pyre construction and understanding of the funeral ritual. This may be achieved by detailed study of the charcoal, which will provide information on preferred fuels. Radiocarbon dating of the *in situ* cremations will determine whether this form of burial occurs throughout the use of the cemetery, as suggested by current evidence, or whether they in fact represent a more limited phase of activity.
- 7.1.23 The distribution of burials within the cemetery suggests that it was focussed on a location of religious significance in its own right. This preoccupation with a specific location suggests that, in spite of the observed diversity in burial rites and the possible foreign element in the population, the users of the cemetery shared a broadly similar belief system. The significance of the principal burial focus identified within the cemetery is unknown and probably undetectable by archaeological means. It could be associated with the cobbled platform (perhaps a roadside shrine) or the well/ shaft (as noted above, deep pits or shafts found elsewhere were often used as depositories for offerings and may have been connected with beliefs surrounding death and the underworld).
- 7.1.24 The cemetery sheds some light on the ceremonial aspects of the landscape in the environs of Springhead, although the archaeological evidence from the temple and cemetery sites is not sufficiently specific to identify the cults involved. The discovery of human infant burials as foundation deposits in one of the Springhead temples makes it unlikely that the focus of the cults was purely classical in outlook (Burnham and Wacher 1998). The common practice of equating indigenous Celtic deities with those of the Olympian pantheon may have provided a mechanism allowing Celtic and Roman forms of religious expression to merge or exist side by side, smoothing the integration of immigrant groups into the community in the immediate post-conquest period.

Potential for palaeo-demographic and palaeo-pathological analysis

- 7.1.25 <u>Inhumations:</u> Although preservation of the inhumation burials is generally poor, bone survived in 95 graves and 46 of these could be assigned to age and sex categories. Basic demographic parameters can therefore be identified for some of the group, which will provide useful evidence for limited comparison with evidence from cemeteries elsewhere.
- 7.1.26 The potential for palaeo-pathological analysis is severely limited by poor preservation. However, it may be possible to apply relevant scientific techniques, such as the identification of the DNA of the bacterium responsible for infectious diseases such as tuberculosis (Mays 1998, 197).
- 7.1.27 The genetic information in ancient DNA recovered from ancient skeletons may provide a means of studying relationships between populations and, on a smaller scale, relationships between groups or individuals in a particular cemetery though it should be emphasised that to date, success in this field has been limited. It may also provide an additional means of sexing skeletons.
- 7.1.28 The study of ancient DNA is still in its early stages and potential problems include poor survival in human skeletal material as well as contamination with modern DNA. Poor survival was a major problem until the development of the polymerese chain reaction

technique (Mullis and Faloona 1987) which allow trace amounts of fragmented DNA to be amplified into quantities which can be studied. It should be emphasised that gross bone preservation is not necessarily an indicator of how well ancient DNA is likely to survive.

- 7.1.29 Samples from this assemblage were not collected under controlled conditions, (ie by staff in appropriate protective clothing), however, this should not present a problem because it is possible, if required, to remove contamination by chemical or physical pre-treatment of bone samples in the laboratory.
- 7.1.30 It is therefore proposed that a pilot study be undertaken on a small number of samples in order to assess the potential of DNA analysis for the entire inhumation assemblage.
- 7.1.31 It is proposed that this work would be undertaken by the Research Group at the Research Laboratory for Archaeology and the History of Art at the University of Oxford.
- 7.1.32 Stable isotope analysis can provide direct information on the past diets of humans. Specifically the carbon isotope ratio can tell us about the amount of marine versus terrestrial protein in past diets and the nitrogen isotope ratio can tell us about the amounts of animal versus plant protein in past diets. The protein portion of human bone, collagen is extracted for isotope analysis and it is possible to check if that collagen has been severely contaminated in the ground by soil carbon and nitrogen
- 7.1.33 Variations in diet may also be indicative of differences in status. Recent work undertaken by the University of Bradford on samples from Poundbury Roman cemetery revealed that those individuals buried in mausolea and lead coffins had a predominantly marine diet whereas those buried in wooden coffins did not (Richards *et al* 1998).
- 7.1.34 Although preservation of human skeletal material is generally poor in many cases dentition survives. It is proposed that a pilot study be undertaken on a small number of samples in order to assess the potential.
- 7.1.35 It is proposed that this work would be undertaken by the Paleodiet Research Group at the Research Laboratory for Archaeology and the History of Art at the University of Oxford.
- 7.1.36 <u>Cremations:</u> The assemblage of cremation burials is a large one and there are few of comparable size that have been excavated and analysed under modern conditions. Preservation of the cremated bone was very good on the whole and there is therefore high potential to recover palaeo-demographic information. Out of a total of 235 deposits of cremated bone, 182 are assignable to broad age categories, and 28 can be identified to sex. This sample is likely to provide a useful basis for comparison with similar evidence from other cemetery sites. No clear evidence for palaeo-pathology has been identified at assessment stage, but may become apparent during more detailed examination.
- 7.1.37 Because of the importance of the site to Roman cemetery studies, it is recommended that limited further recording and analysis is carried out on the inhumations, and that the cremations are subject to detailed analysis, in order to maximise the palaeo-demographic and palaeo-pathological information recovered. This would take the form of detailed examination of the larger or better preserved groups, and those with good artefact associations, in order to derive more detailed information than can be obtained

from a preliminary assessment of potential. It is nevertheless clear that preservation conditions will severely limit the scope and value of the work in the case of the inhumations.

- 7.1.38 A number of deposits are very small and offer no potential for further osteological analysis; many of these deposits do not represent the entire remains of any one individual. However, these are of interest in that they may represent rituals involving token deposition of selected body parts.
- 7.1.39 It would be useful to examine all of the bone in detail to determine the quantity of animal bone present and to identify it to species if possible. The identification of animal bone within human cremations has implications for the study of burial practice of the period. Sheep/goat was present within a proportion of the Iron Age cremation burials at Westhampnett (McKinley *et al* 1997, 73) and has also been identified within cremation deposits from Westhawk Farm, Ashford, Kent.

Taphonomic issues

7.1.40 There is a spatial dimension to the survival of skeletal remains. For as yet undetermined taphonomic reasons, bone and body shadows survive predominantly in the central part of the cemetery. Soil chemical analysis may shed light on the factors involved in preservation, which may be connected with local variations in geology or the residual effects of aspects of funerary ritual on ground conditions.

Structured deposition

- 7.1.41 A number of the deposits were excavated in spits (sub-groups 68, 88, 178, 185236, 237, 239, 290, 298, 307, 332, 354, 355, 423, 488, 498, 554, 629, 655, 670, 672, 716, 719, 750, 875, 1015, 1070, 1071, 1180, 10109, 10166, 10263, 10313, 10426, 10458, 10512, 10568, 10595, 10605, 10698, 10703, 10813, 10824, 10837, 10871, 10907, 10953, 10986, 11007, 11017, 11052, 11058, 11064, 11079, 11097, 11118, 11231, 11271, 11281, 11286, 11312, 11353, 11360, 11365, 11402, 11408, 11455, 11475, 11510, 11598, 11599, 11637, 11684, 11756 and 11825). Therefore there is potential to determine whether or not there is any evidence of the structured deposition of body parts as they were removed from the pyre.
- 7.1.42 As an assessment, cremation sub-group 88 was excavated in a series of 20 mm spits and the bone from each of the spits was subsequently examined. The cremation vessel was a complete fine grey ware jar which was lifted as a block with its contents untouched.
- 7.1.43 The initial layer was a cleaning layer which contained natural flint nodules only. Each spit was planned and a written record produced. Photographs were taken where considered appropriate. The data was then analysed by the human bone specialist for indications of patterning in the distribution of bones and artefacts within the vessel. The data on each of the individual spits appear in Table 7.3.
- 7.1.44 It is clear from the assessment of sub-group 88 that there is considerable evidence to indicate that the deposition of the cremated remains within the vessel was structured comprising skull at the top, followed by torso (ribs and vertebrae), upper limb bones, spongy and degraded bone (?pelvis and sacrum), lower limb bones including patella. This suggests that the cremated remains were sorted into body parts prior to deposition within the vessel. Pyre debris, including charcoal is largely absent, which is a further indication that the remains were sorted or `cleaned' prior to deposition.

7.1.45 The analysis of structured deposition can contribute to Landscape Zone Priority 3, Roman burial practice and ceremonial use in the environs of Springhead, and to Fieldwork Event Aim 9, to determine whether spatial variations exist within the cemetery in relation to burial practice. Structured deposition may be a particular practice specific to some groups and not others.

Multiple burial

7.1.46 Examples of multiple burial have been tentatively identified during the assessment phase. Sub-group 56 contained the very partial remains of an adult female and a subadult. Sub-group 77 comprised an adult and a subadult. Sub-group 307 has been identified as the mixed remains of a young adult female and a subadult. Multiple burial is a potential indicator of relationships between individuals in life, and as such may contribute to analysis of family groups or communities in the cemetery. It may also relate to other facts of interest such as status, or belief.

Pyre debris deposits

7.1.47 Of particular importance, given the scarcity of published accounts of similar material from other British sites is evidence for the deposition of residues from cremation pyres. This will contribute to understanding of the burial ritual by providing evidence for material that was used in the cremation process. This could include, for example, species of wood selected for pyres. Comparison of bone fragments from the deposited residues with bone from structured cremation deposits may also cast light on differential selection of body parts for burial, which will presumably reflect ritual and systems of belief.

Grave group analysis

7.1.48 There is potential for detailed analysis of all classes of evidence from individual grave groups, in order to correlate relationships between treatment of human remains and specific suites of artefacts. This will contribute to research aims relating to the chronology and development of the cemetery, to the identification of families and groups, and to the identification of particular burial rites.

Scientific dating

- 7.1.49 It is proposed that a programme of radiocarbon dating is undertaken to improve the chronology of the site. Advice has been sought from the Scientific Dating Co-ordinator at English Heritage (A Bayliss). The programme would require both high precision dating and the AMS measurement of cremated bone and involves the application of newly developed statistical techniques (Bayesian modelling) to the results to substantially reduce the probable date range (Lanting and Brindley 1998).
- 7.1.50 It should be possible to establish the date of individual cremation burials to within a century or so by using high-precision measurements which would require 10-50 g of identified short-lived charcoal per burial.
- 7.1.51 It is likely that by submitting approximately 20 samples it will be possible to confirm both the start date and the end date of the period of use of the cemetery. If AMS measurements (on either bone or charcoal) are applied, this scale of programme would be required to counteract the effects of statistical scatter on the measurements. A similar number of further dates could be required to address specific questions, such as the chronological range of *bustum* burials within the cemetery, although samples will

wherever possible be selected to address multiple aims. Dating might be desirable for discrete groups of graves, or to assess the chronology of identified ritual practices; dating will also be useful to date human bone from the well/shaft, and to confirm the date of suspected Iron Age features.

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APPENDIX 8 - MACROSCOPIC PLANT REMAINS AND CHARCOAL

8.1 Assessment of the Charred Plant Remains

By Ruth Pelling

Introduction

- 8.1.1 All of the samples taken during excavation (963) were processed for the recovery of charred plant remains from cremation urns, pits and associated features. Following a preliminary scan of all samples for presence/ absence of charred material, 320 were chosen for assessment of charred plant remains and charcoal. Samples were processed by flotation in a modified Siraf-type machine. The flots were collected onto a 250µm mesh and allowed to air dry slowly. The same samples, most of which were from Roman cremations, were assessed for identifiable charcoal by Dana Challinor (see below). Charred remains other than charcoal were observed in 23 samples. Of these 21 were submitted for detailed assessment.
- 8.1.2 The Fieldwork Event Aims which the assemblage can be expected to contribute to are as follows:
 - Fieldwork Event Aim 5: To recover other palaeo-economic indicators known to be well preserved: (eg. animal bone, molluscs, charred plant remains) to establish the fullest possible picture of the urban economy.
 - Fieldwork Event Aim 6: To recover palaeo-environmental indicators to elucidate the interaction of the town within the local environment.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.
 - Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

8.1.3 All cremation deposits encountered during the excavations were sampled for the recovery of charred plant remains and cremated bone, with some cremation urns sampled in 20 mm spits, so producing multiple samples. The charred remains were dominated by charcoal hence initial assessment was carried out by a charcoal specialist. A total of 21 samples in which charred remains other than charcoal were noted were submitted for further assessment. Flots submitted were first put through a stack of sieves from 500µm to 2mm mesh size in order to break them into manageable fractions. Each fraction was then scanned under a binocular microscope at x10 to x20 magnification. Any seeds or chaff noted were provisionally identified based on morphological characteristics and an estimate of abundance was made.
Quantification

- 8.1.4 Quantifiable grain was identified in 5 of the 21 samples assessed for charred seeds and chaff. In each case the number of items noted was less than 10. *Hordeum vulgare* (barley), *Triticum spelta* (spelt wheat) and a short grained *Triticum* sp. (wheat) were identified. The short grained *Triticum* is probably of a free-threshing species. Chaff was present in two samples, again in each case less than 10 items. The species identified in both samples was *Triticum spelta*. Weed seeds were also rare, and were present in small numbers in six samples. The species identified include *Rumex* sp. (docks), *Polygonum aviculare* (knotgrass), *Medicago/Trifolium* sp. (medick/clover) and *Bromus* sp. (brome grass). Occasional pulses were present in three samples (ARCPHL97 sample 35, ARCNBR98 samples 399 and 398). Preservation was poor, so identification is unlikely to be possible beyond the level of *Vicia/Pisum* sp. (bean/pea), with the exception of sample 399, in which two or more species appear to be present. A particularly interesting and unusual find from this sample were several (up to 50) seeds of *Vitis vinifera* (grape) including examples with some flesh still attached.
- 8.1.5 The preservation of cereal remains and the pulses was generally poor. The *Vitis vinifera* seeds tended to be very well preserved.

Provenance

8.1.6 The occasional cereal remains within the deposits are likely to represent occasional cereal processing debris which was present as background noise, or had perhaps entered the cremation pyres as kindling. Sample 399, context 11728 (ARCNBR98) is more curious however. The presence of grape flesh still attached to some of the seeds might indicate that whole grapes were placed on the funeral pyre, perhaps as a funerary offering. The pulses in this context may have derived from a similar origin. This sample was taken from a cremation pit. The remaining samples which produced seeds and chaff were from cremation pits, one grave and two cremation urns.

Conservation

8.1.7 The flots are in a stable condition and can be archived for long term storage.

Comparative Material

8.1.8 The range of species identified are appropriate for the Romano-British period. Hordeum vulgare and Triticum spelta have been recorded from the other contemporary sites within the rail link project (eg. Thurnham Villa and Hockers Lane). They are the principal cereals recorded throughout southern Britain at this time (Greig, 1991). Finds of grape seeds from the period are not common, although occasional seeds have been identified from several sites and a large assemblage was recovered from a 2nd century pit in Southwark, London (Willcox 1978). Viticulture has recently been demonstrated for Roman Britain. Bedding trenches excavated at Wollaston, near Northampton, were confirmed to be the remains of vineyards with the identification of Vitis pollen (Meadows, 1996). No other examples of deposits of grape within cremation deposits are known in either Kent or in southern Britain. Other food products are known in ritual deposits, notably *Pinus pinea* (stone pine) which has been found associated with ritual or temple deposits (Kislev 1988). The choice of stone-pine cones is presumably partly because it emits a pleasant scent when burnt although it is possible that the relatively exotic nature of certain food items makes them a valuable offering.

Potential for Further Work

8.1.9 Generally the concentration of seeds and chaff is too low to offer any potential for detailed analysis. The one sample which produced grapes and pulses does merit closer examination. The aspect of possible funerary deposits deserves to be explored. A detailed search through the published literature for comparable deposits is also recommended. This work should take two days of technical time and up to three days of specialist time.

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8.2 Charcoal

By Dana Challinor

Introduction

- 8.2.1 All of the samples taken during excavation (963) were processed for the recovery of charred plant remains from cremation urns, pits and associated features. Of these, 320 were chosen for the assessment of the wood charcoal. The purpose in sampling was to examine the evidence for change and continuity in burial practice. The samples were processed by flotation in a modified Siraf-type machine, with the flots collected onto a 250µm mesh.
- 8.2.2 The Fieldwork Event Aims to which the assemblage can be expected to contribute are as follows:
 - Fieldwork Event Aim 5: To recover other palaeo-economic indicators known to be well preserved: (eg. animal bone, molluscs, charred plant remains) to establish the fullest possible picture of the urban economy.
 - Fieldwork Event Aim 6: To recover palaeo-environmental indicators to elucidate the interaction of the town within the local environment.
 - Fieldwork Event Aim 7: To establish the chronology of the cemetery.
 - Fieldwork Event Aim 9: To establish if spatial variations exist within the cemetery in relation to burial practice.
 - Fieldwork Event Aim 11: To establish the nature and distribution of structural features located within the cemetery.
 - Fieldwork Event Aim 12: To identify ancillary features associated with a specific burial practice.

• Fieldwork Event Aim 14: To determine the nature of activity and land utilisation, other than that directly forming part of the cemetery, associated with the Roman town of Springhead.

Methodology

8.2.3 A total of 320 flots were assessed. The volume of soil processed varied considerably (from 0.05 kg to 100 litres) according to the feature type. All cremation deposits were sampled in entirety for the recovery of charred plant remains and cremated bone; however, some of the cremation urns were sampled in spits of 20 mm, with the result that the individual samples were very small. For the assessment, only one spit from a single cremation burial was assessed, although several spits may need to be amalgamated to provide enough material in any further work. The flots were air-dried and divided into fractions using a set of sieves. Fragments of charcoal were randomly extracted, fractured and examined in transverse section under a binocular microscope at x10 and x20 magnification. Fragments caught in the >2mm sized sieves were quantified as identifiable. In the case of large flots, a sample of *c*. 20% was examined, although any quantification given is based on estimates of the entire flot. The flots were also scanned for the presence of any other charred plant remains.

Quantification

- 8.2.4 A total of 213 flots produced identifiable wood charcoal (Table 1). Six taxa were provisionally identified *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel), cf. Salicaceae (willow, poplar), *Prunus* sp. (blackthorn, cherry), Maloideae (hawthorn, apple, pear etc.) and *Fraxinus excelsior* (ash). Some of the ring-porous taxa were difficult to identify as many fragments, and particularly small twigs, exhibited very slow growth and the full range of anatomical characteristics were not always visible. Some of the identified *Quercus*, for example, did not have the characteristic large pores and rays and will require examination at high magnification in all three planes.
- 8.2.5 There was some variation in the taxonomic composition between cremation deposits. Cremation pits produced the best preserved and largest quantity of charcoal, including some very large fragments with more than ten years growth evident. In contrast, cremation urns and vessels produced much smaller quantities of material and preservation was poorer. This may be due to the smaller soil sample sizes of the spit samples, but this was not always the case, as some of the cremation pit deposits which produced large assemblages were only a couple of kilogrammes in size. A few grave and pit samples also produced good assemblages, with similar taxonomic composition to the cremation deposits. *Quercus* was the most common taxon, present in almost all feature types, followed by Maloideae and *Fraxinus*. Some of the assemblages appeared to be dominated by a single taxon; in most cases this was *Quercus* but *Fraxinus* also predominated in some flots. No flot appeared to contain more than three taxa, but this will require confirmation through further analysis.
- 8.2.6 There was some cremated bone present in the cremation samples and one flot appeared to contain animal vertebrae (context 163). General charred amorphous material was present in most flots; some of this is likely to be carbonised liquid from the cremation process but it is also possible that other plant remains were present in the pyre. Coal was observed in most flots and modern seeds were common. The coal could be Roman in date although the very small quantities present suggest it is more likely to be modern. The presence of the modern seeds is probably due to contamination either when the site

was first stripped or when some features were half sectioned. However, the integrity of the samples is unlikely to have been compromised. Small droplets of slag were noted in several cremation flots, suggesting that metallic objects may have been present on the cremation pyre, but these require examination by an appropriate specialist.

Provenance

8.2.7 The preservation of charcoal at this site was variable, with better preservation in the central part of the site. This may be due to local variations in soil type. The lower concentration of material is to be expected in the burial urns where the bone has been carefully removed from the pyre remains. Indeed, it is possible that more than a single burning event is represented in the composition of the cremation pits, although the lack of taxonomic diversity suggests either a single event or the deliberate selection of a species for fuelwood. Certainly, the evidence from the charcoal suggests continuity in burial practice and there is potential for a comparison between deliberately deposited pyre remains and the accidental inclusion of pyre debris in burial urns.

Conservation

8.2.8 The flots are in a stable condition and present no problems for long-term storage and archive.

Comparative material

8.2.9 It is interesting that the same limited range of taxa identified in the Waterloo Connection cremation deposits have been identified in cremation burials from Tutt Hill, Chapel Mill and Boys Hall Balancing Pond, despite a range in date from the Bronze Age to the Roman period. Since individual assemblages show a lack of taxonomic diversity, the fuelwood must have been deliberately selected. Indeed, the predominance of a single taxon in prehistoric cremation assemblages, indicating the use of a single tree or specifically selected species in ritual activities, has been noted at Radley Barrow Hills (Thompson 1999, 352) and at Rollright Stones (Straker 1988). However, it has also been suggested that the abundance of oak or ash in cremation deposits, compared to other species, is a result of the pyre structure; the timber from these trees providing the supports in a central position, less likely to have been totally reduced to ash (Gale 1997, 82). The choice of fuelwood may have been determined by the burning properties of the wood (oak and ash burn very well), rather than ritual concepts.

Potential for further work

8.2.10 Since there has been little publication on Iron Age and Roman charcoal from cremation deposits (Gale 1997, 77), the charcoal from Waterloo Connection will provide a valuable addition. Indeed, the charcoal from this site has high potential to add to our understanding of regional Roman cremation practices, and the continuity and change within burial practices over time by comparison with earlier burials. It is recommended that the remaining unassessed flots are scanned to determine if any variation or trends have been missed in the sample covered in this assessment. More detailed analysis should then be carried out on a selection of assemblages to confirm identifications, to establish the presence of any additional taxa, to consider the evidence for deliberate selection of fuelwood and to explore regional trends and the possibility for woodland management practices.

- 8.2.11 It is been proposed that a programme of radiocarbon dating is undertaken to improve the chronology of the site. Advice has been sought from the Scientific Dating Co-ordinator at English Heritage (A Bayliss). The programme would require both high precision dating and the AMS measurement of cremated bone and involves the application of newly developed statistical techniques (Bayesian modelling) to the results to substantially reduce the probable date range (Lanting and Brindley 1998).
- 8.2.12 It should be possible to establish the date of individual samples to within a century or so by using high-precision measurements which would require 10-50 g of identified short-lived charcoal per burial.
- 8.2.13 It is likely that by submitting approximately 20 samples it will be possible to confirm both the start date and the end date of the period of use of the cemetery. Some measurements would be taken on human bone and some on charcoal. If AMS measurements (on either bone or charcoal) are applied, this scale of programme would be required to counteract the effects of statistical scatter on the measurements. A similar number of further dates could be required to address specific questions, such as the chronological range of *bustum* burials within the cemetery, although samples will wherever possible be selected to address multiple aims. Dating might be desirable for discrete groups of graves, or to assess the chronology of identified ritual practices; dating may also be useful to date human bone from the well/shaft, and to confirm the date of suspected Iron Age features.

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APPENDIX 9 - CONSERVATION REQUIREMENTS

By Dana Goodburn-Brown

Introduction

9.1.1 This assessment considers the conservation work needed to stabilise the condition of all classes of artefact for long-term storage in line with UKIC guidelines, and the potential for cleaning and/or reconstruction to aid interpretation of the objects.

Methodology

9.1.2 The condition of the finds was assessed by handling and observation by the individual specialists. The metalwork was also X-rayed and assessed by a specialist conservator.

Quantification and conservation requirements

Pottery

9.1.3 No particular conservation needs are anticipated, other than for the samian ware, unless it is proposed that large numbers of vessels should be displayed. A significantly above-average amount of reconstruction work is likely to be required, but in the case of vessels not required for long-term display this can be carried out by the pottery specialists as an integral part of the process of detailed recording and analysis.

<u>Samian</u>

9.1.4 The very poor condition of the assemblage is commented on in Tables 1.4 and 1.5. A total of 44% of all contexts contained samian ware that is in need of further cleaning by a conservator. The surface condition of several vessels is degrading, as for instance that in ARC PHL97 (1263). Handling appears to exacerbate the problem. Any further cleaning should be undertaken under the supervision of a qualified conservator.

Ceramic building material and fired clay

9.1.5 The condition of the material is fairly abraded, but there is no risk to its preservation. Further analysis may be needed on some of the material, so it should not be placed in long term storage until this has been carried out. There are no special requirements for long term storage, other than the use of robust packaging materials and a dry environment.

<u>Flint</u>

9.1.6 In general the flint is appropriately bagged and boxed for long-term storage, although some reorganisation is required. A great deal of natural flint was recovered which has been discarded during the assessment. It is therefore recommended that an initial task should be the revision of all of the box lists. This will result in a reduction in the overall total numbers of boxes. It is recommended that samples only of the burnt flint are retained.

Stone

9.1.7 There are no conservation requirements. All unworked stone could be discarded.

Glass

9.1.8 The glass is chemically stable and needs no conservation input. The current packaging is adequate for long term storage.

Metalwork (except nails)

- 9.1.9 The finds were processed and packaged to archive standard by the OAU finds department (packaged in polyethylene bags, in sealed boxes with self-indicating silica gel). Items requiring conservation for long term storage are itemised below:
- 9.1.10 Approximately 45 items have been selected for further conservation input to aid final analysis. The amount of input that will be required varies from air abrading selected areas on ironwork items (to establish details), to lightly cleaning surface soil from some copper alloy items (to aid illustration). The investigation of some areas where organic traces have been preserved by mineral replacement will also be needed. None of this work should conflict with long term storage. The small find numbers of the selected items are as given below.

ARC PHL 97 : 2, 3, 8, 163, 165, 305, 874, 1092, 1334, 1753, 1805, 1815

ARC NBR 98 : 150, 262, 442, 677, 678, 681, 687, 767, 827, 829, 892, 926, 927, 930, 931, 932, 958, 1117, 1119, 1159, 1180, 1204, 1212, 1213, 1321, 1350, 1425, 1923, 1924, 1951, sample 221 and one item from context 10597

<u>Nails</u>

9.1.11 Most of the nails are heavily mineralised, although there is a significant number of unusually well preserved nails (indeed, these were originally processed as copper alloys because of their red/brown surfaces). This differential preservation suggests some potential for conservation research (see below). Otherwise the nails have been X-rayed and require no specific conservation measures, although, before transfer to archive, the final packing of boxes should be reviewed, with some minor packing readjustments as some boxes were slightly overpacked, and some slightly underpacked. If not discarded, the nails should be stored in conditions of low level of humidity and monitored over time for signs of active corrosion.

<u>Coins</u>

9.1.12 Nine of the 14 Roman coins require specialist cleaning in order to improve their identification (though it is not certain, in one or two cases, that anything identifiable remains), but consolidation work is unlikely to be appropriate. The post-Roman coins require no conservation work.

Worked bone

9.1.13 The 13 fragments from a single piece of inlay are currently obscured by soil. They will need to be cleaned by a conservator. Special care should be taken when cleaning to see if the fragments were originally stained or coloured in any way.

Conservation Research Aims

9.1.14 The following research aims, which lie beyond the scope of the CTRL research strategy, have been identified by the conservation specialist:

- 9.1.15 Amongst the several thousand nails recovered from Waterloo Connection, the process of X-radiography has produced some interesting results which suggest further research potential in the area of conservation and/or iron production technology. There is a consistent pattern across the site wherein seemingly similar nails have survived in remarkably different states of preservation. The majority of nails are heavily mineralised, as is expected on an aerated site, with no waterlogging. Although, there are occasional instances of nails which are extremely well preserved, so much so that they were often mislabelled or queried as copper alloy, these nails often have areas of their surface with crisp detail and red corrosion products, often quite powdery. The use of a hand held magnet confirmed them to be iron.
- 9.1.16 Examination of the reasons for differential preservation would provide valuable data for conservation research, with potential for improving mitigation strategies and conservation measures. Possible explanations include localised variations in soil chemistry, perhaps caused by burial activity, or different iron ore/production technology, or a combination of the two. The potential for this type of conservation research is accepted, but few examples have been published (Goodburn-Brown, 1988).
- 9.1.17 A closer examination, including instrumental analysis of metal corrosion products found on items from cremations in comparison to finds from inhumations may help to distinguish aspects of funerary practice, such as whether or not an item was included in the funerary pyre. A possible brooch from a cremation context (739, s.f.927) has unusual black corrosion deposits, which may relate to having been burnt. There are 481 items recovered from cremations and 1157 from inhumations. It is recommended that a selection of these be analysed, in consultation with the finds specialist and following microscopic examination. The analytical work recommended to be employed on the nails would involve taking destructive samples, and/or sectioning shafts of selected examples. The samples and artefacts could then be put into long term storage with the archive.

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