Roman London: the eastern cemetery

Post-excavation assessment report and updated project design for research and publication

Contents

1 Introduction

1.1 This document contains a report on post-excavation assessment of the results of archaeological fieldwork relating to a cemetery on the east side of Roman London (Fig 1). Antiquarian observations and collections to do with this cemetery are also considered. This report is followed by an updated project design containing proposals for publications arising from this assessment, and for the requisite research.

1.2 Preliminary assessments of these site data and of some antiquarian collections and observations were published in *Britannia* (Barber *et al* 1990) and *London Archaeologist* (Evans & Pierpoint 1986), respectively. The work of assessment reported here, funded by English Heritage, was carried out in 1992-3 according to a project design submitted to and approved by English Heritage (MOLAS 1992A). This assessment deals systematically with all site data - original stratigraphic and other site records, finds and environmental materials - after completion as far as possible of all relevant site archives. In general such an assessment, and consequent research and publication, follows the terms of *Management of archaeological projects* 'MAP2' (English Heritage 1991), and specifications prepared by the Museum of London Archaeology Service MAP2 Working Party (MOLAS 1992B, 1993A).

1.3 The 1992 project design itemised the original and current research aims, described the method and scope of post-excavation assessment and summarised much of what was already known of the cemetery. The purpose of this document is not to repeat such information, but rather to explain how and why it is proposed to use this information in further work leading to appropriate forms of publication. Reference is made to the 1992 project design as necessary.

1.4 Another distinct purpose of this project is to provide a model and, partly, a means for future assessment, analysis and publication of other burials in and around Roman London, especially burials in cemeteries to the west and north of the town and, on the south side of the River Thames, in Southwark. Burials of Roman date are already included in other post-excavation assessments (MOLAS 1993B, 1993C).

1.5 Nearly all the work of assessment was carried out by a project team that included specialists in particular classes of site data: stratigraphic and other site records (including graphics and AutoCAD), finds (including non-ceramic registered or small finds, Roman pottery and ceramic building materials), environmental materials (including human bone and cremated remains, animal bones and microfauna and flora). They were assisted by curatorial staff of the Museum of London and by computing specialists. Their work has generated in most cases substantial files of data, both in digital form and on paper, which this document could not reproduce in every detail. Instead, for the sake of presenting a readable and integrated report, this document draws on these files, which should therefore be regarded as supporting and standing behind this document.

1.6 The main sites excavated in 1983-90, data from which are included in this assessment, are as follows (site codes first in alphabetical order; supervisors' names in brackets; see also Fig 2):

ETN88: East Tenter St, E1 (David Bowsher)
HAY86: 13 Haydon St, EC3 (Rob Ellis, Kevin Wooldridge)
HOO88: Hooper St, E1 (Bruno Barber, David Bowsher)
MNL87, MNL88: 65-73 Mansell St, E1 (Steve Haynes)
MSL87: 49-59 Mansell St, 2-8 Alie St, 29-31 West Tenter St (Al Mackie, Ken Whittaker)
MST87: 31-43 Mansell St, 1-15 Alie St, E1 (Ken Whittaker)
PRE89: Prescott St, E1 (David Bowsher)
SCS83: 9 St Clare St, EC3 (Rob Ellis)
TTL85: The Three Lords, 27 Minories, EC3 (Paul Falcini)
WTE90: 28-29 West Tenter St, 59 Mansell St, E1 (Bruno Barber)
WTN84: West Tenter St, E1 (Rob Whytehead)

1.7 In this document the major excavated sites (above) and other sites are referred to by site code and the area of primary interest in this project (2.1.1, 2.1.2) is called 'the study area'. The word 'cemetery' is used in this document for convenience: whether, and to what degree, the burials in the study area did in fact constitute a single cemetery is to be determined by analysis. Reference to 'burial' may mean the actual remains of the dead as well as the act of disposal of the dead, and covers both inhumations and cremations, unless these are specifically distinguished. 'Burial goods' include food as well as artefacts deliberately deposited with a burial, or consumed in a burial rite on site. The latter case includes burning of goods during cremation. Elements of the assessed stratigraphic sequence may be referred to by provisional group or subgroup of contexts, rather than by individual context (*eg* HOO88, 4.4; MSL87, F10; letter prefixes usually refer to trenches).

2 Factual data

2.1 Summary

2.1.1 The exact extent of the area occupied by burials immediately to the east of the Roman town is not known, but this project concentrates on a study area roughly to the south of the Aldgate road, the main Roman road between London and Colchester, and to the east of the city wall (Fig 1). The road is believed to date to the beginning of the Roman settlement in London, but the city wall was not built until *c* AD 200, considerably later than the date by which the eastern cemetery was established. In accordance with Roman law burials would have taken place beyond the original boundary of the settlement, which need not of course have coincided with the line of the later wall. How burials took place, and whether they constitute a single cemetery, is to be determined by analysis.

2.1.2 The outer limits of the putative cemetery are even less obvious to the east and to the south, and are likely to be defined simply by an absence of burials as by any trace of a deliberate boundary. For the purpose of this project, the study area extends a minimum of 700m from west to east and 300m from south to north (Fig 2).

2.1.3 Within this area eleven recent excavations and numerous watching briefs and evaluations conducted by the Museum of London have produced evidence for several hundred inhumations and cremations, reasonably well dated from the 1st to the 5th centuries AD. These excavations obtained data from only certain parts of the study area; evidence for burials in other areas, nearer the Aldgate road for example, has been collected previously mainly by antiquaries operating over a period of about 400 years, naturally with different standards and biases.

2.1.4 Assessment confirms the evidence for an organised landscape in this area, with traces of gravel quarries and possible field boundaries, before the first burials took place towards the end of the 1st century AD.

2.1.5 A road was built running apparently from the town into the area occupied by burials, although the date of the road remains to be confirmed. When the city wall was built *c* AD 200 it may have interrupted this road and curtailed the area available for burials.

2.1.6 Evidence exists for a variety of burial rites, as well as funerary structures, inscriptions, ditches and pits in use in the area, pyre residues and probable *in situ* remains of cremation. Evidence for minimum totals of 587 inhumations and 122 cremations was recovered, together with cremation debris and disarticulated human bones. A large assemblage of artefacts and some animal bones were found either with these burials or redeposited in grave fills and surrounding strata, the latter, like the cremation debris and disarticulated human bone, presumably marking either previous burials that had been disturbed or an as yet unrecognised burial rite.

2.1.7 The excavated evidence for a cemetery is generally relatively late in date, much of it dated to the 3rd and 4th centuries. Evidence of this date from inside the town, by contrast, is typically truncated or much disturbed. There also appears to be evidence for cremation even in relatively late contexts, when generally it had been superseded by inhumation. Burials probably continued into the 5th century AD. Where subsequent deposits have not been truncated by medieval and post-medieval gravel quarries, and by the foundations and cellars of later buildings, Roman burials were superseded by possible evidence for agriculture, yet to be dated accurately.

2.1.8 Post-excavation assessment should be of all site data, regardless of assumed date. A principal point of interest in the later history of the area was the establishment of a medieval religious house, the Convent of the Little Sisters of St Clare, or the Minoresses, substantial evidence for which was found on two of the excavated sites, HAY86 and SCS83. The potential of these site data with respect to the later history of the study area is pursued further in an annexe to this document.

2.2 Stratigraphic and other site records

2.2.1 Existing studies and documentation

As described in the original project design (MOLAS 1992A, 5.1.1), archive reports had been compiled previously for the stratigraphic data from several of the sites. This work had entailed some of the tasks that were done in the course of assessment, with respect to the other sites, and some of the elements of analysis for publication that is now proposed (*eg* composite plans of individual inhumations). This table shows which elements had been completed previously, and which not, according to the following key: (1) number of contexts (in brackets: no archive report), (2) number of inhumations (in brackets: no composite plans of individual inhumations)

key	ETN	HAY	HOO	MNL	MSL	MST	PRE	SCS	TTL	WTE
1	82	103	1850	(66)	(2101)	(439)	63	(289)	(31)	233
2	8	(16)	115	(5)	(230)	(77)	4	(4)	1	9

Computerised indexes of data existed already for ETN and HOO. A descriptive

catalogue of 120 inhumations and 14 cremations at WTN had already been published (Whytehead 1986).

2.2.2 Work undertaken for assessment

The original plans and context records for SCS83 were not located, and inclusion of this site in the assessment is based on published information and an index of contexts as interpreted subsequently by the excavator.

For all sites the stratigraphic sequence was checked and, in the case of MSL87, reconstructed from original plans and context records (the amount of time for this particular task allowed in the work programme was underestimated by half).

Subgroups of contexts were defined and numbered, where this had not already been done in post-excavation work. Sequence diagrams (matrix diagrams) of subgroups have been drawn. Interpetative indexes of contexts, subgroups and other attributes have been created and, for the larger sites, input in computer data files.

Photographs were not input in computer indexes. There are more than 7500 black-and-white and colour frames, and time was sufficient only to scan these for images (A) with publication potential, as being highly informative in their own right, and (B) of use for subsequent analysis. Photographs of every excavated inhumation will serve as a basis for making composite plans of these burials.

2.2.2 Integration with other data

Spot-dating information has been applied to these sequences as a check on their reliability and to help establish their phasing. No attempt has yet been made to correlate phases between sites.

Finds information was collated with contexts to produce lists site by site of burial goods that accompany inhumations and cremations, and this information has been distributed.

2.2.3 Products of assessment

For each site a file of 'archive notes' has been created, both as a guide to the contents of each site archive and as an aid to future work. These notes comprise: a summary of each sequence referring to subgroups, a land use diagram (see examples inserted below), a list of contexts that are interpreted as spurious or unusable (minor natural features, without written and drawn records, or unlocatable), notes on any field evaluations and trial works and how they would tie in with subsequent excavations, notes of any problems noticed in the recorded stratigraphic sequence, full sequence diagrams (matrices) of contexts as interpreted and placed in subgroups, notes on dating evidence so far available, and other lists and indexes.

2.2.4 Quantification of subgroups

This table shows the quantity of subgroups on each excavated site and categorises their interpretation according to the following key: (1) total subgroups, (2) natural, (3) pre-Roman, (4) quarrying, (5) inhumation, (6) cremation, (7) ditches, (8) road, (9) structural, (10) other, (11) post-Roman

key	ETN	HAY	HOO	MNL	MSL	MST	PRE	TTL	WTE
1	24	66	428	53	445	133	14	8	66
2	1	1	5	1	2		2		1
3				1	1		1		3
4			4				3		
5	8	15	159	5	230	90	3	1	11
6	1	2	53		31	19			12
7		2	36	8	11	2	1	1	2
8				2					
9	4				10			2	
10	5		175		116	16	4	3	27
11	5	44	13	36	44	6		1	5

2.3 Non-ceramic finds

2.3.1 Work undertaken for assessment

Registered or small finds (RF) and non-ceramic bulk finds (BF) were located. Non-ferrous artefacts were scanned with the aid of radiographs where appropriate. Iron objects were assessed from x-rays where these were available. Identifications have been checked and, where necessary, corrected, the paper records being amended. Computer records have been checked but not yet fully amended. Objects requiring conservation treatment for identification or stabilising were noted, as were any groups requiring specialist scientific analysis.

Objects were identified as burial goods according to the evidence of the stratigraphic records. Groups were identified by combining the computerised stratigraphic indexes, where available, with the computerised artefact records, or else by examining the existing Level III

archive reports. The stratigraphic site archive for some sites was incomplete (MNL88, SCS83), and in these cases such classification must remain provisional. Careful analysis is required in the case of the more complex sites (*eg* MSL87).

Tables show in summary form estimates of the range of finds from each site and, within the limits of the available information, an indication of how many were deliberately deposited burial goods and how many were occupational debris or residual.

2.3.2 Quantity of excavated material

A minimum total of 587 inhumations were excavated [467 without WTN84], of which 164 (28%) [138 (29%)] produced artefacts. Of a total of *c* 122 cremations, 45 (37%) produced non-ceramic artefacts, of which about 16 (13%) are likely to be burial goods.

These burials produced about 300 individual non-ceramic burial goods, including coins. This table quantifies these by site and by material, according to the following key: (1) gold/silver, (2) copper alloy, (3) iron (including hobnails), (4) lead, (5) coins, (6) glass object, (7) glass vessel, (8) jet, shale, stone, (9) ceramic object, (10) bone, ivory, (11) other items, (12) objects in backfills, other contexts

key	ETN	HAY	HOO	MNL	MSL	MST	PRE	SCS	TTL	WTE
1					4					
2	2	1	11		27	9				
3	2		17	1?	13?	9	1			1
4			1		4					1
5	1		10	1	22	4	1	2	1	2
6		1	5		29	4				2
7	1	1	4		15	3		2		1
8	2	3	15		33	5				3
9					4					2
10		1	4		9	2				3
11		3	11		5	2		3		3
12	5	11	*c*200	2	*c*70	8	3	3		*c*15

HOO (12) includes pyre debris.

Notes have been made of accessioned finds (RF) of all materials from grave backfills, and 27 other finds of intrinsic interest, most of these being residual. Many of these objects are clearly redeposited burial goods.

2.3.3 Provenance and date

The sites were not all contiguous, but may be regarded as representing either a single cemetery or a series of burial grounds in close proximity. Most finds came from inhumations, including plaster or chalk burials, with a smaller quantity coming from cremations. They range in date, provisionally, from the late 1st-early 2nd century to the 5th century AD. All burial goods and other objects in association with a burial, including coffin nails, were recorded in plan. Material found in grave backfills, quantified separately, apparently demonstrates a high degree of residuality, with much redeposited cremation debris. In some places later activities have greatly disturbed Roman levels. Objects which are clearly of funerary origin, some of considerable intrinsic interest, have been identified in post-burial contexts. Little of the Roman material identified in Roman contexts is obviously unassociated with the burials and burial processes.

2.3.4 Range and variety

Artefacts found in every type of burial fall into two well-defined categories: (A) objects worn on the person; (B) goods deliberately left with the burial, broadly comprising other personal ornaments (not worn), coins, vessels of glass and pottery, and 'equipment'. Among cremations, these categories may be cross-divided again into goods burned with the body and unburned goods interred with cremated remains.

Jewellery and other accessories, in both categories (A) and (B), are well represented in different materials: brooches of silver and copper alloy; bracelets of silver, copper alloy, shale, glass, tortoiseshell and ivory; earrings; necklaces and anklets of bone and jet; amulets; finger rings, several with intaglios; hairpins of bone and jet; belt fittings; and shoes, represented by the hobnails from their soles. These finds range in date from the 2nd to the 5th centuries, showing considerable variation in quality and degree of elaboration.

Other burial goods include coins, several placed in the mouth and others apparently selected and deposited deliberately (*eg* 3rd century coin of Mariniana showing a peacock); pewter and glass vessels with some complete examples of types rarely found in London; and many items loosely called 'equipment', among which are combs, dice, a gaming set, wood and ivory vessels, figurines and a stylus.

The burial groups vary considerably in character, from single items of simple personal adornment, footwear or pottery, to small collections of goods, such as jewellery and trinkets, personal possessions both worn on the body and not worn, and various items that may be interpreted as equipment intended to be of use in the afterlife.

The assemblage also contains lead coffins, evidence for wooden coffins in the form of nails and other fittings, and burial markers such as tombstones and inscriptions. Some types of container well-attested in burials, such as lead canisters and glass cinerary urns, are poorly represented or not represented at all in the excavated sample.

The finds from undisturbed burials are frequently well-preserved with many complete objects present. Ironwork is more corroded than other metals and radiography is essential to confirm identifications. Finds from the grave backfills comprise a similar range of goods and materials but most objects are fragmentary.

Material that is unassociated with burials, from ditches for example, is also often fragmentary and worn, much of it apparently redeposited.

Soil conditions on all the excavated sites have not in general permitted the survival of organic materials, such as wood, leather and textiles; a few mineral-replaced organics have been noted.

2.3.5 Sample

The quantity of artefacts assessed represents an unknown proportion of the total that might have been present in the entire London cemetery. The excavations that are the main subject of the 1992 project design fall within a very large area, but the degree to which they are likely to be representative of the eastern cemetery as a whole is as yet uncertain. There has been no discernable bias, however, in the collection strategy for the excavated material, as each site was excavated and recorded *in toto*. In some places the degree of post-depositional and post-Roman disturbance is a complication, and might explain the apparent lack of some classes of material, but despite these provisos the fact remains that this is the largest single assemblage of Roman burial goods and burial furniture from London that can be studied.

2.3.6 Previous studies and documentation

Previous publications: individual items have been exhibited and published (*eg* Murdoch 1991). Preliminary notes also exist on specific objects, noted in the individual site summaries. Copies of these documents have been filed with respective site records. See also Antiquarian sources (2.10).

RF from all sites have been accessioned as stated in respective individual summaries. Computerised records in old DGLA format exist for all sites, but updating and correction are required in accordance with amendments noted during assessment. All stratified coins are identified but records are not yet computerised. X-raying of copper alloy objects has been undertaken as appropriate but for most site assemblages only a little iron has been x-rayed. Specific requirements are noted in individual summaries and x-ray is recommended in general, in view of the perishable nature of the material.

2.4 Pottery

2.4.1 The comments on provenance, sample and condition given for non-ceramic finds apply also to pottery, at least with respect to pottery associated with burials and burial vessels. Pottery from SCS83 was not found.

2.4.2 Previous studies and documentation

Work on pottery from some of the excavated sites had previously been done by DGLA specialists. Their approach differed in some respects from that used in the DUA and since adopted by MOLAS: *eg* several sites had been quantified but not spot-dated. Certain records noted as having been made (*eg* quantification of SCS83, various drawings) were not found.

2.4.3 Spot-dating

Records existed for HAY86, SCS83 and TTL85, which were corrected and updated as far as feasible. Records were created for MSL87, ETN88, PRE89 and WTE90. MST and HOO?

2.4.4 Samian

Samian had already been separated out, accessioned and sent to Joanna Bird for specialist examination, and she wrote a report on samian from HAY86, MST87, MNL88 and HOO88. Little or no samian appears directly in burials, but it is not necessarily for this reason to be disregarded as entirely disturbed and residual; its presence may relate to activities above ground after burial.

2.4.5 Burial vessels

It became clear that not all the pottery which had been accessioned (*ie* given small finds numbers) could have been primary burial material. Some of the accessions consisted of a single small abraded sherd that is obviously from grave backfill; other accessions are not from burial contexts and it is unclear why they were accessioned. Lists have been compiled identifying these categories, also noting missing vessels and whether illustration is desirable.

2.5 Building materials

2.5.1 In general the comments made for non-ceramic finds about provenance, sample and condition apply also to building materials, most of which are ceramic building materials (CBM).

2.5.2 Work undertaken for assessment

The material was scanned by eye and some accessions were examined with a binocular microscope (x20). Most of the material was identified as being of one relatively well-differentiated and datable group of fabrics (2815) originating to the north or north-west of London, some was a 1st century fabric (2454) from Kent, and there were small quantities of other fabrics, capable of being identified by closer analysis.

2.5.3 Quantities

The following table shows how many contexts from each site contained CBM associated with burials (1) and with structures (2), and from which mortar samples were taken (3):

key	ETN	HAY	HOO	MNL	MSL	MST	PRE	SCS	TTL	WTE
1			8		31	3	1			4
2	7		6		8		6			9
3	2									1

2.6 Human remains: inhumations

2.6.1 Work undertaken for assessment

A total of 587 inhumations (including 67 plaster burials) and 122 cremations were counted. Seven existing analytical reports were read and checked (including two reports on two individuals in lead coffins from MST87). Analytical reports remain to be compiled on all human remains from five sites (totalling 302 inhumations and 39 cremations) and on the 47 cremations from HOO88.

Inhumation and cremation remains were rapidly scanned and observations noted. A detailed report gives data and conclusions in text and tables, summarised here.

2.6.2 Completeness and condition

Completeness was assessed by what body parts were present in the material scanned from each context, and the result given as a score betwen 7 (complete) and 1 (least complete). 58% of inhumations scored less than 4, and 42% more than 4.

Condition was graded as good (7%), average (59%) or poor (34%). This grading determines the amount of information that could be expected from each body, in calculating the time required for analysis.

2.6.3 Composition and other characteristics

In a rapid scan of the inhumations, their composition is provisionally identified as 21% female, 47% male, 6% adults of undetermined sex and 26% children. Although analysis may alter these figures the rough proportion of males to females of 2.2:1 is worth noting.

Some pathology was noted in remains from all sites, although this was not being specifically observed and recorded. Detailed analysis can be expected to extract more information on pathology.

2.6.4 Sample

The skeletal data provide a sample of the buried population, but the relation between the two is uncertain because no exact estimate is possible of the original total number of burials. The relation between this buried population and any actual population is also to be determined, and cannot be assumed (see 3.5, below). Evans and Pierpoint (1986, 202) calculated the number of people that could have been buried in Roman London's cemeteries by assuming an average urban population of 20,000 and an annual death rate of 50 per 1000, which produces a total of 350,000. On the further assumption that the eastern cemetery contained one third of these bodies, then the excavated sample would constitute less than 1% of the total in this cemetery. These calculations are given here not because they are thought to be correct in all respects but rather to illustrate the difficulty, simply in numerical terms, of extending any inferences from the excavated sample to the whole cemetery, let alone to the whole burial population or, even more dubiously, to the living population of the town.

The remains from each individual excavated site however are an excellent sample from that site: all remains were recovered for study and no bias in recovery is discernable. The only counter factor is degradation of the remains over time. All excavated burials were recorded in plan and photographed.

Many inhumations were disarticulated, but it is possible to identify primary burials: these can be treated separately from disturbed and redeposited remains, initially, and all the remains constitute a good basis for analysis.

2.6.5 Existing documentation

Existing reports have fortunately employed the same standard recording methods and all cover the same basic elements (such as state of the material, age, sex, stature and physique, non-metric traits and pathology) in compatible ways. The reports differ, however, in their approach to more interpretative matters, *eg* some calculate prevalent rates of pathologies or non-metric traits while others record only occurrence. One report includes disarticulated remains in its calculations of prevalence rates for undisturbed burials, which will require more checking and re-examination of material. Existing documentation on remains from MST include reports on two burials in lead coffins; 23 inhumations and 15 cremations from MST are recorded but not yet analytically reported.

2.6.6 Summary quantification

This table summarises basic quantification of inhumations according to the following key: (1) inhumations scanned for this assessment [probably including some disarticulated bone], (2) inhumations recorded as such on site, (3) plaster burials, (4) disarticulated burials, (5) original materials not found, including 2 lead coffin burials from MSL, (6) burials with burial goods, (7) inhumations reported on previously [not always consistently], (8) inhumations to be reported [+ indicates some original materials not found in addition to any that were found]

site	1	2	3	4	5	6	7	8
ETN		8	3	10		5	8	
HAY		14	7			4	14	
HOO		115	18	68		38	115	
MNL		5	1		5	1		+
MSL	242	230	23	211		46		242?
MST	11	77	13		68	20	2	11+
PRE	3	4	1		1	4		3+
SCS		4	1			4		+
TTL		1						
WTE	4	9			5	2		4+
WTN		120	8					

2.7 Human remains: cremations

2.7.1 The comments made above about provenance, sample and condition for inhumations also apply generally to the cremations.

Existing reports were read (for MST87, WTE90 and WTN84), and other cremation remains were rapidly scanned. Most contexts produced only small amounts, with small fragment size, a small proportion of identifiable fragments and few body parts obviously represented. A high proportion of fragments were white, which indicates efficient burning.

All these remains are suitable for analysis, *eg* patterns of cracking indicate if the body was burnt fresh or allowed to dry out before burning; body parts represented indicate if all parts are present, if all remains were kept together or if more than one person is included in a cremation; perhaps half the bodies represented can be sexed.

2.7.2 Summary quantification

Cremations are quantified according to the following key: (1) found during assessment, (2) recorded as such on site, (3) analysed and reported on previously, (4) contexts to be analysed, (5) bodies probably represented by these contexts, (6) total bodies

site	1	2	3	4	5	6
HOO	48	47		81	48?	48?
MNL	1	0		1	1?	1?
MSL	64	26		41	38	38
MST	14	16	16?			14
WTE	13	12	12?		1?	13?
WTN			14			14

2.7.3 Comment

Assessment noted that many samples from HOO88 need to be rebagged, reboxed, and in all cases except one, so-called sorted residues still contain bone and therefore need to be resorted to extract bone. Samples from MSL87 must still be sieved: it has been assumed that these will all produce some bone, and the residues must be sorted and scanned. Samples from WTE90 are properly sorted and boxed. Samples of bone from MST87, although reported on already, still contain extraneous material which must therefore be removed before the bone is reweighed. The report on WTN84 mentions 26 cremations, although only 14 are described in the publication, and this discrepancy must be checked.

2.8 Animal bone

2.8.1 Work done for assessment

The assemblage from each context was weighed and then given a score for number of fragments, fragment size and preservation. The basic composition of each assemblage was noted, identifying species and anatomical element, using standard bone cataloguing terms. Individual bones were not described in detail (eg age, sex, side of animal), nor were any measurements made.

Records were input and summary reports compiled for each site.

2.8.2 Sample and provenance

The bones were hand-collected. The provenance of the bone is clear in terms of contexts, but the question remains of how closely bones are associated with particular burials. This is explained in 3.4.1 and 3.4.7.

2.8.3 Preservation

This was generally good, with enough large fragments and in good enough condition for measurements to be made.

2.8.4 Summary quantification

This table summarises basic quantification of animal bone according to the following key: (1) number of contexts containing bone, (2-5) weight of bone in kg: (2) in all contexts containing bone, (3) in contexts identified as burial fills, (4) in contexts identified as ditches and gullies, and (5) in contexts identified as related to other features, *eg* structures, layers, pits (breakdown not available for MNL and MST)

site	1	2	3	4	5
ETN	10	1.23	0.21	0	0.31
HAY	58	12.07	2.04	3.88	3.08
MNL	46	15.92	-	-	-
MSL	110	47.64	5.31	11.68	18.83
MST	31	5.70	-	-	-
PRE	2	0.64	0	0	0.64
SCS	36	7.35	0.54	0.28	3.76
TTL	12	6.55	0.07	4.85	0.74

2.9 Environmental soil samples

2.9.1 Work done for assessment

At least 166 samples were collected from 7 sites, of which 100 samples from HOO88 have already been analysed (de Moulins 1990). About 15 complete samples and all residues from HOO88 had been excluded from this analysis, for no obvious reason. Some more samples (in excess of the 166) were processed on site (MSL, MST and WTE), and may have been discarded after sorting for cremated bone and finds. Remaining samples were processed in accordance with MOLAS procedures and the project design (MOLAS 1992A and 1992B). All flots were dried, as none appeared to be rich in organic material, and were scanned to note frequency and diversity of plant and other biological material. Most flots were small (many of them less than 10ml) and quantities of seeds, etc, were correspondingly small. Residues were sorted for finds and biological material.

2.9.2 Summary quantification

This table summarises the number of samples from different sites obtained from different types of context, according to the following key: (1) cremations, (2) burnt layers relating to cremations, (3) burial fills, (4) fills of ditches, pits, a well, (5) contents of pot

site	1	2	3	4	5
ETN	0	1	0	0	0
HAY	2	0	1	5	1
MSL	3	11	2	1	0
PRE	0	0	0	5	0
SCS	0	0	9	9	0
WTE	10	0	0	0	0

2.9.3 Sample, condition and variety

Charred plant remains were found in many samples, in small quantities, and there were a number of lentils and pulses, which are a relatively uncommon find from the Roman period. Cereal grains and related weed seeds were commonest (including evidence for cleaned wheat in the backfill of a well at PRE), with remains also of burnt and unburnt human bone, molluscs and charcoal large enough for wood species to be identified. There was little waterlogged and uncharred plant material, and little can therefore be said from such data about vegetable food deposited with inhumations and unexposed to fire. The shortage of rich organic material will limit the potential for general environmental interpretation, but it may be possible to characterise

the use of certain pits, ditches and wells.

2.10 Antiquarian and other sources

2.10.1 The main sources of information for site data recovered before *c* 1983 are described in Evans and Pierpoint (1986). The catalogue prepared by Wheeler and published in 1928 describes at least 18 burials in the present study area (RCHME 1928, 157-9), and the British Museum and the Museum of London (inheriting the collections of the former London Museum and Guildhall Museum) contain relevant materials, *eg* a sculpted stone sarcophagus, a lead cinerary canister, and burial goods - pottery, glass vessels and jewellery.

As Evans and Pierpoint note, antiquaries in general recorded only burials associated with burial goods, although recent excavations indicate that these constitute between a quarter and a third of all burials in this area (2.3.2). Furthermore, the burial goods collected by antiquaries are rarely collated and published or displayed in their original burial groups.

2.10.2 Work done for assessment

Most of the non-ceramic finds in the Museum of London were located and scanned, by arrangement with Jenny Hall. It appears that all these finds thought to have been in the Museum are still there. Records of the pottery were being computerised and no attempt could be made to check the objects themselves against their records. It would probably take an inordinate amount of time to search out every object believed to have come from this cemetery, and in most cases published information will suffice.

These objects could be catalogued and described by function and type in the same way as is proposed for the excavated burial goods, but in an annexe to the catalogue in the proposed publication. Similarly, some objects could be illustrated, especially of types not otherwise represented in the cemetery (*eg* containers), in an annexe to the proposed illustrations of the excavated burial groups. It would not be useful to include these antiquarian objects in the proposed relational database, as they have been collected according to a different policy and would introduce confusing inconsistencies.

3 Assessment of potential for analysis

3.1 This should be read in conjunction with the article on the cemetery and its potential yield of information published in *Britannia* (Barber *et al* 1990). In this project, assessment of the site data has underlined two main points:

(1) Data deriving from a cemetery such as this furnish closed groups of finds and associated osteological information, which for the most part represent deliberate deposits that are well datable and culturally highly significant.

(2) These data in particular provide the best single body of evidence for late Roman London now in existence. This is true both with regard to the sample of the population represented by the inhumations and cremations, and to the sample of objects, especially pottery and glass vessels and ornaments, interred with them.

3.2 With these points in mind, the research aims that guided assessment have been refined and rearranged. These aims are reproduced below in the form of questions, with statements of potential following them. The research questions have been rearranged according to their applicability to:

(1) development and layout of the cemetery,
(2) burial rites,
(3) the population,
(4) Roman London in general, especially late Roman London.

References in the headings, in square brackets, are to the research aims as stated in the original project design (MOLAS 1992A). References elsewhere containing the letters S, F, P, HI, HC, A, E and RBDB are to the correspondingly itemised tasks proposed in 7.1-7.12 below.

3.3 **Development and layout of the cemetery**

3.3.1 *Is there evidence for the pre-cemetery landscape, and for factors that influenced the siting of the cemetery, such as natural topography and land use?* [3.2.2]

Limited evidence exists: *eg* pre-Roman pits at MSL87 (F10) and WTE90 (2.3), and Roman brickearth and gravel quarrying predating the cemetery at HOO88. These quarries were apparently delimited by ditches, which were retained when the open area was used later for burials; some ditched enclosures may represent pre-cemetery fields (S). An early ditch at Aldgate may be related to pre-cemetery activity (Chapman & Johnson 1973).

Pre-cemetery finds assemblages are small and do not appear to contain artefacts that would definitely identify the former use of the area, except possibly finds from GYD75-76 where evidence of pre-burial quarrying may be dated (Whytehead 1980) (F). The degree of residuality of artefacts can be clarified further (F, P).

Some plant and microfaunal data may come from pre-cemetery contexts (A, E).

3.3.2 *Is there evidence for the extent and date of the cemetery?* [3.2.1]

How far the burials represent a single cemetery rather than a series of burial grounds in close proximity, and what proportion of the area available for burial was in fact occupied by burials, are to be determined. Enough data exist to indicate where and when burials began, and to trace their subsequent development. Although a cemetery at its maximum extent is likely to have been much larger than the areas recently available for excavation, the latter appear to be well-distributed. The likely maximum extent of the cemetery can be mapped and compared with the extent of areas where strata will have been destroyed and those where remains of the cemetery are likely still to survive (S).

The origin of the cemetery can be sought by systematically correlating in the RBDB the date and position of individual burials, and mapping the output (RBDB, F, P, S). It will be possible by this means to see at least how the cemetery developed spatially: *eg* by progressive expansion from one or more points or edges, as might be expected to have happened if burials were inserted first nearest the town and along the Aldgate road. The area of active burials at any particular time can be mapped; if non-burial uses contemporary with, and superseding, burials are identified, this would indicate contraction of the cemetery (RBDB).

Some burials were inserted into deposits that appear to have contained or been derived from previous burials, and dating information from associated artefacts might clarify when the first burials were inserted in any particular area (F, P).

Evidence to be considered from outlying excavated sites in the study area, but not among the 11 main sites, includes: redeposited cremation vessels from GDC80 and BCL88 and hobnail boots from GYD75-76 (P, F); a redeposited skull (XWL80), human bone (GYD75-76), redeposited cremations (GDC80; BCL88) (HI, HC).

Antiquarian sources record burials of various types in the study area, about 40 with finds, indicating at least the definite presence of burials. The converse, the absence of findspots, is no proof of absence of burials, in view of collection bias and the likelihood of post-burial disturbance. With this proviso these findspots can be dated and mapped (F, P, S).

3.3.3 *Can the burials be dated accurately?*

Many features float stratigraphically within a broad Roman horizon, and artefactual or other dating evidence will be required to phase them (S, F, RBDB).

About 41% of burials (*ie* 164 inhumations and most of the 122 cremations) were accompanied by artefacts, 26% of burials (*ie* the 164 inhumations and at least 16 cremations) being accompanied by burial goods. Many of these artefacts can be dated closely, and many burial groups include several items which in combination will strengthen the evidence for date: *eg* 41 burials have more than one pottery vessel. Dating tables and an overall dating framework for the cemetery can be constructed (P, F). The unusual types of glass can probably be more closely dated, given further study (F).

Pottery and glass vessels, many of which are complete or nearly complete, are unlikely to be residual except in the case of heirlooms. Methods of identifying heirlooms and estimating their persistence can be tested (P, F).

3.3.4 *Is there evidence for the internal layout of the cemetery, and how burials might have been located in relation to ditches, hedges, roads, paths, and similar features?* [3.2.4, 3.2.5]

Density and arrangement of burials varied and some of the data suggests that only certain parts of the area available for burial were used, whether for inhumations or cremations. In some places burials were in rows, while elsewhere successive burials cut previous burials, up to a maximum of seven successive burials in any single stratigraphic string. These variations can be systematically plotted in plan and compared with other features of the landscape and with other burial data (S, RBDB).

Clear evidence for a road was found at SCS83 and MNL88 (although not planned at 1:20). The projected line of this road, yet to be dated precisely, coincides with a set of double ditches at HOO88 (4.4, 4.5, 4.7, 4.8), probably indicating that there was a single road running in a straight line WNW-ESE for at least 500m (Fig 2; Whytehead 1986, 25-7). This projected line runs through other sites (WTN84, ETN88, PRE90) but not through excavated areas; burials on those sites appear to be aligned to this projected line, however. Pottery from roadside ditches (HOO88, SCS83) can be dated. Most non-ceramic finds from successive surfaces of the road appear to be redeposited burial material, and residual, but analysis of coins (SCS83, MNL88) may refine the dating. It may be possible to say if burials preceded the road or vice versa, with implications in either case for the relationship of this road to the developing layout of the cemetery (F, S).

Evidence exists for a series of ditches on two different alignments, forming possibly discrete enclosures with entrances, *eg* HOO88 (2.3, 2.7). Some but not all burials were aligned to these ditches; some ditch fills can be dated, and the progressive development of these features in relation to burials can be plotted in plan (S, RBDB).

The distribution of antiquarian findspots can be examined for equivalent spatial patterns but, being sparser and strongly subject to collection bias, will be excluded from the RBDB (F). It may help to confirm the existence and extent of areas where the layout of burials respected projectable features like ditches and roads (S).

3.3.5 *Is there evidence for funerary structures and markers?*

Evidence exists for a mausoleum, including painted plaster and tesserae, with signs of reuse (MSL87: G108), and for two small masonry structures associated with cremations (MSL87: G78, G79). Other structures are represented by post holes, *eg* four-post structures associated with cremations. These features can be compared systematically with each other and with other elements in plan to see if they align with datable features, if other burials align with them, cluster around them, or avoid them (S). Some evidence exists for the use of other burial markers (MST87: 34).

Fragments of inscribed stone from funerary monuments survive in secondary deposits (HOO88: 5.12; WTE90: 8.3) (F, S). Antiquarian collections and observations (2.5) provide more examples of stone monuments and burial markers. At least five fragments are probably from this cemetery, although their exact provenance is unknown.

3.3.6 *Are there sufficient data to provide evidence for grouping of burials (perhaps because of family relationship, social status, livelihood, cult, burial rite, ethnic origin, pathology, etc)?* [3.2.7, 3.2.8]

Quality and quantity of plans from the excavated sites provide good evidence of variation in density of burials, with groups and clusters in some places and other areas without any burials. The layout of burials can be systematically compared with other burial data, to test for correlations attributable to social and cultural factors, and trends through time (S, F, P, HI, HC, A, E, RBDB). Long-term planning, evidenced for example by reserving areas for particular families or groups, would suggest institutional mechanisms of control, and perhaps ownership of burial plots or equivalent rights to them.

No single source of data can be expected to provide an answer to this question, out of context. The interrelationship of various attributes of burials will be tested, challenging simple

assumptions about how these might interrelate. Aspects of finds data relevant to this aim are considered in more detail with reference to burial rite (see 3.4.1).

Skeletal data are sufficient for the presence of genetic relationships to be sought, independently of other data, and their possible relationship with other burial data can then be tested (HI, RBDB). Possible genetic relationships cannot be confirmed by tests of blood groups, which would require the presence of collagen, which has not survived, nor of DNA or amino acids, for bone was not collected under the extremely strict conditions required to make these tests feasible.

Double burials (*eg* HOO88: 5.81) and multiple burials (*eg* HOO88: 5.41; MSL87: E39) can be examined to test for common traits indicating kin relationship (HI). These burials are rare among late Roman burials and have implications for attitude to death and the dead, for social organisation and culture in general. Was an infant buried in the upper fills of an adult grave related to the adult? If not, this would imply that it had been buried in that spot either from convenient expediency (small burial taking advantage of large burial?) or the existence of some less evident relationship with the adult (protection, quasi-kinship?) Intact cremations found buried in the backfill of inhumations (*eg* MSL: E73) will be investigated similarly (HC).

3.3.7 *Can parts of the cemetery not used for burials be identified, and is there evidence for their alternative use (eg preparation of the dead before burial, storage of equipment and fuel, habitation, shelters, cultivation, rubbish disposal, trees, etc)?* [3.2.9]

Such non-burial areas exist, some with ditches and others with features apparently related to cremation processes, such as pits with burned sides (*eg* MST87: 36). One large pit at HOO88 (7) appears to represent separation of cremated bone from pyre debris and the burial of the latter. Its infill (large amounts of burned human bone, animal bone, artefacts, seeds and other plant remains) can be examined and compared with spreads of cremation debris nearby (HOO88: 8.1) (A, E, HC, F, P, S). Perhaps the remains of the cremated dead were not always buried or disposed of individually?

Stratigraphic evidence of other open areas can be analysed and can be interpreted in relation to applicable finds and environmental data (S, A, E, F, P).

3.3.8 *Do the data supply evidence for the disuse of the cemetery and the date of this?*

The latest burials in every stratigraphic string can be identified. Other subgroups correlable with or later than these, to which a Roman date can be assigned, can be examined for evidence of change of use (S, F, P, A, E).

In general post-burial contexts are subject to much disturbance and truncation, and they may not yield conclusive information. There is an apparent decline in the number of datable artefacts accompanying later burials, which may be significant in itself, while also limiting the usefulness of finds as a dating tool. A few burials are obviously late, *eg* two in MSL87 containing chip-carved belt fittings and crossbow brooch (G86) and tutulus brooches (E101).

Artefacts associated with burials identified as late in the sequence, because stratigraphically later than others dated fairly late anyway, can be examined for wear, particularly coins (F, P).

Coins and pottery in immediately post-burial contexts (*eg* HOO88) can be examined and dated for a possible TAQ, but most appear to be highly residual (F, P).

3.4 **Burial rites**

3.4.1 *What is the evidence of burial rite? Can burials with goods (including plant and faunal remains) and burials without goods be compared?*

Evidence of the commonest burial rites, without burial goods, will depend on alignment, orientation, arrangement and treatment of the body, and other attributes (*eg* at least 44% of inhumations were in wooden coffins, 12% were 'plaster burials' and others were amphora burials). These data can be systematically analysed both for significant patterns among themselves, and for correlations with other factors that may appear in other burials with goods (RBDB). 28% of inhumations and 13% of cremations were accompanied by burial goods; the proportion of cremations burned with goods, especially food, is to be determined but may have been 50%.

Burials with goods, which should provide the most evidence of rite, are considered further below (3.4.3).

At least 70 plaster burials were excavated. Samples were taken, analysis of which would indicate its original form, whether deposited in a liquid or a solid state (E). There are sufficient data to correlate this form of burial with other burial attributes (RBDB). Some cases are unusual: *eg* decapitated plaster burial with skull replaced by ceramic vessel and the inhumation sealed by ragstone boulders (HOO88: 5.114), which has already given rise to published comment (Philpott 1991, 95).

The assemblage is both large and varied enough to allow classification of objects according to function, and for comparison of individual burial groups, *ie* all articles associated with individual burials (F, P).

There is a large enough assemblage of pottery to examine systematically for vessels that are deliberately broken or damaged, presumably as part of the burial rite, those that are reused, bearing signs of wear, sooting, residues, limescale, etc, and the identification of sets of ware used in individual burials (P). Some pottery is especially informative, *eg* miniatures, pieces with graffiti.

Residues are detectable in some glass and ceramic vessels, and can be examined for possible identification (E, F, P). The contents of a vessel may have been of much greater significance in the burial rite than the type of vessel; there may also have been boneless meat on plates.

Animal and bird remains inside vessels accompanying inhumations (*eg* HOO88: 5.85) can be identified (A, E). Other such remains appear to be mostly in inhumation backfills and ditch fills, rather than in layers, pits or other features. They are rarely found in cremation backfills though sometimes in actual cremations. They can be examined for evidence of butchery and other signs of treatment, indicating whether whole carcasses or only parts were used, and if parts, whether there are regularities in this (A). Results can be compared with the equivalent obtained from faunal remains in secondary contexts (RBDB). The distribution of remains can be plotted: if deposited deliberately, perhaps they were intended as food to accompany the dead or, if outside the coffin, they may be the residue of eating at or after the time of burial (A, RBDB). Perhaps certain types of food correlate with particular types of burial.

The best evidence of plant remains is contained in cremation material, uncharred plant material not surviving well or at all elsewhere: *eg* carbonised cereal grains, lentils, and other pulses at HOO88 (de Moulins 1990). Pulses are relatively uncommon on other Roman sites. Unidentified vesicular plant material at HOO88 and elsewhere may represent plant fuel ash (de Moulins), or perhaps the remains of food offerings, *eg* root vegetables and cooked food. Plant remains can be examined for identification (E).

The condition of artefacts associated with cremations varies considerably, and provides evidence for the cremation processes themselves. Systematic comparison can be made of burnt and unburnt finds, in relation to their position (F, P, HC, RBDB). It should be possible to determine which types of object were burned with the body, *eg* personal ornaments, and where such objects were placed on the body, from staining and fusion with cremated bones.

Analysis of the condition and position of the bone and the artefacts found in the spreads of debris derived from cremation fires at HOO88, especially the large quantities of glass, much of it burnt, should provide information about the techniques of burning: size, arrangement, duration and temperature (F, HC).

Some environmental samples contain fragments of charcoal large enough to identify species used in cremation fires (E).

No textile survives, nor mineralised traces of textile.

3.4.2 *Do the data provide evidence for variation in burial rite spatially and through time? Can inhumations and cremations be compared in this respect?* [3.2.11, 3.3.2]

The long life of the cemetery, and the large and datable sample of burials, will allow possible changes in burial practice and characteristic rites to be identified, some of which may indicate increasing Romanisation of a native population, or changes in attitude to the afterlife, the advent of Christianity and of other religions.

Cremation and inhumation represent different rites, in themselves, but their attributes can be compared to detect similarities and define differences in other respects (RBDB). The range of types of object burned or buried with cremations is similar to that found with inhumations, but obviously the sample is smaller in size. There is also greater variation in the condition and position of the objects, with significance for interpretation of the burial rite.

3.4.3 *Are the data sufficient to question if there is any significance in the internal arrangement of inhumations, and the position of types of burial goods within burials?* [3.3.3]

Inhumations and cremations were planned during excavation so as to record the position of individual burial goods and other elements of every burial in detail, although not necessarily on a single plan for any one burial. Every inhumation was recorded in a vertical photograph, from which the position of the body in relation to both burial cut and burial goods can be reconstructed in plan (S).

The position of objects shows considerable variation, with significance presumably both for the appearance of the body and its dress, and for ritual and belief: among inhumations, objects were placed either inside or outside the coffin, and among cremations, objects were either burned with the body, or placed with the cremation, either inside or outside the cremation vessel. These positions can be categorised, and the position and treatment of the body can be categorised, for better inputting of data into the RBDB (S, F, P, HI, A, RBDB).

Among inhumations, objects worn on the person, *eg* jewellery, ornaments, hairpins, brooches, combs, can provide evidence as to the appearance, dress and arrangement of the dead

body. The range of such items is diverse enough to allow comparison with similar objects deposited deliberately in graves but not worn on the person (F).

There are at least six cases of decapitation. The location and arrangement of redeposited skulls, mandibles and cervical vertebrae can be examined to determine how decapitation occurred, whether at or after death (HI). There are sufficient data to justify attempting to correlate these cases with other burial characteristics, and possible post-burial disturbance would be identified (RBDB). In general, displacement of bones is sometimes severe: analysis of other factors in each of these cases of apparent disturbance may suggest causes, *eg* seasonal burial, coffin survival, interference by small mammals.

3.4.4 *Are the data sufficient to trace a relationship between burial goods and age, sex and other attributes of burials?* [3.3.4]

Analysis can be made of the ways in which burial goods relate to the age and sex of the body, as revealed by interpretation of skeletal and other data, including cremation debris, presence and type of coffin, date, etc. All the attributes of burials in the RBDB can be tested against each other for possible correlations, which would indicate systematic variation in the burial rite (RBDB). This would distinguish *eg* between objects likely to have been the personal possessions of the individual and objects selected specifically for burial. There appear to be some inconsistencies, especially in the larger assemblages of types of object from MSL88, which suggest that this comparison would be fruitful.

Comparison of the state of preservation of similar objects in burials of different types, especially plaster burials and other burials, will have use for estimating likely rate and condition of survival, both in general and for the sake of future excavation of this cemetery (F, P, C).

3.4.5 *Are there enough data to provide evidence for coffins and burial containers?*

At least 44% of inhumations were in wooden coffins, evidence for which was in the form of nails and fittings, small quantities of mineralised wood, and stains of decayed wood. Most wooden coffins were apparently constructed with nails. Coffin nails and fittings were all recorded in plan in situ. Nail types can be analysed (F), and the layout of nails in plan systematically plotted and analysed (S). Some constructional details, at least, can then be reconstructed on paper (F, S), allowing conclusions to be drawn for coffin construction on lines already attempted with data from WTN84 (by Orton, in Whytehead 1986, 61), *eg* whether they had lids or were simple stretchers (*cf* Rodwell 1988, 31-42). Perhaps there was a fixed range of sizes, perhaps coffins were made individually to order, or perhaps these alternatives co-existed?

WTN84 produced evidence for a lead-bound wooden coffin (Whytehead 1986, 60), like examples among antiquarian data.

Two lead coffins were excavated (MSL87: E80, E124), and there are examples at WTN84 and in antiquarian collections. These demonstrate variety in construction technique and decoration. Some decoration may have apotropaic significance, and the use of lead coffins may have significance also for status and wealth.

Antiquarian collections have types of coffin not found in the excavated sample, *eg* a stone sarcophagus (RCHME 1928, plate 57).

Evidence exists for other containers or their equivalent, *eg* simple shrouds, represented by pins and fastenings. The position of individual pins was recorded, allowing the position of shrouds to be reconstructed to some extent (S, F).

Information about use of different types of coffin and other burial container can be compared systematically with other burial data, to suggest its possible social and cultural significance (RBDB).

Most cremated remains were deposited inside pottery vessels. These pottery vessels often have lids, apparently improvised from pottery bowls, tiles, building stone and lumps of mortar.

Enough evidence of pottery vessels exists to make occurrence, type, and date worth analysing both in themselves and in relation to other data (P, RBDB). Are vessels of certain types preferred, apart from utilitarian characteristics such as size? It may be that low-value vessels were preferred, *eg* seconds and wasters, sometimes broken in antiquity. This may have been simple economy or it may have had symbolic significance: *cf* the apparent significance of deliberately-broken vessels among burial goods. There must have been some way of obtaining such seconds, perhaps at cemeteries, suggesting that the 'funeral market' for seconds may have been a very small and limited but reliable component of pottery distribution. The reuse of some ceramic containers, *eg* amphorae, can be investigated (P).

There is limited evidence of the use of non-ceramic containers, other vessels and wooden boxes, or burial directly in the ground without any evidence for a container, although containers made of organic materials, *eg* cloth or leather bags, and baskets, would not have survived. Cremations and cremation debris include traces of wooden boxes and a fragment of a glass cinerary urn; antiquarian collections include a lead cinerary canister (London Museum A20547, RCHME 1928, 157). Examination of residual glass fragments would identify more examples (F).

3.4.6 *What is the evidence for post-burial rites?*

Burial monuments and markers (3.3.5) imply continuing recognition of individual burials, suggesting the possibility of post-burial activities. There is some evidence of post-burial activity, *eg* pits cut into burials (MST87: 34) and lids on cremation vessels that must have protruded above ground level, facilitating libations (WTE90: 6.7) (S). There are some secondary deposits, *eg* containing samian, which are not apparently disturbed and residual, and may indicate that rites occurred around the burial or after burial (S, P, A, E).

3.4.7 *Do data from secondary deposits (eg ditch fills, pit fills) provide evidence for burial rite?* [3.2.13]

Some burials were cut into previous burials, displacing bones and burial goods. There is little or no evidence for deliberate reburial of such displaced remains: there are no charnel pits and there is a large amount of residual human bone in secondary deposits, which can be examined in its own right and as an indication of the circumstances in which pre-existing burials lost importance (HI, S).

In general there is no direct evidence for slaughtering animals, cooking, feasting, or similar activities, although plenty of indirect evidence (*eg* 3.4.6). Identifying any plant and faunal remains characteristic of cremations (3.4.1) will help to determine if redeposited material is derived from cremations (HC, E).

Animal bone recovered from ditches (*eg* HOO88: 4.7) can be compared with that from inhumations and burial fills, to detect differences between food consigned with the dead and food eaten by the living during obsequies (3.4.1) (A).

Horse burials (*eg* MSL88: E89, where a horse was buried with harness fittings, at least one dog and possibly a pig) are also known from other cemeteries. Although this doesn't explain why horses and other animals were buried in the same cemetery as human beings, it does indicate that it was not exceptional. These animal bones can be examined to determine if the horses were butchered for food (A).

Other features with possible ritual significance include: a pit containing a large assemblage of pottery vessels, a heron and many frogs (SCS83: 7.82; although there may be a prosaic explanation for this faunal assemblage, the pit operating as a natural trap) (A, P); and deep pits or tanks (described at WTN84, Whytehead 1986, 65-7), similar to a presumed well elsewhere (PRE89: 6.9) (S). A source of water would presumably have been required for several of the activities identified or presumed, *eg* plaster burials and cooking; perhaps also for cooling and washing cremation debris.

3.4.8 *What is the evidence for ritual and belief?*

Strictly speaking it is impossible to rely on material objects when investigating the beliefs of another age; observance of ritual, which may leave material traces, isn't necessarily evidence of belief (Macdonald in Clarke 1979, 405; Philpott 1991, 235). Among the excavated data are objects and materials that are known from literary and other sources to have had a ritual or apotropaic significance, *eg* coins placed in the mouth as Charon's fee, pendants showing Medusa, figurines and lion head studs, probably from small caskets. A total of 152 coins were recovered, of which *c* 50 appear to have been deposited deliberately. Certain coins may have been chosen for the symbolism of their design (*eg* MSL87: E2), and this can be investigated (F).

Artefacts present in inhumations can be interpreted in this light: *eg* selection of particular objects and recurrent types of object, placement of burial goods, the deliberate breaking or burning of artefacts (*cf* Alcock 1980). The treatment of areas apparently containing previous burials, and of earlier funerary monuments, suggests a relatively pragmatic attitude to the long dead and unidentified dead. The context in which to place and examine these activities is provided by Classical literature and iconography, and evidence of Iron Age burial practices in southern Britain (Philpott 1991).

3.5 **The population**

3.5.1 *Are there sufficient data to provide evidence for human demography and whom the burials represent, and for disease, diet, occupation, causes of death, etc?* [3.4.2]

The excavated inhumations and cremations provide a large and fairly well-preserved human population sample, although the likely relationship of this sample to the population of the nearby town, or of other places, is still undetermined. The artefacts associated with the sample can be well dated, and may supply more information about the sample's origins and lives (*eg* 3.6.4 below).

The skeletal data can provide osteological evidence for sex, disease, diet, ethnic mix, family relationships, age at death (in terms of physiological development) and, in some cases, cause of death. This information can be related to other burial data, suggesting answers to questions of status, culture and demography. Correlation with evidence for date would be

especially valuable, bridging what has been interpreted as a change in the 3rd century from preference for cremation to preference for inhumation.

The data contain evidence of pathologies from which the environment of the population can be inferred (HI, HC): *eg* presence of calculus deposits indicating standards of hygiene. Iron deficiency may be indicated by cribra orbitalia; corroboration would require testing of bone for iron content, and this would require control samples of surrounding strata or, second best, using bone from individuals without cribra. The same qualification applies to testing bone for lead.

Evidence for stress caused by occupational practices can be seen in characteristic skeletal modification (HI).

In general these skeletal data are well-preserved. Differential preservation of skeletal remains can be correlated with other factors, *eg* plaster burials, burial practice, pathology, with corresponding implications for estimating the effects of preservation on samples elsewhere (HI).

3.6 Roman London in general, especially late Roman London

3.6.1 *Are there enough data to trace a relationship between the use of articles in a domestic context and as burial goods?* [3.3.1, 3.3.6]

The burial goods can be examined to compare them with objects found in non-burial assemblages, to establish the relationship between use of objects as burial goods and use as domestic equipment (F, P). It should be possible to see if the selection of objects for burial purposes is unusual, despite the relative paucity of non-burial assemblages. Any significant patterns can be compared with patterns previously produced, *eg* for glassware (van Lith & Randsborg 1985).

The pottery assemblage includes a large proportion of 3rd century wares, which are found relatively rarely in London, as elsewhere. The existence of many complete or nearly complete vessels in primary contexts will permit systematic examination and analysis and illustration (P).

The excavated glass comprises a wide variety of vessels with dates of manufacture ranging from the late 1st-early 2nd century to the late 4th-early 5th. Many complete or nearly complete vessels were found in situ with burials; recognisably similar vessels in other contexts are apparently redeposited burial goods. There appear to be practically no purpose-made burial goods or burial containers, and the vessels are assumed to represent the types and variety of glassware in circulation in the town and round about, with a secondary use only as burial goods. Comparison with other major assemblages of glass from London will confirm this (F).

The late Roman types are particularly interesting, some of them not seen before in London. Specialised drinking vessels are rare, but one 3rd century beaker (ETN88) is an outstanding item, and several vessels of fine quality have been recognised among residual fragments. Specific types can be compared with other material from London, *eg* a Frontinus bottle (MSL87: 71), and late Roman bulbous-bodied vessels (MSL87, MST87). Dating and understanding of the significance of the glassware will be enhanced by comparison with material from outside London (F).

Ornaments found worn on the person can be compared with similar objects found in contemporary domestic assemblages in London (3.4.3). It should be possible to identify trends in popularity of different types of object and materials (*cf* Clarke 1979, 301).

3.6.2 *Do the data provide evidence for technology (eg management of wood resources for fuel and coffin making; making pottery, copper alloy, jet and shale objects, shoes; etc)?* [3.2.12, 3.3.6, 3.3.7]

The artefacts provide no direct evidence for activities such as digging graves, building tombs, making coffins, felling and working timber or building cremation fires: these must be inferred. X-raying all the ironwork may identify tools (F, C). Indications of coffin manufacture would have implications for off-site activities, *eg* timber growth and management, supply, carpentry, metal-working.

Recent analysis of copper alloy artefacts by x-ray fluorescence (Bayley 1990, 136; AML report on Uley, 198X) suggests that different and specific alloys were used for particular types of object. The sample of copper alloy bracelets here, from both excavated sites and antiquarian collections, is large and varied enough to justify such analysis: this would determine if there is systematic variation in the alloys used for different types of bracelet, and will permit comparison with other samples elsewhere (C, F). This analysis would contribute to appraising the economic and social significance of such items of jewellery.

Many artefacts were identified on site as jet and shale. Recent studies (Hunter 1991) suggest that this material can be examined by non-destructive means to identify it more precisely, *eg* as either jet or cannel coal, and indicate its possible source (C, F). This would also help in determining better conservation treatment for jet and shale.

3.6.3 *Do the data supply evidence for the relationship between the cemetery and the town,*

and the cemetery and the countryside? [3.2.3, 3.2.5, 3.2.14]

Topographical evidence for such relationships exists and can be examined relatively easily. The relationship with the city wall, built *c* AD 200, can be examined (S). There are data that may represent or reflect a pre-city wall boundary (TTL85: north-south ditch). Platforms or bastions added to the outer face of the wall, dated to the 3rd century or later (Maloney 1983), incorporated reused stone from funerary monuments. This suggests a pragmatic attitude preferring civic defence to respect for the dead (or their families and other interested parties).

The line of the road through the cemetery (3.3.4) can be projected westwards into the town, where its relationship with the more strictly urban streets of various dates can be examined, and eastwards towards the site of a supposed signal station at Shadwell (Johnson 1975) and a possible settlement at Ratcliff (SMR 080911). The Aldgate road bounds the study area and presumably the cemetery, and its influence can be considered, although the major sites contain no data directly connected with it (S). Further to the east, at Bow, evidence of a Roman settlement with a substantial cemetery has been uncovered (Sheldon 1972; Pitt BOD91), with which these data can be compared (S).

Non-topographical evidence exists but is more circumstantial (see 3.6.4 below).

3.6.4 *What is the evidence for wealth and social status?*

Social status and wealth are notoriously difficult to discern properly and to ascertain (Philpott 1991, 228-232 for attempts and cautions). The number, variety, quality and rarity of artefacts, in terms of material, technology and skill, can be considered (F, P). The presence of imported articles which may have been expensive, *eg* glassware, although suggestive, is not a sure indicator of social standing (van Lith & Randsborg 1985). Richness of finds is not a conclusive factor in any interpretation as to social status, but correlation between this and methods of burial, presence of funerary structures, concentration and density in plan, and skeletal evidence, may be more reliable (RBDB). It remains to be determined how representative of Roman London's inhabitants the burial population of this cemetery could have been, in respect of social status (*cf* Perring 1991, 121-3; Morris 1992, 81-90).

Artefacts that are found in small numbers and fragmentary condition elsewhere are here in large numbers and often intact. The burials dated to the 3rd and 4th centuries are very notable in this respect: contemporary occupation deposits in the town are typically very disturbed or truncated by later activities, making the outlying cemeteries a prime source of data for this period. Particular classes of material are very useful, *eg* glass: it has been suggested that vessels deposited in late Roman burials show a pattern in range, quantity and distribution that is closer to actual domestic assemblages than those found in earlier burials (van Lith & Randsborg 1985, 463).

Notable individual artefacts raise social and cultural questions, *eg* late 4th-early 5th century chip-carved belt fittings and tutulus brooches (MSL87). Are these artefacts associated with a particular class of person, with official or military significance? An attempt can be made to date these artefacts more precisely and to answer these questions (F).

Antiquarian collections are a biased sample, but should be compared with the sample of objects recovered from controlled total excavation, which therefore constitutes a sort of control sample (F, P). One may suppose that the antiquarian bias was towards objects that were intact, pretty, curious and sellable. If few or no comparable objects are in the control sample, this would suggest that the range of artefacts in areas from which only antiquarian finds come was indeed different, and richer. Perhaps more elaborate and richer burials, with conspicuous tomb monuments, lay nearer the access roads, including the Aldgate road?

3.6.5 *What is the evidence for the end of Roman London?*

This question relates to changes that apparently took place in the 4th and 5th centuries: depopulation of the town, change in public authority, economic and political decline, the possible immigration of mercenaries, and other more drastic changes in population, settlement and culture. The latest date given to any object in this cemetery is early 5th century, and associated data may contain evidence of disease or ethnic type. A more precise statement of potential is not possible.

3.6.6 *Do the data permit comparison with other cemeteries and burials of Roman London?*

Data from this cemetery can be compared easily at this time with published evidence of other cemeteries and burials (Wheeler 1930; RCHM 1928; Bentley & Pritchard 1982; Evans & Pierpoint 1986). Comparison of artefactual evidence will help to define broad similarities and differences (F, P).

The weak point here is that apart from antiquarian collections little of the data about other Roman burials in and around London has been published. Antiquarian data dwells on artefacts and skeletons with much less information about cremated remains, especially animal bone and other goods burned with cremations. Most of the more recent data are represented for the moment only by masses of material in archive reports, very little of which has been collated.

There are burials inside the line of the wall and predating it, especially at the west side of the city, which have been taken to indicate that the town boundary before the building of the wall followed a different line (Bentley & Pritchard 1982). The position of some burials to the north and in Southwark has similar implications for the development and boundaries of the settled area. There were extensive cemeteries to the west and north of the town, very comparable to the eastern cemetery. Burials, of late Roman or post-Roman date, were inserted in the berm and the partially-infilled ditch immediately outside the city wall at various points around the circuit of the defences. Not much can be said yet about this category of burial.

3.6.7 *Do the data permit comparison with other cemeteries and burials of Roman Britain?*

Comparisons can be made between these data and data for other urban cemeteries that have been published or analysed. In this table sites are numbered as follows: (1) Trentholme Drive, York (Wenham 1980), (2) Lankhills, Winchester (Clarke 1979), (3) Bath Gate, Cirencester (McWhirr 1982), (4) Poundbury, Dorchester (Farwell & Molleson 1993), (5) Baldock (Roberts 1984), (6) St Stephen's & King Harry Lane, St Albans (Stead & Rigby 1989; J McKinley pers comm), (7) London eastern cemetery (the quantities from London's eastern cemetery exclude antiquarian finds and possible burials not yet identified individually)

	Site	Cremations	Date	Inhumations	Date
1	50	2nd-mid 3rd	350	2nd-late 4th	
2	7	4th	451	4th-early 5th	
3	3	?-4th	450	?-4th	
4	3	3rd-4th	1442	LIA-early 5th	
5	*c*300		*c*700		
6	*c*40	LIA-1st	*c*300		
7	122		587		

The data here will support comparison on these grounds: absence and presence of particular burial rites? mix and character of burial goods? chronological development in relation to density of burials, types of burial rite, burial goods, characteristics of the population? (S, F, P, HI, HC, A, E).

A relationship between ditched enclosures and the location and alignment of burials has been noted elsewhere, *eg* Poundbury (Farwell & Molleson 1993), and evidence for wooden coffin construction was examined and coffins reconstructed both there and at Kelvedon (Rodwell 1988, 31-42).

In a provincial and even a wider context, this cemetery could be compared with those excavated in major urban centres (*ie* Cirencester, St Albans, York and Dorchester) and in rural areas (*cf* Philpott 1991); in the latter case a useful comparison would be between this dense, urban cemetery and a cemetery attached to a small rural settlement nearby, at Bow, along the London-Colchester road (Pitt BOD91; Sheldon 1972). Evidence can be examined to see if London differed in burial practice, in respect of rites, composition of assemblages and chronology. Limited comparison between artefacts in this London cemetery and in continental sites would also be valuable for dating and typology in the case of certain artefacts at least, *eg* Noviomagus-Ulpia Noviomagus (Brunsting 1937), Krefeld-Gellep (Pirling 1966, 1974, 1979, 1986).

Trends in fashion or use of different types of personal ornament and objects worn on the person, detected among burial goods, can be compared with trends detected elsewhere, *eg* attempted for bracelets at Lankhills (Clarke 1979, 301).

4 Summary of potential for analysis

The potential of the site data is summarised here in relation to its local, regional and national importance.

4.1 Development and layout of the cemetery

This cemetery is the best known and possibly the largest of the four main areas of burial around Roman London, including burials to the south of the River Thames. The sample of burials is by far the largest single sample of its kind, and the richest, from any of these areas of burial, and is one of the largest from anywhere in Britain. The cemetery appears to have originated in the 1st century and to have been continuously in use until the early 5th century. The sample is well distributed across the original burial area, with good potential to show how the cemetery expanded and its layout developed through time. Evidence of the cemetery from recent excavations is augmented by antiquarian collections and observations made in the area over the last 400 years.

4.2 Burial rites

The burial sample consists of both cremations and inhumations, many accompanied by burial goods. Evidence of cremation includes remains of pyres and debris raked from them, with good potential to show how artefacts of different kinds were burned with the body and the conditions under which cremation was carried out. Evidence of inhumation includes well-recorded information about the treatment of the body and its arrangement in the grave, with or without wooden coffin and burial goods. The inhumations include many buried with plaster or gypsum, and several decapitated bodies. Further evidence for burial rite includes deposits of animal bone, presumably representing food offerings for the dead or food consumed by the living, and burials of animals. This evidence for Roman burial rite in an urban context is the best of its type locally, and should be compared with the few equivalent examples so far published from other towns in Roman Britain.

4.3 The population

The human remains represent a sample of the population buried in London, presumably at least some of the town's inhabitants themselves. The osteological evidence survives well enough to convey information about the human population: demographic structure, diet, health, occupational diseases and environment.

4.4 Evidence for late Roman London

This cemetery contains some of the best evidence for Roman London in the 3rd century and later. The assemblages of pottery and glass are the largest and finest of this date in the region, with many complete or near complete vessels. The non-ceramic finds are equally varied with several fine individual items of great interest. These artefacts seem to represent the range of types that were used in a domestic context in the town, but are rarely recovered there, because of different circumstances of deposition, and subsequent truncation and disturbance. Burials in this cemetery constitute some of the latest evidence for the occupation of Roman London, perhaps in the early 5th century. The later burials could throw light on conditions of life in a place and at a time of transition of national importance.

5 Revised research aims

5.1 Development and layout

What was the pre-cemetery landscape of the study area? What factors influenced the siting of burials here?

Where and when were the first burials?

How did the cemetery develop (from one point or several, and by different processes)? Where was the area of active burial at any particular time? What was the maximum extent of the cemetery and when was it reached?

What was the relationship between the west-east road from the town and the cemetery? Which came first, the road or the burials? How were burials laid out in relation to the road?

How were burials laid out in other respects? What continuity was there from the pre-cemetery landscape? What was done in areas not occupied by burials? What alternative land uses existed?

How were burials marked on the ground? What structures existed in the cemetery?

How were burials grouped and, so far as it is possible to say, why were they so grouped?

When and how did the cemetery fall out of use? What activities directly succeeded it?

5.2 Burial rites

What were the burial rites in use at any particular time and place in the cemetery? What did these rites consist of (before death, post-mortem treatment of the body, preparations for burial, cremation if applicable, interment, post-burial activities)?

What were the social, economic and cultural correlates of different burial rites?

So far as this can be determined, what do the rites appear to have meant to the participants?

5.3 The population

Who was buried in the cemetery? What living populations of London and its surrounding area, or elsewhere, does this burial population represent? What was their social status?

What are the characteristics of this burial population (sex, age at death, diseases, occupational stress, ethnic type)? What were their diet, state of health and environment like?

5.4 Late Roman London

What types of objects, including glass, non-ceramic objects and pottery, were in use as burial goods and in use in the town? How were copper alloy, jet and shale objects, in particular, manufactured? How are the goods used in burial rites related to goods used in other social contexts?

What else can be said about resources, technology, fabrication, distribution and use of such goods, based on the goods recovered in the cemetery?

What in general was the relationship between the cemetery and the town, and the cemetery and the countryside?

What light does the latest use of the cemetery and its disuse throw on the end of Roman London?

Compare the evidence of this cemetery, and the conclusions reached, with evidence of other cemeteries around London, near London and near large towns elsewhere in Roman Britain.

5.5 General

What comparable data exists for burials elsewhere in London of the Roman period? Will the RBDB accept these data? How can these data be collated and entered in the RBDB?

What is likely to survive of the rest of this cemetery? How can pre-fieldwork assessment, fieldwork techniques and post-excavation methods be economically improved?

6 Proposed publications

6.1 Monograph

This would be the main publication. The programme of work would suffice to produce this, and other publications envisaged would be spin-offs, separately funded.

Contents:

Chapter 1: Introduction

Text: Explains the research design, the circumstances of excavation, the existence of antiquarian collections and the use to which they have been put, and the method of post-excavation work; also describes the scope of the Roman burial database (RBDB), and access to this. Written in fairly general terms, reference being made if necessary to more detail in other chapters. Maximum 4,000 words.

Graphics: Location of the study area in relation to the modern city, at 1:10,000. Location of the excavated sites and antiquarian find spots within the study area, at 1:2,500 (fits on A3 double-page spread).

Chapter 2: Development and layout of the cemetery

Text: A mainly chronological account of the development and internal layout of the cemetery. This would examine its physical setting, preceding land use, origin, dating and extent, and would touch on its disuse. It is difficult to say how many major phases of activity will be revealed by analysis of dating evidence, and few are obvious in the stratigraphic data. In the absence of more precise phasing the development of the cemetery could probably be broken into perhaps six successive periods of fifty years or so (*cf* five periods of different length at WTN84, Whytehead 1986). About 15,000 words.

Graphics: Plans of the study area in each period (as defined above), showing successive areas of active burial. This will be at a large enough scale to show individual burials distinctly but not on a fold-out, *ie* 1:2,500 on a double-page spread. Other plans as necessary to show extent and shape of particular features, at a larger scale, *eg* 1:200 or 1:50. These larger scale plans could not economically show all the study area, but it is unlikely that any of them would have to.

Chapter 3: Burial rites

Text: A thematic account of the social and cultural significance of the burials, concentrating on rites, ritual and belief, and touching on the burial population, burial containers, burial goods, funerary markers and structures, and funerary activities outside the cemetery. Comparison with other cemeteries of London, other towns and rural settlements, in this respect. About 20,000 words.

Graphics: Plans at small and large scales, as necessary, *eg* to show distribution plots at a small scale (1: 5,000 if feasible, otherwise 1:2,500), and individual features at larger scales (as specified for chapter 2); possibly also some burial plans, selected to be representative of main types of burial (either additional to plans in chapter 8 or at a smaller scale than those), one or two isometric, axonometric or perspective reconstructions of tomb monuments, no more than 10 reconstructed coffins, and photographs of notable phenomena (*eg* figurines, coins in the mouth, animal burials) in order to substantiate or illustrate a point made in the text.

Chapter 4: The population

Text: Data, aims, methods and results to do with all demographic, pathological, dietary and economic evidence obtained from human remains. Comparison with other populations. About 10,000 words.

Graphics: Probably one or two photographs or drawings of unusual pathology; some x-rays; 10-20 computer generated tables and distribution plots.

Chapter 5: Late Roman London

Text: Discussion of the evidence for late Roman London in general that this cemetery contains: population, goods used in burials and in a domestic context, evidence for any kind of activity outside the cemetery, evidence for the relationship between the cemetery and the town, and the cemetery and the countryside. The reasons for and date of disuse of the cemetery, touching on succeeding land use. About 15,000 words.

Graphics: Plans of the study area in relation to the town and the locality, at 1:5,000 or 1:10,000. Details if necessary at appropriately larger scales, as for chapters 2 and 3.

Chapter 6: Gazetteer of sites

Text: Tabulated data about all excavated sites and find spots in the study area, including sites that contain negative or unclear information. Roughly 200 items. Explanations of conditions of excavation and methods of recording that affected recovery of information will form a sub-chapter here.

Graphics: Location plan at 1:2,500 in the Introduction should suffice, but if it would clutter up that plan to show all sites and find spots, then these must be shown in a second plan here.

Chapter 7: Catalogue of burial goods

Text: Data, aims, methods and results to do with objects deposited with burials and recovered

from secondary contexts (*NB* virtually no objects found are believed to have been unconnected with burials). Much of this text will constitute a catalogue of objects, to be arranged by putative function and type: *ie* ornaments, coins, burial equipment, hobnails, pottery vessels, glass vessels, coffin fittings, animal remains, etc. Descriptive catalogue contains *c* 500 items, cross-referred with chapter 8. Specialist analysis of animal remains and environmental materials will form a sub-chapter here.

Graphics: Drawings of burial goods arranged by burial group appear in chapter 8, referred to in this chapter by burial number and object number. One or two type series may need to be shown at a smaller scale than in chapter 8, perhaps one page of drawings for each series (*eg* brooches, glass vessels), and other details might require one or two small drawings or photos (*eg* slightly variant pots).

Chapter 8: Catalogue of burials & tables of correlation

Text: Tabulated data about all burials, arranged in numerical order of burial. These data will be the output of the RBDB, and numbered burials will be located on an accompanying plan (A, below). The database will be designed to include data from other sites in London, and the number series started here may therefore continue beyond the scope of this project. The obvious correlates will be sex, age, posture, pathology, associated objects, and coffin type. Other tables will be generated as necessary to correlate data conveniently. Catalogue contains at least 700 burials.

Graphics: The graphics in this chapter will probably form the largest single component of the publication, with three distinct elements:

(A) A plan at a large enough scale to show the location of every burial and its number; this plan may be in sections, with a common key plan, but if it is a fold-out then the bulk of the book should be readable with this plan folded out (*ie* at the back of the book). A separate oversized sheet, folded to fit A4, is a possible alternative but runs the risk of being lost.

(B) Drawings of all artefacts found in burials. These would be arranged by burial, and such drawings combined with plans of respective burials (C, below). This entails drawing more than simply new, unusual and excellent examples of types and forms, and referring to typologies and accessible corpora for other, undrawn objects, as would be suitable for most reports. It is highly desirable to show together all objects found together in this cemetery (see 3.1 (1), above). In any case there are some new types, many excellent examples, *eg* complete or nearly complete pottery and glass vessels, and several examples of similar types with small variations, which should be summarised graphically (Fulford & Huddleston 1991, 4.3.1.5). Objects will be drawn at appropriate scales and to appropriate levels of detail: pottery will be drawn as simply as practicable, usually at 1:4, and small finds usually at 1:1 or 1:2.

(C) Each burial plan (at 1:20) will show the arrangement of objects and human remains within the grave cut, if there was one, skeletons being shown as found.

Other elements of the monograph

Front matter (title, contents, abstract, bibliographical-data-in-publishing, copyright, preface, acknowledgements) and back matter (bibliography, index), to be decided according to the conventions of the proposed *London Archaeological Reports* (LAR) (*eg* footnotes are discouraged, and if necessary are listed at the end of each relevant chapter).

Size and length

Size of page should be A4, to accommodate the graphics, and the format would follow the conventions set out for LAR, unless there exists a good reason to do otherwise.

Estimates of length in pages:

Written text at 1000 words per page: 64 pages
Catalogue text at 12-24 items per page: 74 pages
Drawings (except chapter 8) and tables: 35 pages
Drawings (chapter 8): 180 pages
Total: 353 pages.

6.2 Other publications

These would be spin-offs from the work done for the monograph, but are important forms of publication in their own right. They include:

6.2.1 Maps

These embody the results of long-term, cumulative and London-wide mapping of significant topographical and cultural features of the Roman and other periods. This project would contribute to such mapping, results appearing in any update of period maps in the *London Archaeological Assessment* (EH & MOLAS forthcoming), and in any revision or replacement of the Ordnance Survey *Londinium* map.

6.2.2 Exhibitions

Some objects have already been displayed in a special exhibition, *Capital gains!*, at the Museum of London; at The Pageant, Tower Hill; and are temporarily displayed in the Roman gallery of

the Museum of London. Many objects are obvious candidates for display in a redesigned Roman gallery at the Museum of London, being complete or nearly complete, with intrinsic appeal (*eg* a motto beaker: HOO88 c). These objects on display could also be the subject of accompanying minor publications: postcards, educational packs for schoolchildren, leaflets. Complete or near complete pots not displayed in a public gallery could be displayed on MOLAS premises as a valuable reference for pottery specialists.

6.2.3 Booklet

Provisionally entitled *Death and burial in Roman London*, this would be an accessible, readable and well-illustrated account, treating the subject on a London-wide scale and placing it firmly in its social and cultural context.

6.2.4 Specialist reports

Some of the research necessary to produce the monograph may generate data and comment that could be published in specialist outlets and formats, rather than in the monograph (*eg* conservation, pottery and glass studies). Some data would otherwise remain in the research archive. The monograph will refer to the research archive and the primary site archive, of course.

7 Method of work and estimates of time required for research and publication

7.1 Overview of method of work

The work described here is required to produce the publication proposed in 6.1. The purpose of this overview is to consider the programme of work as a whole, to pinpoint certain crucial tasks and to indicate how these tasks interrelate. The direction and scope of the programme of work, like the publication, are governed by the revised research aims of the project (5.1-5.4).

At the centre of the programme is the Roman burials database (RBDB). This will consist of tables of data, related to each other by certain items in common (expected to be project-wide burial number, site codes and context numbers). Indexes of contexts already exist for some sites, and will be completed for the others, that interrelate basic aspects of the interpretation of contexts (*eg* they identify burials). These are the foundation of the RBDB. Much of the data to be entered, however, will be the product of some initial analysis in this programme: *eg* sex and age of human remains, date of associated objects, phase of burial.

The database will be designed by a computing specialist, who will consult the specialists using the RBDB to ascertain their requirements. Input will entail categorisation of some data (*eg* posture of body, position of goods), to be simple, fruitful for the probable significance of these data, and consistent with previously published work, if possible. Question routines will be developed similarly, and actually run by computing specialists, at least in the first instance. Output will be in the form of lists, indicating correlations between data: some of the output will be subjected to tests of statistical significance. The output can easily be shown graphically, as the position of all burials will first be digitised in CAD and these spatial data can then be selected automatically for display and plotting, according to burial number.

An obvious example of output would be to show the position of different burials with successively later associated grave goods: this would suggest how the area of active burial represented by these burials developed through time, but such correlations would not be conclusive and would require careful interpretation.

The RBDB will be controlled by the computing specialist, who will require time to train other members of the project team to use it efficiently. Use is expected to proceed in at least three or four stages, with revised question routines and possibly revised input at each stage.

The main responsibility for data in plan rests with stratigraphic specialists. They must make composite plans of every burial (combining information at present in different forms, including vertical photographs of burials), select plans to be digitised in CAD (*eg* burial cuts and burial-related features, ditches, roads and areas of truncation) and interpret the spatial development of the study area. Later work would proceed in stages, incorporating other specialists' revised output (*eg* dating), at a higher level of interpretation, across the whole study area. The stratigraphic specialists are expected to be the principal authors of chapters 1, 2, 3, 5 and 6, and are expected to contribute to other chapters, especially 8.

A lot of work on artefacts and human remains can proceed independently of other tasks, provided that initial indexes have been checked, revised and received from stratigraphic specialists. The product of this work will in part be entered in the RBDB. Human remains specialists are expected to write chapter 4, finds specialists are expected to write chapter 7, and all are expected to contribute to other chapters, especially 3, 5 and 8.

Later tasks for all authors will depend on output from the RBDB and will therefore proceed in corresponding stages in tandem with revision of question routines, exchange of information and interpretations, and revision of interpretations.

It will be impractical for all members of the project team to work in a single concurrent block of time, although certain equivalent elements of their work must coincide. The simplest way to coordinate work will be to have clear breaks in the timetable, especially towards the end of the programme, to allow everyone to catch up with each other.

The extent to which objects are to be drawn for publication (mainly in chapter 8) is subject to review, for reasons of economy, although it should be understood that there may be little opportunity for making economies. Review points are in the programme (at S12, S13, F12, F15, P17, below).

Individual tasks are set out below (7.2-7.14) by class of data or type of work: stratigraphic and other site records, graphics (including CAD), photography, non-ceramic finds, conservation, pottery, building materials, human remains (inhumations), human remains (cremations), animal bones, soil samples (microfauna and flora), computing (mainly the Roman burials database), and editing, production and project management. Tasks are lettered and numbered, the letters being referred to in the assessment of potential for analysis (3.3-3.5). Reference is made here to the main topics of the revised research aims (5.1-5.5).

Abbreviations:

RBDB: Roman burials database
pd: person day

7.2 Stratigraphic and other site records

S1 Interpret subgroups in MSL, MST, SCS and TTL (sites for which no archive report exists and subgroups have not been interpreted) (5.1):
Collate context sheets and plans by subgroup, note interpretations, determine and input interpretations in computer index file. Subgroups representing individual burials: MSL 261; MST 109; SCS ?8; TTL ?2: total *c* 380. These can be collated and input at a rate of *c* 35 per pd: 11 pd
Other subgroups: MSL 184; MST 24; SCS ?21; TTL ?2: total *c* 231. These can be collated and input at a rate of *c* 10 per pd: 23 pd
S1 total: 34 pd

S2 Photos:
Complete catalogue of photos (*c* 2590 images from ETN, HAY, MSL, MST, WTE not yet catalogued) and enter in computer files (5.1). Total *c* 4900 images, at a rate of *c* 300 images per pd: 16 pd

S3 Digitising plans:
Select and prepare plans for digitising in AutoCAD (burial cuts, burial-related features, ditches, roads, areas of truncation) (5.1); *c* 3000 plans to be examined (at a rate of *c* 300 plans per pd), of which *c* 800 are to be selected: 10 pd

S4 Composite plans:
Compile composite plan at 1:10 of each inhumation in HAY, MNL, MSL, MST, SCS and TTL, using vertical photo, plan of burial cut, plan locating burial goods, etc, on a par with composite plans already drawn for inhumations in the other sites (*NB* vertical photos must be printed to scale first: PH1). Reconstruct original length of truncated burials where feasible and add this to composite plans (5.2). Total of 341 inhumations at a rate of *c* 15 per pd: 23 pd
Compile composite plan at 1:10 of each cremation with burial goods (5.2). Total 16 cremations at 20 per pd: 1 pd
S4 total: 24 pd

S5 Site phasing:
Revise dating of reconstructed burials (*NB* must follow application of dating information to burials in indexes: F8, P7; plotting digitised burial plans, etc: G2; reconstruction of burials: S4). Make corrections if feasible to sequential relationships of burials and plotted phase plans of burials and consider spatial relationship to non-burial features (this may be subject to revision later: S13) (5.1). Rate difficult to estimate (say 1 pre-burial phase, 6 phases of burials, and 1 post-burial phase; average 0.25 pd per phase per site; 11 sites): 22 pd

S6 Intersite phasing:
Compare phasing of different sites, revise dating information, produce multisite land use diagram and dated burial sequence diagram (5.1). Rate difficult to estimate (say total of 8 phases; 2 pd per phase): 16 pd

S7 Gazetteer:
Collect and collate information for chapter 6, incorporating antiquarian information and sites other than the main study sites (*c* 200 items) (5.1, 5.2). Compile first draft of gazetteer: 10 pd

S8 Background reading of comparative information, literary sources (5.2, 5.4, 5.5): 10 pd

S9 RBDB familiarisation and training (*NB* must coincide with RBDB2) (5.5): 4 pd

S10 Enter strat data in RBDB: 4 pd (aggregate)

S11 Run questions and obtain output from RBDB (*NB* must coincide in part with RBDB3): 8 pd (aggregate)

S12 Coffins:
Reconstruct coffins from coffin nails and fittings, including preparation of drawings (*NB* depends on prior examination and analysis of coffin nails: F23) (5.2). The best examples, to a maximum of 10 examples at 0.5 pd each: 5 pd

S13 Plans:
Prepare in consultation with graphic specialist (G4) phase plans and other plans to illustrate chapter 2 and possibly chapter 3 (*NB* must follow intersite phasing: S6). These plans show spatial correlations between burials and other features definitively (5.1, 5.2). Probably six plans at 2 pd each: 12 pd
Reconstruct monuments and other burial structures (5.2): 5 pd
S13 total: 17 pd

S14 Chapter 2 (Development and layout):
Write first draft. Probably 10,000 words at 1000 words per pd: 10 pd

S15 Chapter 3 (Burial rites):
Write first draft. Probably 20,000 words at 1000 words per pd: 20 pd

S16 Chapter 5 (Late Roman London):
Write first draft. Probably 15,000 words at 1000 words per pd: 15 pd
S17 Incorporate colleagues' contributions to chapters 2, 3 and 5: say 10 pd (aggregate)
S18 Chapter 1 (Introduction):
Write first draft. Probably 4,000 words at 1000 words per pd: 4 pd
S19 Edit text: 15 pd
S20 Re-archiving records: 2 pd
STRATIGRAPHIC SUBTOTAL: 255 pd

7.3 Graphics

G1 Digitise plans in CAD:
Digitise *c* 800 plans of burial cuts, burial-related features, ditches, roads, areas of truncation (5.1, 5.2) (*NB* must follow S3). Rate *c* 75 plans per pd: 11 pd
G2 Produce multisite templates at various scales (1:100-1:1250) for site and intersite phasing (S5 and S6) and distribution plots (5.1): 5 pd
G3 RBDB output:
Produce multisite and single site plans from correlated data (5.1) (coinciding with S11, F21, P22, HI9, HC5, A3, E7, and in part RBDB3): 20 pd (aggregate)
G4 Advise on content and appearance of authors' plans and all other drawings, at early stage of working out (5.1, 5.2) (*NB* coinciding in part with S5, S6, S13, and S12, F24, and F12, F15, P17): 4 pd (aggregate)
G5 Publication drawings for chapters 1, 2, 3, 5, 8 (A):
Draw phase plans and similar plans and reconstructions. Say 2 large location plans and 6 large phase plans (at *c* 2 pd per plan): 16 pd
Draw *c* 20 more detailed plans, 3 other location plans (at *c* 1 pd per drawing): 23 pd
Draw *c* 10 drawings of reconstructed coffins and monuments, at 1.5 pd per drawing: 15 pd
G5 total: 54 pd
G6 Publication drawings for chapter 8 (C):
Draw burial plans: 164 inhumations and 16 cremations at 7.5 per pd: 24 pd
G7 Publication drawings for chapters 7 and 8 (B):
NB must follow review (F15, P17, P18)
Draw *c* 121 pottery and 30 glass vessels at average 4 vessels per pd: 38 pd
Draw 220 non-ceramic objects at average 2 objects per pd: 110 pd; 5 intaglios at 1 per pd: 5 pd
Paste-up: *c* 180 pages at 5 pages per pd: 36 pd
G7 total: 189 pd
GRAPHICS SUBTOTALS:
(1) G1-G6: 118 pd
(2) G7 (after review, F15, P17, P18): 189 pd

7.4 Photography

PH1 Burial prints:
Print vertical photos to scale of inhumations for composite plans (S4) and for human remains specialist (HI2) (5.2). 341 inhumations and 16 cremations with burial goods at 45 per pd: 9 pd
PH2 Collect and re-archive negs of vertical burial photos: 1 pd
PH3 Photograph coins associated with burials (5.2) (*NB* must follow F15), *c* 50, both sides: 2 pd
PH4 Photograph other selected objects for chapters 3 (S15), 4 (HI11) and 7 (F25) (5.2, 5.3, 5.4): 6 pd
PHOTOGRAPHY SUBTOTAL: 18 pd

7.5 Non-ceramic finds

F1 Complete paper and computer records:
Records must be completed so that analysis of objects can be undertaken and objects referred to in the publication can be located and examined (5.1, 5.2, 5.4).
X-ray 20 boxes of iron objects, *c* 50 objects per box, at 100 objects per pd: 10 pd
F2 Scan new x-rays and newly-cleaned objects, update records (5.2, 5.4): 2 pd
F3 Repack and relabel *c* 250 RF at 50 RF per pd: 5 pd
F4 Complete paper and computerise accession records of finds from WTN in accordance with MOLAS practice (5.1, 5.2, 5.4): 2 pd
F5 Create MOLAS-style computer files containing corrections and updates of original DGLA files of other sites according to notes made during assessment, and archive both DGLA and corrected MOLAS files (5.1, 5.2, 5.4): 5 pd
F6 Create coin computer files from existing paper files (5.1, 5.2, 5.4): 2 pd
F7 Create glass computer files partly from existing paper files (5.1, 5.2, 5.4): 5 pd

F8 Define groups of objects by collating interpretative indexes from stratigraphic specialists (S1) with finds computer files (F5, F6, F7); examine objects, group by group, particularly for identification, date, condition, degree of fragmentation and wear (5.1, 5.2, 5.4); identify and assemble burial groups from MSL, PRE and SCS, not yet done; *c* 238 groups at a rate of *c* 25 per pd: 10 pd
F9 Examine objects from pre-burial contexts, road ditches and surfaces (for dating: 5.1): 5 pd
F10 Examine objects from backfill of ditches, pits, etc (for comparison with burial goods in situ: 5.2): 10 pd
F11 Examine objects from HOO cremation pyre (for comparison with burial goods, especially objects on the person, in situ: 5.2): 2 pd
F12 Examine objects in and published accounts of antiquarian collections, locate find spots for mapping, select objects for illustration (for extent and date of cemetery, variation of rite, comparison with excavated sample: 5.1, 5.2, 5.5): 10 pd
F13 Prepare catalogue of artefactual burial goods by function and type, including research of individual objects, except glass and intaglios; *c* 220 non-ceramic entries (for RBDB entry, chapters 7, 8): 30 pd
F14 Prepare annexe to chapter 7 (Burial goods) accounting for goods in antiquarian collections (*cf* chapter 6): 5 pd
F15 Select objects for drawing or photo, including glass and coins (photo *c* 50 coins thought to have been deposited deliberately in burials, ie 100 images; *c* 250 non-ceramic objects, *c* 10 coffin drawings): 1 pd
F16 Prepare catalogue of glass, including research especially of dated parallels; *c* 30 vessels, with comment on residual and burnt fragments (for dating and RBDB entry): 30 pd
Write text contributing to chapters 5 and 7 (*ie* glass component of burial goods catalogue): 10 pd
F16 total: 40 pd
F17 Prepare report on coins (for dating, 5.1, and RBDB entry, and contributing to chapters 3 and 7): 2 pd
F18 Prepare report on intaglios, 5 objects, and on iconographic aspects of coins (for dating, 5.1, 5.2 and RBDB entry, and contributing to chapters 3 and 7): 2 pd
F19 Computer and RBDB familiarisation and training: 2 pd
F20 Enter data in RBDB: 6 pd
F21 Run questions and obtain output from RBDB: 6 pd (aggregate)
F22 Background reading:
Study comparative material (including cemetery and selected non-cemetery assemblages in London and elsewhere), iconographic and literary sources (5.2, 5.4, 5.5): 10 pd
F23 Coffins:
Study coffin nails (to reconstruct coffins: 5.2) contributing to chapter 3 (*NB* must follow x-ray of iron objects: F1 and F2; reconstruction of burials in plan: S4): 5 pd
F24 Dress and layout of burials:
Reconstruct appearance of the dead from clothing accessories, including preparation of drawings (5.2) contributing to chapter 3 (*NB* must follow reconstruction of burials in plan: S4): 5 pd
F25 Chapter 7 (Burial goods):
Edit complete catalogue *c* 500: 15 pd
F26 Chapters 3, 5 and 8:
Write contributions to the main text (non-ceramic and non-glass element): 5 pd
F27 Other editing:
(includes antiquarian finds references): 5 pd
F28 Packing and re-archiving: 2 pd
NON-CERAMIC FINDS SUBTOTAL: 214 pd

7.6 Conservation

C1 Examine objects and conserve, repack, relabel as necessary (*NB* must coincide with F3); *c* 50 objects at 3 objects per 2 pd: 35 pd
C2 Examine, conserve, repack 2 lead coffins: 5 pd
C3 Investigate stability of jet and shale objects; *c* 60 objects at 9 per pd: 7 pd
C4 Write contribution to chapter 7 and edit text: 5 pd (aggregate)
CONSERVATION SUBTOTAL: 51 pd

7.7 Pottery

P1 Process pottery (WTE90) (for dating, 5.1, and further analysis, 5.2, 5.4); 1 box at 3 boxes per pd: 0.5 pd
P2 Spot date pottery (HOO88, MST87, WTE90) (for dating, 5.1); 11 standard and 4 large boxes at 3 boxes per pd: 5 pd

P3 Check, correct and re-enter spot dates (SCS83, TTL85) (for dating, 5.1); 8 standard boxes: 1 pd
P4 Check identification of vessels on lists of burial goods compiled during PX assessment (5.2); *c* 185 vessels at *c* 40 per pd: 5 pd
P5 Identify so far unrecognised burial vessels, record as others have been recorded (5.2); rough estimate 25 vessels: 3 pd (aggregate)
P6 Rebox, relabel, rationalise storage (combine partly with P5): 3 pd
P7 Check dates of burial vessels and refine wherever possible; assign group dates to burials where more than one vessel present (for dating: 5.1) (*NB* must follow S1): 5 pd
P8 Review changes required to dating and interpretation of late Roman pottery types in London (for dating, relationship between domestic and burial contexts, manufacture and use: 5.1, 5.2, 5.4, 5.5) (NB must follow P7); write contribution to chapter 5: 10 pd
P9 Assign revised date ranges to subgroups of contexts identified stratigraphically as pre-cemetery (5.1): 1 pd
P10 Assign revised date ranges to subgroups of contexts identified stratigraphically as related to the road (5.1): 2 pd
P11 Assign date ranges to subgroups of contexts identified stratigraphically as backfills of latest burials and post-cemetery (5.1, 5.2): 1 pd
P12 Dating and burial rites:
Prepare data for entry to RBDB, analyse output for chronology of burial rites, write contributions to chapters 2-4 (5.1, 5.2, 5.4, 5.5): 10 pd (aggregate)
P13 Identify probable heirlooms (*ie* anomalously old individual objects; *cf* Orton & Orton 1975) (5.1, 5.2, 5.3, 5.4, 5.5): 5 pd
P14 Examine pottery from SCS83 'ritual pit' (SCS: 7.82), especially for evidence of wear, use, burning, etc; check identifications and spot dates; amend records accordingly (5.2): 2 pd
P15 Compare dating of primary burial vessels with vessels not in situ (5.2, 5.4):
Quantify or complete quantification of pottery from selected groups (HOO: 4, 7.3, 8.1, 11; MSL 44, 56; MST: 97) (5.2, 5.4, 5.5); total 10 boxes: 7 pd
Complete quantification of pottery from select groups (*ie* HOO burial backfills) (5.2, 5.4, 5.5); total 5 boxes: 4 pd
Weigh complete burial vessels (5.4, 5.5): 3 pd
Compare dating of primary burial vessels and of backfills, to identify probable disturbance and redeposition (5.1, 5.2): 5 pd
P15 total: 19 pd
P16 Chapter 7:
Prepare pottery component of catalogue of burial goods (*c* 200 items): 10 pd
P17 Drawing:
Select burial vessels and pottery for drawing (probable minimum 121 vessels) and select burial vessels to be reconstructed in order to be drawn (probably 90, number depending partly on number of missing burial vessels that prove to be worth drawing and need reconstructing): 1 pd
P18 Drawing:
Reconstruct selected burial vessels: 30 pd (maximum)
P19 Background reading:
Comparative material and literary sources: 5 pd
P20 Computer and RBDB familiarisation and training: 2 pd
P21 Enter data in RBDB: 6 pd (aggregate)
P22 Run questions and obtain output from RBDB: 6 pd (aggregate)
P23 Identify suitable assemblages from occupational sites in London for comparison with burial assemblages; compare these assemblages by means of computer files (for comparison of similar vessels in domestic and burial contexts: 5.4, 5.5): 5 pd
P24 Compare eastern cemetery data with data published for other Roman cemeteries in Britain (5.2, 5.4, 5.5): 5 pd
P25 Chapters 3, 5 and 7:
Write contributions to these: 15 pd
P26 Edit texts, check burial plans, etc: 10 pd
P27 Packing and re-archiving: 2.5 pd
POTTERY SUBTOTAL: 170 pd

7.8 Building materials

B1 Examine CBM from burials with x20 binocular microscope, check identifications and dating, and update records (for dating: 5.1); *c* 47 contexts: 3 pd
B2 Examine and record CBM and stone from possible funerary structures (5.2); *c* 36 contexts: 2 pd
B3 Analyse 3 mortar samples from possible funerary structures to determine method and

similarity of construction (5.2): 1 pd
B4 Background reading of comparative material (5.2, 5.4, 5.5): 3 pd
B5 Computer and RBDB familiarisation and training: 2 pd
B6 Enter data in RBDB: 1 pd
B7 Run questions and obtain output from RBDB: 2 pd
B8 Write report on results and methods of mortar analysis (B3): 1 pd
B9 Write report on CBM and stone from non-burial contexts (ditches, pits, etc) (5.1): 1 pd
B10 Chapters 3 and 5:
Write contributions about burial CBM and stone, including reconstruction of funerary and burial structures: 6 pd
B11 Check and edit text: 1 pd
B12 Packing and re-archiving: 0.5 pd
BUILDING MATERIALS SUBTOTAL: 23.5 pd
7.9 Human remains: inhumations
HI1 Collect material (*ie* 302 inhumations on which no PX report has been made) (5.3): 2 pd
HI2 Examine articulated remains of inhumations for (1) age, (2) sex, (3) physique, (4) ethnic characteristics, (5) genetic relationships, (6) pathology, (7) evidence of occupation, (8) evidence of environmentally-induced disease, (9) suitability for histological analysis, (10) suitability for x-ray, (11) suitability for chemical analysis; make appropriate records and enter in Environmental computer files (5.2, 5.3). This work will proceed at a rate varying according to completeness and condition of the bodies (2.6.2) (17 bodies at 2 per pd: 8.5 pd; 154 at 3 per pd: 51.5 pd; 89 at 4 per pd: 22 pd): 82 pd
HI3 Examine disarticulated remains of inhumations for (1) minimum number of individuals, (2) pathology, (3) any association with primary burial (5.1, 5.2, 5.3): 15 pd
HI4 Packing and re-archiving: 2 pd
HI5 The next tasks draw together newly-recorded data (HI2, HI3) and the data recorded previously for five sites. There may be some elements of the existing reports that are inadequate, and these should be identified when data is entered in Environmental computer files. Material from these five sites may be re-examined accordingly: although this requirement can be reasonably anticipated it can't be quantified very well at the present time.
Examine original records to which existing reports refer, abstract previously reported data (285 bodies), enter in computer files (5.3): 19 pd
HI6 Select material for photo, histological analysis, x-ray, chemical analysis (5.3): 5 pd
HI7 Computer and RBDB familiarisation and training: 2 pd
HI8 Enter data in RBDB: 6 pd
HI9 Run questions and obtain output from RBDB: 6 pd (aggregate)
HI10 External specialists (HI6): histological analyst; X-rays at £3-50 each, and handling; consultant palaeopathologist.
HI10 total: equivalent to 4 pd
HI11 Chapter 4 (The population):
Write first draft (10,000 words at 1000 words per pd), contribute to bibliography, prepare tables and diagrams: 15 pd
HI12 Write contributions to chapters 3 and 5: 5 pd
HI13 Edit texts, check data and bibliography: 15 pd
INHUMATIONS SUBTOTAL: 178 pd
7.10 Human remains: cremations
HC1 Examine cremations for evidence of (1) more than one individual represented in any cremation, (2) age, (3) sex, (4) pathology, (5) efficiency of cremation process, (6) associated materials (*eg* coffin, burial goods, plant matter) (5.2, 5.3); make appropriate records and enter in computer files; 88 cremations at *c* 6 per day: 15 pd
HC2 Examine redeposited cremation debris for evidence of (1) number of individuals represented, (2) associated materials, etc; make appropriate records (5.1, 5.2, 5.3): 10 pd
HC3 Packing and re-archiving: 2 pd
HC4 Enter data in RBDB: 4 pd
HC5 Run questions and obtain output from RBDB: 4 pd (aggregate)
HC6 Chapter 4:
Write contribution: 5 pd
HC7 Chapters 3 and 5:
Write contributions: 5 pd
HC8 Edit text and check data: 5 pd
CREMATIONS SUBTOTAL: 50 pd
7.11 Animal bones
A1 Examine, record, enter in computer files (for comparison between bone inside and

outside coffins, and bone in burials in situ and other deposits: 5.2); 8 sites: 28 pd
A2 Enter data in RBDB: 2 pd
A3 Run questions and obtain output from RBDB: 2 pd (aggregate)
A4 Chapter 7:
Write contribution to sub-chapter: 3 pd
A5 Chapters 3 and 5:
Write contributions: 3 pd
A6 Check and edit text: 1 pd
A7 Packing and re-archiving (all environmental materials): 1 pd
ANIMAL BONES SUBTOTAL: 40 pd
7.12 Soil samples, microfauna and flora
E1 Sort, identify and analyse HOO samples (5.1, 5.2); 15 at 3 per 2 pd: 10 pd
E2 Plant remains:
Background reading (5.2): 2 pd
E3 Sort selected flots (23 samples), identify plant remains, research vesicular plant material, record and enter in computer files (to identify plants used in burial rite: 5.2): 10 pd
E4 Identify plant remains from residues, record and enter in computer files (5.1, 5.2): 4 pd
E5 Identify species in charcoal samples, record and enter in computer files (to identify how cremations were burned: 5.2, 5.4) (max 10 samples): 2 pd
E6: Enter data in RBDB (including mollusc, fish bone and small mammal data): 2 pd
E7 Run questions and obtain output from RBDB: 2 pd
E8 Chapters 3, 5 and 7:
Write report, and contributions to sub-chapter in chapter 7, and to chapters 3 and 5: 5 pd
E9 Check and edit text: 1 pd
SOIL SAMPLES SUBTOTAL: 38 pd
E10 Molluscs:
Sort, identify and record molluscs (reasons as for animal bone) (6 samples): 1 pd
E11 Analyse and write report: 2 pd
MOLLUSCS SUBTOTAL: 3 pd
E12 Fish bones:
Sort, identify and record fish bones (reasons as for animal bone): 1 pd
E13 Analyse and write report: 1 pd
FISH BONES SUBTOTAL: 2 pd
E14 Small mammal bones:
Sort, identify and record small mammal bones (reasons as for animal bone): 1 pd
E15 Analyse and write report: 1 pd
SMALL MAMMAL BONES SUBTOTAL: 2 pd
MICROFAUNA & FLORA TOTAL: 44 pd
7.13 Computing
RBDB1 Design and test RBDB: 20 pd
RBDB2 Training other staff: 10 pd
RBDB3 Advice and maintenance while operating: 10 pd (aggregate)
COMPUTING SUBTOTAL: 40 pd
7.14 Editing; project management
EP1 General editing after external refereeing (*c* 64,000 words): 50 pd
PM1 Project management (minimum 0.5 pd per week of the project): 26 pd

8 Summary of requirements & timetable

8.1 Stratigraphic & other site records: 255 pd
Graphics, including AutoCAD and other graphics: (1) 118 pd; (2) 189 pd
Photography: 18 pd
Non-ceramic finds: 214 pd
Conservation: 51 pd
Pottery: 170 pd
Building materials: 23.5 pd
Inhumations: 178 pd
Cremations: 50 pd
Animal bones: 40 pd
Microfauna & flora: 44 pd
Computing: 40 pd
SUBTOTAL: 1350.5 pd
General editing: 50 pd
Project management: 26 pd
TOTAL: 1426.5 pd

8.2 Timetable

The timetable inserted here shows a sequence of tasks corresponding to those in 7.1-7.12 above. Weeks in this timetable are working weeks (*ie* five day weeks). An individual task is shown as a single horizontal line and the person days estimated for a task may be specified on the line. If someone is expected to work only part time on a task, this will be shown as so many work days within a longer total number of days (*eg* 12 in 20). Distinct stages of work, a critical path linking tasks or stages that must be completed before others can begin, and performance indicators may be identified.

This timetable is provisional and relative only: any calendar dates on it are purely illustrative, for the time being. Actual timing of tasks must take account of non-work factors, *eg* leave, sickness and public holidays, and other projects, *ie* time committed to other work and not available to this project. Many of these factors cannot be predicted accurately, but a rational allowance can be made for them, and in general non-work factors lengthen a single-project work-only timetable by at least 20%. These other factors must be considered when relating critical path and performance indicators to actual calendar dates.

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