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HARTSFIELD JMI SCHOOL Baldock, Herts

(HN043)

*Post-Excavation Assessment
and Research Design*

THE HERITAGE NETWORK

Archaeological Director: David Hillelson, BA MIFA

HARTSFIELD JMI SCHOOL Baldock, Herts.

HN043

Post-Excavation Assessment and Research Design

Prepared on behalf of Hertfordshire County Council

by

J.R.Hunn BA PHD MIFA

with contributions by

H. Ashworth, J. Cowgill, M. Curteis,
J. Rackham, C. Turner and R.J. Zeepvat.

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12 ROYSTON ROAD, BALDOCK, HERTS. SG7 6NT
TELEPHONE: (01462) 435007 FAX: (01462) 893562

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1. SUMMARY

Following the proposed expansion of Hartsfield JMI school, Baldock a formal excavation was undertaken by *The Heritage Network* between October 13th 1997 and January 16th 1998. This revealed two parallel ditches, a rectangular post-built structure, several well shafts, a series of spatially related cess and storage pits, several disjointed slots or gullies and a miscellaneous scatter of shallow post-holes. The present assessment report provides an overview of the significance and quality of the data collected in the course of the excavation, including the stratigraphic, environmental and artefactual records. It further quantifies the additional research that is required in order to complete a full report of the project to the standards required by the county curatorial authority.

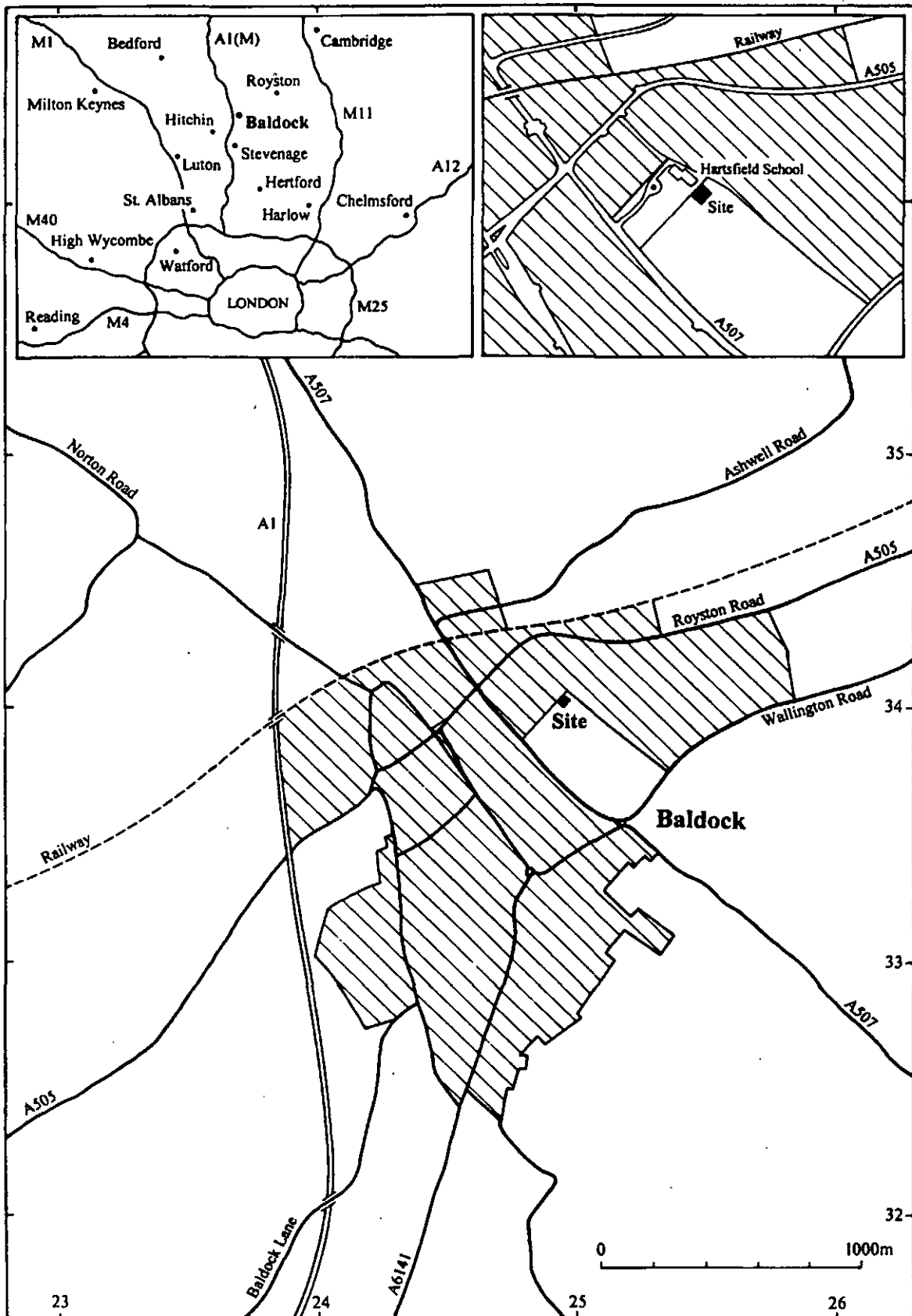


Figure 1 Site location plan

2. PROJECT BACKGROUND

2.1 Location, topography and soils

The site lies on terrain that gently slopes to the south west (65 m above OD) on soils that are derived from chalk. These are classified as belonging to the Swaffham Prior Association which are a *'well drained calcareous coarse and fine loamy soil over chalk rubble. Some similar shallow soils. Deep non-calcareous; loamy soils in places. Striped and polygonal soil patterns locally'* (Lawes Agricultural Trust 1983). The closest source of surface water today is the headwaters of the Ivel which lie approximately 700 m WNW. It is probable that the source lay further to the south in previous ages.

The 1997/98 excavation abutted the eastern side of Hartsfield JMI school and lies adjacent to the previous areas of archaeological investigation, at the north-west end of a plot of agricultural land known as Walls Field. This area was scheduled as an Ancient Monument after World War II following excavations in the 1920s and 1930s. These excavations demonstrated that it was the site of an extensive and previously unknown settlement of the Romano-British period. The field forms a part of *Archaeological Area no. 96* and *Ancient Monument no. 11*, as defined in the North Hertfordshire District Local Plan no. 2.

2.2 Archaeological and Historical Background

The site under consideration forms a small element of a Romano-British settlement. This has been described in various terms as a 'local centre' (Hingley 1989, 89), a 'nucleated settlement' (Millett 1990, 24), a 'settlement' (Finch-Smith 1987, 212; Stead and Rigby 1986, 29), a 'modest market town' (Niblett 1995, 53). It is classified as a 'major settlement' by the Ordnance Survey (1978); a *'site with an original or added element of planning'* (Burnham 1987, 168); in the late Iron Age as a 'minor oppidum' (Cunliffe 1991, 145; Burleigh 1995, 103). It appears to have doubled from about 20 to 40 ha (100 acres) in the Roman period. It has a comparatively long history of excavation and discovery (Taylor 1914, 149; Westell 1927, 27; Applebaum 1932, 244; Stead and Rigby 1986; Burleigh 1980, 35-8; 1982, 3-19; 1995, 103-12).

The most recent phase of activity has centred on Hartsfield School (Colley and Burleigh 1992; Fenton 1995). The area of excavation lies immediately between the 1300 sq m area excavated in 1991 and the 3975 sq m area excavated between 1968-72 (Site B in Stead and Rigby 1986). An evaluation trench (25 m x 1.5 m) crossed the area in 1995 together with a second, small, obliquely aligned trench (5 m x 1.5). This information, together with a geophysical survey (undertaken in 1972) afforded an insight into the probable spatial patterning of the area. These calculations were based on the general accuracy of a composite plan (produced by the North Herts Museums, Field Archaeology Section) that was illustrated in the Heritage Network report of 1995 (Fenton, fig 2).

According to the composite plan the NE corner of Site B lay just 5 m from the SE edge of the proposed excavation area. In addition, it would appear that about 40% of the proposed excavation area was surveyed by Proton-magnetometer in 1972. This evidence indicated that there was a good probability that the excavation would reveal part of the NW boundary of the enclosure which was partly excavated in the late 60s / early 70s (Stead and Rigby 1986, fig. 5). The 1995 evaluation (Trench A) revealed only a single sub-circular pit (2.5 m dia). However, some 10 m to the NW, the 1991 excavation produced evidence for a series of parallel slots (orientated NE-SW), pits, a cellar (3 m sq), a well and 40% of a gully belonging to a circular building. These structures had a date range of between the mid-1st century BC to the 4th century AD. It is possible that the parallel slots (referred to above) could have supported a raised floor whose limits may extend into the proposed excavation area. A second important element was the presence of inhumation burials in the upper fill of the cellar deposits. The well (9.7 m deep) contained a rich assemblage of animal bone and intact ceramic vessels.

It was apparent that there was every prospect of recovering more remains of the same pattern in the present excavation. Accordingly, the results of the previous excavations were examined in order to formulate the research and academic objectives of the project. However, the 1968-72 excavations of Site B, were lacking in both the taphonomic and environmental aspects of the site's development. For example, from the published report it is simply not possible to relate which finds came from which contexts. The chronology of the site is clearly summarised, but there is no detailed discussion of the chronological sequence of the sites and little or no integration of the faunal and economic data derived from the various specialist studies. While the material assemblage is clearly and amply illustrated, its social and environmental context receives far less attention. This is perhaps not so surprising given the prevailing archaeological practices of the late 60s / early 70s.

2.3 Project background

The present project represents the latest phase of the development of the Hartsfield School site prior to its expansion to meet the growing demand for pupil numbers in the locality. Following discussions between English Heritage, the County Archaeology Office (on behalf of their clients Herts County Council) and the contracting body (*The Heritage Network*) a project design was drawn up for the purposes of undertaking a formal excavation of the proposed development site. The study area was extended at the end of 1997 to take into account alterations to the drainage design for the new building. The footprint of the proposed development eventually covered an area of 1351 sq. m (that is an expansion of 35% from the 875 sq. m area included in the original project design).

2.4 Excavation methodology

The overburden (defined as the plough zone containing an intermix of the A and B horizons) was mechanically removed. The surface was then hoed by hand prior to being drawn in plan. A metal detector was used to scan the surface of the site before

and after excavation. This proved of limited use due to the presence of high concentrations of ferrous material, which subsequent assessment suggests may have been due to the presence of a Romano-British smithy on the site. The project design specified that 20 % of linear features would be excavated. There were three principal linear features but the majority of the archaeology consisted of pits and post-holes. Of these, 100% were excavated with the exception of those features which appeared to be well shafts.

Given the nature of the site (dry alkaline-rich deposits with little or no prospect of waterlogging) it was necessary to devise a strategy which would be sufficiently flexible to allow for resources to be targeted where they would benefit the overall research objectives in the most-cost-effective manner. To this end a rigid sampling policy was not implemented. Where a deposit appeared to be rich in faunal remains it was dry-sieved (10 mm mesh size) in order to maximise the range of animal species present in the context. However, this was only undertaken where the deposit had an obvious potential and could be reliably phased.

Soil samples were based on a standard 30 litre sample and were intended to be taken from as many single, datable contexts as possible. In reality, only 6.1% of all primary contexts were actually sampled. The procedure for their processing and analysis is described in appendix 7.

2.5 Summary of results

2.5.1 Pre-Roman evidence

This area of the Hartsfield site is devoid of any pre-Roman occupation evidence. Several contexts contained material of 1st century BC date but this was all residual and derived from later features.

2.5.2 1st/2nd century AD (see fig 3a)

This was represented by an enigmatic palisade slot or narrow, slightly curvilinear ditch which appears on the northern side of the site and proceeds down slope at an angle. The dating evidence is extremely poor and this feature has only been assigned to this period on the basis of both the dearth of finds and the difficulty of associating it with any other feature. A rectangular pit [200], approximately 1 m square and 1 m deep, could conceivably also belong to this phase.

2.5.3 2nd/3rd century (see fig 3a)

This was represented by three pits (one of which was a cluster of three shallow features [78, 80 and 192], the others being [106, 312 & 315]; two ditch terminals [489 and 523] and a pair of possibly associated construction slots. With the exception of two pits [312 & 315] and a ditch terminal [523] the other features were only loosely datable.

2.5.4 3rd/4th century

(see fig 3a)

This was represented by a N-S ditch [83], an E-W ditch [487], four pits [43, 91, 134 & 484] and a well [491]. Only one of these features (pit 91) had a definite physical relationship with a later ditch [85].

2.5.5 4th century

(see fig 3b)

This was represented by a second N-S ditch [85] situated immediately to the east and parallel with ditch 83. In addition, there were at least two pits associated with this phase [64 and 498]. Of the two pits, [64] was the more securely dated.

2.5.6 4th/5th century

(see fig 3b)

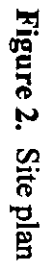
This was represented by five pits [67, 130, 148 185 and 322], one which could be a well [67]; and all of which post-date ditch 85. There were no other associated features with the exception of those itemised below.

2.5.7 4th/5th century (?)

There was one pit [71] and a well [249] which may have been associated with this late period. In addition, there was a post-built structure comprising four pairs of post-holes which lay adjacent to ditch 85. This was about 2.2 m wide by at least 13 m long.

2.5.8 Unphased

This comprised at least six pits (all to the west of the parallel ditches), a well, three principal construction or gully slots, several lesser linear features and numerous dispersed post-holes (on both sides of the parallel ditches)



Phase Plan

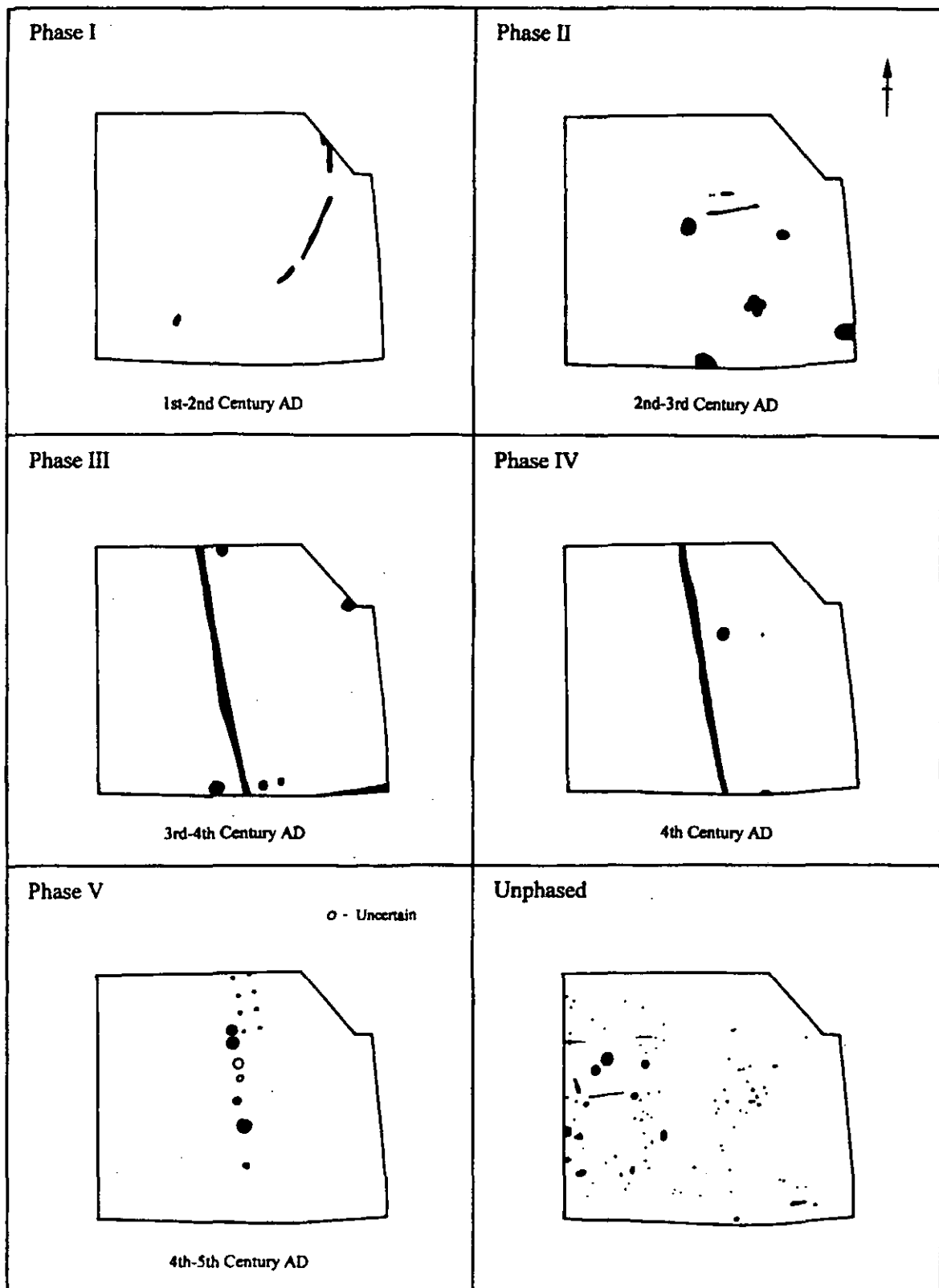


Figure 3. Phase plan

3. ASSESSMENT

3.1 Quantification of the archive

Record type	Quantification
context records	544
matrices	1
plans A2 (1:2500)	0
plans A2 (1:500)	0
plans A2 (1:100)	3
plans A2 (1:50)	4
plans A2 (1:20)	32
plans A4 (1:20)	17
plans A4 (1:10)	1
sections A2	
1:20	0
1:10	60
black & white photographs	246
colour transparencies	255
level record sheets	15

3.2 Quantification of artefacts, faunal remains and samples

Type	Quantification
Pottery	6010 sherds (83,940 gms)
Animal bone	16,788 fragments (113.5 kls)
Human bone	2 inhumations (1 adult, 1 infant)
Flint	0
Tile	56 fragments (2670gms)
Wood	0
Tile and brick	102 (8530 gms)
cbm/daub	267 fragments (3908 gms)
Mortar & wall plaster	32 fragments (1190 gms) +1 bucket of plaster (possibly painted)
Slag	151 pieces (5300 gms)
Stone, jet & shale (worked)	21 pieces
Shell	4 objects
Iron	51 pieces
Glass	17 fragments
Lead	2 objects
Fired clay	198 fragments (2125 gms)
Worked bone & antler	39 objects
Ceramic object/vessels	1
Coins	17
Cu alloy	10 objects
Soil samples (wet)	32 (904 kl)
mollusc samples	4 + 5 column samples
marine shell	1 box

3.3 Stratigraphy & site phasing

There was a total of 186 cut features mostly belonging to the mid to late Roman periods. Almost half of these (47.31%) were post-holes, over a fifth (22.04%) were pits and about 5% were ditches (sub-divided into 33 segment cuts); the remaining 8% was made up of a miscellaneous range of features. (Table 2)

Table 2 illustrating the types of features and proportion of bulk finds derived from each category.

Type	number	pottery (wght)	%	bone (no.)	%
animal burial	1			49	
cremation	1	510		53	
ditch	10				
ditch fill	62	19272	25%	2296	13%
ditch segment	33				
dog skeleton	1				
dog skel. Fill	1	15		325	
gully	3				
gully fill	3	5			
inhumation	2				
layer	8	2740		476	
pit	40				
pit fill	144	46280	60%	10658	62%
post-hole	88				
post-hole fill	94	130		31	
scoop	1				
scoop fill	1	165		3	
slot	3			2	
well	3				
well fill	27	7275	9.5%	3172	18.5%
other/deleted	18				
total		76392*		17065	

*this total is the amount derived from the ceramic list.

With the exception of a relatively small quantity of 1st century BC and 1st century AD sherds the majority of pottery was derived from the mid-Roman period (i.e. late 1st/2nd century). However, in terms of phasing much of this pottery was residual since the principle features of the site belong to the late Roman period. As will be evident from an examination of the above table, pits/wells account for over 70% of ceramic finds (by weight) and 80% of animal bone (by number). The next largest category, ditches, accounts for 25% of ceramics and 13% of bone. There is a relatively good structural relationship between the ditch and pit sequences and, therefore, reconstructing a pattern of deposition would seem a plausible objective.

The structural matrix (appendix 1) resulting from the preliminary analysis of the stratigraphic relationships suggests that the majority of finds from the site may be placed within a relatively secure chronological sequence. The preliminary appraisal of the excavated evidence also indicates that there is the potential to meet the objectives of the original research design. There should be sufficient evidence to assess the nature of the late Roman settlement, through the study of the character and composition of the site's disposal pattern of animal waste products. This evidence should permit a comparison with other bone assemblages from the Hartsfield site. This data may be enhanced by an analysis of the discard pattern of finds and its subsequent interpretation.

The site plan together with a comparison of the results of earlier excavations should enhance our understanding of the morphology, function and economy of the site. Personal items, utilitarian objects and charred and dietary remains were present. The faunal evidence is of particular importance and should permit comparison with both the work of Chaplin and McCormick (Stead & Rigby 1986, 396-415) and other settlements such as Puckeridge/Braughing, Skeleton Green and Gorhambury. The importance of this assemblage (most of which was derived from stratified contexts) may be illustrated by Table 3 (below).

Table 3 list of sites with comparative animal bone assemblages
(arranged in alphabetical order)

Site	Animal bones (nos.)	notes	references
Baldock 68-72*	'large number'	unspecified no.	Stead & Rigby 1986
Boxfield Farm	11,661	fragments	Going & Hunn forthcoming
Gadebridge Park	1,241	identifiable bones	Neal 1974
Gorhambury	15,815	excluding small mammals	Neal et al 1990
Hartsfield*	16,788	fragments	this assessment
Lobs Hole	2,218	frags (1,167 individuals)	Hunn forthcoming
Magiovinium	11,306	stratified bones	Neal 1987
Puckeridge/Braughing	12,564	pieces	Potter & Trow 1988
Skeleton Green	2,519	identifiable bones	Partridge 1981

* This is the only settlement in the region north of London to produce a comparatively rich faunal assemblage.

3.4 Site characterisation

Table 4

Type	rectang.	circular	regular	irregular	nucleated	dispersed	storage	latrines	extractive
buildings	*								
structures									
wells						*			
linears	*		*						
fences									
pits					*	*	*	*	*
postholes						*			
dew-pond									
dene-holes									
tree-hollows						*			
burials						*			

3.5 Artefacts

3.5.1 Pottery

The pottery has been assessed by Helen Ashworth (see appendix 6). There are approximately 6010 sherds from 144 contexts. There are a few abraded LPRIA sherds (see Ashworth....). The number of spot-dated contexts is as follows:

Table 4 illustrating the number of spot-dated contexts

Periods	number	percentage
4/5 th century	4	2.7
4 th century	9	6.1
2 nd /4 th century	3	2.0
3 rd /4 th century	8	5.4
mid/late 3 rd century	2	1.4
3 rd century	1	0.6
2 nd /3 rd century	17	11.5
mid to late 2 nd century	3	2.0
early to mid 2 nd century	12	8.1
2 nd century	25	17.3
late 1 st early/mid 2 nd C	25	17.3
mid to late 1 st century	8	5.4
early to mid 1 st century	5	3.4
late 1 st c. BC/early 1 st century	2	1.2
general Romano-British	23	15.6
Total	147	100

Although over half the spot dated contexts fall within the period from the late 1st century to 2nd/3rd centuries, when they have been phased, they appear to fall within the 4th century. It may be that many contexts contain a high proportion of residual sherds

though until more detailed analysis of the phasing is undertaken this cannot be certain. An understanding of the character of the primary and secondary disposal patterns will be important in understanding the sequence of rubbish disposal from the site, and particularly in attempting to establish the pattern of cess pit use. For example, does the ceramic evidence point to a series of contemporary pits (latrines) or a sequential development of pit usage. This is significant for establishing population numbers and density for that part of the site.

3.5.2 Metalwork

There are 10 copper alloy objects (excluding coins) of which all but one were derived from stratified contexts. These include brooches, fittings, a pin, a ring and unclassified objects. The amount of iron work was relatively low despite the initial use of a metal detector (the high readings are probably indicative of metal working debris in the topsoil). There were 51 pieces of metal (Fe) recovered from stratified contexts, most of which are unclassified at present though a hook, a hinge and a blade have been identified. Only a single piece of lead was recovered.

3.5.3 Slag

The amount of slag derived from the site amounted to 151 pieces (5.3 kl). The data indicates the presence of an iron smithy on or adjacent to the site (see Cowgill, appendix 4).

3.5.4 Fired clay

(coarse building material/daub)

There were 267 (3908 gms) fragments recovered from a variety of features from across the site. One piece in particular revealed the impressions of several wattle stakes and may have belonged to an internal wall of some domestic dwelling.

(brick and tile)

A total of 102 fragments of brick and tile (8530 gms) were recovered from the site.

(mortar and plaster)

A total of 32 fragments of mortar/plaster (1190 gms) were recovered from the site.

3.5.5 Worked stone

This group consisted of 21 fragments worked stone, including quern stone, all of which were derived from stratified contexts (see appendix 5)

3.5.6 Chalk

No objects of chalk were recovered during the course of the 1997/8 season.

3.5.7 Flint

No worked flints were recovered other than odd flakes derived from possible agrarian activities and occasional episodes of burning.

3.5.8 Glass

There were 17 fragments of glass (all but one were stratified) recovered from 10 individual contexts, excluding those derived from the soil samples (see appendix 5)

3.5.9 Worked bone

There were 39 bone objects recovered from the site including an awl (from 237), a pin (from 301) and waste products from pin/needle manufacturing (see appendix 5)

3.5.10 Ceramic objects

No ceramic objects, other than vessels, were recovered from the 1997/8 season.

3.5.11 Coins

A total of 21 coins were recovered during the course of 1997/8 season (including one from a soil sample). Of these, 4 (19%) were unstratified and were of mid to late 4th century date. The remainder were derived from the fills of three wells. All but three were dated to the mid to late 4th century. The earliest coin belonged to the late Iron Age (Cunobelin) but was derived from a late Roman context. (see appendix 3).

3.6 Environmental evidence

3.6.1 Animal bone and shell

There were 16,788 fragments of animal bone from 157 contexts amounting to 113.5 kilos. This does not include any material derived from the soil samples. Given the alkaline condition of the soils the level of preservation is good and the quantity of sufficient size to warrant full analysis.

A total of 662 shell fragments were recovered amounting to 6483 gms.

3.6.2 Carbonised material

A total of 791 litres of soil samples were taken for wet sieving from 33 contexts. Preservation was good (see appendix 7)

3.6.3 Human bone

One adult skeleton was recovered from a well (491) and one infant burial from a pit (134). Both are provisionally dated to the 3rd/4th century (see appendix 8).

3.7 Dating

A majority of features can be dated by a combination of their physical relationships to one another and the nature of their contents. The dating should be adequate to provide a reliable chronological framework for the later part of the Romano-British period on the site.

3.7.1 Radio-carbon C14

No samples are anticipated to be worth analysing.

4. STATEMENT OF POTENTIAL

4.1 Stratigraphic

A great majority of the artefact rich contexts derived from the 1997 excavation can be phased. Some of the contexts are more reliably phased than others but this is only to be expected on a site where all horizontal deposits have been obliterated by ploughing. Of those phaseable contexts a majority may be assigned to the later part of the Roman period, that is, post-dating the 3rd/4th centuries. Of particular interest is a group of pits of 4th to 5th century date aligned on the western side of the N-S ditched boundaries. The primary function of these pits is believed to be for cess although some may have been excavated as wells. The secondary function of the pits, as convenient dumps for waste material has more chance of being explained. The range, type and date of material and its sequence of deposition should permit an insight into the nature of the contemporary habits of the human population. It will be necessary to analyse and compare the different sequences of material derived from phased contexts. This evidence, will in turn enable comparisons to be made with features from the Hartsfield site that were excavated in previous seasons.

4.2 Artefactual

4.2.1 Prehistoric Pottery

No material of this date has been identified from the 1997-8 season of activity.

4.2.2 Late Pre-Roman Iron Age / Romano-British Pottery

The ceramic assemblage (6010 sherds or 83,940 gms) is mainly derived from stratified contexts. Its date range appears to fall predominantly into the mid to late Romano-British period (52.7% of features are spot dated up to the mid 2nd century and 13.5% to mid-2nd/3rd centuries). The extent and nature (in terms of quantification) of any earlier material is, as yet, unclear. However, the larger groups would appear to be derived from the deeper features such as pits and wells. These groups are particularly important in that they will permit a relatively reliable chronology of deposition to be established. This is important given the nature of the associated faunal and environmental deposits.

Given the spatial character of most of the assemblage and the nature of its dating there is a good potential for placing this part of the site in a reliable chronological framework. The relationship of the various ceramic groups is of key importance in understanding the sequence of stratification that has occurred on the site. The material is also of potential importance for ascertaining both the function of the features and domestic habits of the inhabitants. The potential link between the assemblage and the archaeo-botanical remains in terms of date, diet, function, status and economy is of primary importance. It will also provide a suitable framework against which the data from previous seasons of excavation on the Hartsfield site may be compared.

4.2.3 Metalwork

Due to the comparatively small quantity of the assemblage only a detailed description of items of intrinsic value is proposed. This is a relatively small task. However, consideration needs to be given to the high iron readings from the metal detecting, the hammerscale and slag, and records of indeterminate iron from pit 130 and others which all suggest evidence of smithing activity. The iron fragments will need to be x-rayed in order to identify smithing waste or recycling of materials. It might also be worth checking the earlier resistivity data to see if it shows a local concentration which may indicate where the smithy was located..

4.2.4 Slag

This material was present from across most of the site and indicates that iron working was going on in the immediate vicinity. In addition to iron working there is also evidence for some copper alloy manufacturing on the site. Work on the chronology and phasing of the site should enable further refinement of the interpretation of this material to be achieved. In addition, a comparison between this material and the distribution of iron objects should indicate the degree to which there is any form of association. Slag and metalworking should be considered together. The intrinsic value of the finds is less important than the indications of the industrial activities on site.

4.2.5 Daub/ceramic building material

Six contexts produced material which have sufficient form to permit them to be discussed in the final report. Apart from that, no further work is required on the assemblage.

4.2.6 Worked stone

Of the 21 objects only two (a rotary quern and a jet hairpin) were of intrinsic value and therefore worthy of further note and illustration.

4.2.7 Tile and Brick

No further work is anticipated

4.2.8 Flint

No further work is anticipated

4.2.9 Glass

Five fragments have been identified as being of potential interest and therefore require further examination (see appendix 5).

4.2.10 Worked bone

Two items of intrinsic interest require further analysis and the description of the worked material should be integrated into the site discussion. Context 453 appears to indicate bone working activity (i.e. another industry/craft). This should be written up and, again, is probably more important than the intrinsic interest of the finished objects. Some of the pin working debris may deserve illustration and should be examined to see what bones were being used.

4.2.11 Ceramic objects

No further work is anticipated

4.2.12 Coins

All the numismatic evidence (apart from three coins recovered from the lower field by pupils of Hartsfield School and one unstratified coin) were derived from three well fills. The majority are of 4th century date and accord with the phasing of the features. Further work on the coin assemblage can only be justified if they can be analysed in relation to the other 189 coins (179 Roman and 10 Iron Age) from previous seasons on the Hartsfield site (See appendix 3).

4.3 Environmental

4.3.1 Animal bone and shell

The assemblage, consisting of 16,788 fragments (113.5 kilos), was mainly derived from pit and well contexts belonging to the late Romano-British period. Apart from the quality and size of the assemblage its importance is derived from the opportunity it offers to understand the character and nature of the diet of the local inhabitants, and the nature of the local economy in terms of trade and agricultural production (see appendix 7). The comparatively late date of the assemblage (4th/5th century) will enable a comparison to be made with the data from Chaplin and McCormick's study of the animal bones from Dr Stead's excavations.

4.3.2 Environmental remains

The identification of cess rich deposits is of primary importance in considering the post-excavation study of the site. It appears that many of the plant remains have become mineralised due to the presence of cess (see appendix 7). This information is potentially important in considering the dietary characteristics of the local population. If these datable deposits are studied in conjunction with the ceramic evidence then it may be possible to answer questions that extend beyond simple matters such as dietary habits. For example, the study can be broadened to ask questions about the sequence of the pit deposits (i.e. whether they were contemporaneous or serial developments), the significance of their location and concentration (i.e. their association with individual households, tenements and/or land holdings). The study of the cess rich deposits can be supplemented by an examination of the associated column samples that were taken during the excavation. Here the frequency of molluscs progressively declines with the

increase in the amount of cess present. Thus, pits which have ceased to be used for human waste may provide answers about the local environment.

The number of cess pits together with the presence of uncharred food remains, charred remains and animal bones can be compared with samples from urban sites such as York and London. In addition, comparison can be made with evidence recovered from previous excavations. Together, this evidence provides a very real opportunity to study socio-economic aspects of the local population at the end of the Roman period in Britain.

4.3.3 Human remains

One adult and one child skeleton was recovered during the course of the excavation. They were found in a pit and a well both provisionally dated to the 3rd/4th century. There were no apparent grave goods and their burial has all the indications of having been a matter of rapid disposal rather than of careful interment (see appendix 8).

5. RESEARCH AIMS

5.1 Revised research aims

The aims defined in the WSI (project design) are still valid. These may now be refined and supplemented by the following questions:

Aims:

1. To produce a detailed description (with line drawings where appropriate) of all the excavated features.
2. To determine, where possible, the sequence and nature of the settlement.
3. To contribute to an understanding of the development of the Baldock 'settlement' and the effects on the natural environment in relation to the character of human society, economy and settlement pattern.
4. To consider differences and similarities between this area and those previously excavated on the Hartsfield site.
5. To provide information on the dietary habits of the human population of a minor regional township at the end of the Romano-British period.
6. To produce an accessible archive of the results in order to permit their integration into future investigations of Iron Age and Romano-British settlement in both the Baldock area and region.

6. METHODOLOGY

6.1 Stratigraphic

Aims 1 - 5

A single 'structural matrix' exists which will require some refinement and checking in order to finalise both phasing and stratigraphic relationships. A feature description, arranged by period/phase will be generated. Drawing briefs will be produced to support the descriptive text. Reports of earlier work on the Hartsfield site will be examined in order to compare the different sets of data. These will be discussed in some detail in as far as access to the primary archive is permitted. **Task numbers 1-7**

6.2 Artefacts

6.2.1 Prehistoric pottery

None recovered

6.2.2 Romano-British pottery

Aims 2, 4 and 5

An examination and quantification of selected groups will be carried out based on size, integrity (a low or absent level of secondary contamination), chronological sequence, spatial spread and, where possible, function. The principal fabric groups will be quantified by sherd count and weight with some EVEs and where appropriate, individual fine and specialist wares. This will be compared with information already obtained during the course of post-excavation assessment. The assemblage from the 1997/8 season will be reviewed in relation to the ceramic material recovered from previous excavations on the Hartsfield site. Selected vessels will be illustrated.

Task no. 12

6.2.3 Registered Finds (i.e. metal work, worked bone and glass objects)

From the assessment, it is evident that most categories of finds are present only in small quantities and contain no finds of special importance, though a few objects are intrinsically interesting. Accordingly, most finds categories will be dealt with by a brief note describing quantity, condition, dating and other relevant information, detailed descriptions being limited to those few finds of intrinsic interest, namely copper alloy, bone, glass and jet. Finds present in quantity will be dealt with statistically, and presented by means of tables, graphs etc where necessary.

6.2.4 Worked stone

No further work on the material from the 1997/8 season is envisaged.

6.2.5 Coins

No further work on the material from the 1997/8 season is envisaged.

6.3 ENVIRONMENTAL

6.3.1 Animal bone

Aims 3, 4 and 5

Identification and analysis of the stratified and datable animal and small vertebrate material will be carried out according to accepted procedures and following the recommendations by Rackham (appendix 7).

Task no. 13

6.3.2 Carbonised remains

Aims 2, 3, 4 and 5

This will require an examination of the residues derived from the five column samples. The remaining two column samples will be processed and concreted mineralised cess material analysed. Botanical analysis of the charred and mineralised plant remains and analysis for parasites in the cess residues will be carried out. The molluscs from the column samples will be studied.

Task no. 14

6.3.3 Human bones

No further work on the material from the 1997/8 season is envisaged.

7. PUBLICATION

7.1 Publication synopsis

Excavations at Hartsfield, Baldock

by J. R. Hunn with contributions by H. Ashworth, J. Cowgill, M. Curteis, J. Rackham, and R.J. Zeepvat.

TEXT

pages (@ c.1000 words per page)

	Contents	5
	List of illustrations	
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	Strategy and methodology	1
	Site location, geology and topography	1
Part 2	The results	15
	1 st to 2 nd century AD	
	2 nd to 3 rd century AD	
	3 rd /4 th century AD	
	4 th century AD	
	4 th /5 th century AD	
Part 3	The Finds	
	Romano-British pottery by H. Ashworth	20
	The Samian by	1
	Small Finds by R. J. Zeepvat	4
	Slag by J. Cowgill	2
	Coins by M. Curteis	1
Part 4	Environmental Finds	
	Animal bones by J. Rackham	25
	Environmental sampling strategy by J. Rackham	3
	Carbonised remains by J. Rackham	20
	Human bones by C. Turner	2

Part 5	Discussion	
	The 1997/8 excavation season	4
	The results in relation to previous work on the Hartsfield site.	6

Bibliography		4
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Total no. of pages		110
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Part 1		
1. location plan showing the site in relation to the modern landscape		1
2. the 1997/8 season in relation to previous excavations in the Baldock area		1

Part 2		
1. overall plan of the site		1
2. phase plans (in chronological sequence)		1

Part 3		
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The pottery		20

Part 4		
Carbonised remains histogram		1
Animal bone histogram (s)		1
sample location plan		1

Part 5		
Detail plan of Hartsfield and Wall's Field excavation		1
Phase plan (s) of the archaeology of Hartsfield and Wall Field excavation		4

Total no. of figures		54
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Plates (to be determined)		4?
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Total no. of pages		72
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7.2 The archive

The archive is currently held by *The Heritage Network Ltd* (at 12, Royston Road, Baldock). The archive is to conform with UKIC guidelines for the preparation of excavation archives and long-term storage. That is, only archivally suitable materials should be used (Walker 1990). All post-excavation documentation will be filed, ordered and indexed as part of the research archive. The archive and finds are to be deposited with the North Hertfordshire Museum Service.

8. PROJECT PERSONNEL

Name	Position	Employer
Helen Ashworth	Finds administrator	The Heritage Network Ltd
Helen Ashworth	Roman pottery specialist	The Heritage Network Ltd
Rajka Makjanic	Samian	Freelance
Helen Ashworth	Archive Officer	The Heritage Network Ltd
Jane Cowgill	Metallurgist	Freelance
Mark Curteis	Numismatist	Freelance
D. Hillelson & Hunn	Post-excavation manager (s)	HN/ASAC Ltd
J. R. Hunn	Site director/author	ASAC Ltd
C. Turner	Human remains	The Heritage Network Ltd
F. Pewtress	Illustrator	The Heritage Network Ltd
James Rackham	Environmental specialist	Environmental Consultancy
James Rackham	Faunal remains specialist	Environmental Consultancy
R. J. Zeepvat	Building materials	ASAC Ltd
R. J. Zeepvat	Finds specialist	ASAC Ltd
R. J. Zeepvat	Worked stone specialist	ASAC Ltd

9 TASK LIST AND CASCADE

Task	Description	Performed by	Days	Cost (£)
1	Stratigraphic analysis	J. Hunn		
2	Report writing	J. Hunn		
3	Preparation of drawing briefs	J. Hunn		
4	Liaison with illustrator	J. Hunn		
5	Liaison with specialists	J. Hunn		
6	Select photographic plates	J. Hunn		
7	Background research	J. Hunn		
8	Liaison with CC re text	J. Hunn		
9	Liaison with DH	J. Hunn		
10	Report assembly	J. Hunn		
11	Archive preparation	H. Ashworth		
12	Roman pottery analysis	H. Ashworth		
13	Animal bone analysis	J. Rackham		
14	Environmental analysis	J. Rackham		
15	Small Finds	R.J. Zeepvat		
16	Iron working/slag	J. Cowgill		
17	Samian	R. Makjanic		
17	Glass	S. Cotton		
18	Plans and sections	F. Pewtress		
19	Pottery illustration	F. Pewtress		
20	Finds illustration	F. Pewtress		
21	X-raying of ironwork	Verulamium Museum		
22	Project monitoring	D. Hillelson		
23	Project management	J. Hunn		
24	Bibliography	J. Hunn		
25	Academic editing	To be agreed		
26	Copy editing/marking up text	D. Hillelson		
27	Proof reading	D. Hillelson		
28	Final archive	H. Ashworth		
30	Publication Costs			
31	Storage charge			

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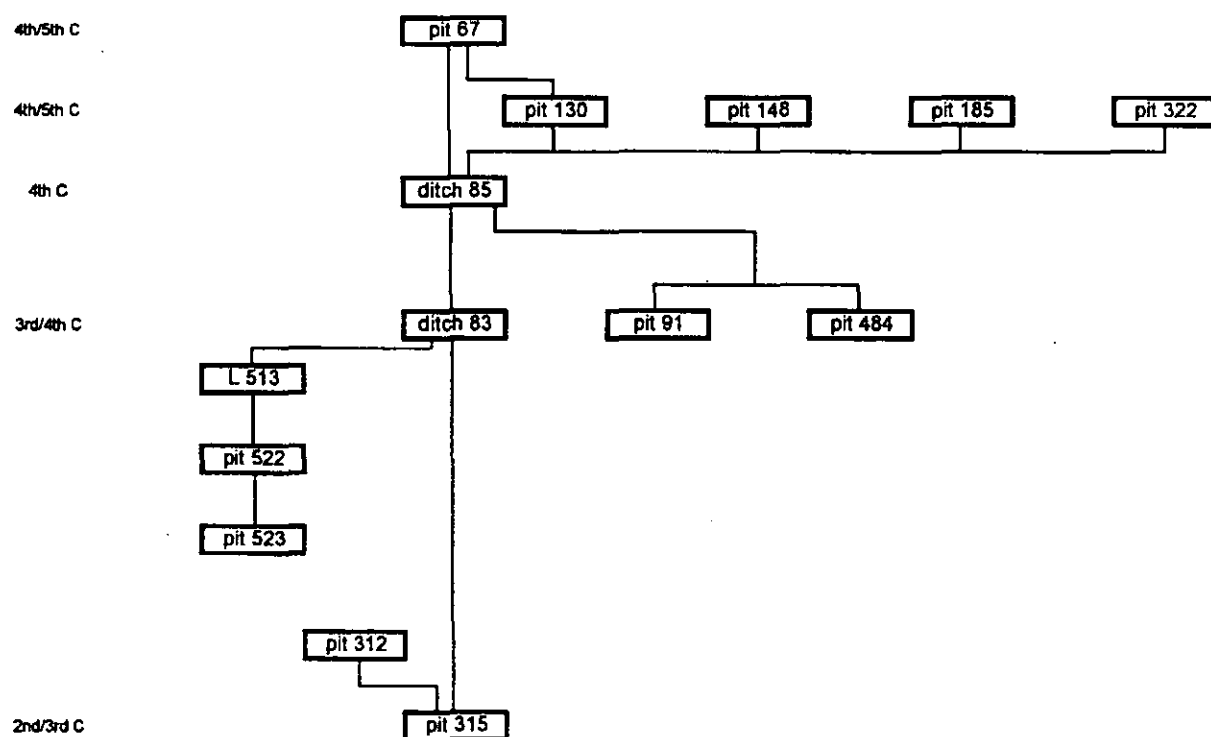
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APPENDIX 1

Structural matrix of the Hartsfield 1997/8 excavation



APPENDIX 2

Hartsfield 1997/8 Phasing Data Base

HARTSFIELD PHASING DATA BASE (Harts Phase Dbase)

context	pot no.	pot wght	bone no.	bone wght	sample	objects	type	spot-date	period
1	10	82	7	25			df	3rd/4th; med pot	
2									
3	67	852	150	1895			pf	2nd-4th	4
4	5	170	9	65			pf	2nd C	4
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36	1	10	2	15			phf	RB	
37									
38									
39									
40									
41									
42	1	5					phf	RB	
43					1026				
44	2	45				1524	pf	L1st-E2nd C	3
45	16	245	26	245			pf	L1st-2nd C	3
46	2	25	19	105			pf	3rd-4th C	3
47									

48									
49									
50									
51									
52									
53									
54			2	10					
55									
56									
57									3
58			10	45					3
59	1	30	5	80			pf	RB	3
60			50	85					3
61									3
62			707	2590					4
63	123	1320					pf	2nd-3rd C	4
64									
65									
66			40	350					
67									
68	151	1345	236	1185	1000		pf	2nd C	4
69	28	430	11	50			pf	2nd C	4
70	3	50	6	55			pf	2nd C	4
71									
72	24	330	35	200			pf	2nd C	5
73	1	10	3	30			pf	RB	5
74									5
75					1023				5
76									
77									
78									
79	23	105	230	1710			pf	L1st-E2nd C	
80									
81	9	125	169	2060	1500		pf	L2nd-3rd C	
82	17	230	4	85			L	L2nd/3rd C	
83									
84	30	225	28	475			df	e/m 2nd C	
85									
86									4
87	25	285	20	265				3rd/4th C+intr.med	4
88									
89	20	290	31	360	1003		df	L1st/2nd - 3rd/4th	5
90	22	235	9	150			pf	L1st - E2nd	3
91									
92									
93									
94									
95									
96									
97									
98									
99									

100									
101									
102									
103									
104									
105									
106									
107									
108									
109	12	160	8	70		1504	df	L3rd-4th C	
110									
111									
112									
113					1001				
114									
115					1002				
116									
117									
118	5	35	25	360	1013		df	L1st-E2nd	
119									
120									
121	1	105	27	1215			pf	L1st-E2nd	
122									
123									
124									
125			8	175					
126									
127									
128									
129	4	15	325	303			dep	3rd-4th C	
130									
131	52	475	440	54			pf	2nd-4th C	5
132	238	3485	239	1905		1516, 1517, 1518, 1519	pf	m2nd-3rd C	5
133	34	790	231	1180		1520-23, 1525-31	pf	L2nd-3rd C	5
134									
135	124	700	270	430			pf	L2nd-3rd C	3
136	321	2305	734	5010		1552-54, 1556, 1559	pf	L2nd-3rd C	3
137									
138									
139									
140									
141									
142									
143									
144									
145									
146									
147					1004				
148									
149	104	1065	195	2230			pf	E/M1st - L2nd/3rd	5
150	9	232	234	120			pf	L1st/2nd C	5
151									

152									
153									
154									
155									
156									
157	15	205	35	665	1005		pf	2nd C	
158									
159									
160									
161			116	230					
162									
163									
164									5
165									5
166									5
167									3
168									
169									
170									
171									
172									
173									
174									
175	2	20			1006		df	2nd-3rd C	
176									
177									
178	1	5					df	RB	
179									
180									
181									
182									
183									
184	3	20			1007		df	RB	
185					1025				
186	134	1470	75	905		1501, 1502	pf	2nd C	5
187	11	175	22	190			pf	L1st-2nd C	5
188									
189	44	800	64	740			df	m2nd C	5
190	61	545	510	40	1008		df	L1st/2nd	
191									
192									
193									
194	8	45						RB	
195					1009				
196									
197	8	67	105	1395			pf	m/L2nd C	5
198									5
199	28	295	92	610		1503	pf	L1st C	1
200									
201									
202	19	165	47	220			df	L1st-E2nd	5
203	114	1805	117	305	1010		df	L1st C	5

204	123	3310	254	1115	1016-17		pf	L1st C	
205									
206									
207									
208	13	510	53	25	1029		crem	m/L1st C	
209									
210			13	45					
211									
212									
213	4	245	22	395			pf	E/M1st C	1
214	10	105	6	20			pf	E/M1st C	1
215	15	130	67	160			pf	L1st BC E1st C	1
216	3	70	14	60			pf	L1st BC E1st C	1
217									
218									
219	2	10	5	20			pf	M/L1st C	1
220									
221									
222									
223									
224									
225									
226									
227									
228									
229									
230									
231	1	10					phf	RB	
232									
233									
234									
235									
236									
237			7	10		1505			5
238					1011				5
239			26	640					5
240									
241									
242									5
243	325	3275	218	1835	1015		df	E2nd-L3rd C	5
244									5
245									
246									5
247	19	160	60	371			df	RB	4
248	16	215	9	20	1012		df	L1st-E2nd C	4
249									
250	54	525	121	830			pf	RB	5
251	7	120	8	20			pf	L1st-E2nd C	5
252	34	515	1298	10335	1014		pf	E/M2nd C	5
253									5
254									
255	48	805	5	15			pf	E/M2nd C	

256									
257	9	90	10	25			pf	L1st/E2nd C	
258	7	50	9	30	1018		pf	L1st/E2nd C	
259									
260									
261	45	261	71	200			pf	L1st/E2nd C	2
262	21	145	70	125			pf	L1st/E2nd C	2
263	171	5440	1242	1840		1509	pf	M/L1st C	2
264					1019				
265									
266	2	35			1021	1510	pf	RB	
267									
268					1031				
269									
270									
271									
272									
273	15	245					df	4th-5th C	5
274									5
275									5
276									
277									5
278	21	280	17	55			df	4th C	5
279									5
280									5
281									
282	155	1355	122	925			df	4th-5th C	5
283	52	480	744	1785	1022	1515	pf	L1st-E2nd C	4
284									
285	30	445	44	135			pf	L1st C	
286									
287									
288			2	45		1511	pf		
289					1020				
290	8	135	12	35			pf	2nd C	
291									
292	14	150	13	55			df	4th C	
293									
294									
295									
296	46	295	14	110			pf	L1st-E2nd C	5
297			64	305					5
298	27	155	27	105			wf	4th C	5
299	2	35	2	5			wf	RB	5
300	57	345	48	180		1506	wf	4th C	5
301	53	740	47	185		1507, 1508	wf	4th-5th C	5
302	4	105	11	165			wf	E/M2nd C	4
303	67	925	110	1515		1536, 1537	wf	3rd-4th C	4
304									
305	25	270						L1st-E3rd C	
306									
307			48	895					

308									4
309									
310	40	630	158	1615			df	L1st/M2nd C	5
311	26	410	39	390			df	E/M2nd C	5
312									
313	24	405	49	880			pf	E/M2nd C	2
314	3	50	14	330			pf	2nd C	2
315									
316	77	805	95	1485		1538	pf	E/M2nd C	2
317	21	215	46	740			pf	3rd/4th C	2
318									
319	3	65	12	15			phf	2nd C	
320									
321	19	165	3	15			dep	2nd C	
322									
323									
324									
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326									
327									
328									
329									
330									
331									
332									
333									
334									
335									
336	1	5					phf	RB	
337									
338									
339									5
340									
341									
342									
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346									4
347									
348									
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371									
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373									
374									
375									
376	1	10					phf	L1st C	
377									
378									
379									
380									
381									
382									
383									
384	1	5							
385									
386									
387									
388									
389									
390					1514		phf		
391									
392					1512, 1513		phf		
393									
394									
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412									
413									
414									
415									
416									
417									
418									
419	1	5					phf	RB	
420									
421									
422									
423	12	75	16	95				2nd/3rdC	4
424	20	305	74	780			df	2nd C	4
425									
426									
427									
428									2
429									2
430	14	430	16	485			pf	2nd C	2
431	2	70	27	135			pf	2nd C	2
432	5	50	3	10			pf	2nd C	5
433	4	60	6	20			pf	L1st/2ndC	5
434									5
435	1	25	20	30			pf	RB	5
436									2
437									5
438	5	185	235	480			pf	2ndC	5
439									5
440	4	40	43	40			pf	L1st C	3
441	39	441	150	595			pf	L1st-E2nd C	3
442									5
443	8	130	16	40			pf	2nd/3rd C	5
444	2	10	3	5			pf	RB	5
445	76	770	170	1600		1532, 1533, 1534	pf	M/L2nd C	5
446	8	120	25	340			pf	2nd C	5
447	7	55	10	385			pf	RB	5
448	68	575	85	440			pf	E/M2nd C	
449					1028				
450					1030				5
451			2	70	1027				5
452	46	325	29	90				L2nd/3rd	
453	36	265	83	68	1032	1535	wf	M/L3rd C	4
454	1	15	41	25			pf	2nd/3rd C	
455									5
456									
457									
458	63	730	92	625			wf	M/L2nd C	4
459									
460									
461									4
462									4
463									4

464									4
465									5
466	18	145	52	835			pf	L2nd/3rd c	
467	1	10	32	135			pf	2nd c	
468					1033				
469									
470									
471	6	330	9	665	1024		pf	L2nd/3rd c	5
472	1	10	3	35			pf	RB	5
473									5
474									
475									
476	1	10	1	75			pf	RB	
477	11	140	8	95			pf	2nd C	
478	12	170	16	150			pf	L1st/2nd C	
479									
480	2	15	6	200			pf	RB	
481									
482									
483	3	20	5	100		1539-44, 1546-47	wf	4th/5th C	4
484									
485	161	2200	421	2720		1545, 1550	pf	L2nd/3rd C	3
486									
487									
488	173	4635	98	970			df	E/M2nd C	
489									
490	133	2380	174	4155	1035	1548, 1551	pf	M/L3rd C	3
491									
492									
493	138	1665	948	7010			wf	4th C	4
494	101	1560	34	420			df	E2nd C	
495	51	1300	26	180			pf	E/M2nd C	3
496	58	635	34	325		1549, 1557	pf	E/M2nd C	3
497									3
498									
499	44	495	26	245			pf	M/L2nd C	4
500	13	215	44	420			pf	L2nd C	4
501	8	235	7	10			pf	RB	4
502	19	200	11	475			pf	3rd C	4
503									
504									
505			49	5					
506	1	30	21	715	1039	1558	pf	RB	3
507	18	340	29	1180			pf	L2nd C	3
508									
509	76	775	89	1385			df	L2nd C	5
510									
511	38	765	50	645			df	E2nd C	5
512					1037	1562	inhum		
513	98	1590	242	3710			L	E/M2nd C	3
514	193	3555	304	6465		1561	pf	M/L2nd C	3
515	1	25	5	180			pf	E/M2nd C	3

516					1036	1555, 1560	pf		3
517									
518									3
519									3
520	2	145					pf	L1st/E2nd C	3
521	11	160	82	1040			pf	2nd C	3
522									
523									
524	22	940	1449	100095		1563, 1565-76	wf	4th C	4
525	1	30	4	165	1038	1564	pf	E1st C	3
526	2	40	286	1545		1577	wf	4th C	3
527	4	35						L2nd/3rd C	
528									
529									3
530									4
531									4
u/s	43	485	4	1					
909	25	275	16	195				3rd/4th C	
Total	5540	76145	16788	203497					

APPENDIX 3

The Coins by Mark Curteis

The nineteen Roman coins and one Iron Age coin form a useful addition to the 179 Roman coins and 10 Iron Age coins previously recorded from [this site].

The issues of Hadrian (117-38) and Domitian (81-96) from pit fill 485 are both worn suggesting a deposition date of the late 2nd century AD. The finding of two early coins from one pit may be significant when considering only six other 1st or 2nd century Roman coins have been recovered from [the site] and coins of this period are generally rare as site finds on civil sites.

The lower part of the fill of the well (context 524) contains eight 4th century coins mostly dating from the 350s to the 370s and comprising falling horseman copies and Valentiniac bronzes that are commonly represented in site assemblages. However, the latest issue is that of the House of Theodosius; a coin issued between 388 and 402 but is generally considered to have circulated at least into the first decades of the 5th century.

The six coins from the upper fill of the well (context 483) range in date from an Iron Age issue of Cunobelin to five 4th century issues dating down to an issue of Magnentius (351-3) and a contemporary copy of a falling horseman of Constantius II (c.354). For political reasons the coin of Magnentius would not have been in circulation later than 354 suggesting a probable deposition in that year. With the Theodosian and Valentiniac coins in the lower fill these coins must be seen as residual.

The earlier Iron Age coin in the assemblage may be residual but its presence here when only ten others are recorded from the site may be significant. Iron Age coin deposition tends to be concentrated in areas of ritual activity and on some sites (such as Baldock) Iron Age coins seem to have been deliberately deposited in Roman features, notably in ditch terminal or in the tops of well fills. Furthermore, the coin is a very rare issue; only two others of this type are recorded from Hertfordshire (Braughing and Bishop's Stortford). If the Iron Age coin was deliberately deposited then the residual coins in the upper fill of the well could also be seen as votives just as today we throw low value coins or valueless coins into wishing wells. The practice of using worthless coins as votive gifts is well attested in Roman times (e.g. at the Uley shrines and Harlow temple).

Context	SF no.	Ruler	Denom.	Rev.	CAT	Date	Wear
483	1539	Constans	-	GLORI[A EXERCITVS] ISTD	8 AR 51	340	SW/SW
483	1541	Magnentius	-	FELICITAS REIPVBLIC(A)E]		350	SW/SW
483	1542	Cunobelin	AE unit	[CVN or CAM] below animal lt.	VA. 1965-1	c.10-20	SW/SW
483	1543	Urbs Roma	-	Wolf and twins	7 TR 529	330-31	SW/SW
483	1544	Hse of Constantine	-	[GLORI[A EXERCITVS] ISTD		335-40	SW/SW
483	1546	'Constantius' II	-	[FEL TEMP REPARATIO] (FH)		354+	SW/SW
485	1545	Domitian	AS	-		81-96	W/W
485	1550	Hadrian	AS/DUP	-		117-38	W/W
524	1563	'Constantius' II	-	[FEL TEMP REPARATIO] (FH)		354+	SW/SW
524	1565	'Constantius' II (?)	-	[FEL TEMP REPARATIO] (FH)		354+	C/C
524	1567	Hse of Valentinian	-	[SECVRTAS REIPVBLICAE] (?)		364-78	C/C
524	1568	Valentinian I	-	[GLORIA ROMANORVM]		364-78	SW/SW
524	1569	Hse of Theodosius	-	[VICTORIA AVGGG]		388-92	SW/SW
524	1570	illegible	-	-		C4	C/C
524	1576	Urbs Roma	-	Wolf and twins	7 TR 561	333-34	SW/SW
524	1597	Hse of Valentinian	-	[SECVRTAS REIPVBLICAE]		364-78	SW/SW
School FW	1	'Constantius' II	-	FRL TEM[P REPA]RATIO		354	SW/SW
School FW	2	Valentinian I	-	[GLORIA ROMANORVM]		364-75	SW/SW
School FW	3	'Constantius' II	-	[FEL TEMP REPARATIO] (FH)		354+	SW/SW
U/S	1591	Gratian	-	[GLORIA ROMANORVM]		367-78	SW/SW

Abbreviations used in the catalogue:

Issuer's name in inverted commas, e.g. 'CONSTANTIUS II' refer to contemporary copies.

Denominations: AE refers to a bronze unit, AS = *as* and DUP = *dupondius*

Rev (Reverse inscription): STD = standar, FH = falling horseman type

Cat (Catalogue reference): VA = Van Arsdell - Celtic Coinage in Britain

7 refers to Roman Imperial Coinage Vol. 7

8 refers to Roman Imperial Coinage Vol. 8

AR = Arles mint, TR = Trier mint

Date: C4 = 4th century

Wear categories (Obverse/Reverse): SW = slightly worn, W = worn, C = corroded

APPENDIX 4

Slag and related material by Jane Cowgill

Introduction

A c. 30 by 30m area of a Romano-British settlement was excavated and a number of wells, pits and ditches were uncovered. Evidence for structures was, however, elusive. This assessment report describes the slag assemblage in detail but only a cursory examination of its relationship to the site has been made.

Methodology

The assemblage from the site was washed (when necessary), identified and recorded on *pro forma* recording sheets. This information was entered into a Microsoft Access database and consists of the following encoded fields: Context; Sample Number; Type; Quantity; Weight; Comments. The slag was visually examined and identified solely on morphological grounds, sometimes with the aid of a x10 binocular microscope. (For more detailed information see the glossary and catalogue). A note of probable fuel type has been recorded when fragments were incorporated within the slags or imprints identifiable. The soil in all the bags containing slag was checked with a magnet for hammerscale. The slags and hammerscale from the environmental samples have also been recorded and are included in Appendix 2.

The metal-working debris

A total of 151 pieces (5.3kg) of industrial material has been recorded. The majority of the assemblage was collected by hand during the excavation but a small quantity was also recovered from the residues of the environmental samples. The condition of the slags is fairly consistent with the majority being well preserved, only a few are grey and matt suggesting that they have suffered from some weathering. Some of the slag has been 'smashed' and has fresh breaks, unfortunately in some instances some of the pieces are missing from the bags. The majority of this metal-working debris was generated during iron smithing but there is also some evidence for copper-alloy working from the lower fills of pit 130 (contexts 446 and 447).

The distribution of some of this evidence has to be treated with caution because it is light and could have been distributed by the wind. Hammerscale, for instance, is easily wind borne.

Table 1 The metal-working debris and associated materials by type.

Type	Quantity	Weight (g)
Cinder	25	139
Fuel Ash Slag	1	1
Fired Clay	3	11
Hammerscale	*	57
Hearth Bottom	28	2995
Slag	27	432
Smithing Slag Lumps	45	1370
Tap Slag	1	20
Vitrified hearth Lining	22	293
Total	151	5298

* Not recorded.

Iron smithing slags.

The iron smithing slags include the plano-convex hearth bottoms, smithing slag lumps and the cinder and is therefore composed of all the normal types of slags that would be expected from this activity. All these slags are generally very dense and thus heavy and many are iron rich, which is indicated by the amount of iron encrusting the surfaces of many pieces.

The main category is the plano-convex hearth bottom and in this instance these are quite small (Table 2). The term is unfortunate because they do not form at the base of the hearth but on the hearth wall just below the source of the air draft (usually a tuyere with a pair of bellows behind). When the hearth bottom is broken off the hearth wall quite often a piece of hearth is also removed but this has only occurred on two of the pieces found at Hartsfield (contexts 444 and 447). Unusually these indicate that the hearth had a straight edge, a curved face is more normal. The piece from 447 also has a mass of small pieces of copper alloy and copper staining within the hearth bottom. This suggests that the smith was also producing copper alloy objects or made a composite piece. Charcoal inclusions and imprints are common indicating that this was the main fuel used. It is particularly common on the bases of the hearth bottoms and a number of large pieces up to 30mm long survive within the slag.

Table 2 The dimensions of the hearth bottoms.

Context	Length	Width	Height	Weight (g)
132	50	50	30	50
68	50	45	23	55
449			30	81*
493		55	35	85*
68	65	60	30	101
68			40	124*
493	55	60	30	132
493	70	85	35	182
458		85	22	190*
445		80	35	217*
68	80	110	35	370

* Incomplete weight

The smithing slag lumps are smaller pieces of slag that remained loose in the hearth and are often considered proto-hearth bottoms while the cinder tends to be lighter and glassier due to its higher silica content obtained from the fuel ashes and other impurities in the hearth. These slags contained a surprising number of pieces of flint, some of which were quite large and totally embedded within the slags. There were also lumps of hearth lining incorporated within these slags, something that is seldom encountered with this frequency. The presence of both materials in such quantity is strange because they would be extremely detrimental to the smith and would probably hinder their work. Flint will explode in the temperatures required in a smithing hearth, especially if iron was being welded when temperatures in the range of 1300 – 1350° C (straw – white heat) would be needed (Lillico 1991). The lumps of hearth lining will increase the amount of slag generated and thereby make the process less efficient. Slag makes the fire in the hearth much less controllable and will eventually kill it. The slag, however, has to be cooled before it is extracted and then the fire must be re-established before smithing can commence again. We know Romano-British smiths were much more tolerant of the presence of slag in the hearth than most of their modern counterparts but this quantity of flint and hearth lining (both serious blindness risks) seems hard to comprehend.

The pieces categorised just as slag are generally small pieces that cannot be more precisely identified with confidence. The majority were probably produced during iron smithing although there are four pieces which may possibly be associated with non-ferrous working (contexts 3, 194 and 446).

Hammerscale is an important indicator of the location of a smithy (McDonnell 1992). The large quantity found in the environmental samples belies the small quantity of slag recovered from the site. It is evident that iron smithing occurred at the site either within the excavated area or close to it probably within a building, although the structure need not have been particularly substantial. Both spheroidal and plate scale are present, the former indicating that welding was one of the smithing operations performed. Many of the individual pieces are quite large suggesting that it was fresh when deposited in the various features while the scale actually within the smithies tends to be trampled and can take the appearance of a loose iron pan. (It is worth noting that the important information concerning the condition and distribution of the hammerscale would not have been recovered if environmental samples had not been collected.)

Associated Finds.

Finds such as fuel ash slags, fired clay and vitrified hearth linings are not necessarily produced during iron smithing and may be generated by other high temperature processes. When found directly associated with iron slags, however, it is likely that that is the means of their formation and a great majority of these finds are indeed from contexts that also contained iron-working debris. All the exceptions are pieces of vitrified hearth lining and consist of two possible tuyere fragments from contexts 81 and 453 and a thin piece from context 446 which is slagged on both sides and was found with a tiny piece of slag? which contained copper alloy droplets.

Two types of vitrified hearth lining are present. The most common are thick pieces (up to 35mm) of hearth wall that are in a reduced fabric and have a slagged surface, the less common are thin oxidised pieces also with a slagged surface. The latter are probably unsuccessful repairs to the hearth that have later spalled off.

A small piece of fired clay from context 68 may also be from a hearth. It is, however, only lightly fired in oxidising conditions and has one flat surface. The unusual feature of this piece is that it has large amounts of hammerscale mixed in with the clay, a feature never encountered before by this author. The addition may not have been on purpose (although the addition of iron lowers the firing temperature of clays), but would suggest that when the structure (hearth?) was built, hammerscale was present in considerable quantity.

Discussion

It is evident from the assemblage that there was an iron smithy on or very near to the excavated area. The slag, however, has not been analysed by phase and no detailed spatial analysis has been attempted while the phasing is still provisional. Further analysis should allow the duration of the smithing activity to be established and its scale. Through spatial analysis the likely location of the smithy may be established or in which direction off the site it may be found. At the Romano-British small town of Scole, on the Norfolk Suffolk border, a number of smithies were identified, all located on the outskirts of the settlement (Cowgill, McDonnell and Mills forthcoming). Smithies were probably established on the edge of settlements for commercial reasons and possibly because they are quite noisy (not because they are a fire risk; if smiths know anything it is how to control a fire!).

There is a noticeable concentration on site within pits 67 and 130 although slag was recovered from right across the site including wells 268 and 491. The only group that shows signs of weathering either because it spent some time on the surface or is redeposited, is from the upper fill of pit 130. The presence of such a large quantity of hammerscale from all of the sampled features is very unusual as is its good state of preservation. Its wide distribution may be due to the fact that it is a fairly light material and is easily blown by the wind, or it could have been carried down the hill and deposited in the pits by rain water.

Recommendations

- The x-radiographs of the iron objects require checking for the presence of hammerscale on any of the objects.
- A higher than normal percentage of unidentifiable iron 'lumps' would be expected in or close to a smithy. The distribution of the iron finds will need to be examined in conjunction with the slag.
- Evidence for any copper alloy off cuts, molten droplets or crucibles found associated with the two pieces of slag that contain some copper alloy should be checked.
- The larger pieces of charcoal embedded in the slag should be identified. A pattern is beginning to emerge which suggests that both iron smiths and smelters used oak charcoal in preference to any other wood.
- The final detailed site analysis of the metal-working debris will take two days.

Bibliography

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Lillico J.W. 1991, *Blacksmith's Manuel Illustrated: A Practical Treatise on Modern Methods of Production for Blacksmiths, Apprentice Blacksmiths, Engineers and Others*. Rural Development Commission

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Catalogue of the metal-working debris

Context	Sample	Type	Quant	Weight	Comments
3	0	SLAG	1	27	+ HL; VERY LIGHT BUBBLY CINDERY GLASSY AND COLOURFUL; SMASHED
68		HAMMS	0	0	SOME
68		SSL	5	93	FEW CHARC
68	0	HB	1	49	LOTS CHARC INCL; FEW HAMMS
68	0	HB	1	55	50; 45; H: 23MM; LARGE CHARC INCL; IRON RICH
68	0	HB	1	96	IRON RICH
68	0	HB	1	101	65; 60; H: 30MM; LOTS CHARC - SOME LARGE; + FLINT; IRON RICH
68	0	HB	1	124	H: 40MM; REST PROBABLY AMONGST SLAG; CHARC INCL; 2 LAYERS
68	0	HB	1	370	L: 80; W: 110; H: 35MM; SOME FLINT INCL; LOTS SMALL CHARC ON BASE - FEW LARGE
68	0	SLAG	12	170	32 SMASHED PIECES OF SSL AND CIND
68	0	SSL	1	18	SANDY BASE; LARGE FLINT INCL
68	0	SSL	1	26	IRON RICH; LARGE CHARC
68	0	VHL	1	22	POSSIBLE TUYERE - BEGINNING OF HOLE
68	0	VHL	2	9	THIN PIECES
68	1000	CIND	1	10	LARGE FLINT INCL; GLASSY AND VERY COLOURFUL; NON IRON WORKING?
68	1000	CIND	8	20	GLASSY; LOTS FLINT INCL
68	1000	FIRE	1	1	OXIDISED
68	1000	FIRE	2	10	OXIDISED; FLAT SURFACE; HEARTH? 1 HAS PLATE AND SPHEROIDAL HAMMS IN FABRIC**
68	1000	HAMMS	0	23	LOTS PLATE AND SPHEROIDAL
68	1000	HB	1	20	+ HL; + LARGE FLINT
68	1000	HB	1	30	+ LOTS CHARC; IRON RICH; HAMMS ATTACHED
68	1000	SLAG	0	43	58 FRAGMENTS; MOST PROBABLY CIND AND SSL
68	1000	SSL	4	119	LOTS CHARC; IRON RICH; QUITE SANDY
68	1000	VHL	1	2	THIN FRAGMENT
69		SSL	1	19	DENSE; + CHARC
69		VHL	2	4	
69	0	CIND	1	6	+ CHARC + SMALL FLINT
69	0	CIND	1	10	GLASSY; CONTAINS LARGE LUMP OF HL
69	0	SLAG	1	7	SSL FRAGMENT? SMASHED; + LOTS CHARC
69	0	SSL	1	29	LIGHT GLASSY; MASSES LARGE AND SMALL FLINTS
75	1023	HAMMS	0	0	FEW
81	0	VHL	1	37	SMASHED; NO TUYERE HOLE; POSSIBLY CIRCULAR
89	1003	HAMMS	0	2	SOME
113	1001	HAMMS	3	3	SOME
115	1002	HAMMS	0	0	FEW
115	1002	SSL	1	7	+ SMALL FLINT
118	1013	HAMMS	0	2	SPHEROIDAL AND PLATE
131	0	SSL	1	39	SMASHED - SOME MISSING; LOTS CHARC INCL
131	0	VHL	1	11	+ PART HB; + SOME FLINT
132	0	HAMMS	0	0	FEW IN BAG
132	0	HB	1	50	L: 50; W: 50; H: 30MM; SMALL AND LIGHT; NO HL
132	0	HB	1	75	ABRADED? GREY; LEACHED
132	0	HB	1	87	SANDY BASE; ABRADED; CHARC INCL
132	0	HB	1	142	ABRADED; LOTS LARGE CHARC ON BASE
132	0	HB	2	46	ABRADED FRAGMENTS? GREY; LEACHED
132	0	SLAG	0	34	SMASHED; 20 FRAGMENTS OF SSL AND CIND
132	0	SSL	1	63	POSSIBLY HB; IRON RICH; + CHARC
132	0	SSL	2	19	CINDERY; SANDY
132	0	SSL	4	145	IRON RICH; SANDY
132	0	VHL	1	21	9 PIECES ALL PROBABLY 1; SLAG ATTACHED
132	0	VHL	1	25	SLAGGED LUMP
133	0	SSL	1	55	ENCRUSTED WITH CESS
133	0	VHL	1	23	SLAG + VHL; 13MM THICK; + FLINT
136	0	CIND	1	3	
136	0	HAMMS	0	0	IN BAG
136	0	HB	2	69	SMALL AND ROUNDED + CHARC
136	0	SLAG	1	35	SMASHED HB? + HL; 14 BITS + CRUMBS
136	0	SSL	2	35	1 IRON RICH; 1 + CHARC
136	0	VHL	2	3	THIN PIECES
147	1004	HAMMS	0	3	SOME
149	0	SSL	1	65	DENSE + LOTS CHARC ON BASE; IRON RICH
157	1005	HAMMS	0	3	SOME

175	1006	HAMMS	0	6	PLATE AND SPHEROIDAL
184	1007	HAMMS	0	0	SOME
184	1007	SLAG	2	3	FAS?
186	0	CIND	1	23	+ HL; SMASHED
186	0	HB	1	135	DENSE; LOTS CHARC ON BASE; POSSIBLY ABRADED
190	1008	CIND	1	4	POSSIBLY NOT IRON WORKING; GLASSY
190	1008	HAMMS	0	0	FEW
194	1009	HAMMS	0	4	PLATE AND SPHEROIDAL + PRILL
194	1009	SLAG	2	4	FAS? IRON WORKING?
203	1010	HAMMS	0	2	SOME
238	1011	HAMMS	0	3	SOME - LOTS
243	0	SLAG	1	13	IRON SMITHING
243	1015	HAMMS	0	0	SOME
248	1012	HAMMS	0	3	SOME - LOTS SPHEROIDAL AND PLATE
250	0	SSL	1	120	VERY DENSE; IRON RICH; MINERALLY PRESERVED STRAW ON SURFACE
252	1014	HAMMS	0	0	SOME
258	1018	HAMMS	0	0	SOME
262	1016	HAMMS	0	0	SOME
263	1017	HAMMS	0	0	FEW
264	1019	HAMMS	0	0	FEW
283	1022	HAMMS	0	0	FEW
289	1020	HAMMS	0	0	SOME SPHEROIDAL AND PLATE
300	0	CIND	2	11	GLASSY; + SAND; + LARGE FLINTS
300	0	SSL	1	9	LARGE FLINT INCL; LIGHT; + HAMMS
300	0	SSL	1	23	DENSE; IRON RICH; + CHARC
300	0	SSL	1	35	LARGE FLINT INCL
300	0	VHL	1	15	
301	0	SSL	2	19	+ CHARC; 1 IRON RICH
301	0	VHL	1	6	
303	0	SSL	1	16	HB FRAGMENT? LOTS VOIDS MANY WITH CHARC; IRON RICH
313	0	SSL	1	36	?HB FRAGMENT; + CHARC + SMALL FLINTS; DENSE; SLIGHTLY ABRADED
439	0	HAMMS	0	0	FEW IN BAG
439	0	SSL	1	65	POSSIBLE HB; MASS CHARC; QUITE GLASSY; HL INCL
440	0	STONE	1	56	NATURAL CONCRETED GRAVEL
443	0	SSL	1	6	LIGHT; HL INCL
443	0	SSL	1	7	LIGHT; IRON RICH; + CHARC
444	0	HB	1	110	SMASHED - LOTS MISSING; VERY DENSE + HL WITH STRAIGHT EDGE
445	0	SSL	1	19	+ 2 HL INCL
445	0	CIND	1	12	SMASHED; 13 PIECES
445	0	CIND	2	12	GLASSY; LOTS OF FLINT
445	0	HAMMS	0	0	FEW CRUSHED IN BAG
445	0	HB	1	217	W: 80MM; H: 35MM; SOME FLINT INCL + CHARC; IRON RICH
445	0	SSL	1	26	GLASSY; SLIGHTLY COLOURFUL; + CHARC
445	0	SSL	1	47	HB FRAGMENT? DENSE BUT LARGE VOIDS; + CHARC
445	0	VHL	2	25	THIN PIECES
446	0	SLAG	1	2	TINY PIECE WITH COPPER ALLOY; SLAG TYPE UNCLEAR; MATT AND DARK GREY
446	0	VHL	1	5	SLAGGED ON BOTH SIDES
447	0	HAMMS	0	0	IN BAG
447	0	HB	1	229	+ LOTS COPPER ALLOY FRAGMENTS; + HL WITH STRAIGHT WALL
448	0	SLAG	5	47	SMASHED PIECES OF CIND + SSL; + HL + LARGE FLINT PIECES; 28 PIECES
448	0	CIND	3	22	+ HL; GLASSY; FREQUENT FLINT INCL
448	0	HAMMS	0	0	FEW CRUSHED IN BAG
448	0	HB	1	118	SMASHED - SOME MISSING; DENSE + CHARC
448	0	IRON	2	6	OBJECT; REMAINS OF A NAIL?
448	0	SSL	1	51	DENSE; IRON RICH; + CHARC
449	1028	HB	1	81	H: 30MM; DENSE; + CHARC
450	1030	FAS	1	1	
450	1030	HAMMS	0		FEW
453	0	VHL	1	30	TUYERE? + IRON SLAG + FLINT; CHINNED; NO HB
454	1032	HAMMS	0		FEW
458	0	HB	1	190	W: 85; H: 22MM; THIN; +CHARC
458	0	HAMMS	0	0	FEW IN BAG
458	0	SSL	1	8	
471	1034	HAMMS	0	3	PLATE AND SPHEROIDAL;
471	1034	HB	1	101	LEACHED; GREY; ABRADED
493	0	CIND	3	6	

493		VHL	1	43	HB FORMING
493	0	HB	1	85	W: 55; H: 35MM; + CHARC; + HAMMS
493	0	HB	1	101	+ CHARC; DENSE; LOTS LARGE FLINT INCL; GLASSY SURFACE; + HL
493	0	HB	1	132	L: 55; W: 60; H: 30MM; +CHARC
493	0	HB	1	182	L: 70; W: 85; H: 35MM; ENCRUSTED; LARGE CHARC INCL - 1 30MM; + HAMMS
493	0	IRON	1	12	OBJECT? SHEET OFFCUT?
493	0	SLAG	1	47	SMASHED; LARGE FLINT INCL
493	0	SSL	2	85	IRON RICH; LARGE CHARC INCL - 1 20MM LONG
493	0	VHL	2	12	+ FLINT; SLAG GLASSY
511		SSL	1	66	HB? DENSE + CHARC + FLINT
999	0	STONE	1	28	NATURAL IRONSTONE

Codes used in the catalogue:

CHARC	CHARCOAL
CIND	CINDER (AN IRON-WORKING SLAG)
FAS	FUEL ASH SLAG
FIRE	FIRED CLAY
H	HEIGHT
HAMMS	HAMMERSCALE
HB	PLANO-CONVEX HEARTH BOTTOM
HL	HEARTH LINING
INCL	INCLUSIONS
SSL	SMITHING SLAG LUMPS
VHL	VITRIFIED HEARTH LINING
+	AND OR PLUS

Unstratified (U/S) has been entered as 999 on the database

APPENDIX 5

Finds assessment by Bob Zeepvat

For the Hartsfield finds assessments the following categories have been examined:

Copper Alloy	Shell
Iron	Tile & Brick
Lead	Daub
Bone & Antler	Mortar
Glass	Wallplaster
Stone	

COPPER ALLOY

Find No	Context	Description	Spot Date	Illustrate
1500	081	Fragment of spring from fibula. Too fragmentary to identify brooch type	L2nd -3rd	no
1502	186	Pin, part shaft and point, L51mm. Probably from fibula	2nd	no
1508	301	Rod, L67mm, D2mm, with traces of ribbed decoration. Probably from a ligula or stylus.	4th-5th	no
1515	283	Ring, 68mm across (part missing), D-section. Similar to a terret, but of larger diameter and of thinner section. Across the face of the ring, between two rounded 'collars', is welded a D-section rod (similar section to ring), broken off at its inner end, and ending outside the ring in a suspension loop, which has been worn through. Function unknown - no direct parallels could be found. Presumed by excavator to be a harness ring, but is much less substantial than a harness ring or terret, and is evidently meant to be seen from one side only. Possibly a form of horse brass or other harness decoration?	L1st-e2nd	yes
1516	132	Curved strip fragment, rectangular 2x1mm section, undecorated. Possible band of plain finger ring.	M2 nd -3 rd	no
1537	303	Two scrap fragments	3 rd -4 th	no
1540	483	Ring, ext D26mm. Rounded square section, 2.5mm across. Section of ring, L4mm, narrowed to rectangular section 2.5 x 1mm, between slightly thickened 'terminals', presumably for attaching a suspension loop or other fixture.	4th-5th	yes
1547	483	Fragment of armlet, W16mm. Median line is flanked by single lines of 'rope-twist' decoration, and a single groove runs parallel to each outer edge. Similar to an example from Colchester (Crummy 1983, fig. 40.1586), dated to c. AD50.	4th-5th	yes
1551	490	Rod, 4 x 2mm max section, L21mm, tapering to point. Possibly tang from decorative stud, but no evidence of use or breakage from larger object could be found.	M/L3rd	no
1561	514	Ring, ext D 10mm, int D 4.5mm, triangular section. Collar or ferrule?	M/L2nd	no

Ten copper-alloy objects were recovered from the site. All were in reasonable condition when found. All except a few small fragments are to be sent to Verulamium Museum for conservation. Identifications are given in the above table. All except Object 1500 were recovered from securely stratified contexts.

The object types represented in the assemblage are all commonly found on Roman settlement sites, and include brooch pins and other jewellery fragments, several rings of differing sizes and functions, a possible ligula and a possible harness fitting, as well as the usual fragments of unidentifiable scrap. None of the objects are of particular significance in relation to the contexts from which they were recovered: three (1515, 1540, 1547) are of intrinsic interest.

LEAD

Find No	Context	Description	Spot Date	Illustrate
1506	300	Waste fragment of cooled molten lead. Approx dimensions 70 × 55 × 7mm.	4th	no
1578	424	Crumpled scrap sheet, Th1mm. Original extent and shape impossible to discern.	2nd	no

Two objects of lead or lead alloy were recovered from the site. These are detailed in the above table. Both are typical of the 'scrap' lead commonly found on Roman sites. No further work is proposed on this material.

IRON

Find No	Context	Description	Spot date	Illustrate
1504	109	Bar 6mm square section, bent into eye (int D6mm) at one end. Overall L70mm (cf Zeepvat & Williams 1994, fig. 166.230)	L3rd-4 th	no
1510	266	Hinge strap? Strip, 230 × 22 × 2mm, rounded end with single hole containing square-headed nail.	RB	no
1511	288	Rod, D5mm, bent at right-angles c.15mm from each end, with rod (broken) of similar section branching off at an angle midway along its length. Overall length 140mm approx. Function unknown.	-	no
1512	392	Blade of implement? Roughly triangular piece, L70mm, one long edge ribbed. From the short edge projects a possible tang.	-	no
1514	390	Rod, 8mm square section, L135mm	-	no
1517	132	Fragment, 45 × 25mm	M2nd-3 rd	no
1518	132	Fragment, 26 × 12mm	M2nd-3 rd	no
1520	133	Fragment, 24 × 20mm	L2nd-3 rd	no
1521	133	Rod, 5 × 7mm section, L85mm	L2nd-3 rd	no
1522	133	Strip, 10 × 3mm section, L58mm	L2nd-3 rd	no
1523	133	Lump, 40 × 22 × 10mm	L2nd-3 rd	no
1525	133	Lump, 26 × 19 × 6mm	L2nd-3 rd	no
1526	133	Lump, 36 × 20 × 12mm	L2nd-3 rd	no
1527	133	Lump, 54 × 28 × 7mm	L2nd-3 rd	no
1531	133	Lump, 38 × 15 × 8mm	L2nd-3 rd	no
1535	453	Tapered square-section bar, max 10 × 10mm, L77mm. Tang from knife or other implement?	M/L3rd	no
1536	303	Strip fragment, 24 × 22 × 2mm	3 rd -4 th	no
1549	496	Bar, 12 × 6 × 93mm, bent at right angles	E/M2nd	no
1555	516	NOT IN BOX	-	-
1559	136	?Hook. Rod, D4mm, L105mm approx, bent into open hook, with remains of eye at other end.	L2nd-3 rd	no
1560	516	NOT IN BOX	-	-

1562	512	Strip, 6 × 2mm, bent into eye (D 5mm) at each end, to form a link approx 55mm long	-	no
1573	524	2 small sheet fragments	4 th	no
1592	046	Ring-headed pin, overall length 75mm. Pronounced flattened head with oval eye, 5 × 10mm, and square-section tapered shaft.	3 rd -4 th	no
1593	062	Strip fragment, 30 × 5 × 1mm	-	no
1594	069	Lump, 25 × 20 × 15mm (possibly iron slag)	2 nd	no
1595	136	Mixed bag, including one lump, one nail head, two hobnail heads, two wire fragments, and four other fragments.	L2nd-3 rd	no
1596	129	2 fragments, possibly from a nail	3 rd -4 th	no
1597	132	3 fragments: one at least possibly a nail	M2nd-3 rd	no
1598	135	2 fragments, possibly a nail	L2nd-3 rd	no
1599	298	Fragment	4 th	no
1600	282	Sheet fragment, L40mm, possibly from an implement socket or ferrule.	4 th -5 th	no
1601	305	Tang from implement, L69mm.	L1st-E3rd	no
1602	438	Fragment	2 nd	no
1603	452	4 hobnails, each L18mm, and one square head from a larger nail.	L2nd/3 rd	no

Fifty-one iron objects from the site were examined (two others - 1555 and 1560 - were missing from the assemblage): these are detailed in the above table. Five further objects identified by the excavator as coming from unstratified contexts were not examined. The majority of the objects examined came from securely stratified contexts. The bulk of the assemblage consisted of unidentifiable lumps, fragments of sheet, rod, etc, many of which were recovered from Context 133, one of the fills of Pit 130. The condition of the assemblage may be described as 'poor to fair': the more complete objects will be submitted to a laboratory for X-raying and conservation. None of the objects could be described as being of intrinsic interest, and none appear to be of any importance in interpreting the site. (However, note comments in Appendix 4).

BONE & ANTLER

Find No	Context	Description	Spot date	Illustrate
1501	186	Spoon, round bowl, D21mm, plain tapering round-section shaft. Such spoons are common finds on Roman sites (cf Stead & Rigby 1986, fig. 71.666; Cunliffe 1971, fig. 67.9 & 10; Frere 1972, fig. 55.206), and are usually dated to the 2 nd and 3 rd centuries.	2 nd	yes
1507	301	Two frags of pin/needle, D2.5mm, one with point (not necessarily parts of the same object!)	4 th -5 th	no
1583	069	Needle, point missing. L77mm, D3mm. Crummy Type 1 (Crummy 1983, fig. 70.1975). Flattened head with one D2mm hole, and one figure -of-eight hole consisting of 2 D2mm holes drilled close together. This type of needle dated by Crummy to 4 th -5 th cent.	2 nd	yes
1584	430	Rough-out for pin/needle. Max D10mm, L86mm.	2 nd	no
1586	301	Rough-out for pin/needle. Max D8mm, L58mm.	4 th -5 th	no
1587	278	Pin/needle, part shaft and point. D3mm, L40mm	4 th	no
1588a	453	Pin/needle, part shaft and point. D3mm, L37mm	M/L3rd	no
1588b	453	Sliver of bone - possibly from unsuccessful attempt to carve pin/needle. L40mm, D4mm.	M/L3rd	no

1589	453	29 fragments of worked bone, including rough-outs for pins/needles, and debris from carving.	M/L3rd	no
1590	446	Fragment of antler, sawn at both ends, split and hollowed out	2 nd	no

Thirty-nine items of worked bone or antler were recovered from the site. These are detailed in the above table. All were recovered from securely stratified contexts. The spoon [1501], pins and needles are common finds on Roman settlement sites, and are primarily of intrinsic interest.

More significant for interpreting the site is the presence of quantities of bone-working waste and rough-outs for carving pins or needles, all recovered from mid to late 3rd-century contexts. The quantities recovered are not large, but could indicate the presence of a workshop producing bone objects on or near the site at that time.

STONE, JET & SHALE

Find No	Context	Description	Spot date	Illustrate
-	496	SANDSTONE. Lump, 120 × 75 × 60mm approx	E/N2nd	no
1503	199	MILLSTONE GRIT. Part of lower stone of rotary quern, D290mm, Th95mm. Tapered socket for pivot, Depth 45mm, D at upper face 18mm.	late 1st	?yes
1505	237	JET. Part shaft and point of hairpin, L57mm, D7mm. Carved rather than lathe-turned, so probably 3 rd -4 th century date (Crummy 1985, 27)	-	?yes
1509	263	LAVA. Fragment, probably from quern. No worked faces visible.	M/L1st	no
1524	044	SLATE. Fragment of slate pencil, D6mm. Partly sharpened tip.	L1st-e2nd	no
1548	490	PUDDINGSTONE. Fragment, probably from quern. No worked faces visible.	M/L3rd	no
1558	506	FLINT/CHERT. Frost-shattered pebble, containing fossil.	RB	no
1575	524	LAVA. Fragment, probably from quern. No worked faces visible.	4 th	no
1585	285	?SLATE. Flake (described by excavator as 'worked bone')	L1st	no
1605	079	?SCHIST. Possible part of whetstone, section approx 35 × 35mm, L50mm	L1st-e2nd	no
1606	081	MICACEOUS SCHIST. Quern fragment, one worn face. Approx dimensions 85 × 70 × 45mm.	L2nd-3 rd	no
1607	202	?SCHIST. Fragment, possibly used as a whetstone or rubbing stone. Dimensions approx 40 × 28 × 27mm.	L1st-e2nd	no
1608	250	LAVA. 5 fragments, possibly from quern.	RB	no
1609	263	MICACEOUS SCHIST. Whetstone fragment, 2 faces worn, section 35 × 36mm.	M/L1 st	no
1610	278	? Flat pebble, possible rubbing stone, 1 face worn. Dimensions 75 × 50 × 12mm approx.	4 th	no
1611	282	LAVA. Small fragments, possibly from quern	L1st-e2nd	no
1612	296	LAVA. Small fragments, possibly from quern	L1st-e2nd	no
1613	297	Pebble	-	no
1614	441	Pebble	L1st-e2nd	no
1615	079	LAVA. Fragment, possibly from quern. 65 × 45 × 30mm approx	L1st-e2nd	no
1616	453	MILLSTONE GRIT. Fragment, possibly from quern. Approx dimensions 75 × 60 × 45mm.	M/L3rd	no

Twenty-one stone finds were recovered from the site. These are listed in the above table. Several deserve no further consideration, either because they come from contexts which were not securely stratified (1524, 1605, 1606, 1616), or because they are of no archaeological interest whatsoever (1558, 1585, 1613, 1614). Of the remainder, most are fragments of quern (Millstone Grit, Hertfordshire Puddingstone or lava) or whetstone (schist), all of which are commonly encountered on Roman settlement sites. Only two stone finds are of intrinsic note: part of a rotary quern (1503) and part of a jet hairpin (1505).

GLASS

Find No	Context	Description	Date	Illustrate
1513	392	?Drinking vessel body sherd, pale green, Th1mm, with fine trailed 'wave pattern'	-	yes
1519	132	Body sherd, pale blue-green, Th3-4mm.	M2 nd -3 rd	no
1528	133	NOT IN BOX	L2 nd -3 rd	
1529	133	Body sherd, pale blue-green, Th3-4mm.	L2 nd -3 rd	no
1532	445	Body sherd, pale blue-green, Th2-3mm, with base of handle present. Possibly from small handled cup.	M - L2 nd	?yes
1533	445	?bowl, pale blue-green base fragment, Th2-4mm.	M - L2 nd	no
1534	445	Prismatic bottle base, plain, mould-blown, 78mm across.	M - L2 nd	no
1552	136	Beaker rim, yellow-brown. Rounded, slightly thickened out-turned rim. Body Th1mm.	L2 nd -3 rd	yes
1553	136	Body sherd, colourless.	L2 nd -3 rd	no
1554	136	Body sherd, pale green, Th2mm. From base of neck of beaker/flask?	L2 nd -3 rd	no
1556	136	Body sherd, yellow-brown, Th1mm.	L2 nd -3 rd	no
1557	496	Beaker rim, colourless, body Th1mm. Plain beaded rim, D38mm.	E-mid 2 nd	no
1564	525	Base-ring of bowl or cup, pale blue-green. Convex sides curving in to concave base with thickened centre. Base ring closed round section, splayed outward. Body Th1.5mm: Base ring D61mm.	early 1 st	yes
1579	068	Bowl/cup: 5 body sherds of one vessel. Plain colourless, Th1mm, surface iridescent.	2 nd	no
1580	004	Hexagonal prismatic bottle, body sherd, blue-green, Th3mm.	2 nd	yes
1581	u/s	Body sherd, colourless, Th1mm.	-	no
1582	135	Body sherd, blue-green, iridescent, Th2.5mm.	L2 nd -3 rd	no

Seventeen finds of glass were recovered from the site: these are listed in the above table. With one exception (1581), all were recovered from securely stratified contexts. Most were small body fragments, the majority in blue-green glass, too small to permit identification of vessel forms. Five pieces (1513, 1532, 1552, 1564, 1580) have been identified as being of possible intrinsic interest, and should be submitted to an appropriate specialist for more detailed comment.

SHELL

Find No	Context	Description	Spot date	Illustrate
1571	524	Oyster shell, worked to teardrop shape. Narrow (top) end pierced by D7mm hole	4 th	no
1572	524	Oyster shell, worked to teardrop shape. Narrow (top) end pierced by D7mm hole	4 th	no
1574	524	Oyster shell, worked to teardrop shape. Narrow (top) end pierced by D7mm hole	4 th	no
1577	526	Oyster shell, worked to teardrop shape. Narrow (top) end pierced by D7mm hole	4 th	no

Four shell objects were recovered from the Hartsfield excavations. All were recovered from the fill of Well 491, from contexts dated to the 4th century. The four objects are near-identical teardrop-shaped pieces of oyster shell, pierced at the narrow (upper) end, presumably for suspension. No parallels have been found for these objects, which evidently form a set: a possible interpretation is that they form part of a crude necklace, maybe intended to act as some sort of charm. No further work is proposed on these finds.

TILE & BRICK

Context	No. Frags	Weight (g)	Description	Spot Date
003	1	105	unid. brick fragment	2 nd -4 th
045	3	135	Imbrex? Hard red-orange sandy fabric	late 1 st -2 nd
087	6	150	Tegula and unid. frags	3 rd /4 th + med
131	3	340	Imbrex, unid. brick	2 nd -4 th
132	2	120	Tegula - orange fabric with no readily visible inclusions	M2nd-3 rd
133	1	325	Sub-floor tile, Th42mm. Fabric as 132	L2nd-3 rd
136	4	345	Tegula, imbrex (Fabric as 132) and unid.	L2nd-3 rd
175	1	55	Tegula. Fabric as 132	2 nd -3 rd
189	1	15	Small unid. fragment	M2nd
197	1	90	Tegula. Fabric as 132	M/L2nd
237	1	75	Tegula. Reddish fabric, containing grog pellets.	-
243	1	45	Tegula. Fabric as 237	E2nd-L3rd
250	1	60	Unid. Fabric as 237	RB
252	1	225	Pila type tile. Fabric as 237, print of a medium-sized dog on upper face, made when tile was still very sticky.	E/M2nd
261	1	85	Sub-floor tile, Th38mm. Fabric as 237.	L1st-E2nd
278	2	125	Unid.	4 th
282	6	790	Tegula and imbrex, fabric as 132. Pila type, Fabric as 237	4 th -5 th
288	1	390	Tegula, fabric as 132	-
292	2	430	Pila type tile	4 th
300	2	180	Tegula in buff shelly fabric. Teg/pila, Fabric as 237	4 th
301	7	290	Tegula, fabric as 300. Pila type, fabric as 237	4 th -5 th
321	1	20	Imbrex, fabric as 132	2 nd
423	1	25	Unid.	2 nd -3 rd
446	1	305	Pila/Sub-floor, fabric as 132	2 nd
452	1	175	Tegula/Pila type, fabric as 300	L2nd/3 rd
453	1	90	Imbrex, fabric as 132	M-L3rd
458	2	55	Imbrex, fabric as 132	M-L2nd
483	1	200	Tegula, fabric as 132	4 th /5 th
490	3	470	Imbrex, fabric as 300. Plain tubulus, fabric as 132	M-L3rd
493	11	840	Pila type, Tegula, combed tubulus, sub-floor. All fabrics	4 th
494	12	100	Unid. fragments	E2nd

496	1	125	Sub-floor?	E/M2nd
502	3	155	Pila type, burnt.	3 rd
509	4	295	Pila, fabric as 237, and unid.	L2nd
511	1	10	Unid. fragment	E2nd
524	6	440	Imbrex, tegula, combed tubulus. Fabrics as 132 & 237	4 th
525	1	85	Tegula, fabric as 237	E1st
909	2	120	Sub-floor?	3 rd /4th
TOTALS	102	8530		

Excavations at Hartsfield produced a small quantity of brick and tile, which is detailed in the above table. The assemblage consists of small, sometimes abraded fragments, found singly or in small numbers in contexts across the site. All common types of Roman brick and tile appear to be present, though considering the small size of the assemblage, no conclusions can be reached regarding the use of brick and tile on buildings on and around the site. To put the size of the assemblage into perspective, a complete *tegula* (roof tile) weighs 4.0 - 5.0kg.

Three fabrics were noted in the assemblage: a hard-fired reddish-orange sandy fabric, a reddish fabric with inclusions of grog (fired clay pellets), and, in much smaller quantities than the first two, a buff to grey fabric containing crushed shell. The first of these is thought to originate from kilns in the Verulamium/Brockley Hill area, and to have been produced in the late first and second centuries. The provenance and date of the grogged fabric is uncertain, but the shelly fabric is similar to one produced by kilns in the Ouse valley, around Harrold and Odell, throughout the Roman period.

No further work is proposed on the tile and brick assemblage.

DAUB/CERAMIC BUILDING MATERIAL

Context	No. frags	Weight (g)	Description	Spot Date
044	5	40	Tile fragments	L1st-e2nd
054	1	15	Daub	-
062	7	40	Daub	-
066	1	45	Tile fragment	-
068	3	110	Daub	2 nd
081	5	70	Fragments of hearth lining/kiln bar?	L2nd-3 rd
084	1	50	Tile fragment	E/M2nd
090	1	50	Daub	L1st-E2nd
132	8	90	Daub	M2nd-3 rd
135	18	125	Fragments of kiln furniture?	L2nd-3 rd
136	1	20	Daub	L2nd-3 rd
149	1	2	Daub	E/M1st - L2nd/3 rd
157	1	5	Daub	2 nd
186	2	50	Daub	2 nd
187	1	30	Daub	L1st-2 nd
194	1	35	Tegula fragment	RB
202	2	10	Daub	L1st-E2nd
204	18	200	Daub	L1st
208	2	5	Daub	M/L1st
213	2	5	Daub	E/M1st
219	2	15	Daub	M/L1st
243	43	650	Hearth/kiln lining?	E2nd-L3rd
252	32	780	Fragments of kiln furniture?	E/M2nd
255	3	140	Daub	E/M2nd

261	8	25	Daub	L1st/E2nd
262	3	0.5	Daub	L1st/E2nd
263	25	135	Daub	M/L1st
266	15	195	Daub	RB
282	6	35	Daub	4 th -5 th
283	3	65	Fragments of kiln furniture?	L1st-E2nd
298	2	35	Daub	4 th
300	1	0.5	Daub	4 th
301	2	10	Daub	4 th -5 th
303	3	75	Fragments of kiln furniture?	3 rd -4 th
305	3	25	Daub	L1st-E3rd
311	3	35	Daub	E/M2nd
313	1	70	Tile fragments	E/M2nd
424	4	25	Daub	2 nd
441	2	15	Daub	L1st-E2nd
445	3	25	Daub	M/L2nd
493	3	230	Daub	4 th
500	1	25	Tile fragments	L2nd
513	3	140	Tile fragments	E/M2nd
521	6	160	Tile fragments	2 nd

A small quantity of daub and burnt clay was recovered from the site. This was classified by the excavator as 'daub' and 'CBM' (presumably 'ceramic building materials') respectively. As examination of these assemblages (detailed in the above table) has shown these categories to be somewhat arbitrary, both have been combined as shown for the purpose of this assessment.

Leaving aside the fragments of tile listed above, the majority of this assemblage consists of daub fragments too small to contain any diagnostic attributes (eg. shape, presence of tempering, wattle impressions). However, six contexts (081, 135, 243, 252, 283, 303) produced fragments of fired clay exhibiting some shape (smoothed faces, straight edges, etc). Like the rest of the assemblage, these were too small and fragmented to attempt reconstruction, but it seems likely that they represent the remains of the linings or furniture of kilns or hearths. The relevance of this to any such features on the site should be examined in the final report: otherwise, no further work is appropriate on this material.

MORTAR & WALLPLASTER

Context	No. frags	Weight (g)	Description	Spot Date
079	7	80	mortar fragments	L1st-E2nd
175	1	35	mortar fragments	2 nd -3 rd
252	2	10	mortar fragments	E/M2nd
266	15	945	mortar fragments	RB
297	1	5	mortar fragments	-
298	1	5	mortar fragments	4 th
524	5	110	mortar fragments	4 th

A very small quantity of mortar fragments was recovered from the site: these are listed in the above table. Like the brick and tile found, this assemblage consisted mostly of small fragments, evidently brought to the site as hardcore. No further work is required on this material

In addition to the above, samples were taken from context 266 of a softish, off-white mortar-like material (c.4.0kg, 57 frags). Some fragments have evidently been shaped, having a more or less flat face (one fragment has two faces meeting at about 90° - an outside corner), and /or a groove or series of fingered grooves to the rear. The front face of most examples is covered by a brown coating, possibly paint. The grooves were definitely made intentionally, and are not impressions of wattle, as one might expect. The function of this material remains unknown.

In the samples along with the above material was a smaller quantity (1.8kg, 62 frags) of a soft brown friable material. None of this appears to have worked faces or other features. It could possibly be some kind of metal (iron?) ore.

Other Finds

From the assessment, it is evident that most categories of finds are present only in small quantities and contain no finds of special importance, though a few objects are intrinsically interesting. Accordingly, most finds categories will be dealt with by a brief note describing quantity, condition, dating and other relevant information, detailed descriptions being limited to those few finds of intrinsic interest, namely copper alloy, bone, glass and jet. Finds present in quantity will be dealt with statistically, and presented by means of tables, graphs etc where necessary.

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APPENDIX 6

Late pre-Roman Iron Age and Romano-British Pottery Assessment Report

by H. Ashworth

Introduction

A total of 6010 sherds of pottery, weighing 83940g and stored in 8 bulk finds boxes, was recovered from 150 stratified contexts during the current season of excavations at Hartsfield JMI School, Baldock, by The Heritage Network. The following assessment is based on a brief examination of this material, which is predominantly Romano-British in date.

The pottery was in variable condition, ranging from small, abraded fragments to sizeable, relatively unworn, sherds. The condition of the pottery from each context was shown on the pottery recording forms by use of a letter code, from A to E. A signified a context containing complete, or almost complete vessels; E signified a small group of abraded, mainly undiagnostic sherds, that were likely to be residual within the context.

Methodology

Initially the pottery from each context was scanned, weighed, counted and assigned a spot-date on the basis of the fabrics and forms present. This was done to provide rapid information to the excavator for the phasing of the site.

Further analysis of the pottery was then undertaken to divide the pottery into broad fabric groups, including grog-tempered ware, shell-tempered ware and Hadham grey ware, which were then weighed and counted. This was done to provide an indication of the relative importance of the sources of pottery supplying Roman Baldock.

The dating of the contexts was refined at this stage to try and obtain some insight into the pattern of discard across the site, though some contexts could not be closely dated.

Chronology

The pottery from the present site ranged from a few residual sherds of late Bronze Age/early Iron Age date to intrusive material from the post-Medieval period. The bulk of the assemblage was Romano-British in date.

On the ceramic evidence there appear to have been two main phases of occupation on the site, the first lasting from the late 1st century AD to the late 2nd century AD and the second falling into the 4th/5th centuries. The earlier phase of occupation was distinguished by large amounts of grog-tempered and early Roman sandy wares, which were replaced by grey wares,

including Hadham grey ware. The later phase was distinguished by the presence of oxidised and red-slipped wares from the Hadham and Oxford kilns.

Discussion

The assessment of the pottery assemblage from the current excavations at Hartsfield JMI School was undertaken to provide a chronological sequence for the site and to identify its significance, in terms of the study of pottery, within the Roman town of Baldock and the wider region.

The pottery from the present site forms only a part of the full assemblage from Hartsfield School but the material from previous excavations on the site has not yet been assessed. The inbuilt bias to the analysis of the pottery from the current season could be overcome by studying all the material from the Hartsfield excavations as one assemblage.

The assemblage from the present site should be compared with pottery from other excavations within the town of Baldock, and from other Roman settlements in the region, such as Sandy, Skeleton Green, Welwyn and Braughing to provide information on relative site chronologies and economic status. Such comparison might establish the relative status and function of the present site. Unfortunately there has been no quantification of previously published material from Baldock, or from many of the comparative sites in the vicinity, so this material could not be usefully assessed in quantitative terms, unless further work were to be done on the unpublished material from Baldock.

The assessment of the environmental samples has revealed that all the pits on the site were almost certainly dug and used as cess pits (Rackham, this report). Column samples from five of the pits has shown that the lower halves of these features were almost pure cess, indicating that these deposits were primary fills and that pottery recovered from them was contemporary with the use of the upper pits. Material from the upper soils layers is from secondary use, or later deliberate backfilling of the pits. Further work on the pottery from these pits, particularly those in close proximity to each other, could show whether the assemblages were contemporary and therefore likely to be the product of several households, or, if there is some slight chronological differences in the assemblages, whether the pits were used by one household and a new pit dug rather than old ones being cleaned out on a regular basis. Comparison with pottery assemblages from other excavated pits at Hartsfield may throw further light on this subject, and may even help to determine how many families lived in this area of Baldock during the Roman period, and what their socio-economic status may have been.

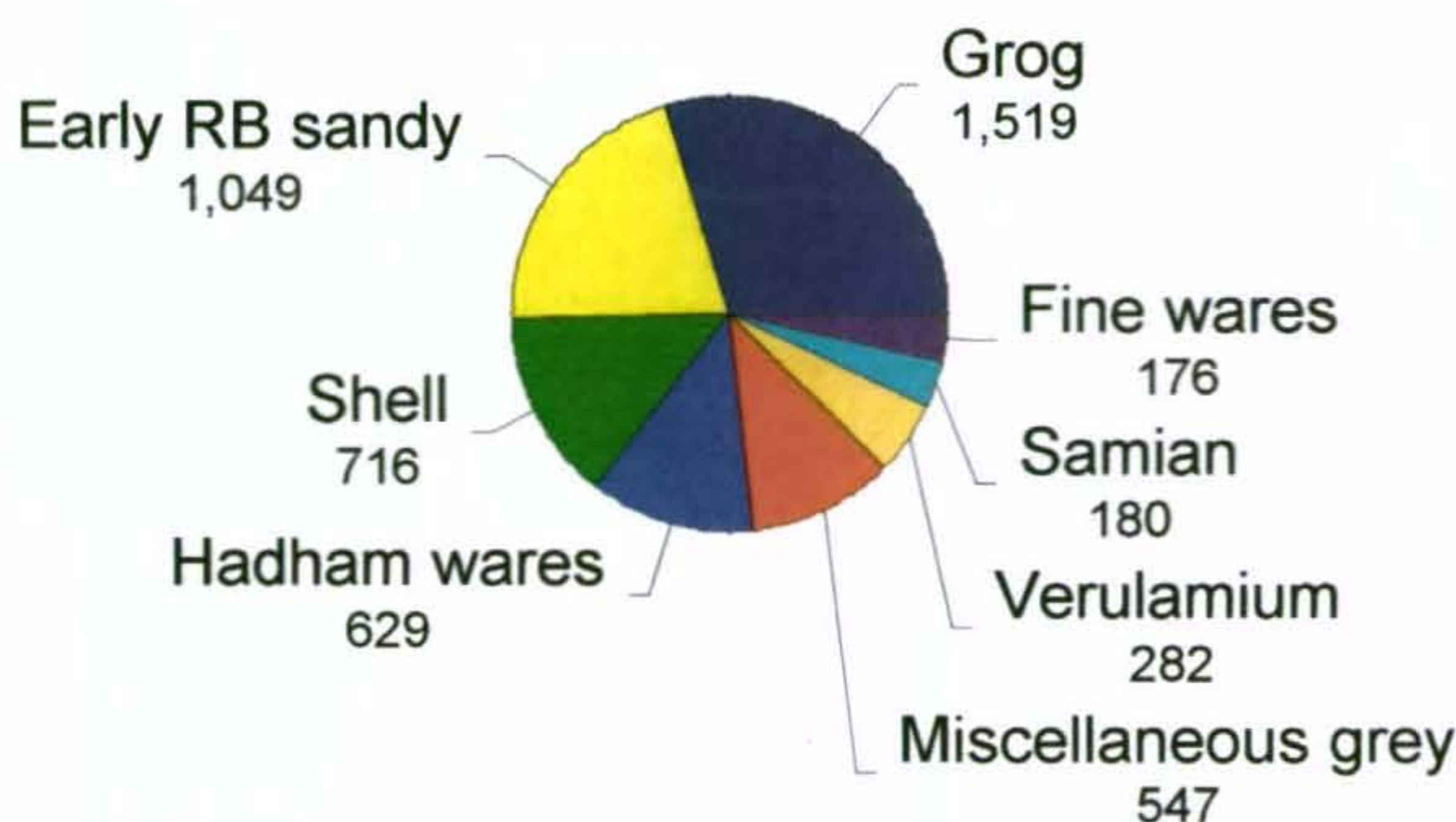
Excavations in Baldock between 1968 and 1972 (Stead and Rigby, 1986) have shown that the main phase of settlement in Baldock had started by the mid 1st century BC and continued into the 5th century AD. There is a dearth of features which can be securely dated to the late pre-Roman Iron Age on the present site, and this may indicate a pattern of settlement shift within the Roman town. This question might be clarified by comparison with the pottery from other excavations in Baldock.

It would appear that most of the pottery reaching the site was supplied by local and regional industries, including Hadham, Harrold and Verulamium. Imported and fine wares make a very small part of the assemblage, 2.38% by weight (excluding samian) indicating that this may have been a low-status occupation site on the edge of the Roman town. Comparison with the pottery from the rest of the site, and with other excavations in the vicinity may determine whether this was the case.

Conclusion

The pottery from the 1997 excavations at Hartsfield JMI School, Baldock, could be studied as an individual assemblage, but would very much benefit from comparison with all the material from previous fieldwork, both on this site and elsewhere within the Roman town.

Main Pottery fabric groups, by numbers of sherds



Hadham wares include both grey wares and oxidised wares

SAMIAN ASSESSMENT REPORT

by H. Ashworth

A total of 180 sherds of samian pottery (3% of the total) including 7 substantially complete vessels which have been recorded as 1 sherd for the purposes of this assessment, weighing 2873g (3.14% of the total) was recovered from stratified contexts during the excavation at Hartsfield JMI School, Baldock, Hertfordshire. The assemblage comprised approximately 45 identifiable vessels (identified from diagnostic sherds) the remainder being undiagnostic sherds.

Much of the assemblage was in the form of small, worn, sherds from vessels that may well have had a long period of usage before deposition. Other sherds were relatively unworn and they may have been broken soon after purchase. There appears to have been a preference for plain vessels, this may be a reflection of the relative costs of plain and decorated vessels and consequently, of the economic status of the Romano-British population of Baldock.

Substantially complete vessels comprised a small, but significant group, of the assemblage, including 4 from a single context (ditch fill 243). The 7 vessels comprised 3 Dr. 27 cups (2 from ditch fill 243); 2 Dr. 18 plates (both from ditch fill 243); 1 Dr. 18/31 plate; 1 Dr. 30 bowl. Specialist knowledge is needed to identify the fabrics and sources and to date the vessels.

Eight potters stamps were also recorded, 4 were on complete vessels and 4 on vessel fragments. Only 3 were legible, the remainder were either worn or broken. Specialist identification is needed for these, and comparison with other recorded stamps from Baldock.

Sixteen fragments of decorated bodysherd, and 1 decorated Dr 30 bowl were recovered. These need specialist input to identify the originating workshop and to compare them with other decorated samian sherds from previous excavations in Baldock.

Part of an incised graffitto was observed on the exterior of a Dr 27 rim fragment from context 316. Specialist knowledge is needed to comment on this.

The samian pottery from the current season of excavations at Hartsfield JMI School, Baldock, should be examined by a samian specialist, who would be able to date the vessels and identify the potters stamps and decorative motifs. It could be examined as a single assemblage from a small domestic site on the periphery of the Romano-British town, but should be considered in conjunction with the samian recovered from previous seasons of excavation, particularly from the same site, to give a larger picture of the use and discard of samian pottery and, possibly, an insight into the economic status of the population in Romano-British Baldock.

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APPENDIX 7

Environmental Archaeology Assessment by J. Rackham

Introduction

During the excavations in advance of an extension at Hartsfield School, Baldock, archaeological deposits of Romano-British date were sampled and animal bone was recovered by hand excavation. A total of 39 samples were collected (Table 1), of which five comprised a column samples through the fills of each of five of the excavated pits, totalling 106 small samples taken primarily for molluscan analysis. The samples derive from ditch, pit and well fills with one sample being taken from around a human 'burial' within a well fill. The animal bone collected amounted to a total of 16,788 fragments of bone, weighing 113.5 kilogrammes. The sampling strategy outlined in the Research and Academic Objectives of the project was broadly followed, with the addition of the column samples, each of 2-3 litres, through five of the excavated pits.

This material was submitted for assessment of its environmental potential, however it has also proved to be invaluable for the assessment of industrial activity on the site. One sample was collected for analysis of ceramic building material and has not been processed and sample 1035 was missing from the material delivered for study.

At this stage of the project the phasing data is incomplete and unphased material can be expected to be phased later in the programme, while some phased material may be re-phased.

Method

The bulk soil samples were processed in the following manner. Sample volume and weight was measured prior to processing. The samples were washed in a 'Siraf' tank (Williams 1973) using a flotation sieve with a 0.5mm mesh and an internal wet-sieve of 1mm mesh for the residue. Both residue and float were dried, and the residues subsequently re-floated to ensure the efficient recovery of charred material. The dry volume of the flots was measured, and the volume and weight of the residue recorded. A total of 791.4 litres of soil was processed in this way. The column samples were processed in a slightly different manner. The samples from five of the columns, a total of 74 samples (161 litres), were washed in a bowl and floated onto a 0.3mm mesh sieve, subsequently dried and re-floated, and in the case of one column, refloated a second time.

The residue from the bulk samples was sorted by eye, and environmental and archaeological finds picked out, noted on the assessment sheet and bagged independently. A magnet was run through each residue in order to recover magnetised material such as hammerscale and prill. The residue was then discarded, except where it was full of concreted mineralised cess material. The latter was retained for further study. The float of each sample was studied under a low power binocular microscope. The presence of environmental finds (ie snails, charcoal, carbonised seeds, bones etc) was noted and their abundance and species diversity recorded on the assessment sheet. The float was then bagged. The float and finds from the sorted residue constitute the material archive of the samples. The column sample residues were not sorted, but have been retained, and only the flots have been studied (see Tables 6-8).

The individual components of the samples were then preliminarily identified and the results are detailed below in Table 2-8.

Table 1: List of soil samples from Hartsfield, Baldock

sampl	contxt	feature	vol in l	wt in kg	phase	structure	sample type
1000	068	pit fill	24	27	4	67	flotation
1001	113	ditch fill	30	39	unp - 1?	112	flotation
1002	115	ditch fill	30	35	unp - 1?	114	flotation
1003	089	ditch fill	32	38	5	85	flotation
1004	147	ditch fill	30	34	unp - 2?	183	flotation
1005	157	pit fill	30	35	2nd?	78?	flotation
1006	175	ditch fill	28	31	2nd/3rd - 1?	174	flotation
1007	184	ditch fill	26	29	RB - 2?	183	flotation
1008	190	ditch fill	30	35	L1st/2nd -4?	188	flotation
1009	194	pit fill	30	33	RB- 2?	195	flotation
1010	203	ditch fill	30	34	5	85	flotation
1011	238	ditch fill	30	30	5	83	flotation
1012	248	ditch fill	30	33	4	83	flotation
1013	118	ditch fill	25	28	L1st/E2nd	117	flotation
1014	252	pit fill	28	30	5	249	flotation
1015	243	ditch fill	25	29	5	85	flotation
1016	262	pit fill	31	36	2	205	flotation
1017	263	pit fill	30	35	2	205	flotation
1018	258	pit fill	23	24	L1st/E2nd	256	flotation
1019	264	pit fill	09	09	unp	256	flotation
1020	289	pit fill	15	14.5	unp	256	flotation
1021	266	pit fill				256	CBM
1022	283	pit fill	30	33	4	64	flotation
1023	075	pit fill	30	30	unp	71?	flotation
1024	471	pit fill			5?	130	snail column
1025	186/7	pit fill			5?	185	snail column
1026	43	pit fill			3?	43	snail column
1027		pit fill			?	249	snail column
1028	449	pit fill	02	02	unp - 5?	185	flotation
1029	208	pot fill	0.9	0.85	M/L1st	254	flotation
1030	450	pit fill	30	31	5	185	flotation
1031		pit fill			?	268	snail column
1032	454	pit fill/well?	28	25	2nd/3rd	249	flotation
1033	468	pit fill	04	04	unp - 2?	315	flotation
1034	471	pit fill	24	22	5	130	flotation
1035	490	pit fill			3	489	sample lost
1036	516	pit fill	24	19	3	484	flotation
1037	512	skely	04.5	4.75	4	491	flotation
1038	507	pit fill	24	21	3	134	flotation
1039	506	pit fill	24	26	3	484	flotation

Results

The site lay on chalk, and the pits had been cut into the chalk bedrock. The soils were therefore very calcareous and this has affected the survival of environmental data from the site. In general bone survives fairly well although the organic component has been lost. In a number of the sampled contexts, however, severe leaching in the calcareous soils has resulted in the solution of the mineral element of the bone which has led to erosion of the bone surface, loss of strength and brittleness. While this poor preservation in some contexts has affected the proportion of fragments that are identifiable, and diminished the information potential of some contexts it is unlikely to have resulted in the complete loss of any more than a small fraction of the original assemblage, and although juvenile and immature bones may have been differentially affected, the dental remains are unlikely to have been biased. In slight contrast to this material from the samples the bulk of the hand collected animal bone is in good condition (see below), with minimal surface erosion, although brittle, which has resulted in elements such as skulls fragmenting into many pieces.

The calcareous character of the soils was responsible for an expectation that only charred plant material would survive in an identifiable condition in the deposits. However a number of the pits had functioned as cess pits (see below) and the combination of the chalk bedrock and the high salt and acid concentrations of the cess have resulted in extensive mineralisation of the organic components of the original fills, with the survival of a number of plant and insect items in an identifiable condition. This is of considerable importance since much of this material derives directly from the organic component of the diet of the occupants of the site.

The bulk samples

Provisional phasing places most of the excavated features in the late 1st-3rd century AD, with a second period of occupation in the 4th-5th. However since a number of the samples remain unphased at present (Table 1) they are dealt with as a single group.

Archaeological Finds

Archaeological finds are fairly common in most of the samples (Table 2). Pottery is more frequent in the ditches than the pits and a little less fragmented. Severely abraded small sherds were recovered from samples 1015 (ditch 85), 1016 (upper fill of pit 205) and 1023 (fill of pit 71).

Table 3: Mean weight and occurrence of finds per litre of sample sediment

	pits	ditches
Mean weight of pot per litre in g.	1.1	2.4
Mean sherd count per litre	0.35	0.6
Mean sherd weight	3.17	4.07
Mean bone weight per litre in g.	2.5	1.3
Mean shell weight per litre in g.	0.4	0.36

Splinters of glass were recovered from 10 of the samples, and iron objects, including hobnails and nails from nine. Very small fragments of Cu alloy and lead were also recovered. A bone pin, still retaining a sheen and indicating much handling or use in hair or clothing was recovered from cess pit 130.

Pit 256 was the only feature that produced any remains of fired earth/clay or mortar. Some abraded brick or tile was recorded from pit 195, and the only stone other than chalk was recovered from fill 75 in pit 71, and fill 468 in pit 315. This was the limit of the evidence for structural or building materials.

Fragments of slag were recovered from nine samples, but all but six of the samples produced hammerscale from the residues. The quantity of the latter varied with the richest samples coming from pits 67 and 130 in the north central part of the site, both samples also producing the largest quantity of slag. This suggests that this area may be fairly close to a smithy, while the occurrence of hammerscale across most of the site, be it in small quantities, suggests a relatively high or persistent (ie permanent) level of smithing activity on or adjacent to the site.

Animal bone and marine shell were present throughout the samples and in contrast to the pottery, the density of bone in the pit fills was higher than in the ditches. This, and the weight of shell, has probably been affected by the corrosive effects of the cess in some of the pits. The relative absence of shell in many of the pit fills (Table 2) and their condition, often little more than fragments surviving, suggests that they have been destroyed after deposition, rather than that they were absent from the deposits.

Environmental Finds

The environmental finds from the bulk samples are summarised in Table 4. Data relating to the palaeoenvironment of the site is limited to the terrestrial snails and charred seeds. Snails are abundant throughout most of the samples, except where the cess content of the sediment rose to such a level that these shells corroded or were not deposited. Because column samples were taken specifically for mollusc analysis it is probably inappropriate, except in individual cases such as a sample from a particular phase, to utilise the snails from the bulk samples for post-excavation study.

Few of the samples contained abundant charcoal remains, and in many of the samples the bulk of the flots was composed of snails rather than charcoal. Much of the recovered charcoal is fragments little more than 2-3mm in diameter, although in a number of samples two or three pieces up to 8-10mm in diameter were recovered which could be identified to wood species. No samples whatsoever contained these larger pieces in any number, and although material, presumably from domestic cooking fires, was being deposited in the cess pits it does not appear that they were routinely used for the disposal of the ash. Identification of the charcoal while indicating which species were being exploited as fuel at the site, would not allow any consideration of woodland management, and little interpretation of the character of the wood being used (ie. faggots, billets, brushwood, etc). For this reason it is not considered that this material could justify further work during the post-excavation, unless the charcoals in the slag are identified, in which case the 'domestic' charcoal should be studied as a comparanda to see if the smiths or charcoal burners are selecting a different wood resource.

The bulk of the environmental data, other than snails, collected from the samples appears to relate to diet. Charred cereal grains are found throughout the samples, although except for pit 256, and to a lesser extent fill 175 in ditch 174, and fill 283 in pit 64, these are not very abundant. Wheat and barley have been preliminarily identified, but these have not been taken to species level. Oats appear to be present but whether as crop or a weed contaminant is likely to remain conjectural. Charred pulses (peas and beans) also occur in a number of samples. Other charred seeds are present in almost all the samples, but rarely in numbers exceeding a couple

of dozen seeds. Chaff, often viewed as an indicator of cereal processing or animal fodder, is present in eight samples, but apart from context 468 in pit 315, fewer than ten fragments were noted in any of these samples.

The presence of concentrated cess deposits in many of the pits has resulted in many plant remains becoming mineralised. Mineralised peas and beans are present in many samples, and fruit pips, including plum, apple/pear, blackberry, grape and elder berry are presence. Some mineralised cereal grains also occur. Detailed analysis of these botanical remains can be expected to confirm and extend the range of food species that have survived in these cess pits.

Other food remains are represented by the animal bones recovered. Sheep bones occur with the greatest frequency (Table 5), cattle in half as many samples, and pig bones in fewer still. Chicken bones were rare, only two samples, while bird eggshell was recovered from 19 samples. Slightly thicker eggshell fragments than the majority suggests that not all these pieces derive from chicken eggs. Fish bones were present in every sample, and although in only small numbers eel vertebrae occurred in 19 samples, and along with a few cyprinid bones, indicate that freshwater fish, and the migratory eel were a regular part of the diet. A number of these bones are misshapen indicating passage through the gut (Wheeler and Jones 1989). The presence of bones of small birds (probably song birds) in 17 samples raises the possibility that these were also eaten, although their occurrence in the pits could be a result of accidents during foraging for food. Specific identification of these bones may help clarify their origin in these contexts.

Apart from the grapes already mentioned (which could conceivably be locally grown) the only other food items that reflect trade over some distance are the shell fish. Oysters, mussels and cockles were recovered from the samples (Table 5). There appears to be no evidence of marine fish, but until all this material has been studied by the specialists this cannot be confirmed.

Table 5: Frequency of animal food items, or possible food items, in the 33 samples.

	No.samples
Cattle	13
Sheep	26
Pig	8
Hare	1
Chicken	2
Small bird	17
Eel	19
Oyster	21
Mussel	18
Cockle	1

The non-food elements of the material from the samples are likely to give a clue to the local circumstances of the features. Leaving aside the snails, discussed below, the mineralised components of the samples included puparia, larvae, woodlice, beetles, worm egg cases and seeds, many of which are identifiable and give some indication of the character of the fills and the vegetation in the immediate vicinity of the cess pits. The vertebrates include house mouse, wood mouse, field vole, bank vole, common shrew, frog/toad, newt, and snake. These

suggest that many of the pits were acting as pitfall traps for the small vertebrate fauna that occurred on the site, and given that they occur even in the rich cess layers, indicates that most of these features were probably open during their functional life, rather than within structures where all but the house mouse and snake are unlikely to have ventured. The small birds if foraging for food in the pits would also suggest these cess pits lay outside buildings.

Specific contexts

Context 468 in pit 315 included the remains of a lamb. This animal was partially burnt, and with charcoal at its most frequent in this context (Table 4), along with charred grain, chaff, pulse and other seeds it may not be implausible to suggest that this reflects some sort of 'ritual' or placed deposit, although the presence of mineralised plant and insect material indicates that the pit was also receiving cess into the same context.

Mollusc Columns

Three of the five column samples taken from pits and originally targetted at the recovery and analysis of the molluscan fauna have been processed for the assessment (Table 6-8). They all show a very similar pattern.

Only the flots from these samples was studied. The presence of snail genera were recorded for each sample, but no counts, or specific identifications were made. Only for the blind snail, *Cecilioides acicula*, which is an introduced species (Evans 1972) which burrows to depths over one metre, was an estimate of frequency made.

In addition to the assessment of the molluscan data it was clear during the scanning of the flots that snail density in the samples diminished as the quantity of mineralised remains and cess increased. These samples were therefore giving some indication of the quantity of cess present in the pit fills. Since only in these pits was a series of samples taken throughout the fills it was decided to record the presence of charred cereal grain, mineralised cess residues and mineralised pulses (peas and beans) and fruit pips (plum, apple/pear, elder, grape, etc) in each sample and use these data to consider the function of the pits.

Pit 130, Sample 1024 - Period 5?

Twenty eight samples from the top to the base of the pit were studied (Table 6). The upper samples had relatively high snails numbers and were dominated by a suite of molluscs in which *Cecilioides acicula* was most abundant, with *Vallonia* sp. and *Pupilla muscorum* as the most frequent of the other snails. These latter two groups, along with *Cochlicopa* sp. and *Helicella itala* are typical of grasslands and open ground on the chalk. Below 20cms the assemblages begin to include shells of the Zonitidae, such as *Oxychilus* sp. and *Retinella* sp.. The snails of these genera prefer shaded habitats, and are often associated with woodlands, (Evans 1972; Cameron and Redfern 1976) but differences in the distribution of individual species makes it difficult to interpret contemporary habitats from this assessment data. Below this *Vallonia* sp and *Pupilla muscorum* continue to be abundant in the samples, while the occurrence of *C. acicula* diminishes with depth, and this snail is not found below the 100 cm point in the sequence. *Hygromia hispida* a species of fairly catholic habits, both shaded and open occurs throughout the sequence. While the suite of snails remains fairly consistent throughout these samples there are changes in their relative abundance and it is felt that a

specific identification and quantification of the shells may permit the recognition of changes in the local environment during the period represented by the secondary filling of the pits.

At 130 cm depth the frequency of snail shells begins to fall, and at a depth of 160cm shells are nearly absent from the samples. This diminution in frequency is correlated with the appearance of increasing numbers of mineralised plant and invertebrate material and the occurrence of mineralised cess concretions in the flots. At a depth of 220 cms and below virtually the whole of the flots is composed of mineralised 'cess' and very few shells indeed were recovered, and these tended to be covered by concretions. These samples were also often accompanied by charred cereal and mineralised pulses remains.

Since the flots of the samples from the basal 100 cm of the pit are almost entirely composed of 'cess' it seems reasonable to assume that the primary function of the pit was as a cess pit. It is also clear that the pit continues to contain a high cess component for a further 50 cm, with some mineralised remains above this suggesting that even some of the upper fills may have included cess. The pit appears to have been allowed to fill well above half its height with cess before ceasing to function in this capacity. It may be that it was originally allowed to fill much higher but that with time the cess deposits shrank and the later fills accumulated above.

The components of the lower half of the fills in this pit therefore clearly relate to the use phase and diet of the people using it. In contrast the snail rich horizons date to a period of time after the pit ceased to function and reflect the character of the local environment during the period of secondary infilling. As such it is important to establish the phasing of the relevant deposits in the pits in order to consider the contemporaneity of the cess pits, and their subsequent secondary fills.

Pit 185, Sample 1025 - Period 5?

A series of 21 samples were taken through the fills of this pit. Snail shell abundance was somewhat lower than in sample 1025 but a very similar sequence was revealed. The suite of snails in the fills was dominated by shells of *Hygromia hispida*, *Cochlicopa* sp., *Vallonia* sp., *Pupilla muscorum*, *C. acicula*, but with shells of *Oxychilus* sp. *Vitrina* sp., *Retinella* sp. and *Cepaea* sp. in a number of samples. Frequencies change and a detailed analysis is likely to reveal differences that may reflect minor changes in the immediate environment of the feature.

Snail numbers fall off below 70 cm, and very few snails occur in the basal half of the pit, although the bottom sample (200-206cm) shows an increase. This pattern is again related to the occurrence of 'cess' in the deposits, and in these fills cess occurs in all samples from 60cm downwards, with concentrations rising at a depth of about 150cm. The very bottom of the pit appears to include some infill of chalk and soil prior to the deposition of cess, suggesting that the pit was open for a short time before its use as a cesspit. Charred cereal grains occur throughout most of the middle and upper fills, and mineralised pulses and fruit pips are present in the cess rich layers. The cess rich component of these fills occupies approximately two thirds of the pit and these results confirm that the primary function of the pit was as a latrine pit.

Pit 249, Sample 1027

A column of 23 samples was taken through this pit, which is at present unphased. The pattern observed in the preceeding two pits is repeated. A somewhat richer suite of snails occurs in the upper fills with a mix of open country and shade loving species, the former appearing to

dominate in many samples. The relative number of different genera do fluctuate and the abundance of the Zonitidae particularly goes up and down suggesting minor changes in the local habitat.

Snail numbers drop below 120cm as the proportion of mineralised cess in the flot increases. The bottom 1.2m of the pit has very high concentrations of cess and the evidence clearly indicates that the primary function of this pit was also as a cess pit. Mineralised pulse and fruit pips occur in samples from the bottom half of the fills, but in this pit the charred cereal remains are concentrated in the upper half, perhaps suggesting that they represent secondary deposition during the secondary filling of the pit.

What this assessment has shown is that these pits were primarily dug as cess pits, and that they were well used and allowed to fill, allowing for some subsequent shrinkage and settling, perhaps almost to the top of their chalk walls. The pottery and finds assemblages associated with these lower fills, and probably those of most of the other pits on the site, therefore lie in a primary context and were deposited during the original or primary use of the pits. The upper half or a third of the pit fills represents secondary filling and may either include reworked material or contemporary deposits from a later period of activity on the site. Seriation of the pottery in the lower fills of all those pits containing cess may therefore permit definition of the sequence in which the pits were dug or used, and the extent to which more than one pit may have been open at the same time, therefore giving some clue to the density of activity or households on the site at different periods, and a potential for recognition of a spatial division of the site into allotments. The two remaining column samples from pits 43 and 268, both of which lie in different areas of the site from those assessed, should be studied to establish if these reflect the same pattern and primary use.

Excavated Animal bone

The animal bone, a total of 16,788 fragments, is contained in thirteen boxes (dimensions 24x11x9 inches), weighs a total of 113.5 kilogrammes and was recovered from 146 contexts. Approximately 15% of the fragments derive from contexts that have not been phased at the assessment stage, with the bulk of the remainder deriving from deposits assigned to periods 4 and 5 (Table 9).

Table 9: Bone fragment numbers by period and feature type

period	1	2	3	4	5	unph.	Total	Percentage
feature type								
undescribed			60	743	99	325	1227	7.3
cremation						53	53	0.03
deposit						328	328	2.0
ditch fill				143	952	723	1818	10.8
layer			242			4	246	1.5
pit fill	206	1630	2356	1244	3520	1038	9994	59.5
post-hole fill						14	14	0.008
well fill			286	2698	124		3108	18.5
Total	206	1630	2944	4828	4695	2485	16788	
Percentage	1.2	9.7	17.5	28.7	28	14.8		

By far the majority of the bone has been recovered from the fills of pits, nearly 60%, with wells producing nearly 20% and ditches approximately 10% of the fragments.

The fragmentation of the bone is variable throughout the deposits and this has been crudely assessed by calculating the average fragment weight in the contexts from different feature types (Table 10), and for the main feature types in each phase. The average fragment weight ranges much higher in the pit fills than other feature types, and suggests that fragmentation is in general lower in the pits, which might therefore be assumed to reflect primary deposition, a conclusion already suggested through the analyses of the column samples.

Table 10: Numbers of contexts in different feature types grouped by average bone weight

average bone weight in g.	undesc.	crem-ation	deposit	ditch fill	layer	pit fill	post-hole	well fill
0.01-1.00	2	1	1	1		4		1
1.01-5.0	9		1	6		28	1	4
5.01-10.0	2			6		24	1	4
10.01-15.0	2			7		9		2
15.01-20.0	1			2	1	8		1
20.01-25.0	2				1	4		
25.01-35.0	1					3		
35.01-50.0						6		
50.01-75.0						2		

The relatively high frequency of contexts with an average fragment weight below 10 grammes may be correlated with the secondary and tertiary fills of the pits, but this has not been checked in this assessment. The other factor is a number of skulls in these deposits were severely fragmented owing to their brittleness, and this may be responsible for some of these low average fragment weights.

In general fragmentation, except in specific contexts, is not particularly high and complete or nearly complete long bones occur with some frequency, and many fragments can be expected to carry one or more zone (Rackham 1986) which will be important when estimating the relative frequency of the different species and bone elements.

Table 11: Average fragment weight in grammes in selected feature types for each period

period	1	2	3	4	5
pit fills	6.1	3.8	10.1	5	6.6
ditch fills				8.2	8.9
well fills			5.4	7.3	3.8

The period 3 pit fills, show the lowest fragmentation levels (Table 11), presumably because many of these are primary fills. In contrast in periods 4 and 5 the ditches show lower levels of fragmentation than the pits. The bulk of the animal bone in period 3 has been recovered from pit fills, that from period 4, the well fills, and that from period 5 pit fills. Only in period 5 does a significant proportion of the sample derive from the ditches on the site.

In order to ascertain the range of species present and the general character of the debris the collection was superficially scanned and one box (approx 10% of the assemblage) studied in a little more detail (Table 12). The condition of the bones in these contexts was generally good,

Table 12: Frequency of contexts with species and bone condition

no. contexts	cattle	horse	sheep	pig	dog	fowl	raven	bird	rodent	frog/toad	3	3/4	4
25	17	3	20	9	2	2	2	4	2	3	2	7	16

with only two of the twenty five contexts scanned including bone in which the surface was seriously eroded, and seven in which a proportion of the bones exhibited surface erosion. This pattern was similar for the remainder of the sample. Sheep occurred with the greatest frequency, with cattle almost as frequent (Table 12). Immature cattle and sheep were present and these scanned contexts produced over a dozen jaws of each species. Fragmented skulls of sheep were present in three contexts and two of these also included cattle skulls, and one a pig skull. The occurrence of foot bones in one of these suggests the possibility that some of these contexts contain primary butchery waste. The large context 524 (see Table 13 below) also appears to include primary butchery waste, with skull, metapodial and vertebral fragments of immature cattle, and 252 skulls of cattle. Skull fragments appear relatively abundant in the assemblage. Dog burials are also present in these latter two contexts, and occur in other contexts on the site.

Other food species include fowl and wild bird, and the horse bones which occur in a number of contexts may have been used for food. There is some evidence for dog gnawing of the bones but this is not extensive, neither is burnt bone frequent, and there is little to suggest any significant post-depositional loss of bone. Two coprolites were present in one of the scanned contexts. It is likely that between 40 and 50% of the assemblage will be identifiable to species during post-excavation, and that substantial data on the age at death of the animals will be available from epiphyseal fragments and dental evidence.

A relatively large number of contexts, most of which can be phased, contained over 100 bone fragments (Table 13) and may permit the recognition of activities such as butchery taking place on the site.

Other remains

In addition to the items discussed above a box of marine shell was collected during excavation and a small box of the larger terrestrial molluscs, particularly *Arianta arbustorum* and *Cepeae* sp.. These will need identification but will require little further work.

The eggs of human gut parasites may have survived in these cess deposits and samples should be studied for the mineralised remains of these.

Discussion

The broad conclusions from this assessment relate largely to the character of the site. The environmental assemblages are consistent with a 'urban' site. Numerous cess pits, indicating a residential area, large assemblages of fairly diverse food remains in the cess pits, charred cereals in most contexts, and some charred pulses, but very little indication of chaff or weed species that might indicate crop processing activities. Probable evidence for primary butchery

and hammerscale in most samples indicates that commercial enterprises were being conducted in the area, and the generally high density of bone, shell, charred and mineralised remains gives an impression of a level of occupation that is more consistent with an urban site than a rural one. Therefore although the site lies at the periphery of this small Romano-British town it still appears to be fully 'urban' in character.

The samples have, however, produced very little evidence of building materials such as brick, tile, daub and stone, which might suggest that the structures on the site were timber and clay, or possibly chalk, and have left little evidence. The fact that the pits were primarily cut for use as latrine pits and were at least half full of cess suggests that the residences must have been nearby, ie on the site, and the absence of evidence for them across most of the site might indicate sill beam construction, the evidence for which would have been largely destroyed within the topsoil.

Previous work on the site (Chaplin and McCormick 1983; Evans 1975; Evans 1983; Murphy 1991) has studied the molluscs, cess, charred cereals and crop weeds and animal bones. A very large sample of bone has been studied (Chaplin and McCormick 1983) from periods covering the pre-conquest period (1), post-conquest to mid 2nd century (2) and mid 2nd to 5th century (3), with the bulk deriving from period 2 deposits. This material offers an important comparanda for the present assemblage and shows a dominance of sheep in the samples, and a high proportion of skull, mandibles and metapodials of cattle, and mandibles of sheep which perhaps also reflect the presence of a butcher's premises on the site (op cit).

Recommendations

The paleoenvironmental potential of the site is limited. Apart from the mollusc evidence from the column samples, the small vertebrate fauna and mineralised insect remains in the pits the evidence relates to diet and activities on site rather than its environment. If the opportunity still exists it would be useful to rectify the omission of a column sample through the period 3 and 4 ditches which would extend the mollusc evidence backwards into earlier phases and allow the analysis of the fauna filling the primary fills of the ditches without the complication of large quantities of cess influencing their survival. It is unlikely that all five column samples will require analysis of the mollusc sequence, but the selection will be dependent upon the results of the pottery seriation from these five pits to ensure that the columns selected cover the broadest span of time with the least duplication. Any results should be compared with Evans (1975) and Murphy's (1991) earlier work on the site.

The primary importance of the environmental assemblages on this site is their information on the diet and livelihood of the residents living on the periphery of a small Roman town. The occurrence of so many cess pits, in which uncharred food remains have survived mineralised, as well as charred remains and animal bones, in what are primary food refuse and cess deposits is unusual. This range of evidence is probably only matched by samples from the larger urban centres such as York and London. Analysis of the relatively large sample of animal bones would also permit comparison with the results from earlier excavations on site and comparable dated assemblages from other local towns and rural sites. The possibility that parasite eggs have survived through mineralisation has not been tested during this assessment. Since few opportunities arise to study this aspect of health during the Roman period it is proposed that a few samples of the concreted mineralised cess are processed and studied for human parasite eggs.

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Hartsfield, Baldock BAL-12-97

Table 2: Archaeological finds from the bulk soil samples

sampl.	contxt	feature	vol in l	wt in kg	phase	struct	pot *	ham' sc'le	slag #	fired earth #	Fe obj *	Finds	bone #	shell- fish #	function \$
1000	068	pit fill	24	27	4	67	113/20	+++	269		19/3	hobnails, etc	81	20	min.
1001	113	ditch fill	30	39	unp - 1?	112	27/11	++			4/2	hobnail, glass (4)	16	11	
1002	115	ditch fill	30	35	unp - 1?	114	96/16	++	7		4/7	hobnails, glass (4), coin	41	13	min.
1003	089	ditch fill	32	38	5	85	259/15	++					62	6	min.
1004	147	ditch fill	30	34	unp - 2?	183	32/14	++					28	8	min.
1005	157	pit fill	30	35	2nd?	78?	8/7	++				glass (1), flint?	33	<1	min.
1006	175	ditch fill	28	31	2nd/3rd - 1?	174	22/9	++	+		12/4	nail, hobnail, mortar, glass (2),	47	33	min.
1007	184	ditch fill	26	29	RB - 2?	183	13/10	++	3		3/1	glass (2)	31	8	min.
1008	190	ditch fill	30	35	L1st/2nd - 4?	188	50/20	++	5				35	<1	min.
1009	194	pit fill	30	33	RB- 2?	195	17/8	++	5		4/1	hobnail?, glass (2), brick/tile - abraded	47	<1	min.
1010	203	ditch fill	30	34	5	85	42/15	++					27		min.
1011	238	ditch fill	30	30	5	83	38/31	++				glass (2), Cu alloy (1)	49	11	min.
1012	248	ditch fill	30	33	4	83	34/15	++				glass (1), Cu alloy (1), Pb? (1), flint?	27	4	min.
1013	118	ditch fill	25	28	L1st/E2nd	117	91/11	+					37	1	min.
1014	252	pit fill	28	30	5	249	26/10	++			5/2	nail, hobnail?, Cu alloy (1)	275	4	cess pit
1015	243	ditch fill	25	29	5	85	138/40	++				glass (1), non-ferous (1)	57	29	min.
1016	262	pit fill	31	36	2	205	30/20	++				wire (1)	53	<1	min.
1017	263	pit fill	30	35	2	205	37/12	+					121		cess pit
1018	258	pit fill	23	24	L1st/E2nd	256	26/7	++		356	2/2	nail, mortar/fired earth	46	1	min.
1019	264	pit fill	09	09	unp	256	8/4	+		265			5		min.
1020	289	pit fill	15	14.5	unp	256	14/4	+				glass (1), mortar (>7mm =188g)	21	<1	some cess
1022	283	pit fill	30	33	4	64	67/14	+					50	41	cess pit
1023	075	pit fill	30	30	unp	71?	29/10	+				stone (1)	55	3	cess pit
1028	449	pit fill	02	02	unp - 5?	185	1/1		81				1	<1	cess pit
1029	208	pot fill	0.9	0.85	M/L1st	254	<1/1						2		cess pit

Table 2 (continued)

sampl.	contxt	feature	vol in l	wt in kg	phase	struct	pot *	ham' sc'le	slag #	fired earth #	Fe obj *	Finds	bone #	shell fish #	function
1030	450	pit fill	30	31	5	185	26/10	++	1			glassy slag	9		cess pit
1032	454	pit fill/well?	28	25	2nd/3rd	249	24/8	+			5/1	nail	27	1	cess pit
1033	468	pit fill	04	04	unp - 2?	315	19/1					burnt sediment	142	1	min.
1034	471	pit fill	24	22	5	130	16/9	+++	103			bone pin	26	1	cess pit
1036	516	pit fill	24	19	3	484							58	88	cess pit
1037	512	skely	04.5	4.75	4	491							10		min.
1038	507	pit fill	24	21	3	134	14/5	+			1/1	hobnail	10		cess pit
1039	506	pit fill	24	26	3	484	2/1						7	2	cess pit

* weight in grammes/count

weight in grammes

\$ min.= mineralised material - which suggests the inclusion of some cess in the deposits

Table 4: Environmental finds from the bulk soil samples

samp	cont.	feature	vol	phase	struct	flot vol.	char coal *	ch'rd grain *	chaff *	ch'rd seed *	min. plant *	min. insect *	egg shell *	snails #	marine shell \$	fish *	plant food species	terrestrial vertebrate
1000	068	pit fill	24	4	67	60	4	3	1	2	2	2/1	1	4/3	m,o	1	barley,oat?	cattle,sheep, field vole, frog/toad, small bird
1001	113	ditch fill	30	unp - 1?	112	30	3	2		1			1	5/3	m,o	1	barley	sheep, vole, house mouse, frog/toad
1002	115	ditch fill	30	unp - 1?	114	18	2	2		2	2		1	5/3	m,o	1	barley, wheat, elder	sheep, pig, chicken, eel, vole, frog/toad
1003	089	ditch fill	32	5	85	42	2	2		2	3			5/3	m,o	1	wheat, barley, oat?, pea	cattle, sheep, eel, field vole
1004	147	ditch fill	30	unp - 2?	183	25	2	2		1	2		1	3/2	m,o	1	wheat?, barley	cattle, common shrew, house mouse, field vole, frog/toad, eel
1005	157	pit fill	30	2nd?	78	17	2	2		2	2		2	4/3	m	1	wheat, pea	sheep, vole, wood mouse, frog/toad, small bird
1006	175	ditch fill	28	2nd/3rd - 1?	174	27	2	3		1	3		2	4/3	m,o	1	wheat, barley, pea	cat, field vole, frog/toad, newt?, small bird
1007	184	ditch fill	26	RB - 2?	183	20	2	2		1	2		1	4/3	m,o	1	wheat, pea, elder	sheep, field vole, house mouse, frog/toad
1008	190	ditch fill	30	L1st/2 - 4?	188	38	2	2			3	2	1	5/3	m	1	wheat, barley	cattle, sheep, pig, dog, field vole, frog/toad, small bird, eel
1009	194	pit fill	30	RB- 2?	195	40	2	2			2	2	1	5/3	m,o,c	1	barley, wheat?, oat?	sheep, field vole, wood mouse, house mouse, snake, frog/toad
1010	203	ditch fill	30	5	85	70	1	2		1	2			5/3		1	pea	cattle, sheep, wood mouse, frog/toad, eel
1011	238	ditch fill	30	5	83	25	3	2		1	3		1	5/2	m,o	1	barley, wheat?	cattle, sheep, pig, field vole, bank vole, wood mouse,snake, frog/toad, small bird, eel
1012	248	ditch fill	30	4	83	50	3	2	1		3		1	5/3	m,o		wheat, barley	cat, sheep, hare,house mouse, field vole, common shrew, frog/toad, small bird
1013	118	ditch fill	25	L1st/E2	117	7	2	2		1	2	1		4/2	o		pea?	sheep, pig, mouse
1014	252	pit fill	28	5	249	65	3	2		2	3	3	1	4/3	o	2	barley, wheat, pea, bean, elder, fruit pips	cattle, sheep, field vole, mouse, common shrew, frog/toad, small bird, eel
1015	243	ditch fill	25	5	85	22	2	2		2	2	1		4/3	m,o	1	barley, oat?, pea, bean?	cattle, sheep, field vole, wood mouse, frog/toad, small bird
1016	262	pit fill	31	2	205	26	2	2	1	2	3		1	4/3	m	1	wheat	sheep, pig, cattle, vole, frog/toad, chicken, small bird
1017	263	pit fill	30	2	205	28	2	2	1	2	4	2	1	4/3		1	barley, wheat, pea, bean, fruit pips	cattle, sheep, house mouse, frog/toad, small bird, eel, cyprinid
1018	258	pit fill	23	L1st/E2	256	22	3	2		2	2		2	4/3	m,o	1	barley, elder	sheep, vole, house mouse, snake, frog/toad, eel, cyprinid
1019	264	pit fill	09	unp	256	14	2	2		2	2	1	1	3/2			barley, pea	rodent

Table 4 (continued)

samp	cont	feature	vol	phase	struct	flot vol.	char coal *	chrd grain *	chaff *	chrd seed *	min. plant *	min. insect *	egg shell *	snails #	marine shell \$	fish *	plant food species	terrestrial vertebrate
1020	289	pit fill	15	unp	256	21	3	4		2	2	2		4/3	o		wheat, barley	cattle, sheep, frog/toad
1022	283	pit fill	30	4	64	58	2	3	1	2	2	2		2/2	o	1	wheat, pea	sheep, field vole, bank vole, wood mouse, house mouse, snake, frog/toad, small bird, eel
1023	075	pit fill	30	unp	71	42	2	2	1	2	3	2	1	3/2	o	2	pea, cereals, fruit pips	sheep, hare, field vole, house mouse, wood mouse, frog/toad, small bird, eel
1028	449	pit fill	02	unp - 5?	185	11	1	1			3	1		1/1	m	1	wheat?, fruit, blackberry	sheep, rodent, eel
1029	208	pot fill	0.9	M/L 1st	254	2	1	1			1	1	1	1/1		1	pea/bean	eel
1030	450	pit fill	30	5	185	43	2	2		2	3	3		2/2		2	pea, bean, elder, fruit pips	pig, field vole, frog/toad, eel
1032	454	pit fill/well?	28	2nd/3rd	249	70	3	2		2	4	4	1	3/2	m	3	barley, oat?, pea, elder, fruit pips	sheep, field vole, wood mouse, frog/toad, small bird, eel
1033	468	pit fill	04	unp - 2?	315	38	5	2	2	3	1	2		3/2	o?		pea	cattle, sheep, partial skeleton of lamb part burnt
1034	471	pit fill	24	5	130	22	2	1		2	2	2		1/1	m, o	3	wheat?, barley, elder	pig, sheep, common shrew, wood mouse, frog/toad, small bird, eel
1036	516	pit fill	24	3	484	11	2	1		1	4	2			o	3	cereals, grape, elder, fruit stones, apple/pear	cattle, dog, sheep, pig, rodent, frog/toad, small bird, eel
1037	512	skely	4.5	4	491	1	1	1		1		1		1/2				human, frog/toad
1038	507	pit fill	24	3	134	15	3	1		2	3	2		1/1		2	barley, wheat, elder, pea, fruit pips, plum, apple/pear	sheep, bank vole, wood mouse, frog/toad, small bird, eel
1039	506	pit fill	24	3	484	5	2	1	1		3	2		1/1	o	1	grape, pea, elder, wheat, fruit pips, plum apple/pear	sheep, rodent, frog/toad, small bird, eel

* frequency on the following scale: 1 = 1-10; 2 = 11-50; 3 = 51-150; 4 = 151-250; 5 = >250

abundance/diversity; abundance as above scale; diversity scales - 1 = 1-3; 2 = 4-10; 3 = 11-25 taxa

\$ m = common mussel; o = oyster; c = cockle

Table 6: Hartsfield, Baldock
Pit 130: Sample Column 1024

Depth	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140-150	150-160	160-170	170-180	180-190	190-200	200-210	210-220	220-230	230-240	240-250	250-260	260-270	270-280	280-290	290-300
Species																														
<i>Hygromia</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+							\$					
<i>Helicella</i>	+		+		+			+	+	+		+	+	+																
<i>Helicella itala</i>	+																													
<i>Cochlicopa</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+											
<i>Valtonia</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+												
<i>Pupilla</i>	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+														
<i>Cecilioides</i> #	+++	+++	+++	+++	++	+	+	+	+	+																				
<i>Vitrina</i>									+		+	+	+																	
<i>Oxychilus</i>			+	+	+	+	+	+	+	+	+	+	+	+		+	+		+											
<i>Retinella</i>			+		+	+	+	+		+	+																			
<i>Punctum</i>				+																										
<i>Pyramidula</i>					+																									
<i>Ena</i>						+					+																			
<i>Cepaea</i>												+															+			
<i>Arianta</i>		+																												
<i>Succinea</i>						+																								
Sample size*	4	3	3	3	4	4	3	3	4	4	4	4	5	3	3	2	1	1	1	1	0	0	0		0	1	0	0	0	
charred cereal										+		+		+				+	+		+				+	+				
cess #																+	+	+	+	+	+	+	+++		+++	+++	++	++	++	
min. pea																+														

* sample size: 1 = 1-10; 2 = 11-50; 3 = 51-150; 4 = 151-250; 5 = >250 shells.

Cecilioides acicula and cess have been scored for frequency/quantity, all other categories are recorded when present but not quantified.

\$ no sample

Table 7: Hartsfield, Baldock
Pit 185: Sample Column 1025

Depth Species	0- 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70	70- 80	80- 90	90- 100	100 -10	110 -20	120 -30	130 -40	140 -50	150 -60	160 -70	170 -80	180 -90	190 200	200 -06
<i>Hygromia</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	?				+	+
<i>Helicella</i>	+	+		+	+	+	+		+	+		+									
<i>Helicella itala</i>									+												
<i>Cochlicopa</i>	+	+		+	+	+	+	+		+			+		+						+
<i>Vallonia</i>	+	+	+	+	+	+	+	+	+	+	+	+		+							+
<i>Pupilla</i>	+	+	+	+	+	+	+	+			+	+									+
<i>Cecilioides</i>	++	++	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+	+	+
<i>Vitrina</i>			+		+																
<i>Oxychilus</i>	+		+	+	+	+	+	+		+											+
<i>Retinella</i>	+	+																			
<i>Ena</i>				+																	
<i>Cepaea</i>			+												+				+		+
<i>Arianta</i>					+																
<i>Succinea</i>																					
Sample size*	3	2	3	3	4	4	3	2	2	2	2	2	2	2	1	1	1	0	1	1	2
charred cereal				+	+		+	+		+	+	+	+	+	+	+					
cess							+	+	+	+	+	+	+	++	++	+++	+++	+++	+++	++	+
min.pea								+	+				+	+					+		
fruit pips															+	+	+		+		

* sample size: 1 = 1-10; 2 = 11-50; 3 = 51-150; 4 = 151-250; 5 = >250 shells.

Table 8: Hartsfield, Baldock
Pit 249: Sample Column 1027

Depth Species	0- 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70	70- 80	80- 90	90- 100	100 -10	110 -20	120 -30	130 -40	140 -50	150 -60	160 -70	170 -80	180 -90	190 200	200 -10	210 -20	220 -30	230 -40	240 -50
															\$	\$									
<i>Hygromia</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+		+	+	+				
<i>Helicella</i>	+	+	+	+	+	+	+	+	+	+		+													
<i>Helicella itala</i>									+					+											
<i>Cochlicopa</i>	+	+	+	+	+	+	+	+	+	+	+	+	+							+					
<i>Vallonia</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+						+					
<i>Pupilla</i>	+	+	+	+	+	+	+	+	+	+	+	+								+					
<i>Ceciloides</i>	++	++	+	++	++	+	+	+	+	+	+	+	+	+											
<i>Vitrina</i>					+																				
<i>Oxychilus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+				+	+							
<i>Retinella</i>	+	+	+	+	+	+			+	+															
<i>Vertigo</i>		+	+							+															
<i>Cepaea</i>			+	+	+	+		+	+	+	+	+	+	+					+	+		+			
<i>Arianta</i>							+		+				+	+											
<i>Succinea</i>										+															
Sample size*	4	4	4	4	5	5	5	5	5	5	4	4	3	2			1	1	1	1	1	1	0	0	0
charred cereal	+		+	+	+	+	+	+		+	+	+	+								+				
cess				+	+	+	+	+	+	++	++	++	+++	+++			+++	+++	+++	+++	+++	+++	+++	+++	++
min.pea												+	+	+						+					+
fruit pips												+		+				+	+	+					

* sample size: 1 = 1-10; 2 = 11-50; 3 = 51-150; 4 = 151-250; 5 = >250 shells.

\$ no sample

Table 13: Contexts which produced over 100 excavated bone fragments

context	bone no	bone weight	feature type	spot date	period	average bone wt
3	150	1895	pf	2nd-4th	4	12.633
62	707	2590			4	3.663
68	236	1185	pf	2nd C	4	5.021
79	230	1710	pf	L1st-E2nd C		7.435
81	169	2060	pf	L2nd-3rd C		12.19
129*	325	303	dep	3rd-4th C		0.932
131*	440	54	pf	2nd-4th C	5	0.123
132	239	1905	pf	m2nd-3rd C	5	7.971
133	231	1180	pf	L2nd-3rd C	5	5.108
135	270	430	pf	L2nd-3rd C	3	1.593
136	734	5010	pf	L2nd-3rd C	3	6.826
149	195	2230	pf	E/M1st - L2nd/3rd	5	11.44
150*	234	120	pf	L1st/2nd C	5	0.513
161	116	230				1.983
190*	510	40	df	L1st/2nd		0.07843
197	105	1395	pf	m/L2nd C	5	13.29
203	117	305	df	L1st C	5	2.607
204	254	1115	pf	L1st C		4.39
243	218	1835	df	E2nd-L3rd C	5	8.42
250	121	830	pf	RB	5	6.86
252	1298	10335	pf	E/M2nd C	5	7.96
263	1242	1840	pf	M/L1st C	2	1.48
282	122	925	df	4th-5th C	5	7.58
283	744	1785	pf	L1st-E2nd C	4	2.399
303	110	1515	wf	3rd-4th C	4	13.77
310	158	1615	df	L1st/M2nd C	5	10.22
438	235	480	pf	2ndC	5	2.043
441	150	595	pf	L1st-E2nd C	3	3.967
445	170	1600	pf	M/L2nd C	5	9.412
485	421	2720	pf	L2nd/3rd C	3	6.461
490	174	4155	pf	M/L3rd C	3	23.88
493	948	7010	wf	4th C	4	7.395
513	242	3710	L	E/M2nd C	3	15.33
514	304	6465	pf	M/L2nd C	3	21.27
524	1449	10095	wf	4th C	4	6.967
526	286	1545	wf	4th C	3	5.402

* particularly heavily fragmented assemblages

Recommended Environmental post-excavation work

0. If it is still an option a column sample should be taken from the two ditches that cross the site
1. Processing of the remaining 2 column samples
2. Sorting for food remains the residues from the five column samples
3. Further study of the concreted mineralised cess material to extract identifiable material
4. Botanical analysis of the charred and mineralised plant remains
5. Identification of suitable charcoal to compare with the remains in the slag
6. Identification of the small vertebrate remains (fish and bird) and shellfish
7. Identification of the mineralised invertebrate remains
8. Analysis for parasites in the mineralised cess residues of selected samples
9. Identification and reporting of the molluscs from 2 or 3 column samples
10. Identification, analysis and reporting of the stratified and dated excavated animal bone
11. Collation of the environmental reports and production of the Environmental chapter
12. Overall interpretation of the environmental assemblages, the Romano-British diet and activities on the site
13. Management of the environmental work.

APPENDIX 8

Human bones by Chris Turner

1 INTRODUCTION

The skeletal assemblage represents the remains of 2 individuals recovered during the open area excavation of a Romano-British site at Hartsfield JMI School, Baldock, Hertfordshire. The fieldwork was undertaken in the autumn and winter of 1997/98.

A disarticulated skeleton, number (137), was recovered from pit feature [65]. This individual was represented by fragmentary remains only, due to age at death. Many of the bones were only identified as human during the post-excavation processing. Disarticulated canine skeletal remains were also present in this context.

An articulated skeleton, number (512), was recovered from well feature [117]. No grave cut for this individual was identified during the excavation.

2 METHODOLOGY

During post-excavation processing the individual bones were carefully cleaned and the removed soil sieved to collect smaller bones, such as phalanges. All elements were marked with the site code and context number after drying.

Following the basic post-excavation processing the remains were laid out in anatomical position and examined macroscopically. Metrical data was obtained using sliding callipers.

The gender of the individuals was established, where possible, using the morphology of the skull, the morphology of the pelvis, and metrical data from the humerus, scapula and femur. As many of these methods were cross referenced with each other as possible, in order to improve accuracy. In some cases the evidence is inconclusive, as an individual may have both male and female attributes, where this occurs the predominant sex is chosen and indicated by a question mark.

Skeleton (137) remains unsexed due to the young age at death of the individual.

Table 1 The distribution of gender amongst the individuals

Female	Male	Unsexed
0.00	1.00	1.00

Age at death was established, where possible, using the eruption of dentition, the fusing of epiphyses, the closing of cranial structures, the morphology of the sternal end of the fourth rib and dental erosion patterns of the molars. As many of these methods were cross referenced with each other as possible, in order to improve accuracy. The general age categories are given

first, followed by an age range in brackets. Due to the fragmentary nature of many skeletal assemblages the category 'Adult (17+)' may be used to denote the positive identification of an individual as being of adult age, but no further refinement of the age range is possible by macroscopic methods alone.

Table 2 The distribution of age at death amongst the individuals

	Infant	Child	Adolescence	Young adult	Middle adult	Mature adult	Adult (17+)	No age at death	Total
Male	-	-	-	-	1.00	-	-	-	1.00
Female	-	-	-	-	-	-	-	-	-
Unsexed	1.00	-	-	-	-	-	-	-	1.00
Total	1.00	-	-	-	1.00	-	-	-	2.00

AGE CATEGORIES - (Clavin Wells)

<i>Embryo</i>	1-8 weeks
<i>Foetus</i>	9-40 weeks
<i>Neonate</i>	1st month after birth
<i>Perinatatal</i>	around birth
<i>Infant</i>	birth - 1st year
<i>Childhood</i>	1 year - puberty
<i>Adolescence</i>	1st three years of puberty
<i>Juvenile</i>	epiphyses unfused
<i>Subadult</i>	has not got full dentition or all epiphyses fused
<i>Young adult</i>	17-25 years
<i>Middle adult</i>	26- 45 years
<i>Mature adult</i>	46 years and over

Stature was calculated from the maximum length of various long bones using the tables by Trotter and Gleser in Bass, 1970. Measurements were only taken from complete bones, no fragmentary skeletal elements were used to calculate stature. The calculated figure is given, followed by the margin of error. The bones used to determine stature are stated within the brackets.

Skeleton (137) was not assigned a stature due to the young age of the individual.

Table 3 The distribution of the stature amongst the individuals

	1.55- 1.59 m	1.60-1.64 m	1.65-1.69 m	1.70-1.74 m	1.75-1.79 m	1.80-1.84 m	1.85-1.89 m	No stature	Total
Male	-	-	-	1.00	-	-	-	-	1.00
Female	-	-	-	-	-	-	-	-	-
Unsexed	-	-	-	-	-	-	-	1.00	1.00
Total	-	-	-	1.00	-	-	-	-	2.00

The state of preservation of each skeleton is described using two factors, the condition of the bone and the approximate completeness of the skeletal assemblage. These are as follows:

Bone preservation:

- Good** - The bones are intact and there is no widespread degradation/ abrasion
Fair - The bones are generally intact, but slightly abraded, especially around proximal and distal ends of the long bones.
Poor - The bones are very abraded and friable

Completeness:

- Almost** - Over 80% of the skeletal elements are present
Fair - Between 50 and 80% of the skeletal elements are present
Fragmented - Below 50% of the skeletal elements are present.

Areas of interest on a skeletal element are described using the standard anatomical terms of orientation:

- Proximal** - nearest the centre of the body
Distal - farthest from the centre of the body
Sagittal - the midline of the body from front to back
Posterior (dorsal) - towards the back of the body
Anterior (ventral) - towards the front of the body
Superior - above
Inferior - below
Medial - towards the midline of the body
Lateral - away from the midline of the body

When assessing palaeopathology in skeletal material there are a number of considerations:

- a) The pathological changes observed in skeletal elements are indicative of acute cases, due to the absence of surviving soft tissue.
- b) The pathological changes in bone can be masked by degradation in the burial environment, animal intervention or other pathological conditions.
- c) Pseudopathological lesions can be caused by the burial environment, animal intervention, the method of excavation.
- d) Bone responds in the same way to many different diseases, making diagnosis difficult.

3 THE SKELETAL MATERIAL

Skeleton: (137)

Sex: -

Age at death: infant (0-6 months)

Stature: -

Comments:

This assemblage was preserved in good, but fragmentary, condition. The survival of so many of the elements, given the individual's age at death, is testament to the favourable burial conditions.

Skeletal elements present:

Parietal, Frontal and occipital fragments of the cranium

The right temporal bone of the cranium

The sphenoid bone of the cranium

The right petrous process of the ear

The incus (anvil), malleus (hammer) and stapes (stirrup) of the right inner ear

The right humerus of the upper arm

The right radius and ulna of the lower arm (the proximal end of the ulna was absent)

The left ilium and pubis fragments of the pelvis

The left and right femurs of the upper leg. (the distal end of the left femur was absent)

The left tibia and fibula of the lower leg

One unsided metatarsal of the foot

No palaeopathology was observed.

Skeleton: (512)

Sex: Male

Age at death: late middle adult (35 +)

Stature: 1.71 m +/- 0.03 m (Femur + Tibia)

Comments:

This assemblage was preserved in good condition and almost complete.

Skeletal elements present: see Appendix.

The dentition was poor, with only six teeth surviving, the rest of the teeth, including the molars, had been lost ante mortum and the mandible and maxilla had successfully remodelled. The process of bone absorption was observed on the mandible and there was evidence of periodontal disease around the sockets of the teeth, especially on the superior aspect of the upper right canine pillar. The upper right canine first premolar and second incisor were worn down, exposing the dentine and the pulp cavity. Although both the lower left incisors and the lower left canine were present, the second incisor and canine were represented by the root only, the rest of these two teeth had been subjected to extensive decay. All the dentition had medium calculus build-up, indicating a poor standard of oral hygiene.

One non-metric trait was observed, a metopic suture. This is retention of the medio-frontal suture beyond the first few years after birth. This feature is thought to be genetic in origin and did not pose a threat to the health of the individual.

The hyoid bone of the neck was present and the left greater horn was unfused to the bone corpus, while the right greater horn was incompletely fused.

Eburnation of bone surfaces was observed on nine skeletal elements. (see figure 1). The breakdown of the joint and the abrasion of the two bone surfaces was observed on the capitulum of the distal end of both the humeri. The radial head of both the left and right radius also displayed increased porosity. The inferior margins of the coronoid process of the right humerus also displayed osteophyte lipping, in response to the degeneration of this joint. The right arm appears to have been affected to greater degree. Further evidence of joint degeneration was observed on the distal end of the first and third metacarpals on the left and right hands, also on the distal aspect of the proximal phalanx of the second digit of the right hand. In addition, the superior articular process on the left hand side of the sixth cervical vertebra of the neck, also displayed signs of eburnation.

The distal end of the fifth metatarsal on the left foot displayed signs of increased porosity, indicating degeneration of the joint in the little toe.

The degeneration of the spine was evident, with mild osteophyte lipping on the inferior margins of the corpus of the fifth, fourth and third lumbar vertebrae. Schmorl's nodes, which are indicative of the degeneration of the intravertebral discs, were observed on the superior aspect of the fourth and third lumbar corpus and the superior surface of the eleventh thoracic corpus. New bone growth was observed on the superior corpus of the first and second lumbar and the inferior and superior aspect of the twelfth thoracic corpus, with further disruption of the corpus surfaces up to the fourth thoracic vertebra.

Evidence of post mortum damage, attributed to excavation of this individual, was observed on the posterior aspect of the sacrum. The superior aspect of the sacro-iliac joint in the pelvis had fused with new bone growth and mild osteophyte lipping was also observed on the right hand articular surface of the sacrum.

4 DISCUSSION

The skeletal assemblage from the present site was preserved in a good condition, but the smallness of the assemblage makes any attempt to derive demographic data, or estimation of prevalence of disease within this population meaningless. These skeletal remains, however, form a valuable addition to any wider palaeodemographic study of the Baldock area and the surrounding landscape in the Romano-British period.

Skeleton (137)

Little information can be gained from skeleton (137). The very young age of the individual at death and the fragmentary nature of the skeletal elements make the assessment of palaeopathology problematic. There is no evidence of violence on the individual's bones, and it would appear that the cause of death affected the soft tissues only.

Skeleton (512)

The state of the dentition in skeleton (512) is not uncommon for individuals of that age group in the Romano-British period. From a practical point of view this person would still be able to eat solid food, but may have experienced difficulty in chewing, which could have led to stomach and bowel problems as the body tried to digest poorly processed food.

The destruction of cartilage and the polished effect of the bones of the joint caused when the two bone surfaces are in direct contact (*eburnation*) can result from several processes, including immune, metabolic and inflammatory diseases, traumatic lesions, and neuromechanical changes in the body associated with age. Joint disease can also be aggravated, or result from, occupational stresses on individual joints. In the case of skeleton (512) the distribution of these lesions is uncommon in osteoarthritis and it is more likely that these areas are the result of rheumatoid arthritis (*autoimmune disease*), occupational trauma (though there appears to be no disruption of the shoulder) or gouty arthritis (*hyperuricaemia*). X-ray analysis of these joints may provide further information and allow a more specific diagnosis.

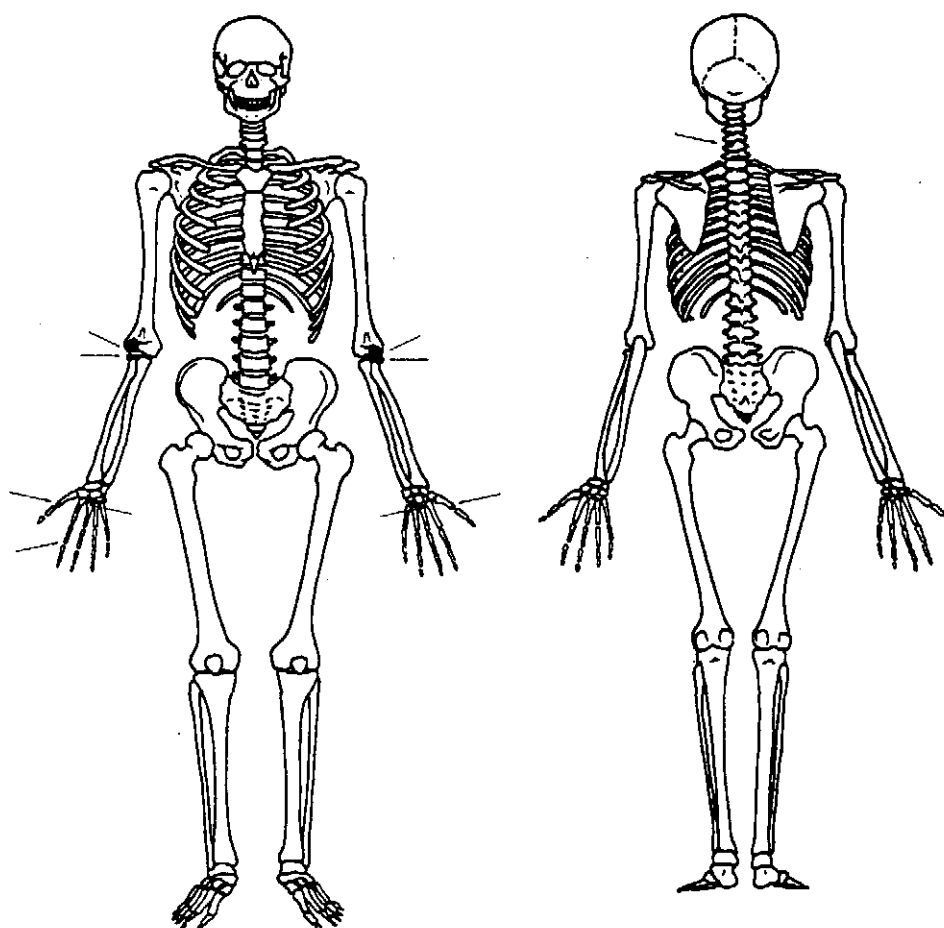
The palaeopathological conditions observed in skeleton (512) are consistent with the estimated age at death. The person may well have been conscious of back pains and soreness or inflammation of their elbows, fingers and toe joints,

The cause of death is often difficult to establish, and this is the case with skeleton (512). The palaeopathology of this individual does not indicate any fatal conditions, but does show degeneration of the bodies elements which is not unusual with the individual's age at death.

Figure 1

Hartsfield School, Baldock.

Distribution Pattern of Eburnation in
Skeleton :512



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Appendix

Skeletal Elements Present

Skeleton Number: 512

Black=Bones Present

