

# Archaeological excavation at the City Campus, University of Worcester

*Simon Sworn,  
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C Jane Evans and  
Elizabeth Pearson*

Worcestershire Archaeology Research Report no 2



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## Archaeological excavation at the City Campus, University of Worcester

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## Summary

Worcestershire Archive and Archaeology Service (Worcestershire Archaeology) carried out a programme of fieldwork in advance of redevelopment of the University of Worcester City Campus, Castle Street, Worcester, a site formerly occupied by Worcester Royal Infirmary. The fieldwork was undertaken between 2007 and 2012. The project was undertaken for the University of Worcester and managed by their agent, CgMs Consulting.

The development site (NGR: SO 8465 5525) was formerly the site of an extensive hospital complex which had developed throughout the 18<sup>th</sup> to 20<sup>th</sup> centuries. The site occupies 2.15ha and slopes down to the floodplain of the River Severn. Four areas were excavated, together with 30 evaluation trenches, in advance of construction of the new university buildings.

Prehistoric evidence was limited to a few sherds of pottery and flint flakes. The most significant period for evidence of occupation was Roman (2<sup>nd</sup> to 3<sup>rd</sup> century), and included buildings, several distinct groups of quarry pits and a small circular enclosure (of uncertain function). Occupation was recorded on the level terrace top, the terrace slope, and on the floodplain of the River Severn. Evidence for Roman occupation was dated between the early 2<sup>nd</sup> century and the later 3<sup>rd</sup> century, the period of the greatest extent of the Roman settlement at Worcester, when its economy was dominated by ironworking. The excavated evidence is characterised as agricultural buildings, probably associated with domestic structures outside the investigated area, gravel quarrying, and the dumping of largely domestic rubbish. Dumps of domestic refuse were recovered from the remains of open middens and within small quarry pits, and their range and quantity provided important information on the material culture of the occupants of Roman Worcester, and was the principal focus of analysis. A single fragmentary burial was recorded, dated to the 4<sup>th</sup> century.

The Roman deposits were sealed by a tillage soil which developed from the late Roman period onwards and contained Roman and medieval material remains, reflecting the agricultural and horticultural use of the area over this period.

The site was further developed from the late 18<sup>th</sup> century onwards, and was gradually completely taken over for the hospital. The excavated areas revealed post-medieval and modern deposits and structural remains, relating to the hospital and a farm, but these were mostly of limited archaeological importance. Human remains and artefacts were recovered relating to medical practices in the hospital in the 19<sup>th</sup> century, and are reported elsewhere.

## Reasons for the project

The University of Worcester City Campus occupies a block of land formerly occupied by the Worcester Royal Infirmary, which closed in 2001 (NGR: SO 8465 5525). The site is a large area (2.15 ha), bordered by Castle Street and Croft Road to the west and south, Infirmary Walk to the east, and a railway viaduct to the south (Fig 1). The site occupies an area outside the medieval city, but close to areas of known Roman occupation, the focus of a number of archaeological excavations (Fig 2). In advance of redevelopment of the site by the University, a desk-based assessment was undertaken by [Mercian Archaeology](#) (2005), followed by a number of stages of archaeological intervention undertaken by Worcestershire Historic Environment and Archaeology Service (now Worcestershire Archive and Archaeology Service), comprising evaluation (in 2007 and 2008), excavation (March–June 2008), and a watching brief (March 2009–September 2012). The work was undertaken on behalf of CgMs Consulting, archaeological consultants to the University of Worcester, to fulfil conditions attached to Worcester City Council’s planning consent. The combination of evaluation trenches and excavation comprised a thorough investigation of the development site (Fig 3).

The excavation of Areas 1–2, 4 and 5, and three further evaluation trenches, uncovered extensive structural remains and associated deposits dating from the Roman period, as well as post-medieval structures and deposits. The depth of excavation was dictated by the depth of the underlying natural deposits, or by the formation level required by the development, which varied across the site.

A programme of building recording of the standing buildings was undertaken by CgMs Consulting as a separate programme of work ([CgMs 2013](#)). A watching brief was conducted during the construction phase of the development. The fieldwork produced no additional information relating to the Roman occupation of the site, although 19<sup>th</sup> century human remains and a few 19<sup>th</sup> century artefacts relating to the former hospital were recovered. Detailed analysis of the 19<sup>th</sup> century human remains and related artefacts has been undertaken ([Ossafreelance 2014](#)). Each of the three themes of the site – the Roman occupation, the human remains and the hospital buildings were substantial in themselves and it was decided that three separate reports should be produced. This report is principally focused on the Roman occupation evidence recorded during the archaeological fieldwork.

## Aims and objectives

The 2007 evaluation trenches were supplemented in 2008 by further evaluation trenching in areas of the development site not previously accessible (Fig 3; Sworn 2007; CgMs 2008). This was carried out as parts of the site became available through demolition and clearance works. The aims of the 2008 evaluation were:

- a) to clarify the presence/absence and extent of archaeological remains and associated artefactual evidence;
- b) to identify the date, character, condition and depth of any surviving remains within the site.

Subsequently a number of areas were identified for excavation (Fig 3). The aims of the excavation (as part of the mitigation strategy) were to gain an appropriate level of information from the archaeological remains, facilitating their preservation by record.

Worcester City Council has published a resource assessment and research framework for the archaeology of Worcester (WCC 2007). This formed a framework for the archaeological investigations of this site, and a number of research priorities were identified prior to the fieldwork (CgMs 2008, 8). These were revised during the assessment stage (HEAS 2010). The research priorities were focused on: understanding the character of the historic floodplain in relation to the adjacent higher ground, fully documenting evidence for prehistoric occupation, and mapping the extent and character of the Roman settlement. The latter included: refining the chronology of the settlement, investigating evidence for craft production and consumption of goods and foodstuffs in Roman Worcester (as well as the dumping of iron slag), and collating evidence for Roman buildings in the form of building materials. This report is focused on the results from Areas 1–2 and 4–5, the 2008 evaluation trenches (Fig 3), and incorporates the results of the 2007 evaluation (Sworn 2007). The post-excavation analysis was focused on research goals relating to the Roman period. The historic buildings, and the archaeological evidence relating to the hospital (19<sup>th</sup> century artefacts and human remains), are not described in this report and will be published elsewhere.

Excavation of a further area (Area 3), in the south-west part of the development site, has not yet been undertaken due to changes in the scope of the construction work. The evaluation trenches in the floodplain were described and assessed in the earlier evaluation report (Sworn 2007). The archaeological evidence from the evaluation trenches in this area is outlined here, but not fully analysed in this report, as that would be more appropriately done when the south-west area of the City Campus is developed. The City Campus site has three broad topographic zones, the terrace top, the terrace slope, and the floodplain. The excavation areas covered the terrace top and slope zones and this report is focussed on these two zones. Only half the proposed development impact area has as yet been fully investigated.

## Methods

### Documentary research

Prior to fieldwork commencing a desk-based assessment was carried out by [Mercian Archaeology](#) (2005), which provided an historic and archaeological background for the archaeological investigations.

### Fieldwork strategy

#### Evaluation

A first phase of evaluation ([Sworn 2007](#)), identified significant deposits, but was limited in scope due to the presence of standing hospital buildings. A further evaluation stage in 2008 followed extensive demolition of hospital buildings and was targeted at previously unavailable areas. The further stage of evaluation was combined with the excavation areas and where significant results were obtained more extensive excavation areas were established ([Fig 3](#)).

#### Excavation strategy

The archaeological excavation project was targeted on areas of the development site that would be impacted by the groundworks for construction, and was designed to mitigate those impacts. A detailed specification was prepared prior to the commencement of fieldwork ([HEAS 2008](#)). Archaeological excavation of two areas (Areas 1 and 2) was undertaken as described in the *Archaeological Mitigation Strategy* ([CgMs 2008](#)). Subsequently these two areas were extended to form one large area, to allow excavation of a 'circular enclosure'. Areas 4 and 5 were excavated following further evaluation trenches ([Fig 3](#)). The *Archaeological Mitigation Strategy* ([CgMs 2008](#)) identified a further area for excavation (Area 3), but this was not undertaken due to a reduction in the scope of the development.

Areas 1 and 2 were located on the top of the terrace, to the south of the main hospital building, and between Mulberry House and the railway viaduct.

Area 4 occupied a central area on the terrace slope, an area previously occupied by an open grassed area to the west of the 1930s nurses' block. This area was excavated on the basis of the results of a 2008 evaluation trench (Trench 5).

Area 5 was a small area on the lower reaches of the terrace slope at the interface with the eastern edge of the historic floodplain of the River Severn. This area was excavated on the basis of the results of a 2008 evaluation trench (Trench 3).

In total, the area of the 2008 excavation amounted to just over 2359m<sup>2</sup>, comprising 1865m<sup>2</sup> for Areas 1 and 2 (excluding the footprint of Walnut Tree House), 429m<sup>2</sup> for Area 4, and 65m<sup>2</sup> for Area 5. Four further evaluation trenches were opened for the 2008 evaluation ([Fig 3](#)), located in areas that had previously been inaccessible due to the presence of standing buildings and other access issues. The combined total for the overall excavation and evaluation was 2444m<sup>2</sup>.

Fieldwork commenced with the mechanical removal of modern surfacing and underlying makeup deposits associated with the car park and recently demolished buildings, including

the majority of the modern intrusions relating to the 20<sup>th</sup> century usage of the site, such as manholes and concrete footings. This process took place under archaeological supervision.

All modern deposits were removed to the upper level of a thick dark soil layer, which was identified across the entire site. The soil was interpreted as resulting from a long period of reworking and accumulation, from the Roman period into the post-medieval period, and is a common feature of archaeological sites outside of the city walls. This soil is referred to as 'tillage soil' throughout this report. A thorough investigation was undertaken of any features cut into this layer. It was removed by mechanical excavator under archaeological supervision in a series of thin spits for artefact recovery. On removal, the exposed archaeological features were excavated by hand to the undisturbed underlying geology, or to a level where the proposed development would not disturb significant deposits.

Clean surfaces were inspected and all deposits were excavated to retrieve artefactual material and environmental samples, as well as to determine their nature. Deposits were investigated and recorded according to standard practice (CAS 1995). Deposit sample levels were established in the project design (HEAS 2008; Table 1).

*Table 1 Deposit sampling levels*

Type of context	% (minimum)
Structural features (hearths), burials, industrial structures (ovens, kilns)	100
Structural features (postholes, floors, wall foundations)	50
Pits	50
Gullies and ditches	10–20
Layers	50

The artefact recovery policy conformed to standard practice (CAS 1995; appendix 2). Initial processing and recording was undertaken on site by a Finds Archaeologist.

The environmental sampling strategy conformed to standard practice (CAS 1995). Large animal bone was hand-collected during excavation. Extensive environmental sampling was carried out on this site, samples of up to 40 litres taken from 220 contexts from various feature types. These were mainly of Roman date from two structures, two distinct groups of quarry pits and a small circular enclosure. Samples from structures, pits and postholes of post-medieval date were also retained.

During the 2007 evaluation phase of the project seven boreholes were undertaken across the western part of the site to assess the nature of deeply buried deposits within the floodplain (Sworn 2007, fig 2). The cores were examined by Dr K Wilkinson (University of Winchester), and revealed that here a layer of fine-grained alluvium overlay gravel deposits on the Worcester Terrace. A single monolith sample was taken from alluvium deposits in the floodplain (Area 5) for the purposes of specialist palynological and geoarchaeological assessment.

### Watching brief strategy

The watching brief was aimed at observation and recording of the construction team's groundworks. There were three phases of attendance. The first was between 27 February 2009 and 24 August 2009, during which time the post-medieval human remains were

recovered and observation was made of pipe trenches in the vicinity of the main historic hospital building. The second was undertaken between 30 April 2010 and 7 June 2010, during which time further human remains were recorded, groundworks associated with conversion of the retained buildings were observed, as well as further pipe trenches and works associated with removal of contaminated ground. A final phase of the watching brief was undertaken between 31 August 2012 and 10 September 2012, and focussed on landscaping works in the south-western quarter of the site. Aside from the human remains the watching brief did not observe significant archaeological deposits, though records were made of each visit.

Table 2 Site periods

Site period	Chronological period
Period 1	Geology
Period 2	Prehistoric
Period 3	Roman, late 1 <sup>st</sup> to late 2 <sup>nd</sup> century
Period 4	Roman, late 2 <sup>nd</sup> to late 3 <sup>rd</sup> century
Period 5	Roman, late 3 <sup>rd</sup> ?early 4 <sup>th</sup> century
Period 6	Roman, later 3 <sup>rd</sup> to 4 <sup>th</sup> century
Period 7	Post-Roman
Period 8	Late Anglo-Saxon
Period 9	Medieval (11 <sup>th</sup> to 15 <sup>th</sup> century)
Period 10	Early post-medieval (16 <sup>th</sup> to early 18 <sup>th</sup> century)
Period 11	Mid-18 <sup>th</sup> to 19 <sup>th</sup> century
Period 12	Modern (19 <sup>th</sup> to 20 <sup>th</sup> century)
Undated	

## Assessment

A site chronology of twelve broad site periods was established at the assessment stage (Table 2). Post-excavation analysis and assessment, artefact assessment and environmental sample assessment followed standard methods and methodologies, as detailed in the assessment report ([HEAS 2010](#)). A programme for further detailed analysis was developed, related to the established research framework for archaeology in Worcester ([WCC 2007](#)).

### Palynological assessment

A single monolith sample (sample 223) was taken from Area 5, which sampled yellow sandy alluvium (context 4502) and sand and gravels (context 4540) for the purposes of palynological and geoarchaeological assessment. Visual inspection of the monolith prior to sub-sampling was undertaken (by Nick Daffern, Worcestershire Archaeology and Archive Service) and it was found that both contexts were primarily inorganic and sandy in nature which, as indicated by [Moore et al](#) (1991, 25), 'often leads to mechanical damage [of pollen grains] particularly crumpling and folding'. The occasional organics that were present were desiccated, the cause of which was most probably fluctuations in the watertable as evidenced by the presence of iron and manganese pans within both contexts. Also as a result of these watertable fluctuations, sediment structures that may have been expected

within the sequence have been lost: this was particularly evident in context 4502 which was homogenous with very little variation, indicating that it was unlikely that geoarchaeological analysis would produce meaningful information. As a consequence no detailed analytical work was undertaken.

## Method of analysis

Details of analytical methods utilised in post-excavation assessment and analysis are set out below, and should be read in conjunction with the detailed reports on results. For most categories of finds, only material from Roman deposits and the dumps incorporated in the tillage soil (Periods 3 to 6–7) was included in the study. Exceptions to this are described below. Relatively small quantities of medieval and post-medieval artefacts were recovered. This material was assessed but not analysed as it was deemed to have a low research potential (HEAS 2010). The assemblage included medieval pottery (14 sherds, 184g), post-medieval pottery mostly of 18<sup>th</sup> century date (623 sherds, 24.6kg), clay pipe (63 fragments), brick and tile, vessel and window glass, and a small number of artefacts of iron and copper alloy. Many of these finds came from a Period 11, robbed well (context 1402) associated with Walnut Tree House, an 18<sup>th</sup> century farmhouse. Though the assemblage was fairly substantial (fill 1399, 255 sherds, 12,764g) and represented an assemblage at the beginning of the 19<sup>th</sup> century its significance was not thought to merit further study within this project, but has been retained for future study (HEAS 2010, 91). Artefacts from all environmental samples were scanned, but were very fragmentary, so are not included in the tables or discussions presented here.

### Roman pottery

The pottery was recorded following standard procedures (HEAS 2009). Fabrics were recorded with reference to the Worcestershire Ceramic On-line Database (WCOD) fabric series (<http://www.worcestershireceramics.org> and see also Hurst and Rees 1992, 200–9), cross-referenced to the National Roman Fabric Reference Collection (Tomber and Dore 1998). Where new fabric variants were identified, these were allocated a code (Table 7). An attempt was also made to cross-reference fabrics with those used for the nearby Magistrates' Court site on the north side of Castle Street (Evans C J nd), though it was not possible to directly compare sherds. Forms were recorded by broad vessel class (jar, bowl etc) and specific form type. A site-specific form type series was devised (see archive). Forms are described in relation to published corpora where possible. Decoration, and evidence for manufacture (eg misfired sherds), use (eg sooting, limescale, wear etc) and re-use (eg rivets and repair holes) is recorded. The pottery was quantified by sherd count, weight and rim EVE. Diameters and percentages were not recorded for bases. It was felt that the data obtained by this did not justify the additional time required. Data were analysed using Microsoft Access 2000 and Microsoft Excel 2007. Forms are illustrated in fabric groups, and used in the discussion as a form type series. They have been selected to illustrate the range of forms present, and to show the dating evidence. In addition to the Roman pottery from Periods 3 to 6–7, all the samian was analysed, to provide dating for 1<sup>st</sup> to 3<sup>rd</sup> century activity in the vicinity of the site. Also included are small quantities of Roman pottery from contexts that, following analysis, were re-phased as post-Roman.



*Table 7 Roman fabrics represented in assemblage*

<b>WAAS fabric code</b>	<b>Site specific fabric code</b>	<b>Fabric common name</b>	<b>NRFRC code (Tomber and Dore 1998)</b>	<b>Other published reference</b>	<b>Magistrates Court (Evans C J nd)</b>
3		Malvernian ware	MAL RE A	<a href="#">Hurst and Rees 1992</a>	G44
12		Severn Valley ware	SVW OX 2?	<a href="#">Hurst and Rees 1992</a>	O20
12.1		Reduced Severn Valley ware		<a href="#">Hurst and Rees 1992</a>	
12.2		Oxidised organically tempered Severn Valley ware		<a href="#">Hurst and Rees 1992</a>	O21
	12.21	Oxidised Severn Valley organic variant, grog			
	12.22	Oxidised Severn Valley organic variant, sparse organic & grog			O91
	12.23	Oxidised Severn Valley organic variant, sand			
	12.24	Fine oxidised Severn Valley organic variant			
	12.25	Oxidised Severn Valley organic variant, common white inclusions			
12.3		Reduced organically tempered Severn Valley ware		<a href="#">Hurst and Rees 1992</a>	R32
12.4		Oxidised Severn Valley ware variant, shelly limestone		<a href="#">Bryant and Evans C J 2004, 255</a>	
12.5		Oxidised Severn Valley ware variant, sandy and micaceous		<a href="#">Bryant and Evans C J 2004, 256</a>	O29? O291? O23? O231? O24
12.6		Oxidised Severn Valley ware variant, common white inclusions		<a href="#">Bryant and Evans C J 2004, 256–7</a>	O27
	12.7	Oxidised Severn Valley ware variant, grog			
	12.8	Oxidised Severn Valley ware variant, vesicular			O36?
13		Sandy oxidized ware		<a href="#">Hurst and Rees 1992</a>	
14		Fine sandy grey ware		<a href="#">Hurst and Rees 1992</a>	
	14.1	Fine sandy grey ware			

<b>WAAS fabric code</b>	<b>Site specific fabric code</b>	<b>Fabric common name</b>	<b>NRFRC code (Tomber and Dore 1998)</b>	<b>Other published reference</b>	<b>Magistrates Court (Evans C J nd)</b>
15		Coarse sandy grey ware		<a href="#">Hurst and Rees 1992</a>	R01/11
16.1		Savernake ware	SAV GT		
17		Pink grog tempered ware	PNK GT	<a href="#">Booth and Green 1989</a>	G11
19		Wheelthrown Malvernian ware		<a href="#">Hurst and Rees 1992</a>	G46, G47?
19.1	19.1	Wheelthrown Malvernian ware, limestone tempered			
20		White slipped ware, general category		<a href="#">Hurst and Rees 1992?</a>	
	20.1	White slipped ware, fine fabric		<a href="#">Hurst and Rees 1992?</a>	
	20.2	White slipped ware, buff			
	20.3	White slipped ware, painted			
	20.4	White slipped ware, sand and common white inclusions cf 12.6			
21		Micaceous ware		<a href="#">Hurst and Rees 1992</a>	
21.3		Early micaceous ware		<a href="#">Griffin 2002</a>	
22		Black-burnished ware, type 1 (Dorset BB1)	DOR BB 1		B01
	22.1	Black-burnished ware, type 1 (South-west BB1)	SOW BB 1		
23		Shell gritted ware	ROB SH		
28		Nene Valley ware, white/pale buff	LNV CC		F53
	28.1	Nene Valley ware, red	LNV CC		F51?
29		Oxfordshire red/brown colour coated ware	OXF RS		F51
30		Oxfordshire white colour coated ware	OXF WS		
32		Mancetter/Hartshill mortarium	MAH WH		M22
33.1		Oxfordshire white mortaria	OXF WH		M23
34		West Midlands mortarium (Wroxeter ?)	WRX WH		
37		Severn Valley mortarium		<a href="#">Hurst and Rees 1992</a>	

<b>WAAS fabric code</b>	<b>Site specific fabric code</b>	<b>Fabric common name</b>	<b>NRFRC code (Tomber and Dore 1998)</b>	<b>Other published reference</b>	<b>Magistrates Court (Evans C J nd)</b>
38		Oxfordshire white ware	OXF WH		
41		Unprovenanced white ware			
42		Amphorae			
42.1		Dressel 20 type	BAT AM 2?		A21
42.2		Dressel type 2–4	CAM AM 1		
42.3		Pelichet 47 type (Gauloise 4 type)	GAL AM 1		A22
43		Samian ware (unspecified)			
43.1		?Southern Gaulish samian ware			S10
43.2		Central Gaulish samian ware, Lezoux	LEZ SA 2		S20
43.3		Eastern Gaulish samian ware, Rheinzabern	RHZ SA		S30
	43.4	Eastern Gaulish samian ware, Trier	TRI SA		S30
	43.5	Eastern Gaulish samian ware, unspecified			S30
	43.6	Central Gaulish samian, Les Martres-de-Veyre	LMV SA		S21
44		Rhenish ware (Mosel Keramik)	MOS BS		F32
	44.1	Rhenish ware (Cologne)	KOL CC		
45.1		Central Gaulish (Cream) Colour-coated ware	CNG CC 2		
	45.4	Central Gaulish Black-slipped ware	CNG BS		
	98.1	Miscellaneous Roman wares, fine fabric			
109		Eggshell ware			
151		South-west oxidised ware	SOW [OX]		

The samian was quantified by count, weight and rim EVE. Fabrics, and hence the kiln site or production centre, were identified by examining a fresh fracture, using a x10 hand lens where necessary. The data were recorded in Microsoft Excel, with reference to the WCOD fabric series, where possible, and site specific codes where necessary. Moulded decoration and potters' stamps were recorded using graphite rubbings, copies of which may be found

in the archive. The records include: context number, fabric code, presence of cross-context joins, vessel form, sherd type, count, weight, condition, rim diameter and EVE, presence of decoration and potters' stamps, and spot dates (early–late date). Additional comments were recorded for some sherds, for example a note was made of use-wear and graffiti, where observed.

### Roman small finds and glass

The analysis included finds from Periods 3 to 6–7, and all typologically Roman finds from later contexts.

### Roman oven material

A quantity of Roman 'oven material' was identified during the assessment ([HEAS 2010](#)), consisting of fragments of 'ovens' and 'platters'. At the time of excavation this material was poorly understood, so all fragments from both Roman and post-Roman contexts were examined and quantified. All information was recorded on a Microsoft Access 2007 database. The material was examined under x20 magnification and recorded by fabric type according to the WCOD fabric series ([www.worcestershireceramics.org](http://www.worcestershireceramics.org)). A site specific form classification was used.

### Animal bone

Analysis of the animal bone was undertaken, following assessment ([HEAS 2010](#)). Most of the animal bone was hand-collected, and consequently an under-representation of smaller bones from the main domestic species and bones from small wild mammals, birds and amphibians is to be expected. The bones were recorded on an Access database (see site archive) following a modified version of the method described in [Davis \(1992\)](#) and [Albarella and Davis \(1994\)](#). In this method all teeth (lower and upper) and a restricted suite of parts of the skeleton are recorded and used in counts. These are: horncores with a complete transverse section, skull (zygomaticus), atlas, axis, scapula (glenoid articulation), distal humerus, distal radius, proximal ulna, carpal 2+3, distal metacarpal, pelvis (ischial part of acetabulum), distal femur, distal tibia, calcaneum (sustenaculum), astragalus (lateral side), centrotarsale, distal metatarsal, proximal parts of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> phalanges.

For birds the following were always recorded if present: scapula (articular end), proximal coracoid, distal humerus, proximal ulna, proximal carpometacarpus, distal femur, distal tibiotarsus, and distal tarsometatarsus.

The separation of sheep and goat was attempted on the following elements: horncores, dP<sub>3</sub>, dP<sub>4</sub>, distal humerus, distal metapodials (both fused and unfused), astragalus, and calcaneum using the criteria described in [Boessneck \(1969\)](#), [Payne \(1969 and 1985\)](#) and [Schmid \(1972\)](#). The shape of the enamel folds ([Davis 1980](#); [Eisenmann 1981](#)) was used for identifying equid teeth to species. Equid postcrania were checked against criteria summarised in [Baxter \(1998\)](#).

Wear stages were recorded following [Grant \(1982\)](#) for all P<sub>4</sub>s and dP<sub>4</sub>s as well as for the lower molars of cattle, sheep/goat and pig, both isolated and in mandibles. These are retained on the database.

Measurements are recorded on the database (retained in the digital site archive). These in general follow [von den Driesch](#) (1976). All pig measurements follow [Payne and Bull](#) (1988). Humerus HTC and BT and tibia Bd measurements were taken for all species as suggested by [Payne and Bull](#) (1988) for pigs. The crown heights of equid teeth were measured following [Levine](#) (1982). SD on dog long bones is measured as suggested by [Harcourt](#) (1974) and represents the midshaft diameter (msd). The post-medieval dog cranium was measured following both the method of [Lüps](#) (1974) and [Harcourt](#) (1974). Some of these measurements are the same as [von den Driesch](#) (1976).

Animal bones of interest and pathologies were photographed (site archive). Comparative discriminant function analysis of the post-medieval dog cranium and comparators for the occipital perforation are in Appendix 1.

### Fish bone

Bones were extracted from standard samples of 10–40 litres from 220 contexts. Fish remains were recovered from 18 of these and analysed. Taxonomic identifications were made using modern comparative collections. All fragments were recorded and were identified to taxon and element where reasonably possible. The archive includes further details of the individual bones not presented in the text.

### Human remains

A single inhumation was excavated: a grave cut (context 1005) containing articulated human skeletal remains (from contexts 1003 and 1004). This inhumation was not apparently associated with the hospital, and was subsequently radiocarbon dated, which established a Roman date. Other human remains were recovered during the watching brief, and could be directly associated with the use of the hospital (this evidence will be the subject of a separate report). The osteological analysis aimed to provide a detailed inventory of the skeletal and dental material recovered, the condition of the bone present, completeness of the skeletons and to provide, where possible, the age, sex and stature of the individual recovered. Any evidence of pathological changes was also noted.

The skeletal material was analysed according to current standards and guidelines ([Brickley and McKinley 2004](#); [English Heritage 2002](#)). Recording of the material was carried out in line with [Buikstra and Ubelaker \(1994\)](#). All skeletal data has been recorded using an MS-Access database(s). The material was analysed macroscopically and where necessary with the aid of a magnifying glass for identification purposes. Where relevant, digital photographs have been used for illustration and a full digital image archive of all pathologies and any other features of interest is retained in the digital archive.

### Plant macrofossils

Samples of up to 40 litres were taken from 220 contexts from various feature types. The samples were processed by flotation using a Siraf tank. The flot was collected on a 300µm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds. The residues were fully sorted by eye and the abundance of each category of environmental remains estimated. The flots were fully sorted using a low power MEIJI stereo light microscope and plant remains identified using

[to previous view](#)

modern reference collections maintained by the Service, and a seed identification manual (Cappers *et al* 2006). Nomenclature for the plant remains follows Stace (1997).

Approximately 75% of the samples were fully assessed (HEAS 2010). Environmental remains (mainly consisting of charred plant remains) was very low in the majority of samples and following assessment, selection of samples for full analysis was focussed in context groups where more abundant evidence was recovered. The following samples were selected for analysis of charred plant remains.

- Period 4. Structure 2: contexts 1170 and 1251.
- Period 5. Quarry pits group 1: contexts 1089, 1110, 1117, 1137, 1172, 1301 and 1315.
- Period 5. Circular enclosure: contexts 2082, 2177 and 2190.
- Period 6. Late Roman burial (context 1004) and layer above quarry pits (context 1245).

## Project archive

The site records and quantities of material recovered from the excavation, and detailed descriptions and discussion of each category of evidence and class of material recovered, are set out in the assessment report (HEAS 2010).

The stratigraphic record also includes the site archives generated during the preceding archaeological evaluation (Sworn 2007).

The project archive will be placed with Worcester City Museum.

## Context

### Location

The site ([Fig 1](#)) lies close to Worcester city centre, north of the medieval city wall and near the eastern bank of the River Severn. The terrain slopes down to the west, from approximately 23.00m to 15.00m AOD, which is the level of the floodplain (somewhat built-up in the modern period). The site is bounded to the east by Infirmary Walk, to the south by the viaduct carrying the Worcester to Hereford railway (built in 1859), to the north by Castle Street, and to the west by Croft Road. The site is mainly above the floodplain of the river, although at peak flood levels, floodwater enters the lower levels of the site at a maximum level of between 15.12m and 15.88m AOD ([STATS 2004](#)).

The site itself lies within a known area of Roman Worcester and 100m north of the medieval city wall. Immediately prior to the start of the excavation, the site comprised car parks, landscaped areas, areas of hard standing, and the footprints of recently demolished 18<sup>th</sup>–20<sup>th</sup> century buildings, many of which were part of the former Worcester Royal Infirmary, which occupied the site until 2001 ([Fig 3](#)). The historic buildings on the site have been the subject of a separate study ([Hulka 2013](#)). The main Infirmary building, the hospital chapel and Mulberry House were retained and subsequently refurbished as part of the re-development project.

### Topography, geology and archaeological context

The soils of Worcester are not fully mapped. The drift geology is of Terrace Deposits of the Second (Worcester) Terrace of the River Severn (gravels and sand) which mainly date from the Devensian, with alluvial deposits along the floodplain of the Severn below the level of around 15.25m AOD ([Carver 1980](#)) This underlying solid geology is of the Mercian Mudstone Group, formerly known as Keuper Marl. Floodplain alluvium is of silt and clay overlying the gravels.

With the site located on a slope, and with quite substantial terracing and disturbance associated with the construction and development of the hospital from the 1770s onwards, certain areas of the site have been heavily truncated. A number of the buildings had basements, and terracing has taken place across the lower central area ([Fig 3](#)), however the majority of the excavated areas showed little or no signs of major disturbance. This was partly due to some areas being protected by fill, made ground above the previous ground level established to provide a level terrace for construction of buildings, such as for the former 1930s nurse's block. This made ground has protected the former ground surfaces and any underlying archaeological deposits.

### Prehistoric evidence

It was noted in the late 1960s that little evidence for prehistoric settlement was known from the area of the medieval city ([Barker 1969a](#)), despite the scatter of Dobunnic coins ([Fendall 1969](#)) and the apparent suitability of the gravel terrace for settlement. The Lich Street excavations produced evidence for prehistoric occupation in the form of Bronze Age pottery and a ditch dated to the Iron Age ([Barker 1969b](#)), and a limited range of Bronze Age and Iron Age evidence was recorded from the Deansway excavation ([Dalwood 2004b](#), 36–9). The nature of prehistoric occupation in the area of the historic city and its suburbs is poorly

understood. Recent fieldwork at the Worcester Arena site, on the west bank of the river, has provided important new information on the prehistoric environment of Worcester (Nick Daffern pers comm).

### The Roman 'small town'

Over the last 40 years archaeological work has provided an insight into the urban development of Worcester through the Roman period. Excavations from the 1960s onwards, prior to major redevelopments of the historic core of the city centre, have demonstrated intensive occupation and activity through the Roman period. This dates from the 1<sup>st</sup> century AD onwards when Worcester became a major ironworking centre (Dalwood 2004d, 79; Jackson 2004, 102).

The origins of the Roman settlement remain obscure due to an absence of evidence, and although it has been suggested that an auxiliary fort was established at Worcester and occupied up to AD 75, no convincing structural or artefactual evidence has been recorded for its location (Dalwood 2004a, 13; Dalwood 2004b, 41–2). A fairly extensive civil settlement developed during the late 1<sup>st</sup> century, with an economy based on both agriculture and some ironworking (Dalwood 2004b, 42). The early civilian settlement is less well understood than the more extensive occupation of the 2<sup>nd</sup> century onwards, characterised by ironworking. The evidence for ironworking is widespread in Worcester, in the form of production areas for iron smelting as well as evidence for smithing, iron slag used for road construction, and large waste dumps of iron slag, attesting to the scale of the industry (Jackson 2004). It is clear that very large quantities of iron slag were dumped on the floodplain close to the Roman settlement area (Davenport and Dalwood forthcoming), as well as on the floodplain west of the river (Nick Daffern pers comm). Roman occupation evidence from Worcester is extensive and focused on the level top of the gravel terrace, although there is occupation evidence from the floodplain as well (eg at Newport Street: Davenport and Dalwood forthcoming). Evidence of the 2<sup>nd</sup> century iron working includes large deposits of iron slag found on many sites and large dumps of slag away from the central occupation areas. Iron slag was used for surfacing and road repair, as noted in the excavations of a major road leading north from the city centre, at Broad Street, Blackfriars and Farrier Street (Barker 1969c; Mundy 1985; Dalwood *et al* 1994). The postulated alignment of this road runs to the east of the City Campus site (see Dalwood *et al* 1994, fig 13). Excavations further north, at the Sanctuary House development (the former Kardonia factory) on Farrier Street (Mann 2009; Daffern and Arnold 2010), and the Police Station on Castle Street/Love's Grove (Edwards *et al* 2002) indicated extensive Roman slag deposits interpreted as yard surfaces, but did not locate the road in this area. Evaluation at 8–12 The Butts, and excavation at 14–24 The Butts on the projected alignment of this road, did locate metallised surfaces, but these were not felt to form definite structural evidence for the road, perhaps due to later truncation (Napthan 2011b, 53–4; Butler 2011, 131).

Excavations at The Hive in 2008–10, to the south of the railway viaduct, identified an east–west road which is interpreted as leading to a river crossing, or river quay, on the site of the present railway bridge, although this is very much a provisional interpretation as analysis is ongoing. It is possible that the north–south road observed at the Broad Street, Blackfriars, and Farrier Street sites within the historic city centre (Dalwood 2004a, fig 11) formed a junction with an east–west road, forming a cross-roads or a T-junction, and further research during analysis of results from The Hive excavation will refine this model. It is clear from the excavation at The Hive that the east–west road was the focus of ribbon development, with



intensive occupation along the southern side of the roadway at least, including a row of strip buildings dating from the 2<sup>nd</sup> century onwards, a later aisled building, and other indicators showing a high density occupation area. The River Severn would have been a major arterial route throughout the entire Roman period, transporting iron ore from the Forest of Dean to the south ([Jackson 2004](#), 103) together with other imports (including wine and olive oil) to Worcester, and exporting salt (from Droitwich) and pottery (from the Malvern area; [Dalwood 2004b](#), 47).

The question of how the river was crossed in the Roman period remains a topic of enquiry, and evidence for a bridge remains circumstantial. A metalled road uncovered at Newport Street in 2005 ([Davenport and Dalwood forthcoming](#)) led towards the river, and possibly a ford close to the site of the medieval bridge. The date of this road is 3<sup>rd</sup> century, which is rather late in the development of the Roman settlement, suggesting that this road was not constructed at an early period, and was probably aligned on a pre-existing ford, crossable when the river was low.

The cumulative archaeological evidence from the northern part of the Roman settlement at Worcester indicates areas of intensive occupation on the gravel terrace, as well as much less intensively occupied areas. Occupation seems to have been piecemeal and unplanned, and comprised clay-built and timber buildings, with areas used for industrial production. There is also, however, evidence for masonry structures. Evidence for high status buildings has been observed at Britannia Square to the north, where a stone building was first uncovered in 1829 ([Barker 1969a](#), 15), and building debris, including a small fragment of mosaic, have been identified at two properties on the south side of Britannia Square ([WCC 2007](#), 39 and [Wainwright 2010](#)). There is indirect evidence for Roman masonry buildings elsewhere in the town (*ibid*), and in particular from the area of The Butts. A stone-lined well excavated at 1 The Butts, which had been backfilled with a substantial dump of building rubble in the late 4<sup>th</sup> century, comprising tesserae (c 200 items), painted plaster (4.5g), ceramic building material (including pilae and box tiles), stone roofing tiles, and a fragment of limestone column. This was interpreted as demolition debris from a public or high status domestic building, located nearby ([Naphan 2011b](#)). Similar building material, in much smaller quantities, has been noted from sites in this area of the Roman town, such as at Sanctuary House on Farrier Street ([Mann 2009](#); [Daffern and Arnold 2010](#)) and at the Conder Building, Infirmary Walk ([Sherlock and Pikes 2003](#)), where painted wall plaster and high status building material was recovered.

Recent redevelopment along The Butts has led to fairly intensive archaeological investigation between 2000 and 2004 ([Fig 2](#)), with excavation of three sites, which all revealed evidence of Roman occupation: at 1 The Butts ([Naphan 2011a](#)), 8–12 The Butts ([Naphan 2011b](#)) and 14–24 The Butts ([Cutler et al 2011](#)). The small area excavated at 1 The Butts revealed the stone-lined well discussed above. The site at 8–12 The Butts included gravelled surfaces, pits and a stake-built structure. The earliest occupation appeared to date from the late 1<sup>st</sup> to early 2<sup>nd</sup> century, with occupation continuing into the 2<sup>nd</sup> to 3<sup>rd</sup> century ([Naphan 2011b](#)). Excavation at 14–24 The Butts revealed evidence for occupation from the 2<sup>nd</sup> century onwards ([Cutler et al 2011](#)). The earliest features were mostly in the form of shallow pits and ditches, the pits being the likely result of small-scale gravel quarrying. Further gravel quarrying continued into the 4<sup>th</sup> century. The fills of features contained a range of artefactual material of different date, interpreted as waste dumping on the edge of the occupied area. A well, dated to the late 3<sup>rd</sup> to 4<sup>th</sup> century, contained environmental evidence indicating that the area was pasture or waste ground in the 4<sup>th</sup> century. An east–west holloway across the site probably

originated in the 4<sup>th</sup> century; it was maintained with a metallised surface and appears to have been used for the dumping of domestic rubbish when it went out of use (Cutler *et al* 2011, 127–8).

There is evidence for changes in use of former occupation areas in Worcester during the 4<sup>th</sup> century, such as at Deansway where the area was used for animal pens and a small cemetery by the mid-4<sup>th</sup> century (Dalwood 2004b, 48–51). It is, however, also clear that occupation of a number of areas of the settlement continued throughout the 4<sup>th</sup> century, including the high status building represented by the demolition debris at 1 The Butts (see above). Aside from these few patterns that are emerging from a growing body of evidence, the later chronological development of the settlement remains poorly understood.

### The Roman environs of the City Campus

The excavations undertaken within the vicinity of the City Campus demonstrate the varying intensity of Roman occupation in the town (Fig 2). At the outset of the fieldwork, the expectation was that occupation evidence would be dispersed and extensive, comparable to the evidence from the sites to the south along The Butts (Butler and Cutler 2011) and to the south-east (Dalwood *et al* 1994). It is clear, however, that localised areas of more intensive occupation are to be expected in this area of the town, such as at the Magistrate's Court (Castle Street), and in particular at The Hive (south of the railway viaduct), where there was intensive occupation along the southern side of a street aligned east–west. The excavated areas at the City Campus lie to the north of this street, and whether the site would be characterised as dispersed or more intensive occupation, was a key issue to be resolved.

### Post-Roman to post-medieval landuse

The potential for continuity of settlement at Worcester between the 5<sup>th</sup> and the 7<sup>th</sup> centuries has been argued on the basis of a range of evidence (see summary in Dalwood 2004a, 19–22). Archaeological attention has focused on the 'dark earth' deposits recorded overlying Roman deposits, although the character of these deposits differs. It is clear that the dark earth deposits recorded at Deansway formed during the later Roman period in areas of animal pens, and were subject to biological reworking in the post-Roman period when the land was used as pasture (Macphail 2004). At the Farrier Street site (Fig 2), however, there was little trace of herbivore penning, and the dark earth deposits were largely the result of debris accumulation from ironworking and domestic (midden) waste during the Roman period, subsequently cultivated from the medieval period (Macphail 1994). Fieldwork at sites along The Butts produced no evidence for post-Roman or early medieval occupation, and similar dark earth deposits to Farrier Street were recorded although detailed analysis was not undertaken due to a presumption that they had been reworked over a period of 1500 years and therefore it would be unprofitable (Butler 2011, 132–3).

Archaeological excavation of sites to the north of The Butts reflects the medieval and earlier post-medieval landuse of this area as agricultural and horticultural land outside the city wall, traversed by a number of trackways and routeways. The earliest map of the area is Speed's 1610 map of Worcester, which shows the area as undeveloped. However, documentary evidence indicates that a few domestic houses were built along Salt Lane in the early 17<sup>th</sup> century (Whitehead 1996, 5). The Vaughan map, published in 1660 (*An exact ground plot of the City of Worcester, as it stood fortified 3 Sep 1651*), based on Speed, showed three bastions of earthen ramparts and ditches, added to the north wall of the city in 1642

(Atkin 1995, 56–8). The Vaughan map has been rectified to fit the modern Ordnance Survey mapping (Atkin 1995, 106) which shows that the City Campus area was less than 100m from the city wall, within the field of fire of musketeers (as well as artillery) in the bastions. The nearby Foregate suburb, to the east, was levelled prior to the siege of 1642 (Whitehead 1989, 10). Archaeological fieldwork at The Hive has identified defensive ditches interpreted as of Civil War date, including the redug city ditch. Following the Battle of Worcester (1651), the earthwork fortifications were levelled (Whitehead 1996, 6).

The Doherty plan (1741) shows that the landscape of this part of Worcester was still fields and open land in the mid-18<sup>th</sup> century, crossed by Salt Lane (now Croft Road/Castle Street) which ran from the North Quay to The Tything. The land to the south of Salt Lane, and bounded by The Butts and Infirmary Walk to the east, was mainly occupied by a seven-acre field called The Artichoke Field (Whitehead 1996, 8). The Doherty map shows a lane called Dr Wall's Walk (later Infirmary Walk) bounding the eastern side of the site.

### Later post-medieval development

The land down to the river remained open with orchards and closes, with the Infirmary and two large private houses (Walnut Tree House and Netherton House) the only substantial development (Whitehead 1989, 36). Building recording and historical research for the historic buildings has greatly enhanced knowledge of the development of the area in the late 18<sup>th</sup> century (Hulka 2013).

During the later 18<sup>th</sup> century, the growth and expansion of the city led to changes in landuse as former agricultural areas were the focus for buildings (Whitehead 1989). The City Campus site was developed from the 1760s, with domestic and public buildings and their grounds occupying the area. A domestic house was built on the southern part of the site, known as Walnut House or Walnut Tree House, in the 1760s. Worcester Royal Infirmary was constructed on two acres of land bounded by Castle Street and Infirmary Walk, formally known as Artichoke Field, between 1768 and 1770. The history and development of the hospital has been studied in detail (McMenemy 1947; Mercian Archaeology 2005), and further research was undertaken in the study of the historic buildings (Hulka 2013). The Infirmary started as a single structure, but quite quickly expanded in size. A chapel was constructed to the rear of the main building in 1851. By 1898 the hospital grounds had extended southwards across the original boundary into the land formally owned by Walnut Tree House, with further construction in the 1930s and in the post-war period. By the early part on the 20<sup>th</sup> century the hospital covered the full extent of the present City Campus (Fig 3). Young's plan (1779) shows that the Infirmary stood surrounded by orchards, whereas to the south along The Butts there was suburban development in the form of tenements and builder's yards.

The Worcester to Hereford railway line to the south of the site lies on a substantial brick viaduct constructed in 1859, with the adjacent Butts siding constructed a few years later and was in use by 1865. The Butts siding extended over Croft Road and to the riverside, and serviced the riverside quays (now disused and partly demolished). The main line viaduct still carries trains on the line to Hereford.

Worcester Royal Infirmary closed in 2001 and was relocated to the outskirts of the city. The entire site was redeveloped as the second campus of the University of Worcester, which comprised extensive refurbishment and conversion of the original hospital buildings, demolition of Walnut Tree House and more recent buildings, as well as the construction of new buildings.

## Structural evidence

### Introduction

The site narrative discusses the evidence gained from the evaluation and excavation stages (with some material excluded from detailed analysis as indicated above). The site was investigated through the excavation of four open areas (Areas 1, 2, 4, and 5). The 1142 contexts recorded during excavation of these areas, and the additional evaluation trenches, were assigned to the site periods. A broad grouping of contexts indicates the chronology of the structural evidence (Table 3).

*Table 3 Number of contexts assigned to broad site period*

Site period	Chronological period	Contexts (count)
Period 1	Geology	24
Period 2	Prehistoric	0
Periods 3–6	Roman	617
Periods 6–7	Late Roman to post-Roman	44
Period 8	Saxon and Norman	0
Period 9	Medieval	4
Period 10	Early post-medieval	6
Period 11	18 <sup>th</sup> century	178
Period 12	Modern	87
Undated		176

### Period 1: geological deposits

Natural deposits were noted in all the trenches and excavation areas, and varied according to topographical location. The higher ground at the eastern part of the site was level, and here the geology is Triassic Mercia Mudstone overlain by Second (Worcester) Terrace sands and gravels, comprising matrix-supported gravels (mudstone, sandstone and quartzite) of Upper Pleistocene date (Keith Wilkinson pers comm). Mercia Mudstone was exposed on the terrace slope in the centre of the site; this geomorphological feature represents the eastern edge of the wide and deeply-cut Flandrian channel of the River Severn (Morris 1974). The western excavation area (Area 5) lay on the floodplain, and here yellow fine-grained alluvial clays were recorded, overlying sands and gravels. The alluvial deposits in the floodplain are up to 5m thick, and developed through overbank deposition from the Flandrian period onwards (Morris 1974, fig 8). The interface between the top of the alluvial clays of the floodplain and the Mercia Mudstone terrace slope was observed in Area 5, and in Trenches 20 and 28 of the 2007 evaluation (Fig 3). The fine-grained alluvium did not contain any archaeological material and was laminated (ie undisturbed). The alluvium formed the ground surface on the floodplain during the Roman period.

### Period 2: prehistoric evidence

No excavated features were assigned a prehistoric date. The fieldwork reported on here did not include detailed investigation within the floodplain, an area of high potential for prehistoric palaeoenvironmental evidence, as indicated by recent excavation at The Hive.

A small number of lithics and prehistoric pottery were recovered as residual material in Roman contexts. The pottery (14 sherds) included late Bronze Age material as well as some probable Iron Age material ([see p28](#)). The lithics (3 flakes) indicate earlier prehistoric activity (Neolithic or early Bronze Age: [see p28](#)). Such small quantities of material are hard to interpret, and probably represent low-level activity across this area over a long period, rather than occupation.

## Periods 3–6: Roman occupation

Roman features were recorded in all excavated areas, bearing out the evidence from the evaluation trenches. The open area excavations provided the clearest evidence for the character of Roman landuse and settlement on the site and this evidence is focused on here, although the evaluation trenches provided general contextual information. There was extensive indication for occupation spanning the mid–later Roman period. There was little evidence for occupation dating from the late 1<sup>st</sup> to 2<sup>nd</sup> century, but with a concentration of activity from the late 2<sup>nd</sup> to 3<sup>rd</sup> century. There was also some activity on the site from the early 4<sup>th</sup> century onwards.

It was not possible to reach a closely-defined chronological phasing of the Roman deposits, as deposits and features were dispersed across the excavated areas. During analysis of the artefactual evidence it became clear that many of the deposits were dumps that consisted of mixed refuse likely to have been collected and deposited from across the Roman town. Other features could only be dated broadly to the Roman period on the basis of undiagnostic artefacts. Therefore the phasing used in this report is not tightly defined.

## Broadly-defined Roman features (Periods 3–6)

### Top of the terrace (Areas 1 and 2)

A large number of features, including pits, ditches and postholes could be assigned a broadly Roman dating, through both stratigraphic and recovered material evidence ([Fig 4](#)). The features in this area could be dated to narrower site periods, and are discussed below.

### Terrace slope (Area 4)

Roman activity on the terrace slope ([Figs 5 and 6](#)) consisted of a series of discrete pits, and the terminus of a possible ditch aligned north–south (context 4011). The pits were not closely dateable and did not appear to form a coherent pattern. A small number of postholes were also recorded, though these too did not form a pattern. They may have originated as fence/stockade posts rather than forming any substantial structure. There was low-level landuse on the terrace slope, but this was limited in extent and occupation evidence was absent. The slope of the terrace may have minimised the usefulness of this area for occupation.

### Floodplain edge (Area 5)

The small open excavation area produced a small number of features that could only be given a broadly Roman date. These included five pits and two ditches aligned east–west (contexts 4503 and 4516: both c 1.50m wide; respectably 0.40m deep and 0.90m deep), cut into the alluvium ([Figs 7 and 8](#)). Both ditches extended out from the edge of the floodplain

deposits, and were probably associated with drainage or land division, ditch 4503 most likely being a replacement of 4516. Ditches in this area would have silted up quite quickly, being located on the floodplain.

### Period 3: late 1<sup>st</sup> to late 2<sup>nd</sup> century AD

The dating evidence indicates that there was limited landuse in the late 1<sup>st</sup> to later 2<sup>nd</sup> century AD, based on the artefact assemblage.

#### Top of the terrace and terrace slope (Areas 1, 2 and 3)

A buried soil horizon (contexts 1007, 2097, 2104) was noted across the site, and contained material ranging from the 1<sup>st</sup> to 3<sup>rd</sup> centuries. This layer was truncated by all the later Roman features. It appears to have originated in the late 1<sup>st</sup> century, though continued reworking in the later periods may account for some of the later 3<sup>rd</sup> century material present. The lack of any major activity datable to Period 3 on the top of the terrace and on the slope indicated that this area lay outside the main areas of Roman occupation. The site probably lay in area utilised for agricultural purposes at this period.

#### Floodplain edge (Area 5)

Quantities of Roman pottery and features were noted on the floodplain (Area 5, Trenches 20–6 and 28). A number of features were assigned to Period 3 in Trenches 23, 25 and 26, including ditches and pits. A well-defined ditch aligned north–south in Trench 23, also of 2<sup>nd</sup> century date, was overlain by later Roman activity. The presence of these early features attests to the usage of this part of the floodplain in the early Roman period onwards.

### Period 4: late 2<sup>nd</sup> to late 3<sup>rd</sup> century AD

There was evidence for more intensive activity on the site from the later 2<sup>nd</sup> century into the mid–late 3<sup>rd</sup> century AD.

#### Top of terrace (Areas 1 and 2)

The construction of two buildings (Structures 1 and 2) was dated to this period, along with extensive small-scale gravel quarrying (Quarry pits group 2). Also at this time there was continued formation and re-turning of a buried soil horizon (contexts 1007, 2097, 2104).

#### *Structures*

Dating for the structures was not secure and the structural evidence had been subject to some level of truncation. The two buildings (Structures 1 and 2) were of different designs. Structure 1 consisted of three sets of parallel short beam slots and at least three associated postholes, with overall dimensions of 7.5m+ by 5m (Fig 4); the eastern end of the structure was truncated. The structure was situated on the top of the terrace and orientated east–west.

Structure 2 was demarcated by at least eight substantial postholes (Fig 11), though the full extent of this structure was not completely revealed as it extended under the eastern edge of the excavation area. The postholes were c 0.60m diameter and 0.70m deep. The area of this structure was 4.50m wide and 9.50m+ long. There were no internal or other features

associated with this building. This structure was located on the top of the terrace, just to the north of the present railway line, and was orientated roughly north–south. It is probable that the two structures were broadly contemporary, and the different construction methods may reflect different functions.

Structure 1 seems to have been a more sophisticated structure, with beam slots, whereas Structure 2 was post-built. Although a small amount of building material was recovered from the site, and is interpreted as rubbish dumped on the site, having been brought from elsewhere in the Roman settlement ([see p95](#)), suggesting that the wall plaster and ceramic roof tiles recovered did not originate from either of these two buildings.

No distinctive artefacts were recovered from these buildings that indicated function. An assemblage of plant macrofossils from Structure 2 included grain, chaff and weed seeds, and is interpreted as the waste from crop processing ([see p122](#)). It seems probable that both structures were agricultural buildings, and were probably associated with domestic buildings outside the area of the City Campus site. Similar structural evidence is recorded from contemporary sites in Worcester, and is interpreted as agricultural buildings or workshops with thatched or shingle roofs ([Dalwood 2004c](#), 83).

### *Quarry pits*

A group of 60 quarry pits (Quarry pits group 2) covered an area of roughly 15m by 7.5m (112.5m<sup>2</sup>; [Fig 4](#)). These intercutting pits varied in size and were c 1.50m to c 2m in diameter and c 0.5m deep ([Fig 9](#), [Fig 10](#)), and concentrated in an area of the natural sands and gravels with a high proportion of gravel in the matrix. The pits appear to have been dug in order to obtain gravel for use elsewhere, and are identified as quarry pits. The artefactual data suggests that the pits were excavated within a short space of time, somewhere in the early to mid-2<sup>nd</sup> century ([see p29](#)). Some of the pits were probably opened and backfilled relatively quickly, and others remained open and were used to discard domestic refuse. A number contained larger amounts of pottery and animal bone, but the volume of material was not very large in comparison to the evidence for rubbish dumping in Period 5.

### *Floodplain edge (Area 5)*

In Area 5 an extensive deposit was recorded overlying earlier Roman features in Trenches 21, 22 and 23. This extensive deposit (WCM 101483: contexts 2113, 2206, 2315) consisted of mixed alluvial clay and silts, containing pottery dating to the 3<sup>rd</sup> century. This extensive deposit, along with a similar one in Trench 24 (WCM 101483: context 2406), may represent the deliberate importation of material onto the floodplain for reclamation, including infilling water channels and general raising of the ground level to allow for occupation of this area. This deposit was followed by continued activity on the floodplain, indicated by the digging of later features including ditches (WCM 101483: context 2208).

### *Period 5: late 3<sup>rd</sup> to early ?4<sup>th</sup> century AD*

There was evidence for continued activity across the site in the late 3<sup>rd</sup> century, and into the early 4<sup>th</sup> century, but the small number of 4<sup>th</sup> century diagnostic artefacts indicates that Roman activity and landuse were at a very low level during the 4<sup>th</sup> century.

## Top of terrace (Areas 1 and 2)

A number of features on the top of the terrace were dated to the later 3rd century (and possibly early 4<sup>th</sup> century), including a circular enclosure and a second large group of gravel quarry pits.

### *Circular enclosure*

On the highest point of the terrace a circular enclosure (context 2258) was recorded ([Fig 14](#)). It measured *c* 29.50m in diameter; the ditch was *c* 1.50m wide and between 0.3–0.4m deep, and contained two separate fills. The ditch had steep, concave sides and a generally flat and regular base. There was no interruption in the ditch indicating an entrance. The ditch appeared to have been constructed in a single phase, and showed no signs of having been re-cut at a later date. The enclosure was circular, although the edges appeared to be slightly irregular, as if the ditch had been excavated in a series of short straight sections.

Two radiocarbon dates were obtained from plant macrofossils from the fills which provided a fairly broad range of dates focused on the mid–late 3<sup>rd</sup> century ([see p143](#)). There were no features in the interior that appeared to be contemporary with the ditch. The environmental evidence from Period 5 deposits is indicative of waste from crop processing ([see p106](#)), which does not in itself point to function. A number of possible interpretations are discussed below ([see p141](#)).

### *Quarry pits*

A second and more intensive phase of gravel quarrying took place during Period 5, represented by a considerable number of quite large intercutting pits in a concentrated area (Quarry pits group 1; [Figs 4, 12 and 13](#)). A group of around 77 pits, *c* 1m diameter and 0.40m deep, occupied an area of 9.5m by 17.5m (*c* 165m<sup>2</sup>). The largest pit (context 1180) in this group was nearly 3.5m in diameter and 0.9m deep. This group of pits was interpreted as being dug for the extraction of gravel, perhaps for road building (the same as the Period 4 quarry pits), as they were located in an area where the gravel had a high concentration of larger, sub-rounded pebbles, while the surrounding geology was primarily sand.

The majority of the quarry pits contained large quantities of rubbish, including animal bone, pottery, personal items and building materials. The pottery was very fragmentary, suggesting that the material may have derived from possible midden dumps before it was used to backfill the quarry pits. The quantity of material suggests that many of the pits were used for the deliberate deposition of quantities of domestic rubbish once the gravel had been removed. There were much larger quantities of domestic rubbish in this group of quarry pits than in the Period 4 quarry pits (Quarry pits group 2), and this probably indicates that the rubbish disposal activities were not the same. The presence of building materials, indicated that an element of the rubbish was demolition rubbish from substantial buildings. The rubbish from these quarry pits was the focus for detailed analyses

## Floodplain edge (Area 5)

During Period 5 there was continued activity on the floodplain, in the form of pits and ditches recorded in the evaluation trenches.



## Period 6: later 3<sup>rd</sup> to 4<sup>th</sup> century AD

A range of deposits and features in Areas 1 and 2 were assigned to Period 6, representing the latest Roman activity on the site. The definitive date of most of the deposits assigned to Period 6 is open to question. There was a very low level of diagnostic 4<sup>th</sup> century artefacts and little other dating evidence. Period 6 deposits were dated to the later 3<sup>rd</sup> century to early 4<sup>th</sup> century, and there is considerable overlap in dating with Period 5 deposits. The development of a thick 'tillage soil' over Roman deposits derives from the dumping of organic refuse in the later Roman period. This deposit contained a Roman burial (context 1004), which probably occurred in the 4<sup>th</sup> century.

### Midden dumps

Layers with high concentrations of Roman artefacts were recorded stratified above earlier Roman features (including Quarry pits groups 1 and 2), and included contexts 1135, 1237, 1551 and 2154. These deposits are interpreted as middens, comprising dumps of refuse which infilled shallow depressions caused by slumping of the backfilled quarry pits. These deposits contained less fragmentary pottery than the rubbish dumped in the quarry pits, which seems to indicate variation in the refuse disposal practices over time ([see p148](#)). The midden dumps were not securely sealed stratigraphically, and underlay the broadly-dated tillage soils. As these layers lay at the base of the tillage soil it is possible that they contain intrusive material due to agricultural or horticultural activity in later periods, and this is noted below ([see p78](#), [see catalogue nos 11 and 79](#)). There was a low incidence of pottery or other artefacts datable to the 4<sup>th</sup> century from these dump deposits indicated that the majority of the dumping occurred before the mid-4<sup>th</sup> century. These layers were assigned to Period 6, but the dating overlaps with deposits assigned to Period 5.

### Tillage soil

In all the excavated areas a thick layer of 'tillage soil' was recorded, representing layers of soil that had derived from organic waste material from occupation areas, originating in the Roman period with additional material from manuring during later periods, on the model put forward for Farrier Street ([Macphail 1994](#), and [see p14](#)). The discovery of a burial within the lower levels of the tillage soil demonstrated that the soil had started to form in the later Roman period. These deposits were assigned to Periods 6–9, as it was considered that there was potential for post-Roman material in these deposits (although no artefactual material has been identified). Reworking and gradual formation of this soil is likely to have continued into the post-medieval period (Period 10).

### Human burial

During the machine removal of the tillage soil, the heavily truncated remains of a human burial were recorded (context 1004; [Figs 4, 16 and 17](#)). The burial had not been truncated during the machining, but showed signs of having been disturbed during past cultivation activity, as only 25% to 50% remained ([Figs 16 and 17](#)). Although the burial had been heavily truncated (including by a brick wall), the torso was intact, and the ribs, vertebrae and an arm were articulated showing that the burial was *in situ*. Analysis suggested it was possibly male and adult ([see p113](#)). There were no associated artefacts, but the dating was resolved by radiocarbon dating which provided a date of cal AD 250–397 ([see p141](#)). The probable date of the burial was in the late 3<sup>rd</sup> to 4<sup>th</sup> century. The burial was located wholly within the

tillage soil, which had started to form in the later Roman period. This appeared to be a single isolated late Roman burial. No disarticulated human bone was recovered from the tillage soils.

## Period 7–8: post-Roman to early medieval landuse

No features dated to the post-Roman period were identified. The tillage soil (see above) was assigned to Period 6–7, as it was effectively unstratified and was probably agricultural land or pasture during the post-Roman period. No artefactual or other evidence dating to this broad period was recorded.

## Period 9: medieval (11<sup>th</sup> to 15<sup>th</sup> century)

A single pit (context 4224) on the terrace slope (Area 4) contained medieval artefacts (Fig 5). This pit was an isolated feature, and it is possible that the dating evidence is residual material in a post-medieval deposit. Two further small pits and a posthole were tentatively dated to the medieval period.

An east–west aligned ditch in Trench 3 (Fig 3) was dated to the medieval period on the basis of roof tile fragments and stratigraphic position. A further section of ditch (WCM 101483: context 2108) aligned north-east to south-west was visible in Trench 21 of the 2007 evaluation. This ditch, with concave sides and base, contained medieval roof tile fragments and can be interpreted as a medieval boundary ditch.

No other features could be assigned a medieval date. The formation of the tillage soils continued throughout this period. A very small amount of medieval pottery was recovered from the tillage soils and from later contexts. The limited evidence for medieval occupation is as expected, as the site lay outside the city wall and medieval suburb, and would have been used primarily for horticulture and grazing livestock.

## Period 10: post-medieval (16<sup>th</sup> to early 18<sup>th</sup> century)

In the south-eastern part of Areas 1 and 2 a north-east to south-west alignment of ten square pits was recorded (Figs 4 and 18). Artefactual evidence indicated a late 17<sup>th</sup> to early 18<sup>th</sup> century date. The alignment extended beyond both the southern and eastern extent of the excavation. The original function of these pits is unclear, although the alignment is tentatively identified as the post pits of a ‘tenter rack’, used for the stretching and drying of woollen cloth after fulling. Areas outside the city walls were used for this purpose during the post-medieval period, and tenter racks are indicated north of the city wall on the Doherty map of Worcester (1742), and in the present name of nearby Rack Alley, just off The Butts to the south. There is no evidence that this area was occupied during the Civil War period. Although the area was close to the defensive works constructed in 1642 (see p17), no archaeological evidence relating to the Civil War period was recorded.

A mixed dark deposit (WSM 101483: contexts 203, 204, 304, 502, 503, 603, 700, 702, 703, 800, 801, 904, 1100, 1204 and 1303) was noted in a number of the trenches and contained residual earlier material, but also datable artefacts from the 17<sup>th</sup> and 18<sup>th</sup> centuries. During the main excavation this layer was machined under archaeological supervision. These mixed deposits are likely to have derived from continued horticultural activity, reworking the earlier tillage soils. The frequency of high quantities of large and unabraded sherds of Roman

pottery suggests that the soils were not being continuously reworked. This deposit appeared to be similar to the earlier 'tillage soils' though contained frequent brick and stone rubble.

## Period 11: late post-medieval (mid-18<sup>th</sup> to 19<sup>th</sup> century)

### Walnut Tree House and associated structures

The earliest standing building on the site was Walnut Tree House, a brick-built house dating from at least 1768 ([Mercian Archaeology 2005](#)) which was recorded by CgMs Consulting prior to demolition ([Hulker 2013](#)). The excavation of Area 1 recorded the cellar of the building ([Fig 4](#)), as well as associated structures.

To the south of Walnut Tree House a number of wall footings were recorded, extending under the southern extent of the site ([Fig 4](#)). These walls appear to relate to outbuildings associated with Walnut Tree House. A plan of these structures first appears on the 1<sup>st</sup> edition Ordnance Survey map of 1886, and they were demolished prior to 1965. Other contemporary structural remains included a large brick-lined well (contexts 1403/1405), a small brick soakaway (context 1414) and associated brick culverts. To the north of Walnut Tree House a brick wall (context 2023) was recorded ([Fig 19](#)), probably the boundary wall of the property.

A small brick structure (5.30 x 2.20 x 0.65m) was fully excavated. The structure lay to the east of Walnut Tree House and does not appear on any historic maps. It consisted of a metal grate and associated stoke pit at the northern end, and a channel to funnel hot air into and around the structure to provide an even distribution. The entire structure was constructed from un-frogged bricks and bonded with a rough lime mortar, and had been demolished and backfilled with brick, tile and ceramic material (mostly flower pots) dated to the 19<sup>th</sup> century ([Figs 4 and 20–1](#)). It could be securely dated to the early Victorian period through the style of the bricks, but no tighter date for construction could be ascertained. The structure was initially identified as a brick kiln, but a stronger interpretation is that it is the stoke pit, furnace hearth and underfloor heating vents of a hothouse (Shona Robson-Glyde pers comm). It is likely that this structure was contemporary with Walnut Tree House.

### Worcester Royal Infirmary

The Worcester Royal Infirmary buildings were either outside the areas of investigation or had been demolished during the demolition phase prior to the area excavations. Consequently only limited evidence for the hospital buildings was recorded during the excavation. The original Worcester Royal Infirmary building (along with some later additions) was retained and was refurbished for use by the University of Worcester. Full building recording and analysis was undertaken ([Hulka 2013](#)).

An east–west brick wall in Trench 3 ([Fig 3](#)) appeared to be the southern boundary wall of the original hospital property. The wall consisted of well-mortared bricks, ten courses deep, bonded with a hard yellow lime mortar, and the bricks were 2.5 inches thick, handmade and dated to the mid/late 18<sup>th</sup> century.

Thin rubble layers, consisting of brick fragments and crushed mortar were observed spread across the higher ground and the terrace slope, and yielded material dating to the late 18<sup>th</sup> century. Construction work in the late 18<sup>th</sup> century to 19<sup>th</sup> century resulted in large-scale soil movements, which comprised both truncation of soils and archaeological deposits down

to natural deposits and the dumping of soil to raise the ground level between the late 18<sup>th</sup> century and the 20<sup>th</sup> century (observed in Trenches 15, 27 and 29).

## Period 12: modern (19<sup>th</sup> to 20<sup>th</sup> century)

### Worcester Royal Infirmary

Human remains dating to the 19<sup>th</sup> century were recovered from three locations close to the hospital building during the watching brief ([Fig 3](#)). Below part of the later hospital a large pit was recorded, which was filled with disarticulated human bone. In close proximity to this pit were a secondary smaller pit and a spread of heavily truncated human bone. A third pit with human remains was also identified some 50m to the north-east. Material recovered from these contexts indicated a 19<sup>th</sup> century date. A large amount of the human bone showed signs of medical intervention, and this material has been analysed ([Ossafreelance 2014](#)) and will be published elsewhere.

A great deal of modern activity was recorded on the terrace slope (Area 4), including pits containing modern material ([Fig 5](#), [Fig 6](#)). Modern construction involving extensive terracing in this area completely changed the previously open character of this area.

### Radiocarbon dating

Radiocarbon dating was undertaken in order to resolve the dating of two features. At the assessment stage ([HEAS 2010](#)) the circular enclosure was not convincingly dated as Roman on the basis of its form, stratigraphic position, and associated artefacts. Similarly, a single human burial was undated. Charred grains of brome grass (*Bromus* sp) recovered from the circular enclosure (context 2177, a ditch fill) were submitted to two different dating laboratories in order to test for variability in date which might be explained by residuality in the charred plant material and for differing degrees of confidence in dating from different dating laboratories. A small sample of human bone was also submitted from the burial (context 1004). Radiocarbon dates from these two structures are set out in Table 47. The dates resolved the question of the dating of both features to the later Roman period. The circular enclosure is assigned to Period 5 (later 3<sup>rd</sup> century) and the human burial to Period 6 (late 3<sup>rd</sup> century to 4<sup>th</sup> century).

## Artefact analysis

### Prehistoric pottery

by *C Jane Evans*

A total of 14 sherds of prehistoric pottery were identified, weighing 79g. All were residual in Roman deposits. This prehistoric pottery is not included in the pottery tables presented below. Descriptions for the prehistoric fabrics can be found at <http://www.worcestershireceramics.org/fabrics>.

Of particular interest was a rim from a small bowl or cup (Fig 22, 1) found in the tillage soil. The form is similar to the latest Bronze Age bowls and cups illustrated from Potterne, Wiltshire (Lawson 2000, fig 48, bowl type 3.1; fig 60, cup type 83), and may be of a similar date.

The remaining fragments were body sherds. One sherd (8g) was in a coarse, angular quartz tempered fabric (Fabric 5.4), typical of Bronze Age assemblages in this region. The sherd, which was hard fired and in a very micaceous clay, came from a Period 5 pit (2185, fill 2184). The same fill also produced a tiny sherd (1g) which may once have had impressed decoration, though its small size and the level of abrasion meant this could not be identified with certainty. This sherd was in a distinctive Malvernian ware variant, similar to dolerite-tempered ware (Fabric 6). A similar fabric has been noted in middle and late Bronze Age assemblages in both Worcestershire, at Beckford (Evans *et al* nd), and also near Worcester at the Perdiswell ringwork (Mullin and Ixer 2010), and in Herefordshire, at Moreton-on-Lugg (Robin Jackson pers comm, Fabric MoL5). A larger sherd (38g) in a similar fabric came from Period 4–5 pit 4532 (fill 4533). This pit also produced a sherd (10g) in a very vesicular fabric which, again, was very abraded but may have had impressed decoration. This may have been a shell tempered ware, based on the shape of the voids (cf Fabric 4.3). Another very small sherd (2g), from Period 5 pit 4011 (fill 4009) appeared to be in dolerite tempered ware (Fabric 6), also a Bronze Age fabric. The other sherds were not in diagnostically earlier fabrics. Seven shattered fragments in a sandy fabric (Fabric 5.1) were recovered from Period 5 pit 1322 (fill 1319). This fabric is found in Iron Age assemblages in the region. A sherd in handmade Malvernian ware (Fabric 3) from Period 5 pit 1114 (fill 1089) did not look like a Roman form and may also be Iron Age in date.

#### *Illustrated prehistoric pottery (Fig 22)*

1. Rim from a late Bronze Age cup or bowl. The fabric is uncertain as the sherd is very vesicular and the inclusions have leached out. Weight 6g. Diam c14cm (5%). Period 6–7 tillage soil, layer 1002.

### Prehistoric lithics

by *Hugo Anderson-Whymark*

Three prehistoric struck flint flakes were recovered as residual finds in Roman contexts (other unworked flint was recovered but is not catalogued). All three flakes are relatively thin and were struck from regular single platform flake cores. One of the flakes exhibits platform-edge abrasion, indicating a careful reduction strategy. These reduction techniques are, however, not intrinsically datable and only a broad Neolithic or early Bronze Age date can be proposed.

### *Catalogue of lithics*

1. Flake of gravel flint with moderate edge-damage. Area 1, Period 5 quarry pit 1303 (fill 1302).
2. Tertiary flake of light brown flint in fresh condition. Area 1, Period 6 layer 1551.
3. Flake of light grey flint with platform edge-abrasion. Slightly edge-damaged condition. Neolithic or ?early Bronze Age. Area 2, Period 5 pit 2187 (fill 2200).

### Roman pottery

*by C Jane Evans, with Kay Hartley (mortaria), Jo Mills (samian), David Williams (amphorae and graffiti) and Roger Tomlin (graffiti)*

#### Introduction

A total of 9,732 sherds of Roman pottery were recovered, weighing 153kg. The intention was that coarse wares from only Periods 3–7 would be recorded in detail; that is material from Roman deposits and pottery from Roman dumping that had been incorporated into the tillage soil. In the event, small quantities of pottery from post-Roman contexts were also recorded, as the phasing of some contexts was revised during and immediately after analysis. All the samian was analysed, to provide dating for 1<sup>st</sup> to 3<sup>rd</sup> century activity in the vicinity of the site. The pottery from post-Roman contexts, recorded and not recorded, is included in Table 4. With the exception of occasional sherds which provide the best example of a form, however, only pottery from Periods 3–7 is discussed in detail in the report that follows.

Most of the pottery recorded came from Area 1 (Table 5), in particular from the Period 4 and 5 quarry pits (Quarry pits groups 1 and 2), and the Period 6 layers sealing these (Table 4). Very little pottery came from the earliest activity on the site (Period 3; Table 4; [Fig 22](#)), and roughly half came from Period 6 deposits. The emphasis on pits and layers is evident when the assemblage is summarised by feature type (Table 6), with relatively small quantities coming from ditches and postholes.

The methodology is described in Method of analysis, [page 7](#). The pottery is discussed below by fabric, describing the range of forms represented. There follows a discussion by date and period, presenting the dating evidence and characterising the period assemblages. Samples of fabrics were retained as part of the WCOD fabric series.

#### Fabrics

A total of 63 fabrics were identified, discussed separately below. The range of fabrics identified is set out in Table 7, and the Roman pottery assemblage is quantified by fabric in Table 8. Detailed information on the range of fabrics by site period is presented in Table 9 and the relationship between fabric and form type is presented in Table 10.

Table 9 Roman pottery by fabric and main periods (count and weight)

Fabric code	Period 3				Period 4				Period 5				Period 6				Period 6-7			
	Count	% count	Wt (g)	% wt	Count	% count	Wt (g)	% wt	Count	% count	Wt (g)	% wt	Count	% count	Wt (g)	% wt	Count	% count	Wt (g)	% wt
3	2	4	86	7	15	2	206	2	135	4	1927	5	89	2	2335	3	3	1	130	1
12	9	18	249	20	219	25	2525	22	1101	30	8985	25	933	24	17687	25	74	25	2441	26
12.1					14	2	162	1	40	1	408	1	38	1	555	1	3	1	68	1
12.2	3	6	74	6	64	7	1768	15	159	4	1984	6	59	2	1808	3	28	9	996	11
12.21					5	1	88	1	37	1	311	1	21	1	408	1				
12.22					2	<1	2	<1	15	<1	103	<1	8	<1	228	<1				
12.23					3	<1	6	<1	16	<1	150	<1	1	<1	10	<1				
12.24	6	12	312	25	200	23	1336	12	240	6	3361	10	146	4	3521	5	5	2	112	1
12.25					19	2	394	3	62	2	824	2	12	<1	153	<1				
12.3	1	2	15	1	4	<1	34	<1	11	<1	252	1	13	<1	463	1				
12.4													1	<1	35	<1				
12.5	3	6	40	3	30	3	228	2	159	4	2210	6	129	3	2311	3	26	9	477	5
12.6	7	14	136	11	90	10	1728	15	458	12	5128	15	370	10	8920	13	33	11	1017	11
12.7					3	<1	52	<1	14	<1	149	<1	33	1	757	1	4	1	150	2
12.8	2	4	6	<1	25	3	334	3	131	4	1267	4	59	2	1078	2	17	6	488	5
13					5	1	73	1	32	1	205	1	7	<1	50	<1	4	1	87	1
14									9	<1	54	<1	8	<1	121	<1	2	1	96	1
14.1									1	<1	11	<1								
15									2	<1	8	<1	1	<1	5	<1	1	<1	24	<1
16.1									1	<1	8	<1	2	<1	91	<1				
19	3	6	68	5	27	3	614	5	72	2	1277	4	429	11	10933	16	23	8	974	10
19.1													1	<1	10	<1				
20					6	1	33	<1	13	<1	180	1	5	<1	98	<1	3	1	94	1
20.1					1	<1	3	<1	12	<1	55	<1	5	<1	10	<1				
20.2									4	<1	21	<1								
20.3									1	<1	3	<1								
20.4					3	<1	7	<1												
21					8	1	8	<1	33	1	160	<1	6	<1	133	<1	1	<1	10	<1
21.3									1	<1	35	<1								
22	6	12	85	7	55	6	341	3	448	12	3163	9	1103	29	9976	14	26	9	539	6
22.1									1	<1	4	<1	2	<1	26	<1				
23									1	<1	4	<1								
28					1	<1	3	<1	11	<1	34	<1	8	<1	31	<1	1	<1	2	<1
28.1									2	<1	7	<1	11	<1	60	<1	4	1	20	<1
29									10	<1	34	<1	5	<1	31	<1	2	1	40	<1
30					1	<1	1	<1	2	<1	2	<1								
32	1	2	117	9	3	<1	131	1	7	<1	267	1	20	1	1612	2				
33.1					19	2	1305	11	5	<1	66	<1	10	<1	579	1				
34													6	<1	485	1				
37									1	<1	38	<1	1	<1	15	<1				
38					2	<1	3	<1	8	<1	54	<1	23	1	238	<1				
41					1	<1	2	<1	2	<1	6	<1	1	<1	2	<1				
41.2									13	<1	75	<1	4	<1	56	<1				
42					2	<1	33	<1	6	<1	83	<1								
42.1					1	<1	6	<1	3	<1	421	1	17	<1	2760	4	4	1	779	8
42.2	1	2	18	1																
42.3					1	<1	14	<1	3	<1	58	<1	8	<1	179	<1	1	<1	157	2
43					1	<1	9	<1	4	<1	3	<1								
43.1																				
43.2	4	8	58	5	26	3	88	1	391	11	1742	5	154	4	925	1	29	10	398	4
43.3									6	<1	55	<1	20	1	284	<1	1	<1	45	<1
43.4									1	<1	6	<1	11	<1	634	1	2	1	154	2
43.5					1	<1	1	<1	1	<1	1	<1								
43.6					5	1	10	<1												
44									3	<1	11	<1	2	<1	12	<1				
44.1									1	<1	15	<1								
45.1									2	<1	6	<1								
45.4	1	2	5	<1					7	<1	23	<1	4	<1	8	<1				
98									2	<1	21	<1								
98.1									3	<1	4	<1								
109									2	<1	3	<1								
151					2	<1	10	<1	10	<1	70	<1	26	1	147	<1				
<b>Total</b>	<b>49</b>	<b>100</b>	<b>1269</b>	<b>100</b>	<b>864</b>	<b>100</b>	<b>11558</b>	<b>100</b>	<b>3715</b>	<b>100</b>	<b>35353</b>	<b>100</b>	<b>3812</b>	<b>100</b>	<b>69780</b>	<b>100</b>	<b>297</b>	<b>100</b>	<b>9298</b>	<b>100</b>

[to previous view](#)

Table 4 Roman pottery assemblage by period and main context group

Period name	Period reference	Context group name	Count	% count	Wt (g)	% wt	Av sherd wt	Rim EVE	% rim EVE
Natural	1		11	0.1	101	0.1	9		
Roman	3		49	0.5	1269	0.9	26	1.72	1
	3-4		23	0.2	449	0.3	20	0.06	<1
	3-4	Area 2, Structure 1	53	0.6	299	0.2	6	0.11	<1
	3-6		29	0.3	251	0.2	9	0.03	<1
	3-10		2	<0.1	13	<0.1	7		
	4		217	2.3	3118	2.2	14	2.41	2
	4	Area 1 Quarry pits group 2	408	4.3	6381	4.6	16	3.58	3
	4	Area 1, Structure 2 Posthole group	239	2.5	2060	1.5	9	1.74	1
	4-5		147	1.6	2014	1.4	14	1.58	1
	4-6		72	0.8	521	0.4	7	0.33	<1
	5		375	4.0	4364	3.1	12	3.85	3
	5	Area 1 Quarry pits group 1	2997	31.7	27563	19.8	9	25.42	22
	5	Area 2 Circular enclosure	343	3.6	3427	2.5	10	3.54	3
	5-6		57	0.6	275	0.2	5	0.11	<1
	5-7		118	1.2	2619	1.9	22	1.38	1
	5-11		26	0.3	110	0.1	4	0.19	<1
	6		718	7.6	19242	13.8	27	11.95	10
	6	Area 1 layer above Quarry pits group 1	1553	16.4	26803	19.3	17	23.79	20
	6	Area 1 layer above Quarry pits group 2	1541	16.3	23735	17.1	15	24.93	21
Roman to post-Roman	6-7		297	3.1	9298	6.7	31	8.13	7
Post-Roman & unstrat: recorded	8-12		183	1.9	5213	3.7	28	2.89	2
Total recorded			9458	100.0	139125	100.0	15	117.74	100
Post-Roman & unstrat: not recorded			274		13698		50		
<b>Total Roman pottery</b>			<b>9732</b>		<b>152823</b>		<b>16</b>		



### Handmade Malvernian ware, Fabric 3

Handmade Malvernian ware first occurred in Period 3 and was present throughout the sequence, with proportions by weight varying from 1% to 4% by period (Table 9, Fig 24) It was proportionately most common in Periods 3 and 5, though the percentage for the small Period 3 assemblage is based on only two sherds. Lids were by far the most common vessel type represented (Table 10), followed by cook pots, dishes and bowls/dishes. A number of form variations were noted amongst the lids: either convex or concave and with plain or beaded rims, though convex lids with plain rims were most common (59% by rim EVE; Fig 25, 4). A possible connection between these lids and Wheelmade Malvernian jars described under Fabric 19, below. The cook pots included ‘tubby cooking pots’, mainly with inturned rims (Fig 25, 1; 6% by rim EVE) and less commonly with upright rims (1% by rim EVE, not illustrated; cf Bryant and Evans 2004, fig 153.6, 7). Other cook pots copied BB1 types, similar to forms illustrated for Fabric 19 below (Fig 38, 64), as did the dishes (Fig 25, 2–3). The presence of sooting, smoke fuming and limescale, sometimes together, confirmed that this ware was used in cooking. Where form was identifiable, limescale was recorded on a tubby cooking pot, sooting and smoke fuming on lids, and a BB1 copy dish is recorded as ‘burnt in use’.

Table 5 Roman pottery quantification by site area

Area	Count	% count	Wt (g)	% wt	Av sherd wt	Rim EVE	% rim EVE
1	8141	86	122726	88	15	103.89	88
2	894	9	10752	8	12	8.47	7
4	170	2	2902	2	17	3.11	3
5	243	3	2635	2	11	2.11	2
unstratified	10	<1	108	<1	11	0.16	<1
<b>Total</b>	<b>9458</b>	<b>100</b>	<b>139123</b>	<b>100</b>	<b>15</b>	<b>117.74</b>	<b>100</b>

Table 6 Roman pottery assemblage by feature type

Feature type	Count	% count	Wt (g)	% wt	Av sherd wt	Rim EVE	% rim EVE
Arbitrary	1573	17	29298	21	19	25.35	22
Beam slot	10	<1	377	<1	38	0.02	<1
Ditch	451	5	4457	3	10	4.70	4
Foundation trench	1	<1	1	<1	1		
Layer	2310	24	46188	33	20	42.07	36
Natural	11	<1	101	<1	9		
Pit	4429	47	48514	35	11	38.55	33
Posthole	364	4	2722	2	7	2.23	2
Unspecified	309	3	7465	5	24	4.82	4
<b>Total</b>	<b>9458</b>	<b>100</b>	<b>139123</b>	<b>100</b>	<b>15</b>	<b>117.74</b>	<b>100</b>

Table 7 Roman fabrics represented in assemblage

WAAS fabric code	Site specific fabric code	Fabric common name	NRFRC code (Tomber and Dore 1998)	Other published reference	Magistrates Court (Evans forthcoming)
3		Malvernian ware	MAL RE A	Hurst and Rees 1992	G44
12		Severn Valley ware	SVW OX 2?	Hurst and Rees 1992	O20
12.1		Reduced Severn Valley ware		Hurst and Rees 1992	
12.2		Oxidised organically tempered Severn Valley ware		Hurst and Rees 1992	O21
	12.21	Oxidised Severn Valley organic variant, grog			
	12.22	Oxidised Severn Valley organic variant, sparse organic & grog			O91
	12.23	Oxidised Severn Valley organic variant, sand			
	12.24	Fine oxidised Severn Valley organic variant			
	12.25	Oxidised Severn Valley organic variant, common white inclusions			
12.3		Reduced organically tempered Severn Valley ware		Hurst and Rees 1992	R32
12.4		Oxidised Severn Valley ware variant, shelly limestone		Bryant and Evans 2004, 255	
12.5		Oxidised Severn Valley ware variant, sandy and micaceous		Bryant and Evans 2004, 256	O29? O291? O23? O231? O24
12.6		Oxidised Severn Valley ware variant, common white inclusions		Bryant and Evans 2004, 256-7	O27
	12.7	Oxidised Severn Valley ware variant, grog			
	12.8	Oxidised Severn Valley ware variant, vesicular			O36?
13		Sandy oxidized ware		Hurst and Rees 1992	
14		Fine sandy grey ware		Hurst and Rees 1992	
	14.1	Fine sandy grey ware			
15		Coarse sandy grey ware		Hurst and Rees 1992	R01/11
16.1		Savernake ware	SAV GT		
17		Pink grog tempered ware	PNK GT	Booth and Green 1989	G11
19		Wheelthrown Malvernian ware		Hurst and Rees 1992	G46, G47?
19.1	19.1	Wheelthrown Malvernian ware, limestone tempered			
20		White slipped ware, general category		Hurst and Rees 1992?	
	20.1	White slipped ware, fine fabric		Hurst and Rees 1992?	
	20.2	White slipped ware, buff			
	20.3	White slipped ware, painted			
	20.4	White slipped ware, sand and common white inclusions cf 12.6			
21		Micaceous ware		Hurst and Rees 1992	
21.3		Early micaceous ware		Griffin 2002	
22		Black-burnished ware, type 1 (Dorset BB1)	DOR BB 1		B01
	22.1	Black-burnished ware, type 1 (South-west BB1)	SOW BB 1		
23		Shell gritted ware	ROB SH		
28		Nene Valley ware, white/pale buff	LVN CC		F53
	28.1	Nene Valley ware, red	LVN CC		F51?
29		Oxfordshire red/brown colour coated ware	OXF RS		F51
30		Oxfordshire white colour coated ware	OXF WS		
32		Mancetter/Hartshill mortarium	MAH WH		M22
33.1		Oxfordshire white mortaria	OXF WH		M23
34		West Midlands mortarium (Wroxeter ?)	WRX WH		
37		Severn Valley mortarium		Hurst and Rees 1992	
38		Oxfordshire white ware	OXF WH		
41		Unprovenanced white ware			
42		Amphorae			
42.1		Dressel 20 type	BAT AM 2?		A21
42.2		Dressel type 2-4	CAM AM 1		
42.3		Pelichet 47 type (Gauloise 4 type)	GAL AM 1		A22
43		Samian ware (unspecified)			
43.1		?Southern Gaulish samian ware			S10
43.2		Central Gaulish samian ware, Lezoux	LEZ SA 2		S20

*to previous view*

<b>WAAS fabric code</b>	<b>Site specific fabric code</b>	<b>Fabric common name</b>	<b>NRFRC code (Tomber and Dore 1998)</b>	<b>Other published reference</b>	<b>Magistrates Court (Evans forthcoming)</b>
43.3		Eastern Gaulish samian ware, Rheinzabern	RHZ SA		S30
	43.4	Eastern Gaulish samian ware, Trier	TRI SA		S30
	43.5	Eastern Gaulish samian ware, unspecified			S30
	43.6	Central Gaulish samian, Les Martres-de-Veyre	LMV SA		S21
44		Rhenish ware (Mosel Keramik)	MOS BS		F32
	44.1	Rhenish ware (Cologne)	KOL CC		
45.1		Central Gaulish (Cream) Colour-coated ware	CNG CC 2		
	45.4	Central Gaulish Black-slipped ware	CNG BS		
	98.1	Miscellaneous Roman wares, fine fabric			
109		Eggshell ware			
151		South-west oxidised ware	SOW [OX]		

Table 8 Roman pottery assemblage by fabric

Fabric code	Count	% count	Wt (g)	% wt	Av sherd wt	Rim EVE	% rim EVE
3	299	3	7681	6	26	6.92	6
12	2559	27	34688	25	14	25.33	22
12.1	100	1	1226	1	12	1.15	1
12.2	326	3	6795	5	21	3.36	3
12.21	63	1	807	1	13	0.08	<1
12.22	26	<1	337	<1	13	0.16	<1
12.23	25	<1	214	<1	9		
12.24	627	7	8875	6	14	6.24	5
12.25	109	1	1637	1	15		
12.3	35	<1	877	1	25	0.72	1
12.4	5	<1	85	<1	17	0.07	<1
12.5	405	4	5895	4	15	5.75	5
12.6	1032	11	18319	13	18	14.39	12
12.7	70	1	1334	1	19	0.33	<1
12.8	247	3	3457	2	14	1.02	1
<b>Total SVW</b>	<b>5629</b>	<b>60</b>	<b>84546</b>	<b>61</b>	<b>15</b>	<b>58.60</b>	<b>50</b>
13	61	1	491	<1	8	0.68	1
14	20	<1	276	<1	14	0.76	1
14.1	1	<1	11	<1	11		
15	4	<1	37	<1	9		
16.1	3	<1	28	<1	9		
17	1	<1	86	<1	86	0.05	<1
19	593	6	14732	11	25	14.12	12
19.1	1	<1	10	<1	10		
20	31	<1	415	<1	13		
20.1	18	<1	68	<1	4		
20.2	4	<1	21	<1	5		
20.3	1	<1	3	<1	3		
20.4	4	<1	23	<1	6		
21	1	<1	35	<1	35	0.07	<1
21.3	49	1	316	<1	6	0.34	<1
22	1708	18	15067	11	9	23.16	20
22.1	3	<1	30	<1	10	0.03	<1
23	2	<1	12	<1	6	0.06	<1
28	21	<1	70	<1	3	0.24	<1
28.1	19	<1	101	<1	5	0.17	<1
29	17	<1	105	<1	6	0.08	<1
30	3	<1	3	<1	1		
32	33	<1	2192	2	66	0.84	1
33.1	36	<1	1982	1	55	1.39	1
34	7	<1	495	<1	71	0.33	<1
37	2	<1	53	<1	27		
38	33	<1	295	<1	9	0.97	1
41	24	<1	152	<1	6		
42	8	<1	116	<1	15		
42.1	26	<1	3972	3	153		
42.2	1	<1	18	<1	18		
42.3	16	<1	531	<1	33		
43	6	<1	13	<1	2		
43.1	1	<1	1	<1	1	0.10	<1
43.2	651	7	3548	3	5	6.62	6
43.3	28	<1	387	<1	14	1.36	1
43.4	16	<1	844	1	53	0.46	<1
43.5	3	<1	4	<1	1		
43.6	5	<1	10	<1	2		
44	6	<1	29	<1	5	0.10	<1
44.1	1	<1	15	<1	15		
45.1	2	<1	6	<1	3		
45.4	15	<1	40	<1	3	0.14	<1
98	2	<1	21	<1	11		
98.1	3	<1	4	<1	1		
109	2	<1	3	<1	2		
151	38	<1	227	<1	6	0.15	<1
<b>Total</b>	<b>9458</b>		<b>139125</b>			<b>117.74</b>	

Table 10: Roman pottery by fabric and form type (rim EVE)

Pot form type	3	12	12.1	12.2	12.21	12.22	12.24	12.3	12.4	12.5	12.6	12.7	12.8	13	14	16.1	19	21	21.3	22	22.1	23	28	28.1	29	32	33.1	34	38	44	45.4	151	
		22		15						1	2									5			13	4							14		
Beaker		54	11							17	4												11	13								15	
Beaker/jar		8	2							37	8									11													
Beaker?																													10				
Bowl		503	4		8	10	157	7		95	284							5							8				7				
Bowl/dish	5	2															39			392													
Bowl/jar		36		5			11				2		10																				
Cup																																	
Cup/bowl																																	
Dish	59		15					6		3							81		7	496													
Dish/ platter																																	
Flagon		18								10	8									55										90			
Flagon/ jar																																	
Jar		129	17	35			33	6		5	60		16	8	2		5	16															
Jar cook pot	106		2												14		1184			1355	3	6											
Jar large storage		140	12	7			2	15		41	37	9				5																	
Jar medium mouthed		13	8					38		14	5		16	25	54																		
Jar narrow mouthed		487	25	12			82			101	343			12																			
Jar narrow mouthed H		13																															
Jar wide mouthed		627	19	234		6	242		7	98	398	24	53	11			20																
Lid	522	58		2						27	11			12	6		83	9		2													
Misc																																	
Mortaria																										84	139	33					
Platter											5																						
Tankard		423		26			97			126	271		5					4															
Unident											1		2																				
<b>Total</b>	<b>692</b>	<b>2511</b>	<b>115</b>	<b>321</b>	<b>8</b>	<b>16</b>	<b>624</b>	<b>72</b>	<b>7</b>	<b>574</b>	<b>1437</b>	<b>33</b>	<b>102</b>	<b>68</b>	<b>76</b>	<b>5</b>	<b>1412</b>	<b>34</b>	<b>7</b>	<b>2311</b>	<b>3</b>	<b>6</b>	<b>11</b>	<b>13</b>	<b>8</b>	<b>84</b>	<b>139</b>	<b>33</b>	<b>97</b>	<b>10</b>	<b>14</b>	<b>15</b>	

*Catalogue of illustrated handmade Malvernian ware forms (Fabric 3; Fig 25, 1–4)*

1. Malvernian 'tubby cooking pot' with an inturned, bead rim, decorated with crude cross hatch burnish. A 1<sup>st</sup> to 2<sup>nd</sup> century type (Peacock 1965–67, fig 1, 10–12). Diam 18cm (9%). Period 5, quarry pit 1180, fill 1177. Database Rec 2589.
2. Dish with an upturned flange rim. While this is a copy of a mid–late 2<sup>nd</sup> century BB1 type (Seager Smith and Davies 1993, fig 123, WA type 22; Gillam 1976, fig 4, 62–3), similar flanged bowls are a feature of the late 3<sup>rd</sup> century, phase 3c, assemblage at Bays Meadow, Droitwich (Barfield 2006, fig 99, 178–80). Diam 17cm (24%). Period 4, cleaning layer 1008. Database Rec 2593.
3. Dish with a very slight flange rim, probably a similar date to the above. Diam 18cm (30%). Period 5, pit 4527, fill 4526. Database Rec 2588.
4. Convex lid with a plain rim. Diam 16cm (33%). Period 6, layer 1551. Database Rec 2221.

*Severn Valley ware, Fabric 12 and variants*

Severn Valley ware dominated the assemblage, as is typical for sites in this region (Fig 26). The fabric description published by Webster (1976, 18) is quite general, though he notes the presence of a range of minor variations. The National Roman Fabric Reference Collection defines two fabrics; a Malvernian Severn Valley ware (Tomber and Dore 1998, 148, SVW OX 1) and an un-sourced group of diverse fabrics (Tomber and Dore 1998, 149, SVW OX 2). A range of fabrics was recorded from this site. Some of these fabrics are already incorporated into the WCOD fabric series and have been published elsewhere (Fabrics 12, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6; Hurst and Rees 1992; Bryant and Evans 2004). Other variants are not so well defined, though some have parallels in assemblages, for example from Worcester Magistrates' Court (Table 7; Evans nd).

*Catalogue of illustrated Severn Valley ware forms: flagons, beakers and jars (Fig 27, 5–26)*

5. Flagon neck, Fabric 12.24. Period 6, layer 1135. Database Rec 657.
6. Bag shaped beaker or jar with a cornice rim. Similar forms, with roughcast decoration, are published from Birch Abbey, Alcester, where they are dated to the 2<sup>nd</sup> century (Lee *et al* 1994, fig 29, 0.220–3. Fabric 12.1. Diam 12cm (11%). Period 5 quarry pit 1118, fill 1117. Database Rec 3107.
7. Globular beaker with an upright bead rim. Possibly a copy of BB1 form WA type 9 (Seager Smith and Davies 1993, fig 122), suggesting a probable later 2<sup>nd</sup> to 3<sup>rd</sup> century date. Fabric 12. Diam 4cm (32%). Period 6, layer 1551. Database Rec 679, 703.
8. Body sherd with spout from a tettina. Fabric 12.5. Period 6–7 tillage soil, layer 1002. Database Rec 3447.
9. Angular, everted rim and grooved shoulder, probably from a rusticated jar. Fabric 12.3. Diam 13cm (19%). Period 5–7 layer 2154. Database Rec 3108.

10. Short necked jar with a simple out-curving rim, and a cordon at the base of the neck. The form is broadly dated to 1<sup>st</sup> to 4<sup>th</sup> centuries by Webster (1976, fig 1, type A1), but the short neck might perhaps support a later Roman date. Fabric 12.6. Diam 8cm (40%). Period 6, layer 1135. Database Rec 350.
11. Small, narrow mouthed jar with a thickened rim, most likely dating to the 2<sup>nd</sup> to 3<sup>rd</sup> century. Fabric 12.6. Diam 8cm (50%). Period 6, layer 1135. Database Rec 373.
12. Narrow mouthed jar with a thickened, triangular rim; a broadly 2<sup>nd</sup> to 4<sup>th</sup> century type (Webster 1976, fig 1, type A4). Fabric 12. Diam 14cm (25%). Period 6, layer 1444. Database Rec 764.
13. Narrow mouthed jar with a pushed out cordon and a gently overhanging rim. Severn Valley ware jars often have a cordon at the base of the neck, but it is unusual to have a pushed out cordon like this. The rim form is consistent with a broadly mid-1<sup>st</sup>/2<sup>nd</sup> to mid-3<sup>rd</sup> century form (Webster 1976, fig 1, type A3). Fabric 12.6. Diam 15cm (38%). Period 6, layer 1551. Database Rec 666.
14. Narrow mouthed jar with a hooked, overhanging rim. Dated by Webster to the 2<sup>nd</sup> to 3<sup>rd</sup> centuries (Webster 1976, fig. 1, type A6), and present in the mid-late 2<sup>nd</sup> to 3<sup>rd</sup> century assemblage from the Newland Hopfields kiln site (Evans *et al* 2000, fig 21, JNM9–11). Fabric 12.6. Diam 20cm (14%). Period 6, layer 1551. Database Rec 382.
15. Narrow mouthed jar with a 'pulley' rim, near-equal beads ; a 3<sup>rd</sup> to 4<sup>th</sup> century type (Webster 1976, fig 3, type A9; Evans *et al* 2000, fig 21, JNM12). Fabric 12. Diam 15cm (7%). Period 6 layer 1551. Database Rec 381.
16. Narrow mouthed jar with a 'pulley' rim, lower bead more pronounced; a late 3<sup>rd</sup> to 4<sup>th</sup> century type (Webster 1976, fig 3, type A10–11; Evans *et al* 2000, fig 21, JNM14; Evans 1999, fig 9.8). Fabric 12.6. Diam 18cm (6%). Period 6, layer 1551. Database Rec 383.
17. Large storage jar with a relatively short, sloping neck and a slightly overhanging rim. This is a common 1<sup>st</sup> to 2<sup>nd</sup> century form that is thought to continue in use to the mid-3<sup>rd</sup> century (Webster 1976, fig 1, type A3). Fabric 12.7. Diam 30cm (9%). Period 6, layer 1551. Database Rec 392.
18. Large storage jar with a relatively short neck and a folded over, hooked rim. This very hooked rim usually occurs on vessels dated to the 3<sup>rd</sup> or 4<sup>th</sup> century (cf Webster 1976, fig 3, type A8). Fabric 12. Diam 20cm (22%). Period 6, layer 1135. Database Rec 366.
19. Medium mouthed jar with an everted rim, probably a 1<sup>st</sup> to 2<sup>nd</sup> century form based on the fabric. Fabric 12.3. Diam 15cm (19%). Period 5, quarry pit 1322, fill 1319. Database Rec 3110.
20. Wide-mouthed jar with an everted rim, a broadly 2<sup>nd</sup> to 4<sup>th</sup> century type (Webster 1976, fig 4, type B16). Fabric 12.7. Diam 19cm (5%). Period 5, quarry pit 1180, fill 1176. Database Rec 629.
21. Wide-mouthed jar with an out-curving flange rim, probably dating from the mid-late 2<sup>nd</sup> to late 3<sup>rd</sup> century (Evans *et al* 2000, fig 23, JWM6; Webster 1976, fig 5, type C23).

- Fabric 12. Diam 34cm (16%). Period 6, layer 1444. Database Rec 766.
22. Wide-mouthed jar with a thickened, triangular rim and a fairly short neck. The rim type dates broadly to the 2<sup>nd</sup> to 3<sup>rd</sup> centuries ([Webster 1976](#), fig 4, type C22). Fabric 12. Diam 29cm (25%). Period 4, quarry pit 1475, fill 1474. Database Rec 93.
23. Wide-mouthed jar with a gently overhanging rim, a mid-2<sup>nd</sup> to late 3<sup>rd</sup> century type ([Webster 1976](#), fig 5, type C23–5). Fabric 12.24. Diam 30cm (46%). Period 4, quarry pit 1475, fill 1474. Database Rec 94.
24. Wide mouthed jar of narrow girth, with a folded over, hooked rim. The form is dated by Webster to the late 3<sup>rd</sup> to 4<sup>th</sup> centuries ([Webster 1976](#), fig 5, type C28). Fabric 12.24. Diam 20 cm (20%). Period 6, layer 1237. Database Rec 643.
25. Wide mouthed jar of narrow girth, with an overhanging, hooked rim, dated by [Webster](#) to the late 3<sup>rd</sup> or 4<sup>th</sup> century (1976, fig 5, type C27). Fabric 12. Diam 28cm (14%). Period 6, layer 1135. Database Rec 367.
26. Globular bowl or jar with a plain, near upright rim and a distinctive, thickened, horizontal flange at the base of the neck. This is an unusual form. There are two possible parallels from Greyhound Yard, Dorchester. One dates to the 1<sup>st</sup> century AD ([Seager Smith and Davies 1993](#), fig 124, WA type 34), while the other has 3<sup>rd</sup> and 4<sup>th</sup> century parallels (*ibid* fig 126, WA type 69). Fabric 12.5. Diam 19cm (21%). Layers 1135 and 1551. Database Rec 377 and 668.

*Catalogue of illustrated Severn Valley ware forms: bowls (Fig 28, 27–47)*

27. Hemispherical bowl with a bead rim, not a closely datable type (1976, [Webster](#) type I, 35). Fabric 12.6. Diam 14cm (9%). Period 6, layer 1237. Database Rec 647.
28. Bowl, a 2<sup>nd</sup> to 4<sup>th</sup> century type ([Webster 1976](#), fig 7, type D34; [Evans et al 2000](#), fig 29, BT55, BT58). Fabric 12. Diam 16cm (10%). Period 5, circular enclosure 2012, fill 2190. Database Rec 796.
29. Small to medium sized bowl with curving walls and an elongated everted rim. The form is broadly dated to the 2<sup>nd</sup> to 4<sup>th</sup> century by [Webster](#) (1976, fig 7, type D35). Fabric 12.24. Diam 12cm (14%). Period 6, layers 1135 and 1551. Database Rec 402 and 669.
30. Small to medium hemispherical bowl, with a grooved bead rim. The form shares similarities with [Webster](#) type D34 (1976, fig 7) dating to the 2<sup>nd</sup> to 4<sup>th</sup> centuries, and [Webster](#) type I61 (1976, fig 9), a copy of samian form Drag 37. Fabric 12.6. Diam 15cm (10%). Period 6, layer 1551. Database Rec 688.
31. Flanged, carinated bowl copying samian form Drag 38, dating from the mid–late 2<sup>nd</sup> to 4<sup>th</sup> centuries ([Webster 1976](#), fig 9, type I62). Fabric 12. Diam 14cm (15%). Period 4, Structure 2, posthole 1171, fill 1170. Database Rec 725.
32. Hemispherical, flanged bowl with a bead rim, a mid–late 2<sup>nd</sup> to 4<sup>th</sup> century type ([Webster 1976](#), fig 9, type I63). Fabric 12.5. Diam 13cm (14%). Period 6–7 tillage soil,



layer 1002. Database Rec 3451.

33. Segmental bowl with a horizontal flanged rim ([Webster 1976](#), type J). The form is not closely datable, though a similar form is illustrated from the Malvern, Newland Hopfields kiln site, which might support a mid–late 2<sup>nd</sup> to 3<sup>rd</sup> century date ([Evans et al 2000](#), fig 29, BT61). Fabric 12.6. Diam 24cm (15%). Period 5, quarry pit 1140, fill 1137. Database Rec 557.
34. Flanged, segmental bowl; noted by Webster as a common 2<sup>nd</sup> century type ([Webster 1976](#), fig 10, type J65; [Evans et al 2000](#), fig 28, BT43). Fabric 12.5. Diam 14cm (12%). Period 6–7 tillage soil, layer 1002. Database Rec 3444.
35. Necked bowl, with a short upright neck and a pulley rim. The dating for this form is uncertain. A similar form, though without the pulley rim, is dated by Rawes to the 2<sup>nd</sup> century ([Rawes 1982](#), fig 4, 70), but the short neck and pulley rim are also consistent with a later date. Fabric 12. Diam 10cm (11%). Period 6–7, tillage soil, layer 4002. Database Rec 3167.
36. Bowl or wide mouthed jar with a short upright neck and a gently everted rim, dated at Droitwich to the mid-3<sup>rd</sup> to 4<sup>th</sup> centuries ([Rees 1992](#), fig 29, 5–6). Fabric 12. Diam 13cm (10%). Period 6, layer 1237. Database Rec 638.
37. Bowl with an elongated, upturned flange. A similar form from Gloucester is dated to the second half of the 2<sup>nd</sup> century ([Rawes 1982](#), fig 6, 113). Fabric 12.24. Diam 22cm (8%). Period 6, layer 1237. Database Rec 636.
38. Rim from a medium–large sized, flanged bowl and an internal lip. The flange is horizontal and has an internal lip and curving sides ([Webster 1976](#), type F, fig 8, 45–6, 50). The form appears to have been produced throughout the Roman period (*ibid*, 31–3). It is known from kiln sites in the Malvern area ([Evans et al 2000](#), fig 26, BT7, BT8; [Tomber 1980](#), fig 16, 246, fig 17, 248), and from other sites in Worcester ([Bryant and Evans 2004](#), fig 157, 7; [Darlington and Evans 1992](#), fig 23, 10), though predominantly from 2<sup>nd</sup> and 3<sup>rd</sup> century contexts. The end date for this form is uncertain. It was present in a 4<sup>th</sup> century layer of dumping at nearby 14–24 The Butts ([Evans 2011](#), fig 5, 18, 17), though associated with residual pottery. A parallel is also illustrated from the Droitwich, Bays Meadow phase 4 assemblage, postdating c AD 355 ([Barfield 2006](#), fig 100, 199). Fabric 12. Diam 24cm (12%). Period 6, layer 1551. Database Rec 673.
39. Flat rim from a medium–large-sized, flanged bowl with an internal lip. Fabric 12.6. Diam 23cm (16%). Period 6–7 tillage soil, layer 1002. Database Rec 3443.
40. Heavy rim from a larger example of a similar form. Fabric 12. Diam 36cm (13%). Period 6, layer 1135. Database Rec 351.
41. Rim from a medium–large-sized, flanged bowl. The flange rim is horizontal and well tooled, with a pronounced internal lip. A broadly 2<sup>nd</sup> to 3<sup>rd</sup> century form, similar to bowls published by [Webster](#) (1976, fig 9, type F51, F52) and bowls from the mid–late 2<sup>nd</sup> to 3<sup>rd</sup> century assemblage from the Newland Hopfields kiln site ([Evans et al 2000](#), fig 26, BT9–10). Fabric 12.6. Diam cm (%). Period 6, layer 1551. Database Rec 675.

42. Upturned flange with an internal lip, from a medium–large sized, flanged bowl, a broadly 2<sup>nd</sup> to 3<sup>rd</sup> century type ([Webster 1976](#), fig 8, type F47–48; [Evans et al 2000](#), fig 26, BT6). Fabric 12.6. Diam 32cm (9%). Period 5, quarry pit 1180, fill 1176. Database Rec 623.
43. Flanged rim with a slight internal lip, from a medium–large sized, flanged bowl. Probably a similar date to the bowls above. Fabric 12.5. Diam 21 cm (9%). Period 6, layer 1237. Database Rec 822.
44. Slightly up-turned, reeded rim from a medium–large sized, flanged bowl. Similar to forms broadly dated by Webster to the 2<sup>nd</sup> to 3<sup>rd</sup> centuries ([Webster 1976](#), fig 9, type G55). Fabric 12.24. Diam 23 cm (8%). Period 6, layer 1135. Database Rec 356.
45. Medium–large sized bowl with a reeded, flange rim. The grooved rim has a heavy flange level with, or above the bead. A mid–late 2<sup>nd</sup> to 3<sup>rd</sup> century form ([Webster 1976](#), fig 9, type G57; [Evans et al 2000](#), fig 28, BT32, 34, 35). While the illustrated example is from a post-medieval pit, the two other examples came from Period 5 contexts. Fabric 12. Diam 26cm (10%). Period 11, pit 1197, fill 1196. Database Rec 3184.
46. Similar to no 45 but with a finer, level flange. Fabric 12.6. Diam 25cm (12%). Period 6–7 tillage soil, layer 1002. Database Rec 3445.

*Catalogue of illustrated Severn Valley ware forms; bowls, tankards and lids (Fig 29, 48–60)*

47. Flat, reeded rim from a medium–large-sized, flanged bowl, probably also a 2<sup>nd</sup> to 3<sup>rd</sup> century type ([Webster 1976](#), type G). Fabric 12.24. Diam 31cm (9%). Period 5, quarry pit 1180, fill 1176. Database Rec 622.
48. Slightly down-turned, reeded flange from a medium–large-sized, flanged bowl. The illustrated example has a twisted handle applied just below the flange. Dated by Webster to the 3<sup>rd</sup> century ([Webster 1976](#), fig 9, type G56), and the most common bowl type recorded at the mid–late 2<sup>nd</sup> to 3<sup>rd</sup> century kiln site at Malvern, Newland Hopfields ([Evans et al 2000](#), fig 27, BT13–15). Fabric 12.24. Diam 37cm (21%). Period 5, quarry pit 1180, layer 1176. Database Rec 626.
49. Reeded, pulley rim from a medium–large-sized, flanged bowl. Fabric 12. Diam 26cm (13%). Period 6, layer 1237. Database Rec 824.
50. Reeded rim from a medium–large-sized, flanged bowl. The flange is down-turned, has two grooves and an internal lip. No exact parallels are published by Webster, but it is similar to forms dated by him to the 2<sup>nd</sup> and 3<sup>rd</sup> centuries ([Webster 1976](#), fig 9, type G55, G56). Fabric 12.24. Diam 26cm (17%). Period 6, layer 1135. Database Rec 348.
51. Reeded rim from a medium–large-sized, flanged bowl, with an internal lip and a raised central bead. The form is known at Deansway, Worcester ([Bryant and Evans 2004](#), fig 155, 13); from a 4<sup>th</sup> century layer of dumping at 14–24 The Butts ([Evans 2011](#), fig 5, 18, 18 ), and from Droitwich Bays Meadow, from phase 3 dated to c 289–96 ([Barfield 2006](#), fig 97, 112). Fabric 12.6. Diam 25cm (15%). Period 6, layer 1135. Database Rec 354.

52. Reeded rim from a medium–large-sized, flanged bowl, with an internal lip; the heavy flange is lower than the bead. A mid–late 2<sup>nd</sup> to 3<sup>rd</sup> century type ([Webster 1976](#), type G; [Evans et al 2000](#), fig 28, BT37, 38, 41). Fabric 12.5. Diam 22cm (7%). Period 6, layer 1551. Database Rec 3196.
53. Fragmentary, reeded rim, possibly from a dish or platter. Fabric 12.6. Diam 35cm (5%). Period 5, quarry pit 1180, fill 1178. Database Rec 590.
54. Upright tankard with a bead rim, decorated with cordons. A mid–late 1<sup>st</sup> century type ([Webster 1976](#), fig 7, type E38). Fabric 12.2. Diam 15cm (19%). Period 5, quarry pit 1303, fill 1301. Database Rec 730.
55. Moderately splayed tankard with a bead rim, a 2<sup>nd</sup> to 3<sup>rd</sup> century type ([Webster 1976](#), fig 7, type E40–1). Fabric 12.6. Diam 16cm (23%). Period 6, layer 1444. Database Rec 95.
56. Moderately splayed tankard with a double grooved rim, similar date to the above. Fabric 12. Diam 15cm (37%). Period 4, quarry pit 1451, fill 1450. Database Rec 91.
57. Bead rim from a tankard with markedly splayed walls, a typically later 3<sup>rd</sup> to 4<sup>th</sup> century type ([Webster 1976](#), fig 7, type E44). Fabric 12.6. Diam 17cm (7%). Layer 1237. Database Rec 804.
58. Grooved rim from a tankard with markedly splayed walls, a typically later 3<sup>rd</sup> to 4<sup>th</sup> century type ([Webster 1976](#), fig 7, type E44). Fabric 12. Diam 15cm (18%). Layer 1551. Database Rec 697.
59. Plain rim from a tankard with markedly splayed walls, similar date to the above. Fabric 12. Diam 15cm (10%). Period 5, circular enclosure 2012, fill 2190. Database Rec 794.
60. Curving, convex lid with a grooved bead rim. Not a closely datable form. Fabric 12. Diam 25cm (18%). Layer 1551. Database Rec 689

The largest group of Severn Valley ware by far comprised the standard oxidised Severn Valley ware (Table 8, Fabric 12), a fairly fine fabric. This dominated all period assemblages but was proportionately more common in Periods 5–7 (Table 9). As for Severn Valley ware as a whole ([Fig 26](#)), wide mouthed jars were the most common vessel class, followed by bowls, narrow mouthed jars and tankards ([Fig 30](#)). A couple of the wide mouthed jars had the shorter necks characteristic of later types (not illustrated), but most were broadly 2<sup>nd</sup> to 3<sup>rd</sup> century types, mainly with overhanging rims ([Fig 27](#), 21, 25; [Webster 1976](#), fig 5, type C23–5) or thickened rims ([Fig 27](#), 23). Simple, out-curving rims were particularly common on narrow mouthed jars ([Fig 27](#), 10) but a range of other forms were also represented ([Fig 27](#), 12 and 14–16). Large storage jars had either thickened or overhanging rims ([Fig 27](#), 18 and 17). Bowls were predominantly the medium–large, flanged types, particularly with plain rims ([Fig 28](#), 38, 40, and 42), but also with reeded rims ([Fig 28](#), 45, 44; [Fig 29](#), 51). Smaller bead or everted rimmed bowls were also present ([Fig 28](#), 28, 27 and 29), along with samian copies and segmental bowls ([Fig 28](#), 31 and 34). A range of narrow mouthed jars was recorded, predominantly the long-lived type with a simple rim ([Fig 27](#), 10) but also with thickened, overhanging and pulley rims ([Fig 27](#), 12, 14, 16). Amongst the tankards, the later 3<sup>rd</sup> to 4<sup>th</sup> century type, with splayed walls ([Fig 29](#), 58, 59 and cf 57) occurred most frequently (9% by rim EVE), though

earlier types were also present (Fig 29, 56, cf 54–5). Other forms included beakers and lids. Fragmentary beakers (not illustrated) included a bag-shaped form with elongated bead rim, and a globular beaker with a flattened bead rim. Lids had bead (Fig 29, 60) or plain rims (not illustrated). Diameters ranged mainly between 18 and 27cm, suggesting they may have been used with wide mouthed, rather than narrow mouthed, jars.

As at Deansway (Bryant and Evans 2004, 257), the most common of the fabric variants was Fabric 12.6, distinguished by its more abundant, soft, white inclusions. An unpublished study, using neutron activation analysis, suggested that this fabric came from a Malvern source (Evans 1991; Bryant and Evans 2004, 257). Similar inclusions were noted in the Malvernian Severn Valley ware described in the National Roman Fabric Reference Collection (Tomber and Dore 1998, 148, SVW OX 1), thought to be decayed feldspar. However they are also present, to varying degrees, in the un-sourced ware (Tomber and Dore 1998, 149, SVW OX 2). This fabric was fairly common throughout sequence, though proportionately most common in Periods 4 and 5 (Table 9). The range of vessel classes and types was very similar to Fabric 12 (Fig 31). The narrow-mouthed jars included a more unusual vessel, with a pushed out cordon (Fig 27, 13), amongst the other types (Fig 27, 10, 11, 14, 16). Wide mouthed jars mainly had overhanging rims (cf Fig 27, 25) or thickened rims (Fig 27, 23). The range of the bowls occurring in this fabric is illustrated (Fig 28, 27, 30, 33, 39, 41, 42, 46; Fig 29, 51, 53). No early tankard types were represented in this fabric, and 3<sup>rd</sup> or broadly 3<sup>rd</sup> to 4<sup>th</sup> century types were most common (Fig 29, 57; 8%), suggesting a later emphasis in the group. This contrasts with the evidence from Deansway, where a 1<sup>st</sup> to early 2<sup>nd</sup> century date was suggested (Bryant and Evans 2004, 257). Only a few fragmentary beakers were recorded (not illustrated).

The next most common group of fabrics was characterised by the presence of organic inclusions. Coarsely organic tempered ware, with macroscopically visible, black, organic inclusions, was present in relatively small quantities, mainly oxidised (Fabric 12.2) rather than reduced (Fabric 12.3). Given the coarseness of the inclusions, it seems likely that these were deliberate. Analysis of this ware by period indicates re-deposition of earlier material in later deposits, with Fabric 12.2 most common in Periods 4 and 6–7, and Fabric 12.3 proportionately as common in Periods 5 and 6, as Period 3. These are typically 1<sup>st</sup> to 2<sup>nd</sup> century fabrics, reflected in the fact that only the earlier tankard types were present (Fig 27, 54; 6% and cf 55; 1%). Wide mouthed jars were by far the most common vessel class in the oxidised fabric (Fig 32), occurring in a range of broadly 2<sup>nd</sup> to 3<sup>rd</sup> century types (Fig 27, 21, 23). A lid was also noted (not illustrated). Forms in the reduced organic ware were generally earlier Roman types. These included possible rusticated jars (Fig 27, 9, 19), a carinated bowl (Webster 1976, type H), large storage jars with simple out-curving or thickened rims (not illustrated), and copies of 2<sup>nd</sup> century BB1 flanged dishes (cf Seager Smith and Davies 1993, fig 123, WA type 22; Gillam 1976, fig 4, 53–66).

A finer organic tempered ware (Fabric 12.24) was far more common than the coarsely tempered ware. In this fabric the black organics were not necessarily visible macroscopically. They may be natural inclusions, perhaps left behind when the coarser organic component was removed during clay preparation. This variant followed a more regular distribution by period, being proportionately most common in Periods 3 and 4 and then declining (Table 9). This is consistent with evidence from the Newland Hopfields kiln site, which suggests that finer organic fabrics are predominantly 2<sup>nd</sup> to 3<sup>rd</sup> century products (Evans *et al* 2000, 17, 26). The main products were wide-mouthed jars and bowls, followed by tankards and narrow-mouthed jars (Fig 33). The narrow-mouthed jars (Fig 27, 10, 12, 16) and wide-mouthed jars (Fig 27,

23–4; Webster 1976, fig 5, type C23–5; Evans *et al* 2000, fig 23, JWM8) were broadly 2<sup>nd</sup> to 3<sup>rd</sup> century types. Amongst the bowls, reeded flanged bowls (Fig 28, 44, 47; Fig 29, 48, 50) were roughly twice as common as the plain flanged bowls (Fig 28, 40), a contrast to Fabrics 12 and 12.6 discussed above. Smaller everted rim bowls were present (Fig 28, 29 and cf 28), along with a samian copy (cf Webster 1976, fig 9, I61) and a more unusual flanged bowl (Fig 28, 37). Typically later, splayed tankards (Fig 29, 57–8) were more common than the earlier upright/near upright types. The assemblage also included the neck of a flagon (Fig 27, 5).

The other organic fabrics occurred in much smaller quantities. They first appeared in Period 4 and were present in small quantities throughout the sequence. Variants also included abundant soft white inclusions (Fabric 12.25), grog (Fabric 12.21, 12.22) and sand (Fabric 12.23). Few diagnostic forms were recorded in these fabrics; a small, everted rim bowl was noted in Fabric 12.21 (Fig 28, 29), and a wide mouthed jar and bowl in Fabric 12.22 (Fig 27, 23; Fig 28, 44). The grog-tempered fabrics, including Fabric 12.7, are typically 1<sup>st</sup> century wares. Similar fabrics were noted, for example, in a mid-1<sup>st</sup> century assemblage from Worcester, St Johns (Evans 2014; Wainwright *et al* 2014, 109–13). Fabric 12.7 was first present in Period 4 and was most common in Periods 6 and 6–7, again suggesting some level of residuality in the sequence. Forms comprised a large storage jar and various wide mouthed jars with simple or slightly thickened rims (Fig 27, 17, cf 23, 25; Evans *et al* 2000, fig 23, JWM8).

The sandy, micaceous variant (Fabric 12.5) was fairly well represented. It was present throughout the sequence, but was most common in Period 5. The range of vessel classes differed from Fabrics 12 and 12.6; tankards were the most common type, followed in roughly equal proportions by narrow-mouthed jars, wide mouthed jars and bowls (Fig 34). This was thought to be an early fabric at Deansway (Bryant and Evans 2004, 256). However, no early tankards were recorded in this assemblage and later types (Fig 29, 57–8) were most common. Jars were broadly 2<sup>nd</sup> to 3<sup>rd</sup> century types (Fig 27, 10, 14, 23, 25). Medium–large flanged bowls with plain rims (Fig 28, 43 and cf 38, 40, 42) and reeded rims (Fig 29, 52 and cf 45, 48) were equally common. Other forms included samian copy bowls (Fig 28, 32, 34), and an unusual flanged jar or bowl (Fig 27, 26), the spout from a *tettina* (Fig 27, 8), a few lids, and some fragmentary beakers. At Deansway, a Malvern source was suggested (Bryant and Evans 2004), and a sandier variant was noted from the Newland Hopfields kiln (Evans *et al* 2000, 26, fabric 08). However, while the jars and flanged bowls are typical Malvern products, the samian copies and more unusual forms are not. It may be that another source is also represented, perhaps Gloucester.

Another Severn Valley ware variant was distinguished by its very vesicular appearance (Fabric 12.8). These vesicles could result from burnt or leached out inclusions. Some of the Newland Hopfields fabrics were described as vesicular (Evans *et al* 2000, 26, fabrics 01, 02, 05, 09). Examination with a binocular microscope showed fragments of carbonised material to be present in the vesicles of some fabrics, and chaff or grass in others. Another cause might be poor wedging, as with the Malvernian Severn Valley ware described in the National Roman Fabric Reference Collection (Tomber and Dore 1998, 148, SVW OX 1). The fabric was present throughout the sequence, but was most common in Periods 5 and 6–7. Wide mouthed jars were the main type occurring (Fig 35; cf Fig 27, 23, 25), along with some medium mouthed jars with collared or slightly cupped rims (not illustrated), and moderately splayed tankards (Webster 1976, fig 7, type E42–3).

Reduced Severn Valley ware was general poorly represented. Fabric 12.3 has been discussed above. Fabric 12.1 was present in small quantities from Period 4 on. Forms comprised: narrow and wide mouthed jars (Fig 27, 10, 15, 25; Evans *et al* 2000, fig 23, JWM8); a fragmentary, medium mouthed jar with an everted rim, a large storage jar with an out-turned rim (neither illustrated), and a copy of BB1 jar (Seager Smith and Davies 1993, fig 122, WA type 1). Other forms included a cornice rimmed beaker, a lid, and copies of BB1 plain rimmed dishes (not illustrated).

The only other fabric was a shelly ware (Fabric 12.4). Only five sherds of this early fabric were recovered, residual in Period 6.

Evidence for manufacture, use and re-use was sought for all the Severn Valley variants. Evidence for repair and re-use is discussed at the end of the pottery report. A distinctive soft, brown firing was noted on some sherds in all variants. It was particularly associated with Fabric 12.24 (160 sherds, representing 25% of the fabric), where it was noted on flanged bowls, tankards and a narrow mouthed jar. It was also fairly common on fabric 12.25 (11 sherds, representing 10%). A similar firing was noted in one of the charcoal tempered fabrics from the Newland Hopfields kiln, where it was thought by Vivien Swan to indicate a more iron rich clay source (Evans *et al* 2000, 26, 70, fabric 05). Overfired or slightly warped sherds, possibly suggesting a relatively local source, were noted in Fabric 12 (21 sherds), Fabric 12.5 (5 sherds) and most commonly in Fabric 12.6 (34 sherds, representing 2.7%). The only other evidence for use came very from occasional sherds with limescale or sooting.

### *Sandy oxidised ware, Fabric 13 (Fig 36)*

Sherds classified as sandy oxidised ware, possibly representing a range of sources, made up roughly 1% of the assemblage (Table 8). They first appeared in Period 4 and were present in small quantities throughout the sequence. Apart from a single lid and a flagon (Fig 36, 61), all rims came from jars (Table 10). These included medium mouthed jars (Fig 36, 62), narrow mouthed jars (Fig 36, 63) and wide mouthed, Severn Valley ware types (cf Fig 27, 23). Two sherds were noted as over-fired, and two as having limescale deposits.

#### *Catalogue of illustrated pottery: Fabric 13, sandy oxidised ware forms (Fig 36: 61–3)*

61. Flagon rim, slightly cupped. Fabric 13. Diam 3cm (100%). Period 6 layer 1224. Database Rec 3442.
62. Everted rim jar with a simple out-curving rim. Diam 17cm (10%). Period 6–7 tillage soil, layer 1002. Database Rec 3111.
63. Narrow mouthed jar with a simple out-curving rim, similar to Webster type A1 Severn Valley ware jars and possibly with the same date range of 1<sup>st</sup> to 4<sup>th</sup> century (Webster 1976, fig 1). Diam 16cm (12%). Period 6–7 tillage soil layer 1002. Database Rec 3195.

### *Sandy reduced ware, Fabrics 14 and 15*

Very small quantities of reduced sandy ware were present (Table 8; Fabrics 14, 14.1 and 15). The finer fabric (Fabric 14) was associated with a fragmentary Severn Valley type jar rim, a copy of a BB1 jar, some fragmentary medium mouthed jars, and a lid. Two sherds had smoke

fuming and one was overfired. One reduced sherd was recorded separately (Fabric 14.1). This was a micaceous fabric with distinctive black inclusions, a reduced core and oxidised margins. This sherd was from a bowl or dish, possibly copying a BB1 type. No forms were identified in the coarser fabric (15). The sandy reduced wares first appeared in Period 5.

### *Wheelmade Malvernian ware, Fabric 19*

Wheelmade Malvernian ware was one of the more common fabrics, after Severn Valley ware (Table 8); not surprisingly given the fairly local source. It first appeared in Period 3, but was most common in Period 6 (Table 9). Cook pot jars, copying BB1 types, were by far the most common form (Table 10; [Figs 37 and 38](#), 64–6), in the particular jars with plain everted rims (46% rim EVE; [Fig 38](#), 64). A correlation can be seen between rim diameters for these and the handmade Malvernian lids ([Fig 39](#)). It seems likely that the lids were specifically made for use with the jars. Limescale, sooting and burnt residues were noted on the jars, sometimes together, indicating use for cooking. In a couple of cases the sooting finished in a neat line inside the rim, presumably where a lid had been placed during use. Lids were also produced in the wheelmade Malvernian ware. Some had simple rims, like the handmade lids, but others had tooled rims ([Fig 38](#), 70, 71). A number were noted with sooting. Other forms comprised BB1 copy bowls and dishes ([Fig 38](#), 67–9), also occasionally with sooting, and a couple of Severn Valley ware type, wide mouthed jars.

#### *Catalogue of wheelmade Malvernian ware forms ([Fig 38](#), 64–71)*

64. Jar with a plain everted rim, of near equal or narrow girth. This was the most common form in this fabric at Worcester, Deansway, where it was found from the 2<sup>nd</sup> to 3<sup>rd</sup> centuries, being most common in later 3<sup>rd</sup> century deposits ([Bryant and Evans 2004](#), 94, fig 164,1–2). Diam 23cm (14%). Period 6, layer 1135. Database Rec 2279.
65. Jar with a gently splayed rim, similar to a mid–late 3<sup>rd</sup> century BB1 form ([Gillam 1976](#), fig 1, 8; [Seager Smith and Davies 1993](#), fig 122, WA type 2). Diam 16cm (45%). Period 6, layer 1135. Database Rec 2542.
66. Jar with a splayed rim, copying a mid–late 3<sup>rd</sup> to 4<sup>th</sup> century BB1 form ([Seager Smith and Davies 1993](#), fig 122, WA type 3). Similar forms are published from the 4<sup>th</sup> century Malvern, Hygienic Laundry assemblage ([Peacock 1965-7](#), fig 3, 20–1, 28) and from a 4<sup>th</sup> century layer at 14–24 The Butts, Worcester ([Evans 2011](#), fig 5, 19, 46). The illustrated vessel has been used for cooking, having sooting and limescale. Diam 16cm (46%). Period 6, layer 1551. Database Rec 2248.
67. Conical bowl with a flat flange rim, copying a 2<sup>nd</sup> century BB1 type ([Seager Smith and Davies 1993](#), fig 123, WA type 22). Decorated with plain burnish externally, and cross hatch pattern burnish internally. Diam 28 8cm (%). Period 6, layer 1224. Database Rec 2489.
68. Conical dish with a flat flange rim, copying a 2<sup>nd</sup> century BB1 type ([Seager Smith and Davies 1993](#), fig 123, WA type 22). The illustrated example has a sagging base and splayed walls, suggesting a mid–late 2<sup>nd</sup> century date (cf [Gillam 1976](#), fig 4, 62–4), and is decorated with cross hatch internally. Diam 26cm (7%). Period 6, layer 1135. Database Rec 2556.

[to previous view](#)

69. The illustrated example has splayed walls, consistent with a later 3<sup>rd</sup> to early 4<sup>th</sup> century date (cf [Gillam 1976](#), fig 5, 81–3), a sagging base, and crude pattern burnish externally and internally. Diam 26cm (7%). Period 6, layer 1135. Database Rec 2554.
70. Convex lid, with an upturned rim; not closely datable. Diam 32cm (10%). Period 67, layer 1002. Database Rec 3090.
71. Lid with a tapered rim; not closely datable. The lid has a patch of sooting externally. Diam 34cm (11%). Period 6, layer 1135. Database Rec 2560.

### *Wheelmade Malvernian Palaeozoic limestone tempered ware, Fabric 19*

One potentially noteworthy find was a body sherd of what appeared to be a wheelmade version of the Malvernian Palaeozoic limestone ware ([Peacock 1968](#), 421-2, B1), from Period 6, layer 1551.

### *Traded wares*

A range of traded wares were recovered ([Fig 40](#)), including Fabric 17 Pink grog tempered ware ([Fig 40](#), 72); Fabric 22 Black burnished ware ([Fig 40](#), 73–85), Fabric 23 Late Roman shell tempered ware (Fabric 40, 86), Fabric 28 Nene Valley ware ([Fig 40](#), 87) and Fabric 38 Oxfordshire white ware ([Fig 40](#), 88).

### *Savernake ware, Fabric 16.1*

Only three sherds of Savernake ware were recovered, residual in Periods 5, 6 and 12. No forms were identified.

### *Pink grog-tempered ware, Fabric 17*

Only one sherd of pink grog-tempered ware (Fabric 17) was recovered, from Period 6. The only form was a necked jar ([Fig 40](#), 72).

#### *Pink grog tempered ware ([Fig 40](#), 72)*

72. Necked jar with an angular, gently overhanging rim; a later 3<sup>rd</sup> to 4<sup>th</sup> century type ([Booth and Green 1989](#), fig 2, 12). Diam 28cm (6%). Layer 1135. Database Rec 3013.

### *Black burnished ware, Fabric 22*

Dorset Black burnished ware was the second most common fabric recovered (Table 8). It was present from Period 3 on, but was most abundant in Period 6 (Table 9). Cook pots dominated the assemblage (Table 10; [Fig 41](#)). Most common amongst these were jars typical of the late 2<sup>nd</sup> to mid-3<sup>rd</sup> century (30% rim EVE; [Fig 40](#), 77), followed by later 3<sup>rd</sup> to 4<sup>th</sup> century types (15% rim EVE; [Fig 40](#), 78). The earlier type (not illustrated; [Seager Smith and Davies 1993](#), fig 122, WA type 1) was present in much smaller quantities (5% rim EVE). One example of this type was perforated for a repair. A few small jars or beakers were also recorded ([Fig 40](#), 75–76). The remainder of the BB1 assemblage,



apart from a lid and a couple of flagon/jugs (Fig 40, 73–4), comprised bowls and dishes. Plain rimmed dishes were particularly common, mainly with flat bases (13% rim EVE; Fig 40, 84) and less frequently with sagging bases (2% rim EVE; Fig 40, 85). Later 3<sup>rd</sup> to 4<sup>th</sup> century, drop flange bowls and dishes (8% rim EVE; Fig 40, 82) were more common than the typically 2<sup>nd</sup> century, flat, flanged types (5% rim EVE; Fig 40, 80), and a few late 2<sup>nd</sup> to early 3<sup>rd</sup> century, groove-rimmed bowls were recorded (1% rim EVE; Fig 40, 81). Limescale and sooting were noted on some cook pots, occasionally together, and sooting and burnt residues were noted on bowls and dishes. The flagon/jugs both had tubular, rather than pinched, necks (Wallace and Webster 1989, Class B).

*Catalogue of Black burnished ware, Fabric 23 (Fig 40, 73–85)*

73. Flagon or jug with a bead rim, a mid-1<sup>st</sup> to late 2<sup>nd</sup> century Black burnished ware type (Seager Smith and Davies 1993, fig 124, WA type 29). Fabric 22. Diam 8cm (5%). Period 5, quarry pit 1288, fill 1287. Database Rec 1449.
74. Flagon or jug with an elongated bead rim, a mid-1<sup>st</sup> to late 2<sup>nd</sup> century Black burnished ware type (Seager Smith and Davies 1993, fig 124, WA type 29). Fabric 22. Diam 4cm (50%). Period 3, layer 2097. Database Rec 1482.
75. Small jar or beaker with an elongated bead rim. The angle of the shoulder suggests an early to mid-, rather than late, 2<sup>nd</sup> century date (Gillam 1976, fig 2, 19, 20, 24, 25). Diam 7cm (11%). Period 5, pit 2199, fill 2198. Database Rec 1328.
76. Small jar or beaker with an elongated bead rim, a broadly 2<sup>nd</sup> to later 3<sup>rd</sup> century type (Seager Smith and Davies 1993, WA type 8). Diam 12cm (8%). Period 6, layer 1551. Database Rec 1077.
77. Cook pot with a moderately splayed rim, WA type 2 dating to the late 2<sup>nd</sup> to mid-3<sup>rd</sup> century (Seager Smith and Davies 1993, fig 122). Diam 15cm (18%). Period 6, layer 1135. Database Rec 994.
78. Cook pot with a markedly splayed rim, WA type 3 dating to the late 3<sup>rd</sup> to late 4<sup>th</sup> (or possibly early 5<sup>th</sup>) century (Seager Smith and Davies 1993, fig 122). Diam 14cm (22%). Period 6, layer 1551. Database Rec 1046.
79. Flat base, possibly from a jar, with external thickening and a re-turned groove. Decorated with an eight-armed cross similar to WA decoration type D38 (Seager Smith and Davies 1993, fig 133). This base form is not typical of the standard range of BB1 jars found in this region, though a similar form is illustrated on a later Roman jar from Dorchester, Greyhound Yard (Seager Smith and Davies 1993, fig 122, WA type 3). Diam 6.5cm (100%). Period 6, layer 1551. Database Rec 2598.
80. Conical bowl or dish with a flat flange rim, decorated with cross hatch burnish; a mid-late 2<sup>nd</sup> century type (Seager Smith and Davies 1993, fig 123, WA type 22). Diam 16cm (8%). Period 6, layer 1135. Database Rec 1079.
81. Conical bowl with a grooved flange rim, a broadly later 2<sup>nd</sup> to mid-late 3<sup>rd</sup> century type (Gillam 1976, fig 3, 42–4). The illustrated example is decorated on the wall, with intersecting arcs, and base. Period 4–5, pit 4532, fill 4535. Database Rec 1265.

82. Conical bowl with a drop flange rim, a later 3<sup>rd</sup> to 4<sup>th</sup> century type ([Seager Smith and Davies 1993](#), fig 124, WA type 25). Diam 25cm (10%). Period 6, layer 1135. Database Rec 980.
83. Dish with slightly beaded rim and burnished arcs, a 2<sup>nd</sup> to 4<sup>th</sup> century type ([Seager Smith and Davies 1993](#), fig 123, WA type 20). Diam 17cm (6%). Period 6, layer 1135. Database Rec 967.
84. Plain rimmed dish, with a flat base and near upright, curving walls; Dorchester, Greyhound Yard WA type 20 ([Seager Smith and Davies 1993](#), fig 123). The near upright walls suggest a date in the late 2<sup>nd</sup> or early 3<sup>rd</sup> century (cf [Gillam 1976](#), fig 5, 77, 79). Diam 19cm (12%). Period 6, layer 1551. Database Rec 968.
85. Plain rimmed dish, with a sagging base and splayed walls; Dorchester, Greyhound Yard WA type 20 ([Seager Smith and Davies 1993](#), fig 123). The splayed walls suggest a date in the late 3<sup>rd</sup> century (cf [Gillam 1976](#), fig 5, 81), consistent with the use of burnished interlocking arcs. Diam 21cm (5%). Period 6, layer 1135. Database Rec 952.

#### *South-west black burnished ware, Fabric 22.1*

Three sherds of Black burnished ware were thought to be from west Dorset or south Somerset, rather than the south-east. These sherds, all from cook pots, were distinguished by the presence of a highly burnished slip. The sherds came from a Period 5 quarry pit (1158, fill 1145) and a Period 6 layer (1551).

#### *Late Roman shell-tempered ware, Fabric 23*

Only two sherds of this diagnostically later Roman fabric were recovered, from Periods 5 and 5–7. The presence of shell gritted ware usually reflects a very late Roman date in this area ([Evans 2011](#), 89–94). However, forms similar to the vessel recovered here ([Fig 40](#), 86) are published from the pottery production site at Harrold, Bedfordshire in deposits dating to the late 2<sup>nd</sup> century ([Brown 1994](#), fig 26, 78), the later 3<sup>rd</sup> century (*ibid* fig 29, 164–173), and the early 4<sup>th</sup> century (*ibid* fig 34, 239–41, 243–5). A similar small quantity of this ware was recovered from the Deansway excavations, where coin evidence indicated activity continuing until c AD 364–78 ([Bryant and Evans 2004](#), 280).

#### *Illustrated Late Roman shell-tempered ware (Fig 40, 86)*

86. Jar or cook pot with a simple out-curved rim. Fabric 23. Diam 17cm (9%). Period 5, quarry pit 1180, fill 1174. Database Rec 2864.

#### *Nene Valley ware, Fabric 28 and Fabric 28.1*

Small quantities of Nene Valley colour coated ware were recorded, first appearing in Period 4 but more common in Periods 5 and 6. The white/pale buff fabric (28) occurred in similar quantities to a pink/red fabric (28.1). The only identifiable forms were beakers. These included 3<sup>rd</sup> to 4<sup>th</sup> century types ([Fig 40](#), 87) and fragmentary, late 2<sup>nd</sup> to early 3<sup>rd</sup> century, devolved cornice rimmed types (not illustrated; [Howe et al 1980](#), 30). Eight body sherds were decorated with barbotine under slip, indicative of a late 2<sup>nd</sup> to mid-3<sup>rd</sup> century date.

### *Illustrated Nene Valley Ware (Fig 40, 87)*

87. Funnel necked beaker. Not enough of the profile survives to identify whether this is from a decorated or folded beaker, but it is broadly a 3<sup>rd</sup> to 4<sup>th</sup> century type (Howe *et al* 1980, fig 5, 50–1; Perrin 1999, fig 61, 173). Fabric 28.1. Diam 6cm (13%). Period 6–7 tillage soil, layer 4002. Database Rec 3053.

### *Oxfordshire wares, Fabrics 29, 30, 38*

The most common Oxfordshire fabric, apart from the mortaria discussed separately below, was the white ware (Fabric 38). A few sherds of this were first recovered from Period 4, but the fabric was most common in Periods 5 and 6. The only form identified was a 2<sup>nd</sup> to 3<sup>rd</sup> century flagon (Fig 40, 88). Small quantities of red colour coated ware (Fabric 29) were present, first occurring and most common in Period 5 (10 sherds). The only identifiable forms in this were a Young type C45 bowl, dated c 270-400+ (Young 2000, 158, fig 58) recovered from Period 5, and a Young type C64 bowl, dated c 300-400+ recovered from Period 6 (*ibid* 162, fig 60). Only three sherds of white slipped ware were present (fabric 30), one from Period 4 and two from Period 5.

### *Illustrated Oxfordshire Ware (Fig 40, 88)*

88. Splayed, ring necked flagon with pronounced upper bead, a common 2<sup>nd</sup> century type, possibly continuing to the mid-3<sup>rd</sup> century (Young 2000, fig 30, type W2.1–2). Diam 5cm (21%). Period 5 quarry pit 1114, fill 1089. Database Rec 2963.

### *Eggshell ware, Fabric 109*

Two sherds of Eggshell ware were recovered. This is a typically early 2<sup>nd</sup> century ware so both sherds, from separate Period 5 quarry pits (1212, fill 1211 and 1130, fill 1129), must be residual. The source for this ware is uncertain, though Eggshell wares are known to have been produced at both Holt and Caerleon, as well as London (Marsh 1978, 129).

### *South-west oxidised ware, Fabric 151*

Thirty eight sherds were identified as South-west oxidised ware, like South-west white slipped ware (Tomber and Dore 1998, 192) but without the slip. The fabric dates broadly to the later 2<sup>nd</sup> to 3<sup>rd</sup> centuries. It is thought to come from south-east Gloucestershire or north Wiltshire, and has been noted on other sites in the County (Timby 2004, 20). Here, it was found in deposits attributed to Periods 4, 5 and 6. The only form was a bag-shaped beaker with an overhanging rim (not illustrated) from a Period 5 quarry pit (1180, fill 1178). Some sherds had sand roughcast decoration.

### *Miscellaneous wares of various sources (Fabrics 20, 20.1, 20.2, 20.3, 20.4, 21, 21.3 and 41)*

Some fabrics could not be attributed to a known source. Included amongst these were white wares and white-slipped wares (Fabrics 41 and 20), both of which undoubtedly represent a range of sources. These were present in small quantities from Period 4 on. The presence of handles and re-tooled bases suggested that some sherds at least came from flagons. Three

*to previous view*

sherds (94g) classified generally as Fabric 20 had white, painted lines and dots internally. These were recovered from the Period 6–7 tillage soil (1002).

A number of sherds were classified as reduced micaceous ware (Fabrics 21 and 21.3). Most were thought to be the early micaceous fabric (Fabric 21.3) identified at the nearby New Police Station site (Griffin 2002, 120), and represented by a waster at the nearby Magistrates Court site (Evans nd), both on the north side of Castle Street. This is an earlier Roman fabric. Two diagnostic body sherds had parallels in forms from the New Police Station assemblage; one from a waisted bowl (Griffin 2002, fig 10, 9; Darlington and Evans 1992, fig 22, 7), and the other, a very fragmentary sherd, from a bowl with distinctive impressed decoration (Griffin 2002, fig 10, 10). The latter appears to be an imitation of a glass pillar-moulded bowl, a common 1<sup>st</sup> century type (Price and Cottam 1998, fig 7a (i)). Other forms comprised a bead rim, hemispherical bowl, a near upright tankard and a lid. Some sherds were highly burnished with a black slip and may represent a different source. Fabric 21.3 first occurred in Period 4 and was proportionately most common in Periods 4 and 5. One sherd, from a plain rimmed dish copying a BB1 type, was identified as the later Roman Fabric 21. This came from a Period 5 quarry pit (1046, fill 1045).

Five sherds were classified as ‘miscellaneous’ Roman (Fabric 98).

### *Mortaria*

*by C Jane Evans and Kay Hartley*

Four mortaria fabrics were identified (Fig 42), from Oxfordshire (Fabric 33.1), Mancetter Hartshill (Fabric 32), the west midlands (Fabric 34) and the south-west (Fabric 37).

#### *Oxfordshire white mortaria, Fabric 33.1*

The most common fabric by sherd count, and second most common fabric by weight and rim EVE, was Oxfordshire white mortaria. This first appeared, and was most abundant, in Period 4. The main form recorded in this fabric (Fig 42, 89) is a type typically dated to the first half of the 2<sup>nd</sup> century, with an optimum date of c AD 110–140. It is estimated that rims from seven different vessels were represented, some by fairly large portions. The number of examples of this form is out of the ordinary, it being unusual for more than one or two of this type to be found on any site, except perhaps for the production site at Littlemore (Young 1973, 230). It is probably significant that six vessels (19 sherds, rim EVE 1.07) came from the fill of a single Period 4 pit (1451, fill 1450). Another came from a Period 6 layer (1444). Other sherds, possibly from the same or similar vessels, came from Period 5 quarry pits (1158, fill 1159; 1180, fill 1439) and another Period 6 layer (1135). This is a type that was generally stamped. It is possible that not all the examples here would have been stamped, but there was not enough evidence to prove this. The other form represented in this fabric was a later type, dating to c 240–300 (Fig 42, 90), found in the Period 5 circular enclosure (2012, fill 2013) and a Period 6 layer (1551). The absence was noted of both the later Roman Oxfordshire type M22 (Young 2000, fig 23) and Oxfordshire red-slipped mortaria, also generally later types (Young 2000, fig 67). This may be significant for dating the latest activity on the site.

#### *Catalogue of illustrated Oxfordshire white mortaria (Fig 42, 89–90)*

89. Mortarium, with roll-rim turned under at tip and an internal bead, and a flat base.

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Young dates this form to c AD 100–150 (Young 2000, fig 18, M1.1), but the examples from this site are dated to c AD 100–140. Diam 23cm (44%). Period 4 quarry pit 1451, fill 1450. Database Rec 2446.

90. Mortarium with an upstanding rim and wide flat flange, hooked over at tip. Dated to c AD 240–300 (Young 2000, fig 21, M17). Diam 30cm (10%). Period 6, layer 1551. Database Rec 2431.

### *Mancetter Hartshill mortaria, Fabric 32*

Mancetter Hartshill mortaria was most common by weight and rim EVE. This first appeared in Period 3 (one sherd weighing 117g), and was otherwise most common in Periods 4 and 6. The earliest, bead and flange, form dated to c AD 170–210 (Fig 42, 91). Only two sherds in this form (rim EVE 0.15) were recovered, one from the Period 5 circular enclosure (2012, fill 2013) and one from a Period 6 layer (1551). Multi-reebed hammerhead mortaria were more common, with nine sherds recovered from a range of contexts (rim EVE 0.69). These are typically 3<sup>rd</sup> century or later types; the examples illustrated (Fig 42, 92–5) show the range of dated forms identified. It is perhaps significant in terms of site dating that one vessel dated c AD 240–330 came from a Period 4 layer (Fig 42, 93), and a vessel dated c AD 270–370 came from a Period 5 quarry pit (Fig 42, 95). Also of interest was a base with grits distributed in concentric rings, suggesting a date later than c AD 250 (Fig 42, 96).

#### *Catalogue of illustrated Mancetter Hartshill mortaria (Fig 42, 91–6)*

91. Bead and flange rim, decorated in red-brown with a pattern of zig-zag and dots. The optimum date is c AD 170–210, most likely later than c AD 180. There is no evidence of earlier mortaria being decorated instead of stamped, and that the hardness, thin body and profile fit well with a post-stamping date. Diam 35cm (10%). Period 6, layer 1551. Database Rec 2428.
92. Multi-reebed, near vertical hammerhead, slightly convex rim. Decorated with diagonal bars and bead in red-brown. Dated by to c AD 230–300. Diam 26cm (20%). Period 6, layer 1224. Database Rec 2425.
93. Multi-reebed hammerhead rim, dated to c AD 240–330. Diam 26cm (20%). Period 4, cleaning layer 1008. Database Rec 2426.
94. Multi-reebed hammerhead rim, slightly concave; dated to c AD 250–350. Diam 33cm (8%). Period 6, layer 1135. Database Rec 2420.
95. Thin-walled, multi-reebed, concave, near vertical hammerhead rim; burnt all over and across the break. Typologically this is a late, probably 4<sup>th</sup> century type, with an optimum date of c AD 270–370. The fabric is not typical for late Mancetter Hartshill products, but does not match any other known source. Diam 26cm (4%). Period 5, quarry pit 1231, fill 1230. Database Rec 2424.
96. Base with black and brown grits very clearly distributed in concentric rings. This practice cannot be dated precisely, but is likely to be later than c AD 250. Period 6, layer 1135. Database Rec 2418, 2419.

### *West midlands (Wroxeter) mortaria, Fabric 34*

Seven sherds of West midlands (Wroxeter) mortaria were identified (Fabric 34; Tomber and Dore 1998, 179–180, WRX WH). The fabric is hard, cream, with a brownish-buff slip. Inclusions frequent, tiny to smallish, mostly quartz, with a few inclusions in off red-brown and black material. Trituration grit, quartz with some red-brown sandstone and sparse black grit. The identifiable form (Fig 42, 97) dates to the first half of the 2<sup>nd</sup> century, so the fabric is likely to be residual in the Period 5–7 and Period 6 contexts in which it was found.

#### *Illustrated West midlands (Wroxeter) mortaria (Fig 42, 97)*

97. Stamped mortarium with a roll rim, turned down at the tip, and an internal bead. The two joining rim sherds show how the clay was cut away to prepare for adding extra clay to form the spout. This appears to have been done at biscuit hard stage, probably with a wire. This made a completely flat area, providing no keying for the extra clay at a point where there was always weakness in mortaria. This is probably the reason why the extra clay has broken away, taking with it part of the potter's stamp which was impressed on the area where the clay had been smoothed into the flange. The fragmentary stamp is from the same die as a stamp from Carmarthen (Brennan and Hartley 2003, fig 7.13, no 11); this stamp has the second H followed by a diagonal stroke. The stamp is from a die used by a probable semi-literate potter, or group of potters, who were active in a workshop whose major market was Wroxeter. Its market fanned out throughout the west midlands and south Wales and its products occasionally reached north-west England. The workshop started c AD 80 (Swan *et al* 2009, 586, no 2) and continued up to possibly the mid-2<sup>nd</sup> century. This group of potters is likely to be c AD 100–140 in date. Diam 31cm (18%). Period 6, layer 1444. Database Rec 2443.

### *South-west mortaria, Fabric (?) 37*

Two sherds were identified as possibly from the south-west (Fabric ?37). The fabric is fine-textured, orange-brown with good cream slip. Inclusions are frequent, tiny (barely perceptible at x20) in the matrix, mostly quartz, with few black and perhaps other material. Also, standing out from the matrix, moderate, small to medium-sized, random, mostly transparent quartz, with few black and one yellowish-cream ?clay pellet (non-reactive). Trituration grit: only three or four survive, including quartz, red-brown sandstone and probably quartz sandstone; these are combined with neat concentric scoring on the inside of the vessel. The identifiable form (Fig 42, 98) is one of the few diagnostically 1<sup>st</sup> century vessels from the site.

#### *Illustrated South-west mortaria (Fig 42, 98)*

98. Rim fragment with the bead thickening as it leads to the right side of the spout. The condition is good, except for the upper surface of the flange which has a battered appearance. The sherd is too fragmentary for the treatment of the flange to be clear. There is neat concentric scoring on the inside of the vessel. The slightly diagonal, fragmentary right-facing stamp preserves an A followed by a downstroke, possibly a T, though it is possible to see a D. The potter who best fits most of the evidence is A. Terentius Ripanus (see Birley 1946–48, 377, fig 2 for a clear drawing of a stamp from a possibly similar die), whose workshop can be attributed to Gloucester (Rawes 1972; see also Hoffmann *forthcoming*), but the rim profile is not typical of

his work and what survives of the stamp cannot be attributed with certainty to any of his known dies. The concentric scoring on the inside of the mortarium points to an optimum date of AD 60–80 if it was made at Gloucester. The only other known potter who could be considered as possible is Adiutor who worked at Bavai (Nord), Amay in Belgium, and perhaps at Halder in the Netherlands (Hartley 2009, 114–15). He was probably at work from the late 1<sup>st</sup> century, but certainly at work in the early 2<sup>nd</sup> century. Concentric scoring was used at some potteries on the continent in the 2<sup>nd</sup> century, but there is no evidence to show that he used it. At the moment a date of c AD 60–80 and manufacture at Gloucester seems the more likely for this stamp, but further finds could make it possible to attribute this stamp with certainty. Diam uncertain (2%). Period 5, quarry pit 1279, fill 1276. Database Rec 2456.

### *Imported colour-coated wares, Fabrics 44, 44.1, 45.1, 45.4*

A small number of imported fine wares were recovered, in addition to the samian discussed below. Most common (15 sherds) was Central Gaulish black-slipped ware (Fabric 45.4), dating from c AD 150 until the early 3<sup>rd</sup> century (Tyers 1996, 138). A single sherd of this was recovered from Period 3, and very small quantities were scattered throughout the sequence. Six sherds of ‘Moselkeramic’ Rhenish ware (Fabric 44) were found from Period 5 on. This ware, from Trier, was exported from the late 2<sup>nd</sup> to mid-3<sup>rd</sup> century (Tyers 1996, 138). The only identifiable form was a funnel-necked beaker (Fig 43, 99). A single sherd of Cologne Rhenish ware (Fabric 44.1), broadly dating to the 1<sup>st</sup> to mid-3<sup>rd</sup> century (Tyers 1996, 148), was recovered from Period 5. The earliest import was Central Gaulish (cream) colour-coated ware (Fabric 45.1), dating from the late 1<sup>st</sup> to early 2<sup>nd</sup> century (Tyers 1996, 140). Only two sherds of this were recovered, both residual in Period 5 contexts.

#### *Illustrated colour-coated wares: Rhenish ware, Fabric 44 (Fig 43, 99)*

99. Rim from a funnel necked beaker. Diam 9cm (10%). Period 5 quarry pit 1173, fill 1172. Database Rec 3040.

### *Samian*

*by Jo Mills*

An assemblage of samian was recovered from the excavation and evaluation (Table 11).

*Table 11 Roman pottery: samian quantification*

	Area	Count	Wt (g)	Av sherd wt (g)	Total rim EVE
Excavation (recorded)	1	627	4301	6.9	8.27
	2	72	433	6.0	1.05
	4	6	16	2.6	0.00
	5	5	57	11.4	0.12
Total excavated		710	4807	6.8	9.44
Evaluation (scanned)		19	430	22.6	0.26
<b>Total samian</b>		<b>729</b>	<b>5237</b>	<b>7.2</b>	<b>9.70</b>

This report is focused on the 710 sherds of samian recovered during the excavation areas, but also includes notes on 19 sherds recovered during the evaluation. The latter group was summarised in the evaluation report ([Sworn 2007](#)) but was not examined by a samian specialist. Decorated sherds and stamps are catalogued below, and a selection of the more unusual decoration and forms is illustrated (Figs 44–5).

*Illustrated decorated samian (Fig 44, 1–5)*

Seven sherds from four different contexts from a small Drag 37 bowl probably the work of Docilis I, Hadrianic or early Antonine (see samian catalogue no 2). Period 6, layer 1135; Period 5, quarry pit 1326, fill 1325 and quarry pit 1180, fills 1175, 1177, 1178.

1. Drag 37, CG. Two body sherds in Doeccus' style, both probably from the same vessel, c AD 165–200 (see samian catalogue no 11). Period 5, quarry pit 1158, fill 1187.
2. Drag 37, CG. The panelled decoration suggests links with Paternus III, Hadrianic-Antonine (see samian catalogue no 7). Period 6–7, layer 1002.
3. Drag 37, CG. Possibly Iullinus ii. The basket is probably [Rogers T29](#) (Rogers shows this basket without detail, but this example has small, neat crosses in the panels), c AD 160–200 (see samian catalogue no 19). Period 5, quarry pit 1279, fill 1277.
4. Form unknown, CG. Judging from the fabric and finish of the piece and the inhabited medallion this piece is likely to date to the second half of the 2<sup>nd</sup> century, probably after c AD 160. It appears to be unique (see samian catalogue no 22), context 1151.

*Illustrated plain samian (Fig 45, 6–9)*

5. CG (Lezoux), Drag 34. Only part of the characteristic flat area above the handle and a scrap of rim was identified. Probably Antonine. Period 5, pit 2187, fill 2251.
6. EG (Rheinzabern), Drag 53. Only a small section of the flaring rim and a handle stub survive. Early 3<sup>rd</sup> century. Period 6–7, layer 2154.
7. EG (Trier). A large section of rim with an applied moulded 'lion-head' spout. Many of the Trier mortaria spouts are in very degenerate 'lion' forms, many, like this example, having a more bat-like appearance. This example seems to have no parallel in this country, but on the basis of fabric and finish is likely to be late 2<sup>nd</sup> to early 3<sup>rd</sup> century in date. Period 6, layer 1551.
8. Sherds from a substantial part of a form Drag 38 bowl, from Trier. There is no potter's stamp which, together with the conical profile of the underside of the footring, suggests a date in the region of c AD 200–40. Period 6, layers 1135 and 1551; Period 6–7, layer 1002.

*Discussion of the samian assemblage*

The samian assemblage comprises predominantly vessels from Central and East Gaul (Table 12). Only a single sherd of possible 1<sup>st</sup> century South Gaulish samian was noted; residual in a pit attributed to Periods 5–11 (2179, fill 2178). The excavation produced only five



sherds from the kilns of Les Martres-de-Veyre (Central Gaul), which was exporting samian from around c AD 100–125/30. These all came from a Period 4 pit (2202, fills 2201 and 2218). The evaluation produced a further two, decorated, Les Martres-de-Veyre sherds.

Table 12: Roman pottery: quantification of samian by fabric

Fabric name	Fabric code	Excavation				Evaluation	
		Count	Wt (g)	Av wt (g)	Rim EVE	Count	Wt (g)
Southern Gaul?	43.1	1	1	1	0.10		
CG (Les Martres-de-Veyre)	43.6	5	10	2		2	32
CG (Lezoux)	43.2	651	3548	5	6.62	16	312
EG (Rheinzabern)	43.3	28	387	14	1.36	3	86
EG (Trier)	43.4	16	844	53	0.46		
EG (unspecified)	43.5	3	4	1			
Samian (unspecified)	43	6	13	2			
<b>Total</b>		<b>710</b>	<b>4807</b>	<b>7</b>	<b>8.54</b>	<b>21</b>	<b>430</b>

The vast bulk of the samian came from the kilns near Lezoux (Central Gaul), which were producing samian for export from c AD 120. Of this material, the majority is probably mid–late Antonine in date. The range of forms present (Fig 46) shows a paucity of types most common before c AD 160 (eg Drag 27 cups, Drag 18/31 and 18/31R dishes) whilst characteristically late 2<sup>nd</sup> century forms (such as Déchelette 72, represented only by body sherds, Drag 31 and 31R, Walters 79 and 80 and mortaria Drag 45) are all present. Another measurement often taken to indicate a late 2<sup>nd</sup> century bias in an assemblage is the fact that Drag 33 cups outnumber Drag 27s, and Drag 31 dishes outnumber Drag 18/31s, as in this assemblage. Samian from Lezoux first appears here in Period 3 (layers 1007 and 2097), and is the only samian from this site period. It is found throughout the sequence, but is proportionately most common in Periods 3 (8% by rim EVE and 5% by weight), Period 5 (10% by rim EVE, 11% by weight) and 6–7 (12% by rim EVE, 10% by weight). The East Gaulish samian is from the main exporting centres of Rheinzabern and Trier. There is a greater range of vessels from Rheinzabern than from Trier, and the Rheinzabern material is more common by both sherd count and EVE. The greater weight of Trier sherds is due to two large fragments of mortaria, including one with a ‘lion’-head spout (Fig 45, 8), and a large section of a Drag 38 bowl. Both fabrics first appear in Period 5 (Rheinzabern six sherds and Trier one sherd), but are proportionately more common in Periods 6 and 6–7, though never representing more than 1% or 2% of the assemblage.

For a samian assemblage of only 710 sherds it is noteworthy that two uncommon forms and one unique sherd were recorded. This might be of importance in considering the source of this dumped material.

As can be seen from Table 13, a high proportion of the assemblage derives from the Quarry pits group 1 and the Period 6 layers overlying these. The use of the quarry pits for rubbish disposal is undoubtedly the reason that most of the samian from the excavations came from these pits. The average sherd size for this group of material is low (4g), suggesting that much of the samian had been broken down considerably after it had been discarded. The pattern of rubbish disposal is reflected in the fact that sherds from a single Drag 37 bowl, attributed to

Docilis i (Fig 44, 1; catalogue no 2), were recovered from two separate, Period 5 quarry pits (pit 1180, fills 1175, 1177, 1178; pit 1326, fill 1325) and a Period 6 layer over the quarry pits (1135). Some of these sherds show signs of post-depositional burning, but not all. Of the 13 burnt sherds from Area 1, 11 were recovered from the Quarry pits group 1.

Table 13: Roman pottery: samian by period, area and fabric

Period	Context group	SG (43.1)		CG LMar-tres (43.6)		CG Lezoux (43.2)		EG Rheinzabern (43.3)		EG Trier (43.4)		EG unspec (43.5)	
		Count	Wt (g)	Count	Wt (g)	Count	Wt (g)	Count	Wt (g)	Count	Wt (g)	Count	Wt (g)
3	Areas 1 and 2					4	58						
3-4	Area 2 Structure 1					1	1						
4	Area 1					8	37						
4	Area 2			5	10	1	3					1	1
4	Area 1 Structure 2					11	19						
4	Areas 4 and 5					6	29						
4-5	Area 5					2	40						
5	Area 1					3	6						
5	Area 1, Quarry pits group 1					352	1524	3	16	1	6		
5	Area 2					16	77					1	1
5	Area 2 Circular enclosure					20	135	3	39				
5-6	Area 1					6	7						
5-7	Area 2					7	69	1	3	2	50	1	2
5-11	Area 2	1	1			4	6						
6	Area 1					19	259						
6	Area 1, layer above Quarry pits group 1					64	306	9	95	2	104		
6	Area 1, layer above Quarry pits group 2					71	360	11	189	9	530		
6-7	Area 1					26	382	1	45	2	154		
6-7	Area 2					3	16						
9	Area 1 Quarry pits group 1(?)					1	3						
11	Areas 1 and 4					17	112						
12	Area 1					1	3						
Unstrat						8	96						
<b>Total</b>		<b>1</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>643</b>	<b>3452</b>	<b>28</b>	<b>387</b>	<b>16</b>	<b>844</b>	<b>3</b>	<b>4</b>

The vast majority of the samian is from Central Gaul (Lezoux), and the predominance of late forms suggests that most dates to the second half of the 2<sup>nd</sup> century. Potters' stamps were recorded on eight vessels, only four of which could be identified and closely dated. Five stamps came from quarry pit 1180. The latest of these, of Maccalus, is dated c AD 175–200.

There are a couple of points to be made about the assemblage from Area 1, in terms of function (measured by rim EVE), which may be pertinent. Overall, and for the Central Gaulish material, dishes are the most common vessel type, with cups a close second (Tables 14–15).

Table 14: Roman pottery: samian from Area 1, maximum number of forms identified (by sherd count) and (rim %) by fabric

Form	Vessel function	CG (Lezoux)		EG (Rz)		EG (Trier)	
		Count	Rim (%)	Count	Rim (%)	Count	Rim (%)
Curle 15	dish	2	17				
Curle 23	dish	1					
Déch 72	jar	2					
Dr 15/31	dish	1					
Dr 18/31	dish	2					
Dr 18/31 or Dr 31	dish	9	35				
Dr 18/31R	dish	2					
Dr 18/31R or Dr 31R	dish	10	27				
Dr 31	dish	31	47			1	
Dr 31R	dish	9	18	1	6		
Dr 31 or 31R	dish	0		2	13	1	
Dr 32	dish	0		1	7		
Dr 27	cup	4	42				
Dr 33	cup	45	116	1	7		
Dr 33 or 46	cup	1					
Dr 40	cup	0		1	5		
Dr 36	dish	8	8				
Dr 30	dec bowl	1					
Dr 37	dec bowl	49	38	3	44		
Dr 38	bowl	9	14	2	20	2	33
Dr 45	mortaria	1		2	14	4	40
Wa 79	dish	9	37				
Wa 80	cup	2	12				
<b>Total</b>		<b>198</b>		<b>13</b>		<b>8</b>	

The pattern is different for the (later) East Gaulish vessels where bowls and mortaria predominate. Decorated bowls account for 13% of all vessels (measured by rim EVE). Despite the apparent paucity of decorated vessels, one decorated sherd appears to be from a unique vessel of unknown type, discussed further below (Fig 44, 5; catalogue no 22). The Period 6 layers sealing the Quarry pits group 1 (1135 and 1551) also produced significant quantities (Table 13). Much of the Central Gaulish material was fragmentary, including a few decorated sherds, mostly from Doeccus bowls (c AD 165–200). The notable feature of

this deposit is the very large sherds from late 2<sup>nd</sup> and early 3<sup>rd</sup> century East Gaulish vessels, including a very large sherd from a Trier mortaria with a 'lion' headed spout (Fig 45, 8) and sherds forming almost half of a Drag 38 bowl. The foot-ring of the latter was well-worn. The large size of these sherds and their fresh appearance suggests little post-depositional activity since they were discarded, which may perhaps have been as late as mid-late 3<sup>rd</sup> century.

Table 15 Roman pottery: samian from Area 1, vessel function by production area (by EVE)

Vessel function	CG	EG	Total
Cup	1.70	0.05	1.75
Dish	1.89	0.26	2.15
Bowl (dec)	0.52 (0.38)	0.97 (0.44)	1.49 (0.82)
Mortaria		0.54	0.54
<b>Total</b>	<b>4.11</b>	<b>1.82</b>	<b>5.93</b>

The underside of two stamped dishes, with a high kick to the base, were worn in the centre (from Period 5 quarry pit 1180, fill 1174 and Period 6 layer 1135) as if the bases had been used as small grinding pallets. Several different types of wear were noted on Drag 38 bowls, two Central Gaulish examples (from Period 5 quarry pit 1180, fill 1439, and unstratified) had worn areas on the flange itself, whilst the other two (Period 5 quarry pit 1248, fill 1246 CG; Period 6 layer 1135 EG) had wear or grooving on the internal wall below the flange. A single body sherd from a Central Gaulish dish or bowl (Period 6, layer 1237) had fine scratches on both surfaces. These are not 'structured' graffiti, but on the inner surface the vertical scratches are so evenly spaced (c 30mm apart) as to suggest a deliberate act. A single Central Gaulish Drag 31R dish (Period 6–7, tillage soil 1002) had been cut to receive a lead repair rivet.

A similar range of samian was recovered from Area 2 (Tables 16–17). The small sherd size made identification difficult. Most of the samian from Area 2 was also recovered from Period 5. Area 2 produced a much smaller group (71 sherds, 1.05 rim EVE) with a low average sherd weight (c 6g). Of the 33 sherds (27 vessels) which were identified to form, most were dishes or bowls (17), with just one example of a decorated Drag 37 bowl, five cups, and single fragments from a Drag 34 cup and a Drag 53 *cantharus* (fig JM1.6, 7 respectively). The earliest samian was a sherd (1g) possibly from a South Gaulish cup, from a post-Roman feature (2179, fill 2178). This area also produced five sherds from Les Martres-de-Veyre, possibly from a single dish (Period 4 pit 2202, fills 2201 and 2218). These are likely to date to c AD 100–125, although production at Les Martres did continue until the middle years of the 2<sup>nd</sup> century, so this vessel *might* be a little later in date. The majority of the samian, as in Area 1, is from Central Gaul and is biased towards the mid-late 2<sup>nd</sup> century. Late form, such as Drag 45, Walters 79 and Déchelette 72, are again present. Later 2<sup>nd</sup> and early 3<sup>rd</sup> century East Gaulish material includes a rouletted bowl and a mortaria from Trier, along with a cup, a rouletted bowl, and a fragment from a Drag 53 (Fig 45, 7) from Rheinzabern. The average sherd weight for the East Gaulish material is around 15g, showing that the later material is less denuded than that from Central Gaul; a pattern also noted with the Area 1 material.

[to previous view](#)

Table 16 Roman pottery: samian from Area 2, maximum number of forms identified (by sherd count) and (rim %) by fabric

Form	Vessel class	SG		Les Martres	CG (Lezoux)		EG (Rz)		EG (Trier)	
		Count	Rim %		Count	Count	Rim %	Count	Rim %	Count
Déch 72	Jar				1					
Dr 18/31	Dish			1						
Dr 18/31 or Dr 31	Dish				1					
Dr 31	Dish				2	18				
Dr 31R	Dish				3	5	1		1	
Dr 31 or 31R	Dish				2					
Dr 27	Cup	1	10							
Dr 33	Cup				3	20	1	10		
Dr 37	Dec bowl				1					
Dr 38	Bowl				3	7				
Dr 45	Mortaria								1	
Wa 79 or 79R	Dish				3	22				
Dr 34	2 handled cup				1					
Dr 53	Cantharus						1	10		

No evidence for repair was noted. The interior of three of the vessels showed signs of prolonged wear. Two Central Gaulish body sherds (from Period 5 pit 2185, fill 2252 and Period 6–7 layer 2154) were so worn that the slip had been removed, the latter with small pits worn into the internal surface. The only mortaria sherd from this area (also from layer 2154), from Trier, was very heavily used; no grits or slip remained. Heavy wear was also noted on the foot-ring of a Trier Lud Sb bowl/dish. Three sherds were burnt; two from pit 2187 (fill 2286) and the third from the Period 6–7 tillage soils (2153).

Table 17 Roman pottery: samian from Area 2, vessel class by production area (rim EVE)

Vessel class	SG	CG (Les Martres)	CG (Lezoux)	EG	Total
Cup	0.1		0.20	0.10	0.40
Dish		0.02	0.46		0.48
Bowl (dec)			0.07		0.07
Beaker			0.01	0.10	0.10
<b>Total</b>	<b>0.1</b>	<b>0.02</b>	<b>0.74</b>	<b>0.20</b>	<b>1.05</b>

Very little samian came from Areas 4 and 5. Area 4 produced only six scrappy sherds, from four contexts. The largest sherd, from a rouletted dish, weighed 9g. Two of the sherds (weighing 1g each) were heavily abraded, as might be expected from such small fragments. All are likely to be from the Lezoux kilns of Central Gaul. Five sherds of samian were recovered from Area 5, from a large Period 4 pit (fill 4528). All are from the Lezoux kilns of

Central Gaul. Forms comprised a Drag 36 dish, a Drag 31 dish, and a Drag 18/31R or 31R dish. An Antonine date (c AD 140–200) is suggested. The average sherd weight of 11.4g is higher than observed for other areas, but is not unexpected for material from a 2<sup>nd</sup> to 3<sup>rd</sup> century pit. The sherd from the Drag 31 bowl has a perfectly smoothed edge, as if cut down and smoothed off for re-use (4531).

### *Samian from evaluation trenches*

The few sherds of samian (19 sherds, weighing 430g) from the evaluation appear to be of a slightly different character to those from the excavation (Table 18). The average sherd size is much larger (26g) and in general the sherds are in a fresher, less abraded, condition. Although the overall date range is similar, the late 2<sup>nd</sup> century bias is not evident. Only 14 sherds were identifiable by form (Table 18). The most closely datable sherds, those with decoration or potters' stamps, include two Drag 37 bowls from Les Martres-de-Veyre (c AD 100–125), a Drag 18/31R dish with a stamp of Bonoxus (c AD 125–150), and a late 2<sup>nd</sup> or early 3<sup>rd</sup> century Drag 37 bowl from Rheinzabern. No repairs or heavy wear were noted. As with the excavated material, dishes were the most common vessel type. Unusual samian forms. It is remarkable that this small collection of samian has produced not one, but two examples of uncommon samian forms albeit small sherds (Fig 45, 6–7), and a sherd which may be unique (Fig 44, 5).

Table 18 Roman pottery: samian from the evaluation trenches, maximum number of forms identified by fabric (count) and rim %

Form	Vessel class	CG (Les Martres)		CG (Lezoux)		EG (Rz)	
		Count	%	Count	%	Count	%
Déch 72	Jar			1			
Dr 18/31R	Dish			1			
Dr 18/31R or Dr 31R	Dish			1	5		
Dr 18/31-31	Dish			1			
Dr 31R	Dish			2			
Dr 31 or 31R	Dish			1			
Dr 36	Dish			2	8		
Dr 37	Dec bowl	2		1		2	6

The Central Gaulish Drag 34 cup or *skyphos* (Fig 45, 6) is represented by a small rim sherd with the characteristic flat 'plate' from the top of one of the handles. The form, which is not at all common, is found as a shallow version as well as an almost hemispherical cup (Oswald and Price 1920, pl LII, 7, 8). An example from Newstead (*ibid* pl LII, 8) is thought to be Antonine, as is one of the fragments from London listed by Stanfield (1929, fig 9, 43). Given the later 2<sup>nd</sup> century bias within this assemblage, as well as the appearance of the sherd, a mid- or even a late Antonine date seems probable.

The Drag 53 beaker or tall handled cup (the Latin name for this form is *cantharus*) is probably a product of the Rheinzabern kilns (Fig 45, 7). The body of these cups is usually decorated *en barbotine*, but here only the stub of one handle and part of the flaring rim survives. Of the few examples from this country sherds have been found in London (Walbrook), Dover, and Chester (Bird 1993, 6). It is probable that the type-vessel, from Pfünz (Oswald and

Pryce 1920, pl LXXXI, 3) dates to the early 3<sup>rd</sup> century (Bird 1993, 6), and a similar date is suggested for this example.

The final sherd (Fig 44, 5; samian catalogue no 22), probably from the Lezoux kilns of Central Gaul, has no known parallels, but might be part of the handle from a *paterna* or similar vessel. The sherd has been examined by several British samian scholars as well as Richard Delage. None have seen a comparable sherd. Again a date in the second half of the 2<sup>nd</sup> century seems likely.

### *The decorated samian*

The decorated sherds were, in general, very reduced in size leaving very little decoration that could be identified. With one exception, all of the decorated vessels from the excavation were from Central Gaul, more specifically from Lezoux. The exception is the rim/handle fragment from a Drag 53 made in Rheinzabern (Fig 45, 7), on which no decoration survives. Of the three decorated sherds from the evaluation trenches, two (probably from the same vessel) are from Les Martres-de-Veyre, and one from Rheinzabern. The majority of the decorated wares (as with the bulk of the assemblage) are Antonine. All of the describable decorated wares are from Area 1, with the exception of one sherd with Cinnamus ii style decoration and one plain Déchelette 72 sherd from Area 2, and three sherds from the evaluation. Most sherds were in a fair condition with a few more abraded and battered. Some had been burnt, presumably after they had been discarded (Fig 44, 1; samian catalogue no 2; some sherds burnt, others not). The work of later potters dominates the group, although there are examples of the products of Hadrianic and early Antonine potters such as the Quintilianus group, Albucius, Docilis i and Paternus III.

### *Overview of the samian assemblage*

Although a comparatively small collection, the samian sheds some light on samian supply, date and status. With the exception of one very small sherd from a Drag 27 cup, samian from La Graufesenque (South Gaul) was conspicuous by its absence. First century material is not consistently present on excavations within Worcester. The first quarter of the 2<sup>nd</sup> century is represented by samian from Les Martres-de-Veyre. Because most of the samian at the City Campus site was dumped, having been transported from other locations in the Roman settlement, the paucity of early material might suggest that it is not derived from the area of the earliest settlement. The vast majority of the samian is of mid-late 2<sup>nd</sup> and early 3<sup>rd</sup> century date; a pattern noted elsewhere (Wild 2010). The proportion of decorated ware across the whole site, if measured by rim EVE, is low at about 14%, although if maximum vessel numbers are used the figure rises to 25%. It has been suggested (Willis 2004) that the proportion of decorated to plain ware varies according to the type of site. Willis based his observations on vessel number, not EVE, so the latter figure (25%) is the appropriate basis for comparison with his data. This is perhaps closest to the average of 26.4% given for samian from major civil centres. If we take it that as many as one in four vessels are decorated, coupled with the presence of mortaria as well as uncommon vessel forms (Drag 34, Drag 53), a high degree of sophistication is implied, making this assemblage directly comparable with material from major civil centres such as Silchester, *Verulamium*, Cirencester and Southwark.

The presence of 3<sup>rd</sup> century vessels from East Gaul indicates that samian was probably available until the middle of that century. Heavy wear of some vessels and the suggestion

that vessels were also repaired with lead rivets (not strictly rivets!! more like cleats) suggests prolonged use. Whether this was due to a decline in supply, lack of access to the samian 'market', poverty or parsimony can only be guessed at.

### *Catalogue of the decorated samian*

#### *Abbreviations used in the catalogue*

O	Figure types from <a href="#">Oswald 1936–37</a>
CG	Central Gaul
Ricken Fischer	Motifs in <a href="#">Ricken and Fischer 1963</a>
EG	East Gaul
Rogers	Motifs in <a href="#">Rogers 1974</a>
Drag	Dragendorff form
S&S	<a href="#">Stanfield and Simpson 1990</a>

#### *Hadrianic–Antonine potters*

1. Drag 37, CG. Body sherd from a large bowl (wall thickness 7–8mm) with ovolo Rogers B70 and wavy border below. The scrap of decoration is probably part of a vine scroll (Rogers M4) with a rosette (Rogers C281) to one side which suggests Quintilianus group rather than Laxtucissa, who both used the ovolo; c AD 125–150. Period 5, quarry pit 1288, fill 1287.
2. Seven sherds from four different contexts from a small Drag 37 bowl; some of the sherds are discoloured by burning. The extant decoration consists of festoon containing cockerel O.2361 perching on double rings with running animals below (bear O.1627). The festoons and lower animal are within vertical panels. The separators are bead rows which appear to alternate between rows of small, and rows of squashed, large, beads; with large astragalus terminals. The festoon is poorly impressed: it is a double bordered example, but the inner line appears intermittently. The style of the bowl has elements in common with bowls of Cerialis ii- Cinnamus ii, X-6 and Large S potters. However, the double rings and large astragalus might indicate this is the work of Docilis i who also used the cockerel. The ovolo is unusual, matching B24 in size, but without the large rosette. Hadrianic or early Antonine. Period 6, layer 1135; Period 5, quarry pit 1326, fill 1325 and quarry pit 1180, fills 1175, 1177, 1178 ([Fig 44, 1](#)).
3. Drag 37, CG. Joining body sherds from the base of the decoration, with the feet of lion O.1378, two impressions of motif Q89, and a plain ring. Bead row at base of decoration. The lion is listed for Large S potter – the motif for X-6C. Hadrianic- early Antonine. Period 11, pit 1195, fill 1194.
4. Drag 37, CG. Body sherd with vertical panel of plain rings between wavy borders. Hadrianic–early Antonine. Period 5, quarry pit 1116, fill 1115.
5. Drag 37, body sherd from bowl with marine theme similar to a bowl in Albus style from Corbridge (S&S pl 121, 8); includes sea monsters O.52A and O.33 and part impressed leaf Rogers J146; c AD 145–175. Period 5, quarry pit 1210, fill 1208.
6. Drag 37, CG. Base of decoration only with leaf Rogers J 162 and unidentified, small



flapping bird. Possibly Quintilianus or Laxtucissa who used the leaf; c AD 145–175. Period 5, quarry pit 1322, fill 1321.

7. Drag 37, CG. Body sherd with only a scrap of single-bordered ovolo (probably Rogers B77) with beaded border below. The panelled decoration has beaded borders with small rosettes at the corners. A St Andrew's cross made from trifid motifs (?Rogers G67) and rams horn motifs (Rogers G370). This arrangement suggests links with Paternus III. The figure in the left hand panel is possibly Diana with deer (O.106), but only the head of the deer survives here. Diana and the ovolo are not listed by Rogers for Paternus III. A sherd with the St Andrew's cross, also with a tentatively identified figure of Diana to the left come from Tiddington, Warwickshire (Samantha Hopkins pers comm). Hadrianic–early Antonine. Period 6–7, layer 1002 (Fig 44, 3).

#### *Cinnamus ii*

8. Drag 37, CG. Three body scraps which could all be from the same pot, although none join. The only one to note has a beaded border fragment and part of a Cinnamus ii mould stamp (die 5b), c AD 145–175. Period 5, pit 1180, fill 1174.
9. Drag 30, CG. Body sherd in Cinnamus ii style only a leaf (Rogers J1) with a sitting bird perching on it survive, c AD 150–180. Period 5, quarry pit 1158, fill 1159.
10. Drag 37, CG. Body sherd with ovolo and wavy border below. Probably ovolo Rogers B182 (Cinnamus ii ovolo 5) which was sometimes used by Cinnamus with a wavy border, c AD 135–180. Period 6, layer 1237.

#### *Doeccus*

11. Drag 37, CG. Two body sherds in Doeccus' style, both probably from the same vessel. The larger sherd has ovolo Rogers B161 with beads below and a medallion (Rogers E8) with leaf (Rogers H17) all of which were used exclusively by Doeccus. The smaller sherd has a scrap of the medallion, very square beads (Rogers A13) like those used at Doeccus' workshop and a rosette (Rogers C 170); c AD 165–200. Period 5, quarry pit 1158, fill 1187 (Fig 44, 2).
12. Drag 37, CG. Body scrap with Doeccus' ovolo Rogers B161. Finish and fabric indicate this could be from same bowl as 1187, c AD 165–200. Period 5, quarry pit 1206, fill 1205.
13. Drag 37, CG. Body sherd with ovolo only extant – probably Doeccus' ovolo Rogers B161, c AD 165–200. Period 5, quarry pit 1118, fill 1117.
14. Drag 37, CG. Scrap with leaf Rogers H16 used by Doeccus, c AD 165–200. Period 6, layer 1135.
15. Drag 37, CG. Scrap with beaded borders and a trace of a medallion (Rogers E8), leaf H15 and two rosettes (Rogers C170), all used by Doeccus, c AD 165–200. Period 6–7, layer 1002.

#### *Unattributed (Antonine)*

16. Drag 37, CG. Very abraded body sherd with part of a double bordered festoon with

beaded border below; below the border is part of panther O.1546 used by Borrillus, Carantinus II, Paternus II, Priscus and Clemens; mid-late Antonine. Period 6, layer 1135.

17. Drag 37 Scrap of ovolo with bead row and astragalus from the top of a festoon only surviving, mid-late Antonine. Period 5, quarry pit 1216, fill 1215.
18. Drag 37, CG. Body sherd with tiny ovolo scrap (with no border below) and the head and shoulders of Apollo (O.91) a figure type listed for Austrus, Butrio, Censorinus, Cinnamus ii, Laxtucissa, Libertus Ia, Mammius; Hadrianic or Antonine. Period 5, quarry pit 1288, fill 1287.
19. Drag 37, CG. Body sherd with part of Pan (O.717), basket ?Rogers T29 (Rogers shows this basket without detail, but this example has small, neat crosses in the panels). Perhaps candelabrum Rogers Q43 to left of figure. Possibly Iullinus ii who used all the details; c AD 160–200. Period 5, quarry pit 1279, fill 1277 ([Fig 44](#), 4).
20. Drag 37, CG Scrap with ovolo Rogers B156 and cabled border below used by Iullinus ii, c AD 160–200. Period 5, quarry pit 1288, fill 1287.
21. Déchelette 72, CG. A Body sherd from a jar decorated with barbotine leaves, late 2<sup>nd</sup> century AD. Period 6–7, layer 1002.
22. Form unknown, CG. A flat sherd with moulded decoration. Only part of a medallion with cabled outer circle and plain inner and a figure survive. The figure within the medallion is a running goat, similar to, but not the same as O.1840. The sherd shows no sign of throwing or turning marks; it has slip on both faces. The surfaces, especially the 'underside' show signs instead of wiping. The fabric and quality of the slip suggest that it is almost certain that this piece derives from the kilns at Lezoux. It has not been possible to find a parallel for this sherd (vessel). Because it shows no curvature at all there are very few known forms from which this sherd could have come. It is not comparable with the internally decorated form 36 dishes from Rheinzabern in any way ([Bird 1998](#), 151–6) as these were decorated *en barbotine*, nor are internally decorated dishes known from Lezoux. Occasionally canteens with flat sides are encountered ([Stanfield 1936](#), fig 5) but these would not have a wiped finish on the 'under-side' and because they are closed vessels are unlikely to be slipped internally, also, they were probably all made in South Gaul. This leaves dishes and trays with projecting flat handles such as form Drag 39 (eg [Stanfield 1929](#), 18) and 'patera' ([Stanfield 1936](#), fig 2) with their single flat handle.

Firstly, to address form Drag 39, this vessel was produced at Rheinzabern, and not at Lezoux. The projecting tabs or handles are generally smaller than the scale suggested by this sherd, and furthermore, the decoration style of the handles of these vessels is rather more crowded than our piece. The cramped or crowded nature of the decoration also applies when 'patera' handles are considered. An example from Ribchester with a mould stamp of Doccius ii is from Central Gaul ([Déchelette 1904](#), 318) and another stamped example, from York, is attributed to Doeccus of Lezoux ([Stanfield 1936](#), fig 2, 6). Both are mould-decorated but neither would be large enough to accommodate the medallion. To conclude, this piece appears to be moulded, but not turned, or to have any signs of throwing or turning obliterated by

the wiped finish. As such it is unlikely to be from the centre of a large dish. Slipped on both sides, it is unlikely to be from a closed vessel form. Within the range of known vessel forms this leaves forms with flat projecting handles. Known examples of these are either not part of the repertoire of Central Gaulish potters, or are not large enough to accommodate the medallion of our example. Finally, the decorative style of projecting handles is usually very 'busy' and 'cramped' whilst this sherd does not appear to be. Judging from the fabric and finish of the piece, and the inhabited medallion this piece is likely to date to the second half of the 2<sup>nd</sup> century, probably after c AD 160. It appears to be unique. Period 5, quarry pit 1155, fill 1151 ([Fig 44](#), 5).

23. Drag 37, CG. Slightly abraded body sherd with a winding scroll of large vine leaves with a flapping bird (O.2315). The flapping bird suggests Cinnamus ii style (S&S 1990, fig 162, 61), c AD 150–180. Period 6–7, layer 2154.

#### *Evaluation trenches*

24. Drag 37, Les Martres-de-Veyre. Two sherds in Drusus I style probably from the same vessel although not joining. A body sherd with ovolo Rogers B28, and dancer O.356 in beaded panel below. A second sherd, probably from the same vessel, is from the lower part of the decoration and has a basal row of beaded rings (Rogers C294) and stand Rogers Q 15 and also motif Rogers U62 impressed over the bead row. U62 also seems to be at the corners of the panels on both sherds although the moulding is not clear, c AD 100–125. Fill 2205.
25. Drag 37, EG (Rheinzabern). A sherd from the lower edge of the decoration and part of the plain zone below with a distinctive finger mark in the slip. The only surviving motif (Ricken Fischer O 161) was used by Janu(arius) I, Julius II-Julianus I, Victorinus II and Respectinus I. It can be seen in a similar position on pots attributed to Janu(arius) I ([Ricken and Thomas 2005](#), taf 19, 1F, 5 and 7) where it was used as a support for an arcade. A late 2<sup>nd</sup> to early 3<sup>rd</sup> century date is probable. Fill 2206.

#### Catalogue of samian stamps (excavation areas and evaluation trenches).

The sherds with potters' stamps are all from layers within Area 1 on the terrace top. This is the excavation area which produced the most samian. The entries below are ordered as follows: potters' name (i, ii etc, where homonyms are involved), die, production centre (fabric), form, reading, date, excavation context number. Ligatured letters are underlined>.

#### *Abbreviations used in the catalogue*

Drag	Dragendorff vessel form series
CG	Central Gaul
EG	East Gaul

#### *Identified stamps*

26. Cinnamus ii, die 5b, CG (Lezoux), Drag 37, CIN[NAMI] (part of first three letters of this die on a very small scrap, c AD 145–175. Period 5, quarry pit 1180, fill 1174.
27. Maccalus, die 3a, CG (Lezoux), Drag 33, MACCILIM (the final splayed M is actually appears more like a vertical arrowhead), c AD 175–200. Period 5, quarry pit 1180, fill 1176, SF112.

[to previous view](#)

28. Namilianus, die 3b, CG (Lezoux), Drag 31, NAMIL[I]AN[I], c AD 170–200. Period 6–7, layer 1002.
29. Tauricus i, die 10a, CG (Lezoux, burnt), Drag 31, TAVR[ICVF], c AD 150–180. Period 5, quarry pit 1180, fill 1175.

#### *Unidentified Stamps*

30. JF, CG, Drag 33, Antonine. Period 5, quarry pit 1180, fill 1178.
31. JMA, CG, Drag 31, mid–late Antonine. Period 6, context 1444.
32. JM[, CG, Drag 18/31R or 31R. Period 5, quarry pit 1180, fill 1174.
33. JTVS, EG, Drag 31, unidentified stamp: the T here is formed more like a Y, late 2<sup>nd</sup> to early 3<sup>rd</sup> century. Period 6, layer 1135.

#### *Evaluation trenches*

34. Bonoxus, 3b, CG, Drag 18/31R, [BON]OXŠ ŽF (retro within guidelines), c AD 125–155 (context 2505).
35. [ or ]V, CG, Drag 18/31–31, c AD 140–160 (context 801).
36. JE, CG, EG (?Rheinzabern), ?Drag 38; late 2<sup>nd</sup> to 3<sup>rd</sup> century (context 2305).

#### *Amphora*

*by C Jane Evans and David Williams*

Amphorae were not at all common in the assemblage, representing only 1% by count and 3% by weight overall. This is similar to the proportions noted at the nearby Magistrates' Court site ([Evans nd](#)) and within the range expected for a Roman small town ([Evans 2001](#), fig 11). The main fabric represented was Dressel 20 olive oil amphorae (Fabric 42.1; [Peacock and Williams 1986](#), class 25). This and the Pélichet 47/Gauloise 4 wine amphorae (Fabric 42.3; *ibid*, class 27) were both found in small quantities from Period 4 onwards.

Of particular interest was a sherd in a black sand fabric (Fabric 42.2) from Period 3 (context 1007). This light red sherd is especially distinctive in the hand-specimen as the fabric appears to contain much 'black sand', caused by the presence of dark green augite crystals ([Peacock 1971](#), fabric 2). This fabric has been sourced to the area around the Bay of Naples and is especially associated with the towns of Herculaneum and Pompeii ([Peacock 1977](#); [Williams and Peacock 2005](#)). In Roman Britain, this fabric is usually associated with the Dressel 2–4 wine amphora form ([Williams and Peacock 2005](#); [Peacock and Williams 1986](#), class 10), though if in a late context it could be from the Almond-rimmed form amphora type, which has a long cylindrical body and a slightly flaring spike, similar to Dressel 2–4, but the handles are ovoid or elliptical and the rim almond-shaped ([Arthur and Williams 1992](#)). This form dates to around the early 3<sup>rd</sup> century AD to the late 3<sup>rd</sup> to 4<sup>th</sup> century AD ([Williams and Keay 2006](#)). It is assumed that wine was also carried in this form, based on the general similarity to the Dressel 2–4 shape and the fact that it comes from the wine producing region around the Bay of Naples. The Almond-rimmed type is a comparatively rare find in Britain and it has often, but not exclusively, been associated with military sites, such

as York, Catterick, and South Shields fort on Hadrian's Wall ([Arthur and Williams 1992](#); [Williams and Keay 2006](#)). The South Shields sherds, for example, were dated AD 250–350 ([Bidwell and Speak 1994](#)). Dressel 2–4 amphorae date from the late 1<sup>st</sup> century BC through to the mid-2<sup>nd</sup> century AD ([Peacock and Williams 1986](#), 106). Given that the sherd comes from a Period 3 deposit, this suggestion by David Williams seems most likely.

### *Counters and lids, and repairs*

Six counters or lids were recorded formed from reused sherds: four in Severn Valley ware, one in white slipped ware (Fabric 20) and one in Oxfordshire white ware (Fabric 38). With the exception of one from Period 5 (catalogue no 6), all came from Period 6 or later deposits. The largest example (catalogue no 1) is interpreted as a lid, based on its size. Another (catalogue no 2) has possibly been used as a rubber, as the edges were very smooth. The others are all probably counters. The diameters for these were fairly consistently around 6cm, with the exception of one smaller example (catalogue no 4). The two counters formed from flagon bases (catalogue nos 5 and 6) would have made attractive counters, both using the 'decoration' of concentric circles on the re-tooled bases. They are so similar, in size as well as look, that they could perhaps have formed part of a set.

Evidence for repair, in the form of drilled holes to receive lead rivets, was found on five sherds: a Central Gaulish Drag 31R dish (Fabric 43.2; Period 6–7, tillage soil 1002); a Mancetter Hartshill, multi-reeded, hammerhead mortarium (Fabric 32; Period 6, layer 1135); a sherd of Dressel 20 amphora (Fabric 42.1; Period 6–7, tillage soil 1002); a 2<sup>nd</sup> to 3<sup>rd</sup> century Severn Valley ware wide-mouthed jar (Fabric 12.6; Period 5 quarry pit 1279, fill 1276); and a 2<sup>nd</sup> century BB1 jar (Fabric 22; [Seager Smith and Davies 1993](#), fig 122, WA type 1; Period 5 pit 2199, fill 2198).

### *Catalogue of lids and counters (not illustrated)*

1. Lid, formed from a base and therefore well rounded. Fabric 12. Diam 10cm. Period 6, layer 1444. Database Rec 761.
2. Counter or ?rubber, formed from an irregularly-shaped body sherd, with smoothed edges. Fabric 12. Maximum diam 8cm. Period 6–7, tillage soil layer 1002. Database Rec 3067.
3. ?Counter, crudely formed, with 'pecked' edges, from a body sherd. Fabric 12. Maximum diam 6cm. Period 6, layer 1551. Database Rec 399.
4. ?Counter, crudely formed, with 'pecked' edges, from a body sherd. Fabric 12.24. Maximum diam 4cm. Period 6 layer 1135.
5. Counter formed from a re-tooled flagon base and therefore well rounded. Fabric 20. Diam 6cm. Period 6, layer above quarry pits 1331. Database Rec 2917.
6. Counter, formed from a re-tooled flagon base and therefore well rounded. Fabric 38. Diam 6cm. Period 6, layer 1551. Database Rec 2952.

## *The graffiti*

by Roger Tomlin and David Williams

Four sherds with graffiti were noted, listed below.

### *Catalogue of graffiti*

1. Large body sherd from the shoulder of a Dressel 20 amphora, with intersecting lines cut into the clay before firing. The lines are difficult to interpret as a letter, but could perhaps be a 'cross' or similar mark of identification. Another interesting possibility, however, is that they represent olive branches. Dressel 20 amphora were made in the valley of the River Guadalquivir and its tributaries, between Seville and Cordoba in southern Spain. This region of Spain was famous in antiquity for its fertility (Columella, *De Re Rustica*, 5, 85; Pliny, *Naturalis Historia*, 17.93), especially for the intensive cultivation of the olive, which produced an abundance of good quality olive oil for exportation (Pliny, *Naturalis Historia*, 15.3.8; Strabo iii.2.6). Olive branches are often shown, for example, in stylized form on Roman coins. Dressel 20 were produced to carry the vast quantities of locally produced olive oil that was shipped over much of the Empire, but in particular to Rome and the north-west provinces. Many of the producer's stamps, found on the handles of Dressel 20 amphorae, are often accompanied by crude drawings in the shape of an olive branch with no flowers and no fruit, just smooth flexible stems, perhaps symbolizing the great fertility of Baetica (Callender 1965). It is possible, therefore, that this might also be an emblematic sketch of undecorated olive branches. Fabric 42.1. Period 6, layer 1551. Database Rec 2383.
2. Rim from a Drag 31 dish in Lezoux Central Gaulish samian (Fabric 43.2). The sherd is very abraded, and has many scratches that are not all necessarily deliberate. Those on the inside all seem to be casual, though the even spacing might suggest they are deliberate. On the outside, two or three lines apparently meet in a 'cross' or 'star' which would be a mark of identification. Short parallel lines below the rim do not appear to be letters. Period 6, layer 1551. Database Rec 4173.
3. Rim from a reeded hammerhead mortarium (Fabric 32). The marks, positioned under the flange, were made before firing and thus belong to manufacture rather than ownership and use. Perhaps VII; either a note of capacity ('7') or the first two letters of the potter's name, VE. The latter seems more likely. Period 5, quarry pit, fill 1279. Database Rec 2421.
4. Body sherd from the shoulder of a flagon in white colour coated ware (Fabric 20), with two pairs of intersecting lines, now incomplete. These could be interpreted as VV, M, or even XX (a numeral). Most likely is M, as the sherd appears to have been this way up. If the flagon was very large, this might be a measure of capacity in m(odii), 'bushels'. Otherwise it is probably the first letter of a personal name, M[...]. Period 6, layer 1136. Database Rec 2918.

### Dating the Roman pottery assemblage

Pottery was the main bulk find used for dating and the pottery data were analysed in more detail to attempt to understand the site chronology. Given a clear chronological

sequence, early fabrics would be proportionately most common in earlier phases, becoming proportionately less common as the ware went out of use and broken vessels became increasingly dispersed and eroded. Analysis of the data indicated that the pattern here is more complex.

The Quarry pits groups 1 and 2 were assigned to different site periods for two reasons: physically they appeared to be two discrete groups, and spot dating suggested there was a chronological distinction. The fills of the two groups were distinct in terms of the quantities of finds recovered: the Period 4 Quarry pits group 2 produced far fewer finds than the Period 5 Quarry pits group 1. The Period 6 layers and the Period 6–7 tillage soils had a clear stratigraphic relationship, overlying the pits.

Some of the more common, chronologically diagnostic fabrics were plotted (Fig 47) as a proportion (by % weight) of the period assemblage. Period 3 is not included, as the very small assemblage is not statistically reliable. Organic tempered Severn Valley ware (Fabric 12.2) is a typically 1<sup>st</sup> to 2<sup>nd</sup> century fabric. This is particularly common in Period 4 and also in Period 6–7, indicating that the tillage soils incorporate significant quantities of residual earlier material. A similar pattern is seen with the Central Gaulish samian, dated more closely to c AD 160–200. As might be expected this is common in Period 3, but it is most common in Period 5 and well represented in Period 6–7.

The East Gaulish samian shows a different chronological trend. This material dates from the late 2<sup>nd</sup> to mid-3<sup>rd</sup> centuries, possibly continuing in use until the mid–late 3<sup>rd</sup> century. It was represented by only a single sherd in Period 4. It was most common in the midden layers and, in particular, the tillage soil. The higher proportion of Mancetter Hartshill mortaria (Fabric 32) in Period 6 also reflects the presence of 3<sup>rd</sup> century material in these layers; the most common forms in this fabric were the hammerhead type, dating from the mid-3<sup>rd</sup> to 4<sup>th</sup> centuries.

### Dating the site sequence

Dating periods of activity on the site was not straightforward, for a number of reasons.

- There was no clear stratigraphic sequence linking features across the site.
- The main activities on the site related to quarrying and rubbish dumping, rather than settlement.
- Many of the forms in Severn Valley ware, the most common fabric, were only broadly datable to the 2<sup>nd</sup>–3<sup>rd</sup> or 3<sup>rd</sup>–4<sup>th</sup> centuries, so *terminus post quem* dates were often based on only one or two more closely dated forms.
- Significant quantities of 2<sup>nd</sup> and 2<sup>nd</sup>–3<sup>rd</sup> century material were present in most assemblages, even where a later *terminus post quem* was indicated by a diagnostically later type.

Despite these limitations there was sufficient dating evidence to suggest the main period of activity and chronological patterns within this. The best dating evidence came from the small finds and the imported or more widely traded pottery, though some Severn Valley ware forms also provided significant dating.

### Period 3

Late 1<sup>st</sup> to late 2<sup>nd</sup> century: pottery mostly c AD 150–200. Only 49 sherds were assigned to Period 3 (Table 4; Fig 23). The pottery assemblage had a high average sherd weight (26g) and relatively low levels of abrasion (35% recorded as none, 43% recorded as slight, and 22% as very), suggesting little disturbance. The pottery mainly came from layers 1007 and 2097 (45 sherds), with only two sherds from ditch 2121 (fill 2120) and posthole 2139 (fill 2138) respectively.

One of the four sherds of samian, from a Curle 15 dish, provided a *terminus post quem* of c AD 150–200. A sherd of amphorae recovered from Period 3 was identified by David Williams as either Dressel 2–4 or an Almond rimmed type. Dressel 2–4 is perhaps more likely, as this dates from the late 1<sup>st</sup> century BC through to the mid-2<sup>nd</sup> century AD, and may therefore have been in contemporary use with the samian. The Almond-rimmed type dates from the early 3<sup>rd</sup> century. The coarse wares were consistent with a date in the second half of the 2<sup>nd</sup> century, though some forms continued in production into the 3<sup>rd</sup> century. The BB1 included diagnostically 2<sup>nd</sup> century forms (Seager Smith and Davies 1993, WA type 1; Fig 40, 74), as well as a less closely dated form (*ibid*, WA type 8). The Severn Valley ware included late 2<sup>nd</sup> to 3<sup>rd</sup> century forms (Webster 1976, fig 7, type E42–3, fig 9, type G55 and fig 5, type C23–5), as well as residual 1<sup>st</sup> century forms (Webster 1976, fig 7, type E38 and fig 9, type H).

### Period 4

Late 2<sup>nd</sup> to late 3<sup>rd</sup> century: pottery mostly c AD 170–260. Period 4 produced a limited assemblage of pottery (Table 4; Fig 23), with 408 sherds coming from the quarry pits, 239 from the Structure 2, and 217 sherds coming from other assorted pits. The pottery from Period 4 deposits was more fragmentary than from Period 3, with an average sherd weight of 13g. Higher levels of abrasion were also noted (19% none, 45% slight, and 36% very). This might reflect increased disturbance of material in this period. Thirty-five Quarry pits group 2 produced pottery, and ten other pits. Most pits only produced a handful of sherds. The exceptions were pits 1451 (264 sherds, 3854g), 1475 (48 sherds, 1086g), pit 4175 (43 sherds, 663g), 2202 (29 sherds, 346g), 4528 (15 sherds, 102g) and 4126 (21 sherds, 297g). Overall these pits had a fairly high average sherd weight (16g). The quantity of pottery from Structure 2 seems quite high. These sherds had a lower average sherd weight lower (9g).

The latest find was a Mancetter Hartshill mortarium dated to c AD 240–330, which came from cleaning layer 1008 (Fig 42, 93). This may, however, be intrusive, as other vessels of this date were found in Period 5. The presence of six separate mortaria was noted, all of the same type and dated to c AD 110–40, from the fill of a single pit (1451, fill 1450; Fig 42, 89). Their presence together suggests a coherent, contemporary deposit. Interestingly, another Period 4 pit (2202, fills 2201 and 2218) produced the only five sherds of Les Martres-de-Veyre samian (Fabric 43.6), also dating to the first half of the 2<sup>nd</sup> century. The majority of the samian could only be dated broadly to c AD 120–200. The latest piece was a vessel in Eastern Gaulish samian (Fabric 43.5) dated to c AD 170–260, which was recovered from pit 2081 (fill 2080). If the Mancetter Hartshill mortarium described above is intrusive, then this sherd provides the *terminus post quem* for the period. A couple of other sherds were dated c AD 140–200 and 150–200. The coarse wares were consistent with a broadly 2<sup>nd</sup> to 3<sup>rd</sup> century date. The BB1 included a typically 2<sup>nd</sup> century bowl (Fig 40, 80), and jars had acute (3 sherds) and right-angle (1 sherd) cross hatch decoration. The latter first appears at Vindolanda and Exeter in the late 2<sup>nd</sup> century (Bidwell 1985, 175; Holbrook and Bidwell 1991, 96). The Severn



Valley ware included 2<sup>nd</sup> to 3<sup>rd</sup> century tankards and jars (cf Webster 1976, fig 7, types E40–3 and fig 5, type C23–5) and jars dating to the 3<sup>rd</sup> to 4<sup>th</sup> centuries (Webster 1976, fig 3, type A9 and fig 5, type C27; Evans et al 2000, fig 21, JNM12). Malvernian wares included 1<sup>st</sup> to 2<sup>nd</sup> century tubby cooking pots (Peacock 1965–67, fig 1, 10–12), and 2<sup>nd</sup> to 3<sup>rd</sup> century, wheelmade jars (Peacock 1965–67, fig 1, 13–14 and fig 3, 20–4). The small finds included a residual 1<sup>st</sup> century brooch (Personal ornaments and equipment, catalogue no 1) and a 1<sup>st</sup> to 2<sup>nd</sup> century nail cleaner (Toilet equipment, catalogue no 52).

### *Period 5*

Late 3<sup>rd</sup> to ?early 4<sup>th</sup> century; pottery mostly later than c AD 270. A large assemblage of pottery and other finds came from deposits assigned to Period 5 (Table 4; Fig 23). This was the most fragmentary period assemblage, with an average sherd weight of 10g. There was no significant difference in average weights between the pottery from the pits and the circular enclosure. The levels of abrasion were similar to Period 4 (none 20%, slight 47%, and very 32%). The Quarry pits group 1 alone produced 20% by weight and 25% by rim EVE of the entire site assemblage. Fifty-five Quarry pits group 1 produced pottery and fifteen other pits. Amongst the group 1 pits, 26 produced less than 10 sherds, 8 produced 10–19 sherds, 10 produced 20–39 sherds, 10 produced 40–100 sherds, and 8 over 100 sherds. The eight pits with the largest assemblages were 1118 (115 sherds, 1301g), 1114 (124 sherds, 1268g), 1140 (152 sherds, 1936g), 1279 (185 sherds, 1496g), 1287 (198 sherds, 1127g), 1158 (200sherds, 2013g), and 1180 (793 sherds, 5939g). The circular enclosure produced 343 sherds weighing 3427g.

A single small body sherd (4g) of late Roman shell tempered ware (Fabric 23) was recovered from the upper fill of pit 1180 (fill 1174). The dating of this is discussed above. Examples of two other late forms could support a 4<sup>th</sup> century date, but do not prove it: an Oxfordshire ware bowl dated c AD 270–400+ (Young 2000, 158, fig 58, C45) and a Mancetter Hartshill mortarium dated c AD 270–370 (Fig 42, 95).

A large number of small finds was recovered from this period, but the majority were dated to the 2<sup>nd</sup> to 3<sup>rd</sup> century, and no distinctive 4<sup>th</sup> century material was recovered (see p79).

The majority of the coarse wares had a similar broad date. Some vessels were datable to the 3<sup>rd</sup> or late 3<sup>rd</sup> to 4<sup>th</sup> centuries. The mortaria included an Oxfordshire form dating to c AD 240–300 (Fig 42, 90), from the circular enclosure (2012, fill 2013). The BB1 included late 3<sup>rd</sup> to 4<sup>th</sup> century flanged bowls, dishes and jars (Seager Smith and Davies 1993, fig 124, WA type 25 and fig 122, WA type 3; Gillam 1976, fig 5, 81) as well as earlier types. Obtuse cross hatch was the most common decoration on jars (35 sherds), followed by right angle lattice (22 sherds). The former first appears at Vindolanda c AD 223–5 and is then typical of 3<sup>rd</sup> and 4<sup>th</sup> century assemblages, while the latter first appears in the late 2<sup>nd</sup> century (Bidwell 1985, 175). Some 3<sup>rd</sup> to 4<sup>th</sup> century Severn Valley jars were also present (Webster 1976, fig 3, type A9–11 and fig 5, type C27, representing 3% by rim EVE here; Evans et al 2000, fig 21, JNM12, JNM14). Tankards with markedly splayed walls were fairly common (4% by rim EVE), but the earliest types with upright walls (1% rim EVE) and intermediate forms were also present (4% rim EVE). A significant quantity of samian was recovered from this period; 403 sherds, representing 11% by count, 5% by weight and 10.6% by rim EVE. The vast majority (391 sherds) was Central Gaulish ware, attesting the presence of residual 2<sup>nd</sup> century material. Ten vessels in East Gaulish samian dated variously between c AD 170 and 260. The latest of

these were two bowls, dated c AD 200–60 and c AD 200–50, and a substantial fragment of a Drag 45 mortarium, dated AD 170–260.

### Period 6

For the later 3<sup>rd</sup> to 4<sup>th</sup> century more than half of the pottery assemblage (52% by weight) were assigned to Period 6 (Table 4; Fig 23), mainly from layers above Quarry pits groups 1 and 2 (c 36% weight, 41% by rim). The assemblage as a whole had a fairly high average sherd weight (18g), higher than in both Periods 4 and 5. The pottery from the layers over the quarry pits was only slightly more fragmentary (16g), suggesting it had not been heavily trampled or disturbed. The assemblage had lower levels of abrasion than material from preceding periods (none 33%, slight 46%, very 21%). The quantity and condition make it likely that the rubbish was dumped onto a midden heap.

The latest diagnostic piece was an Oxfordshire bowl dated c AD 300–400+ (Young 2000, 162, fig 60, C64). No late Roman shelly ware was noted. The latest coarse wares present suggested a broadly late 3<sup>rd</sup> to 4<sup>th</sup> century date. The BB1 included late 3<sup>rd</sup> to 4<sup>th</sup> century bowls, dishes and jars (Seager Smith and Davies 1993, fig 124, WA type 25 and fig 122, WA type 3; Gillam 1976, fig 5, 81) as well as earlier types. However, amongst the jars, the later 2<sup>nd</sup> to 3<sup>rd</sup> century types were more common (Seager Smith and Davies 1993, WA type 2; 10% by rim EVE) than the later 3<sup>rd</sup> to 4<sup>th</sup> century types (Seager Smith and Davies 1993, WA type 3; 5% by rim EVE), reflecting the high levels of residuality. Obtuse cross hatch was by far the most common type of decoration on the jars: 165 sherds compared to 8 with right angle cross hatch). The former first appears at Vindolanda c AD 223–5 and is then typical of 3<sup>rd</sup> and 4<sup>th</sup> century assemblages (Bidwell 1985, 175). A range of 3<sup>rd</sup> to 4<sup>th</sup> century Severn Valley jars and bowls were present (Webster 1976, fig 3, type A9–11; Evans *et al* 2000, fig 21, JNM12, JNM14; Rees 1992, form 69.1) as well as late 3<sup>rd</sup> to 4<sup>th</sup> century types (Webster 1976, fig 5, types C27 and C28; fig 9, type F53). Tankards with markedly splayed walls (Webster 1976, fig 7, type E44) were more common than earlier types (5% by rim EVE compared to 3% for vessels with moderately splayed walls). Wheelmade Malvernian jars with splayed rims, copying later BB1 types (Seager Smith and Davies 1993, fig 122, WA type 2 and 3; Gillam 1976, fig 1, 8; Peacock 1965–67, fig 3: 20–1 and 28) were very common, representing 13% of the assemblage by rim EVE. However, the majority of coarse ware forms, particularly in Severn Valley ware, could only be broadly dated to the 2<sup>nd</sup> to 3<sup>rd</sup> centuries. The assemblage also included a significant quantity of samian (185 sherds, representing 5% by count, 2% by weight and 5% by rim EVE). This was predominantly Central Gaulish and therefore residual, dating to the 2<sup>nd</sup> century (154 sherds). The remaining 31 sherds were in East Gaulish samian, with dates between c AD 170 and 260.

### Period 6–7

The Period 6–7 tillage soils produced a relatively small assemblage of pottery (Table 4). The pottery from the tillage soil had a high average sherd weight (31g; or 29g excluding four heavy amphora sherds weighing 779g). The difference with the Period 6 midden layers is probably due the level of retrieval during mechanical excavation of these deposits. It is probable that most of the period 6–7 Roman pottery derives from the same midden dumps as discussed for Period 6.

The latest vessels dated to the late 3<sup>rd</sup> to 4<sup>th</sup> centuries. These included forms in BB1 (Seager Smith and Davies 1993, fig 123, WA type 20 and fig 124, WA type 25; Gillam 1976,

fig 5, 81), Severn Valley ware ([Webster 1976](#), fig 3, type A8, A10, A11; [Evans et al 2000](#), fig 21, JNM14; [Webster 1976](#), fig 5, type C27) and Nene Valley ware ([Fig 40](#), 87). The only decorated sherd from a BB1 jar had obtuse cross hatch decoration. A significant number of forms dating to the 2<sup>nd</sup> to 3<sup>rd</sup> century were also recorded, including a fairly high proportion of samian. There were 29 sherds of Central Gaulish samian, dated to c AD 160–200 (10% by count, but only 4% by weight), and 3 sherds of East Gaulish samian (1% by count, 2% by weight). The latter included a large fragment from a Drag 45 mortarium (102g) dated to c AD 170–230, and two bowls/dishes dated c AD 200–40 and 200–60 respectively.

### The Roman pottery assemblage in context

The bulk of the pottery and other finds dated to the late 2<sup>nd</sup> and 3<sup>rd</sup> century, but a small quantity of residual, diagnostically earlier material was identified. Two 1<sup>st</sup> century brooches were identified: an Aucissa and a Hod Hill, dating to the AD 50s or 60s ([see p79](#)). Both are types that have been found elsewhere in Worcester, for example from Deansway ([Mackreth 2004](#), 439 no 16–19) and from the Sainsbury supermarket site in St John's ([Cool 2014](#)). A South-west mortaria (dated to c AD 60–80) was residual in Period 5. Amongst the samian, however, only one sherd of possible 1<sup>st</sup> century, South Gaulish samian was recorded.

A few of the coarse ware fabrics and forms were dated broadly to the 1<sup>st</sup> to 2<sup>nd</sup> centuries, present in relatively small quantities and again residual in later contexts. These included: early Severn Valley ware variants (Fabrics 12.2, 12.21, 12.22, 12.23, 12.25, 12.7), and forms such as upright walled tankards, handmade Malvernian wares (Fabric 3), early micaceous ware (Fabric 21.3); and Savernake ware (Fabric 16.1). A small quantity of diagnostically early to mid-2<sup>nd</sup> century material was identified: Eggshell ware (Fabric 109), an Oxfordshire white mortarium ([Fig 42](#), 89) dated to c AD 110–40, and a West midlands mortarium dated to c AD 100–40 ([Fig 42](#), 97). However, it is notable that amongst the Central Gaulish samian, only five sherds from Les Martres-de-Veyre were recovered, typically dating to c AD 100–125, and very few of the Lezoux forms predated c AD 160. Also poorly represented was reduced ware rusticated jars. This typical late 1<sup>st</sup> to early 2<sup>nd</sup> century form is described from other published Worcester assemblages, including the nearby Police Station site ([Griffin 2002](#), fig 10, 5, 7, 8), sites on The Butts ([Evans 2011](#), 87, fig 4.7, 10), Sidbury ([Darlington and Evans 1992](#), fig 22, 1–2 and fig 23, 1), and Deansway ([Bryant and Evans 2004](#), fig 159, 1–5 and fig 162, 1, 2, 5). No sherds with rusticated decoration were noted in this assemblage, and only two fragmentary rims were possibly from such jars ([Fig 27](#), 9 and 19). There were only four BB1 jars with wavy decoration on their necks, a type dating to the first half of the 2<sup>nd</sup> century ([Seager Smith and Davies 1993](#), fig 122, WA type 1; [Gillam 1976](#), fig 1, 1–3) and noted elsewhere in Worcester ([Darlington and Evans 1992](#), fig 27, 4–5; [Bryant and Evans 2004](#), fig 166, 2). Amongst the small finds, the paucity of Polden Hill brooches may also be significant in terms of dating. These dominated assemblages from other sites in Worcester, and in the western midlands they are the typical brooch in the later 1<sup>st</sup> to mid-2<sup>nd</sup> centuries.

The great majority of finds and pottery, where closely datable, dated from the latter half of the 2<sup>nd</sup> to the 3<sup>rd</sup> century, with activity continuing to the late 3<sup>rd</sup> and possibly early 4<sup>th</sup> century. Only four Roman coins were recovered ([page 78](#)), ranging in date from c AD 196 to c AD 293. These dates sit well with the other finds evidence. The metal and glass finds ([page 79](#)) are primarily an early to mid-Roman group: the hair pins, for example, were generally 2<sup>nd</sup> century types. The samian provided useful dating: the majority came from Lezoux, Central Gaul, and most of this was mid to late Antonine. The presence of characteristically late 2<sup>nd</sup> century types

was noted, as well as the paucity of types that elsewhere are most common before c AD 160. Other fine wares and mortaria also provided useful dating. Imported wares comprised Central Gaulish black-slipped ware (Fabric 45.4), dating from c AD 150 until the early 3<sup>rd</sup> century, 'Moselkeramic' Rhenish ware (Fabric 44), exported from the late 2<sup>nd</sup> to mid-3<sup>rd</sup> century, and a single sherd of Cologne Rhenish ware (Fabric 44.1), broadly dating to the 1<sup>st</sup> to mid-3<sup>rd</sup> century. Forms in Nene Valley ware, decorated with barbotine under slip, were also consistent with a 2<sup>nd</sup> to 3<sup>rd</sup> century date. The mortaria included Mancetter Hartshill vessels dated to c AD 170–210 (Fig 42, 91) and c AD 230–300 (Fig 42, 92), and an Oxfordshire white mortarium dating to c AD 240–300 (Fig 42, 90). A 2<sup>nd</sup> to 3<sup>rd</sup> century date was supported by the coarse wares, in particular Black burnished ware forms and vessels in Severn Valley ware. Many of the latter had parallels at the Newland Hopfield kiln site (Malvern, Worcestershire), where the main period of production was dated to the latter half of the 2<sup>nd</sup> century to the early/mid-3<sup>rd</sup> century (Evans *et al* 2000, 56). The majority of BB1 jars were decorated with obtuse cross hatch (207 sherds), followed by right angle (31 sherds) then acute (12 sherds). Obtuse cross hatch first appears at Vindolanda c AD 223–5 and is then typical of 3<sup>rd</sup> and 4<sup>th</sup> century assemblages, while right angle cross hatch first appears in the late 2<sup>nd</sup> century (Bidwell 1985, 175). Acute cross hatch is typical of 2<sup>nd</sup> century assemblages. The Wheelmade Malvernian ware forms (Fabric 19) and South-west oxidised ware (Fabric 151) are also typical of this date.

Some finds could be dated to the later 3<sup>rd</sup> century, or more broadly to the later 3<sup>rd</sup> to 4<sup>th</sup> centuries. However, while some small finds have a general late Roman date (ie 3<sup>rd</sup> to 4<sup>th</sup> century) none could be unequivocally dated to the 4<sup>th</sup> century (see p79). The same is true of the pottery. Later Roman small finds included hair pins (see p79, catalogue nos 23 and 24), although these were incomplete and could therefore be an earlier type, bangles (see p79, catalogue nos 28 and 29), though these could be decorative strips rather than bracelet fragments and therefore not chronologically diagnostic, and a broadly 3<sup>rd</sup> to 4<sup>th</sup> century needle (see p85, catalogue no 55). The pottery assemblage included Mancetter Hartshill mortaria with dates ranging from c AD 230–300 to c AD 270–370 (Fig 42, 92–5), but the absence was noted of both the later Roman Oxfordshire type M22 (Young 2000, fig 23) and Oxfordshire red-slipped mortaria, also generally later types (Young 2000, fig 67). Both were present at 14–24 The Butts, nearby (Evans 2011, fig 5.20, 76 and 78). There was, in fact, very little Oxfordshire red colour coated ware in general. The only identifiable forms were a bowl dated c AD 270–400+ (Young 2000, 158, fig 58), from Period 5, and bowl dated c AD 300–400+, from a Period 6 layer (*ibid*, 162, fig 60). This contrasts with the evidence from the nearby sites at 1 The Butts and 14–24 The Butts, where a range of diagnostically 4<sup>th</sup> century Oxfordshire ware forms was noted, including Parchment ware (Evans 2011, fig 3.6, 14 and fig 5.20, 64–5, 67–8, 73). Various broadly later 3<sup>rd</sup> to 4<sup>th</sup> century forms were present amongst the Severn Valley ware (Fig 27, 16, 18, 24–5; Fig 28, 36; Fig 29, 51, 57–9) and Wheelmade Malvernian ware (Fig 38, 69). Later Black burnished ware forms included splay-rimmed jars and bowls or dishes with drop flanges, the latter more common than the 2<sup>nd</sup> century types (Fig 40, 78 and 82). Only one body sherd from a BB1 jar was decorated with oblique lines. Elsewhere this decoration increases significantly in late 4<sup>th</sup> century assemblages. No fish dishes were identified, a type which emerged in the closing years of the 3<sup>rd</sup> century and was produced through the 4<sup>th</sup> century (Gillam 1976, 78), and was present at 14–20 The Butts (Evans 2011, fig 5.20, 58). Only one sherd of pink grog tempered ware was recovered (Fabric 17), another typically later 3<sup>rd</sup> to 4<sup>th</sup> century type.

The latest dating evidence came from two sherds of shell tempered ware (Fabric 23), recovered from a Period 5 (pit 1180, fill 1174) and a Period 5–7 layer (2154). Elsewhere in the region this is associated with late 4<sup>th</sup> century activity, for example at Bays Meadow villa, Droitwich (Barfield 2006), at Alcester (Evans 1994, 146) and Gloucester (Hassall and Rhodes 1975, 85–6). Its absence in many Worcester sites has been used as evidence to suggest that areas of the Roman town were abandoned some time between the late 3<sup>rd</sup> or early 4<sup>th</sup> century (Darlington and Evans 1992, 32; Bryant and Evans 2004; Dalwood *et al* 1994, 97; Griffin 2002, 129). However, there is clear evidence for 4<sup>th</sup> century occupation at other excavated sites in the Roman settlement, and the fabric has been recovered from sites in the vicinity of the City Campus site. It was well represented in the late Roman well at 1 The Butts (Evans 2011, 33, table 3.2; 6% by weight, 12% by rim EVE), where it was associated with a range of other diagnostically 4<sup>th</sup> century vessels (discussed above), and nine 4<sup>th</sup> century coins, the latest dating to c AD 364–78. It was also present, in smaller quantities, in a layer of dumped material at 14–20 The Butts; associated there with coins dated to c AD 330–5 and c AD 337–40 (Evans 2011, 89–94, table 5.10, 2% by weight and 1% by rim EVE). Elsewhere on Castle Street it was noted in the late Roman assemblage from the County Education Offices (Dalwood *et al* 1997, fig 6). Only three sherds were recorded at Deansway (Bryant and Evans 2004, 280). The only form recovered here (Fig 40, 86) is not necessarily a very late type. Similar forms are published from a production site at Harrold (Bedfordshire) in deposits dating to the late 2<sup>nd</sup> century (Brown 1994, fig 26, 78), the later 3<sup>rd</sup> century (*ibid*, fig 29, 164–173), and the early 4<sup>th</sup> century (*ibid*, fig 34, 239–41 and 243–5). It seems clear from evidence elsewhere that this fabric does not reach this region, and Worcester specifically, in any quantity until the later 4<sup>th</sup> century. What is less clear is when occasional vessels in this fabric might have first arrived.

[to previous view](#)

## The Roman and later coins

by Cathy King

The City Campus excavations yielded five coins, four Roman (Table 19) and one 18<sup>th</sup> century British coin. The Roman coins ranged in date from c AD 196 to c AD 293 while the British coin was a halfpenny of George III with a Britannia reverse minted in 1774. There were no 1<sup>st</sup> or earlier 2<sup>nd</sup> century coins and no 4<sup>th</sup> century coins, but it would be unwise to place too much significance on this fact which may reflect the small size of the group as a whole.

The relatively strong representation of 3<sup>rd</sup> century coins is not incompatible with the finds from the Deansway excavation (King 2004), although that site produced 4<sup>th</sup> century coins. Over a hundred Roman coins were recovered from the recent excavations at The Hive (analysis ongoing). More detailed analysis of the data from these Worcester sites is not feasible given the scope of this report. However, it is intended to undertake this analysis at a future date.

Table 19 Roman coins (denominations: DEN – denarius; ANT – antoninianus)

Coin no	Ruler	Denomination	Date	Obverse	Reverse	Reference	Mint	Imit	MM	Material	Broken	Notes
1	S Severus	DEN	c 196-211	[L SE]PT SEV [PERT AVG IMP VIII	[ADVENTVI AVG FEL] ICISS[IMO], emperor riding right.	Mattingly 1965–68 (BMC 5), 151, pl 9, 8		Yes		Ag/Cu	Chipped	Unstrat. SF24
2	Claudius II	ANT	c 270-286	[ ]CLAV[ ]	[CONSE]CRATIO, altar			Yes		Cu Alloy	Chipped	Period 5, layer 4004, SF 274
3	Later 3rd century	ANT	c 260-286	Illeg.	Illeg., figure standing left			Yes		Cu Alloy	Chipped	Period 12, layer 17000, SF 282
4	Carausius	ANT	c 286-293	IMP C M CARAVS-IVS [P] AVG	SALVS AVG, feeding snake rising from altar		British		Illeg	Cu Alloy		Period 5, ditch 4011, fill 4009, SF 273

## The Roman small finds and vessel glass by Hilary Cool

### Introduction

An assemblage of approximately 500 small finds and vessel glass fragments were recovered. Those from Roman contexts (excluding unidentifiable fragments) and those which are typologically of Roman date are summarised by area and function in Table 20.

*Table 20 The Roman small finds and vessel glass by area*

<b>Function</b>	<b>Area 1</b>	<b>Area 2</b>	<b>Area 4</b>	<b>Unstratified</b>	<b>Total</b>
Personal equipment	138	10	3	14	165
Toilet equipment	2	1			3
Textile equipment	5	1			6
Household items	9	6			15
Writing equipment		1		1	2
Transport items	1				1
Tools and knives	4				4
Fasteners	3	1			4
Craft waste	13	1			14
Miscellaneous	18	1	1		20
<b>Total</b>	<b>193</b>	<b>22</b>	<b>4</b>	<b>15</b>	<b>234</b>

The nails are tabulated separately (Tables 21–2). As can be seen the personal equipment category dominates the assemblage (Table 23). In part this is because of the large number of hobnails, but even if they are excluded, personal ornament is still the single most prolific category. The discussion below is structured first by functional category where the individual types present are discussed and dated, before going on to take an overview of the assemblage.

This is primarily an early to mid-Roman group of finds. There are no items that can be unequivocally dated to the 4<sup>th</sup> century, although there are some that have a general late Roman date, ie 3<sup>rd</sup> to 4<sup>th</sup> century. There is also very little diagnostic medieval to post-medieval material. The only item that falls into that category is an 18<sup>th</sup> century apple or cheese scoop (SF 287) from a Period 11 context in Area 1 (not catalogued here: see [MacGregor 1985](#), 180 for type). Selected finds are illustrated ([Fig 48](#)).

*Table 21 Roman hobnails by area and period*

<b>Period</b>	<b>Area 1</b>	<b>Area 2</b>	<b>Area 4</b>	<b>Total</b>
5	72	2	3	77
6	36			36
9	1			1
11	6			6
<b>Total</b>	<b>115</b>	<b>3</b>	<b>3</b>	<b>120</b>

Table 22 Distribution of nails by period and area of site

Period	Area 1		Area 2		Area 4		Total
	Complete	Head	Complete	Head	Complete	Head	
1		1					1
3-6		1					1
4		2	2				4
4-5						1	1
5	34	43	12	9	1	1	100
5-6		1					1
6	24	33					57
5-7			1				1
<b>Total</b>	<b>58</b>	<b>81</b>	<b>15</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>166</b>

Table 23 Distribution of finds by function in principle context groupings

Function	Structure 1	Quarry pits 2	Quarry pits 1	Sealing layers over Quarry pits 1	Circular enclosure	Total
Personal equipment	1	1	88	40	4	134
Toilet equipment	1	1	1			3
Textile equipment		1	3	1		5
Household item			4	2	1	7
Writing equipment					1	1
Transport equipment				1		1
Tools			1	3		4
Fasteners			1	2		3
Craft debris	1		8	5		14
Miscellaneous			9	5	1	15
Nail – complete			34	24	2	60
Nail – head		1	40	33	4	78
<b>Total</b>	<b>3</b>	<b>4</b>	<b>189</b>	<b>116</b>	<b>13</b>	<b>324</b>

### Personal ornaments and equipment

The identifiable brooches from this site are mainly of mid-1<sup>st</sup> century date. No 1 is fragmentary and bent out of shape. The conical footnob is diagnostic of it coming from an Aucissa brooch rather than one of the other mid-1<sup>st</sup> century strip bow, hinged forms which the rather flat bow section might otherwise have suggested. The type (Bayley and Butcher 2004, 151, Hull type 51) is one that entered the country in large numbers with the army in AD 43 and is typical of sites with occupation in the 50s and 60s. They were going out of use during the later Neronian period. Hod Hill brooches were in contemporary use with the Aucissa. There is a large diversity of forms and some differences in date have been suggested. The type found here (no 2) is a Hull Type 60 without side lugs. This is a common form, but it is absent from the very large assemblage of this family of brooches from the Hod Hill fort itself, possibly suggesting that its main floruit was in the 50s and 60s rather than earlier (Bayley and Butcher 2004, 153, their variant b).



Aucissa and Hod Hill brooches were recovered at the Deansway site (Mackreth 2004, 439 nos 16–19) and an Aucissa brooch was also found during the excavations at the Sainsbury supermarket site in St John's (Wainwright *et al* 2014, 113). At both of these sites mid-1<sup>st</sup> century military activity could plausibly be suggested. There is no evidence for that at the City Campus site. Both types are not exclusively confined to military use, and so it could be that they reflect mid-1<sup>st</sup> century activity on the site by non-military individuals. It seems more likely, however, that the fragmentary no 1 at least represents the re-deposition of rubbish as it was found in one of the Period 4 quarry pits.

Hitherto brooch assemblages from sites in Worcester have tended to be dominated by the Polden Hill variant of the Colchester Derivative family, the typical brooch of the western midlands in the later 1<sup>st</sup> to mid-2<sup>nd</sup> centuries (Mackreth 1992, 73 nos 1–8; Mackreth 2004, 437 nos 1–7). No 3 could well come from such a brooch, but as only the foot is present, the type cannot be identified with certainty. The brooch spring fragments could also well come from such brooches. No 9 retains a rod through its centre and this is typical of the Polden Hill method of spring fastening where the rod is lodged in perforations in the ends of the spring cover. The perforation in the catchplate of no 3 would indicate a 1<sup>st</sup> century date for the brooch, and so it is obviously residual in its context.

No 5 is a disc brooch which would originally have been decorated with a separate sheet of metal with a repoussé design. Only a small fragment of this is now preserved. This is not a well-dated type as few have come from useful contexts. Bayley and Butcher suggest the type is Flavian (Bayley and Butcher 2004, 173, Hull type 249). Mackreth by contrast suggests a date after AD 150 with use into the 3<sup>rd</sup> century (Mackreth 2011, 155). The context of this piece, from the Period 5 circular enclosure, would favour the latter. Interestingly Mackreth had no examples from the midlands in his corpus and so this example is a useful addition, both as far as the dated context, and the find spot is concerned.

The hair pin assemblage is dominated by 2<sup>nd</sup> century forms where the head decoration is effectively produced by cutting into the top of the shank and there is no terminal knob of any form. When done in copper alloy this produces a baluster effect (Cool 1991, 154, Group 3A). In bone it takes the form of a simple grooved head (Crummy 1983, 21, type 2). There are nine examples from the site, one in copper alloy (no 12) and the rest (nos 13–20) in bone. This broad type of pin is a common one, both generally and in Worcester. One in copper alloy came from Sidbury (Darlington and Evans 1992, 78, fig 39.1) and several examples in bone have been noted in the assemblage from the adjacent site at The Hive. The Quarry pits group 1 also produced a group of bone working debris. This included a Type 2 pin possibly broken during manufacture (see nos 84–94 below).

Other types of bone hair pins were present in smaller numbers. The plain Crummy (1983) Type 1 is represented here by nos 21 and 22, whilst nos 23 and 24 belong to the knob-headed Crummy Type 3 category. Again both of these are common forms generally with Type 1 being in use throughout the Roman period and Type 3 conventionally dated to the later Roman period.

Despite the established difference of typological date between the Crummy Type 2 and 3 forms, all of these pins came from the fills or the cleaning layers assigned to Periods 5 and Period 6, with both the early and the late forms found in both. The typological dating is somewhat problematic because Worcester has produced several unusually long examples of the late Crummy Type 3 pins at Sidbury (Darlington and Evans 1992, 91, fig 44, 1). Long pins

are normally indicative of a 1<sup>st</sup> to 2<sup>nd</sup> century date rather than a later one. Whether these do indeed represent a local early variant, will have to wait for the full analysis of the assemblage from the excavation at The Hive. The two Crummy Type 3 knob-headed pins from this site are both broken, and so it is unknown whether they came from this long and possibly early variant. What may be noted though is that none came from the large pit 1180 assigned to Period 5, which produced five of the undoubted 2<sup>nd</sup> century pins (nos 13, 15–16, 18–19).

The Quarry pits group 1 also produced two small globular glass beads from Period 5 contexts (nos 25–6). The simple globular form is not sufficiently diagnostic to allow a closer date within the Roman period. Small beads such as this start to appear in late 2<sup>nd</sup> century contexts, but within civilian/native environments only really become common in the later 3<sup>rd</sup> century onwards. No 26 is made of a very unusual mauve-coloured glass not hitherto seen used in Roman beads.

Two bracelets or bangles can be identified with certainty. One of these, a fragmentary penannular bracelet with simple grooved terminals, came from a layer sealing the Quarry pits group 1 (no 27). The wearing of copper alloy bracelets is primarily a 4<sup>th</sup> century fashion, but penannular bracelets such as this were in use during the 2<sup>nd</sup> century (Cool 1983, 140, Group VI). Plausibly therefore such a bracelet could have been part of the 2<sup>nd</sup> to 3<sup>rd</sup> century refuse disposal seen on the site. A fragment of a plain shale bracelet (no 30) came from the Period 5 fill of the circular enclosure. These are not closely dateable as they started to be used in the late Iron Age and continued to be worn in the Roman period.

Nos 28 and 29 are apparently parts of the light bangle-style copper alloy bracelets that were very common in the 4<sup>th</sup> century, though neither retain a terminal which would be diagnostic. No 29 came from the fill of the circular enclosure. No 28 however came from a pit associated within Structure 1 (Period 4). This context would be far too early for a light bangle, so the possibility that these are decorative strips rather than bracelet fragments must be entertained.

Hobnails (nos 31–51) from shoes were found widely (Table 21) and were present in the fills of the Quarry pits groups 1 and 2, as well as elsewhere on site. In some cases, given the numbers found corroded together they obviously represent discarded shoes (nos 32, 44–6, 47, 49) which in some cases must have been very densely nailed (nos 32 and 45).

### *Catalogue of personal ornaments and fittings*

1. Aucissa brooch; three fragments. Copper alloy. Flattened strip bow with upper end rolled up and over to front retaining broken fragment of hinged pin, upper part of pin detached. Front of bow reeded, three central ribs with beaded decoration and wide channel on either side; curved lower body fragment with conical footknob. Length of upper bow fragment 24mm, upper bow section 5 x 1.5mm. Period 5 (context 1462), SF 259.
2. Hod Hill brooch. Copper alloy. Upper part of bow bent up and over to front to form broken hinge cover; upper bow has central vertical rib with transverse grooves and channel down either side; central channel and transverse rib; D-sectioned plain lower bow with rib and footknob; broken catch plate. Front of brooch coated with white metal. Length 40mm, width of hinge c 8mm. Period 6 (context 1356), SF 235. Illustrated (Fig 48, 2).
3. Bow brooch, foot fragment. Copper alloy. Oval sectioned bow broken at top triangular

- catch plate with triangular perforation. Present length 39mm. Period 5 (context 1106), SF 85.
4. Brooch? Iron. Curved bow with one end bent over. Identified from X-radiograph. Present length 45mm. Period 5 (context 1246), SF 188.
  5. Hinged disc brooch. Copper alloy. Disc with raised frame, one edge chipped, Small fragment of foil with double rib by edge of frame. Two hemispherical lugs with remain of hinged pin between them; rectangular catchplate. Diameter 27mm, depth of catchplate 9mm. Period 5 (context 2191), SF 41. Illustrated ([Fig 48, 5](#)).
  6. Brooch spring fragment. Copper alloy. Part of one turn. Diameter of spring c 5mm. Period 4 (context 1293), SF 219.
  7. Brooch pin. Copper alloy. Circular-sectioned pin with broken end and retaining one turn of pin. Present length 37mm, section 2.5mm. Period 4 (context 2201), SF 47.
  8. Brooch, three fragments of pin and spring. Copper alloy, very corroded. Fragment of spring preserves two turns. Diameter of spring 6mm. Period 5 (context 1172), SF 265.
  9. Brooch spring fragment. Copper alloy. Six turns extant with rod through centre. Diameter of spring 5mm. Period 6 (context 1135), SF 230.
  10. Brooch spring fragment. Copper alloy. One side of spring (four turns) with cord extending onto other side. Present length 17mm, diameter of spring 6mm. Period 5 (context 2158), SF 22.
  11. Brooch spring fragment. Copper alloy. Part of a spring with two turns and part of chord. Diameter of spring 6mm. Period 3–10 (context 2140), SF 5.
  12. Hair pin. Copper alloy. Circular-sectioned shank with head decoration cut into upper end. Conical terminal, three grooves forming two ribs; baluster moulding; two grooves below forming ribs. Present length 70mm, section 2mm. Period 12 (context 1136), SF 178. Illustrated ([Fig 48, 12](#)).
  13. Hair pin. Bone. Circular-sectioned shank with rounded terminal, other end broken. Two grooves around head. Present length 39mm, section 4mm. Period 5 (context 1178), SF 138.
  14. Hair pin. Bone. Oval-sectioned tapering shank with conical terminal and broken end. Three horizontal grooves below terminal. Present length 57mm, maximum section 3.5 x 3mm. Period 6 (context 1331), SF 215.
  15. Hair pin. Bone. Circular-sectioned shank with conical head, other end broken. Two grooves around conical tip. Present length 32mm, section 3mm. Period 5 (context 1180), SF 268.
  16. Hair pin. Bone. Oval-sectioned shank with conical terminal and broken end. Two horizontal grooves below terminal. Present length 18mm, section 3 x 2.4mm. Period 5 (context 1176).
  17. Hair pin. Bone. Circular-sectioned shank with shallow conical terminal, tapering very

- slightly to broken end. Four grooves below conical tip. Present length 52mm, section 3.5mm. Period 5 (context 1090), SF 69.
18. Hair pin. Bone. Circular-sectioned tapering shank with slightly faceted terminal, tip broken; one wide and one narrow groove below head. Present length 93mm, section 3.5mm. Period 5 (context 1178), SF 143. Illustrated (Fig 48, 18).
  19. Hair pin. Bone. Circular-sectioned tapering to point with conical head; groove below head. Length 75mm, section 2.5mm. Period 5 (context 1176), SF 130.
  20. Hair pin. Bone. Circular-sectioned tapering slightly to conical head, other end broken; two grooves below conical tip. Present length 42mm, section 2.5mm. Period 6 (context 1136), SF 164.
  21. Hair pin. Oval-sectioned shank tapering from flat head to broken end. Present length 56mm, maximum section 5.5 x 5mm. Period 5 (context 1089), SF 167.
  22. Hair pin. Bone. Oval-sectioned shank tapering from flat head to broken end. Present length 63mm, section 5 x 4mm. Period 5 (context 1179), SF 145.
  23. Hair pin. Bone. Oval circular-sectioned knob head; circular-sectioned shank with constriction below head and tapering slightly to broken end. Present length 68mm, head section 5mm, shank section 4mm. Period 6 (context 1135), SF 150. Illustrated (Fig 48, 23).
  24. Hair pin. Bone. Oval circular-sectioned knob head; circular-sectioned shank with constriction below head and tapering slightly to broken end. Present length 54mm, head section 5mm, shank section 4mm. Period 5 (context 1146), SF 109.
  25. Bead. Blue/green glass. Irregular globular/cylindrical. Length 5mm, maximum section 6mm, perforation diameter 1.5mm. Period 5 (context 1172), SF 281 (sample 115).
  26. Globular bead. Opaque reddish mauve glass with striated surface. Length 4mm, diameter 4.5mm, perforation diameter 1mm. Period 5 (context 1338), SF 262 (sample 157).
  27. Penannular bracelet; fragment. Copper alloy. D-sectioned, one straight-ended terminal, other end broken and bent out of shape. Seven or eight transverse grooves at terminal. Present length 63mm, section 5 x 3mm. Period 6 (context 1224), SF 156.
  28. Bracelet fragment. Copper alloy. D-sectioned strip, widest to wrist; both ends broken. Transverse grooves on upper face. Present length 21mm, section 2 x 1.5mm. Period 3–4 (context 2086), SF 6.
  29. Bracelet fragment. Copper alloy. D-sectioned hoop widest to wrist, both ends broken. Transverse grooves on upper face. Twisted and bent out of shape. Length 33mm, section 2.5 x 1.5mm. Period 5 (context 2157), SF 20.
  30. Bracelet; two joining fragments. Shale. Slightly rounded square-section. Outer diameter c 70mm, 10% circumference extant, section 5mm. Period 5 (context 2158), SF 18.

31. Hobnails (2). Iron. Shallow heads. Lengths 14mm, head width 7mm. Period 3–5 (context 4035).
32. Hobnails. Iron. One group of six very closely set, one group of three and two groups of two corroded together, and 49 singletons. Shallow domed heads. Lengths c 15mm, head diameter c 9mm. Period 5 (context 1427), SF 253.
33. Hobnail. Iron. Pyramidal head. Length 15mm, head width 9mm. Period 4 (context 1131).
34. Hobnail (?). Iron. Head diameter 8mm, length 10mm. Period 6 (context 1081), SF 61.
35. Hobnail. Iron. Details obscured. Head width c 10mm. Period 5 (context 1301).
36. Hobnail. Fragmented. Head width 7mm. Period 5 (context 1321), SF 232.
37. Hobnail. Iron. Domed head. Length c 20mm, head width 8mm. Period 9 (context 1133), SF 108.
38. Hobnail. Iron. Bent. Head width c 7mm. Period 5 (context 4007).
39. Hobnails (5). Iron. Two corroded together. Head width c 10mm. Period 5 (context 1137).
40. Hobnail. Iron. Pyramidal head. Length 16mm, head width 8.5mm. Period 5 (context 2251), SF 56.
41. Hobnail. Iron. Complete. Pyramidal head and tip bent. Length 12mm, head width 9mm. Period 5 (context 2186), SF 31.
42. Hobnail. Iron. Truncated pyramidal head. Corroded to nail. Length 14mm, head width 10mm. Period 5 (context 1178), SF 154.
43. Hobnail. Iron. Pyramidal head. Length 18mm, head width 8.5mm. Period 5 (context 1177).
44. Hobnails; groups of five and three corroded together, and two singletons. Diameter of head c 5mm. Period 6 (context 1551).
45. Hobnails. Two tight set rows of seven and eight corroded together, one group three corroded together, and two singletons. Head diameter c 8mm. Period 6 (context 1551).
46. Hobnails. Four corroded in a line. Iron. Diameter of head c 12mm. Period 6 (context 1135), SF 247.
47. Hobnails (2). Iron. Damaged heads. Period 6 (context 1551).
48. Hobnails; five corroded together. Iron. Head diameter c 9mm. Period 11 (context 1196).
49. Hobnail. Iron. Head diameter 9mm. Period 11 (context 1202).

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50. Hobnail. Pyramidal head. Length 18mm, head width 10mm. Period 13 (context 2146).
51. Hobnails. Iron. Domed heads. Twelve singletons and two corroded together; some traces of mineralised leather. Lengths c 13–15mm, head widths 8–9mm. Unstratified, SF 93.

### Toilet equipment

One nail cleaner (no 52) and one set of tweezers (no 54) can be identified with certainty. The former from one of the Quarry pits group 2 is a well-known regional variant of later 1<sup>st</sup> and 2<sup>nd</sup> century date. It is a Severn estuary form and Worcester lies at the northern edge of the main distribution ([Eckardt and Crummy 2008](#), 66, fig 30, 130). Another example of the type was found at the Deansway site though there the button-shaped head was suggested to possibly be glass which is most unusual ([Crummy 2004](#), 410, no 11, fig 240). Simple tweezers such as no 54 have a long life and are not typologically distinctive, but given the scarcity of diagnostic medieval finds in the assemblage, a Roman date for this residual find is likely. The implement no 53 from one of the Quarry pits group 1 can only tentatively be identified as a nail cleaner or other item of grooming equipment. The preserved section moving from circular to rectangular would be appropriate for a nail cleaner, but the majority of those have perforated heads allowing them to be suspended as part of a set. This example has a flat head. The head and its decoration would be appropriate for a hair pin (eg [Cool 1991](#), 157, Group 5A), but the changing section would not be normal in such a case.

### *Catalogue of toilet equipment*

52. Nail cleaner. Button-shaped bone head on copper alloy shank. Circular-sectioned shank flattening and widening to blade. Upper part of shank has diagonal grooves producing an acute lattice of three rows of diamonds bounded by horizontal groove at base; one face of blade centrally notched. Length 43mm, head section 8 x 7.5mm, shank section 2.5mm. Period 4 (context 1498), SF 257. Illustrated ([Fig 48](#), 52).
53. Nail cleaner? Copper alloy. Circular-sectioned shank with flat head becoming rectangular-sectioned over lower part, both faces showing faint vertical lines as if from cold working; tip broken. Upper part has spiral groove of four turns. Present length 56mm, maximum section 2mm. Period 4–5 (context 1213), SF 131. Illustrated ([Fig 48](#), 53).
54. Tweezers. Copper alloy. Rectangular-sectioned strip bent in two; one arm missing. The whole much corroded. Length 50mm, width 5mm. Period 3–4 (context 2112), SF 11.

### Textile equipment

Fragments of six needles were present. No 60 was unstratified in a cleaning layer, no 57 came from the fill of one of the earlier Quarry pits group 2, and the rest came from the fills of group 1. Of the copper alloy examples, only no 55 retains the eye. This has a groove above and below the eye, placing it in Crummy's Type 3 category ([Crummy 1983](#), 67) which is generally found in late Roman contexts of the 3<sup>rd</sup> and 4<sup>th</sup> centuries. No 56 has a notch on either side of the shank and plausibly comes from another example. Another example was found at the Sidbury site ([Darlington and Evans 1992](#), 79, fig 39.4). The third copper alloy

example (no 57) has the characteristic change of section and transverse grooves which indicates it came from a spatulate-ended needle. These were certainly in use by the later 1<sup>st</sup> century, as an example was found in a context of that date at Colchester, and their use continued in the 2<sup>nd</sup> century (Crummy 1983, 65 Type 2, see especially no 1976).

Of the bone needles no 58 is certainly an example of a Crummy (1983) Type 1 needle and nos 59 and 60 could also be, although lacking the upper parts of the head they might come from the more spatulate ended form. Type 1 needles appear commonest in the 2<sup>nd</sup> century. Bone needles in general appear commonest in early to mid-Roman contexts (ie up to the mid-3<sup>rd</sup> century) rather than in later ones (Greep 1986, 198). When discussing Roman finds by functional groups it is conventional to include bone needles as part of textile equipment, as indeed they may well have been. Stevens (2008, 121), however, has made a good case for much Roman female hairdressing relying on the style being sewn in place rather than being pinned, and the bone needles would have been ideal for this. Given the presence of numerous contemporary bone hair pins in the Quarry pits group 1, the presence of bone needles, if they were used in hairdressing, would be appropriate.

### *Catalogue of toilet equipment*

55. Needle; head only. Copper alloy. Circular-sectioned shank tapering to blunt end with broken oval eye with groove above and below on both sides. Present length 23mm, shank section 2.5mm. Period 6 (context 1136), SF 91. Illustrated (Fig 48, 55).
56. Needle, head fragment? Copper alloy. Circular-sectioned shank flattening towards one end with notch on each side. Present length 23mm, section 2mm. Period 4–5 (context 1211), SF 158.
57. Needle; two joining fragments, both ends broken. Copper alloy. Circular-sectioned shank, expanding at one end to rectangular section, two transverse grooves across junction between circular and rectangular-sectioned sections 120mm, circular section 2.5mm, 5 x 1.5mm. Period 4 (context 1492), SF 254.
58. Needle. Bone. Oval-sectioned shank tapering from conical terminal to broken end. Rectangular eye, internal short ends bevelled. Present length 63mm, maximum section 5 x 4.5mm. Period 5 (context 1117), SF 205. Illustrated (Fig 48, 58).
59. Needle. Bone. Oval-sectioned tapering shank; both ends broken; upper end broken across base of a perforation with internal bevelled short end. Present length 41mm, maximum section 4.5 x 3.5mm. Period 5 (context 1129), SF 127.
60. Needle. Bone. Oval-sectioned shank tapering slightly to broken end; other end flattening slightly and broken across rectangular perforation. Present length 59mm, section 4.5 x 3.5mm. Period 12 (context 2240), SF 53.

### Household equipment

The household items served a range of functions. The items from Roman contexts, included nos 66 and 69 from the circular enclosure, while the rest were from the Quarry pits group 1. The absence of this category of finds in any of the earlier Quarry pits group 2 might provide a some hints that the rubbish that filled the later pits was coming from a wider range of sources (see final discussion).

There is one example (no 61) of the common 1<sup>st</sup> to 2<sup>nd</sup> century round-bowled spoon (Crummy 1983, 69, Type 1) and the rim fragment of a copper alloy bowl (no 62) which is not sufficiently diagnostic for the vessel to be independently dated. The shale bowl fragments (no 63) were found in a Period 6–7 context and the vessel is also likely to be of Roman date. The deformation of the piece makes reconstructing the vessel profile difficult but the internal groove below the rim is a feature of some Roman shale vessels (eg Lawson 1976, 260, 68). Shale vessels seem to have been commonest in the early to mid-Roman period. This is well demonstrated in Dorchester, where numerous examples were found during the Greyhound Yard excavations and there is a noticeable concentration in the earlier contexts (Mills and Woodward 1993, 139, table 11).

Given the wealth of finds in the quarry pit dumping, Roman vessel glass is curiously sparse with less than ten fragments being recovered. Most of these belong to blue/green prismatic bottles (nos 67–9) which were very common finds from the later 1<sup>st</sup> to the earlier 3<sup>rd</sup> centuries (Price and Cottam 1998, 191–201). There is also a rim fragment from a colourless cylindrical cup which was the commonest late 2<sup>nd</sup> to mid-3<sup>rd</sup> century drinking vessel (Price and Cottam 1998, 99–101), and an upper body fragment that might come from a wheel-cut beaker which was the common early to mid-2<sup>nd</sup> century form (Price and Cottam 1998, 91–2). Prismatic bottles and cylindrical cups were also found at the Deansway site (Cool and Jackson 2004, 442). That site also produced some evidence for the melting and probable blowing of glass in the 2<sup>nd</sup> to early 3<sup>rd</sup> century (*ibid*, 443–9). There would therefore have been a market for cullet (broken glass) in the town and this might account for the paucity of vessel glass in the contemporary rubbish.

#### *Catalogue of household equipment*

61. Spoon; handle and bowl fragment. Bone. Back part of shallow circular bowl; faceted circular-sectioned shank running onto back of bowl with triangular terminal; handle broken. Present length 63mm, diameter of bowl c 25mm, 15% of circumference. Period 5 (context 1164), SF 121.
62. Bowl; rim fragment, Copper alloy. Vertical rim with internal thickening. Rim diameter 160–170mm, 12% circumference, present height 20mm. Period 5 (context 1320), SF 227. Illustrated (Fig 48, 62).
63. Bowl or cup; four rim and body fragments. Shale with white inclusions. Vertical, flat-topped rim; convex-curved body; groove below rim edge with interior sheared off below groove on best preserved fragment. Other fragments exfoliating and out of shape. Rim diameter c 100mm, present height 30mm, wall thickness at rim 5.5mm. Period 6–7 (context 1002), SF 285.
64. Beaker or cup; two joining upper body fragments. Colourless. Straight side beginning to curve out to missing rim. Wide wheel-cut line. Dimensions 24 x 22mm, wall thickness 3mm. Weight 0.95g. Period 5 (context 1137), SF 266.
65. Cylindrical cup; rim fragment. Colourless glass. Vertical rim, edge fire rounded. Rim diameter 100mm, wall thickness 2mm, present height 22mm. EVE 0.4. Weight 3.74g. Period 5 (context 1135), SF 286.
66. Base fragment. Blue/green glass. Tubular pushed-in base ring; wide lower body. Body and base broken. Base diameter 60mm. Weight 3.54g. Period 5 (context 2190).



67. Bottle; rim and neck fragment. Blue/green glass. Rim bent out, up and in; cylindrical neck with small fragment from handle attachment. Rim diameter 40mm, present height 33mm. EVE 0.28. Weight 15.23g. Period 11 (context 1196), SF 170.
68. Square bottle; shoulder fragment. Blue/green glass. Broken at edge of neck; shoulder bending over to side. EVE 0.14. Weight 5.1g. Period 5 (context 1277).
69. Prismatic bottle; lower body and edge of base fragment. Blue/green glass, present height 51mm. EVE 0.28. Weight 15.6g. Period 6 (context 2191). Illustrated (Fig 48, 69).

Prismatic bottle fragments were also found as follows: Period 6 (context 1551), weight 8.57g; Period 11 (context 1196), SF 270, weight 8.57g; Period 6–7 (context 2153), weight 6.5g.

## Writing equipment

Both of the items connected with literacy are fragmentary. They consist of a fragment from a circular seal box base (no 70) from the Period 5 fill of the circular enclosure and an unstratified iron stylus (no 71). Both of the diagnostic ends are missing on the latter but the x-radiograph shows the decorative grooving centrally. On Roman ironwork such decoration is only normally found on styli, so the identification of no 71 can be made with some certainty. The typology of decorated styli often relies on details of the tip and the eraser in addition to the decoration and as these are missing here, this presents a problem. Major's (2002) Group 8 is characterised in part by simple decoration like that seen on no 71, and most of her well-dated examples belonged to the 2<sup>nd</sup> century. Seal boxes were in use during the 1<sup>st</sup> to 3<sup>rd</sup> centuries and fragments such as no 70 cannot be more closely dated within that period.

### *Catalogue of writing equipment*

70. Circular seal box; base fragment. Copper alloy. Back part of angled side of base retaining two hinge lugs, central part of hinge from lid remains between them. Diameter of base c 25mm, c 35% circumference remaining, depth base 4mm. Period 5 (context 2177), SF 23.
71. Stylus. Iron. Central part of shank with broken ends, one end expanding; central part grooved producing conical moulding with three ribs on one side and one rib on other. Present length 113mm. Unstratified, SF 99.

## Transport equipment

One of the Quarry pits group 1 produced a complete lynch pin of Manning (1985) Type 2b form. These are the commonest type found in Romano-British contexts. A complete pin retains sufficient iron to be a useful source of raw material for re-working and the fact that it was discarded suggests there was no stress on iron supplies in the town.

### *Catalogue of transport equipment*

72. Lynch pin. Iron. Spatulate head with turned over loop at top; rectangular-sectioned, slightly tapering stem. Length 145mm, width head 42mm. Period 6 (context 1136), SF 163.

## Tools

The relative profligacy in throwing away iron items can also be seen in no 73, a virtually complete large knife or small cleaver of Manning (1985) Type 12, which is not closely dateable within the Roman period. The other blade fragments would almost certainly have come from knives. All of these items are plausibly of Roman date. Some doubts, however, can be raised over the folding clasp knife handle (no 77) which also comes from a midden layer. Clasp knives were used in the Roman period and their handles were frequently made of bone. A regularly encountered form has a hound chasing a hare, but it is clear from the numerous and sometimes idiosyncratic designs (which include gladiators and other figured designs) that many must have been individual commissions. It is possible that no 77 falls into this category, but stylistically it can be observed that it does not fall into the normal range of Roman designs, nor indeed of Saxon ones, and it has to be suspected that this is a much more recent intrusion.

### *Catalogue of tools*

73. Cleaver; broken in two, end of tang missing. Iron. Triangular blade with tang continuing the line of the back and cutting edge curving up to tip. Present length 160mm, length of blade 130mm, depth of blade 58mm. Period 6 (context 1551).
74. Knife fragment. Iron. Part of centrally placed tang with back of blade, bent up. Present length c 80mm. Period 5 (context 1089), SF 66.
75. Blade fragment. Iron. Length 52mm, width 12mm. Period 6 (context 1446).
76. Blade in two joining fragments. Iron. Edge parallel to back; both ends broken. Length 98mm, width 26mm. Period 6 (context 1135), SF 249.
77. Pen knife handle. Bone, cancellous tissue visible on one side. Elongate triangular outline with arrow-shaped tip; other end has recessed collar; tapering slot for blade and perforation on one corner for hinge. Length 79mm, section 21 x 8mm. Period 6 (context 1135), SF 233. Illustrated ([Fig 48, 77](#)).

## Fasteners

The fastener category on Roman urban sites is normally quite prolific but few items can be attributed to it from the City Campus assemblage. The normally numerous stud category is only represented by one composite stud of typical Roman form (no 78) and a small fragment of another stud (no 80). An iron stud (no 79) is not a typical Roman form and again intrusion might be suspected.

### *Catalogue of fasteners*

78. Composite stud; fragmented. Shallow domed head of copper alloy sheet casing a lead alloy centre, iron corrosion centrally. Diameter c 22mm. Period 6 (context 1135), SF 107.
79. Stud. Iron. Rectangular plate head, rectangular-sectioned shank tapering to point. Length 42mm, head dimensions 36 x 25mm. Period 6 (context 1135), SF 229.

80. Stud. Copper alloy. Small fragment. Period 7 (context 1280), SF 277.
81. Binding. Copper alloy. Sheet strip bent in two along long axis; ends pinched closed. Slightly curved. Length 82mm, depth 6mm, thickness 3mm. Period 4 (context 2201), SF 49.

### Craft waste

There was a small amount of evidence for the probable working of copper alloy alloys. A piece of casting waste was found in one of the Quarry pits group 1 (no 83), and a possible waster from a casting of a one piece brooch (no 82) came from a Period 3–4 pit fill. The manufacture of one-piece brooches is to be expected not later than the earliest years of the Roman occupation. Though no 82 from a relatively early context, it is likely that it was re-deposited rubbish, as was suggested for the Aucissa brooch. Equally the apparent resemblance to a brooch waster might be fortuitous, and this scrap might be a failed piece for some other type of item.

The most interesting group of craft waste is a group of rough-outs for bone rods (nos 85–94). These were found in four of the Quarry pits group 1 and in general layers associated with them. Another of the same group of pits produced a [Crummy](#) (1983) Type 2 hair pin that gave the appearance of probably having broken during the manufacturing process (no 84). It is very possible that these rods were part of hair pin manufacture, though similar blanks would have been needed for bone needles. The debris from the manufacture of hair pins is not uncommon. Greep noted the centres known to him up to 1983 when discussing the group from Canterbury ([Greep 1995](#), 1135, fig 497), and more centres could now be added. As can be seen from the finds assemblage from the City Campus, women used large numbers of pins, and bone-working industries to supply this need must have been very common.

Finally in this section the fragments of shale (no 95) may be noted. As this is not a naturally occurring stone type here the supposition might be that the material represents craft industry somewhere in Worcester.

### *Catalogue of craft waste*

82. Brooch waster? Copper alloy. Flat wings with pair of vertical grooves on either side; stump of bow and folded strip that may have been spring and pin. Width 21.5mm. Period 3–4 (context 2098), SF 26. Illustrated ([Fig 48](#), 82).
83. Casting waste? Copper alloy. Weight 8.66g. Period 5 (context 1176), SF 126.
84. Hair pin, possibly unfinished. Circular-sectioned shank with broken head with incomplete groove below; shank broken. Present length 63mm, section 4.5mm. Period 5 (context 1246), SF 187. Illustrated ([Fig 48](#), 84).
85. Roughout? Approximately circular-sectioned, faceted broken shank with roughly faceted point. Present length 28mm, section 3mm. Period 5 (context 1089), SF 186.
86. Roughout. Bone. Roughly faceted rod tapering in one direction; both ends broken. Present length 50mm, section 5 x 3mm. Period 5 (context 1117), SF 202.
87. Roughout. Bone. Roughly faceted rod tapering in one direction; wider end faceted to

wedge shape; other end broken. Present length 49mm, maximum section 6mm. The same sample produced one flat splinter (length 25mm) of the type likely to have been produced in the manufacture of such a rod. Period 5 (context 1175; sample 119).

88. Roughout. Bone. Roughly faceted rod; one end broken, other spatulate. Present length 72mm, section 5mm. Period 6 (context 1331), SF 275.
89. Roughout. Bone. Roughly faceted rod; both ends broken. Present length 63mm, section 6.5 x 5mm. Period 6 (context 1136), SF 179.
90. Roughout. Bone. Roughly faceted rod; both ends broken. Present length 59mm, section 6 x 4mm. Period 6 (context 1136), SF 182.
91. Roughout. Bone. Roughly faceted rod, one end roughly faceted, other broken. Present length 34mm, section 5mm. Period 6 (context 1136), SF 183.
92. Roughout. Bone. Oval-sectioned faceted rod tapering from spatulate end to broken point. Present length 80mm, maximum section 6 x 4mm. Period 6 (context 1135), SF 220.
93. Roughout. Bone. Approximately circular-sectioned, faceted, tapering shank; ends broken. Present length 50mm, maximum section 6mm. Period 6 (context 1135), SF 228.
94. Roughout. Bone. Approximately square-sectioned, faceted shank; ends broken. Present length 49mm, maximum section 4.5mm. Period 6 (context 1551).
95. Offcut. Shale. One face naturally smoothed, back of this has an exfoliated surface. Dimensions 40 x 31mm, thickness 7mm. Period 5–7 (context 2158), SF 271.

Also two unworked fragments of shale: Period 3–4 (context 2086), SF 294 and Period 4 (context 4531), SF 293.

## Miscellaneous

### *Catalogue of miscellaneous artefacts*

96. Spiral fitting. Iron. Narrow rod with broken ends curving in opposite directions. Wire wrapped around central part in approximately four turns. Present length 38mm. Period 5 (context 1246), SF 175.
97. Ring. Iron. Oval outline. Diameter 37 x 33mm. Period 5 (context 1089), SF 68.
98. Shank fragment. Copper alloy. Circular-sectioned, both ends broken. Present length 47mm, section 2mm. Period 6 (context 1136), SF 88.
99. Shank fragment. Copper alloy. Present length 8mm, section 1.5mm. Period 5 (context 1356), SF 234.
100. Shank fragment. Copper alloy. Circular-sectioned tapering to point at end; other end broken. Present length 70mm, shank section 2mm. Period 5 (context 1164), SF 137.

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101. Shank fragment. Bone. Circular-sectioned shank tapering to point; other end broken. Present length 73mm, section 4.5mm. Period 5 (context 1209), SF 149.
102. Shank fragment. Bone. Circular-sectioned tapering to point. Present length 26mm, section 2.5mm. Period 6 (context 1331), SF 218.
103. Shank; fragment. Bone. Circular-section with faceted conical point; other end broken. Present length 54mm, section 3.5mm. Period 6 (context 1331), SF 216.
104. Shank fragment. Bone. Circular-sectioned shank tapering very slightly to both broken ends. Present length 66mm, section 3mm. Period 5 (context 1277), SF 209.
105. Shank fragment. Bone. Circular-sectioned shank; both ends broken. Present length 20mm, section 2.5mm. Period 5 (context 1138), SF 194.
106. Shank fragment. Bone. Circular-sectioned; one end faceted to point, other broken. Present length 51mm, section 3mm. Period 5 (context 1164), SF 203.
107. Shank fragment. Bone. Circular-sectioned shank tapering to point; other end broken. Present length 85mm, section 3mm. Period 6 (context 1135), SF 236.
108. Shank fragment. Bone. Oval-sectioned shank tapering to point, other end broken. Present length 25mm, section 2.5 x 2mm. Period 6 (context 1135), SF 221.
109. Shank fragment. Bone. Circular-sectioned shank tapering to bevelled point; other end broken. Length 32mm, section 2mm. Period 6 (context 1245), SF 136.
110. Shank fragment. Bone. Circular-sectioned tapering shank; both ends broken. Present length 35mm, section 2.5mm. Period 11 (context 1217), SF 267.
111. Shank fragment. Bone. Circular-sectioned with faceted, possibly re-sharpened point, other end broken. Present length 55mm, section 3.5mm. Period 11 (context 1196), SF 263.
112. Shank fragment. Bone. Circular-sectioned tapering to point. Present length 17mm, section 2mm. Unstratified, SF 288.
113. Metapodial bone. Hollowed. Proximal end has perforation worked through one side; distal end broken. Present length 110mm. Period 6 (context 1151).
114. Sheet, copper alloy. Trapezoidal and slightly tapering, the slightly wider short end broken across an area where the piece had been bent; possibly originally centrally perforated behind this bend and at other end, but missing areas obscure details. Length 35mm, width 19–15mm, thickness 0.5mm. Period 5–7 (context 2158), SF 19.

## Nails

The nails from the Roman contexts are summarised in Table 20. The quantification for the incomplete nails is derived from the number of heads. The complete nails range from 35 to 115mm in length with a median value of 60mm and inter-quartile ranges of 50 and 74mm. The majority thus belong to division E (between 40 and 70mm) of Manning's Type 1B ([Manning 1985](#), 134), which are the typical timber nails of the Roman period.

## Discussion of the Roman small finds and glass

As will be obvious from the foregoing, the majority of this assemblage comes from the Quarry pits group 1. This is demonstrated more precisely by Table 23 which shows the distribution according to the principle context groupings. The nails, quantified in the same way, have been included as well as the functional categories. The material associated with the Quarry pits group 1 has been separated out into that found in the fills proper, and that found in the layers overlying the pits, as there were hints that there may well be more modern material intrusive into the latter. A comparison of the material from the fills and from these sealing layers shows that the functional profile is very similar. It seems reasonable to conclude that the rubbish filling the pits and in the sealing layers is fundamentally derived from the same sources and that the possible intrusion problem is a minor one.

As can be seen from the table, very little material came from the Period 4 quarry pits, so the significance of any difference in functional profile, as for example was observed in the household category, cannot be judged. The circular enclosure fill also produced relatively few finds but here the functional profile does appear somewhat different from that associated with the Quarry pits group 1. It lacks toilet and textile equipment, the personal equipment forms a smaller proportion of the whole and it has the only stratified item of writing equipment. The one brooch present is also a relatively uncommon form. As far as dating goes, however, there is little difference between that suggested by the pit material and that from the fills of the circular enclosure.

Generally the rubbish associated with the quarry pits appears to come from a domestic non-specialised source. Even the major craft activity represented, bone working, is one that can be carried out within the household without specialist tools. It is noticeable that the tool element consists of knives and blade fragments only. No more specialised craftsmen's tools were identified.

Overall the assemblage from the Quarry pits group 1 gives us a very good snapshot of the sort of material culture in common use in the Roman Worcester in the 2<sup>nd</sup> to 3<sup>rd</sup> centuries. There are some curious absences. One might, for example, have expected more Polden Hill brooches to be securely identified for an assemblage of this date and size, and the amount of vessel glass is curiously low. In other aspects, however, such as the presence of regional variants like the button-headed nail cleaner, it is just what may be expected. As a whole it provides a very useful reference collection against which any future contemporary assemblages from Worcester may be judged.

## Stone building materials

*by Dennis Williams*

The stone building material recovered from Roman contexts was quantified and examined, and is summarised by site period in Table 24. All of the building material could be identified as either limestone or sandstone, and is quantified in Table 25.

The largest proportion of the diagnostic building stone comprised roof tile fragments, with sandstone as the predominant material. Roughly half a complete roof tile was recovered (Fig 49, 1), made of Old Red Sandstone and recovered from the Period 6–7 tillage soil.

Table 24 Roman building stone by site period

Period	Context group name	Count	% count	Wt (g)	% wt	Av wt (g)
4–6		1	2	1198	7	1198
5		5	8	1150	7	230
5	Quarry pits group 1	20	31	4588	26	229
5	Circular enclosure	5	8	1064	6	213
6		1	2	348	2	348
6	Layer above Quarry pits group 1	20	31	2756	16	138
6	Layer above Quarry pits group 2	10	15	3854	22	385
6–7		3	5	2594	15	865
<b>Total</b>		<b>65</b>	<b>100</b>	<b>17552</b>	<b>100</b>	<b>270</b>

Table 25 Roman building stone by type

Stone type	Count	% count	Wt (g)	% wt	Av wt (g)
limestone	8	12	1536	9	192
lias	4	6	3648	21	912
sandstone	53	82	12368	70	233
<b>Total</b>	<b>65</b>	<b>100</b>	<b>17552</b>	<b>100</b>	<b>270</b>

Similar Old Red Sandstone found in Roman deposits at Deansway is thought to have been quarried in east Herefordshire, possibly around Wellington Heath (Roe 2004, 463). It is likely that this tile comes from the same source. Buildings with stone roofs are known to have existed in this area of Roman Worcester: excavation of a late Roman well at 1 The Butts, produced c 80kg of stone roofing tile, including similar hexagonal tiles with single peg holes (Naphan 2011a, 36–7). Old Red Sandstone tiles are also known from other Roman sites in the region, notably from Bays Meadow villa, Droitwich (Roe and Barfield 2006) and a rural settlement outside Kenchester, Herefordshire (Wilmott and Rahtz 1985, archive section 101.3). Fragments of Old Red Sandstone roof tiles were found in other contexts, but all were undiagnostic except for one with a measurable width of at least 175mm. Sandstone roof tile fragments with a grey colour were also recovered, again from a number of contexts. These had a micaceous fabric similar to that of the purplish-brown or reddish-brown Old Red Sandstone, and are likely to be from the same source.

Limestone fragments recovered from three contexts (1002, 1237 and 2184) were irregular in shape but may have also been from roof tiles. However, all of these fragments had a fairly uniform microstructure that was not typical of oolitic limestone quarried in the Cotswolds or at Bredon Hill. This would be consistent with the evidence from Deansway, where oolitic limestone first appeared as a building material in post-Roman contexts (Roe 2004).

Thick fragments of blue lias stone were recovered, from either floor slabs or building blocks. Similar thick fragments were found in a grey sandstone with a microstructure similar to that observed in the red and grey sandstone roof tiles. Some very small fragments of coarse red sandstone and Malvernian rock may be from building stone, but were undiagnostic.

## Ceramic building materials and fired clay

by C Jane Evans and Angus Crawford

### Ceramic building material

The Roman ceramic building material from Roman contexts was studied. Fabrics were recorded at x20 magnification using a site specific fabric series. Forms were identified, where possible, along with evidence for manufacture, if this survived. The material was quantified by count and weight. The level of preservation was generally good with the majority of fragments displaying only low levels of abrasion.

A total of 316 fragments were recovered, weighing c 44kg. The majority came from Period 6 layers over the quarry pits (particularly contexts 1135 and 1551) and the tillage soil (Table 26). Only small quantities were present in Period 3 and 4 deposits. The quantity was slightly higher from the Period 5 pits, with a handful of fragments deposited in nine of the pits (1130, 1132, 1158, 1173, 1180, 1222, 1288, 1326 and 1279).

None of the material can plausibly be associated with the structures on the site, so the ceramic building material is interpreted as building rubble redeposited from elsewhere in the Roman town. It is likely that there were some significant Roman buildings in the vicinity of 1 The Butts, where finds from a late Roman well produced a range of ceramic bricks and tiles (*lydion*, *pilae*, *tegulae*, and *imbrex*) as well as other building materials (Naphan 2011a, 37, fig 3.8 and 3.9).

Table 26 Roman ceramic building material by period and context group

Period	Area/context group name	Count	% count	Wt (g)	% wt	Av wt (g)
3	Area 2	5	2	120	<1	24
4	Areas 1 and 4	2	1	100	<1	50
4	Area 1 Structure 2	3	1	738	2	246
4–5	Area 5	1	<1	42	<1	42
4–6	Area 5	2	1	46	<1	23
5	Area 4	4	1	186	<1	47
5	Area 1 Quarry pits group 1	29	9	4634	10	160
5	Area 2 Circular enclosure	21	7	928	2	44
6	Area 1	11	3	1406	3	128
6	Area 1 layer above Quarry pits group 1	107	34	13536	31	127
6	Area 1, layer above Quarry pits group 2	84	27	15026	34	179
6–7	Areas 1 and 2	47	15	7384	17	157
<b>Total</b>		<b>316</b>	<b>100</b>	<b>44146</b>	<b>100</b>	<b>140</b>

Three broad fabrics were recorded (Table 27), based on the fabric classifications used to record the ceramic building material from the Sidbury site in Worcester (Lentowicz 1992, 66). All the fabrics were sandy. Fabric 2j, the most common fabric here and at Sidbury, is described as red to orange, with the following inclusions: moderate, medium sized 0.1–0.5mm, well-sorted quartz; sparse clay pellets/grog; and sparse white inclusions. The sparse white inclusions may be similar to the soft white inclusions described in some of the Severn



Valley ware fabrics (eg Fabric 12.6). Some variation was noted in the frequency of sand present in the fabrics recorded here, from sparse to abundant. The white inclusions were also more obvious in some fragments than others. Some fragments were distinguished by the presence of organic voids, like Sidbury Fabric 2d. This was another common fabric at Sidbury. A relative few fragments were classified as miscellaneous, Fabric 10. The distinctive white banding, noted in the second most common fabric at Sidbury (Fabric 2e), was not recorded in this assemblage.

Table 27 Roman ceramic building material by fabric

Fabric code/name	Count	% count	Wt (g)	% wt	Av wt (g)
Fabric 2d, Roman red	56	18	7112	16	127
Fabric 2j, Roman common sandy	242	61	36692	68	152
Fabric 10 miscellaneous	14	6	322	1	23
<b>Total</b>	<b>312</b>	<b>100</b>	<b>44126</b>	<b>100</b>	<b>141</b>

Roof tile was the most common type recovered (Table 28), with *tegula* and *imbrex* present in roughly equal proportions. The presence of box flue tiles, or *tubulus*, suggests the presence of a building with hypocaust heating in the vicinity. This is comparable to the evidence from 1 The Butts, which produced pilae used in the pillars that supported the floor above the hypocaust (Napthan 2011a). One fragment of box flue tile had the combing typical of this type, necessary to key the tile into the structure. One near complete profile of an imbrex was noted as being partially burnt. At 1 The Butts some of the stone roof tile was also noted as reddened by intense heat. The underside of a number of tegulae fragments were sanded, presumably resulting from when they were laid out to dry, and one was noted with wiping and finger marks. No cutaways were recorded, and no fragments with animal prints.

Table 28 Roman ceramic building material by form and function

Function	Object specific type	Count	% count	Wt (g)	% wt
Cavity walling	Box flue	1	<1	240	1
Cavity walling	Box tile	1	<1	60	<1
Wall	Brick	3	1	150	<1
Roof tile	Imbrex	125	40	17874	41
Roof tile	Tegula	112	36	23114	52
Roof tile?	Tegula?	12	4	212	<1
Roof tile?	Tile	47	15	2304	5
Uncertain	Brick/tile	11	4	172	<1
<b>Total</b>		<b>312</b>	<b>100</b>	<b>44126</b>	<b>100</b>

## Fired clay

Small quantities of fired clay, possibly hearth material, were found across the site (Table 29). The largest group (85 fragments, 1446g) came from a Period 4 cleaning layer (1008). The other concentrations came from Period 6 layers over the quarry pits, and may be from the same source as the ceramic oven material. Other fragments cannot be associated with any particular on site activities.

Table 29 Roman miscellaneous fired clay

Period	Context group name	Count	% count	Wt (g)	% wt	Av wt (g)
4	Area 1	85	38	1446	30	17
4–6	Area 5	6	3	53	1	9
5	Areas 1 and 4	7	3	51	1	7
5	Area 2	14	6	110	2	8
5	Area 1 Quarry pits group 1	15	7	237	5	16
5	Area 2 Circular enclosure	15	7	96	2	6
6	Area 1	3	1	149	3	50
6	Area 1 layer above Quarry pits group 1	30	13	1011	21	34
6	Area 1 layer above Quarry pits group 2	47	21	1613	33	34
6–7	Area 2	2	1	68	1	34
<b>Total</b>		<b>224</b>	<b>100</b>	<b>4834</b>	<b>100</b>	<b>22</b>

## Ceramic oven material

*by Angus Crawford*

### Introduction

The Roman ceramic oven and platter material was recovered in some quantity from the site (Tables 30–1), providing detailed quantification and information about the distribution and phasing of the material. The excavated assemblage consisted of 276 fragments weighing 24.8kg. The level of preservation was generally good with the majority of fragments displaying only moderate levels of abrasion. The material was recovered from a number of contexts across the site, but the majority (16.05kg) came from the Period 6 layers overlying the quarry pits, in particular from layers 1135 and 1551 (Table 30). None of the oven material was associated with structural oven bases.

### Fabric and forms

#### *Fabric*

Both the oven and platter material were of a hard-fired fabric, containing moderate to abundant, angular fragments of Malvernian rock (up to 6.0mm, but more commonly 1.0 to 2.0mm). The fabric varied in colour from orange to grey and could be a patchy combination of both. Fragments of similar material have previously been identified as Fabric 3.1, handmade slab-built Malvernian ware. In keeping with this, Fabric 3.1 has been assigned to all of the oven and platter material recovered, regardless of method of manufacture.

Table 30 Roman ceramic oven material by area and context group

Period	Area/context group name	Count	% count	Wt (g)	% wt
4	Areas 1 and 4	3	1	158	1
4–5	Area 5	1	<1	180	1
4–6	Area 5	2	1	246	1
5	Area 2	4	1	162	1
5	Area 1 Quarry pits group 1	10	4	674	3
5	Area 2 Circular enclosure	18	7	711	3
5–6	Area 1	1	<1	140	1
5–7	Area 2	27	10	1732	7
6	Area 1	11	4	1244	5
6	Area 1 layer above Quarry pits group 1	86	31	8862	36
6	Area 1 layer above Quarry pits group 2	89	32	8706	35
6–7	Areas 1 and 2	10	4	380	2
11	Area 1	12	4	1518	6
12	Area 1	2	1	94	<1
<b>Total</b>		<b>276</b>	<b>100</b>	<b>24807</b>	<b>100</b>

## Forms

The assemblage consisted of material identifiable as two broad forms: ‘ovens’ and ‘plates/platters’, with the former broken down into a number of elements (Table 31). The different forms and elements are discussed below. This material has been identified in much smaller quantities from other sites, and similar slab-built vessels have been recorded previously from a number of sites in Worcestershire (for example, [Peacock 1965–67](#), fig 4, 80–2 and possibly 86–7; [Hurst and Woodiwiss 1992](#), 64, fig 46; [Darlington and Evans 1992](#), 67–8, fig 35.4a–c; [Bryant 2004](#), 366, fig 210: 1–6; [Hurst nd](#)). A fragment of oven plate is described from the nearby Conder Buildings site ([Morgan 2003](#)). These disassociated individual fragments have proved difficult to interpret. However, the recent excavation at The Hive provided an association of the material with *in situ* structural oven bases. While this evidence has yet to be studied in detail, it has allowed a provisional interpretation to be made which is followed here. Smoke fuming and sooting were noted on a small number of fragments in all forms.

Table 31 Roman ceramic oven material by form and element

Form	Count	% count	Wt (g)	% wt	Av wt (g)
Edge or base	14	5	1316	5	94
Plate/platter	119	43	12709	51	107
Folded over rim	7	3	1560	6	223
Wall – plain	107	39	6924	28	65
Wall – flanged	24	9	2062	8	86
Wall – perforated	5	2	236	1	47
<b>Total</b>	<b>276</b>	<b>100</b>	<b>24807</b>	<b>100</b>	<b>90</b>

### *Flange rims*

One of the characteristic elements identified elsewhere is a flange rim (Fig 50, 1–3). Seven fragments were recovered, three of which are illustrated to show the range. The provisional identification for this element is an oven apertures, either from the mouth of an oven or possibly from a vent opening at the top of the oven. Some of these fragments had no visible curvature (Fig 50, 1) while others were curved (Fig 50, 4).

### *Edge or base fragments*

Another identifiable element is a plain rim, which is characteristically flat and slightly splayed (Fig 50, 5), and is identified as the open base of the oven. Fourteen base fragments were recorded. Smoke fuming was noted on four examples.

### *Oven wall*

Undiagnostic oven wall sherds were the most common element recorded (133 fragments). In many cases this material can be difficult to identify unless recovered with known diagnostic indicators (discussed below), or substantial fragments can be joined. It is therefore likely that examples will have been missed in other assemblages. The oven body fragments tend to have a rougher external surface, indicating the use of firm finger and hand pressure to smooth and shape the outer and inner surface. This in turn regularly results in distinct finger swipes in varying directions and occasionally an uneven surface finish (recorded on 94 fragments). This is perhaps one way of distinguishing fragments of oven material from large storage jars, as the surface treatment tends to be rougher than would be expected on hand-made jars with thicknesses similarly varying from 10 to 25mm. A diagnostic feature of the wall fragments is the presence of holes pierced externally through the body, prior to firing (Fig 50, 6). These were noted on five fragments, and ranged in diameter from 8mm to an estimated 30mm. Their exact purpose is unclear as it has not been possible to identify where on the oven structure they occur. They could have been used to regulate internal temperatures though controlling air flow (they could be easily blocked with a plug) or they could have supported rods on which meat was hung to smoke or dry cure.

Previous research, for example from Droitwich and Worcester, has noted wall fragments with defined 'ledges' (Hurst and Woodiwiss 1992; Darlington and Evans 1992; Hurst nd). None of the material at City Campus exhibited this feature, although 24 fragments from apertures had 'flanges' broken off along a weakly folded joint, resulting in a T-shaped or L-shaped profile.

### *Platters*

Another diagnostic form recorded elsewhere is the plate or platter (Fig 50, 7–10). The larger fragments recovered from the recent excavation at The Hive could be reconstructed as large ovoid platters, with parallel long sides and curving ends. The examples in the City Campus assemblage were not so complete, but one at least shows the signs of a curving end (Fig 50, 8). It is a particular characteristic of this form that the undersides are sanded, indicative of forming on a sanded surface as in roof tile manufacture. One fragment had hobnail impressions (Fig 50, 10), suggesting they were laid on the ground to dry. The upper surface was smoothed over with various finishes; for example finger wiping, various banded patterns (Fig 50, 7), and slightly ridged lines that may have been produced by a knife or spatula-type implement (Fig 50, 9).

### Catalogue of illustrated forms (Fig 50, 1–10)

1. Heavy, folded over, flange rim. No discernible curvature. The section shows where additional clay has been added to extend the rim. Period 6 (context 1135). Database Rec 1.
2. Folded over, flange rim, trimmed. No discernible curvature. The section shows how the rim was folded over to form the flange, which has been trimmed, resulting in a faceted profile. Period 6 (context 1135). Database Rec 2.
3. Smaller, slightly out-turned rim. Period 6 (context 1135). Database Rec 3.
4. Heavy, out-curving rim. The aperture that this is from bends sharply; perhaps from the top of an oven mouth. The section shows how the rim was folded over, and possibly a ring of clay applied to strengthen the neck. Period 6 (context 1551). Database Rec 16.
5. Flat, slightly splayed base. The base has a gentle curvature, suggesting an estimated diameter of c 55cm. Period 6 (context 1135). Database Rec 7.
6. Perforated wall fragment. The fragment also shows 'bloating', where air has expanded forming a bubble during firing. Period 6 (context 1135). Database Rec 15.
7. Platter rim, with upper surface wiped in bands. Period 6 (context 1551). Database Rec 21a.
8. Sharply curving platter rim. Period 6 (context 1551). Database Rec 21b.
9. Platter rim, with rilled upper surface. Period 6 (context 1551). Database Rec 25.
10. Platter rim, with hobnail impressions. Period 5, circular enclosure 2012, fill 2161. Database Rec 286.

### Discussion

This assemblage represents one of the larger recorded assemblages of this material, here identified as fragments of portable ovens and platters. None was recovered *in situ* associated with an oven base, as recorded at the nearby excavation at The Hive. Fragments of this material are difficult to identify. Similar material has previously been associated with later 3<sup>rd</sup> to 4<sup>th</sup> century occupation, but recent work suggests that its production spans the entire period of Roman occupation, though with increasing use in the later period (Laura Griffin and Derek Hurst pers comm). The evidence from this site indicates that these artefacts were in use from the 2<sup>nd</sup> century onwards (Period 4).

It is intended that a more detailed discussion of their interpretation as ovens will be undertaken for the report on the excavations at The Hive. Evidence for ovens in Roman Britain is not common (Cool 2006, 52), and this material is of particular interest. They may be most similar to the *clibani* produced at Holt.

## Plaster and mortar

by C Jane Evans

A small quantity of plaster and mortar was noted from Roman deposits (Table 32). Most came from Period 6 layers overlying the quarry pits and the tillage soil. A few fragments of plaster were recovered from two Period 5 pits (1158, 6 fragments; 1180, 1 fragment). Both these pits produced diagnostically late 3<sup>rd</sup> century or later pottery, although 1180 in particular also produced significant quantities of 2<sup>nd</sup> century samian. Very small quantities of mortar came from a Period 4 pit (1461) and Period 5 pits (1113, 1114, 1116, 1288, and 1435). Amongst these, only Period 5 pits 1113 and 1114 produced late 3<sup>rd</sup> century or later pottery. Of particular interest were seven fragments of painted plaster, from Period 6 layer 1135. The surviving decoration (Fig 51) indicated a simple panel, with red and white paint.

Table 32 Roman plaster and mortar by period and context group

Period	Context group name	Material class	Count
4	Quarry pits group 2	Mortar	1
5	Quarry pits group 1	Mortar	9
5	Quarry pits group 1	Plaster	7
6	Layer above Quarry pits group 1	Mortar	10
6	Layer above Quarry pits group 1	Plaster	1
6	Layer above Quarry pits group 2	Mortar	23
6	Layer above Quarry pits group 2	Plaster	7
6–7	Tillage soil	Plaster	2

Like the ceramic and stone building material discussed elsewhere (see p94, p95), the presence of painted plaster suggests there was a relatively high status Roman building not too far from the site. Its presence is not surprising as significant quantities (4.5kg) of painted plaster were recovered from a late Roman well at 1 The Butts (Naphan 2011a, 37). Much of this also indicated a red and white decorative scheme. Smaller quantities of painted plaster were also noted at the Police Station site in Castle Street (Edwards *et al* 2002, 128) and at the nearby Conder Building (Morgan 2003). Compositional analysis undertaken on samples from the Conder Building identified a lime based red ochre paint on a white lime intonaco layer, 'as used for painting in the buon fresco method where the pigment is applied to the wet lime intonaco' (Morgan 2003). It was thought that the plaster may have been used over daub. Elsewhere, high quality decoration on lime mortar and plaster finishing layers has been found on buildings made from mud bricks, wattle and daub or rammed earth or cob (*ibid*). There was no indication of the highest status pigments being used, for example the more exotic cinnabar for deep red.

## Industrial residues

by C Jane Evans and Dennis Williams

Industrial residues related to Roman ironworking were recovered, including various types of slag, iron ore, and hammerscale.

### Iron slag

A total of 237.6kg of iron slag was recovered. Ninety-one percent of this came from Roman deposits, Periods 3 to 6–7 (Table 33). Only this material is discussed in the report that follows. The dumping of iron slag is a well-known phenomenon from Roman excavations in Worcester, such as at Deansway (McDonnell and Swiss 2004), reflecting the existence of a major ironworking industry in the Roman town (Jackson 2004). None of the slag from this site was associated with structural or artefactual evidence for *in situ* metalworking. The iron slag was interpreted as material brought onto the site from elsewhere in the Roman town. For this reason, no detailed scientific analysis was undertaken. A detailed analysis was undertaken on ironworking waste from a nearby site at 14–24 The Butts (Blakelock 2011), which included essentially the same types of debris, based on visual inspection.

Table 33 Roman iron slag by period, area and main context groups

Period	Area and context group name	Wt (g)	% wt
3	Area 1	79	<1
3	Area 2	1800	1
3–6	Areas 2 and 4	1832	1
3–11	Trench 5	243	<1
4	Area 1	2	<1
4	Area 1 Quarry pits group 2	49	<1
4	Area 1 Structure 2	1409	1
4	Area 4	4198	2
4	Area 5	10	<1
4–5	Area 4	3092	1
4–6	Area 4	1950	1
4–11	Area 4	548	<1
5	Area 4	2357	1
5	Area 2	22107	10
5	Area 1 Quarry pits group 1	41536	19
5	Area 2 Circular enclosure	32040	15
5–6	Area 1	881	<1
5–11	Area 2	3	<1
6	Area 1	2246	1
6	Area 1 layer above Quarry pits group 1	33719	16
6	Area 1 layer above Quarry pits group 2	56781	26
6–7	Area 1	34	<1
6–7	Area 2	7648	4
6–7	Area 4	1254	1
6–7	Trench 5	364	<1
<b>Total</b>		<b>216182</b>	<b>100</b>

The slag came predominantly from dumped layers and pit fills (Table 34). Most of the Period 4 slag was associated with Structure 2, in particular posthole 1252 (1344g). Only eight of the Period 4 Quarry pits group 2 produced iron slag, with the largest amount from pit 4175 (1.8kg). A significant proportion came from the Period 5 Quarry pits group 1. Slag was recovered from 39 of these pits, in greatly varying quantities. The largest assemblages came from pits 1114 (5897g), 1180 (5176g), 1158 (4009g), 1140 (3196g), 1155 (3140g), 1173 (3107g), 1130 (2923g), 1165 (2857g), and 1322 (2470g). The largest dumps of slag came from the Period 6 layers, particularly from layers 1135 (55.3kg) and 1551 (27.5kg).

Table 34 Roman iron slag by feature type

Feature type	Wt (g)	% wt
Ditch	35912	17
Layer	99235	46
Pit	76135	35
Posthole	3946	2
Unclassified	954	<1
<b>Total</b>	<b>216182</b>	<b>100</b>

All the slag was visually inspected as part of the assessment, and a sample was scanned by David Starley. The slag represented waste from smelting, rather than from smithing. It was very dense and generally free from large pores. Amongst the diagnostic fragments, the majority appeared to be smelting tap slag, waste tapped from the furnace, exhibiting the typical pre-solidification flow lines. A significant number of pieces of furnace slag were also noted, in the form of larger blocks without surface flow lines, typical of slag that had solidified within the base of the furnace. Four contexts (Period 6 layers 1135 and 1237; Period 5 circular enclosure, fill 2190; and Period 5 pit 2187, fill 2251) produced examples of 'rods', one with a clear central shrinkage pore. These represent runs of slag that solidified within holes in, or tubes through, the furnace walls, provided either for forced ventilation during smelting or for tapping of the slag, or both (McDonnell and Swiss 2004, 370). There were a few instances of slag adhering to fired clay from the furnace structure, and in two contexts (Period 5 pit 1158, fill 1145; Period 6 layer 1331) there was good survival of wood embedded in slag.

## Iron ore

Of interest because of its relative rarity in Worcester was a small amount of iron ore. This had a dark purplish, matt, fracture surface, typical of haematite ( $\text{Fe}_2\text{O}_3$ ). It had possibly been subjected to a preliminary roasting process, under highly oxidising conditions, to drive off water, carbon dioxide and other volatile impurities.



## Hammerscale

Hammerscale was noted in a number of scanned environmental samples from Roman contexts (Tables 35 and 36).

*Table 35 Roman hammerscale from environmental samples by period and number of contexts*

<b>Period</b>	<b>Number of contexts</b>	<b>Frequency</b>
3	1	Occasional
3-4	9	Occasional
3-6	4	Occasional
3-11	1	Occasional
4	33	Occasional
4	1	Occasional/moderate
4	2	Very occasional
5	1	Moderate
5	48	Occasional
5-6	1	Moderate
5-6	1	Occasional
5-6	1	Very occasional
5-11	1	Occasional
6	2	Moderate
6	5	Occasional

*Table 36: Roman hammerscale from environmental samples by feature type and number of contexts*

<b>Feature type</b>	<b>Number of contexts</b>	<b>Frequency</b>
Beam slot	2	Occasional
Ditch	1	Moderate
Ditch	12	Occasional
Layer	2	Moderate
Layer	3	Occasional
Pit	73	Occasional
Pit	1	Occasional/moderate
Pit	2	Very occasional
Posthole	1	Moderate
Posthole	12	Occasional
Posthole	1	Very occasional
Unspecified	1	Occasional

## Environmental analysis

### Animal bone

by Ian Baxter

#### Introduction

All Romano-British material that could be assigned to a site period was examined, together with a mid-late 18<sup>th</sup> century well and a mid-late 18<sup>th</sup> century dog burial. Results are presented in Tables 37–8 and Figures 52–4. A total of 4436 fragments of animal bones were recovered from securely dated Roman contexts, 99 fragments from the late post-medieval well and 89 bones from the dog burial of similar date (4624 fragments in total). Of this total, 652 statistically significant fragments (see below) recovered by hand-collection and 44 fragments recovered from the sifted environmental sample residues have been identified to species or broader taxonomic category (Tables 37–8). Because the assemblage is relatively small all the Roman material is considered together below under taxonomic headings with a following discussion of the assemblages found in the major feature groups. The Roman material was primarily recovered from the infills of quarry pits and midden layers sealing these. A smaller amount of animal bone fragments derives from refuse pits, postholes and a circular enclosure. The animal bones date from Period 4 to 6 and from Period 11.

Table 37: Number of hand collected mammal and bird bones (NISP)

Taxon	Period 4	Period 5	Period 6	Period 11	Total
Cattle ( <i>Bos f domestic</i> )	16	175	151	4	<b>346</b>
Sheep/goat ( <i>Ovis/Capra f domestic</i> )	8	120	61	16	<b>205</b>
Sheep ( <i>Ovis f domestic</i> )	(3)	(35)	(16)	(7)	<b>(61)</b>
Pig ( <i>Sus scrofa</i> )	1	16	24		<b>41</b>
Equid ( <i>Equus sp</i> )	1	20	15		<b>36</b>
Dog ( <i>Canis familiaris</i> )	1 <sup>1</sup>	3	8	1 <sup>2</sup>	<b>13</b>
Cf fox ( <i>Vulpes vulpes</i> )		1 <sup>3</sup>	1		<b>2</b>
Hare ( <i>Lepus sp</i> )		1	1		<b>2</b>
Domestic fowl ( <i>Gallus f domestic</i> )		3	2		<b>5</b>
Duck ( <i>Anas platyrhynchos</i> )		1			<b>1</b>
Raven ( <i>Corvus corax</i> )		1			<b>1</b>
Cf turdid ( <i>Turdus sp</i> )		+			<b>+</b>
<b>Total</b>	<b>27</b>	<b>341</b>	<b>263</b>	<b>21</b>	<b>652</b>

**Notes:**

*Sheep/Goat also includes the specimens identified to species.*

*Numbers in parentheses are not included in the total of the period.*

*+ means that the taxon is present but no specimens could be “counted” (see text).*

<sup>1</sup> *Includes thirteen bones from a partial skeleton*

<sup>2</sup> *Includes eighty-nine bones from a partial skeleton*

<sup>3</sup> *Includes three bones from a forelimb*

Table 38 Number of mammal, bird and fish bones (NISP) in the sieved assemblage

<b>Taxon</b>	<b>Period 4</b>	<b>Period 5</b>	<b>Period 6</b>	<b>Total</b>
Cattle ( <i>Bos f domestic</i> )	1	3		<b>4</b>
Sheep/goat ( <i>Ovis/Capra f domestic</i> )	3	9	2	<b>14</b>
Sheep ( <i>Ovis f domestic</i> )		(2)		<b>(2)</b>
Pig ( <i>Sus scrofa</i> )		4	1	<b>5</b>
Mouse/vole ( <i>Murid/Microtine</i> )		4	7	<b>11</b>
Domestic fowl ( <i>Gallus f domestic</i> )	1	1		<b>2</b>
Woodcock ( <i>Scolopax rusticola</i> )		1		<b>1</b>
Bird ( <i>Aves sp</i> )		3	2	<b>5</b>
Fish ( <i>Pisces sp</i> )			2	<b>2</b>
<b>Total</b>	<b>5</b>	<b>25</b>	<b>14</b>	<b>44</b>

### Provenance and preservation

In general the preservation of the animal bone was fairly good and ranged from good to poor. For the Romano-British material, 63% derived from pits, primarily the quarry pits of Periods 4 and 5, 30% from the Period 6 layers, 3% from postholes and 5% from the Period 5 circular enclosure. The post-medieval animal bones are also fairly well preserved.

### Frequency of species

The Romano-British animal bone assemblage was dominated by the remains of the main domestic mammals: cattle, sheep, pig and horse (Table 37). Domestic birds (fowl, and possibly duck) are uncommon although their numbers are liable to be an under-estimation due to a recovery bias against smaller bones. Wild animals are scarce, suggesting that hunting played a minimal role in the provision of food.

Cattle were the most common taxon by number of identified fragments (NISP) in all periods in the City Campus site, followed by sheep/goat (Fig 52). This pattern is similar to Deansway (Nicholson and Scott 2004a) which also showed an increase in the relative frequency of sheep/goat in Period 4, comparable to that at City Campus (Period 5). Pig was much less frequent in the City Campus assemblage, well below the frequency recorded at Deansway in Periods 4 (c AD 120–c 240) and 5 (c AD 240–400). Equid numbers were also moderate and within expected levels, unlike Deansway Period 3 (early 1<sup>st</sup> century–c AD 120) where they are exceptionally high at almost 30% of major domesticates. This assemblage is closely compared with Deansway as the only significant Romano-British assemblage published thus far from Worcester.

### Roman period faunal remains

#### *Cattle*

Cattle were the most frequent taxon by NISP throughout the Roman period, accounting for 64% of the major domesticates in Period 4, 56% in Period 5 and 64% in Period 6. The cattle represented can be classified as two types based on the morphology of their horncores: small horn with cores less than 96mm long and short horned with cores measuring between 96mm

and 220mm (Armitage and Clutton-Brock 1976; Armitage 1982; Fig 54). The small horn type is often taken to be typical of the Iron Age, although the short horned type is also found during that period, but is not found after the Roman period. Of the horncores that can be assigned to these two types (n = 43), 21% derive from small horn and 79% from short horned. Although always in a minority, small horn cattle appeared to persist at similar frequencies until the end of the Roman period in this assemblage. Unfortunately the cattle horncores recovered from Deansway were not measured for their length (Nicholson and Scott 2004b, 525) and it is not known what types they belonged to. The shape of the frontal profile and intercornual ridge were recorded for this assemblage when possible, following the methods of Grigson (1976). Three frontal profile types were observed: convex (n = 4), flat (or very slightly convex; n = 2) and slight boss (n = 2). Studies on recent cattle have demonstrated that the frontal profile seen from above is closely related to breed (Grigson 1976, 126–8). In specimens where the horncores can be classified according to type, a convex frontal profile is combined with small horn cattle in two out of three cases while the other frontal shapes are associated with the short horned type.

While several methods have been used in the past to attempt to sex cattle horncores, with variable success, it is generally easy enough to identify those of cows and oxen visually, with cows having cores relatively long compared to their basal diameter and oxen having generally more massive and thinner walled cores. On this basis most of the cattle horncores in this assemblage came from oxen and cows. As might be expected, possible entire males were in a minority. Of horncores that could be aged using the method of Armitage (1982; n = 52), juveniles account for 6%, subadults 17%, young adults 12%, adults 38% and old adults 27%. Evidence from mandibles and the epiphyseal ends of long-bones also indicated that adult and elderly beasts were in a majority in all periods (Fig 53). Only three long-bones were sufficiently complete to estimate the height at the withers of cattle using the multiplication factors of Matolcsi (1970). These derived from Period 6 and ranged from 93cm to 117cm (mean = 108cm), compared with 107cm to 117cm (n = 22; mean = 111cm) at Deansway (Nicholson and Scott 2004b). This lends support to the conclusion of Nicholson and Scott (2004a) that the cattle at Roman Worcester were relatively small in all periods.

Pathologies and abnormalities observed affecting the Roman cattle in this assemblage included occipital perforations, absence of the third pillar or hypoconulid of the lower 3<sup>rd</sup> molar, and unexpected posterior–anterior wear of the same tooth. Occipital perforations in bovines are congenital defects (Manaseryan *et al* 1999; Baxter 2002), most probably caused by a developmental disorder during the pneumatization of the frontal, parietal and occipital bones (Fabis and Thomas 2011). Absence or reduction of the M<sub>3</sub> hypoconulid, frequently combined with congenital absence of P<sub>2</sub> (Andrews and Noddle 1975) and abnormal wear of M<sup>3</sup>, is another hereditary trait caused by a recessive gene, the phenotypic expression of which only appears in homozygous individuals. In both cases a genetic relationship may be expected to exist between affected individuals within a given population.

### *Sheep/goat*

The remains of sheep/goats were the next most frequent taxon by NISP at after cattle, accounting for 32% of the major domesticates in Period 4, 39% in Period 5 and 26% in Period 6 (Fig 52). A similar pattern of relative frequency was recorded at Deansway (Nicholson and Scott 2004b). No specimens from this assemblage could be identified as deriving from goats but almost one third (54 out of 189) were identifiable as sheep (Table 37). The available mandibles suggested that most sheep were slaughtered at around 6–12

months, 1–2 years, and over 4 years old in Period 5, with a much smaller number killed at 2–4 years. In Period 6 a much broader range of ages was represented although the number of ageable mandibles is less than half that of Period 5. Mortalities at mandible wear stage A (0–6 months) are most probably natural when encountered on sites other than those of temples. The only other major difference between the periods is that more sheep appear to have been slaughtered in Period 6 aged between 2–4 years (stage D) than aged 1–2 years (stage C) and less aged between 6–12 months (Stage B; [Fig 53](#)). However, the numbers of mandibles involved in all periods are very small and interpretations are necessarily highly tentative. The patterns of slaughter in both Periods 5 and 6 are not indicative of any specialization regarding sheep products. Most of the sheep/goat long-bones recovered from the site had fused epiphyseal ends.

No ovicaprid horncores were found although a few sheep cranial fragments seen had the horns chopped off. The size of the sheep ranged from 55cm to 65cm (n = 9; mean = 61cm) at the withers based on the multiplication factors of [Teichert \(1975\)](#). The sheep are therefore similar in size to those at Deansway, where the Roman average was 60cm ([Nicholson and Scott 2004a](#)).

The only pathology observed affecting the sheep/goat population in this assemblage was a mandible from an aged individual dating from Period 5 with heavily worn teeth and caries in M<sub>1</sub>.

### *Pig*

Pigs formed a much smaller component of the faunal assemblage than at Deansway, accounting for 4% of the main domestic species in Period 4, 5% in Period 5, and 10% in Period 6 ([Fig 52](#)). None of the few mandibles recovered had M<sub>3</sub> in full wear and no late fusing epiphyses were observed. This suggests that pigs were customarily slaughtered before reaching dental and skeletal maturity in common with other sites of the period.

### *Equids*

Equid numbers in the City Campus assemblage were at a low frequency throughout the Roman period, accounting for 4% by NISP in Period 4, 6% in Period 5, and 6% in Period 6 ([Fig 52](#)). By comparison equid remains were unusually common at Deansway in the Period 3 assemblage, a phenomenon that is not explained in the specialist report ([Nicholson and Scott 2004b](#)). Although all the equid grinding teeth (P2–M3) and diagnostic bones in this assemblage can be safely ascribed to horse (*Equus caballus*), isolated incisors and some particularly small but undiagnostic fragments cannot be confidently ascribed to species. Dental elements recovered from a minimum of four individuals range between 6 and 15 years based on incisor wear ([Barone 1980](#)) or the crown height of grinding teeth ([Levine 1982](#)). Three long-bones give withers heights of 126cm to 129cm (mean = 128cm) based on the multiplication factors of [May \(1985\)](#). This is broadly similar to Deansway with a range of 125cm to 137cm (n = 7; mean = 130cm) when the same system is used. In the Deansway report the factors of [Kiesewalter \(1888\)](#) were applied to GL (greatest length) when he used LI (lateral length) because his study was based on mounted skeletons ([von den Driesch and Boessneck 1974](#)) thus inflating the withers heights obtained in the Deansway study.

Pathologies observed on the horse bones included an astragalus from a Period 5 pit (1137) with exostoses typical of infective arthritis (cf [Baxter 1996](#)) and a calcaneum from another Period 5 pit (1145) with exostoses also indicative of an arthropathic condition. Several horse bones had been butchered and equid remains appeared to have been treated similarly to those of the domestic food species.

### *Canids*

While most of the canid bones in this assemblage can be ascribed to domestic dogs, three bones from a forelimb (context 1174, Period 5) and an isolated humerus (context 1135, Period 6) are metrically similar to those of red fox (*Vulpes vulpes*; [Bonifay 1966](#); Sheila Hamilton-Dyer pers comm). Perhaps significantly, these were the only canid bones recovered from the site that had been gnawed by dogs. The most frequent dog remains were isolated postcranial bones of dwarf or brachymel animals ([Teichert 1987](#)) a typically Roman form that is becoming better known morphologically from the recent study of complete skeletons and associated remains ([Baxter 2006, 2010](#)). A very partial skeleton of this type of dog was recovered (context 1008, Period 4). The dwarf dogs in this assemblage have midshaft diameter (msd) indices of 9.2, 9.5 and 9.6 for the humerus, 10.7 for the radius and 9.1 for the femur and withers heights ranging from 28cm to 33cm ([Harcourt 1974](#)). The limb bones of dwarf dogs are also relatively thick walled. A tibia of a larger but more lightly-built dog with an msd index of 6.8 (a Period 5 pit, 1159) came from an animal 53cm high at the shoulder, based on the multiplication factors of [Harcourt \(1974\)](#). A distal humerus belonging to a lightly-built small to medium-sized dog (slightly larger than the bones tentatively identified as possible fox) from a Period 6 layer (1135) has exostoses on the lateral and medial surfaces of the articular end and probably came from an old dog with arthritis.

### *Hare*

Isolated hare (*Lepus* sp) distal humerus fragments were found in the Period 5 circular enclosure (context 2190) and a Period 6 layer (1135). The significance of these bones is obscure although the hare features in Romano-Celtic religion ([Green 1997](#), 112–13) and was hunted on horseback by the Romans ([Toynbee 1973](#)).

### *Rodents*

Postcranial bones belonging to mice or small voles were recovered from sample residues taken from Period 5 and 6 pits and layers. No gnathic elements were found that could help determine species.

### *Birds*

The remains of domestic fowl (*Gallus f domestic*) occurred at low frequency in all Roman periods and included both spurred and non-spurred tarsometatarsi indicative of cocks and hens respectively. A duck carpometacarpus was found in a Period 5 pit (2187, fill 2200). This belongs to either a wild mallard (*Anas platyrhynchos*) or its domestic descendant. A woodcock (*Scolopax rusticola*) distal humerus was recovered from a sample taken from Period 5 pit (1173, fill 1172). The preferred habitat of the woodcock is damp woodland with open clearings and rides and a good growth of bracken and bramble ([Burton et al 1987](#)). This species is frequently found on Roman sites ([Parker 1988](#)) suggesting that the required habitat was ubiquitous during the period. The above birds have commonly been utilized as food

species throughout history. Smaller wild passerine birds are represented in the assemblage by isolated fragments recovered by hand and from sample residues from Period 5 and Period 6. These range in size from sparrows and finches to thrushes. None of these could be identified to species although a small thrush carpometacarpus (from context 2161) may possibly belong to redwing (*Turdus iliacus*), in recent times a winter visitor. Although thrushes would seem to have been eaten, at least on high status sites, during the Roman period (Albarella 1997), it seems more likely that all the smaller wild bird remains in this assemblage are accidental inclusions in similar fashion to the rodents. A complete raven (*Corvus corax*) ulna was found in Period 5 pit (1180, fill 1411). This, like the putative foxes (see above), would have been a common scavenger during the Roman period.

## Discussion of the Romano-British faunal assemblage

The site lies at the western edge of the Roman settlement near the River Severn. As noted above, most of the Romano-British animal bones were recovered from the infills of Quarry pits (groups 1 and 2) dating from Period 4 and 5, and the Period 6 midden layers. A smaller amount of material was recovered from the Period 5 circular enclosure and other pits and structural postholes (Structures 1 and 2). None of these bones appeared to be in primary deposition, although their condition suggested minimal exposure to the elements prior to their final deposition. The remains of the domestic food species consisted primarily of primary butchery waste and there is no convincing evidence for kitchen refuse anywhere on the site.

Cattle were the main species by NISP throughout the Roman period. Two main types were represented based on the horncores recovered, small horn and short horned. Both types persist to the end of the Roman period and there is no indication from this assemblage of any improvements in stock or husbandry over this timescale. This has been observed at a number of sites in England, including Great Holts Farm, Boreham, Essex (Albarella 1997); Bob's Wood, Hinchingsbrooke, Cambridgeshire (Baxter forthcoming a) and Love's Farm, St Neot's, Cambridgeshire (Baxter forthcoming b). It should be noted that this assemblage and the Deansway assemblage are relatively small for such changes to be readily identified. However, as was speculated in the faunal report for Deansway (Nicholson and Scott 2004a), the cattle represented in this assemblage appear to be of heterogeneous stock and derived from several herds of differing genetic lineage.

Likewise, the sheep in this assemblage (again in common with Deansway) do not appear to show any indication of improvement throughout the Roman period unlike some sites in England, for example Elms Farm, Heybridge, Colchester, and Great Chesterford in Essex, which have been attributed to the introduction of new breeding stock (Johnstone and Albarella 2002; Baxter 2011). Again the sample sizes of this assemblage and that from Deansway are insufficient for any temporal changes to be observed. Pigs and chickens appear to have comprised a relatively minor dietary element and the possible contribution of hunting and wildfowling was minimal. The horses were small pony-sized animals of 12 to 13 hands and little changed from the preceding Iron Age. Many of the dogs represented at were dwarf or brachymel animals. This type of dog is particularly common in the Roman period and may have been used for herding domestic stock after the manner of the modern Corgi (Baxter 2010).

## Post-medieval faunal remains

From the excavated post-medieval deposits only the animal bones from a well and a dog burial were selected for recording and study. Both features date from the mid–late 18<sup>th</sup> century (Period 11) and were associated with the occupation of Walnut Tree House (dating from at least 1768).

The animal bones from the post-medieval well (1402, fill 1399) comprised cattle and sheep. While sheep bones comprised the majority of the recordable elements, a quantity of unrecorded cattle rib and vertebra fragments were also recovered. In addition to these unrecorded elements, cattle remains included deciduous upper teeth, a subadult calcaneum, a pelvic fragment and a 2<sup>nd</sup> phalanx. The more frequent sheep elements included bones from the upper and lower parts of both fore and hind limbs. The sheep ranged in size from 59cm to 62cm at the withers (n = 3, mean = 60cm). While the post-medieval sheep were no taller than those from the Roman period, they were much stockier and heavier animals with wider long-bone measurements than those from earlier periods. The evidence from the well is indicative of a diet including veal, beef and mutton.

Excavation of a dog burial (1333, fill 1332) yielded 89 bones from an expected total of 321 bones (Evans 1979). However, all head elements, the major bones of the forelimb on both sides, and a femur, were among the elements recovered. This assemblage is of particular importance as comprising the relatively complete skeleton of a dog dating from before the establishment of internationally recognized dog breeds in the modern sense. Measurements of the cranium based on the method of Lüps (1974), compared with several dog crania of various known breeds of similar size housed in the Albert Heim collection at the Natural History Museum in Berne, Switzerland, suggested that this animal should probably be classified as a terrier (Appendix 1). Withers height estimations based on the method of Harcourt (1974) indicated an animal standing around 34cm at the shoulder. This receives support from calculations based on Clark (1995) for the metapodia. The basicranial morphology is female, based on the criteria of The and Trouth (1976) and the dog was aged between 15 to 24 months at time of death, based on the wear of the teeth (Horard-Herbin 2000). The msd indices of the long-bones from this specimen are significantly lower than dwarf animals of similar stature (dating from the Roman period) at 7.8 for the humerus, 8.3 for the radius and 8.1 for the femur. A peculiarity of the cranium of this animal is a large occipital perforation (maximum diameter 6.8mm). This congenital feature is presently of unknown origin, but has been observed sporadically in more recent crania of various breeds (Appendix 1). It does not appear to be directly related to the relatively common phenomenon of keyhole foramen magnum which is widely documented and dates back to at least Roman times (Evans 1979; Deb Bennett pers comm). However this specimen is of 18<sup>th</sup> century date. It is intended that the dog skeleton, and particularly the cranium and its pathology, will be studied further and published in greater detail elsewhere.

## Fish bone

*by Sheila Hamilton-Dyer*

### Introduction

A total of 201 individual specimens was recorded (Table 39). The condition of the bone was generally good and diagnostic elements were readily identified. As is typical of sieved



material most of the fish remains, 139 of the 186, are indeterminate fragments of rays, ribs, spines, cranium and scales. The remaining 47 specimens could be identified either to species or family.

Table 39 Fish bone from sample residues

Context	Sample	Period	Feature type	Eel	Salmonid	Herring	Cyprinid	Perch	Flatfish	Indet	Totals
1065	84	5	Pit			1					
1089	100	5	Pit	3						3	6
1110	95	5	Pit							1	1
1117	105	5	Pit							1	1
1121	97	5-6	Posthole							2	2
1135	173	6	Layer							8	8
1135	213	6	Layer							3	3
1136	106	6	Pit							9	9
1137	107	5	Pit							6	6
1172	115	5	Pit							11	11
1175	119	5	Pit			1				1	2
1176	120	5	Pit						1	2	3
1245	136	6	Layer	1							1
1315	154	5	Pit							2	2
1335	158	9						1		2	3
1410	177	11	Soakaway	24	1		1		11	82	119
2184	48	5	Pit							1	1
2190	45	5	Ditch	1						3	4
2192	46	5	Ditch			1				2	3
			<b>Total</b>	<b>29</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>12</b>	<b>139</b>	<b>186</b>
			<b>percentage</b>	<b>15.6</b>	<b>0.5</b>	<b>1.6</b>	<b>0.5</b>	<b>0.5</b>	<b>6.5</b>	<b>74.7</b>	
			<b>% excl unid</b>	<b>61.7</b>	<b>2.1</b>	<b>6.4</b>	<b>2.1</b>	<b>2.1</b>	<b>25.5</b>		

### Roman fish bone

A total of 64 fish bones came from 16 Roman contexts, nine of these could be identified to taxon. Eel vertebrae (five in total) were recorded (contexts 1089, 1245 and 2190), as well as single vertebrae of herring (contexts 1065, 1175 and 2192) and a flatfish vertebra, probably of plaice or flounder, was identified in 1176. All the other material is indeterminate.

### Medieval fish bone

Only three bones come from a medieval context (1335) but one of these is a scale that can be identified as perch *Perca fluviatilis*, the only specimen of this species from the assemblage.

## Post-medieval fish bone

The majority of the fish remains in the submitted material come from a single sample (177) from context 1410, the fill of a soakaway. Of the 119 specimens recorded, 37 could be determined to taxon. The most frequent of the identified remains (24) belong to eel (*Anguilla anguilla*), mostly vertebrae of individuals of around 30–40cm in length. Flatfish, probably plaice or flounder, are represented by 11 mixed vertebrae and head elements. A fragmentary parasphenoid (a head element) can be identified as a small salmonid but whether one of salmon or trout could not be determined. The final bone that could be identified is the urohyal of a cyprinid, probably a small roach.

## Discussion

This is a very small assemblage of fish bone in comparison with that from Deansway but its importance lies in the Roman material. At Deansway there were many hundreds of identified fish bones from the medieval and later contexts but, despite the extent of the excavation and the large quantities of sieved material, only one fish bone was recovered from Roman contexts. This was a cod bone hand-collected from a late Roman context (Nicholson and Scott 2004b). Even at Gloucester, where access to both marine and freshwater fish should have been easy, only nine bones were identified by Wilkinson from the East Gate site: these were of salmon, conger, gadid (cod family) and a flatfish (Maltby 1983). There have been few reports of fish from Roman assemblages in the west of Britain, and in part this has been because older excavations tended not to employ sieving, essential for the recovery of all but the largest of fish bones (Locker 2007). However, even where good-sized assemblages have been sieved there is still a paucity of fish in the Roman levels. Only at sites such as Dorchester near the south coast are fish bones found in any numbers (Hamilton-Dyer 1993a and b).

The fish found in Roman contexts in this assemblage were of three taxa; eel, herring and flatfish, which are often the most common in Roman assemblages (Locker 2007). Eels of the small size here could have been caught from any of the local waters. Flatfish are inshore fish and these probably came from the Severn estuary, if flounder they may have been caught quite far up the tidal reaches as they are tolerant of low salinity. The herring is a marine species but makes seasonal use of estuaries (Titmus *et al* 1978). The fish remains, though limited, provide a useful data baseline for Roman Worcester and appear to indicate a limited local and inshore/estuarine fishery.

The later material comes from just two contexts and is insufficient to stand alone but can be considered in relation to the Deansway assemblage. The fish from the post-medieval soakaway are of local freshwater or estuarine species; all are quite small and the large gadids found at Deansway are not present. The single medieval sample contributes a new species to the list, as perch was not found at Deansway.

## Human bone

by Gaynor Western

### Introduction

During the excavations one grave cut (1005) was recorded containing articulated human skeletal remains (contexts 1003 and 1004). Analysis revealed that the skeletal elements

[to previous view](#)

recovered from these contexts were part of the same individual and here the skeleton is referred to as SK 1003/1004. No artefacts were recovered from either grave fill. From stratigraphic evidence, the burial postdated the Roman occupation evidence and predated the construction of the post-medieval Walnut Tree House. The human remains were deposited in a supine and extended position with the burial being aligned north–south, roughly aligned with Infirmary Walk (previously known as Dr Wall's Walk).

The burial was located within soils that had accumulated from the later Roman period through to the 18<sup>th</sup> and 19<sup>th</sup> centuries. These soils would have been subject to repeated disturbance through cultivation and it is assumed that this had led to the removal of several skeletal elements as no specific cutting features were identified. No residual human remains were identified in the surrounding area.

## Analysis

### *Condition of the bone present*

The condition of the bone was assessed macroscopically. The human remains were found to be in excellent condition and graded as '0'. Very little flaking or post-depositional erosion was observed.

### *Completeness of the skeleton*

The completeness of SK 1003/1004 was recorded as being 25–50% complete. The individual was represented by the lower spine and ribs, the lower arms, the left hand (incomplete) and an incomplete right leg.

### *Inventory of skeletal material*

A full inventory of the skeletal elements present and absent, including observable joint surfaces and completeness of individual elements, was recorded in tabular form and on the MS-Access database (archive).

### *Age assessment*

Age assessment is based upon the developmental status of the individual elements up until skeletal maturity, after which degeneration of specific joints in the pelvis as well as dental attrition can be used as indicators of age at death. All the observable epiphyses of the long bones and the end plates of the vertebra were recorded as fused and, therefore, the individual was considered to be adult. Given the lack of pelvis and dentition, the areas of the body that contain the diagnostic elements used to ascertain age at death of an individual, no specific age estimate of SK 1003/1004 could be made.

### *Sex determination*

No sex estimation for SK 1003/1004 could be made based upon observation of the diagnostic morphological features of the pelvis and skull. However, metric assessment of the epicondylar width of the humerus as well and the circumference of the tibia at the nutrient foramen indicated that the individual was a possible male.

### *Non-metric analysis*

Non-metric traits are morphological features that occur both in bone and dentition. These features have no functional purpose and occur in some individuals and not in others. Only the lack of distal septure apertures in the left and right humerii could be recorded for SK 1003/1004 due to the lack of elements present.

### *Stature and metric analysis*

Stature estimates are based upon metric analysis of complete long bones, using the formula provided by Trotter (1970). One radius was sufficiently complete after reconstruction to allow a stature estimate of 1.64 (+/-3cm).

### *Skeletal pathology*

All skeletal elements were observed for the presence of pathological changes. The only changes observed were small Schmorl's nodes on vertebra of the lower spine (T6–T11). These are caused through herniation of the inter-vertebral disc into the surface of the adjacent vertebral bodies and are a relatively common finding in skeletal populations as well as in radiographic findings in modern populations. Schmorl's nodes are of little clinical significance and are clinically associated with the natural aging process (Salter 1999).

### *Dental pathology*

Neither the mandible, nor the maxilla, were observable and no teeth were recovered. There was, therefore, no observable dental pathology.

### Discussion

The findings of the osteological analysis of SK 1003/1004 are summarised in Table 40. The articulated remains from two contexts (1003 and 1004) were found to belong to the same individual. Only 25–50% of the skeleton was retrieved and thus the osteological analysis was restricted. However, metric analysis indicated that the remains represented an adult, possibly male, of 1.64m in stature.

Radiocarbon dating provided a date of cal AD 250–397 (see p27), and a later Roman date for the burial can be reconciled with the stratigraphic evidence and with the broader chronological framework (see p148).

*Table 40 Skeleton 1003/1004: summary of the osteological analysis*

<b>Condition</b>	0–Excellent
Completeness	25–50%
Age	Adult
Sex	Possible male
Stature	1.64m
Skeletal pathology	Minor Schmorl's Nodes
Dental pathology	Unobservable

## Plant macrofossils

by Elizabeth Pearson

### Introduction

The environmental evidence recovered is summarised in Tables 41 to 46. Charred plant remains were abundant in many contexts, and whilst uncharred plant remains were widespread across the site it was uncertain whether these have survived as a result of waterlogged or anoxic conditions and are contemporary with the deposits or are modern intrusive remains. However, abundant waterlogged plant remains in a medieval and a post-medieval context were considered to be contemporary.

Table 41 Environmental samples selected for full analysis

Context	Sample	Period	Feature type	Context group	Context group name	Volume processed (l)
1004	47	6	Burial			10
1089	100	5	Pit		Quarry pits group 1	40
1117	105	5	Pit		Quarry pits group 1	10
1137	107	5	Pit		Quarry pits group 1	40
1170	114	4	Posthole		Structure 2	20
1172	115	5	Pit		Quarry pits group 1	40
1245	136	6	Layer		Layer above Quarry pits group 1	40
1251	139	4	Posthole		Structure 2	20
1301	152	5	Pit		Quarry pits group 1	30
1315	154	5	Pit		Quarry pits group 1	40
1335	158	9	Pit			20
2082	22	5	Ditch	2258	Circular enclosure	40
1410	177	11	Soakaway			20
2177	43	5	Ditch	2258	Circular enclosure	40
2190	45	5	Ditch	2258	Circular enclosure	40

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Table 42: Summary of environmental remains

Context	Sample	Large mam-mal	Small mam-mal	Fish	Bird	Mol-lusc	Insect	Char-coal	Charred plant	Mineral-ised	Water-logged plant	Phos-phate concre-tions	Ham-mer-scale	Comments
1004	47							mod	abt					
1089	100	occ/mod		occ				occ	abt				occ	occ pot, Fe nail, Fe slag & clinker, glass, fired clay
1117	105	occ						occ	abt				occ	occ pot, Fe slag
1137	107	ooc/mod	occ			occ			mod					occ/mod oyster, occ pot, mortar, Fe slag & nail, glass
1170	114	occ							mod				occ	occ Fe slag, pot, glass, mortar, tile
1172	115	occ-mod		occ					mod					fired clay/furnace clinker, pot, CBM, mortar, Fe nail, Cu alloy obj, glass, abt Fe slag
1245	136	mod	occ	occ		occ		mod	abt		occ		mod	occ pot, burnt clay, mod Fe slag,
1251	139	mod	occ					v occ	mod				occ	mod pot, Fe slag & nail
1301	152	occ	occ						abt				occ	occ pot, brick
1315	154	occ	occ	occ					occ-mod				occ	occ cbm, burnt clay, fe nail
1335	158	occ	occ	occ		occ	occ	occ	occ		abt		occ	occ pot, brick, Fe slag & nail, glass, Cu pin
1410	177	mod	mod	abt	occ		occ		mod	occ	abt	occ		occ glazed pot, fe slag, glass
2082	22	occ					occ		occ				occ	occ pot, Fe nail, abt Fe slag
2177	43								occ		occ			occ pot, Fe slag & nail, mod/abt cbm
2190	45	mod		occ				occ	abt		mod		occ	mod pot, Fe nail, abt Fe slag, occ tile, burntclay/furnace lining?

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Table 43 Charred plant remains from Period 4, Structure 2

Latin name	Family	Common name	Habitat	1170	1251
<i>Triticum spelta</i> glume base	Poaceae	Spelt wheat	F	1	
<i>Triticum dicoccum/spelta</i> grain	Poaceae	Emmer/spelt wheat	F	9	1
<i>Triticum dicoccum/spelta</i> glume base	Poaceae	Emmer/spelt wheat	F	1	
<i>Hordeum vulgare</i> grain (hulled)	Poaceae	Barley	F	1	1
Cereal sp indet grain	Poaceae	Cereal	F	5	4
<i>Poa</i> sp grain	Poaceae	Meadow-grass	ABCD		1
<i>Bromus</i> sp grain	Poaceae	Brome grass	AF	3	2
<i>Avena</i> sp grain	Poaceae	Oat	AF		1
Poaceae sp indet grain	Poaceae	Grass	AF	4	1
Poaceae sp indet grain (small)	Poaceae	Grass	AF	23	7
<i>Polygonum</i> sp	Polygonaceae	Knotgrass	AB	1	
Cf <i>Polygonum</i> sp	Polygonaceae	Knotgrass	AB	1	
<i>Rumex acetosella</i>	Polygonaceae	Sheep's sorrel	ABD	3	1
<i>Rumex</i> sp	Polygonaceae	Dock	ABCD		1
<i>Vicia sativa</i>	Fabaceae	Common vetch	AB		1
<i>Vicia</i> sp	Fabaceae	Vetch	ABD		1
<i>Prunella vulgaris</i>	Lamiaceae	Selfheal	D	1	
<i>Galium aparine</i>	Rubiaceae	Cleavers/goosefoot	ABC	1	
<i>Tripleurospermum inodorum</i>	Asteraceae	Scentless mayweed	AB	1	
Cf <i>Tripleurospermum inodorum</i>	Asteraceae	Scentless mayweed	AB	10	
<i>Rumex/Carex</i> sp	Polygonaceae/ Cyperaceae	Dock/sedge	ABCDE	1	
Unidentified stem fragments	Unidentified				3
Unidentified	Unidentified			10	

Habitat					
A= cultivated ground	B= disturbed ground	C= woodlands, hedgerows, scrub etc	D = grasslands, meadows and heathland	E = aquatic/wet habitats	F = cultivar

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Table 44 Charred plant remains from Period 5 Quarry pits 1 and Circular enclosure (key: see Table 43)

Latin name	Family	Common name	Habitat	1089	1117	1137	1172	1301	1315	2082	2177	2190
<i>Triticum spelta</i> glume base	Poaceae	Spelt wheat	F		2	3		13	3	10	1	1
<i>Triticum dicoccum/spelta</i> grain	Poaceae	Emmer/spelt wheat	F	6	3	8			1	15	2	12
<i>Triticum dicoccum/spelta</i> glume base	Poaceae	Emmer/spelt wheat	F			1		6	3		1	21
<i>Triticum sp</i> grain	Poaceae	Wheat	F				3					
<i>Hordeum vulgare</i> grain (hulled, straight)	Poaceae	Barley	F		4							4
<i>Hordeum vulgare</i> grain (hulled, twisted)	Poaceae	Barley	F	1	1							
<i>Hordeum vulgare</i> grain (hulled)	Poaceae	Barley	F			2	2		1	4		
Cf <i>Hordeum vulgare</i> grain (hulled)	Poaceae	Barley	F		1	1						
Cereal sp indet grain	Poaceae	Cereal	F	4	3	8	7	7	3	18	1	35
<i>Festuca/Lolium sp</i> grain	Poaceae	Fescue/ryegrass	A				1					
<i>Bromus sp</i> grain	Poaceae	Brome grass	AF	2	1	2		6		4		3
Cf <i>Bromus sp</i> grain	Poaceae	Brome grass	AF	3		1			1			
<i>Avena sp</i> grain	Poaceae	Oat	AF	3				2		1		
Cf <i>Avena sp</i> grain	Poaceae	Oat	AF							1		2
Poaceae sp indet grain	Poaceae	Grass	AF	10				7	5	27	3	30
Poaceae sp indet grain (small)	Poaceae	Grass	AF	9	2	7	2	7	1	24	3	48
<i>Corylus avellana</i> shell fragment	Betulaceae	Hazelnut	C	1								



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Latin name	Family	Common name	Habitat	1089	1117	1137	1172	1301	1315	2082	2177	2190
Cf <i>Corylus avellana</i> shell fragment	Betulaceae	Hazelnut	C						1			
<i>Chenopodium</i> sp	Chenopodiaceae	Goosefoot	ABD	1	1							
<i>Rumex acetosella</i>	Polygonaceae	Sheep's sorrel	ABD	4	2							
<i>Rumex</i> sp	Polygonaceae	Dock	ABCD					1				
<i>Fabaceae</i> sp indet	Fabaceae	Legume	ABCDE									2
<i>Vicia</i> sp	Fabaceae	Vetch	ABD			2						
<i>Prunella vulgaris</i>	Lamiaceae	Selfheal	D	1								
Cf <i>Chrysanthemum segetum</i>	Asteraceae	Corn marigold	AB									1
<i>Eleocharis</i> sp	Cyperaceae	Spike-rush	E	1								
<i>Carex</i> spp (2-sided)	Cyperaceae	Sedge	CDE			1		1				1
<i>Carex</i> spp (3-sided)	Cyperaceae	Sedge	CDE			1						
<i>Rumex/Carex</i> sp	Polygonaceae/Cyperaceae	Dock/sedge	ABCDE									2
Unidentified seed	Unidentified									1	1	4
Unidentified seed/spore	Unidentified								1			

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Table 45 Charred plant remains from Period 6 (key: see Table 43)

Latin name	Family	Common name	Habitat	1004	1245
<i>Triticum spelta glume base</i>	Poaceae	Spelt wheat	F	12	43
<i>Triticum spelta rachis</i>	Poaceae	Spelt wheat	F		5
<i>Triticum dicoccum/spelta grain</i>	Poaceae	Emmer/spelt wheat	F	38	42
<i>Triticum dicoccum/spelta glume base</i>	Poaceae	Emmer/spelt wheat	F	5	31
<i>Hordeum vulgare grain (hulled, straight)</i>	Poaceae	Barley	F		12
<i>Hordeum vulgare grain (hulled, twisted)</i>	Poaceae	Barley	F		6
<i>Hordeum vulgare grain (hulled)</i>	Poaceae	Barley	F	7	4
Cereal sp indet grain	Poaceae	Cereal	F	18	69
Cereal sp indet embryo shoot	Poaceae	Cereal	F	1	
<i>Bromus sp grain</i>	Poaceae	Brome grass	AF	7	4
<i>Cf Bromus sp grain</i>	Poaceae	Brome grass	AF		1
<i>Avena sp grain</i>	Poaceae	Oat	AF	8	7
<i>Cf Avena sp grain</i>	Poaceae	Oat	AF		13
Poaceae sp indet grain	Poaceae	Grass	AF	24	116
Poaceae sp indet grain (small)	Poaceae	Grass	AF	37	153
<i>Ranunculus acris/repens/bulbosus</i>	Ranunculaceae	Buttercup	CD		1
<i>Corylus avellana shell fragment</i>	Betulaceae	Hazelnut	C		1
Chenopodium/Atriplex sp	Chenopodiaceae	Goosefoot/orache	AB		8
<i>Cf Stellaria graminea</i>	Caryophyllaceae	Lesser stitchwort	D		1
<i>Polygonum aviculare</i>	Polygonaceae	Knotgrass	AB		2
<i>Rumex acetosella</i>	Polygonaceae	Sheep's sorrel	ABD		5
<i>Vicia sativa</i>	Fabaceae	Common vetch	AB		1
<i>Anthemis cotula</i>	Asteraceae	Stinking chamomile	AB		1
<i>Tripleurospermum inodorum</i>	Asteraceae	Scentless mayweed	AB	2	2
<i>Carex sp</i>	Cyperaceae	Sedge	CDE	1	
<i>Festuca/Lolium sp</i>	Poaceae	Fescue/rye-grass	ABD		1
Unidentified seed	Unidentified			1	3

## Period 4: Structure 2

Charred plant remains were generally only sparsely distributed in Structure 2 (Table 43). Nevertheless in two postholes (1170 and 1251) charred plant remains were relatively abundant. This material was dominated by small grass grains, such as annual meadow grass (*Poa* sp), brome grass (*Bromus* sp) and weed seeds which presumably were associated with a cereal crop. The weed seeds were dominated by the smaller scentless mayweed (*Tripleurospermum inodorum*) in context 1170 along with knotgrass (*Polygonum* sp), dock (*Rumex* sp), sheep's sorrel (*Rumex acetosella*), vetch (*Vicia* sp), selfheal (*Prunella vulgaris*), and cleavers (*Galium aparine*). Other remains included occasional grains of emmer or spelt wheat (*Triticum dicoccum/spelta*) and barley (*Hordeum vulgare*) and fragments of chaff (spelt and emmer/spelt glume bases). [Figure 55](#) shows the proportions of grain, chaff and weed seeds.

This type of material, which is dominated by small weed seeds and grain is likely to be either the waste from fine-sieving during the processing of a glume wheat crop or, as it was recovered from the postholes of a building, possibly from threshing or winnowing in a barn where the small seeds and grain have separated from larger fragments of chaff, settling into the postpipes of the building.

## Period 5: Quarry pits group 1

Samples were analysed from the Quarry pits group 1, which consisted of charred cereal crop material (Table 44). Charred plant remains were widespread in the Quarry pits group 1. The composition of this, where proportions of grain, chaff, weed seed and large weed seed (the latter including large grass grains) were concerned, was very variable and mixed ([Fig 55](#)), although this may be a reflection of the fairly low concentration of material. Spelt wheat (*Triticum spelta*) and hulled barley (*Hordeum vulgare*) crops were identified. The weed assemblage was similar to that identified for Period 4 Structure 2 but the proportion of small-seeded grasses was lower and the small-seeded scentless mayweed (*Tripleurospermum inodorum*) was absent. Occasional fragments of hazelnut shell (*Corylus avellana*) or possible hazelnut were identified.

## Periods 5 and 6: Circular enclosure, burial and layer over quarry pits

The composition of samples from Period 5 was similar to that seen in other samples in that spelt wheat and hulled barley crops were identified along with brome grass, oat, small grass grains and occasional weed seeds such as possible corn marigold (*Chrysanthemum segetum*) and sedge (*Carex* sp), although the overall proportions of grain, chaff and weed seeds were more consistent.

## Periods 9, 10 and 11 (medieval and post-medieval)

The potential of a limited range of medieval and post-medieval environmental samples was identified during the assessment, and analysis was undertaken of samples from two contexts: the fill of medieval pit (fill 1335, pit 1336), and the fill of an 18<sup>th</sup> century brick soakaway (1410) associated with Walnut Tree House (Table 46).

Table 46 Plant remains from medieval and post-medieval contexts (key: see Table 43)

Latin name	Family	Common name	Habitat	1335	1410
<b>Charred plant remains</b> Triticum/Secale sp grain	Poaceae	Wheat/rye	F		+
Cereal sp indet culm node	Poaceae	Cereal	F	+	
Poaceae sp indet grain	Poaceae	Grass	AF		+
<i>Galium aparine</i>	Rubiaceae	Cleavers/goosefoot	ABC	+	
<b>Waterlogged plant remains-</b> <i>Ficus carica</i>	Moraceae	Fig	F		+++
Caryophyllaceae sp indet	Caryophyllaceae	Pinks	ABCDEF		+
<i>Rubus idaeus</i>	Rosaceae	Raspberry	CD	++	+++
<i>Rubus sect Glandulosus</i>	Rosaceae	Bramble	CD	+ / ++	+
<i>Fragaria vesca</i>	Rosaceae	Wild strawberry	C		+
<i>Vitis vinifera</i>	Vitaceae	Grape-vine	F		+
<i>Aethusa cynapium</i>	Apiaceae	Fool's parsley	AB	+	
<i>Sambucus nigra</i>	Caprifoliaceae	Elderberry	BC		+
<i>Sambucus ebulus</i>	Caprifoliaceae	Dwarf elder	BD		+

Waterlogging was evident in the pit fill (1335), as moderate levels of waterlogged plant remains included raspberry (*Rubus idaeus*), bramble (*Rubus sect Glandulosus*) and fool's parsley (*Aethusa cynapium*). The raspberry and bramble may represent food remains (possibly from cess waste) or from surrounding garden or horticultural land. Occasional charred remains included a grass or cereal culm node (straw fragment) and a cleavers (*Galium aparine*) seed.

The soak away was rich in waterlogged plant remains, and also contained low levels of charred crop waste. Evidence for food waste included abundant raspberry (*Rubus idaeus*) and fig (*Ficus carica*) pips with occasional grape (*Vitis vinifera*) pips. These survived as a result of waterlogging, although some grape seeds were mineralised and may derive from cess waste. However, as abundant raspberry pips are common to both the medieval pit and the 18<sup>th</sup> century soakaway, both of which were in close proximity, those in the soakaway may originate from pips residual in the surrounding soil from earlier horticultural activity or from existing fruit bushes.

## Discussion

Charred cereal crop waste was widely distributed across the site in Roman contexts, generally in low levels, but with higher concentrations in Period 4 Structure 2, the Period 5 Quarry pits group 1 fills, and the Period 5 circular enclosure. Waste from fine-sieving or possibly from winnowing (the fine, light material having separated from the large, coarser

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material) or threshing was dominant in the Structure 2, suggesting that the building is likely to have been a barn or agricultural building where crop processing was taking place. The composition of the material in the Period 5 Quarry pits group 1 was very variable and the 'circular enclosure' less so. Crop processing waste from various sources may have been disposed of in the quarry pits in a piecemeal fashion over time.

No concentrated deposits of clean or semi-clean grain were found and hence no evidence for grain storage was found. It is likely that crop processing was undertaken only on a small-scale, domestic level. The type of crop processing waste and pattern of distribution lies somewhere between the evidence for some large-scale crop processing from the excavation at The Hive (in association with a generally sparse spread of crop waste) and the evidence for very little use or processing of cereal crops on sites such the Conder Building (Pikes and Sherlock 2003) to the east and the Police Station and Magistrates' Court sites on the north side of Castle Street (Pearson 2000 and 2002).

After the Roman period the land appears to have returned to pasture or horticultural use, suggested by the extensive dark 'tillage soil' layer. Placenames reflect the character of the area in the post-medieval period, such as 'Artichoke Field', on which Walnut Tree House and Worcester Royal Infirmary were built in the late 18<sup>th</sup> century. The moderately abundant raspberry pips recorded in both a medieval pit and a nearby soakaway associated with the late 18<sup>th</sup> century Walnut Tree House could be evidence of a longstanding use of the area for horticultural use.

## Discussion

The fieldwork at the City Campus site examined part of an area of Worcester that has recently seen a great deal of archaeological investigation (Fig 2). The area lies north of the medieval city wall, and intensive medieval and early post-medieval occupation was focused on the main suburban routeways. The expansion of the town into the area west of the Tything was a slow process, starting in the later 18<sup>th</sup> century (Whitehead 1989), and archaeological evidence from this area is limited, consistent with the documentary and cartographic evidence. In this part of Worcester the focus of archaeological interest has been the evidence for Roman occupation. It became clear in the 1990s that a very extensive spread of Romano-British occupation evidence extends north of the medieval city, as far north as Britannia Square. Much of the occupation evidence is on the level top of the gravel deposits but occupation evidence also extends onto the floodplain (see p14).

The extensive evaluation trenching of the City Campus site showed that Roman occupation evidence was extensive but scattered, preserved between the Worcester Royal Infirmary buildings. The stratigraphy was mostly shallow, except upon the floodplain. Excavation was undertaken on three discrete areas of the site. The most significant excavated evidence reported on here relates to Roman occupation, but evidence for medieval and post-medieval activity was also recorded.

## Geology and topography

The geology and topography of the City Campus site was varied, and the excavation provided additional information on local variations (see p19). Roman and post-medieval occupation evidence was focused on the eastern part of the site (Area 1 and 2), where the present level ground surface reflects the top of the Worcester Terrace. Here sands and gravels are encountered at between c 20.80m AOD and c 22m AOD (the modern ground level is between c 22.60m AOD and c 23m AOD). Much of the City Campus site slopes down to the lower level ground of the historic floodplain, reflecting the slope of the eastern edge of the River Severn's Flandrian channel, and on the slope the Mercian Mudstone is exposed beneath surface deposits and soils (ie in Area 4). The terrace slope was utilised during the Roman period at a lower intensity to the level terrace gravels, and subsequently this area was agricultural land until the expansion of the hospital during the 20<sup>th</sup> century. The western part of the City Campus site lies within the historic floodplain of the River Severn, and extensive pre-Roman alluvial deposits were recorded, along with further Romano-British occupation evidence (Area 5). The interface of alluvium and Mercian Mudstone is at c 16m AOD.

## Prehistoric activity

No prehistoric deposits were recorded but prehistoric artefacts were recovered from later deposits, including three Neolithic or early Bronze Age flakes (see p28) and 14 sherds of late Bronze Age and Iron Age pottery (see p28). These small quantities of material probably represent low-level prehistoric activity over a long period, and a similar pattern has been detected at other sites in Worcester (Dalwood 2004b; WCC 2007, 17).

Quantities of domestic refuse were discarded on the site during the later Roman period. This refuse included a disparate range of materials (see below), and it is probable that some of

the prehistoric artefacts were redeposited from elsewhere in Worcester, mixed in with Roman refuse.

The alluvium in Area 5 predated Roman features, and was sampled in order to obtain pollen. Organic remains, however, were poorly preserved in these deposits and therefore detailed analysis was not undertaken (see p6). Borehole data obtained prior to and during the evaluation indicated that groundwater levels in the floodplain vary considerably at present. It is likely that buried deposits in this area are periodically dehydrated when they are above the water table (Sworn 2007), which may explain the lack of well-preserved organic environmental material.

## Roman occupation and landuse

The excavation produced evidence for Roman occupation, quarrying and refuse dumping. The density of evidence varied across the four areas excavated, with a concentration of activity on the level top of the terrace, and a range of activity on the edge of, and on the floodplain, with some evidence for Roman activity on the terrace slope.

There was limited evidence for late 1<sup>st</sup> to 2<sup>nd</sup> century occupation, and the wider area was probably largely in agricultural use during that period. The area was occupied from the mid-late 2<sup>nd</sup> century (Period 4) into the late 3<sup>rd</sup> century (Period 5 and 6). Two Roman rectangular structures were identified, one of which is identified as a barn where crop processing took place, while the other was probably also an agricultural building. No domestic buildings were identified with certainty, and it is likely that these agricultural buildings were part of a more extensive occupation area, extending to the south and east of the excavated area. These two structures add to the rather limited number of recorded Roman buildings in Worcester. The buildings were timber structures and were roofed with organic materials, and as such are similar to the fragmentary structural evidence for agricultural buildings and workshops identified throughout the settlement (Dalwood 2004c).

The function of the circular enclosure (Fig 14, and 15) cannot be interpreted with certainty. There was an absence of structural evidence (such as postholes) in the interior as well as of any associated artefacts indicative of a particular function. A review of the literature shows that small circular enclosures are rather rare on Roman settlement sites, with the exception of ring gullies associated with roundhouses.

Many roundhouses, with postholes for structural timbers and external drip gullies, have been excavated on Roman rural and urban settlements throughout Britain, a form of building in direct continuity of tradition from the pre-Roman period. The construction methods of Roman-period roundhouses varied widely, reflecting local house-building traditions and availability of materials. At Worcester there is clear evidence for Roman rectangular buildings with earth-fast posts and sill beams, with a suggestion that mass wall construction was also utilised (Dalwood 2004c, 83; Lockett 2002), and there is also evidence for Roman-period roundhouses. At rural sites such as Longdon Marsh in Worcestershire the roundhouses were represented by sub-circular ring gullies with no definite structural features in the interior, and the interpretation is that the roundhouse walls were constructed of cob or mud brick (Simmonds *et al* 2010, 53). It may be that a circular structure stood inside the enclosure ditch at the City Campus site, with earth walls and a thatched or shingle roof.

There are, however, a number of features that are inconsistent with the interpretation as a domestic roundhouse. The circular enclosure is 30m in diameter, which is very much larger than the majority of domestic roundhouses: a ring gully at Longdon Marsh was less than 7m in diameter (ring ditch 7640: [Simmonds et al 2010](#), 53) which is consistent with many excavated roundhouse plans. Moreover, roundhouse drip gullies tend to be rather shallow, and form incomplete circuits with definite entrances. The complete circuit of the City Campus circular enclosure may indicate another interpretation is possible.

One possible interpretation is an animal pen for smaller livestock such as sheep, used in conjunction with hurdles (the shallow ditch and lack of substantial fence posts would preclude its use for penning cattle). Although the normal pattern for ditched animal pens is to have a strongly demarcated entrance to control animal movements into and out of the pen, the absence could be explained by the use of some sort of lightweight bridging structure. A circular enclosure was recorded at Longdon Marsh, comprising a 15m diameter enclosure which was interpreted as a livestock pen, although this feature had a more substantial V-shaped ditch and an entrance (enclosure 7645: [Simmonds et al 2010](#), 14). The interpretation of the City Campus circular enclosure as an animal pen is broadly consistent with the other site evidence for agricultural buildings and crop processing, and is consistent with the absence of other evidence (artefactual or structural).

There are, however, some other possible interpretations that deserve mention. One recognisable type of small Roman circular enclosure is the military signal tower. At sites such as Westerton Tower, constructed in the 1<sup>st</sup> century in north-east Scotland, a strong timber watch tower was erected within a ditched enclosure 14m in diameter ([Hanson and Friell 1995](#)). A distinctive feature of such sites are four substantial post-pits that provided foundations for the tower structure, and these were certainly absent here which rules out this interpretation.

A 2<sup>nd</sup> century sub-circular ditched enclosure was partially excavated at the Holmes Grainwarehouse site in Lincoln, within the southern commercial suburb of the Roman city ([Steane 2001](#), 101–34). This enclosure (ditch LUB 23) was 10m to 15m in diameter and bounded an area of industrial activity, possibly iron smithing ([Steane 2001](#), 113, 129, figs 8.11 and 8.12). There was no trace of industrial activity within the City Campus enclosure, but a number of industries based on organic materials leave little direct evidence, so a function as a craft workshop should not be ruled out. The Period 5 quarry pits produced a limited range of evidence for craft production, but the most notable evidence was a number of bone rough-outs of rods for making pins or needles and a bone pin broken during manufacture ([see p 93](#)). A ditched enclosure (with hurdles) may have functioned to keep animals out of an area used for craft production.

A final alternative interpretation is that the circular enclosure represents a shrine. Romano-British shrines vary widely in form, and are increasingly being recognised through excavation ([Wilson and Wilson 2011](#)). Although earlier research suggested that shrines could readily be recognised through either distinctive stone architecture or closely associated votive artefact assemblages, it is now clear that some shrines have unexceptional architecture and do not contain distinctive artefact assemblages, making interpretation problematic. Votive deposits may have occurred in a nearby well or waterhole rather than in the shrine structure, as at Westhawk Farm in Kent, where a post-built structure was not readily identifiable as a shrine ([Wilson and Wilson 2011](#), 4). At the City Campus there was limited evidence that may support the shrine interpretation in the animal bone assemblage. Two hare bones (*Lepus* sp)



were recovered, one of which came from the circular enclosure ditch. Hare had a religious significance in Roman Britain (Baxter this volume, [see p105](#)) and was associated with both Artemis and Aphrodite (Roger White pers comm). A number of bones of domestic fowl (*Gallus f domestic*) were also recovered, including cockerel ([see p105](#)), which could be interpreted as the remains of sacrifices. This limited evidence is not conclusive, but it is a possibility that deserves consideration.

Rather few religious sites have been excavated or identified in the west midlands region, but a review of the evidence shows that fully documented sites include both individual shrines and shrines that formed one element of a temple complex (Ferris 2002). There is no definite evidence to support the interpretation of a shrine for this circular enclosure, but it is possible that the circular enclosure contained a shrine building, built in an earth-wall tradition which seems well established in Worcester and the local area, and that votive deposition occurred at a nearby location, such as in the area to the north of the site.

A few features were recorded on the edge of the floodplain (Area 5), and the evaluation trenches in the south-west part of the site produced quite extensive evidence for Roman activity on the floodplain, as well as the dumping of soil deposits to raise the ground level. The evidence for fairly extensive Roman activity on the floodplain is significant, and bears out similar evidence from the Newport Street site (Davenport and Dalwood forthcoming) and the excavation at The Hive (post-excavation analysis ongoing). This evidence refocuses understanding of Roman landuse of the floodplain and hence the archaeological significance of this area. It is now clear that the floodplain was not simply wet meadowland used only for grazing livestock in the Roman period, but instead was the focus of a range of activity in addition to grazing.

Roman occupation and rubbish dumping was dated to a period between the late 2<sup>nd</sup> century to late 3<sup>rd</sup> century, with very limited evidence for 4<sup>th</sup> century activity. There is extensive evidence that areas of the Roman town were abandoned by the early or mid-4<sup>th</sup> century, although this interpretation is largely based on the absence of diagnostic 4<sup>th</sup> century artefacts. The single isolated human burial recorded at the City Campus site is dated to the 4<sup>th</sup> century (Period 6), and is broadly contemporary with a concentration of evidence for 4<sup>th</sup> century occupation south and east of the City Campus site, including a substantial stone building ([see p15](#)). The Deansway site produced extensive evidence for Roman occupation and industrial production up to the early 4<sup>th</sup> century, but this large area of the Roman settlement was subsequently largely abandoned and part of the area was used as a cemetery (Dalwood 2004b, 48–51).

Archaeological fieldwork has demonstrated that the area occupied by the Roman small town is very extensive, covering an area of over 50ha (Dalwood 2004a, 16, fig 11). Continuing archaeological investigation contributes to understanding the character of the settlement and its economic basis. The Roman townscape of Worcester included a fairly irregular road network, sparsely-occupied industrial areas used for iron production, areas used for penning herds of livestock (inferred to be cattle), and a few stone-built domestic buildings which can be interpreted as the homes of the land-owning local elite (Dalwood 2004a and 2004b).

## Roman rubbish disposal

The Roman quarry pits and the surface dumps of artefacts and ecofacts are clear evidence for site formation processes and rubbish deposition, with very little disturbance by later

occupation activity. The refuse assemblage included a wide range of material, which were not simply derived from domestic households. The animal bone was identified as primarily butchery waste rather than food waste (see p110). Quantities of industrial refuse (iron slag), and relatively small quantities of building materials (stone and ceramic) were also incorporated. This range of materials is interpreted as indicating that the refuse derived from a range of locations within the Roman settlement, rather than a discrete adjacent occupation area.

The levels of fragmentation in the pottery assemblage were analysed together with the composition of the assemblages. The pottery from the tillage soil and other layers above the pits (Periods 6 and 6-7) was less fragmentary than the pottery from the Period 4 and 5 pits. Figure 56 demonstrates that this was true for the diagnostically earlier fabrics (3, 12.2, CG and EG samian) as well as later fabrics (29). The average sherd weight of pottery from the tillage soil (31g) is even higher than for pottery from 4<sup>th</sup> century layers at nearby 14-24 the Butts (Evans 2011, table 5.7, context 1005, 21g). This is not at all the expected pattern for a tillage soil which, because it has been turned and disturbed, should contain more fragmentary finds. The evidence is more suggestive of a large primary dump, which might also explain the high proportion of bulk finds coming from the Period 6 layers (Fig. 57). It is significant that the animal bone, mainly from Period 5 pits and Period 6 layers, is described as having had minimal exposure to the elements prior to deposition on the site (Baxter this volume, p105). This suggests that dumps of material were covered over fairly promptly. No animal bone from Period 6-7 was studied, so there is no record of the condition of this material.

Differences were evident between the Period 4 and Period 5 quarry pits (Quarry pit groups 2 and 1 respectively). Pottery from the Period 5 pits was more fragmentary than from the Period 4 pits, although there was great variation between individual pits. The Period 5 pits produced a much larger assemblage of both pottery (20% by weight and 25% by rim EVE of the entire assemblage) and small finds and nails (189 items compared to 4) than the Period 4 pits. The very marked difference in quantities of finds seems significant, suggesting differing patterns of rubbish disposal over time. The relative paucity of finds in the Period 4 pits is reflected in finds (Fig 57) and animal bone (Fig 58).

The layers overlying the quarry pits were interpreted as a surface refuse dump (Fig 57). Average sherd weights were high indicating a low level of fragmentation. The animal bone, mainly from Period 5 pits and Period 6 layers, is described as having had minimal exposure to the elements prior to deposition on the site (see p105).

The average sherd weight of sherds from the tillage soil was high (31g). This is not an expected pattern for an agricultural soil which, having been turned and disturbed many times, is expected to contain very fragmentary material. It is possible that the average weight is distorted upwards by the level of finds retrieval from deposits that were mostly mechanically excavated, but the overall pattern is clear. The material in the tillage soil is relatively unbroken and one interpretation of this is that there was only a limited period when the lower part of the tillage soil was disturbed. It is not clear when that occurred, but on balance it is likely to have been during the later post-medieval period when the area came under more intensive landuse.

The majority of finds represent rubbish brought on to the site and dumped, either on the surface or in small disused quarry pits. The material is interpreted as rubbish transported from other parts of the Roman settlement. The variations in fragmentation are interpreted as

largely due to changes in refuse disposal practices over time. Some of this material may have been moved around the site, for example moved from surface dumps to infill quarry pits.

There are hints of some selectivity in the material deposited, whether deliberate or accidental. There is a paucity of Roman vessel glass ([see p86](#)), and it may be that glass was separated for recycling. The majority of finds represent rubbish brought on to the site and dumped, either on the surface or in pits excavated while quarrying. Very few fasteners were present, a class that is normally prolific on urban sites, but on the other hand a relative profligacy was noted with regard to the disposal of iron objects, which suggests that iron was in plentiful supply ([see p89](#)).

## Roman households and evidence for craft and industry

The relatively large artefact assemblage, and the interpretation that it represents the dumping of rubbish from various locations in the Roman town, prompts the question as to what information this rubbish assemblage provides for the Roman settlement? The small finds from the Period 5, Quarry pits group 1 and the Period 6 layers all seem to be derived from a domestic, non-specialised source, as there was an absence of craft tools ([see p90](#)). Most of the pottery was also consistent as general domestic rubbish, comprising mainly utilitarian vessels, though table wares were also present, including some imports. Within the overall assemblage, however, there are various groups of finds that suggest that different and more discrete sources are represented.

The overall percentage of samian is fairly low (4%), though this varies by period (Period 3 5%; Period 4 1%; Period 5 5%; Period 6 3%; Period 6–7 11%). These proportions are within the range recorded for small towns with 2<sup>nd</sup> to 3<sup>rd</sup> century activity, but lower than the percentages recorded for major civil settlements ([Willis 2004](#), table 24). Similar proportions, in fact, were noted at the industrial site of Upwich in Droitwich (*ibid*). The proportion of decorated samian present is high, and this, and the presence of some very unusual forms, suggests that some of the samian, at least, was derived from a high-status domestic household.

[Figure 59](#) shows some of the more common pottery fabrics by period. The high proportion of Oxfordshire white mortaria in Period 4 reflects the presence of six vessels from a pit ([see p70](#)). This group is highly unusual. While they could have been used in food processing, the fact that none of them was worn raises the possibility that they are broken unused vessels dumped by a trader.

The proportion of Black burnished ware and wheelmade Malvernian ware in midden layers indicates a high proportion of cook pots, perhaps relating to an occupation area particularly associated with food preparation (see also [Fig 62](#)). Ceramic material, thought to be fragments of 'portable bread ovens' ([see p97](#)), was also common in Period 6 deposits ([Fig 57](#)). A very large assemblage of this relatively rare material was recovered from the nearby excavation at The Hive, and full analysis of that assemblage may resolve questions of form and function. This adjacent area could well be the source of the 'oven' material found at City Campus.

Animal bone ([Fig 58](#)) was interpreted as primary butchery waste, rather than general kitchen waste, which marks out the animal bone as a distinct element of the assemblage. It may be the City Campus site, on the western edge of the Roman settlement, was used for slaughtering and butchering livestock. The Period 5, Quarry pits group 1 also produced

evidence for bone working, and possibly copper alloy working (see p93). A relatively small range of ceramic building material (see p95) was incorporated in the rubbish deposits (Fig 57), together with painted plaster and building stone (see p93 and 101). This type of animal bone assemblage has not previously been noted in Worcester, with excavated Roman sites producing typical domestic waste assemblages of bone.

Evidence for ironworking is fairly ubiquitous on Roman sites in Worcester (McDonnell and Swiss 2004, 368; Jackson 2004). There was no structural evidence for ironworking on the City Campus site. The quantity of iron slag recovered (216kg) was very small compared to other Worcester sites where there was evidence for ironworking: 2.6 tonnes were recovered from Deansway (McDonnell and Swiss 2004, 371). The iron slag came mainly from Period 5 features. The presence of hammerscale was recorded in a number of environmental samples. These came from 37 of the Period 5 pits and 27 of the Period 4 pits. The fills of these pits contained mostly domestic refuse, originating from other part of Roman Worcester (see above), and the hammerscale can be understood as part of such refuse collections.

As noted above, the pottery assemblage overall could be classified as general domestic rubbish. More detailed analysis was undertaken of the pottery forms, to see if any functional patterns emerged within this (Figs 60–3). The profiles for Periods 4 and 5 were superficially similar (Figs 60 and 61): both included a range of vessel classes used for storage, food preparation and consumption. However, some variations were evident. Bowls, dishes, lids and cook pots were more common in Period 5 deposits. The Period 4 bowls were all BB1 types that could have been used for cooking. A much wider range of bowls was present in the Period 5 assemblage, including medium to large mixing bowls (eg Fig 28, 38, 45, 48), small serving bowls (eg Fig 28, 28–9), and BB1 cooking pot types.

The Roman pottery from the Period 6 deposits (Fig 62) was dominated by cook pots, and lids were more common. Analysis of the diameters of Malvernian cook pots and lids suggested these were intended for use together. Wide-mouthed jars were proportionately less common than in Periods 4 and 5, but the range of bowls and dishes was similar to Period 5. The tillage soils (Period 6–7) differed again (Fig 63), with a narrower range of vessel classes, but it is probably unwise to put too much emphasis on differences in this group due to uncertainties about recovery rates.

As a whole the assemblage can be interpreted as surface rubbish dumps on land that during the late 2<sup>nd</sup> to the late 3<sup>rd</sup> century was sparsely utilised, and was used for both gravel quarrying and refuse disposal. The rubbish was dumped on the ground surface and in pits, and covered over fairly rapidly with more rubbish. This material provides a broad picture of the material culture used in Roman Worcester at this time, and reflects its status as a small town with a population that varied in wealth and status. The assemblage will provide valuable comparative material for future study of Roman Worcester.

## Roman cultivation and animal husbandry

The excavation provided evidence for agricultural activities in the Roman settlement. A range of charred cereal crop and butchery waste was recovered, together with small quantities of bird, small mammal and fish bone waste (see p105–112). Evidence for Romanisation was limited. For crops and plant food sources, a specialisation in production or processing or the presence of exotics and imports are generally considered to be indicative of Romanisation. The assemblage was indicative of cereal crop processing on a relatively small scale, with

no evidence for grain storage and distribution. There was no evidence for exotic or imported plant foods. The lack of waterlogged conditions limited the likelihood of this type of evidence being recovered, as these are mostly fruits, herbs and spices which tend not to be exposed to fire and hence are normally only found in waterlogged or mineralised conditions.

Improvements in animal breeds and the presence of exotic or imported species are normally considered as possible evidence for Romanisation in mammal or fish bone assemblages, as well as a specialisation in use (such as a use in craft or industry) such as would be expected in an urban situation. In this assemblage there was no evidence for improvements in cattle or sheep/goat breeds ([see p110](#)). In the case of cattle, the presence of small horned or short horned cattle is consistent with a continuation of Iron Age practices. However, dwarf (or brachymel dogs) were being reared, which are now being more commonly recognised as being a feature of Roman sites. These dogs may have been bred either as specialist working dogs or as lapdogs, but it is uncertain in which category the City Campus example lies. The predominance of primary butchery waste rather than kitchen waste is of interest, as this implies that the waste was not coming from domestic activity but from an area where butchery was a specialised activity. Castle Street may, therefore, have been on the fringes of urban activity, and such is the character of occupation at the adjacent excavated site of The Hive, to the south.

Fish bones were recovered in small numbers ([see p111](#)). Fish such as eels were probably caught locally, while flat fish were probably caught further south in the Severn Estuary. Despite the small size of the fish bone assemblage, their presence is of interest as very few fish bones have been recovered from Roman sites countrywide, despite extensive sampling. This was the case at Deansway ([Nicholson and Scott 2004a](#)) as well as at the recent excavation at The Hive.

With the exception of cereal crop processing waste in a building interpreted as a barn or agricultural building, crop and animal bone waste was not found *in situ*, but discarded with other rubbish in pits. The variability in the composition of the charred cereal crop debris is suggestive of waste from various sources.

## Medieval and earlier post-medieval activity

The City Campus site lies outside the city walls and some distance from the Tything suburb, and historic landuse was primarily agricultural between the early medieval period and the late post-medieval period ([see p17–18](#)). Detailed study of the dark earth deposits at the Deansway excavation indicated that following abandonment of occupation areas during the 4<sup>th</sup> century the area was grazed pasture, and remained so until the 10<sup>th</sup> century ([Macphail 2004](#)). This was the landuse pattern at the City Campus site from the early medieval period onwards.

The thick deposit of tillage soil recorded at the City Campus site was interpreted as having been deepened through the addition of organic material and reworked through cultivation, analogous to the thick soil deposits analysed in detail at the Farrier Street site ([Macphail 1994](#), 84). Constant re-working of the upper part of the tillage soil occurred during the medieval and post-medieval period, and artefactual material was incorporated into the soil. The lower levels of the tillage soil were not disturbed after the late Roman period, as attested to by the late Roman burial (Period 6) and the relative low fragmentation of Roman pottery in the tillage soils.

A few features were assigned a medieval date (Period 9), reflecting low-level activity. A medieval pit produced a range of waterlogged plant remains, including raspberry and bramble, probably from the surrounding horticultural land ([see p122](#)).

A row of post-medieval postpits were dated to the 17<sup>th</sup> to 18<sup>th</sup> century and identified as a tenter rack or tenter-frame (Period 10; [Fig 4](#)). These long timber-framed structures were used to stretch and dry woollen cloth following fulling (scouring, cleaning and beating in water) to restore the length and width of the cloths, which were typically 32 yards long when woven but shrank to 25 yards long after fulling ([Walton 1991](#), 332). Tenter racks required considerable open space, and were often located on the edge of towns where space was available in paddocks and other pasture fields. The cloth industry was the mainstay of Worcester's economy in the later 15<sup>th</sup> to 16<sup>th</sup> century, but although the industry suffered a serious decline in the early 17<sup>th</sup> century the town continued to produce traditional woollen broadcloth throughout the 17<sup>th</sup> century and the 18<sup>th</sup> century ([Dyer 1973](#); [Mann 1987](#), 19–23; [Whitehead 1976](#), 128). There is documentary evidence for a fuller's workshop in Newport Street in the mid-17<sup>th</sup> century ([Whitehead 1976](#), 127–8) and tenter racks to the north of the city wall in the early 17<sup>th</sup> century ([Curtis and Curtis 1986](#)). Excavation at the Blackfriars site (immediately south of the city wall) recorded six substantial postholes and three post settings, identified as the settings for the uprights of a tenter rack dating from the 16<sup>th</sup> or 17<sup>th</sup> century (unpublished excavation; see [Mundy 1985](#), 11, fig 1.5). The Doherty map of Worcester (1742) depicts tenter racks north of the city wall. The identification of a tenter rack at the City Campus site provides further archaeological evidence that reflects the long tradition of cloth production in Worcester.

## Later post-medieval occupation

Excavation at the City Campus site was focused on evidence for Roman occupation, but later post-medieval structures were recorded, relating to Walnut Tree House and Worcester Royal Infirmary which were both built in the later 18<sup>th</sup> century ([see p26](#): Period 11). Outbuildings, a well, and a structure interpreted as the stoke pit and heating vents for a hothouse were recorded, close to the cellar of Walnut Tree House, which was fully recorded prior to demolition ([Hulka 2013](#)). Deposits associated with these structures yielded plant remains consistent with horticultural activity, most likely in the form of fruit bushes and orchards. Some latrine waste, however, could have contributed to the assemblages ([see p122](#)). The animal bones included cattle and sheep, indicative of the consumption of veal, beef and mutton ([see p110](#)). A dog burial was identified as a terrier, and aspects of the skeleton are of wider research interest ([see p110](#)).

The archaeological evidence relating to Worcester Royal Infirmary was limited in extent ([see p26](#): Period 11). A range of human remains and medical implements were recorded from three locations during the watching brief ([Fig 3](#)). This material forms an important archaeological contribution to ongoing research into the history of medical science ([Ossafreelance 2014](#); [Western 2011](#); [Western forthcoming](#)).

## Conclusions

The archaeological fieldwork undertaken at the City Campus site was focused on an area of modern Worcester that was first developed during the late 18<sup>th</sup> century and then intensively redeveloped during the 19<sup>th</sup> and 20<sup>th</sup> centuries as the Worcester Royal Infirmary

expanded to fill the available open space. The evaluation demonstrated that archaeological deposits survived in open spaces and in areas between buildings, and the area excavations successfully retrieved a range of evidence relating to the Roman settlement, and to a lesser extent to later periods. The survival of relatively shallow Roman deposits in an intensively developed area was due to the masking effect of the post-Roman to post-medieval 'tillage soil' which formed the ground surface for new buildings in the 18<sup>th</sup> and 19<sup>th</sup> century. This circumstance has been observed across this part of Worcester, such as along The Butts (eg [Cuttler \*et al\* 2011](#), plate 5.3).

Archaeological fieldwork in the area north of the medieval city wall in recent years has led to the understanding that this area is a significant part of the Roman settlement of Worcester, and not just a peripheral area. Excavations along The Butts (eg [Butler and Cuttler 2011](#); [Dalwood \*et al\* 1994](#)) and Castle Street (eg [Edwards \*et al\* 2002](#)) have demonstrated the ubiquity of Roman occupation evidence, varying in intensity. The excavated sites produced evidence for domestic occupation and agricultural buildings, with some evidence for craft production in the form of hearths and standing pots to hold water, indicative of blacksmithing, at the Conder Building site ([Pikes and Sherlock 2003](#)). It is clear that this was not an area where iron smelting was undertaken, evidence for which has been recovered across a broad area of the Roman settlement to the south ([Jackson 2004](#)).

The Period 5 circular enclosure is open to a range of interpretations based on the details of its form and the absence of evidence for function. Various interpretations have been considered including a livestock pen, a craft production area, a domestic roundhouse, and a shrine. It may be that future excavation in the area will provide support for one or other of these interpretations.

The archaeological evidence from the City Campus provided another dimension to knowledge of this part of the Roman 'small town'. Occupation largely dated between the later 2<sup>nd</sup> and late 3<sup>rd</sup> century and was primarily agricultural in character. Although this evidence is broadly characteristic of this part of the Roman town, there were some distinctive aspects. The large number of small gravel quarry pits can be compared to evidence from other sites in this part of the town. The dumps of primarily domestic refuse dating to the 3<sup>rd</sup> century recorded at City Campus are interpreted as the result of the collection of refuse from a number of discrete locations. The low level of glass in the dump deposits may reflect reuse of broken glass vessels in local small-scale industries. Although this assemblage was not associated with identified domestic buildings, it provided a broad picture of the artefacts used in domestic households in Worcester. The thickness of the dark earth deposit can be taken to indicate that this area was used for penning cattle over extensive periods, by analogy with the evidence from the Deansway site ([Macphail 2004](#)). The City Campus site also added to the growing body of evidence that the floodplain was fairly intensively utilised during the Roman period, with evidence for occupation alongside the dumping of iron slag.

The excavation highlighted the fact that although medieval and post-medieval landuse in Worcester is fairly well understood, and the nature and character of medieval and post-medieval archaeological deposits across the historic city can be predicted with some confidence, the form and character of the Roman settlement is still unclear. The City Campus site provided new evidence for the landscape of Roman Worcester.

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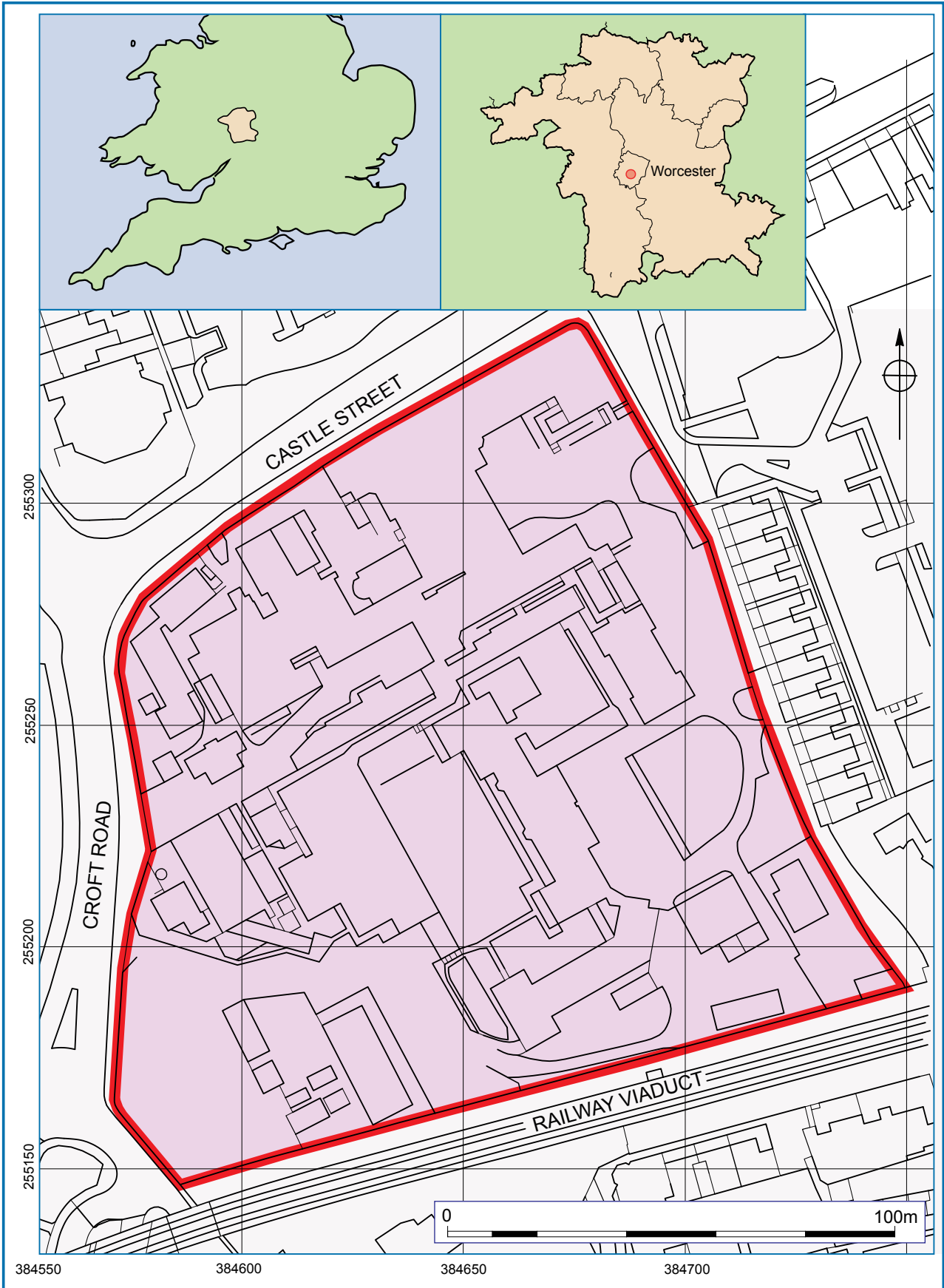
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**Figure 1: Location of the site**



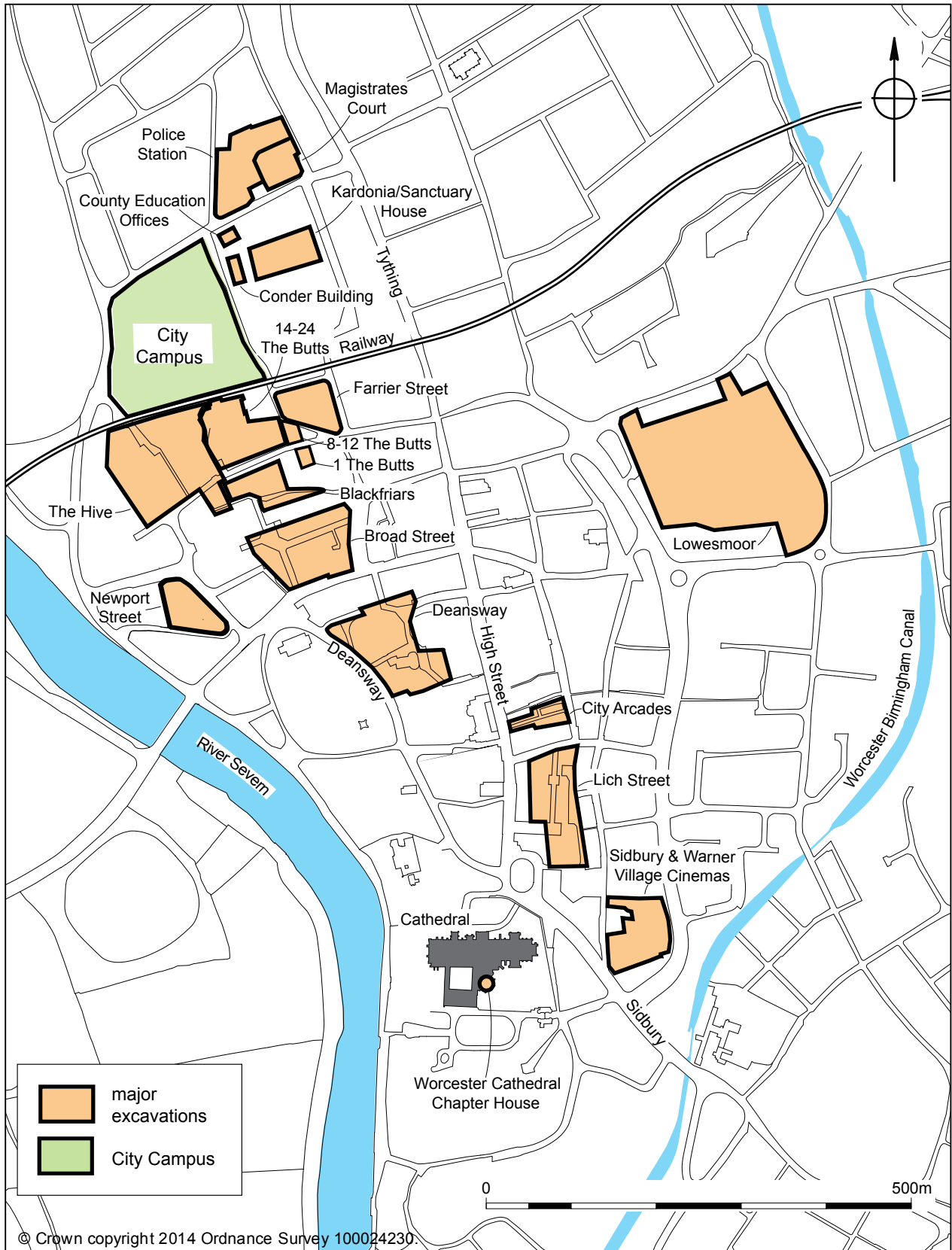


Figure 2: Major excavations in Worcester

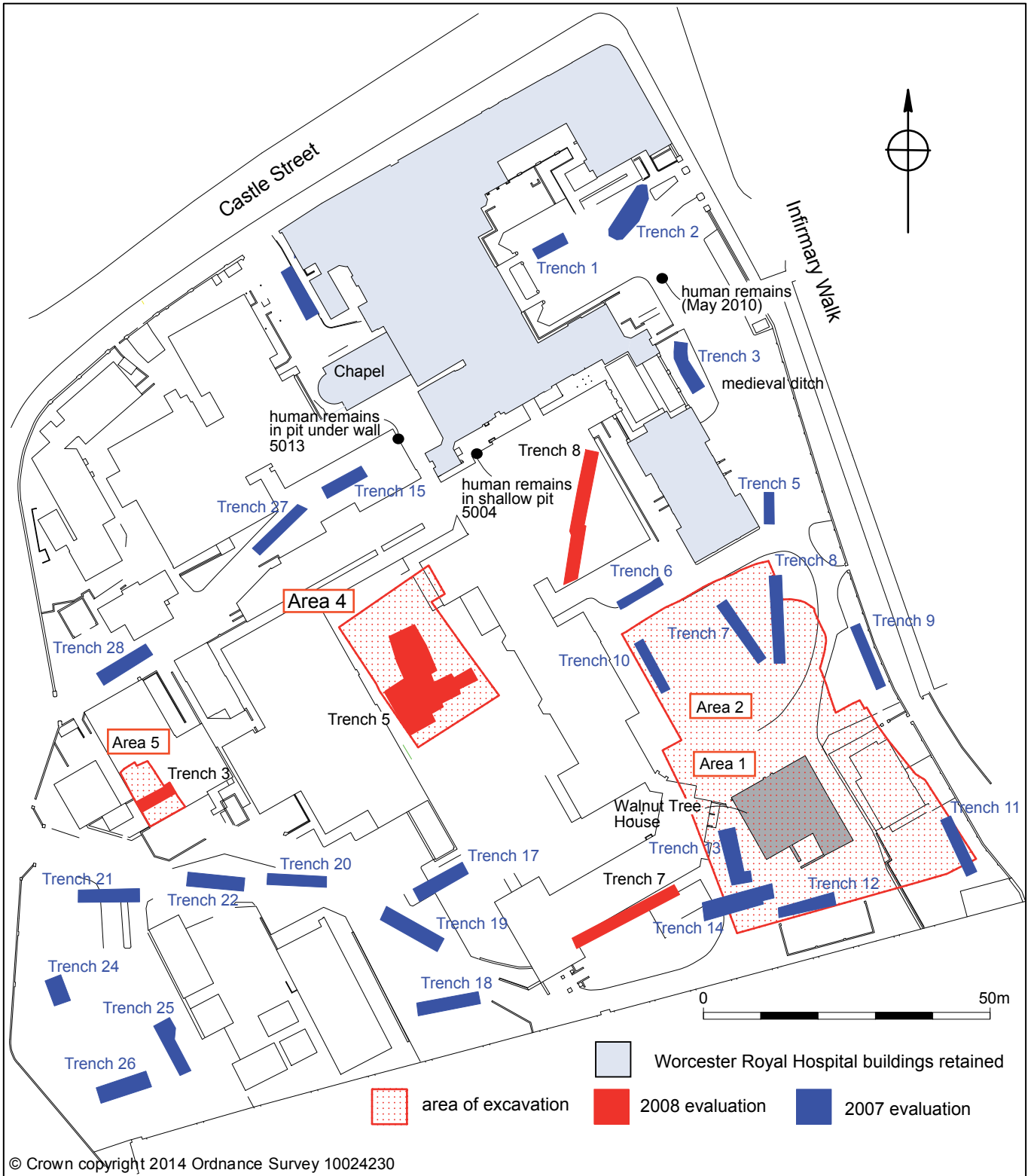


Figure 3: Areas of investigation

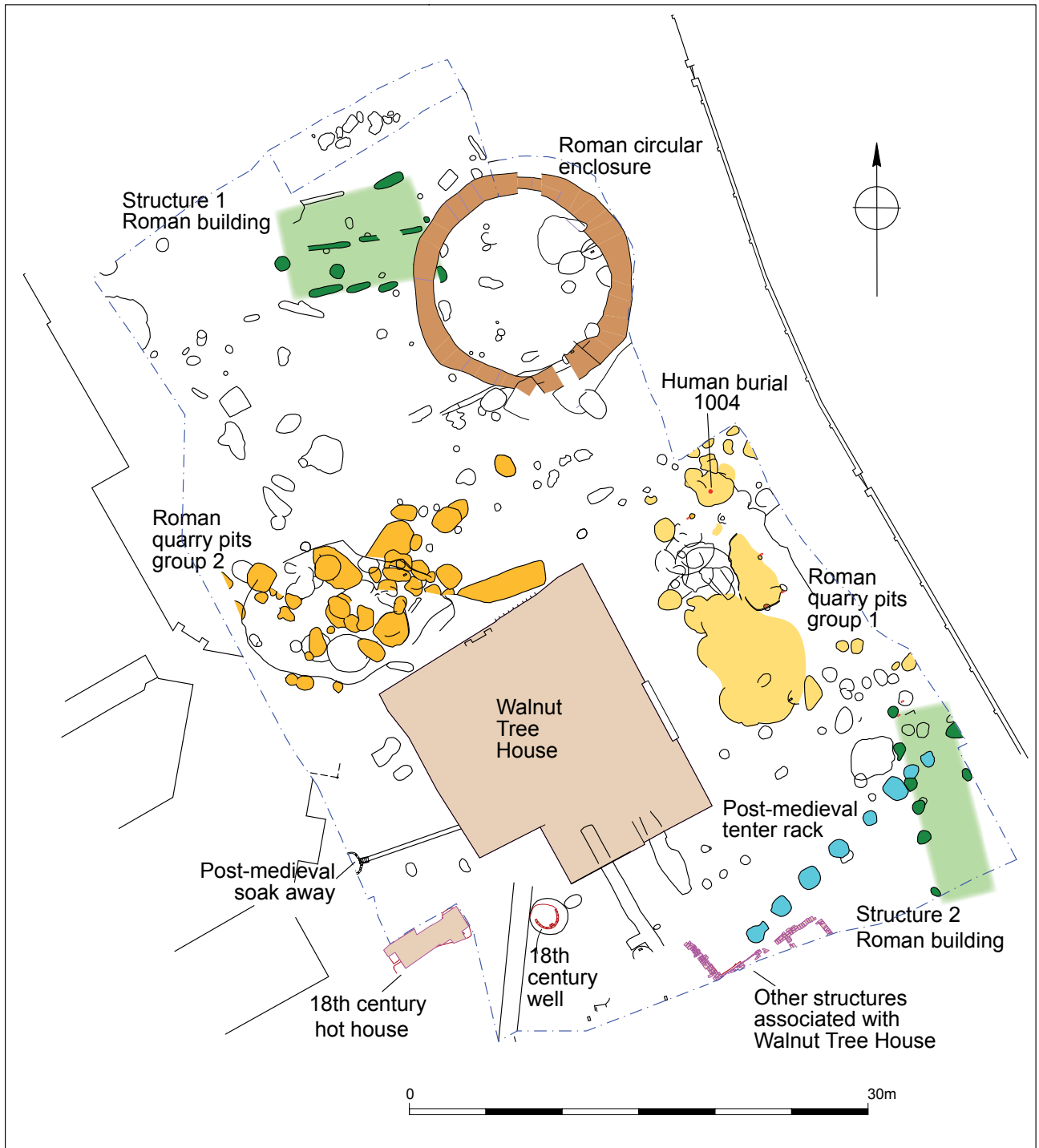
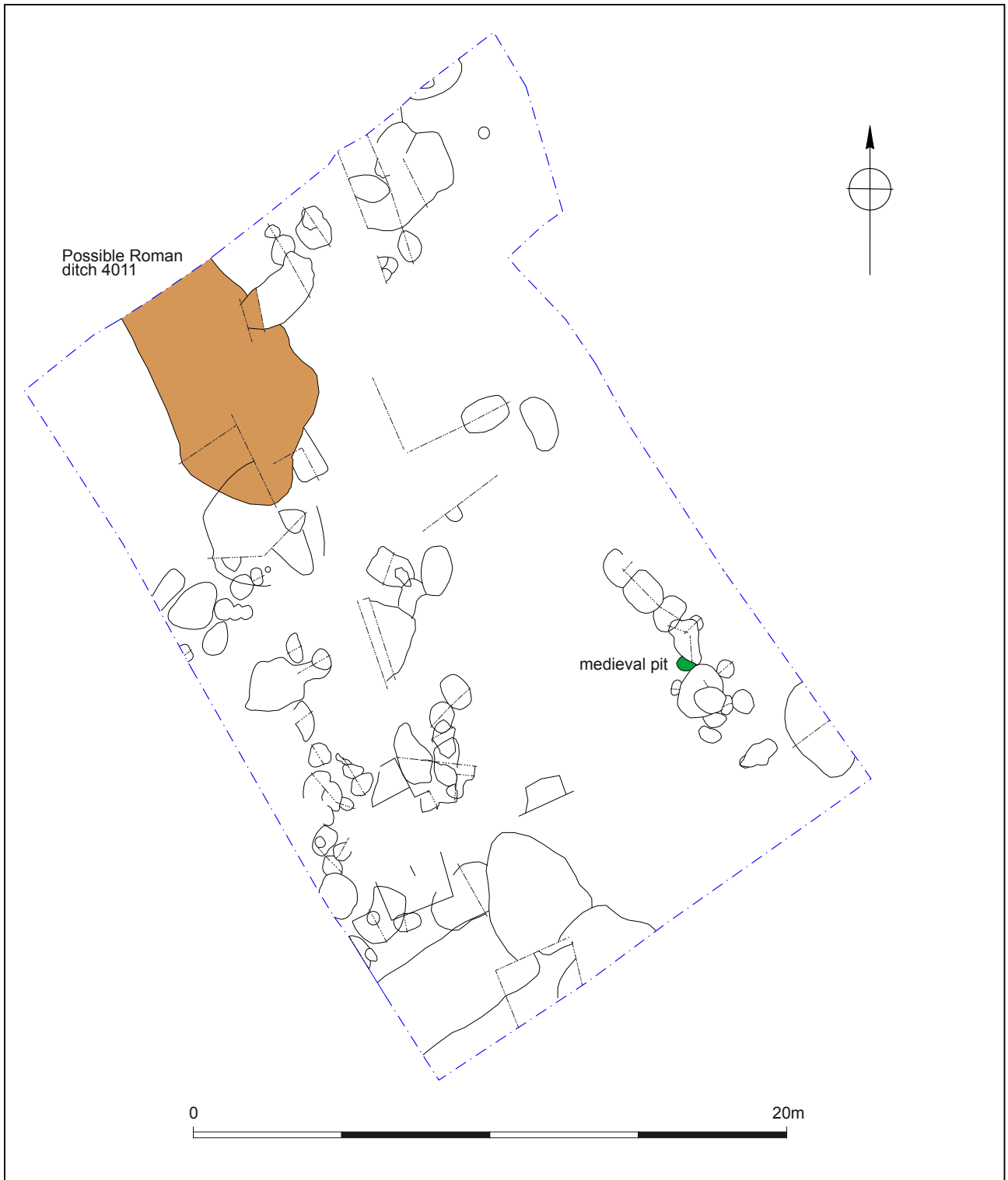


Figure 4: Features in Areas 1 and 2

*to previous view*

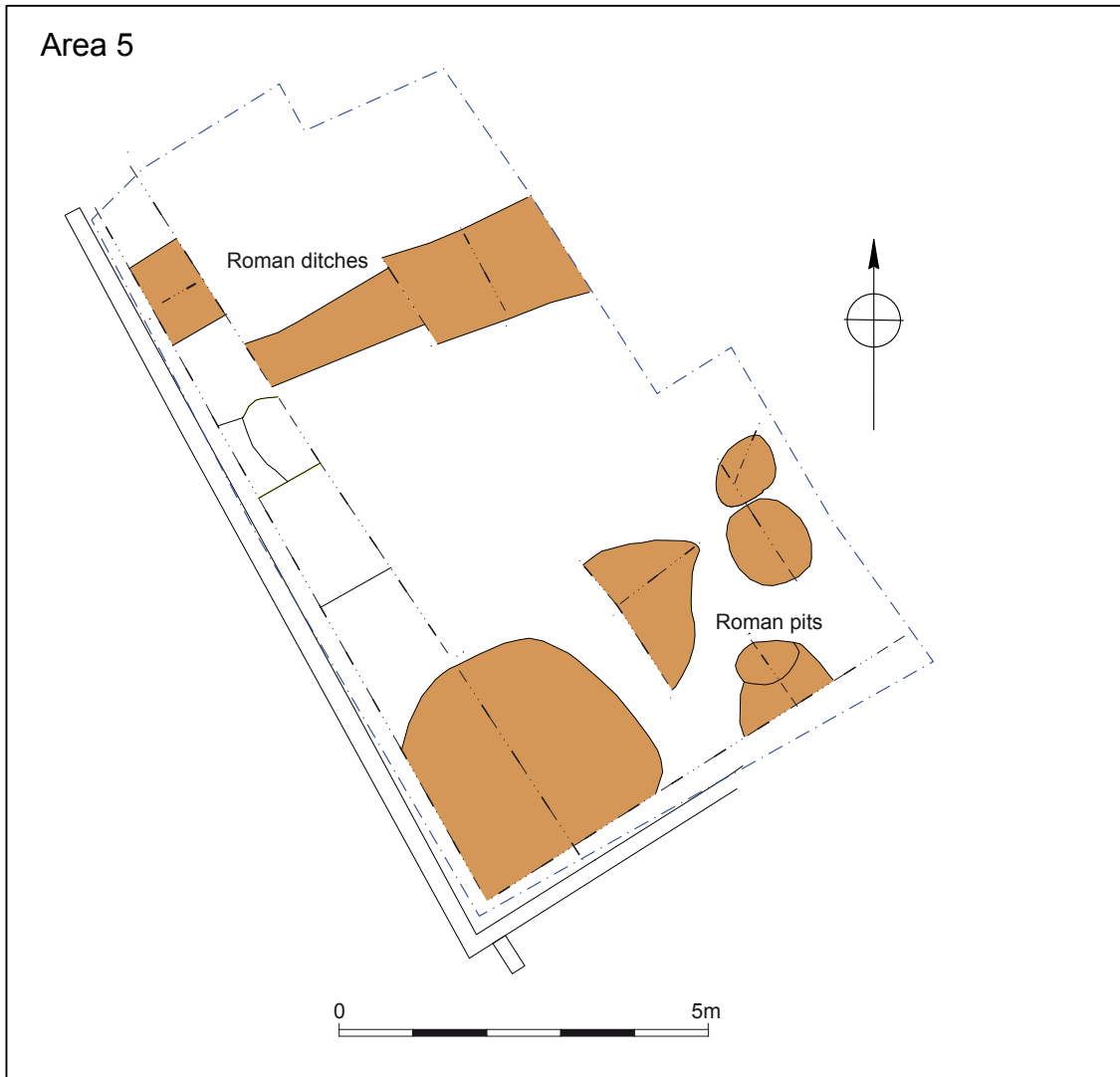


**Figure 5: Features in Area 4**

*to previous view*



*Figure 6: Area 4, Roman and post-medieval features of the terrace slope; facing south-west*



*Figure 7: Features in Area 5*

to previous view



Figure 8: Area 5; facing south-west

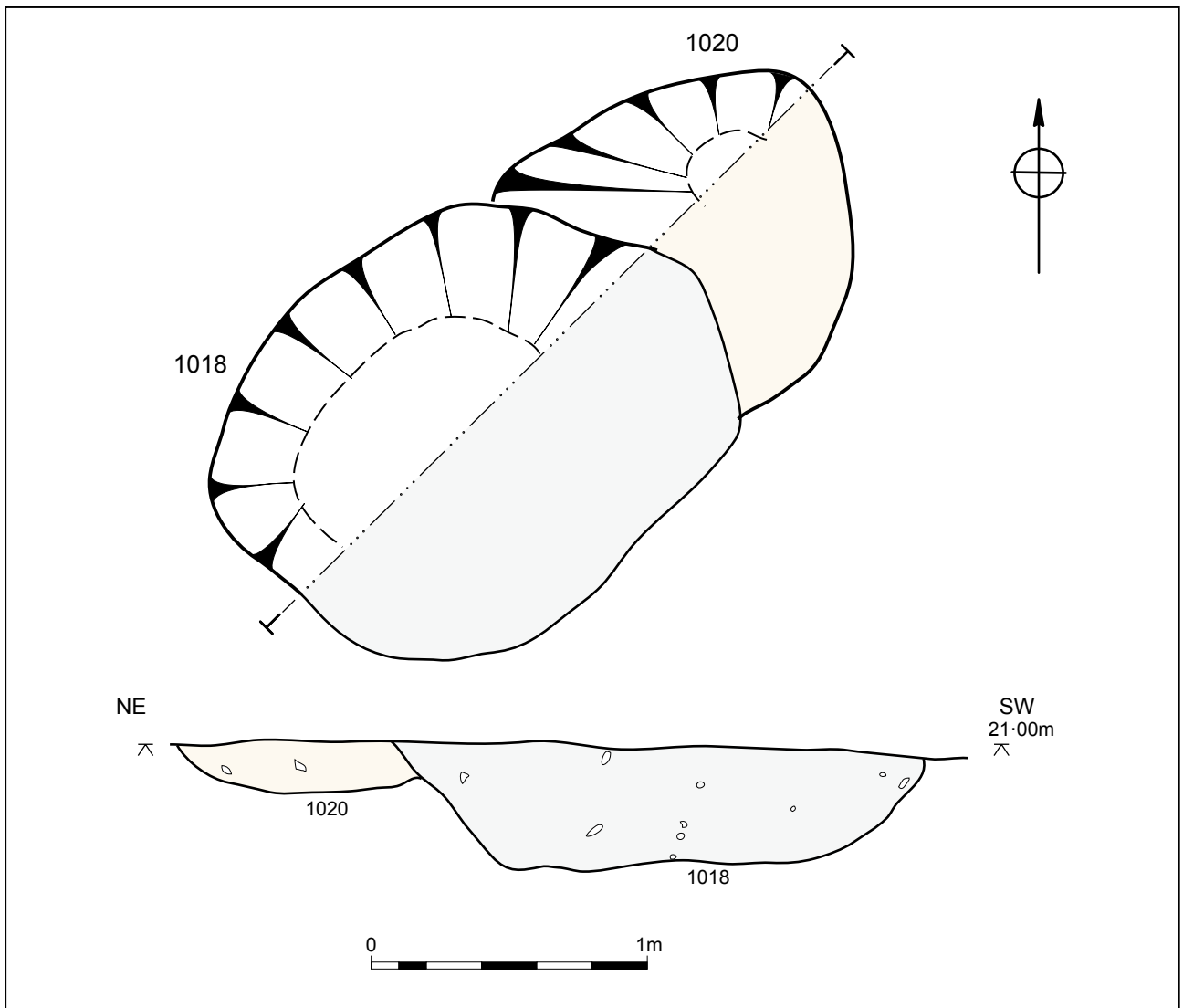


Figure 9: Quarry pits group 2

[to previous view](#)



*Figure 10: Earlier group of pits (Quarry pits group 2) located to the north-west of Walnut Tree House. The footprint of the building can be seen as a concrete slab in the top left of the picture. Scales at 1m and 2m, facing south.*



*Figure 11: Structure 2, postholes marked by the blue flags. The other pits/postholes are all post-medieval. Scale 1m and 2m, facing south.*

to previous view

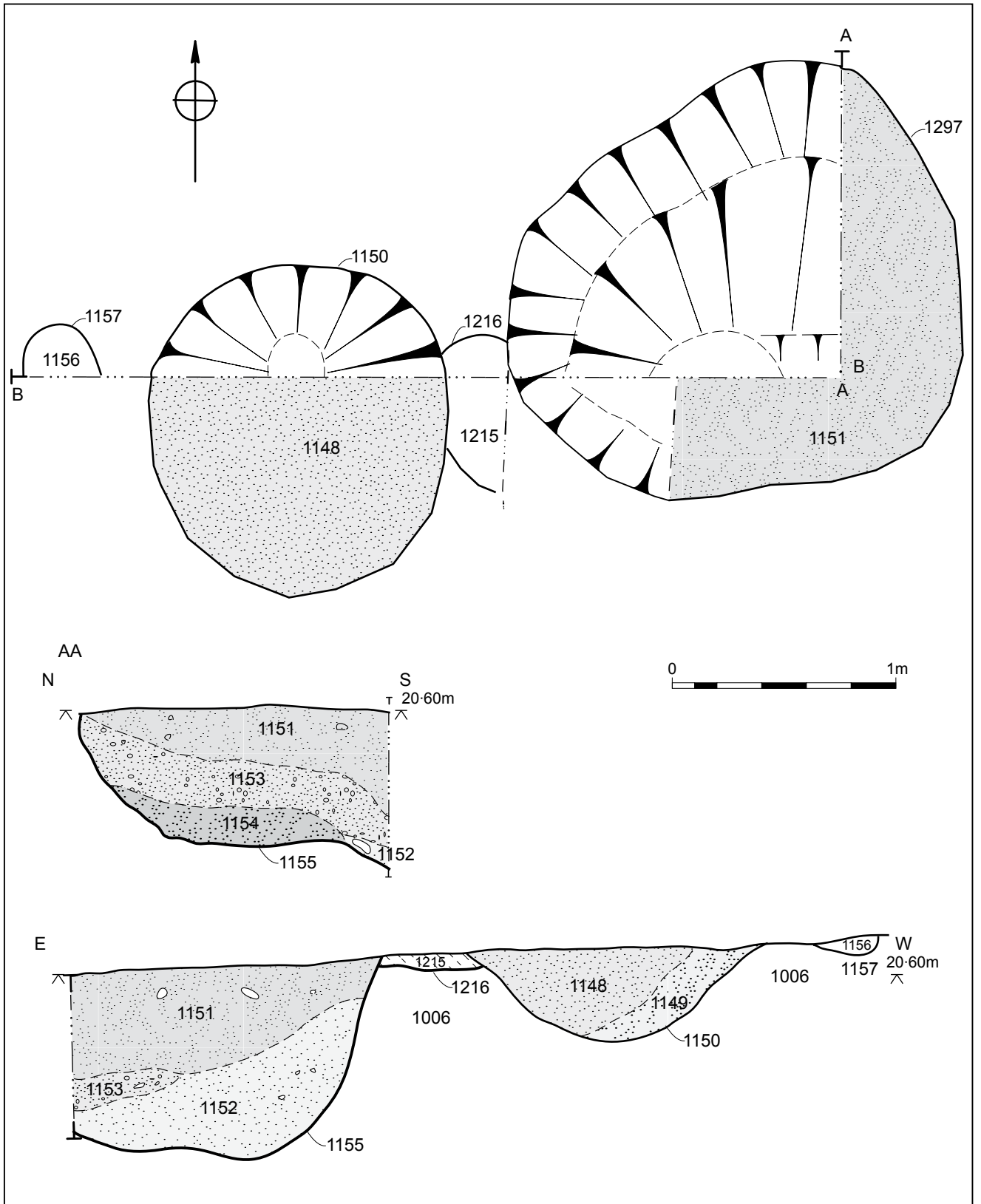


Figure 12: Quarry pits group 1



*to previous view*



*Figure 13: Concentration of pits (Quarry pits group 1).  
Scale 1m and 2m, facing south*

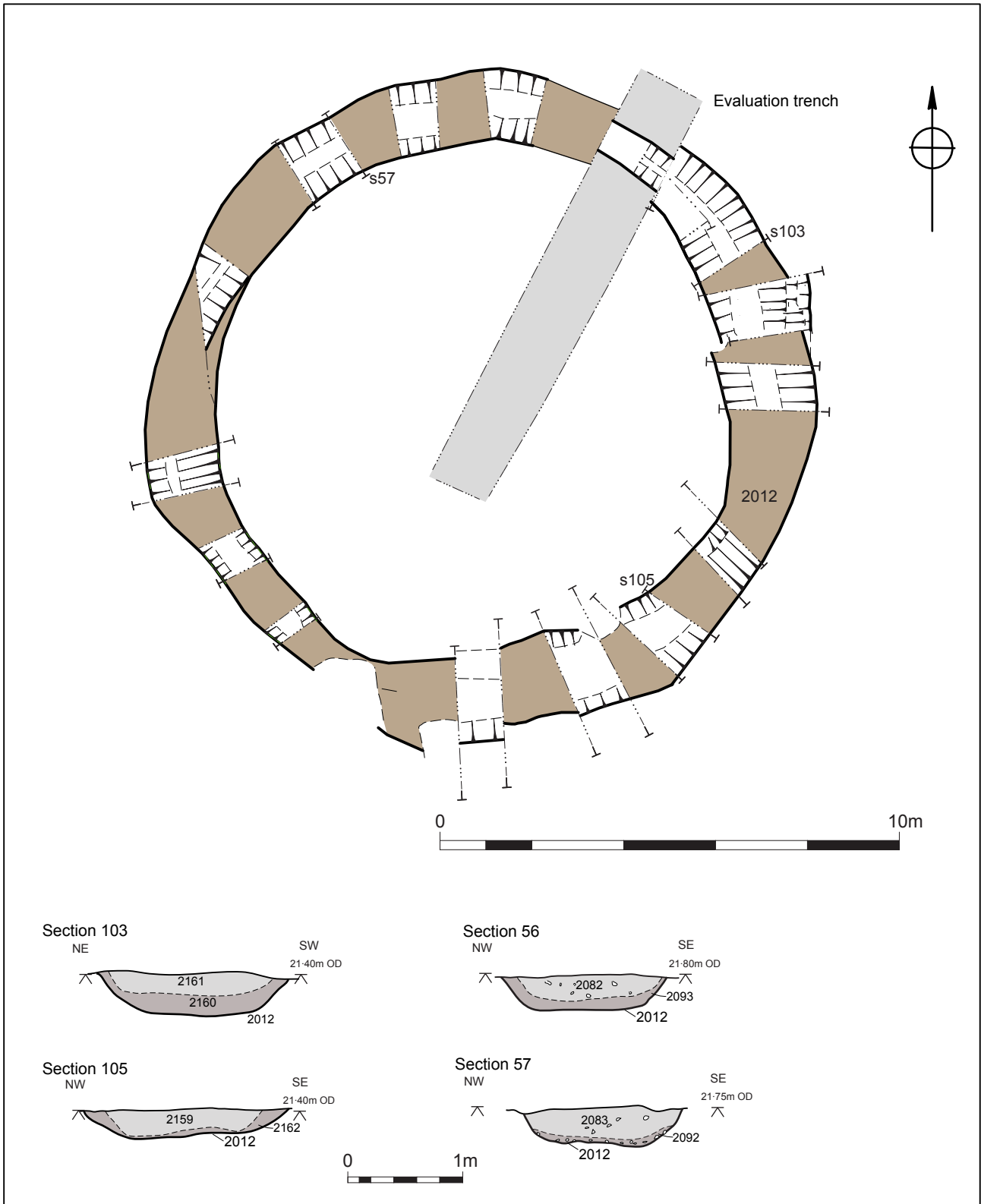


Figure 14: Circular enclosure

to previous view

Figure 15: Circular enclosure (2258), and earlier beam slots for Structure 1 to the lower right of the picture.  
Scale 2 x 2m, facing south.

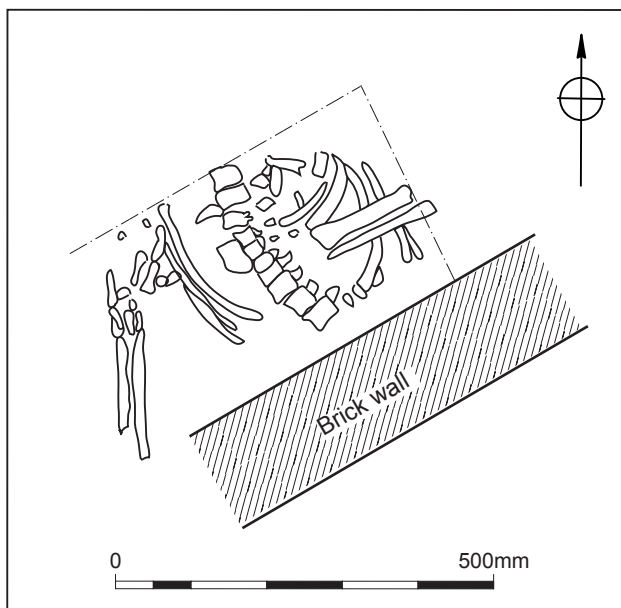


Figure 16: Burial 1004, plan



Figure 17: Burial 1004.  
Scale at 0.3m, facing north

*to previous view*



*Figure 18: Tenter rack, an alignment of square pits, WW leading away from the camera.  
Scale at 1m and 2m, facing south-west.*



*Figure 19: Relieving arch in late post-medieval garden(?) wall (2023).  
Scale at 1m, facing north.*

to previous view

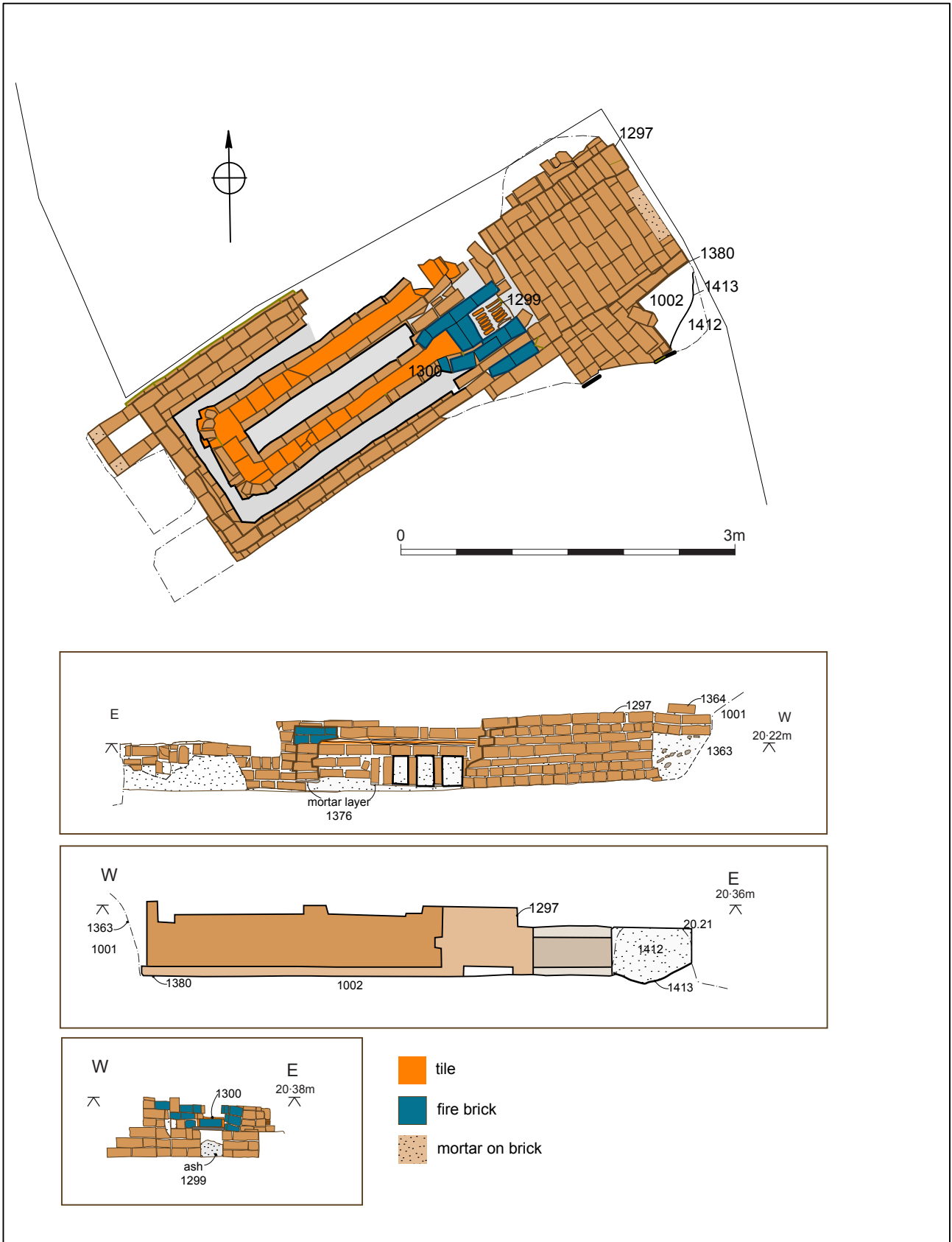


Figure 20: Hothouse (1297)

to previous view



Figure 21: Hothouse (1297).  
Scales at 1m and 0.3m, facing west



Figure 22:  
Prehistoric pottery

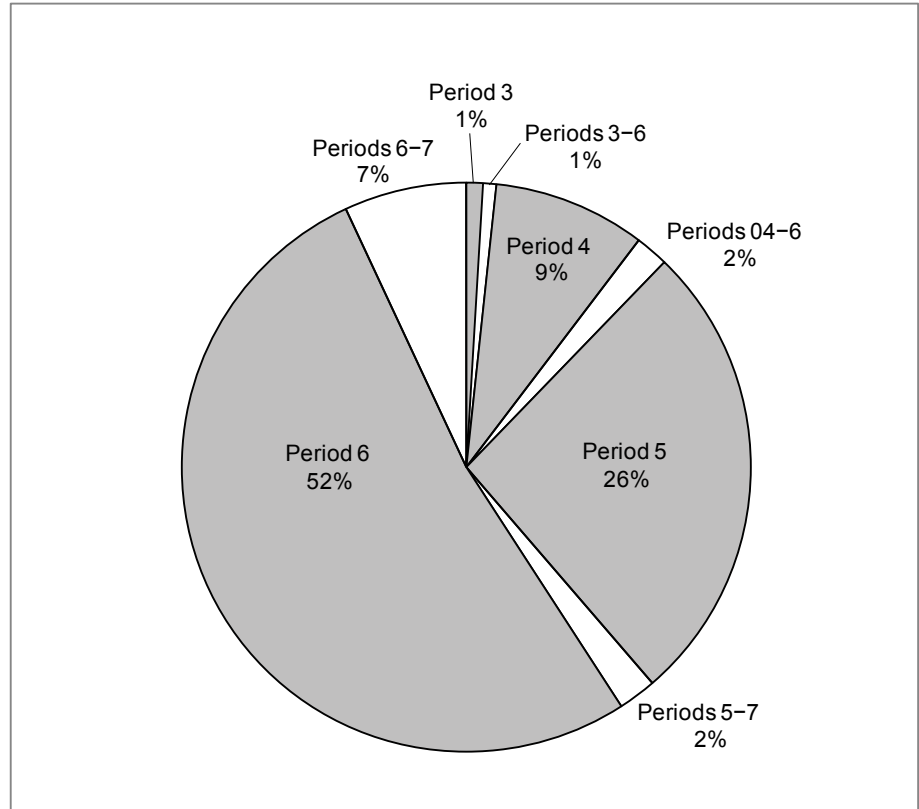


Figure 23: Summary of Roman pottery from Periods 3 to 6-7 (% weight)

to previous view

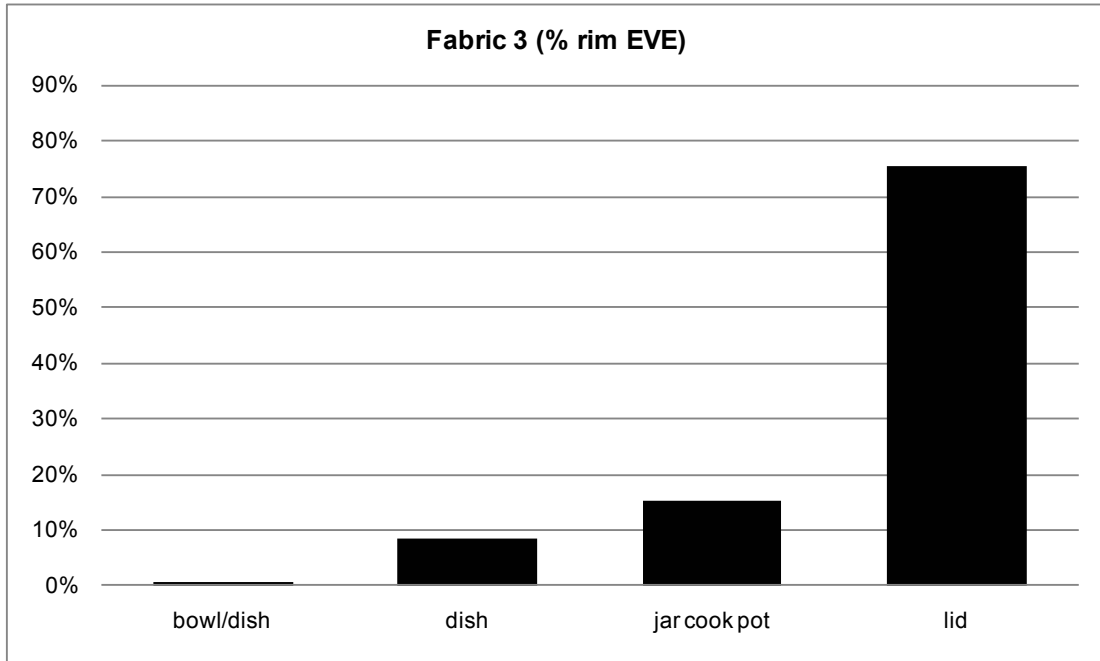


Figure 24: Roman pottery. Fabric 3, handmade Malvernian ware; form types (% rim EVE)

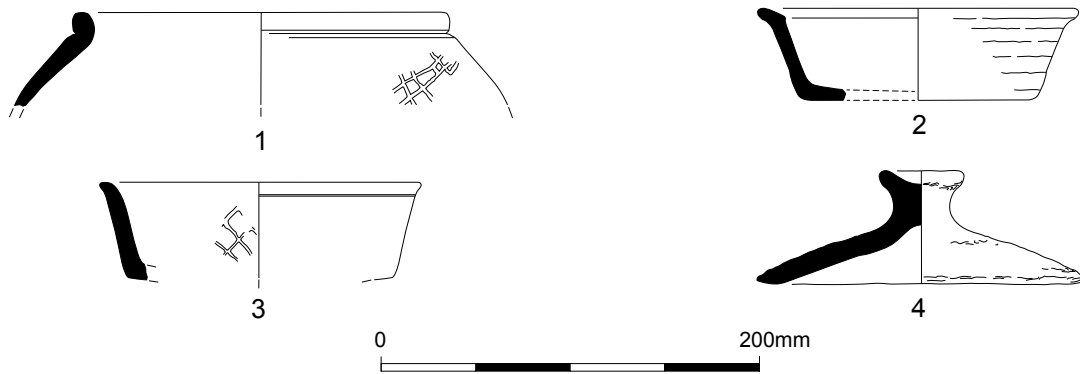


Figure 25: Roman pottery. Fabric 3, handmade Malvernian ware; form types.

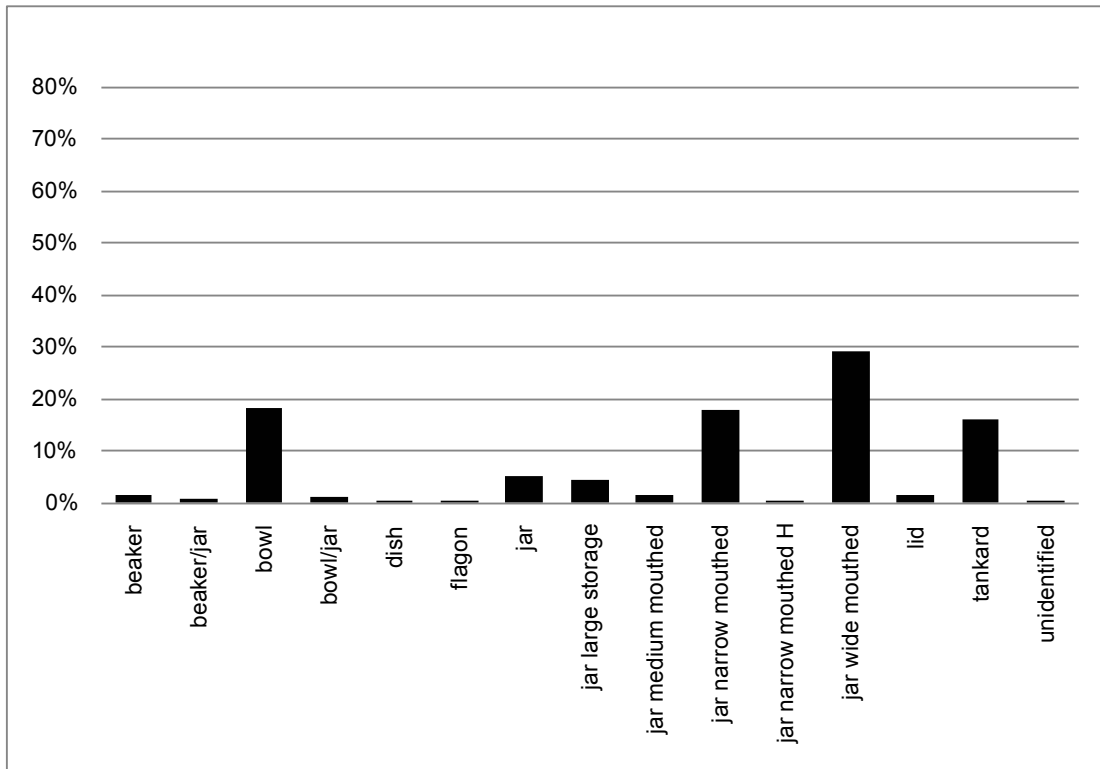


Figure 26: All Severn Valley ware; (% rim EVE)



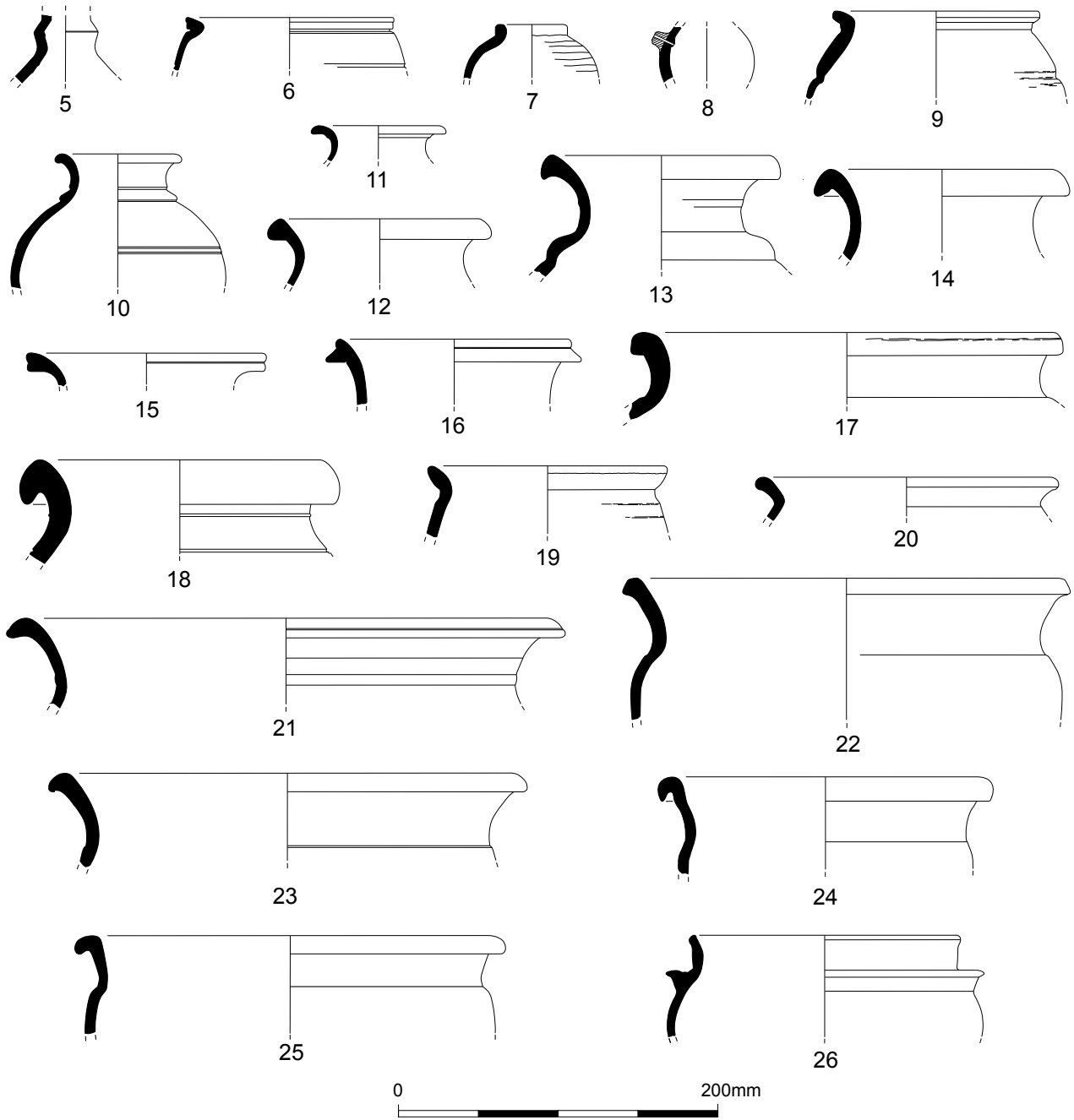


Figure 27: Roman pottery. Severn Valley ware forms; flagons, beakers and jars (5–26)

to previous view

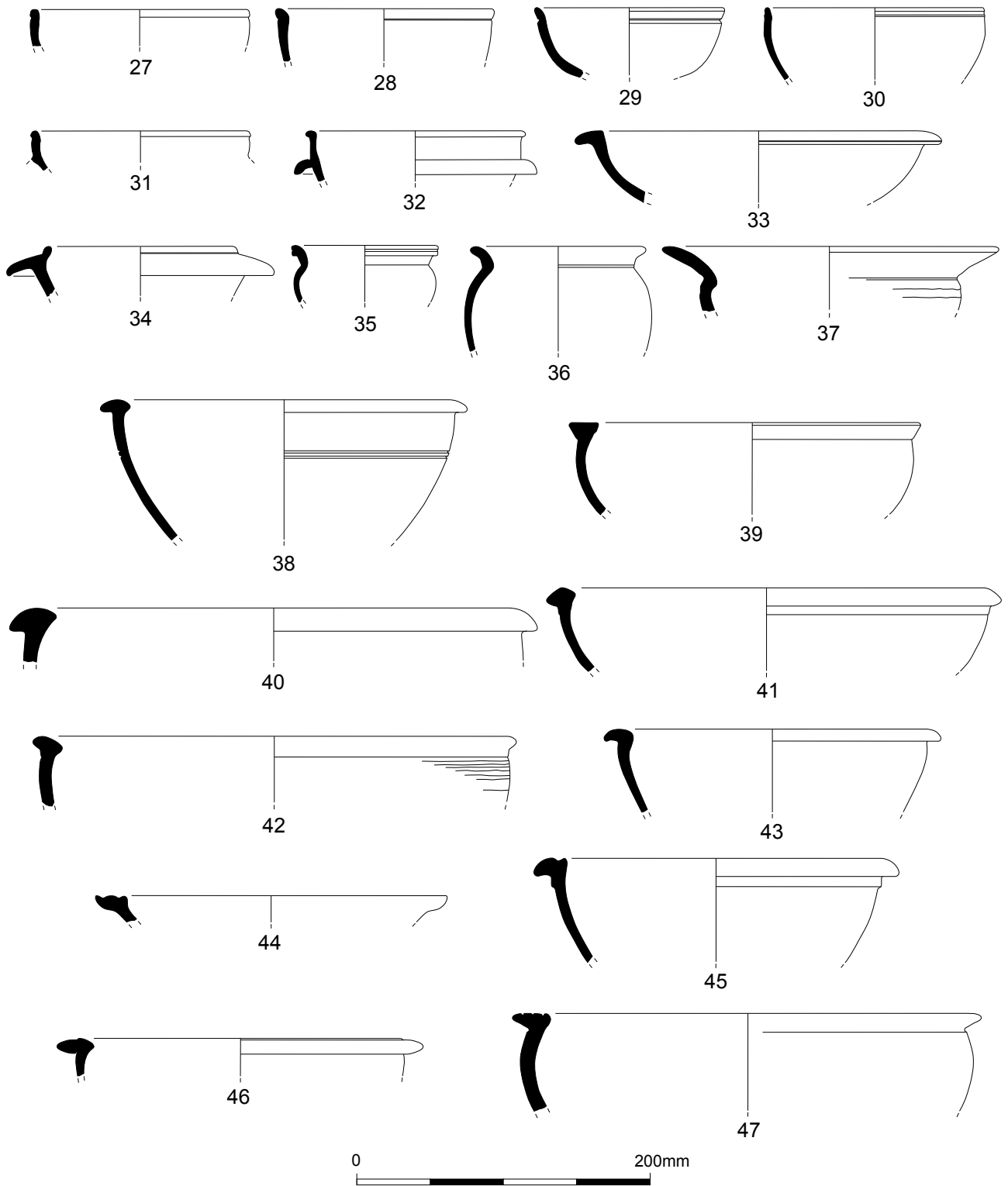


Figure 28: Roman pottery. Severn Valley ware forms; bowls (27–47)

to previous view

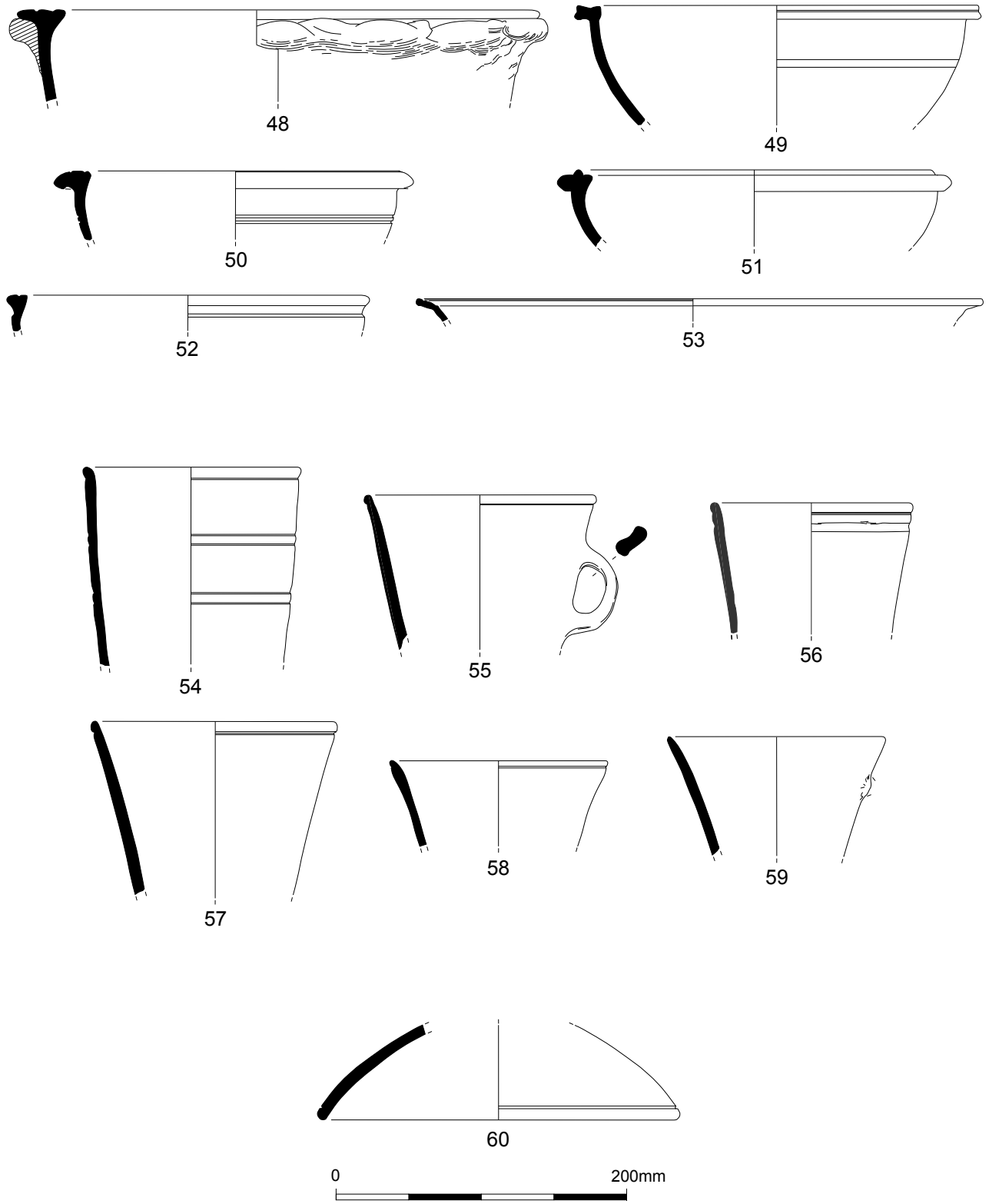


Figure 29: Roman pottery. Severn valley ware forms; bowls, tankards and lids (48–60)

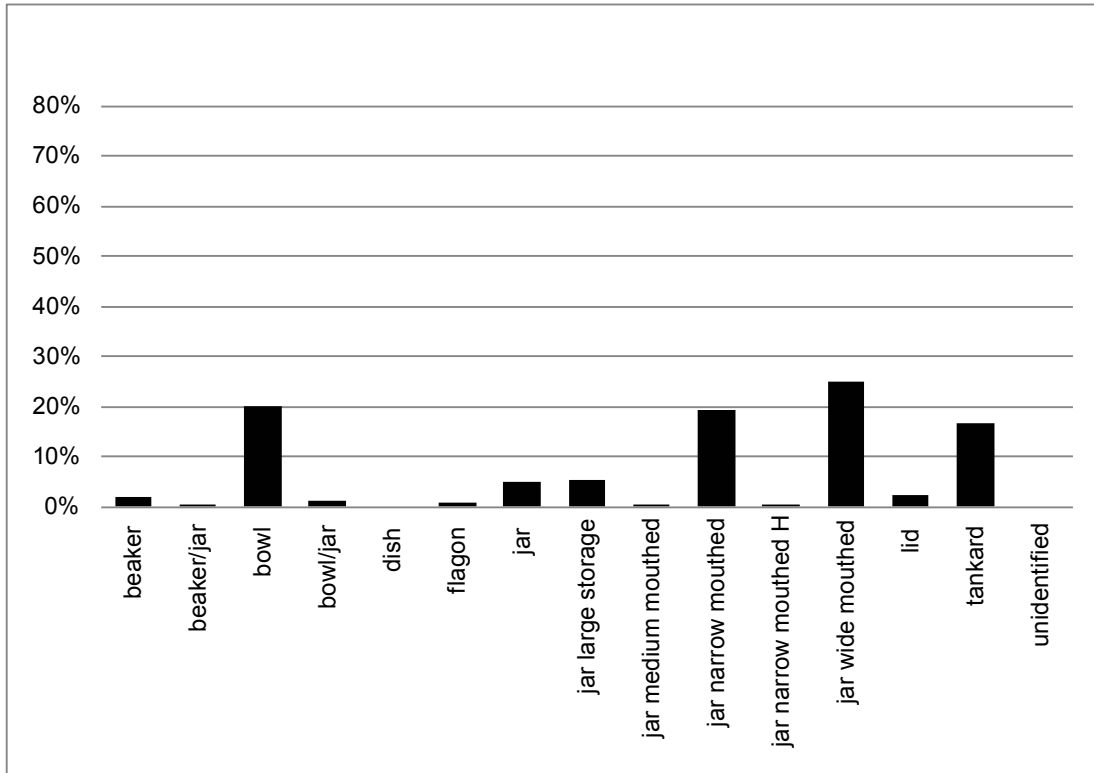


Figure 30: Roman pottery. Fabric 12, Severn Valley ware; form types (% rim EVE)

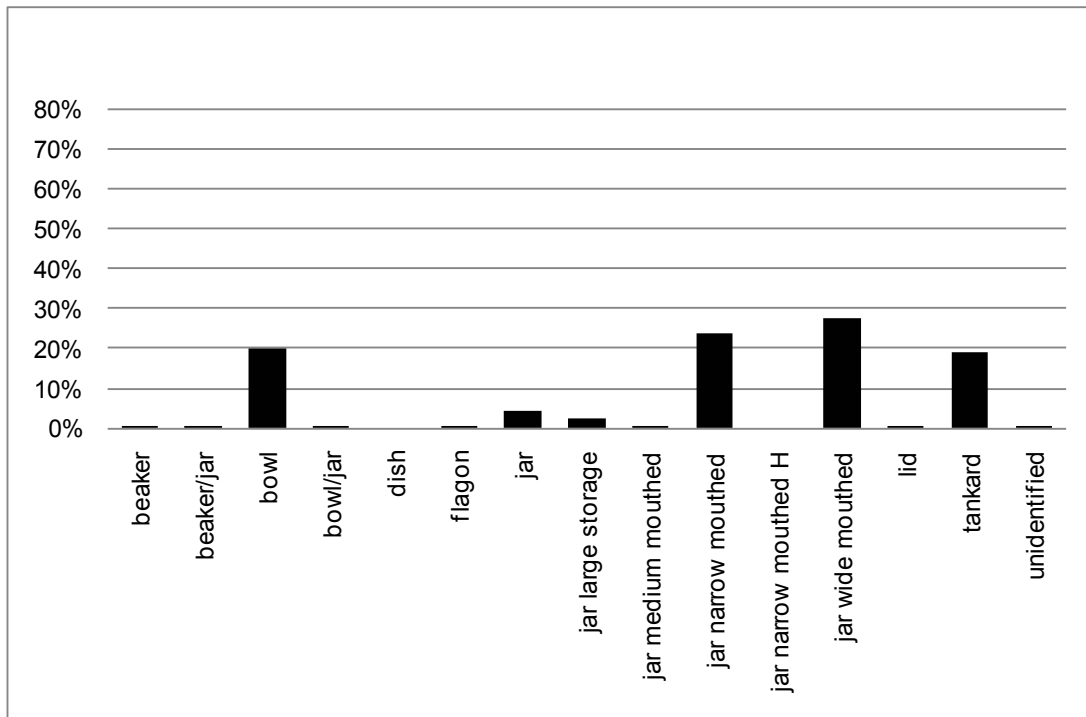


Figure 31: Roman pottery. Fabric 12.6, Severn valley ware; form types (% rim EVE)

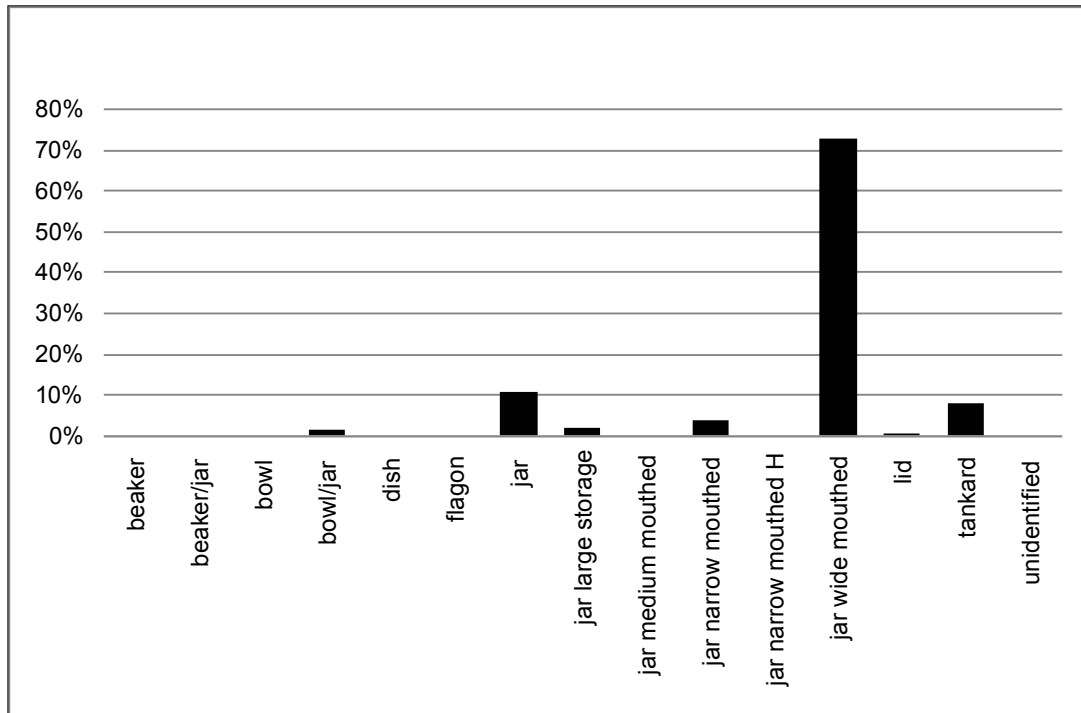


Figure 32: Roman pottery. Fabric 12.2, Severn Valley ware; form types (% rim EVE)

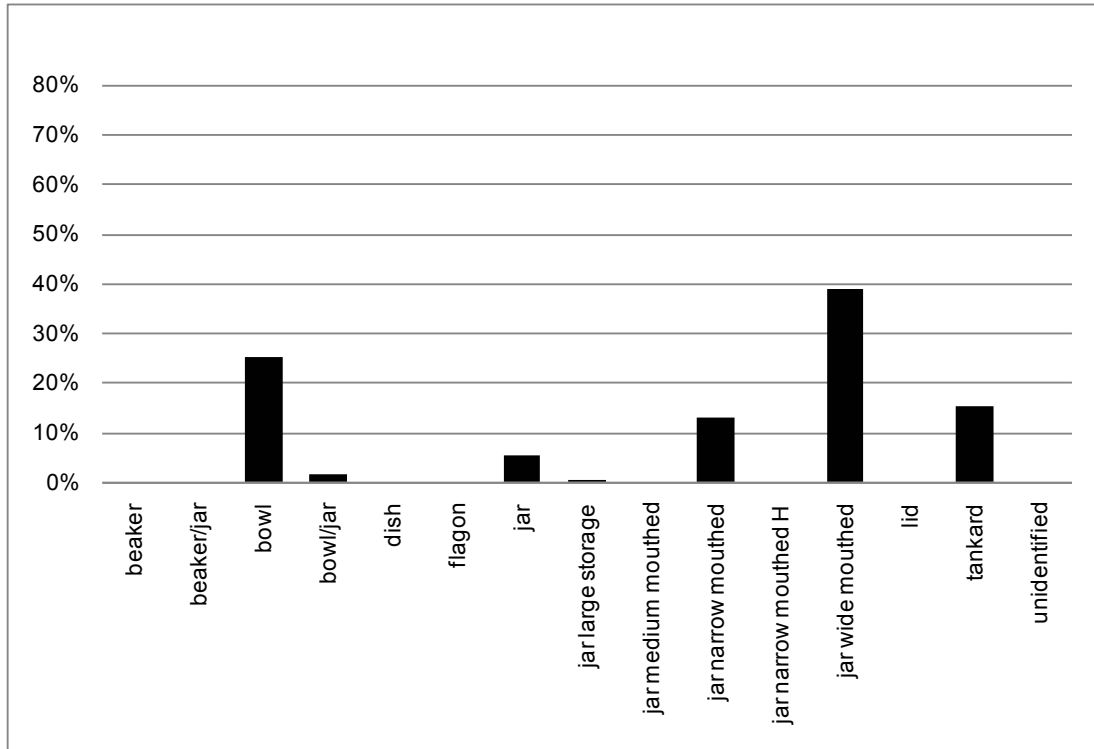


Figure 33: Roman pottery. Fabric 12.4, Severn Valley ware; form types (% rim EVE)

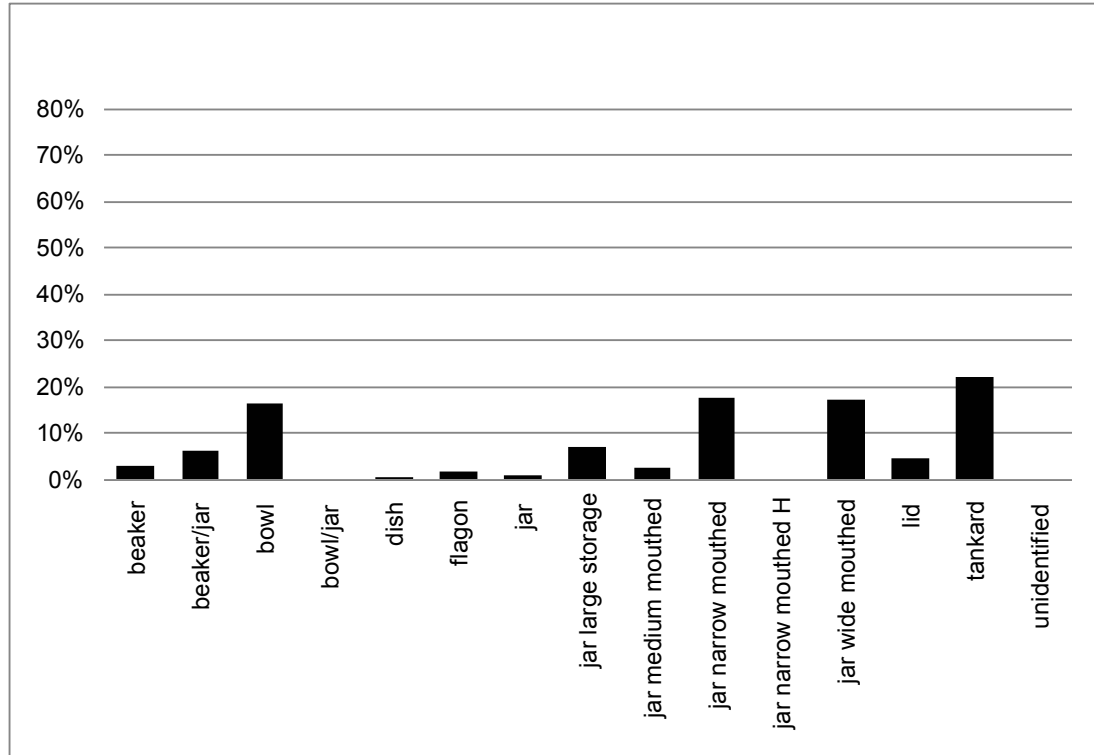


Figure 34: Roman pottery. Fabric 12.5, Severn Valley ware; form types (% rim EVE)

to previous view

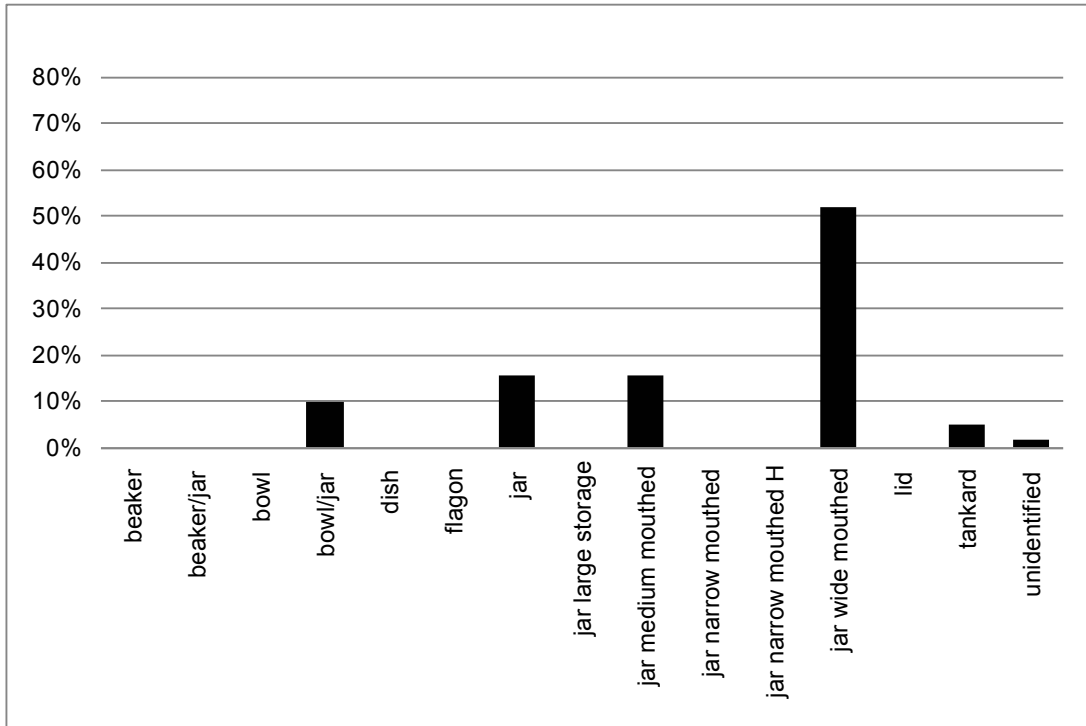


Figure 35: Roman pottery. Fabric 12.8, Severn Valley ware; form types (% rim EVE)

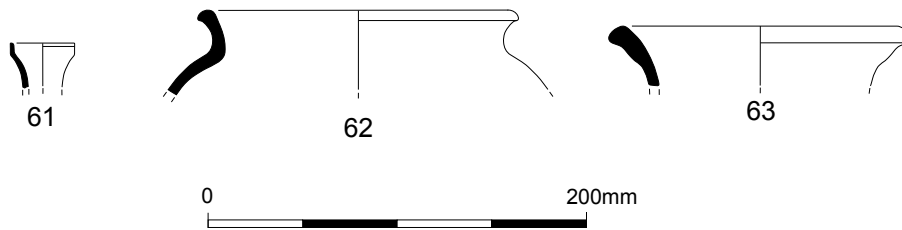


Figure 36: Roman pottery. Fabric 13, sandy oxidised ware forms

[to previous view](#)

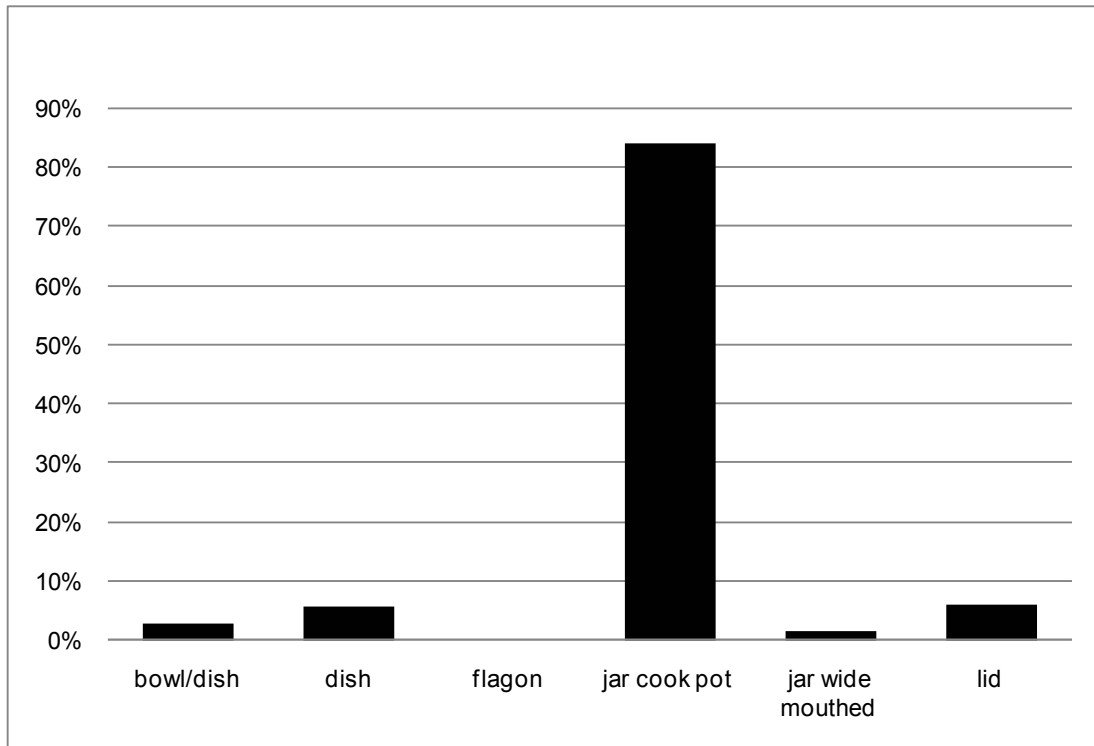


Figure 37: Roman pottery. Fabric 19, Wheelmade Malvernian ware, form types (% rim EVE)



to previous view

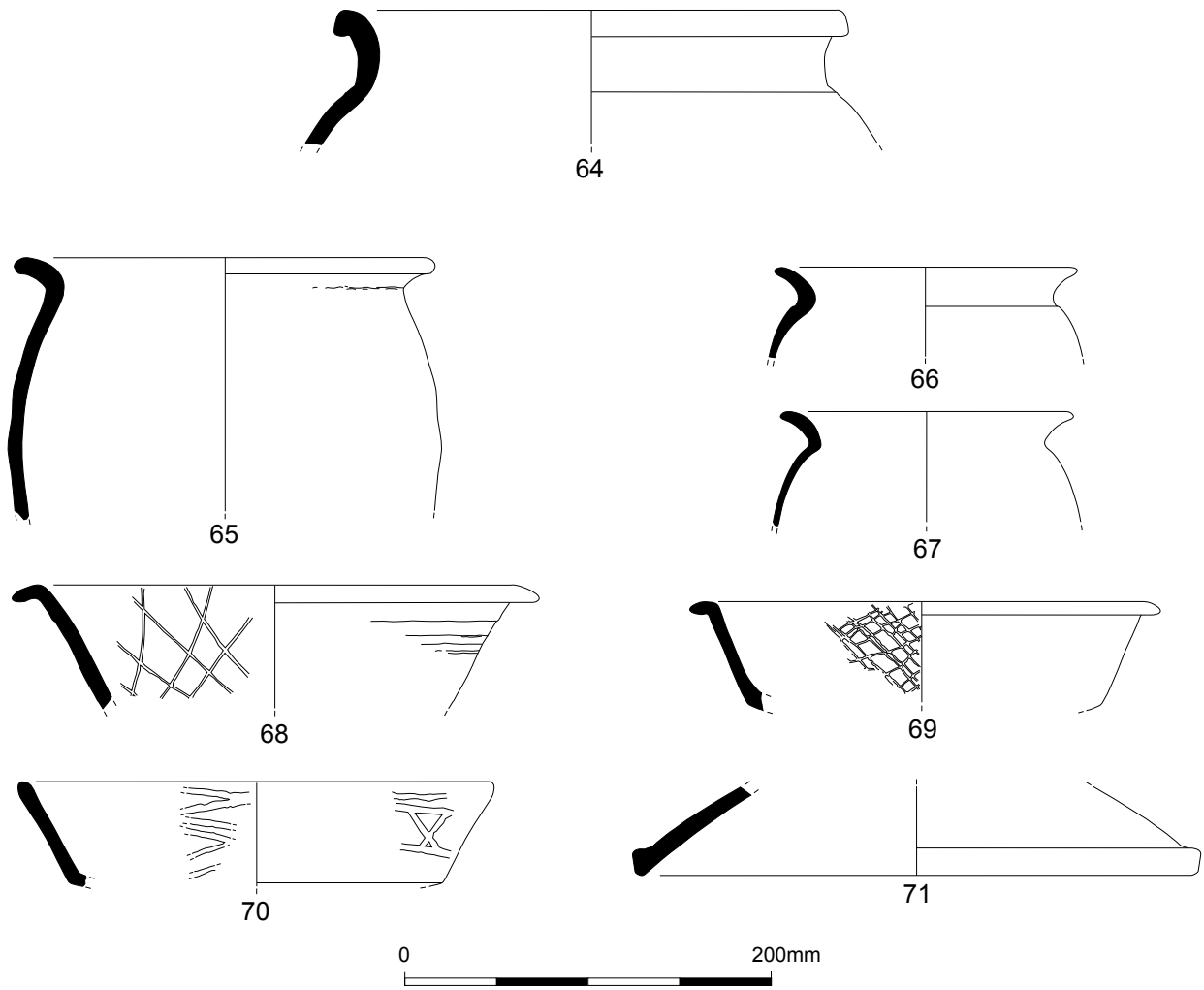


Figure 38: Roman pottery. Fabric 12, Fabric 19, wheelmade Malvernian ware; forms (64–71)

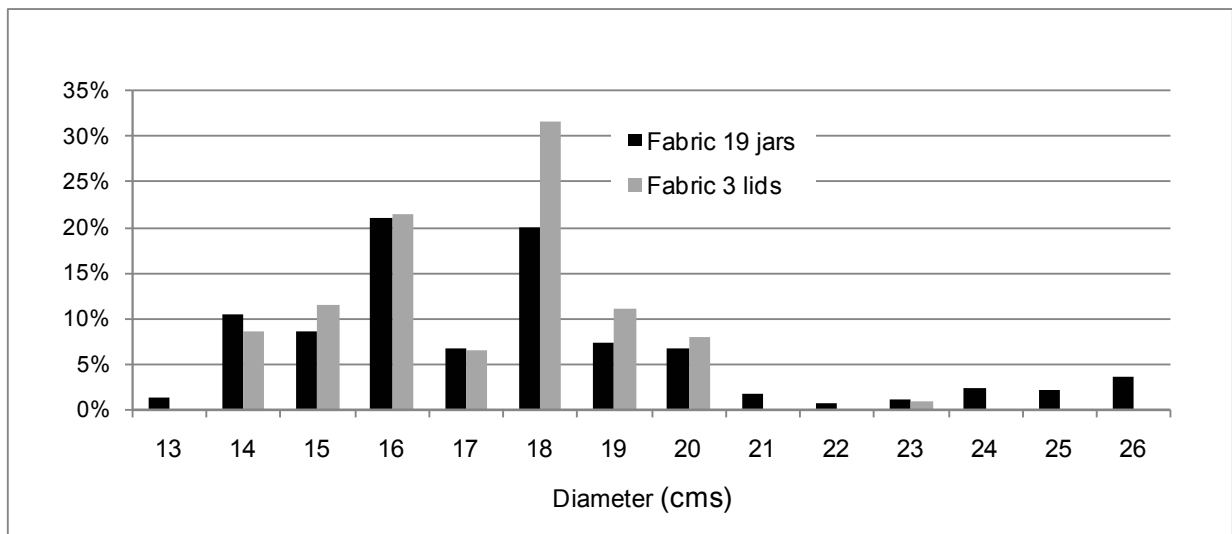


Figure 39: Roman pottery. Comparison of rim diameters for Fabric 19 jars and Fabric 3 lids (% rim EVE)

to previous view

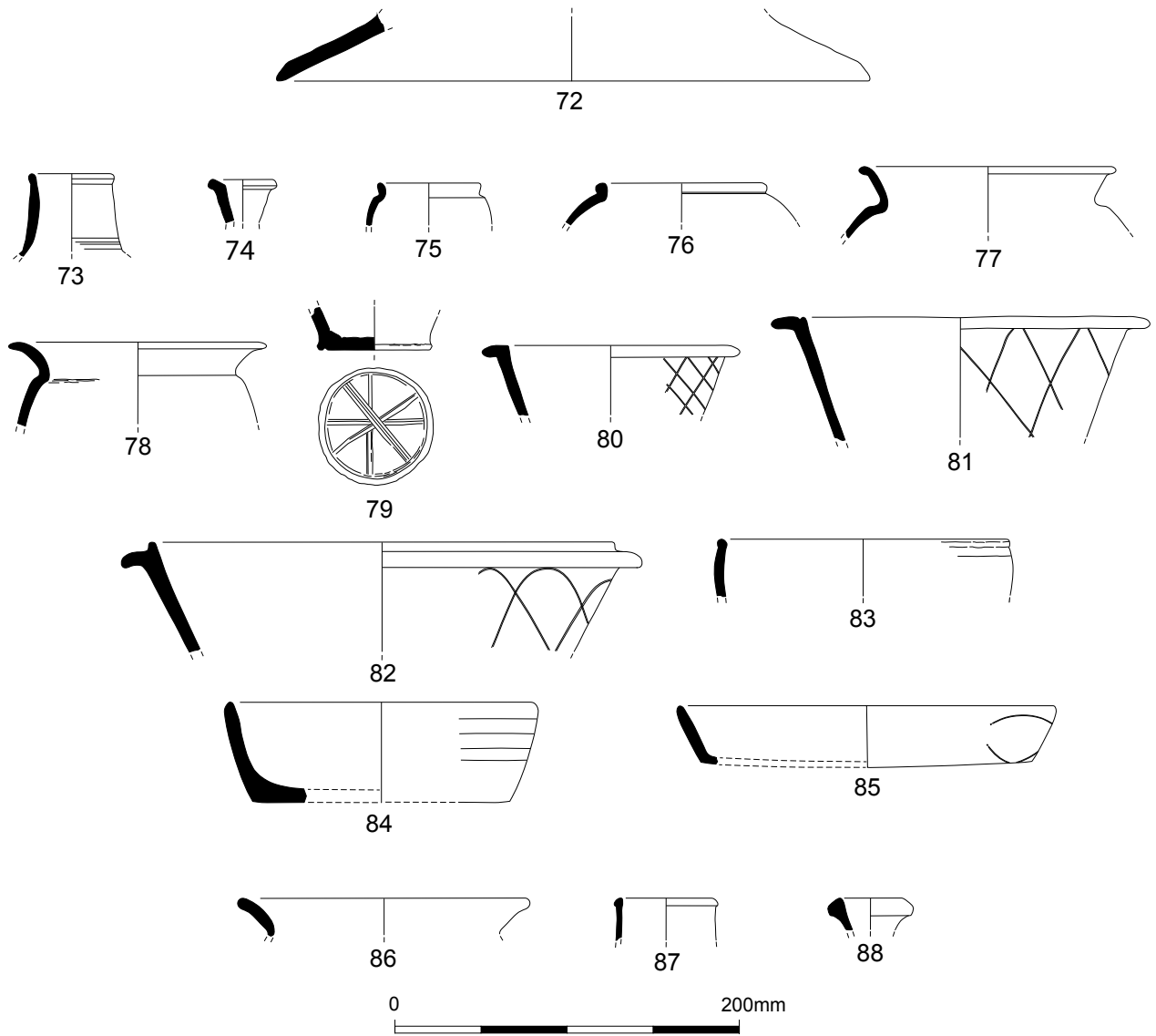


Figure 40: Roman pottery. Traded wares

[to previous view](#)

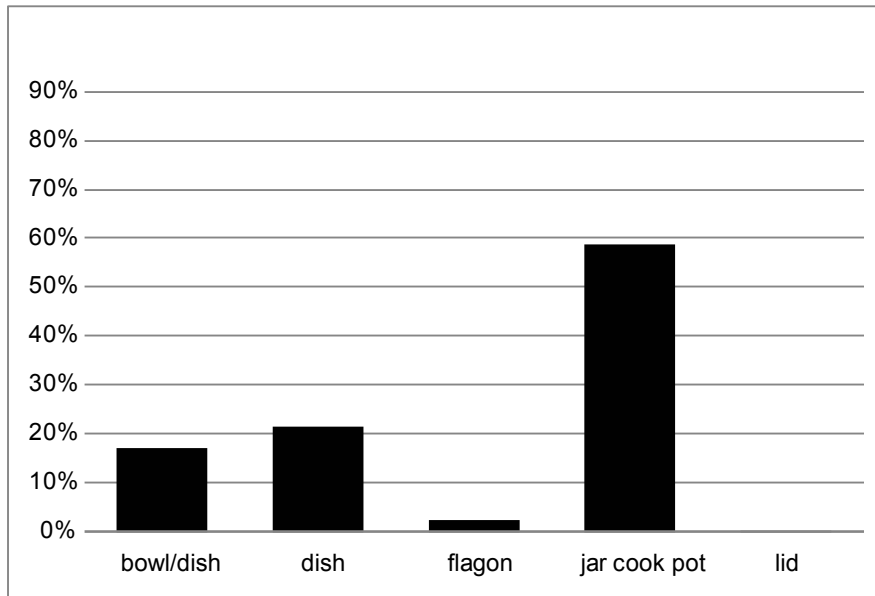


Figure 41: Roman pottery. Fabric 22, Black burnished ware, form types (% rim EVE)

to previous view

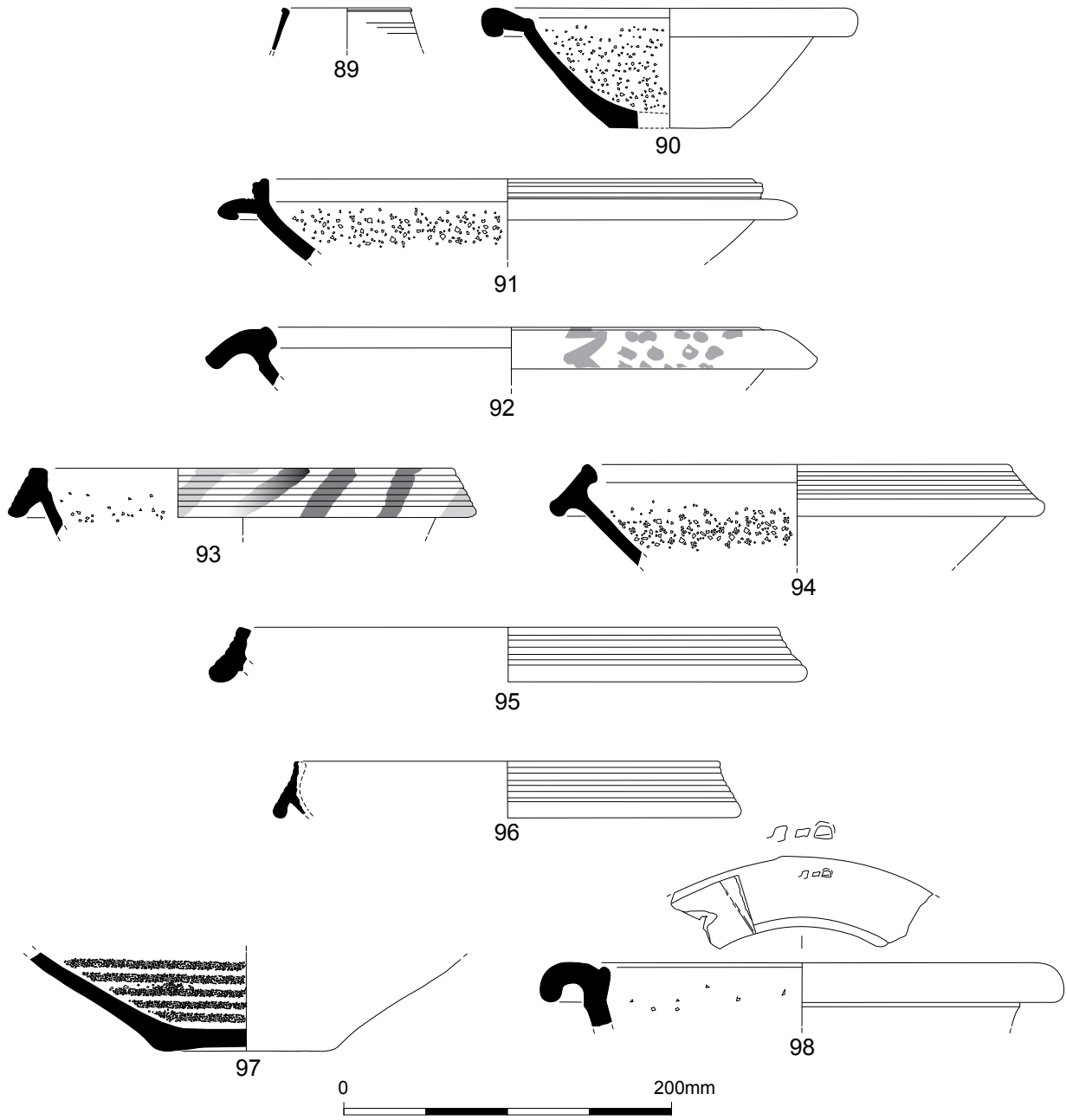


Figure 42: Roman pottery. Mortaria

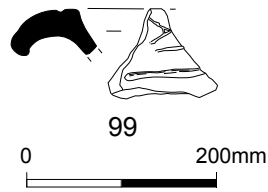


Figure 43: Roman pottery.  
Imported colour coated wares

[to previous view](#)

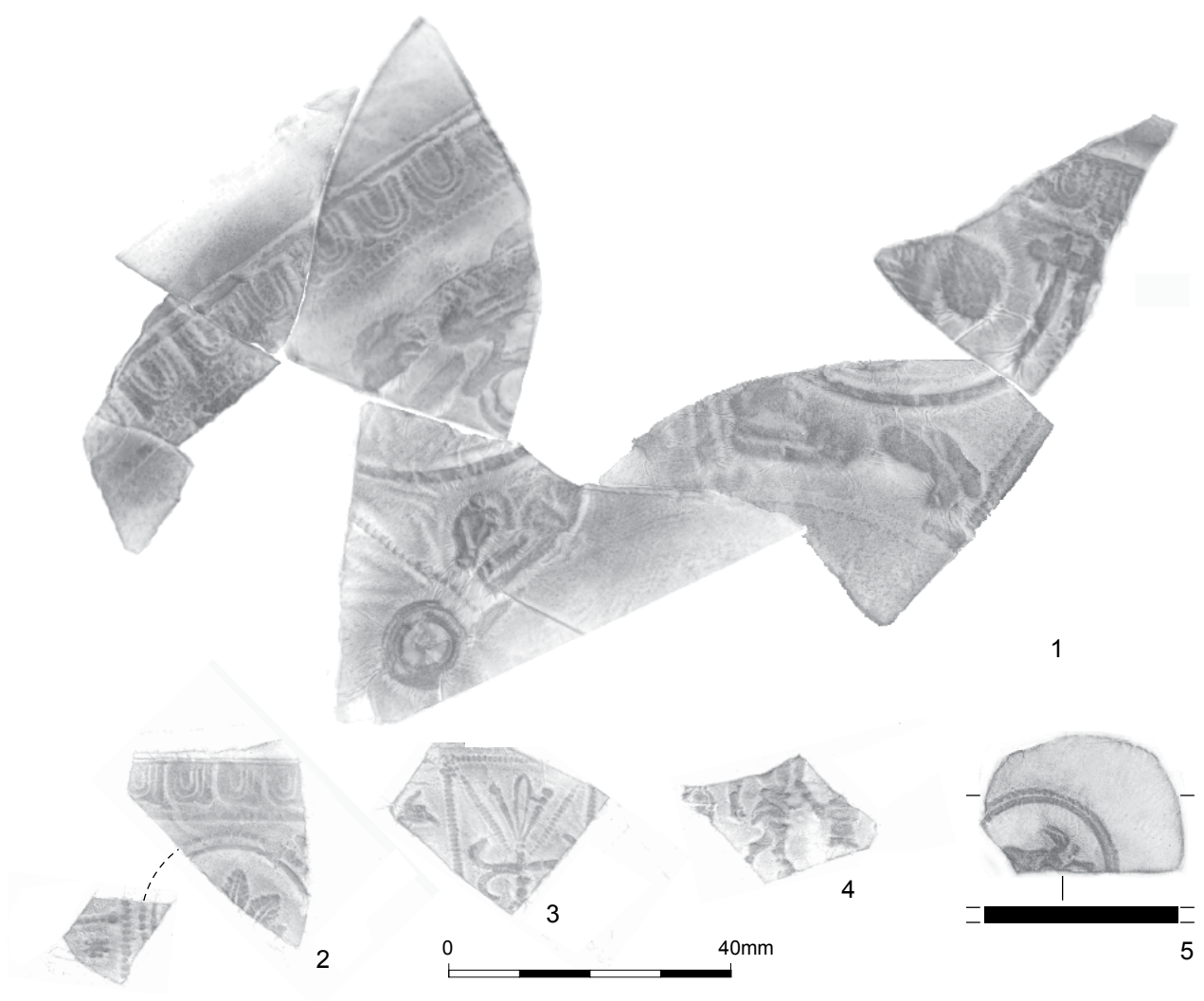


Figure 44: Roman pottery. Decorated samian

to previous view

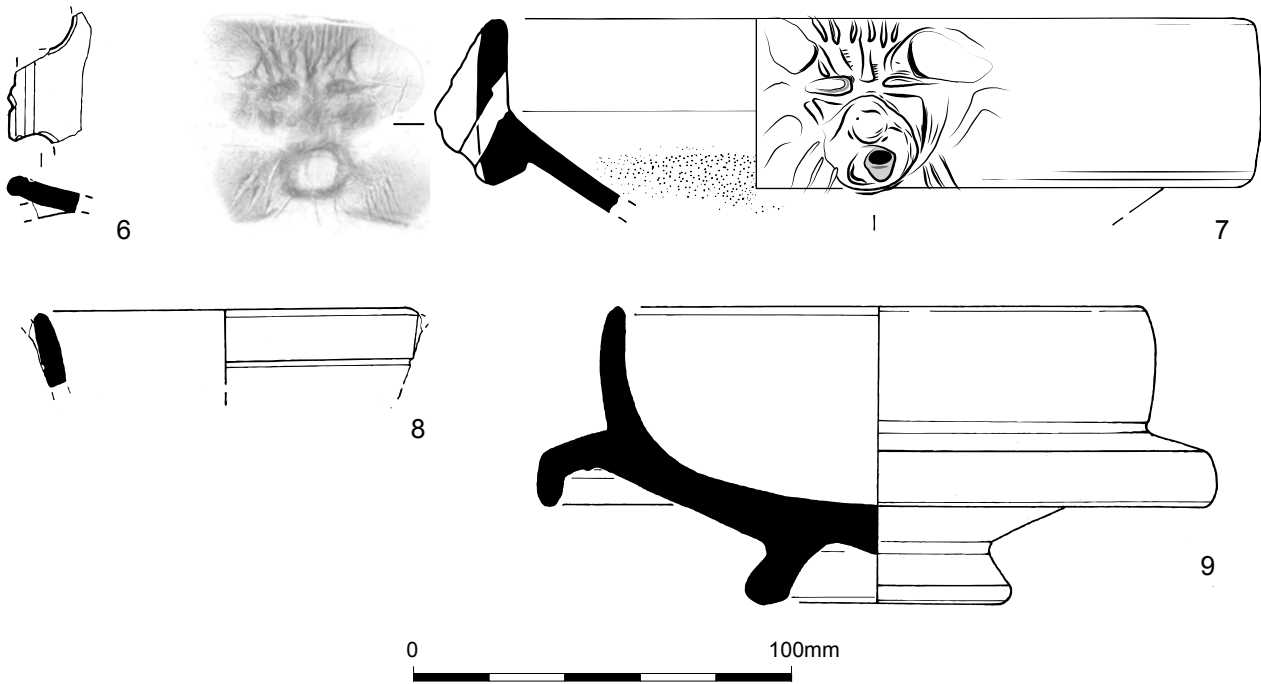


Figure 45: Roman pottery. Samian plain wares; unusual forms

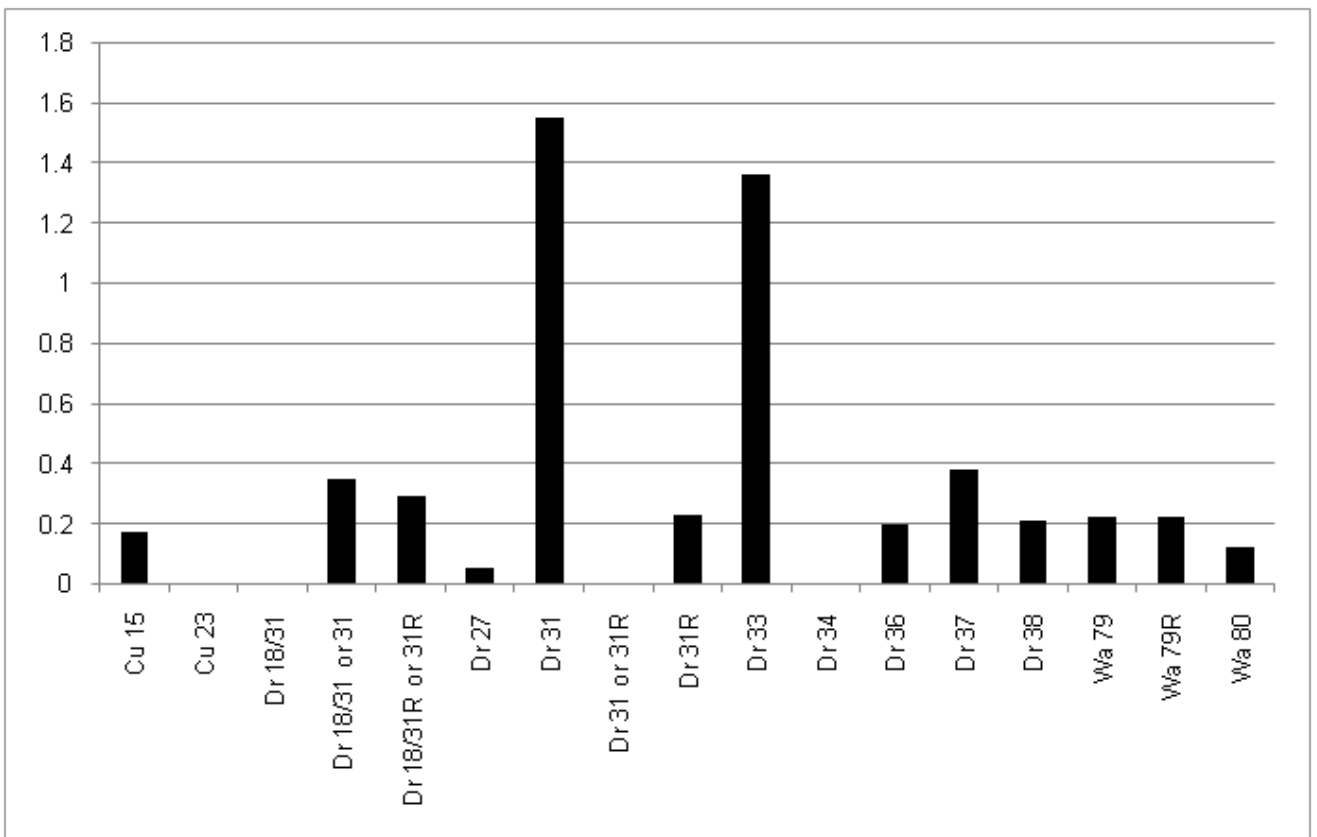


Figure 46: Roman pottery. Lezoux samian; identified forms (rim EVE)

[to previous view](#)

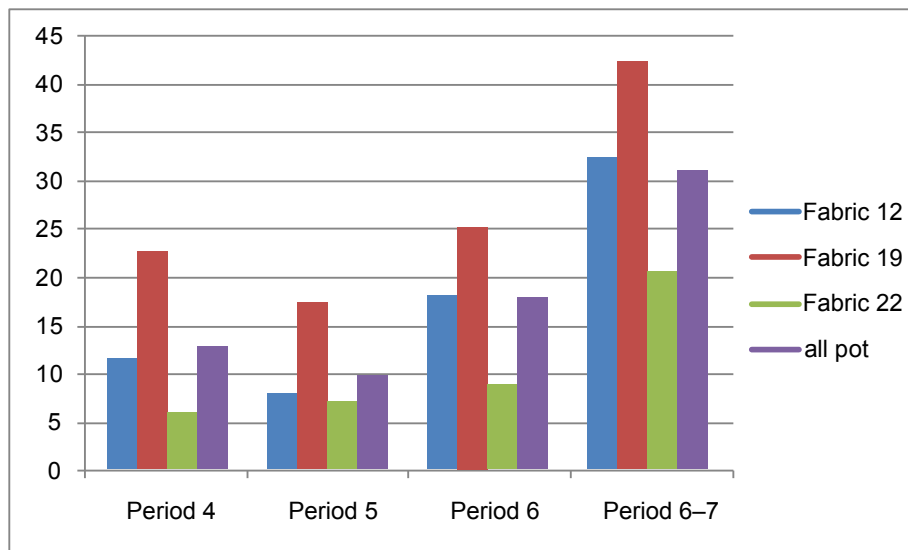


Figure 47: Roman pottery fabrics by period, average sherd weight

to previous view

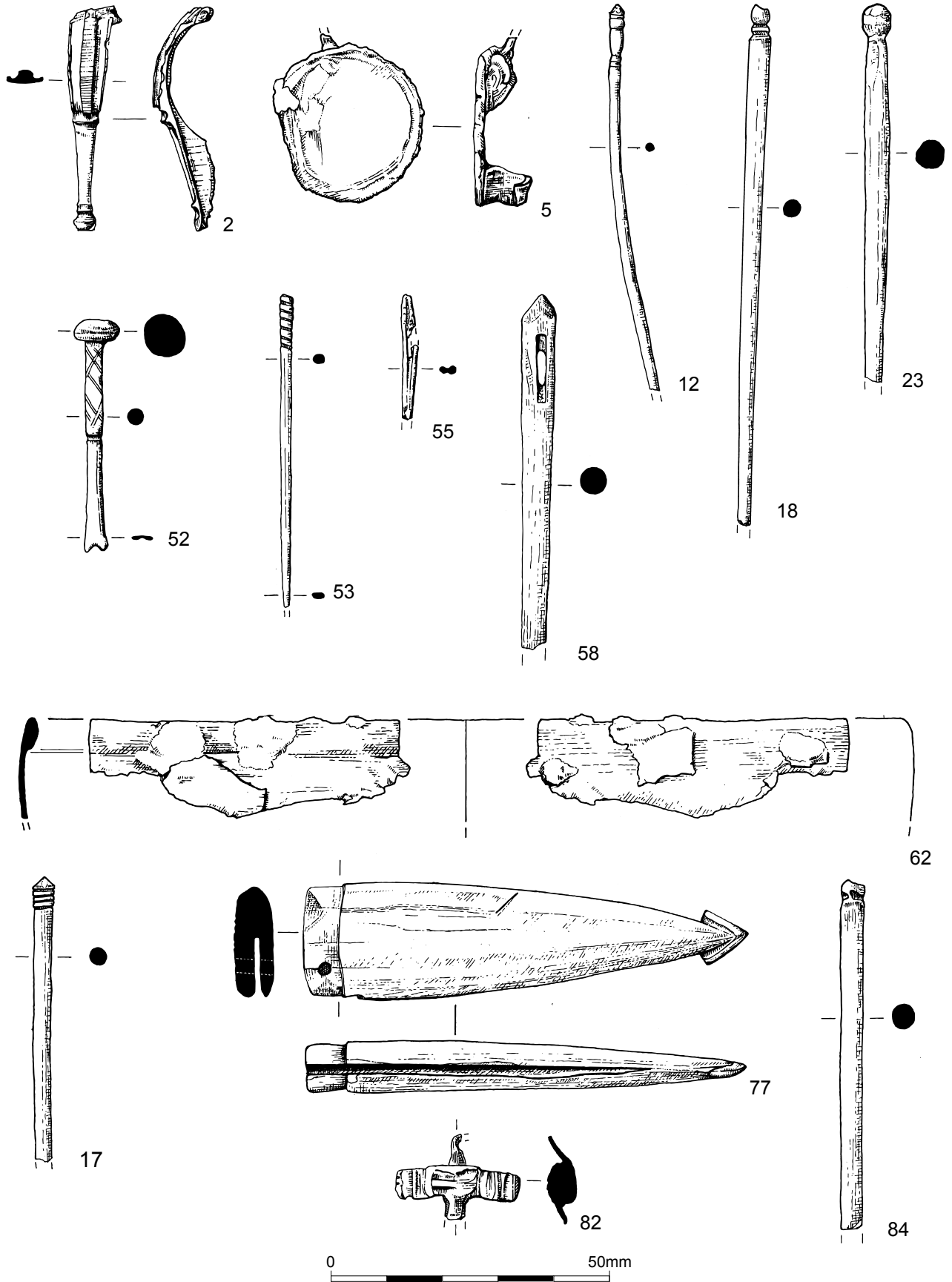
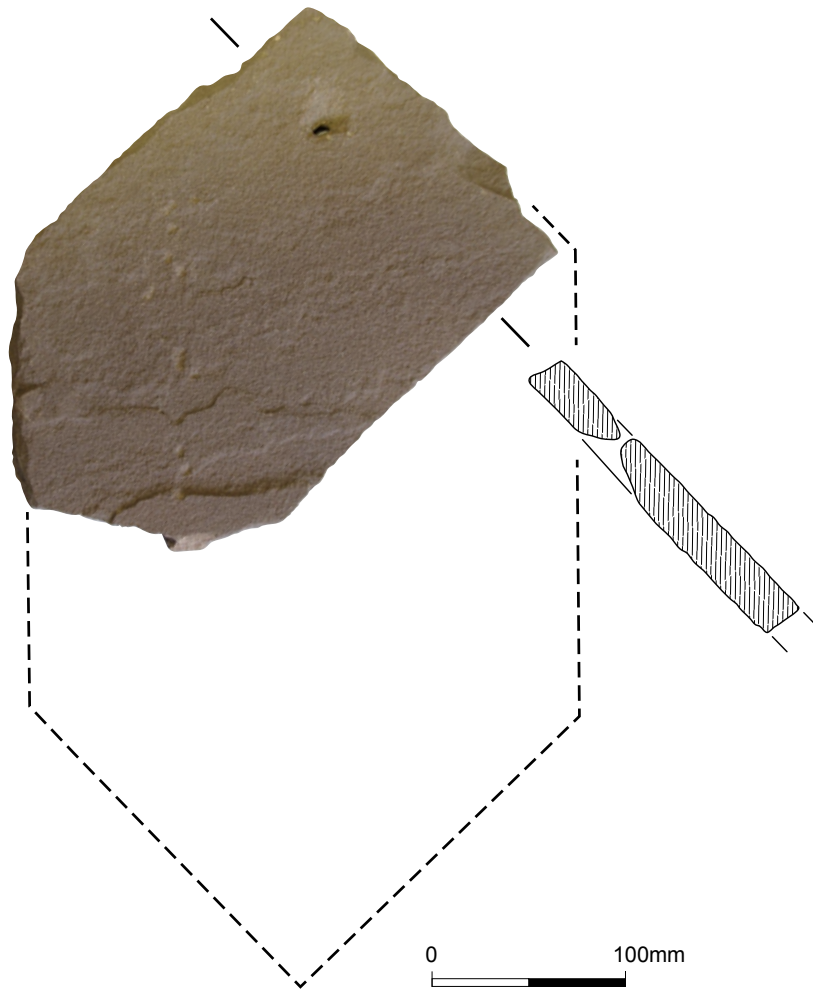


Figure 48: The illustrated small finds (ordered by catalogue number)



*to previous view*



*Figure 49: Stone tile*

to previous view

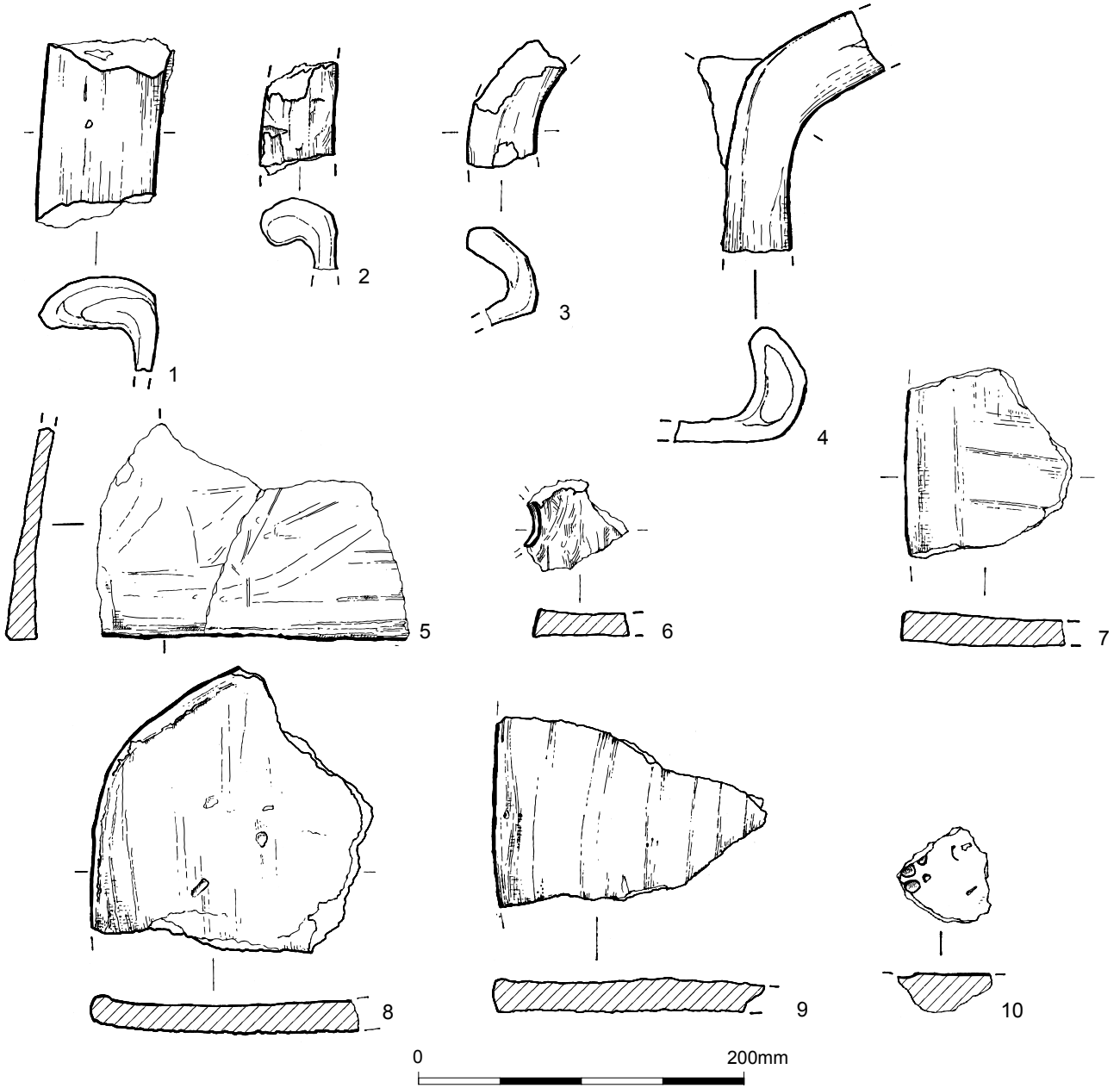


Figure 50: Ceramic oven material

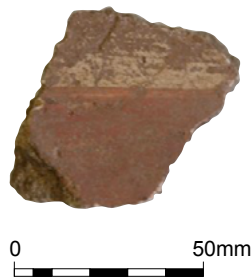


Figure 51: Painted plaster

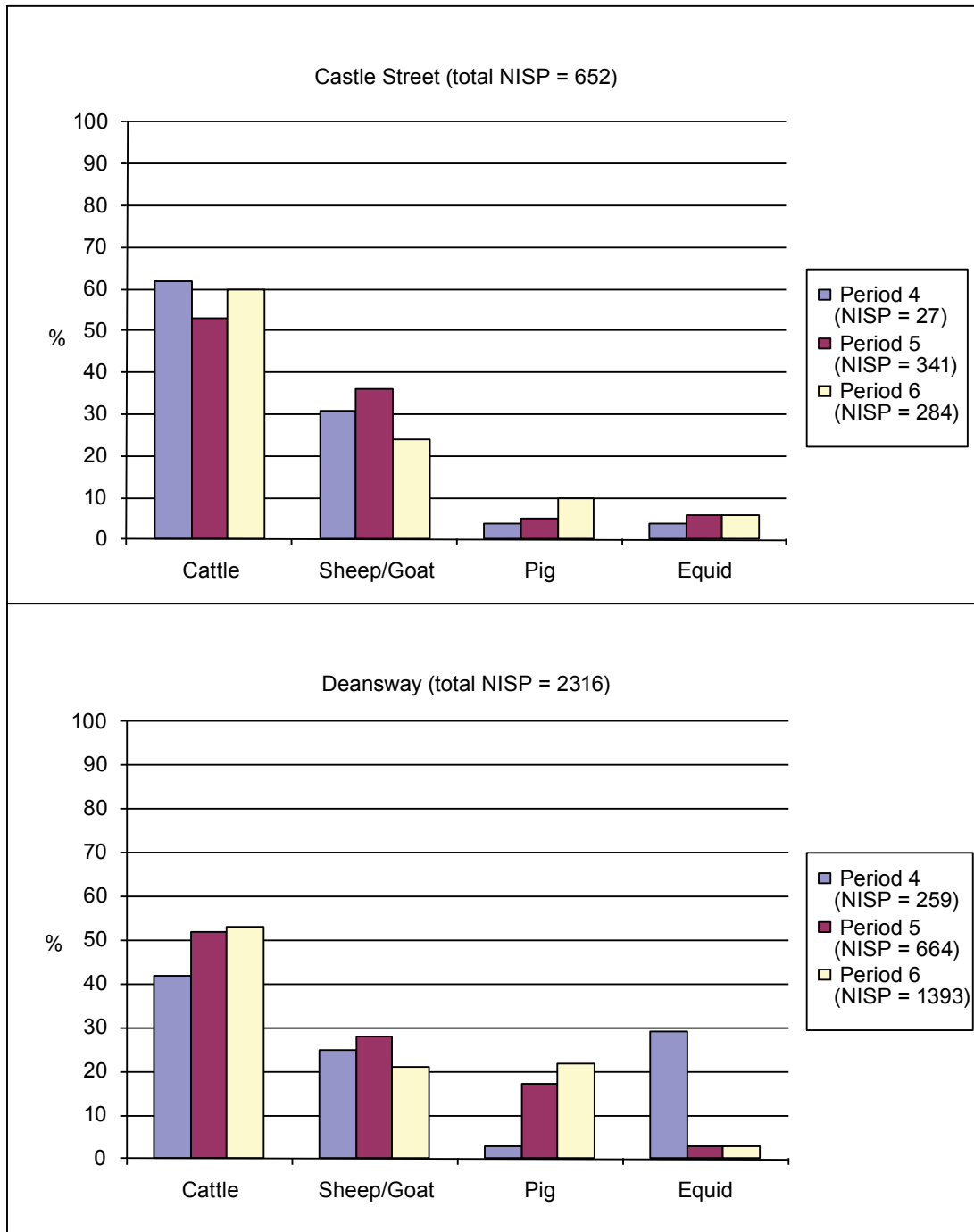


Figure 52: Frequency by Number of Identified Specimens (NISP) of the main domestic mammals by period

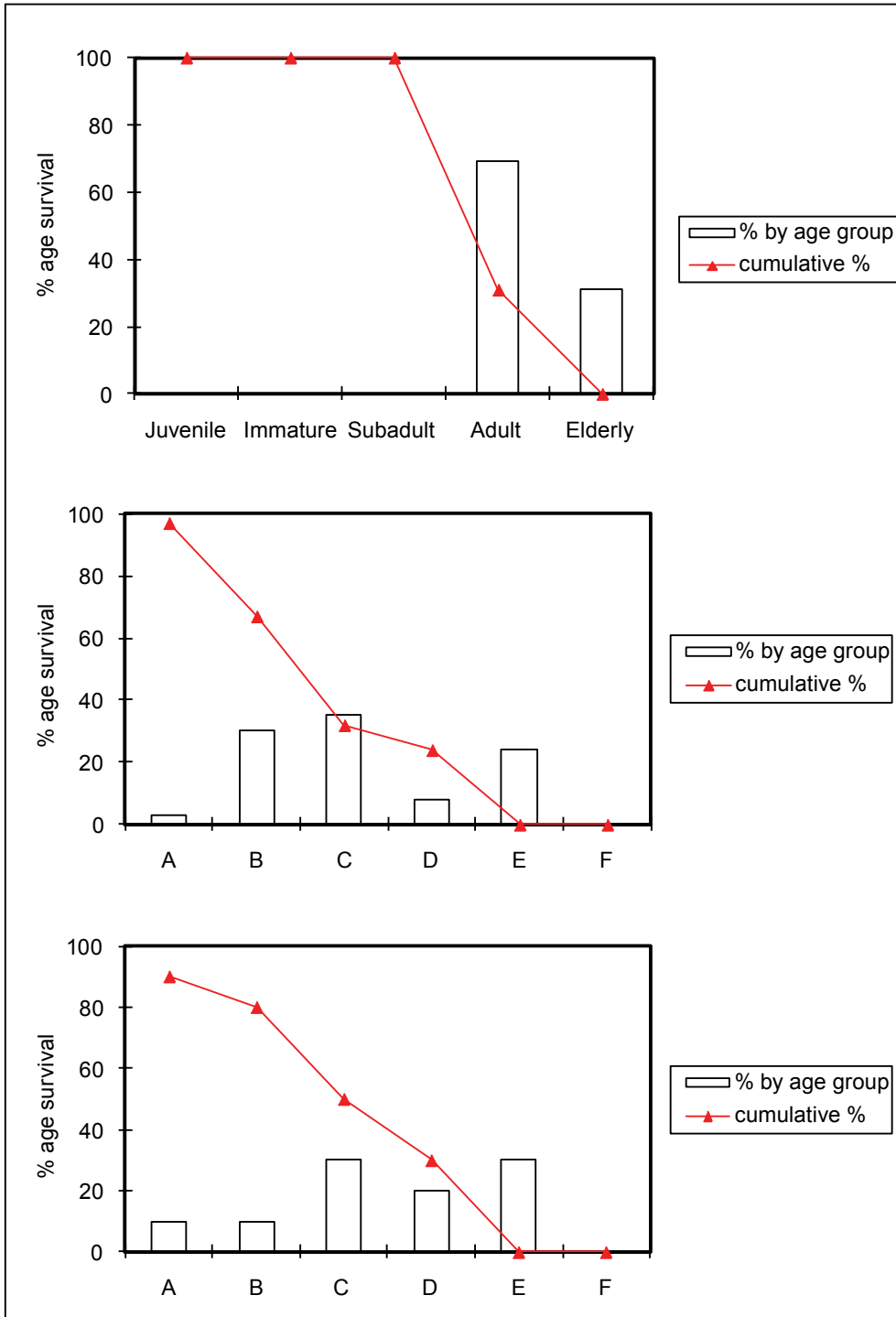


Figure 53: Distribution of cattle and sheep goat mandibles by age stage

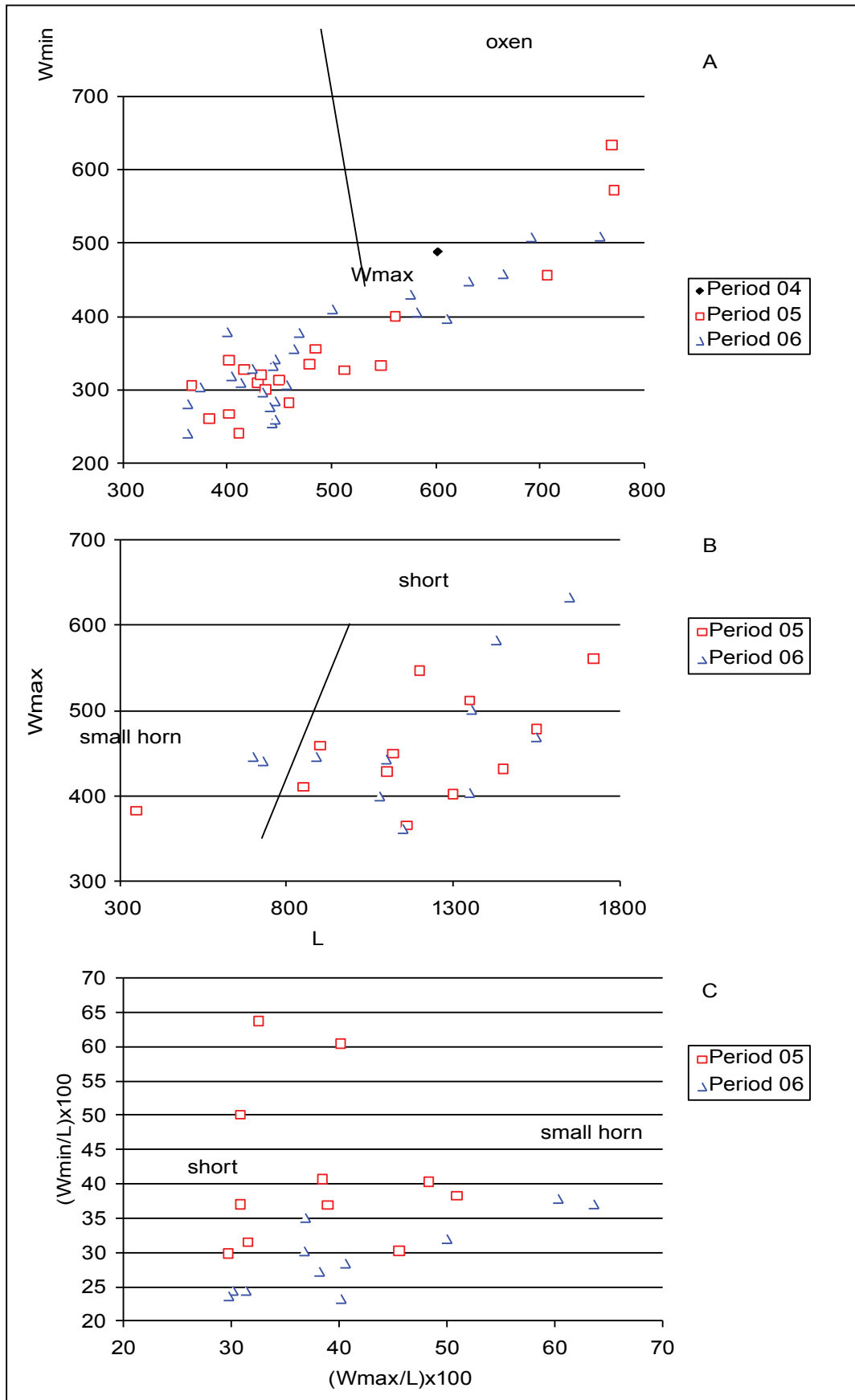
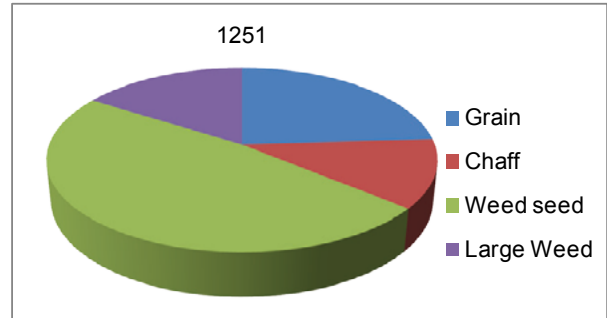
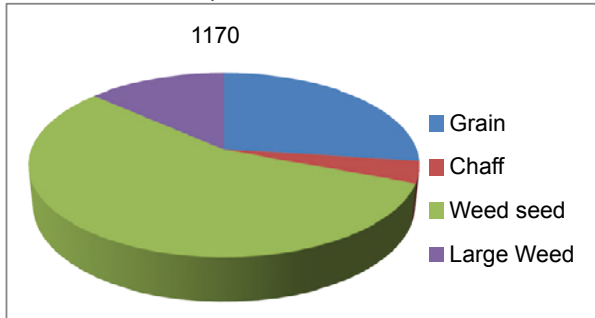


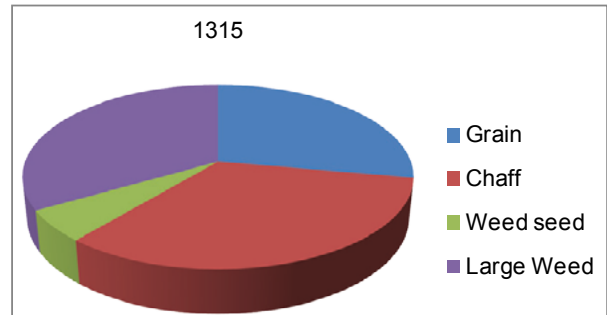
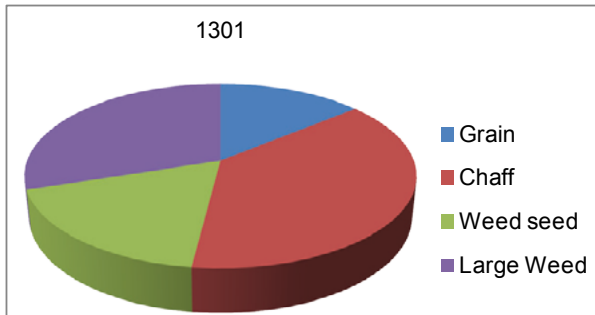
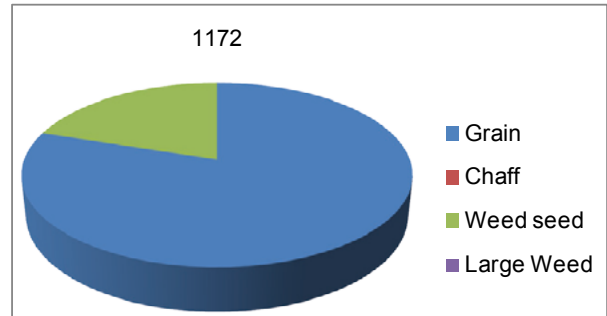
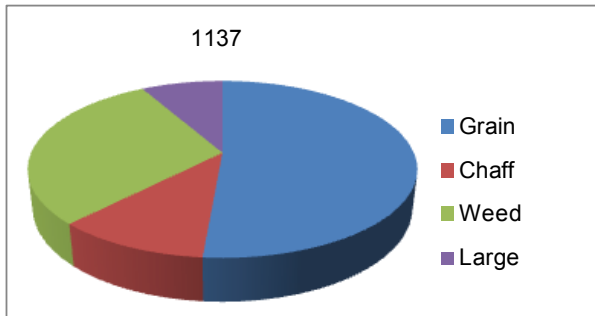
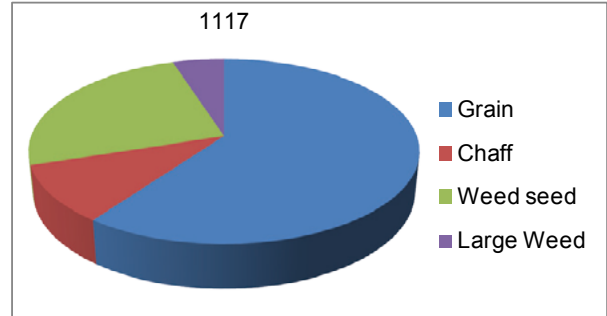
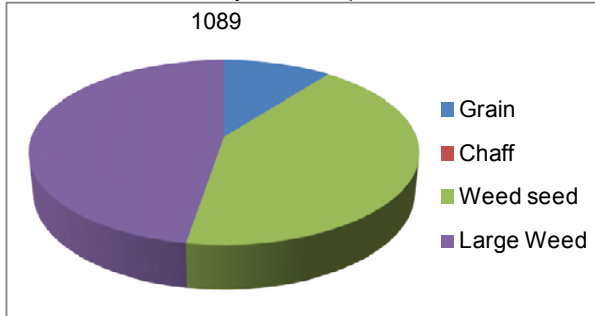
Figure 54: Cattle horncores size (A and B) and shape (C)

*to previous view*

Phase 4 structure 2 post holes



Phase 5 Roman Quarry Pits Group 1



Phase 5 Roman Ring Ditch

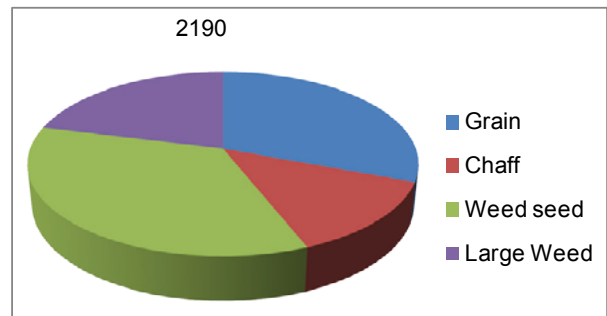
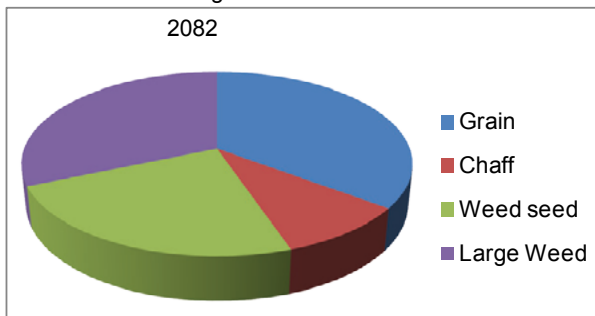


Figure 55: Proportions of charred plant remains

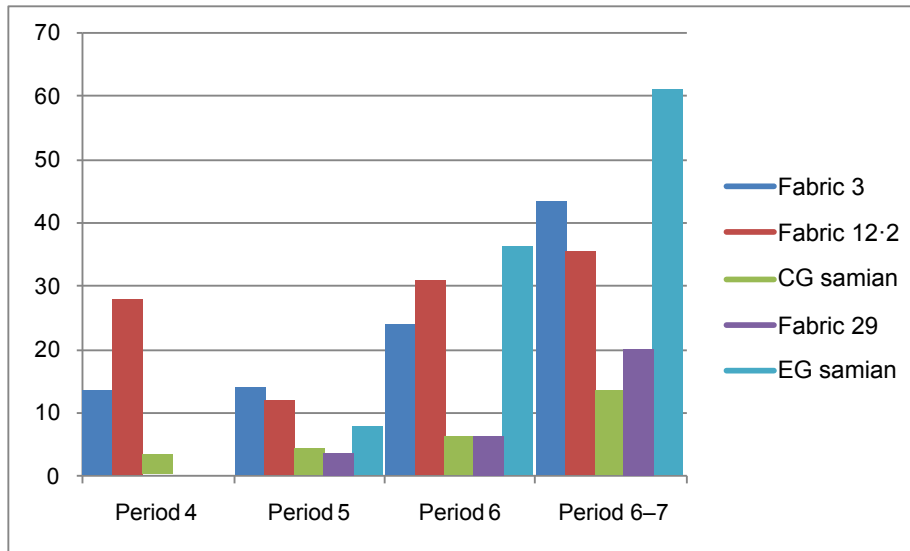


Figure 56: Roman pottery by period

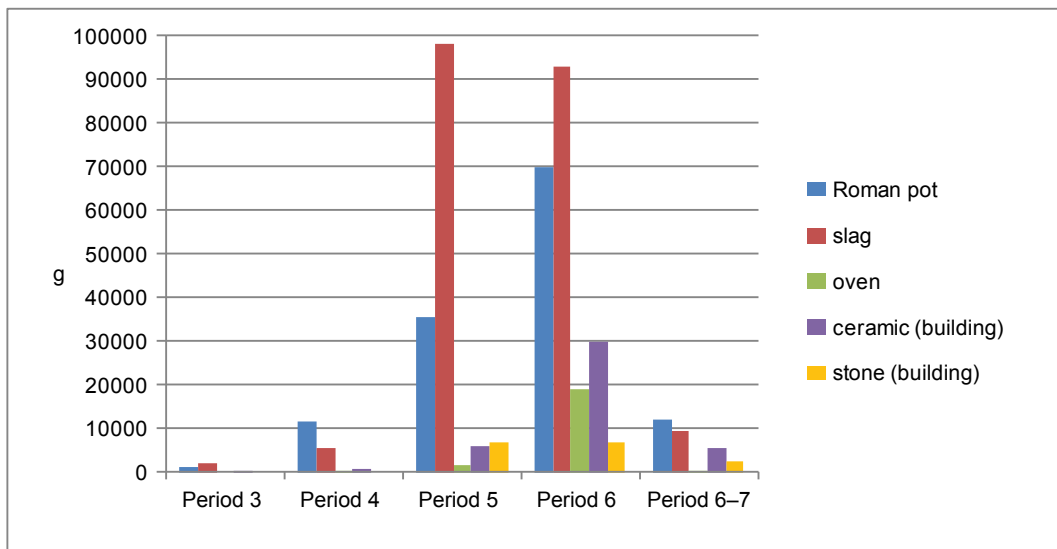


Figure 57: Major artefact assemblages by period and weight

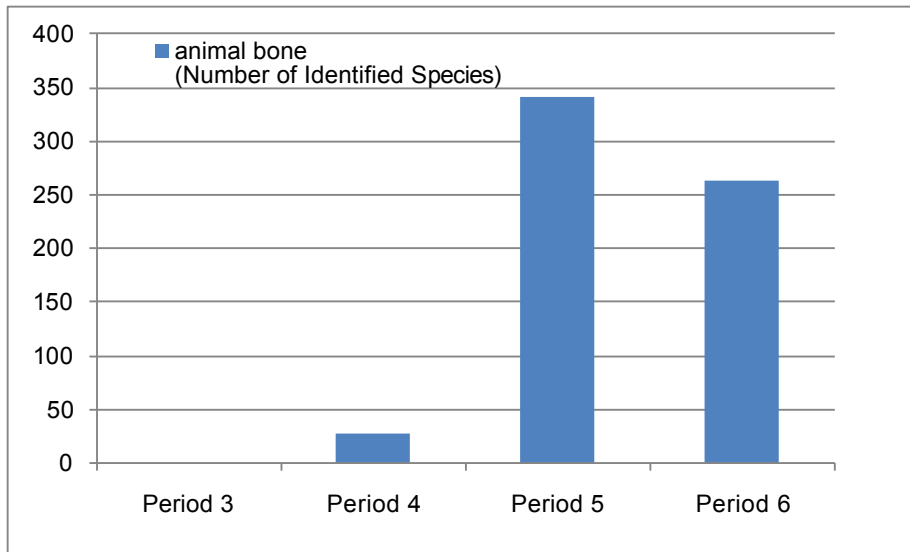


Figure 58: Animal bone by period

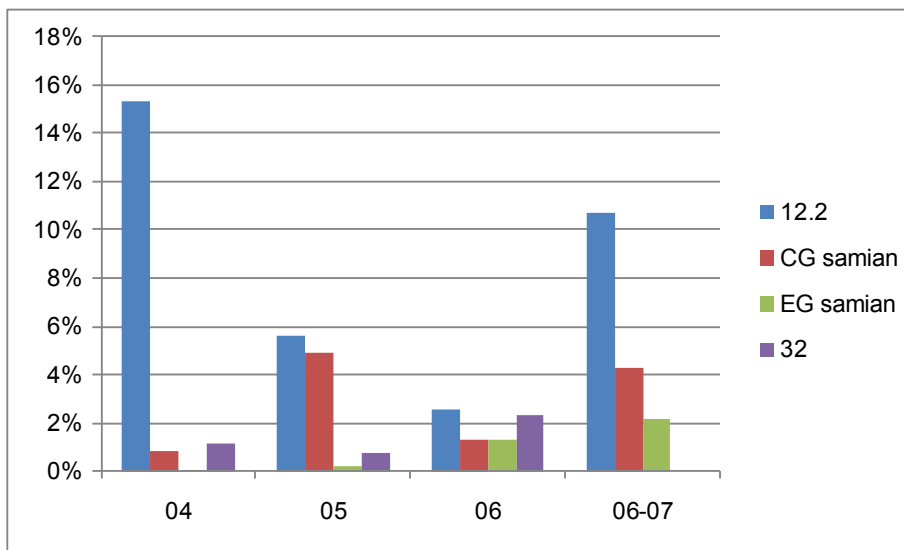


Figure 59: Selected Roman pottery fabrics by period



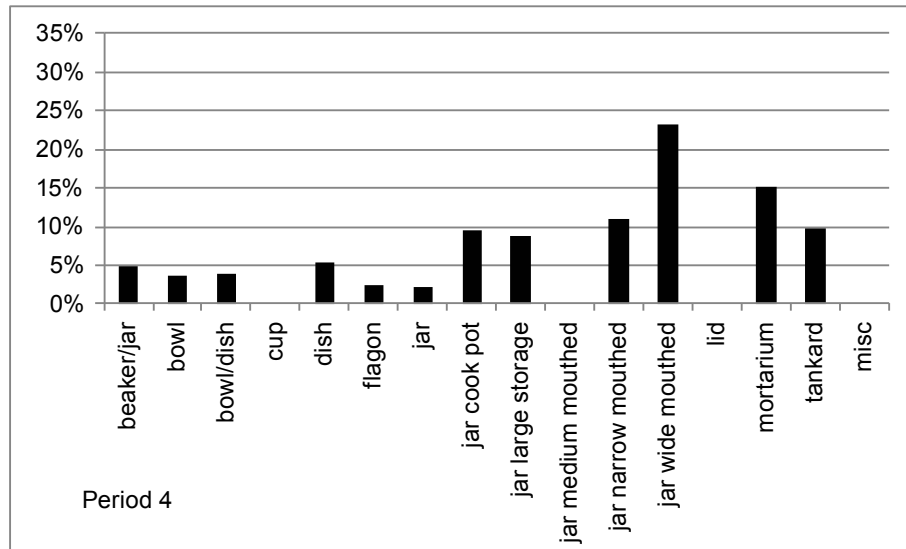


Figure 60: Period 4 pottery vessel classes (% rim EVE)

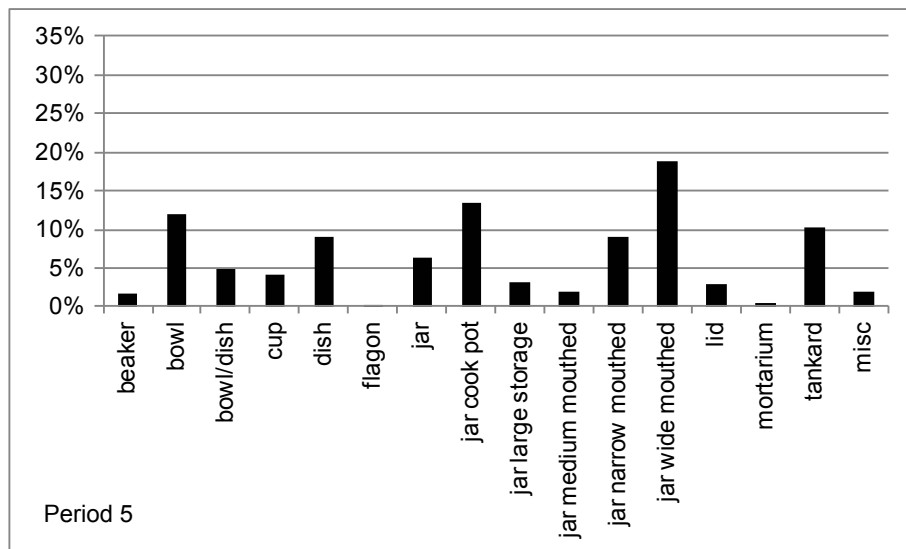


Figure 61: Period 5 pottery vessel classes (% rim EVE)

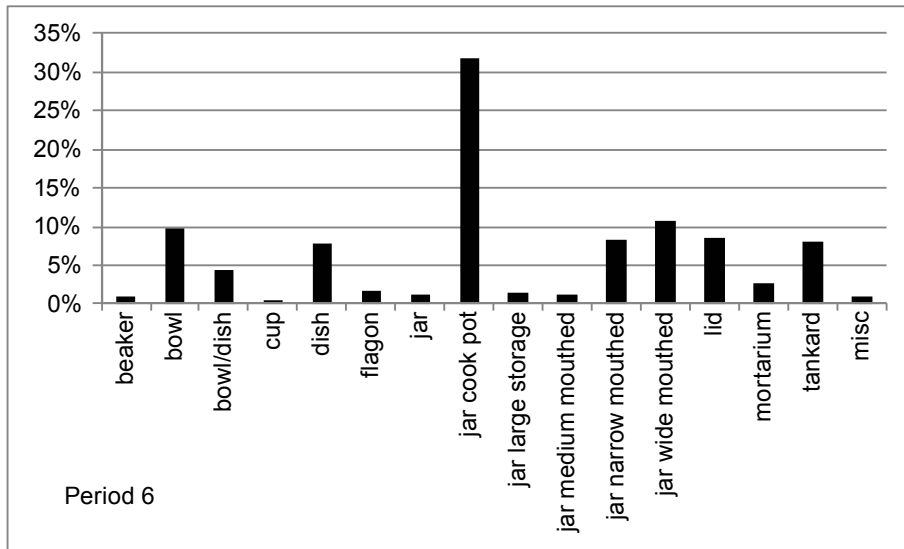


Figure 62: Period 6 pottery vessel classes (% rim EVE)

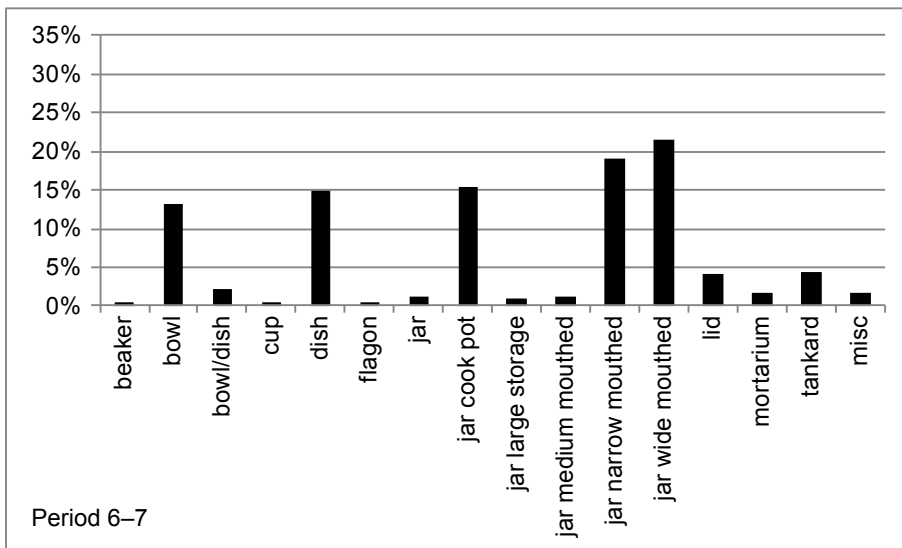


Figure 63: Period 6-7 pottery vessel classes (% rim EVE)

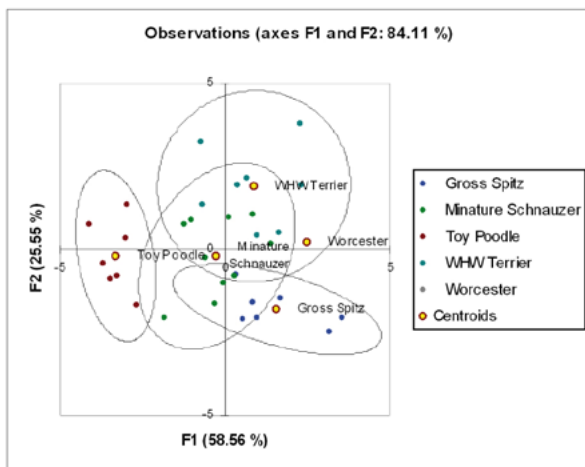
## Appendix 1

### Animal bone: discriminant function analysis of dog crania

by Ian Baxter

The late post-medieval cranium from a pit dug for a dog burial (1333, fill 1332) is compared with 32 crania of similar size belonging to 4 modern breeds from the Albert Heim collection housed at the Natural History Museum, Berne, Switzerland.

Variables/Factors correlations:				
	F1	F2	F3	F4
B	0.307	-0.253	0.531	0.646
C	0.380	-0.351	0.341	0.613
D	0.287	-0.232	0.569	0.500
E1	0.491	0.122	0.769	-0.012
F	0.757	0.227	0.359	0.303
G	0.758	-0.223	0.257	0.534
H	0.649	0.009	0.428	0.476
M	0.402	-0.663	0.289	0.312



### Occipital perforations in dog crania



City Campus, Worcester (UK)



Massey University,  
Palmerston North (NZ)



Natural History Museum,  
Berne (Switz)