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LAND SOUTH OF TUNBRIDGE HALL, TUNBRIDGE LANE, BOTTISHAM, CAMBRIDGESHIRE
RESEARCH ARCHIVE REPORT

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NGR: *TL 5460 6090*	Report No. 4506
Approved: Claire Halpin MIfA	Project Number P2620
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During August and September 2000 and between August 2006 and December 2007, Archaeological Solutions conducted two open area excavations on land south of Tunbridge Hall, Tunbridge Lane, Bottisham, Cambridgeshire, in advance of residential development. A trial trench evaluation (2003) had indicated the high potential of the site for Roman remains, including the possibility of a villa complex. *The excavations identified four phases of Roman activity. The earliest Roman remains comprised two stone buildings, which were partially revealed at the south-western edge of the site, and smaller, possibly wooden structure. These appear to have been agricultural buildings rather than parts of the conjectured villa. During Phase 2, the site was divided into ditched enclosures. A malting oven/corn drier and a second, smaller oven, were also in use. In Phase 3 (, the boundaries on site were reorganised; several new enclosures were established, including a large rectangular field/paddock with a small ?timber building in its centre. An industrial feature in Area 2 has been tentatively associated with brewing. During Phase 4 (4th century AD), land use on the site changed, with several large chalk quarry pits and numerous scattered rubbish pits. The finds from the site suggest that it lay adjacent to areas of occupation during all four phases.* *Over and above providing further information about the settlement pattern in this part of Cambridgeshire and some interesting observations regarding possible agricultural specialisms, this site is notable as it demonstrates the distinct possibility that Bottisham was the site of a Roman villa complex.*		
Project dates (fieldwork)	*August and September 2000; August 2006 – December 2007*		
Previous work (Y/N/?)	*Y*	Future work (Y/N/?)	*N*
P. number	*1222; 2620*	Site code	*HAT 432; AS1011*
Type of project	*Archaeological excavation*		
Site status			
Current land use	*Formerly pasture, now residential*		
Planned development	*Residential*		
Main features (+dates)	*Romano-British field boundary ditches, cobbled yard surface, five structures (two stone; three ?timber), large quarry and rubbish pits, malting oven or corn drier, second smaller oven (all 3rd – 4th century AD), possible brewing features*		
Significant finds (+dates)	*Early Neolithic to early Bronze Age struck flint including blades and leaf arrowheads; Romano-British pottery (largely Horningsea coarsewares), animal bone and CBM (mainly 3rd – 4th century AD), several RB coins*		
Project location			
County/ District/ Parish	*Cambridgeshire*	*East Cambridgeshire*	*Bottisham*
HER/ SMR for area	*Cambridgeshire HER*		
Post code (if known)	-		
Area of site	*1.5ha (Areas 1 & 2)*		
NGR	*TL 5460 6090*		
Height AOD (max/ min)	*11m AOD*		
Project creators			
Brief issued by	*CAPCA*		
Project supervisor/s (PO)	*Tom McDonald (HAT 432); Dan McConnell (Area 1); Chris Pole (Area 2)*		
Funded by	*Land Charter Homes*		
Full title	*Land South of Tunbridge Hall, Tunbridge Lane, Bottisham, Cambridgeshire, Areas 1 & 2: Archaeological Excavation Interim Report*		
Authors	*Andrew A. S. Newton*		
Report no.	*4506*		
Date (of report)	*January 2014*		

LAND SOUTH OF TUNBRIDGE HALL, TUNBRIDGE LANE, BOTTISHAM, CAMBRIDGESHIRE. RESEARCH ARCHIVE REPORT

SUMMARY

During August and September 2000 and between August 2006 and December 2007, Archaeological Solutions conducted two open area excavations on land south of Tunbridge Hall, Tunbridge Lane, Bottisham, Cambridgeshire, in advance of residential development. A trial trench evaluation (2003) had indicated the high potential of the site for Roman remains, including the possibility of a villa complex.

The excavations identified four phases of Roman activity. The earliest Roman remains comprised two stone buildings, which were partially revealed at the south-western edge of the site, and smaller, possibly wooden structure. These appear to have been agricultural buildings rather than parts of the conjectured villa. During Phase 2, the site was divided into ditched enclosures. A malting oven/corn drier and a second, smaller oven, were also in use. In Phase 3 (, the boundaries on site were reorganised; several new enclosures were established, including a large rectangular field/paddock with a small ?timber building in its centre. An industrial feature in Area 2 has been tentatively associated with brewing. During Phase 4 (4th century AD), land use on the site changed, with several large chalk quarry pits and numerous scattered rubbish pits. The finds from the site suggest that it lay adjacent to areas of occupation during all four phases.

Over and above providing further information about the settlement pattern in this part of Cambridgeshire and some interesting observations regarding possible agricultural specialisms, this site is notable as it demonstrates the distinct possibility that Bottisham was the site of a Roman villa complex.

1. INTRODUCTION

This report comprises the research archive for archaeological excavations at land south of Tunbridge Hall, Tunbridge Lane, Bottisham, Cambridgeshire, undertaken by Archaeological Solutions Ltd (formerly Hertfordshire Archaeological Trust) during August and September 2000 and between August 2006 and December 2007. The work was commissioned by Hunting Gate Anglia Ltd and Land Charter Homes.

Prior to the first phase of fieldwork on which this document reports (that undertaken during August and September 2000), no formal archaeological excavation had been undertaken in Bottisham although stray finds and evidence from field-walking attested to prehistoric, Roman and medieval activity in the parish.

2 SITE NARRATIVE

2.1 Overview

During August and September 2000, Hertfordshire Archaeological Trust (HAT; now Archaeological Solutions Ltd) carried out an archaeological excavation on land at Tunbridge Lane, Bottisham, Cambridgeshire (TL 5453 6095; Figs. 1, 2 and 3). This work was carried out under the site code HAT432). The work was commissioned by Hunting Gate Anglia Ltd in advance of a proposed new surgery. The excavation was undertaken as part of a planning condition imposed by the Local Planning Authority, based on advice from Cambridgeshire County Council County Archaeology Office (CCC CAO). The proposed development comprised the construction of medical and dental surgeries on the site (Planning application no. E/99/0824). The archaeological excavation was conducted in accordance with a brief prepared by CCC CAO (dated 19/06/00), and a specification compiled by HAT (dated 31/07/00). It compiled with the Institute of Field Archaeologists' (IFA) *Code of Conduct* and *Standard and Guidance for Archaeological Excavations.*

Between August 2006 and December 2007, Archaeological Solutions Ltd (AS; formerly Hertfordshire Archaeological Trust) carried out two phases of open area excavation (Area 1, August 2006 to January 2007; Area 2, September to December 2007) on land south of Tunbridge Hall, Tunbridge Lane, Bottisham, Cambridgeshire (NGR TL 5460 6090; Figs. 1, 2 and 3), which was located immediately adjacent to the new surgery site. This work was carried out under the site code AS1011. The excavation was commissioned by Land Charter Homes in advance of proposed residential development, and was carried out as part of a planning requirement of the local planning authority (based on advice from Cambridgeshire County Council Archaeology Planning and Countryside Advice (CAPCA)). The archaeological excavation was conducted in accordance with a brief issued by Cambridgeshire Archaeology Planning and Countryside Advice (Kasia Gdaniec; dated 17th August 2005), and a Specification compiled by AS (dated 26th July 2006). It complied with the Institute for Archaeologists' (IfA) *Code of Conduct* and *Standard and Guidance for Archaeological Excavation* (revised 2001) and the *Standards for Field Archaeology in the East of England* (Gurney 2003).

The archaeological potential of the latter site for Romano-British remains had been demonstrated by a trial trench evaluation carried out by Cambridge University Archaeological Unit in 2003 (Wills 2003). Roman archaeology had previously been shown to be present in the immediate vicinity due to the excavation work conducted at the immediately adjacent doctor's surgery site (HAT 432; McDonald 2000; Pearson and O'Brien 2006).

2.2 Description of the site

The site lies in the northern part of the village of Bottisham, some 10km east of Cambridge (Figs. 1 & 2). It is located on the south-east side of Tunbridge

Lane, a minor road between Bottisham and Swaffham Bulbeck, approximately 450m north of the parish church.

The new surgery site (HAT 432) comprised a rectangular plot of land measuring 2960m². The land south of Tunbridge Hall site (AS 1011) was an irregularly-shaped plot adjacent to the new doctors' surgery, comprising two fields lying under pasture. Cartographic sources show this land to have been part of Tunbridge Hall Farm for at least the past 200 years. Prior to the excavation, it was believed that the site had been under pasture for much of this period and that it had therefore not been subject to modern deep ploughing. The proposed development was divided into two phases: Area 1, comprising the west field, and Area 2, the east field.

2.3 Background

2.3.1 Topography, geology and soils

The site lies at a height of *c.* 11m AOD and is generally level. The solid geology of the area is a *c.* 3km wide band of Lower Chalk which skirts the south-eastern fen edge on a south-west to north-east alignment at a height of 10-15m AOD (Hey & Perrin 1960). The chalk is overlain by River Terrace Gravels and (drained) fen marsh deposits, with patches of drier land, which include the northern part of Bottisham in which the site lies. A few minor watercourses dissect the landscape, including a stream that rises at Whiteland Springs, passes *c.* 250m north-east of the site and flows into Swaffham Bulbeck Lode about 2km further north. The area around Bottisham is characterised by thin chalky drift soils.

2.3.2 Archaeological and historical background

The chalk ridge which runs south-west to north-east immediately east of Bottisham has numerous cropmark ring-ditches representing ploughed-out late Neolithic and Bronze Age barrows, although fieldwalking to the east of the village has yielded little evidence of occupation at this time. Settlement and topographic evidence suggests that the site would have lain in the 'mortuary zone'. The possible earlier ceremonial importance of the area is attested by a possible cursus to the north (HER 6605) and the Neolithic causewayed enclosure at Great Wilbraham, 3km to the south.

In the wider area, Roman settlement is attested by the remains of a villa in Swaffham Prior and a recently-excavated 1st and early 2nd century temple complex at Gallows Hill, Swaffham Prior, *c.* 4km north-east of the site (Malim 2006). A second possible Romano-Celtic temple (probably 3rd – 4th century) has been identified through geophysical survey and trial trenching at Whiteland Springs, 1.3km south-east of the site (Robinson 1992). As noted by Robinson, the distribution of Roman settlements in this area correlates closely with the springs rising at the interface between the Middle and Lower Chalk beds. On the whole, Roman settlement consists of well-dispersed small farm

estates (*ibid*.), although with a few high-status sites such as the villa at Swaffham Prior and a second possible villa at Swaffham Bulbeck, *c*. 1.5km north-east of the present site (Swaffham Bulbeck site 1; Hall 1996, 112). Recent excavations in Bottisham itself have revealed extensive evidence of a Roman rural settlement (McDonald 2000; Pearson & O'Brien 2006; Kenney 2008, see below).

In comparison with the numerous settlements and cemeteries of the Cam valley, there are few Anglo-Saxon finds from the fen edge. An isolated disc brooch was found by metal detecting at the southern end of the village (HER 6599) and later Anglo-Saxon coins and metalwork have been found further east (HER 6628, 6629). There was clearly some post-Roman activity in the area, as suggested by the reuse of the Roman temple at Gallows Hill (see above) as a burial ground in the 6th/7th century AD (Malim 2006, 112).

The medieval settlement of Bottisham is characterised as a 'street' village. However, it may represent the eventual nucleation of a more dispersed pattern of hamlets found within the parish. This earlier pattern may have had its origins in the Roman period. Although very close to the present Tunbridge Hall, the site is apparently some distance from the original medieval manor.

2.3.3 Previous archaeological work at this site

2.3.3.1 Evaluation of the new surgery site (Seddon 2000)

The evaluation revealed a sequence of Romano-British enclosure ditches to be present on the site. These were believed to have related to agricultural exploitation though the quantities of ceramics and other finds suggested that occupation occurred close by. The ditches generally appeared to be co-axial and aligned with the present field boundaries, though F1007 followed an unusual, curving alignment that indicated a possibly different origin

The finds from the ditches suggested a general date of the 2nd century AD and generally comprised locally produced wares (such as from the Roman kilns at Horningsea).

Prior to this evaluation, Romano-British occupation of the Bottisham area was poorly-defined but known, nonetheless. Robinson (1992) noted that the distribution of Roman settlement in the Bottisham area resembled the modern settlement pattern, situated where the springs rise on the interface of the chalk beds, mainly comprising well-dispersed small farm estates. The possible Romano-Celtic temple site some 1.3km to the east-south-east is of importance, associated with shelly wares of the 3rd-early 4th century. Finds spots in the vicinity of the site (such as to the north of Tunbridge Lane) were considered to attest to small-scale activity locally.

2.3.3.2 Evaluation of the land south of Tunbridge Lane site (CAU; Wills 2003)

The evaluation of the larger part of the site was carried out by Cambridge University Archaeological Unit in April-May 2003 (Figs. 3 & 4) and was preceded by a geophysical magnetometer (gradiometer) survey by Oxford Archaeotechnics (Johnson 2003). Following machining, the density of archaeological features revealed in the 14 trial trenches (total length 365m) led to a re-evaluation of the investigation strategy and the emphasis of the work was redirected towards testing the survival and extent of the archaeology rather than full excavation of features.

The evaluation of the site found linear features (ditches/slots), pits and postholes, largely dated to the later Roman period (probably mainly *c.* AD 250 – 400) based on pottery recovered from their surfaces/upper fills.

In addition to linear features, structural remains were revealed in two trenches. In Trench 3, in the West Field (Area 1 of the site), a possible north to south aligned wall footing was identified (F.84). The base of the wall was constructed of chalk blocks and fragments of ceramic building material; roof and box flue tile and painted plaster were also recovered (Wills 2003, 7, figs. 7 & 9). Possible postholes were observed in a beam slot [022], which may represent the wall foundation. In Trench 9 (and 15, a western extension of Trench 9), in the East Field (Area 2 of the site), a substantial north-north-east to south-south-west aligned rammed chalk wall footing (0.90m wide x 0.25m deep) was identified (F.2; Wills 2003, 8, figs. 8 & 9).

The evaluation suggested that the site contained well-preserved features associated with a late Roman settlement, probably including remains of buildings, enclosures and field systems. The presence of three different ditch alignments (north-east to south-west, north-west to south-east and north to south) was thought to possibly indicate three separate phases of occupation. The stone-built wall footings and the recovery of associated roof and box flue tiles, *opus signinum* and painted wall plaster suggested the presence of well-constructed high-status buildings. The faunal assemblage suggested that cattle played an important part in the economy of the site, while the presence of slag fragments hinted at industrial processes being carried out.

Finds assemblages recovered during this evaluation have been incorporated into the finds assemblages recovered during excavation, where possible, and the material is reported on as a whole within this document.

2.3.3.3 Geophysical survey and test pitting (Stratascan & AS)

Prior to excavation, the two areas of the land to the south of Tunbridge Lane site were subject to phases of reconnaissance comprising Resistivity survey, test pitting of the B-horizon, and Magnetic Susceptibility survey (Fig. 5).

The Resistivity survey of Area 1 produced relatively poor results, with only two archaeological features identified with any certainty, both as low resistance anomalies. The first of these was a probable boundary ditch running north-west to south-east across the excavation area; the second was an 'L'-shaped linear feature, thought to represent either an enclosure ditch or a wall line. The Resistivity survey also identified numerous north-east to south-west aligned anomalies, which were confirmed during subsequent machining to be remains of agricultural ridge and furrow. The Resistivity survey of Area 2 produced more useful results, identifying several possible north-east to south-west aligned positive linear anomalies, possibly Roman boundary ditches, in addition to scattered positive area anomalies, possibly indicating the presence of archaeological cut features such as pits and postholes. Clusters of these localised positive anomalies were present in the south-west, north-west and far south-east of Area 2, with a large possible pit located in the central eastern part of the excavation. Extensive magnetic disturbance along the western boundary of Area 2 was probably the result of the earlier machining of the Area 2 Road Corridor.

A programme of test pit sampling in each area was undertaken in order to assess finds distribution and to identify potential concentrations of occupation/ industrial activity. In Area 1, finds were variable, but high concentrations of Roman tile, pottery and animal bone suggested that domestic-type activity was concentrated in the central and south-western parts of the excavation area. In Area 2, finds were much sparser, with little recovered from the test pits apart from a handful of struck flints.

Following the test pitting of each area, Magnetic Susceptibility surveys were carried out. In Area 1, the survey clearly displayed a high set of values centred on the south-west corner of the excavation area, to the south of a north-west to south-east aligned boundary ditch which crossed the centre of the site. This high set of values was thought to correspond to at least one building or demolition spread. The boundary ditch appeared to enclose an occupation area to the south, with paddocks and field systems extending to the north. North of the boundary ditch, a second high value anomaly (just north of the adjacent New Drs Surgery building) was tentatively identified as a kiln or other industrial feature.

2.3.4 Previous archaeological work in the surrounding area

2.3.4.1 No. 31 Tunbridge Lane (CAU/OAE; Kenney 2008)

A small site on the opposite side of Tunbridge Lane, to the south-west of the present site, was excavated by Cambridge County Council Archaeological Field Unit (now Oxford Archaeology East) in 2002 (Fig. 3). The investigation revealed Roman activity, mainly of 2nd-3rd century date, but possibly continuing to the end of the Roman period.

Phase 1 at No. 31 Tunbridge Lane comprised a possible prehistoric buried soil of brownish-yellow sandy clay. An assemblage of 42 early Neolithic and

Bronze Age worked flints was found scattered across the surface. After this initial period of possible prehistoric land use, all other remains were Romano-British. Phase 2 (AD 100-120) saw the cutting of numerous small pits and postholes, suggesting that the site was an unenclosed area used for small-scale industrial processes and disposal of rubbish. In phase 3 (AD 120-140), a large boundary ditch was established, with a narrower curvilinear ditch nearby apparently enclosing an area to the north-west of the site.

In phase 4 (AD 120-140), six linear flues, discoloured and hardened by burning, were cut through the boundary ditch, and in turn cut by a recut of the ditch. During phase 5 (AD 150-250), two further moderately-large boundary ditches were dug, in addition to a possible oven/corn drier and several pits. In phase 6 (AD 270-410), a new large boundary ditch was laid out in the south of the site, with a later corn drier or malting oven cut into the top of the ditch. The final period of activity on the site (phase 7) saw a single straight ditch cut across the site. The alignment of the ditch contrasted with that of almost all the earlier linear features, which had been orientated either parallel or perpendicular to the line of Tunbridge Lane. Although the ditch only yielded 3rd century finds, the 'dramatic' change of alignment is thought to indicate a post-Roman date.

2.4 Excavation Methodology and Deposit Model

2.4.1 Excavation Methodology

The new surgery site

The excavation of the new surgery site was conducted in accordance with the brief and specification, and conformed to the guidelines of CCC CAO and the IFA. A single excavation trench (46m x 15.5m, with a small extension to the north-west) overlay the footprint of the proposed new building. Because of the presence of trees subject to preservation orders the remainder of the construction (access and car parking) was not subject to ground disturbance.

The overburden was mechanically excavated under archaeological supervision using a 360° tracked excavator fitted with a toothless ditching bucket, thereafter all work was undertaken by hand. Exposed surfaces were cleaned and examined for archaeological features. Deposits were recorded using *pro-forma* recording sheets, drawn to scale and photographed where appropriate (Figs. 6 & 7).

Land to the south of Tunbridge Lane: Area 1

The two excavation areas comprising the land to the south of Tunbridge Lane site were stripped of topsoil under close archaeological supervision using a mechanical excavator fitted with a toothless ditching bucket.

Following topsoil stripping, Resistivity survey, metal detecting, grid-based test-pitting were undertaken in Area 1 (see Section 5 above). Mechanical excavation then continued under close supervision, to the top of the archaeological surface (`high strip'). Magnetic Susceptibility survey and phosphate sampling on a 5m grid were undertaken. Mechanical excavation then continued, under close supervision, to the level of the archaeological features (Figs. 6 & 7).

Land to the south of Tunbridge Lane: Area 2

Based on the specialists advice the strategy was altered slightly. Following topsoil stripping, metal detecting and grid-based test-pitting were undertaken in Area 2. Mechanical excavation then continued under close supervision, to the top of the archaeological surface (`high strip'). Resistivity survey, Magnetic Susceptibility survey, and phosphate sampling on a 5m grid were undertaken (see Section 5, above). Mechanical excavation then continued, under close supervision, to the level of the archaeological features.

Exposed surfaces were hand cleaned and all further excavation was undertaken manually. Deposits were recorded using pro-forma recording sheets and photographed as appropriate. All feature sections were drawn to scale and the site was planned digitally using a total station theodolite (Nikon NPL 820). In addition, the excavation area and the spoil were checked and scanned for finds with a metal detector.

Pits and postholes were half-sectioned, while linear features were excavated in slots providing a minimum of 10-20% coverage. Slots were positioned for optimal determination of inter-feature relationships. Intrinsically interesting features e.g. structural remains, ovens and burials, were 100% excavated (Figs. 6 & 7).

2.4.2 Deposit Model

Within that part of the site excavated as AS 1011 Topsoil (L2000 (=L4000)), comprising loose dark brown silty sand with occasional chalk and flint inclusions (<100mm), was present across the whole site. It was up to 0.64m deep in Area 1, but no more than 0.31m deep in Area 2. It was removed during machining. A moderate assemblage of finds was recovered from the topsoil in Area 1, including 33 sherds (288g) of late 3rd to mid-4th century pottery, some CBM and several Cu alloy coins (**SFs 2-4**). No finds were present in the topsoil of Area 2.

Below Topsoil L2000 (=L4000) was Subsoil L2001 (=L4001), a loose mid to dark brown silty sand with occasional grey patches and frequent small sub-

rounded chalk and flint inclusions (<50mm). It was present across the whole site and was up to 0.38m deep in Area 1 and 0.34m deep in Area 2. It sealed all the Roman features. L2001 contained a large number of finds, including significant quantities of pottery (2nd – 4th century) and CBM (144kg recovered during machining, in addition to large quantities from some test pits). The subsoil of Area 2 (L4001) also contained large quantities of finds, including 42 sherds of post-medieval pottery and numerous Roman finds (including 264 Roman potsherds). The ceramic and stratigraphic evidence suggests that the subsoil was a post-medieval/modern agricultural soil, containing residual Roman finds which had been ploughed-out from the underlying archaeological features.

The very large quantity of (mainly Roman) finds present in the subsoil is almost certainly to be explained as a consequence of ploughing at some point in the site's history. It was initially believed (following the evaluation) that the site had not been subject to ploughing, but this is unlikely to be the case given the evidence to the contrary. Not only were large quantities of Roman material recovered from Subsoil L2001 (=L4001), but the underlying features, particularly in the south and east of the site, almost certainly did not survive to their original depth (e.g. the ditches forming the south-western boundary of the main Phase 3 enclosure in Area 1). The south-eastern corner of the site also showed some evidence, particularly in section, for ridges and furrows left by arable cultivation, and a possible 'headland' deposit, resulting from the build-up of ploughsoil at the corner of a field, was observed in the south-west facing baulk at the east end of Area 1.

In the southern parts of Area 1, a patchy buried soil layer (L2002 (=L2850)) survived. It was a compact light to mid orange/brown silty sand with occasional angular flint and chalk pebbles (<50mm). The extent of L2002 (=L2850) was not clearly seen; it was mainly present in the south-west corner of Area 1 and running along the south-western boundary of the excavation area, but not extending as far as the south-east corner of Area 1. It probably extended no more than *c*. 12.5m north of the southern limit of the Area 1 excavation, disappearing close to the boundary demarcated by Ditch F2934 (=F3063) during Phase 3 and Ditch F2791 (=F2884) in Phase 4. It varied in depth, hardly being present at all in the extreme south-west corner, where Structure S2901 was located, but extending to a depth of up to 0.18m elsewhere.

The limits of Buried Soil Layer L2002 (=L2850) were often hard to discern with certainty and made interpretation of stratigraphic relationships in this part of Area 1 difficult. It certainly sealed several Phase 2 features, which were only revealed following its removal (e.g. Gullies F3023 and F3068). However, several other Phase 2 features, particularly those associated with the reorganisation of the original Phase 2 ditch system later in the phase (e.g. Gully F2950 and Ditch F2804 (=F2854, F2978, F3109)), were cut into Buried Soil L2002 (=L2850). On the basis of these relationships, it seems most likely that the formation of L2002 (=L2850) was an ongoing process during Phase 2, resulting from whatever activity was taking place in this area of the site. It is perhaps most likely to represent a mid to late 3rd century ploughsoil or a build-

up of material through manuring, although its composition and the lack of associated finds is perhaps difficult to reconcile with the latter interpretation.

A very similar buried soil layer (L4002), sealed beneath Subsoil L4001, survived across Area 2. It was identical in appearance to L2002 (=L2850), comprising compact light to mid orange/brown silty sand with occasional angular flint and chalk pebbles (<50mm). Like L2002 (=L2850), the extent of L4002 was difficult to discern; it was present within Area 2 Test Pits 1 and 2, to the north-east of the main Area 2 excavation, as well as in places within Area 2 itself. The maximum depth of the layer was 0.28m. During excavation, it was thought that L4002 was a prehistoric soil layer. It filled possible Glacial Feature F4412, in the far south-west corner of Area 2, and where present, Roman features in Area 2 were always cut through it. A similar buried prehistoric soil was present at 31 Tunbridge Lane (Kenney 2008). However, the near-identical buried soil in Area 1 of the site (L2002 (=L2850)) was seen to seal some Roman features. There are two possible explanations for this discrepancy. First, despite their very similar appearance, L2002 (=L2850) and L4002 may have actually been different deposits. In support of this is the fact that L2002 (=L2850) did not extend as far as the south-east corner of Area 1, seemingly petering out in the direction of Area 2. In contrast, L4002, though patchy, was noted across the whole of excavation Area 2, rather than being a localised deposit restricted to one part of the site. The second possible explanation for the discrepancy in the stratigraphic positions of L2002 (=L2850) and L4002 is that there was an error in on-site recording. Particularly in the south-west corner of Area 1, where there was a complex sequence of intercutting linear features, it was difficult to discern L2002 (=L2850) from the subsoil/the fills of the numerous features concentrated in this area.

The natural drift (L2040 (=L4003)) comprised off-white to mid brown clayey chalk brash resulting from the weathering of the surface of the underlying chalk geology. It was broken by occasional solution hollows filled with mid orange/brown silty sandy clay.

2.5 Phasing

On the basis of artefactual evidence, stratigraphy and spatial relationships, features have been divided into six phases (Table 1, below; Figs. 6, 7 and 8). The first four of these phases are Roman, followed by two phases of small-scale post-medieval and modern activity. Preceding the Roman activity, the site appears to have been subject to limited Neolithic to early Bronze Age and late Bronze Age activity as evidenced by the presence of unstratified struck flint, indicative of the former period, and residual pottery dated to the latter period.

The Roman pottery assemblage is almost uniformly dated to the late 3rd to 4th centuries AD. It comprises a consistent set of vessel and fabric forms and types indicative of this date and demonstrates that Roman activity occurred within a fairly short timeframe. This indicates rapid development of the Roman

period layout of the site, which is demonstrable through the stratigraphic evidence. Where available, it is notable that the coins recovered from the site are consistent with the dating of the phases from which they were recovered, with each individual coin being contemporary with, or slightly earlier in date than, the phase to which the context from which it was recovered was assigned.

Phase	Period	Date
-	Pre-Roman	Prior to AD 43. Features include: • Geological palaeochannels/solution hollows • Natural tree boles- natural features may be later in date than AD 43 but pre-date Roman activity at this site • Unstratified Neolithic- early Bronze Age struck flint and residual late Bronze Age pottery
Phase 1	Roman	Pre-/early 3rd century AD
Phase 2	Roman	3rd century AD
Phase 3	Roman	Late 3rd - early 4th century AD
Phase 4	Roman	4th century AD
-	Unphased Roman	Pre 3rd century to 4th century AD
Phase 5	Post-medieval	AD 1500- AD 1750
Phase 6	Modern	AD 1750 onwards
-	Undated	-

Table 1: Phase summary

2.6 Pre-Roman natural features and unstratified prehistoric artefacts

2.6.1 Geological features

A notable feature of Area 1 of the AS 1011 site was the large number of geological features which had disturbed the surface of the natural chalk brash (L2040). These were characteristically elongated and irregular in plan, sometimes up to 15m or more long by around 2-3m wide, but generally not more than 0.10 - 0.15m deep. They usually had irregular uneven sides and flattish bases. It was initially thought that they might be manmade linear features, so segments were dug through several to investigate them further (e.g. F2076, F2019, F2921 (=F2715), F2891, F2861 and F2899; Figs 7.1 & 7.2). However, in addition to their irregular plans and profiles, they were generally found to have orange-mottled sandy, stony fills contrasting with the usually mid to dark grey/brown clayey silt fills of the majority of the manmade features on the site. It therefore seemed more likely that they were natural in origin. They were present across excavation Area 1, but were particularly prevalent in the centre and south-east corner.

Where stratigraphic relationships with phased features existed, the palaeochannels always predated the Roman archaeology. Several contained small assemblages of cultural material; notable in this respect was F2921 (=F2715), which contained nearly 10kg of animal bone. This material may

have been intrusive from Ditch F2098, which truncated the palaeochannel. It is possible that the palaeochannels were present as open undulations in the ground surface during the 3rd and 4th centuries AD, when the site was in use, and that they were sometimes deliberately used for dumping unwanted 'rubbish'. Perhaps the most significant feature of the palaeochannels was that they consistently followed the same north-east to south-west alignment.

The process behind the formation of these channels is unknown. They may represent glacial scarring, an explanation which may explain their consistent north-east to south-west alignment. Alternatively, they may be solution hollows resulting from freeze/thaw weathering and the break-up of the natural chalk. This could lead to localised pockets of sunken ground, which then gradually filled in with natural silt, sand and small quantities of manmade material over time. The consistent alignment of the majority of these features might be a result of lines of weakness running through the chalk along this axis, increasing the impact of natural weathering in those places. However they were formed, the people using the site in the late Roman period seem to have been at least partially aware of the presence of channels of looser, sandier soil crossing the site. In several places, the lines of palaeochannels seem to have been deliberately dug into in order to make boundary/drainage ditches, presumably because their relatively sandy fills were easier to excavate than the natural clayey chalk. This can be seen, for example, at the south-west end of Phase 2 Ditch F2765 (=F3028), which was dug through a palaeochannel running on the same north-east to south-west alignment. Similar irregular features, filled with mid orange sand and devoid of cultural material, were identified at Gallows Hill, Swaffham Prior, and interpreted as naturally-occurring anomalies caused by periglacial action (Bray & Malim 1998, 9).

2.6.2 Tree boles/natural features

A large number of undated features were identified (see also Section 2.14). Some of these contained few finds, had irregular plans and profiles, and were filled with loose orangey sandy deposits unlike the darker clayey silt fills of the anthropogenic features on the site. They have therefore been interpreted as tree boles and/or areas of root disturbance caused by vegetation.

The majority of these natural features truncated, and therefore postdated, Roman features on the site. However, upon excavation a number of these tree boles, particularly in the northern half of Area 1, were found to be cut by later Roman features. This might suggest that, prior to the commencement of Roman activity in this part of the site during the 3rd century AD, it had been covered by woodland, or at least dotted with trees and scrub.

2.6.2 Residual Prehistoric finds

Although no prehistoric features were identified on site, the excavation of Areas 1 and 2 and the New Doctor's Surgery site yielded a small/moderately

sized (430 fragments; 2640g), but significant, assemblage of residual/unstratified early Neolithic to early Bronze Age struck flint. Most pieces were recovered from features of contexts associated with Roman occupation of the site or as scattered material in the subsoil or topsoil, although 3 fragments (24g) were recovered from natural or geological features.

A further 95 fragments of worked flint were recovered during the trial trench evaluation (Wills 2003) that preceded the excavation. Most of this material (65 fragments) was unstratified, having been recovered from spoil heaps thrown up during the cutting of the trial trenches. The remaining flint fragments were recovered as residual artefacts from later features.

In addition to the lithic material, 25 sherds (263g) of residual later Bronze Age pottery were recovered from Phase 2 Ditch F4168, Pit F4233, which cut F4168, and Phase 4 Pit F2255.

2.7 Phase 1. Roman: pre/early 3rd century AD (Figs. 9-11)

2.7.1 Introduction

The archaeology assigned to Phase 1 (Figs. 8 & 9) comprised the remains of three separate structures located towards the southern edge of the excavated areas. All three extended beyond the limits excavation and were, therefore, only partially revealed.

2.7.2 Structure S5144

The most north-westerly of the Phase 1 structures was S5144 (Grid Square ZZ14-ZZ15; Figs. 7.1, 8 & 9), which was recorded during the excavation of the new surgery site. It was only partially excavated because its north-east corner lay beneath a live underground electricity cable. The outline of the cut of the building was rectangular (length 5.7 m; width 2.8 m; depth 0.28 m) and was orientated north-east to south-west (Fig. 11). Its fill was a mid grey brown, sandy silt (L5145) which contained pottery indicating a date in the 2nd century, fragments of daub, tile, *opus signinum*, animal bone and an iron object. Also present in significant quantities were pieces of Purbeck Marble and one fragment of burnt millstone grit. The remnants of a rammed floor surface of yellow/white chalky marl, L5150 (0.11 m deep) was found below L5145. It contained no finds, and no structural components were revealed. Three later pits (F5146, F5148 and F5153) were cut into the floor area of the structure.

Approximately 5m to the south-east of S5144 was sub-rectangular Pit F5134. This too was dated to Phase 1 and, given the lack of other features of this date in the vicinity, may be considered to have had a functional association with the nearby structure. This was a fairly substantial feature (length 1.16m; width 1m; depth 0.41m) containing a mixed mid grey/dark brown orange, silt clay loam fill with frequent flecks of charcoal (L2135).

2.7.3 Structure S2901

Part of a stone structure (S2901) was partially revealed in the most south-westerly corner of Area 1 of that part of the site excavated as AS1011 (Grid Square D9; Figs. 7.2, 8 & 9; Plate 1). It extended beyond the limits of the excavation area to the south and west. The surviving structural remains comprised a single north-west to south-east aligned wall (M2966) (2.92m+ long x 0.63m wide x 0.21m deep), constructed of irregularly-shaped medium to large-sized pieces of clunch (60-200mm) bonded with sandy mortar, containing some shell inclusions, which survived to one course in height (Fig. 10). The wall was constructed in a rectangular, flat-based construction cut (F2968), which was cut into the natural chalk brash (L2040).

Immediately to the south-west of Wall M2966 was a roughly rectangular pit, F2967, also cut into the natural chalk brash (L2040). This had a gently-sloping south-eastern side, but was steep and stepped to the north-east, towards M2966. This was probably dug at the same time as F2968 as the foundation cut for the building, perhaps to contain a floor surface or other structural features. It respected Wall M2966 to the north-east (Fig. 10).

The building foundation (F2967) contained a sequence of layers relating to the structure's disuse (L2965, L2924, L2912 and L2911), which were in turn partially sealed by a buried soil layer (L2850) which covered the south-east end of the building, and by further localised patches of rubble (L2902). The sequence of disuse deposits gives some indication of the stages in which the building decayed. A soil layer (L2912) was sealed between layers of rubble (L2924 and L2911), suggesting that the building fell down in at least two separate stages. Perhaps after the roof fell in or was demolished (L2924), the remains of the building lay derelict for some time, resulting in the formation of a soil layer (L2912) above the fallen roof. After this, another phase of collapse or demolition occurred, with the second rubble layer (L2911) representing the fallen remains of a clunch wall parallel to that which survived on the north-east side of the building (M2966). The shallow overlying rubble deposit (L2902) appears to represent the final levelling of the area of the former building after its decay. All these disuse deposits contained ceramic building materials, mainly roof tile but also bessalis brick and box flue tile. The largest assemblage, some 160 tiles and tile fragments (36kg), came from the fallen roof (L2924).

Underneath the building, and probably cut by Foundation Cut F2967, was a single small Roman pit (F2937). The full size and profile of this pit are unclear, as it extended beyond the site boundary to the south-west. The presence of the pit within the footprint of the building led to its tentative interpretation as a well during excavation, with S2901 representing a well-house. However, the portion of Pit F2937 which was revealed within the site was shallow and gently-sloping, not what would be expected of a well shaft. It is feasible that, beyond the excavation area, it became steeper sloping and deeper, but this is conjectural. On the balance of the available evidence, the interpretation of Pit F2937 as a well is insecure. It was probably just a small pit predating, and not directly associated with, the building.

The dating evidence associated with Building S2901 is inconclusive. The associated demolition layers, notably L2924, yielded late 3rd – 4th century pottery, indicating a fairly secure later Roman date for the destruction of the building. However, it is not entirely clear how the use and subsequent demolition of the building relates to the successive phases of late Roman activity identified at the site. Perhaps significantly, the south-east end of S2901 was partially overlain by Buried Soil Layer L2850. A number of Phase 2 features in the south-west corner of the site were only revealed after this deposit was stripped, suggesting that they were sealed by it. In turn, the Phase 3 and 4 ditches running through the area (e.g. F2934 (=F3063), F2791 (=F2884)) were seen to cut L2850, as were some of the ditches established late in Phase 2 (e.g. Gully F2950, Ditch F2804 (=F2854, F2978, F3109)). These relationships make the dating of Buried Soil L2850 far from certain, but seem to suggest that its formation was an ongoing process during Phase 2 (see Deposit Model, above). If this is the case, then its stratigraphic position overlying the demolished remains of Building S2901 suggests that the building fell derelict during the earliest phase of intensive Roman activity on the site, perhaps by *c.* AD 300 at the very latest. Building S2901 may have been in use prior to the phases of activity identified on site. Without the excavation of a wider area to the south and west, where further structural remains might survive, many questions about the structure remain unanswered. The similar clunch building in the south-west of Area 2 (see below) was cut by a ditch which related to the earliest system of fields/paddocks in this area of the site, suggesting that the building predated the majority of the late Roman activity.

2.7.4 Structure S4348

A rectangular clunch building (S4348), measuring 11.50m long x 5.75m+ wide, was located in the south-west corner of Area 2 (Figs. 7.4, 8, 9 & 11). The structure had previously been identified during the evaluation of the site (Wills 2003). It extended beyond the site perimeter to the south and therefore, its full extent remains unknown. The building appears to have been located on an area of slightly higher ground in this area of the site, perhaps indicating that the area was deliberately built up prior to the construction of the building. The foundation cut for the walls of the structure (F4355) was linear in plan, with vertical sides and a flat base (Fig. 11). Its fill, L4410, comprised unworked chalk or clunch blocks, which formed packing material supporting the foundations of the wall (M4354). Wall M4354 consisted of three to four courses of irregular clunch blocks, each with maximum dimensions of 0.20m x 0.15m x 0.18m. No internal floor surface was identified within the interior of the structure. The building was sealed by L4351 (=L4001), a soil accumulation relating to the post-medieval and modern agricultural use of the site.

There was little dating evidence associated with Structure S4348. The wall of the building was cut to the east by a curvilinear gully (F4296), which yielded late Roman (late 3rd to mid-4th century) pottery and appears to have been related to the earliest field system in Area 2 of the site. On the basis of this stratigraphic relationship, the structure has tentatively been dated to no later

than the first half of the 3rd century AD. The clunch structure in Area 1 has provisionally been assigned a similar date, probably having fallen derelict or been demolished by *c.* AD 300 at the latest; however, the dating evidence in this instance is also limited.

2.8 Phase 2. Roman: 3rd century AD (Figs. 12-15)

2.8.1 Introduction

The majority of the archaeology assigned to Phase 2 (Figs 8 & 12) comprised ditches seemingly representing a rectilinear system of land division. In addition to this, towards the north-western end of the site, a pair of ovens or corn driers were recorded and to the south west of these were located a fairly extensive metalled surface and a small structure of beam-slot construction.

On the basis of artefactual evidence, Phase 2 is considered to represent activity dateable to the 3rd century AD. Stratigraphic relationships between features of this date indicate that there was continued development of the layout of the site during this phase. These relationships were insufficient, however, to determine a clear series of sub-phases within Phase 2. However, it would appear that the majority of the archaeology assigned to this phase is broadly contemporary, displaying clear spatial and functional relationships but not stratigraphic ones, and on this basis it is possible to identify a handful of clearly early features and a number of features representing later alteration, within Phase 2, to the site's layout.

2.8.2 The earliest Phase 2 features

A small number of features that were cut by Phase 2 features which were, themselves, cut by stratigraphically late features assigned to Phase 2 have been identified as the earliest features within this phase of activity. These features demonstrate no clear spatial or functional relationships with the enclosure system that dominated this phase, suggesting that that they predated this aspect of the site and thus further suggesting an early date for their formation. It is likely that further Phase 2 features belong to this earliest wave of activity but insufficient stratigraphic evidence is available to identify them.

Towards the north-east corner of excavation Area 1 was Pit F2464 (Fig. 7.2). This was cut by Ditch F2492 and was a large, but shallow feature that contained a small assemblage of pottery and CBM. Despite its early stratigraphic position, the pottery assemblage recovered from this feature was suggestive of a date late in the range for this phase of activity. It is possible, however, that at least some of this material was intrusive from the ditch by which it was cut.

Within the area excavated as the new surgery site was F5105, a ditch, aligned north-east to south-west. It was cut by Structure S5500 which was, in turn, cut

by linear F5064 (Figs. 7.1 & 15.8). A hand-dug segment revealed a V-shaped profile and a mid brown, sandy silt fill with occasional flints and stone (L5106).

A short distance to the south of F5105 and also cut by Structure S5500 was Pit F5047. F5047 was subcircular in plan and had steep sides that gave way to a concave base. Its fill was a dark mid grey, silty loam with lumps of clay and chalk, and flints (L2048). It contained pottery, fragments of tile, a single piece of *opus signinum* and iron objects. It was cut by Ditch F5165 and Structure S5500 (Figs. 7.1 & 15.8).

2.8.3 The peak period of Phase 2 activity; Phase 2, Sub-phase 2

2.8.3.1 The enclosure system

The majority of features assigned to Phase 2 formed part of a rectilinear system of land division comprising features aligned broadly north-west to south-east and south-west to north-east (Figs 7 & 12).

The most northerly north-west/south-east aligned element of the ditch system comprised what would appear to have been a composite boundary, formed of several ditches, and which may have become a double-ditched boundary towards its south-eastern extent. It was formed of parallel Ditches F2178 (=F2210, F2225), F2514 (=F2468), F2552 (=F2559), F2539 and F2492 (=F2511). The dimensions of the ditches varied, but they were consistently fairly narrow and shallow, generally measuring only *c.* 0.70m wide by 0.15 – 0.40m deep (Fig. 15.2). It is considered likely that they had suffered truncation at some point, perhaps from ploughing of the site. In total, from the north-western limit of Ditch F2178 (=F2210, F2225) to the south-east end of Ditches F2552 (=F2559) and F2539, the boundary ran for approximately 56.00m. It appeared to terminate *c.* 16.00m from the south-east edge of Area 1, although Ditches F2552 (=F2559) and F2539 became difficult to trace at this point and may have originally extended further. Their continuations could have been truncated by later perpendicular Ditches F2561 and F2598 (see below). To the north-west, Ditch F2210 became increasingly shallow and probably petered-out before meeting later Gully F2123.

Not all of the ditches were necessarily in use at the same time; some may represent recuts or replacements of earlier ditches which had silted up and fallen out of use. This is particularly likely to be the case towards the south-eastern extent of the boundary, where three parallel ditches were identified (F2552 (=F2559), F2539 and F2492 (=F2511); Figs. 7.2 & 15.3). The gap between the features forming the double-ditched part of the boundary varied along its length. In its central portion, the gap between Ditch F2178 (=F2210, F2225) and Ditch F2514 (=F2468) was *c.* 3.00m. Further south-east, it is unclear exactly which of the ditches would have been in use at the same time; if, as seems likely, F2552 (=F2559) and F2492 (=F2511) were contemporary, the gap would have been approximately 4.25 - 4.75m wide. Ditch F2552 (=F2559) may later have been replaced by F2539, leaving a narrower gap of *c.* 2.5m between F2539 and F2492 (=F2511). Two short shallow gullies

(F2223 and F2227) running parallel to Ditch F2178 (=F2210, F2225) probably formed parts of the same system. A short gully or ditch terminus, F2658, on the same alignment as these ditches, but largely truncated by Pit F2620 (=F2525, F2656), may also have been associated.

Early interpretations regarding these features suggested that they formed some kind of delineated trackway. This seems unlikely as the positioning of any such track would have been functionally illogical.

F2098 was a large linear ditch averaging around 1.30m in width and 0.30m in depth (Fig. 15.1), which ran across excavation Area 1 on a north-west to south-east alignment for nearly 70.00m but was not present within Area 2. As with the ditches to the north, Ditch F2098 was probably originally a larger feature, having been reduced to a fairly shallow depth by ploughing. Two short gullies running parallel to F2098 and cut by its northern side were probably related (F2336 and F2338). To the south-west of F2098, several smaller ditches were identified (F2731, F2801 and F2765 (=F3028)). These ran on south-west to north-east alignments parallel to each other and broadly perpendicular to Ditch F2098. These are thought to have formed subdivisions within the enclosure demarcated by F2098. Irregular Gully F2808, to the east of F2801, may have been associated with these subdivisions. At the north-east terminus of Ditch F2765 (=F3028), Ditches F2712 and F2698 may have formed part of the same system, curving around to form the north-east side of a plot which was demarcated by F2765 to the west.

In the south-west corner of Area 1, several other ditches and gullies are likely to have formed contemporary parts of the same field system. Gully F3068 ran on a south-westward alignment from close to the south-west terminus of Ditch F2731, continuing beyond the limit of the excavation area. Adjacent to the south-western terminus of Ditch F2731 was a perpendicular gully, F3023, which ran north-westwards for 7.50m before ending in a square terminus. Gully F3023 was a fairly substantial feature (1.10 – 1.90m wide x 0.55m deep; Fig. 15.6) and in addition to a large assemblage of pottery, contained more than 24kg of CBM. It was cut by Ditch F2731 at its south-east end, but is likely to be of similar date, perhaps forming a part of the same field boundary system.

F2307 (=F2326) (Plate 2), in the north of Area 1, may represent the south-west terminus of a fairly large ditch which extended beyond the site boundary to the north-east.

To the east (within Area 2) the field system comprised a series of ditches representing a long south-west to north-east aligned boundary at the southern end of which was a broadly north-west to south-east aligned curvilinear boundary. This curvilinear boundary was formed by three narrow ditches (F4296, F4278 and F4358), which ran for a total distance of approximately 40m, before extending beyond the southern limit of the excavation area. Although the ditches did not all share a similar profile or fill type, they appeared to follow the same curving alignment and two of them produced pottery of broadly the same date. Ditch F4296 (the westernmost ditch of the

group) cut through the south-east wall of the Phase 1 clunch building (S4348), indicating that the structure had fallen into disuse and been at least partially demolished by this time. Two gaps between the three ditches may have formed points of access/egress but may be the result of plough truncation. All three ditches were very shallow and would not, in themselves, have prevented stock from crossing; this again, however, may be the result of plough truncation. It is possible that the ditches were in fact foundation slots for wattle fences or hurdles; they all had very uneven bases which could have been created by the construction of a fence line, although natural rooting could equally have caused these irregular profiles. An undated posthole (F4349) was located at the terminus of the easternmost ditch (F4358; Grid Square M2), and perhaps had a functional association with the boundary, possibly representing part of a gate or associated fenceline. However, no finds were recovered from the posthole and its association with the enclosure therefore remains uncertain.

Finds from Ditch F4296 include abundant pottery (63; 1.5kg), CBM and animal bone (1058g), in addition to a spindle whorl. Ditch F4278 yielded pottery, a moderate CBM assemblage, as well as animal bone, shell and mortar. The presence of shell within this ditch may be indicative of food consumption on site; the shell, combined with the animal bone, suggests that the ditch may have been deliberately backfilled with domestic refuse following its disuse. Ceramic building materials and mortar within the fill of the ditch probably indicate refuse from construction or demolition of structures, perhaps S4348. Ditch F4358 yielded pottery and animal bone.

The long south-west to north-east aligned boundary was composed of three ditches (F4224, F4168 and F4033). Ditch F4224 was located just to the east of Curvilinear Enclosure Ditch F4358 (both ditches extended beyond the southern site boundary) and ran south-west to north-east for at least 15m, ending in a rounded terminus. After a gap of *c.* 2m from the north-east terminus of Ditch F4224, Ditch F4168 continued on the same north-eastward alignment for a further 29m. Gaps between Ditches F4224 and F4168, as well as between F4168 and Ditch F4033, to the north-east, potentially represent points of access/egress. Ditch F4033 continued on the same alignment as F4224 and F4168, extending north-eastwards for a further *c.* 19m. Just to the north-east, after a gap of around 2m from the north-east terminus of F4033, undated Ditch F4034 may have also formed part of the same boundary.

Ditch F4224 yielded pottery (7; 9g). Ditch F4168 also produced pottery, along with animal bone and CBM. Struck flint and animal bone were recovered from the fills of Ditch F4033. The finds assemblage from F4168 was also notable for including a small group of residual late Bronze Age potsherds (12; 120g). Late Bronze Age pottery (12; 125g) was also present in undated Pit F4233, which cut Ditch F4168 close to its south-west terminus. It is likely that one or more late Bronze Age features originally existed in this area of the site, but were destroyed by later Roman activity.

To the west, and perhaps within an enclosure defined by the curvilinear boundary and the linear boundary formed by ditches F4224, F4168 and

F4033, was a group of three linear features forming an 'L'-shaped arrangement. Ditch F2994 ran on a north-west to south-east alignment. It was slightly narrower than the Phase 2 features to the east and displayed steep sides and a concave to flat base. It appeared to be the easterly continuation of F4324. Parallel to, and west of, Ditch F4168, Ditch F4231 was similar in form and fill. This ditch was recut twice during Phase 2. Ditch F4249 apparently replaced a short length of the central portion of Ditch F4231, possibly representing an episode of maintenance after the original ditch had silted up. Ditch F4231 was also cut at its northern end by Ditch F4324. Ditch F4324 appeared to curve around to the south-east to run on the same alignment as F2994.

Several small ditches and gullies (F2066 (=F2025), F2062, F2034, F2085, F2087 and F2047) identified in the north-west of Area 1 were probably also established during Phase 2. It is possible that they served to divide this area into small plots, which they also would have helped to drain. Several similar Phase 2 features (F5078, F5138 and possibly F5064 and F5105) recorded within the new surgery site, to the south, potentially represent the continuations of these ditches and gullies or were directly related to them.

2.8.3.2 Surfaces and features associated with the field system

One of the most significant aspects of the Phase 2 site was a small complex of 'industrial' features in the north of excavation Area 1. This comprised a well-built corn drier or malting oven (F2579; Fig. 13), with a second, smaller oven of simpler construction positioned a few metres to the north-west (F2576; Fig. 13). To the south-east of these features was a curvilinear gully (F2123), thought to have supported a windbreak intended to shelter the ovens.

S2579 (Plates 3-5) was a large malting oven or corn drier located in the central northern portion of Area 1, immediately to the east of and parallel to Phase 3 Ditch F2092. S2579 comprised a large roughly circular pit (F2606; 1.52 x 1.91 x 0.80m deep) cut into the natural chalk, forming an oven chamber, with a linear cut (F2607) extending north-eastwards from it for *c.* 2.35m, forming a flue. Oven Chamber F2606 appeared to cut Flue F2607, but in reality, the two features formed part of the same structure and would have been contemporary. To the north-east, F2607 was cut by a deep pit (F2628 (=F2636); 2.05 x 1.49 x 1.01m deep), thought to have been the fire pit associated with the oven/corn drier. In total, Oven/Corn Drier S2579 (comprising Oven Chamber F2606, Flue F2607 and Fire Pit F2628 (=F2636)) was approximately 6m in length, although its south-west end was slightly truncated by a modern geotechnical pit (F2108). To the north, elongated Pit F2734 may have also been associated, perhaps forming a stokehole, or point of access for feeding fuel into Fire Pit F2628 (=F2636) (Fig. 13).

The base and sides of both Oven Chamber F2606 and Flue F2607 were lined with large irregular pieces of clunch, chalk, CBM and flint bonded in a matrix of compacted redeposited natural clayey chalk (L2849). In Flue F2607, a

narrow central channel between the flue lining on either side was left open, presumably for hot air to pass from the fire pit to the oven chamber. This was capped with a single layer of neatly-positioned regularly-sized ceramic tiles (L2848), resting on the top of the stone flue lining to either side of the air channel (Plate 5). These were imbrex tiles and are likely to have originally been used in the construction of a nearby building before being re-used in this context (Peachey, Ch. 3.3). The tile-capped flue and stone lining of the oven chamber were then sealed with a layer of compacted clayey chalk (L2807).

Presumably, a fire was made in the pit at the north-east end, which must have been covered in some way to prevent the heat dissipating. Hot air was then channelled down the flue, into the oven chamber, where cereals for drying or malting perhaps rested on a slightly raised platform of which no trace survives. There is highly likely to have been some kind of above-ground superstructure to keep the hot air in the oven chamber. It is possible that the above-ground elements of the structure were temporary affairs, either rebuilt with each episode of use or removable in between 'firings' of the oven to enable cereals for drying/malting to be placed in the oven chamber and fresh fuel to be added to the fire pit. Indications of high temperatures being reached in whatever process was being carried out were present: there was some burning and discolouration of the natural clayey chalk on the sides of the cut for Flue F2607; in addition, a few of the stones and tiles used in the flue and oven lining were cracked from exposure to heat. The basal fill of Pit F2628 (=F2636), of which little survived due to truncation by a geotechnical pit, contained abundant charcoal, possibly deriving from the fires made in it.

Following its disuse, the conjectured oven superstructure was probably demolished. The oven chamber, flue and fire pit were deliberately backfilled with clayey silt deposits, the generally dark colour of which may be indicative of redeposited ash and burnt material. The air channel running down the centre of Flue F2607 was also filled in (L2858 and L2853). Given that this channel was capped with tiles (L2848) and sealed with a clayey layer (L2807), it is difficult to understand how it came to be filled in after the oven's disuse. It is likely that these deposits gradually seeped into the channel through natural filtration rather than being the result of deliberate backfilling. An origin as gradual natural silting deposits is consistent with their loose, 'sticky' consistency. Much of the clunch, CBM and charcoal present in the large pit (F2738) located just to the north may represent demolition material from the oven. It is possible that this pit had originally been dug in order to extract chalk nodules to construct the lining and superstructure of the oven/corn drier.

Around 5m north-west of Oven/Corn Drier S2579 was a second, smaller oven, F2576 (Plate 6; Fig. 13). This was in a far poorer state of preservation than S2579, surviving to only *c.* 0.19m in depth. The surviving evidence suggests that it was of considerably simpler construction than S2579. It comprised an oval pit cut into the natural chalk, with a narrower linear continuation running north-eastwards from it (F2627). This cut formed both the oven chamber and flue. The extent of the flue to the north-east was unclear: a linear feature continuing on the same alignment as the flue was identified (F2671), but its relationship with F2627 was unclear. It may have formed a continuation of the

flue, running north-east for another *c.* 2.00m; alternatively, it may have been the oven's rake pit. It contained a small assemblage of daub.

The sequence of fills (Fig. 13) in the oven indicated that it had been cleaned out and relined at least once, suggesting reuse on a number of occasions. The basal fill, L2619, probably represented several episodes of oven use; its variable survival (thicker at the edges of the oven chamber, absent in the centre) was probably due to the oven chamber being raked out after use. At some point, it was apparently necessary to reline the oven, as L2619 was sealed by a highly compacted layer of redeposited natural clayey chalk, presumably intended as a new oven base. As with the more elaborate oven/corn drier to the south-east, F2576 would probably have originally had an above-ground superstructure. The backfill of the flue following its disuse (L2588) contained a large quantity of daub, perhaps suggesting that this was constructed of wattle and daub. The fill of the flue contained a single large sherd of 4th century pottery, which probably derived from the demolition and backfilling of the structure rather than being contemporary with its period of use.

A few metres south-east of F2579 was a long, shallow curvilinear gully, F2123, which curved around to enclose an area to the north-west. It may represent a beam slot or foundation trench for a windbreak sheltering the two nearby ovens. It was noted during excavation that the prevailing wind direction was from the south-east, so a windbreak in this position would have been well-placed to shield the features to the north-west. The charcoal-rich fill of the gully might suggest that the conjectured windbreak was destroyed by fire.

The area to the north-west, which was 'enclosed' by the curve of Gully F2123, was covered by layers of overburden, L2072 (loose mid grey/brown clayey silt; possibly the same as Subsoil L2001) and L2073 (Loose mid to dark grey/brown clayey silt). Layer L2072 yielded 26 sherds (148g) of pottery, while L2073 contained 16 sherds of pottery (170g), CBM (2kg+) and 1.5kg+ of animal bone. Layer L2073 probably represents demolition material from the destruction and backfilling of Oven/Corn Drier F2579.

Around 10m to the south-west of the ovens, and extending beyond the limit of excavation of Area 1, was Cobbled Surface L2157 (Grid Sq D13). It is highly likely that it was contiguous with the metalled yard surface L5006 (Grid Sq D12) L5502 (Grid Sqs B-C12) identified within the new doctor's surgery site. Cobbled Surface L2157 covered an area approximately 10.50m from north-west to south-east, by 2.50m across from north-east to south-west. If, as thought likely, it formed an extension of the metalled surface revealed at the New Drs Surgery site, the total dimensions of the cobbled surface would have originally been at least 10.50 x 17.50m, with the long axis of the cobbled area aligned from north-east to south-west.

L2157 (Fig, 15.2) was fairly regular in plan, forming a rectangle with relatively 'clean' edges, although the cobbles became less frequent towards the east as the surface began to peter out. The surface was made up of small to medium-sized rounded flints and river-rolled stones (<50mm) held in a matrix of

compact mid brown/grey silty sand. It had been laid in a large, shallow, roughly rectangular pit with rounded corners, which had gradual sides and a flat base (F2158). Prior to the construction of the cobbled surface, a thin compact mid grey/brown silty clay deposit (L2751; 5.05 x 1.65 x 0.15m) had been laid down underneath in order to level an area of undulating ground which had been disturbed by earlier features (Grave F2755 and Pit F2760; see below). This prepared the ground for the construction of L2157. The cobbles were overlain by a layer of firm dark grey/brown silty sand (L2180), which probably represents a gradual accumulation of material from surface runoff after the cobbled surface went out of use. The cobbled surface sealed an undated pit (F2760) and an undated grave cut (F2755; see below).

L5006 was revealed below L5007, a dark black abandonment layer. L5502 lay close to the southern area of the new surgery site excavation area but would appear to have formed part of the same surface, separated from L5006 by a small gap and later Ditch F5003. L5006 (= L5502) comprised a compact layer of metalling composed of both rounded and sub-angular flint pebbles (>0.02 m - 0.2 m) within a matrix of grey brown, clayey silt. Many fragments of tile (117; 21,869g) and animal bone (45; 1366g) were collected from the surface. Other finds comprise fragments of millstone grit (4; 2811g), stone (2; 520g), oyster shell (4; 90g), an iron nail (6g) and Roman pottery (1; 46g). The most interesting find is a fragment of *opus signinum* (1; 150g). The surface was uneven and patchy (length 21.5 m, width 16.5 m wide, depth 0.3 - 0.7 m). It overlay a thin layer of silt, L5133, and feature F5011. It was cut by Pit F5142 and Ditch F5003.

To the north-west of the metalled surfaces, in the approximate centre of the new doctor's surgery excavation area, lay Structure S5500 (Grid Squares A-B14 and B13). This structure was rectangular in plan (3.1 x 2.1 x 0.2m) and orientated north-north-west to south-south-west (Fig. 14). Three beam slots (labelled 1-3) were present along two long sides and at the north-western end. No beam slot was present at the south-eastern end. Two further beam slots (labelled 4-5) ran across the centre of the structure. With the exception of Beam Slot 5, all of the slots had a similar square profile. In the southern corner an entrance way has been inferred from a deep step, F5088, cut through the chalk (width 1.7 m; depth 0.1 m) leading to a stone-lined hearth (F5086).

Beam Slot	Contexts			Axis	Dimensions: Length x Width x Depth (max)
1	F5099,	L5100	(=F5066, L5067)	NNE\SSW	5.2m x 0.12m x 0.25m
2	F5074,	L5075	(=F5070, L5071)	NNW\SSE	8.2m x 0.12m x 0.10m
3	F5103,	L5104	(=F5084, L5085)	NNW\SSE	7.9m x 0.15m x 0.12m
4	F5082,	L5083	(=F5072, L5073)	NNE\SSW	4.2m x 0.25m x 0.25m

Table 2. Structural components of S5500

The method of construction comprised the quarrying of the sub-basement leaving an internal step (F5088) in the south-western corner. Three timber sleeper beams (1, 2 and 3) were laid against the external sides of the basement and two thicker beams (4 and 5) were laid (centrally) across the basement floor 2.1 m apart. A sub-floor of re-deposited chalk (L5167; probably the quarried material) was rammed in place between the beams further securing them in place. No finds were present within the beam slots or the sub-floor.

The hearth, F5086, was broadly square in plan (0.6 x 0.5 x 0.15m). Its sides were vertical and its flat base lined with selected flattish stones (L5098). Associated with L5098 were fragments of tile and lava quern. It was filled by a medium/dark grey loam (L5087).

A thick layer of mottled white/grey clayey silt (L5501) filled the sub-basement. This layer was excavated in four quadrants, and contained a small amount of pottery, tile, daub, animal bone, a lava quern fragment, two nails and other iron fragments.

2.8.3.3 Scattered pits and postholes of Phase 2 date

A number of pits and postholes were identified across the site that were positively dateable to Phase 2 but which displayed insufficient information from which a definitive function could be determined or direct spatio-functional relationships to other aspects of the Phase 2 site could be determined. Most of these features did not occur in clear groups or concentrations.

Pit F2738 (=F2233) (Plates 7 & 8; Figs 15.4-15.5), in the north of the site (GS F14), was by far the largest, measuring around 6.00m in length, 5.00m in width and 1.15m in depth. In terms of size and shape, it had much in common with the quarry pits dug during Phase 4 (see below) and may represent an earlier episode of chalk extraction on site, perhaps for building or making lime. It is possible that the extracted chalk was used in the construct the adjacent ovens/corn driers, S2576 and S2579. The backfill of the pit contained a moderate quantity of CBM and a fairly large assemblage of animal bone (7kg+). Four sherds of 4th century pottery recovered from upper fills L2815 and L2816 are thought to be intrusive from Phase 3 Ditch F2092, which cut through the pit.

F2083, F2245, F2166 and F2355 were scattered across the northern part of excavation Area 1 and were generally small (not more than 1m in diameter) and shallow. They may represent rubbish pits, although they contained few finds. Approximately halfway between the south-east end of Ditch F2178 (=F2210, F2225) and Ditch F2098, was a large isolated posthole (F2405), which contained a large quantity of CBM and daub used as packing material. There were no obvious spatial relationships with other features to suggest a

structural function. A second posthole positioned alongside Ditch F2098, some distance to the west (F2113), and also containing packing material, may have been related to the field boundary ditch. Towards the north-east corner of excavation Area 1, Pit F2464, cut by Ditch F2492, was large, but shallow, and contained a small assemblage of pottery and CBM.

An isolated large, deep, roughly square pit, located at the south-eastern boundary of Area 1, was assigned to Phase 2 (F2707). It contained a single sherd of late 2nd – 3rd century pottery and 4kg+ of CBM. Towards the south-west corner of the excavation area, Pit F2970 cut Phase 2 field boundary Ditch F2731, around 5m from its southern terminus. It was in turn cut by the recut of the field boundary, F2801, securely dating it to Phase 2. A few other generally small Phase 2 pits were found in the south-west of Area 1 (F3123, F3086, F2961, F2963 and F3012). Few contained finds, undermining an interpretation as rubbish pits, although they may have been used for the disposal of organic waste which has not survived.

Posthole F5131 was flat-bottomed with near vertical sides. It was filled with a dark mid grey, silty clay loam with occasional flecks of charcoal, small lumps of clay, and stones (L5132). It contained a single sherd of Roman pottery (54g), fragments of tile (7; 496g), daub (5; 42g) and *opus signinum* (1; 84g). Approximately 8m to the south-east was another posthole; F5062. This had a rounded profile and contained a mid grey brown, silt sand with small pebbles and re-deposited marl (L2063). Finds comprised Roman pottery (26; 318g) and a large quantity of Roman building material: fragments of *opus signinum* (23; 2047g), tile (53; 2368g) and daub (1; 2g). It has previously been suggested (McDonald 2000; Pearson and O'Brien 2006) that these features formed part of a post-built structure with undated posthole F5121. The structural configuration of these three postholes is convincing but the presence of such a structure remains open to conjecture due to the lack of dating evidence associated with F5121 and its shallow depth.

Pit F5041 was rectangular in plan and had near vertical sides and an irregular base. Its fill was a mid grey brown, loamy silt with patches of clayey silt (L2042). It contained pottery (17; 1038g), fragments of daub (8; 150g) and animal bone (2; 6g). It was located to the south-west of S5500 and its proximity to this building might indicate an associated function. The nature of this function is unclear. Similarly, the proximity of F5096 to S5500 might indicate that this had a function associated with the building. This too was rectangular in plan but had a shallow, concave profile. It was aligned parallel to S5500, further suggesting a functional or spatial link between the two. However, the later (Phase 3) pit, F5092, also followed this same alignment and was very similar to F5096.

Pit F5008 (length 1.62 m; width 1.43 m; depth 1.2 m) was situated a little to the north-west of cobbled surface L5006. Its sides were nearly vertical and gave way to a slightly rounded base (Fig.6). It contained three fills. The primary fill was a dark brown, silty loam, 0.47 m thick (L5013) which contained a sherd of undated Roman pottery and eight fragments of tile. The secondary fill was a light greyish brown, loamy silt, 0.34m thick (L5010). It contained a 3rd

century pottery sherd, large fragments of tile, numerous fragments of animal bone and fragments of a lava quern. The upper fill was a dark greyish brown, silt loam, 0.39m thick (L5009), containing 3rd century pottery, fragments of tile, *opus signinum*, animal bone and a small piece of Roman glass (SF2).

2.8.3.4 Late Phase 2 adaptation to the enclosure system

Probably fairly late in Phase 2, a change appears to have been made to the earlier system of enclosure ditches in Area 1. Two new ditches were laid out on parallel alignments, approximately 27m apart. Although they were orientated broadly north-west to south-east, the alignment of these two ditches was slightly offset from that of most of the other linear features on the site. This slightly differing alignment seems to mark them out as contemporary parts of the same system of land divisions. The northernmost of the two new ditches, F2148 (=F2163, F2203), began close to Ditch F2178 (=F2210, F2225), cutting the earlier ditch near its northern terminus. Ditch F2148 (=F2163, F2203) then ran north-west for 25m, continuing beyond the northern limit of excavation. In nearly all of the segments excavated through it, F2148 was consistently 0.70 – 0.80m wide by around 0.30m deep, with steep sides and a concave or flat base. At some point, a narrow channel (F2146 (=F2319)) was dug, this was possibly for drainage purpose and fed into F2148 (=F2163, F2203) from the north-east.

Around 30m away in the south-west of Area 1, Ditch F2806 ran broadly parallel to F2148 (=F2163, F2203). It was fairly similar in profile to F2148 (=F2163, F2203), with generally steep sides and a concave base. However, it was somewhat larger, on average measuring *c.* 1.30m wide by at least 0.50m deep. This difference in size between the ditches is perhaps at odds with the idea that they were contemporary parts of the same boundary system, but could be accounted for by differential survival.

To the south-east, the course of Ditch F2806 was lost in an area of numerous intercutting ditches. However, its recut, F2804 (=F2854, F2978, F3109), continued southwards for more than 25m, extending beyond the southern limit of excavation. In its southern portion, it curved around to the south-west, perhaps enclosing the area to the west where Building S2901 was located (see above). As well as recutting Ditch F2806, F2804 cut another earlier curvilinear gully which followed a similar north-west to south-east alignment (F3075). This also curved around to enclose the area where S2901 was located and may have been an earlier demarcation of a boundary surrounding the building. This part of the ditch system was later augmented by a possible drainage gully, F2950, which fed into Ditch F2804 (=F2854, F2978, F3109) from the east. A late Phase 2 pit, F3012, was located adjacent to the eastern terminus of F2950 and this potentially had an associated function.

It has been suggested that this reorganisation of the Phase 2 ditch system may have been intended to aid drainage more than to redefine land divisions on the site. Both main ditches, F2148 (=F2163, F2203) and F2806/ F2804 (=F2854, F2978, F3109), were associated with smaller gullies which fed into

them, possibly carrying surface runoff water (F2146 (=F2319) and F2950, respectively). The south-south-east to north-north-west alignment of the ditches could have channelled water towards the stream which flows through the north end of Bottisham.

In the south-western corner of the new surgery excavation area, a substantial right angled ditch, F5003, signified a change of land use (Figs 7.1 & 12). The ditch demarcated the higher ground and cut Metalled Surface L2006 (= L5502). Ditch F5003 measured 23m in length, 2.1 to 3.3m in width and 0.82m in depth. Three segments revealed it to be moderately steep sided giving way to a flattish base (Fig. 15.8). It extended beyond the limits of the new surgery excavation area but did not occur within the adjacent Area 1 excavation area. Unlike the other late features in Phase 2, this feature is unlikely to have had any function associated with drainage.

Also identified as being of late Phase 2 date was F5064, the southern terminal of a ditch, aligned north/south. It cut Ditch F5155. F5064 was concave in profile (width 1.28 m; depth 0.35 m). Its fill was a dark brown sandy loam (L5065). It contained Roman pottery (15; 1247g), a fragment of animal bone (4g) and an iron nail (11g). The alignment of this feature suggested that it may have been the continuation of F2034, which would suggest that this feature should be considered to be of a later date within this phase.

2.9 Phase 3 Roman: Late 3rd – early 4th century AD (Figs. 16-19)

2.9.1 The rectilinear enclosure system

During Phase 3, the site was dominated by a series of substantial, regular ditches which appeared to form a system on enclosures (Figs 6, 7 & 16).

Within Area 1, the ditches appeared to combine to form a single enclosure. This apparent enclosure followed the same alignments which had been followed by the Phase 2 enclosure ditches. The north-west, south-east and south-west sides of the enclosure were formed by Ditches F2092, F2598 and F2934 (=F3063) with F3083, F3054 and F3043, respectively. The conjectured north-eastern side of the enclosure was not revealed within the excavation area. That part of the enclosure which lay within the site measured approximately 65 x 50m+, just over ¾ of an acre.

The boundary ditches which formed the north-west and south-east sides of the enclosure, F2092 (Fig. 19.1) and F2598 (Fig. 19.2-19.3), were substantial features. Ditch F2092 ran for some 29.00m on a north-east to south-west alignment, extending beyond the excavation area in both directions. Its profile varied along its length, but it generally had moderate to steep concave sides, a rounded or flattish base, and measured *c.* 1.55m wide by 0.43m deep. Ditch F2598 (Plate 9) ran from north-east to south-west for 39.00m, parallel to Ditch F2092 some 65m to the north-west. It had a similar profile to F2092, generally exhibiting moderate concave sides and a flat or rounded base. It averaged

around 2.18m wide by 0.53m deep, becoming slightly narrower and shallower towards its rounded south-western terminus.

The ditches forming the south-western side of the enclosure were less well-preserved, probably in part due to a greater level of plough disturbance in this part of the site. Nevertheless, the principal ditch, F2934 (=F3063), was still a fairly prominent feature (27.50m long; averaging 1.22m wide x 0.25m deep; Fig. 19.4) and was similar in profile to F2092 and F2598. It became shallower towards its south-eastern terminus, where a conjectured entranceway to the enclosure was positioned (see below). To the north-west, F2934 (=F3063) probably originally continued on the same alignment towards Ditch F3083, in the south-west corner of the site. However, the relationship between these features had been obscured by Ditch F3054, which formed a later recut of this portion of the south-west boundary of the enclosure. This recutting of part of the enclosure ditch, which had presumably silted up, suggests that the enclosure was well-maintained over a period of time. To the south-east, Ditch F2934 (=F3063) ended in a rounded terminus. There was then a gap of *c.* 2.50m, before the south-west side of the enclosure was continued by Ditch F3043, which ran south-eastwards for a further 11.80m towards the south-west terminus of Ditch F2598. A short gully, F3077, then continued the south-west side of the enclosure for a final 1.15m, terminating just short of the larger south-eastern enclosure ditch, F2598. Ditch F3043 was poorly-preserved, partly as a result of an evaluation trench running roughly parallel to, and cutting, its north-east side. The surviving portion of the ditch was around 0.70m wide by 0.20m deep, with steep concave sides and a rounded base where these remained intact. In some segments (A & C), Ditch F2934 (=F3063) could be seen to cut Buried Soil Layer L2850.

Between the terminals of Ditches F2934 (=F3063) and F3043 was a gap of 2.50m, which is suggested to have formed a narrow entranceway to the enclosure. This entranceway was framed by an arrangement of short, narrow, shallow gullies running either parallel or perpendicular to the main enclosure ditches (F3061, F3071, F3050 and F3014) (Figs. 7.2, 16 & 19.4). The gullies were not all contemporary, some representing recuts of earlier demarcations of the entrance, but their spatial positioning around the gap between Enclosure Ditches F2934 (=F3063) and F3043 implies that they were part of the same boundary system, designed to control access to the enclosure. Shallow Gully F3041 (*c.* 7.00m long x 0.71 wide x 0.12m deep), which ran parallel to Ditch F2934 (=F3063), on the 'inside' of the enclosure, just north-west of the entranceway, was probably also contemporary, forming part of the same system. A group of three possible postholes positioned around the entranceway may represent the position of an associated fenceline (F3039, F3073 and F3059).

The south-east terminus of Gully F3014, at the end of the narrow corridor formed by the gullies positioned around the enclosure entranceway, contained a possible deliberate/special deposit of a Cu alloy coin (**SF68**) and a sheep/goat mandible (**SF69**) (Plate 10). These finds may simply have been a combination of butchery waste and a chance loss of a coin, *i.e.* everyday 'rubbish'. However, the objects appeared to have been carefully placed at the

base of the gully, rather than casually 'dumped' like the rest of the waste material (CBM and pottery fragments) found in the backfill of the feature; these items could be conceived as a specially selected 'package' of objects (c.f. Lally 2008) designed to be of symbolic significance to the individuals carrying out the act of deposition. In addition, the spatial positioning of the deposit, in the terminus of the gully and at the 'end' of the entranceway, where it opened into the inside of the enclosure, may suggest that this was indeed a deliberate 'ritual' or symbolic deposit.

In the northern part of the enclosure, roughly halfway between Ditches F2092 and F2598, was Ditch F2543 (which recut an earlier ditch on the same alignment (F2541)). This entered the site from the north-east and ran south-west for approximately 13.00m, parallel to Ditches F2092 and F2598, before being cut by later Pit F2620. It might have continued for a short distance further on the far side of the pit, with Gully F2494 possibly representing its south-west terminus. Based on the late 3rd – 4th century pottery recovered from its fills and its similar size and profile to the other ditches of the Phase 3 enclosure, F2543 is thought to have been contemporary with them, perhaps forming an internal subdivision within the enclosure. It is unclear why it ended partway across the enclosure, rather than continuing across to meet Ditch F2934 (=F3063) on the far side. It is of course possible that a continuation of this subdivision did extend across the full width of the enclosure, but was demarcated by a fenceline or other above-ground features which have left little archaeological trace. However, it may be significant that Ditch F2543 terminated next to a small structure (S2661, see below). Ditch F2543 and Gully F2494 are thought to have remained at least partially open following the destruction of Structure S2661, as moderate quantities of demolition material (CBM etc.) were recovered from their fills.

Three intercutting gullies in the south-west corner of the site, just outside the south-western boundary of the Phase 3 rectilinear enclosure, were also assigned to Phase 3. Of these, F3119 was the largest and ran north-west to south-east for *c.* 6.5m, roughly parallel to Enclosure Ditch F2934 (=F3063). At its south-east end were two narrow, short, perpendicular gullies (F3101 and F3143), the northernmost of which (F3143) was cut by Ditch F2934 (=F3063). Gully F3143 contained a near-complete late 3rd – 4th century pot (**SF71**).

Features appearing to form part of the same system of enclosures were recorded in Area 2. Ditch F4091 (=F4214) was located close to the north-eastern edge of Area 2. It was a wide (up to 2.00m across) but relatively shallow (no more than 0.60m deep) feature (Figs. 19.5-19.6), which was cut by F4150, the outflow from a possible industrial feature located a few metres to the south (see below). Ditch F4091 (=F4214) ran north-west to south-east across Area 2 for at least 27m; it extended beyond the limit of excavation to the north-west and was cut by Phase 4 Ditch F4036 to the south-east. Finds recovered from F4091 (=F4214) include pottery indicating a date in Phase 3, animal bone, CBM and oyster shell. A clay pipe bulb was also recovered, indicating that the ditch may have been disturbed by later activity; this find is considered to be intrusive within the fill. The ditch was recut at its south-eastern end by Ditch F4138, which ran on the same alignment. This recut may

represent maintenance of the ditch system after a period of silting up. No finds were recovered from F4138.

Later during Phase 3, the boundary demarcated by Ditches F4091 (=F4214) and F4138 was recut by Ditch F4109 (= F4215, F4136) (Figs. 19.5-19.6). This ran on the same north-west to south-east alignment as F4091 for 23m, then curved to the south and continued for a further *c.* 7m, before being cut by perpendicular Phase 4 Ditch F4036. The recovery of burnt flint within the feature could indicate prehistoric activity in this area of the site, perhaps contemporary with the residual late Bronze Age pottery recovered from Phase 2 Ditch F4168 (see above) and undated Pit F4233 (see below). The presence of building materials suggests that the ditch was backfilled with small amounts of demolition waste. All three ditches were later truncated by Phase 4 Ditch F4036, which followed a broadly perpendicular north-east to south-west alignment. It is thought likely, particularly based on the fact that Ditch F4136 appeared to turn towards a north-east to south-west alignment at its south-east end, that Ditch F4036 entirely obscured an earlier boundary ditch running on the same alignment. This would presumably have joined Ditches F4091 (=F4214) and F4109 (=F4215, F4136) with the group of contemporary parallel boundary ditches 70m to the south-west (see below), forming the south-eastern boundary of a large rectangular field or enclosure similar to that which occupied the central portion of Area 1 during this phase (see above).

Towards the south-west end of Area 2, a system of slightly narrower ditches ran on north-west to south-east alignments, parallel to Ditches F4091 (=F4214), F4138 and F4109 (=F4215, F4136), to the north. The two sets of parallel ditches were spaced approximately 70m apart. Ditch F4285 (Fig. 19.7) was the earliest feature within this southern set of ditches. It followed a north-west to south-east alignment for 22m+, with an irregular 'bulge' close to the point at which it was cut by two other ditches (Phase 3 Ditches F4263 (=F4223) and F4271 (=F4281); Fig. 19.6). Pottery recovered from F4285 dates to the 3rd to mid-4th century AD. Animal bone, CBM and a cockle shell (**SF28**) were also recovered. The next ditch in the sequence was F4287 (Fig. 19.7), which was cut through Phase 2 Ditch F4294; only a short length (4.46m) of F4287 survived and its original extent is unknown. Finds from F4287 include pottery dated to the late 3rd to mid-4th century (16; 206g), CBM, animal bone (1244g), two fragments of painted plaster (23g) and oyster shell. Both F4285 and F4287 were later cut by Ditch F4271 (=F4281), which followed the same alignment and ran for a length of *c.* 21m. Ditches F4285, F4287 and F4271 (=F4281) followed the same course and north-west to south-east alignment and represent successive demarcations of the same field boundary, within the same broad timeframe. The repeated recutting of the field boundary over time resulted in a series of parallel intercutting ditches with a 'braided' appearance.

The latest demarcation of this southern enclosure boundary was represented by rectilinear Ditch F4263 (= F4223) (Fig. 19.6). This entered Area 2 from the north-west and followed a north-west to south-east alignment for 15m, at which point it turned through 90° to a south-west to north-east alignment, narrowing as it did so. It then continued for a further 21m, ending in a rounded

terminus. Late 3rd to mid-4th century pottery was recovered, along with iron fragments (**SF23** and **SF25**), struck flint, oyster shell, mussel shell, CBM, animal bone, a copper disc (**SF22**) and a copper alloy coin (**SF24**). Ditch F4246 (=F4219) was located very close to the north-eastern terminus of F4263 (=F4223) and continued on the same course and alignment for a few metres further; the full extent of the ditch is unknown as it was then cut by Phase 4 Ditch F4217. Late 2nd to 4th century pottery, CBM and animal bone were recovered from this feature. Another small ditch (F4221) ran parallel to the east side of F4263 (=F4223) for a short distance. While the north-west to south-east aligned portion of Ditch F4263 (=F4223) represents the continued demarcation of the enclosure boundary line which had earlier been marked by Ditches F4285, F4287 and F4271 (=F4281), the narrower south-west to north-east aligned portion of the ditch appears to have formed a subdivision of the enclosure formed by the two sets of Phase 3 parallel ditches.

Ditch F2998, recorded within Area 1, may have been a continuation of either Phase 3 Ditch F4285 or Ditch F4263 (=F4223). If so, these latter ditches would have formed the south-east side of the rectilinear enclosure which was partially revealed at the south-eastern edge of Area 1

Cut by, and running perpendicular to, Ditch F4285 and Ditch F4263, and therefore parallel to F4223, was Ditch F4294. Ditch F4294 began close to the north-western terminus of Ditch F4278 (part of the Phase 2 curvilinear boundary) and ran north-eastwards for approximately 16m. The ditch had a slightly variable profile and dimensions along its length; it became wider (roughly double the width at its southern terminus) where it was cut by Ditches F4287 and F4271 (= F4281). It was also cut by Phase 5 Ditch F4021. It appears likely that F4347, which was located close to the southern limit of excavation, is the continuation of this feature. During the preceding trial trench evaluation of this part of the site (Wills 2003) a curvilinear feature (F4) was recorded within Trench 9 in the same position as F4347, but extending further to the north to the approximate position of the southern terminus of F4294.

2.9.2 Curvilinear ditches in the north-west of Area 1

Two or more small possible enclosures were partially revealed in the north-west corner of the Area 1 site. They were demarcated by small curvilinear ditches/gullies, some of which might have been continuations of features identified within the new surgery excavation area. The enclosures appeared to be aligned with their long axes running broadly north-east to south-west. The fairly small size of the enclosure ditches (averaging *c.* 0.78m wide x 0.26m deep) may suggest that they would not have been particularly prominent features.

Ditch F2027 (Fig. 19.1), the most north-westerly of these features, ran north-east to south-west for 4m, before extending beyond the limit of the excavation area (Fig. 7.1). It was recut immediately to the south-east by Ditch F2008 (=F2021), which ran on the same alignment for *c.* 5m before also extending beyond the limit of excavation. Ditch F2006, which ran parallel 6m to the

south-east of F2027 and F2008 (=F2021), may have formed the opposite boundary of a narrow north-east to south-west aligned parcel of land. It extended beyond the excavation area to the north-east; to the south-west, it carried on beyond an unexcavated baulk as Ditch F2017. This continued on the same south-westward alignment for a further 5m, recutting Phase 2 Ditch F2034. Ditch F2017 continued beyond the limit of this excavation area to the south-west, but it is thought likely to have continued as Ditch F5080 within the new surgery excavation area. The identification of these two features as the same is based largely on their similar spatial positioning and alignments and the dateable artefacts that were recovered from each of them. The dimensions (0.5m wide x 0.22m deep) and profile (rounded base) of F5080 were also not dissimilar to those of Ditch F2017, which might reinforce their suggested identification as continuations of the same feature.

To the south-east of Ditch F2017 was the equally sinuous Ditch F2052. This ran for *c*. 5m on a north-west to south-east alignment, before curving 90° to a perpendicular north-east to south-west alignment and continuing for a further *c*. 6m. It may have formed the north-east and south-east sides of a second small plot adjoining, and aligned parallel to, that formed by Ditches F2006, F2017 and F5080, to the north-west. Ditch F2052 extended beyond the southern limit of Area 1 and is considered to be the same feature as Ditch F5165 recorded within the new surgery excavation area. This continued on the same alignment around 6m south-west of F2052. It was also of similar size and had the same moderately-steep concave profile as F2052. Two additional linear features, F2045 and F2163, may represent a continuation of F2165, giving a total length of 11m. The apparent plot of land bounded by F2052 and F5165 to the north-east and south-east, and by F2017 and F5080 to the north-west, was approximately 9 – 11m wide, from north-west to south-east, and over 23 in length, from north-east to south-west. The curving north-eastern corner of this plot had probably earlier been demarcated by Ditches F2078 and F2199, which were recut by Ditch F2052 later in Phase 3.

2.9.3 Small enclosure in the south-eastern corner of Excavation Area 1

Towards the south-east corner of Excavation Area 1 (Figs. 7.2 & 16), the north-western edge of a second, smaller, Phase 3 enclosure was identified. It was probably also rectilinear in form, with its sides aligned north-west to south-east and north-east to south-west. It comprised Ditches F2696 (=F2669, F2745), F2998 and F3032, which closely followed the positions and alignments of the ditches of the Phase 2 field system in this part of the site (F2765 (=F3028), F2712 and F2698). F2669 was, however, cut by Ditch F2598, possibly suggesting that this enclosure slightly pre-dated the wider system of enclosure or that F2598 was a late addition to the site's layout in Phase 3. This latter explanation is perhaps more likely as the positioning of the features forming this enclosure showed clear spatial relationships to suggest that they functioned in conjunction with the contemporary Ditches F4287, F4285, F4271 (=F4281) and F4263 (=F4223), in the western part of Excavation Area 2 (Figs 7.4 & 16).

Ditch F2696 (=F2669, F2745), which formed the north-west and north-east sides of this enclosure, was fairly narrow and shallow (*c*. 0.70m wide x 0.30m deep, with variable concave sides and a rounded/flat base (Fig. 19.3). It ran on a south-west to north-east alignment for 22.50m parallel to Phase 2 Ditch F2765 (=F3028), a few metres to the north-west. At this point, it turned through 90° and continued for a further 10.00m, forming the north-east side of the enclosure. It extended beyond the limit of the excavation area to the south-east. At its south-western end, F2696 (=F2669, F2745) cut the terminus of a broadly contemporary ditch, F2998, which formed the south-west side of the enclosure. This was of similar profile and dimensions (Fig. 19.4) and ran on a north-west to south-east alignment perpendicular to F2696 (=F2669, F2745) for 7.00m, before extending to the south-east, beyond the limit of Area 1. At some point during the use of the enclosure, the right-angled corner formed by F2696 (=F2669, F2745) and F2998 was recut by a replacement ditch, F3032. This episode of 'repair' to the corner of the enclosure may have taken place in the early 4th century, as the south-western terminus of Ditch F3032 yielded a fairly large assemblage of 4th century pottery.

2.9.4 Industrial Feature F4148

Within the central northern part of Excavation Area 2 a large feature (F4148), considered to have had an industrial function and dated to Phase 3, was recorded. This comprised a large, shallow, near circular pit (4.18 x 4.40 x 0.40m), with relatively steep sides and a flattish base (Fig. 18). To the north, it cut a narrow sinuous gully (F4150), which appeared to run into one of the contemporary boundary ditches to the north-east (it cut Ditch F4091 and was in turn cut by its recut, F4109). Pit F4148 had been backfilled after its disuse with quantities of 'rubbish' (pottery, animal bone and CBM etc.), obscuring its original function. During excavation, it was observed that a slight 'ridge' of natural chalk brash had been left in place around the base of the pit; these cuts into the natural geology had a 'squared' appearance, suggesting that they may have been deliberately constructed/left in place to hold some kind of internal furniture or fittings. At the intersection of Gully F4150 and Pit F4148, a small patch of *in situ opus signinum* (L4161) was present at the base of the two features. This may have been the remnant of an original waterproof lining, or the remains of bonding material used to hold internal structures in position.

The association of a large shallow pit (F4148) with a narrow linear gully (F4150) initially gave rise to the interpretation that the feature had been used as a corn drier or oven, with the gully forming the flue. However, comparison with the Phase 2 corn driers/ovens S2579 and S2576 would indicate that this was not the function of F4148: the drying chambers of S2579 and S2576 were much smaller than Pit F4148 and the flues considerably wider than F4150. The flue of the corn drier S2579 was connected to a stokehole or fire pit; any feature at the end of Gully F4150 would have been destroyed by the recut Ditch F4109, and thus it is not possible to determine whether F4148 was originally associated with a fire pit. However, there was no evidence of burning or discolouration of the natural around the features to indicate that they had ever been subject to heating. Several other factors may indicate a

different function. First, the 'ridge' of natural chalk left in place around the base of Pit F4148 had the appearance of having originally been deliberately 'constructed' as the base perhaps for one or more wooden tanks (presumably removed after the feature's disuse). Secondly, the small patch (0.15 x 0.20m) of *in situ opus signinum* at the base of the intersection between Pit F4148 and Gully F4150 suggests that the gully and/or pit could have originally been lined with this material, or contained some kind of internal furniture for which it acted as bonding agent. In addition, the positioning of Gully F4150, running towards and apparently connecting with one of the contemporary ditches to the north-east, suggests a function as a drainage or outflow channel carrying water or other liquids away from Pit F4148. It therefore seems more likely that F4148 and F4150 were used for an industrial process involving water, possibly forming a retting tank for the breaking down of plant fibres (e.g. flax) during cloth production. If it was utilised as a retting tank, it is possible that the surrounding enclosure was employed to cultivate flax or another textile crop.

Finds recovered from F4148, and presumably relating to its disuse rather than period of operation, include pottery, CBM, mortar, burnt flint, animal bone, oyster shell and struck flint. A notable number of small finds were also recovered from F4148; these include a glass fragment (**SF9**), iron nails (**SFs 10-19**), a copper coin (**SF5**) and a metal fragment (**SF6**). The composition of the finds assemblage suggests that possible domestic or small-scale industrial waste was dumped into the industrial feature following its disuse.

2.9.5 Structure S2661

Structure S2661 (Fig. 17; Plate 11) was positioned roughly centrally within the main Phase 3 enclosure in Excavation Area 1, adjacent to the south-west terminus of Ditch F2543. It was rectangular in plan, with its long axis aligned north-west to south-east; it measured approximately 3.00 x 2.50m. It was defined by an apparently continuous beam slot (F2679 (=F2664)) running the length of its four sides, with small postholes of approximately equal size positioned at each of the four rounded corners (F2690, F2692, F2526 and F2681). Although the postholes (with the exception of F2681) appeared to be cut by Beam Slot F2679 (=F2664), they and the beam slot are considered likely to have been contemporary structural features associated with the same building. Posthole F2681, at the north-east corner of Structure F2661, was offset by *c.* 0.30m from the building and may therefore represent a later replacement of an earlier post of which no trace remains. An internal beam slot (a continuation of F2679 (=F2664)) ran on a north-east to south-west alignment across the centre of the building, dividing it into two roughly equally-sized 'rooms'. Layer L2662 was an internal floor surface, divided in two by the internal beam slot. It was a highly compact layer of mid white/light grey packed clunch nodules in a silty clay matrix (2.45 x 2.25 x 0.08m). The floor surface yielded a large assemblage of pottery (53; 905g) and a Cu alloy fragment (**SF63**). After its disuse, the structure was backfilled with L2663, a layer of demolition material and dumped refuse which contained 4th century pottery (52; 610g), CBM (3.7kg) and animal bone (1.4kg). Structure S2661 was truncated to the south-east by Pit F2620 (=F2525, F2656).

2.9.6 Scattered Phase 3 pits

A few scattered pits, most of which are likely to have been dug for rubbish disposal, were dated to Phase 3 (Fig. 16). In the north-west of Area 1, a single large but shallow pit, F2064, lay close to Ditch F2052 (Figs. 7.1 & 16). It contained a small quantity of late 3rd - 4th century pottery, in addition to CBM.

A loose cluster of three small pits (F3150, F3153 and F2729) was located towards the centre of Area 1, within the area of the main Phase 3 rectangular enclosure (Figs. 7.2 & 16). Pit F2729 was notable for a large assemblage of finds including more than 70 sherds (703g) of late pottery, 14kg of CBM and several kilos of animal bone. It appears to have been dug for refuse disposal as no clear primary function is evident. The two pits to the south-west (F3150 and F3153) contained fewer finds, but may have been used to dispose of largely organic waste, which has left little trace. They are unlikely to have been dug as quarry pits, as they were cut into the backfills of earlier features (Gully F3105 and Ditches F2731 and F2801, respectively).

Around 20m to the east was a cluster of four fairly large intercutting pits (F2761, F2792, F2826 and F2763; Figs. 7.2 & 16), cut through Phase 2 field boundary Ditches F2765 and F2712. Several of these pits were very large: F2763, for example, was over 4m in length. However, they were generally shallow, extending to a maximum depth of only *c.* 0.60m. Again, the fact that they often inter-cut with each other or with earlier features, suggests that the pits were not dug in order to quarry for raw clay or chalk. Pit F2792 contained a moderate assemblage of 3rd – 4th century pottery, while F2763 yielded more than 12kg of CBM and fragments of lava quern.

Another group of pits were clustered in and around the far south-eastern corner of the main Phase 3 enclosure in Area 1 (F3036, F3030, F3034, F3087 and F3165; Figs. 7.2 & 16). Pit F3165 was probably fairly early, as it was truncated by Ditches F2998 and F2696 (=F2669, F2745) at the corner of the smaller, south-eastern Phase 3 enclosure. The other four Phase 3 pits in this area were all oval in plan and fairly large (*c.* 2.00-3.00m long x 1.00m wide x 0.40-0.60m deep). Their spatial positioning was notable; the pits were all dug immediately alongside and aligned parallel to the boundaries and had been 'squeezed' right into the corners of the contemporary enclosures as if they were peripheral to the main use to which the enclosures were being put. It is possible that they were dug to quarry for chalk, perhaps to use for marling and improving the soil quality of the land inside the enclosures. With the exception of F3030, which contained a moderate assemblage of 4th century pottery (19 sherds; 257g), the pits in this area contained few finds and do not seem to have been intended for waste disposal, unless, again, it was organic waste which has left little archaeological trace. An alternative interpretation, which might tie in with their positioning at the corners of the Phase 3 enclosures, is that they were dug as sumps to help drain excess groundwater.

A small pit (F3145) and a posthole (F3115), in the south-west corner of Excavation Area 1 (Figs. 7.2 & 16), probably also date to Phase 3, the first on account of its stratigraphic position cutting Phase 3 Gully F3143 and in turn

cut by Phase 3 Enclosure Ditch F2934 (=F3063); the latter on account of a single sherd of late 3rd – 4th century pottery (14g) recovered from its fill.

Two isolated postholes (F2851 and F2623) were identified in the north of Area 1 and dated to Phase 3. Posthole F2623 was located just 1.50m east of Structure S2661 and may have been related, perhaps forming part of an associated fenceline.

Pit F5092 (Figs. 7.1 & 16) was a shallow feature with a concave profile. It lay to the west of Phase 2 S5500, on a parallel alignment, and was similar in form to the Phase 2 Pit F5096, which also ran parallel to S5500. Initially, both were considered to be directly associated with S5500 but the available dating evidence suggests otherwise. Their similarity in form is suggestive of a shared, but unidentified, function. Both were cut by the circular Pit F5094, which was dated to Phase 3. To the east, Pits F5031, F5033 and F5037 all contained finds assemblages to suggest that they were used for the deposition of refuse, though all may have had an alternative primary function.

2.10 Phase 4. Roman: 4th century AD (Figs. 20 & 21)

2.10.1 Reorganisation of the enclosure system

A reorganisation or reworking of the earlier land divisions on the site appears to have occurred during the 4th century AD (Figs 8 & 20). Stratigraphic and spatial relationships with features of Phase 4 date suggest that several of the ditches forming the large Phase 3 enclosure in Area 1, as well as those of the second smaller enclosure in the south-east corner of this part of the site, became redundant, or had fallen out of use, at this time. The north-western boundary ditch of the main Phase 3 enclosure (F2092), for example, was backfilled with chalk, perhaps discarded low-quality stone extracted from one of the nearby quarry pits established during Phase 4 (see below). The south-eastern boundary ditch of the large Phase 3 enclosure F2934 (=F3063) was presumably also disused, as two new ditches were established in this area during Phase 4, seemingly replacing the earlier feature. It remains possible, however, that some of the Phase 3 ditches remained as extant parts of the functioning site layout.

Ditches F2880 and F2884 (=F2791) formed a new boundary which ran for some 56.00m on a slightly curvilinear north-west to south-east alignment across the southern portion of the Area 1 site, extending beyond the limit of the excavation to the south-east (Figs. 7.2 & 20). For much of its length, F2884 (=F2791) closely followed the south-western edge of Phase 3 Ditch F2934 (=F3063), presumably acting as a replacement for this earlier boundary. However, to the south-east, Ditch F2880 veered slightly southwards, away from the alignment of F2934 (=F3063), indicating that slight

but deliberate changes were being made to the morphology of the enclosures. Ditch F2884 (=F2791) was slightly sinuous in appearance, being wider towards the north-west (*c.* 1.85m) and becoming narrower to the south-east (a little over 1.00m wide); it consistently had moderate to steep concave sides and a flattish base (Figs. 21.3-21.4). As with the earlier ditches in this part of the site, F2884 (=F2791) was fairly shallow, probably as a result of plough damage, and generally only survived to *c.* 0.30m in depth. Ditch F2880 (Fig. 21.4), which formed the south-eastern portion of this new Phase 4 boundary, was similar in size and profile to F2884 (=F2791), although it widened in its central part, giving it a slightly 'bulbous' appearance. It was cut by F2884 (=F2791) to the north-west, but is nevertheless thought to have been broadly contemporary. At its north-western end, the course of Ditch F2884 (=F2791) became unclear amidst an area of numerous intercutting linear features (of all phases). It is possible that this part of the south-western boundary of the main Phase 3 rectangular enclosure, formed by Ditch F3054, was still open and functional at this time, forming a continuation of the boundary formed by F2884 (=F2791).

Two Phase 4 ditches, located close to the eastern limit of Excavation Area 1, formed a right-angle with one another, possibly indicating the presence of a new rectilinear enclosure in this part of the site (Figs. 7.2 & 20). F2941 (=F3005, F3025), which formed the north-west to south-east aligned portion of this right-angle ran for approximately 16.00m and appeared to extend beyond the south-eastern limit of the excavation area. It was not, however, present within the western part of the adjacent Excavation Area 2 suggesting that any enclosure that features represent is likely to have been quite narrow in comparison to its width. Ditch F4021 ran on a similar alignment to F2941 within Area 2, albeit offset by a couple of metres, and extended beyond the western limit of excavation; any suggestion that these two features represent the same boundary, however, has been quashed by the post-medieval dating evidence recovered from F4021. The north-east to south-west aligned part of this right-angle was formed by Ditch F2561, which ran for 41.00m broadly parallel to the Phase 3 Ditch F2598. To the north-east, it extended beyond the limit of the excavation area; to the south-west, it ended in a rounded terminus and cut F2941 (=F3005, F3025). Both ditches exhibited very similar profiles (moderate to steep concave sides, rounded or flattish bases) and were of similar narrow, shallow dimensions (*c.* 0.65 x 0.21m (F2561); *c.* 0.62 x 0.15m (F2941 (=F3005, F3025)). These ditches closely followed the positions and alignments of the earlier boundaries in this part of the site and the enclosure they may have formed could represent a recut and enlargement of the Phase 3 enclosure formed by Ditches F2696 (=F2669, F2745), F2998 and F3032 (see above).

In the north-west of Area 1, a curvilinear ditch, F2050, was assigned to Phase 4 (Figs. 7.1 & 20). It ran for at least 16.00m on a broadly north-west to south-east alignment, curving to a north to south alignment in its southern section, before extending beyond the limit of the excavation area. In plan it was similar to the earlier curvilinear ditches recorded in this part of the site, though it ran on a slightly different alignment. It was generally narrow and shallow (averaging *c.* 0.70m wide by 0.23m deep), with moderately-steep concave

sides and a rounded or flattish base. It seems possible that F2050 was related to Ditch F5016, within the new surgery excavation area. Although their alignments do not appear to match up directly, the steep sided, flat based profile of F5016 was very similar to that of F2050. F5016 was undated, though clearly Roman, but it shared a close relationship with F5014, which contained pottery to indicate a date in Phase 4. F5016 was recorded as cutting F5014 but it is possible that the two formed part of the same feature. F5014 traversed the northern-eastern edge of the excavation area and cut Ditch F2165 and Pit F2031.

Excavation Area 2 revealed two large ditches (F4217 and F4036) of Phase 4 date (Figs. 7.3, 7.4 & 20). Ditch F4036 (Fig. 21.5) ran on a north-east to south-west alignment for the full length of this excavation area (87m). It appeared to extend beyond the limits of the excavation area at either end though its northern extent was obscured by Phase 5 (post-medieval) Ditch F4185. The ditch was also cut by Phase 5 Enclosure Ditch F4021 and a modern service trench (F4094). F4036 cut through numerous earlier features, including Phase 2 Ditches F4278 and F4326. Phase 3 Ditches F4304, F4271 (=F4281), F4136, F4138, F4091 and F4109 were also truncated by this large feature, as were several undated pits and linear features. Ditch F4036 was a substantial feature, generally measuring around 2m across, but was shallow, probably at least in part as a result of post-medieval and modern plough damage. It may have recut an earlier (Phase 3) boundary ditch, of which no trace survived; Ditch F4109 (=F4215, F4136) appeared to curve around to the same north-east to south-west alignment as F4036 at its south-eastern end, but its course was obscured by F4036. It ran parallel to the interrupted Phase 2 boundary in this part of the site formed by Ditches F4224, F4168 and F40333, perhaps remarking or re-invigorating the earlier boundary. At its south-western end, Ditch F4036 was recut along its eastern edge by another Phase 4 ditch (F4389 (=F4417)), which also extended beyond the southern limit of Excavation Area 2. Approximately 11m east of F4036, at the north-eastern end of the excavated area, Ditch F4023 (=F4027), a much narrower feature (Fig. 21.5), ran on a parallel south-west to north-east alignment for 17.5m, possibly forming a related boundary.

Ditch F4036 was probably associated with Ditch F4217, which followed a broadly north-west to south-east alignment, perpendicular to Ditch F4036. This ditch was similar in size and profile and was cut through Phase 3 Ditch F4246 (=F4219). Ditch F4217 ran parallel to the Phase 3 ditches to the north-east and south-west, possibly suggesting that successive reorganisations of the late Roman enclosure system at this location were carried out by people who had knowledge of the former layout.

2.10.2 Possible quarrying activity in Phase 4

A notable feature of the site during Phase 4 was the presence of large pits which have been interpreted as quarry pits for the extraction of the natural chalk. In Area 1, these were concentrated mainly in the northern half of the excavation area and occurred in dense clusters (Figs. 7.1, 7.2 & 20). In Area

2, they were present as single large pits which occurred in the eastern part of the excavated area (Figs. 7.4 & 20).

Quarry Pit F2255 and associated pits

One such cluster of intercutting pits was located in the north-west of Area 1, *c.* 12m north of Phase 2 Cobbled Surface L2157 and 10m north-west of Phase 3 Ditch F2092. It comprised (in approximate stratigraphic order, from earliest to latest) Pits F2232, F2130, F2268, F2160 (=F2162, F2177, F2215), F2255 and F2217 (Figs 21.1-21.2; Plate 12). The pit group was notable for comprising a combination of shallow pits at either end of the 'cluster' (e.g. F2232 and F2160 (=F2162, F2177, F2215)), with a deep central pit (F2255). It is suggested that the shallower pits represent initial 'explorative' attempts to find suitable deposits of natural chalk to quarry. Once a good chalk deposit was encountered, this was then fully-exploited through the digging of a larger, deeper pit alongside the earlier abortive attempts. This two stage process, with initial shallow pits at the sides of a deeper quarry pit, would also have created a stepped edge at the side of the main extraction pit which would have made it easier to remove the quarried material. The combination of shallow pits at the east end (rear of photo) and a deep pit in the centre (foreground of photo) of the pit cluster can be clearly seen in Plate 12.

In total, the group of quarry pits situated around and incorporating F2255 was more than 9m long by 3m wide, with deep central Pit F2255 measuring 4.60m long x 3.15m wide x up to 0.85m deep. This suggests that a substantial quantity of natural chalk could have been extracted, if this was indeed the purpose of these features. The alignment of the pit group is also interesting: the digging of the pits in a broadly north-west to south-east line, similar to the alignment of many of the boundary features on site, might suggest that the extraction activity was in some way influenced by the pattern of land divisions.

After the disuse of the quarry pits, they seem to have been backfilled fairly quickly with the same grey/brown clayey silt, sometimes with inclusions of redeposited chalk lumps, presumably quarried material that was not wanted. The backfill of Pit F2255 contained a large quantity of 4th century pottery, around 10kg of CBM and several small finds, including two coins (**SF26** and **SF27**) and several iron objects. This suggests that the empty quarry pits in this group were subsequently used for the disposal of general waste.

2.10.2.1 Phase 4 pit cluster north-east of Ditch F2050

A group of five intercutting 4th century pits was located north-east of curvilinear Ditch F2050 and to the immediate north-west of contemporary Quarry Pit F2255. The group comprised Pits F2639, F2414, F2440, F2577 and F2574 (Fig. 21.2). All were roughly circular or oval in plan, with steep concave sides and rounded or flat bases; they were generally around 1.50m across by *c.* 0.50m deep. The group was dissimilar in several respects to the quarry pit cluster immediately to the south-east and to that around Pit F2557

some distance further south-east (see below). Notably, the group did not comprise the combination of shallow 'test' pits and deeper main extraction pits seen in these two pit clusters. Rather, all of the pits in this group were of similar size and depth. In addition, the cluster was fairly tightly-grouped, rather than spread out in an elongated line as if following a particular 'seam' of chalk, as was the group immediately to the south-east. Nevertheless, F2639, F2414, F2440, F2577 and F2574 may represent efforts to extract the underlying chalk. Although they inter-cut with one another this intercutting was slight, with the vast majority of each individual feature cutting into clean natural chalk. All of the pits contained finds, mainly of pottery and some CBM, suggesting that their secondary function was as receptacles for refuse material.

2.10.2.2 Pit F2557 (=F2473) and associated pits

Quarry Pit F2557 (=F2473) was the largest of a group of intercutting pits located in the central northern part of Area 1, a few metres north-west of Phase 3 Structure S2661. The group comprised Pits F3172, F2470, F2474 and F2557 (=F2473) and, in total, covered an area nearly 6m long by over 3m wide (Figs. 21.2-21.3). As with the quarry pit group centred on F2255 in the north-west of the site, the group around F2557 (=F2473) comprised a combination of shallow pits at the edges (F2470 and possibly F3172), with a larger central pit (F2557 (=F2473)) extending to nearly a metre in depth. Again, the shallower pits are thought to represent initial attempts to find deposits of chalk suitable for quarrying, deposits which were then more fully-exploited by digging a deeper adjoining pit.

These pits seem to have been backfilled fairly rapidly and it appears that they were used for the disposal of large quantities of rubbish. However, in contrast to the quarry pits in the north-west of the site, this rubbish was less mixed and 'everyday' in character. In addition to considerable quantities of CBM and pottery, the pits contained large assemblages of animal bone. Notably, the third fill (L2424) of F2557 (=F2473) yielded some 22kg of animal bone, including several near-complete skulls (**SFs 40, 41, 42, 44** and **48**). It is possible that this animal bone represents butchery waste; a notion reinforced by the recovery of a fragmented iron knife blade (**SF37**) from L2407 (=L2534, L2538), a homogenous dark grey/brown silt layer which covered Pits F2557 (=F2473) and F2470, forming the final fill of both pits.

2.10.2.3 Pit Group F2439

Pit Group F2439 was located just to the south of Pit F2557 (=F2473), in the approximate centre of Area 1, and comprised ten intercutting pits: F2428, F2430, F2429, F2426, F2427, F2425, F2408, F2411, F2378 and F2317. The pits ranged in size, but some, notably F2317, were fairly large features (up to around 2.75m across) (Figs. 21.1-21.2). They were generally shallow and although they inter-cut with each other, the later pits in the sequence generally only slightly truncated the neighbouring pits, largely being dug into the natural chalk rather than the backfills of earlier features. Central Pit F2408 seems to

have been the earliest in the sequence, with later pits radiating outwards from it. An interpretation as chalk quarry pits seems likely; certainly, the pits contained few finds and are thus unlikely to have been dug specifically for rubbish disposal. The clear preference for digging pits into clean natural chalk rather than the backfills of earlier pits also supports this interpretation. All of the pits in the group were sealed by L2316, a compact layer of dark grey/brown silty clay (5.70 x 3.50 x 0.38m), which contained a large assemblage of 4th century pottery (59; 443g), CBM (9kg+) and animal bone (2kg+), in addition to an Fe nail (**SF32**) and a Cu alloy coin (**SF33**).

A few probable postholes (F2480, F2484 and F2486) were situated close by to the south of Pit Group F2439 and may have been related given their spatial proximity to the quarry pits.

2.10.2.4 Possible Quarry Pits in Area 2

Further possible quarrying activity was identified in the eastern part of Excavation Area 2. Unlike that recorded in Area 1, it did not comprise dense clusters of pits of varying depth. Instead, it took the form of two very large pits, F4174 and F4202. Pit F4174 was the earlier of the two pits, as it was cut by F4202, and was recut by Pit F4317 prior to its final infilling. It was approximately circular in plan and measured around 8m x 7.25m across, by up to 1.64m deep (Figs. 21.6-21.7). During excavation, the pit was interpreted as a watering hole for livestock. This is a possibility, as the north-western edge of the pit formed a gradual and somewhat stepped slope which may have been practical for cattle to approach the hole to drink (cattle generally being reluctant to approach deep, steep-sided pits from which they would be unable to get out). However, when compared with the Area 1 quarry pits (e.g. F2255, F2232, F2130, F2268, F2160 and F2217), F4174 and F4202 appear similar in both scale and profile, and may therefore represent a similar type of activity taking place in Area 2 of the site.

The pits were possibly created in order to extract natural chalk for construction of buildings in the immediate area; however, it was observed on site that the natural chalk was of relatively poor quality and would probably not have been suitable for construction. Despite its poor quality, the natural chalk might still have been suitable for the construction of rubble walls such as those seen in the two probable barns on the site. An alternative use for the chalk might have been lime production. Post-medieval pottery (4 sherds; 19g) was recovered from the upper fill of Pit F4174 (L4175); this is considered to be intrusive, as the pit was cut by Phase 5 (post-medieval) Enclosure Ditch F4021.

The sequence of fills within F4174 (Figs. 21.6-21.7) indicates that the pit was left open for some time and either began to gradually infill through natural processes, or was subject to periodic dumping of waste materials (L4331, L4383, L4382, L4319 and L4381). Some time later, the pit was recut by F4317, a smaller steep-sided, flat-based pit. The precise reason for this recut is unclear. It was obviously not a quarry pit, as it was dug into the backfill of an earlier pit rather than into undisturbed natural chalk. It may have been a

rubbish pit, deliberately sited here because it was easier to dig into the fill of F4174 than into the natural geology of the site. Certainly, the fills of F4317 contained quantities of waste material, including animal bone (1174g), CBM (3762g) and a piece of worked stone (1044g). The piece of worked stone mirrors the larger blocks of squared limestone from Excavation Area 1 (see below) and indicates the demolition of a well-built Roman building in the vicinity.

Pit F4202 cut the south-western edge of Pit F4174. This feature was of similar size (7.33 x 5.86 x 1.85m) and a similar shape in plan (roughly circular) to F4174. In contrast, however, F4202 had steep sides and would not have been suitable for large animals to drink from. Towards its southern side, Pit F4202 became deeper and extended below the water table; excavation ceased due to safety constraints. The fills of the pit, which seemed to represent a gradual sequence of silting up, slumped downwards into this deeper part of the feature (Figs. 21.7-21.8). A similar finds assemblage to that from Pits F4174 and F4317 was recovered from F4202, indicating that it was possibly used for the disposal of domestic waste after chalk extraction had ceased.

2.10.3 Further Phase 4 features

Pit F2620 (=F2525, F2656) (Plate 13; Figs 7.2 & 20), which was cut through a number of earlier features, including Structure S2661. Given the number of earlier features which it truncated and its shallow depth (0.33m max.), F2620 is considered unlikely to have been a quarry pit. It contained a fairly large quantity of CBM (24kg+), in addition to a sizeable assemblage of late 3rd – 4th century pottery, and it is suggested that the feature was created in order to hold material arising from the demolition of the Phase 3 S2661. It is notable that F2620 (=F2525, F2656) formed an elongated oval in plan and was aligned north-east to south-west, following the line of the earlier Ditch F2543 which it cut. It appears that a pit was required in this area to hold demolition material from S2661, but that for ease and convenience, the pit was dug into the backfill of a nearby ditch rather than into the firm natural chalk brash, which presumably would have required far more effort on the part of the original excavators.

To the west of this feature were the fairly amorphous Pits F2388 and F2667 (Figs 7.1, 7.2 & 20). These contained dateable material to place them in Phase 4 but clear functional indicators were not evident.

Four intercutting pits in the south-west corner of Excavation Area 1 (F2871, F2869, F3093 and F2867; Figs. 7.2 & 20)) are likely to belong to the 4th century based on a combination of their stratigraphic relationships and associated finds. As they were cut into the backfills of several earlier ditches (including that of Phase 3 Enclosure Ditch F3054), they are unlikely to have been dug as quarry pits. The pits varied in plan, but they shared similar steep-

sided profiles; they were generally around 1.50 – 2.00m across by around 0.60m deep, although F3093 was far shallower (0.16m deep). Of the group, only F2869 and F2867 contained finds. It is possible that they were dug primarily for the disposal of organic waste, which has not survived. Pit F2867, the largest of the group and the last in the sequence, contained a moderate assemblage of 4th century pottery (13 sherds; 141g). It is possible, however, that they were associated with Phase 4 Ditch F2791 as they were located at its apparent terminus. Around 4.5m to the south-east, large Pit F3048 (approx. 2m long by 1m wide), cut through the terminus of Ditch F3054, and was probably of similar date. It contained a moderate assemblage of late 3rd – 4th century pottery (25 sherds; 261g).

Two small pits (F2972 and F2973) were cut through Phase 4 Ditch F2791 (Seg. D). Pit F2973 may have been used to dispose of hearth waste or demolition material as its basal fill was a thin, charcoal-rich, lens. Based on their stratigraphic relationships with the underlying ditch, they either belonged to, or post-dated, Phase 4. Given the proximity of a group of other Phase 4 pits a few metres to the north-west, which were also cut through earlier ditches, F2972 and F2973 are thought to belong to Phase 4.

Approximately halfway along the south-western boundary of Excavation Area 1, 6.75m south of Phase 4 Ditch F2884 (=F2791), was a large shallow oval pit, F2903 (4.25 x 3.40 x 0.45m deep) (Plate 25; Figs 7.2, 20 & 21.4). This had been used to dispose of approximately 15kg of ceramic building materials and a very large quantity of late 3rd and 4th century pottery including 20 sherds (567g) which are almost certainly of 4th century date. Further eastwards, large Pit F2882 cut the north-western terminus of Phase 4 Ditch F2880. It contained a large quantity of mid to late 4th century pottery (127 sherds; 2.2kg+).

Pit F2957 (Figs 7.2 & 20) was located in the centre of Excavation Area 1, in isolation from other Phase 4 features. It was around 1.50m across by 0.40m deep and had near-vertical sides and a flat base. It contained a small quantity of CBM and a few sherds of 4th century pottery

Pit F5142 (Figs. 7.1 & 20) cut the Phase 2 metalled surface F5006. It was subcircular in plan and, in section, had steep sides giving way to a slightly concave base. It contained pottery, fragments of tile and animal bone and appears, at least as a secondary function, to have been used for the deposition of refuse material.

To the north-west of F5142, Pit F5153 was one of three pits that cut the Phase 1 Structure S5144. F5153 was the latest of these and was dated to Phase 4 on the basis of the presence of a single sherd of pottery.

In the south-western corner of Excavation Area 1 (Grid Squares E9-E8), a localised patch of rubble (L2694) was identified, overlying Phase 2 Pits F2961 and F2963. It yielded a large quantity of 4th century pottery (78 sherds; 1608g), nearly 6kg of animal bone, 29kg of CBM and a numerous fragments of painted plaster (47; 550g), as well as a Cu alloy coin (**SF56**) and a glass fragment (**SF64**). Layer L2694 is thought to derive from the demolition of a

nearby building, perhaps S2901 *c.* 10m to the west, but possibly another unidentified building either in this part of the site, or just beyond the southern limit of the excavation.

2.10.4 Abandonment layer

Towards the southern end of the new doctor's surgery excavation area, all of the archaeological features were sealed by a dark black abandonment layer, L5007. The layer contained an assemblage of pottery sherds dated *c*. AD 300-370, together with substantial quantities of tile and animal bone. Other finds included fragments of *opus signinum* mortar and wall plaster, an iron blade (**SF5**), two pieces of another iron object (**SF6**), a large fragment of Purbeck Marble, a Millstone Grit fragment, oyster shell, mollusc shell and two iron nails. A single residual struck flint was also present.

2.11 Unphased Roman features (Fig. 8)

2.11.1 Introduction

A small number of features recorded at the site contained artefactual evidence to indicate that that they were of Roman date but this evidence was not attributable to a particular date. To exacerbate this, these features displayed insufficient stratigraphic relationships from which they could be assigned to a particular phase of activity. As such, these features have been classified as being unphased features of Roman date.

2.11.2 Four-post structure (S4134)

A small rectangular structure, comprising four postholes (F4096, F4087, F4074 and F4072), was located towards the northern corner of Area 2, close to Phase 3 feature F4148 (Fig. 7.3). The structure was aligned with its long axis orientated north-east to south-west and measured approximately 4.20m x 2.50m. Posthole F4074, the northernmost posthole within the group, produced a considerable amount of CBM, indicating that rubble packing material may have been used to hold a structural post in place. A post pipe void (F4403) was apparent within the posthole; similar voids were present within the other postholes in the group. Posthole F4072, to the south-east of F4074, produced the only dating evidence for all four features: pottery of late 3rd to mid-4th century date. Therefore, although the structure was contemporary with the other late Roman activity on the site, the absence of stratigraphic relationships with other phased features makes it unclear exactly which phase of activity within this timeframe the structure belonged to. CBM and mortar were also recovered from F4072, but in smaller amounts than were present in F4074. A post pipe void (F4083), in the centre of the posthole, indicates that the post may have been deliberately removed and then immediately backfilled (rather than left open enabling the surrounding fill of the posthole to slump into the

void). Posthole F4096, to the south-west of F4072, also displayed evidence of a post pipe void (F4405). The post appears to have been supported by demolition material, including clunch. These features failed to produce any datable material, but have been dated due to their spatial association with the other postholes of the four-post structure. Posthole F4087 was located at the western corner of the structure. Again, the post would have been supported in its position with clunch, clay and chalk fragments. The post pipe void, F4089, was not situated directly in the centre of the posthole.

Posthole F4114 was located to the north-east of the four-post structure (S4134), in the north of Area 2. A post pipe void (F4116) was identified within the feature; 3rd century pottery was found in association, as well as animal bone. The posthole could have been created during any of the Roman phases represented on the site, although probably not as late as Phase 4.

Posthole F4118 was located to the south-east of Posthole F4072. This feature was very similar to Posthole F4114 in profile, fill and finds. The associated pottery dates to the 3rd to mid-4th century AD; animal bone, worked stone and CBM were also present. The presence of worked stone and CBM within the posthole may indicate that it was created after a structure was demolished close to the site. The posthole was lined with clunch and CBM in order to support the post; this is very similar to Posthole F4114 and those forming the possible four-post structure (S4134).

Posthole F4070 was located to the south-east of Posthole F4096 and was aligned with this feature and F4087, although not with F4118 to the north. This was a much smaller feature than the other postholes located in this area but it was certainly Roman as it produced 3rd to mid-4th century pottery sherds, CBM, animal bone and oyster shell. This would appear to be a typical finds assemblage for the Roman phases represented on the site.

2.11.3 Further unphased Roman features

In the south-western corner of the new surgery excavation area lay F5159 (Fig. 7.1), a subcircular pit containing Roman pottery and CBM, and F5175, a slightly amorphous linear which also contained Roman pottery. The pottery assemblage from F5159 spanned the period of Roman occupation at the site and as such it was not possible to assign the feature to a specific phase. However, its northern edge was cut by the late Phase 2 Ditch F5003, indicating that it must belong to Phases 1 or 2. Similarly, the pottery assemblage from F5175 did not assist in assigning it to a particular phase; this material was of very late date in the range of Roman activity recorded at this site but the feature was cut, like F5159, by Ditch F5003. This indicates that the pottery is potentially intrusive and that the true date of F5175 must be in Phases 1 or 2.

Like F5159, Pits F5090 and F5054 contained Roman pottery that could not be assigned a close date and neither displayed sufficient stratigraphic relationships from which a specific phase of activity could be identified. Both

of these features, however, were located in fairly close proximity to the Phase 2 Structure S5500 and may have been related; F5090 contained tile, possibly associated with the demolition of a nearby structure.

To the north-west, Ditch F5140 contained pottery more consistent with a date in Phase 1 but cut Phase 3 Ditch F2080. This pottery is potentially residual from earlier features in this area. This indicates that while this feature cannot be assigned to a particular phase, it must be of Phase 3 date or later.

2.12 Phase 5 Post-medieval (Fig. 8)

2.12.1 Enclosure/boundary ditches

Linear Ditch F4021 was recorded running from close to the south-west corner of Excavation Area 2 on a north-west to south-east alignment for 50m. It then turned through 90° to follow a south-west to north-east alignment for a further 72.5m. Its width varied along its length, but it remained relatively narrow. Its north-west end was obscured by a trial trench; it probably extended in this direction beyond Area 2, towards Area 1. To the north-east, F4021 was cut by post-medieval Ditch F4185. Ditch F4021 was not particularly deep and would not have been effective for enclosing livestock unless it was associated with some kind of fence line or embankment. In contrast to the earlier (Phase 2) Roman boundary ditches in this part of the site, the base of F4021 was regular in profile and slightly concave throughout and it is thought unlikely that it was itself a foundation slot for a fence line. It is therefore probable that this feature was used to demarcate a field boundary and facilitate drainage. The possibility of plough damage must also be considered given the shallow depth of the ditch. It may originally have been a more prominent landscape feature.

Finds recovered from Enclosure Ditch F4021 include post-medieval pottery (4; 55g), as well as a few sherds of residual Roman pottery; the ditch cut through many earlier features. Ceramic building materials were encountered in many segments of the ditch, perhaps indicating the construction or demolition of buildings in the vicinity.

Ditch F4185 was located along the north-eastern boundary of Area 2, running on a north-west to south-east alignment for almost the full width of the excavation area (38m). It was a considerably wider, deeper and generally much more substantial feature than broadly contemporary Phase 5 Ditch F4021 (3.10m across where its full profile was revealed in Segment B). It is therefore likely that it represented a field boundary, as well as possibly the boundary to a whole plot of land which was under particular ownership. None of the historic maps of the area, dating from 1790 until 1926, show any features within the site boundaries. It is therefore possible that the post-medieval field boundary (F4185) was created, and backfilled, either prior to 1790 or after 1926; a substantial ditch such as F4185 would almost certainly be depicted on the historic maps. This is not necessarily the case for F4021, a

much smaller and narrower ditch, which was possibly primarily intended for field drainage. Such a feature would not necessarily denote ownership, and thus may not be identified on a historic map. The boundary ditches may have had a dual purpose, both demarcating an area, as well as providing drainage for surface water.

Finds from Ditch F4185 include CBM, suggesting that the ditch may have been infilled with construction or demolition waste. A layer of animal bone was discovered at the base of Segment B (L4104), possibly indicating that the ditch was used at some point to dump dead or diseased cattle. A clay pipe was also recovered from the fill of Segment D (L4104). A pair of relatively modern Fe scissors was also recovered from the ditch (not concorded). No finds were recovered from the upper fill of the ditch, indicating that it may have been left to silt up naturally after some initial episodes of rubbish dumping.

2.13 Phase 6 Modern (Fig. 8)

Three modern features were identified during the watching brief and excavation of Area 2. A modern storm drain (F4094) was aligned north-east to south-west and cut through many phased features in the excavation area (Figs. 7.3 & 7.4). This feature also cut through Subsoil L4001. Two other services were located in the watching brief area. Located in Test Pits 1 and 2, Service Trenches F4004 and F4006 were also aligned north-east to south-west. A single modern feature, a gravel trackway associated with a house to the north of the site, was recorded in Area 1.

2.14 Undated features

2.14.1 Introduction

A number of excavated features identified across all three excavation areas remain undated due to a lack of appropriate artefactual and stratigraphic evidence. In most cases these were discreet features but some displayed sufficient stratigraphic relationships from which a *terminus ante quem* or *terminus post quem* could be discerned but no close dating or phasing could be identified.

2.14.2 Grave F2755

Beneath Cobbled Surface L2157, in Area 1, was a rectangular grave cut with rounded corners (F2755), cut partly into the natural chalk and partly into earlier undated Pit F2760 (Figs. 6 & 7.1). It had steep, concave to near-vertical sides and a flat base. It measured 2.70m in depth, 1.42m in width, and 0.45m in depth. Its long axis was aligned approximately south-east to north-west. Within F2755 were the remains of a human burial (SK2753). There were slight indications that SK2753 may have originally been buried in a coffin, as it

was noted during excavation that a rectangular outline/soil mark could be discerned in the surface of the natural chalk.

Skeleton SK2753 was incomplete, with only the skull and some of the smaller bones of the lower arms, hands, lower legs and feet present. The skull was positioned at the south-east end of the grave, but was found facing upwards, out of the grave, rather than in its 'natural' position. The other bones were disarticulated and scattered throughout the grave in no coherent order. The grave was backfilled with a fairly firm dark greyish-brown clayey silt (L2752), very similar to the backfills of the majority of the Roman features found on site. This overlaid a thin layer of compact light grey clayey silt (L2754), presumably a silting deposit which formed during the short period in which the grave was open before being backfilled. The grave was sealed by a thin levelling layer, L2751. This covered both Grave F2755 and an area to the east of the grave where the surface of the natural chalk was uneven and undulating. It was presumably laid down at the time the cobbled surface above was constructed, in order to provide a level surface for the cobble stones. Cobbled Surface L2157 yielded a few sherds of 3rd – 4th century pottery and is thought to have been established during the one of the earliest phases of Roman activity at the site, although it may have continued in use during later phases of activity. There was no other dating evidence associated with the inhumation. The disarticulated skeleton and absence of many of the larger bones, which might be expected to preserve better than the small bones of the hands and feet, suggests that Grave F2755 represents a reburial of a disturbed inhumation.

2.14.3 Worked stone blocks

Two worked limestone blocks were recovered from the central northern part of Excavation Area 1. L2377 (*c.* 0.80 x 0.60 x 0.24m) was found at the interface between the subsoil (L2001) and natural chalk brash (L2040) (Plan 21). There was no surviving evidence of a surrounding cut. Approximately 4.50m to the north-east, another worked limestone block, L2616 (0.78 x 0.44 x 0.17m), was found. This was contained in a north-west to south-east aligned rectangular pit with rounded corners (F2614; 1.10 x 0.70 x 0.42m), which had vertical sides and a flat base. The pit had been backfilled with a fairly loose light grey sandy silt. There were traces of mortar on the 'upper' face of the stone block. Both stone blocks were rectangular, with relatively cleanly-squared edges; both also exhibited toolmarks including both shallow diagonal grooves, perhaps from sawing, and much deeper gashes, possibly resulting from being worked with a chisel.

The purpose of these limestone blocks is unknown. Their presence perhaps lends weight to the idea that a substantial stone building once existed somewhere in the vicinity and that they were salvaged for reuse following its demolition. They may have been brought to this part of the site and positioned close to each other, perhaps both originally in pits, for a particular structural function. They would have made effective post pads supporting large timber

uprights but there were no obvious related structural features in the surrounding area to indicate the presence of a timber building.

2.14.4 Other undated features

A number of features recorded during excavation of the Tunbridge Lane site remain undated due to a lack of dateable artefactual evidence or stratigraphic relationships that provide conclusive *termini post* or *ante quem*. These are mostly discrete features, or sometimes occurring as small intercutting clusters of undated features (e.g. F2351, F2347, F2353, F2349 or F4121, F4123, F4125), scattered across the site. Some undated features do display stratigraphic relationships with dated features; those undated features which are cut by Roman features, especially those belonging to later Roman phases, are likely, themselves, to be Roman. However, this cannot be proven conclusively as the possibility remains that they are representative of earlier activity.

Amongst the undated linear features (e.g. F4029, F4049, F2153, F2487, F3105) there was a general conformity to the north-east to south-west/north-west to south-east alignments that the majority of the Roman archaeology followed. This, however, is not suitable evidence on which to base a Roman date for these features as the post-medieval boundary ditches recorded in Excavation Area 2 also followed these alignments, suggesting that the local topography lends itself to the laying out of enclosures, and other aspects of settlement, on these alignments; it is notable that much of modern Bottisham is aligned in this way too. There are some exceptions to this pattern but these are mostly small, fairly ephemeral features such as F2959, F3001 and F2080.

2.14.5 Undated deposits

A localised layer of stony overburden in the extreme south-east corner of Area 1 overlaid Ditches F2998, F3032, F2745, F3005 and F2880. It was a firm mottled mid grey/brown and mid orangey clayey sandy silt with moderate subangular flint inclusions (10-30mm) and occasional larger flint nodules (50-70mm). It covered an area *c*. 9.50m long from north-east to south-west by around 3.80m wide. The layer contained late 3rd – 4th century pottery (19; 385g), CBM (3.6kg+) and a small quantity of animal bone (362g). It was initially thought that it might represent the remains of a cobbled surface, in which case its stratigraphic position above Ditch F2880 suggests a date late in, or postdating, Phase 4. However, it is equally possible that it was formed from the ploughed-out fills of the underlying ditches and numerous natural palaeochannels which ran through this area of the site. The stony, sandy composition of the layer was certainly similar to the fills of the natural palaeochannels identified on site.

3 SPECIALIST REPORTS

3.1 The struck flint

Andrew Peachey

Excavations produced a total of 525 pieces of struck flint. The flint occurs in a wide range of states of preservation and largely appears to represent Neolithic activity with evidence for early Bronze Age activity also present. However, with the exception of three fragments of debitage that appear to occur in natural or geological features, the struck flint fragments were entirely recovered from features associated with occupation in the Roman period or later (Table 3). Therefore the struck flint is grouped for discussion by implement/flake type rather than by groups of stratified/chronologically associated fragments.

Site/Feature Group	Implements	Cores	Debitage
Tunbridge Lane			
Phase 2 (Roman)	1	2	48
Phase 3 (Roman)	2	1	47
Phase 4 (Roman)	8	6	61
Phase 5 (post-medieval)	0	0	1
Undated features (probably Roman)	0	2	26
Subsoil L2001/L4001	10	5	191
Natural/Geological features	0	0	3
New Doctors Surgery site	0	*0*	16
Tunbridge Hall Farm TT Eval (TUB03)	5	8	82
Total	*26*	*24*	*475*

Table 3: Quantification of struck flint in phased groups by frequency

Methodology & Terminology

The flint from Tunbridge Lane (AS1011) was quantified by fragment count and weight (g), with all data entered into a Microsoft Excel spreadsheet that will be deposited as part of the archive. Flake type (see 'Dorsal cortex,' below) or implement type, patination and colour were also recorded as part of this data set. The data for the flint from the New Doctors Surgery (HAT432, McDonald 2000) and the Tunbridge Hall Farm trial trench evaluation (TUB03, Beadsmore 2003) was subsequently integrated into this data set, although some categories had been omitted in the original recording.

The term 'cortex' refers to the natural weathered exterior surface of a piece of flint, and the term 'patination' to the colouration of a flaked surface exposed by human or natural agency. Dorsal cortex is categorised after Andrefsky (2005, 104 & 115) with 'primary flake' referring to those with cortex covering 100% of the dorsal face; 'secondary flake' with 50-99%; 'tertiary' with 1-49% and 'non-corticated' to those with no dorsal cortex. A 'blade' is defined as an elongated flake whose length is at least twice as great as it's breadth, often exhibiting parallel dorsal flake scars (a feature that can assist in the identification of broken blades that, by definition, have an indeterminate length/breadth ratio).

Raw materials

The raw flint used to manufacture the struck implements and debitage in the assemblage is generally very dark grey with either a blue or brown tint and, where extant, a relatively thick white cortex. This flint is of relatively high quality and indicative of chalk-derived flint (as might be expected given the local geology). A small element of the assemblage is in a distinctive orange-brown flint that may have been specifically selected or imported for, or as, leaf-shaped arrowheads (see below). Identification of the raw flint was occasionally hampered by the varying degrees of patination that resulted in the heavy surface whitening of some fragments, obscuring their original colour. The wide variation in degrees of patination may be the combined result of varying levels of exposure or weathering during re-deposition and the chronological duration between when individual flakes, implements or cores were originally manufactured and deposited.

Commentary

Cores: A total of 12 complete cores and 12 core fragments were recorded, accounting for c.5% of the struck flint assemblage by frequency, a closely comparable proportion to that if the implements in the assemblage. The cores have an average fragment weight of 54.40g therefore they were probably discarded due to a perceived fault or imperfection during reduction. Of the cores, two examples were single platform cores, most probably associated typologically with later Mesolithic to earlier Neolithic activity. The single platform cores (Clark 1960: type A2) were present in Pits F2232 (L2231) and F2970 (L2888), with the example in Pit F2232 exhibiting flake scars that suggest it was being reduced to produce blades prior to its deposition. Probable rejuvenated variants of these are cores with two parallel striking platforms (Clark 1960: type B1) in Ditch F4034 (L4035) and TUB03 Tr.1 (L1), which appear to have been rotated to allow for continued explotation of the core. The remaining cores are multidirectional and appear to exhibit unsystematic reduction and were contained in Pit F2425 (L2451) and Sealing Layer L2694 at Tunbridge Lane, and as un-stratified material within the TUB03 trial trench evaluation. These flake cores probably represent discarded cores, with a date within the later Neolithic to early Bronze Age appearing most likely, although if they were trial or tested pieces earlier origins cannot be discounted.

The core fragments include at least two core rejuvenation flakes: in Quarry Pit F2557 (L2424) and as un-stratified material from the TUB03 evaluation, both probably struck from a blade producing cores. The remaining core fragments probably represent discarded cores that were broken during reduction or reduced beyond a practical size. These were present in Ditches F2731 (L2730), F2791 (L2790), Pits F2103 (L2104), F2317 (L2316), F2688 (L2689), Buried Soil L2001 and Topsoil L2000. The core fragments have an average fragment weight of 25.82g and it was noted in the March/Manea area that cores under *c*.25g tended to represent cores worked down to exhaustion (Middleton 1990, 16) suggesting these nodules, or parts there of were no longer viable.

Implements

Fabricators: In addition to the discarded cores and heavily worked core fragments, an additional indication that flint implements were being produced on or near the site is the presence of a fabricator in Industrial Feature (Pit) F4148 (L4147). This fabricator comprises a flint 'rod' approximately 100mm in length and 20-25mm in diameter (roughly circular). One end of the fabricator is heavily blunted from the repeated impact of a hammer stone, while the other is a chipped striking point. The chipped or fractured nature of the striking point may have been the reason for the fabricator's discard. Fabricators such as this are more common in the later Neolithic to early Bronze Age periods, but are not unknown earlier in the Neolithic.

Arrowheads: Two arrowheads were recovered as residual material from the Phase 4 'Quarry Pit F2255 and associated features' feature group, while a further three arrowheads were recovered from Buried Soil L2001 during test pit excavation. The arrowheads in 'Quarry Pit F2255 and associated features' comprised a broken/re-worked leaf-shaped arrowhead (3g) in Pit F2255 (L2253) and a broken leaf-shaped arrowhead (11g) in Pit F2232 (L2231). The leaf-shaped arrowhead in Pit F2255 was manufactured from the dark grey-brown chalk derived flint common in the assemblage, and was probably broken during manufacture rather than in use. A failed attempt has been made to re-work the object piece into a smaller arrowhead, possibly leading to its discard. The leaf-shaped arrowhead in F2232 is present as the butt end of the arrowhead and was manufactured from a distinct orange-brown flint. This arrowhead is relatively large for its type, though similar examples are present at Hurst Fen (Clark 1960, 220), and may actually have originally been intended as a laurel-leaf rather than an arrowhead. Two further leaf-shaped arrowheads were recovered from test pits into Buried Soil L2001 (not located in close proximity to 'Quarry Pit F2255 and associated features'). The first, in L2001 Test Pit 39, is a broken example (3g) in the same distinctive orange-brown flint as the arrowhead/laurel leaf in Pit F2255. The second is a partly worked example (2g) in dark grey-brown flint recovered from L2001 Test Pit 47. These types of arrowhead, including the possible laurel leaf, are typical of types produced throughout the Neolithic period. During this period at Hurst Fen, it was noted that an orange flint was preferred for arrowheads and laurel leaves rather than for scrapers (Clark 1960, 216).

In contrast to the arrowheads already described, the final arrowhead, recovered from Buried Topsoil L2001 Test Pit 8 is a barbed and tanged type (2g) typical of types produced in the early Bronze Age. It is unusual in that it only has one tang, with the other presumably broken off during manufacture so that the piece was finished without it. The tip of the piece is also absent but was probably snapped during use, rather than broken during manufacture.

Borers: Single examples of borers were recovered from Gully F2801 (L3128 Seg. H) and Buried Soil L4001 Test Pit 2. Both examples had had flakes removed from one direction only in order to form points, thus classifying them

as 'piercers' rather than 'awls' or 'spurred pieces' (Healy 1988, 49). Short pointed piercers are largely, but not exclusively, associated with earlier Neolithic activity (Healy 1988, 46).

Scrapers: Two scrapers were recovered as residual pieces in discrete features (Pit F2425 (L2451) and Ditch F4263 (L4262 Seg. B), while a further three scrapers were recovered from Buried Soil L2001 (from test pits 7, 30 and from excavation), with a single un-stratified example from Tr.12 of the TUB03 evaluation. All six pieces were side-end scrapers formed from tertiary flakes that had been moderately but not extensively retouched using percussion flaking. The scrapers varied in weight between 7 to 18g with an average weight of 12g. The lack of extensive retouching suggests a date in the earlier Neolithic, but with such a limited sample these scrapers may date anywhere in the Neolithic to early Bronze Age.

Blades: Despite evidence provided by the cores in the assemblage for the production of blades on or close to the site, the number of blades present in the assemblage is extremely limited. This may reflect a chronology in the later Neolithic to early Bronze Age when blades were much scarcer (Healy 1988, 46), but is probably an anomaly resulting from the re-deposition of the prehistoric struck flint. The blades all tend toward elongate, narrow proportions generally associated with the earlier Neolithic. The presence of two serrated blades in Pits F2125 (L2127) and F2255 (L2174), both part of Phase 4 'Quarry Pit F2255 and associated features,' with a further un-stratified example at Tunbridge Hall farm (TUB03) also supports a date in the earlier Neolithic. The remaining blades are present in Pit F2557 (L2424), Ditch F4136 (L4135 Seg. D) and Buried Soil L4001 Test Pits 1 and 6.

Debitage: A total of 215 debitage or waste flakes were present as residual material in discrete features, while a further 260 flakes were recovered from Suboil L2001/L4001 or as un-stratified material. Of this entire group 46.54% (by frequency) are tertiary flakes, 24.47% un-corticated flakes, 7.98% secondary flakes and 6.12% primary flakes with the remaining 14.89% comprising broken flakes that cannot be classified. The various waste flake types exhibit a moderate degree of variability but the residual and re-deposited nature of the flakes does not allow for any reliable comparison of flake size or shape related to chronology. However, the quantities present do suggest core reduction was taking place on or in close proximity to the site.

Distribution

The struck flint is thinly distributed across the entirety of the three sites and through Buried Soil L2001/L4001. The only major concentration of struck flint in the assemblage is in Phase 4 'Quarry Pit F2255 and associated features' comprising a total of 33 fragments (200g) including a blade core, two blades, two leaf-shape arrowheads and a range of debitage that coincide with significant quantities of Roman pottery and CBM. Smaller concentrations of struck flint are also apparent in Phase 2 Ditch F2731 and Phase 4 'Quarry Pit F2557 and associated features'. Phase 2 Ditch F2731 contained a total of 21

fragments (162g) recovered from five segments and including a core fragment and a range of debitage. Phase 4 'Quarry Pit F2557 and associated features' contained a total of 16 fragments (63g) including a core fragment, a blade and a range of debitage. Both of the smaller concentrations of struck flint were also associated with significant quantities of Roman pottery and CBM.

Conclusion

This assemblage represents a re-deposited scatter of struck flint that appears to have a focus on activity in the earlier Neolithic period, as evidenced by several leaf-shaped arrowheads, single platform cores, narrow blades (including serrated types) and piercers. The cores also suggest that blade production, often associated with the earlier Neolithic, was occurring in the vicinity. However the presence of types of barbed and tanged arrowhead and fabricator associated with later Neolithic and early Bronze Age activity highlight the fact that the re-deposition of this assemblage has resulted in a potentially high degree of mixing and scattering. There are no *in situ* pieces in this assemblage and the entire assemblage occurs in association with high quantities of Roman material that has been deposited as rubbish or demolition debris from a nearby villa. Therefore it is logical that the bulk, if not all, of the struck flint does not represent disturbed material from this site prior to Roman occupation but may have been 'imported' from an adjacent location when Roman material was discarded.

3.2 The Pottery

By Andrew Peachey

Ceramic form types discussed in this report are referenced to comparable assemblages rather than illustrated.

Excavations recovered a total of 8319 sherds (126078g) of pottery in a slightly abraded and moderately fragmented condition (Table 4). The assemblage is almost entirely comprised of Romano-British pottery with a very small element of residual prehistoric pottery. Stratigraphic Phases 1 to 4 include important groups of pottery associated with occupation within the late 3rd to 4th centuries AD, almost certainly related to domestic villa occupation and consumption in the immediate proximity of the excavated area. The Roman pottery is dominated by products of the nearby Horningsea industry supplemented with integral elements of regionally imported pottery typical of the region, notably from the Lower Nene Valley, Oxfordshire and Hadham, but incorporating a broad spectrum of minority fabrics that provide valuable dating evidence.

Group	Sherd Count	Weight (g)	R.EVE
Tunbridge Lane & New Doctors Surgery sites			
Geological and tree bole features	18	303	0.19
Prehistoric Pottery (residual in later groups)	37	295	0.12
Phase 1	49	1130	0.40
Phase 2	1506	32985	14.90

Phase 3	2104	31872	14.61
Phase 4	1286	21586	12.07
Un-phased: Roman	279	5017	1.14
Undated features	58	888	0.22
Post-Roman Pottery (intrusive/un-stratified)	42	605	n/a
Subsoil L2001/L4001 (Excavation/Test Pits)	2058	15895	4.95
Tunbridge Hall Farm site			
All Roman pottery	882	15502	n/a
Total	*8319*	*126078*	*48.60*

Table 4: Quantification of Roman pottery in phased groups, and (in total) prehistoric and post-Roman pottery in the assemblage

Methodology

The pottery from Tunbridge Lane (AS1011) was recorded by sherd count, weight (g), R.EVE. Integrated into this data set was the archive data from the New Doctors Surgery Site (HAT432), recorded in 2000 by Andrew Fawcett and Malcolm Lyne (Lyne 2001). The latter data was comprised of quantification by sherd count/weight with basic form identification but no R.EVE data or detailed form type comparisons that could be incorporated. Added to the general quantification was the data from the limited archaeological investigation/assessment at Tunbridge Hall Farm (TUB03; Monteil 2003, 11-12) but the absence of context specific data did not allow further analysis.

All fabrics were examined at x20 magnification and referenced wherever possible to the National Roman Fabric Reference Collection (Tomber and Dore 1998), equivalent fabric descriptions from local or regional kiln sites or typologies, or are described fully in the site report. Form types were referenced to relevant published typologies or comparative examples, in particular to Evans' (1991) report on pottery from the Horningsea kilns, henceforth abbreviated in the text to *Evans*, and to Perrin's (1999) report on pottery from Water Newton (Durobrivae), henceforth abbreviated to *Perrin*. All form and fabric data was entered by context into a Microsoft Excel spreadsheet that will be deposited as part of the archive.

Fabric Descriptions

Prehistoric Pottery

F1 Bonfire-fired (hand-made) with dark red-brown to black surfaces and a very dark grey to black core. Surfaces may be smoothed but are otherwise abrasive. Inclusions comprise common calcined flint (1-4mm) and fine quartz (0.1-0.3mm). This fabric is comparable to a later Bronze Age type recorded at Pampisford, Cambridgeshire (Pollard 2002, 12: fabric 6).

Roman Pottery

Samian ware

LEZ SA 2	Lezoux samian ware (Tomber and Dore 1998, 32)
RHZ SA	Rheinzabern samian ware (Tomber and Dore 1998, 39)
TRI SA	Trier samian ware (Tomber and Dore 1998, 41)
CHF SA	Chémery Faulquemont samian ware (Tomber and Dore 1998, 36)

Other Fine wares

LNV GS	Lower Nene Valley grey slipped ware (Perrin 1999, 78)
LNV CC	Lower Nene Valley colour-coated ware (Tomber and Dore 1998, 117; Perrin 1999)
OXF RS	Oxfordshire red-slipped ware (Tomber and Dore 1998, 176; Young 1977)
PAK CC	Pakenham colour-coated ware (Tomber and Dore 1998, 182)
PAK MD	Pakenham mica-dusted ware (Smedley and Owles 1960; Tomber and Dore 1998, 182: fabric similar to PAK CC)
HAR RS	Harston (Obelisk kiln) red-slipped ware (Pullinger and Young 1982, 5)
NFO RS2	New Forest (fine) red-slipped ware 2 (Tomber and Dore 1998, 144)
SWN CC	Swanpool colour-coated ware (Tomber and Dore 1998, 163)
UNS RS	Unspecified red-slipped ware. This fabric exhibits a red-orange colour coat over oxidised margins and a mid grey core. The fabric is relatively soft with inclusions of common fine quartz (<0.2mm) and sparse fine mica. This fabric is very similar to a type recorded at Milton Keynes (Marney 1989: Fabric 38), also from an unknown source, and may be related to an off-shoot of the OXF RS tradition situated locally.

Coarse Ware Products of the Horningsea industry

HOR RE	Horningsea reduced ware (Tomber and Dore 1998, 116; Evans 1991, 35). A hard fabric with inclusions of abundant, well-sorted quartz (0.2-0.7mm), sparse mica, sparse red/black iron rich grains and limestone (<0.5mm) with occasional larger flint/limestone inclusions. Colours vary between a range of light-dark greys, sometimes with a red-brown tinge, and generally with thin margins defining the surfaces and core. Evans (1991, 35) described four fabrics that he comments may be regarded as a continuum and a moderate degree of variation was noted in all the Horningsea fabrics recorded in this assemblage, however these variations were not present with enough consistency to allow additional fabric divisions to be made. HOR RE accounts for the bulk of 'sandy grey ware' fabrics in the assemblage, to be expected given the proximity of the kilns, therefore any 'sandy grey ware' sherds (GRS) that could not be positively differentiated from HOR RE on grounds of fabric or form were assigned to this category as the most probable source. Products in this group probably represent the combined output of a large number of local kilns.
HOR BS	Horningsea black-surfaced ware. A variant of HOR RE in which vessels appear to have had a relatively coarse black slip applied or been subject to fuming during the latter stages of firing. The specific process to cause this effect is difficult to discern and may encompass both options.
HOR OX	Horningsea oxidised ware. As HOR RE but with mid red-orange surfaces, and generally a slightly paler or reduced mid grey core, possibly representing mis-fired HOR RE.

Other coarse wares

GRS	Non-local 'sandy grey wares'. Miscellaneous reduced wares with common quartz temper and incidental inclusions that do not allow a source to be assigned. Likely sources may include Cambridge, Hadham, the Lower Nene Valley, possible occasional Nar Valley body sherds and at least one vessel with an Essex-Chelmsford source.

ROB SH	Romano-British (late) shell-tempered ware (Tomber and Dore 1998, 115). Probably produced at Harrold, Bedfordshire (Brown 1994) but sources in the Lower Nene Valley cannot be ruled out.
HAD RE2	Hadham (burnished) reduced ware 2 (Tomber and Dore 1998, 153)
HAD OX	Hadham Oxidised ware (Tomber and Dore 1998, 151)
WAT RE	Wattisfield reduced ware (Tomber and Dore 1998, 184)
SOW BB1	South-West black-burnished ware 1 (Tomber and Dore 1998, 129)
DOR BB1	(South-East) Dorset black-burnished ware 1 (Tomber and Dore 1998, 127)
BB2	Black-burnished ware 2, probably of Colchester origin (Tomber and Dore 1998, 131)
SOB GT	Southern British ('Belgic') grog-tempered ware (Tomber & Dore 1998, 214)
PNK GT	Pink grog-tempered ware (Tomber & Dore 1998, 210)
BSW	Black-surfaced/Romanising grey ware. Black/very dark grey surfaces, dark grey-brown margins and a mid grey core. Inclusions comprise common-abundant, well-sorted quartz (0.1-0.5mm), sparse black to grey brown iron-rich grains/clay pellets.
NAR OX	Nar Valley Oxidised ware (Andrews 1985, 89-90: RW1/OW1; Peachey forthcoming: NAR RE1)
LNV WH	Lower Nene Valley white ware (Tomber and Dore 1998, 119)
LNV RE	Lower Nene Valley reduced ware, sometimes grey-slipped (Perrin 1999, 78)
OVW WH	Overwey white (Portchester D) ware (Tomber and Dore 1998, 146)
COL WH	Colchester white ware (Tomber & Dore 1998, 133)
GOD WS	Godmanchester (coarse) white-slipped ware (Evans 2003, 209: Fabric P05.1)
ALH RE	Alice Holt Reduced ware (Tomber and Dore 1998, 138)
?HAD RE1	Probable Hadham reduced ware 1 (Tomber and Dore 1998, 152). Inclusions comprise common, fine quartz and red/black iron rich grains (<0.25mm) with sparse pale grey grog/clay pellets (0.1-0.5mm) that are difficult to define from the matrix. All sherds present in this assemblage are burnished. A dense, very well-made fabric that probably originates with the Hadham kilns, but may possibly have been manufactured in the Lower Nene Valley or Northamptonshire.
UNS WS	Unspecified white slipped ware. Hard, oxidised fabric, sometimes with a grey core with inclusions of common, moderate to coarse quartz (0.25-0.6mm), sparse iron rich grains (<0.25mm) and occasional flint (1-5mm). The slip is thick and varies from white to a slightly streaky pale yellow. Vessel form suggests this fabric may possibly be a Colchester product (Symonds and Wade 1999, 287), but a Hadham source cannot be discounted. The fabric may be related to fabrics described at Chelmsford (Going 1987, 5-6: fabrics 14 and 15).
STOR	Storage jar fabric, tempered with sparse calcined flint, possibly Rettendon Ware, produced in Essex (Going 1987, 10)

Mortaria

LNV CC (M)	Lower Nene Valley colour-coated ware mortaria (Tomber and Dore 1998, 117; Perrin 1999)
LNV WH (M)	Lower Nene Valley white ware mortaria (Tomber and Dore 1998, 119)
LNV WS (M)	Lower Nene Valley white-slipped ware mortaria (Hartley 1985, 100: fabric M12)
OXF RS (M)	Oxfordshire red-slipped ware mortaria (Tomber and Dore 1998, 176; Young 1977)
OXF WS (M)	Oxfordshire white-slipped ware mortaria (Tomber and Dore 1998, 177; Young 1977)
OXF WH (M)	Oxfordshire white ware (Tomber and Dore 1998, 174)
HAD OX (M)	Hadham oxidised ware mortaria (Tomber and Dore 1998, 151)
SWN CC (M)	Swanpool colour-coated ware mortaria (Tomber and Dore 1998, 163).
NAR OX (M)	Nar Valley Oxidised ware mortaria (Tomber and Dore 1998, 171)

Amphorae

RHO AM1	Rhodian (Pink) amphorae 1 (Tomber and Dore 1998, 112)
BAT AM2	Baetican (late) amphorae 2 (Tomber and Dore 1998, 85)

Prehistoric Pottery

Excavation produced a total of 37 sherds (295g) of residual prehistoric pottery Though fragmented these sherds were well-preserved, uniform in fabric (fabric F1) and, at least in the case of the sherds recovered from discrete features (not the buried soil), probably derived from a single later Bronze Age vessel.

The diagnostic later Bronze Age sherds were recovered from Phase 2 Ditch F4168 (L2226 Seg.D) (12 sherds, 120g) and Undated Pit F4233 (L4234) (12 sherds, 125g). Pit F4233 cuts Ditch F4168 and is situated less than 10m north of F4168 (Seg.D), therefore the sherds in Pit F4233 may have been re-deposited from Ditch F4168. Sparse, small, non-diagnostic body sherds in a comparable fabric were also recovered from Phase 4 Quarry Pit F2255 (L2174) (1 sherd, 8g) and Buried Soil L4001 Test Pits 1 and 6 (10 sherds, 24g).

The fabric (F1) of the prehistoric sherds is comparable to a later Bronze Age type recorded at Pampisford, Cambridgeshire (Pollard 2002, 12: fabric 6) and the diagnostic rim sherds confirm this date. The two small groups of later Bronze Age pottery: in Ditch F4168 (L4226 Seg.D) and Pit F4233 (L4234), both contained diagnostic rim fragments of an urn, almost certainly derived from the same vessel but unfortunately not cross-joining (therefore not beyond doubt). The vessel has a t-shape rim and, as indicated by non cross-joining body sherds in Pit F4233 (L4234), a cordon on the body decorated with a row of oblique finger-nail impressions and is comparable to a later Bronze Age vessel recorded at Pampisford (Pollard 2002, 13: fig. 9.6).

Given the residual nature of the later Bronze Age pottery in this assemblage it is not possible to reconcile its occurrence with any identifiable occupation or activity, although the significance of the location of the two principal concentrations of later Bronze Age pottery should not be understated. Ditch F4168 (L4226 Seg.D) comprises a ditch terminus within a series of (Roman) parallel rectilinear ditches, and Pit F4233 a disturbance and re-deposition of material in very close proximity to this location. Therefore it cannot be discounted that the identified later Bronze Age urn may have been interred in an earlier incarnation of Ditch F4168 prior to the re-cutting or re-establishment of the ditch in the Roman period, which may have removed any further evidence of prehistoric stratigraphy. No later Bronze Age sites have previously been recorded in the parish of Bottisham (Hall 1996, 112), however, the adjacent landscape contains numerous examples of scattered Bronze Age burial mounds and flint work, including an urned cremation at Fen Ditton discovered in the 19th century (Taylor 1998, 29), as well as further burial mounds known largely by earthworks and crop marks at Horningsea, Stow cum Quy and the Wilbrahams (Taylor 1998, 45, 83 and 100).

Samian ware
With grateful acknowledgement to Joanna Bird

A total of 24 sherds (481g) of samian ware were present in the assemblage (Table 5), dating no earlier than the mid to late 2nd century AD. The bulk is comprised of sherds imported from East Gaul, including the ovolo of a Dr.37 bowl, with sherds from Central Gaul also present, including the stamped base of a cup. All the samian ware sherds are in a moderate to good state of preservation, exhibiting very low or limited degrees of abrasion.

Feature Group	No. of contexts containing samian	Central Gaulish		East Gaulish	
		sc	w	sc	w
Phase 2: field system	3	1	12	3	143
Phase 2: metalled surfaces	2	1	16	1	2
Phase 2: other ditches	4	2	8	4	133
Phase 3: rectilinear enclosure	4	2	18	3	45
Phase 3: other ditches	1	1	70	0	0
Unphased: Roman	1	1	4	0	0
Subsoil L2001/	1	0	0	4	24
Un-stratified	1	1	6	0	0
Total	*17*	*9*	*134*	*15*	*347*

Table 5: Quantification of samian ware in feature groups by sherd count (sc) and weight (w), in grams

Central Gaulish samian was imported into Britain until the demise of it's producers export industry in the late 2nd century AD (Webster 1996, 3), while East Gaulish samian ware was imported into Britain until the mid 3rd century AD with the kilns at Rheinzabern in particular, not ceasing to export until the decade 250-260AD (Bird 1993, 2). The samian ware in this assemblage may be residual but probably represents long-lived survivals and/or 3rd century imports, therefore constituting vessels that were retained by the occupants that developed this site in the late 3rd century AD until the vessels were discarded as domestic rubbish in Phases 2-4, substantially after the date of their manufacture.

The samian ware in Phase 2 exhibits a slight concentration in the Phase 2 Enclosure System (Ditches F2098 (L2183, L2895 Seg.L) and F2731 (L2730)). This includes fragments from a CHF SA Form 38 bowl (the only fragment from this East Gaulish centre in the assemblage) and the footring from a LEZ SA2 Form 30/37 bowl, both in Ditch F2098 (L2183), while Ditch F2098 (L2895 Seg.L) also includes a fragment from a TRI SA Form 31/31R bowl. Also in the Phase 2 Field System, Ditch F2731 (L2730) contains a body sherd of RHZ SA that cannot be assigned a form.

In other Phase 2 ditches, further sherds of RHZ SA were contained in Ditch F3012, Ditch Terminus F2062 and Re-cut Ditch F2804, with the sherd in Re-cut Ditch F2804 (L2803) part of the footring of an unidentified bowl or dish. Ditch F5003 contained small sherds of LEZ SA2, including in L5005 a fragment of a Dr.33 conical cup. The phase 2 metalled surfaces incorporated

sherds of LEZ SA2 and RHZ SA, notably including in Layer L5133 the base of a Dr.27 cup stamped with **PATERNIM**, die 1c of Paternus iii of Lezoux (Hartley & Dickinson 2011, 54). This stamp was used between *c*.AD130-160, thus making this potentially the earliest samian sherd in the assemblage, although other LEZ SA2 vessels may be contemporary. However, if produced towards the end of this date range the cup may have been imported into Britain in the third quarter of the 2nd century AD and remained in use for a substantial duration after this.

The remaining stratified samian ware sherds were all recovered from Phase 3: Rectilinear Enclosures (Areas 1 and 2, Ditches F2934, F3014, F4109 and Re-cut Ditch F4281), and Ditch F5080; and include small sherds of Dr.33 cups or Dr.31 bowls in RHZ SA, TRI SA and LEZ SA2. The samian ware in Ditch F3014 (L3016 Seg.A) comprised a fragment of a Form 37 bowl, including the rim and ovolo, manufactured at Rheinzabern (RHZ SA). The ovolo is Ricken and Fischer (1963) type E26 which was shared by a number of potters dating from the later 2nd century and the first half of the 3rd, however the rather flattened rim suggests that it belongs in the 3rd century AD (J Bird *pers comm.*). The fragment is in the 'better quality' Rheinzabern fabric and is in a particularly good condition, in contrast to the two cross-joining sherds of Central Gaulish samian (LEZ SA2) recovered from Ditch F4109 (L4110 Seg. C). These two fragments are derived from the base of a Form 33 cup, including makers stamp, with their abraded condition the result of wear rather than abrasion through re-deposition. The base of the cup is stamped **CADGATIS.F**, die 4b of Cadgatus of Lezoux (Hartley 2008, 155-8). The stamp is associated with manufacture between *c*.AD150-180, and has previously been recorded on Form 33 cups at Chester (Fortress), Northampton (White Hills) and Ipswich (Stanton Chair). This vessel may have been imported just prior to occupation on this site; however, the heavy wear pattern the sherds display indicates that the vessel may have had a lengthy lifespan, a not uncommon phenomena for samian vessels. The slip on the exterior of the vessel has been slightly abraded at the junction of the wall and base but is generally intact; while the slip on the interior of the vessel including over the makers stamp has been heavily abraded by series of linear and curvilinear scratches. It may be suggested that such a wear pattern may have resulted from a repeated stirring or scooping motion by an implement harder than the vessel (i.e. metal). Such a wear pattern is not found on any of the other sparse samian sherds (including basal sherds), most of which would have been imported later. This supports the theory that this Form 33 cup may have had a lengthy lifespan, which could quite feasibly have extended through the 3rd century and the period in which the site was occupied.

The Pottery in Phased Groups

Phase 1

Excavation of Phase 1 features recovered a total of 49 sherds (1130g) of Roman pottery, predominantly associated with features comprising Building S2901, and also with Structure S5144. The bulk of these sherds (*c*.80% by

sherd count) were in Horningsea fabrics, predominantly HOR RE, with sparse sherds of HOR OX and HOR BS. Foundation Cut F2967 (L2911) and Pit F2937 (L2938) contained only very low quantities of non-diagnostic sherds in Horningsea fabrics, with a GRS rilled jar in the internal fill of S5144 (L5145). In contrast, Foundation Cut F2967 (L2923 and L2902) yielded more informative small concentrations of sherds. Foundation Cut F2967 (L2923) contained fragments from three HOR RE vessels, comprising a bead and flange rim bowl (*Evans* 52) that would not pre-date the late 3rd century AD, with a bead rim dish and a small everted rim jar (*Evans* 69 and 43 respectively), as well as body sherds of ROB SH and LNV WH (M). Foundation Cut F2967 (L2902) also contained a bead and flange rim bowl, but in LNV CC (*Perrin* 258), which similarly would not pre-date the late 3rd century (and continued to be produced throughout the 4th century) as well as Horningsea fabric body sherds and a LNV CC body sherd with a painted 'vine and berry' motif and rouletted decoration originating from an unidentified beaker or flagon. The pottery recovered from the Phase 1 features may comprise a small sample size, however, the range of forms and fabrics present are typical of late Roman occupation in the region with the bead and flange rim bowls indicating a date after *c*.270AD.

Phase 2

A total of 1507 sherds (32985g) of pottery were recovered from Phase 2 features (Table 6), however, the distribution of the sherds between features (or groups there of) within Phase 2 is very heavily biased. The pottery group recovered from the Phase 2 'Field System' accounts for *c*.52.00% of the Phase 2 pottery by sherd count (*c*.49% by weight), with a further *c*.20% (*c*.20%) accounted for by the 'Late Phase 2 changes to Area 1 Ditch system' group, which represents subsequent alterations to the 'Phase 2 Field System' and 'Northern composite boundary'.

Phase 2 Feature Group	Sherd Count	Weight (g)	R.EVE
Phase 2: Northern composite boundary	18	247	0.15
Phase 2: Field System	779	16323	9.50
Phase 2: Ditches\Gullies in NW of Area 1	52	597	0.49
Phase 2: Curvilinear enclosure in S of Area 2	75	1587	1.33
Phase 2: Parallel rectilinear ditches in Area 2	16	43	0.00
Late Phase 2 changes to the Area 1 Ditch system	304	6726	1.48
Phase 2: Oven\Corndrier and associated features	58	1072	0.58
Phase 2: Metalled Surfaces	52	1851	0.00
Phase 2: Pits and Postholes	140	4360	1.27
Phase 2: Other features	12	179	0.10
Total	*1506*	*32985*	*14.90*

Table 6: Distribution of pottery within feature groups in Phase 2

Phase 2 Field System

The 779 sherds (16323g) of pottery recovered from the Phase 2 Field System group principally comprises pottery from four Ditches: F2098, F2731, F2801

and F3023 with sparse additional sherds recovered from Pits F2336, F2338, Gullies F2765 and F2698. Although moderate quantities of sherds are present throughout the excavated segments of the four principal ditches in the Phase 2 Field System, two focal points of concentrated occurrence appear particularly notable. The first comprises Ditch F2098 (L2183 Seg.C) which contained a single large deposit of pottery (172 sherds, 2476g). The second comprises a cluster of high concentrations of pottery distributed between four ditch sections close to the south-west boundary of the excavation and all within *c.*10m of one another: Ditches F2731 (L2838 Seg.D), F2801 (L2887 Seg.F and L3126 Seg.H) and F3023 (L3081 Seg. B), in total 165 sherds (4246g).

The pottery from the Phase 2 Field System included a minimum number of 71 vessels in Horningsea fabrics (Table 7) and a further 30 vessels in other fabrics. Key components within this group of vessels are bead and flange rim bowls, mortaria in multiple fabrics and other bowl types in HAD RE2 and OXF RS that were not manufactured prior to the late 3rd century AD. Although many of these vessels could feasibly have been produced throughout the 4th century AD, only a single vessel in HAR RS is associated with production beyond the mid 4th century AD, therefore the deposition of pottery in the Phase 2 Field System appears to be focused on the late 3rd to early 4th centuries AD, and had probably declined or stopped by the mid 4th century AD.

As with the assemblage as a whole, the locally produced Horningsea coarse wares dominate the Phase 2 Field System pottery group, with HOR RE accounting for *c.*78% of the group by sherd count (*c.*73% by weight), HOR OX for *c.*3% (3%) and HOR BS for *c.*6% (7%). In total, the Horningsea fabrics account for *c.*87% (82%) of the Phase 2 Field System pottery group. The slight disparity between the percentages of Horningsea fabrics by sherd count and weight provides an insightful commentary on the preservation of the pottery in the Phase 2 Field System. By their manufactured nature the Horningsea fabrics are, in general, bulkier and heavier than the remaining fabrics in the assemblage and one might expect these percentages to be reversed. However the disparity between the percentages, with the weight 5% less than the sherd count, reflects a high degree of fragmentation amongst the Horningsea fabrics probably explained by the combined processes of the accumulation/collection of this pottery as rubbish and it's (re-) deposition into open ditch features. This less than ideal state of preservation is also apparent in the extent of recordable vessel profiles, and therefore identifiable vessel types, in the group. Form types are often present as 'rim only' with little or no association to body sherds which often makes ascribing specific form types a difficult or impossible exercise. However, the evidence from the Horningsea fabrics and other fabric groups allows for a meaningful commentary on the pottery from the Phase 2 Field System.

Within the Horningsea fabric group the dominant vessel type appears to be open dishes and bowls (Table 7), whose precise categorisation as a dish or bowl is slightly arbitrary given the unknown depth of the bulk of vessels. In total, a minimum of 45 Horningsea dish and bowl forms were recorded in the

Phase 2 Field System, including 16 plain rim dishes comparable to *Evans* 66 and 67, 14 bead and flange rim bowls comparable to *Evans* 52 and 53 and 11 bead rim bowls comparable to *Evans* 68 and 69. None of these vessels exhibits any form of decoration beyond the plain burnishing of interior/exterior surfaces, which appears to have been applied to approximately half the recorded dishes and bowls in this group, although abrasion may have masked the true number. The distribution of these dish and bowl forms exhibits no further bias than that outlined for the concentrations of pottery within the Phase 2 Field System (above). Analysis of the jar types within the Phase 2 Field System group is equally problematic with the degree of fragmentation resulting in the presence of only very limited profiles. Of the 21 jars recorded in this group in Horningsea fabrics only 11 can be assigned a probable type, while the remaining 10 comprise miscellaneous fragments from vessels with either plain or beaded, everted rims. The jar types that could be identified include types with everted plain rims and a shoulder cordon (*Evans* 18, 19 and 22), with everted bead rims and, where extant, a shoulder cordon (*Evans* 28, 29, 41 and 44) and with ledge rims (*Evans* 32), however, no one specific type was ever present as more than two examples in the Phase 2 Field System group. In addition to the rim sherds present a single fragment of pedestal base, probably associated with an everted rim jar, was also recovered from Ditch F3023 (L3081 Seg.B). The final form type to comprise an important element of this pottery group are the distinct storage jars typical of the Horningsea industry, and like the jars these exhibit considerable variation in rim form but never beyond the types recorded in *Evans* typology. Variants include plain everted rims (*Evans* 2), everted bead rims (*Evans* 9 and 10) and everted bifid rims (*Evans* 6 and 7). Like the bulk of the jar forms these could not be associated with body sherds to form a profile beyond the rim/neck, although a HOR OX example of an everted plain rim storage jar (*Evans* 2) in Ditch F2098 (L2112) does display an extant white slip on the rim and neck.

Vessel Type	Incorporating form types	HOR RE		HOR BS		HOR OX	
		R.EVE	MNV	R.EVE	MNV	R.EVE	MNV
Storage jar	*Evans* 2, 6, 7, 9 and 10	0.37	4			0.12	1
Defined jar types	*Evans* 18, 19, 22, 28, 29, 32, 41 and 44	1.18	9	0.32	2		
Miscellaneous jars	Small everted fragments of plain and bead rims	1.04	10				
Bead and flange rim bowls	*Evans* 52 and 53	1.04	10	0.37	4		
Other bowls	*Evans* 59 and 64	0.20	3				
Bead rim dishes	*Evans* 58 and 69	0.65	6	0.32	4	0.05	1
Plain rim dishes	*Evans* 66 and 67	0.46	8	0.64	7	0.05	1
Other dish	*Evans* 68	0.07	1				
Total		*5.01*	*51*	*1.67*	*17*	*0.22*	*3*

Table 7: Horningsea form types in the Phase 2 Field System

A date range has broadly been established for the Horningsea industry as a whole, but the chronology of individual types is not as well understood.

However, the bead and flange rim bowl (*Evans* 52 and 53) common in this group is a relatively ubiquitous Romano-British type that does not predate the late 3rd century AD and continues into the 4th century AD. The relatively small but vital quantities of non-Horningsea products in the Phase 2 Field System group allow the chronology of the group to be slightly elucidated. Of the non-Horningsea fabrics in the Phase 2 Field System group, none account for more than 2% of the group by sherd count, with LNV CC, ROB SH and HAD OX the most common.

As with the Horningsea fabrics, the minority of fabrics in the Phase 2 Field System group largely represent open forms, predominantly bowls and mortaria with dishes and bowl-jars also present (Table 8). The ratio of open to closed forms is just under 2:1. Excluding the samian ware (discussed above), the bowls in this group include four further bowls in red-slipped fabrics. These comprise three bowls in OXF RS; an imitation of samian Form 36 in Ditch F2098 (L2186), Form 38 in Ditch F3023 (L3021) and a shallow bowl with an out-turned, grooved rim in Ditch F2098 (L2906) (Young 1977: types C47.4, C51/52 and C49 respectively) which were produced from the late 3rd to 4th centuries AD; and a single bead and flange rim probably from a bowl but possibly from a mortaria in HAR RS. The limited fragments from this vessel, in Ditch F2098 (L2906), are comparable to a bowl type produced at the Oxford kilns (Young 1977: type C93) and to mortaria recorded at the Obelisk kilns, Harston (Pullinger and Young 1982: type 33). Indeed, as the products of the Obelisk kilns are thought to include vessels representative of a migrant potter from Oxfordshire (Pullinger and Young 1982, 8), both comparisons may be pertinent. Importantly this vessel type does not appear to have been produced before the mid 4th century AD and may represent one of the latest vessels in the Phase 2 Field system. The remaining open forms include types dated to the late 3rd century AD or later. These are two necked bowl-jars in HAD RE2 with highly burnished black surfaces in Ditches F2731 (L2838) and F3023 (3081) comparable to Camulodunum type 299 (Symonds and Wade 1999) and a flanged bowl in ROB SH (*Perrin* 489). Also present are single examples of a bead rim dish in LNV CC and a plain rim dish in GRS.

Vessel Type	R.EVE	MNV	Fabrics
Bowl	0.38	8	OXF RS, HAR RS, ROB SH (+LEZ SA2, TRI SA and CHF SA)
Dish	0.20	2	GRS, LNV CC
Bowl-Jar	0.25	2	HAD RE2
Jar	0.28	4	LNV CC, ROB SH
Flagon	0.20	3	LNV CC, HAD OX, UNS WS
Beaker	0.17	3	LNV CC
Mortaria	1.14	7	LNV CC (M), LNV WH (M), SWN CC (M)
Total	*2.62*	*29*	

Table 8: Quantification of vessel types in fabrics other than Horningsea products in the Phase 2 Field System

Closed forms in non-Horningsea fabrics are very scarce in the Phase 2 Field System and do not include any diagnostic sherds in any other variant of sandy grey ware fabric, although body sherds in a probable Verulamium fabric in Ditch F3023 (L3009) are probably derived from a jar/flagon. Of the four jars in the Phase 2 Field System group three are accounted for by ROB SH vessels

recovered from Ditch F2098 (L2186, L2863 and L2895). Each vessel is comprised of only small fragments of everted rim: two plain and one beaded, of the type generally associated with later Roman vessels at the Harrold kiln site (Brown 1994) but further comparisons are limited on such small sherds. However the remaining jar is a wide mouthed, everted bead rim type in LNV CC in Ditch F 2731 (2730) that can be paralleled with types recorded at Water Newton in late 3rd to 4th century AD groups (*Perrin* 282).

The evidence for flagons in this substantial group is limited with a HAD OX handle in Ditch F2098 (L2186) and a fragment of spout in LNV CC from Ditch F2098 (L2647). A third flagon in UNS WS comprises fragments from a tall-necked vessel with an everted bifid rim, seemingly comparable to Camulodunum type 283 (Symonds and Wade 1999). UNS WS was probably produced at either Colchester or Hadham, and unfortunately the vessel type is known to have been produced in fabrics from both locations beginning in the late 2nd/3rd centuries AD and continuing through the 4th century AD. As with the flagons, evidence for the three beakers in the Phase 2 Field System group is restricted to very small rim and body sherds. All the beakers are 3rd-4th century AD types in LNV CC, with small fragments from plain funnel rim beakers (*Perrin* 166-7) in Ditches F2098 (L2183) and F3023 (L3011), and fragments from a pentice moulded beaker (*Perrin* 176) in Ditch F3023 (L3081).

The mortaria in the Phase 2 Field System group are chronologically important because, in contrast to the tentatively identified HAR RS bowl/mortaria in Ditch F2098 (L2906), they include vessels that do not appear to post-date the early/mid 4th century AD, thus suggesting a potential final date for deposition into the Phase 2 Field System, although longevity of use and vessel survival may be issues. The LNV WH (M) mortaria in Ditch F2801 (L3126) has a beaded rim with a hooked flange and is a copy of a form type more common within the Oxfordshire kilns (Young 1977: types M12/18) and dates to the mid 3rd to early 4th centuries AD. The SWN CC (M) mortaria in Ditch F2801 (L2887) is a reed-rimmed form that was probably produced in the late 3rd to mid 4th centuries AD (Webster and Booth 1947, 65: type A4). The remaining five mortaria (four in LNV WH (M) and one in LNV CC (M) in the Phase 2 Field System group are all also reed-rim type (Hartley and Perrin 1999, 129-132: types M12, M18-19 and M36; Hartley 1985, 121: type 180), broadly of 3rd to 4th century AD date, with at least two probably no earlier then the late 3rd century AD. It is notable that reed-rim mortaria in LNV WH (M), LNV CC (M) and SWN CC (M) all occur in Ditch F2801 (L2887), however this is in conjunction with an overall concentration of pottery.

Other Phase 2 pottery groups

The pottery group recovered from features comprising 'late Phase 2 changes to the Area 1 ditch system' (in total 304 sherds, 6726g) includes concentrations in Ditches F2950 (especially L3007, but also L2951 & L3008) and F5003 (F5004 & L5005). Small but notable groups were also present in Recut Ditch F2804 (L2803 and L2847) and Ditch F5064 (L5065). This group is

dominated by HOR RE, which accounts for *c*.58% of the group by sherd count (*c*.78% by weight). Of the remaining fabrics PAK CC accounts for 11 sherds, all derived from a single fragmented vessel (and the only stratified occurrence of the fabric in the assemblage), while no other fabric including HOR OX and HOR BS accounts for more than 20 sherds. The remaining minority fabrics comprise GRS, BSW, LNV CC, OXF RS, UNS WS, ROB SH, samian ware and notably OVW WH. The OVW WH occurs as a single sherd (15g) in Ditch F2804 (L2803), which appears to be derived from a 4th century jar with a moulded rim although the fragment of rim extant is too small to allow any further comparisons. Similarly the OXF RS contained in Ditch F5003 (L5004 & L5005) is derived from a beaker but is too fragmentary for further identification. The Horningsea forms present in the 'late Phase 2 changes to the Area 1 ditch system' group mirror those in the Phase 2 Field System group with bead rim dishes (*Evans* 58 and 69), bead and flange rim bowls (*Evans* 52) and plain everted rim jars (various) represented by multiple vessels (3-5 examples of each), while storage jars with combed bodies and a single jar with an everted rim and band of rilling on the shoulder (*Evans* 31) are also present.

The pottery group from the 'Curvilinear Enclosure in the South of Area 2' (in total 75 sherds, 1587g) is in fact, largely accounted for by pottery from one feature. Ditch F4296 accounts for *c*.87% of the pottery in the group by sherd count (*c*.92% by weight). The bulk of the group is accounted for by HOR RE with sparse sherds in the other Horningsea fabrics. Rare sherds in LNV CC, HAD OX, ROB SH, GRS and BAT AM2 are also present and suggest a late Roman date, confirmed by the presence of a late 3rd to 4th century AD LNV CC bead and flange rim dish (*Perrin* 259) in Ditch F4296 (L4295). As with the previous groups the Horningsea dish and bowl forms include bead and flange rim bowls (*Evans* 52), bead rim (*Evans* 69) and plain rim (*Evans* 66) dishes, however these are supplemented by at least three examples of flange rim bowls (*Evans* 59). The Horningsea jars in this group are also consistent with those in the 'Phase 2 Field System group' but here are limited to everted bead rim types (including *Evans* 29 and 41 but largely too small for classification). The forms in the group support a comparable date range to the 'Phase 2 Field System' group in the late 3rd to mid 4th century AD.

The Phase 2 'Oven/Corn-Dryer and associated features' produced a sparse scatter of pottery with small concentrations in Layers L2072 and L2073 which probably represent demolition deposits from the destruction and backfilling of the oven/corn-dryer (in total 58 sherds, 1072g). Similarly to the other Phase 2 groups, this group is dominated by HOR RE with sparse sherds in HOR OX and HOR BS, and rare sherds in LNV CC, HAD OX, ROB SH and LNV WH. Important in this group is the presence of the neck of a cordon-necked flagon in HAD OX comparable Camulodunum types 366/281 (Symonds and Wade 1999) and an everted bead rim jar in ROB SH (*Perrin* 449), which both support a date in the late 3rd/early 4th centuries AD. The Horningsea wares in this group include a comparable range of dishes and bowls (bead and flange rim, flanged rim, bead rim and plain rim), jars and storage jars (plain and bead rim) to that previously described for other Phase 2 groups (above) and also support a date in the late 3rd to mid 4th century AD; however, none are present

in any significant number. A sparse scatter of sherds distributed across metalled surfaces L2157, L5006, L5077 and L5133 also contained Horningsea ware bead and flange rim dishes and storage jars, but was notable for the associated presence of sherds from a BAT AM2 Dressel 20 amphora in L5007 and a stamped base of LEZ SA2 Dr.27 cup in L5133 (see above).

The final pottery group (140 sherds, 4360g) of any apparent substance in Phase 2 is actually a collection of sherds from a more disparate group of features: pits and postholes distributed across the site but not identified with any particular function. The group does not contain any particular concentrations of pottery but does include fragments from three regionally imported fine ware vessels that tentatively date to the 4th century AD. These comprise a roulette decorated lid in LNV CC (*Perrin* 213) in Pit F2233 (L2234), a pedestal base in HAD OX also in Pit F2233 (L2235) and roulette decorated body sherds from an unidentified beaker in SWN CC in Posthole F2113 (L2114). The Horningsea forms in this group conform to the same pattern of common bowls, dishes and jars identified in previous Phase 2 groups, with none ever present as more than one or two examples.

Phase 3

The 2104 sherds (31872g) in Phase 3 features form the largest amount of pottery recovered from any one phase and include several large and diagnostic groups from associated features, notably Rectilinear Enclosures (Areas 1 and 2) (Table 9). However, these groups demonstrate very little chronological differentiation from those in Phase 2 and although the groups may be differentiated stratigraphically there is unlikely to be a significant duration between their depositions within the late 3rd to mid 4th centuries AD.

Phase 3 Group	Sherd Count	Weight (g)	R.EVE
Phase 3: Rectilinear Enclosure Ditches in Area 1	328	7531	3.4
Phase 3: Rectilinear Enclosure Ditches in Area 2	1004	11971	7.22
Phase 3: Enclosure in SE of Area 1	76	1411	1.11
Phase 3: Curvilinear Enclosures in NW of Area 1	326	3866	1.62
Phase 3: Industrial Feature F4148	36	1326	0.00
Phase 3: Structure S2661	109	1879	0.75
Phase 3: Pits	225	3888	0.51
Total	*2104*	*31872*	*14.61*

Table 9: Distribution of pottery within feature groups in Phase 3

Phase 3 Rectilinear Enclosures (Areas 1 and 2)

As the Phase 2 pottery was dominated by groups recovered from the Field System, so the Phase 3 pottery is dominated by groups recovered from Rectilinear Enclosures present in Areas 1 and 2 of excavation (combined

here for discussion), in total 1332 sherds (19502g) or *c*.63% of the Phase 3 pottery by sherd count (*c*.61% by weight). Partially accounting for the occurrence of such substantial quantities of pottery is the extensive size of the ditches that make up the Rectilinear Enclosures, which span the length and breadth of the excavated areas, and must have acted as easily accessible and open receptacles for pottery to accumulate in. However, the bulk of the pottery within the Rectilinear Enclosures (Areas 1 and 2) group was found in very high concentrations at only two focal points. These comprise Ditch F4263 (L4262 Segs. A, B and D: adjacent to one another) which included a total of 686 sherds (6928g) and Ditch F2934 (L2935 and L2981) which included 169 sherds (3590g). Together these two concentrations of pottery account for *c*.64% by sherd count of the pottery recovered from the Rectilinear Enclosures (Areas 1 and 2) (*c*.54% by weight). Both of these very high concentrations of pottery are located close to the south-western limits of the excavated areas, as is a cluster of several similarly high concentrations that form part of the Phase 2 Field System.

Within the pottery groups recovered from the Rectilinear Enclosures (Areas 1 and 2) HOR RE accounts for *c*.78% of the group by sherd count (*c*.71% by weight), with HOR OX accounting for a further *c*.4% (*c*.6%) and HOR BS *c*.3% (*c*.3%). In total Horningsea fabrics account for *c*.85% (*c*.82%) of the pottery recovered from the Rectilinear Enclosures (Areas 1 and 2), a comparable proportion to that calculated for the major groups in Phase 2. The general distribution of form types within the group (Table 10) is broadly similar to that calculated for the Phase 2 Field System with open dishes and bowls slightly outnumbering jars (the bulk of which remain unclassified), although a slightly greater proportion of forms are present in HOR RE rather than HOR BS or HOR OX. In total, a minimum of 47 dish or bowl forms were recorded in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group, including 15 plain rim dishes comparable to *Evans* 66 and 67, 15 bead and flange rim bowls comparable to *Evans* 52 and 53 and 13 bead rim bowls comparable to *Evans* 68 and 69. A single bead rim dish in HOR OX has been treated with a white slip, but otherwise (as with the Phase 2 vessels) none of the dishes of bowls have been decorated in any fashion other than the plain burnishing of interior/exterior surfaces. The distribution of these dish and bowl forms exhibits an expected and logical bias towards the larger concentrations in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group: Ditches F2934 (L2981 Seg.C) and F4263 (L4262 Segs.A and B).

Vessel Type	Incorporating form types	HOR RE		HOR BS		HOR OX	
		R.EVE	MNV	R.EVE	MNV	R.EVE	MNV
Storage jar	*Evans* 5, 7 and 10	0.25	4				
Defined jar types	*Evans* 22, 25, 26, 27, 29, 31, 42 and 46	1.55	12				
Miscellaneous jars	Small everted fragments of plain and bead rims	1.5	22	0.05	1	0.05	1
Bead and flange rim bowls	*Evans* 52 and 53	1.31	14	0.1	1		
Bead rim dishes	*Evans* 58 and 69	0.69	9	0.2	3	0.1	1
Plain rim	*Evans* 66 and 67	0.89	13	0.12	2		

dishes							
Other dish	*Evans* 68 and 70	0.21	4				
Other (Lid)	\	0.12	1				
Total		*6.52*	*79*	*0.47*	*7*	*0.15*	*2*

Table 10: Horningsea form types in the Phase 3 Rectilinear Enclosures (Areas 1 and 2)

Analysis of the jar types recorded in the Rectilinear Enclosures (Areas 1 and 2) group is hampered by the same issues of fragmentation that affected those in Phase 2, only to a greater extent. Only approximately 33% of the recorded jars could be reliably cross-referenced with *Evans* typology, with the bulk comprising plain or beaded everted rims that could potentially be derived from *Evans* 18-29: the most common types amongst those that could be defined. The jar types that could be positively identified include types with plain rims and a shoulder cordon (*Evans* 22), with everted bead rims and, where extant, a shoulder cordon (Evans 25-29, 42 and 46), and with ledge rims (Evans 31). The jar types present in this Phase 3 group are broadly comparable to those recorded in the Phase 2 Field System and elsewhere in Phases 2 and 3. Overall the only sight difference in jar forms between Phases 2 and 3 is that bead rim types appear more prevalent in Phase 3, where as bead and plain rim types were present in more equal proportions in Phase 2, although this may be more apparent than actual based on the sample and its preservation/fragmentation. Four Horningsea storage jars are present in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group and include a single everted bead rim type (*Evans* 10) with three bifid rim variants (*Evans* 5 and 7). The final Horningsea form type recorded is very rare in this assemblage and comprises a bead rimmed lid in HOR RE recovered from Ditch F2543 (L2581). Lids do not feature in *Evans'* typology; however a comparable Horningsea vessel was recorded in a (probable) later 3rd century AD group from High Fen, Denny Abbey (Millet 1980, 251: type CA21), albeit inverted as a dish.

The non-Horningsea fabric vessels (Table 11) in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group maintain the consistent chronological range of late 3rd to early/mid 4th century AD recorded in the Horningsea fabrics in this group, as well as elsewhere in Phases 2 and 3. The non-Horningsea fabrics are dominated by a broad range of LNV CC forms and a very narrow range of ROB SH forms, with all other fabrics relatively rare in addition to those outlined below, non-diagnostic sherds of HAR RS, UNS RS and WAT RE are also present in the group). There are also much more equal proportions of closed forms (jar, flagon, and beaker) and open forms (bowls, dishes, Castor Boxes and mortaria) than observed in the non-Horningsea fabrics in the Phase 2. The most numerous vessel form type in the non-Horningsea fabrics is in fact the jar. The bulk of the jars (8 vessels, R.EVE: 0.64) are very similar ROB SH types with everted, slightly thickened or triangular bead rims. In addition to the very similar forms, these jars also occur in a narrow size range with rim diameters ranging from 16 to 26cm. A single example exhibits rilling on the body, but the bulk of the diagnostic fragments are rim only. The ROB SH jars are present in Ditches F2494 (L2495), F2543 (L2544), F2934 (L2935), F4091 (L4092 Seg.A), F4281 (L4280 Seg.B), F4287 (L4286 Seg.C) and F4263 (L4262 Segs.A and B). The type was a common

product of the kilns at Harrold, especially in the late 3rd to 4th centuries (Brown 1994), although other sources remain quite feasible. The remaining jars comprise single examples of wide-mouthed, necked types in LNV CC (*Perrin* 282) in Ditch F2092 (L2736) and OXF RS (Young 1977: type C18.3) in Ditch F2543 (L2544) that do not pre-date the late 3rd century, while a miscellaneous everted bead rim similar to those in the Horningsea fabrics is also present in GRS.

Vessel Type	R.EVE	MNV	Fabrics
Bowl	0.73	6	LNV CC, HAD OX, HAD RE1 (+RHZ SA)
Dish	0.40	3	LNV CC, GOD WS
Jar	0.95	11	ROB SH, GRS, LNV CC, OXF RS
Flagon	0.07	2	UNS WS
Beaker (and Cup)	0.57	5	LNV CC, PAK CC (+LEZ SA2)
Castor Box	0.19	3	LNV CC
Mortaria	0.57	7	LNV CC (M), LNV WH (M), OXF RS (M)
Total	*3.48*	*37*	

Table 11: Quantification of vessel types in fabrics other than Horningsea products in the Phase 3 Rectilinear Enclosures (Areas 1 and 2)

In addition to the jars, the other closed vessel types include sparse quantities of flagons and beakers. The flagons in this group are limited to two vessels in UNS WS, of which only one can be assigned a type. Ditch F3054 (L3091) contained the everted bead rim of a flagon broadly comparable to Camulodunum types 207/296 (Symonds and Wade 1999), while Ditch F2092 (L2306) contained body and neck sherds from a comparable vessel. As noted in Phase 2 Field System, UNS WS is thought to have been produced at Colchester and Hadham in the 3rd to 4th centuries AD. In this assemblage it occurs in rare quantities in Phases 2, 3 and 4 (see below) and is only ever associated with flagons whose exact types remain relatively undefined due to fragmentation. This suggests these vessels may have been imported as a bi-product (container) for a particular product (i.e. wine) rather than for their intrinsic value as a pottery vessel.

The beakers in this group are a little more in character with the other non-Horningsea vessel types being largely comprised of LNV CC vessels with a single PAK CC beaker, however all the beakers appear to be of broadly comparable form. Ditch F4223 (L4222 Seg.E) contained the rim and neck of a LNV CC funnel necked beaker (*Perrin* 173) while Ditches F3014 (L3016 Seg.A) and F4091 (L4090 Seg.A) contained fragments of pedestal base beakers with indented bodies decorated with bands of rouletting (*Perrin* 167 and 175) that would appear to indicate they are derived from the same type of funnel neck beaker. The PAK CC beaker recovered from Ditch F2934 (L2981 Seg.C) is also a funnel neck type with an indented body and three rows of rouletted decoration, comparably not only to Lower Nene Valley types but also with a Rhenish equivalent (Symonds 1992: Group 35, Fig. 27.525-28). Each of these beakers is associated with production in the late 3rd to early 4th centuries AD, with production or life spans possibly extending to the mid 4th century AD, providing some of the narrowest dating of any vessels in the group and in Phase 3.

Within the non-Horningsea fabric open vessel types in this group, half the bowls are comprised of late 3rd to 4th century AD LNV CC vessels. These include two bead and flange rim bowls (*Perrin* 256 and 258) in Ditches F2934 (L2981 Seg.C) and F4263 (L4262 Seg.D) similar to the common Horningsea types, and a single hemispherical, flanged bowl imitating samian Form 38 (*Perrin* 247) in Ditch F4091 (L4090 Seg.A). The remaining two bowls are in Hadham fabrics and comprise a HAD OX s-profile bowl of Camulodunum type 299 (Symonds and Wade 1999) in Ditch F4263 (L4262 Seg.D) and a HAD RE1 bowl imitating samian Form 37 decorated with faint rosette stamps in Ditch F4263 (L4262 Seg.A). As with the bowls, the dishes predominantly comprise LNV CC vessels, and are in similar forms to the Horningsea coarse wares. The two LNV CC dishes in this group, in Ditches F3119 (L3104 Seg.B) and F4263 (L4262 Seg.A), are both plain rim types (*Perrin* 231-233), while the remaining dish in this group is a bead rim type in GOD WS in Ditch F3063 (L3065 Seg.B). The kilns that have been excavated and linked to the production of GOD WS date to the late 3rd to early 4th centuries AD (Evans 2003, 42), but the proximity of Horningsea would appear to block the distribution of any products of this industry which are present as only rare outliers in this assemblage.

Probably of a similar function to the popular (as fine ware) LNV CC dishes and bowls, are the Castor Boxes in this group. Three LNV CC Castor Boxes were recorded in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group, in Ditches F2598 (L2748), F2934 (L2981 Seg.C) and F4263 (L4262 Seg.A), each corresponding to late 3rd to 4th century AD types with roulette decorated bodies (*Perrin* 205-6). Intriguingly no complementary lids were recorded. Also notable is the fact that no further Castor Boxes were recorded in Phase 3, while no examples were present in Phase 2 and only a single example was recorded in Phase 4.

The remaining open vessels in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group comprise an extremely consistent collection of mortaria vessels. Of the seven mortaria recorded in this group, four are in LNV WH (M) and two in LNV WS (M). All the Lower Nene Valley mortaria in this group are 3rd to 4th century AD reed rim variants (*Perrin* M19, M21 and M42) with slightly to moderately worn black slag trituration grits. These Lower Nene Valley mortaria were present in Ditches F2934 (L2981 Seg.C), F4281 (L4280 Seg.B), F4285 (L4284 Seg.L) and F4263 (L4262 Seg.B and D). The one outlier in this group is an OXF RS (M) mortaria recovered from Ditch F4281 (L4280). This mid 3rd to 4th century AD type has a bead and flange rim and a spout formed by pushing down the flange (Young 1977: M22.5) and exhibits heavily worn trituration grits. Once again the predominance of the reed rim Lower Nene Valley mortaria types accompanied by a regionally imported outlier in this Phase 3 group is paralleled in the large Phase 2 Field System group, highlighting the similarities in postulated function (and thus occupation) between the two phases and their closely related chronologies.

Other Phase 3 groups

Of the remaining pottery groups in Phase 3, that recovered from the Curvilinear Enclosures in the north-west of Area 1 accounts for *c.*15% of the Phase 3 pottery by sherd count (*c.*12% by weight), while no other group accounts for more than *c.*10% (*c.*12%). These groups possess only sparse diagnostic and analytical value compared to that from the Phase 3 Rectilinear Enclosures (Areas 1 and 2) but provided valuable data and are summarised below.

The pottery group from the Curvilinear Enclosures in the north-west of Area 1 (262 sherds, 2988g) is sparsely scattered through a number of ditch and gully features with small concentrations in Ditches F2006 (L2007), F2052 (L2119), F5080 (L5081/5181) and Ditch Terminus F2269 (L2270). The bulk of this group, *c.*80% (*c.*64%) is comprised of Horningsea fabrics, mainly HOR RE with very low quantities of HOR OX and HOR BS. However the Horningsea wares in this group are highly fragmented and abraded with little diagnostic value. Eight jars with everted bead rims were recorded and include *Evans* 18, 24 and 27 but are largely miscellaneous, while four shallow dishes including plain rim (*Evans* 66) and delineated rim (*Evans* 70) types were also present. The presence and proportion of the non-Horningsea fabrics in this group is similar to that in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group, except for the presence of two sherds (34g) of 'late' grey-slipped ALH RE from an everted bead rim jar in Ditch F2052 (L2053). These are the only ALH RE sherds in the whole assemblage but are not incongruous as outliers in their distribution (southern England) as rare sherds are known across East Anglia including Cambridgeshire. As is observed in the larger groups the bulk of the non-Horningsea fabrics are LNV CC and ROB SH. The LNV CC is limited to the body sherds of beakers but these demonstrate a greater variability of form than those recorded in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group. Variants include an indented vessel with scale decoration (*Perrin* 166), variants with *en barbotine* or overslip decoration, and pentice moulded forms with either rouletted or painted decoration (*Perrin* 176). The ROB SH includes bifid rim and lid-seated rim jars (*Perrin* 424 and 466) as well as a rilled jar and an everted bead rim storage jar (*Perrin* 459) that are all probably produced within the 3rd century AD however small fragment size makes this definition tentative. More reliable signifiers of chronology comprise an OXF RS imitation of samian Form 31R (Young 1977: C45.3) in Ditch F2008 (L2009), a HAD OX flagon with an everted bead rim Symonds and Wade 1999: Cam.281) in Ditch F2052 (L2059) and a highly burnished HAD RE1 wide-mouthed bowl-jar (Symonds and Wade 1999: Cam.299) in Ditch Terminus F2269 (L2270), all of which date were not produced prior to the late 3rd century AD before continuing through the 4th century AD.

A further notable group in Phase 3 is that recovered from features forming Structure S2661 (in total 109 sherds, 1879g). The group is primarily composed of two concentrations recovered from Building Fills/Layers L2662 and L2663, with sparse additional sherds present from Beam Slot F2664 (L2666). The fabric composition of the groups mirrors that of the larger Phase 2 and 3 groups with Horningsea fabrics (mainly HOR RE) accounting for *c.*88% of the group by sherd count (*c.*94% by weight) with sparse sherds of

LNV CC and ROB SH and rare sherds of OXF RS also present. Of the eight Horningsea vessels in this group, seven are bowls or dishes. These include four bead and flange rim bowls (Evans 52 and 53) with plain and bead rim types also present. The LNV CC in the group also comprises a bead rim bowl (Perrin 249/251) associated with production in the late 3rd to mid 4th centuries. Jars in the group are limited to single examples miscellaneous everted bead rim types in both HOR RE and ROB SH.

The pottery group from features forming the 'Enclosure in the south-east of Area 1' (in total 76 sherds, 1411g) is primarily composed of sherds from Gully F2745 (L3003 Seg.C) (45 sherds, 576g) which is situated very close to the south-west baulk of the excavation area, as are the principal concentrations in the Phase 2 Field System and Phase 3 Rectilinear Enclosures (Areas 1 and 2) groups. As with the larger groups Horningsea fabrics comprise the bulk of the group with rare sherds of LNV CC, OXF RS and ROB SH also present. The Horningsea forms in this group include approximately even proportions of jars to bowls and dishes (6:5), with jars restricted to plain or beaded everted rim types (unclassified due to fragmentation), while the bowls and dishes include bead and flange, bead and plain rim types. An interesting occurrence in this group is the neck from an LNV CC disc-necked flagon with two handles in Gully F2745 (L3003 Seg.C), comparable to an example recorded at Hinton Fields, Teversham (Pullinger and White 1991: vessel 175) in a 4th century AD deposit.

The remaining pottery groups in Phase 3 from Industrial feature F4148 and from the remaining dispersed Pits included relatively low quantities and only rare diagnostic sherds of pottery. Industrial feature F4148 (L4147 Segs.A, C and D) produced a small concentration of HOR RE sherds with single sherds of OXF RS (M) and BAT AM2, however included only body sherds ands and no diagnostic rims. The dispersed Pits in Phase 3 included several single examples of common Horningsea form types with rare sherds of regionally imported fabrics in line with the character of the larger Phase 3 groups.

Phase 4

A total of 1286 sherds (21586g) were present in Phase 4 features (Table 12), with substantial concentrations recovered from Rubbish Pits (north and south in Area 1) and Boundary Ditches (Area 1). Important groups were also recovered from a series of Quarry Pits dispersed across the site and from Sealing Layer L2694 (included under 'Other Deposits'). It is notable that while the Phase 4 Rubbish Pits (north and south in Area 1) account for *c*.39% of the Phase 4 pottery by sherd count (*c*.46% by weight), they also account for *c*.59% of the diagnostic material (by R.EVE) in Phase 4 which translates as a strong preservation bias towards these features.

As with the pottery from previous Roman phases, the Phase 4 group is dominated by the products of the nearby Horningsea kilns (*c*.80% by sherd count, *c*.77% by weight) associated with the late 3rd to mid 4th centuries AD, but the non-Horningsea fabrics allow a finer distinction to be made. The range

of regionally imported fabrics present indicate that the deposition of the Phase 4 groups probably does not pre-date the early to mid 4th century AD and has ceased by the end of the mid 4th century AD (when the Horningsea industry appears to decline).

Phase 4 Group	Sherd Count	Weight (g)	R.EVE
Phase 4: Boundary Ditches in Area 1	263	3597	1.03
Phase 4: Field Boundary Alterations in Area 2	27	993	0.31
Phase 4: Quarry Pit: F2255 and associated pits	194	1584	1.17
Phase 4: ?Quarry Pit: Pit Cluster NE of Ditch F2050	61	552	0.37
Phase 4: Quarry Pit: F2557 and associated pits	46	1246	0.64
Phase 4: Quarry Pit: Pit Group F2439	72	755	0.57
Phase 4: Quarry Pits: in Area 2	21	293	0.07
Phase 4: Rubbish Pits in N of Area 1	164	2056	0.92
Phase 4: Rubbish Pits in S of Area 1	334	7774	6.19
Phase 4: Other Deposits	104	2736	0.80
Total	*1286*	*21586*	*12.07*

Table 12: Distribution of pottery within feature groups in Phase 4

Phase 4 Rubbish pits (north and south in Area 1)

The Phase 4 Rubbish Pits in the north and south of Area 1 form a single group of pottery (for the purposes of discussion) with a unifying character. The group includes a very high concentration of pottery in Pit F2903 (158 sherds, 4422g), high concentrations in Pits F2620 (159 sherds, 1969g) and F2882 (127 sherds, 2555g) with all remaining features in the group containing little or no pottery. Combined, the group from Pits F2903, F2620 and F2882 account for *c*.89% of the Phase 4 Rubbish Pits group by sherd count (*c*.91% by weight). Pits F2903 and F2882 were situated close to the south-western baulk of the excavation area close to the large concentrations of pottery in the Phase 2 Field System and Phase 3 Rectilinear Enclosures (Areas 1 and 2). Pit F2620 is situated further to the north in the vicinity of Quarry Pits F2557 and F2439 (also in Phase 4) but contains approximately twice the amount of pottery, and thus the location of this concentration remains an anomaly in the general distribution pattern.

Horningsea fabrics account for *c*.86% of the Phase 4 Rubbish Pits group by sherd count (*c*.84% by weight), of which *c*.80% (*c*.78%) is HOR RE, with the remainder divided approximately equally between HOR BS and HOR OX. Within the Horningsea fabrics in this group, open forms (bowls and dishes) are present in equal proportions to closed forms (jars); however, a greater proportion of the open forms appear to have been manufactured in the HOR BS fabric, possibly in an attempt to imitate late black-burnished type vessels (Table 13). As in Phases 2 and 3 the bead and flange rim bowls (*Evans* 52-54) continues to comprise about half of the open vessels with a significant element comprising bead rim dishes (*Evans* 58). However, in this group the quantity of plain rim dishes (*Evans* 66) appears to have declined. The Horningsea jars largely conform to the pattern set in Phases 2 and 3 with everted bead and plain rim types common and ledge rim jars sparse, however, narrow-necked (Evans 12 and 14) and wide-mouthed (Evans 17)

types are also present in Phase 4, albeit in very low numbers. These types may simply be uncommon forms, but were not recorded in any of the previous Roman phases. A bifid rim variant (Evans 6) represents the only diagnostic storage jar sherd in this group; however, non diagnostic body sherds from a second storage jar, in this instance in the HOR OX fabric, were also recorded. No diagnostic sherds in HOR OX were recorded in this group, but body sherds indicate that several vessels were present.

Vessel Type	Incorporating form types	HOR RE		HOR BS		HOR OX	
		R.EVE	MNV	R.EVE	MNV	R.EVE	MNV
Storage jar	*Evans* 6	0.05	1				
Defined jar types	*Evans* 12, 17, 18, 30, 32, 39, 40, 41 and 43	1.52	9	0.2	2		
Miscellaneous jars	Small everted fragments of plain and bead rims	1.02	10	0.05	1		
Bead and flange rim bowls	*Evans* 52, 53 and 54	0.78	9	0.21	2		
Bead rim dishes	*Evans* 58	0.25	2	0.6	6		
Plain rim dishes	*Evans* 66			0.1	1		
Other dish	*Evans* 60 and 68	0.07	1	0.1	1		
Total		*3.69*	*32*	*1.26*	*13*		

Table 13: Horningsea form types in the Phase 4 Rubbish Pits (north and south in Area 1)

The non-Horningsea fabrics in this group are crucial to dating the Phase 4 Rubbish Pits as the Horningsea fabric vessels exhibit little typological change in the overall chronological range of the assemblage. The composition of the fabric types actually changes very little with LNV CC and ROB SH still the most common types with all other fabrics relatively rare but several slight but marked changes may be perceived in the proportions of vessel types and the individual form types present. In terms of proportions of vessel types in the non-Horningsea fabrics there is a notably lower incidence of open vessels (Table 14). In the non-Horningsea fabrics in the Phase 4 Rubbish Pits group closed forms (jars, beakers, flagons) become more frequent than open forms (bowls, dishes, mortaria) with a ratio of 4:3, where as in the Phase 3 Rectilinear Enclosures (Areas 1 and 2) group the proportions were approximately even, and in the Phase 2 Field System closed forms were in the minority with a ratio of approximately 1:2.

Vessel Type	R.EVE	MNV	Fabrics
Bowl	0.35	4	LNV CC, OXF RS, ROB SH
Dish	0	0	\
Jar	1.05	7	ROB SH, NAR OX, GRS
Flagon (inc.Face Pot)	0.02	1	HAD OX
Beaker	0.62	4	LNV CC, NFO RS2
Castor Box	0.05	1	LNV CC
Mortaria	0.22	4	LNV WH (M), NAR OX (M), OXF WH (M)
Total	*2.31*	*21*	

Table 14: Quantification of vessel types in fabrics other than Horningsea products in the Phase 4 Rubbish Pits

Jars remain the most prominent closed vessel with the most common jar type (four vessels) in the group comprising ROB SH vessels with everted bead or plain rim rims comparable to those present in Phases 2 and 3 and to the late Roman types produced at Harrold (Brown 1994), although more specific comparisons are limited by fragmentation. The ROB SH jars are present in Pits F2620 (L2600 and L2686) and F2903 (L2904 and L2905). The remaining three jars appear to be of relatively diverse origins (within East Anglia) and occur as single examples in each of the three high concentrations in the group. Pit F2620 (L2442) contained a GRS small storage jar with an oval rim and recessed neck comparable to an example at Chelmsford (Going 1987: G42/2.2). The form is typical of vessels produced in the Chelmsford (Essex) region in the late 3rd to 4th centuries and the fabric, tempered with coarse sand and with dark grey surfaces and an oxidised core, would also be typical of the region. Pit F2882 (L2883) contained a GRS 'Braughing' jar with a tall neck, sharply angled rim and a band of rilling on the shoulder. The type has previously been recorded at Teversham (Pullinger and White 1991: vessel 46 (Site B)) and Cambridge (Hull 1999, vessel 408) and is almost certainly a 4th century AD product of the Hadham kilns although the fabric is not distinctive. Pit F2903 (L2905) also contains a distinctly 4th century AD jar in NAR OX. The jar has a narrow neck with finger tip frilling on the underside of the rim comparable to an example recorded at Brancaster (Andrews 1985: type 85) close to the kiln sites in the Nar Valley. Nar Valley fabrics have previously been recorded at Littleport and Stonea in the Fens, and Bottisham is on the extreme fringe of its regional distribution which is curtailed by the presence of the local Horningsea industry (which dominated this assemblage). A single flagon or 'face-pot' is present in the Phase 4 Rubbish pits group in Pit F2957 (L2958) and comprises a HAD OX vessel with an everted, frilled rim. The fragments from this vessel are very small but appear to exhibit a boss and relief decoration that would have formed part of a face comparable to examples recorded at Colchester (Symonds and Wade 1999: Cam.288) and, importantly, not dated before the mid 4th century AD. Pit F2620 (L2683) also contains a HAD OX strap handle, probably from a flagon, but no further sherds are present.

Beakers, the remaining closed form, continue to be a relatively common type in non-Horningsea fabrics in the Phase 4 Rubbish Pits group and demonstrate a degree of consistency. Of the four beakers in the group, three are LNV CC types with funnel necks, indented bodies, rouletted and/or overslip decoration (*Perrin* 172-3) comparable to the beakers recorded in the Phase 3 groups, especially those in the Phase 3 Rectilinear Enclosures group. The final beaker in this group is a NFO RS2 vessel in Pit F2882 (L2883), the only occurrence of this fabric in the assemblage, although cross-joining fragments from this vessel were also found in Gully F2880 (L2881) which is cut by Pit F2882, and Ditch F2884 (L2896) which cuts Gully F2880. Gully F2880 and Ditch F2884 form part of the Phase 4 Boundary Ditches (in Area 1) adjacent/adjoining Pit F2882 but only contained sparse quantities of pottery suggesting that the sherds (and potentially others) in the ditch and gully may represent disturbed, re-deposited material or 'overspill' from the rubbish pit. The cross-joining fragments from these features belonged to a funnel neck beaker with a bead

rim and bulbous body (Fulford 1975: type 41.3). The vessel is decorated with a band of rouletting on the shoulder white painted zig-zags and circles filled with crosses (Fulford 1975: motifs 18 and 63) on the body. This type of vessel was produced from the early/mid 4th century AD and although outside its common distribution area is consistent with the common form types of LNV CC beaker in the group and the assemblage as a whole. It provides a useful *terminus post quem* for the group, and is corroborated by the dates of certain regionally imported bowls and mortaria, below.

Amongst the non-Horningsea fabric open forms in the Phase 4 Rubbish Pits group, dishes are completely absent and bowls have declined in number. This may be because equivalent forms were easily accessible in Horningsea fabrics. There is certainly little functional difference between the Horningsea bead and flange rim bowls and the single examples of LNV CC and ROB SH equivalents in this group. The LNV CC bead and flanged rim bowl (Perrin 255) was present in Pit F2903 (L2925) and the ROB SH bead and flange rim bowl (Brown 1994: vessel 211) in Pit F2620 (L2621). The remaining two bowls in the group are imitations of samian Form 38 in OXF RS (Young 1977: types C51.1 and C52) in Pits F2903 (L2933) and F2882 (L2883) respectively. Conveniently this form type is not paralleled in the Horningsea repertoire and also probably dates no earlier than the early/mid 4th century AD. Finally in the Phase 4 Rubbish Pits group, mortaria have an important presence with LNV WH (M) reed rim types persisting into Phase 4 with two examples (Perrin M25 and Hartley 1985: type 180) in Pit F2903 (L2905 and L2925). These are complemented by heavily worn basal from a NAR OX (M) mortar in Pit F2882 (L2883) and an OXF WH (M) mortar with a split bead and chunky flange (Young 1977:type C100.6) in Pit F2957 (L2958) that similar to the OXF RS bowls probably does not predate the mid 4th century AD.

Other Phase 4 Groups

The Phase 4 Boundary Ditches manage to contain both moderate concentrations and quantities of Roman pottery without incorporating a high degree of diagnostic material, notably in Ditches F2050 and F5014. The bulk of the group *c*.77% by sherd count (*c*.78% by weight) is comprised of Horningsea fabrics, almost entirely HOR RE. The Horningsea fabrics are dominated by three examples of both bead and flange rim bowls (*Evans* 52) and plain rim dishes (*Evans* 66) with two everted bead rim jars (*Evans* 28 and 31) also present. The principal dating evidence in the group comprises the NFO RS2 beaker in Gully F2880 and Ditch F2884 that is also present in Phase 4 Rubbish Pit F2882 (discussed above), complemented by an LNV bowl imitating samian Form 38 (*Perrin* 246) in Ditch F2050 (L2051) that probably does not pre-date the 4th century AD. Also present are fragments of ROB SH everted rim jars in Ditches F2791, F2884 and F5014, comparable to those common in this assemblage, along with small fragments of an LNV CC beaker, UNS WS flagon, HAD OX (M) and LNV WH (M) mortaria distributed in the group.

Of the various quarry pit features in Phase 4 only 'Quarry Pit F2255 and associated pits' contained a particularly concentrated and diagnostic group of pottery (in total 194 sherds, 1584g). In keeping with the larger Phase 4 groups and the assemblage as a whole, *c*.78% of the group by sherd count (*c*.83% by weight) is Horningsea wares, almost entirely HOR RE, with sparse quantities of Lower Nene Valley fabrics, Hadham fabrics, OXF RS and ROB SH. Approximately two thirds of the Horningsea vessels are open forms comprised of the bead and flange rim bowls, bead and plain rim dishes common in this assemblage supplemented with (miscellaneous) everted rim jars. Intriguingly, Pit F2255 (L2253) also includes a HOR OX lid that appears to be a direct copy of an angular type common in LNV CC (*Perrin* 213) in the 4th century AD. The HOR OX lid is undecorated where as the LNV CC equivalent would have been roulette decorated, but the profile of the HOR OX fragment present is directly comparable. Coincidentally a slightly smaller LNV CC lid of identical type (*Perrin* 213) with rouletted decoration is present in the same context. While these vessels indicate a date within the 4th century AD, the most important dating evidence in the group is an OXF RS upright sided bowl with a bead rim (Young 1977: type C61) also in Pit F2255 (L2253) that does not pre-date the mid 4th century AD.

The 'Phase 4 Quarry Pit F2557 and associated pits' group is of interest as despite containing a moderate concentration of pottery entirely in the fills of Pit F2557, only *c*.39% (*c*.31%) comprises Horningsea fabrics. These Horningsea sherds are entirely HOR RE and lack any diagnostic sherds. The presence of an S-shape bowl in HAD OX (Symonds and Wade 1999: Cam.299) and a plain rim dish in ROB SH (*Perrin* 495) suggest a date within the 4th century AD. Three plain rim dishes in LNV CC (*Perrin* 233-4) and an everted bead rim jar in ROB SH are also present, as are body sherds of OXF RS and UNS RS, but cannot further narrow the dating. The remaining quarry pits in Area 1 ('Pit Cluster north-east of Ditch F2050' and 'Pit Group F2439') and Area 2 conform to the pattern of fabric and form distribution common for the bulk of assemblages with Horningsea fabric dominant and sparse quantities of ROB SH, LNV CC, OXF RS and HAD OX and rare 'outlier' sherds of other fabrics. Intrinsically interesting sherds in these groups include non-diagnostic sherds of OVW WH and the base of an LNV CC bowl (*Perrin* 237) with a white-painted geometric/curvilinear pattern on its interior in Pit F2317 (L2316). These sherds date the feature, part of 'Pit Group F2439,' no earlier than the early/mid 4th century AD.

Within the remaining Phase 4 pottery groups only a moderate concentration (76 sherds, 1839g) in Sealing Layer L2694 (within ''Other Deposits') merits further comment. In character with the overall assemblage, *c*.87% of the group by sherd count (*c*.67% by weight) is comprised of Horningsea fabrics. Fragments of a LNV CC bowl with white-painted decoration (*Perrin* 269) and of OXF WS (M) suggest a 4th century AD date for this deposit, which also includes Horningsea bead and flange rim bowls (*Evans* 52), bead rim dishes (*Evans* 57) and a variety of everted rim jars (miscellaneous).

Subsoil L2001/L4001

Subsoil or Buried Soil L2001/L4001 was recorded sealing the Romano-British features across the site. A total of 2058 sherds (15895g) were recovered during test pit sampling followed by the excavation of this layer. These sherds were fully recorded but no detailed analysis was undertaken. In general the distribution of form and fabric in this group mirrors that for the late 3rd to mid 4th century AD assemblage from the stratified/discrete features, however, this group is notable for including four sherds (66g) of Rhodian Amphorae (RHO AM1), which is absent from the excavated assemblage. Rhodian type amphorae (or Peacock & Williams Class 9) were imported up to the mid 2nd century AD typically as a transport container for wine, and this vessel may have been a survival into the 3rd century AD similar to the central Gaulish samian ware in the assemblage.

Conclusions

This assemblage is remarkable for its consistency both in terms of fabric and form. The pottery groups were recovered from four Phases of Romano-British activity, of which Phases 2 to 4 included a number of highly concentrated pottery groups. Phases 1 to 4 all represent activity in the late 3rd to mid 4th centuries AD, therefore the consistency of the sources, form types and quantities of pottery consumed/deposited on the site may be expected as opposed to an evolving pattern that may be observed over a broader chronological lifespan. The assemblage provides a clear 'ceramic profile' that reflects the type of occupation and activity that created it.

The highest concentrations of pottery within the assemblage, principally in the Phase 2 Field System, the Phase 3 Rectilinear Enclosures (Area 1 and 2) and the Phase 4 Rubbish Pits clearly represent the consumption and deposition of domestic refuse on a substantial scale, probably from a source (structure/complex) to the immediate south-west of the excavated area. The remainder of the assemblage is of identical character and undoubtedly from the same source, whose character and status may be inferred by the fabric supply to the site and the form and function of the vessels within the assemblage:

Fabric Supply: With the Horningsea kilns situated *c*.6km to the west of Bottisham it is to be expected that products of the Horningsea industry account for *c*.80-85% of the pottery in each phase. HOR RE always accounts for the bulk of this total, with HOR OX and HOR BS consistently accounting for *c*.5-7% of the pottery in each phase. The proximity of Horningsea places a heavy bias on the overall fabric supply to the site serving to reduce the need to import other wares by being more cheaply and readily available therefore blocking local markets by product saturation. The remaining *c*.15 to 20% of the fabric supply is divided between fine and coarse wares, including mortaria and amphorae. Similar to the consistent levels of Horningsea products, the

relatively common regional imports retain consistent levels throughout the phases. The most common of these are products of the Lower Nene Valley industry (notable LNV CC and mortaria fabrics) and ROB SH probably produced at Harrold, Bedfordshire or the Lower Nene Valley, followed by lesser but still consistent levels of Oxfordshire and Hadham products (predominantly OXF RS and HAD OX). These consistent levels are probably the result of easy access to the large markets and convergence of trade routes at nearby Cambridge (*Duroliponte*), which is probably also the reason for the scatter of diverse 'outlier' fabrics in each Phase although passing trade and 'unusual' travel purchases cannot be discounted.

The bulk of the relatively rare fabrics are still sourced from other East Anglian industries that are simply out competed in this specific locality by the Horningsea industry and include products from Harston (HAR RS), Pakenham (PAK CC and PAK MD), Wattisfield (WAT RE), the Nar valley (NAR OX) and probably Essex (some GRS). Also to be expected in these phases are fragments of both long-lived samian ware and contemporary black-burnished wares (in this case SOW BB1), but this remains very rare probably due to it's similarity in form/function to the Horningsea wares. The fabric supply at Bottisham does include some Romano-British products that are substantially outside their general distribution areas, primarily from the Hampshire region including products of the kilns at Alice Holt (ALH RE), Overwey/Portchester (OVW WH) and the New Forest (NFO RS2). As outliers there may be a multitude of reasons for the presence of these fabrics, but they do serve to highlight the prodigious consumption of fabrics, in terms of variety as well as quantity at Bottisham that suggests that the nature of the occupation adjacent to the excavated area must have been of high status, probably a villa or equally prestigious structure. Given this general supply pattern and the conclusion it may suggest, amphorae are extremely uncommon in all phases, possibly because by this period they have been partially superseded by storage jars (i.e. Horningsea) and/or wooden barrels.

The pattern of supply recorded for this assemblage is mirrored in assemblages of varying size from the local area, including late 3rd to 4th century AD groups from the High Fen Gravel Works, Denny Abbey (Millet 1980), Hinton Fields, Teversham (Pullinger and White 1991), Fen Ditton/Teversham (Going 1997) and Great Wilbraham (Going 1993), each within a relatively close proximity to the pottery production centre of Horningsea. Although slightly more distant a very similar pattern of supply was also recorded in Phases II and III (*c.*240-360AD) at Wimpole (Lucas 1998, 58-59). Comparison with these assemblages, especially Wimpole, suggests that a terminal date for this assemblage in the mid 4th century AD is correct as after this date the pattern of fabric supply changes so that late ROB SH fabrics increase in quantity accounting for proportions close or equal to that of the sand-tempered fabrics (i.e. Horningsea products).

Form and Function: The limited range of prevalent form types within each of the principal vessel types (bowls, dishes and jars) allows for a straightforward summary of the form types that characterise this assemblage. The bulk of bowls are bead and flange rim types in Horningsea and LNV CC, with the

remainder comprised of generally deeper types of bowl including rare samian vessels, samian imitation vessels and s-shape bowls. Dishes are predominantly bead or plain rim types in Horningsea fabrics supplemented by low quantities of the same types in LNV CC. Jars and storage jars appear to have a limited range of forms; however, this may be the result of fragmentation. The bulk of jars have everted, out-curved rims that are either plain or beaded (or bifid for storage jars). Cordons are not uncommon, but any decoration beyond plain burnishing is very rare (this is also true of the bowls and dishes). The bulk of jars are in Horningsea fabrics with low quantities of similar types in ROB SH. Importantly the Horningsea forms in these popular vessel types do not include any variants not in the range of forms defined by Evans (1991), and give a clear indication of the predominant Horningsea types in circulation beyond the late 3rd century AD.

The less common vessel types include very little, if any, examples in Horningsea fabrics. Beakers are almost entirely funnel neck, indented LNV CC types with varying decoration (mainly rouletting), with isolated examples of comparable form types in other fine wares. Castor boxes and lids are similarly largely limited to LNV CC roulette decorated types, although two lids in Horningsea fabrics appear to be local imitations. Flagons, face-pots and bowls jars exhibit little consistency but are largely sourced form the Lower Nene Valley or Hadham (and possibly Colchester). Mortaria are dominated by reed rim forms in Lower Nene Valley fabrics, with scarce other forms from other regional industries.

These vessels and the proportions they occur in are indicative of the consumption pattern that may be expected for a high status domestic site, such as a villa. This pattern includes a relatively high proportion of open vessels or tableware (bowls/dishes) to jars (Table 15). The proportions of every vessel type remain relatively constant in Phases 2, 3 and 4 (Phase 1 does not contain enough vessels for a valid comparison) with no dramatic rises or falls in proportions of vessel types. As the four Romano-British phases represent a narrow chronological range covering the late 3rd to mid 4th centuries AD, the relatively homogenous nature of the form types and phase groups allows for statistically valid proportions to be calculated for the total assemblage (Table 15), and indeed for the period in Bottisham.

Vessel Type	Phase 2 %MNV (%R.EVE)	Phase 3 %MNV (%R.EVE)	Phase 4 %MNV (%R.EVE)	Phases 1 to 4 (total) %MNV (%R.EVE)
Bowl	20.92 (21.34)	17.04 (20.33)	26.62 (19.64)	19.27 (20.77)
Dish	30.07 (26.04)	25.57 (23.55)	25.90 (23.12)	27.12 (24.32)
Jar	31.37 (33.69)	38.55 (42.03)	38.13 (46.98)	36.22 (40.32)
Storage Jar	5.23 (5.30)	3.41 (3.01)	1.44 (0.41)	3.39 (3.04)
Flagon	3.25 (1.34)	1.70 (0.82)	2.88 (1.24)	2.54 (1.12)
Beaker	2.61 (3.83)	5.68 (3.90)	4.32 (5.14)	4.24 (3.36)
Mortaria	4.58 (8.46)	3.98 (3.90)	5.76 (2.24)	4.66 (5.00)
Other	1.96 (2.35)	3.41 (2.46)	2.16 (1.24)	2.54 (2.05)
	153 vessels	*176 vessels*	*139 vessels*	*472 vessels*

Table 15: Proportions of vessel types in all fabrics by %MNV and %R.EVE (to 2d.p.) of the total for each Phase (Phase 1 is excluded from individual

analysis as it contained only 4 vessels, but is incorporated into the combined Phases total)

The most striking element of the assemblage remains the very high proportion of bowl/dish forms to jars (predominantly but not exclusively in Horningsea fabrics). The total proportions of bowl/dish to jar in Phases 1 to 4 are 46.39%:36.22% by minimum number of vessels (MNV) and 45.09%:40.32% by R.EVE, or just under approximately 4:3 (Table 15). Functional analysis to compare the proportions of these vessel types has been conducted on a number of sites in northern Cambridgeshire where it was observed that the distinction between urban and rural assemblages in the area (in terms of functional analysis) becomes blurred. This is especially true in late 3rd to 4th century AD rural groups, such as this, where exceptionally high levels of table ware (bowls/dishes) normally associated with urban assemblages were present (Evans 2001, 30). When plotted the highest proportions of bowls/dishes to jars were recorded in late 3rd to 4th century groups at Lynch Farm, near Peterborough (Evans 2001, 30). The proportions calculated for this assemblage depict *c*.5% more bowls/dishes and *c*.5% fewer jars than the Lynch Farm groups.

In north Cambridgeshire, this effect is attributed to the Lower Nene Valley industry continuing to produce large volumes of types previously manufactured in coarse ware (i.e. bead and flange rim bowls) in colour-coated ware (LNV CC), which saturated the market (Evans 2001, 30-31). At Bottisham, these proportions may be the result of a similar effect. The dominant Horningsea kilns would have undoubtedly saturated the local markets with their repertoire and, on this evidence, included a similarly high proportion of tableware. Thus this pottery assemblage associated with a rural (probable) villa has a distinctly 'urban' character. Such a pattern may partially be the result of demand from the villa, but is more likely to have been shaped by the level of commercialism (market saturation) achieved by the Horningsea kilns. This aptly demonstrates the extent of influence that the local pottery industries may have had in shaping the living habits and consumption of affluent households in the late 3rd to mid 4th centuries AD, and the reflexive relationship between supply and demand.

In conclusion, the pottery assemblage is heavily biased in terms of form and fabric by the proximity of the Horningsea industry, but nevertheless depicts a level of occupation that consumed high quantities of table ware and had access to a wide range of fine ware (should it be required). This pattern of pottery consumption strongly suggests that the assemblage is the result of the deposition of high quantities of domestic rubbish in the late 3rd to mid 4th centuries AD in the immediate proximity of a probable villa building or complex.

3.3 The Ceramic Building Materials

By Andrew Peachey

Excavations produced a total of 9662 fragments (1214185g) of Romano-British CBM, with a further 373 fragments (25220g) of mortar, plaster and *opus signinum* (Table 16). This CBM appears to have been directly deposited from a late 3rd to mid 4th century AD villa or equivalent building complex that had a substantial tiled roof in addition to a (partial) hypocaust heating system. The bulk of the assemblage was manufactured in a single, locally produced fabric with similarities to the coarse fabrics used in the manufacture of storage jars at Horningsea. Similarly, a single form (tegula roof tile) accounts for an overwhelming proportion of the form types present. Therefore, while the categories of fabrics and forms are outlined, the bulk of the commentary focuses on the occurrence and distribution of the CBM rather than facets of its typology. In addition to the Romano-British CBM, 18 fragments (256g) of post-medieval, glazed sewer pipe were also recovered from Buried Soil L4001.

Phase Group	Ceramic Building Material		Mortar, Plaster and Opus Signinum	
	F	W	F	W
Tunbridge Lane Site				
Geological and tree bole features	169	14223		
Phase 1	280	66985	4	369
Phase 2	1802	396734	98	6803
Phase 3	1248	174749	65	4739
Phase 4	1446	216702	52	4513
Unphased/Undated	391	48105	37	1882
Buried Soil L2001/L4001	2528	186448	34	2411
Unstratified/Post-Medieval/Modern	35	3835	3	32
Tunbridge Hall Farm evaluation				
All Roman CBM	356	52400	3	54
New Doctors Surgery site				
Phase 1	2	20	15	524
Phase 2	1040	13889	56	2733
Phase 3	79	4838		
Phase 4	71	4208		
Unphased/Undated	162	21288	3	26
Buried Soil L5001	22	3411	2	12
Unstratified	31	6350	1	1122
Total	*9662*	*1214185*	*373*	*25220*

Table 16: Quantification of Roman CBM, mortar, plaster and opus signinum in phased groups by fragment count (F) and weight (W, in grams)

Methodology

The CBM was recorded by fragment count and weight (g). Fabrics were examined at x20 magnification and are described in the report. Forms were assigned according to Brodribb (1987) with those classified also described in the report. All data was entered into a Microsoft Excel spreadsheet that will be deposited as part of the archive. Data on the total quantity of CBM from the evaluation which preceded the main excavation (Regan 2003, 12-13) and the New Doctors Surgery (Mills 2001) was integrated, where possible, into Table 16 but context/form type specific data was not present in the archive to allow integration with subsequent tables, however, discursive/interpretive comments were added where applicable.

Fabric Descriptions

Fabric 1: Oxidised red Surfaces (2.5YR 5/6 to 6/8) with a slightly contrasting, darker (oxidised) or reduced dark grey core. Inclusions comprise common to abundant moderately sorted, sub-rounded quartz 0.2-0.7mm), sparse red and black iron rich grains (<0.7mm), sparse fine silver mica, sparse flint (1-5mm, occasionally larger) and occasional limestone (<2mm). The fabric is hard with a slightly sandy or sandy feel. This fabric is comparable to Mills' (2001) Group B, and is similar to coarser variants of the pottery fabric Horningsea Oxidised ware (Tomber & Dore 1998, 116) used for the production of storage jars approximately 6km west of Bottisham.

Fabric 2: Oxidised reddish-yellow (7.5YR 6/6 to 7/6) throughout. Inclusions as Fabric 1, except the quartz is slightly finer (<0.5mm) so appears better sorted. This fabric is almost certainly of the same provenance as Fabric 1.

Fabric 3: Oxidised off-white/very pale brown (10YR 8/3) throughout. Inclusions comprise common well-sorted, sub-rounded quartz (<0.25mm) and common black iron rich grains (<0.25). The fabric is hard with a slightly abrasive feel and an irregular fracture. This fabric is almost certainly produced in Cambridgeshire, probably to the north of Bottisham.

Mortar: The off-white to cream mortar has a lime base that was probably manufactured from the local chalk/clunch and has been tempered with common, poorly sorted quartz (<0.1-0.5mm) and sparse grog, probably crushed CBM (<3mm), however preservation conditions have left the mortar in a relatively soft and friable condition. Excavations produced a total of 252 fragments (14860g) of mortar; however the preservation conditions and the presence of mortar attached to a high proportion of tile and brick indicate that statistically this quantification has little value. The only notable concentration is present in the Phase 2 'Oven/Corn Drier F2579 and associated features' group.

Form Descriptions

Tegula: The dimensions for the trapezoid shape of the tegula roof tile comprise a length of 380-395mm, a width of 300-310mm (tapering to 270mm) and a thickness of 20-30mm. Individual tiles in this size range weighed *c.*5570g. Flanges are generally poorly executed and tend towards a 'square' profile with 'sharp' edges (i.e. knife-trimmed), but more rounded/angular examples (i.e. hand-formed) are also present. Cutaways appear equally crude consisting of vertical sections cut through the flange and body of the tile (Brodribb 1987, 16: type 4) or the chipped removal of the end of the flange leaving the flat body of the tile. Most fragments were confidently assigned according to the presence of a flange, cutaway, surfaces or edges that distinguished them from fragments of box flue tile; however it is possible that a few flat tile fragments may have been mistakenly classified as tegula or box flue tile as the two types are of similar thickness. The tegula in this assemblage are of comparable thickness and manufacture to those recorded during neighbouring excavations at Tunbridge Lane (Mills 2001, 16), although no further dimensions were extant in that assemblage. These tegula are also of a comparable size to examples recorded at Piddington Roman Villa (Ward 1999, 14: type 2).

Imbrex: The dimensions for the ridge tile in this assemblage remain unknown; however the tile would have been 20-30mm thick (as the tegula) with a length of at least 330mm (expected to extend to *c.*400mm but no examples were complete enough to be measured). Many examples exhibit a slightly ribbed appearance along their length probably the result of finger smoothing when the tile was formed over a mould.

Box Flue Tile: Two sizes of box flue tile were recorded in the assemblage, however the bulk of box flue tile fragments were not sufficiently complete to be assigned to either. The smaller variant has a width of 140-160mm (combed face), a depth of 100mm (plain, ?vented face) and a thickness of 20mm. The larger variant has a width of 220mm (combed face), a depth of 180mm (plain, vented face) and a thickness of 20mm. The length of either type remains unknown. Patterning or 'keying' is always combed, as was recorded during previous excavations on Tunbridge Lane (Mills 2001, 17), with a variety of patterns recorded and discussed below. Vents appear to have been circular (diameter c.45mm).

Bessalis: The dimensions of this type of square brick are 200-230mm wide with a thickness of 35-40mm. Fragmentation may have masked the presence of larger bricks with a comparable thickness. Bessalis bricks would have been stacked (mortared) into *pilae* to support the raised floor of a hypocaust heating system.

Pedalis/Lydion: The extant dimensions of this type of brick are a width of 290mm and a thickness of 50mm. A Roman foot or *pes* was 29.6cm and provided the basic unit of size for Roman bricks (Brodribb 1987, 36) with *bes* (of bessalis) indicating two-thirds and *pes* (of pedalis) indicating a complete foot. A pedalis brick would have been square, while a lydion would have been rectangular with its shortest side approximately one foot wide. Pedalis bricks would have been used as capping for *pilae*, while lydion may also have been used for this purpose, or alternatively for flooring or for bonding or lacing courses in walls.

Commentary

Phase 1

The CBM recovered from Phase 1 features was entirely associated with demolition layers in Foundation Cut F2967 (L2902, L2911, L2912 and L2924), part of Building S2901 (Table 17). Of this material, *c.*62% was recovered from L2924, with a further *c.*24% recovered from L2902 and only sparse quantities in L2911 and L2912.

	Tegula		**Other Tile**		**Brick**	
Feature Group	F	W	F	W	F	W
Building S2901	254	59009	16	3921	10	4055
Total	*254*	*59009*	*16*	*3921*	*10*	*4055*

Table 17: Quantification of CBM in Phase 1

The vast bulk of the Phase 1 CBM (90.71% by sherd count, 88.09% by weight) is made up of tegula roof tile (Table 17), almost entirely in Fabric 1 with only two fragments in Fabric 2 and a single fragment in Fabric 3. The remaining 'other tile' is predominantly Fabric 1 imbrex roof tile in L2924, with rare fragments of Fabric 1 box flue tile in L2902 and L2924. Fabric 1 bessalis brick also has a sparse presence in L2902, L2912 and L2924. These fragments clearly represent a primary deposit of demolition material, either of Building S2901 or of another building in the close vicinity.

Also associated with Building S2901 are three fragments (58g) of plaster in L2902 and a single fragment (311g) of mortar/*opus signinum* in L2924. The three fragments of plaster each retain traces of red paint on their surfaces.

Phase 2

Phase 2 features contained a total of 1802 fragments (396734g) with an average fragment weight of 220.16g. This is a significantly larger total than that present in Phase 3 or 4 features, and also a significantly higher average fragment weight. Fabric 1 accounts for 95.56% by fragment count (98.53%) by weight of the CBM in Phase 2, with the remaining CBM including rare fragments of both fabrics 2 and 3. These proportions are consistently present (+/-1%) in all of the feature groups within Phase 2. The distribution of the CBM between Phase 2 feature groups (Table 18) is heavily biased with 66.20% by fragment count (52.16% by weight) contained in the 'Phase 2 Field System' and a further 13.98% by fragment count (31.09% by weight) contained in 'Oven/Corn Drier F2579 and associated features'.

	Tegula		**Other Tile**		**Brick**	
Feature Group	F	W	F	W	F	W
Composite boundary	17	3567	19	3321	11	3609
Field System	993	137250	129	26589	71	43110
Ditches/Gullies in NW of Area 1	14	671	2	790	12	3918
Curvilinear Enclosure in S of Area 2	16	2281	6	602	1	217
Parallel Rectilinear Ditches in Area 2	1	445	13	390	2	645
Late Phase 2 changes to Area 1 Ditch System	66	7867	3	181	1	672
Oven\Corn Drier F2579 and associated features	184	91516	39	3679	29	28154
Pit and Postholes	101	25755	15	4305	4	1683
Other Phase 2 features	46	4129	3	438	4	950
Total	*1438*	*273481*	*229*	*40295*	*135*	*82958*

Table 18: Quantification of CBM in Phase 2 feature groups

Phase 2 Field System

The distribution of CBM within the 'Phase 2 Field System' group is focused on Ditch F2098, which accounts for 799 fragments (133163g) of the CBM in the group, or 65.49% by fragment count (63.80% by weight), including an especially high concentration in L2183 of 314 fragments (52672g), which also coincides with a very high concentration of pottery. Excluding this concentration, a similar modest to high density distribution of CBM is present in Ditches F2731, F3023 and Gully F2801, albeit of lower total quantity as these features were physically of shorter extent than Ditch F2098. A further group of 370 fragments (32550g), predominantly tegula from Ditch F5003 on the New Doctors Surgery site is also likely to be associated with the same process of deposition in the Phase 2 field system.

The form composition of the 'Phase 2 Field System' group is dominated by tegula, which account for 81.31% of the group by fragment count (65.57% by weight) and exhibit a near ubiquitous presence in the features that contained CBM. A single tegula fragment in Fabric 3 was recorded in Ditch F2731 (L3125) alongside Fabric 1 fragments, while the remainder were in Fabric 1. In Ditch F2098 (L2183) three fragments of Fabric 1 tegula had been painted white (paint applied to upper/exterior surfaces). No complete examples of

tegula were extant (or could be reconstructed) in the 'Phase 2 Field System' group. However, based on the weight and dimensions of complete tegula tiles elsewhere in Phase 2 the equivalent of approximately 25 tegula are represented in the group (based on a weight of *c.*5570g per tile), which would have covered *c.*12.25m^2 (based on a length of 395mm and a width of 310mm). The tegula fragments are present alongside sparse imbrex roof tile, box flue tile and brick. The fragments of imbrex roof tile present are entirely in Fabric 1, account for 3.93% of the group by fragment count (4.44% by weight), and occur as sparse fragments alongside the more frequent tegula.

Box flue tile accounts for 5.9% of the 'Phase 2 Field System' group by fragment count (8.25% by weight). It occurs alongside the tegula and imbrex roof tile and is never present in any high concentrations. The bulk of the box flue tile in this group is in Fabric 1, but sparse fragments in Fabrics 2 and 3 are also present. Scored markings on the box flue tile, to allow for greater adherence by plaster, are a common feature on the recorded fragments but only 13 examples were intact enough in this group to allow for dimensions and pattern to be quantified (Table 19). All of the scored marks were applied with a comb. The combs used demonstrate a moderate degree of standardisation, occurring in a narrow size range of 25-43mm, with one variant (33-36mm, 6 teeth) clearly the most frequently used in this sample. The patterning of the comb marks exhibits considerable variation and probably reflects the idiosyncrasies of individual craftsmen.

Type of Comb		Discernable Patterns	No. of examples	
Width	No. of teeth		Field System	Other Phase 2 Features
25mm	4	Wavy lines	1	0
35mm	3	X-shape	0	2
33-36mm	6	Lattice & X-shape	6	2
36mm	4	\	1	0
38mm	8	\	1	0
40-43mm	4	X-shape	3	0
43mm	8	Intersecting lines/arcs	1	0
		Total	*13*	*4*

Table 19: Quantification of scored comb marks on box flue tile in phase 2

In terms of fragment count Roman brick occurs with a similar frequency to box flue tile (5.82%) in the 'Phase 2 Field System', although by its larger size and more robust nature accounts for a higher proportion in terms of weight (20.65%). The brick in the 'Phase 2 Field System' appears to be entirely derived from bessalis with the bulk in Fabric 1 and rare fragments in Fabric 2. The bulk of fragments were categorised according to their thickness only, although a partially complete fragment with extant width/length dimensions was recovered from Ditch F3023 (L3009). The combination of the box flue tile and the bessalis that accompanies the roof tile suggests that the demolition debris deposited in the 'Phase 2 Field System' originates from a relatively substantial masonry building with a hypocaust heating system. This conclusion is supported by a fragment of *opus signinum* recovered from Ditch F2098 (L2864) and a fragment of plaster with traces of red paint in Ditch F2731 (L2838).

Oven/Corn Drier F2579 and associated features

Within this group Oven/Corn Drier F2579 contained a very high concentration of CBM probably representing the *in situ*, collapsed or demolished superstructure of the oven/corn drier. The composite features of Oven/Corn Drier F2579 (including Layers L2073 and L2073) contained a total of 244 fragments (122191g) of CBM, accounting for 76.97% by fragment count (95.51% by weight) of the CBM in the 'Oven/Corn Drier F2579 and associated features' group. Only sparse quantities of comparable CBM were present in Oven F2576 and only rare fragments in other associated features.

The bulk of the CBM in Oven/Corn Drier F2579 was recovered from the flue of the oven/corn drier (L2848 and L2849), and includes fragments recorded *in situ* forming part of the flue (along with chalk, clunch and flint). There are no clear instances of burning, although sparse fragments may have been cracked by heat. This may be explained by the fact that the flue was lined with a mixture of clay and chalk which acted to shield the CBM. Indeed, this feature group contains the only notable presence of mortar in the assemblage with 11 fragments (998g) in Corn Dryer F2579 (L2580) and 32 fragments (3170g) in neighbouring Oven F2576 (L2588). The bulk of the CBM in Oven/Corn Drier F2579 and the remaining features in the group is comprised of tegula roof tile (almost entirely in Fabric 1), which accounts for 58.04% of the group by fragment count (71.53% by weight). Rare fragments of imbrex and a single fragment of box flue tile are also present, but are conspicuous by their near absence, and suggest that the tegula were deliberately selected for this alternate purpose. That the bulk of the CBM recovered from the features in this group formed part of Oven/Corn Drier F2579 cannot be doubted, however, the CBM, notably the tegula, may have been deliberately selected for re-use from demolition debris originating from a nearby structure. It follows that the most intact, or largest fragments may have been selected for such a re-use, therefore it is not surprising that the tegula in this group has a high average fragment weight of 497.37g compared to 138.22g in the 'Phase 2 Field System' group, or that two tegula with extant dimensions were recovered from L2848 (described under *Form Descriptions*). In addition to the tegula roof tile, brick types also form a key part of this group. Fragments of brick were almost entirely recovered from the flue (L2848 and L2849), possibly because they would have been used as supports at key locations/arches in the oven/corn driers structure. Brick fragments account for 9.15% of the group by fragment count (22.01% by weight) and are primarily composed of bessalis bricks (22 fragments, 16252g) with pedalis/lydion bricks present to a lesser degree (7 fragments, 11902g). The only fragment of a pedalis/lydion type with any extant dimensions beyond thickness was also recovered from L2849 (see *Form Descriptions*).

CBM in other Phase 2 groups

The remaining Phase 2 feature groups from the Tunbridge Lane site contained relatively low quantities and sparse distributions of CBM (Table 18) consistent with the types and proportions of the forms and fabrics in the previously described Phase 2 groups with only very minor concentrations apparent. A notable concentration was present in Posthole F2405 (L2406) (in 'Pits and Postholes'), comprising 26 fragments (10924g), predominantly tegula with bessalis also present. Spatially, the posthole is relatively isolated in the centre of the site, and the CBM may represent packing material. Another small concentration (in total 23 fragments, 7187g) in the 'Pits and Postholes' group was recovered from Pit F2738 in very close proximity, and possibly related to, the concentration recorded in Oven/Corn Drier F2579. The remaining Phase 2 CBM also includes sparse box flue tile with extant scoring (Table 19) that is consistent in terms of fabric, form and pattern with that recorded in the Phase 2 concentrations.

The New Doctors Surgery site also included significant quantities of CBM assigned to Phase 2, the bulk of which: 535 fragments (90960g) formed a series of metalled surfaces comprising L5006, L5007, L5133 and L5502. The CBM in this group was more abraded than that from the rest of the site, with clear evidence of mortaring on the ancient breaks of large fragments of flat tile (tegula), suggesting these fragments were deliberately selected for a secondary use as a paving material.

Phase 3

Phase 3 features produced a total of 1248 fragments (174749g) of CBM with a significant proportion of this total occurring as a moderate distribution through the segments of Rectilinear Enclosures in Areas 1 and 2 (combined here for discussion) (Table 20). The 'Rectilinear Enclosures (Areas 1 and 2)' group accounts for 48.40% of the Phase 3 CBM by fragment count (52.32% by weight). The CBM in the remaining Phase 3 groups is relatively sparsely distributed with two further notable concentrations present in discrete features but not reflective of the groups as a whole.

	Tegula		**Other Tile**		**Brick**	
Feature Group	F	W	F	W	F	W
Rectilinear Enclosure (Area 1)	253	31872	50	8075	21	5320
Rectilinear Enclosure (Area 2)	202	24876	39	5256	39	16030
Enclosure in SE of Area 1	64	10187	21	4430	0	0
Curvilinear Enclosures in NW of Area 1	68	5872	22	856	4	1386
Industrial Feature F4148	30	2238	44	2522	2	1359
Structure S2661	45	3724	6	748	0	0
Pits	301	35782	23	4689	14	9088
Total	*963*	*114551*	*205*	*26576*	*80*	*33183*

Table 20: Quantification of CBM in phase 3 feature groups

Rectilinear Enclosures (Areas 1 and 2)

The CBM in the 'Rectilinear Enclosures (Areas 1 and 2)' group is relatively evenly distributed in modest quantities, except for high concentrations in Ditches F2543 (L2520) and F2494 (L2495). These contexts are situated immediately north and south respectively of Phase 4 Rubbish Pit F2620, which truncated both ditches (if they are not one and the same) and also contained high concentrations of CBM and pottery.

As with the major Phase 2 groups the most frequently occurring form type in the Phase 3 'Rectilinear Enclosures (Areas 1 and 2)' group is composed of tegula roof tile. Tegula accounts for 70.98% of the group by fragment count (60.07% by weight), with 3.55% (4.32%) of the tegula in Fabric 2, 2.86% (3.58%) in Fabric 3 and the remaining bulk in Fabric 1. Low quantities of fragmentary imbrex and box flue tile occur in conjunction with the tegula in this group, but are very sparsely distributed. The box flue tile in this group exhibits a total of four extant comb marks, with a further four elsewhere in Phase 3 (Table 21) that are identical to types previously recorded in Phase 2 (Table 19). In addition to the box flue tile in the group, Ditch F2494 (L2495) also contained a high concentration of plaster (28 fragments, 1007g), of which a single fragment exhibited traces of red paint and several fragments exhibited traces of white paint or whitewash.

Type of Comb		Discernable Patterns	No. of examples	
Width	No. of teeth		Rectilinear Enclosures (Areas 1 and 2)	Other Phase 3 Features
25mm	4	\	1	
35mm	3	X-shape		1
33-36mm	6	Lattice & X-shape	2	2
36mm	4	\	1	
43mm	8	\		1
		Total	*4*	*4*

Table 21: Quantification of scored comb marks on box flue tile in Phase 3

Like the imbrex and box flue tile in the 'Rectilinear Enclosures (Areas 1 and 2) group, the brick types have a sparse distribution, accounting for a total of 57 (19983g) fragments of bessalis and three fragments (1367g) of pedalis/lydion. These fragments occur sporadically in the ditch fills and do not demonstrate any bias in distribution that may associate them with any particular structure.

Other Phase 3 features

Beyond the 'Rectilinear Enclosures (Areas 1 and 2)' group in Phase 3 there are two further notable concentrations of CBM, each associated with individual pits rather than with groups of features. These comprise 125 fragments (15049g) in Pit F2763 and 144 fragments (19491g) in Pit F2729. Both concentrations are dominated by Fabric 1 tegula fragments with imbrex, box flue tile and bessalis fragments also present in low quantities. Given the

relatively low average fragment weight in each group (120.39g and 135.35g respectively), and the contrasting quantities of CBM in other pits located close by, it appears likely that this CBM represents substantial packing material possibly to support a post or provide a foundation.

The 'Enclosure in the south-east of Area 1' group contained a total of 64 fragments (10187g) with *c*.1.5-6.5kg of CBM. This group comprised largely tegula but with a very consistent (albeit low) presence of box flue tile as well as imbrex and a single fragment of opus signinum (in Ditch F2669 (L2711)). This group is not substantial enough to represent a demolition deposit but may suggest proximity to a major building.

The remaining features (and feature groups) in Phase 3 can be summarised as containing consistent but low to moderate quantities of CBM, largely tegula with imbrex, box flue tile and brick also present. There is no positive indication of specific dumping, or of relationships with a particular structure. Notably, Industrial Feature F4148 and Structure S2661 are not associated with large quantities, although F4148 did include near complete examples of imbrex, box flue tile and bessalis.

Phase 4

Phase 4 features produced a total of 1446 fragments (216702g) of CBM (Table 22), with concentrations in several feature groups but with none accounting for more than *c*.23% of the phase total (by fragment count or weight).

	Tegula		**Other Tile**		**Brick**	
Feature Group	F	W	F	W	F	W
Boundary Ditches in Area 1	203	30140	44	6251	10	6473
Field Boundary Alterations in Area 2	63	7995	21	2160	15	8218
Quarry Pit F2255 and associated pits	97	3818	12	73	0	0
Pit cluster north-east of Ditch F2050	8	1137	11	87	2	1758
Quarry Pit F2557 and associated pits	209	31430	44	5962	8	4125
Pit Group F2439	62	8686	15	3326	1	155
Phase 4 Quarry Pits in Area 2	91	11973	15	1914	8	2890
Rubbish Pits in N of Area 1	141	16371	12	2895	4	1084
Rubbish Pits in S of Area 1	161	17863	13	3508	2	1876
Other Phase 4 deposits	128	26996	45	7235	1	303
Total	*1163*	*156409*	*232*	*33411*	*51*	*26882*

Table 22: Quantification of CBM in phase 4 feature groups

The 'Boundary Ditches in Area 1' group contained a total of 257 fragments (42864g) of CBM, accounting for 17.77% of the Phase 4 CBM by fragment count (19.78% by weight). Of this, 78.99% by fragment count (70.32% by weight) was tegula, almost entirely in Fabric 1. As with previous groups only sparse fragments of imbrex, box flue tile and brick are present. Within the 'Boundary Ditches in Area 1' group two particular concentrations are evident. The former comprises 63 fragments (9445g) in Ditch F2791 (L2790), close to the south western baulk of excavation and in the vicinity of several other concentrations of pottery and CBM in the whole assemblage. The latter

comprises 30 fragments (10967g) in Ditch F2050 (L2082) in the north-west of Area 1, quite apart from other concentrations. This concentration is primarily composed of tegula with sparse imbrex, rare box flue tile and no brick. It has a relatively high average fragment weight (365.57g) that suggests it is a primary demolition deposit. The sparse box flue tile in the 'Boundary Ditches in Area 1' group included only three extant comb marks that owing to their sparse occurrence are quantified with the other eight Phase 4 examples (Table 23). All of the comb marks recorded in Phase 4 had previously been recorded in Phases 2 and 3, with multiple examples only occurring in Sealing Layer L2694 (see below).

Type of Comb		Discernable Patterns	No. of examples
Width	No. of teeth		
33-36mm	6	Lattice & X-shape	6
38mm	8	\	1
40-43mm	4	\	1
43mm	8	linear	3
		Total	*11*

Table 23: Quantification of scored comb marks on box flue tile in Phase 4

The 266 fragments (41863g) of CBM that form the 'Quarry Pit F2557 and associated pits' group account for 18.05% by fragment count (19.16% by weight) of the Phase 4 CBM. The distribution of CBM in the group is heavily biased with 92.86% by fragment count (94.50% by weight) recovered from the fills of Quarry Pit F2557, with the remainder recovered from Pit F2470. The bulk of the CBM in Quarry Pit F2557 was contained in L2424 (191 fragments, 30313g). As with the assemblage as a whole, tegula accounts for the bulk of the CBM forms (almost entirely in Fabric 1), with all other form types rare. Three fragments of tegula in the group had white paint applied to their upper surfaces. A single fragment of *opus signinum* was also present in Quarry Pit F2557 (L2424). The remaining quarry pits in Phase 4 contained a similar composition of material, albeit in slightly lower quantities, that provides valuable data sets but warrants no further discussion.

The 'Rubbish Pits in the north and south of Area 1' (combined for discussion) contained a total of 333 fragments (43597g), which accounts for 23.03% of the Phase 4 CBM by fragment count (20.12% by weight). Tegula accounts for 90.69% of the group by fragment count (78.52% by weight), with rare imbrex, box flue tile and bessalis fragments also present. Within this group there are three significant concentrations of CBM: in Pits F2620 (76 fragments, 13239g), F2656 (82 fragments, 9162g) and F2903 (41 fragments, 10065g).

The final significant group of CBM in Phase 4 was recovered from Sealing Layer L2694 and comprised 185 fragments (31738g). Tegula were present as a lower proportion of this group than is typical for the assemblage, accounting for only 61.62% of the group by fragment count (75.73% by weight). In contrast to the principal CBM groups in Phases 1 to 4, this group includes a significant proportion of box flue tile, which accounts for 17.84% of the group by fragment count (16.28% by weight). The flue tile in this group includes four extant comb marks that were all impressed using a similar (or the same) comb with 6 teeth and a width of 33-36mm. This type of comb accounts for the bulk

of comb marks not only in Phase 4 (Table 23) but also in Phases 2 and 3 (Tables 19 and 21). In addition to the box flue tile, this group also included a high concentration of plaster (28 fragments, 597g). The plaster fragments include 14 fragments with traces of red paint on intact surfaces, including one fragment with a clear linear edge between red paint and white background, however, no pattern is discernable.

Conclusions

This assemblage would appear to represent two possible stages in the development of a substantial building or complex, probably a villa, adjacent to the excavated area. The villa would have had an extensive tiled roof and had a small area with a hypocaust heating system. The former stage appears to be represented by the substantial deposition of CBM in Phase 2, principally in the Phase 2 'Field System' that, it may be speculated, could represent the demolition of one building or simply the re-roofing of an existing structure. Phase 2 also includes an oven or corn drier with a significant element of CBM utilised in its construction. Based on the weight of a complete example of tegula from this assemblage (*c*.5570g) it may be estimated that the total weight of tegula in Phase 2 (273481g) represents approximately 49 roof tiles or enough roof tile to cover *c*.60m^2. This clearly represents only a fraction of the CBM from the villa (in Phase 2), but exactly what fraction of the original total remains open to speculation. Intriguingly the slightly smaller groups recovered from the features that are developed in Phases 3 and 4 prior to the end of occupation on the site contained a total weight of tegula of 270960g, which represents approximately the same number of tiles and surface area.

The principal fabric (Fabric 1) used in the manufacture of the CBM was undoubtedly produced locally, if not by itinerant craftsman brought to the site during the villas construction. There is no direct evidence for this but the predominance of a single fabric and a predisposition to certain comb-types used in keying box flue tile might be explained by such a process. The scarcity of Fabrics 2 and 3, which also appear of local manufacture, suggest that they may have been bought in small quantities from local sources for the purposes of on-going repairs and maintenance. The form types used in the construction of the villa show a high degree of consistency (on the extant evidence available) but this may be expected of an assemblage that only spans the late 3rd to mid 4th centuries AD. It may be speculated that the two size variants of box flue tile represent different types used in separate rooms, highlighting the fact that only select rooms had hypocaust heating systems or that the tubes were designed to allow the greater or lesser emission of heat, possibly into linked warm and hot rooms (the *tepidarium* and *caldarium*). Whether these rooms would have been part of the same building as the main villa or part of an out-building remains open to speculation, but the presence of sparse bessalis and pedalis brick fragments suggests a hypocaust utilising *pilae* was present (although such bricks may have also been used in bonding or lacing courses in walls otherwise made of clunch or flint). The sparse presence of painted plaster and *opus signinum* also supports the presence of floors or walls built over or around a hypocaust heating system.

3.4 The coins

By Nina Crummy (*with additional information by Andrew Peachey and Andrew A. S. Newton, edited from a report by Adrian Challands and Roderick Regan*)

All of the coins are copper-alloy issues and very few are sufficiently well-preserved to be identified. They are listed below in Table 24, the columns of which are self-explanatory apart from the last, headed 'Period', which refers to the coinage periods defined by Reece (1995; 2002, 145-150).

The coins were scattered across the site with no concentrations either by feature or date. The earliest identifiable piece is an *antoninianus* of Valerian I, dated AD 253-7, but several of the illegible issues are earlier and would extend the period at which coinage appeared on the site to at least the 2nd century. The latest identifiable issue is of the House of Valentinian, AD 364-78, but again, many of the illegible late Roman issues may extend this closer to the end of the 4th century or into the early 5th. The assemblage is too small to provide a meaningful graph according to either the cumulative value method used by Reece (1995) or the bar charts preferred by Plouviez when dealing with the coins from Suffolk sites (2004). However, it is apparent from Table 24 that the concentration of both the legible and illegible coinage in the later 3rd and 4th centuries places the site within the norm for rural Cambridgeshire, with little coin loss before the mid to late 3rd century (Guest 2003). This adds to the increasing evidence from rural sites in eastern Britain and elsewhere that, from the 1st to mid 3rd century or later, rural economies were based on barter rather than cash. For example, Monument 97 at Orton Longueville had only one *dupondius* of Antonia minted under Claudius I (AD 41-54), the West Fen Road site at Ely had only one coin of Trajan and 3rd-4th century issues, while no Roman coinage at all was found at Ely's Trinity Lands and Hurst Lane reservoir sites (Mackreth 2001, 39; Evans *et al.* 2007, 52, 68-9). Plouviez's analysis of coinage from the small towns of Suffolk points to a similar situation, even in urban contexts (2004, figs. 59-60).

One feature of the legible coins that deserves comment is that all four coins of the House of Constantine have the reverse of two victories facing each other, each holding a wreath, and the legend VICTORIAE DD AVGGQ NN, which was issued between AD 341-6 and copied until *c.* 350. As a type this issue is common enough on sites in eastern Britain, and any comment on this apparent concentration of reverse type must be considerably tempered by the number of illegible issues from the site, yet it is sufficiently unusual to suggest that some reason might lie behind it, such as the arrival of a particular batch of coins to the site in the early 340s.

Abbreviations used in coin catalogue:

HK: Hill, P.V. and Kent, J.P.C. 1972 'Part 1: the bronze coinage of the House of Constantine AD 324-346' in R.A.G. Carson, P.V. Hill, and J.P.C. Kent *Late Roman Bronze Coinage*, London

RIC: Roman Imperial Coinage

SF	Context and Feature	Context description	Identification	Diameter (mm)	Weight (g)	Reference	Mint	Date	Period
TUB03 sf8	F.84 [20]	-	Victorinus, AE4 Obv. IMPC]VIC[TORINVSPFAVG] Radiate crowned and draped bust, right. Rev. Illegible	14	0.79	*RIC VII 118*	-	265-70	13
TUB03 sf9	F84 [20]	-	radiate antoninianus. Legend illegible, radiate crowned bust, right; reverse illegible	18	1.80	-	-	last third of 3rd century AD	-
TUB03 sf11	US [001]	unstratified	radiate antoninianus. Legend illegible, traces of radiate crowned bust, right; reverse illegible	17	1.98	-	-	last third of 3rd century AD	-
TUB03 sf12	US [001]	unstratified	Barbarous radiate minim. Barbarous radiate crowned bust, right; reverse barbarous standing figure	11	0.87	-	-	late 3rd-4th century	-
TUB03 -	US [001]	unstratified	illegible Minim	11	1.04	-	-	late 3rd-4th century	-
70	-	unstratified	Valerian I, *antoninianus*, reverse APOLINI CONSERVA, Apollo standing left, holding branch and leaning lyre on rock	21	3.4	*RIC* 32	Rome	253-7	12
33	2316 F2317	fill of pit	Tetricus I, *antoninianus*, reverse COMES AVG, Victory to left with wreath and palm	17	2.66	*RIC* 56	-	270-3	13
22	2001	buried topsoil	Allectus, *antoninianus*, rev. illegible	23	4.37	-	-	293-6	14
24	4262 F4263	fill of ditch	Constans, AE4, reverse VICTORIAE DD AVGGQ NN, two victories facing each other, each holding a wreath	15	1.09	HK 150; mint mark: D / TRP	Trier	341-6	17

17	2001	buried topsoil	House of Constantine copy, AE4, reverse VICTORIAE DD AVGGQ NN, two victories facing each other, each holding a wreath	14	1.41	mint mark: palmette above exergue	-	341-50	17
36	2415 F2414	fill of pit	House of Constantine, AE4, reverse VICTORIAE DD AVGGQ NN, two victories facing each other, each holding a wreath	14	1.74	as HK 139-40 (mint mark: leaf above exergue	Trier	341-6	17
20	4216 F4217	-	House of Constantine copy, AE4, reverse VICTORIAE DD AVGGQ NN, two victories facing each other, each holding a wreath	12	0.97	mint mark: ST above exergue	(Lyons)	341-50	17
56	2694	layer	House of Valentinian, AE3, reverse SECVRITAS REIPVBLICAE, Victory to left with wreath and palm	18	2.14	-	-	364-78	19
2	4037 F4036	fill of ditch	illegible *as*	26	5.77	-	-	mid 1st-early 3rd century	-
68	3016 F3014	fill of ditch	illegible dupondius, with thick accretion of soil and corrosion products	32	-	-	-	2nd century?	-
1	2000	topsoil	illegible radiate antoninianus	17	2.28	-	-	mid-late 3rd century	-
35	2382 F2381	fill of posthole	illegible radiate antoninianus	19	2.47	-	-	mid-late 3rd century	-
54	2701 F2598	fill of ditch	illegible radiate antoninianus	13	1.14	-	-	mid-late 3rd century	-
66	2925 F2903	fill of pit	illegible radiate antoninianus	20	2.39	-	-	mid-late 3rd century	-
9	2001	buried topsoil	illegible antoninianus?	20	2.39	-	-	3rd century?	-
60	2803 F2804	fill of re-cut ditch	illegible ?antoninianus	19	2.49	-	-	3rd century?	-
3	2000	topsoil	illegible	23	4.37	-	-	3rd-4th century	-

4	2000	topsoil	illegible	18	2.06	-	-	3rd-4th century	-
5a	2000	topsoil	illegible	15	2,32	-	-	3rd-4th century	-
5b	2001	buried topsoil	illegible	18	3.19	-	-	3rd-4th century	-
8	2001	buried topsoil	illegible, with thick accretion of soil and corrosion products	16	-	-	-	3rd-4th century	-
-	2001	buried topsoil	illegible	20	2.87	-	-	3rd-4th century	-
-	2001	buried topsoil	illegible	17	1.57	-	-	3rd-4th century	-
26	2174 F2255	fill of pit	illegible	16	2.88	-	-	3rd-4th century	-
27	2174 F2255	fill of pit	illegible	13	0.79	-	-	3rd-4th century	-
51	2587 F2557	fill of quarry pit	illegible	14	1.15	-	-	3rd to 4th century	-
1	4022 F4023	fill of ditch	illegible fragments	-	-	-	-	late 3rd-4th century	-
3	4044 F4043	fill of gully	illegible minim	5	0.12	-	-	late 3rd-4th century	-
5	4147 F4148	fill of pit	illegible fragment	9	0.23	-	-	late 3rd-4th century	-

Table 24: Coin catalogue

3.5 The small finds

By Nina Crummy

Only a selection of objects from the site is catalogued here. As is usual with rural sites, a large part of the assemblage consists of small pieces of scrap metal, with no concentrations of form or context to suggest that they relate to any particular activity on the site; these items are briefly described in the post-excavation assessment.

From the AS1011 excavation areas, several dress accessories, a knife and two keys are, however, reasonably complete. This might be considered to be an indication of formal deposition, particularly in the case of key SF30, which came from a ditch terminus. However, the objects cover a wide date range, at the least from the 1st to 2nd centuries, and at the most from the late Iron Age to the 4th century, so any ritual activity would have been very sporadic. Domestic and agricultural crafts are not well represented. There is a single spindlewhorl used for spinning thread, part of a shattered quernstone for grinding grain or other foodstuffs, and a small part of what may be a pruning hook or similar tool. A degree of economic wealth is implied by some of the items, particularly a ring-key, two box studs and the two keys, all of which point to the ownership of personal possessions and property that were so valuable, or so valued, that they had to be kept secure.

That part of the assemblage recovered from the New Doctor's Surgery excavation area was small in comparison to that from the other areas of the site. It consists of a copper-alloy strip, possibly a belt-fitting but lacking any clear diagnostic features, a corroded iron brooch of probable 1st century date, a large iron knife, also early Roman, a few fragments of iron fittings, a fragment of building stone, part of a possible cobble, and over one hundred fragments of Mayen lava.

Dress accessories

The dress accessories range in date from the 1st to the 6th century AD. The earliest items are the Fowler Type C penannular brooches with round-section hoop (Figs. 22.1 & 22.2, SF 57 and SF 7), a form which belongs to the 1st century AD and has been found at *Camulodunum*, Maiden Castle, Prae Wood, Glastonbury and Thetford in contexts dating to the first half of that century (Fowler 1983, 19; Hawkes and Hull 1947, 326, Class A; Wheeler 1943, 264-5; Wheeler and Wheeler 1936, 176, fig. 24, 3-4; Bulleid and Gray 1911, 203-8; Mackreth 1992, nos. 42-4).

The damaged ring-key (Fig. 22.3, SF 45) cannot be dated closely. Examples in the eastern region have been found in graves dating to the 2nd and 4th centuries, with the latest example found in position in the lock of a jewellery box (Johns 1996, 55; Crummy 1983, fig. 90, 2195). They are of particular interest in that they allowed the wearer to imply that they owned jewellery of great value at home. Flaunting wealth in this manner was first observed by Pliny in the mid 1st century AD: 'Some people put all their rings on their little

finger only, while others wear only one ring even on that finger, and use it to seal up their signet ring, which is kept stored away as a rarity not deserving the insult of common use, and is brought out from its cabinet as if from a sanctuary; thus even wearing a single ring on the little finger may advertise the possession of a costlier piece of apparatus put away in store' (*Hist. Nat.* 33.6, 25).

A second finger-ring is an unusual combination of snake-ring and keeled ring (Fig. 22.4, SF 24). It has a central bezel flanked by triangular panels that are held in the mouths of snakes, the whole effect being similar to the keeled rings of the 3rd century, so that a date for the piece in the later 2nd or early 3rd century is probably appropriate (Johns 1996, 49). Although not made of precious metal, this ring, like SF 45, is indicative of a degree of economic status above the ordinary. The use of the snake motif may be in reference to a healing deity such as Aesculapius and Salus, or perhaps to one of the resurrection cults that became popular in the second century (Cool 2000).

The remaining Roman objects are all iron hobnails. Most were found in a variety of contexts in Area 1 of the excavation and can be put down to casual loss, but a small group found in Industrial Feature F4148 in Area 2 presumably came from a single discarded shoe.

The latest item is part of a florid cruciform brooch dating to the later 6th century (Fig. 22.5, SF 1). The lappets flanking the panel below the arch of the bow are well-formed bird's heads, similar to those on a brooch from Nassington in Northamptonshire (Leeds and Atkinson 1944, pl. 26, 31). Without the rest of the brooch, this cannot be attributed to one of the forms of florid cruciform defined by Leeds and Pocock (1971).

Fig. 22 no. 1, SF 57. (2790), fill of Ditch F2791. Complete copper-alloy penannular brooch of Fowler's Type C (1960, 152, 165), with the terminals rolled upwards. The hoop is circular in section. Diameter 31mm.

Fig. 22 no. 2, SF 7. (2001), Buried Soil. Complete copper-alloy penannular brooch of Fowler's Type C, as SF 57, above. The hoop is circular in section. Diameter 24mm.

Fig. 22 no. 3, SF 45. (2578), fill of Pit F2574. Copper-alloy ring-key with broken hoop. Diameter 19mm, length 14mm.

Fig. 22 no. 4, SF 24. (2127), fill of ?Sunken Structure F2125. Copper-alloy finger-ring, with central oval bezel flanked by tapered panels that are held in the mouths of snakes. Maximum diameter 23mm, internal diameter 17mm.

(-), fill of Gully F2222. Iron hobnail. Length 12mm.

(2587), fill of Quarry Pit F2557. Two iron hobnails. Lengths 17 and 12mm.

(2060), fill of undefined Feature F2061. Iron hobnail. Length 14mm.

(2796), fill of Ditch/Gully F2765. Two iron hobnails. Lengths 13 and 12mm.

SF 8. (0), unstratified. Iron hobnail. Length 10mm.

SF 10. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 10mm.

SF 11. (4147), fill of Industrial Feature F4148. Small pellet of iron, possibly part of a hobnail. Diameter 4mm.

SF 12. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 12mm.

SF 14. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 15mm.

SF 15. (4147), fill of Industrial Feature F4148. Iron hobnail shank. Length 10mm.

SF 16. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 11mm.

SF 18. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 7mm.

SF 19. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 14mm.

SF -. (4147), fill of Industrial Feature F4148. Iron hobnail. Length 15mm.

Fig. 22 no. 5, SF 1. (2000), Topsoil. Fragment of a copper-alloy cruciform brooch of Mortimer's Type Z (1990), with lappets in the form of bird's heads flanking the panel below the bow. There are worn triangular palmette punch marks on the sides of the panel and on the bow. Length 37mm, width at the lappets 23mm.

Fig. 22 no. 6. ndsSF 1. (1016). Ditch F1015. Fragment of a copper-alloy strip, with the surviving original end slightly rounded. Possibly a belt-fitting. Length 35 mm, width 10 mm.

Fig. 22 no. 7. (5012). Pit F5011. Corroded iron brooch, the pin missing. The form is uncertain, but it appears to have a simple short straight bow, terminating in a blunt foot and with a small catchplate, which suggests that is of mid to late 1st century date, and akin to Colchester derivatives. Length 49 mm.

Textile manufacture

The only domestic craft item is a spindlewhorl made from a reused sherd of Roman pottery (Fig. 22.8, (4295)). It is well-made and wear on both surfaces and on the sides of the spindle hole points to a considerable amount of use.

Fig. 22 no. 8, (4295), fill of Ditch F4296. Spindlewhorl made from a reused greyware pot sherd. The edge has been ground smooth and the surfaces are abraded. The spindle hole is a worn figure-of-eight shape. Diameter 34mm, 8mm thick.

Household equipment

Household equipment is represented only by some fragments of a shattered quernstone of Mayen lava from the Eifel Hills in Germany. Querns of this type were imported from the early Roman period at least until the late 2nd century, possibly later (Critchley 2010, 81).

(4105), fill of test pit 4106. Small fragments of Mayen lava from a shattered quernstone. Weight 311g.

Tools

A worn knife from quarry pit F2557 is unusual in having a markedly S-shaped back and in retaining an iron terminal plate from a wooden handle at the end of the tang (Fig. 2.9, SF 37). The handle has completely decayed. Part of a socketed blade from ditch F3023 may be from a knife similar to Manning's Type 22, or from a small hook used for pruning and other agricultural tasks (1985, 56-8, 117-18). A large iron knife (Fig. 22.10, ndsSF 5) from surface L5007 is a variant of Manning's Type 8 (1985, fig 28), in which the tang usually remains solid and thick in section to the end, which may be knobbed. The type is early Roman and not widespread, with three examples known from Hod Hill (*ibid*, 113), one from Verulamium (Wheeler & Wheeler 1936, pl 64B), and one from Baldock (Manning & Scott 1986, fig 66, 525).

Fig. 22 no. 9, SF 37. (2407), fill of quarry pit F2557. Iron knife with more or less straight edge and S-shaped back. The back slopes down at the upper end so that the blade narrows before the tang, which is centrally set. The upper end of the tang passes through a small oval plate and has been hammered down to fix it securely. Length 221 mm.

(3009), fill of ditch F3023. Short fragment of a socketed blade, possibly). Length 72 mm, width 21 mm.

Fig. 22 no. 10. ndsSF 5. (5006)/(5007). Metalled surface/build-up over metalled surface. Large iron knife, with the blade angled sharply down from the junction with the tang. The tang is thick, rectangular in section close to the blade, but beaten out at the terminal to form a hollow socket, which retains traces of mineralized wood. Length 265 mm.

Fittings

Two keys are comparatively rare finds on a rural site. One is a composite piece with an iron shank and bit fitted with an openwork handle (Fig. 22.11, SF 25). Similar keys generally come from contexts dated to later than *c.* AD 150 (Crummy 1983, 126; Seeley 2004, 136, fig. 95, 303-5; *ORL* 8, Taf. 12, 51). The second key is a tumbler-lock lift key (SF 30) that was found in a ditch terminus, a context which suggests the object may have been a formal deposit. Two composite studs from Pit F2656 and Ditch F2804 are of the type with a copper-alloy convex head and an iron shank fixed together by filling the underside of the head with lead or lead-tin solder. They were used on wooden boxes to secure the lock-plate and other external metal fittings and cannot be closely dated. A possible L-shaped iron lift key was recovered from Ditch F5020 (ndsSF 3).

A large number of nails and nail fragments were found scattered across the site, mostly in the fills of pits and ditches. Some may derive from hurdles or gates used to secure livestock enclosures, but there are no linear spreads to suggest the use of wooden fences. Most of the nails are of Manning's Type

1b, with flat or slightly convex head and a shank less than 150 mm in length, but there are also several Type 2 nails, with a triangular head no wider in one plane than the shank, allowing the nail head to be aligned with the grain of the wood and driven so far in that very little of the iron was exposed on the surface (Manning 1985, 134-5).

Fig. 22 no. 11, SF 25. (4262), fill of Ditch 4263. Fragmentary iron tumbler-lock slide key with copper-alloy openwork palmette handle. Length 97mm.

SF 30. (2270), fill of Ditch Terminus F2269. Fragmentary iron L-shaped lift-key with the top of the shank rolled to form a suspension loop. The bit had at least three teeth. Length 154mm.

SF 49. (2600), fill of Pit F2656. Composite box stud, consisting of a convex copper-alloy head filled with lead-tin solder that secures an iron shank. Diameter 25 mm, height 12mm.

SF 59. (2803), fill of re-cut Ditch F2804. a) Composite box stud, as SF 49, but smaller. Diameter 17mm, height 7mm.

Fig. 23 no.12. ndsSF 6. (5006)/(5007). Metalled surface/build-up over metalled surface. Iron tongue-ended strip, rectangular in section, narrowing sharply at the other end and bent downwards at an angle. Possibly part of a hinge. Length 108 mm, maximum width 25 mm.

Not illustrated. ndsSF 3. (5021). Ditch F5020. Iron shaft, circular in section, with right-angled return at the base to a short wide arm, and slightly bent at the top, which is broken. Possibly an L-shaped lift key. Length 96 mm.

SF	Context	Context description	Identification	Length
-	2116 F2047	fill of ditch	incomplete nail	38
-	2051 F2050	fill of ditch	incomplete nail	39
-	2071 F2050	fill of ditch	incomplete nail	31
-	2079 F2078	fill of ditch	shank fragment	50
-	2082 F2050	fill of ditch	shank fragment	41
-	2183 F2098	fill of ditch	2 complete nails, 1 incomplete nail, 1 shank fragment	69, 44, 34, 53
-	2186 F2098	fill of ditch	4 nails, 6 shank fragments	47, 35, 34, 25, 52, 51, 49, 45, 34, 33
25	2127 F2125	fill of ?sunken structure	head only	-
-	2176 F2177	fill of pit	2 incomplete nails	28, 24
28	2179 F2178	fill of ditch	shank fragment	41
-	2673 F2225	fill of gully	shank fragment	42
-	2231 F2232	fill of pit	2 shank fragments, 1 clenched	47, 43
-	2174 F2255	fill of pit	1 incomplete nail, 1 shank fragment	30, 17
-	2253 F2255	fill of pit	shank fragment	24
-	2389 F2225	fill of gully	2 incomplete nails	53, 37

-	2309 F2307	fill of pit	incomplete nail	32
32	2316 F2317	fill of pit	Type 2 nail, complete	121
-	2316 F2317	fill of pit	2 complete nails	73, 61
-	2341 F2340	fill of posthole	shank fragment	41
38	2345 F2344	fill of tree bole	shank fragment	32
-	2432 F2431	fill of posthole	incomplete nail	39
-	2407 F2557	fill of quarry pit	incomplete nail	25
-	2424 F2557	fill of quarry pit	2 incomplete nails, 2 shank fragments	34, 29, 49, 21
-	2683 F2620	fill of pit	1 incomplete nail, 1 shank fragment	50, 58
-	2600 F2656	fill of pit	2 nails, 4 shank fragments	46, 40, 57, 38, 28, 25
-	2662 F2661	floor layer in building	4 incomplete nails, 3 shank fragments (1 clenched)	55, 53, 38, 37, 33, 34, 22
-	2688 F2689	fill of pit	shank fragment	40
-	2835 F2731	fill of ditch	complete nail	86
-	2838 F2731	fill of ditch	4 complete nails, 1 incomplete nail	51, 47, 44, 37, 30
-	3003 F2745	fill of gully	shank fragment	33
-	2860 F2763	fill of pit	2 shank fragments	37, 19
-	2887 F2801	fill of ditch/gully	shank fragment	52
-	2847 F2804	fill of re-cut ditch	incomplete nail	53
-	2866 F2867	fill of pit	1 complete Type 3 nail, 1 incomplete nail	70, 29
-	3004 F2880	fill of ditch/gully	shank fragment	68
-	2883 F2882	fill of pit	2 shank fragments	58, 45
-	2933 F2903	fill of pit	incomplete nail	46
-	2924 F2923	fill of gully	1 incomplete Type 2 nail	58
-	2935 F2934	fill of ditch	incomplete nail, the shank bent and split	87
-	3007 F2950	fill of ditch/gully	shank fragment	40
-	3013 F3012	fill of ditch	incomplete nail, clenched	28
-	3152 F3150	fill of pit	complete nail	42
-	4108 F4109	fill of ditch	shank fragment	27
6	4147 F4148	fill of pit	clenched shank fragment	30
-	4147 F4148	fill of pit	shank fragment	40
-	4211 F4210	fill of pit	1 incomplete nail, 1 shank fragment	21, 25
-	4262 F4263	fill of ditch	2 incomplete nails, 2 shank fragments	49, 28, 44, 25
-	4270 F4271	fill of ditch	incomplete nail	47
-	4280 F4281	fill of re-cut ditch	1 incomplete Type 2 nail	60
-	4346 F4347	fill of ditch	shank fragment	53
-	4344 F4354	fill of ditch	1 incomplete type 2 nail	53

Table 25: Iron nails from Bottisham (AS 1011). Nails are Manning's Type 1b (1985, 134), with flat or slightly convex head, unless stated otherwise.

Other

Mayen lava hand-querns were introduced into Britain by the invading Roman army, and in the east of the new province soon replaced local stones. Though light to carry and effective in use, their friability must have been a strong disadvantage, but here, lining a hearth (Fig. 23.13 (5098)), the fragments have been reused in a situation where the naturally porous stone may have been a useful insulator, as well as providing good drainage.

The large fragment of Purbeck marble (Fig. 23.14 (5007)) is less well-worked than was usual where the stone was used for internal architectural features, such as dados or cornices (Crummy 1992, figs 5.30-31). The stone, from the Purbeck beds in Dorset, was widely used in southern Britain by the Romans, but it is unlikely that an entire building in Cambridgeshire would have been constructed from it. The fragment, which is substantially thicker than most excavated fragments of the stone, may have been part of an external feature or of an internal arch or other aperture, or may have been used as a threshold, as occurred in one doorway at Colchester (*ibid*, 176, no 1140).

Not illustrated. ndsSF 4. (5021). Ditch F2020. Wide iron strip, curved at one end. Length 54 mm, width 19 mm.

Fig. 23 no. 13. (5098). Hearth lining. One hundred and eleven weathered fragments of Mayen lava quern. Some show signs of burning. Very slight traces of tooling are visible on some pieces. One (illustrated) has been reworked. It has two sides set more or less at right angles on either side of a rounded corner. Weight 5.274 kg.

Fig. 23 no. 14. (5007). Build-up over metalled surface. Large corner fragment of a block of weathered Purbeck marble. All the surfaces are only roughly worked, though the larger face is reasonably smooth and was presumably displayed. The two contiguous sides meet at a slightly obtuse angle, and the edge of the shorter side is chamfered towards the smaller, rougher, surface. Maximum dimensions 178 by 150 mm, 80 mm thick.

Fig. 23 no. 15. Ditch F5140. Fragment of sandstone with one smooth, symmetrically wavy, edge, and three with concoidal fracture, slightly worn. One surface is polished but is not completely flat. It is spalled in three places along one edge. Possibly used as a floor tile or cobble. Maximum dimensions 66 by 62 mm, 13 mm thick.

The metalwork from the TUB03 Evaluation
Andrew A. S. Newton

A variety of lead and iron objects were recovered from the site during the evaluation (Wills 2003) conducted under the site code TUB03. This material is described below. It is referenced here using the finds and context numbering as presented on the bags in which it was sent to archive.

Only four of these artefacts were recovered from identifiable cut features. As such, their provenance as Roman is considered likely. They comprise a small lead cuboid, which may have been a weight, two iron nails, and a scoop-like object. The majority of the rest of the objects came from context 001, which is

described as a ploughsoil. The majority of these were recovered from spoilheaps adjacent to the cut trenches. Their provenance as Roman is, therefore, less secure and this is demonstrated by a small handle-like object which displays markedly less corrosion than many other objects and is highly reminiscent of the chain pull from a high-level cistern toilet. Other artefacts amongst this group are comparable to objects from particular Roman type series (Manning 1976, 1985) and are therefore possibly of Roman origin.

Lead

F84 <207> [020] Lead cuboid. Possibly a weight. 10 x 9.5 x 6mm. wt 15g

<206> [019] Amorphous lead fragment. 0.15mm in length

<205> [001] Broken/torn lead strip. Max length 43mm, max width 14mm, max depth 2mm

Iron

F4 <208> [017] Fe nail. Length 62mm. Square cross section. Possible ridged or T-shaped head. Potentially of Manning's (1985) Type 3 or 4.

F98 <211> Head of Fe nail. 23mm. Wide discoidal head 16mm diam. snapped just below head.

F125 <212> Fe object. 87mm. Becomes broader to one end (14mm) which is slightly curved giving the impression of a small scoop.

<213> sf001 Fe nail. Length: 64mm. Wide discoidal head makes it similar to Manning's (1985) Type 7 but length of stem is greater than the quoted examples.
<214> sf002. Fe nail. 61mm. Shaft fragment only. Round or oval in cross-section

<215> sf002. Fe nail. 66mm. Shaft fragment only. Round in cross-section
Fe nail. 45mm. Shaft fragment only. Square in cross-section

<217> sf005 Fe nail or tack. Length: 31mm. Wide discoidal head, square/angular cross section. Possibly Manning's (1985) Type 7

<218> sf006 Fe nail. Length: 44mm. Oval domed head and circular cross section of shaft.

<219> sf007 Fe nail or tack. Length 25mm. Potentially Manning's (1985) Type 7.

<209> [019]. Fe nail or tack. 18mm. Similar to an example from <210> [020]. Domed head. Narrow, circular shaft. Similar to Manning's (1985) Type 6.
Fe nail. 35mm. Shaft square in cross-section. Flat, rectangular head.
Fe nail or tack. 24mm, Broad, T-shaped head. Similar to Manning's (1985) Type 3 but with a short triangular shaft.
Fe frag. 30mm. Possible part of a nail.

<210> [020] Fe nail. 36mm. Shaft round in cross-section.
Fe nail. 36mm Round discoidal head. Shaft square in cross-section.
Fe nail. 52mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 70mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 50mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 72mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 25mm. Round discoidal head. Shaft square in cross-section. Bent at right-angle

Fe nail. 22mm. Round discoidal head. Shaft square in cross-section. Shaft broken just below head
Fe nail. 84mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 31mm. Head and partial shaft. Round discoidal head. Shaft square in cross-section.
Fe nail. 72mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 109mm. Round discoidal head. Shaft square in cross-section. Significantly larger and heavier than the other nails from this context.
Fe nail. 33mm. Round discoidal head. Shaft square in cross-section. Bent at right-angle and head bent flush with shaft.
Fe nail. 29mm. Round discoidal head. Shaft square in cross-section. Largish nail, broken just below head.
Fe nail or tack. 11mm. Domed head. Narrow, circular shaft. Similar to Manning's (1985) Type 6.
Fe nail. 36mm. Shaft square in cross-section. Head missing.
Fe nail. 22mm. Shaft square in cross-section. Tip only
Fe nail. 28mm. Shaft square in cross-section. Shaft frag only
Fe nail. 30mm. Round discoidal head. Shaft square in cross-section.
Fe nail. 26mm. Round discoidal head. Shaft square in cross-section. Bent at right-angle
Fe nail. 36mm. Shaft square in cross-section. Head missing.

<203> [001] Cu alloy button. Slightly domed upper surface. Loop on reverse for attaching to garment. Diam 15mm. Wt 1g

<220> [001] Fe nail or tack. Length 24mm. Wide discoidal head, square/angular cross section. Possibly Manning's (1985) Type 7

<221> [001] Fe Horse shoe. Length: 109mm. Width: 125mm. Unstratified horse shoes, even when they are found on a Roman site cannot be identified as Roman, medieval or even later on morphological grounds alone (Manning 1976, 31).
Fe nail. Length 82mm. Similar to Manning's (1985) Type 6 but with oval domed rather than round domed head.

<222> [001] Fe rectangle with one end bent round to form a loop 45 x 26 x 9(max) mm. Possibly part of a simple hinge.
Fe nail. 56mm. Square cross-section. Similar to Manning's (1985) Type 3 or 4.
Fe nail. 33mm. Flat, discoidal head. Square cross-section
Fe nail. 36mm Possible inverted L-shaped head. Square cross-section. Tip missing.
Fe nail. 29mm. Square cross-section. Head missing.
Fe nail. 32mm. Round or oval cross-section. Truncated just below head. Head misformed.
Fe nail. 33mm Head misformed. Square cross-section. Truncated.

<223> [001] Socketed Fe tool with hooked end. 223mm in length. Diam 15mm

<225> [001]. Fe nail. 46mm. Round head. Shaft square in cross-section.
Fe nail. 21mm. T-shaped head. Shaft square in cross-section. Shaft snapped- head and small length of shaft only. Similar to Manning's (1985) Type 3.
Fe nail. 30mm. Square head. Shaft square in cross-section.
Fe nail. 43mm. Shaft square in cross-section. Head possibly T-shaped. Perhaps similar to Manning's (1985) Type 2 or 3
Fe nail. 22mm. Shaft fragment only. Square in cross-section. Tip blunted and bent slightly backwards.

<226>. [001] Fe object. Broadly semi-circular loop of metal measuring 46mm with a further projection branching off from 'shoulder' of curve of 23mm.

<227> [001]. Crescent-shaped Fe fragment. Length 85mm. Width 32mm (max). Narrows to one end. Potentially part of a blade, possibly from a reaping hook or sickle.

<227> [001]. Fe nail. 56mm. T-shaped head. Shaft square in cross-section. Similar to Manning's (1985) Type 3.
Fe nail. 31mm. Flattened head and short length of square shaft.
Fe nail. 46mm. Shaft round in cross-section. Flat, circular head diam. 22mm
x4 Fe nail shaft fragments 21mm, 29mm, 31mm, 37mm

<229> [001]. Fe nail. 29mm. Shaft fragment only. Round in cross- section

<228> [001]. Fe frag. 109mm. Possibly a broken knife blade with a short tang. Much of the blade appears to be missing but the back and tang and present. A ridge on one side may be a strengthening ridge similar to that recorded on an example from Housesteads (Manning 1976, illus 129, 37, 55).
Fe object. Triangular fragment of iron 23mm x 23mm
Fe object. 45mm. Rod or shaft or heavy nail.

<230> [001] Fe nail. Length: 44mm. Rounded cross section and rounded, flattened head.

<231> [001]. Fe frag. 24mm. Possible nail head.
Fe frag, 35mm. Rectangular in cross-section. Narrowing to sharp point.

<233> [001] Possible Fe staple. However, it resembles a very small horse shoe. A protruding spike may represent a horse shoe still *in situ* within the shoe. Its dimensions of 77mm in length and 56mm in width would suggest that it can only have been used on a very small horse and this seems unlikely.

<234> [001]. Fe fitting or fastening. 92mm. Very straight Fe rod, circular in cross-section. Bulbous section close to one end. Striations above this appear to represent where a thread has been cut, indicating that this is a fairly modern object.
Miscellaneous unidentifiable Fe fragments also recovered from this context.

<235> [001]. Fe fragment. 45mm x 12-21mm x 11-14mm. Broadly rectangular in cross section. Thicker towards one end.

<236> [001]. Fe frag. 25mm. Possibly a nail shaft

<237> [001]. Fe frag. 30mm. Possibly the head of a square cross-sectioned nail.

<238> [001] Fe nail. 44mm. Shaft square in cross-section. Discoidal head 20mm diam.
Fe nail. 57mm. Shaft square in cross-section. Square, possibly pyrimadal head.

<239> [001]. Fe nail or peg. 87mm. Rectangular in cross section becoming wider towards head.
Fe nail. 71mm. Very narrow, head much corroded and fragmented. Modern in appearance.

<240> [001] Fe object. 50mm. The head has a circular eye, suggesting that this may have been some kind of large needle or pin. The shaft is oval in cross-section and has a grooved running down each of the broader surfaces in line with the eye.

<241> [001] Small metal handle or chain-pull. Oval ring with lug for attachment and smaller triangular protuberance projecting into the interior for finger-grip. Modern or late post-medieval.

<242> [001]. Fe nail. 55mm. Shaft square in cross-section. Square head. Tip bent. Similar to Manning's (1985) Type 1a.

<242> [001]. Large Fe staple. 55mm.

<243> [001]. Fe nail frag. 22mm. rectangular in cross section. Square head.

<245> [001] Unidentifiable Fe fragment. 30mm

3.6 The glass

By H.E.M. Cool

The Roman window glass (AS1011 Area 1)

Three fragments from glazed windows were found. No. 1 is a cast fragment and so may be dated to the 1st - 3rd centuries, as that technique of making glass was replaced in the 4th century by blowing. Nos. 2 and 3 are blown and may thus be dated to the 4th century.

1 Cast matt/glossy. One rounded edge. Area 21cm². Ditch F2098. **SF65**
2 Blown. Pale greenish, colourless, bubbly. One rounded edge. Area 5cm². Ditch F2269 (L2270). **SF31**
3 Blown. Light green, bubbly. One rounded edge. Area 1.5cm². Test Pit 46

The Roman vessel glass (AS1011 Area 1)

The Area 1 excavation produced 12 fragments of Roman vessel glass. Overwhelmingly, this is of 4th century date, with the possible exception of the body fragment, no. 5. This is made of blue/green glass, which is typical of the 1st to 3rd centuries and became much rarer in the 4th century, when most glass vessels were made in shades of pale and light green bubbly glass.

The only form that can be identified with certainty is the truncated conical beaker with cracked-off rim (nos. 1-3). These were an extremely common form of drinking vessel throughout the 4th century (Price and Cottam 1998, 121-3). There are also fragments from an indented vessel (no. 4). This is most likely to come from an indented conical bowl (*ibid*., 128-9), a form that was in use during the second half of the 4th century and into the 5th century.

Catalogue

1 Truncated conical beaker; rim fragment. Pale green-tinged colourless; heavy enamel-like irridescence. Curved rim, edge cracked-off but not ground; straight side sloping in. Abraded band below rim. Rim diameter 90mm, wall thickness 0.5mm, present height 35mm. Ditch F3075 (L3076).

2 Truncated conical beaker; lower body and base fragment. Light green bubbly. Straight side sloping into shallow conical base; abraded band on lower body. Base diameter 30mm, wall thickness 1mm, present height 32mm. Ditch F2050 (L2082). **SF16**.

3 Truncated conical beaker; lower body fragment. Light green bubbly. Straight side curving into edge of base. Present height 15mm, wall thickness 1mm. Subsoil L2001.

4 Body fragments (2). Pale greenish colourless bubbly. Parts of two indentations. Dimensions 27 x 21.5mm. Demolition Layer L2694. **SF64**.

5 Blue/green body fragment. Pit F2517 (L2516). **SF39**.

6 Green-tinged colourless and light green bubbly body fragments (6). Ditch F2047 (L2048), Ditch F2078 (L2079) (**SF11**), Ditch F2050 (L2082) (**SF15**), Ditch F2052 (L2119) (**SF21**), Quarry Pit F2557 (L2424) (2 fragments), Structure S2901 Demolition Layer L2924 (**SF67**).

The Roman glass (AS1011 Area 2)

Blue/green bottles have very characteristic moulded ridges on their bases and the small part of a rounded ridge on no. 1 is clearing from such a moulding. This enables it to be identified as a fragment from a prismatic bottle, a type which is very common type from the later 1st century into the early 3rd century (Price and Cottam 1998, 194-200).

The other fragment of Roman glass (no. 2) is clearly of 4th century date given the bubbly light green glass it is made of. It preserves the lower part of a narrow deep indentation. The commonest 4th century vessel type with indentations is the indented truncated conical bowl in use during the second half of the 4th century and into the 5th century (Price and Cottam 1998, 128-9), and it was suggested that the indented fragments found during Phase 1 of the excavations belonged to such a vessel. The indentation on this fragment seems too narrow and deep for that and so it is probably more likely to have come from an indented beaker (see for example Vanpeene 1993, 50 no. 81, pl XVIII). This is another late fourth to fifth century form, but one which is uncommon in Britain. Examples have been identified at Winchester (The Brooks and Staple Gardens – both unpublished) but otherwise they are very rare. The presence of one at Bottisham is therefore a very useful addition to the corpus.

<u>Catalogue</u>

1 Prismatic bottle; chip from base. Blue/green. Lower face retains a part of a rounded ridge. dimensions 16 x 10mm. 4129.

2 Indented beaker; lower body fragment. Light green with many small bubbles. Part of one deep narrow indentation. Fragment probably

broken at the edge of the base. Dimensions 39 x 13mm, wall thickness 1mm. 4147 sample 9.

3.7 The slag

By Jennifer Jones and Philip Clogg, Durham University (*with additional information by Andrew A. S. Newton*)

Quantification

Eight samples of industrial residues (total weight 331g) were received for examination and identification. The samples derived from Romano-British contexts, dated to between 3rd and 4th centuries AD. Three of the samples came from subsoil and a further three from ditch cuts or recuts (see Table 26, below).

A further 11 samples of industrial residues were recovered during the trial trench evaluation (Wills 2003) of the site that preceded the excavation. This material all derived from F102, which was recorded as F2884=2791 during the excavation and was dated to the 4th century AD.

Examination

The aim of the examination was to characterise the material and to identify the industrial processes from which it originated. The material was examined visually and under x16 magnification, and classified by morphology, density, colour and vesicularity. The category criteria used are based on the English Heritage Centre for Archaeology Guidelines on Archaeometallurgy (Bayley *et al*. 2001).

Results

Test Pit 39: This small sample (4.3g) was identified as fuel ash slag. Fuel ash slag is a white/brown/grey, lightweight, vesicular material formed during combustion, when non-organic components of alkali-rich fuels, such as wood, react with silicates present in earth, stone or ceramics. The sometimes glassy and fragile slag-like material can form at temperatures easily achieved in a domestic hearth, if the correct conditions are present. Its presence does not necessarily suggest that industrial processes were taking place on site.

Test Pit 40 Spit 1: This 15g sample was also identified as fuel ash slag. Formation processes as above.

Test Pit 78: A piece of melted glass, probably a vessel fragment or artefact. Parts of the surface are dark-coloured and bubbly and parts are a translucent green/blue colour. Semi-vitrified sandy soil has become fused to the surface. Surface EDXRF analysis detected silica, iron, manganese and calcium. This is an analysis consistent with glass, the iron being used as a colourant. It is not glass-making waste, but probably the result of accidental or intentional disposal or loss in a hearth or conflagration.

Subsoil L2001: An oval nodule of iron-rich geology, 40mm long. This is probably a piece of iron ore.

Layer L2072: A small piece of rather undiagnostic ironworking slag. The material formed from an accumulation of slag drips. It is most likely to be the result of smithing.

Ditch F2731H (L3125): Two fragments of undiagnostic ironworking slag, which are non-magnetic, slightly vesicular and fairly dense. Iron pyrite (FeS) is visible on the outside of the piece, formed from impurities within the iron or from its burial environment.

Ditch F2801B (L2780): Smithing slag, formed as an accumulation of slag drips inside a small rounded depression.

Ditch F2804C (L2847): Three fragments of dense ironworking slag – parts of the same rounded piece – perhaps derived from iron smelting, although there are no traces of the flowed appearance characteristic of a tap slag. The slag is vesicular on the surface and very dense towards its centre. A fragment was detached, homogenised by crushing to a powder and pelletised for analysis using EDXRF (energy dispersive X-ray fluorescence). Major elements detected were iron and silica, which together made up almost 90% of the sample. Minor elements present were aluminium, phosphorus and calcium, these deriving from impurities in the iron ore and the fuel (see Table 27, below). The results are consistent with those obtained by other researchers for the composition of rather inefficiently produced iron smelting slags (Bachmann 1982).

Ditch F102 (F2884=2791). Eleven fragments (1143g), identified as smithing hearth bottoms were recovered from this context during the trial trench evaluation of the site (Wills 2003).

Discussion

The excavation of Area 1 produced just over 160g of undiagnostic and smithing slags. Evidence for primary iron extraction was again very slim, with one probable sample of smelting slag, from Ditch F2804 (L2847), and a single nodule of possible iron ore, from Subsoil L2001. A total of 331g of industrial residues suggest that ironworking and smithing were of very minor economic importance at the site.

A further 1143g of probable smithing slag was recovered from Ditch F102, during the trial trench evaluation of the site that preceded the excavation. It would appear that Ditch F102 was one of the many features that was not excavated during this evaluation, but was merely plotted, measured and had its upper fill described. This would suggest that this slag was recovered from the upper fill of this feature and probably from its upper surface. This may indicate that it was not deposited into the feature and may be intrusive from

elsewhere; during the excavation of the site no further industrial residues were recovered from this feature (which was recorded as F2884=2791). A lack of hammerscale recorded in association with these fragments of smithing hearth bottoms has been suggested as indicator that the smithing activity from which they derived took place elsewhere (Wills 2003).

A complete absence of slag was noted during the excavation of the New Doctor's Surgery area and Area 2 of the AS1011 site. This may be considered further indication that ironworking and smithing did not form a major part of the site's economic life.

Context	Context description	Weight	Identification	Comments
Test Pit 39	Subsoil	4.3g	Fuel ash slag	
Test Pit 40 Spit 1	Subsoil	15g	Fuel ash slag	
Test Pit 78	Subsoil	8.5g	Melted glass	
L2001	Subsoil	35.3g	Iron ore nodule	
L2072	Layer. Romano-British	26.5g	Undiagnostic/possible smithing slag	
F2731H (L3125)	Ditch fill. 3rd-4th C	21.6g	Undiagnostic ironworking slag	
F2801B (L2780)	Ditch fill. 3rd-4th C	112.5g	Smithing slag	
F2804C (L2847)	Ditch recut fill. 3rd-4th C	105.5g	?Smelting slag	XRF
F102 (F2844=2791	Upper fill of ditch	1143g	11 fragments of possible smithing hearth bottom	

Table 26: Industrial residues from Area 1

Sample:	Na2O	MgO	Al2O3	SiO2	P2O5	S	Cl	K2O	CaO	TiO2	V	Cr	MnO	Fe2O3	Co	Ni	Cu	Zn
AS 1011	0.3215	0.5619	2.7358	27.6686	1.2838	0.0547	0.0182	0.9745	5.2105	0.1305	0.0011	0.0118	0.0740	60.5214	0.1018	0.0260	0.0261	0.0047

Table 27: EDXRF analysis of smelting slag from Area 1

3.8 The human bone

By Carina Phillips

Introduction

Human bone was recovered from three contexts during excavations at Tunbridge Lane Bottisham. A disarticulated human molar, exhibiting a large caries, and part of a long bone, were present in Subsoil L2001 (Test Pit 47). Part of the shaft of an adult sized humerus was recovered from Cobbled Surface L2157. A partial skeleton (SK2753) was recovered from a grave-shaped pit, F2755.

Method statement

Stature estimation followed Trotter (1970). Pathologies and non-metric traits were recorded following Brickley and McKinley 2004; Buikstra and Ubelaker 1994; Ferembach *et al.* 1980.

Results

The human bone assemblage from Tunbridge Lane, Bottisham comprises the remains of a minimum of two individuals, an adult and a juvenile.

SK2753, recovered from F2755, is approximately 25-50% complete; preservation is moderate (Grade 1, following Brickley and McKinley 2004). Parts of the skull, mandible and maxilla, long bone shafts, three vertebrae fragments, metacarpal shafts and hand phalanges are present. The absence of the pelvis from SK2753 restricted estimation of age and sex. An estimation of sex based on skull features was inconclusive; the assessable traits are ambiguous. It was not be possible to take any measurements leading to an estimate of height due to the incompleteness of all bones.

The long bone recovered from Subsoil L2001 comprised an immature femur. The molar from this context was that of an adult as was the humerus recovered from L2157.

3.9 The animal bone

Julia E. M. Cussans, Emma Pomeroy, Ian Baxter

Introduction

Animal bones from the main excavation area and the new doctor's surgery excavation area are examined. These two groups are described and examined separately due to their different methods of recording. The main excavation area and the larger of the two assemblages is examined first and the new surgery is examined and compared to this secondarily. The assemblage is dominated by domestic

mammals, particularly cattle but also has a higher than average representation of horse; possible reasons for this are discussed.

Main Excavation Area

Methods

Bone fragments were identified to element and species where possible. The category sheep/goat was used due to widely acknowledged difficulties in distinguishing between these species. However, elements where these species could be distinguished more readily (cranium following Boessneck, 1969, and horn core) were recorded as either sheep or goat. Where fragments could be assigned to a particular size of mammal but not to species, the categories medium mammal for indistinguishable fragments from sheep/goat, pig, small deer or dog and large mammal for indistinguishable fragments from cattle, horse or large deer were used. Bird bones were identified to species where possible, otherwise they were recorded as 'Bird Unidentifiable'. Where fragments could not be identified to species or size class they were recorded as 'unidentifiable'. Mandibular tooth eruption and wear was recorded for sheep/goat, cattle and pig mandibles following Grant (1982) and converted to mandible age stages following Halstead (1985) for cattle, Payne (1973) for sheep/goat and Hambleton (1999) for pig. Long bone epiphyseal fusion was recorded and used to estimate age profiles for cattle, sheep/goat and pig following bone fusion groups defined by O'Connor (1989). Evidence of gnawing, knife cuts, chopping, deliberate smashing, sawing or burning and any pathology was recorded.
Data were analysed by phase. Number of Identified Specimens (NISP), the number of bones or fragments assigned to a particular taxa, was calculated for each species/animal group and Minimum Number of Individuals (MNI) was calculated for the principal domestic species as the most frequently repeated bone part (e.g. distal femur) taking left and right sides into account; over 50% of the particular bone part had to be present for it to be counted for the MNI. Body part representation was examined through raw fragment counts only and potential differences in recovery and fragmentation between species should be taken into account.

Results

Quantification

A total of over 7000 animal bone fragments were recorded but of these less than 2500 could be identified to species. Over 2000 fragments could not be identified to any level and *c.*2800 could only be identified as large or medium mammal. The identified species were dominated by domestic mammals with cattle being by far the most abundant taxa followed by horse and sheep/goat. The sheep/goat bone included a small quantity of positively identified sheep bone but no positively identified goat; henceforth this taxon will be referred to simply as sheep. Pig and dog bones were present in small numbers. A single cat bone was present but derived from an undated context. A small number of wild mammals were represented these were red deer, fallow deer (antler only) and hare. Bird bones were also present in small numbers; chicken bones were the most numerous followed by goose, both

taxa seem likely to have been domestic. A single crow bone was also found as well as four unidentifiable bird bones.

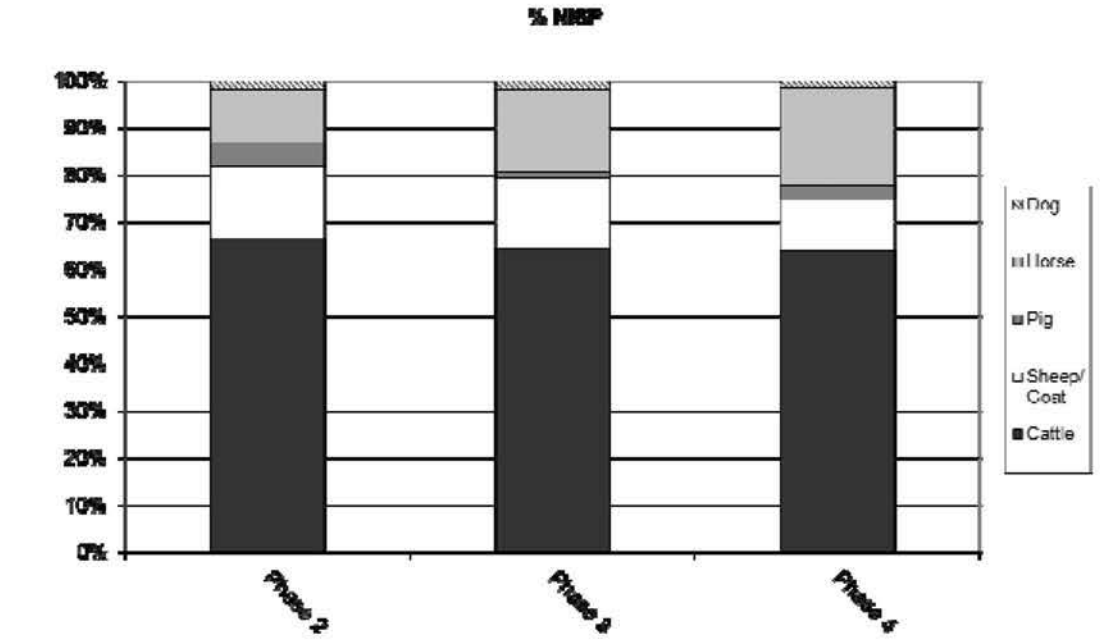
The NISP data are presented in Table 28 by phase and taxa. Some of the phase groups have very small sample sizes and only the samples from Phase 2, 3 and 4 are large enough to give reliable representations of the species present and their relative proportions during the occupation of the site. Each of the other phases has less than 100 bones each in total and are therefore unlikely to provide a reliable picture of site economy at these times. For this reason the majority of this report will focus on Phases 2, 3 and 4 of the Roman occupation.

Examination of the species distributions in the three main phases shows little change over time. In terms of domestic mammals (Graph 1) there appears to be a slight increase in horse exploitation over time, apparently at the expense of sheep which reduce in proportional representation. Representation of cattle is fairly constant throughout the three phases and make up *c.*65% of the domestic mammal assemblage. Dog and pig are present in small numbers throughout the three phases. Red deer remains are present throughout the three phases although only antler is present in Phase 4; a single piece of fallow deer antler was found in Phase 2. As this is a mid beam section, chopped through above the burr it cannot be said if this is a shed antler or from a killed specimen. A single hare bone is present in each of Phases 3 and 4.

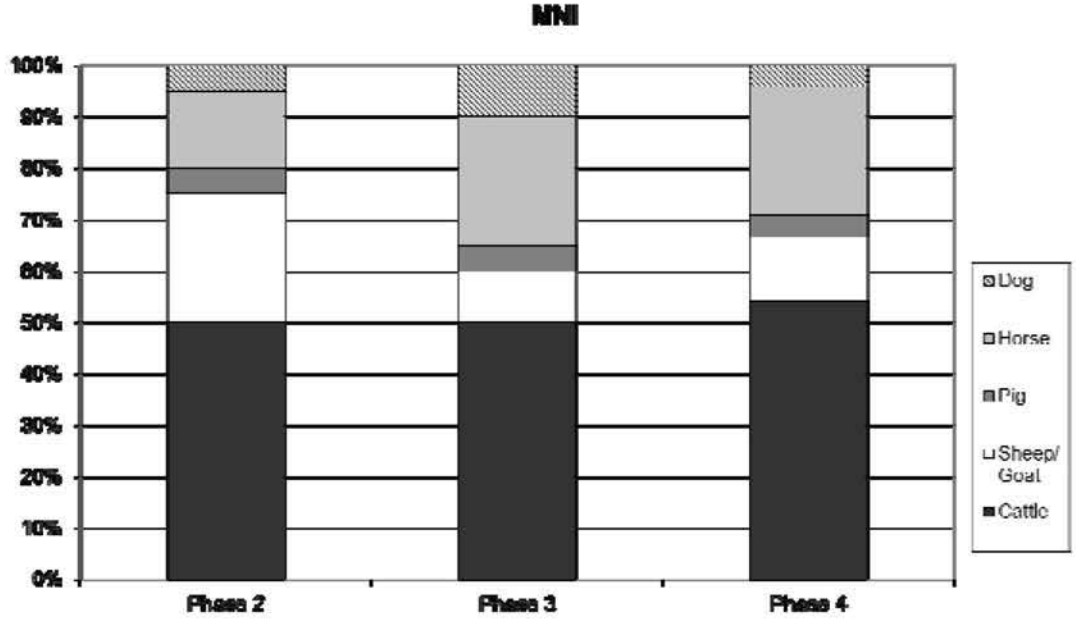
Chicken bones were found throughout the Roman phases with the exception of Phase 3; their absence from this phase seems most likely a product of archaeological sampling rather than their absence from the site at this time. A single goose bone was found in each of Phase 2, 3 and 4.

	Pre Roman	Phase 1	Phase 2	Phase 3	Phase 3/4	Phase 4	Unphased Roman	Phase 5	Phase 6	Undated	Total
Cattle	15	29	342	353	14	454	9	10	2	187	1415
Sheep/Goat	4	2	79	81	\	76	1	1	1	86	331
Sheep	\	\	\	\	\	3	\	\	\	3	6
Pig	1	2	25	8	1	22	\	\	\	13	72
Horse	1	7	59	96	10	148	\	1	\	51	373
Dog	\	\	9	10	\	10	1	\	2	6	38
Cat	\	\	\	\	\	\	\	\	\	1	1
Red deer	\	\	3 (1 ant)	3 (2 ant)	\	2 (ant)	\	\	\	3 (2 ant)	11
Fallow deer	\	\	1 (ant)	\	\	\	\	\	\	\	1
Hare	\	\	\	1	2	1	\	\	\	\	4
Large mammal	24	47	518	610	56	835	7	50	2	304	2453
Medium mammal	4	3	100	73	\	76	1	7	\	91	355
Chicken	\	1	5	\	\	3	\	\	\	1	10
Goose	\	\	1	1	\	1	\	\	\	1	4
Crow	\	\	\	\	\	1	\	\	\	\	1
Bird sp.	\	\	2	1	\	1	\	\	\	\	4
UNID	7	1	501	575	\	754	4	1	2	283	2128
Total	56	92	1645	1812	83	2387	23	70	9	1030	7207

Table 28. NISP for main excavation area, all phases and groups.



Graph 1. Percentage representation of principal domestic mammals from NISP.

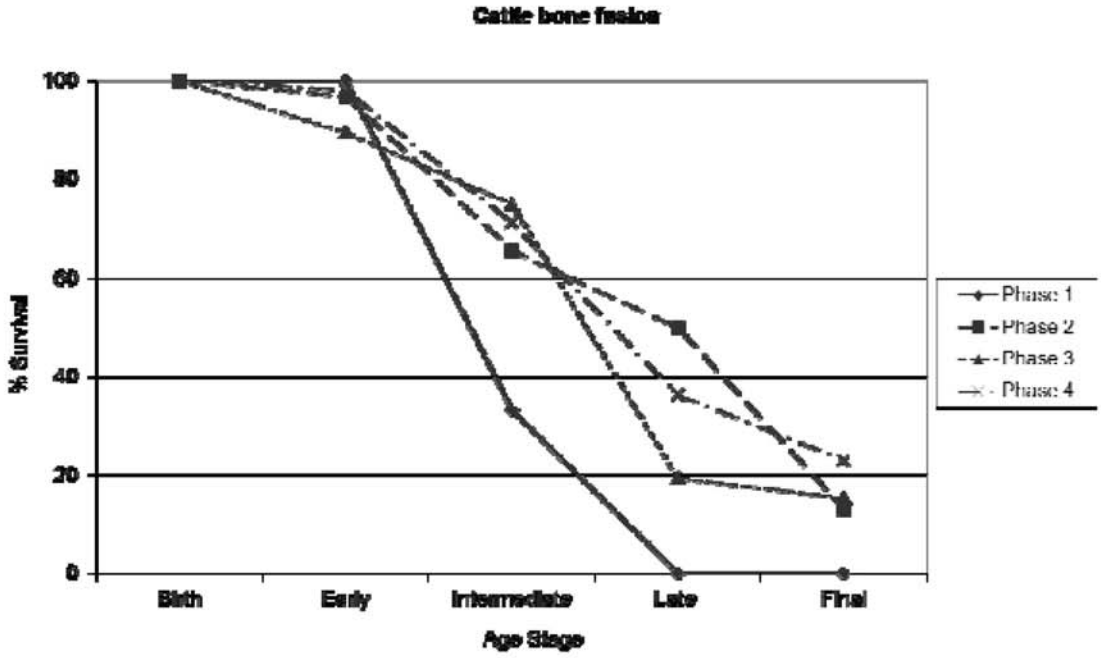


Graph 2. Percentage representation of principal domestic mammals from MNI.

Overall, the picture of mammal and bird exploitation seems fairly consistent throughout the Roman period. MNI was calculated for the main domestic species in the three largest phases and the relative proportions of the different species (Graph 2) show no significant difference to NISP with the exception of the slightly lower representation of cattle compared to the other domesticates; this is likely to be a product of greater fragmentation of the bones of this species due to more intense butchering.

Animal Age - bone fusion

Sufficient cattle bone fusion data were available for some phases to gain an idea of cattle survivorship and husbandry practices. The sample for Phase 1 is very small compared with Phases 2, 3 & 4 but appears to show that all animals survive beyond the early fusion stage and that no animals survived beyond the late fusion stage (Graph 3). It therefore seems likely that these animals were used for prime meat production. The other three phases have much larger samples and all follow a very similar path. Very few animals appear to die before the Early fusion stage and those that did not survive beyond this stage seem likely to be natural deaths as they are in too few numbers to indicate a dairy based economy. There follows a steady loss of animals through the Intermediate and Late fusion stages, indicating the slaughter of prime meat age animals. A small number of animals survive beyond the Final fusion stage and may represent breeding stock and animals used for traction. These older animals do not appear to be present in Phase 1 but this may be due to the small sample size rather than a genuine lack of breeding age animals at this time. Alternatively during Phase 1 the site inhabitants may have been importing prime meat animals or joints onto the site and not breeding livestock themselves as may be suggested by the lack of very young and fully adult animals.



Graph 3. Cattle survivorship based on bone fusion.

There is very scant data available for sheep bone fusion. Only ten or fewer bones are available for each of Phases 2, 3 and 4. When all three phases are examined together as a single (yet still small) sample the data indicates that no animals died before the Intermediate I fusion stage and only a small number died before the Intermediate II fusion stage, however, none apparently survive beyond the Late fusion stage. This would tend to indicate that animals from a narrow age range were being brought onto site, most likely as a meat source. It seems unlikely that wool production was a primary economic focus as no fully adult animals appear to be present. However the small sample size must again be taken into account.

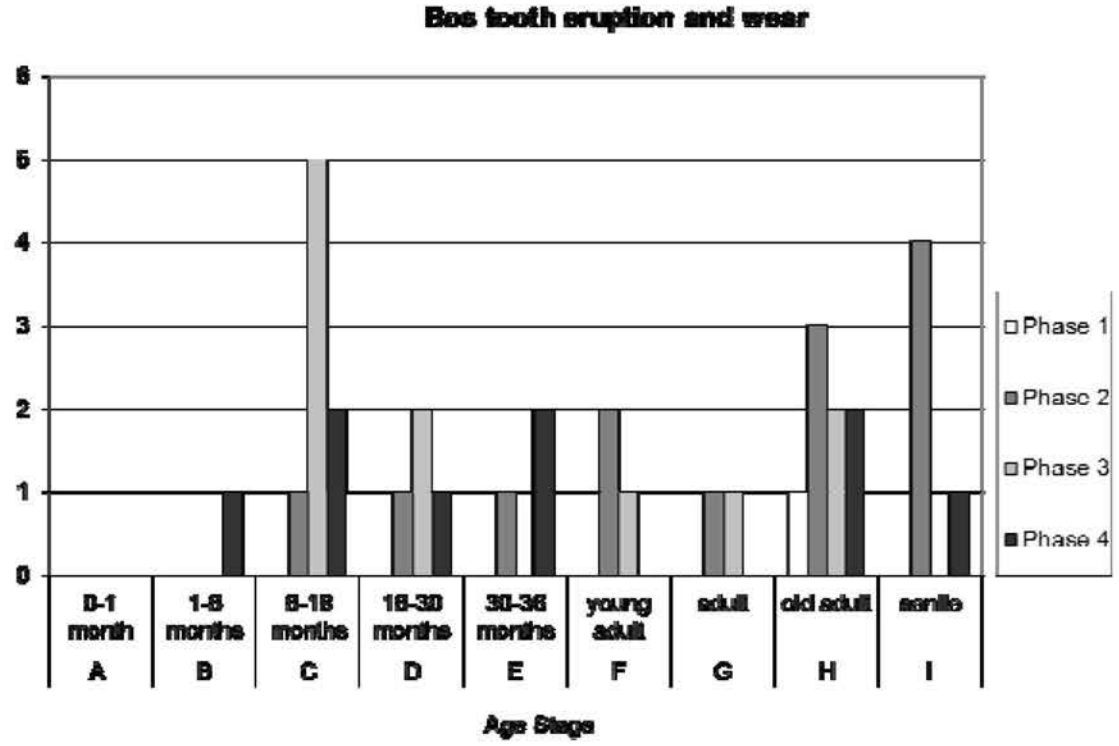
Very little bone fusion data were available for horse, pig and dog; however, some comment can be made. For dog, where suitable bones were present all were found to be fully fused, indicating that dogs at the site all lived to full adulthood. For pigs the opposite was found to be the case, where data were available no fully fused bones were present, one partially fused proximal femur came from Phase 4, but all other available bones were unfused. This would indicate that pigs were being slaughtered before reaching full maturity and as would be expected would likely be used for prime meat. The apparent lack of neonatal and fully mature animals may suggest that these animals were not bred on the site itself but brought in from elsewhere. For horse the majority of bones were found to be fused with the presence of a small number of unfused and partially fused elements. These included a Phase 2 tibia that was fused distally but unfused proximally, a proximal humerus, distal radius and proximal tibia from Phase 3; a similar suite of unfused bones were present in Phase 4. All of the unfused horse bones present are relatively late fusing elements, most of which, according to Silver (1969) fuse at around 3-3 ½ years. Therefore it appears that while the majority of horses survived well into adulthood a small number died before reaching full maturity.

Animal age – tooth eruption and wear

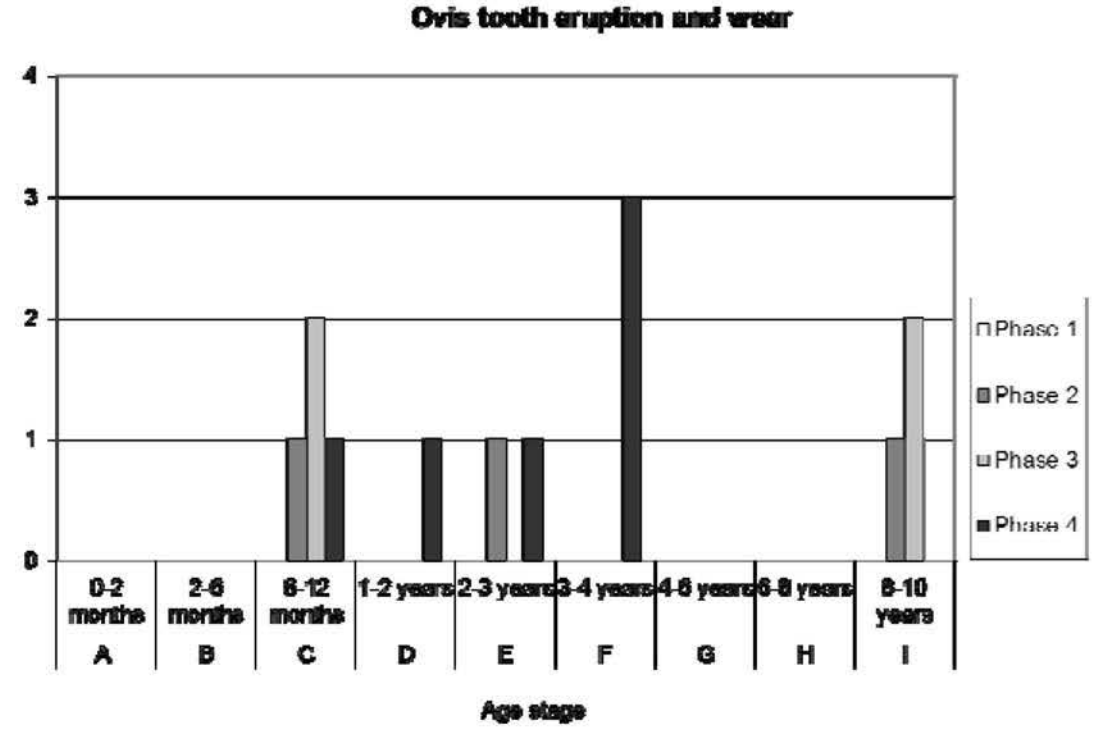
A reasonable amount of tooth eruption and wear data was available for cattle, sheep and pig. These data are presented in Graphs 4-6 and are in broad agreement with the bone fusion data. Cattle tooth wear data show the majority of animals surviving beyond the early stages of life followed by a steady kill off of juvenile and young adult animals. As mentioned above these animals were most likely prime meat producers. A number of older animals are also present as indicated by the bone fusion data; again these animals likely represent breeding stock and/or traction animals. Interestingly the only mandible belonging to Phase 1 belonged to age stage H (old adult) an age group that was apparently missing from the bone fusion data, indicating the presence of some older possible breeding animals on the site at this time.

The sheep tooth eruption and wear data largely agree with the bone fusion data in that the majority of the animals appeared to have been slaughtered for meat. It should be noted that animals of 2-3 and 3-4 years old would also have provided a few clips of wool before their death. The main difference between the bone fusion data and the tooth wear data is the representation of older animals, likely used as breeding stock. These were not represented by the bone fusion data but a few mandibles do show their presence on the site.

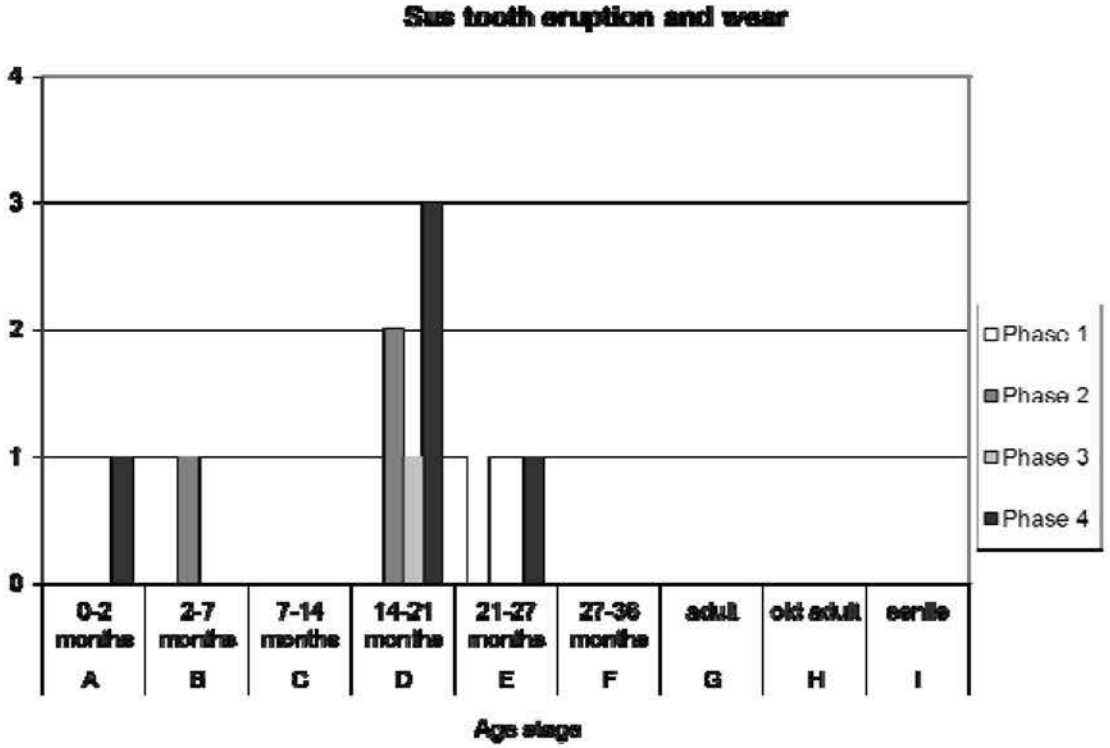
A small amount of tooth eruption and wear data were also available for pigs. The majority of these indicate the presence of juvenile animals killed for prime meat. Two of the mandibles indicate the presence of particularly young animals indicating that some pig breeding may have been taking place on the site and that these represented natural deaths of young animals. There does, however, appear to be a lack of breeding age animals.



Graph 4. Cattle mandible wear stages.



Graph 5. Sheep mandible wear stages.



Graph 6. Pig mandible wear stages.

Body Part Representation

As for all of the other data sets the small size of the Phase 1 sample must be borne in mind. The body part representation data are shown in Tables 2-5 and Graphs 7-10. Cattle show that all areas of the body are represented with very little difference in body part proportions between the phases. Both meaty and waste parts are present and hence it appears that whole carcasses were being processed on site. For sheep the Phase 1 data is limited, however, the other three phases show similar body part distributions to each other and to cattle. There is a lack of neck elements in Phase 2 but overall all body parts are present and hence whole animals appear to have been present at the site. For pigs again the Phase 1 data is not particularly reliable. In the other phases there appears to be a dominance of head elements and a lack of foot elements, with the exception of Phase 2 which has the largest sample for pig. The lack of foot elements is likely due to the small sample size for pig and the small size of these bones being those most likely missed of the pig elements during hand collection on site. It should also be noted that sheep feet are largely represented by the large metapodial bones with few of the smaller phalanges, carpals and tarsals present and that pig metapodials are generally smaller than those of sheep. With the exception of Phase 1, where again small sample size is a factor, the body part representation for horse closely resembles that for cattle for Phases 2, 3 and 4; again indicating the presence of whole animals/carcasses.

		Phase 1	Phase 2	Phase 3	Phase 4
Head	Horncore	\	12	4	18
	Skull + horncore	\	\	\	\
	Frontal	1	\	\	\
	Occipital	\	\	\	\
	Paretial	1	\	\	\
	Temporal	\	\	\	\
	Zygomatic	\	\	\	\
	Maxilla	\	4	\	2
	Premaxilla	\	\	\	\
	Nasal	\	\	\	\
	Hyoid	\	\	\	\
	Skull fragment	1	4	16	31
	Mandible	2	47	38	35
	Incisor	\	\	3	3
	Premolar	\	\	6	8
	Molar	1	31	19	42
	Tooth fragment	\	\	\	3
Neck	Atlas	\	4	6	2
	Axis	1	3	4	5
Fore limb	Scapula	1	35	36	37
	Humerus	4	27	18	38
	Radius	5	20	29	29
	Radio-ulna	1	4	3	4
	Ulna	\	7	9	14
Hind limb	Innominate	2	15	15	21
	Sacrum	\	4	2	3
	Femur	3	26	35	50
	Patella	\	\	\	2
	Tibia	4	23	26	31
	Lateral malleolus	\	\	1	\
Feet	Carpal	\	\	2	2
	Astragalus	\	5	7	9
	Calcaneus	\	7	7	5
	Naviculocuboid	\	2	8	\
	Tarsal	\	1	4	\
	Metacarpal	\	25	28	20
	Metatarsal	2	22	14	24
	Metapodial	\	3	3	1
	Phalanx 1	\	7	7	12
	Phalanx 2	\	2	2	2
	Phalanx 3	\	2	1	1
	Carpal/tarsal fragment	\	\	\	\
	Sesamoid	\	\	\	\

Table 29: Cattle body part representation bone counts.

		Phase 1	Phase 2	Phase 3	Phase 4
Head	Horncore	\	\	\	2
	Frontal	\	\	\	\
	Occipital	\	\	\	\
	Paretial	\	\	\	\
	Temporal	\	\	\	\
	Zygomatic	\	\	\	\
	Maxilla	\	\	1	\
	Premaxilla	\	\	\	\
	Hyoid	\	\	\	\
	Skull fragment	\	2	\	4
	Mandible	1	11	8	9
	Incisor	\	\	1	\
	Premolar	\	\	2	\
	Molar	\	8	14	7
	Tooth fragments	\	2	1	5
Neck	Atlas	\	\	\	1
	Axis	\	\	1	\
Fore limb	Scapula	\	1	3	1
	Humerus	\	3	4	6
	Radius	\	14	5	13
	Radioulna	\	\	\	\
	Ulna	\	1	\	\
Hind limb	Innominate	\	4	1	1
	Sacrum	\	\	\	\
	Femur	\	7	2	4
	Patella	\	\	\	\
	Tibia	1	12	12	10
	Lateral malleolus	\	\	\	\
Feet	Carpal	\	\	1	\
	Astragalus	\	\	1	\
	Calcaneus	\	1	\	\
	Naviculocuboid	\	1	1	\
	Tarsal	\	\	\	\
	Metacarpal	\	4	3	3
	Metatarsal	\	8	15	12
	Metapodial	\	\	1	\
	Phalanx 1	\	\	2	1
	Phalanx 2	\	\	2	\
	Phalanx 3	\	\	\	\
	Carpal/tarsal fragment	\	\	\	\

Table 30. Sheep body part representation bone counts.

		Phase 1	Phase 2	Phase 3	Phase 4
Head	Frontal	\	\	\	\
	Occipital	\	\	\	\
	Paretial	\	\	\	\
	Temporal	\	\	\	\
	Zygomatic	\	\	\	\
	Maxilla	\	1	\	2

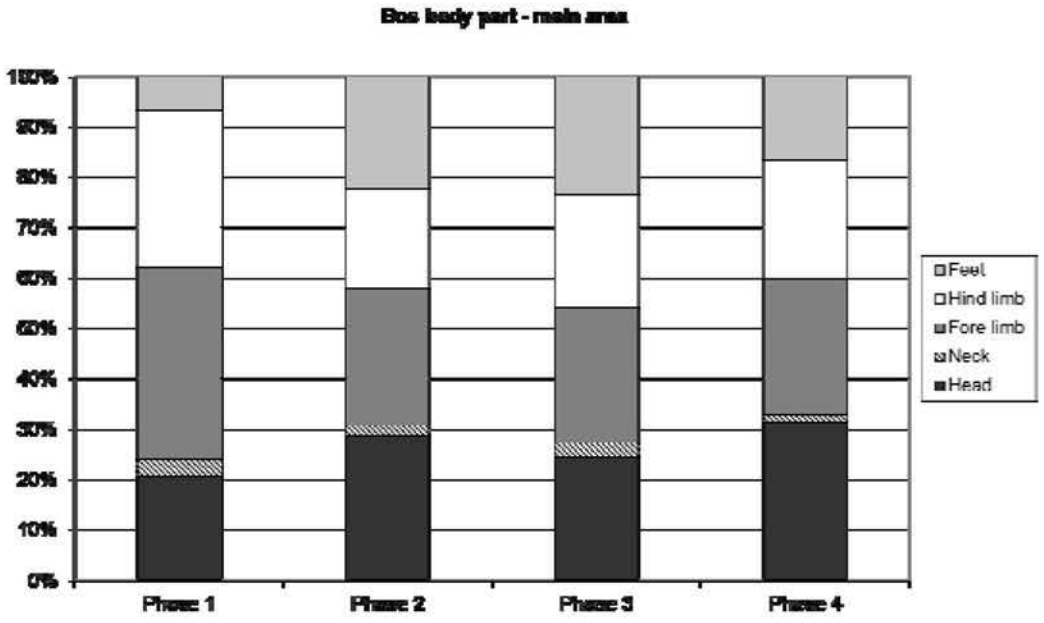
	Premaxilla	\	\	\	\
	Skull fragment	\	\	1	\
	Mandible	1	5	2	6
	Incisor	\	\	1	\
	Canine	\	1	\	1
	Premolar	\	\	\	\
	Molar	\	\	\	1
	Tooth fragment	\	1	\	\
Neck	Atlas	\	\	\	\
	Axis	\	\	\	\
Fore limb	Scapula	\	2	1	2
	Humerus	\	3	\	3
	Radius	\	\	1	\
	Ulna	\	\	\	\
Hind limb	Innominate	\	3	2	1
	Sacrum	\	\	\	\
	Femur	\	2	\	2
	Patella	\	\	\	\
	Tibia	\	\	\	\
	Fibula	\	\	\	\
Feet	Carpal	1	\	\	\
	Astragalus	\	\	\	\
	Calcaneus	\	\	\	\
	Naviculocuboid	\	\	\	\
	Metacarpal	\	1	\	\
	Metatarsal	\	\	\	\
	Metapodial	\	\	\	\
	Phalanx 1	\	\	\	\
	Phalanx 2	\	\	\	\
	Phalanx 3	\	\	\	\
	Sesamoid	\	\	\	\
	Carpal/tarsal fragment	\	\	\	\

Table 31. Pig body part representation bone counts.

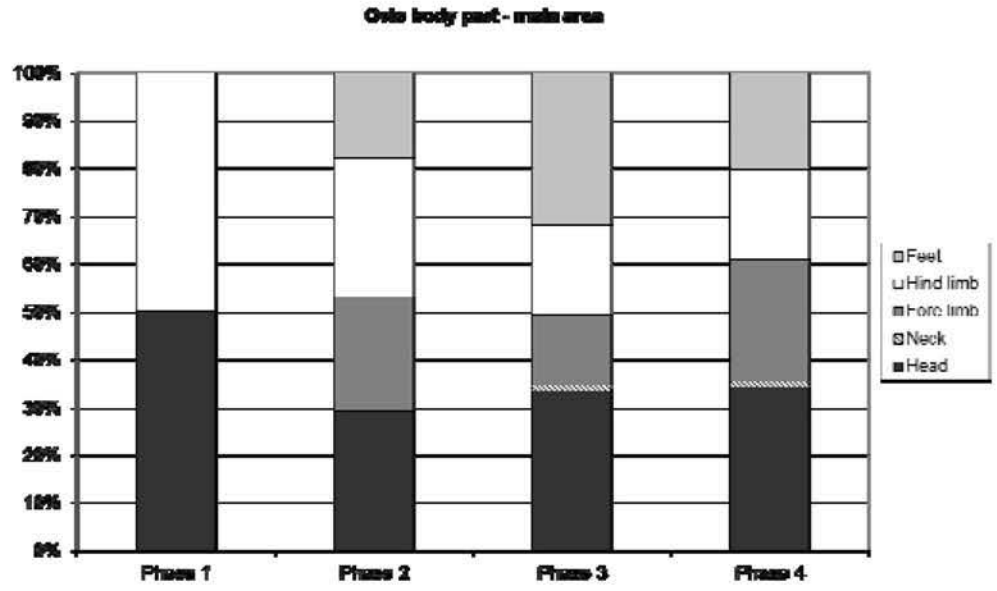
		Phase 1	**Phase 2**	**Phase 3**	**Phase 4**
Head	Frontal	\	\	\	\
	Occipital	\	\	\	\
	Paretial	\	\	\	\
	Temporal	\	\	\	\
	Zygomatic	\	\	\	\
	Maxilla	\	\	\	2
	Premaxilla	\	\	\	\
	Skull fragment	4	3	5	10
	Mandible	2	6	11	15
	Incisor	1	1	2	4
	Canine	\	\	\	1
	Premolar	\	\	1	1
	Molar	\	6	11	6
	Tooth fragment	\	\	\	8
Neck	Atlas	\	1	1	5

	Axis	\	\	1	2
Fore limb	Scapula	\	2	7	10
	Humerus	\	4	4	9
	Radius	\	5	3	5
	Radio-ulna	\	\	5	4
	Ulna	\	2	2	\
Hind limb	Innominate	\	6	8	14
	Sacrum	\	\	\	1
	Femur	\	6	2	9
	Patella	\	\	\	1
	Tibia	\	3	3	11
	Fibula	\	\	\	\
Feet	Carpal	\	2	\	2
	Astragalus	\	2	\	2
	Calcaneus	\	1	\	3
	Naviculocuboid	\	\	\	\
	Metacarpal	\	5	11	7
	Metatarsal	\	4	6	7
	Metapodial	\	\	1	1
	Phalanx 1	\	\	4	6
	Phalanx 2	\	\	2	\
	Phalanx 3	\	\	3	1
	Sesamoid	\	\	\	\
	Carpal/tarsal fragment	\	\	\	\

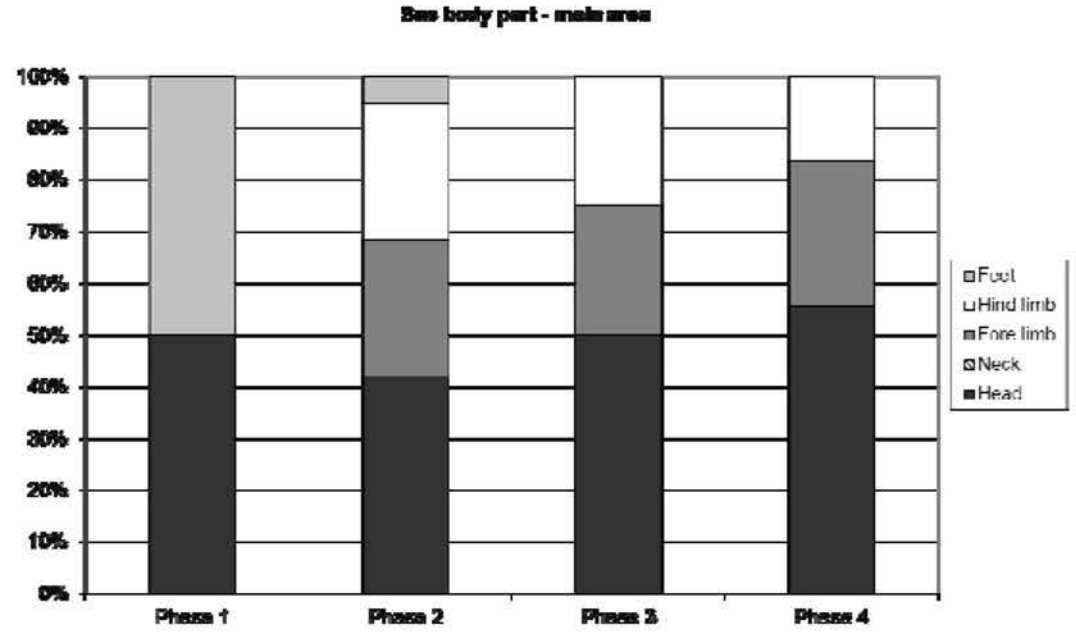
Table 32. Horse body part representation bone counts.



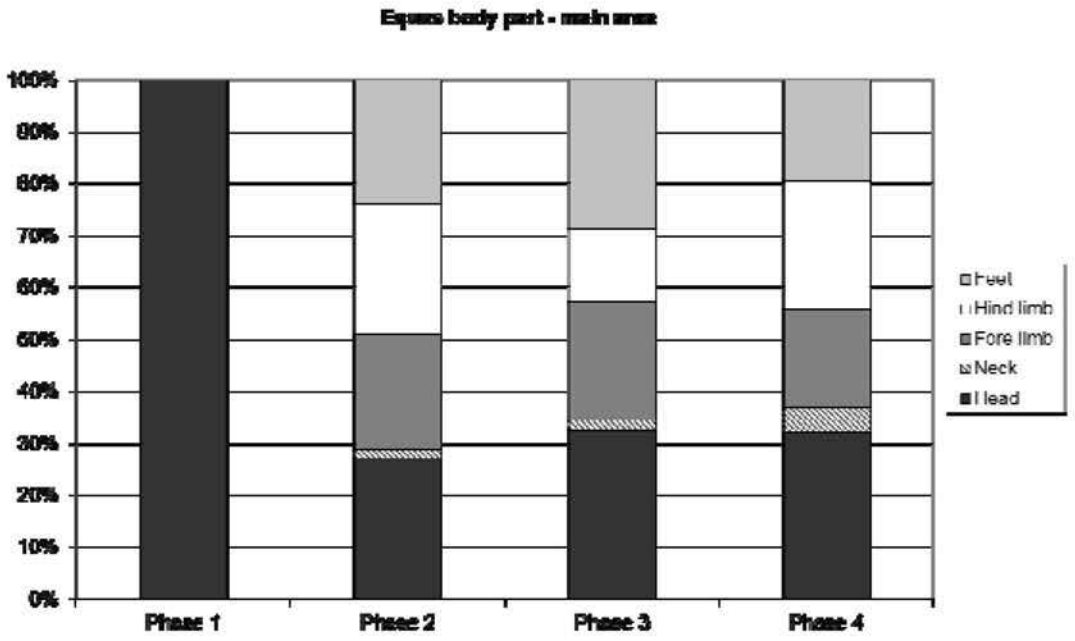
Graph 7. Cattle body area percentage representation.



Graph 8. Sheep body area percentage representation.



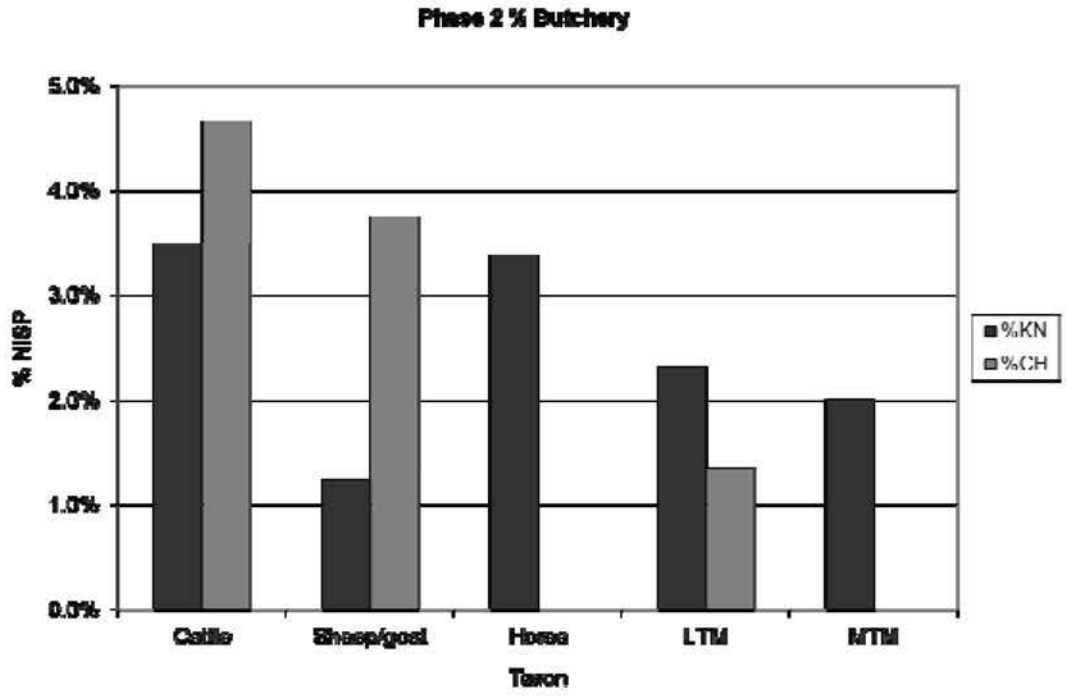
Graph 9. Pig body area percentage representation.



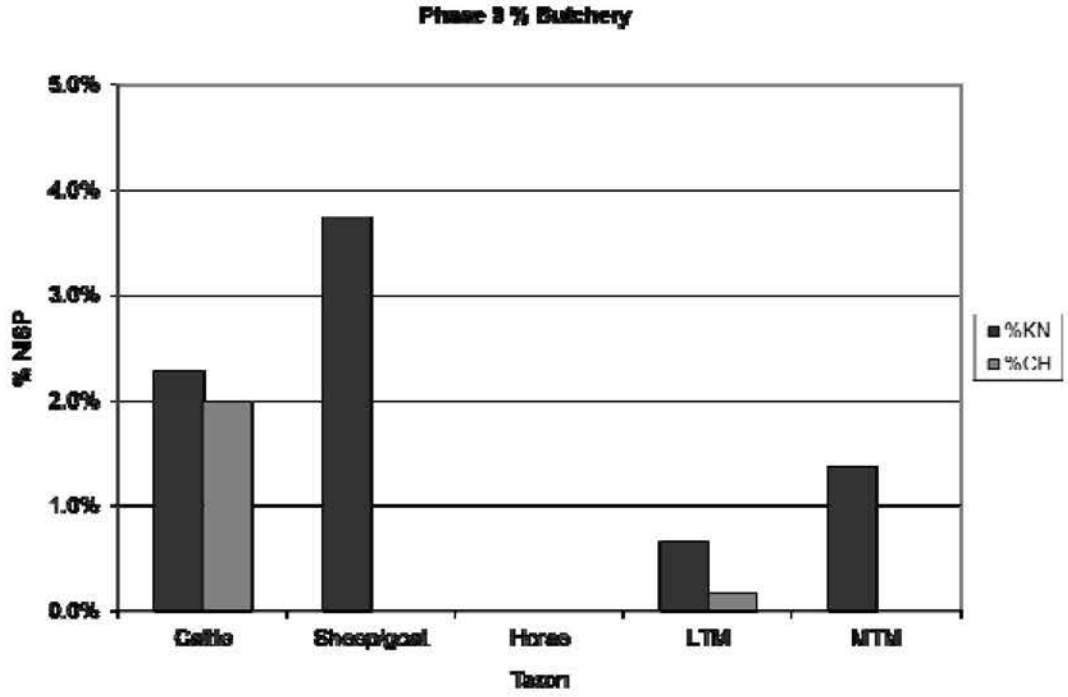
Graph 10. Horse body area percentage representation.

Butchery

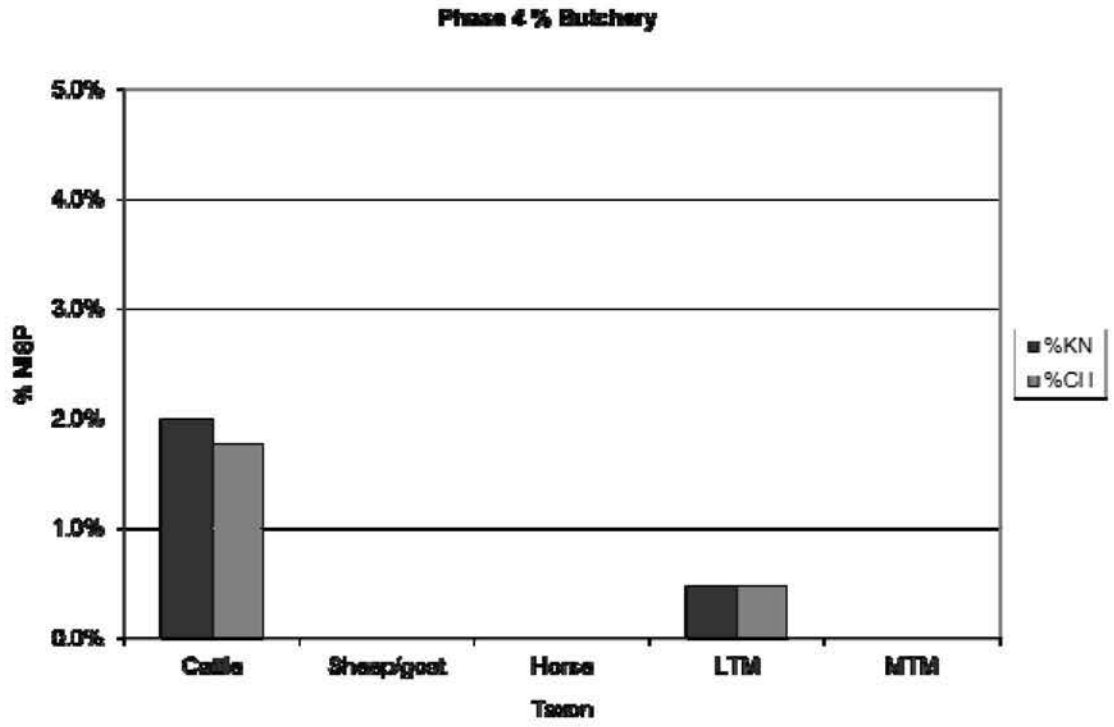
Butchery is examined by phase, taxa and type of butchery mark (Graphs 11-13). Butchery marks were divided into two main categories, small knife cuts (KN) and large blade chop marks (CH). For part of the assemblage blunt impact marks were also noted, however, these were not consistently recorded throughout the assemblage so are not included in the figures presented here. Pig and dog are not included on the figures as only one bone of each was recorded as having evidence of butchery, a dog distal humerus from Phase 2 and a pig rib from Phase 4, both of which had small blade cut marks.



Graph 11. Phase 2 butchery marks as a percentage of NISP (LTM – large mammal, MTM – medium mammal).



Graph 12. Phase 3 butchery marks as a percentage of NISP (LTM – large mammal, MTM – medium mammal).



Graph 13. Phase 4 butchery marks as a percentage of NISP (LTM – large mammal, MTM – medium mammal).

Examination of the butchered bone as a percentage of NISP shows that the highest frequency of butchery marks was on bones from Phase 2. Progressively fewer marks were present in Phases 3 and 4. Cattle always have the overall greatest frequency of butchery marks. In Phase 2, chop marks are more frequent on cattle and sheep bones than cut marks; however in the other phases cut marks are always more frequent. In Phase 4 only cattle and large mammal bones show any signs of butchery. With the exception of cattle having the highest frequency of butchery and an apparent decrease in butchery frequency over time there is little coherent patterning in butchery practices. Cut and chop marks showed evidence of all stages of butchering including skinning, disarticulation and filleting of meat from the bone.

Impact marks were present on all domestic taxa with the exception of dog and only one case each was noted for horse and pig; however, as noted above these were not routinely recorded. Such impact marks are likely to be the result of bone cracking for marrow extraction or further processing of bones for the production of stock, grease or glue.

Pathology

Site code	Catalogue No	Context No	Phase	Species	Element	Side	Part	Count	Pathology Comments
AS1011	270	2186	2	Cattle	Astragalus	R	W	1	On medial edge of plantar articular surface is roughly crescent-shaped lesion c.22mm long where articular surface is not present and bone is porous.
AS1011	2474	2836	2	Cattle	Femur	R	W	1	Extra development of muscle attachment at proximal end of supracondyloid fossa
AS1011	2161	2739	2	Cattle	Humerus	R	W	1	Small bony spur at proximal end of lateral condyloid crest about 6mm long. This is the origin of the extensor carpi radialis muscle and the spur probably represents localised ossification of muscle/tendon (myositis ossificans traumatica) following minor
TUB03	32	43	2	Cattle	M3	L	LW	1	missing/extremely reduced 3rd cusp on M3
AS1011	156	2035	2	Cattle	Mandible	R	F	1	Around gonial angle on lateral side area of muscle insertion is unusually raised with a relatively sharp edge to raised are and porosity along its margin. Raised area itself has smooth, normal appearance. Muscle insertion?
AS1011	2190	2739	2	Cattle	Mandible	L	F	1	Depression in medial part of joint surface of TMJ. Approximately circular, c. 5mm diameter, with irregular inner surface and shallow channel leading posteriorly to edge of joint surface. Smooth edges
AS1011	376	2183	2	Cattle	Metacarpal	L	W	1	Circular defect in proximal joint surface near medial edge, depression with porous surface. Also two creases in joint surface radiating from depression.
AS1011	2259	2780	2	Cattle	Metacarpal	R	W	1	Oval defect on articular surface of proximal articulation on medial side, 10x5mm. Slightly depressed with rough surface
AS1011	2401	2895	2	Cattle	Tarsal	R	W	1	Articulation with metatarsal shows osteophytes around the anterior and lateral margins, and the anterior half of the articular surface shows extreme porosity and loss of subchondral bone surface. Suggestive of OA
AS1011	2310	2730	2	Cattle	Ulna	R	F	1	Semilunar notch has shallow, rough defect in articular surface. Circular, approx 5mm diameter

AS1011	2480	2815	2	Horse	Humerus	L	DIS	1	Shallow defect in anterior aspect of distal articular surface in the midline. Defect is a shallow depression 12x10mm with rough, slightly porous surface and well-defined edge. Congenital defect?
AS1011	1604	3009	2	Large mammal	long bone frag	\	F	1	Shaft covered in periostitis
AS1011	2174	2739	2	Large mammal	Lumbar vert	\	W	1	Just to right side of midline of centre of body is a large oval channel approx 13mm (cranio-caudally) x 6mm (mediolaterally). Channel penetrates body dorso-ventrally and is subdivided by a bony strut at ventral and dorsal openings.
AS1011	2374	2863	2	Large mammal	Lumbar vert	\	W	1	On inferior surface of body of centrum to right of midline and towards the caudal end is an oval cavity which has been truncated by modern damage. This connects with the foramen which penetrates the centrum super-inferiorly and may
AS1011	2389	2844	2	Large mammal	Rib	\	F	5	One fragment shows deposits of new bone at one end, particularly on the visceral side. The deposits double the thickness of the rib at the very end, mainly due to bone deposition on the visceral side. There is some remodelling of this bone.
AS1011	1540	3007	2	Large mammal	Rib	\	F	1	Patches of periostitis on surface
AS1011	106	2073	2	Medium mammal	long bone frag	\	F	1	Small patches of periostitis, bone surface poorly preserved
AS1011	2409	2844	2	Sheep	Femur	\	F	1	Shaft covered in periostitis
AS1011	107	2073	2	Sheep	Mandible	R	F	1	Small patches of periostitis on labial side of alveolar region (small fragment)
AS1011	2451	2803	2	Sheep	Metacarpal	\	F	1	Periostitis on anterior surface of shaft
AS1011	418	2183	2	Sheep	Metatarsal	R	F	1	Ridge of bone on anterior surface of shaft, medial edge. Muscle attachment?
AS1011	3353	4270	3	Cattle	Mandible	R	F	1	Thick porous periostitis between condyle and coronoid process both medially and laterally

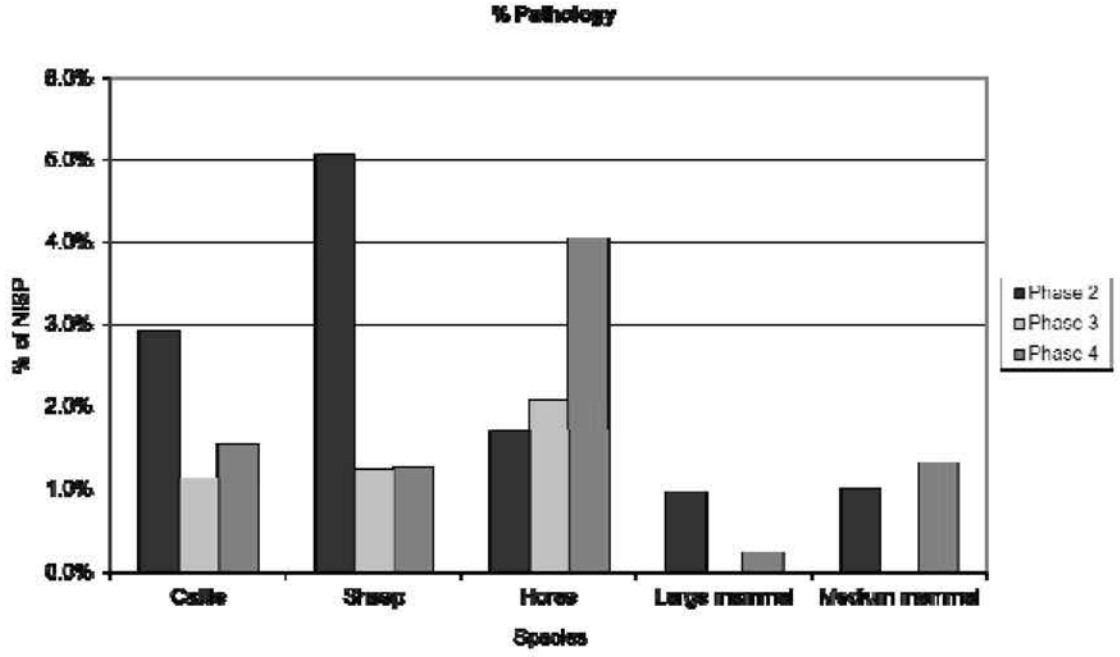
AS1011	44	2049	3	Cattle	Metacarpal	L	W	1	Small depression 7x5mm on proximal articular side, medial facet, just posterior to centre of facet. Internal surface of depression is porous.
AS1011	2910	4280	3	Cattle	Tibia	L	W	1	Bony spur directed cranially on medial side of shaft less than 1/4 from proximal end. Myositis ossificans traumatica? Osteophytes on medial and lateral sides of distal epiphysis.
AS1011	1369	2520	3	Cattle	Tibia	R	W	1	Area of periostitis on anterior surface beginning around midshaft and extending proximally, approx. 100mmx30mm. More towards lateral side
AS1011	2944	4280	3	Horse	Metacarpal	R	PRO	1	Overgrowth of bone on medial side where 2nd metacarpal joins
AS1011	2140	2736	3	Horse	Pelvis	R	F	1	Slight lipping of external margin of acetabulum
AS1011	2519	2981	3	Sheep	Tibia	R	F	1	Strip of periostitis along anterior border of shaft, proximal to midshaft
AS1011	1004	2373	4	Cattle	1st phalanx	\	PRO	1	Small area of eburnation on posterior part of proximal articular facet. Also antero-posterior grooves on proximal joint surface and osteophyte development around muscle insertions/edge of joint capsule. Very large.
AS1011	1341	2442	4	Cattle	1st phalanx	\	W	1	Pronounced thickening of bone on posterior aspect of adaxial half. Marked muscle insertion? Texture slightly rougher than rest of bone but reminiscent of muscle attachment. Site of minor trauma?
AS1011	888	2424	4	Cattle	Pelvis	L	F	1	Large depression on ventral side of cranial edge of acetabulum. Normal variation? Matches specimen 750 in size and expression of this trait - same individual
AS1011	750	2424	4	Cattle	Pelvis	R	F	1	Large depression on ventral side of cranial edge of acetabulum, 79mmx21mm. Normal variation? Slight porosity and eburnation on acetabulum in region closes to root of pubic ramus. Matches specimen 888 in size and expression of this trait
AS1011	89	2071	4	Cattle	Radius	R	W	1	Circular area c. 20mm diameter raised and uneven, on medial side of anterior surface of shaft close to proximal end. Probably muscle insertion

AS1011	2742	4211	4	Cattle	Radius	R	PRO	1	Small bone mass on posterior surface of shaft at lateral edge. Oval in shape, oriented with the long axis of the bone. 16x6mm. Dense appearance like cortex but slight lip at edge, similar in appearance to button osteoma on human skulls
AS1011	697	2082	4	Cattle	Tibia	R	DIS	1	At centre of distal articulation , area which is usually rough is a depression with crease running into lateral side of articular surface. Normal variation?
AS1011	1345	2442	4	Horse	Femur	L	F	1	Large triangular area of osteoarthritic change 33mmx33mm on anterior surface of distal articulation, medial side (articulation with patella). Area is porous and shows eburnation over much of the surface. Most superior and lateral part shows complete loss.
AS1011	1298	2424	4	Horse	Humerus	L	W	1	Same individual as 1296?
AS1011	1296	2424	4	Horse	Humerus	R	W	1	Light depression on posterior aspect of trochlea in the midline, approx. 18x7mm. Rough granular texture. Same individual as 1298?
AS1011	1483	2694	4	Horse	Metacarpal	L	PRO	1	Periostitis on lateral side of anterior surface just below joint surface
AS1011	851	2424	4	Horse	Metatarsal	R	W	1	Area of periostitis 18x9m on lateral side of shaft just proximal to midshaft
AS1011	707	2082	4	Horse	Tibia	R	F	1	Periostits on articular surface of medial epicondyle, although bone surface quite eroded.
AS1011	695	2082	4	Large mammal	Lumbar vert	\	F	1	End plates not fused. One vertebral body shows a channel running dorso-ventral through the centre of the body. Channel is oval shaped, longest cranio-caudally, c. 6mmx4mm on the dorsal surface of the body and 10mmx5mm on the ventral surface. On the dor
AS1011	2603	2905	4	Large mammal	Rib	\	F	3	1 fragment shows deposit of new bone along cranial border, 25mm long x 3mm. Porous appearance with clearly defined margin. Ossification of muscle attachment following minor trauma?

AS1011	2416	2866	4	Medium mammal	Skull	\	F	6	Small patches of periostitis on surface of one fragment (probably vault) and one (probably nasal) and internal surface of another (probably nasals). Part of dog skull (2410)?
AS1011	1472	2694	4	Sheep	Metacarpal	L	W	1	Defect in proximal articular surface on medial side approx 5mm x 9mm, slight depression and roughened appearance

Table 33. Description of pathologies and abnormalities.

Pathologies were recorded in a descriptive manner and all those recorded are presented in Table 33. Frequencies of pathologies by species are show in Graph 14. Overall cattle, horse and sheep show approximately similar frequencies of pathology although these vary from phase to phase; no pathology was recorded for Phase 1. No particular patterning in the pathologies recorded could be detected and many of those recorded may well be congenital defects rather than those caused by disease or trauma. The lower third molar with reduced third cusp (hypoconulid) certainly comes into this category as do probably many of the articular surface defects. Some indications of joint stress that may have resulted from the use of animals for traction are also present, for example a Phase 4 cattle 1st phalanx (Table 33, catalogue no. 1004), but none of these are particularly severe.



Graph 14. Pathologies as a percentage of NISP.

Deer Remains

Two deer species are represented at Bottisham; red deer (*Cervus elaphus*) and fallow deer (*Dama dama*). Red deer were present in Phases 2, 3 and 4 and the undated group and were represented by seven antler pieces and four post cranial bones. Phase 2 red deer remains were an antler tine tip, a distal metacarpal (fused) and a scapula articulation; no butchery marks were present. Phase 3 yielded a distal humerus and two antler fragments. One of the antler fragments was noted as possibly burnt. The second had evidence of cut and saw marks and was thought to be a fragment cut from an antler tine (*c.* 2cm long). As well as having been sawn through, the fragment had been 'shaved' down the sides to create a polygonal cross-section; there were also occasional cut marks around the circumference. Two antler fragments were present in Phase 4 deposits, both of which had been scorched, one had also been subject to a series of cut and chop marks around its outer circumference. This piece had also been broken longitudinally and the scorching mentioned above was largely present on the internal surface.
Two more antler pieces and a 1st phalanx came from the undated material. One of the antler pieces had clear signs of working; the other was a very smooth tine tip

which may well have become smoothed through natural wear of the antler. It appears that antler working was practiced at least on a small scale at the site and that red deer were occasionally hunted throughout the Roman occupation there. Whether shed antlers were collected in addition to those that may have been present on hunted animals is impossible to say as no shed or unshed antler burrs are present.

Fallow deer were represented by a single piece of antler. This was noted as not being particularly well developed and possibly belonging to a young buck. Signs of working were present as the antler had been chopped through the beam and between two of the tines. As for the red deer, due to the lack of a burr, it cannot be said if this antler was shed or not. The presence of fallow deer remains in Roman Britain is rare and there is some debate as to whether living populations of the animals had been introduced into Britain at this time, although it seems more likely that this happened at a later date (Sykes 2010). This single piece of antler, which may easily have been imported from the continent, does little to elucidate on this debate.

In comparison with red deer antler, fallow deer antler is much less useful for artefact manufacture due to its much thinner compact layer. It has however been suggested to have had medicinal uses or religious significance in the Roman period (Sykes 2010, 54), which may explain its reason for import into Britain.

Special deposits

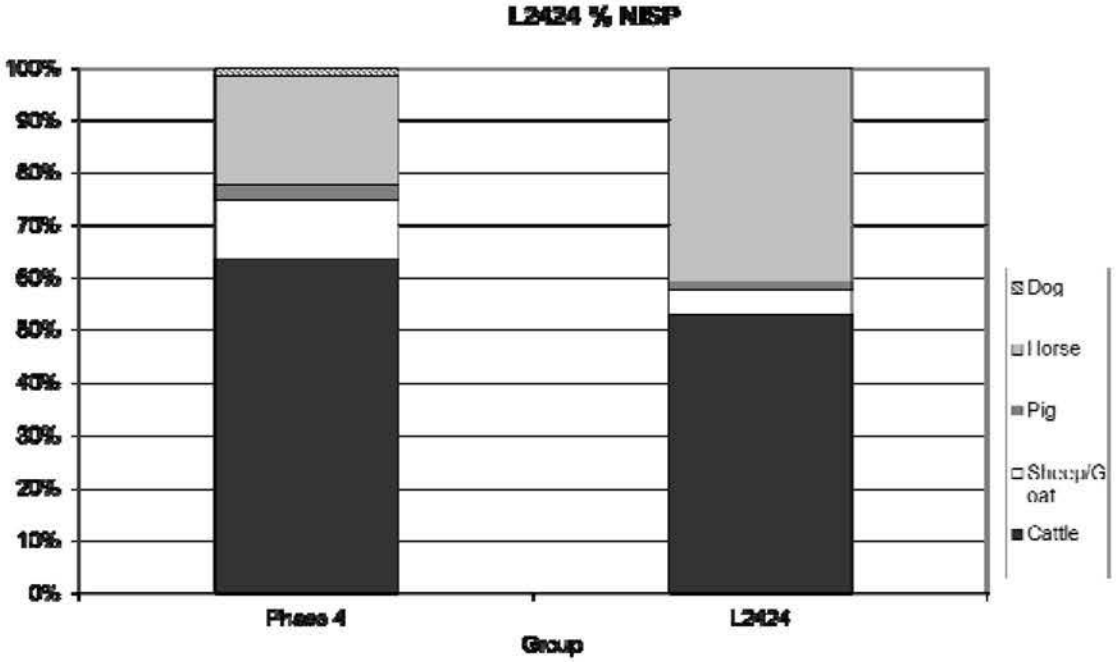
One of the Phase 4 deposits was noted as being potentially special in nature as it contained six relatively complete cattle and horse skulls. This deposit was L2424 from Pit F2557. This feature was a large quarry pit and the deposit concerned (L2424) was one of the middle fills. In addition to the skulls the deposit contained a variety of pottery, CBM and other animal bone. The composition of the animal bone assemblage has been briefly examined here and compared to Phase 4 as a whole to see if/how it might differ from the norm.

	Phase 4	**L2424**
Cattle	454	66
Sheep/Goat	79	6
Pig	22	2
Horse	148	51
Dog	10	\
Cat	\	\
Red deer	2 (ant)	\
Fallow deer	\	\
Hare	1	\
Large mammal	835	143
Medium mammal	76	2
Chicken	3	\
Goose	1	\
Crow	1	\

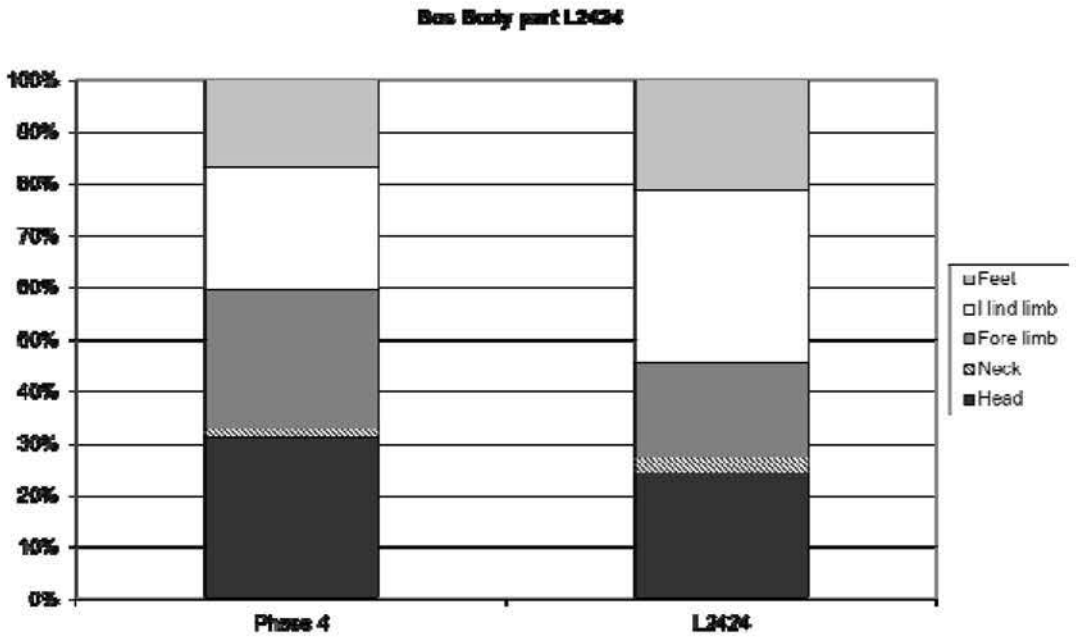
Bird sp.	1	\
UNID	754	112
Total	2387	382

Table 34. NISP for L2424, compared to Phase 4 as a whole.

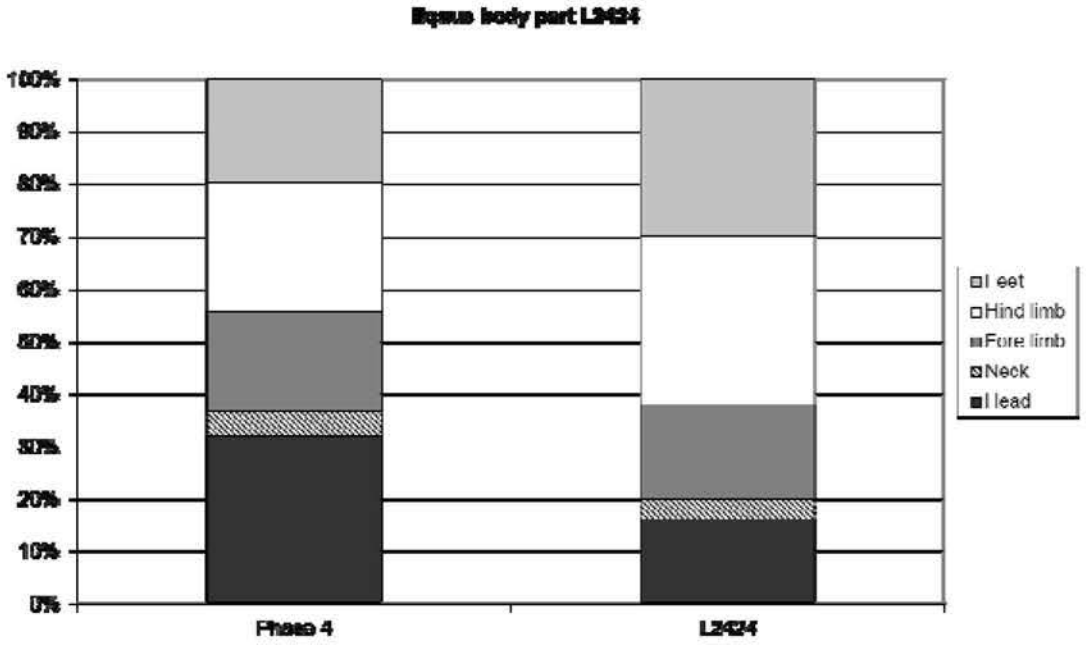
Identified species in the deposit were cattle, horse, sheep and pig, a number of other bones could only be identified as large or medium mammal and some were recorded as unidentified; no wild mammals or birds were present (Table 34). Examination of the percentage representation of the main domestic species (Graph 15) shows some differences between L2424 and Phase 4 as a whole. L2424 has a much higher representation of horse and a much lower representation of sheep and cattle than Phase 4 as a whole; dogs are also absent from L2424.



Graph 15. % NISP for L2424 compared with Phase 4 as a whole.



Graph 16. Cattle body area representation for L2424 compared with Phase 4 as a whole.



Graph 17. Horse body area representation for L2424 compared with Phase 4 as a whole.

Looking at the body part representation of cattle (Graph 16) and horse (Graph 17) shows some minor differences between L2424 and Phase 4 as a whole. For cattle there is a greater representation of hind limb elements and lower representation of fore limb elements in L2424. There is also a slightly lower representation of head elements and a slightly higher representation of foot elements than in the Phase 4 assemblages as a whole. A similar set of differences is noted for horse although here the greatest differences are in the head and foot elements, rather than the limbs. Perhaps of most interest here is the apparently lower representation of head elements, when the deposit has been noted due the number of skulls found within it. This seems most likely due to differences in fragmentation. In the majority of deposits skulls tend to be fairly fragmented with the skull of an individual potentially

being split into any number of identifiable pieces, particularly when teeth become loose. In the pit deposit L2424 very few head elements are present aside from the relatively complete skulls. The skulls present are described in table 8. Phase 4 had a very low occurrence of butchery and that is also reflected in the L2424 deposit, only two cattle bones were recorded as having cut marks, both thought to be associated with carcass disarticulation.

The nature of the L2424 deposit does not appear to have any intrinsically 'special' properties about it in a ritual or religious sense. It is a middle fill of a pit created by quarrying and not specifically for the disposal of these remains and there is what appears to be a relatively mundane assortment of domestic rubbish within the deposit. The makeup of the deposit does appear to differ slightly from the Phase 4 assemblage as a whole, particularly in the relative completeness of the skulls and the higher proportion of foot elements, in addition to the increased representation of horse remains. The lack of butchery may have been of interest if it were not also replicated in the wider assemblage and may simply reflect the skill or techniques of the butchers at this time. The completeness of the skulls in comparison to the rest of the assemblage is however interesting. It implies that whereas skulls in the majority of the assemblage may have been broken up in order to access meat and offal from in and around the head, this does not appear to have happened with the skulls from L2424 indicating a difference in carcass usage at the time this deposit was created. Whether this was a one off event or a deposit created over a period of time is impossible to say. It is also interesting that cattle and horses appear to have been treated in a similar manner, when one may expect them, having often quite different economic uses, to have been treated in different ways.

SF No.	Species	Catalogue Description
SF40	Equus	Fragmented but substantially complete. All major regions of skull represented.
SF41	Bos	Fragmented. All major regions of skull represented among fragments.
SF42	Bos	Fragmented. Mainly cranial vault represented, no evidence of maxilla, teeth or nasal region.
SF44	Bos	Fragmented
SF48	Equus	Fragmented and incomplete. Substantial part of cranial vault and right side of maxilla recovered.
\	Equus	Highly fragmented. All major areas of skull represented. Young individual, upper canines just erupting (Levine 1982: 4yr-5yr 9 months). Same individual as 1301 and 1302?

Table 35. Catalogue descriptions of cattle and horse skulls from L2424.

New Doctors Surgery

Animal bone from the new surgery excavation area (HAT432) was originally recorded and reported on by Ian Baxter (Baxter, undated) but without the current phasing scheme in place and prior to the excavation of the main site area. Due to differences in recording methods it is necessary to report on these remains separately to the main part of the site, but attempts are made draw comparisons and consolidate the data where possible.

Methods

The mammal bones were recorded following a modified version of the method described in Davis (1992) and Albarella & Davis (1994), which records a select suite of 'countable' elements. The separation of sheep and goat was attempted using the criteria described in Boessneck (1969), Kratochvil (1969), and Payne (1969; 1985). Tooth wear stages follow Grant (1982). The presence of large (cattle/horse size) and medium (sheep/pig size) vertebrae and ribs was recorded for each context, although these were not counted. 'Non-countable' elements of particular interest were recorded but not included in the counts. An attempt was made to record butchery marks following the method of Maltby (1989).

The following report was constructed using the original bone database, which included all of the 'countable' elements but not those which were recorded but were 'non-countable', and with significant reference to Baxter's (undated) original report, which contained additional information. All of the data from the bone database was imported into an Excel spreadsheet and contexts were renumbered and phased following the whole site phasing scheme. Data were extracted and processed so as to allow a best comparison between the new surgery area and the main excavation area; however due to the differences in recording methods this was not always fully possible and in many cases allowances had to be made for such differences.

Results

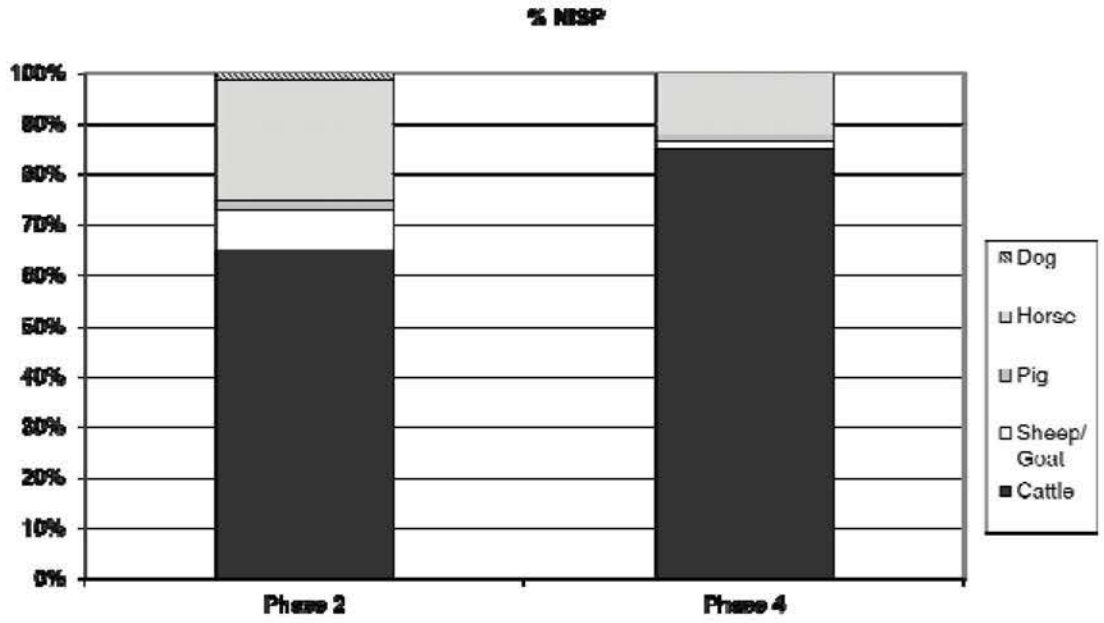
Quantification

Species identifications and their NISP are presented in Table 36. Due to the selective recording method employed the overall sample size is much smaller than for the main excavation area and no unidentified elements are present. Domestic species identified in order of abundance are cattle, horse, sheep/goat, pig and dog. No goats were positively identified but a small number of sheep were, as for the main part of the site, therefore for simplicity all of the sheep/goat remains will be referred to as sheep henceforth. Wild species are represented by a single bone each of red deer, badger and frog/toad. Sample sizes for most of the phase groups are extremely small indeed, with Phases 2 and 4 being the only ones to be of sufficient size for more detailed examination. The proportions of species represented (Graph 18) show some similarities with the main excavation area, particularly for Phase 2. Cattle are the most numerous and there are small quantities of pig and dog. In Phase 2 for the new surgery excavation area horses are more numerous than

sheep. The two Phase 4 assemblages are less similar with the new surgery assemblage having a much greater proportion of cattle, no dog and only a very small proportion of sheep.

	Phase 1	Phase 2	Phase 3	Phase 4	Unphased Roman	Undated	Total
Cattle	6	93	1	56	2	7	165
Sheep/Goat	\	11	1	1	\	\	13
Pig	\	3	\	1	\	1	5
Horse	2	34	3	8	\	\	47
Dog	\	2	\	\	\	\	2
Red deer	\	1	\	\	\	\	1
Badger	\	1	\	\	\	\	1
Frog/toad	\	1	\	\	\	\	1
Chicken	\	1	1	\	\	\	2
Total	8	150	6	67	2	8	241

Table 36. NISP for new surgery excavation area.



Graph 18. % NISP for new surgery excavation area.

Animal age – bone fusion

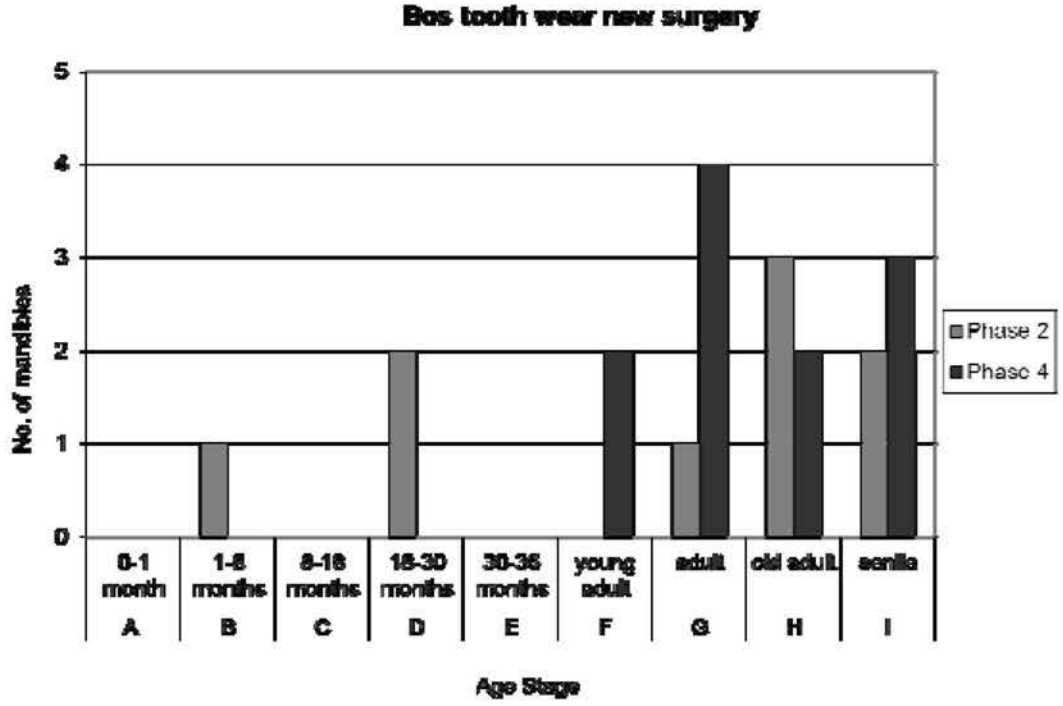
Assessment of bone fusion, particularly with comparison to the main excavation area is somewhat difficult. Sample sizes are small and only cattle had anywhere near sufficient data for analysis. Additionally the recording method employed does not routinely record a number of the later fusing epiphyses, as for most long bones only one end is routinely recorded with the other end only being recorded if part of a complete bone. Additionally no final fusion stage can be examined as very few vertebrae are recorded as these are rarely determined to species and are therefore not recorded here. Hence the fusion data is very much biased towards the earlier fusing elements.

The cattle bone fusion chart for the new surgery excavation area indicates higher rates of survivorship than is indicated for the main excavation area with over 80% of animals surviving beyond the late fusion stage. This is quite different from the main excavation area where no more than 50% of animals survive beyond this stage. This difference seems likely to be at least partly due to the lack of later fusing bones being included within the assemblage. The sample sizes are also considerably smaller for the new surgery area than for the main area which may also have some effect. Essentially, reliable comparisons between the two excavation areas cannot be made. Some younger animal were present and are represented by the partial skeletons of three calves, all from Phase 2. As individual bones were not recorded for fusion they could not be included with the fusion data. However Baxter (undated) originally noted that the calves were well grown but that their pelves were unfused indicating an age of less than ten months (Amorosi 1989, table 4 -21). Given their semi-articulated status it seems unlikely that the meat of these calves was consumed and that they most likely represent natural deaths.

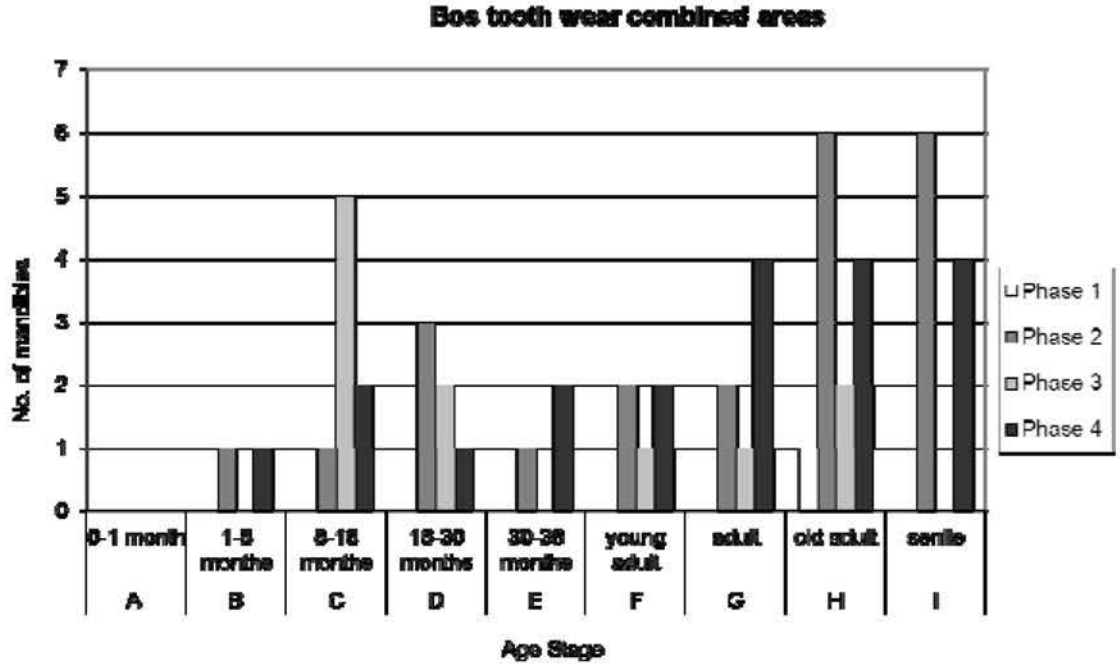
A very small amount of fusion data was available for the other domesticates with the exception of dog. Very little data were available for pig but where present bones were unfused, indicating the presence of young animals. A mix of fused and unfused elements was present for sheep indicating a mix of adult and younger animals. For horse almost all of the available bones were fused with the exception of a whole tibia from Phase 2 which was fused distally but unfused proximally, again indicating a mix of adult and slightly younger animals. This sparse fusion data appears to be broadly in agreement with that seen for the main excavation area.

Animal age – tooth eruption and wear

Tooth eruption and wear data was only available in sufficient quantities for cattle and only from Phases 2 and 4. These data for the new surgery excavation area are presented in Graph 19 and show an interesting picture. Like the fusion data for this area the majority of the animals represented are from the adult or older age stages, indicating that these may have been breeding age animals or those used for traction. There are however also a small number of younger animals that were not clearly represented by the bone fusion data and may have been missing for the reasons mentioned above. The proportion of older animals is however high when compared with the tooth wear data from the main excavation area, and here the data are directly comparable. It would appear that for whatever reason (possibly just chance) the older animals present on the site were more likely to be disposed of in the area covered by the new surgery excavation area and that neither area of the site gives a full picture of the site economy in terms of cattle husbandry. For this reason the tooth wear data for the two areas of the site have been combined onto a single tooth wear chart (Graph 20), this is possible as all available mandibles from both areas of the site were recorded for tooth eruption and wear following Grant's (1982) tooth wear codes. This shows that while there was a steady kill off of younger, prime meat animals there were also a significant number of animals surviving to advanced ages, being classed as old adult and senile (Halstead 1985). These animals most likely represent older breeding stock and traction animals.



Graph 19. Cattle mandible wear stages, new surgery excavation area.



Graph 20. Cattle mandible wear stages combined excavation areas.

Body part representation

While body part representation may not be directly comparable between the two areas of the site, due to the differences in recording methods, most major bones are recorded in the method used for the new surgery excavation area and hence if present all body areas should be represented. Data for sheep and pig are extremely

sparse and appear to indicate a bias towards elements of the head. Data for horse (Table 37) are also sparse for the majority of phases, with the exception of Phase 2, where all body areas appear to be represented. In Phase 1, 3 and 4 where data is more sparse head elements appear to be favoured, dominated in particular by loose teeth, which is the same pattern seen for sheep and pig. This would tend to indicate that the bias toward head elements is at least partially a result of the recording method, which would record certain loose teeth but not fragmented but identifiable parts of limb bones for example. Examination of cattle body part data (Table 38) shows a good spread of elements, particularly for Phases 2 and 4 where the samples are largest with all major body parts being represented.

		Phase 1	Phase 2	Phase 3	Phase 4
Head	Frontal	\	\	\	\
	Occipital	\	\	\	\
	Paretial	\	\	\	\
	Temporal	\	\	\	\
	Zygomatic	\	\	\	\
	Maxilla	\	\	1	\
	Premaxilla	\	\	\	\
	Skull fragment	\	\	\	\
	Mandible	1	4	\	\
	Incisor	\	2	1	\
	Canine	\	\	\	\
	Premolar	2	6	1	3
	Molar	3	5	\	2
	Tooth fragment	\	\	\	\
Neck	Atlas	\	\	\	\
	Axis	\	\	\	\
Fore limb	Scapula	\	1	\	\
	Humerus	\	3	\	1
	Radius	\	2	\	\
	Ulna	\	\	\	\
Hind limb	Innominate	1	1	\	\
	Sacrum	\	\	\	\
	Femur	\	\	\	\
	Patella	\	\	\	\
	Tibia	\	2	\	1
	Fibula	\	\	\	\
Feet	Carpal	\	\	\	\
	Astragalus	\	3	\	\
	Calcaneus	\	\	\	\
	Naviculocuboid	\	\	\	\
	Metacarpal	\	4	\	1
	Metatarsal	\	2	\	\
	Metapodial	\	\	\	\
	Phalanx 1	\	1	\	\
	Phalanx 2	\	1	\	\
	Phalanx 3	\	2	\	\
	Sesamoid	\	\	\	\

	Carpal/tarsal fragment	\	\	\	\
	Radio-ulna	\	\	\	\

Table 37. Horse body part representation new surgery excavation area.

		Phase 1	Phase 2	Phase 3	Phase 4
Head	Horncore	\	\	\	2
	Skull + horncore	\	\	\	\
	Frontal	\	1	\	\
	Occipital	\	\	\	\
	Paretial	\	\	\	\
	Temporal	\	\	\	\
	Zygomatic	\	\	\	2
	Maxilla	\	1	\	2
	Premaxilla	\	\	\	\
	Nasal	\	\	\	\
	Hyoid	\	\	\	\
	Skull fragment	\	\	\	\
	Mandible	1	9	\	5
	Incisor	\	\	\	1
	Premolar	1	6	\	4
	Molar	1	14	\	17
	Tooth fragment	\	\	\	\
Neck	Atlas	\	\	\	\
	Axis	\	1	\	1
Fore limb	Scapula	\	5	\	3
	Humerus	\	10	\	3
	Radius	\	5	\	1
	Radio-ulna	\	\	\	\
	Ulna	\	\	\	1
Hind limb	Innominate	\	3	\	2
	Sacrum	\	\	\	\
	Femur	\	2	\	2
	Patella	\	\	\	\
	Tibia	2	6	\	4
	Lateral malleolus	\	\	\	\
Feet	Carpal	\	1	\	\
	Astragalus	\	2	\	\
	Calcaneus	\	3	\	1
	Naviculocuboid	\	\	\	\
	Tarsal	\	2	\	\
	Metacarpal	\	5	1	\
	Metatarsal	1	9	\	3
	Metapodial	\	\	\	\
	Phalanx 1	\	5	\	1
	Phalanx 2	\	\	\	1
	Phalanx 3	\	\	\	\
	Carpal/tarsal fragment	\	\	\	\
	Sesamoid	\	\	\	\

Table 38. Cattle body part representation new surgery excavation area.

Butchery

While no butchery was noted in the bone database some was noted in the original report on the new surgery area by Baxter (undated). He noted that butchery was particularly sparse, but that a small number of cattle bones showed signs of having been butchered. One of these, a tibia that had been chopped through the shaft, came from Phase 1 and the remaining four, also long bones with chops to or through their shafts were from Phase 2. Baxter also noted the presence of a number of long bones with spiral fractures to the shafts, indicating bone cracking for marrow removal. The Phase 2 red deer cranium (Ditch F5003, L5004), with the pedicels and one antler burr preserved, seems to have suffered a (probably post-mortem) axe blow to the frontal bone and chops to the posterior right pedicel. The evidence from this deer cranium suggests that some antler at least was collected from hunted deer.
Pathology

No pathologies were noted in the bone database but some cattle pathologies were noted in the original bone report. All those reported on involved the broadening of the distal articulations of metacarpals and metatarsals and following Bartosiewicz et al. (1997) were thought likely to relate to the use of cattle for traction. These pathologies occurred in Phases 2 and 3.

Discussion

Examination of the two datasets showed a great deal of similarities between the two areas of the site. Some allowance did have to be made for the differences in recording methods and some incompatibility of data but broad patterns were often similar.

Domestic mammal species present on the site were cattle, horse, sheep, pig, dog and cat. Cats were only represented by a single bone from an undated context and may not have been present during the Roman period. Pigs and dogs were present in very small numbers. Horses were present in surprisingly large numbers and were overall more numerous than sheep. Cattle were by far the most numerous species and accounted for 65% of the domestic mammal assemblages in most cases. Bird bones were present in small numbers and mostly belonged to domestic chicken; some goose bones, probably also domestic, were also present.

Wild species were present in very small numbers and included red deer and fallow deer; the latter being represented by a single antler fragment that may have been imported. Badger, hare, frog or toad and crow were also represented.

Cattle appear most likely to have been used for prime meat and for traction. The presence of a small number of very young animals and older breeding age animals would indicate that animals were being bred on site. Sheep and pigs also appear to have been used as prime meat animals. Adult sheep were present on the site and it seems likely that their wool would also have been utilized and that some sheep breeding may have taken place on site. No adult pigs appear to have been present so it seems unlikely that pigs were bred on site; however the presence of one or two

particularly young animals suggests this may have taken place. Body part representation for cattle, sheep and pig indicates that whole carcasses were present on the site. How many of these were bred on the site and how many were brought in from elsewhere is impossible to say.

The relatively large quantity of horse bones found at the site is interesting and deserving of more detailed discussion. Overall horses make up 17% of the domestic mammal assemblage and in Phase 4 for the main excavation area they comprise 20% of the domestic mammal bones and in Phase 2 in the new surgery excavation area they account for over 20% of the recorded domestic mammals. This is a very high percentage compared to most Romano-British sites in the east of England. At Roman Braintree horses made up 2.5% of the assemblage (Smoothy 1993), at Roman Coggeshall they made up 6.5% of the assemblage (Bedwin 1988) and at Nazeingbury in Essex they account for 3.9% of domesticates. At Rayne, also in Essex a higher percentage of horse bones was found (10.4%) but these were partially inflated due to the presence of a fragmented skull (Smoothy 1989) and MNI figures show a much lower proportion of horses compared to cattle and sheep/goat.

The other notable feature of the horse assemblage is it similarity in terms of fragmentation and dispersal to the cattle bone assemblage. As found at Rayne (Smoothy 1989) horse bones are usually much less fragmented than those of cattle. Additionally they are more likely to be found as complete burials or in semi-articulated groups given their lower likelihood of being used for food and their frequent status as companion or work animals.

The age distributions of horses tended to indicate the presence of mostly adult animals with a small number of juveniles. One possible reason for there being so many horses at the site could be that horses were being bred there for sale outside the site. However the age profile and bone fragmentation does not seem to fit with this theory. While there are plenty of breeding age animals on the site there are no very young neonate animals that one may expect to find as a result of natural deaths. The presence of juveniles also seems at odds, as one may expect these to have been sold off away from the site. It also seems likely that long lived and well cared for breeding stock would have been dismembered and widely distributed across the site after death.

A second possibility is that horse carcasses were being processed at the site i.e. that the site partly functioned as a knackers yard where animals were brought at the end of their life or in the case of the juveniles following accidental death or premature death from disease. It should be noted that some of the Phase 2 horse bones did bare butchery marks and some horse meat may have been used for human consumption throughout the phases; however butchery marks are much less frequent than they are for cattle and sheep. The presence of a knackers yard at the site would fit well with the data presented. Processing of bones for grease and glue would result in dismembered, fragmented and dispersed carcasses of mostly adult animals. If this was a local centre for horse carcass processing this may explain the high horse numbers found at the site, if horses or horse carcasses were being brought in from around the area. Additionally the act of processing and dismembering the carcasses would increase the fragment count per individual horse.

If horse bones from other sites are generally less fragmented this would result in lower fragment counts and lower % NISP.

3.10 The shell

Julia E. M. Cussans

Introduction

A small dispersed assemblage of marine molluscs is examined. The majority of shells belong to the native oyster. Various opening methods and other modifications are noted. Parasitic infestations are fairly common.

Method

Shells were recorded on a context by context basis on a shell scan form. This took account of shell preservation, rated from very poor through to excellent and a semi-quantitative assessment of the presence of abraded shells and fresh breakages (none, few, some, many). Shells were identified to species where possible and counted using the following scheme: for bivalves left and right or upper and lower valves with umbos present were separated and counted, any remaining fragments were also noted. Gastropods were counted only if the apex of the shell was present, again fragments were noted separately. The presence of shells bearing any signs of human modification, parasites or disease was noted. Notes were made on any points of interest within each context.

The data were entered into an Excel spreadsheet and sorted by phase. Minimum numbers of individuals (MNI) were calculated for each species and phase. For bivalves this was whichever was the greatest of the number of left or right valves (no valve pairing was attempted) and for gastropods this was the same as the number of apices. The number of countable shells to deposit ratio for all shells was also calculated for each phase to indicate if the intensity of shell exploitation changed between phases.

Preservation

Shell preservation was mostly rated as ok with smaller numbers of contexts rated as having good or poor preservation and very small numbers rated as very poor or excellent. The majority of shells showed low levels of abrasion and fresh breaks were fairly common. Overall the shells were relatively complete with very few small fragments present.

Quantification

Nearly 250 countable shells were present in the hand collected shell assemblage from phased deposits, as were a number of shell fragments. Additional shells were found in unphased deposits and are not reported on here as they contain no

additional information. Shell quantities are shown in Table 39. Native oysters (*Ostrea edulis*) are by far the most common shell species with an MNI of 124 and are represented by roughly even numbers of upper and lower valves. Mussels (*Mytilus edulis*) were the next most common marine mollusc species, but were present in much smaller numbers with an MNI of just 8; more right valves than left valves were present but given the small quantities involved, little can be read into this. The only other marine species present was the common whelk (*Buccinum undatum*) with a total MNI of three. Oysters were present in all four Roman phases, mussels were present in all phases except Phase 1 and whelks were present in Phases 2 and 3. Phase 1 only had a very small assemblage with shells deriving from only two deposits; Phase 2 had the largest assemblage with 110 countable shells from 46 deposits. The ratio of shells to deposits is fairly even through all of the phases being just either side of two. Phase 2 has the highest shell to deposit ratio and Phase 3 the lowest; however there appears to be little variation in the intensity of marine mollusc exploitation throughout the period of Roman occupation.

	Oysters				Mussels				Whelks				
Phase	Lower	Upper	Frag	MNI	L	R	Frag	MNI	Apex/ MNI	Frags	Number of deposits	Total Countable	Shell to deposit Ratio
1	3	1	0	3	0	0	0	0	0	0	2	4	2.0
2	51	54	59	54	2	1	2	2	2	0	46	110	2.4
3	25	21	22	25	0	3	2	3	1	0	30	50	1.7
4	35	42	17	42	2	3	7	3	0	0	36	82	2.3
Total	114	118	98	124	4	7	11	8	3	0	114	246	2.2

Table 39. Quantification of shell species by phase.

Human Modifications

Overall more modifications were found on lower valves than upper ones with around 19% of lower valves affected and 17% of upper valves, phase by phase details are given in Table 40. Modifications took a variety of forms with the majority appearing to have resulted from opening the oysters for consumption. Opening or shucking marks usually took the appearance of a notch missing from the ventral edge (opposite the hinge) and were most commonly of the V-shaped form, however W- and U-shapes notches were also observed as was more slight damage with poorly defined shape, thought likely to also have resulted from oyster opening; such notches were found throughout the phases. As the oysters themselves were quite finely dispersed throughout the deposits with no large deposits of oysters present no coherent groups or patterns of opening notches were present.

	Lower			Upper		
Phase	Total	Modified	% Mod	Total	Modified	% Mod
1	3	1	33.3%	1	0	0.0%
2	51	12	23.5%	54	9	16.7%
3	25	7	28.0%	21	4	19.0%
4	35	2	5.7%	42	7	16.7%
Total	114	22	19.3%	118	20	16.9%

Table 40. Quantification of modified oyster valves by phase.

Other modifications included chops or breaks across the ventral edge of the shells; these were present on both upper and lower valves. The purpose of such an action is unknown but they may have resulted from a crude method of opening. A small number of the valves had holes pierced or drilled through them; all of these occurred in shells recovered from Phase 4 deposits. One lower valve had a circular hole made through the centre of the valve; an upper valve had a sub-rectangular hole punched through it, also roughly central. A final upper valve had a circular hole made in the dorsal end of the shell, just below the hinge and would have allowed the shell to be used as a rather attractive pendant, although this cannot be confirmed with any certainty.

Parasites

Parasitic infestations were noted throughout the assemblage, with varying proportions of contexts being affected in each phase. No parasites were noted on Phase 1 shells, but as previously mentioned this was a very small sample. Proportions of contexts affected for Phases 2, 3 and 4 are 22%, 20% and 11% respectively. Two main types of parasitic infestation were noted; these were polychaete worm burrows most likely of the species *Polydora ciliata* and sponge borings of the species *Cliona calata*. A small number of the shells with sponge borings had been very severely affected, giving a honeycomb appearance to the shells all the way through to the internal surfaces and these shells would not have been collected as live oysters. Where the polychaete worm burrows were noted these were only ever found in the outer surface of the shells and would not have had an adverse effect on the health of the oysters.

Summary

Oysters were by far the most numerous marine mollusc species exploited of the site and were a consistent presence throughout the Roman period. Opening methods appear to have been fairly varied, but with the V shaped notch being most common, at least of the visible opening methods. Parasitic infestations were relatively common in the shell assemblage but in most cases would not have affected the health of the oysters. Some of the shells may have been put to other uses once the oysters had been eaten; one example may have been used as a pendant.

3.11 The archaeobotanical samples

By Kate Nicholson, University of Leicester, School of Archaeology and Ancient History, with additions by John Summers

Introduction

Archaeological Solutions Ltd carried out two phases of excavation at Tunbridge Lane, Bottisham, Cambridgeshire, during 2006-2007. The site is thought to represent part of a third to fourth century farmstead or small settlement; its features have been subdivided into four phases (1: pre/early 3rd century AD; 2: 3rd century AD; 3: late 3rd to early 4th century AD; 4: 4th century AD). During excavation, 213 samples were taken for the recovery of charred plant macrofossils in accordance with a judgement-based sampling strategy. Initial post-excavation work (McConnell *et al.* 2008) showed that 136 of these samples came from phased contexts (Phase 2, 63 samples; Phase 3, 48 samples; Phase 4, 25 samples). These were selected for full analysis.

This report begins by describing the composition of the samples, thus identifying the crop species cultivated at Roman Bottisham. It goes on to consider the ways in which crops were stored, processed and utilised at the site, providing an insight into the site's economic base and the organisation of its labour. The extensive sampling strategy employed at this site, along with the decision to analyse all phased samples, has allowed consideration of the spatial aspects of crop processing and utilisation, showing how different areas were used, and how this altered over time. In addition to these considerations, autecological analysis of the weed assemblage has allowed characterisation the site's arable regime. The drawing together of all of these lines of evidence has allowed this archaeobotanical report to offer a true insight into life at Bottisham in the Roman period.

Methodology

Flotation was carried out by staff at Archaeological Solutions Ltd; the flots were collected in a 0.5mm mesh sieve and air dried. In most cases, the entire flot was sorted. The exceptions to this were a small number of very rich samples (1.107, 1.28, 1.75, 1.81, 1.103), which were sub-sampled using a riffle box to reduce them to a manageable size. All sub-samples contained more than the 384 items required to ensure that they are representative of the sampled material (cf. Van der Veen and Fieller 1982). Flots were sieved into >2mm, >1mm and >0.5mm fractions to aid sorting, and were examined using a binocular microscope at resolutions of x6 to x50. Plant macrofossils were removed from the flots, and identified by species and plant element with reference to the Leicester University Botanical Reference Collection, and counted. Where broken items were present, counts represent the minimum number of individual items. The identified items are listed in Appendix 1; nomenclature and ordering of non-economic species follows Stace (1997). Definite and cf. identifications were combined in the following analyses.

The number of items per litre of deposit was calculated for each sample in order to determine sample richness (cf. Van der Veen and Jones 2006; Van der Veen 2007). High density samples (≥21 items/litre of deposit) probably represent rapid/single

event deposition, while low density samples (3-13 items/litre of deposit) are more likely to have accumulated gradually, in the course of day to day activity. Samples of intermediate density are more difficult to interpret. Very low density samples (<3 items/litre of deposit) are considered to represent items accidentally incorporated (e.g. blown by wind) into the fills of features with which they have no further association and are discounted from all further analyses. The cut-off points used here are to some extent arbitrary, but fit well with the data from this site.

The crop processing derivation of the samples was determined through the calculation of a series of ratios designed to quantify the compositional differences between each sample and an unprocessed harvest (cf. Van der Veen 1992, 82-84; Van der Veen and Jones 2006; Van der Veen 2007). Evidence for malting (the arresting of grain germination by exposure to heat following the conversion of grains' stored starch to sugars) was also identified by the calculation of ratios to identify samples in which germinated grain was present in significant quantities. Letter-designation of ratios, with the exception of Ratio I, follows Van der Veen (2007). Interpretation of ratios follows Van der Veen (2007) for ratios A and E, Van der Veen (1992, 82-84) for Ratios B, C and D, and Van der Veen (1989) for Ratios G and I.

- Ratio A - straw nodes:cereal grains.
    - High ratios suggest by-products of early-stage crop processing (threshing, winnowing, coarse-sieving). Low ratios suggest products of these stages (i.e. products or by-products of late-stage crop processing).
- Ratio B_1 - barley rachis internodes:barley grains; Ratio B_2 – bread wheat rachis internodes:bread wheat grains.
    - For both species, the ratio in a live plant or unprocessed harvest is 0.3. Ratios significantly higher than this (>0.4) suggest by-products of early-stage crop processing. Ratios significantly lower (<0.2) suggest the products or by-products of fine-sieving. Ratios approximating 0.3 (0.2-0.4) would be consistent with an unprocessed harvest.
- Ratio C: glume bases:glume wheat grains
    - In a live plant or unprocessed harvest, the ratio is 1. Ratios significantly lower than this (<0.2) suggest dehusked grain (i.e. the product of fine-sieving). Ratios approximating 1 (0.2-1.5) are consistent with grain in spikelet form. Ratios greater than 1.5 are consistent with fine-sieving by-products.
- Ratio D: weed seeds:cereal grains
    - High ratios suggest by-products of late-stage crop processing (fine-sieving/hand-cleaning). Low ratios suggest the clean grain product of these activities.
- Ratio E: large weed seeds:small weed seeds
    - High ratios suggest by-products of fine-sieving. Low ratios suggest products of fine-sieving or by-products of hand-cleaning.
- Ratio G: ungerminated:germinated grain:
    - Ratios of <0.15 are consistent with accidental germination of stored grain. Ratios >0.75 indicate malting. Intermediate ratios should be interpreted on a sample by sample basis, with ratios as low as *c.* 0.2 potentially indicative of inefficient malting practice. This ratio was calculated both by species and by total grain. Owing to poor preservation, all values for this ratio represent the minimum proportion of germinated grains originally present.
- Ratio I: coleoptiles:grains (cf. van der Veen 1989)

- Ratios significantly greater than 1 suggest the by-product of malt-cleaning prior to grist-milling in preparation for brewing.

Each ratio was calculated for all samples containing ten or more relevant items and having a density greater than 3 items/litre of deposit. The total count of glume bases included both *Triticum spelta* and *Triticum* sp. Wheat grains not identified to species were split between the spelt and bread wheat totals according to the proportion of wheat accounted for by each species in the sample. Indeterminate cereal grains were split between the spelt wheat, bread wheat and barley totals according to the proportion of each sample accounted for by each species (cf. Van der Veen 1992, 82). Weed seeds were categorised as large or small following Jones (1984) and Van der Veen (1992, table 7.4; Table 41). Species which were not present in these studies were categorised by visual comparison to those which were. Where it was not possible to identify seeds to species level, the size category given is appropriate to the seeds present in the samples; where the appropriate categorisation varied within an identification to genus or family, seeds were categorised on an individual basis.

Large weed seeds	Small weed seeds	Individually categorised
Fallopia convolvulus, Lithospermum arvense, Lapsana communis, Vicia/Lathyrus sp., Large Poaceae indet., *Avena* sp., *Bromus* sp.	*Chenopodium* sp., *Silene* sp., *Silene* cf. *dioica.,* Polygonaceae indet., *Rumex* sp., Malvaceae indet., *Malva* sp., Brassicaceae indet., Lamiaceae indet., Asteraceae indet., *Centaurea* sp., *Anthemis cotula*, *Tripleurospermum* sp., Cyperaceae indet., *Cladium mariscus, Carex* sp., Small Poaceae indet., *Festuca/Lollium* (small) sp., *Setaria* sp.	Caryophyllaceae indet., *Vicia* sp., Indet. seeds.

Table 41: Weed seed size categories

The ecology of the weed species growing within a crop is indicative of the natural and anthropogenic conditions under which that crop was grown, and can thus be informative as to edaphic (soil) conditions and cultivation practice. Ellenberg numbers (cf. Ellenberg 1979; Ellenberg *et al.* 1991), i.e. indicators of tolerance, for soil fertility (i.e. nitrogen content), acidity, moisture and salinity were recorded for each species present in the assemblage (data from Hill *et al*. 2004). These were grouped into broader categories, based on the range of conditions tolerated by each species; the number of seeds in each category was counted and tabulated. In addition, information on plant height (data from Hill *et al* 2004, classification after Bogaard *et al.* 2001), perennation (data from Hill *et al.* 2004), regenerative ability of perennials (data from Hillman 1981; Van der Veen 1992, 137), onset and duration of flowering period (information from Hanf 1983, classification after Bogaard *et al*. 2001) and germination time (from various sources including Van der Veen 1992 and Hanf 1983) was recorded, categorised and the relevant seeds counted. Where identifications were to genus (or to two possible genera) the range of possible categories was recorded; ranges narrow enough to be interpretable were quantified alongside the values from weeds identified to species; ranges too broad to be informative were discounted. Identifications to family were excluded from the analysis of weed ecology. Evaluations of species' preference for particular soil-types (e.g. Hanf 1983; Stace 1997; Preston *et al*. 2002) were also noted and considered. To discount any possible biases caused by the dominance of *Bromus* sp. in all crop-

processing groups, seeds in categories which include this species were quantified both including and excluding it.

Results: sample composition

All plant macrofossils had been preserved through carbonisation. Preservation was generally poor, meaning that many grains and seeds could not be identified to species level. There were some exceptions to this, and grain preservation was mostly better in the samples from the Phase 2 ovens than in other samples. All identifications are recorded in Appendix 1. Assemblage composition is summarised by phase in Table 42.

	Phase 2	**Phase 3**	**Phase 4**
Total grain	3134	2777	391
% spelt wheat*	35%	41%	34%
% barley*	28%	23%	23%
% bread wheat*	1%	1%	0%
% indet. cereal	36%	35%	43%
Total chaff	12077	10629	1168
% glume bases	99.5%	99.7%	98.8%
% Rachis internodes	0.4%	0.3%	1%
% Awn fragments	negligible	0%	0%
% Straw nodes	negligible	negligible	0.2%
Total weeds	1389	960	141
Weeds as % of total identifications	8%	7%	8%
Total hazelnut shell fragments	2	2	0

*Definite and cf. identifications included

Table 42: Summary of assemblage composition by phase

Wild foods were minimally represented by nutshell fragments, some identifiable as hazelnut, in Phases 2 (1.78 and 1.103) and 3 (1.98, 1.101 and 1.126) samples, but the assemblage is primarily comprised of the grains and chaff of cultivated cereals and the seeds of their accompanying weeds.

In all three phases spelt wheat (*Triticum spelta*) was the main crop species, with barley (*Hordeum vulgare*, the species identification being indicated by rare asymmetrical grains) also present as a significant sample component. Owing to poor preservation, high proportions of grain in all phases could be identified only as *Cerealea* indet. Bread wheat (*Triticum aestivum/durum*) was also present in some Phases 2 and 3 samples, notably in those from the Phase 2 ovens and associated features, but never in significant quantities. Spelt wheat and barley are frequently represented in the chaff assemblage, the glume bases of the former being present in far greater quantities than the rachis internodes of the latter, as expected given their differential survival of the carbonisation process (cf. Boardman and Jones 1990). Two bread wheat rachis internodes were also present in the Phase 3 assemblage. A total of just eight straw nodes was present in the site assemblage. Detached coleoptiles (grain sprouts) were present in small numbers in all phases, but were

more scarce in Phase 4 than in Phases 2 and 3, and were absent in Phase 3 samples from Area 2.

In Phase 2 Sample 2.57 barley grains were present in large numbers (249 definite and cf. identifications), and rachis internodes in relatively high numbers (12), but spelt wheat was absent. In other samples (Phase 2, 1.49; Phase 3, 1.40 and 2.3) where barley grains outnumbered (or were approximately equal in number to) spelt grains the numbers of indeterminate wheat grains were high, meaning that wheat continued to dominate over barley. The composition of Sample 2.57 indicates that, at least in some instances during Phase 2, spelt and barley were grown as separate crops. Bread wheat is thought to have occurred only as a minor component of other crops, and not to have been cultivated in its own right. Oats (*Avena* sp.) were present in very small quantities in four samples from Phases 2 and 3, but it was not possible to tell whether these were of domesticated or wild variety. In either case they (along with the ubiquitous *Bromus* sp.) are considered to represent another incidental minor component or weed of the wheat and barley crops. The same is probably true of the small numbers of indeterminate pulses identified in six Phase 2 and 3 samples and single cf. *Pisum sativum* (Phase 2) present in the assemblage. Pulses (or legumes) are also attested by an indeterminate pod in Phase 2 Sample 2.52.

The dominance of spelt wheat, with barley as a subsidiary crop, is typical of assemblages from Roman sites in the east of England, though several also include emmer wheat (*Triticum dicoccum*) as another subsidiary crop (Murphy and De Moulins 2002). The approximately contemporary archaeobotanical assemblage from 31 Tunbridge Lane, Bottisham, was similar in composition, though rye (*Secale cereale*) grain was also identified there (Fryer 2008). The lack of significant variation in the assemblages between the phases (particularly between Phases 2 and 3) is unsurprising given their chronological overlap and the relatively short duration of activity at the site, but is also typical of Roman sites in the east of England (Murphy and De Moulins 2002).

The weeds are dominated by Poaceae (grasses), mainly large (approximately grain-sized) seeded species. Where closer identification was possible, these were mostly *Bromus* sp. (*secalinus/mollis* type). The small Poaceae in all three phase included seeds which could not be identified to species but resembled *Festuca* sp. or small *Lolium* sp. in size and form. Other weed seeds identified to genus or species were *Chenopodium* sp., *Rumex* sp., *Fallopia convolvulus*, *Anthemis cotula*, *Tripleurospermum* sp., *Centaurea* sp., *Cladium mariscus*, *Carex* sp., *Vicia/Lathyrus* sp. (smaller than the pulses), *Silene* cf. *dioica*, *Silene* sp., *Malva* sp., *Lithospermum arvense* and *Lapsana communis*. A tuber of *Arrhenatherum elatius* ssp. *bulbosum* was present in Phase 2 Sample 1.76 and an indeterminate tuber in Phase 2 Sample 1.49. In addition, indeterminate Polygonaceae (Phase 3, 1,101 only), Lamiaceae (Phase 2, 1.76 only). Brassicaceae (Phase 3, 1.126 only), Malvaceae (Phase 4, 1.35 only), Caryophyllaceae, Asteraceaea and Cyperaceae were present. Weeds (except Poaceae) were poorly represented (a maximum of 6 seeds per species in most samples) by comparison to cereal grain and chaff, accounting for just 7 or 8% of the assemblage in each phase. This is probably owing to the derivation of most samples from the later stages of crop processing (see below). Similar assemblages have been encountered at other Roman sites in the region (Murphy 2004, 338). The

approximately contemporary assemblage from 31 Tunbridge Lane, Bottisham, was similar in composition but also included *Agrostemma githago* and *Eleoarchis palustris*.

A single *Portulaca oleracea* seed in Sample 1.37 is carbonised, but is thought to represent modern contamination of the sample, as this species is a relatively recent introduction to mainland Britain (Stace 1997, 155); this seed is not included in further analyses of the weed assemblage.

Deposition rates

Sixty-seven very low density samples (<3 items/litre of deposit) are considered to represent accidentally incorporated (e.g. wind-blown) debris (Table 43). These samples were also sparse in terms of overall numbers of identifications, each containing fewer (in most cases significantly fewer) than 50 identified items. These samples were excluded from all further analyses.

	Phase 2	**Phase 3**	**Phase 4**
% of samples having very low density	41%	56%	56%
Samples of very low density (grouped by area of site).	Rectilinear Enclosure: 2.10, 2.17, 2.18, 2.25, 2.39, 2.40, 2.42, 2.43, 2.46, 2.50, 2.56, 2.59, 2.62, 2.63, 2.64, 2.84, 2.85. Curvilinear Boundary: 2.19 Field System: 1.52. Northern Composite/double-ditched boundary: 1.30, 1.37, 156, 1.65, 1.72. NW Enclosure: 1.6, 1.17.	Rectilinear Enclosure: 2.23, 2.24, 2.26, 2.27, 2.28, 2.36. 2.37, 2.38, 2.45, 2.47, 2.48, 2.55, 2.58, 2.60, 2.61, 2.66, 2.67, 2.69. Field/Paddock: 1.60, 1.119, 1.120, 1.121, 1.89 NW Enclosure: 1.5, 1.8, 1.9, 1.39.	Boundary: 2.1, 2.5, 2.16, 2.29, 2.32, 2.49 Pit F2903: 1.112 Quarry Pits: 1.35, 1.45, 1.48, 1.54, 1.73, 1.74. NW Enclosure: 1.7

Table 43: Samples representing accidentally incorporated debris

The possibility that the very low density samples result from inadequate sample volumes (i.e. that the samples were too small to be representative of the items present in the sampled deposits) has been considered, but no correlation between sample size and sample density was found. Very low density samples accounted for 27% of 10L samples but for 48% of 15L samples, 57% of 25-35L samples and 60% of ≥40L samples. A closer correlation was found between very low sample density and the area of the site from which samples were taken (Figs. 34-36). In all three phases, most of the samples from Area 2 of the site were of very low density, suggesting that plant processing activities did not normally take place in this area.

Crop processing and malting

All samples not interpreted as wind-blown/accidentally incorporated debris are summarised in Tables 44 to 46. The density of each sample is shown, along with its

values of ratios A-I (see *Methodology*). This is followed in the lower parts of the tables by an interpretation of each sample in terms of crop processing derivation and evidence for malting. These interpretations are discussed further below. Figures 34-36 show the location of many of the more significant samples/groups of samples in order to allow some functional interpretations of certain features/structures.

	NW Enclosure		Cobbled Surface		Ovens											
Sample no.	**1.4**	**1.44**	**1.33**	**1.38**	**1.23**	**1.28**	**1.29**	**1.34**	**1.75**	**1.76**	**1.78**	**1.81**	**1.82**	**1.83**	**1.103**	**1.10**
Feature	**F2034B**	**F2085E**	**F2158**	**F2158**	**F2123A**	**F2123B**	**F2123E**	**F2123J**	**F2579**	**F2576**	**F2576**	**F2579**	**F2576**	**F2576**	**F2579**	**F27**
Context	**L2035**	**L2219**	**L2180**	**L2180**	**L2124**	**L2107**	**L2129**	**L2144**	**L2580**	**L2588**	**L2619**	**L2638**	**L2593**	**L2599**	**L2853**	**L28**
Feature Type	**Ditch**	**Ditch**	**Layer**	**Layer**	**Gully**	**Gully**	**Gully**	**Gully**	**Oven**	**Oven**	**Oven**	**Oven**	**Oven**	**Oven**	**Oven**	**Pit**
Items/litre deposit	11.13	3	5	8	15	179	60	17	180	43	37	528	108	15	165	68
Ratio A	0.00			0.00		-	-	-	-	-	-	-	-		-	-
Ratio B_1	-	-	0.06	-	0.00	0.00	0.00	-	0.02	0.04	0.00	-	0.00	0.00	0.00	0.45
Ratio B_2		-	0.00		-	-	-	-	0.00	0.00	-	-	-	-	-	0.00
Ratio C	9.16	0.43	0.68	1.59	1.23	12.29	7.03	4.85	2.02	1.60	3.09	5.38	4.01	1.10	6.97	9.06
Ratio D	1.13	0.00	0.07	0.14	0.19	0.20	0.19	0.36	0.16	0.72	0.15	0.64	0.27	0.26	0.83	0.72
Ratio E	1.57	-	-	-	2.17	3.60	11.00	2.50	5.75	0.73	4.80	15.33	3.67	1.57	5.36	10.8
Ratio G (spelt wheat)	-	0.00	0.26	0.45	0.17	0.20	0.25	0.07	0.02	0.33	0.09	0.21	0.24	0.50	0.17	0.23
Ratio G (indet. wheat)	-	-	-	0.00	0.14	0.00	.014	0.08	0.00	-	0.12	0.03	0.18	0.33	0.21	0.00
Ratio G (barley)	-	-	0.31	-	0.11	0.00	0.00	-	0.09	0.12	0.00	-	0.04	0.20	0.07	0.08
Ratio G (total grain)	0.25	0.00	0.22	0.11	0.12	0.07	0.16	0.05	0.03	0.14	0.04	0.09	0.10	0.26	0.14	0.14
Ratio I	0.31	0.00	0.02	0.05	0.04	0.19	0.04	0.13	0.05	0.05	0.01	0.01	0.08	0.06	0.06	0.14
Sieved spikelets		✓	✓m		✓m									✓m		
Clean spelt grain																
Barley fine-sieving product/by-product																
Spelt fine-sieving by-product (low density)	✓			✓m												
Spelt fine sieving by-product (int./high density)						✓m	✓m	✓	✓	✓m	✓	✓m	✓m		✓m	✓m

	Composite/double-ditched boundary				Field system										
Sample no.	**1.31**	**1.32**	**1.47**	**1.49**	**1.27**	**1.58**	**1.93**	**1.100**	**1.107**	**1.114**	**1.115**	**1.118**	**1.122**	**1.123**	**1.124**
Feature	**F2146A**	**F2148A**	**F2203B**	**F2148C**	**F2098A**	**F2098D**	**F2405**	**F2804A**	**F2804C**	**F2731G**	**F2970**	**F2950C**	**F3023B**	**F2731H**	**F2801H**
Context	**L2147**	**L2149**	**L2230**	**L2237**	**L2099**	**L2278**	**L2406**	**L2803**	**L2847**	**L2945**	**L2888**	**L3008**	**L3081**	**L3125**	**L3126**
Feature Type	**Gully**	**Gully**	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**PH**	**Ditch**	**Ditch**	**Ditch**	**Pit**	**Ditch**	**Ditch**	**Ditch**	**Ditch**
Items/litre deposit	30	14	6	89	41	10	25	27	105	41	4	5	4	58	18
Ratio A	-	0.00	0.00	-	-		-	-	-	-		0.06	0.00	-	0.02
Ratio B_1	-	0.04	-	0.01	0.30	0.00	-	0.07	0.47	0.14	-	-	-	0.40	0.07
Ratio B_2	-	-		-	-	-	-	0	-	-	-			0	-
Ratio C	10.59	0.55	6.43	1.68	4.95	0.74	7.88	4.99	20.00	7.45	1.04	1.58	3.07	12.14	8.91
Ratio D	0.85	0.07	0.39	0.63	0.30	0.39	0.41	0.78	0.38	0.26	0.18	0.39	0.27	0.29	0.29
Ratio E	10.33	4.00	-	-	31.00	1.31	5.33	1.67	1.00	0.91	0.25	0.17	1.00	0.48	1.46
Ratio G (spelt wheat)	-	0.23	-	0.09	0.11	0.00	0.16	0.15	0.45	0.17	0.00	-	0.23	0.09	0.21
Ratio G (indet. wheat)	-	0.32	-	0.03	0.20	0.00	-	0.00	-	0.20	0.00	-	-	0.09	0.00
Ratio G (barley)	-	0.32	-	0.03	-	0.00	-	0.00	-	-	-	-	-	0.00	0.15
Ratio G (total grain)	0.00	0.26	0.08	0.03	0.06	0.00	0.09	0.07	0.11	0.10	0.00	0.06	0.12	0.05	0.08
Ratio I	0.15	0.01	0.06	0.10	0.08	0.09	0.00	0.03	0.47	0.23	0.00	0.00	0.00	0.22	0.14
Sieved spikelets						✓					✓				
Clean spelt grain															
Barley fine-sieving product/by-product															
Spelt fine-sieving by-product (low density)			✓									✓	✓m		
Spelt fine sieving by-product (int./high density)	✓	✓m		✓	✓m		✓m	✓	✓m	m✓				✓	✓m

	Curvilinear boundary				Rectilinear enclosure	
Sample no.	**2.20**	**2.21**	**2.52**	**2.53**	**2.54**	**2.57**
Feature	**F4278B**	**F4278C**	**F4296D**	**F4296B**	**F4168B**	**F4168E**
Context	**L4290B**	**L4277C**	**L4295D**	**L4295B**	**L4170B**	**L4237**
Feature Type	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**Ditch**
Items/litre deposit	6	10	13	12	4	21
Ratio A	0.00	0.00	0.00			0.004
Ratio B_1	0.00	-	0.04	0.00	0.00	0.04
Ratio B_2	-			-	0	0.00
Ratio C	0.09	1.72	1.95	1.10	0.69	0.00
Ratio D	0.06	0.18	0.23	0.09	0.02	0.06
Ratio E	-	-	32.00	4.33	0.00	0.60
Ratio G (spelt wheat)	0.18	0.14	0.05	0.12	-	-
Ratio G (indet. wheat)	0.00	0.00	0.00	0.00	-	-
Ratio G (barley)	0.00	0.00	0.00	0.00	-	0.06
Ratio G (total grain)	0.06	0.07	0.01	0.05	0.00	0.05
Ratio I	0.00	0.00	0.04	0.02	0.02	0.00
Sieved spikelets				✓	✓	
Clean spelt grain	✓m					
Barley fine-sieving product/by-product						✓
Spelt fine-sieving by-product (low density)		✓	✓			
Spelt fine sieving by-product (int./high density)						

Table 44: Crop processing and malting: ratios and interpretation, Phase 2 samples. m = (possible) indication of malting.

	NW Enclosure						Field/paddock						Industrial feature	
Sample no.	**1.1**	**1.2**	**1.3**	**1.15**	**1.22**	**1.40**	**1.18**	**1.51**	**1.70**	**1.99**	**1.126**	**1.125**	**2.3**	**2.87**
Feature	**F2008**	**F2017A**	**F2017B**	**F2078A**	**F2052C**	**F2052B**	**F2092A**	**F2092C**	**F2494**	**F2729**	**F3143**	**F3119B**	**F4148C**	**F4148**
Context	**L2009**	**L2018**	**L2033**	**L2079**	**L2119**	**L2198**	**L2091**	**L2242**	**L2495**	**L2688**	**L3144**	**L3104**	**L4147C**	**L4147**
Feature Type	**Ditch**	**Ditch**	**Gully**	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**Ditch**	**Gully**	**Gully**	**Pit**	**Pit**
Items/litre deposit	4	5	29	10	9	6	9	3	6	9	10	54	3	4
Ratio A	0.00	0.00	0.05	0.00	0.00	0.00	0.00	-		0.00	0.04	0.00		
Ratio B_1	-	-	-	-	-	0.00	-	-	-	-	0.72	0.03	0.00	0.00
Ratio B_2			-						-			-	-	-
Ratio C	4.70	5.46	37.42	6.01	5.71	2.00	5.05	8.33	0.73	2.22	20.09	3.54	1.40	4.18
Ratio D	0.15	0.28	0.25	0.32	0.77	0.21	0.13	0.78	0.17	0.62	1.09	0.39	0.13	0.36
Ratio E	-	-	-	-	2.33	-	-	-	-	1.00	0.47	1.17	-	0.11
Ratio G (spelt wheat)	-	-	-	-	-	-	-	-	0.00	0.00	-	0.18	0.17	0.70
Ratio G (indet. wheat)	-	-	-	-	-	-	-	-	-	-	-	0.03	0.25	-
Ratio G (barley)	-	-	-	-	-	0.18	-	-	-	-	-	0.27	0.00	-
Ratio G (total grain)	0.00	0.11	0.20	0.11	0.00	0.07	0.08	-	0.00	0.00	0.00	0.12	0.09	0.25
Ratio I	0.00	0.06	0.40	0.04	0.00	0.04	0.08	0.11	0.00	0.00	0.30	0.12	0.00	0.00
Sieved spikelets									✓				✓m	
Clean spelt grain														
Barley fine-sieving product/by-product														
Spelt fine-sieving by-product (low density)	✓	✓		✓	✓	✓m	✓	✓		✓	✓			✓m
Spelt fine sieving by-product (int./high density)			✓m									✓m		

	Structure S2661				Rectilinear Enclosure		
Sample no.	**1.79**	**1.97**	**1.98**	**1.101**	**2.6**	**2.7**	**2.8**
Feature	**F2623**	**F2692**	**F2690**	**F2664**	**F4109A**	**F4109B**	**F4109C**
Context	**L2622**	**L2693**	**L2691**	**L2666**	**L4110A**	**L4110B**	**L4110C**
Feature Type	**PH**	**PH**	**PH**	**BS**	**Ditch**	**Ditch**	**Ditch**
Items/litre deposit	189	22	46	194	67	13	13
Ratio A	0.00	0.00	0.00	0.00	0.17		
Ratio B_1	0.00	0.09	0.00	0.05	0.00	0.00	0.04
Ratio B_2	0.00	-	-	-	0.00	-	-
Ratio C	3.21	2.42	1.96	8.73	4.00	1.33	1.08
Ratio D	0.36	0.40	0.19	0.36	7.89	0.10	0.07
Ratio E	3.37	21.00	5.11	1.91	-	4.50	1.45
Ratio G (spelt wheat)	0.13	0.27	0.28	0.16	-	0.37	0.14
Ratio G (indet. wheat)	0.06	0.00	0.06	0.07	-	0.14	0.05
Ratio G (barley)	0.05	0.26	0.02	0.00	-	0.13	0.00
Ratio G (total grain)	0.06	0.17	0.13	0.07	-	0.20	0.09
Ratio I	0.03	0.02	0.00	0.09		0.01	0.00
Sieved spikelets						✓m	✓
Clean spelt grain							
Barley fine-sieving product/by-product							
Spelt fine-sieving by-product (low density)							
Spelt fine sieving by-product (int./high density)	✓	✓m	✓m	✓m	✓		

Table 45: Crop processing and malting: ratios and interpretation, Phase 3 samples. m = (possible) indication of malting.

	NW Enclosure			Quarry pits			Pit F2903	Boundary			
Sample no.	**1.13**	**1.14**	**1.16**	**1.24**	**1.66**	**1.92**	**1.113**	**2.14**	**2.15**	**2.30**	**2.35**
Feature	**F2050B**	**F2050C**	**F2050D**	**F2162**	**F2439**	**F2480**	**F2903C**	**F4217B**	**F4217C**	**F4036J**	**F4036H**
Context	**L2070**	**L2071**	**L2082**	**L2161**	**L2316**	**L2482**	**L2993**	**L4216B**	**L4216C**	**L4037J**	**L4037H**
Feature Type	**Ditch**	**Ditch**	**Ditch**	**Pit**	**Layer**	**Posthole**	**Pit**	**Ditch**	**Ditch**	**Ditch**	**Ditch**
Items/litre deposit	8	6	28	4	4	24	4	3	6	6	3
Ratio A	0.00	0.07	0.00	-	0.00	0.02	-	0.00	0.00		-
Ratio B_1	0.00	-	0.17	-	-	0.00	0.00	-	0.00	0.00	-
Ratio B_2	-	-	-	-	-	-	-	-	-	-	-
Ratio C	7.50	9.25	6.13	5.95	4.23	6.62	0.07	3.00	8.11	0.36	10.00
Ratio D	0.88	0.36	0.49	0.43	0.25	0.39	0.10	-	-	-	-
Ratio E	1.14	-	2.00	-	-	3.33	-	-	-	-	-
Ratio G (spelt wheat)	-	-	-	-	-	0.00	0.04	-	-	0.18	-
Ratio G (indet. wheat)	-	-	0.00	-	-	0.00	-	-	-	-	-
Ratio G (barley)	-	-	-	-	-	0.00	-	-	-	-	-
Ratio G (total grain)	0.00	0.00	0.00	-	0.00	0.00	0.02	0.19	0.06	0.10	-
Ratio I	0.00	0.14	0.20	-	0.10	0.05	0.00	0.04	0.03	0.00	-
Sieved spikelets										✓m	
Clean spelt grain							✓				
Barley fine-sieving product/by-product											
Spelt fine-sieving by-product (low density)	✓	✓		✓	✓			✓m	✓		✓
Spelt fine sieving by-product (int./high density)			✓			✓					

Table 46: Crop processing and malting: ratios and interpretation, Phase 4 samples. m = (possible) indication of malting.

Phase 2

Within the Phase 2 assemblage, of the 37 samples with a density greater than three items per litre, eight (21.6%) were considered to represent sieved spelt spikelets, one (2.7%) clean spelt grain, one (2.7%) barley fine sieving product/by-product and 27 (73%) spelt fine-sieving by-product. Possible evidence of malting was identified in 19 of the samples.

Samples considered to represent carbonised spelt spikelets, were interpreted based on their values for Ratio C (glume bases: glume wheat grains). Values for Ratios D (indicating more grain than weed seeds) and E (indicating more large than small weed seeds) are consistent with the spikelets having been sieved prior to carbonisation. Similarly, the barley in these deposits also appeared to have been sieved prior to carbonisation (Ratio B_1). It is possible that the barley and spelt were sieved together using a grain-sized mesh. This would have removed small weed seeds and any rachis internodes or straw nodes which remained after winnowing and coarse sieving, but retained barley grain, any loose spelt grain and the larger weed seeds.

Samples containing the by-product of spelt wheat fine-sieving were the most numerous. These are represented by high values for Ratio C. Seven of these were of low density, suggesting accumulation in the course of day to day activity, 17 were of high density, suggesting rapid or single event deposition, while three were of intermediate density.

The ratio analysis also produced evidence for the malting of cereals at the site (Ratio G). This is a problematic issue which is difficult to prove categorically. In the Phase 2 assemblage, the proportion of high density samples with a result for Ratio G in excess of 0.15 for any taxon was 61%, while it was only 29% for lower density samples. It is these which have been highlighted in Figure 34 as providing possible evidence of malting, although relatively low proportions of malted grain such as this could also represent a portion of spoiled grain within a stored product. Selecting a higher values (0.3), inevitably produces a smaller number of possible malt deposits. The proportion of samples producing results for Ratio G in excess of 0.3 are 17% (high density, 4 samples) and 14% (low density, 2 samples). Of these, three are associated with oven S2576 and nearby gully F2148A (L2149) (see below).

From Phase 2, there are a number of feature groups which produced multiple samples relevant for further discussion. These are detailed below and shown in Table 44 and Figure 34.

Ovens S2576 and S2579 and associated features

The group of features associated with the two keyhole shaped ovens produced some of the richest samples in the Phase 2 assemblage (Fig. 34, Table 44). The majority of the samples from this area are categorised as high density spelt fine-sieving by-product, being dominated by spelt wheat glume

bases and spikelet forks (high value Ratio C). The material within oven S2576 (L2588, L2593 and L2619) gave values for Ratio C of 1.6, 4.01 and 3.09 respectively. Sample 1.83 of L2599 produced a result of 1.1. Although this puts it in the region of expected results for sieved spelt spikelets, the likely degree of loss of glume bases compared to more durable wheat grains (e.g. Boardman and Jones 1990) is perhaps more likely to indicate a significant proportion of de-husking waste in this sample. In oven S2579, all three samples (L2580, L2638 and L2853) were very rich (108-528 items per litre) and classified as spelt wheat fine-sieving by-products, based on a high value for Ratio C. Most of the oven samples had relatively high values for Ratios D and E, further emphasising the input of fine-sieving by-products.

It is probable that a significant proportion of the remains in these samples represent the fuel used within the ovens. The use of spelt wheat de-husking waste as fuel in kilns and ovens is quite common in the East of England during the Roman period (e.g. Fryer 2004; Murphy 1989; Carruthers 2008, 34.9), as it was more generally in Roman Britain (e.g. Campbell 2008; Huntley 1996; van der Veen 1989). It is possible that a proportion of the grain in these samples represents part of the product being processed within the ovens, although it is difficult to determine what contribution this makes to the sample totals. Within the fine-sieved by-product, there will have been a certain amount of loss of smaller grains which passed through the mesh and ended up in the material used as fuel.

Within both ovens, there is the potential evidence for malting (>0.15 for Ratio G). This is strongest in L2588 and L2599 from oven S2576, which produced values of 0.33 and 0.5 respectively. In addition, sample 1.32 of L2149 (F2148A) produced a slightly higher proportion of germinated grain (0.32) and could have been receiving waste from oven S2576. The interpretation of those with a lower ratio is more problematic since less extensive germination could simply result from grain spoilage prior to processing or while fine-sieving by-products were in store prior to use as fuel (see Phase 3, S2661). However, the frequent occurrence of germinated grain across the site is a good indication that deliberate malting of spelt wheat was a significant part of the site's economy. Indeed, the by-products used as fuel could have come from the processing of spelt that was malted in spikelet form. At Beck Row, Suffolk, a fen-edge agricultural site, carbonised remains associated with a kiln and aisled barn have also been interpreted as the result of malt production/drying (Fryer 2004) during the 2nd to mid 3rd century AD.

Unfortunately none of the surrounding features produced samples which can be reliably interpreted as charred remains of any form of 'product' from either of the ovens. Most of the surrounding features produced samples which can be similarly classified as spelt wheat fine-sieving by-products. Even sample 1.23 from L2124, which is tentatively classified as sieved spelt wheat spikelets, had a higher proportion of glume bases and could easily be seen as containing fine-sieving by-products once differential preservation is considered (e.g. Boardman and Jones 1990).

As such, it is possible to state that the ovens were fuelled by spelt wheat fine-sieving by-products, which can produce an intense, fast burning fire. The comparability of the samples from the majority of the surrounding features suggests that most of the material incorporated into their fills took the form of rake-out from the two ovens. It is possible that the ovens had some role in malting, malt drying or some other cereal drying but the signature for this is difficult to precisely disentangle from the more dominant record of fuel debris.

A probable corndrier was also excavated by CAU at 31 Tunbridge Lane to the north-east of the present site (Kenney 2008). In this feature, spelt fine-sieving by-products were considered to represent the primary fuel used. Although the material was not fully quantified, a qualitative assessment of the material indicated that insufficient numbers of germinated grains and detached coleoptiles were present to indicate malting activity. The presence of some whole spikelets was taken as evidence of the use of the oven for parching the grain prior to pounding and de-husking (Fryer 2008).

Boundary ditches F2804, F2731 and F2801

Samples from ditches F2804, F2731 and F2801 are all classified as spelt wheat fine-sieving by-products, with high results for Ratios C and E. All but L3126 (F2801H) have a high density of carbonised remains, indicating rapid or single event deposition. These features are at some distance from the two Phase 2 ovens S2576 and S2579 and it is possible that another centre of carbonisation originally existed in this part of the site. As with the area surrounding the ovens, the appearance of these samples is of deposits dominated by fuel debris in the form of spelt fine-sieving by-products, perhaps deposited as rake-out from nearby kilns/ovens.

Curvilinear boundary F4278 and F4296

The density of material from these samples was considerably lower than those already discussed from Area 1. A range of interpretations are placed on these samples and they are likely to be mixed deposits accumulated over time, rather than discrete, single episode dumps. Large dumps of spelt wheat fine-sieving by-products are largely absent from Area 2, suggesting that this eastern portion of the site was away from the main areas of cereal processing and the intensive burning of crop processing waste as fuel.

Sample 2.20 (L4290B) had very low values for Ratio C, consistent with interpretation as clean spelt grain. The presence of barley grain but absence of barley rachis (Ratio B_1) is consistent with the interpretation of clean grain. The few weed seeds which remained were not plentiful enough for the calculation of Ratio E, but all were of large size (i.e. approximately grain-sized). The limited occurrence of such material is unsurprising, as the end product of crop processing is less likely to be exposed to fire in the course of day to day events (cf. Van der Veen and Jones 2006; Van der Veen 2007). Ratio G for Sample 2.20 (spelt wheat) may be consistent with accidental

carbonisation during malting. However, this sample was recovered from a ditch in isolation from contemporary malting-related samples and away from the Phase 2 ovens (Fig 34). In addition, the relatively low density of remains (six items per litre) is consistent with a more gradual accumulation of material, indicating that it may not result from a single act of deposition. The germinated grain could, therefore, simply represent spoiled or accidentally germinated grain within the sample.

Boundary ditch F4168

Samples were present from F4168B and F4168E. The former was of low density (4 items per litre) and appears to represent sieved spelt spikelets, based on a result of 0.69 for Ratio C. The other sample, 2.57 of L4237, was dominated by barley and was the only one of its kind from the site. It has been classified as barley product/by-product based on a low result for Ratio B_1. However, it was not possible to accurately determine which of these was represented: Ratio D indicated the dominance of grain over weed seeds, suggesting a grain product, but Ratio E showed that the remaining weed seeds were small, as would be expected in a fine-sieving by-product. However, it is possible to determine that a threshed and winnowed barley crop is present; the only clear evidence of such from the entire site. This is of significance as it demonstrates that barley was grown as a crop in its own right, being processed, stored and used in separation from the spelt wheat crop. It is possible that it represents the accidental burning of a store of barley fodder kept in the vicinity of stock enclosures. In the Roman military, barley was mostly restricted to use as horse fodder (Davies 1971) and could also have been used for a similar purpose at the present site.

Features from the CAU evaluation

A rich sample was present from Trench 3 (F125) of the evaluation, which was equivalent to F2098, and was found to contain abundant cereal grains and spelt wheat glume bases in just three litres of sediment (Roberts 2003). Although not fully quantified, the material appears to represent spelt wheat fine-sieving by-products. The non-cereal taxa were dominated by wild grasses, accompanied by a small number of goosefoot (*Chenopodium* sp.), clover/medick (*Trifolium/Medicago* sp.) and stinking chamomile (*Anthemis cotula*). This is comparable to a number of the other Phase 2 samples already discussed. It should, however, be noted that the sample was taken from the top of the un-excavated feature and may not be representative (Roberts 2003, 18).

Phase 3

From Phase 3, 21 samples were present with a density greater than three items per litre. Of these, four (19%) were considered to represent sieved spelt spikelets and 17 (81%) were consider to represent spelt fine-sieving by-

products. This is a broadly similar scenario to that seen in Phase 2. Three groups of features have been identified which are worthy of further discussion. These are detailed below and presented in Table 45 and Figure 35.

Structure S2661 and associated features

Structure S2661, incorporating beam slots F2664 and F2679 and four postholes (F2623, F2626, F 2690 and F2692), was extensively sampled (Fig. 35). All of the sampled deposits (L2622, L2666, L2691 and L2693) produced a high density of carbonised plant remains (22-194 items per litre). The ratio characterisation of the samples produced a high result for Ratio C for all deposits, as well as Ratio E. This indicates that all contained the carbonised remains of spelt fine-sieving by-products. Three of the four samples were classified as containing evidence of malting, with L2691 and L2693 producing results for Ratio G of 0.28 and 0.27 respectively.

The high density of material is indicative of rapid/single event accumulation which, coupled with the structural interpretation of the features, may indicate that the building and its contents were destroyed by fire. The size of the building lends itself to an interpretation as a storage structure. This raises the possibility that the fine-sieving by-products were stored on the site prior to their use as fuel in ovens and kilns. Under such a scenario, it is possible to envisage some of the grain within the fine-sieving by-product beginning to germinate, which could account for the relatively high proportion of germinated grain. This is clearly of significance in the interpretation of samples of a similar composition from other parts of the site for which evidence of deliberate malting is inferred. If storage of this material is considered possible, there is also the potential that it was stored with the intention of being used as fodder. The stray grains and weed seeds within such by-products can form a useful fodder for animals such as domestic fowl, although evidence of such activities is quite limited from European sites (e.g. van der Veen 1999).

However, it is also possible that the remains may not be directly associated with S2661, instead originating in a nearby hearth, kiln or oven. Large amounts of spent fuel debris from such features could easily have found its way into the fills of the post holes and beam slots of the structure. A possible candidate is the un-dated feature F2897, which had the appearance in plan of a key-hole oven but little other evidence to support such an interpretation, approximately 8m to the north-east of S2661.

Gullies F3119 and F3143

Two samples from closely associated features in the south-west of Area 1 (L3104 in F3119B and L3144 in F3143) were relatively rich and produced evidence of spelt fine-sieving by-products. Sample 1.125 of L3104 was the richer of the two (54 items per litre compared to 10 items per litre) and is likely to represent a rapid accumulation or discrete dump of material. This matches

the trends seen in a large number of the samples from both Phases 2 and 3. The results are likely to represent the deliberate burning of spelt fine-sieving by-products in the vicinity of the sampled features; either as a means of disposal or as fuel in an un-identified hearth, kiln or oven feature.

Industrial feature F4148 and ditch F4109

Sample 2.3 of L4148C (F4147C) and two samples from F4109 (L4110B and C) have been categorised as representing sieved spelt spikelets based on the results of Ratio C. All three produced a low density of carbonised remains (3-13 items per litre) and are probably the result of more gradual accumulation. A further low density sample was present from L4148 (F4147), which has been classified as spelt fine-sieving by-product. Due to the lower density of these samples it is possible that they were receiving material over an extended period of time, perhaps from a range of sources. Under such conditions, the results of 1.33 and 1.4 achieved for Ratio C in Samples 2.7 of L4110B and 2.3 of L4148C, could reflect the presence of a quantity of spelt fine-sieving by-product, taking account of the differential preservation of grain and glume bases (Boardman and Jones 1990).

A higher density sample, 2.6 of L4110A (F4109A), was also classified as spelt fine-sieving by-product and is likely to represent the rapid accumulation of such debris from activities taking place in the immediate vicinity. This may indicate the presence of an oven/kiln nearby, performing a similar role to those in Phase 2.

Due to the nature of carbonised plant macrofossil assemblages, it is more likely that the material present in F4147 and F4109 reflects activity in the area surrounding the sampled features rather than anything relating to the actual role of the features themselves. The low density of the material in F4147 suggests that the intensive use and processing of cereals was not of primary importance in the vicinity of this feature. The higher density of material in F4109, particularly in segment A, may indicate the presence of a hearth or oven burning spelt fine-sieving by-products as fuel in this part of the excavated area during Phase 3.

Phase 4

Fewer rich samples were present from Phase 4, amounting to 11 with a density greater than three items per litre. Of these, one (9%) was classified as sieved spelt spikelets, one (9%) was classified as clean spelt grain and the remaining 9 (82%) were classified as spelt fine-sieving by-products. The results of the ratio analysis are presented in Table 46 and Figure 36.

Ditch F2050

Ditch F2050 runs through the far western part of the site and yielded productive samples from three excavated segments (L2070 from F2050B, L2071 from F2050C and L2082 from F2050D). Sample 1.16 from L2082 in the most northerly part of the feature was the richest (28 items per litre) and was classified as containing spelt fine-sieving by-products. The other two samples, although of lower density (6-8 items per litre) were similarly categorised as spelt fine-sieving by-product. It would seem that a rapid/single event deposition of such material occurred in L2082, while L2070 and L2071 received less concentrated material that was similar in character. It is possible that carbonisation of spelt wheat processing debris was taking place in the vicinity of F2050, perhaps quite close to F2050D

Pits F2411 and F2482

Pit F2411 (L2416) is part of the larger pit cluster F2439 while Pit F2480 (L2482) is a smaller, closely associated feature. Both produced evidence of spelt fine-sieving by-product, with L2482 being considerably richer than L2416 (24 items per litre compared to 3 items per litre). Whatever the role of pit group F2439, it would appear that it was not a focus for the deposition of significant quantities of carbonised plant macrofossils. As for L2482 (F2480), it would appear that it received a deposit of carbonised crop processing waste which was burnt somewhere in its immediate vicinity. As with a number of the other similar deposits, it is difficult to determine whether this was as a result of deliberate disposal or as fuel debris from a nearby hearth, kiln or oven. Based on the area around the Phase 2 ovens S2576 and S2579, the likelihood of this material representing spent fuel debris seems quite possible.

Ditch F4217

Two samples were present from L4216 B and C in the west of Area 2 Both were of a relatively low density (six and three items per litre respectively) and were classified as spelt fine-sieving by-products. The lower density of these deposits is likely to indicate a more gradual accumulation of material, perhaps from mixed sources, although with an emphasis on spelt de-husking waste. Such material may have been deliberately burned for disposal or as fuel but it is not likely that such activities were taking place in the immediate vicinity of F4217. As in previous phases, the samples from the eastern part of the site (i.e. Area 2) are generally less rich than those from Area 1, indicating that cereal processing activities and the extensive use of spelt processing waste as fuel were concentrated in the central and western parts of the excavated area.

Features from the CAU evaluation

A single rich sample was present from Trench 4 (F102) of the evaluation at the site (Wills 2003). This feature is equivalent to Phase 4 ditch F2791=F2884. Although not fully quantified and of a low volume (two litres), the sample was quite rich in material, containing wheat grains and spelt wheat glume bases. A number of non-cereal taxa were also present, with wild grasses dominating. In addition were seeds of vetch/wild pea (*Vicia/Lathyrus* sp.) and bedstraw (*Galium* sp.). A small number of detached coleoptiles were present, representing germinated grain, although apparently only in limited concentration. This material is comparable to other Phase 4 samples and is most likely derived from spelt wheat fine-sieving by-products. As for the previous evaluation sample discussed above, it must be noted that the material was taken from the top of the un-excavated feature and may not be representative (Roberts 2003, 18).

Summary

Throughout all phases is the emphasis on the recovery of spelt fine-sieving by products from the majority of the richer samples. The evidence provided by ovens S2576 and S2579 is indicative of the use of this material as fuel within such features, which is likely to have led to its widespread carbonisation and deposition at the site. It is likely that these by-products were produced on the site from the de-husking of large amounts of spelt wheat and the evidence of S2661 (Phase 3) may even suggest that it was stored on-site for later use as fuel or fodder.

The spatial analysis of sample densities clearly indicates that the central and western parts of the excavated area (Area 1) was the focus of cereal processing and the carbonisation of large amounts of spelt fine-sieving by-products. Area 2 produced generally lower densities and more varied interpretations, perhaps relating to the likely mixed nature of these deposits. Sample 2.54 of Phase 2 L4170B (F4168B) produced the only significant concentration of barley. Its situation away from the core areas of wheat processing may support the tentative interpretation above of carbonised grain from a fodder store.

The continuity in sample composition over time indicates that the agricultural role of the site was comparable over Phases 2-4. The gradual decrease in the number of very rich samples over time may be an indication that the intensity of cereal processing and the carbonisation of crop processing by-products decreased between Phases 2 and 4. It is possible that the focal point for such activities moved to a different area outside the current excavation in later periods, which may be supported by the presence of a late 4th century AD corndrier at 31 Tunbridge Lane (Fryer 2008).

Weed ecology and cultivation practice (Table 47)

This analysis is based on weed seeds from samples of known crop processing derivation, and from crop processing groups represented by three or more samples, i.e. on a total of 870 weed seeds. This number is relatively low, so the results of this analysis should be viewed with a degree of caution. To ensure that inter-sample differences caused by differential removal of weed seeds by crop processing (cf. G. Jones 1984; Van der Veen 1992, 81, 89), the weed assemblage was divided into groups of like-processing derivation: sieved spikelets, low density fine-sieving residues and high density fine-sieving residues (the last two separated because of the likelihood that the weed seed component in at least some of the latter was of mixed derivation). These groups were initially sub-divided by phase, but analysis demonstrated no chronological variation and so the phases were re-combined to allow analyses based on larger numbers of seeds.

Factor and categories	**Number of seeds**		
	Low density fine-sieving by-products	**High density fine-sieving by-products**	**Sieved spikelets**
Soil fertility (nitrogen content)			
Rich	5	20	1
Intermediate	51 (26)	649 (137)	62 (19)
Soil acidity			
Neutral or basic	3	18	2
Circum-neutral	1	5	0
Moderately acid to neutral	54 (29)	707 (195)	71 (28)
Soil moisture			
Shallow water, periodically absent	3	18	2
Slightly moist to damp	8	77	10
Dry to moist	35 (10)	575 (63)	53 (10)
Soil salinity			
Non-saline	45 (17)	655 (139)	63 (20)
Plant perenation			
Annual	38 (13)	592 (80)	53 (10)
Perennial	20	78	9
Perennial able to regenerate from root fragments	0	1	0
Plant height			
Tall (>65cm)	29 (4)	539 (27)	45 (2)
Medium (25-65cm)	9	55	9
Germination time			
Spring	0	6	0
Autumn	1	0	0
Both	33 (8)	568 (56)	52 (9)
Onset and duration of flowering period			
Late onset	4	19	1
Early onset and short duration	3	18	2

Figures in brackets have been calculated excluding *Bromus* sp.

Table 47: Weed autecology and plant characteristics.

Where seeds could be identified to species, there was no indication of salt-tolerant species in any of the three groups. Most of the less specific identifications had ranges of tolerance too broad to be informative, though all

included species with no salt tolerance. This is consistent with a non-coastal origin for the crops, and so with the consideration of seeds identified as *Tripleurospermum* sp. as the species *T. inodorum* (the only British non-maritime species in this genus) in the following analyses. The species *Anthemis cotula* and *T. inodorum* are tolerant of heavy, clay soils and (especially *A. cotula*) have been considered indicators of such soil conditions (e.g. Jones 1981). Although *A. cotula* was present in significant numbers (52 seeds) in the residues of fine-sieving and hand-cleaning, a recent evaluation of this species' occurrence (Preston *et al*. 2002) notes that it can also grow on light soils, including those over chalk, like those in the immediate Bottisham area, and it is thus considered most likely that the crops were grown locally.

All three weed assemblages indicate soils of intermediate fertility. They also indicated moderately acid to neutral soil conditions, which is surprising given the chalk geology and modern calcareous soils of the area (Swaffham Prior and Reach Associations; Anon. 1983), and may indicate a degree of soil exhaustion. The scarcity of species indicative of fertile soils is consistent with this, suggesting that there was no regular programme of soil enrichment, whether through manuring or tillage (aeration to facilitate re-nitrification). However, the small numbers of indeterminate pulses, cf. *Pisum sativum* and other legumes (*Vicia* sp. and *Vicia/Lathyrus* sp.) present would have had some effect on soil nitrogen levels, and there is no ecological indication in the weed assemblage of very poor or very acidic soils. Low levels of tillage are consistent with the relatively high numbers of perennial weeds (which are less able than annual weeds to recover from disturbance) in the assemblages (cf. Van der Veen 1992, 137; Bogaard *et al*. 2001), particularly when *Bromus* sp. is discounted (see *Methodology*). Further supporting evidence comes from the poor representation among the perennial species of those with the ability to regenerate from root fragments (cf. Van der Veen 1992, 137), represented by a single tuber of *Arrhenatherum elatius* ssp. *bulbosum* in the high density fine-sieving by-products.

Seeds of *Cladium mariscus* indicate periodic, shallow standing water. This species may have grown on the sides/edges of drainage ditches at the edges of arable plots, or possibly in low-lying, frequently inundated parts of the plots, rather than occurring generally within the crops. The genus *Carex* and family Cyperaceae (both also identified in the assemblage) include further species typical of such wet conditions, but also include species of drier ground and so were not included in the counts presented in Table 47. The rest of the seeds in all three assemblages were consistent with dry to moist, or slightly moist to damp, soil conditions, consistent with the modern soils of the area (Anon. 1983).

The assemblages are dominated by tall weeds, or by weeds of medium height if *Bromus* sp. is discounted; no short weeds were present. This may indicate that the crop was reaped at a height above *c*. 25cm, the presence of two tubers in the site assemblage being insufficient to indicate harvesting by uprooting. Alternatively, the dominance of tall (and medium) weed species may be interpreted as an indication of fertile soil conditions (Jones *et al*. 2000), though this is inconsistent with the other evidence from this site, or of

conditions of low disturbance. This last interpretation would be consistent with the above suggestion of low levels of tillage (cf. Jones *et al.* 2000); alternatively, it could relate to sowing time as many summer-annuals, favoured by spring-sowing, are tall (Bogaard *et al.* 2001).

Analysis of sowing time (through consideration of germination time and onset and duration of flowering period) was inconclusive owing to the small number of species level identifications and limited availability of data. The majority of species for which germination time could be determined are able to germinate in both spring and autumn and so are uninformative. Lack of species-specific identification meant that several of the identified ranges of onset and duration of flowering were too varied to be of use; several of the more specific identifications have flowering periods of intermediate onset and medium duration, and so cannot be used to identify sowing time. The spring germination of *Fallopia convolvulus* and *Avena* sp. and late onset of flowering in *F. convolvulus* and *Chenopodium* sp. are consistent with spring germination. However, Lithospermum arvense germinates primarily in autumn and *Cladium mariscus* has an early and short flowering period, consistent with autumn sowing. The data is too weak to support any firm conclusion on the question of sowing time.

Discussion

The main crop grown at this site in the Roman period was spelt wheat, with barley cultivated separately, at least during Phase 2; this is consistent with evidence from 31 Tunbridge Lane (within 200m to the south-west of the current site). The evidence presented here is consistent with the crops represented in the archaeobotanical assemblage having been grown in the local area and processed at/in the vicinity of the site. The early stages of crop processing (threshing, winnowing and coarse-sieving) are very poorly represented but this is consistent with the poor survival of the carbonisation process by the light weed seeds and chaff fragments indicative of these stages (cf. Boardman and Jones 1990). The scant surviving evidence for these processes consists of early processing residues of barley in a few samples dominated by fine-sieving by-products, and a few straw nodes throughout the assemblage. The samples represent stored spelt spikelets (and clean grain) and by-products from day to day fine-sieving, some used as fuel, perhaps for malting. Malting is potentially represented by germinated grain accidentally carbonised during the process. There is no evidence to suggest that the material used as fuel was imported (cf. van der Veen 1999) rather than being generated by crop processing at this site.

Crop processing appears to have taken place at the site in all three phases, though the level of activity may have decreased after Phase 2. This was concentrated in the west of the site (Area 1) during Phases 2 and 3, but spread (sparsely) across the site in Phase 4 (Fig. 35). A proportion of the evidence from Phases 2 and 3 may be related to malting, with both accidentally carbonised malt and fine-sieving by-products used to fuel the process being present. Malting-related samples were concentrated in the area

around the ovens in Phase 2, indicating a possible function as malting ovens, particularly S2576. The distribution of similar evidence in Phase 3 suggests a continuation of such activities, perhaps associated with other similar features elsewhere on the site, such as F2897 in the north. Large-scale malting in features like these ovens would be consistent with production of beer (or malt) for market sale (Van der Veen and O'Connor 1998), possibly in an attempt to solve the problem of seasonal fluctuation in cash-flow (Jones 1981). However, malting may not have been the only role of these features and a range of cereal processing activities may have been associated with them.

Excavation at 31 Tunbridge Lane revealed flues of unknown features dating to AD 120 – 140 and an oven or corndrier dating to AD 270-410. Analysis of the archaeobotanical material from these features (Fryer 2008) revealed no evidence of malting: small numbers of detached coleoptiles were present in some samples from the oven/corndrier but were interpreted as results of accidental germination. The samples were considered to represent crop processing residues burnt as fuel and the corndrier was interpreted as having been used for parching of spelt wheat spikelets. This suggests that, in this locality, malting may have been an activity confined to the third to early fourth century, and to the ovens identified at the current site.

The evidence suggests that spelt wheat was stored both as clean grain and as sieved (and unsieved) spikelets. Barley grain was also present in most of these samples, and may have grown within the spelt crop. Cultivation of barley in its own right is represented by a single sample, of uncertain crop processing derivation (fine-sieving product or by-product). Comparative evidence for Roman grain storage practice in the region is scarce (Murphy and De Moulins 2002), but assemblages from a late 3rd/4th century granary destroyed by fire at Great Holt's Farm, Boreham, Essex, indicate the storage of clean grain (and pulses), separated by species (Murphy *et al*. 2000). Storage of spelt wheat in spikelet form had been normal practice in the region in the Iron Age, and has the advantage of the grain being less susceptible to spoilage (Murphy and De Moulins 2002). The evidence from Tunbridge Lane suggests that Roman grain storage practice in this region was more varied than has previously been realised. As noted above, the barley-rich sample may represent a store of high quality fodder, which may explain its isolation from the bulk of the other cereal-rich samples.

Despite the small size and poor preservation of the weed assemblage, autecological analysis has indicated that the cultivation regime at this site was extensive in character, with relatively low levels of investment of time, labour and/or resources in tillage or manuring to improve crop yields. This may reflect limited labour resources or cultivation over a large territory.

Conclusions

This study has provided clear information on the crop species cultivated at this site, as well as characterising the cultivation regime under which they were grown and identifying the ways in which they were processed and uses to

which they were put. This has allowed comment on the site's economic base and on the amount of labour expended by its population on cultivation and the subsequent preparation of grain for domestic and commercial use. In addition, owing to the inclusive sampling strategy employed and the decision to analyse all phased samples, it has been possible to comment definitively spatial and chronological variation in crop-related activity at this site. As well as being informative as to the nature of life at Bottisham in the third to fourth century AD, this study has thus made a genuine contribution on a regional level to understanding of how crops were cultivated, processed, stored and utilised.

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3.12 The phosphate samples

By Dr. J. Crowther

Introduction

Previous results from Tunbridge Lane suggested that the analysis of soil organic matter, phosphate and magnetic susceptibility could potentially provide valuable insight into the nature/origin of individual contexts and spatial patterns of human activity at the site (Crowther, 2008). In the present investigation, ten further samples have been analysed: five from the floor surface (context L2662) of a small beamslot structure (structure S2661); and five from the backfill (context L4351) of a larger, more substantial building with stone foundations (structure S4348; details in Table 48). It should be noted that the samples supplied for analysis from S4384 were taken from backfill, rather than the floor surface. As a consequence, any patterns observed in the analytical data are likely to reflect variations within the backfill rather than across the floor of the structure at the time it was being used. On field evidence both structures were considered to be possible agricultural buildings, and it was hoped that soils analysis would provide independent evidence relating to their function.

Each sample was analysed for: loss-on-ignition (LOI), which provides an estimate of the organic matter concentration; phosphate, enrichment of which is associated with inputs of organic materials, most notably excreta and especially bone (see reviews by Bethel and Máté, 1989; Crowther, 1997; Heron, 2001); and magnetic susceptibility, which is indicative of burning (Clark, 1996; Scollar *et al.*, 1990).

Methods

Analysis was undertaken on the fine earth (i.e. < 2 mm) fraction. LOI was determined by ignition at 375ºC for 16 hours (Ball, 1964) – previous experimental studies having shown that there is normally no significant breakdown of carbonate at this temperature**.** Phosphate-P concentrations were determined colorimetrically following alkaline oxidation with NaOBr, using 1 N H_2SO_4 as extractant (Dick and Tabatabai, 1977).

In addition to χ (low frequency mass-specific magnetic susceptibility), determinations were made of χ_{max} (maximum potential magnetic susceptibility) by subjecting a sample to optimum conditions for susceptibility enhancement in the laboratory. χ_{conv} (fractional conversion), which is expressed as a percentage, is a measure of the extent to which the potential susceptibility has been achieved in the original sample, viz: (χ/χ_{max}) x 100.0 (Tite, 1972; Scollar *et al.*, 1990). In many respects this is a better indicator of magnetic susceptibility enhancement than raw χ data, particularly in cases where soils have widely differing χ_{max} values (Crowther and Barker, 1995; Crowther, 2003). χ_{conv} values of ≥ 5.00% are often taken as being indicative of some degree of susceptibility enhancement. A Bartington MS2 meter was used for magnetic susceptibility measurements. χ_{max} was achieved by heating samples at 650°C in reducing, followed by oxidising conditions. The method used broadly follows that of Tite and Mullins (1971), except that household flour was mixed with the soils and lids placed on the crucibles to create the reducing environment (after Graham and Scollar, 1976; Crowther and Barker, 1995).

Results and Discussion

The analytical results are presented in Table 49. For comparative purposes, relevant summary data from previous soil studies at Tunbridge Lane are presented in Table 50.

1. Context L2662, Structure S2661

The mean figures for the five samples analysed from this structure (Table 49) are broadly similar to those recorded in the previous investigations. These reveal the soils to be largely minerogenic (mean LOI, 2.08%); have moderate concentrations of phosphate-P (mean, 0.820 mg g^{-1}); and show no clear evidence of magnetic susceptibility enhancement (mean χ, 29.6 x □□$^{-8}$ m^3 kg^{-1}) – with χ_{conv} values in the range 1.95–2.55%, which are well below threshold of 5% which is often taken as being indicative of heating/burning in archaeological contexts under UK conditions. What is also noteworthy is the apparent uniformity of the measured properties across the samples analysed – i.e. there is no clear evidence of spatial variability, as might be attributable to patterns of activity within the buildings. Overall, therefore, the samples from this structure provide no evidence of organic or phosphate enrichment or of magnetic susceptibility enhancement as might be associated with past phases of human activity, e.g. human occupation or use by animals.

2. Context L4351 (Spit2), Structure S4348

As noted above, these samples were taken from backfill, rather than the floor surface, and had any clear indications of human/animal activity emerged from the results, then these would clearly need to have been interpreted with caution. As it happens, the data for the five samples analysed from structure S4384 (Table 49) are very similar to those recorded in structure S2661: LOI (mean, 2.08%), phosphate-P (0.791 mg g^{-1}) and χ □27.4 x □□$^{-8}$ m^3 kg^{-1}), with χ_{conv} values ranging from 2.22–2.66%. Here, too, therefore, the soils data provide no evidence relating to the function of the structure.

Conclusions

The analytical results reveal no evidence relating to human occupation or the use of the structures by livestock.

Bulk sample
Context L2662, Structure S2661 L2661: Internal floor surface of S2661. Compact layer of mid white/light grey packed clunch nodules in a silty clay matrix. S2661: Rectangular in plan. 3.00 x 2.50m. Defined by an apparently continuous beam slot (F2679 (=F2664)) running the length of its four sides.
1495
1496
1497
1498
1499
Context L4351 (Spit2), Structure S4348 L4351: Firm mid grey/brown clayey sandy silt containing redeposited natural chalky clay. S4384: A rectangular clunch building (S4348), measuring 11.50m long x 5.75m+ wide.
1
2
5
6
9

Table 48: Samples analysed

Bulk sample	LOI (%)	Phosphate-P (mg g^{-1})	χ (10^{-8} m^3 kg^{-1})	χ_{max} (10^{-8} m^3 kg^{-1})	χ_{conv} (%)
Context L2662, Structure S2661					
1495	1.94	0.825	27.1	1390	1.95
1496	2.15	0.856	31.0	1520	2.04
1497	2.05	0.805	30.4	1190	2.55
1498	2.15	0.807	29.2	1400	2.09
1499	2.11	0.805	30.5	1350	2.26
Mean:	2.08	0.820	29.6	1370	2.18
Context L4351 (Spit2), Structure S4348					
1	1.88	0.767	25.7	1160	2.22
2	2.13	0.782	28.4	1070	2.65
5	2.06	0.732	26.5	1170	2.26
6	2.22	0.766	27.2	1090	2.50
9	2.09	0.906	29.0	1090	2.66
Mean:	2.08	0.791	27.4	1120	2.46

Table 49: LOI, phosphate and magnetic susceptibility data

	n	Mean	Minimum	Maximum	Std dev.
LOI (%)	356	1.96	0.625	4.31	0.548
Phosphate-P (mg g^{-1})	50	0.758	0.454	1.78	0.271
χ (10^{-8} SI)	50	22.9	8.5	63.3	11.3
χ_{max} (10^{-8} SI)	50	766	442	1310	165
χ_{conv} (%)	50	3.11	1.34	8.51	1.64

Table 50: Summary statistics for soil analytical data from previous studies at Tunbridge Road (from Crowther 2008)

3.13 Radiocarbon Dating

By Scottish Universities Environmental Research Centre & Andrew A. S. Newton

A sample of cattle bone from L4291, the only fill of Ditch F4292, an undated feature stratigraphically earlier than Phase 3 Ditch F4294, and a sample of human bone from Sk2753, an undated burial present in Grave F2755, were submitted to the radiocarbon dating laboratory at the Scottish Universities Environmental Research Centre.

These samples were selected in order to date the contexts from which they were recovered and, due to the early stratigraphic positions of these contexts,

to help establish a chronology for activity at this site. Contexts were chosen for sampling based on their containing suitable material for dating.

Dating of the cattle bone from L4291 returned a Radiocarbon Age of 1726 ± 32 BP, placing the material in the 4th century AD (Table 51 and Appendix 9). Dating of the sample of human bone from Grave F2755 was unsuccessful as the sample contained insufficient carbon to produce a date.

Laboratory number (Beta-)	Sample/context reference	Material	δ13C relative to VPDB	δ15N relative to air	C/N ratio (Molar)	Radiocarbon Age BP
SUERC-49907 (GU32411)	BOT1/4291	Cattle bone	-21.8 ‰	6.2 ‰)	3.3	1726 ± 32

Table 51. Radiocarbon date for cattle bone recovered from L4291 (F4292)

The dating of the cattle bone recovered from L2491 to the 4th century AD, while in keeping with the overall date for Roman activity at Tunbridge Lane, and mostly corresponds with what was expected from a context identified as being stratigraphically earlier than a feature assigned a 3rd to 4th century date and placed in Phase 3. However, the calibrated dates for this sample range from AD301 to AD391 (Appendix 9); the later date may be considered contradictory to the stratigraphic/artefactual evidence as this would be beyond of the date range for Phase 3, which must be considered to be the *terminus ante quem* for F4292, due to its relationship with Ditch F4294

3.14 Pollen Analysis

A column sample (Sample 72) was taken from Pit F4148 for pollen analysis. The material in this sample was, however, dry and fractured, and unsuitable for analysis

4 DISCUSSION

4.1 The site prior to Roman occupation

The earliest evidence of human activity recovered from the Tunbridge Lane site comprises the lithic assemblage, which is considered to be representative of the Neolithic and early Bronze Age periods. A similar assemblage was found during excavation at 31 Tunbridge Lane, to the south-west of this site, and was considered to demonstrate little other than temporary human occupation of the area from the Neolithic onwards. This was recovered from a possible buried soil of brownish-yellow sandy clay. A similar deposit (L2850=L2002) was identified during the excavation of Area 1 at this site but stratigraphic relationships demonstrate that it was of much later date.

Although small, the struck flint assemblage is significant. Not only does it add to the growing picture of early Neolithic and Bronze Age activity in Bottisham, it also includes notable pieces such as two unusually-large leaf arrowheads. It

is feasible that these represent some kind of symbolic or ritual rather than purely 'practical' activity. This would fit with other evidence of ritual activity in the surrounding area during this period of prehistory, such as the Neolithic causewayed enclosure at Great Wilbraham, 3km to the south, and a possible Neolithic cursus visible on aerial photographs roughly 1km to the north (HER 6605; Last 2000). It has previously been postulated that the assemblage, especially that part of it from Area 1, includes debitage suggestive of on-site flint reduction. Blade production is indicated by blades, a blade core and a blade core trimming flake. Two loose concentrations of flint finds may represent two separate foci of prehistoric activity on site and it has been suggested that the flint assemblage might represent the disturbed remains of an arrowhead dump or 'repair shop' (Martin Tingle *pers. comm.*). However, the majority of the assemblage was present as residual or redeposited material and therefore may not necessarily be representative of activity at this particular location (Peachey, Ch. 3.1).

Late Bronze Age pottery (24 sherds; 245g), recovered as residual material from two intercutting features in the south-east of Area 2 (Ditch F4168 and Pit F4233), strongly implies that one or more late Bronze Age features were originally present in this part of the site. However, no other residual late Bronze Age finds were recovered from elsewhere on the site, suggesting that activity at this time had probably only been small-scale and concentrated in just this small area. A number of Bronze Age funerary monuments are known in the area surrounding Bottisham and lithic artefacts from this period have been recovered from locations in closer proximity to the excavation site but this pottery is amongst the first indication of domestic material recovered from the area.

A series of naturally formed features (F2076, F2019, F2921 (=F2715), F2891, F2861 and F2899), which clearly pre-dated the Roman activity evident at the site, were present within Excavation Area 1. As has been noted, several of these contained cultural material and it is possible that they were present as open channels or clear undulations/dips in the ground surface when Roman-period occupation first commenced at this location. It is interesting to note that, while Roman cultural material was present in these natural features, earlier material was not. This may be an indication of the date of these features, suggesting that they formed in the earlier Roman period prior to occupation of this site. It is possible that the processes which formed them made the site unsuitable for any kind of human activity prior to the later Roman period. Kenney (2008) reports no such features at the nearby site at 31 Tunbridge Lane, possibly suggesting that represent a fairly localised natural phenomenon.

4.2 The development of the Roman site

The changing layout of the Tunbridge Lane site

An excavation on land to the west of the current site, at 31 Tunbridge Lane

(Kenney 2008), revealed Romano-British activity very similar in character to that recorded at this location. Evidence from the 31 Tunbridge Lane site included large ditches, possibly representing boundaries, pits, postholes and a corn dryer or malting oven. Building materials recovered from this site, including painted wall plaster, indicate a reasonable level of wealth. Some aspects of the small finds assemblage, which was considered to represent the accoutrements of the daily lives of ordinary working people, also contains elements that hint at a degree of wealth and status.

Pottery recovered from the 31 Tunbridge Lane site spans the period AD70-270, indicating the main period of occupation at this location occurred between the 1st and 3rd centuries. This indicates that activity at 31 Tunbridge Lane preceded that at the current site, which has been dated as early 3rd century to 4th century. As Kenney (2008) notes, there is some chronological overlap in the periods of occupation at the two sites but the 31 Tunbridge Lane site appears to have been abandoned while the current site appeared to flourish. This may indicate that the two sites represent a shift in the focus of settlement in this area, or at least in the main areas of activity associated with the farmstead or villa complex that these features are considered to represent.

It has been noted in some parts of the fens that there is a mid 3rd century gap in occupation, attributed to changing climate conditions and a rise in the water table (Upex 2008, 178). Kenney (2008) suggests that the end of the main phase of occupation at the 31 Tunbridge Lane site may be the result of such climate changes. This may be the case, but as settlement appears to have shifted only a short distance to the east, the very slight difference in height between these two locations appears unlikely to have made much appreciable difference to the effect on daily life of the higher water table of this period. Across the Empire, however, at this time there was a period of severe crisis known as the 'Third Century Crisis' or the 'Military Anarchy'. This was precipitated by the assassination of Severus Alexander and was characterised by extreme political instability, a constant and rapid turnover of Emperors, near-continuous warfare, and the collapse of the silver currency (Watson 2004; Cameron 1993, 3). The result, of this instability, although perhaps also a contributory factor, appears to have been a widespread economic recession (Wacher 1978, 117), which may have played a part in the changes that are evident in Bottisham, both in the shift from the 31 Tunbridge Lane site and in the rearrangements made at the current site.

The earliest features recorded during the AS1011 and New Doctor's Surgery excavations comprised buildings S5144, S2901 and S4348; a single Phase 1 pit was recorded a short distance to the south-east of S5144 and must have been associated with it. These structures were all recorded towards the southern extent of the excavation areas in which they were identified, indicating that Roman development began to the south of the area under investigation and spread northwards during the 3rd and 4th centuries. Based on the material recovered from it, S5144 is considered to have been constructed of wattle and daub, with a rammed chalk floor. Not much remained of either S2901 or S4348, apart from their clunch walls, to indicate their function. S2901 was open-ended to the south-east, giving it the

appearance of a well-built barn. As such, it would appear that these structures are more likely to represent out-buildings or ancillary structures than the main dwelling of the farm complex.

It is interesting to note that even prior to the laying out of enclosures and boundaries, which occurred in the proceeding phases of Roman occupation at this site, that the buildings are arranged on a similar alignment to that which appears to have been followed throughout the history of settlement in Bottisham. S2901 and S4348 were arranged the same north-west to south-east line that the later enclosures and more recent roads/streets appear to follow, while S5144 was similarly positioned but slightly offset to the north of the alignment of the other two structures.

The dating evidence associated with these structures was limited, but there is some indication that S2901 and S4348 at least were demolished fairly early during the late Roman use of the site, probably by the mid to late 3rd century. It is likely that the period of use of these buildings preceded the majority of the late Roman activity on the site. Building S4348 was cut by a ditch which was associated with the earliest Roman ditch system in Area 2, while Building S2901 was partially overlain by Buried Soil L2002 (=L2850), which is thought to have formed during the 3rd century AD, placing it in Phase 2.

It is during the 3rd century that enclosures and boundaries appear to have been first laid out in the area to the immediate north of the Phase 1 structures. It would appear that S2901 and S4348 may have been cleared to make way for the use of this area. On the basis of stratigraphic evidence it has been possible to identify a small number of features which potentially represent activity early in Phase 2. Dating evidence places these features in Phase 2 but they are stratigraphically earlier than other features assigned to this phase. They are, however, few in number and have no clear structural function or coherent role in a system of land division. As such, there is insufficient evidence to define them as a distinct sub-phase of Phase 2. The majority of Phase 2 features combined to form a rectilinear boundary system with axes aligned north-west to south-east or north-east to south-west. The oven structures S2576 and S2579 were located at the eastern extent of this enclosure system. To their south-west, were cobbled surface L2157=5006 and, slightly further to the west, rectangular beam-slot building S5500. At the very western end of the site were a series of sinuous ditches or gullies, which terminated in close proximity to S5500. These, despite their sinuosity, broadly followed the same north-east to south-west alignment as elements of the enclosure system to the south-east. The small number of features which have been identified as late Phase 2 features would appear to represent adaptation of the existing Phase 2 boundary system rather than a more widespread reworking of the enclosure arrangements, as is represented by Phases 3 and 4.

Phase 2 is marked by the deposition of a substantial quantity of CBM, thought to derive from the demolition, or at least the re-roofing, of a building in immediately surrounding area. It is possible that this material derived from the two stone-founded structures assigned to Phase 1, although the perceived

agricultural function of these buildings would be in contrast with the character of the CBM, which is potentially from a higher status structure. The deposition of this material may represent an event, along with the laying out of the enclosure system, suggesting a significant shift in the character of activity at the site. This may be reflected in the construction of Building S5500 which was of much simpler, and much cheaper, construction than those of Phase 1, especially S2901 and S4348. This may be an indicator of a changing function for this area, with a shift to simpler, utilitarian buildings occurring alongside the laying out of enclosures, presumably for agricultural purposes.

The north-east to south-west and north-west to south-east axes on which the Phase 2 enclosure system was arranged were also adhered to by the boundary ditches assigned to Phase 3. It has previously been suggested (McConnell *et al* 2008) that the successive reorganisations of the enclosure system, represented by the different assigned phases of activity, were carried out by people who had knowledge of the former layout and that the changing systems of field boundaries represent gradual evolution and continuity rather than wholesale replacement. However, the apparent stratigraphic differences that distinguish the Phase 3 enclosure system from that of the preceding phase would suggest that Phase 3 does indeed represent a wholesale change in the layout of the site, albeit one which is positioned on the same axes of alignment. It is possible, indeed likely, that the Phase 3 enclosure system was laid out by individuals who were familiar with the previous layout; some Phase 3 boundaries followed or reflected the positions of those from Phase 2 while others, such as those formed by F2092 and F2598, were entirely new. While it is possible that the layout of the Phase 3 enclosures was deliberately allowed to be influenced by the positioning and alignment of the previous system of enclosures it seems more likely that the overriding influence was the local topography; the post-medieval ditches (Phase 5) followed the same alignments as the earlier Roman boundaries, suggesting that there is some aspect of the natural or human topography of the area which has continued to influence the organisation of land divisions in this part of Bottisham from the Roman period to the present day. Indeed, it is notable that these axes of alignment are still evident in the layout of modern-day Bottisham. It would appear that much of the village, especially its eastern half, is aligned parallel to the 10m contour (Fig. 24) and it would appear to be this that influenced the layout of the Roman enclosures. Whether the modern layout of Bottisham is directly influenced by the local topographical alignments or if successive phases of property boundaries, and therefore the positions of later roads and houses, have been influenced by the positions of earlier ones is unclear, but it is evident in Bottisham that the lines of text on Crawford's (1953, 51) metaphorical palimpsest clearly follow those that have gone before.

Further indications that the Phase 3 arrangement of the site represents a clear departure from that of the preceding phase are the positioning of Building S2661, markedly further to the north than those of the preceding phases, and the suggestion that a different kind of industrial or agricultural processing activity was taking place, as represented by F4148. S2661, was of similar construction to the Phase 2 building S5500 and this might indicate that the area was used for similar purposes; the key difference between these

structures, however, was the lack of a hearth in S2661.

At the far western end of the site, the sinuous of gullies of Phase 2 appear to have been replaced with similar features during Phase 3, suggesting a continued function or topographical/environment situation at this location that necessitated ditches of this type. The function of the features remains unclear and they appear not to have formed part of the main boundary systems of each of these phases. Initial observations (McConnell *et al* 2008) suggested that the Phase 3 ditches in this area formed enclosures but the ditches appeared to peter out to the south, within the New Doctor's Surgery site excavation area.

Similarly sinuous ditches in this area (F2050, F5014 and F4016) were created during Phase 4. The positioning and arrangement of these features would suggest that they did not form an enclosure, possibly indicating that the similar features of preceding phases did not either. While the presence of these features indicates a continued requirement for these sinuous gullies or ditches in the north-western part of the site much of the rest of the Phase 3 activity represents another fairly major rearrangement of the enclosure system. Enclosure ditches were only present in the south-eastern part of the site (the south-east of AS1011 Excavation Area 1 and Excavation Area 2) and this is the only phase of Roman activity during which no buildings appear to have been present within the areas subject to excavation. Also absent are the industrial or agricultural processing features that were present during Phases 2 and 3. Perhaps the defining characteristic of this phase was the presence of the large pits and pit clusters which are thought to be representative of the quarrying of the natural chalk. This would suggest that, in addition to the rearrangement of the enclosure system, the principle, or at least the most archaeologically visible, activities carried out in this area changed in Phase 3. Another notable feature of the Phase 4 site was the large number of other pits distributed across Area 1, which seem to have been dug specifically for rubbish disposal.

Initially, the lack of boundary ditches in AS1011 Area 1 led to the suggestion that the Phase 4 site was an open area of 'waste land' (McConnell *et al* 2008). However, a decreasing emphasis on cut boundary features and a possible shift towards less archaeologically-visible forms of land division has been noted in the later Roman period at sites in the East Midlands (Taylor 2006, 145); the same may be true of Bottisham. Alternatively, and perhaps more convincingly, the rearrangement of the enclosures during Phase 3 may simply have occurred such that fewer boundaries fell within the area that was subject to archaeological excavation. The evidence from AS1011 Area 2 would appear to suggest that larger enclosures were laid out meaning that overall density of enclosure ditches was reduced in this phase.

Some of the stratigraphically latest deposits at the site appear to be surface soil or rubble layers containing Roman cultural material, or pockets of dark, finds-rich earth present in the upper fills of the large quarry pits. These were initially identified as abandonment layers, with those comprising primarily rubble to be associated with the demolition of buildings at the time of

abandonment. However, it is possible that they represent a regionally observed shift in patterns of refuse deposition in the later Romano-British period.

The overall character of Roman activity

The archaeological features recorded at this site give the impression of small enclosures and low to moderate status buildings that must have had an agricultural or associated function. Added to this are features representing the processing of cereal crops and, later in the span of activity, attempts to extract the underlying chalk, presumably for economic purposes.

The finds assemblages from the site, however, indicate something other than simply agricultural activity. The pottery recovered from the site is indicative of the kind of consumption pattern that may be expected for a high-status domestic site. The assemblage is considered to represent the deposition of domestic rubbish in the immediate proximity of a probable villa building or complex; the distribution pattern suggests that the main range of buildings was located to the south-west of the excavated areas (Peachey, Ch.3.2). The character of the finds assemblage appears not to have changed, or decreased in quality over the span of Roman occupation, indicating that the changes represented within the excavated area represent alterations in the economic activity associated with this apparent villa, rather than a major shift in the character of activity although some hints of a downturn in the economic situation during later phases may be present. The impression of a high-status domestic site is also indicated by the CBM assemblage, which appears to be derived from a substantial building or complex with an extensive tiled roof and a hypocaust heating system. Particular elements of the small finds assemblage are indicative of economic wealth but interestingly, given the agricultural character of the features within the excavated area, objects associated with domestic or agricultural crafts did not form a large part of the assemblage. A similar pattern was observed at the Roman site at Spring Close, Boxworth, Cambridgeshire, where the finds recovered from an area considered to be peripheral to settlement suggested the presence of a high status dwelling nearby (Connor 2008).

The Roman archaeology recorded within the excavated areas at Tunbridge Lane may be understood to represent agricultural or semi-agricultural activity in close proximity to a high-status dwelling. This dwelling and the land associated with it may be described as a villa. As Wacher (1978, 111) notes, the definition of the term ‘villa’ is variable and sites of varying character and function have been described in this way. In Latin, it means farm and implies the *whole* farm, not just the main residential building (*ibid.*). It is possible that the stone-founded buildings of Phase 1 were originally part of the main ‘villa’ range of buildings but these were seemingly removed fairly early in the evolution of the complex, possibly to make way for the utilisation of the area to their north for agricultural or associated purposes. Given the perceived

proximity of this agricultural area to the main complex of villa buildings, it may be best understood as 'in-field' or paddock-type land and especially in Phase 2, due to the presence of the corn-driers and nearby metalled surfaces, might be considered to represent 'yards' adjacent to the villa core. A variety of scattered pits and occasional postholes within these yards and enclosures might be considered to be in keeping with Neal's (1983, 83) observation about such features being characteristic of land associated with the villas at Gadebridge Park, Boxmoor, Northchurch and Gorhambury in Hertfordshire.

The dating evidence from the site, beginning in the middle of the third century, would be broadly consistent with the emergence of the villa economy in the East Anglian region, brought about by increased engagement between the Roman authorities and the native elite following the abandonment of the military bases in the area (Fincham 2002, 73).

4.3 The systems of enclosure

An understanding of the true layout of the enclosure systems represented at the site is hampered somewhat by most of the ditches forming them stretching beyond the limits of excavation. What is clear is that there is significant alteration to the layout of the enclosures over time but that these alterations were, as was observed during the development of the late Iron Age and early Roman enclosures at Dernford Farm, Sawston (Newton 2012), based on a pre-existing layout (established in Phase 2).

The earliest system of enclosure, that which was established during Phase 2, would appear, in comparison to the enclosures of later phases, to comprise fairly small plots of land. The northern-most NW-SE aligned element of the Phase 2 enclosure system within Excavation Area 1 incorporated a length of double-ditched boundary towards its south-eastern extent, formed of parallel Ditches F2178 (=F2210, F2225), F2514 (=F2468), F2552 (=F2559), F2539 and F2492 (=F2511). This was initially identified as a 'droveway' although this is perhaps an inaccurate term. This was considered to be evidence that the enclosures were used for pastoral agriculture. It is possible that these features delineated or defined a trackway but this clearly wasn't a long distance route. It is perhaps more likely that, if this was indeed the nature of the relationship between these ditches, that they formed some kind of race or other system for sorting, or controlling the movement from one enclosure to another, of livestock. It is equally possible, however, that these ditches simply represent successive alteration to the boundary in this area but within the timeframe of Phase 2. It also seems unlikely that pastoral agriculture would have been carried out within an area in which kilns or corn-drying ovens were in operation (S2579 and S2576 were located to the north-west of this arrangement of ditches) although it is not possible to know if further subdivision of the apparent enclosures was carried out using archaeologically invisible means. Given the presence of metalled surfaces L2157, L5006 and L5502, building S5500, which contained a hearth and therefore may have had an industrial function, ovens/kilns S2579 and S2576 and the apparent proximity of this area to the main range of villa buildings, as suggested by the

presence of the Phase 1 stone-founded structures, it may be more appropriate to view these enclosures as a series of 'yards' rather than as paddocks or fields. The volume of artefactual material recovered from the site might support such a suggestion as this would appear to be greatly in excess of what might be expected to have occurred in either pastoral or arable fields even when processes such as manuring are taken into account. It is possible, however, that due to the perceived proximity of these enclosures to the main range of buildings that other activities, such as orchard or vineyard cultivation, which are unlikely to have left enough archaeological evidence to be identified with any confidence, may have occurred within this group of enclosures.

The curvilinear boundary formed by F4296, F4278 and F4358 would appear to be an unusual shape for an agricultural or semi-agricultural enclosure. It is possible that a particular agricultural practice or process required a circular or semi-circular enclosure; small but noteworthy concentrations of plant macrofossils were recovered from these features. There is, however, no artefactual evidence to support such an interpretation; the majority of the finds are typical of the refuse-type deposits recorded across the site. It is equally possible that the shape of this boundary had more to do with aesthetic concerns, possibly due to its proximity to the area in which the postulated villa range is thought to have been located.

In Phase 3, a series of more definite north-east to south-west aligned boundaries (F2092, F2543 and F2598) were established. This appears to have served to create larger enclosures than those of the preceding phase, although it remains possible that these were further subdivided using hurdles or panels that have left little or no archaeological trace. The arrangement of narrower Phase 3 ditches recorded in the south-eastern corner of Excavation Area 1 appears to mirror those of similar ditches in the preceding phase, indicating that a similar enclosure, albeit shifted slightly to the east, was laid out here. This appears to have been a fairly short-lived arrangement as the ditch forming the north-western corner of this enclosure (F2669) was cut by the substantial boundary ditch F2598.

The rearrangement of the enclosures may represent changes in land use. Their increased size may have made them more suitable to pastoral or arable cultivation, rather than use as yards or infields as appeared to be the case in the preceding phase. There are clear distinctions in the distribution of CBM (Figs. 25-27), pottery (Figs. 28-30) and animal bone (Figs. 31-33) between Phases 2 and 3. The earlier phase shows a general concentration of all of these classes of finds towards the north-western end of the site and particularly in the south-eastern end of the New Doctor's Surgery site and that part of AS1011 Excavation Area 1 to its immediate south-east. In Phase 2, there is a much more even distribution of all of these classes of finds. This may be indicative of the differences in land use between these two phases of activity, however, while there is some difference in overall quantities, these remained generally quite high and the character of these assemblages remained very similar, suggesting that while the pattern of distribution changed, the character of activity remained the same. It is quite likely, however, that the activity that many of the deposits from which these finds

were recovered represent little more than the deposition of refuse or the use of refuse material for material for backfilling features when they became redundant. Further evidence that the yard-like nature of the enclosures of Phase 2 may have persisted in the Phase 3 enclosure may be found in the presence of the small building S2661, the possible industrial feature formed by pit F4148 and gully F4150 and the unphased Roman possible posthole structure to the north-west of F4148 and with which it is potentially associated. Further, associated and similar activity may have taken place within these enclosures but left little archaeological trace, especially if this was associated with the management, storage, preparation or transportation of organic materials or items that are unlikely to have survived.

The reorganisation of the enclosure system in Phase 4 again appears to have been carried out in order to increase the size of the enclosures. Only two main Phase 4 boundaries (F2884 and F4036) are represented within the areas of excavation with the other linear features of this date to the north and west of these appearing to represent internal subdivision. Further enclosures may have been appended to that which falls within the limits of excavation. This is suggested by the extent of Ditch F4036 which clearly extended beyond AS1011 Excavation Area 2 to both the north-east and the south-west.

A significant change in land use is demonstrated in Phase 4 by the presence of the possible chalk-extraction pits. It is unclear if the enclosures relate directly to the possible quarrying activity, if this undertaking was deliberately separated from other parts of the estate, or if attempts to extract the chalk were made after the enclosures were laid out for some other purpose. The pattern of the distribution of finds in Phase 4 (Figs 27, 30 & 33) is dominated by the refuse deposits that sealed or infilled the chalk-extraction pits. The character of the finds assemblages within other features is similar to these refuse deposits and may not necessarily be any more representative of the day to day activity that occurred within the enclosures than the material present in the quarry pits. It is notable, however, that there is a marked, albeit not huge, decrease in the quantity of cereal remains in Phase 4. This would appear to indicate a decrease in cereal processing, at least in this part of the presumed villa estate, that would be consistent with the change of land use that the possible chalk-extraction pits represent.

The post-medieval enclosure ditches, as has already been noted, follow the same axes of alignment as the Roman ones. The northern-most Phase 5 ditch (F4185) followed the position of F4136, the most easterly (F4021) ran parallel to Phase 4 ditch F4036, which given its relationship with the Phase 3 ditches at either end of its excavated extent must have cut an earlier ditch in the same position, and the southern-most (F4021) ran parallel to Phase 3 ditch F4285 and its recuts.

4.4 The Buildings

The Phase 1 buildings

With the exception of square pit F2134, Phase 1 of Roman activity was represented solely by the remains of buildings. These varied in character with two having been constructed of stone, and possibly masonry, while the third appears to have been a much more ephemeral structure, with no clear indication of the materials used in the construction of its superstructure present.

S5144 was the most north-westerly of the Phase 1 structures and was recorded during the excavation of the New Doctor's Surgery site. It comprised simply a sub-rectangular pit containing a floor surface of rammed yellow-white chalky marl. The complete lack of structural components means that nothing is known of the superstructure of the building although it may be assumed that this was of timber construction and rested on the contemporary ground surface and/or the floor surface in the base of the pit. At only 2.8m in width the structure was narrower than the 3.1-6.1m identified, by Morris (1979, 66), as the average width of simple rectangular timber buildings.

Hingley (1989, 35-37) notes that simple rectangular houses often occur as outbuildings at villa sites and on non-villa settlements in southern Britain. This structure would appear, however, to be much simpler and smaller than such structures, most of which were at least 5m in width (Hingley 1989, fig. 15). It is possible that it functioned as a workshop or storage shed but despite a fairly extensive finds assemblage present within its fill, no diagnostic artefacts, upon which such an interpretation could be based, were present. A similar structure was recorded at Little Oakley in Essex, this comprised a substantially deeper pit (0.65m to the 0.28m of S5144) but like S5144 displayed a surface in its base, in this case interpreted as a layer of trample, which was considered to demonstrate that this was not a hollow beneath a sprung floor. Similar Belgic structures have been identified in Canterbury and Roman ones at Gorhambury and King Harry Lane in St Albans, Hertfordshire. At these sites, the structures have been interpreted as animal pens or similar agricultural buildings (Barford 2002, 19). Such an interpretation would be appropriate for S5144, especially given the apparent agricultural nature of the area to the south and east in later phases, it also indicates that the much of the finds assemblage recovered from the fill of S5144, such as the tile, *opus signinum* and fragments of limestone are unlikely to have derived from the superstructure of this building and must have been imported as backfill material; the single fragment of daub that was present, might, however, be representative of the construction of such a building.

The other two buildings assigned to Phase 1, S2901 and S4348, displayed stone footings. This indicates that they were of stronger and probably more permanent construction than S5144. It may also indicate that they were of higher status. It does not, however, necessarily indicate that these were constructed entirely of stone; many Roman buildings comprised structures that, in the majority, were built of timber with stone footings intended to inhibit rotting of the superstructure (de la Bédoyère 2001, 22).

There was little indication as to the use to which Building S2901 was put. It is also impossible to draw any firm conclusions about its form, construction or

purpose. This is because all that was revealed of the structure was a single length of wall footing (M2966), the construction cut for this wall (F2968), an associated contemporary pit (F2967) and a buried soil layer (L2850) and 'demolition' layer (L2902) overlying the structural remains.

McConnell *et al* (2008) suggested that it is likely that these remains represent only the corner of a larger structure, the majority of which lay beyond the excavation area. Building S2901 was clearly fairly sturdily-built, using irregularly-shaped medium to large-sized pieces of clunch and a sandy, shelly mortar. The CBM recovered in very large quantities from demolition layers L2965, L2924, L2912 and L2911 within Pit F2967, and the painted wall plaster recovered from L2902 might represent materials used in the building's construction, but it is also conceivable that this material was transported from elsewhere within the immediately surrounding area as backfill or levelling material. The presence of the painted wall plaster might suggest a high-status structure but other factors weigh against this interpretation. Particularly problematic is the complete absence of evidence for an 'end' wall to the south-east. Even if it had been robbed-out, there was no hint of a wall cut having ever existed at this end of the building. This suggests that S2901 was open-ended to the south-east or simply comprised a single wall which terminated in Grid Square D9. However, the possibility that rectangular pit F2967 may have been intended to contain a floor surface, which must have been removed or robbed-out after the disuse of the structure, lends itself to the supposition that this was a more complex structure than a single wall. The apparent open-ended form of the structure suggests a building more like a barn than a high-status dwelling; the open end is likely to have been covered with a large door or gate. The width of the surviving masonry of S2901, M2966, at 0.63m is only slightly less than the identified 0.7m widths of the walls of Roman Barns 3 and 4 at Orton Hall Farm, Peterborough (Mackreth 1996, 66-67). These, however, were aisled barns; no evidence for aisle posts or columns was recorded in association with S2901 and it is unlikely that a Roman aisled building would be open-ended. Morris (1979, 67), however, notes several examples of rectangular Roman agricultural buildings that were partly or wholly open-ended or open-sided. If this structure was a barn, byre or similar structure then it may have been closer in construction to buildings of this type. In such cases it may be expected that postholes or post-pads would be present representing supports for the roof, especially if the building had only one side walled, as at Brading 35 (Morris 1979). Any such elements associated with S2901 must have lain beyond the limit of excavation.

Approximately 70m to the south-east of S2901 lay a third structure that was assigned a date in Phase 1, S4348. These buildings appeared to be positioned on the same alignment. It has been suggested that the building may have been used as a barn, given its location adjacent to the late Roman paddock/field system (McConnell *et al* 2008); its Phase 1 date is derived from its stratigraphic relationship with one of the ditches (F4296) forming this field system. However, when part of this structure was investigated during the trial trench evaluation that preceded excavation here (Wills 2003) it was interpreted as indicating that settlement activity here may have been of reasonably high status. The stone-built wall footings were considered to

suggest that they were well constructed and the recovery of associated roof and box flue tiles, *opus signinum*, mortar and painted wall plaster further attests to the quality of the structure and suggests a non-agricultural function. The pottery recovered from this structure during the evaluation is representative of domestic wares and includes one fragment of imported samian (Wills 2003). Interestingly, during excavation, they were no further finds from this structure, with the exception of post-medieval pottery recovered from a layer that sealed much of the interior of the building. The Roman material reported by Wills (2003) may not have originated from this building and potentially represents material moved, through human agency, from elsewhere, possibly as refuse or levelling material. Aspersions must be cast on any suggested direct link between this material and structure S4348 due to the complete lack of Roman finds recovered from the structure or any associated demolition deposits identified during the more detailed investigation conducted during the excavation.

The surviving masonry portion of S4348, M4354, was significantly more substantial than that from S2901, measuring 0.80m in width and surviving to a height of 3 to 4 rough courses. Like the masonry from S2901, M4354 was constructed of irregular clunch blocks, with rubble infill material. However, in contrast to S2901, no bonding material was present. This simply may not have survived weather and environmental conditions, especially if the footings were left open to the elements for any length of time following demolition and if this material was of the same sandy consistency as that from S2901. Alternatively this might indicate that, despite its more substantial width, this building was of cruder construction that S2901. No such material was found in conjunction with this structure but that a very large amount was recovered from features associated with S2901, leading to the suggestion that, despite its stone footings, S4348 had a superstructure constructed mostly of wood, and presumably daub. This, however, may be an anomaly caused by the processes of demolition associated with these buildings and later dumping of waste and refuse material; S5144, which would appear to be a building of particularly simple construction was also shown to contain a notable quantity of CBM, albeit a smaller one than S2901.

No internal divisions or clear evidence for floor surfaces were recorded within S4348. This may indicate that it was a barn-like agricultural building. Backfill material from the interior of the structure was submitted for soil organic matter, phosphate and magnetic susceptibility analysis in the hope that this might show evidence for enrichment by manure, lending support to the theory that this was an agricultural building. However, analyses showed that no such evidence was present (Crowther Ch. 3.12). The provenance of this backfill material and the processes by which it built up or accumulated are, however, uncertain and it could have originated from anywhere in the vicinity of the site. The lack of evidence for enrichment by manure may, therefore, not be surprising and, equally, may not rule out the use of this structure as a barn.

Alternatively, S4348 could have been a simple one, two, or three-roomed rectangular house of the type identified by Hingley (1989, 35) as being common on Roman sites in southern Britain. However, without further

excavation it is not possible to know if the 11m of its north-eastern wall represents the full length or the full width of the building. If it is the former, then S4348 would be significantly shorter than the majority of the examples of such buildings cited by Hingley (1989, fig. 15), but if the latter, then it would have been significantly wider than the majority of such buildings (*ibid.*)

Buildings in Phase 2

The only positively identified building structure of Phase 2 date was S5500. This was constructed by excavating a flat-based pit, with an internal step in one corner and placing ground beams against the sides of this pit and two cross-beams linking the two sides; a similar method of construction was used for the Phase 3 building S2661. The superstructure would have been built up from these ground beams. The presence of ground beams on only 3 sides of the structure suggests that it may have been open-ended to the south-east. There is no evidence for the use of masonry in this building and it would probably have been constructed from wattle and daub. In support of this hypothesis it can be noted that small quantities of daub were recovered from its fill, as well as other features on the site, including the nearby S5144, which may have been of similar construction. The roof would have been of pitched thatch, resting on the outer walls. This building, and the other buildings like it (S5144 and S2661) are of such small size that comparable examples do not seem to be specifically discussed (see for example Morris 1979). Small rectangular agricultural buildings are described as an 'all purpose shell' (Morris 1979, 66), and there is little to suggest a precise function except to say that they are too small to be dwellings. The presence of a hearth in S5500 indicates that it was not used for storage. The possible three-sided construction of the building might indicate that it only served as a form of shelter for the hearth and those occupied in the activities associated with it and helps to give the impression of an industrial function for the structure. It is unlikely to have been a smithy, partly because of the small working area that it would have provided, and also because of the complete absence of slag within this part of the site. The lack of loomweight fragments also seems to rule out wool production in this part of the settlement.

To the south-east of S5500 was Ditch F5003. This was a substantial feature and it was initially considered to demarcate the higher ground within the site (McDonald 2000, 12). However, its regularity in plan and sharp right-angled turn is at odds with all of the other Roman ditches recorded at the site. In plan, it was most similar to the masonry portion, M4354, of S4348. It did, of course, not contain any *in situ* masonry or building material. However, its form in plan, regularity, positioning on the same axes of alignment as the two masonry structures that existed during the preceding phase of Roman activity, and its general character suggest this feature may have had a structural function.

If it did formerly contain the stone footings of a building then clearly these must have been robbed out. The flat base of the feature would support an

interpretation as a foundation cut for a stone wall but its profile, with sides described as 'moderately steep', would not; Barker (1996, fig. 9, 35) suggests that the vertical sides of the original foundation cut would remain intact following stone robbing. This, however, is dependant on the method used to access the material surviving within the foundation cut; anyone wanting to access this material is unlikely to have had much regard for the integrity of the original feature. In some cases a trench may have been dug around the foundations in order to access them (Adkins and Adkins 1998, 211). This could account for the apparent flaring of the sides of the feature and may go some way to explaining its great width, which, at, 2.1 - 3.3m, was far in excess of the width of the confirmed masonry structures recorded elsewhere on the site. The relationship of this feature with metalled surfaces L5006, which it was originally recorded as cutting, and L5502, which lay within the interior of the area that it enclosed, may indicate that a building is represented here. Metalled surfaces occurring on both the interior and exterior of buildings have been interpreted as provision for the entry of carts, although other evidence would be required to support such an interpretation (Morris 1979, 67). It may be expected, however, that more evidence of rubble and other building material may have been left behind by any wall that existed within F5003 (Barker 1996, fig. 9) but no rubble and only 3 fragments of tile were recovered from the robber trench associated with the portion of robbed-out Roman wall at 97-99 High Street, Braintree, Essex (Murray 2000; Pearson 2002) and comprehensive robbing of material from the masonry foundations of a substantial Roman building was observed at Bishop's House, Great Chesterford (Garwood 2004).

With the exception of surface L5502, no internal features were present within the area enclosed by F5003 which would support the interpretation of this feature as part of a building. However, its distinct differences from the enclosure/boundary ditches recorded elsewhere on the site suggest that it had a markedly different function than these features. Its regularity in plan may be considered consistent with the footprint of a building. As the CBM assemblage from the site is considered to demonstrate that substantial structures existed in the vicinity of the site, it is reasonable to suggest that this feature is potentially related to the presence of a building here.

The Phase 3 structure

S2661 appears to have been constructed by digging a shallow flat-based rectangular pit into the natural chalk brash. Sleeper beams were then positioned around the edges of the pit cut, and across the centre, possibly where a partition wall was required. The spaces between the sleeper beams were then backfilled with compacted natural chalk, to hold the beams securely in place and possibly to form a firm internal floor surface. This was probably the same chalk that had initially been quarried out of the cut for the structure. There is no evidence for precisely how the walls and roof were constructed. Presumably, a timber frame was supported on the sleeper beams.

Structure S2661 was of very similar size and (probably) construction to Phase 2 Structure S5500 (within the new surgery excavation area). S5550 differed from S2661 due to the presence of a large central stone-lined hearth. The presence of a fireplace clearly indicates that these structures could be more than just storage sheds, but their small size almost certainly rules out use as dwellings. A function as a workshop or shelter seems plausible for Structure S2661. Its position, immediately to the west of enclosure ditch F2543 and therefore presumably within an enclosure formed by this ditch and F2092, suggests that it had a function associated with whatever agricultural practice was being carried out within this area. It is notable that a high density of material derived from the fine-sieving of spelt grain was recovered from the beamslots of this structure, suggesting that it may have been associated with the processing or storage of cereals. Soil organic matter, phosphate and magnetic susceptibility analysis (Crowther Ch. 3.12) was carried out on samples taken from the floor surface (L2662) with the intention that this might aid in the identification of the nature of activity within the structure. However, the results of the analyses showed no evidence relating to human activity or the keeping of livestock within the building.

At the villa at Barnack, a much larger building, but which like S2661 appears to have been constructed on ground-beams, has, based on comparisons with military buildings, been interpreted as a granary building with a raised floor, intended to protect the contents against damp and vermin (Wilson 1974, 256). While, superficially at least, L2662, the basal chalk layer within S2661, appeared to form a floor surface, there is no reason why this structure could not have had a raised floor. Such an arrangement would make sense in light of the building's association with cereal remains and this interpretation might be supported by the lack of evidence for human activity revealed during analysis of the samples taken from L2662 (Crowther Ch. 3.12).

Unphased Roman structure S4134

It is most likely that this possible four-post structure was in use during Phase 3. This would place it within the system of enclosure partly represented by ditches F4136 and F4109 to its immediate north-east and suggests a possible association with the large feature (F4148) a few metres to the south-east. The four-post structure could feasibly have been associated with the conjectured industrial function of F4148 (see below). Four-post structures on Iron Age and Roman sites are often interpreted as granaries and it is possible that S4134 was used in this way. Similar postholes were recorded in the immediately surrounding area, most notably F4114, which was positioned in alignment with F4087 and F4074, and F4118, which was positioned in alignment with F4074 and F4072. This potentially indicates that the structure was more elaborate than a simple four-post structure, that more than one structure was located in this area, or that the posts do not necessarily form a structure *per se*, but were erected for some other purpose.

An overview

With the exception of the Phase 1 stone-founded structures (S2901 and S4348) none of the identified buildings would appear to be of the magnitude, scale and function that is suggested by the CBM assemblage, the pottery and elements of the small finds assemblage. These finds indicate that a fairly high status building, in which domestic occupation occurred, was located in the vicinity of the excavated site and that the building had a tiled roof and a hypocaust heating system. The majority of the buildings recorded at this site would appear to have been of comparatively light construction, mostly having been of timber framed construction, possibly with daub walls or, at most, brick-infill panels. These buildings must have been ancillary buildings associated with but separate from the main range of buildings. The presence of a hearth in S5500 suggests that it may have been a workshop, presumably associated with some process involving heat, though the hearth could simply have been to keep workers warm. The other smaller buildings are likely to have had similar functions, though the possibility remains that the simplest of these, S5144, may have been an animal pen.

Faulkner (2002) has noted that villa civilisation in Britain peaked around AD 300 but that this peak was very brief with the boom in their construction running down by *c.* AD 325. Some houses had already been abandoned by the middle of the fourth century and by the second half of this century villas and the agricultural economy were in terminal decline (Faulkner 2002, 71). It is possible that the apparent replacement of stone-founded buildings with those of more ephemeral construction represents a downturn in the prosperity of the settlement. However, given the date ranges of the artefactual evidence and the persistence in quality throughout these ranges, economic hardship does not seem likely. Rather, this is considered to be a simple rearrangement of this part, at least, of the land. It is notable, however, that at some villa sites, such as Llantwit Major for example, whole wings of stone-built structures have been identified as workshops and ancillary buildings (Hogg 1974). This may indicate that the Bottisham villa was a comparatively less wealthy household; as Frere (1967, 266) notes, there is a great degree of variation in the size and wealth of Roman villas. However, as the main buildings of the villa range have not yet been identified, it may be that more substantial workshop buildings also existed at this location.

4.5 The Industrial structures and associated features

Introduction

Several features were recorded across the site which may be described as industrial features due to their possible association with particular processes, in all but one case involving heat. Three of these features may be more accurately termed agri-industrial features as it seems that their most likely function was for the processing of agricultural produce, presumably grown on land associated with or forming part of the same estate as that within the excavated site. The fourth, which conversely is discussed here first, could potentially have been involved with a true industrial process or with similar

agri-industrial processes.

The hearth in S5500

F5086, the hearth observed in building S5500, measured, in plan, 0.6 x 0.5m, indicating that it would have taken up a large proportion of the floor space of the structure in which it was located, which itself measured 3.1 x 2.1m. This might indicate that the hearth was the dominant aspect of S5500, something that would appear to also be indicated by the possible three-sided/open-ended construction of the building which would indicate that S5500 served as a shelter or cover for the hearth, rather than the hearth serving to heat the building. This might suggest an industrial function for F5086.

The hearth was lined with a layer of flat stones which also incorporated fragments of tile and fragments of mayen lava quernstone which indicates that material that would inhibit the dissipation of heat from the hearth were used in its construction but nothing about the processes for which it was used. The presence of a large hearth like this might be considered to naturally lead to the suggestion that Iron working was carried out here. Iron smelting and smithing was carried out at many villas and agricultural sites and repairing and remaking iron objects must have been usual on a villa estate (Morris 1979, 68-69). If the Tunbridge Lane site, as is suggested by some of the available evidence, represents part of a villa estate then the presence of a smithy or forge would not be unexpected. When iron slags are found in hearths in small buildings there is a strong likelihood that smithing took place here (Morris 1979, 70). However, no slag was recovered from this feature; the only finds present in either the stone lining or the backfill were fragments of quernstone and tile. Neither was any such material present elsewhere in structure S5500. Indeed the picture across the entire site is that iron-working was of limited importance. The structural evidence also suggests that this hearth would not have been suitable for iron-smithing or smelting; a greater quantity of clay 'furniture', walls or vitrified clay from the interior may be expected if such structures had been present (Crew 1995; Crew 1996). It remains possible that all such evidence was removed when S5500 was dismantled but it seems unlikely that no slag at all would remain if iron-working had been conducted here. Hearth F5086 must, therefore, have been used for some other process but like slag residues from other such activities are absent. A large hearth or oven, capable of heating a vat of considerable size, could have been used for baking, brewing, dyeing or steeping flax (Wacher 1978, 212). The hearth could have been used for the smoking of fish, meat or other foods or for the production of sulphurous fumes used to bleach material as one of the final stages in the fulling process (Wacher 1978, 210). It could also have been used for cooking and, while it is likely that the landowners would have had their food cooked in kitchens within the main villa complex, if it was extensive enough to have such facilities, this building may have provided food for the work force tending the land.

Pit F4148 and Gully F4150

Pit F4148 and Gully F4150 were located in the north-eastern part of the excavated area and potentially comprised an 'agri-industrial' feature.

Excavations at Kettle's Yard, Cambridge (Evans 1999) revealed a possible retting tank. The retting pit was connected to a trough, which was in turn linked to a 'flat-based tank-like feature' (Evans 1999, 256). The shape of the Kettle's Yard retting pit and associated trough were similar to that of Pit F4148 and Gully F4150, perhaps indicating a common function. The feature appears to have been positioned some distance from the location of the assumed main range of buildings and this may have been because the retting process produces an unpleasant smell. This interpretation is hampered by the fact that there is no evidence that flax was grown or processed at this site. There is, however, some possible evidence that grain was malted at this site in the Roman period. Fairly high concentrations of cereal remains which contained possible evidence for malting were recovered from the Phase 3 structure S2661 and smaller concentrations, also containing possible evidence for malting, were recovered from Pit F4148 itself. The arrangement of a pit, possibly originally containing a vat or tank of some kind, with an associated drainage gully may lend itself to the brewing process, for which malted grains are required. Today, traditional ales are brewed by mixing crushed malt with hot water and leaving for several hours while the sugars in the malt dissolve. When the liquid has absorbed as much sugar as possible it is run off through the base of the vessel in which it has been standing (CAMRA 2013). Historical brewing methods and traditions would not necessarily have been identical to this process; Hornsey (2003, 534) describes a quite different process, used during the medieval period in the Low Countries, to achieve the same (or similar) results. However, the ridges of chalk left *in situ* in the base of Pit F4148 would have been ideal for raising a mash tun vessel with a slotted base or false bottom so that the wort, the liquid produced during this part of the process, could be drained off. Tanks possibly used for steeping grain in the brewing process have been identified at Halstock, Huntsham, Hambledon and Whitton (Morris 1979, 7). Gully F4150 would have facilitated the running-off of the wort and its *opus signinum* lining would have ensured that no soil particles or other debris could become incorporated into the liquid. However, F4150 appeared to drain directly into ditch F4136, meaning that, unless a receptacle was placed within the ditch at the end of the gully, the wort would have been lost and therefore unavailable for fermentation into beer. Also lacking in support of this possible interpretation is evidence of heating, although the application of heat to the mash tun may not have left any evidence on the base of the pit and is unlikely to be represented in the backfill material excavated from the feature.

Nicholson (Ch. 3.11) remarks that the cereal evidence from these features is more characteristic of material derived from activities in the surrounding area, rather than the function of the features themselves. However, the brewing process postulated here is unlikely to have left cereal remains in the same quantities as other processes due to the wet conditions that would have been required and the fact that the actual processing would have been conducted in a separate vessel, now long removed. F4148 and F4150 may not have been

associated with brewing but the presence of possible evidence for malted cereals, both within F4148 and elsewhere on the site, indicate that a function associated with the processing of malt is more likely than one associated with the retting of flax. Beer was fairly widely drunk in Roman Britain; Frere (1967, 294) suggests it largely took the place of wine from around the 3rd century, although imports still continued and there is evidence for locally produced wines. Beer would have been part of a Roman soldier's diet and may have formed part of his basic rations (Birley 1977, 53; Wacher 1978, 173). While the more senior members of the villa household may have preferred imported or even locally produced wine, beer may have been brewed for the consumption of the estate's working staff or slaves. It is even possible that beer was produced for sale as part of the estate's income-generating activities, though this seems less likely. Spent grain from the brewing process may have been used as fodder for animals (CAMRA 2013).

Corn-driers

Simply on the basis of form and construction the precise nature of the process for which S2579 and S2576 were used is unclear. Similar features have been recorded at various sites, such as Beck Row, Mildenhall, Suffolk, where they have been interpreted as corn-drying or malting ovens (Bales 2004, 65) and at Fosters End Drove, East Winch, Norfolk where such a feature was, due to the lack of cereal remains and its position close to a pottery-production area, interpreted as having been used for the drying of pottery prior to firing (Lally *et al*, in prep). However, environmental samples from these two features contained amongst the richest assemblages of cereal remains from all of the Phase 2 features, indicating that an association with cereal processing is the most likely interpretation.

Corn-driers are common agricultural structures in Roman Britain (Morris 1979, van der Veen 1989, 302). They occur in a variety of types but the most common is the T-shaped oven. The recovery of charred grain from the flue and stoke-hole areas of such features led to the interpretation of these ovens as corn drying ovens (van der Veen 1989, 302). However, experiments by Reynolds and Langley (1979) and Reynolds (1981) concluded that such apparatus was an inefficient way of drying cereals. Indeed, the results of these experiments and ethnographic evidence suggested that a farmer would have difficulty in drying all of his corn in a corn drier before it dried naturally (Reynolds and Langley 1979, 41). In the modern malting process the grain, following germination, is heated and turned regularly on a malting floor to produce malt (CAMRA 2013). However, a corn-drying oven may alternatively be used for this purpose; drying kilns have been used in Ireland for drying malt for the manufacture of poteen (Morris 1979, 7). It was shown by Reynolds and Langley (1979, 41) that corn drying ovens could be used for the roasting of malt and a batch of this product, suitable for the manufacture of an ale of modern standards, was produced. Later work (van der Veen 1989) has overturned these conclusions, suggesting that 'corn-driers' would have been suitable both for roasting malt for brewing and for parching grain for storage or consumption. At Parnwell, Peterborough archaeobotanical analysis has

shown that the corn drier there was used to roast malt produced from spelt wheat (Webley 2007, 111). Although it is mainly barley that is used in modern brewing, other grains were used by the Romans, possibly more commonly than barley. Wheat sprouts more quickly, and may have been more efficient to use, and oats were also used (Morris 1979, 7). Evidence from Barnack (Simpson 1993) and Haddon (Fryer 2003) is also suggestive of malting of spelt and it has been suggested that the brewing of wheat beer may have been a common activity among rural communities in this area (Webley 2007, 111). It is possible that any such beer would have been similar to Lambic, one of the oldest known beer styles in existence today, with its origins reaching back to *c.* 3000BC. Lambic is a wheat beer, although the Lambics that are brewed today use unmalted wheat in combination with other, malted, cereals. It is a speciality of the Brussels region and fermentation of the wort occurs in the open air (in specially adapted lofts in modern craft breweries) because the process is reliant on naturally occurring atmospheric yeasts (Protz 2010, 240-241).

Although Barley was processed, stored and used in separation from spelt wheat in Phase 2, the evidence for malting is limited to spelt wheat. It would appear, however, that barley was used for brewing both in Roman Britain and in the wider Roman world; Hornsey (2003, 229) states that is was grown throughout the Empire for brewing beer and feeding animals. It was grown more extensively than wheat around the Mediterranean until the demand for bread from the fast-growing cities reversed the trend. In Britain, however, the situation did not change (Hornsey 2003, 229). If this assertion is accurate then the apparent predominance of wheat malt in the Cambridgeshire area might be indicative of local/regional tastes or specialities; modern wheat beers tend to be more opaque in appearance and fruitier in flavour than those brewed from barley. The production of both wheat and barley malt at Beck Row, Mildenhall, Suffolk (Fyer 2004, 53), suggests that there was a market for both wheat and barley beers in the area during the Roman period, although if Lambic-style beers were being brewed the two cereals may have been used in conjunction.

While it is unlikely that the malt possibly being processed in Phase 3 Pit F4148 was roasted in S2579 or S2576, due to the differences in date of these features, similar structures may have existed elsewhere. Similarly, the malt possibly produced in the Phase 2 kilns may have been used in beer-making or the production of other foodstuffs requiring malt elsewhere in the surrounding area.

These ovens may not have been used for malting or malt-drying alone. They may also have been used for other cereal drying processes. The evidence from them consists mostly of material that is likely to have been used as fuel (Nicholson Ch. 3.11). It seems likely, however, that given the usually mixed nature of the agricultural regime employed at villa sites that these corn-drying ovens would have been multi-functional entities and used for a variety of appropriate activities.

4.6 Economic evidence

Agricultural and Industrial production

Branigan (1988, 42) indicates that for several reasons, including the limitations of the available evidence, it is generally considered that the villa estates of Roman Britain operated mixed economies. Hall (1996, 159) suggests that this type of economy is typical of most Roman sites in the Fenlands and on its margins. The evidence from the current site would appear to support this view with both arable and pastoral agricultural practices represented.

The identifiable elements of the faunal assemblage recovered during all phases of excavation are dominated by domestic species with cattle the most abundant species represented, followed by horse, sheep/goat and pig, although there was some slight variation from phase to phase. Dog was also present. Such a high proportion of cattle would indicate that the farmstead is typical of sites of full Roman tradition (King 1978). The evidence from Excavation Areas 1 and 2 indicates that cattle were raised for meat production (Cussans *et al*, Ch. 3.8). Initial reports on the assemblage from the new doctor's surgery site suggested that older beasts comprised the majority of the cattle indicating an emphasis on arable farming with cattle used primarily for traction. As Cussans *et al* (Ch. 3.8) demonstrate, however, the data leading to this conclusion might be erroneous. Body part representation indicates that whole cattle carcasses were being processed on site, indicating that the meat was either consumed nearby or sold, as ready prepared cuts of meat, within little more than a day's travel.

Despite some variation from phase to phase the general picture of chronological species distribution remains fairly consistent. There appears to be a slight increase in horse exploitation and a decrease in the raising of sheep in the later phases of Roman occupation. The proportion of horse in the assemblage is quite notable. A normal percentage, where horses are considered as mounts for ranching activities, is of the order of 2-5% (for example at the Gadebridge Park villa, Hertfordshire; Harcourt 1974), but at Bottisham the figure is higher, comprising around 17% of the domesticates present. Little bit-wear was observed; this would be expected in animals used as mounts (Clutton-Brock 1974; Hyland 1990, figs. 15-16) and it is unlikely that horses would be being used for draught purposes during the Roman period (Armitage and Chapman 1979, 345-359; Grant 1989). Salway (1967) argues for horses being raised for meat at the fenland site of Hockwold. However, horsemeat never featured as an important part of the Roman diet (White 1970) and, indeed, in much of the Roman world the consumption of horse meat was considered taboo, although it may have been eaten in some rural communities (Groot 2008, 19). It is, therefore, unlikely that they were deliberately raised for this purpose, although they could have been slaughtered for meat or other products when no longer serving any other useful function. It is possible that horses were being bred for export, either for the Army, *Cursus Publicus* or perhaps for the civilian market.

Groot (2008, 81) states that specialist horse-breeding sites can be identified from a higher than normal proportion of horse bones and that there should be evidence for newborn animals, juveniles (representing natural deaths and culled animals), and for the breeding stock, older adults as well as some animals in all age categories. Young adults should be underrepresented as this is the age at which the animals would have been sold off. The majority of horses represented in the assemblage appear to have survived well into adulthood with a smaller number of individuals which died before reaching full maturity. This pattern might fit with a breeding programme designed to produce horses for sale to these markets but it does not entirely meet Groot's (2008, 81) criteria. It might also be expected that horse harness and other gear would be represented at a specialist horse breeding site (Groot 2008, 81) but the only such items present comprised two unstratified horse shoes amongst the metalwork recovered during the preceding evaluation of the main part of the site (Wills 2003; Newton in Crummy, Ch. 3.5).

The way in which horse remains appear to have been treated at the site might, however, be considered to be unusual. There is a notable paucity of articulated horse remains within the assemblage, suggesting that some kind of carcass utilisation was taking place; treatment seems to have been very similar, in many respects, to that which the remains of the more traditional food animals were subject. It is possible that horse remains were being used for secondary purposes, which could include the production of glues, grease and other products, although evidence of bone smashing, which might be consistent with this, is limited. Evidence of butchery is also evident on horse remains; this would appear to be in contrast with what may be expected at a horse-breeding site and with the widespread Roman taboo on the consumption of horse meat. However, it is nowhere near as evident as it is on the remains of other animals and appears to be limited to Phase 2. The evidence is, therefore, insufficient to state that horse meat was being eaten or prepared for consumption but the utilisation of horse carcasses is apparent. It is unlikely that horses were being reared primarily for this purpose, but it could represent attempts to maximise the economic yield from horses. Alternatively, this pattern of horse utilisation might indicate that an operation similar to a knacker's yard was present at, or near, the Tunbridge Lane site.

Further explanations might be considered for the proliferation of horse bone in the assemblage. For example, a location at which horses were regularly stabled, such as a roadside tavern or *mansio* (an explanation that might fit neatly with the possible brewing of beer and the high consumption of table wares represented in the ceramic assemblage), might be proposed but the age profiles of the represented animals, the apparent post-mortem treatment of horses, and the lack of horse-related paraphernalia in the small-finds assemblage make this less likely than the breeding centre interpretation.

Pig remains in the assemblage mostly represent juvenile animals killed for prime meat. This might indicate that pigs were not raised at the site or on land forming part of the same estate and were simply traded into the site as ready slaughtered carcasses for consumption. A similar pattern is evident for sheep. Based on bone fusion data alone it would appear that sheep were only utilised

for meat and that there was little wool production. However, evidence from the tooth-eruption data might suggest that there were some older animals, possibly representing a breeding stock, from which wool would have been a beneficial by-product.

Archaeobotanical remains indicate that cereal crop processing was carried out at the site in the Roman period. While it is possible that the only economic involvement that the presumed villa estate had with these cereals was during the processing stage, it seems more likely that this is evidence that arable agriculture formed an important part of its economy. Indeed the loamy soils of the area may be well-suited to cereal cultivation, being relatively free-draining but with adequate moisture-holding properties (Hodge and Seale 1966). A reasonable amount of crop diversity may also have been possible: in 1794 the soils in Bottisham were described as being 'applicable to the culture of wheat, barley, turnips, trefoil, rye and peas' (Fitch 1976, 6). The main crop appears to have been wheat but barley was also clearly grown. It seems likely that the two crops would have been grown for different purposes or for the production of different end-products. Barley may have been a fodder crop (Nicholson & Summers Ch. 3.11) but equally may have been grown for use in a different range of foodstuffs.

Although few deposits of pure grain were recovered, the prevalence of fine-sieving debris across the site suggests that cereal processing was taking place in bulk and it may have been stored or exported as fully processed grain. It is clear that cereal processing was being conducted on an agricultural, rather than domestic, scale and this must have made a contribution to the economic viability of the presumed villa estate here. The grain may have been exported locally or traded further afield to small towns or even military centres. The evidence for malting and possibly the production of beer indicates the enhancement of a basic staple for further financial gain but is likely to be an additional commodity produced alongside that staple. However, if long-distance trade was carried out, it is much more likely that this trade was in malted grain as, when it is dried, it is a very stable commodity, less prone to spoilage than simple grain. If, as has been speculated, malt produced here was used in the production of beer it is possible that the sale of this commodity produced some income. However, it is unlikely to have been traded over long distances and most hostelries are likely to have brewed their own beer. It is more likely that any beer brewed here would have been solely consumption for the household and/or staff of the presumed villa estate.

Technologically, the corn-drying ovens identified at the site (S2579 and S2576) could have been used both for roasting malt and for parching grain. As such, they would have played an important role in the arable agricultural regime of the site. The disappearance of such features from the excavated area in Phase 3 coincides with the beginning of an apparent downturn in cereal processing activities, although this may simply be the result of the relocation of this activity to a location beyond the limits of excavation.

The identification of a number of large pits and groups of pits of Phase 4 date in AS1011 Areas 1 and 2 suggests that the land within the site was used for

an alternative, or additional, purpose to agricultural production during the later part of the Romano-British period. These pits have been suggested as representing the extraction of the underlying natural chalk. They are assigned to Phase 4 on the basis of the finds recovered from them; only one of these features, F4174, displayed stratigraphic relationships from which a relative date could be identified. It is possible that at least some of these possible quarry pits were earlier in date than the finds evidence suggested with the 4th century material recovered from them possible representing either a deliberate phase of 'late' site clearance and rubbish dumping or the remnants of once more widespread surface occupation horizons. Chalk or clunch, a hard variety of chalk was used in the construction of buildings S2901 and S4348, oven/corn-drier S2579 and was present in the internal floor of building S2661 and it may be that this material was extracted on site. However, the quality of the material is unlikely to have been suitable for building and it is perhaps more likely that clunch used in the construction of buildings came from locations such as Isleham, Cherry Hinton, Reach or Burwell which became the primary clunch quarrying locations to the east of Cambridge in the medieval period (Purcell 1967, 26) or Swaffham Bulbeck, just to the north-east of Bottisham, where worked clunch and Roman quarries have previously been identified (Connor 1998). It is, however, possible that chalk/clunch used as infill material or for the apparent floor surface of S2661 could have been extracted from the pits present within the excavation area. Despite this evidence, which is no more than circumstantial, an earlier date for the quarrying activity remains nothing more than speculation.

Given the scale of the quarrying activity represented here, it seems unlikely that the chalk/clunch was being extracted on a large scale as dressed blocks for use in construction. The pits did not delve particularly deep into the natural chalk (generally not more than *c*. 1.00m), and chalk found close to the surface on site was generally of fairly poor quality owing to natural bioturbation and freeze/thaw weathering. It would not have been much use for construction. Indeed, the effectiveness of clunch as a building material is compromised as it erodes comparatively quickly; Christ's College, Cambridge built of alternating courses of brick and clunch in the early 16th century eroded so badly that its repellent appearance reportedly deterred people from entering their sons at the college (Clifton Taylor 1972, 63). The clunch extracted from this site may have been used in rubble form in the rubble courses present in the foundations of some Roman buildings or put to other uses in which clunch rubble may have been used but it is perhaps more likely that the material extracted was burned for lime production. This may have been used for the construction or maintenance of buildings under the same ownership as the extraction pits themselves or it may have been sold or traded. There is no evidence for any limekilns within the excavated area but they may have existed elsewhere in the vicinity or the raw chalk may have been sold/traded and the processing of it in to lime carried out at a different location.

It is interesting to note that moderate to large finds assemblages were present in all of these groups of features, with the notable exception of the complex of pits assigned the collective feature number F2439. A number of other pits of Phase 4 date, scattered across the excavated area, have been interpreted as

having been excavated solely for use as rubbish pits (McConnell *et al* 2008). In light of this, it cannot be completely ruled out that the some of the apparent quarry or chalk extraction pits might, in reality, represent concentrations of refuse pits.

Trade, contacts and status

Analysis of the finds shows the site to have been receiving goods from local, regional and extra-regional sources. The overall character of the assemblages indicates wealth.

The pattern of pottery consumption has been identified as being that which may expected at a high status domestic site. Fine ware pottery seems mostly to have been provided by the industries of the Lower Nene valley and Oxfordshire. Samian wares are present, but in smaller quantities, perhaps reflecting the comparatively late date of the site within the Roman period. The majority of pottery was from the Horningsea kilns, located only 6 km to the north-west of the site.

The stone items can be shown to have originated from a variety of sources. Querns of Millstone Grit and Niedermendig lava are common finds on Roman sites in the region, but the presence of Purbeck Marble is rarely reported, and is informative about the status of the site. Purbeck Marble is quarried from the Isle of Purbeck, Dorset, where several Roman industrial sites are known (Sunter and Woodward 1987). Although some household artefacts (primarily mortaria) were made from the stone, its main use was as a high quality architectural stone, as tessarae, paving, floor tiles, columns and wall casing or veneer (Beavis 1970). It had a wide distribution across Britain, and there are examples of its use as far afield as Chester, Caerleon, Silchester and Colchester (Beavis 1970, fig. 2).

The presence of Purbeck Marble chimes with other evidence from the site, namely *opus signinum* mortar, wall plaster and tile (which included *tegula, imbrex* and box-flue fragments as well as many unassignable flat fragments). These combine to imply the presence of a fairly wealthy dwelling, with a hypocaust heating system. The unabraded nature of the tile might support the suggestion that this building was extant close to the site of the present excavation.

Glass vessels were used and eventually discarded at the site, and amongst the items of personal adornment in the small finds assemblage are items indicative of economic prosperity including a ring-key (SF45) which would have been a conspicuous display of the wearer's wealth (Crummy Ch. 3.5). There are, however, some points of interest within these assemblages that might not be entirely consistent with high levels of wealth.

Of the items most indicative of wealth in the form of personalia from the small finds assemblage (Brooches SF 7 and 57, ring-key SF45 and ring SF24) all are potentially slightly earlier in date than the main dating evidence for the site and, in the case of two penannular brooches, significantly earlier. This possibly suggests that old items, or heirlooms, were kept and worn as symbols of status to maintain an air of dignity in times of reduced economic fortune. Alternatively, of course it might just be that these represent old, worn out, broken or simply unfashionable items that were discarded while more favoured items, more contemporary with the other dating evidence from the site, are not represented in assemblage. It is interesting to note, however, that with the exception of one of the penannular brooches, all of these items came from Phase 4 contexts.

The relative lack of amphorae in the pottery assemblage is also interesting. Peachey (Ch. 3.2) suggests that this is due to the replacement of such vessels with Horningsea storage jars and wooden barrels by this point in time. However, amphorae continued to be imported into Britain even beyond the end of Roman rule over the province. It is most likely that imported commodities such as wine and olive oil would have arrived in such containers. It seems reasonable to suggest that the lack of such imported goods at a site of apparent high status might hint at a lack of spending power.

Utilisation of wild species

Evidence for the utilisation of wild species at the site is limited. In the archaeobotanical assemblage evidence for the consumption of wild species is limited to the presence of a small number of nutshell fragments from samples taken from Phase 2 and 3 contexts. However, seeds of saw sedge (*Cladium mariscus*), a wild growing plant, were recorded and these might represent the use of this species as roofing or flooring material. In the faunal assemblage, a number of wild species are represented. Red deer, fallow deer and hare could all have been hunted for food or sport but there is no evidence for butchery marks. The only evidence for human modification is on red deer antler. Fallow deer is only represented by a piece of antler and, as there is no clear evidence to indicate if this species was present in Britain at this time, could conceivably have been imported from abroad. Of the other wild animal species present it is unlikely, although not inconceivable, that badger, frog/toad and crow were utilised for food. Marine mollusc shells were recovered from the site; these would have been easily and fairly quickly transported from coastal areas.

Summary of the economic evidence

For the most part, the economic evidence recovered during the various phases of excavation may be seen to be fairly typical of Roman sites in the fenland region (Hall 1996, 159) and of Roman villa estates (Branigan 1988, 42) in general, representing a mixed arable and pastoral economy. There is some variation between phases (Cussans *et al* Ch. 3.9; Nicholson &

Summers, Ch. 3.11), which may be directly related to the various rearrangements of the site's layout, but the mixed character of the economy remains fairly consistent.

Within this picture of a mixed agricultural economy there is some evidence for specialisation. The unusually large proportion of horse remains in the faunal assemblage may indicate that these animals played an important role in site's income generating activities. This may have taken the form of horse breeding, presumably for sale as working animals, but may in addition, or possibly alternatively, may indicate some process involving the utilisation of dead animals for economic gain. The slightly unusual feature F4148 has been suggested to be associated with the production of beer. Brewing is not necessarily an unusual undertaking at Roman rural site but the possibility that evidence for such activity is present adds an extra point of interest to the available economic evidence. However, the evidence to suggest that this feature was used for brewing is far from conclusive and it could have been used for other processes involving liquid. The evidence suggesting malt production makes it possible that brewing was carried out at this site, though it is equally possible that malt was produced to be exported away from the site for sale.

Much of the artefactual evidence, particularly elements of the pottery and building material assemblages, from the site gives the impression of a high status dwelling in the near vicinity. It is the combination of this with the evidence for agricultural production that makes it possible to suggest that the site represents part of a villa estate or a wealthy farm in close proximity to the main range of buildings.

Despite the evidence for status and wealth, there is other evidence to indicate a fluctuating economic situation. A decrease in the level of crop processing activities after Phase 2 coincides with both an apparent change in climatic conditions in the fenland and an Empire-wide economic depression. Either of these factors may have had an effect on the demand for cereal crops at the markets at which produce from Tunbridge Lane may have been sold. While the production of malt or beer may have been carried out to help solve seasonal fluctuation in cash-flow (Nicholson & Summers Ch. 3.11), these activities are unlikely to have improved the situation in a more universal economic downturn. It is, however, interesting to note that the features suggested as being associated with brewing (F4148 and F4150) occurred in Phase 3, at or around the time that the 3rd century crisis would have been mostly keenly felt in this area. A downturn in economic fortunes later in the later phases of Roman occupation might be implied from the relative antiquity of items of personalia in comparison to the date of the contexts from which they were recovered, the decrease in the quantity of pottery recovered from Phase 4 (*c*. 10kg less than in the preceding two phases), and the apparent lack of foodstuffs imported from the continent, as suggested by the relative lack of amphorae in the pottery assemblage. This appears to culminate in the Phase 4 with the apparent change in use of the enclosures revealed in the excavated area from an agricultural function, or the processing of agricultural products, to the extraction of the underlying natural chalk. In light of the other

economic evidence this might be seen to represent attempts to find an alternative source of income.

4.7 Environmental factors affecting the function, layout, development and abandonment of the site

The natural environment

The site lies between 2 and 3km from the fen edge and this is likely to have varied to some degree during the Roman period due to changing climate conditions and fluctuations in the water table such as that noted by Upex (2008, 178). Given the proximity of the fen it is reasonable to assume that its resources would have been exploited, to some extent at least, by the inhabitants of the postulated villa estate. Indeed, it is feasible that the estate may have incorporated parts of the fen or the fen edge. However, it is has been noted at the Roman site at Parnwell, a site which lies much closer to the Roman fen edge, that the evidence for the use of wetland resources was limited, following a pattern also observed at other contemporary sites in the Flag Fen area (Webley 2007, 111). Seeds of saw sedge (*Cladium mariscus*) were present in the archaeobotanical assemblage. This is a species that can be used as a roofing or flooring material or for kindling and which grows in shallow standing water, perhaps suggesting that it was collected close to the fen edge and transported for use at the site. There is little evidence for the utilisation of fenland animal species at the site. However, it is possible that fish were caught in fenland areas and consumed at the site although no remains of fish species were recovered during the processing of environmental samples.

Late Phase 2 features such as F2146 and F2950 were initially considered to have a function associated with drainage. A similar interpretation was applied to the curvilinear ditches which occurred at the very north-western end of the site during all of the phases of Roman occupation. This suggests that there was a problem with flooding or standing water within the Roman enclosures. However, the addition of further of gullies or channels to aid drainage seems unlikely. The enclosure ditches themselves were aligned either perpendicular or parallel to the 10m contour, suggesting that these ditches would have served to carry any standing water away in a downslope direction. The enclosure ditches at several of the Roman sites in the Cambourne area appear also to have had a secondary drainage function (Wright 2009, 87) and it seems sensible to suggest that the potential of such features to serve this purpose would have been inherent in the decision to use ditches over any other kind of boundary marker.

It also seems unlikely that the most effective form of drainage at the north-western end of the site would have been the sinuous ditches that were recorded here. The most effective form of drainage would have been a channel running directly downslope and there is no obstacle that seems to

have necessitated the winding form of these features. Indeed, this part of the site was not notably low-lying or topographically susceptible to flooding in comparison to the rest of it and it seems unlikely that it would have been in particular need of drainage. This aspect of the site is, however, somewhat intriguing. The persistence of similar features during the later three of the four identified periods of Roman activity suggests that this part of the site was used continuously for the same, or a similar, function throughout the history of the site.

The site lies on free-draining soils and it therefore seems unlikely that standing water would have been a major problem, even when late Roman changes in climate conditions and the level of the water table are considered. Evidence from the archaeobotanical assemblage would appear to support this. Although amongst the evidence of weeds of cultivation there are species which are more indicative of wet conditions, the overall character of the archaeobotanical material appears to indicate fairly dry conditions, suited to the cultivation of cereal crops. An apparent decrease in activity associated with arable crops in Phase 4 might be an indication of some kind of pressure on crop production, possibly from changing climatic conditions, but the plant remains from this phase continue to show dry conditions. It is, however, unlikely that the cereal and associated weed remains recovered during excavation were grown within the enclosures represented within the excavated area. These enclosures appear, mostly, to have had alternate functions and the plant remains represent crops (and weeds) grown elsewhere and transported to the site for processing. These remains are, therefore, not directly representative of the ground and climate conditions that prevailed at the excavated site during the Roman period. However, they may be considered to be indicative of the general conditions of the wider area as, even if the site lay at the heart of a particularly extensive estate, they are likely to have been grown within an easily reachable radius. While the fen clearly would have formed an important part of the hinterland of the putative villa site at Tunbridge Lane, possibly providing certain resources and communication links to fenland settlements, its distance (in excess of 2km) suggests that the site would not have been directly effected by changes in the level/extent of the fen.

The human environment

In the immediately surrounding area, the only Roman archaeology recorded to date comprises that identified during the various phases of work at this location (McDonald 2000/O'Brien and Pearson 2006, Wills 2003 and McConnell *et al* 2008) and at the 31 Tunbridge Lane site (Kenney 2008). This evidence is considered to represent the development of a single villa/farmstead or small settlement and suggests that occupation was focussed on this area. Roman material has been recorded elsewhere in Bottisham; Roman coins and pottery found at The Shielings (CHER 04133), Roman pottery found at a building site at College Close (CHER 06586) and a Roman jug of brown clay and two massive Roman iron fetter-lock shackles found in unspecified locations during the 19th century (CHERs 06581 &

06582) could indicate further settlement in the area but could equally be directly related to the settlement activity recorded at Tunbridge Lane. Indeed, the identification of villa sites at Reach, to the north, Swaffham Prior and Swaffham Bulbeck, also to the north but much closer to Bottisham, and a possible villa site identified at Allington Hill, to the south-east of Bottisham (Wilson 1974, 256; the NGR given by Wilson for this would appear to be incorrect, placing it close to Reach) might suggest a settlement pattern comprising well-dispersed small farm or villa estates (Robinson 1992).

In the wider area, in addition to the farmsteads and villa estates, Roman activity is represented by the 1st and early 2nd century temple complex at Gallows Hill, Swaffham Prior (Malim 2006) and the possible Romano-Celtic temple (probably 3rd-4th century) at Whiteland Springs (Robinson 1992). The later of these temples would have formed part of the contemporary landscape in which the site at Tunbridge Lane would have operated. Even further afield, the pottery kilns at Eye Hall, Horningsea (Hall 1996, 118), the canal wharf at Reach (Malim & Paterson 1990, 113), the clunch digging site at Swaffham Bulbeck (Connor 1998), the furnace and lime kiln recorded in the 19th century at Fulbourn and even the 2nd to 4th century cemetery at the Babraham Institute (Timberlake *et al* 2007) may all have been part of the contemporary late Roman landscape. The direct influence on the layout and development of the Tunbridge Lane site of these aspects of the local landscape is likely to be minimal, although the transport network of the area will have linked them all together, either directly or indirectly.

Infrastructure is more likely to have had a direct influence on the layout of the site. As noted elsewhere in this document, the axes of alignment on which the Roman enclosure ditches are closely mirrored by later aspects of the landscape such as the post-medieval (Phase 5) enclosure ditches recorded during excavation and elements which remain extant in the landscape such as more recent boundaries and modern roads. Upex (2002) has noted that at some locations in Cambridgeshire there is evidence for the continuity and fossilisation of Roman fields in to later landscapes. Bottisham is not identified as one of these locations but the influence of the Roman organisation of the landscape should not be dismissed entirely. These alignments meant that all of these enclosures were positioned either parallel or perpendicular to Tunbridge Lane. This was also noted at No. 31 Tunbridge Lane, on the opposite side of the street (Kenney 2008) and might suggest that Tunbridge Lane already existed in the Roman period. To the north of the site, Tunbridge Lane now bends northwards away from its south-west to north-east alignment; however, aerial photographs show a linear cropmark continuing north-eastwards from the road at this point, suggesting that it may once have continued north-east in a straight line. In the south of Bottisham, Bell Road, apart from a slightly offset section in the core of the village, also continues on the same north-east to south-west alignment. This raises the possibility that Tunbridge Lane could originally have been a Roman road running north-eastwards to the substantial settlement and villa at Swaffham Prior, and perhaps serving other communities along the south-eastern fen edge. However, as concluded above, the local natural topography seems likely to have had as much influence on the layout of the settlement during all periods

of history as any other factor. Pre-existing elements of the human landscape may, of course, have contributed to, or exacerbated, the persisting influence of the natural topography.

In the vicinity of *Durobrivae*, modern Water Newton, it has been noted that a close relationship exists between the small town and the villa estates that are known in its hinterland. It appears that these estates were dependant on the development of the town for their economic impetus (Fincham 2002, 75). This makes sense as a market or trading centre is likely to have been required for the output of the various activities carried out at the estates. This suggests that the possible villa at Bottisham will have been as equally reliant on a market centre in the surrounding area; it seems reasonable to suggest that the produce of the estate would have found a market at Cambridge or Great Chesterford, which lies to the south-west. This indicates that not only must a physical link have existed between the site at Bottisham and these markets, which perhaps provides further support for the notion of a Roman (or earlier) origin for the route now marked by Bell Road/Tunbridge Lane, but that changes in economic fortune at these larger settlements may also have been felt at the Tunbridge Lane site. Other external economic factors are also likely to have impacted on the site. There was an active land market in the Roman world and land was constantly being bought and sold (Fincham 2002, 74). Landholding patterns were not static and it is conceivable that some of the changes evident at the site, for example the 2nd/3rd century shift from one side of Tunbridge Lane to the other, could be the result of changes in ownership. In the 4th century there appears to be a decline in small farms and estates and a consolidation of landholding into larger estates (Fincham 2002, 77). The incorporation of the Bottisham estate into another, larger, estate might account for apparent decline and abandonment represented in the final stages of Phase 4 activity. Indeed, the changes to the enclosure system and the apparent changes in economic practices might reflect attempts to change the economic basis of the site in order to prevent the sale of the land to a larger, richer estate.

4.8 Processes of deposition and distribution of artefactual material

The general pattern of distribution

The distribution of finds was plotted to provide a greater understanding of the way in which materials were used and disposed of within the excavated area. The distributions of CBM, pottery and animal bone were plotted across all of the phases of Roman occupation as it was considered that this might be illustrative of the focus, or foci, of human occupation. It was considered that spatial variation in the distribution of CBM would help further identify the positions of masonry structures and to identify occurrences of rapid infill of features. Variation in the chronological distribution of CBM was considered to be potentially illustrative of demolition and/or construction work at the site. The spatial distribution of animal and bone and pottery was plotted in order help identify the ways in which refuse material was dealt with and the potential locations of midden deposits. Chronological variations in the overall densities

of such material might, in combination with other evidence, reflect variations in the level of economic success at the site and its associated estate.

Of the three buildings assigned to Phase 1, two (S2901 and S5144) contained a variety of artefactual material, the dateable elements of which has contributed to the understanding of their positions in the chronological development of the site. The third, S4348, was not associated with any finds (post-medieval pottery was present within material overlying it) and was assigned to Phase 1 as it was cut by a Phase 2 boundary feature. The differences in the quantities of artefacts associated with these buildings provide useful information regarding their lifecourses.

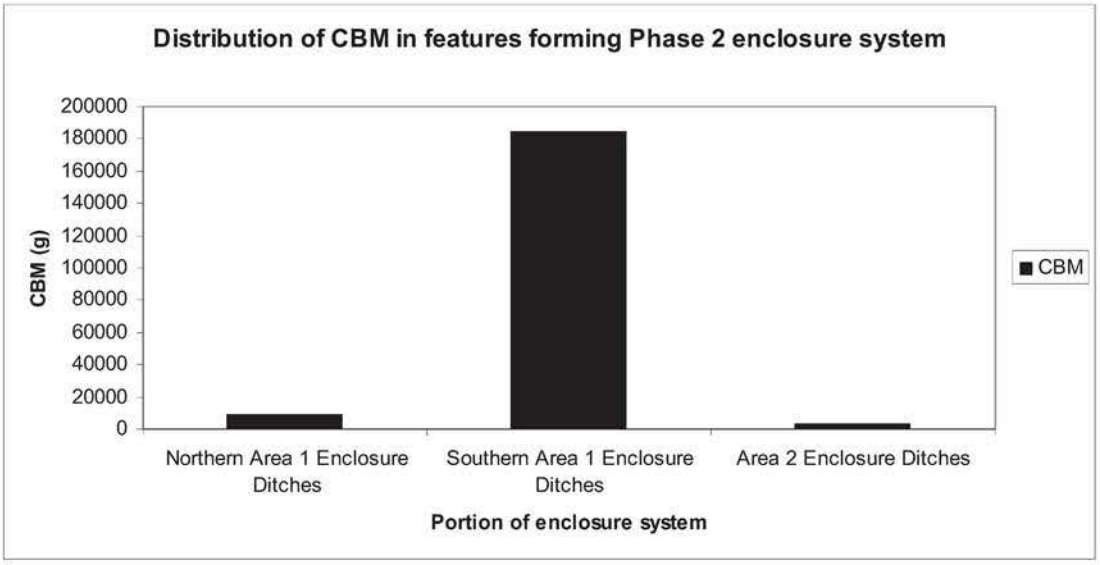
Within S2901, several 'demolition' deposits were recorded. These included L2924, which contained *c*. 45kg of CBM, and was interpreted as a possible collapsed roof, and L2911, which contained *c*. 6kg of CBM, and was suggested to include part of a collapsed wall. As suggested above, this material may merely represent material dumped here at a later date to backfill or level the site of S2901. However, if it does represent elements of the building's own superstructure which have been left *in situ* following collapse this has implications for the biography of this building. No deposits of CBM were found in association with S4348 and, as this was cut by Phase 2 Ditch F4296, it is possible to suggest that this structure was deliberately dismantled and the construction material removed to a different location. In light of this, it seems unlikely that S2901 would have been demolished or dismantled and the construction material left within what must have been the interior of the structure when it could have been reused elsewhere. This leads to one of two possibilities: firstly, that S2901 was demolished and either, immediately, using CBM from its own superstructure, or later, using CBM from another demolished building, the site on which it stood was backfilled/levelled; or secondly, that it was allowed to fall in to ruin and eventually collapsed, leaving large quantities of the material used in its construction to remain within the footprint of the structure. The stratification of L2912 between L2924 and L2911 may support the latter hypothesis; however, this too, despite being described as a 'soil' layer during excavation, also contained a large quantity of CBM and could equally represent another layer of backfill.

Whether S2901 was allowed to fall into ruin or was dismantled and then backfilled/levelled with building materials its markedly different treatment to S4348 suggests that their demolition may not have been immediately contemporary. The finds assemblage from recovered from the fill of S5144 is suggestive of refuse material mixed with CBM and other rubble and would appear to indicate that the site of this structure was backfilled and levelled. This might indicate the likelihood of similar treatment occurring at the location of S2901 but the method of construction employed in association with this building will have necessitated backfilling when it was dismantled.

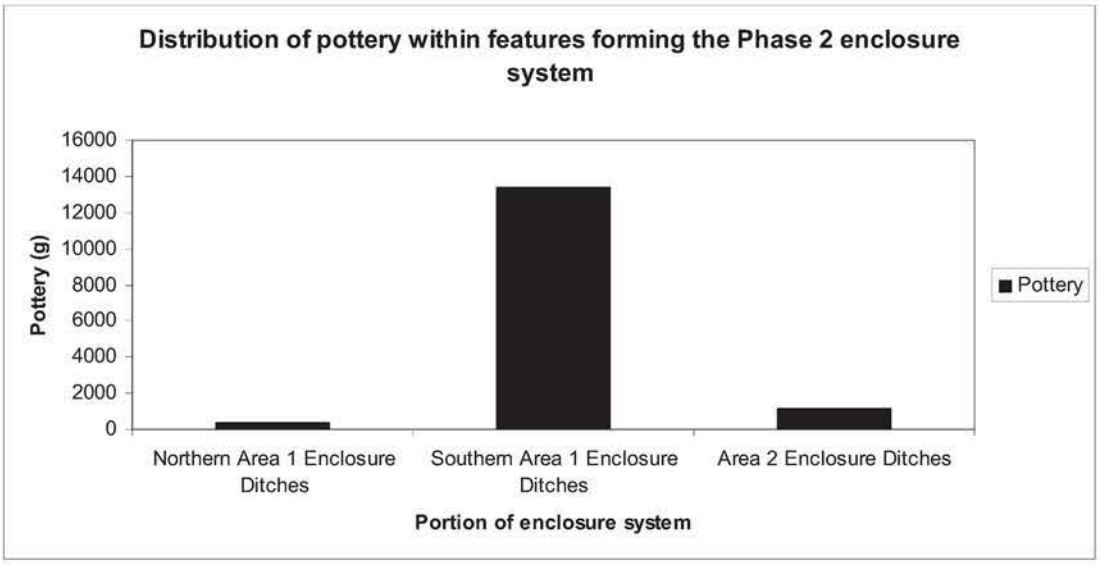
To some extent the patterns of deposition associated with Phase 2 features may be anticipated to have comprised deliberate backfill rather than the gradual accumulation of material, though the latter is likely to have played some role, due to the fact that the layout of the enclosure system was

completely rearranged in Phase 3. This may have necessitated that the ditches defining the Phase 2 enclosure system were fairly rapidly backfilled. The large quantity of CBM present in the Phase 2 enclosure ditches might support this. Such material is much more likely to have been used as backfill material; it would, unlike pot sherds and animal bone, have occurred in small deposits of refuse material that may have been occasionally dumped into the enclosure ditches in the knowledge that the majority of this material would have been carried away by the water that is likely to have drained downslope through these ditches. This, however, is not to say that domestic refuse would not have formed part of the backfill material; the quantity and nature of the finds from these ditches indicates that it most certainly did.

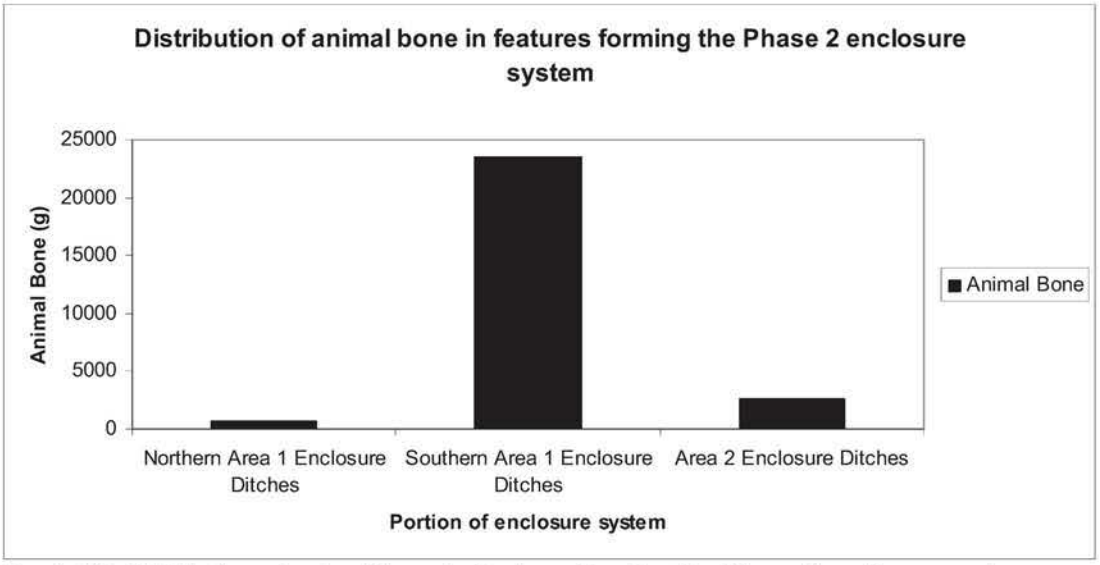
Figures 25, 28 & 31 demonstrate the distribution (by weight) of CBM, pottery and animal bone in Phase 2 features. This indicates a general bias in quantities of material to the more south-westerly parts of the site in this period. The main range of buildings of the putative villa complex is most likely to lie beyond the limit of excavation to the south-west and this pattern of finds distribution may be considered to help demonstrate this. This is further illustrated if the features forming the enclosure system are split into groups based on their proximity to the presumed location of the main building range. As Graphs 21, 22 and 23 demonstrate, the quantity of finds present is, by comparison, greatly reduced in those parts of the enclosure system furthest from the presumed buildings.



Graph 21: Distribution of CBM in features forming the Phase 2 enclosure system



Graph 22: Distribution of pottery in features forming the Phase 2 enclosure system



Graph 23: Distribution of animal bone in features forming the Phase 2 enclosure system

While it is difficult to precisely identify which material comprises deliberate backfill material and which comprises deposits of refuse material, unless it is identified in features interpreted as refuse pits, the pattern of deposition illustrated by Graphs 21-23 may also be seen to indicate that waste material is more likely to have been dumped directly into, or in the immediate vicinity of, the ditches comprising the southern part of the enclosure system within Excavation Area 1. This might be seen as further evidence to indicate that these ditches were those in closest proximity to the main areas of occupation

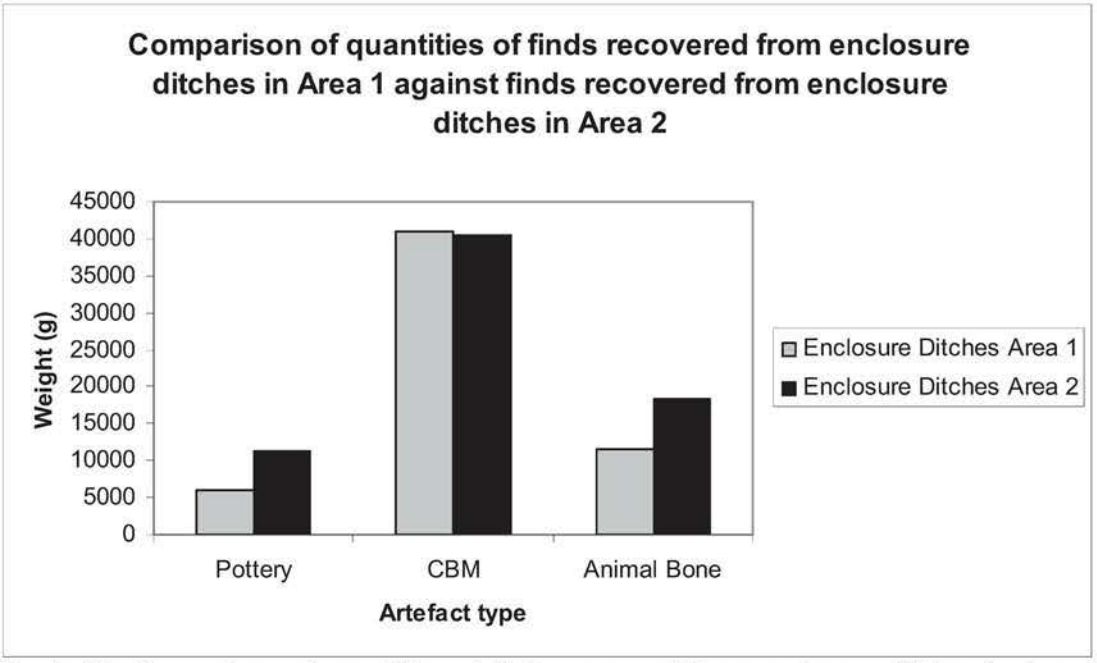
and, therefore, the main range of Roman buildings.

The pattern of distribution of archaeobotanical remains in Phase 2 is similar to that observed for pottery, CBM and animal bone, with generally lower densities of plant macrofossils in samples taken from Excavation Area 2. This, however, is not necessarily indicative of the relative position of the main areas of occupation as crop processing, as would appear to be demonstrated by the locations of ovens S2579 and S2576, did not always occur in the immediate vicinity of the main range of buildings.

The distribution of finds in Phase 3 differs significantly from the patterns observed in Phase 2. The distribution of CBM (Fig. 26) was much more even than in the preceding phase and spread across the site, with the pattern of distribution in the northern part of Excavation Area 2 not dissimilar to that in the southern part of Area 1. There were a few pockets of very high densities of this kind of material in the central part of Area 1, most notably in F2494, F2729, F2543D, F2763 and F3032D. However, weight of material to feature (or to excavated segment) was generally low. This pattern of distribution, and the comparatively low quantities of this particular material, might indicate that there was little or no change to the main buildings of the putative villa complex associated with this phase of activity, although clearly this material must have originated from somewhere.

The distribution of pottery was uniformly low across the site, with almost all occurrences of pottery comprising deposits of less than 250g (Fig. 29). Notable deposits were, however, present in Segments A, B and D of F4263 and F2934, both of which lay close to the southern edge of their respective excavation areas. A slightly higher concentration than elsewhere in this phase was noted in Segment C of the possible industrial feature F4148. A very similar pattern of distribution was noted for animal bone (Fig. 32) in this phase. Interestingly the slightly higher concentrations of animal bone occurred away from the southern part of Excavation Area 1, that part of the excavation site though to be in closest proximity to the main range of buildings.

Indeed, not only are the main concentrations of animal bone located in areas of the site other than the southern part of Area 1, a slightly greater amount (in weight) of both pottery and animal bone was recovered from the enclosure ditches of Area 2 (Graph 24).



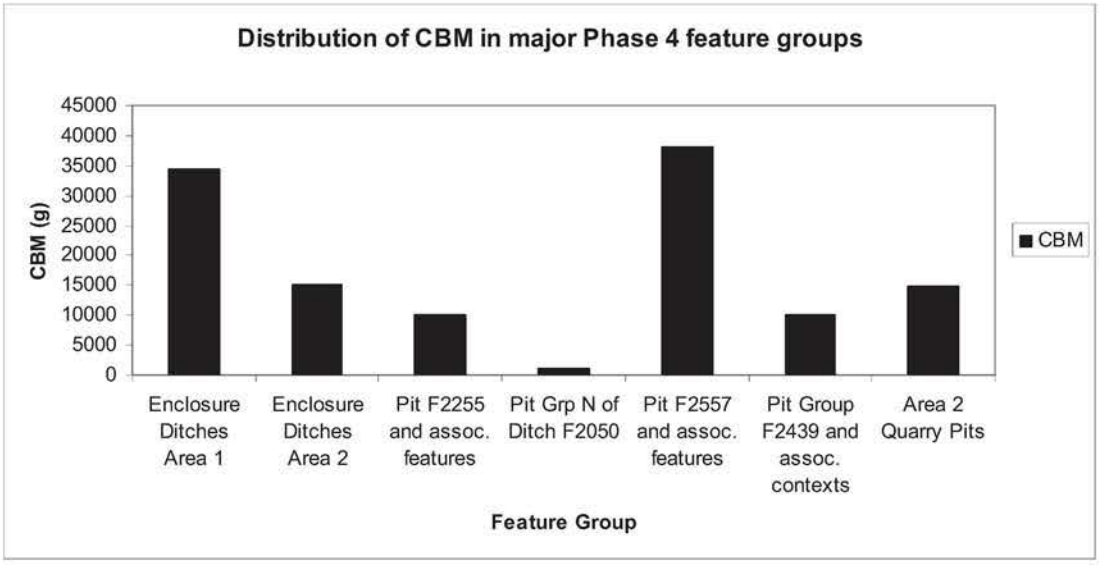
Graph 24: Comparison of quantities of finds recovered from enclosure ditches in Area 1 against finds recovered from enclosure ditches in Area 2

This general pattern of distribution might suggest that refuse material was carried further away from the main range of buildings for disposal. However, as the majority of the features in Phase 3 comprised ditches this may need re-examination. It is unlikely that ditches would have been the primary location for refuse deposition during Phase 3 and so, although other processes of deposition are likely to have played some part, the material recovered from these ditches is most likely to represent refuse material, collected elsewhere, and used as deliberate backfill material at the point in time that these features were taken out of use. This would account for the fairly even distribution of these finds.

In Phase 4, the distribution of finds appears to be biased towards finds-rich deposits associated with or sealing the putative quarry pits that occurred within this phase. These deposits are discussed in further detail in Chapter 4.9.

CBM (Fig. 27) occurred in high concentrations in the finds-rich deposits associated with the pit groups present in Area 1 and at the far eastern side of Area 2. In other features, the highest concentration occurred in general towards the south of Excavation Area 1. The clear bias of this material to

deposits within and overlying the possible quarry pits is demonstrated by Graph 22. Pit F2557 and its associated features alone contained a greater weight of CBM than the enclosure ditches present in Area 1 and the two quarry pits in Area 2 contained a weight of CBM comparable to that recovered from the enclosure ditches recorded in this excavation area.



Graph 25. The distribution of CBM in major Phase 4 features groups

Pottery generally occurred in fairly low weights with a fairly even distribution across the site, although with a slight bias to Excavation Area 1 (Fig. 30). Slightly higher concentrations were observable in the finds-rich deposits associated with the putative quarry pits. Densities of animal bone were generally low but evenly spread across the site (Fig. 33). It appears that there may have been a slightly greater weight recovered from Area 2 although the major concentrations (in Pit F2557 and Ditch F2050D) occurred in Excavation Area 1. A slight bias towards the deposits associated with putative quarry pits is observable. This, however, is influenced by the presence of a substantially-complete horse skeleton and two cattle skulls in Pit F2557.

The general pattern of distribution associated with Phase 4 activity would appear to suggest that CBM and refuse material was deliberately used for the backfilling of the large pits groups. It seems reasonable to suggest that any such refuse material would have been collected/accumulated elsewhere before being used for such purposes. Although taphonomic processes leading to the apparent homogeneity of fills must be considered, the majority of features comprising these pit groups only contained or two fills suggesting that they were backfilled fairly rapidly. Indeed, it is only the constituent features of the pit group identified as F2439 that contained multiple fills, suggesting the gradual accumulation of backfill material or the episodic deposition of refuse.

Foci of activity

While examination of the distribution of finds was primarily aimed at identifying the way in which material radiated from the presumed location of the main

range of villa buildings, it was also anticipated that this approach would demonstrate foci of particular activities. For example, a concentration of animal bone in features in close proximity to a building might indicate a cookhouse/kitchen or an area used for butchery. Apart from a notable concentration of CBM in the immediate vicinity of Phase 3 structure S2664, which is unlikely to be indicative of activities associated with this building, no such patterns were evident. The archaeobotanical evidence, however, is different and analysis of the distribution of plant remains has led to the identification of several foci of activity.

Unsurprisingly, in Phase 2 (Fig. 34), the main concentrations of cereal remains occurred in and around the corn-driers F2579 and F2576. Other notable concentrations were recorded towards the more south-westerly parts of each of the excavation areas, in proximity to the assumed location of the main range of buildings. In Phase 3 (Fig. 35), the concentration in and around Structure S2667 has contributed to the interpretation of this building as a grain or seed store and the material in F4148 and ditch F4109 is considered to be supportive of the suggested agri-industrial function of features in this part of the site. In Phase 4 (Fig. 36), although notable concentrations are evident, the distribution appears, based upon the type of features in which they occurred, to be more random and not particularly indicative of foci of crop processing activity.

Economic and other reasons for the pattern of finds distribution

In general, the pattern of distribution of finds appears to be the result of refuse deposition and the use of such material, amongst other things, as backfill. Some indication of economic fluctuation might be indicated by the general patterns of distribution. Wacher (1978, 117) suggests that the entire Roman world was affected by an economic recession during the 3rd century AD; this might account for the generally sparse distributions of pottery and animal bone in Phase 3 (dated to the late 3rd to early 4th centuries). In terms of pottery this might indicate that less pottery was entering refuse deposits in this period, perhaps because the use of individual pottery items was prolonged and broken vessels were repaired or perhaps, as there is little indication of such phenomena in the pottery assemblage, there was merely less pottery available for use. This suggestion is supported, to some extent, by the raw data for pottery (Peachey Ch. 3.2; Table 4) which indicates that, by weight, there was less pottery from Phase 3 contexts than Phase 2 contexts. By sherd count, however, a greater quantity of pottery is evident in Phase 3 than in Phase 2, though this might indicate that pottery had to be more completely broken or fragmented before it was discarded during this phase.

It is difficult to state with any certainty whether the quantities present or patterns of distribution, within each phase, of CBM are representative of economic success or downturn. Buildings might be demolished because they are being replaced by bigger, more expensive structures or they might be demolished because they have fallen into disrepair due to a lack of finance available to put towards their upkeep. From the mid to late 4th century, the villa

at Redlands Farm, Northamptonshire fell in to steady decline. The demolition of the wings of the building is considered to be indicative of this state of affairs (Keevil 1996, 44). To make such a statement about the relationship between the economic situation and the demolition of buildings at Bottisham, further evidence is required. Taking Phase 3 as an example, it is possible to suggest that the sparse distribution and reduced quantities of pottery and animal bone present in this phase represent economic/financial downturn. The quantities and distribution of CBM present in this phase display a similar reduction to these other types of finds (Peachey Ch. 3.3) but if the assumption from Redlands Farm (Keevil 1996) is used, it might be expected that more of this material would be present. Without the buildings of the putative villa range themselves, and an incorporation of these into the overall stratigraphic sequence for the entire site, it is difficult to interpret precisely how variations in the distribution and quantities of CBM present are related to the economic situation.

As well as the factors so far considered as influencing the pattern of finds distribution, other, less prosaic, factors must be considered. At Redlands Farm, Northamptonshire it was noted that, following the dereliction of the hypocaust and the ripping up of the tessellated pavement, the tesserae were used to cover a pair of infant burials in the demolished west wing (Keevil 1996, 44). This might represent simple reuse of these items to mark the graves or as a protective covering. However, the possibility that there is some kind of symbolism involved in this act cannot be ruled out.

Clear evidence for such symbolic acts is not present at Bottisham. One possible example might be represented by the presence of a substantially-complete horse and two cattle skulls in the secondary fill (L2424) of Pit F2557. These might represent a specifically selected set of objects deposited in a structured manner in an act holding special symbolism for those carrying out or witnessing it; a so called 'special deposit' (after Grant (1984b)). However, despite the relative completeness of the skulls and the higher proportion of foot elements in comparison to the rest of the Phase 4 faunal assemblage, Cussans *et al* (Ch. 3.9) assert that the material recovered from L2424 does not appear to represent acts of symbolic deposition. It is equally possible that these items merely represent waste material deposited along with other rubbish, including pottery and CBM, as backfill material when this possible quarry pit was abandoned. L2424 is, however, a very interesting deposit due to the apparently similar treatment, after death, of horse and cattle which, under normal circumstances, might be expected to be treated very differently (Cussans *et al* Ch. 3.9).

4.9 Human remains

The small quantity of human bone recovered during excavation offers, due to its poor preservation and the unstratified and/or undated character of the contexts from which it came, little information to aid understanding of the character of the Roman period occupation of the site. Its presence does, however, indicate that human remains were deposited or disposed of at this

site and, given the balance of probability, this is most likely to have occurred during the Roman period.

An adult human molar and an immature femur were recovered from subsoil L2001. In a Roman context it is not unusual to find the remains of children outside of a formal burial setting and the occurrence of isolated fragments of infant remains is not uncommon. Before the 4th century it is common to find the remains of young infants in pits, ditches or houses (Watts 1989, 1991, 1993). It is likely that this is linked to the fact that children under 10 days had no legal existence (Wacher 1978, 242). The position of this artefact in the subsoil suggests that, if indeed it is of Roman date, the original burial must have been disturbed by significantly later activity. Across many periods the graves of children have tended to be shallower than those of adults, making them more vulnerable to later disturbance by human and/or animal activity (Taylor 2001, 17).

The adult molar recovered from L2001 and the fragment of adult humerus from cobbled surface L2157 potentially come from the burial identified in F2755; an MNI of two was recorded for the human remains from this site. This, however, is unlikely and suggests that further, possibly disturbed, burials existed within the site or in close proximity.

Sk2753, the partial skeleton recovered from Pit F2755 remains undated; radiocarbon dating of a sample from this burial was unsuccessful as the submitted bone contained insufficient carbon to obtain a date. However, as it was sealed by Phase 2 cobbled surface L2157, this burial must be of *c.* 3rd century AD or earlier. In urban settings, inhumation was rare until this time but in the countryside was already established as the normal rite, although its usual form was as crouched burials without deep graves (Taylor 2001, 109). Unlike the towns, where burial usually occurred in a communal necropolis or cemetery, in rural parts of the Roman world rich or poor could be interred in more or less isolated graves (Toynbee 1996, 73). This might, therefore, represent the grave of an estate worker. The position of the burial in fairly close proximity to the assumed position of the putative villa buildings might indicate that the individual was an important or respected member of the staff. Any suggestion that this might have been the grave of a member of the land-owning family, or villa household, may be ruled out by the lack of any evidence for a monument (although clearly this is likely to have been removed at a later date) and the paving over of the grave with L2157. The burial, however, was substantially disturbed with various elements of the skeleton disarticulated and scattered throughout the grave in no coherent order. This might indicate the skeleton itself was substantially earlier than the Roman occupation of the site, possibly contemporary with the limited prehistoric evidence that was recorded within the excavated area, and represents a burial that was disturbed following decomposition and reinterred in this pit beneath L2157.

4.10 Dark earth and abandonment layers

A notable characteristic of the site are a series of very stratigraphically late, dark-coloured, finds-rich deposits containing Roman material (L5007, L2407 (=2534, 2538), L2316 and possibly L2174 (=2127, 2253, 2257)). L5007 was present at the south-eastern end of the New Doctor's Surgery site excavation area and overlay cobbled surface L5006 and other features in this area. L2407 (=2534, 2538) was an amorphous spread of material overlying Phase 4 quarry pits F2470 and F2557 (=2473); similarly, L2316 sealed all of the quarry pits comprising the group assigned the number F2439. L2174 (=2127, 2253, 2257) formed the upper fill of Pit F2255, the latest feature in the group of intercutting quarry pits that also contained Pits F2232, F2130, F2268, F2160 (=2162, 2177, 2215) and F2217.

Initially, these deposits were interpreted as abandonment layers, associated with the disuse of the site, but it is also possible that they fit with a pattern observed at numerous other East Anglian rural sites (e.g. Vicar's Farm, Newnham (Lucas n.d.), The Camp Ground, Colne Fen, Earith (Regan, Evans and Webley 2004), Kilverstone, Norfolk (Garrow, Lucy and Gibson 2006), Brandon Road, Thetford (Atkins and Connor 2010), Cedars Park, Stowmarket (Nicholson and Woolhouse forthcoming) and Hacheston (Blagg, Plouviez and Tester 2004)), where there was a shift in the later Roman period towards the deposition of occupation material in midden heaps or surface layers instead of pits. As Blagg, Plouviez and Tester (2004, 198-199) note, this development is apparent in the later Roman period in towns and, at least in East Anglia, at rural sites, it is a practice that starts well before the end of the sites and results in the formation of deposits of 'dark earth', generally with little stratification. 'Dark earth' is often regarded as evidence of major, if not total, abandonment but there is evidence to suggest that it may not represent just a deposit which forms on abandonment but one which may be the only representation of once complex stratigraphy which has become homogenised (MacPhail 1994, 13). Domestic animal penning, manure burning, the dumping of organic matter, and even the presence of insubstantial clay, turf or timber buildings have all been suggested as sources of deposits which, following abandonment, are transformed by natural processes into 'dark earth' (MacPhail 1994, 40; O'Brien & Roberts 2005, 13). Indeed, chemical, physical, geophysical and soil micromorphological analyses of dark earth have shown that it is formed pedologically from derelict Roman Buildings, their debris and the deposits derived from the most recent land-use (MacPhail, Galinié and Verhaeghe 2003, 353).

Of the stratigraphically late, dark-coloured, finds-rich deposits recorded during archaeological work at Tunbridge Lane, F5007 is that which, arguably, most closely resembles the dark earth deposits recorded in a variety of urban contexts and in several East Anglian rural ones. It was much darker in colour than the other 'abandonment' deposits and was distributed over a wider area, covering a variety of features of varying date, rather than appearing to seal or cap a specific group of features as the other deposits did. Finds assemblages all of these deposits were, however, similar character, containing large quantities of pottery and CBM and a variety of other material.

Their position in relation to the quarry pits groups may suggest that these other deposits may suggest that they do not wholly conform to the pattern of deposition of occupation material in middens or surface layers as observed at the other East Anglian sites listed above. Their direct relationship with these pits groups might indicate that they were deliberately deposited to complete the infilling of the quarry pits. Indeed, as L2174 was restricted to Pit F2255, it might be accurately interpreted as a refuse deposit used to infill this particular feature; other apparent refuse deposits were present in other features from quarry pit groups that did not display the sealing deposits that these layers represent. It also notable that L2174 lacked the large quantities of animal bone that were present in all of these other deposits (Table 52).

Deposit	Location	Area covered	Description	Finds
L2174 (=2127, 2253, 2257)	D14-E14	Restricted to Pit F2255	Compact mid to dark grey brown clayey silt	Pottery (110; 783g), CBM (10kg+), various small finds
L2316	G11-H11	5.70 x 3.50m, sealing all pits in Grp F2439	Compact dark grey brown silty clay	Pottery (59; 443g), CBM (9kg+), A.bone (2kg+), Fe nail, Cu alloy coin
L2407 (=2534, 2538)	H12	2.80 x 1.80, covering Pits F2470 and F2557 (=2473)	Dark grey brown sandy clayey silt of variable consistency with frequent large chalk pieces	Pottery (20; 266g), CBM (6kg), A.bone (1.9kg), Fe knife
L5007	C12-D13	*c.* 12 x 6m	Dark, black ?silt	Pottery (28, 1102g), CBM 35kg), *opus signinum* (59g), wall plaster (12g), A.bone (12kg+), str.flint (12g), Worked limestone (4kg), shell (242g), Fe nails, Fe blade, Fe frags,

Table 52. Comparison of 'abandonment' deposits

L2316 and L2407 (=2534, 2538) clearly, however, were not fills but appear to have had a specific purpose; rather than comprising simple dumps of waste material or midden deposits they appear to have served as levelling or capping layers over the former quarry pit groups. A similar situation has been observed at Cedars Park, Stowmarket (Nicholson and Woolhouse, forthcoming) where finds-rich deposits have been interpreted as dumping of material including flint nodules, brick/tile and waste animal bone in order to form a level, dry ground surface. However, (Nicholson and Woolhouse, forthcoming) have also suggested that these layers might simply represent hollows where material present in surface middens or occupation horizons was able to survive later plough damage.

Nicholson and Woolhouse (forthcoming, 184) state there were two types of

late Roman apparent abandonment 'soils' present at Cedars Park; that which has been identified in demonstrable heaps and that which appears to have been mixed by late or post-Roman ploughing. This statement contains an implicit suggestion that one of these types of deposit may be equated to 'dark earth' but given MacPhail, Galinié and Verhaeghe's (2003, 353) description of 'dark earth' this may be discounted. Clearly, the deposits listed in Table 52 do comprise at least two distinct types; L5007, which may be considered to be a 'dark earth' following MacPhail, Galinié and Verhaeghe's (2003, 353) description, and L2316 and L2407 (=2534, 2538), which appear to have been deposited in demonstrable 'heaps'. The pattern reported by Nicholson and Woolhouse (forthcoming, 184) has, however, been noted elsewhere. Blagg, Plouviez and Tester (2004, 198-9) have noted that the significance of these deposits is not fully-understood, except that they appear to reflect a change in depositional practices away from the disposal of rubbish in 'cut' pits, in favour of dumping on the surface. At Tunbridge Lane, however, these refuse deposits appear to have been used specifically for infilling or levelling, rather than just occurring as surface dumps of material. The same may be true of Cedars Park, Stowmarket, where some of the deposits similar to those recorded here may have served as levelling layers.

Deposit L2174 (=2127, 2253, 2257), despite its similarities to the other deposits discussed here, comprises material dumped into a 'cut' pit. Similar refuse deposits were present as fills of some of the Phase 4 quarry pits. This, along with the deliberate and specific use of L2316 and L2407 (=2534, 2538) as levelling/capping deposits may indicate that the apparent shift away from disposal of rubbish in 'cut' pits to surface deposition observed elsewhere in East Anglia did not occur here. It is possible that the proliferation of open pits, brought about by the apparent quarrying activity that occurred here, provided a convenient location for refuse disposal, making surface deposition unnecessary.

L5007 is the deposit which most closely conforms to MacPhail, Galinié and Verhaeghe's (2003, 353) description of 'dark earth'. Simple, possible daub or mud-walled, structures S5144 and S5500 were formerly located in the vicinity of L5007 and, as MacPhail, Galinié and Verhaeghe (2003, 353) have demonstrated, the dereliction and decay of such structures appears to contribute to the formation of dark earth deposits. It may, therefore, be unsurprising that such a deposit formed in this part of the site. However, these buildings, assigned to Phases 1 and 2, would have gone out of use long before total abandonment of the site occurred at the end of Phase 4. Like the other Phase 4 'abandonment' deposits, L5007 contained a notable artefactual assemblage. Much of this comprised animal bone (in excess of 12kg was present) suggesting that the deposition of refuse material may have contributed to the composition of L5007. A similar quantity of wall plaster was present in L5007 and this, along with 4kg of limestone, might be associated with the abandonment and, at least partial, dereliction of the putative main range of buildings.

It appears, therefore, that L5007 is the only one of these deposits that can wholly be considered to represent processes and activities associated with

abandonment of the site. The other deposits, despite their initial interpretation as 'abandonment' deposits are more likely to represent the deliberate use of material containing a large proportion of domestic refuse to infill, cap or level the large pits/pit groups that were created across the site during Phase 4. This kind of act would suggest that there was some intention to reuse the land in which these pits were located, suggesting that these deposits are not indicative of the abandonment of the site. They might indicate, however, a radically different use of the land. The putative high status dwelling, assumed to have existed to the immediate south of the excavated area might have fallen into disuse, possibly to be replaced by another, similar dwelling elsewhere but the enclosures could conceivably have been put to a new, archaeologically invisible use, pastoral agriculture for example. Such a usage is likely to have necessitated the infilling of deep excavations.

Subsoil L2001 (recorded as L4001 in Excavation Area 2) sealed all of the Roman features and deposits. It was recorded as a loose mid to dark brown silty sand with occasional grey patches and frequent small sub-rounded chalk and flint inclusions. It was present across the whole site and was up to 0.38m deep in Excavation Area 1 and 0.34m deep in Excavation Area 2. Test pits to identify displacement levels of artefacts were hand excavated on a 10m based grid. In Grid Squares F11, H8-H11 and I10 the ratio was increased with the interval between test pits reduced to 5m. Each test pit measured 1m by 1m and was excavated stratigraphically in 5cm spits. As noted above, a variety of Roman and post-medieval finds were recovered from this deposit. The full range of artefacts recovered is listed in Appendices 2a and 2b and discussed, where relevant, in Chapters 3.1-3.10.

The distribution of CBM, pottery and animal bone within this deposit has been plotted in Figures 37-39. This work has demonstrated a broad spread of CBM (Fig. 37) across the site with a notable concentration of material present towards the centre of Excavation Area 1 and the largest quantities present within Test Pits 72 and 75 in Grid Squares H10 and I10. This distribution of material indicates a concentration slightly to the east of the most concentrated distribution of CBM in features of Phase 2 date and in between the main concentrations in features of Phase 3 and 4 date. CBM may also be seen to be distributed further north, than might be expected, of the main source of such material across all phases of occupation, i.e. the main range of buildings to the south-west of the excavated areas.

The distribution of pottery (Fig. 38) in L2001=4001 appears to be fairly even across the site with a complete absence of such material in the test pits at the north-western end of Excavation Area 2 and a slight concentration in Grid Squares H10, H11 and I10 in Excavation Area 1. Animal bone was almost completely absent from in Excavation Area 2 with only Test Pits 4, 6, 7, 8 and 55 in this area containing low quantities (below 250g). The distribution across Excavation Area 1 was much more uniform with most test pits producing 250g or less of animal bone with only test pits towards the margins of the excavation area being devoid of such material. A slight concentration of material is observable in the test pits within Grid Squares H9-H10 and I10.

This general pattern of distribution of pottery and animal bone was similar to that observed for CBM with overall lesser quantities but apparent concentrations occurring in a similar area. It is notable that these areas of concentration, centred on Grid Square H10, H11 and I10 do not necessarily correlate with the densest areas of features or particularly with the greatest concentrations of material deposited in to features. This may be unsurprising as L2001=4001 has been identified as a ploughsoil of post-medieval or modern origin. This would suggest that he Roman material present within it has been removed from its primary depositionary context. The lateral distance that this material is likely to have been moved from its original position is, however, negligible, indicating that dense deposits of CBM and, to a lesser extent, pottery and animal bone are likely to have existed in the approximate areas of high concentration prior to the accumulation/development of L2001=4001. Excavation has demonstrated the presence of fairly substantial buildings at the south-western margins of the excavated areas, suggesting that the main range of buildings associated with the putative villa were located in this direction. It seems likely that the concentrations of artefactual material, especially the CBM, present in L2001=4001 originated from the area in which these buildings were located. Exactly why the highest concentrations occurred in the central eastern part of Excavation Area 1, rather than being more evenly spread, in relation to the spacing of the Phase 1 buildings, may only be explained by the direction of ploughing or the possibility that the plough turned in this approximate area.

Prior to the commencement of excavation L2001=4001 was identified as a 'B-Horizon'; the various physical and chemical changes that effect soils (see Holliday 2004, 267) during the formation of such a deposit can have an effect on the preservation of artefacts and there may also be a de-stratifying effect, effectively removing artefacts from their original context. This, however, does not adequately explain the apparent concentrations of artefactual material in the central eastern part of Excavation Area 1.

It is interesting to note that the four occurrences of small finds recovered from the test pit investigation of L2001=4001 all correlated with the apparent concentrations CBM, pottery and animal bone; small finds, comprising 3 coins and Cu alloy buckle were recovered from Test Pits 70, 71, 76 and 84 (see Appendix 2b).

The distribution of finds in L2001=4001 may be considered to be indicative of the presence of large scale Roman activity in this area. As such, it supports the picture given by the other archaeological evidence and helps to demonstrate the potential proximity of a high status dwelling in the vicinity.

4.11 Concluding Summary

The present site fits well into the general pattern of settlement in the area. It was located approximately 2km from the Roman Fen-edge, on elevated ground safe from flooding, yet still in a position to exploit the varied resources

offered by the fen and the chalk grassland. On the whole, the evidence on the southern Fen margins is for well-dispersed farmsteads or villa estates, rather than for minor village settlements or tenant-farmed tracts of imperial land (Salway 1970).

From the very earliest phases of archaeological investigation at Tunbridge Lane (McDonald 2000; Pearson & O'Brien 2006) it has been considered that the site represents land in the vicinity of, and probably appended to, a high status Roman dwelling which, in light of the known settlement pattern of the area, suggests that the site represents a villa estate. No evidence to suggest that this was not the case has come to light during post-excavation research and various elements of the artefactual assemblages, particularly the pattern of pottery consumption and the presence of high quality building materials, can be considered to support this idea.

Based on the presence of buildings with stone/masonry foundations at the very southern edges of the AS1011 excavation areas, it has been assumed that the most likely location for the main range of buildings associated with this high status dwelling is to the south of the areas that have been subject to archaeological investigation. However, anecdotal evidence which suggests the presence of a mosaic pavement (not recorded on the Cambridgeshire Historic Environment Record) to the north-east of the current site might suggest that this is not the case. With the evidence of similar Roman activity, albeit slightly earlier in date than that at the current site, at 31 Tunbridge Lane, the exact location of the main range of villa buildings remains uncertain. As the current site is considered to represent a shift in the focus of Roman activity from the 31 Tunbridge Lane site to this location, it is equally possible that the main high status buildings varied in position over time.

Roman activity at the site appears to end in the 4th century AD. However, it is not clear if this represents an abandonment of the putative villa/farmstead in its entirety or just one part of it. It is possible that this represents another shift in the focus of activity similar to that from 31 Tunbridge Lane to this location. Possible reasons for any general abandonment are obscure, but such an event would pre-date the collapse of Roman authority by a notable margin. It is possible to speculate on a disaster of a similar nature to the fire that destroyed the Exning villa (Webster 1987), or maybe look to more mundane economic causes over a longer period.

A large amount of information relating to the economy of the site was recovered during excavation. For the most part this simply helps to support the identification of this as a possible villa site, indicating a mixed agricultural economy typical of such a site. It does, however, in addition to displaying some evidence indicating potential specialisations within the overall picture of a mixed economy, contain some evidence to hint at a general downturn in the economic situation at the site, which may be seen to be contemporary with both a deteriorating climate in the fenland region and the so-called 3rd century crisis that effected much of the Roman Empire. This might be further expressed through the fairly rapid rearrangements of the enclosure system which possibly represent changes in the kind of activities that were taking

place within them. The available evidence may be taken to imply that the economic situation worsened until the site was abandoned.

Explanations relating to only a partial abandonment are more tenuous. It is possible that a worsening economic situation led to a contraction of the land in use. It is equally possible, however, that a change in the location of the main range of buildings led to the activities represented within this site also being moved to an alternate location.

The overall picture of the archaeology recorded during the excavations undertaken on this land to the south of Tunbridge Lane in Bottisham comprises a series of enclosures, possibly yard-like in nature, in which a variety of agricultural or agricultural-related processes were carried out. Their apparent proximity to a high status dwelling, the structures and other features present within them, and the size and character of the artefactual assemblages recovered, indicate that they were not fields or paddocks. This character remained consistent despite the frequent changes to their layout, suggesting that these changes were intended to accommodate changes in the nature of processes conducted within them.

While providing further evidence for the Roman economy and environment in the fenland region, providing some information regarding the relationship between field form and function, helping to inform on rural settlement forms and settlement typology (Medlycott 2011, 47) and adding to the corpus of known sites of this date in the area, the main research value of the archaeological work conducted at Tunbridge Lane has been to demonstrate that there was a high status Roman dwelling within the village of Bottisham. What is not clear from the available evidence is the exact location of this dwelling, though this has been speculated on in this report, or what form this dwelling took. This work has provided a variety of information about Roman occupation in Bottisham but raises several more, which may only be answered through further fieldwork at other locations within the modern settlement.

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DIGITAL PHOTOS

Plate 1: Phase 1 Building S2901, from south-east

Plate 2: Phase 1 Ditch F2307 (=F2326), from north-east

Plate 3: Phase 2 Oven/Corn Drier F2579, from south

Plate 4: Oven chamber of Phase 2 Oven/Corn Drier F2579, from south

Plate 5: Oven/Corn Drier F2579: detail of flue construction, from east

Plate 6: Phase 2 Oven F2576, from north-east

Plate 7: Phase 1 Pit F2738 (C), from north-west

Plate 8: Phase 2 Pit F2738 cut by Phase 3 Ditch F2092 (H), from south-west

Plate 9: Phase 2 Ditch F2598(A), from south-west

Plate 10: Possible special/structured deposit of sheep mandible and a coin in

south-eastern terminus of Phase 2 Gully F3014 (B)

Plate 11: Phase 2 Structure S2661, from west

Plate 12: Phase 4 Quarry Pit F2255 and associated pits, from west

Plate 13: Phase 4 Rubbish Pit F2620 (A), from north-east

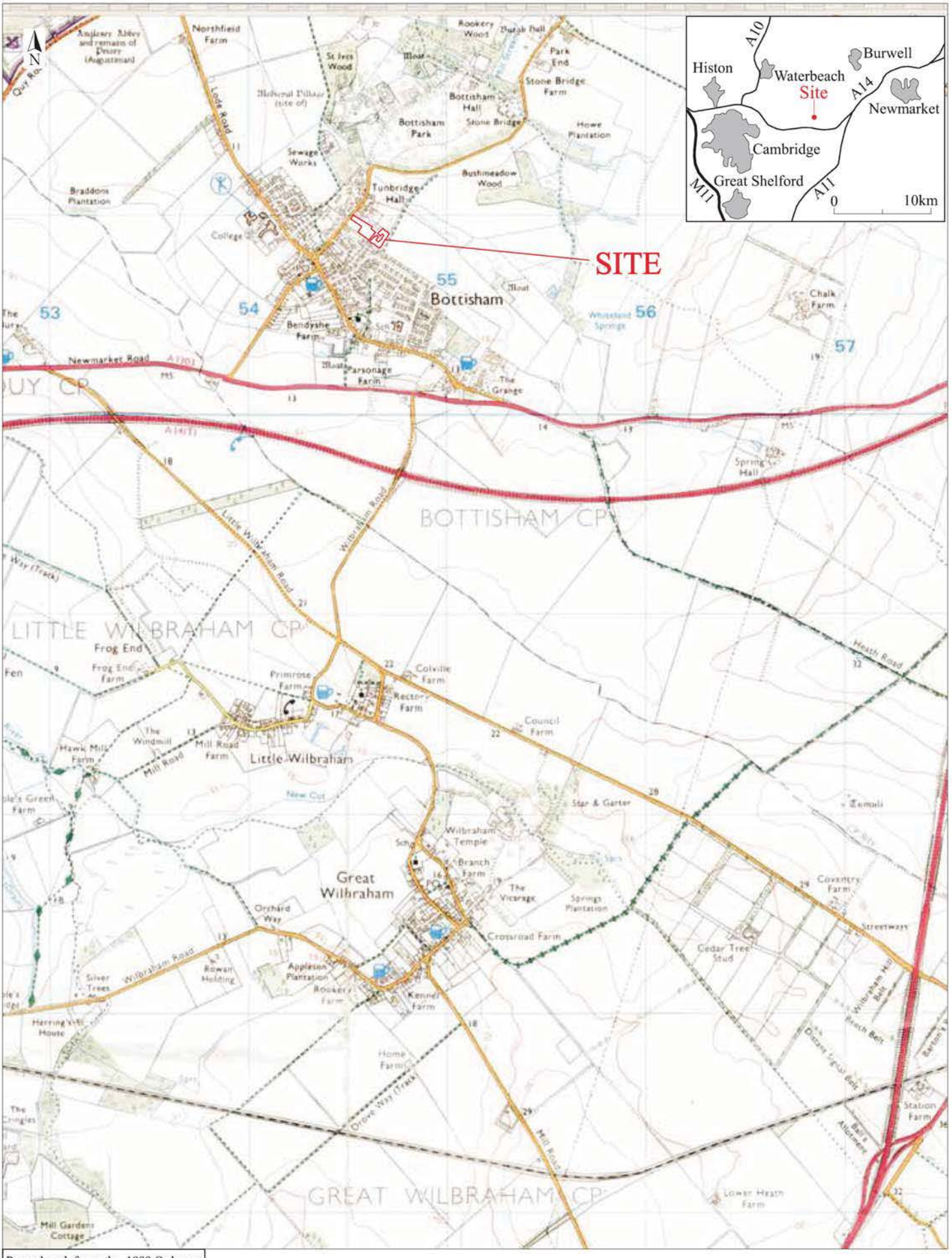

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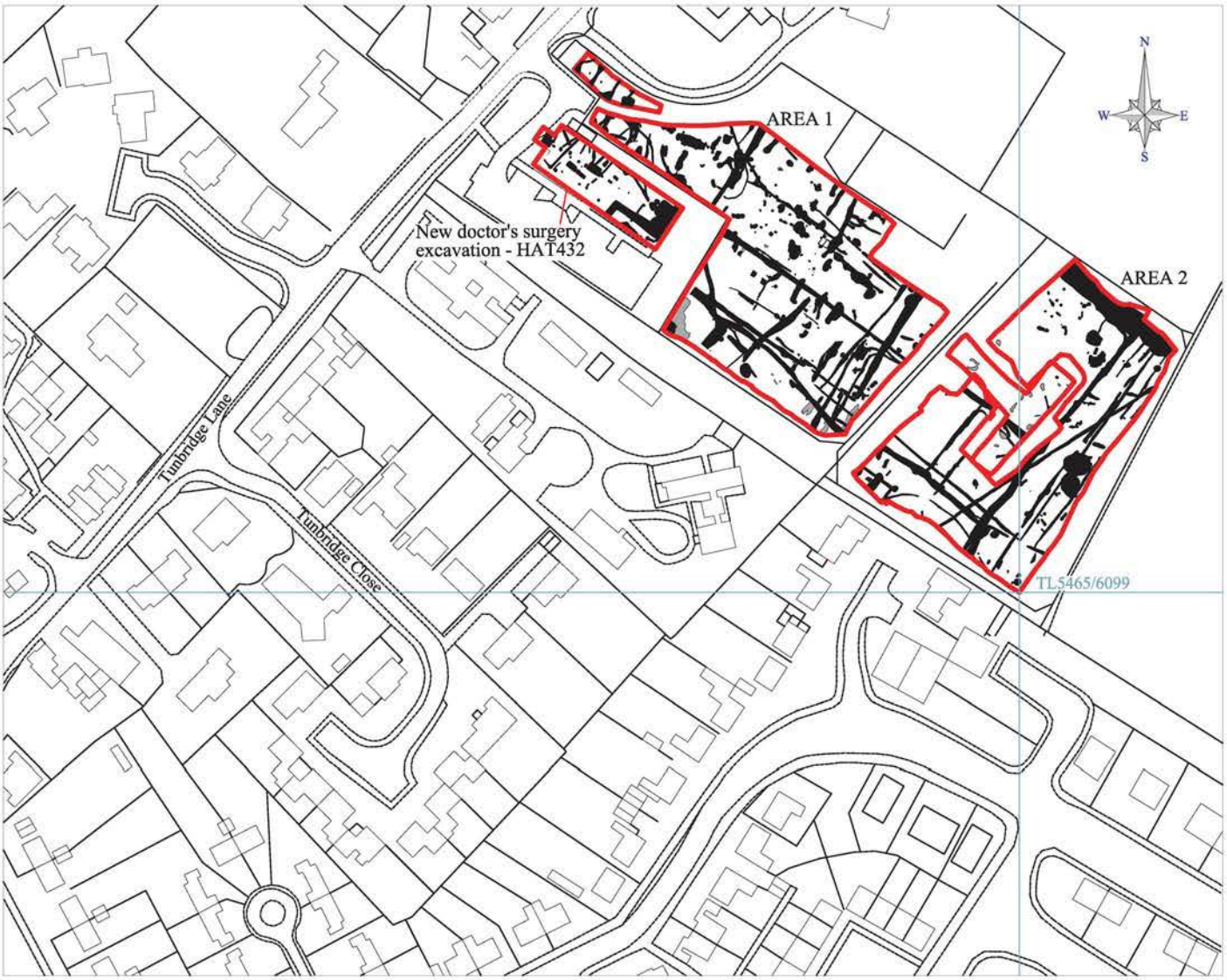
Fig. 1 Site location plan

Scale 1:25000 at A4



0 150m

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Fig. 2 Detailed site location

Scale 1:2000 at A3

0 150m

Key:

- Tunbridge Lane - AS1011
- New Doctor's surgery - HAT432
- Tunbridge Lane - CAU trial trenches
- No. 31 Tunbridge Lane - CAU

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Fig. 3 Previous fieldwork

Scale 1:2000 at A3

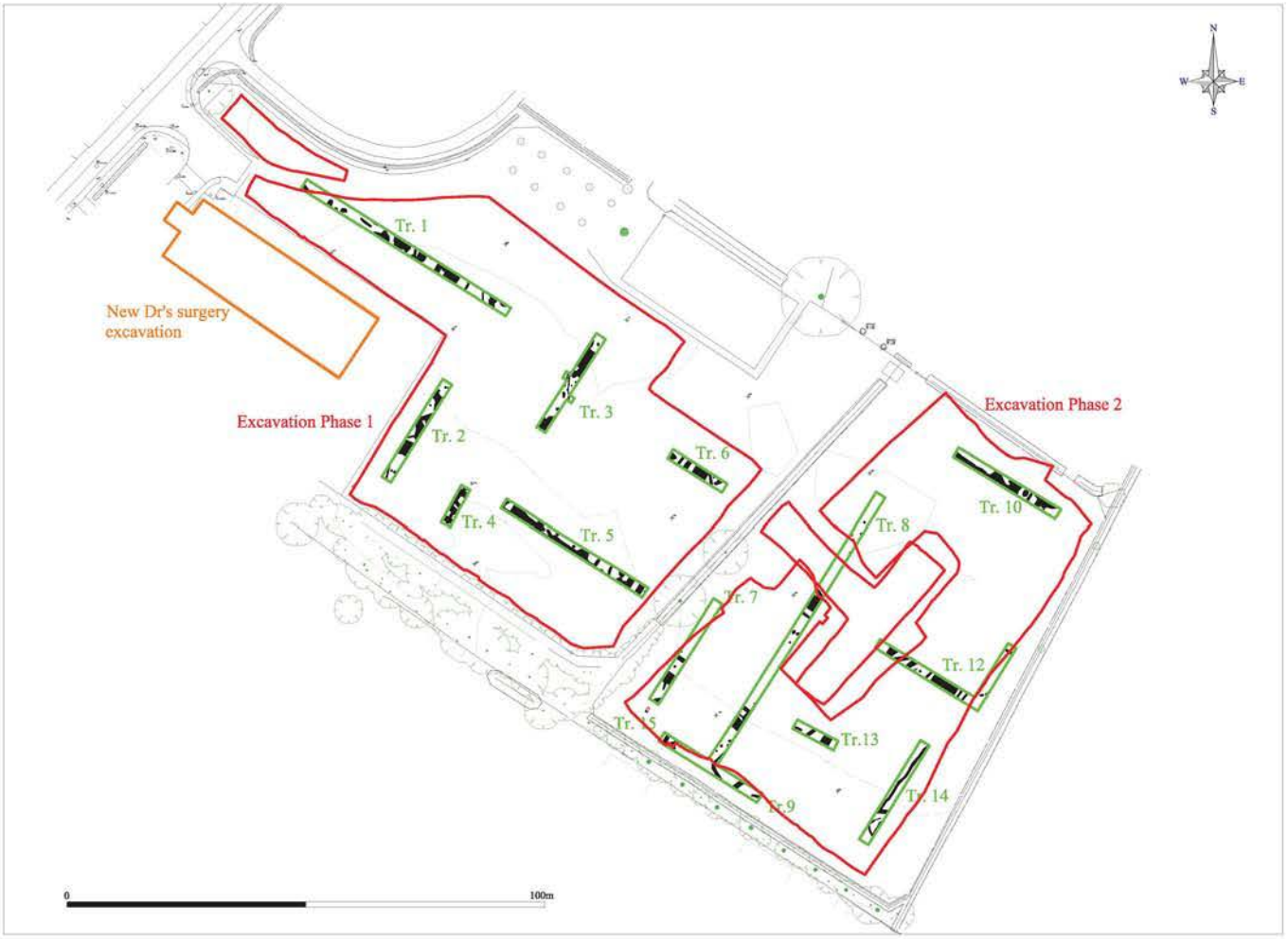

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Fig. 4 CAU trial trenches

Scale 1:750 at A3

0 150m

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Fig. 5 Geophysical survey

Scale 1:2000 at A4

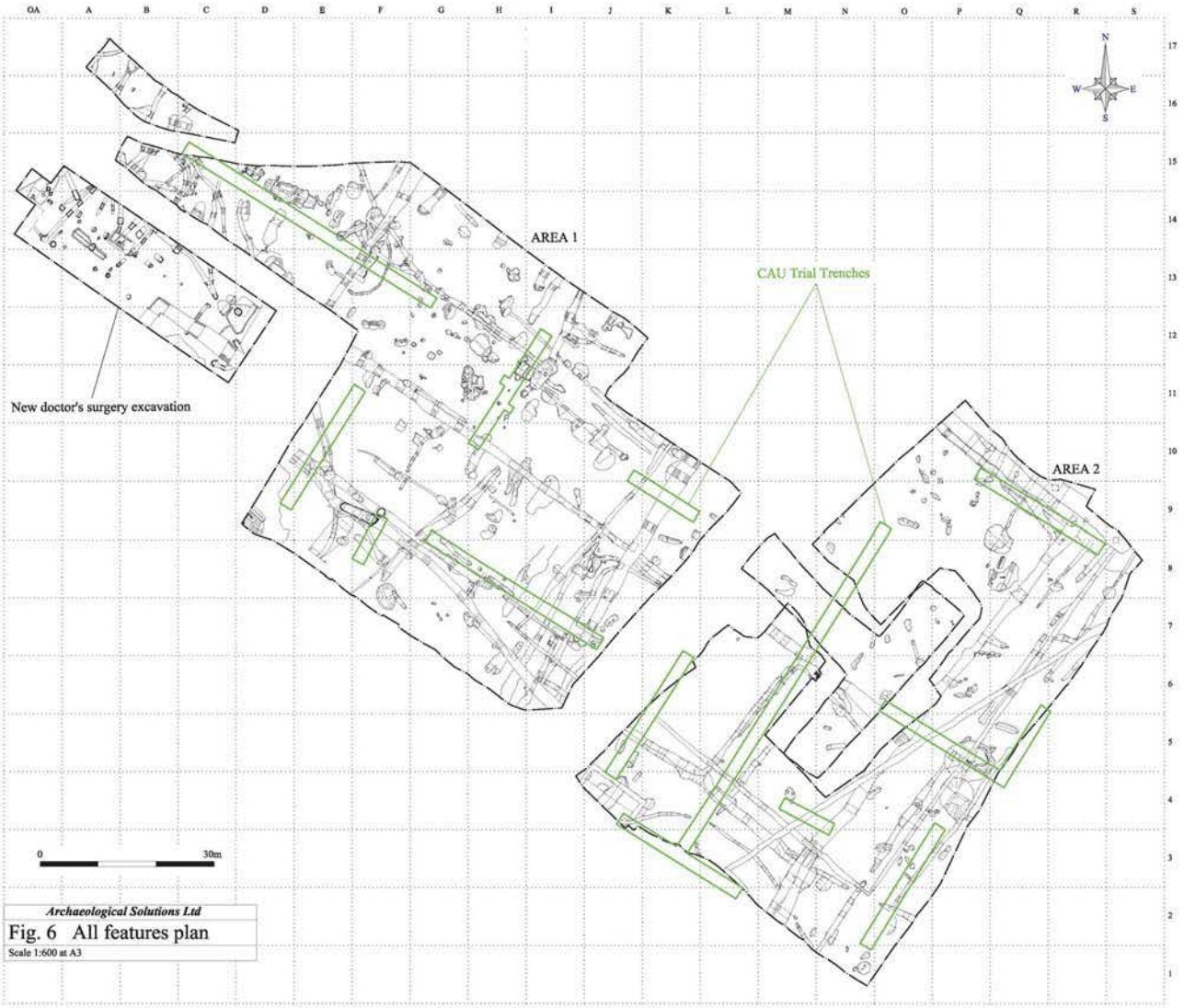

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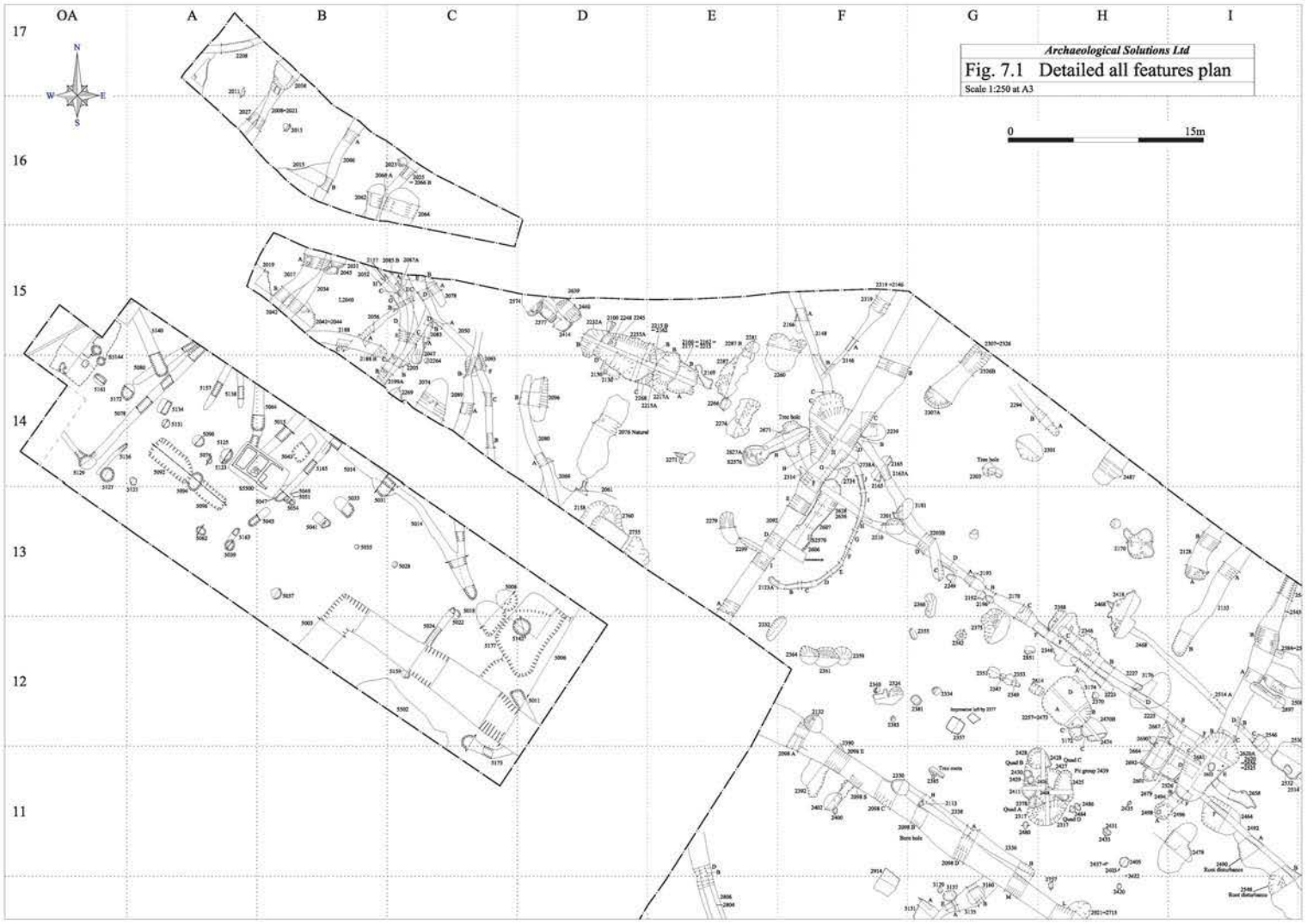
Fig. 6 All features plan

Scale 1:600 at A3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Archaeological Solutions Ltd
Fig. 7.1 Detailed all features plan
Scale 1:250 at A3
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15m

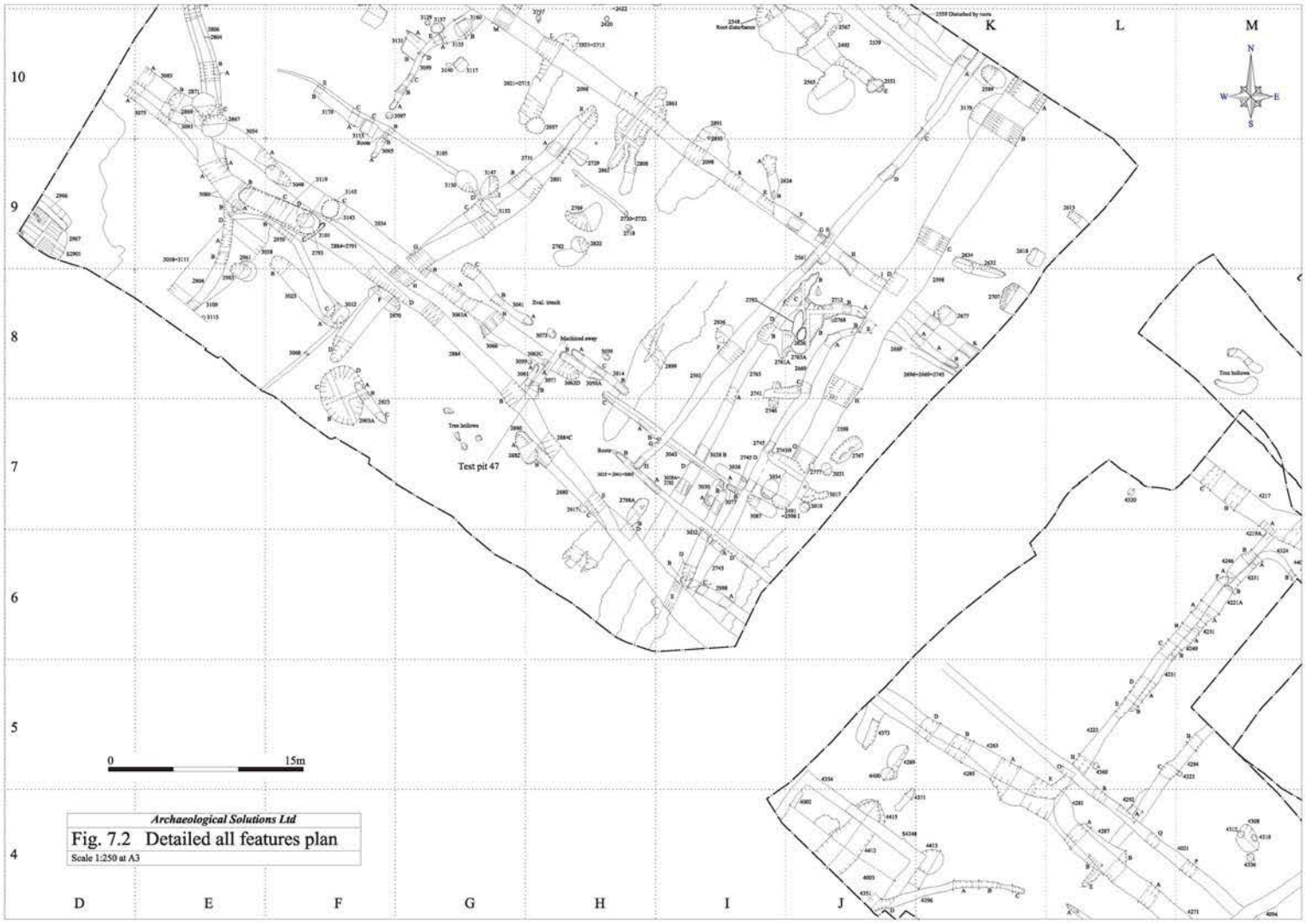

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Fig. 7.2 Detailed all features plan

Scale 1:250 at A3


Archaeological Solutions Ltd
Fig. 7.3 Detailed all features plan
Scale 1:250 at A3
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15m
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W
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K
L
M
N
O
P
Q
R
S
13
12
11
10
9
8
7
6
Tree hollows
Sliding layers

Archaeological Solutions Ltd

Fig. 7.4 Detailed all features plan

Scale 1:250 at A3

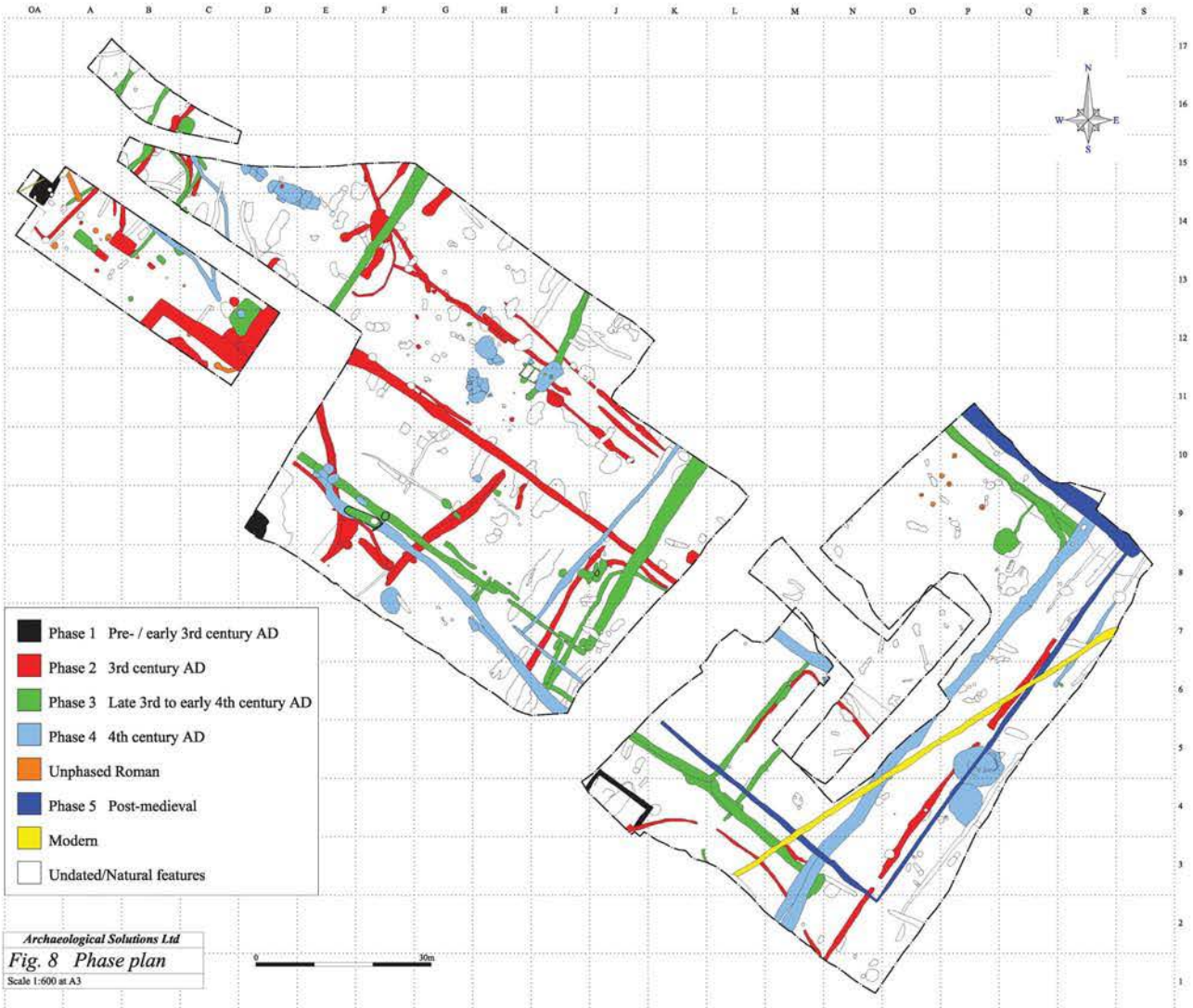

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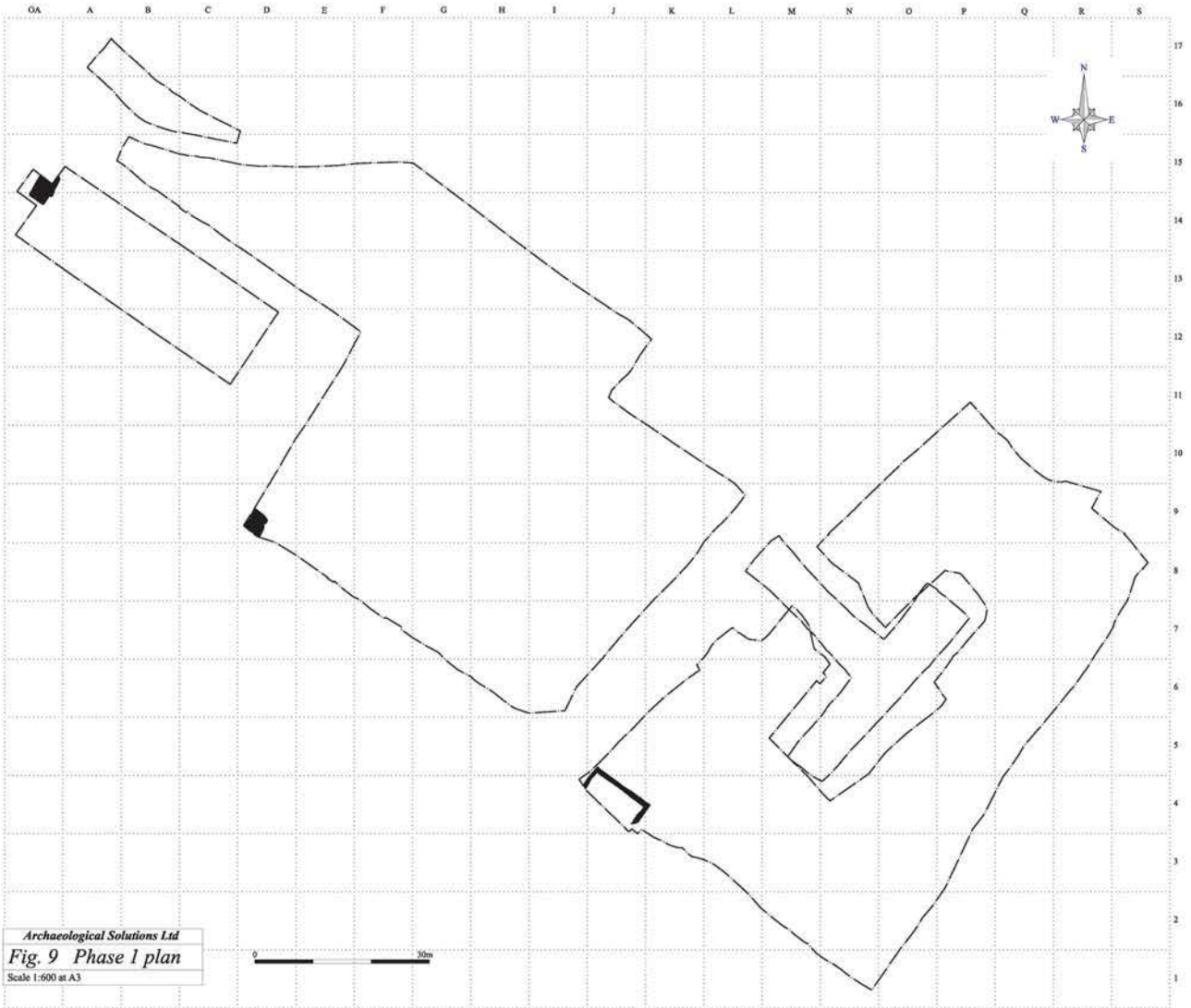
Fig. 8 Phase plan

Scale 1:600 at A3


OA A B C D E F G H I J K L M N O P Q R S
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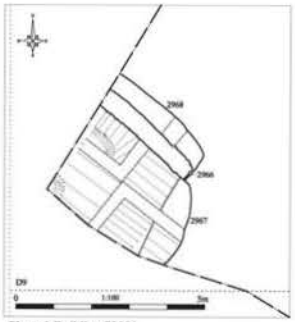
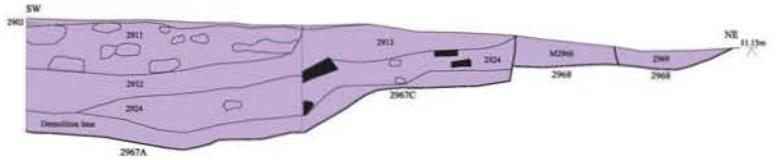
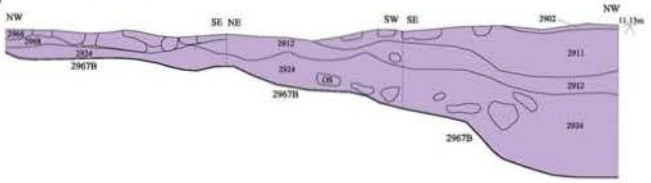
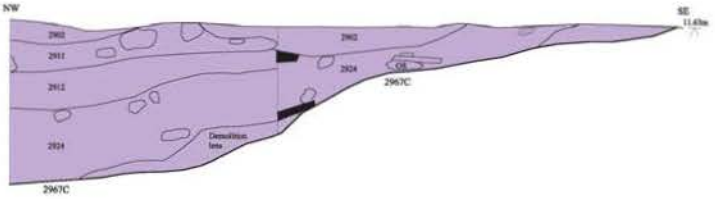
0 30m
Archaeological Solutions Ltd
Fig. 9 Phase 1 plan
Scale 1:600 at A3

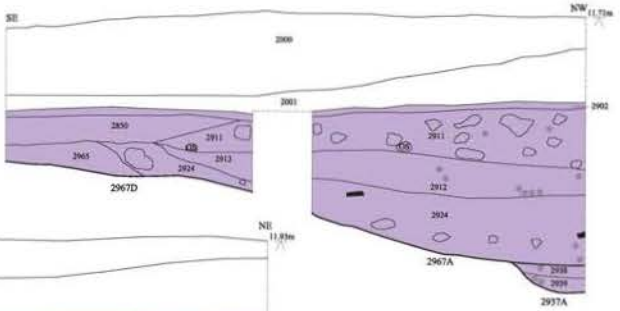


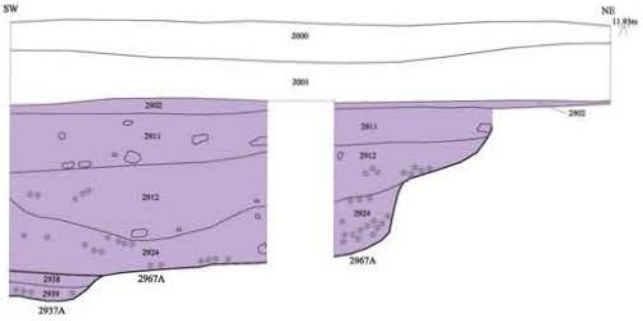
Phase 1 Building S2901











Charcoal

Pottery

Opus signinum

0 1:20 2m

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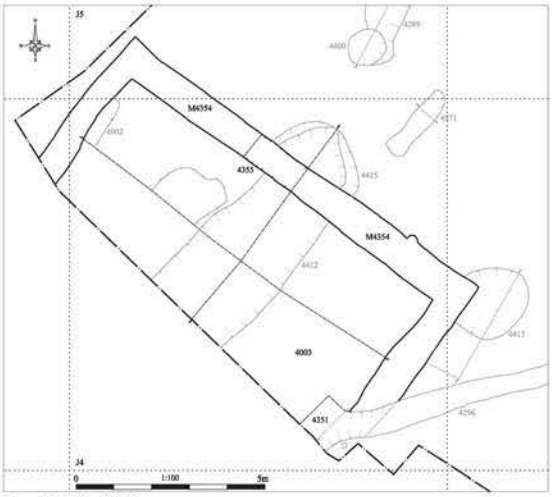
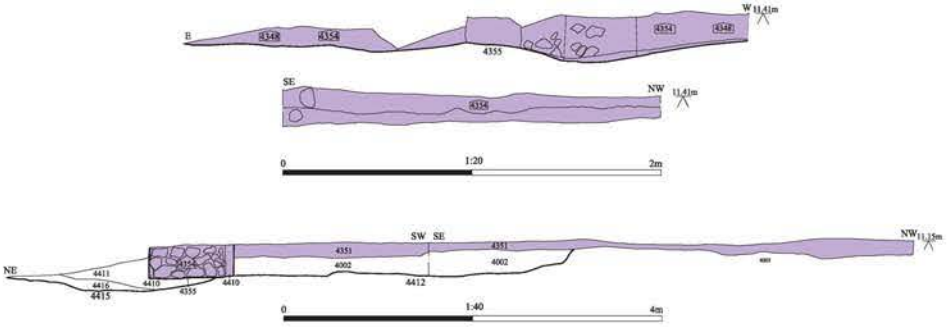
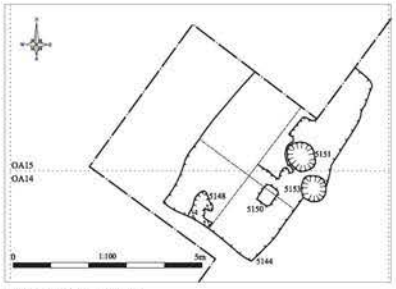
Fig. 10 Phase 1 building S2901

Scale: Plans 1:100 & sections 1:20 at A3



Phase 1 Building S4348





Phase 1 Building S5144

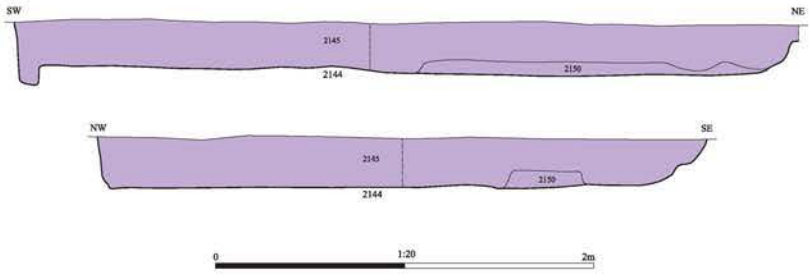


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Fig. 11 Phase 1 buildings S4348 and S5144

Scale: Plans 1:100 & sections 1:20 & 1:40 at A3

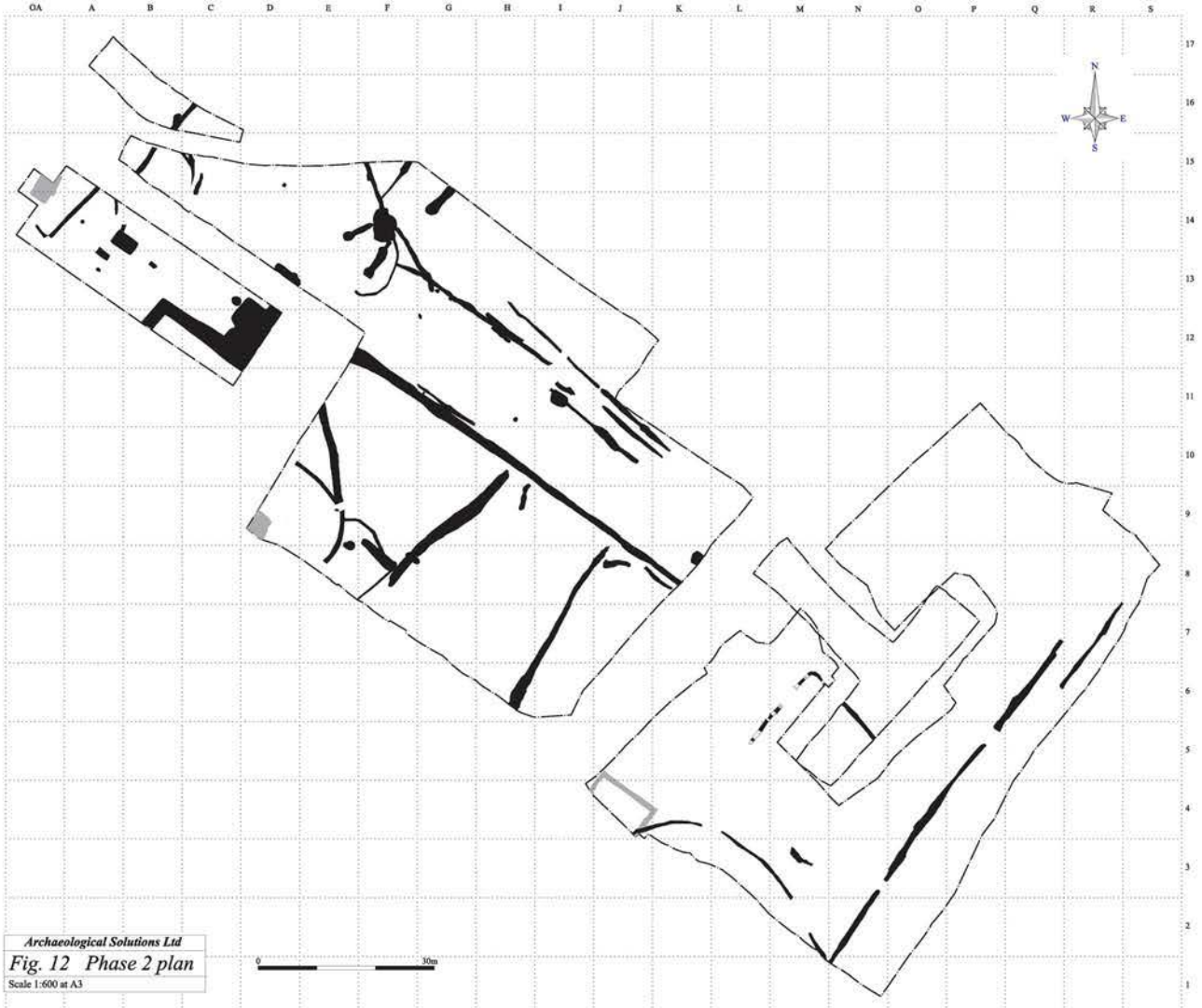

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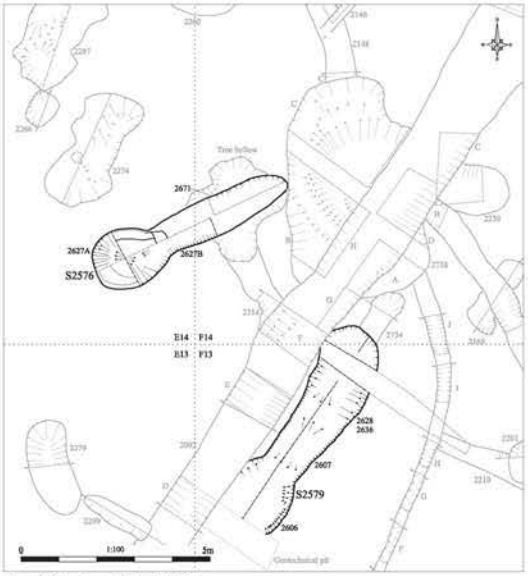
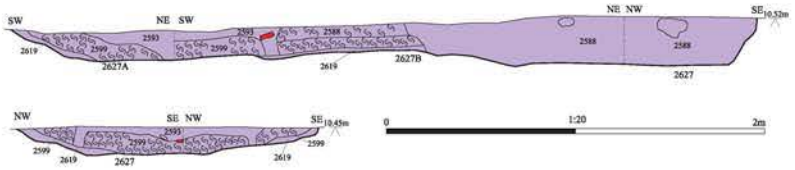
Fig. 12 Phase 2 plan

Scale 1:600 at A3

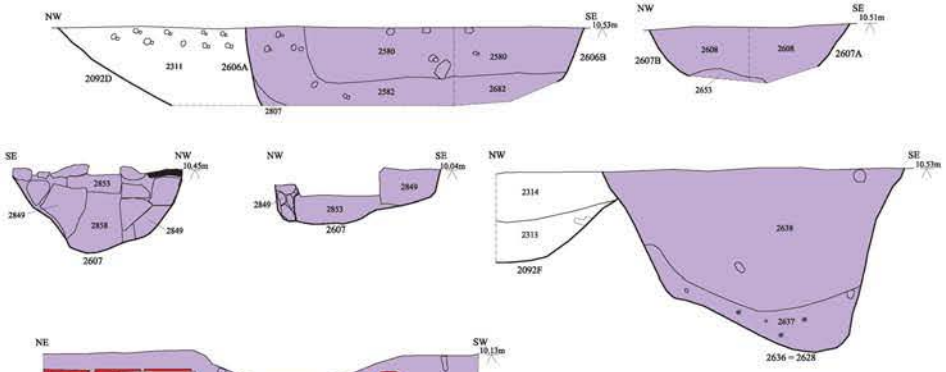


Phase 2 Structures S2576 & S2579

Oven S2576 sections



Oven S2579 sections



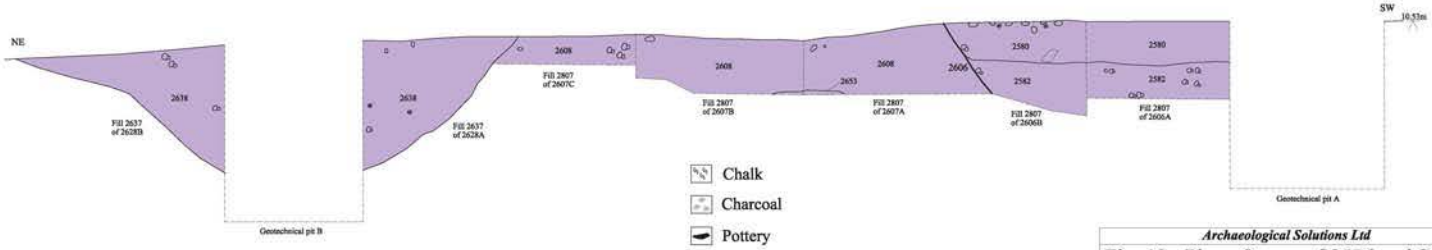


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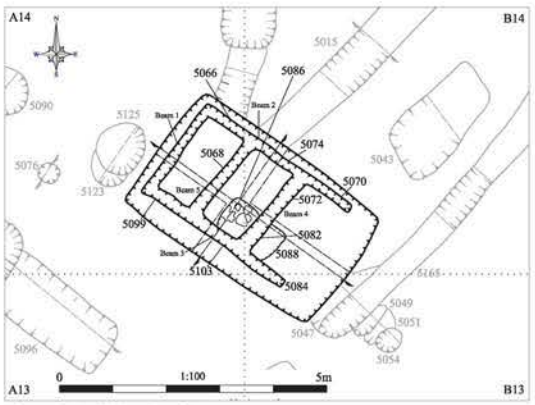
Fig. 13 Phase 2 ovens S2576 and S2579

Scale: Plans 1:100 & sections 1:20 at A3



Phase 2 Building S5500

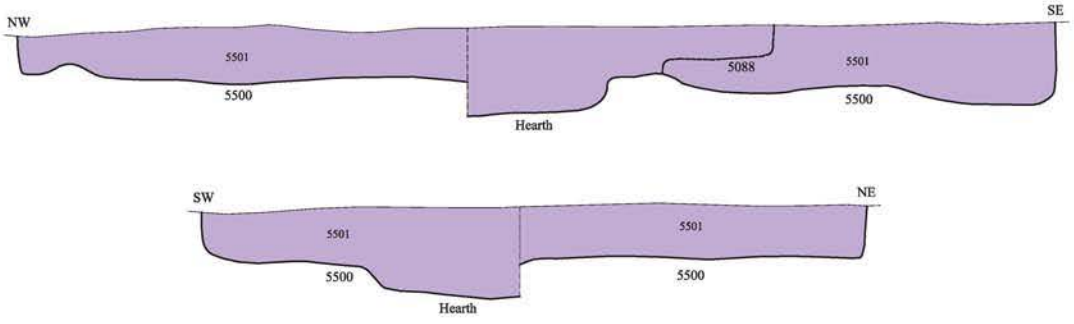


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Fig. 14 Phase 2 building S5500
Scale: Plans 1:100 & sections 1:20 at A3

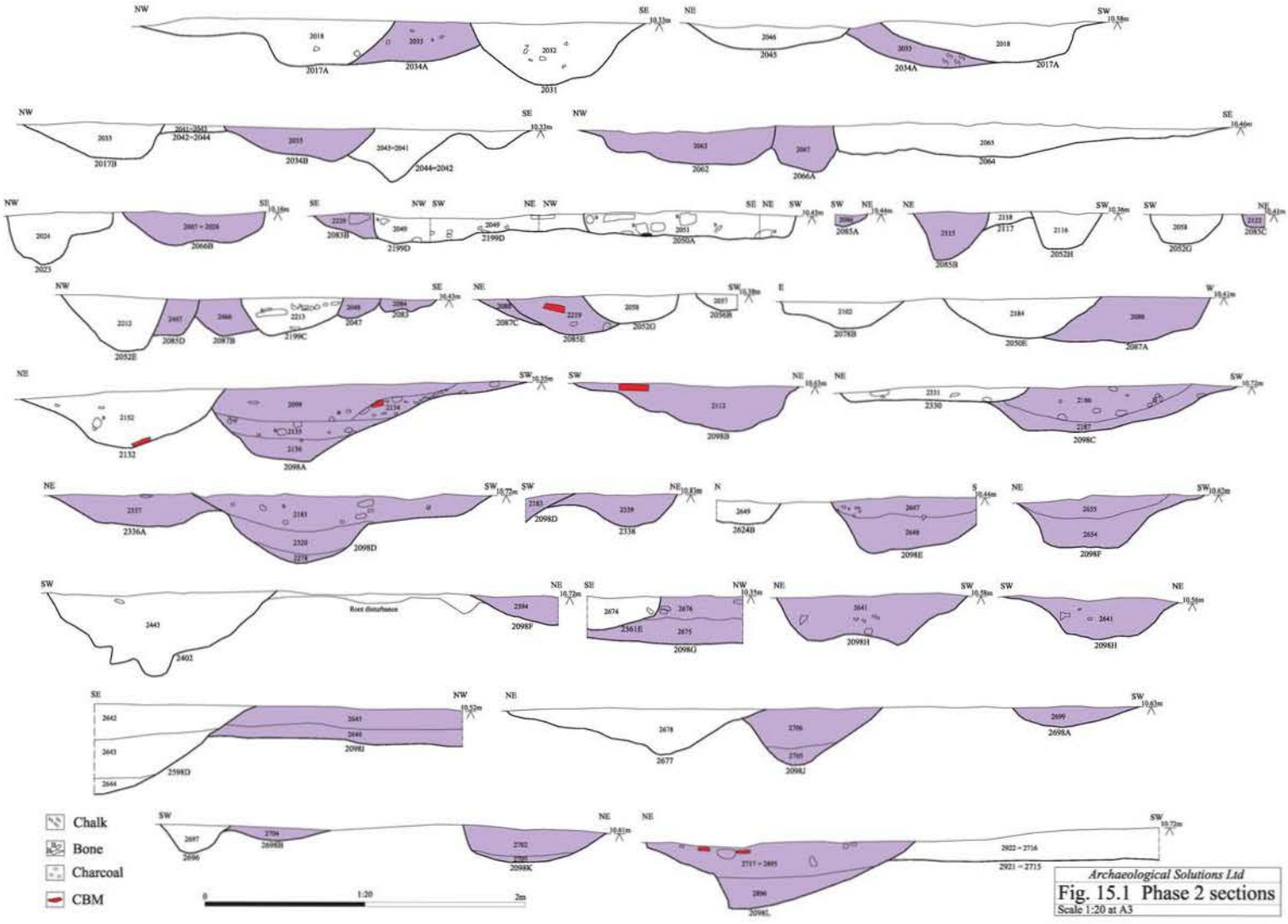

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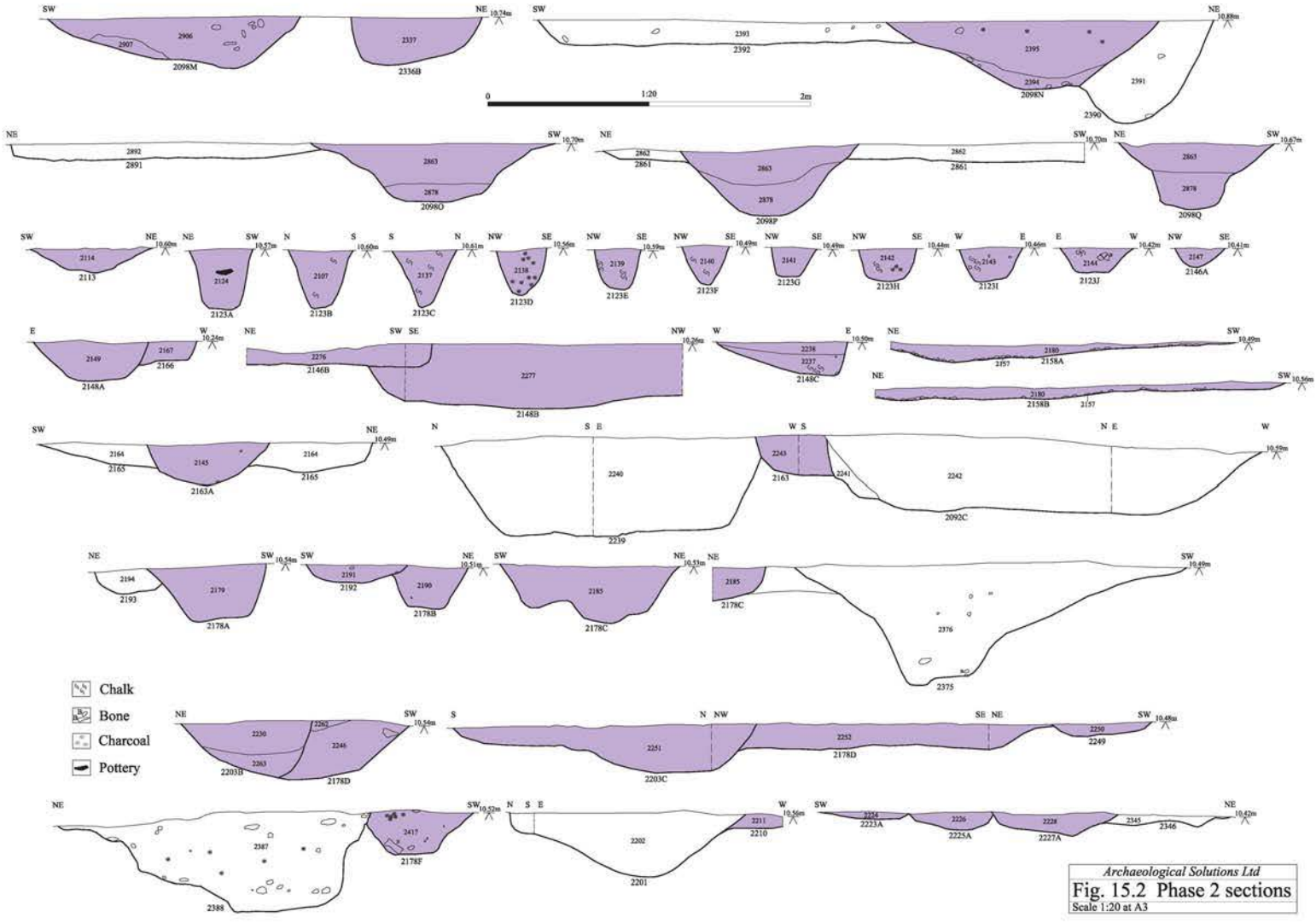
Fig. 15.1 Phase 2 sections

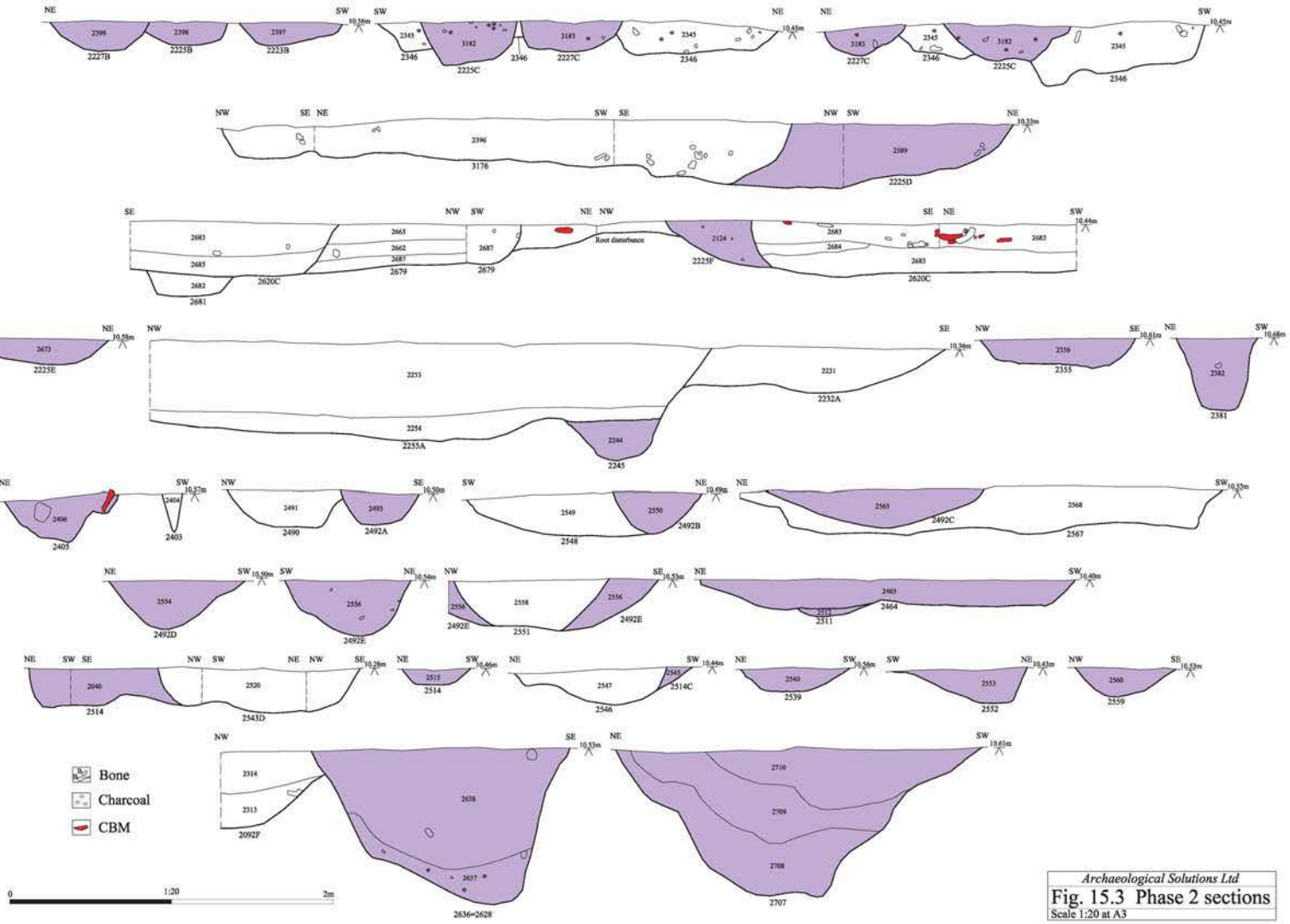
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 15.2 Phase 2 sections

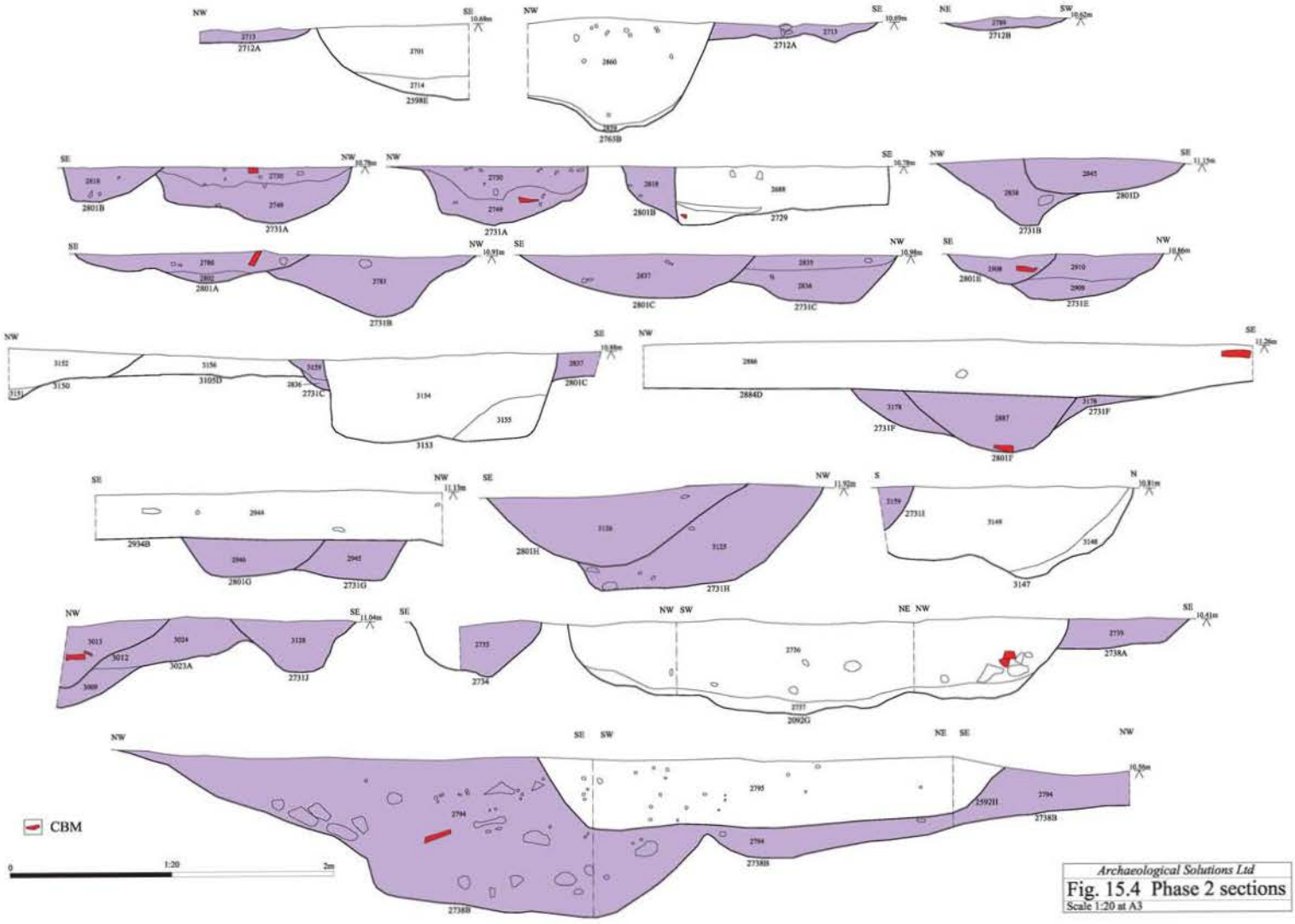
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 15.3 Phase 2 sections

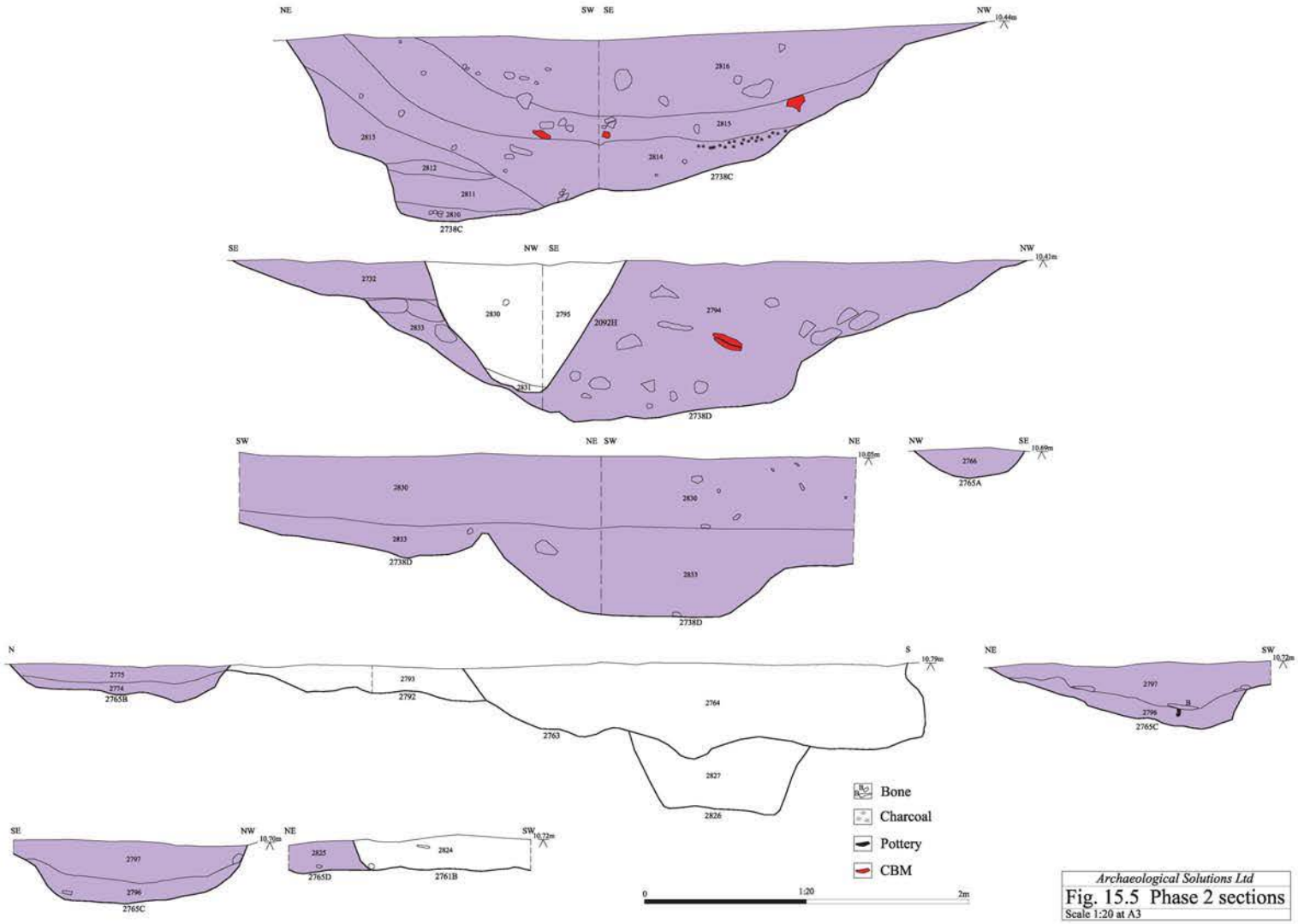
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 15.4 Phase 2 sections

Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 15.5 Phase 2 sections

Scale 1:20 at A3

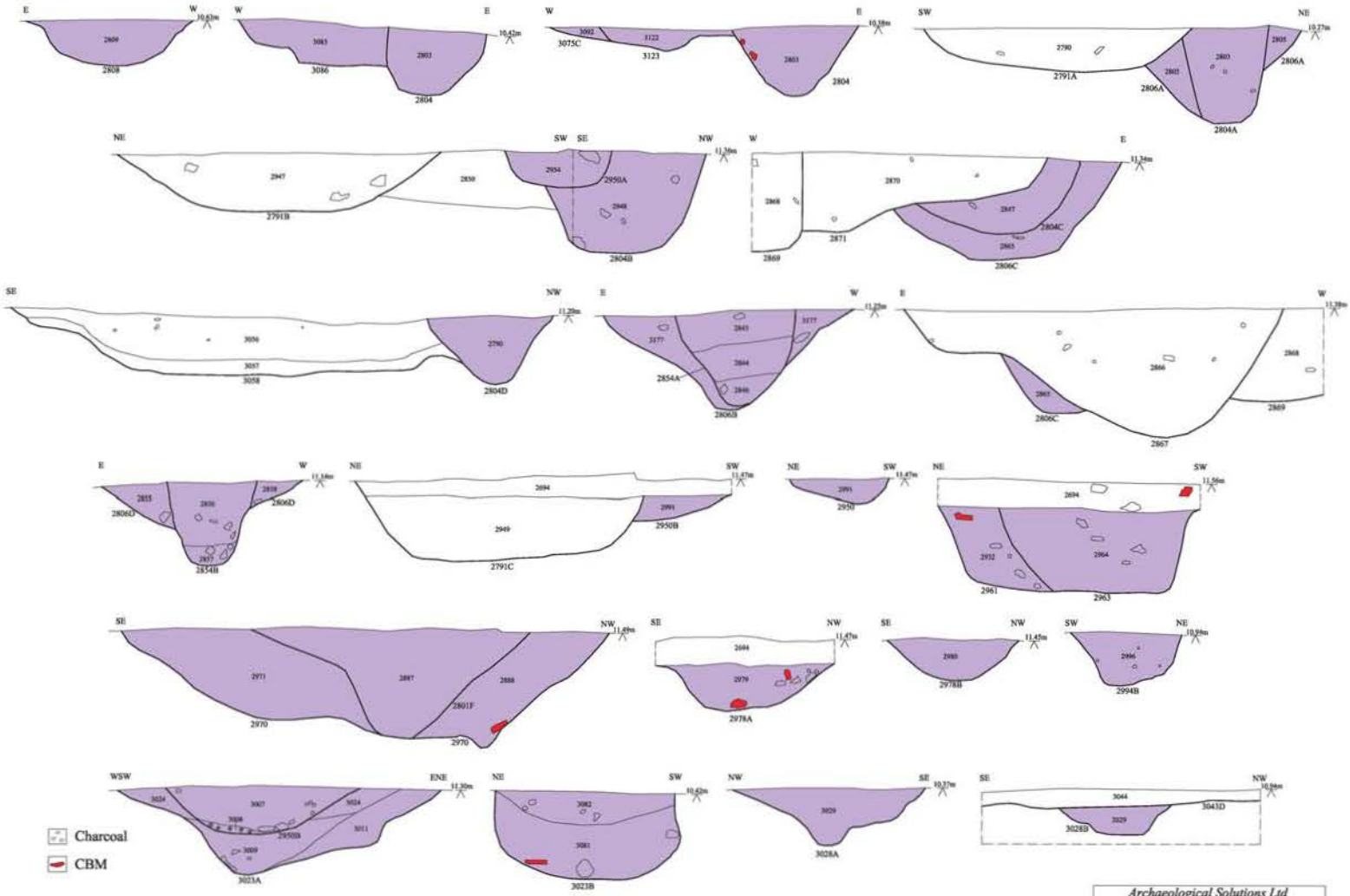


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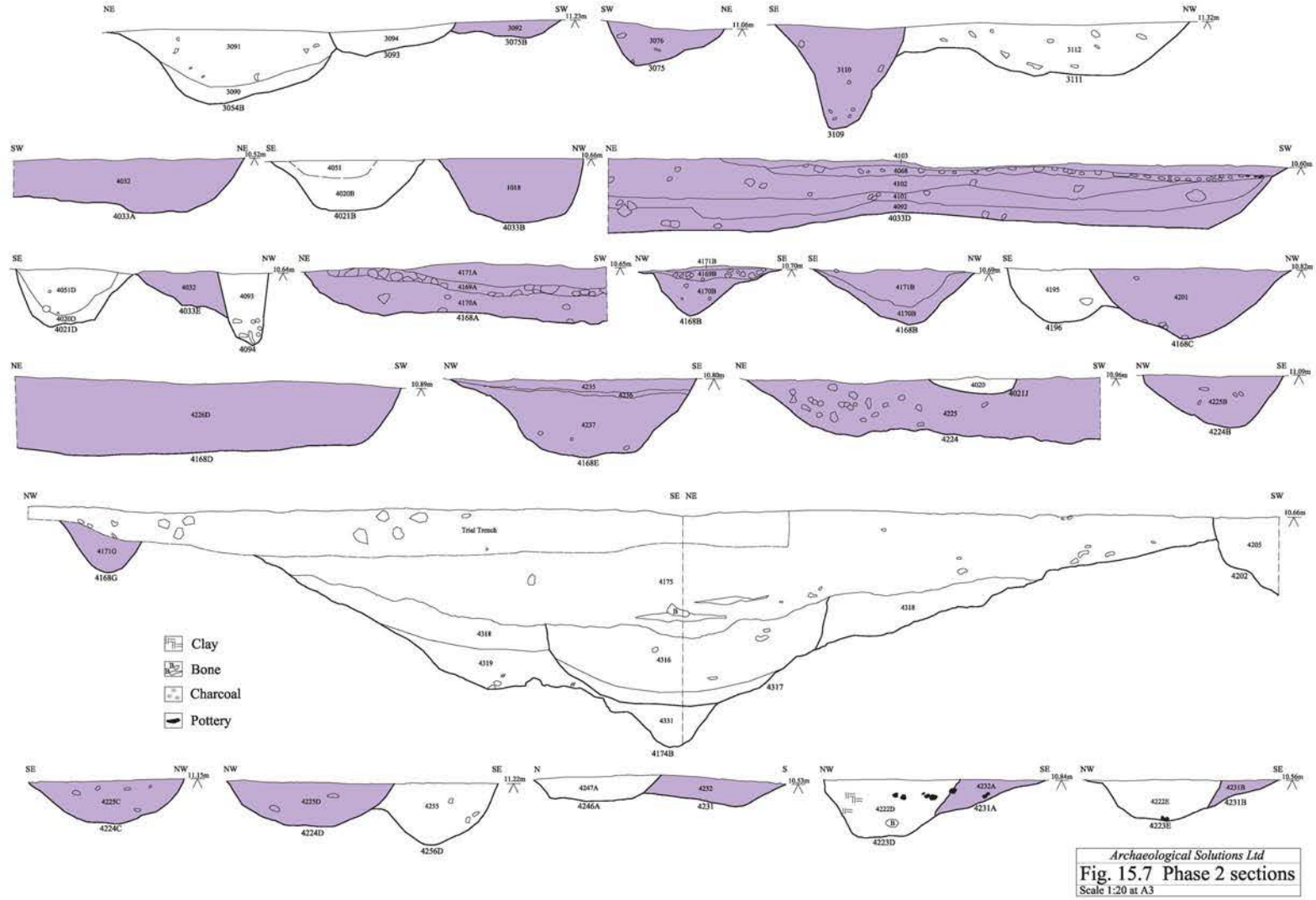
Fig. 15.6 Phase 2 sections

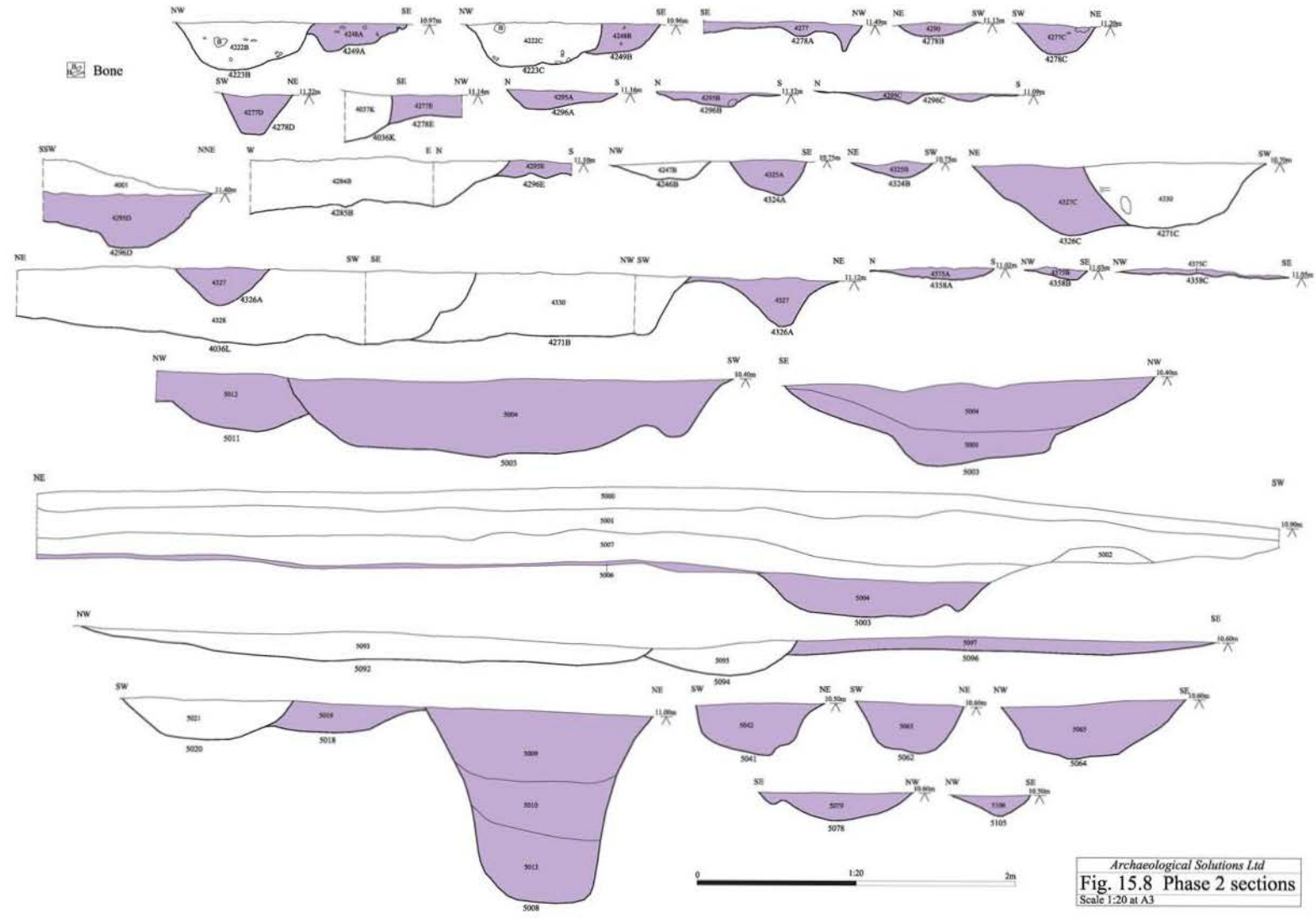
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 15.7 Phase 2 sections

Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 15.8 Phase 2 sections

Scale 1:20 at A3

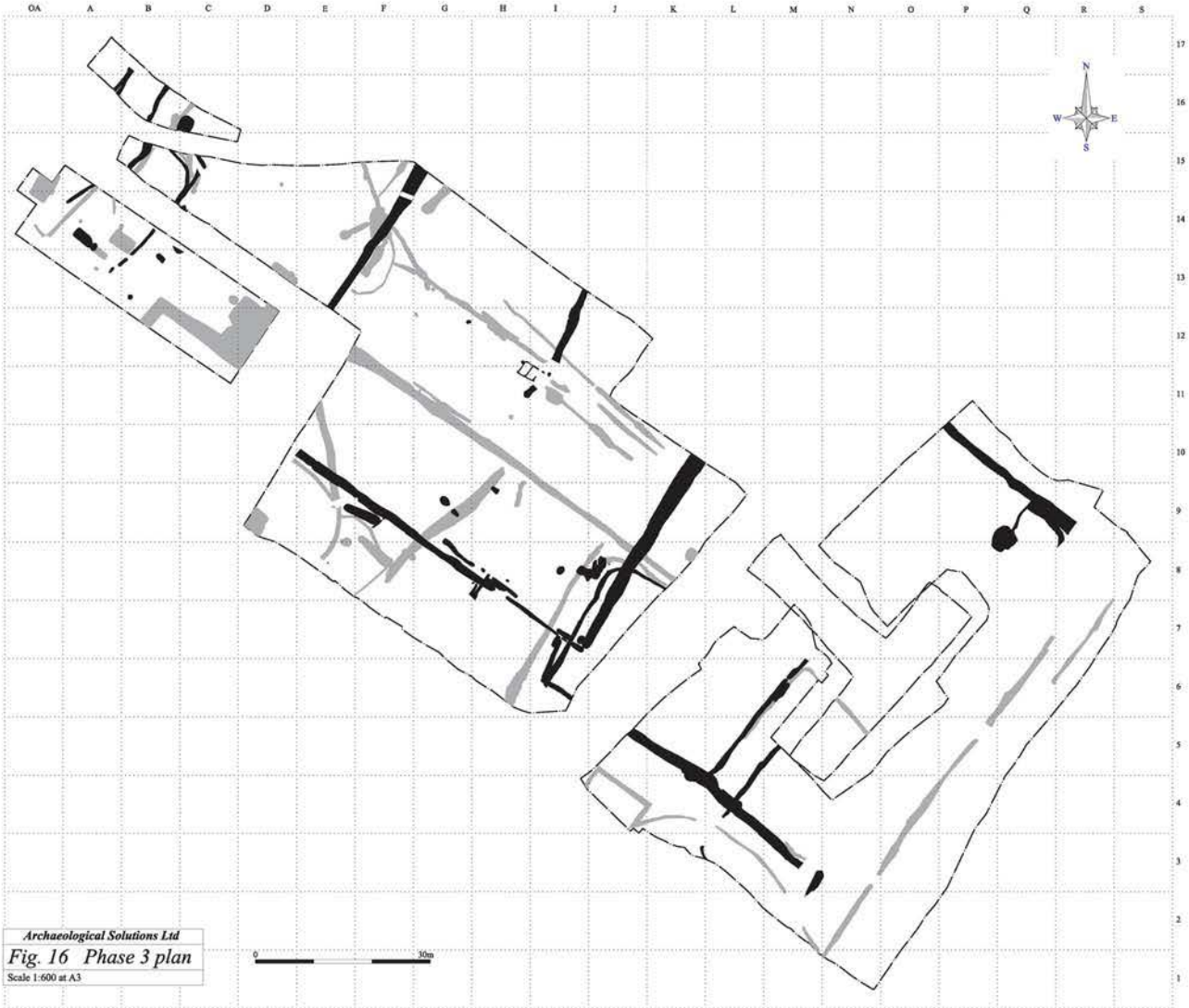


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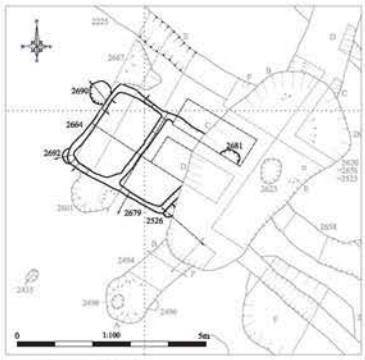
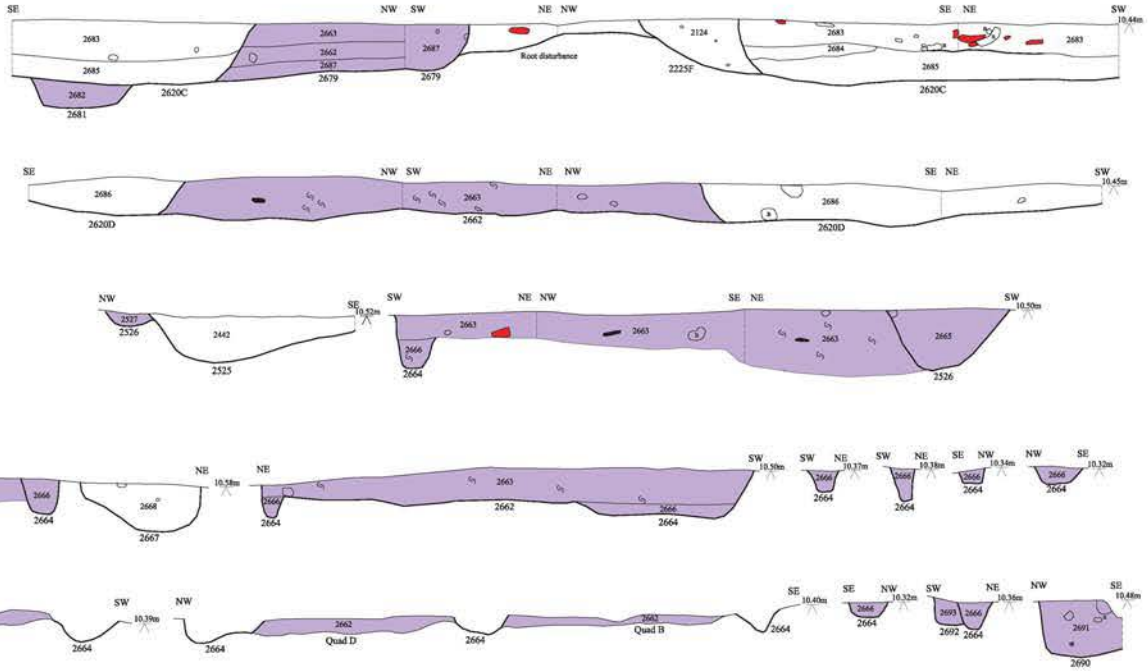
Fig. 16 Phase 3 plan

Scale 1:600 at A3



Phase 3 Structure S2661



Chalk
Bone
Charcoal
Pottery
CBM

0 1:20 2m

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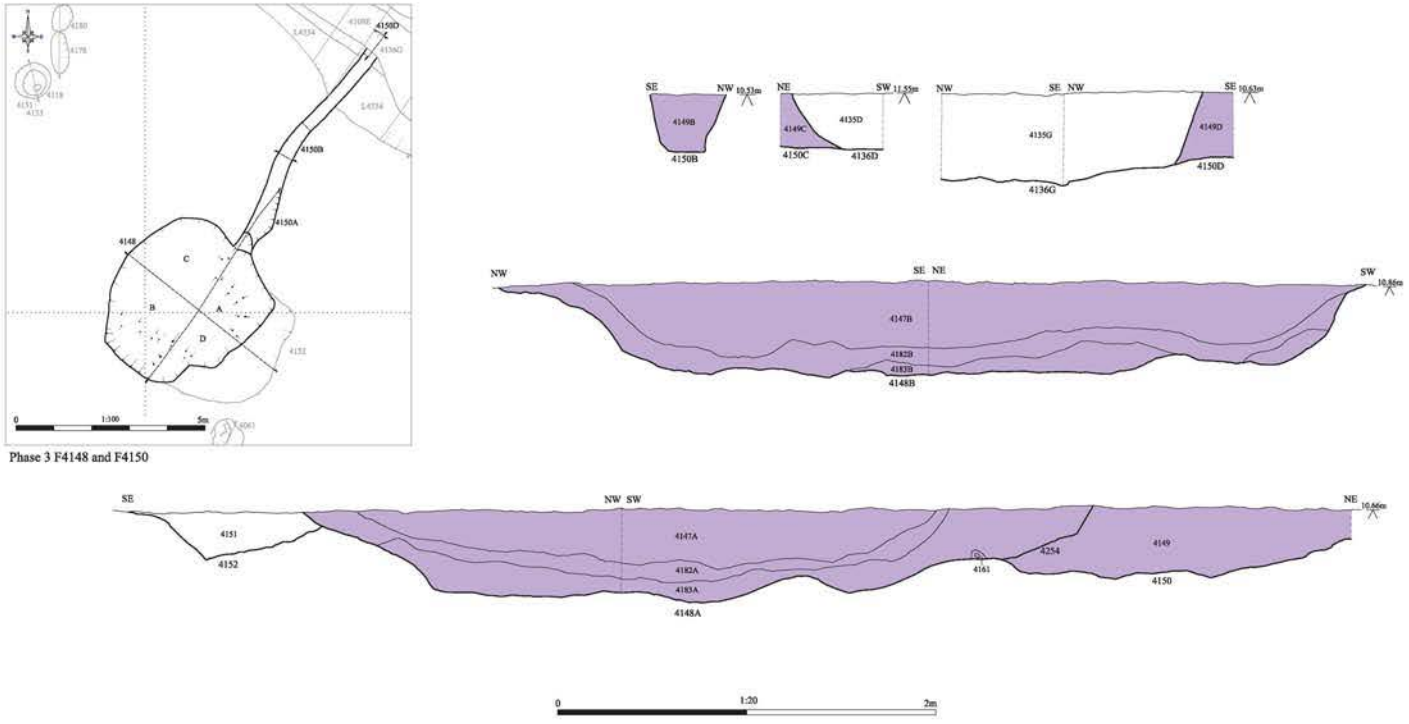
Fig. 17 Phase 3 building S2661

Scale: Plans 1:100 & sections 1:20 at A3



Phase 3 F4148 and F4150

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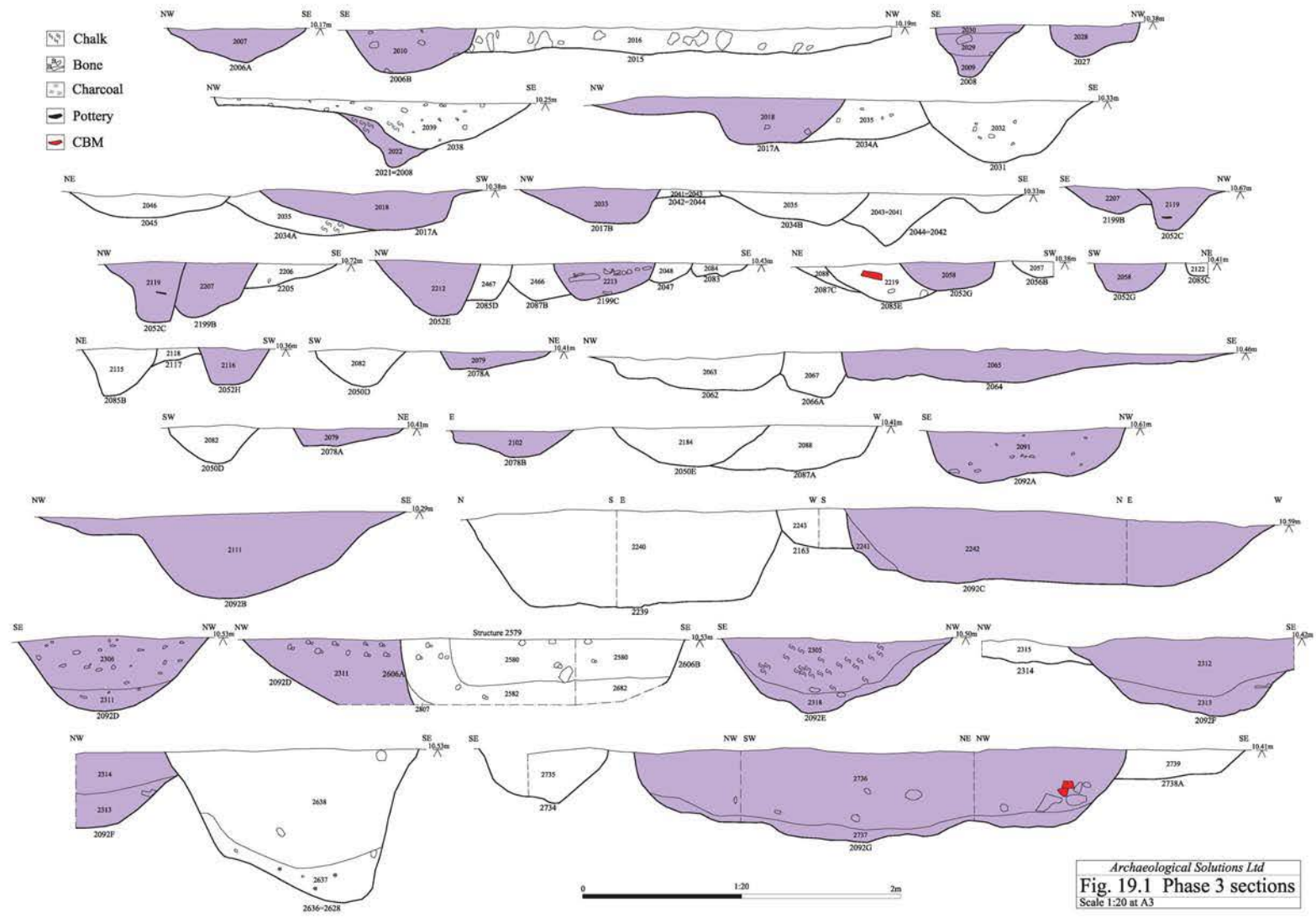
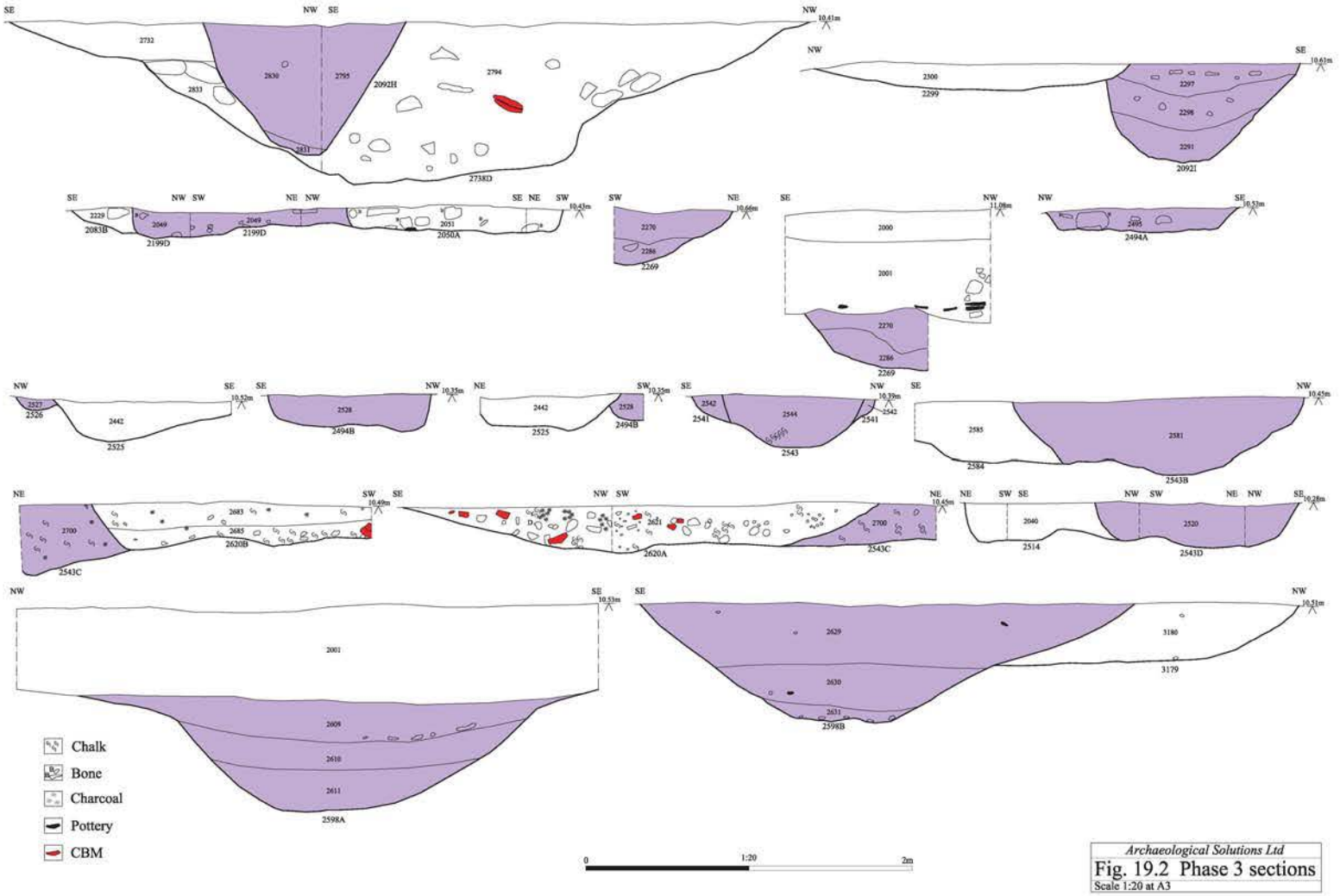
Fig. 18 Phase 3 F4148 and F4150
Scale: Plans 1:100 & sections 1:20 at A3

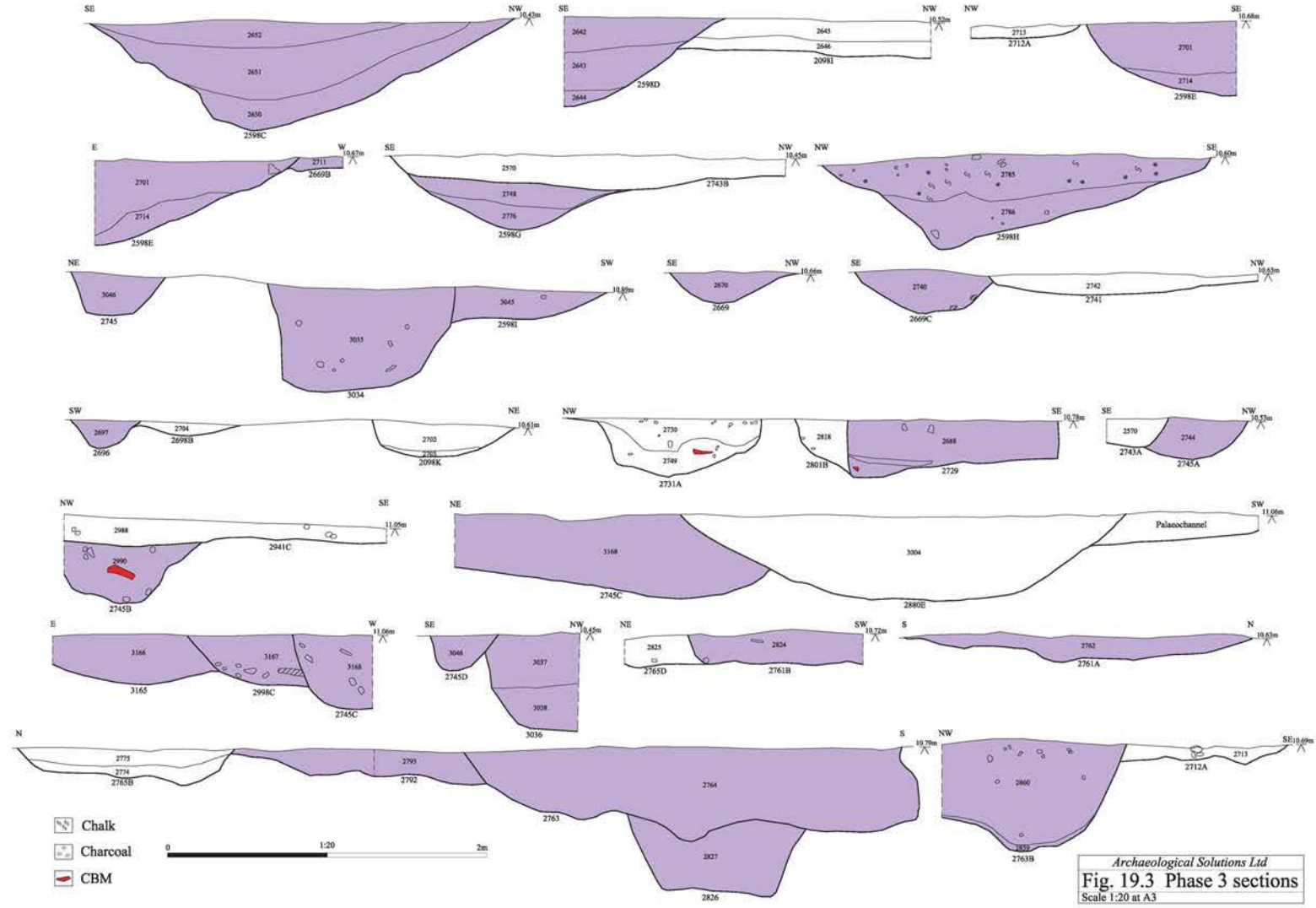

Chalk
Bone
Charcoal
Pottery
CBM
2006A
2006B
2015
2027
2008
2021=2008
2017A
2034A
2031
2045
2017B
2034B
2044=2042
2199B
2052C
2052C
2199B
2085D
2052E
2199C
2087C
2085E
2052G
2056B
2052G
2085C
2085B
2052H
2050D
2078A
2062
2066A
2064
2050D
2078A
2078B
2050E
2087A
2092A
2092B
2092C
2239
2163
Structure 2579
2092D
2606A
2606B
2092E
2314
2092F
2092F
2638
2636=2628
2734
2737
2092G
2738A
0
1:20
2m
Archaeological Solutions Ltd
Fig. 19.1 Phase 3 sections
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 19.2 Phase 3 sections

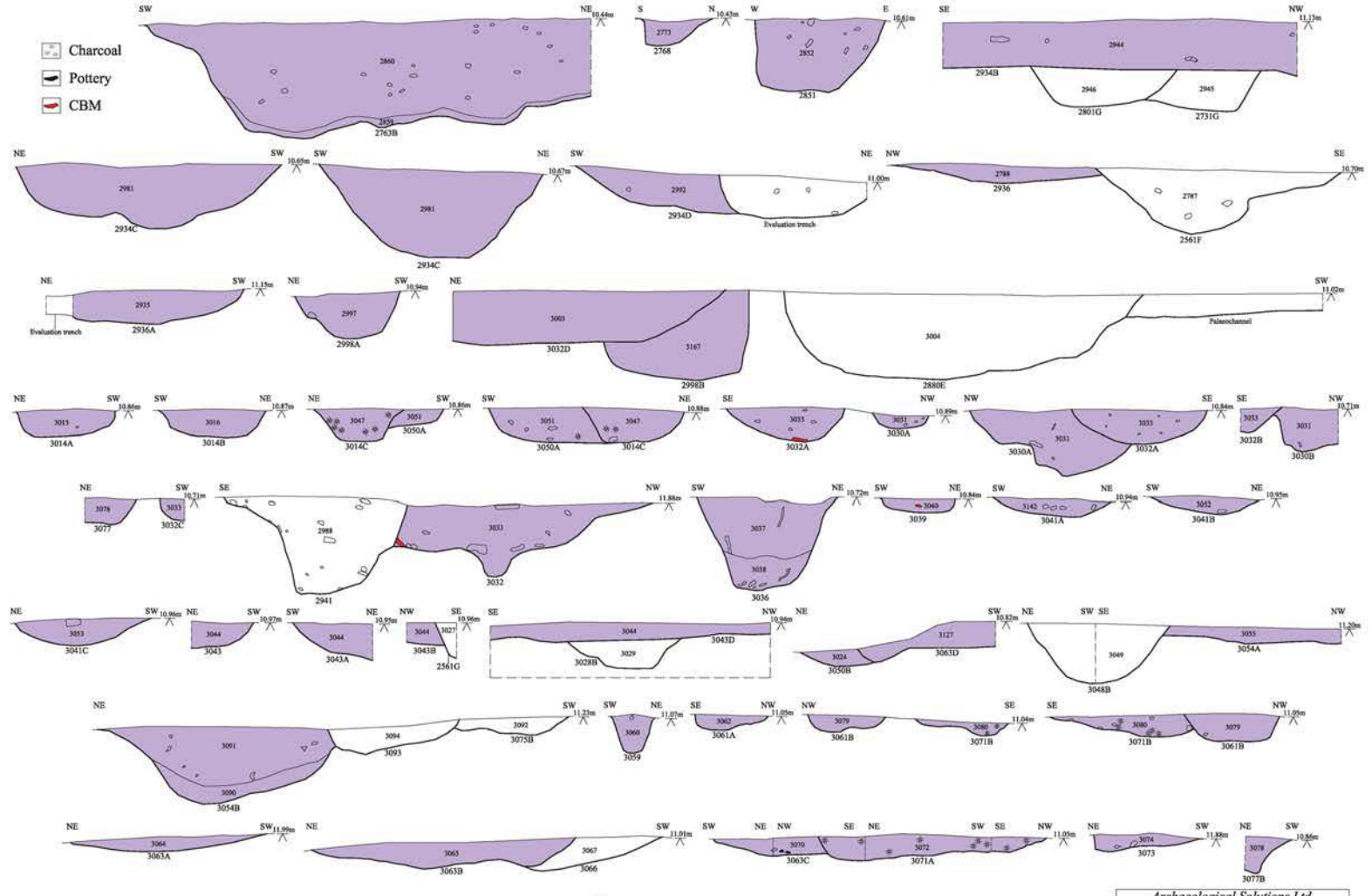
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 19.3 Phase 3 sections

Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 19.4 Phase 3 sections

Scale 1:20 at A3

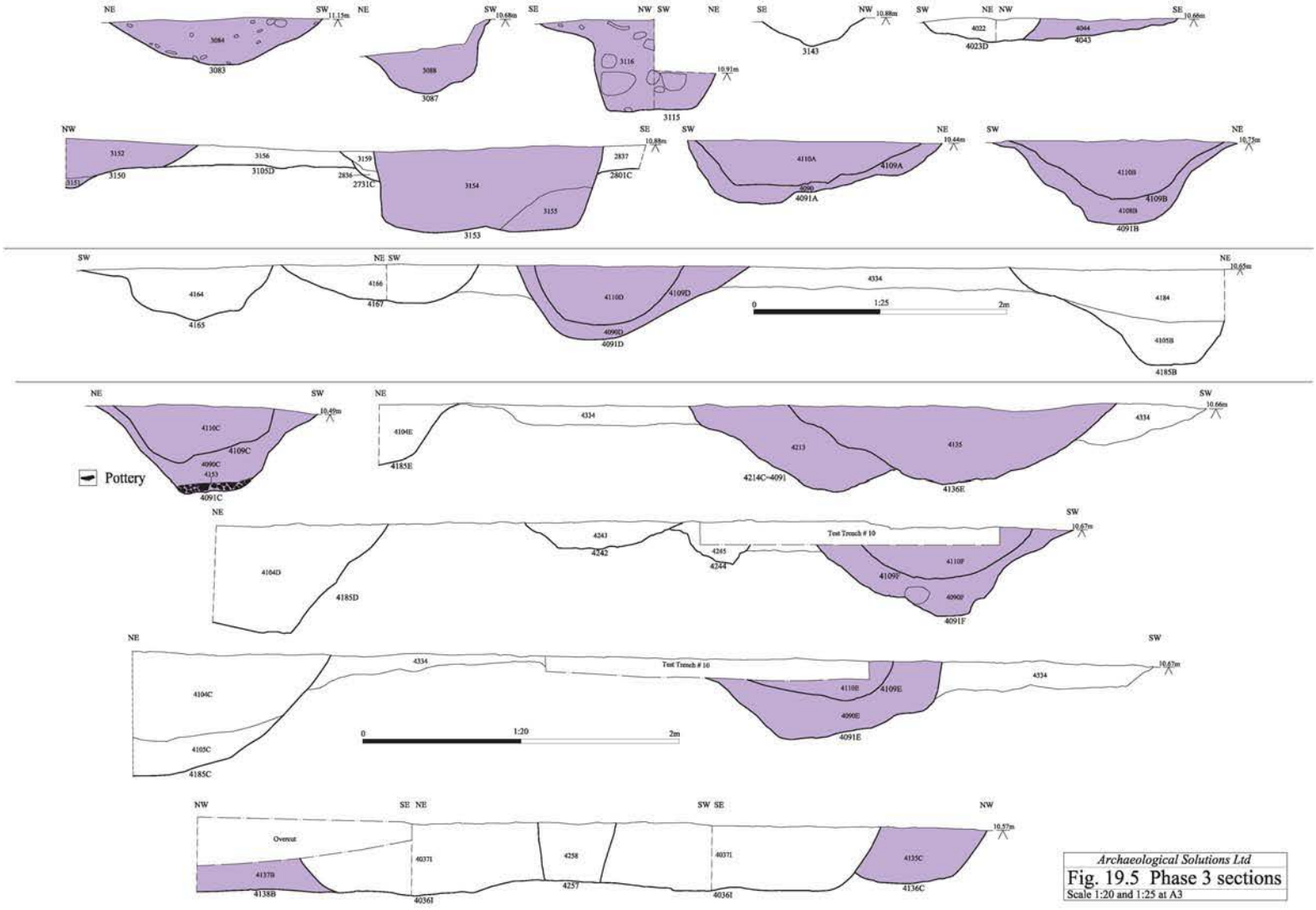


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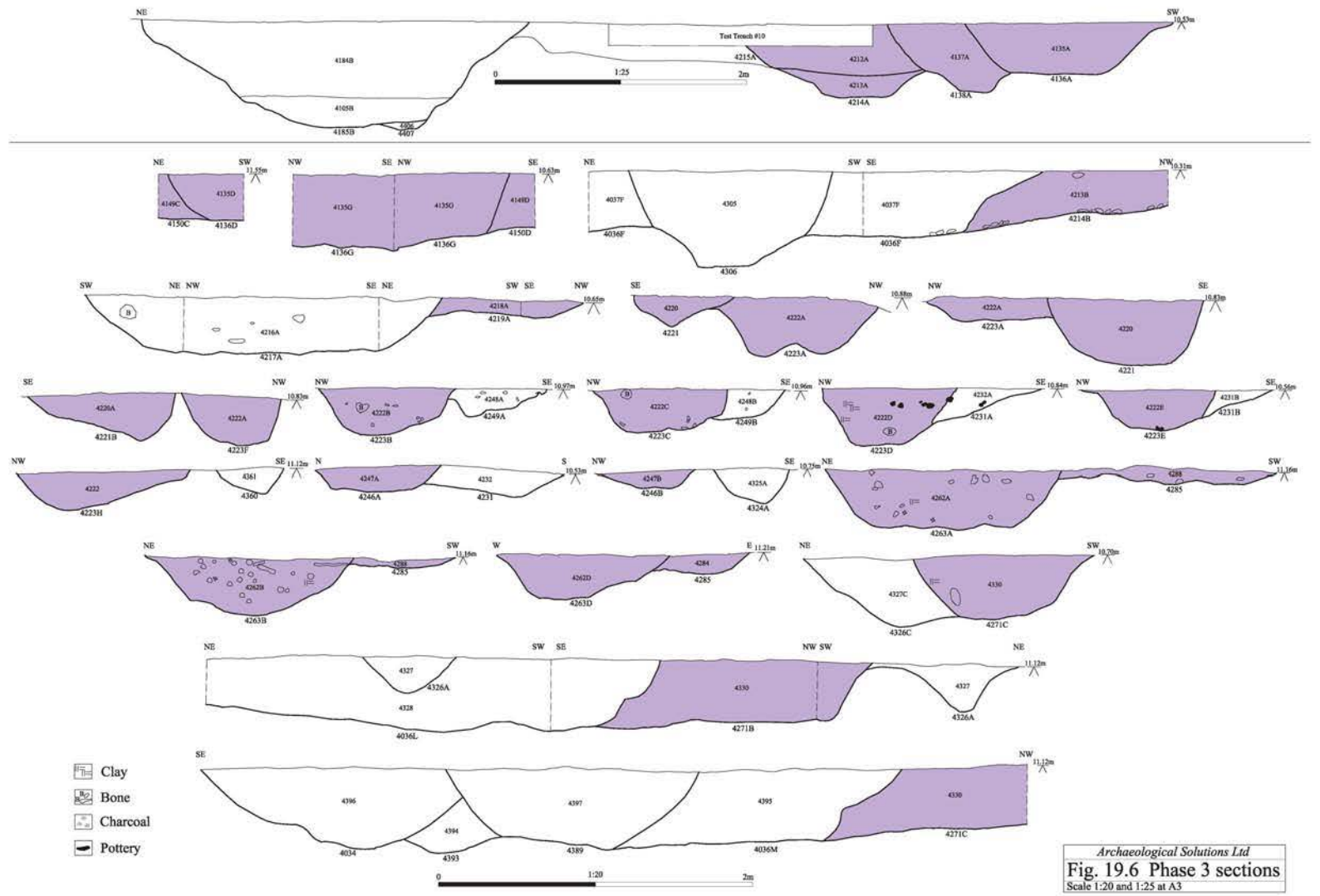
Fig. 19.5 Phase 3 sections

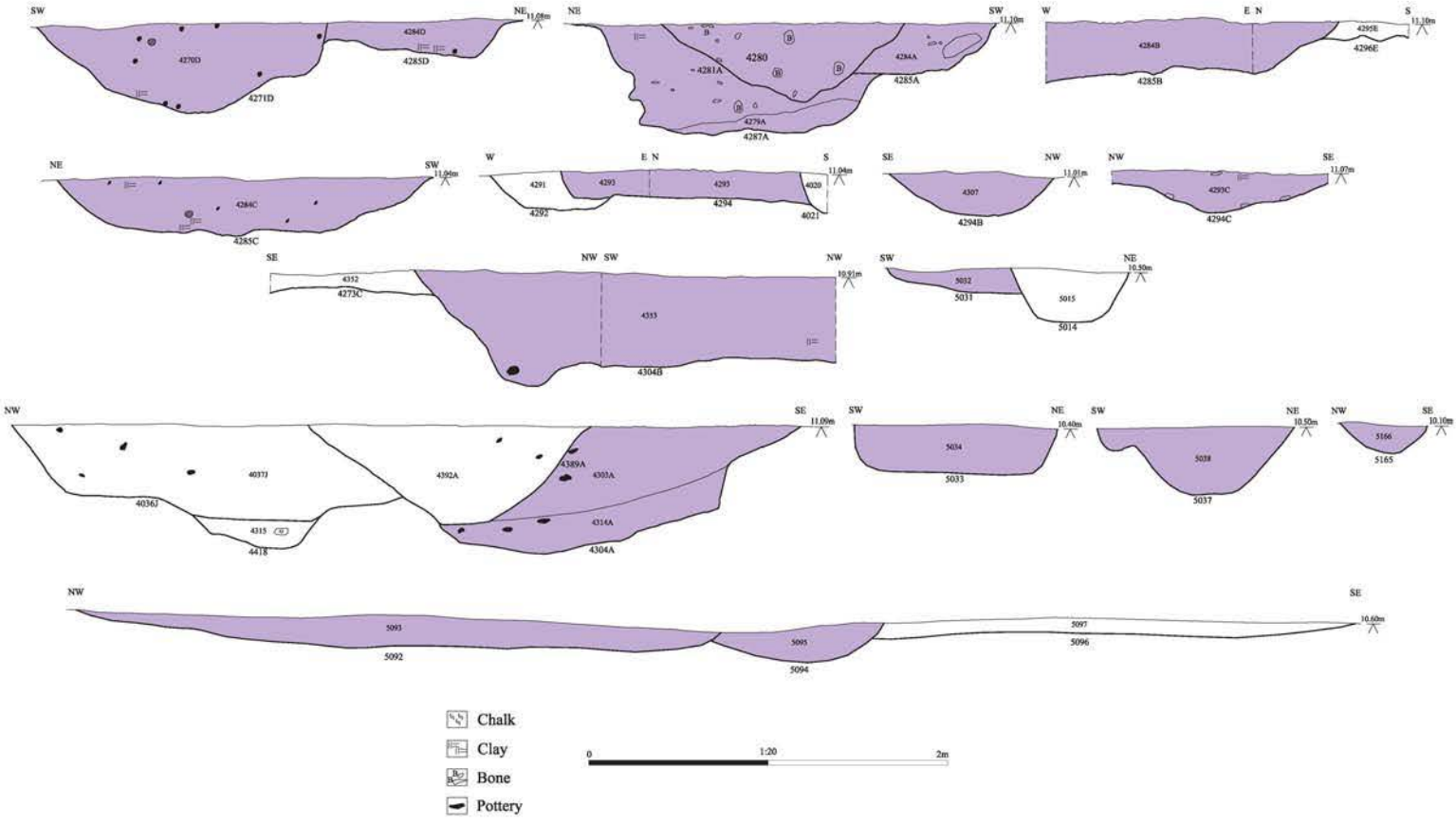
Scale 1:20 and 1:25 at A3



Archaeological Solutions Ltd

Fig. 19.6 Phase 3 sections

Scale 1:20 and 1:25 at A3



Archaeological Solutions Ltd

Fig. 19.7 Phase 3 sections

Scale 1:20 at A3

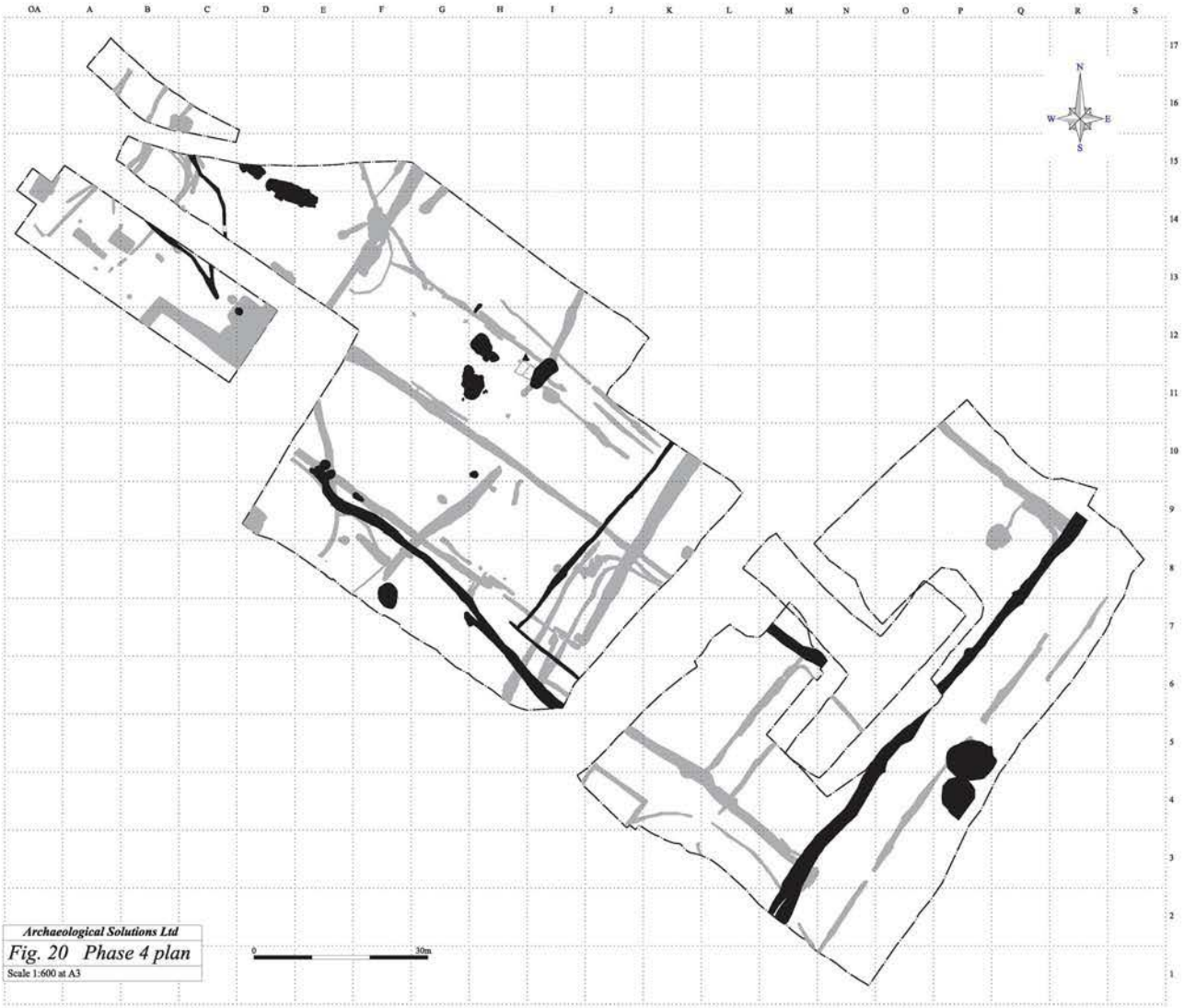


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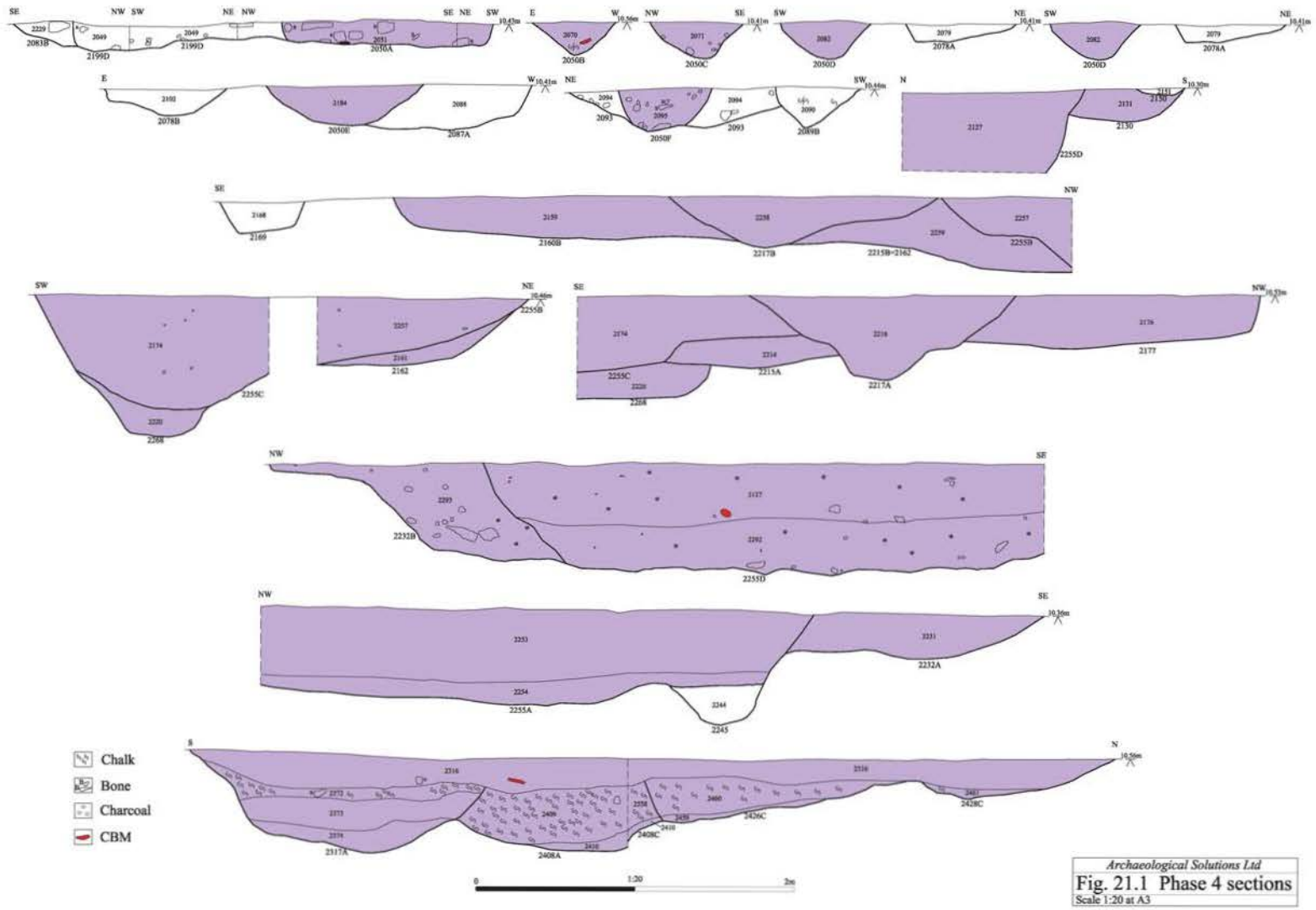
Fig. 20 Phase 4 plan

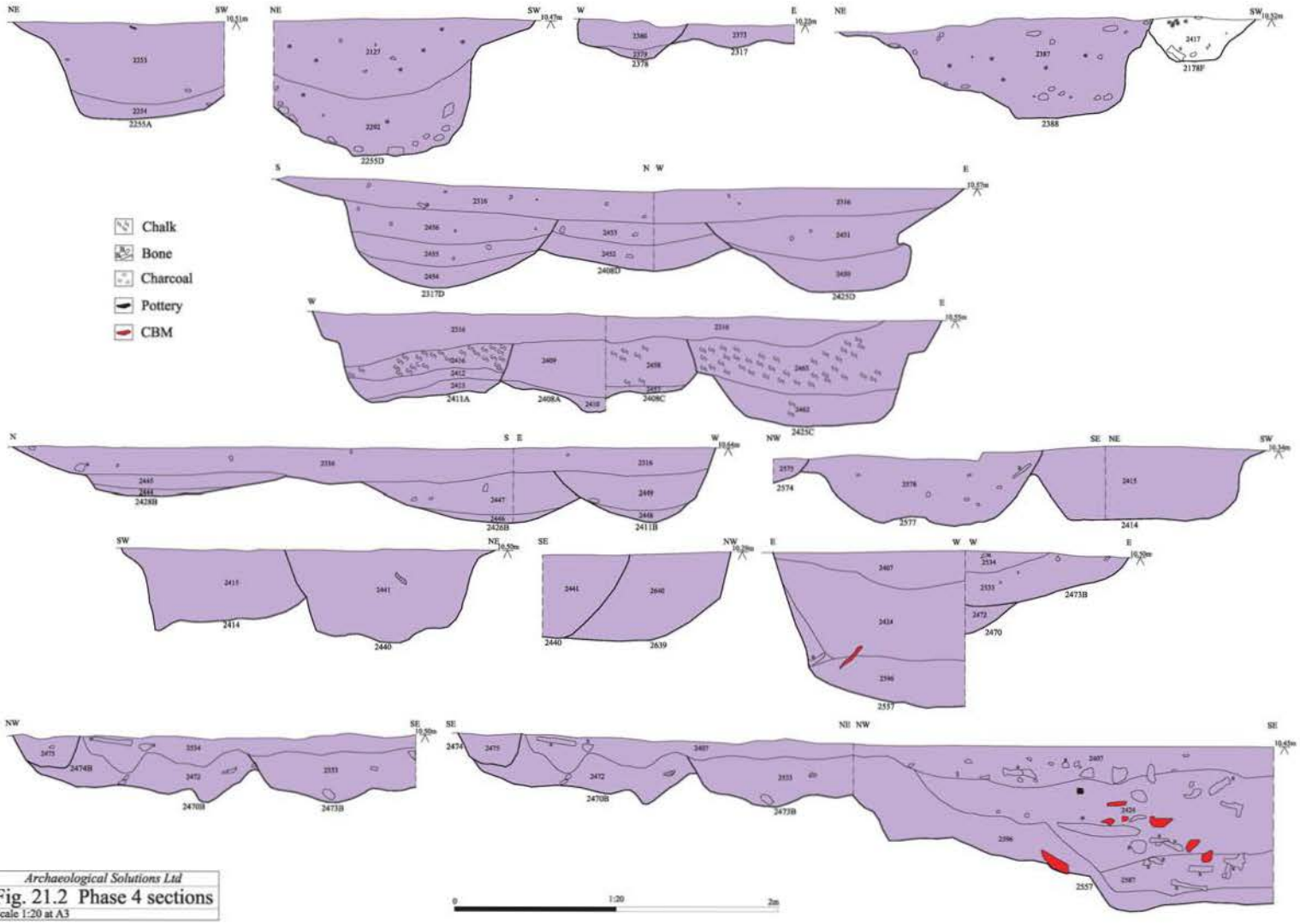
Scale 1:600 at A3



Archaeological Solutions Ltd

Fig. 21.1 Phase 4 sections

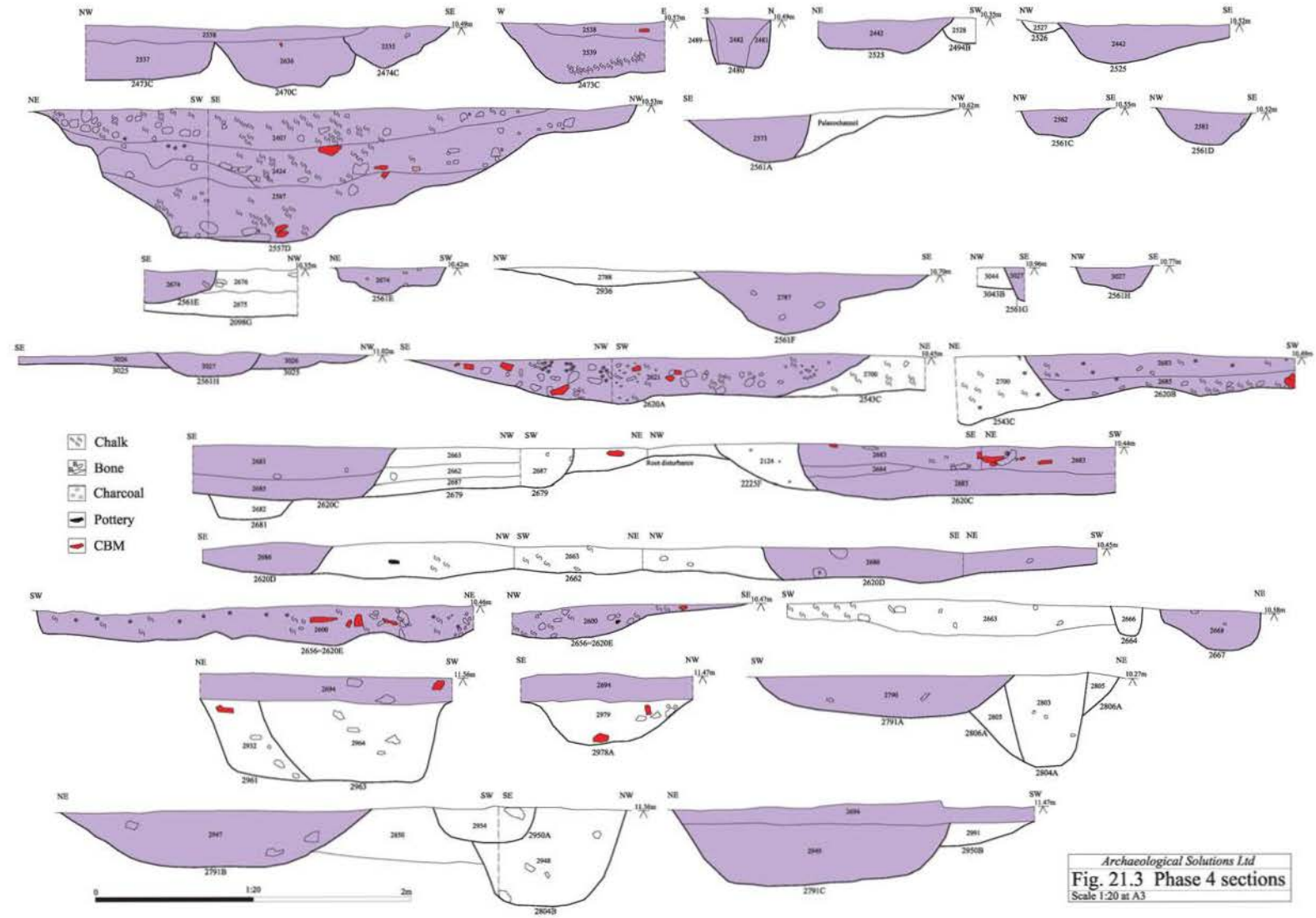
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 21.2 Phase 4 sections

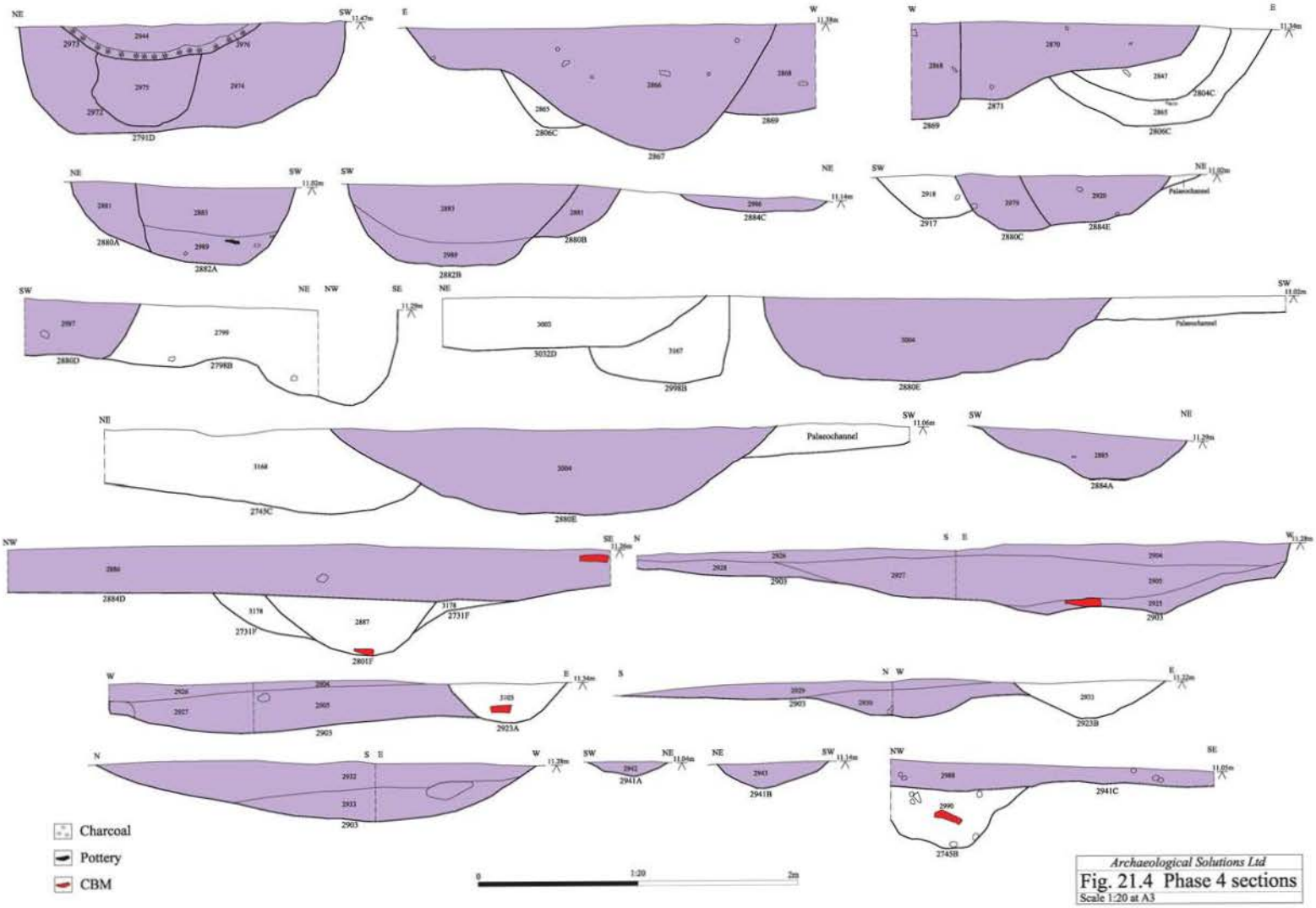
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 21.3 Phase 4 sections

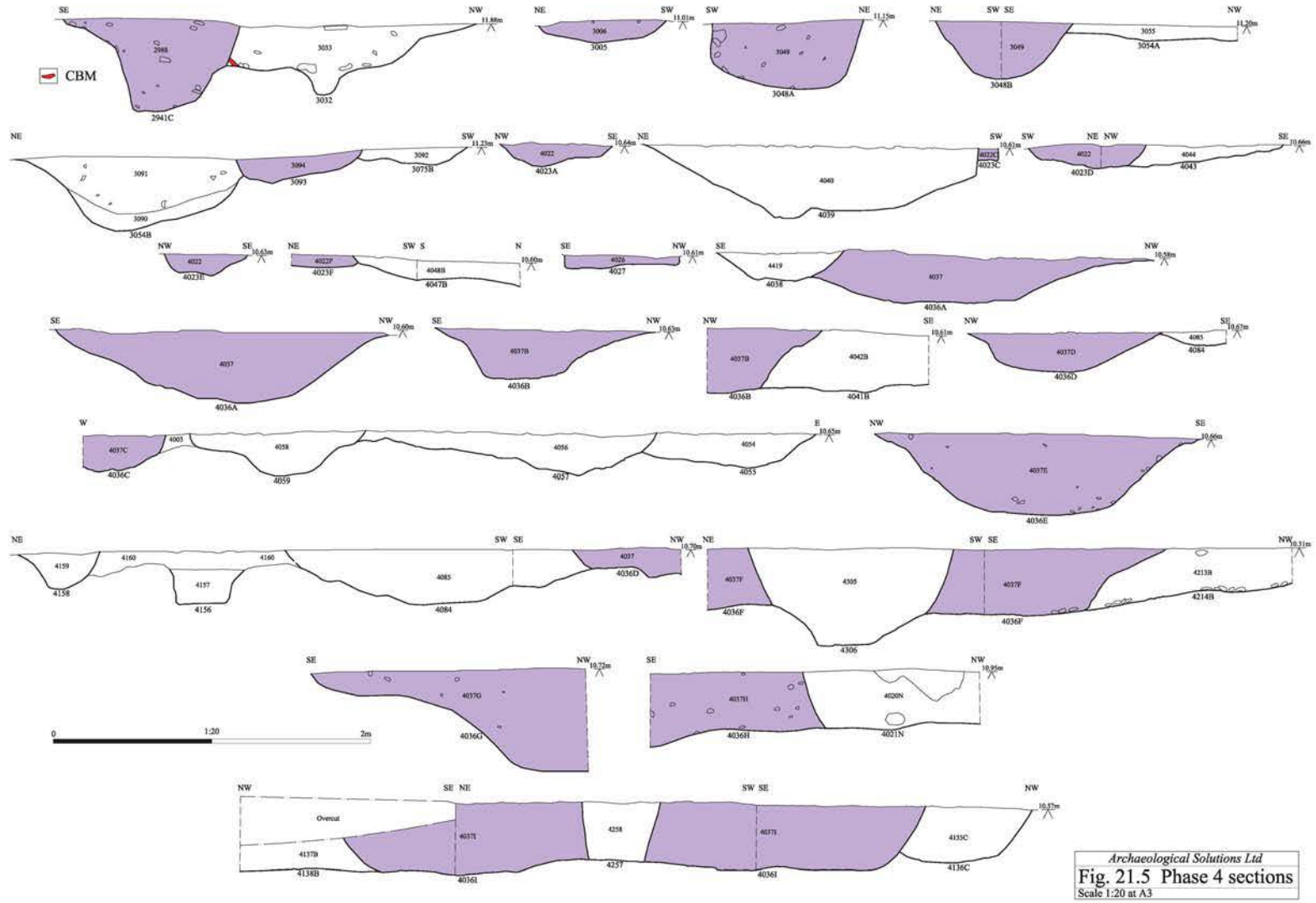
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 21.4 Phase 4 sections

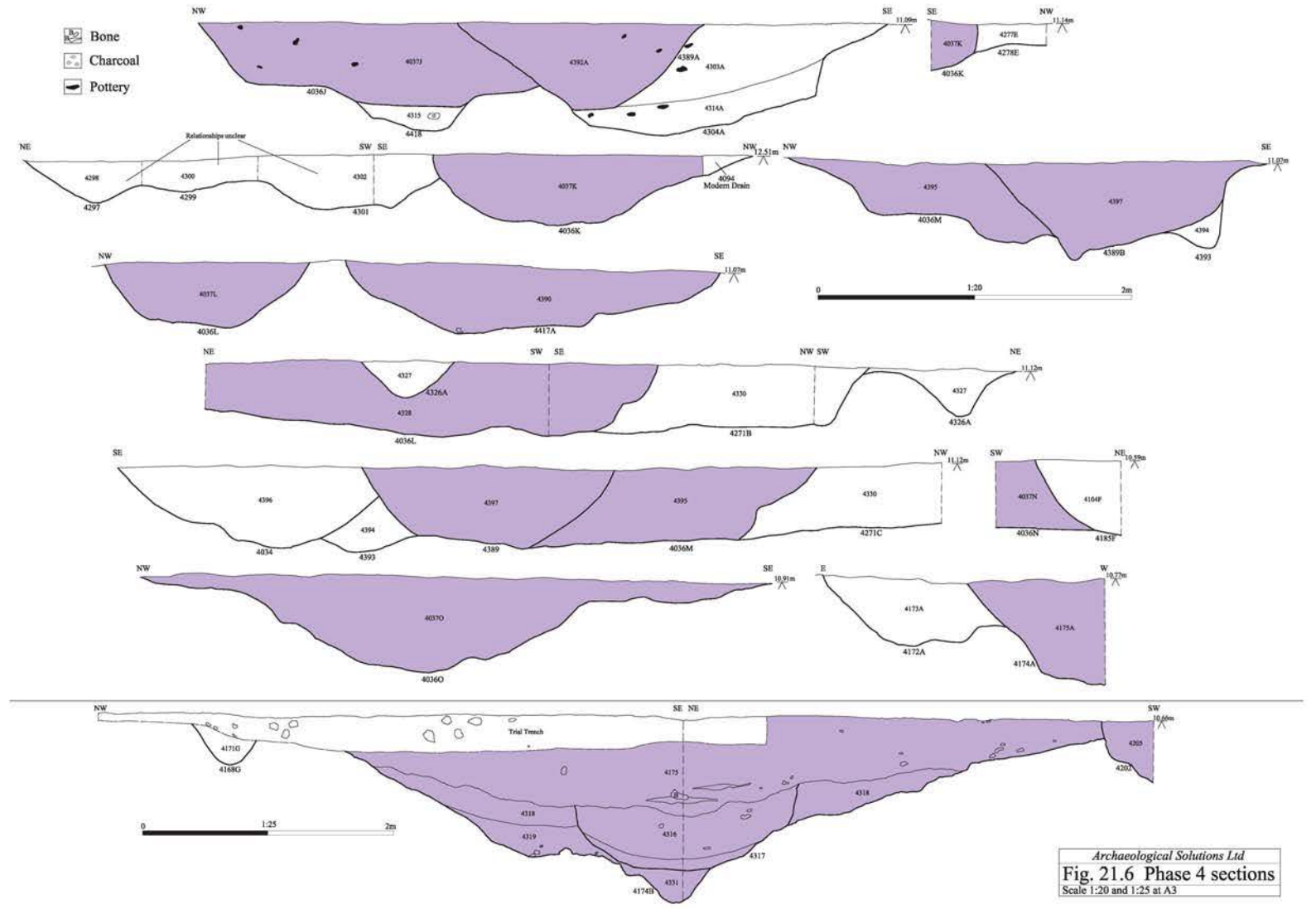
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 21.5 Phase 4 sections

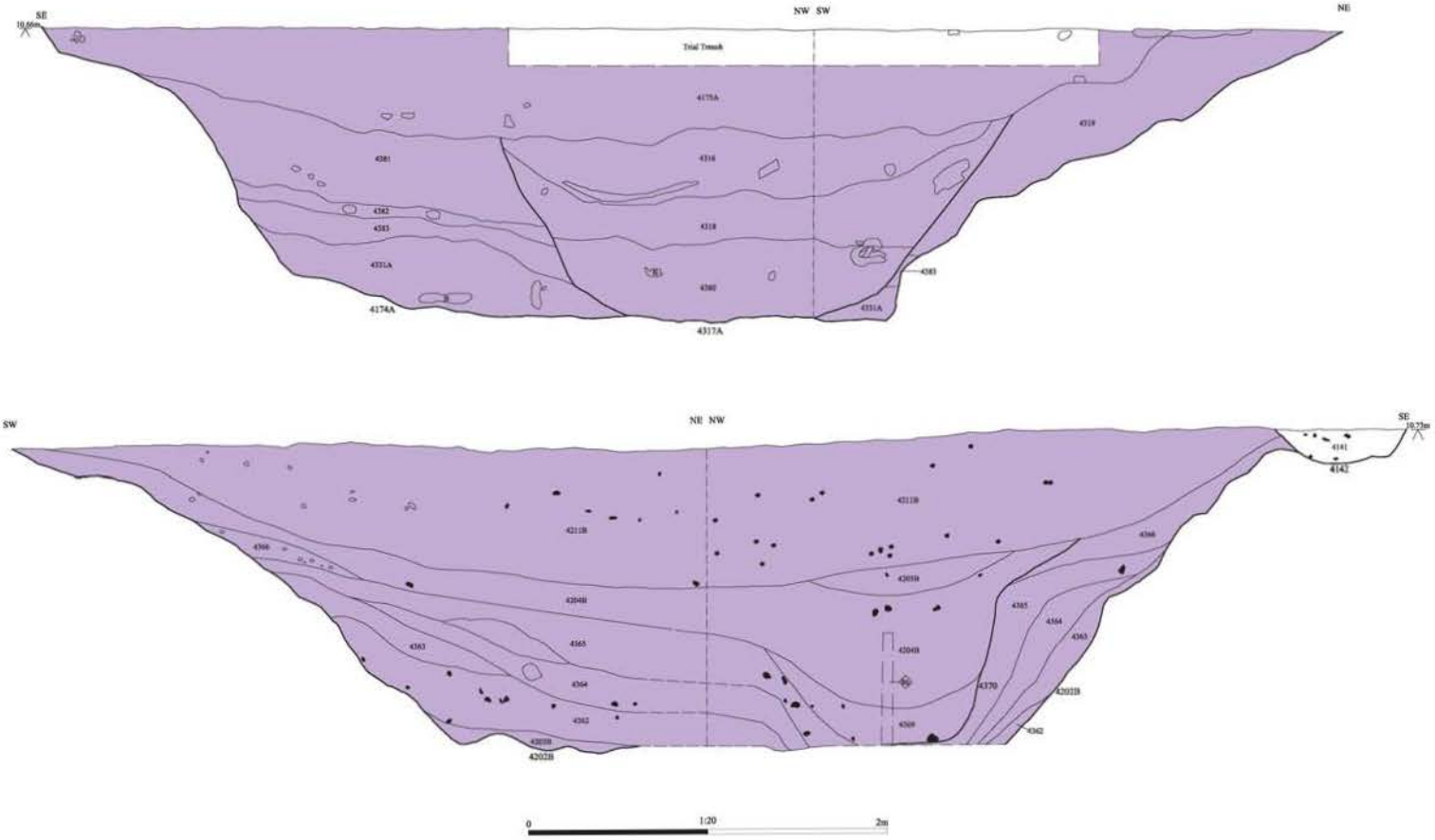
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 21.6 Phase 4 sections

Scale 1:20 and 1:25 at A3



0 1:20 2m

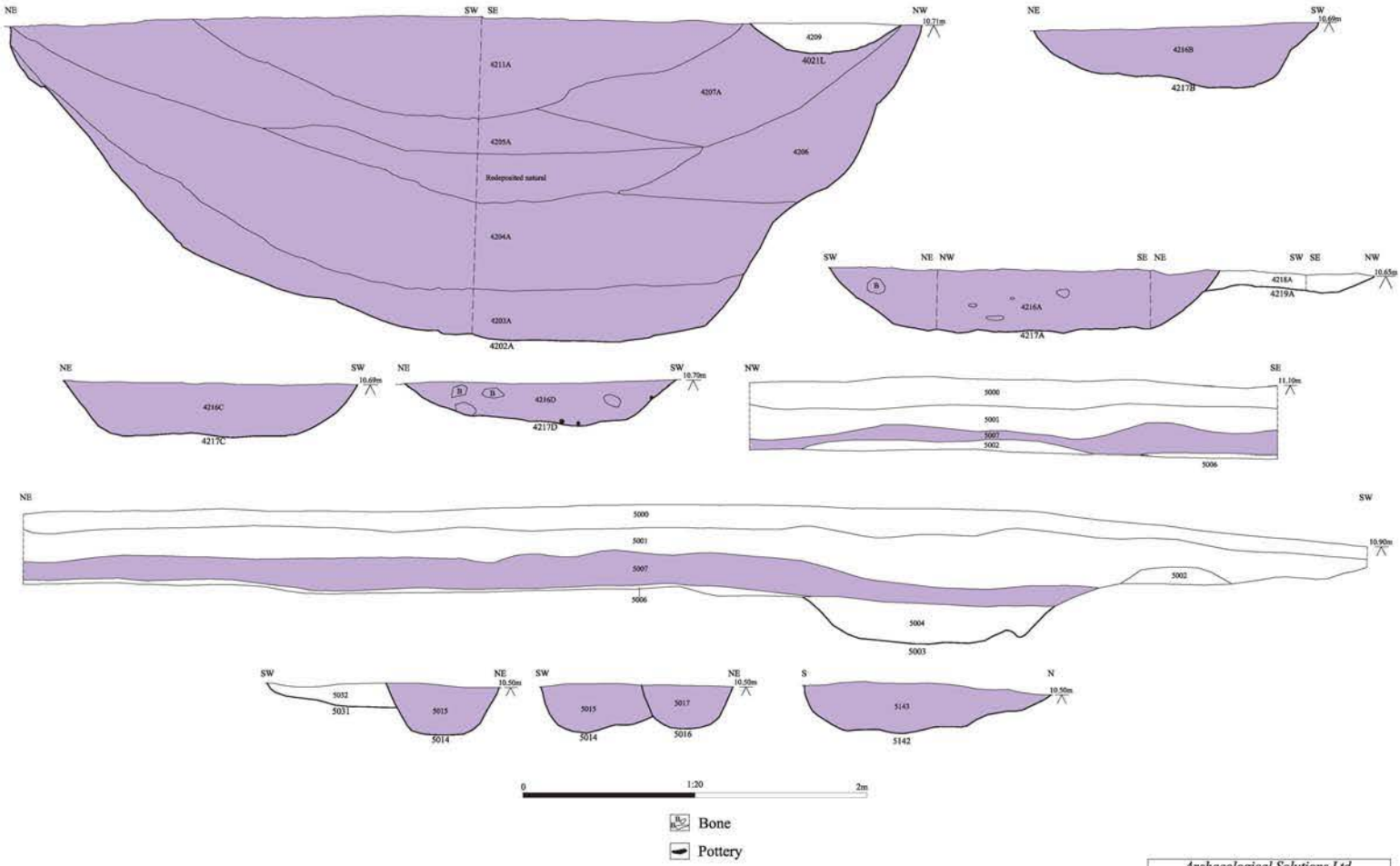
Bone

Pottery

Archaeological Solutions Ltd

Fig. 21.7 Phase 4 sections

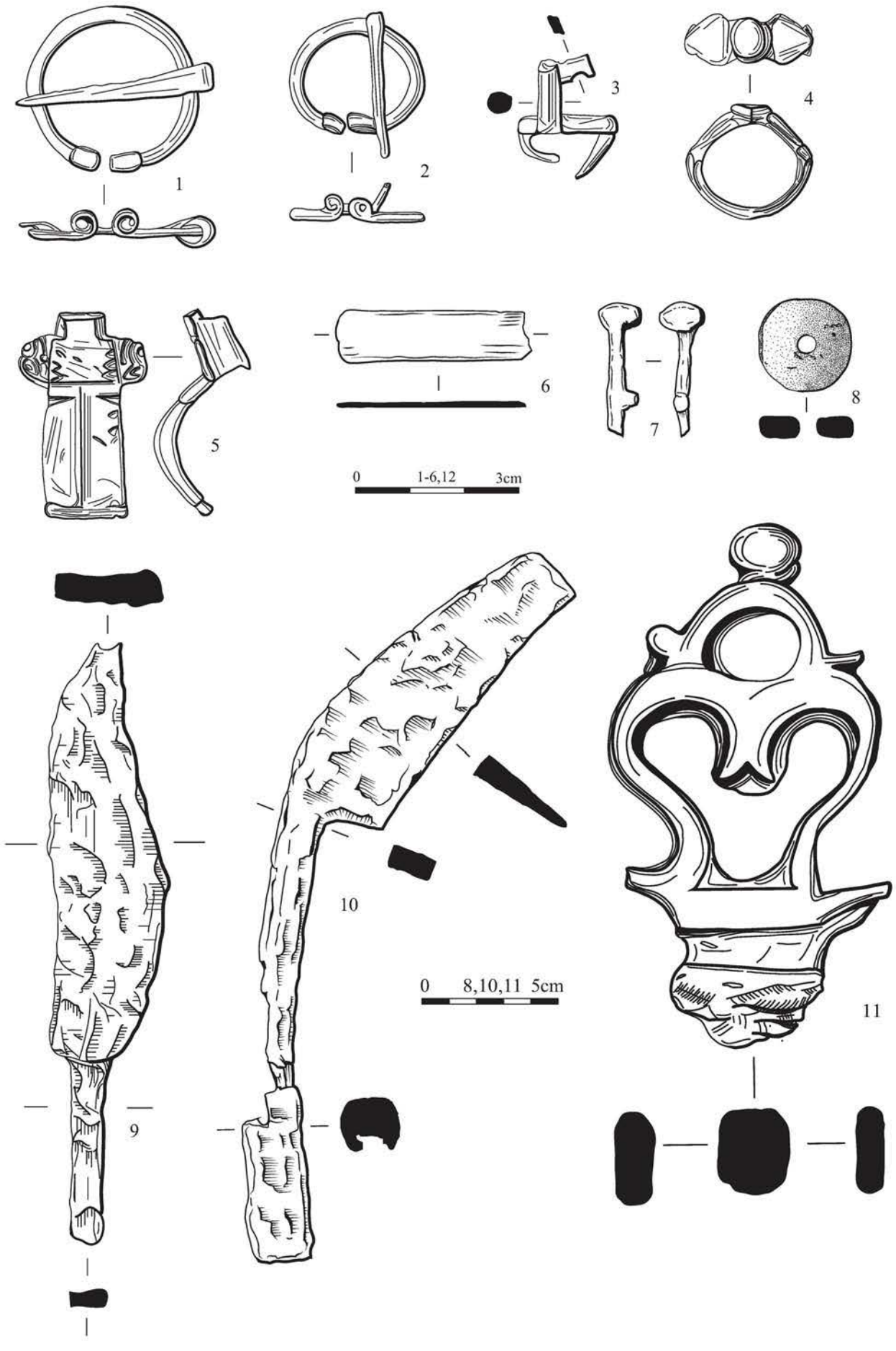
Scale 1:20 at A3



Archaeological Solutions Ltd

Fig. 21.8 Phase 4 sections

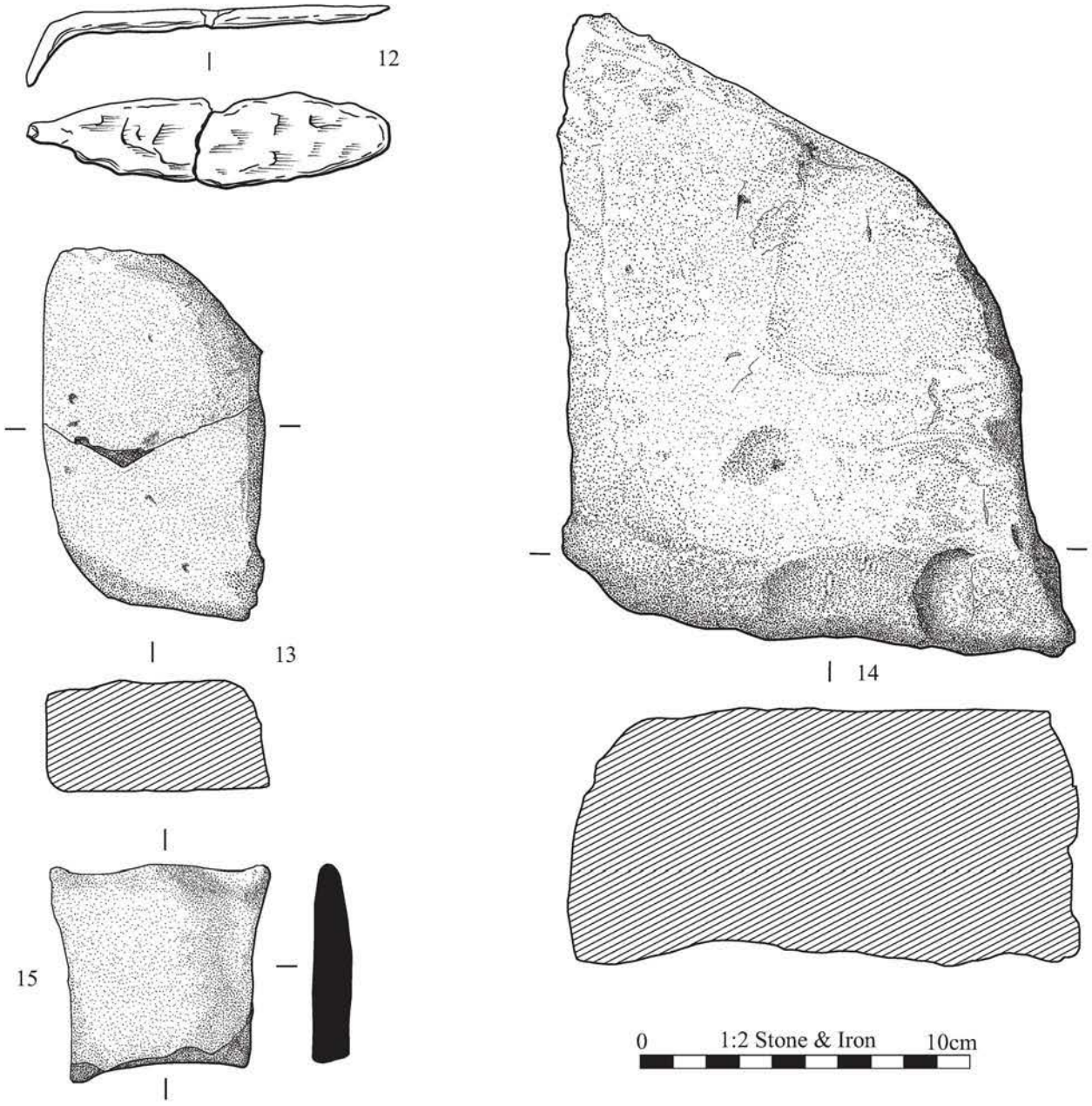
Scale 1:20 at A3



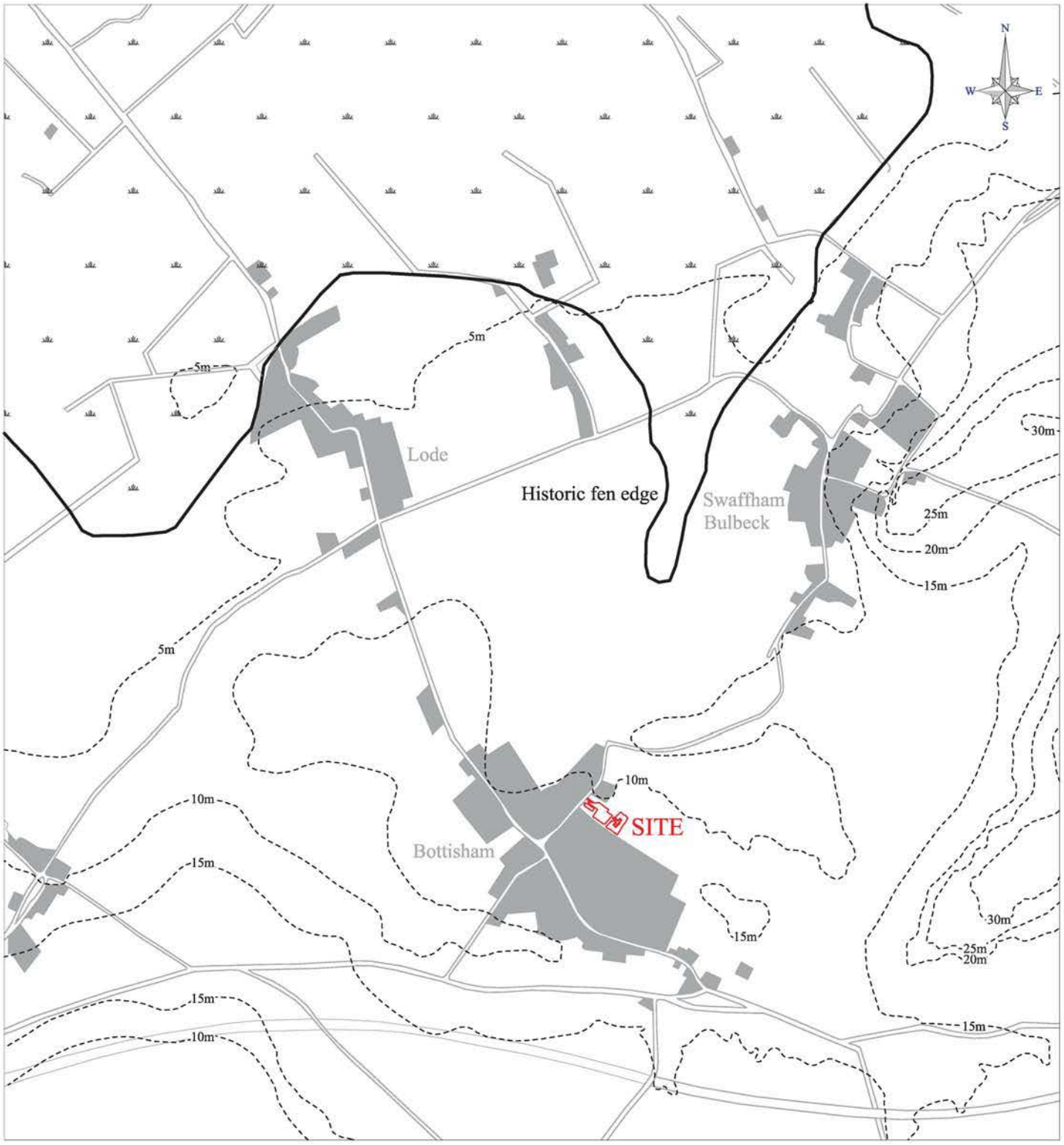
Archaeological Solutions Ltd

Fig. 22 Small finds illustrations

Scale 1:1 & 1:2 at A4



Archaeological Solutions Ltd
Fig. 23 Small finds illustrations
Scale 1:2 at A4



0 1:25000 1500m

——————— Contour line

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Fig. 24 Local topography

Scale 1:25000 at A4

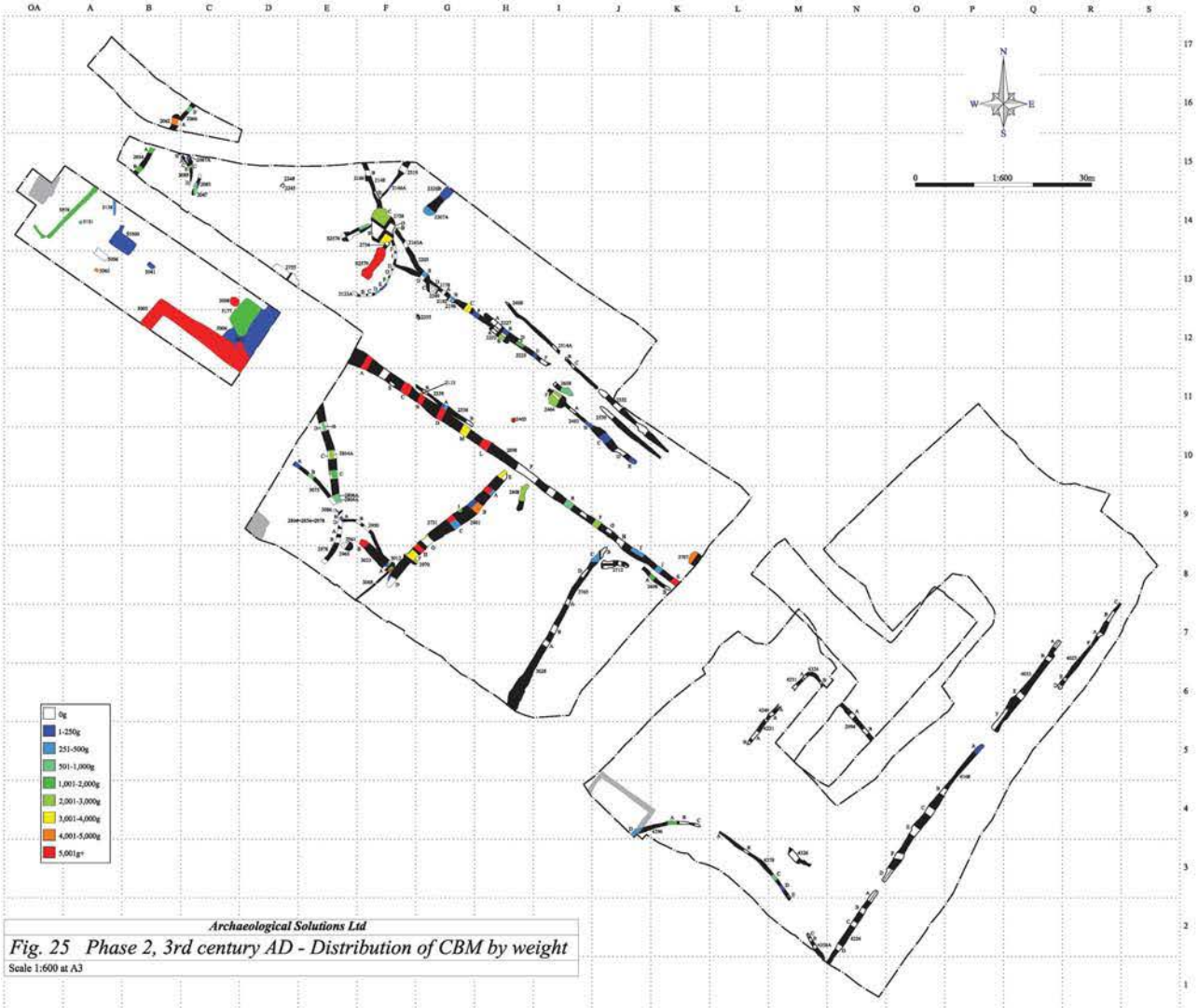

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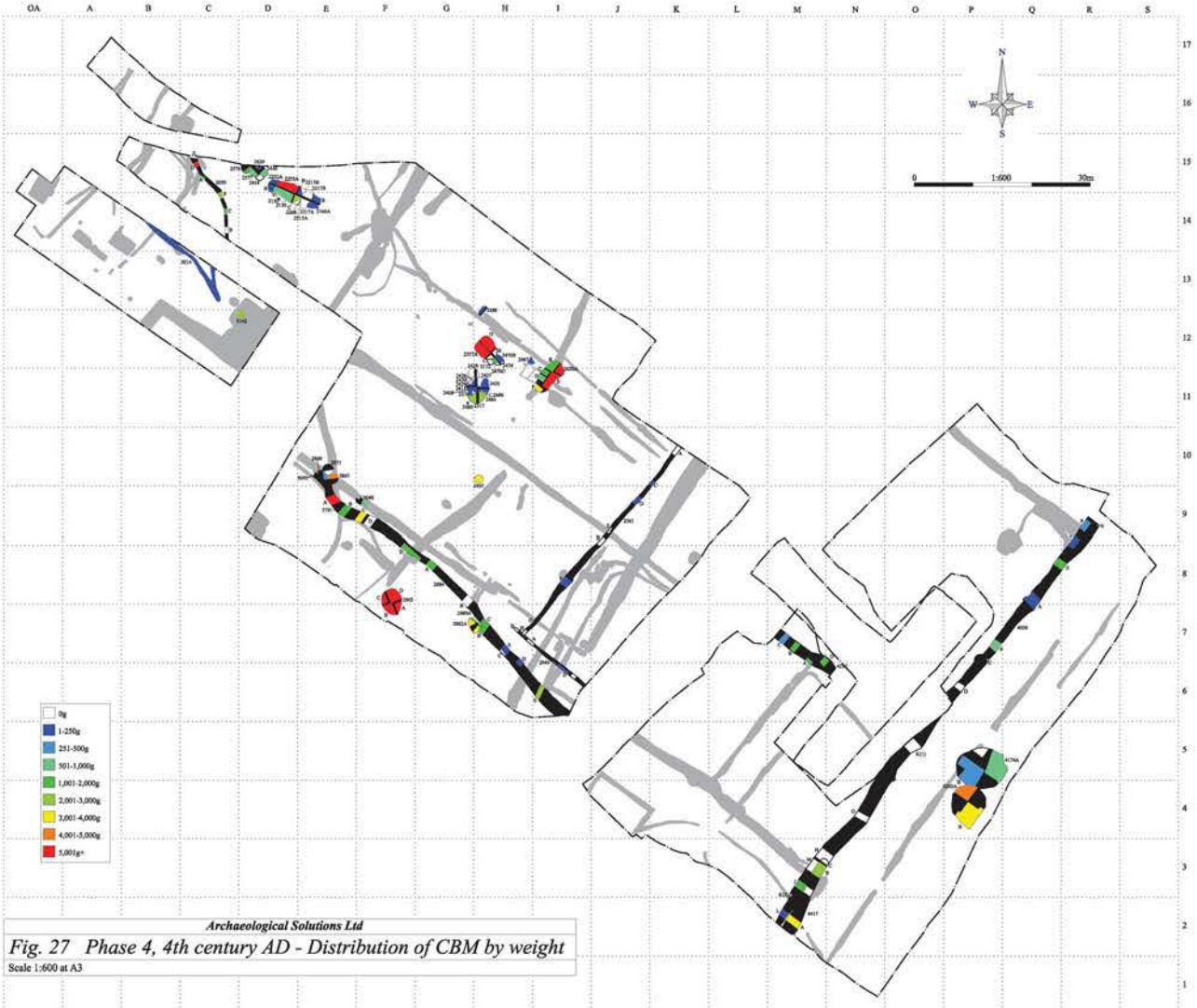
Fig. 25 Phase 2, 3rd century AD - Distribution of CBM by weight

Scale 1:600 at A3

Archaeological Solutions Ltd

Fig. 26 Phase 3, late 3rd - early 4th century AD - Distribution of CBM by weight

Scale 1:600 at A3



Archaeological Solutions Ltd

Fig. 27 Phase 4, 4th century AD - Distribution of CBM by weight

Scale 1:600 at A3

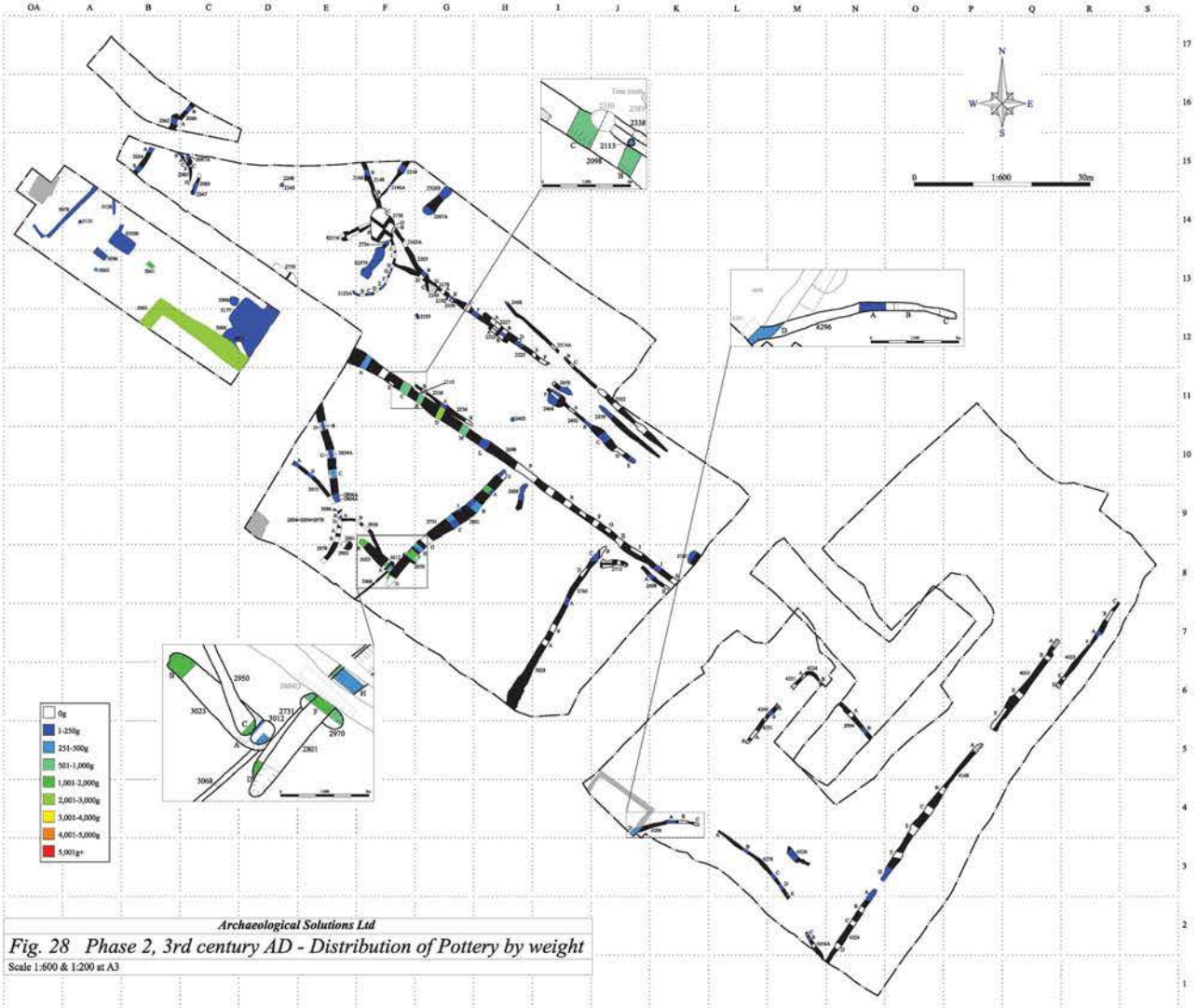


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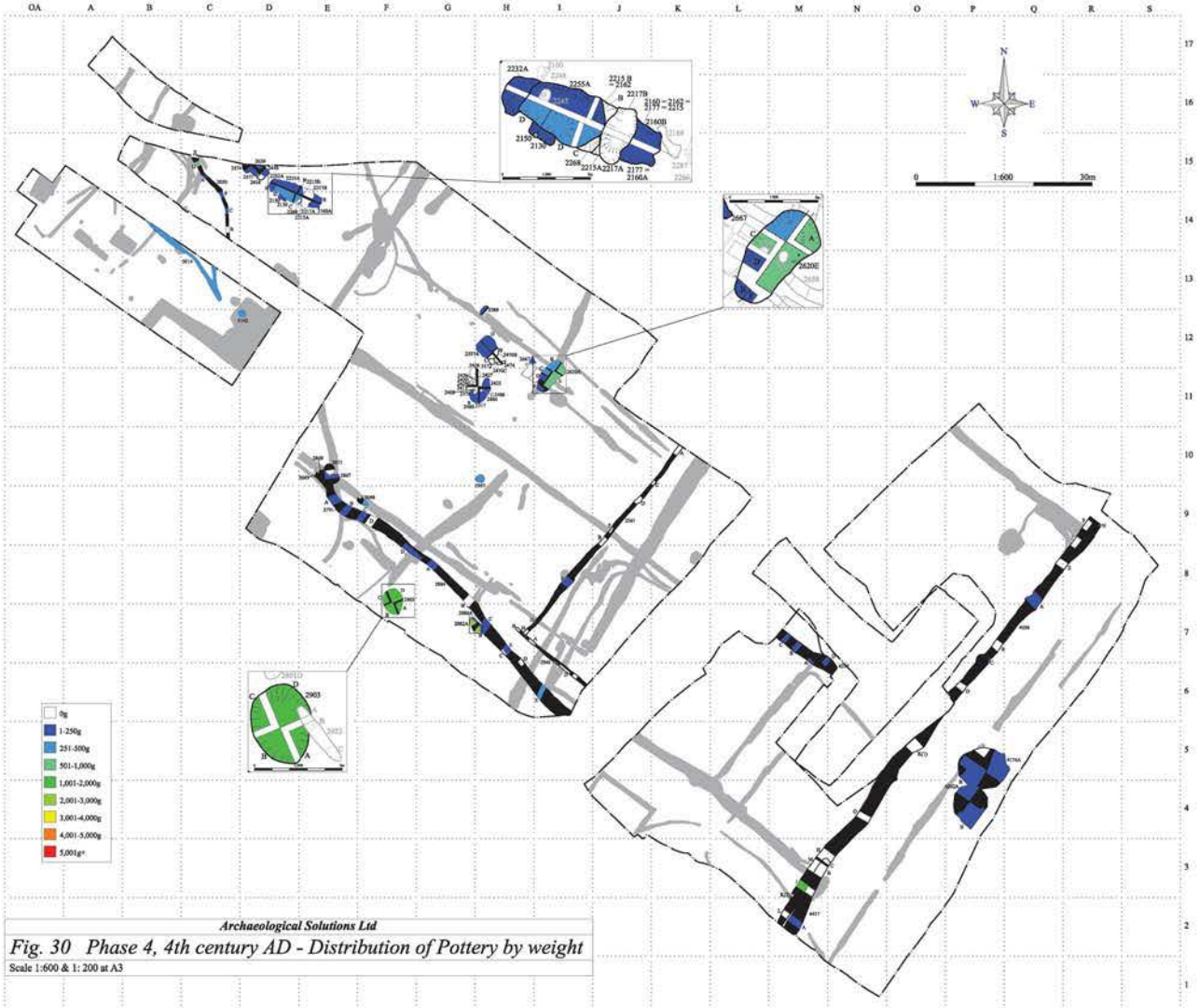
Fig. 28 Phase 2, 3rd century AD - Distribution of Pottery by weight

Scale 1:600 & 1:200 at A3

Archaeological Solutions Ltd

Fig. 29 Phase 3, late 3rd - early 4th century AD - Distribution of Pottery by weight

Scale 1:600 & 1:200 at A3



Archaeological Solutions Ltd

Fig. 30 Phase 4, 4th century AD - Distribution of Pottery by weight

Scale 1:600 & 1: 200 at A3

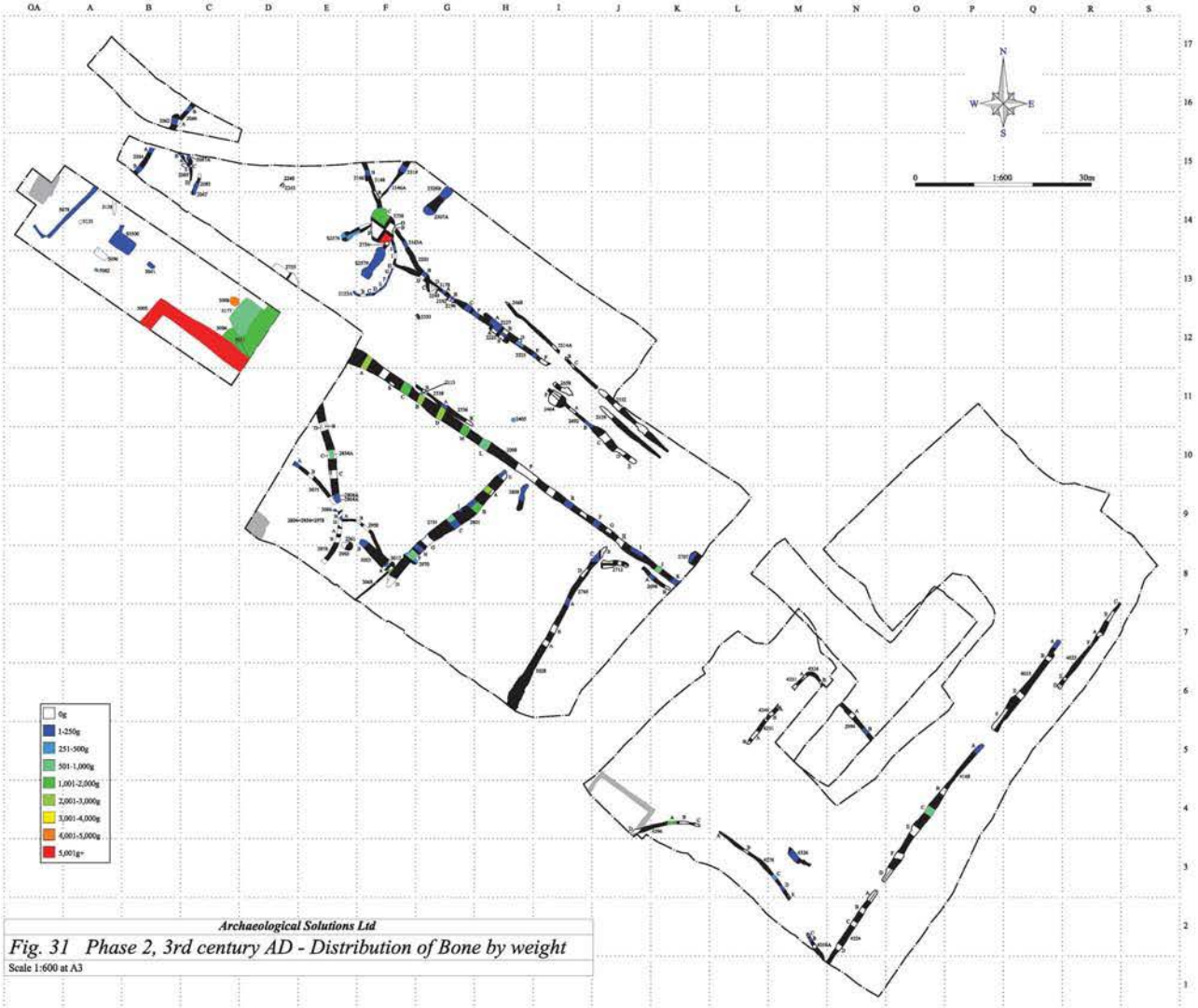


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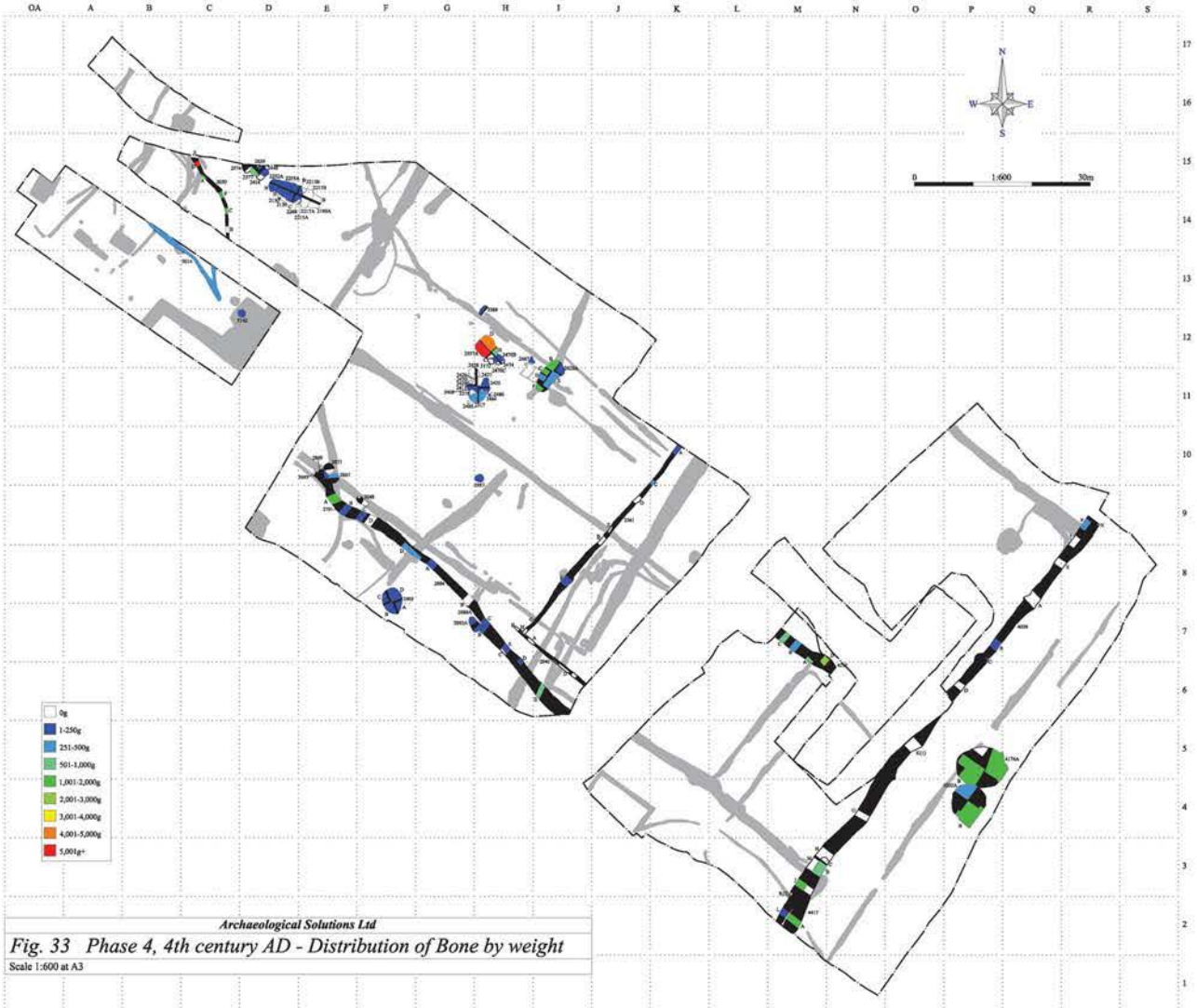
Fig. 31 Phase 2, 3rd century AD - Distribution of Bone by weight

Scale 1:600 at A3

Archaeological Solutions Ltd

Fig. 32 Phase 3, late 3rd - early 4th century AD - Distribution of Bone by weight

Scale 1:600 at A3



Archaeological Solutions Ltd

Fig. 33 Phase 4, 4th century AD - Distribution of Bone by weight

Scale 1:600 at A3

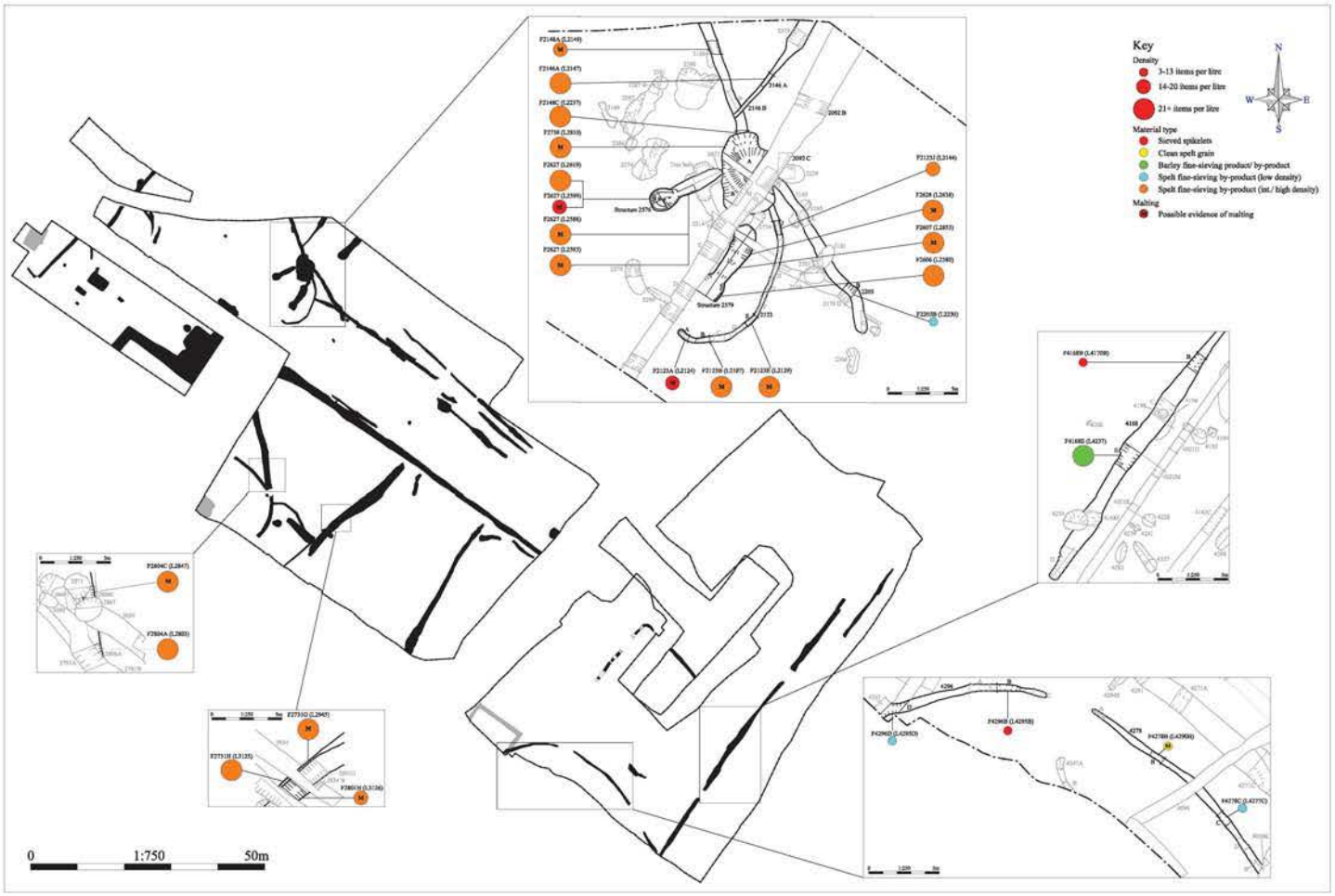


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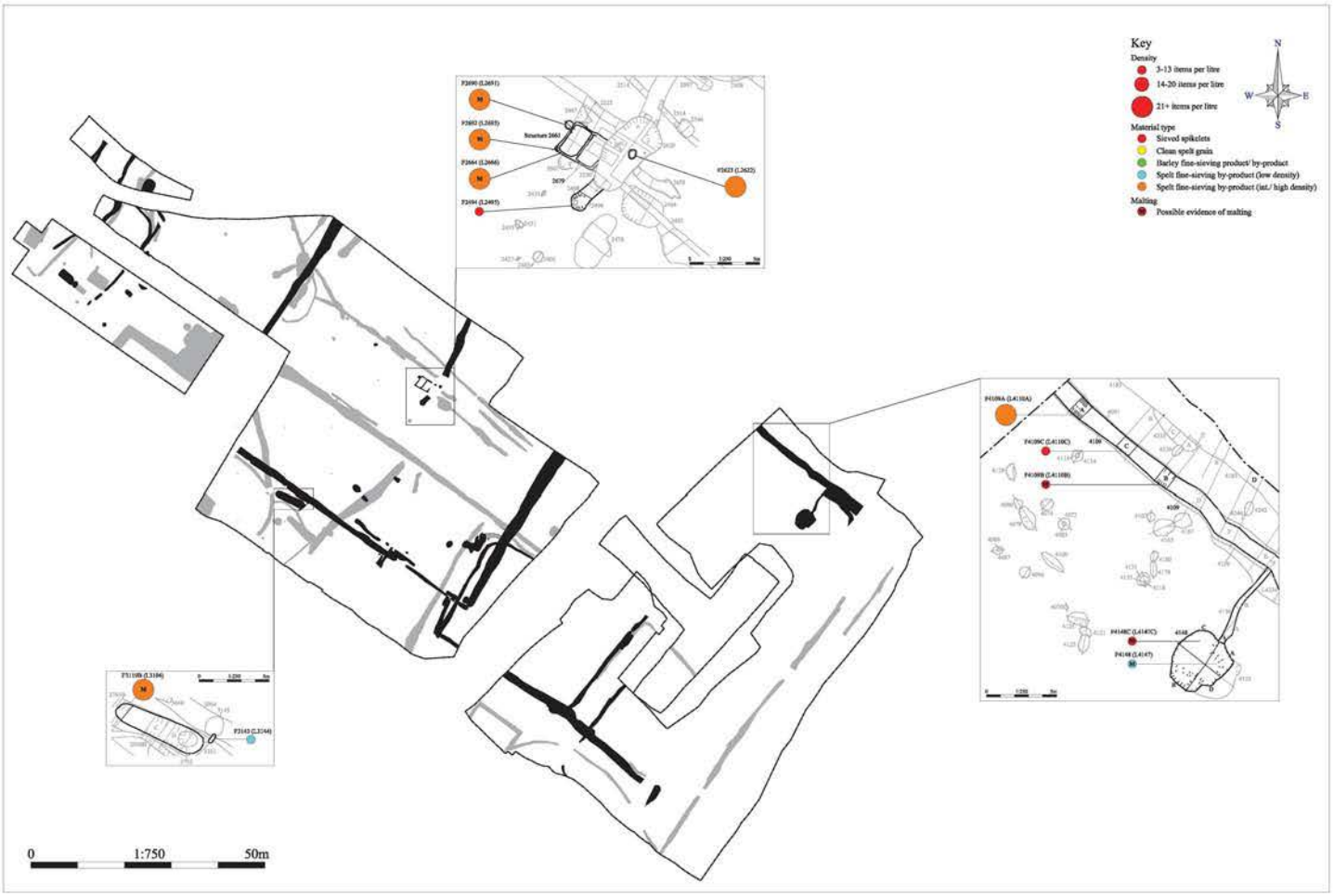
Fig. 34 Phase 2, 3rd century AD - Distribution of charred plant macrofossils

Scale 1:750 and 1:250 at A3



Archaeological Solutions Ltd

Fig. 35 Phase 3, late 3rd - early 4th century AD - Distribution of charred plant macrofossils

Scale 1:750 and 1:250 at A3

Archaeological Solutions Ltd

Fig. 36 Phase 4, 4th century AD - Distribution of charred plant macrofossils

Scale 1:750 and 1:250 at A3

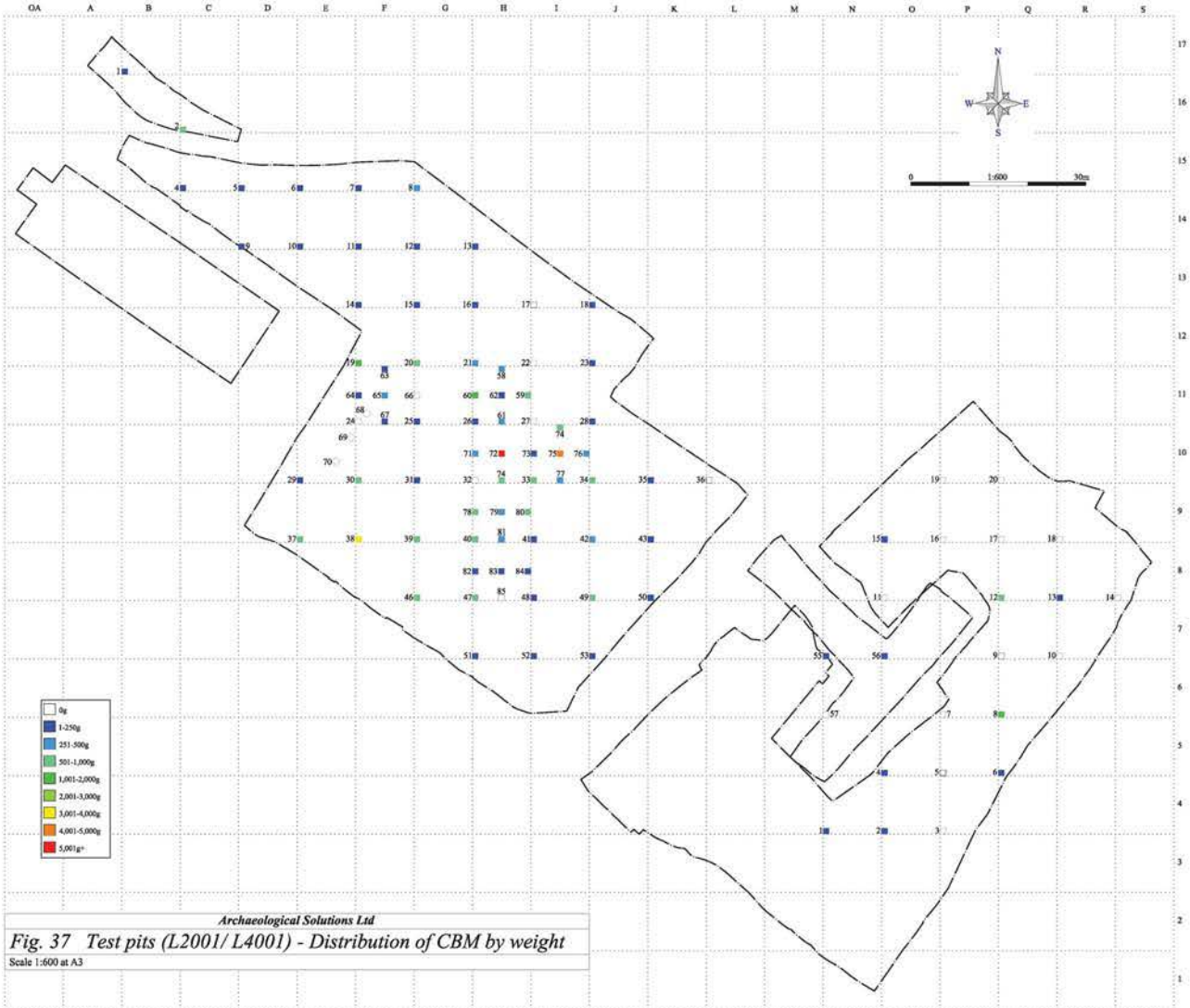


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Fig. 37 Test pits (L2001/ L4001) - Distribution of CBM by weight

Scale 1:600 at A3

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Fig. 38 Test pits (L2001/ L4001) - Distribution of Pottery by weight

Scale 1:600 at A3

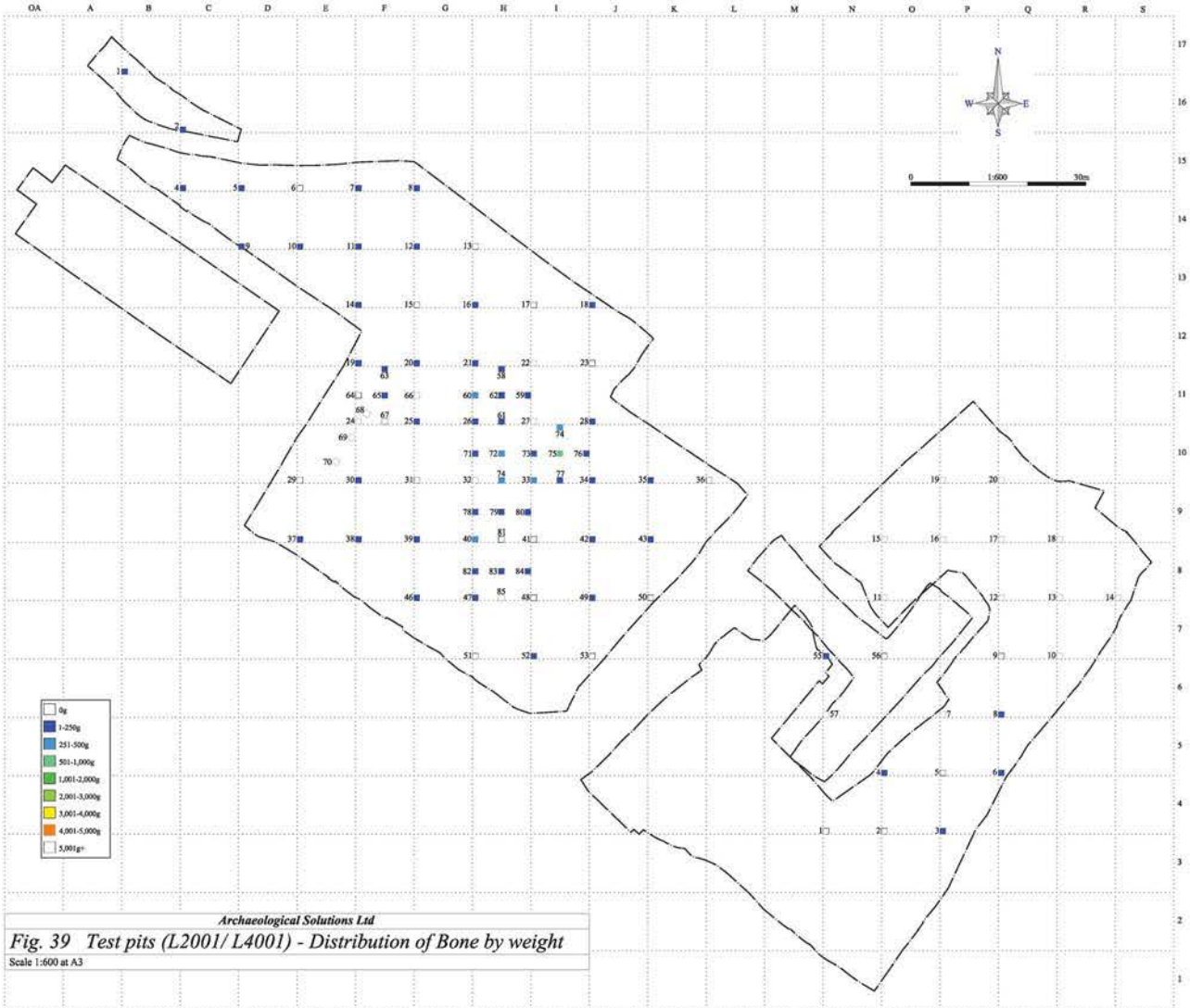

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Fig. 39 Test pits (L2001/ L4001) - Distribution of Bone by weight

Scale 1:600 at A3