Farming at Hill Field, Wilshamstead in the first millennium AD

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with contributions by
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SUMMARY

Excavations by Albion Archaeology in 2007 and 2008 at Hill Field, Wilshamstead, revealed the remains of a low-status late Iron Age to Roman enclosed farmstead. Ceramic evidence indicates that occupation was principally restricted to the 1st and 2nd centuries AD, during which the farmstead had a pastoral basis. With an increase in the number of water-holes, the enclosures remained in use through to the mid-Saxon period, serving perhaps as a temporary camp for shepherds and drovers. One of the water-holes was maintained over a long period before being transformed into a well; this was in use during the 9th to 11th centuries, probably on a seasonal basis.

INTRODUCTION

Gallagher Estates was granted planning permission for the creation of four garden villages at Wixams, near Elstow, Bedfordshire. A programme of archaeological evaluation including fieldwalking, geophysical survey and trial trenching was undertaken in 1999 (RPS Planning and Development 1999) as part of an Environmental Statement (National Power and Gallagher 1999). The evaluation identified several areas of archaeological sensitivity, the main one of which was located at Hill Field (Area 4). As a result of this, Bedfordshire County Council's Archaeological Officer specified a programme of archaeological work that would be required as a condition of planning permission.

An Archaeological Project Strategy and Research Design for the overall project (RPS Planning and Development 2006) provided the basis for the programme of archaeological work. In addition, site-specific Written Schemes of Investigation were prepared by RPS Panning and Development, in association with Albion Archaeology, and were agreed with the County Archaeological Officer. Albion Archaeology was commissioned by RPS Planning and Development on behalf of Gallagher Estates to undertake the work between 2007 and 2008. Only the excavation at Hill Field produced substantial archaeological remains, which form the subject of this report; the remainder are briefly summarised below. The parameters for this report were set out following assessment of the Hill Field remains and production of an Updated Project Design (Albion Archaeology 2009).

Hill Field, located in the north-western part of the parish of Wilshamstead (or Wilstead), is one of the highest points of very gently rolling topography within the Marston Vale (Fig. 1). Its name is shown by the Bedfordshire Historic Environment Record's parish survey to date back to at least 1607. An area of *c*. 1.5ha was excavated there, centred at TL 054438; it was situated just below the top of the hill at a height of 37–41m OD, on land that slopes gently down towards the south-east. The area was arable farmland prior to the excavation.

The geology of the Marston Vale is Lower Oxford Clay overlain by a variable layer of Head Deposits, which manifest themselves as stiff, gravelly clay with thin spreads of flint-gravel at Hill

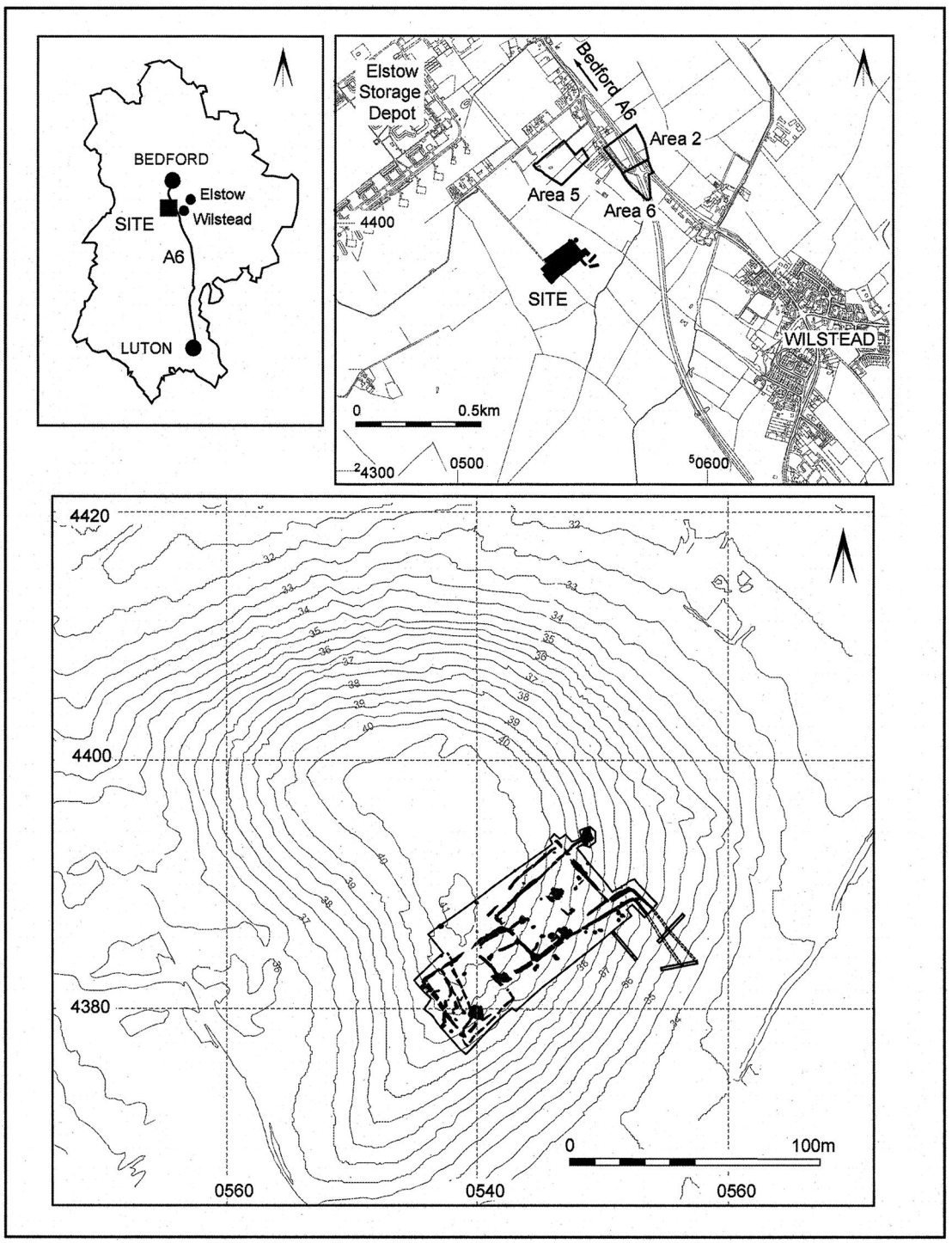

Figure 1: Site location and contour plan

Field. This area of mostly low-lying and poorly drained clay is situated between the gravel terraces of the River Great Ouse to the north, and the Greensand Ridge several kilometres to the south.

Little information was previously known about the area immediately surrounding the site at Hill Field before the geophysical surveying and trial trenching (RPS Planning and Development 1999). The nearest excavated site was at Luton Road, Wilstead, where a late Iron Age to late Roman farmstead was revealed, along with traces of Saxo-Norman settlement (Luke and Preece 2010). Excavations in advance of the Willington to Steppingley gas pipeline identified several other sites on the clay to the west and south of Hill Field, the nearest ones revealing remains that mostly dated to the Iron Age (Network Archaeology in prep.). The Historic Environment Record for this area is dominated by entries for the post-medieval period, with little definite evidence for pre-medieval activity; crop-marks are known just over 1km away to the south (HER 14759) and west (HER 3280), with earthworks to the east (HER 7142), but all these remains are undated. In contrast, the gravel terraces of the Great Ouse to the north have been widely excavated, producing evidence for intense human activity from the early prehistoric period onwards (Dawson 2000b).

As part of the Wixams project, archaeological fieldwork was also undertaken on areas to the north and north-east of Hill Field (Albion Archaeology 2007, Areas 2, 5, 6 and 9). All areas contained the remnants of ridge and furrow earthworks, but other features were only revealed in Areas 2 and 5 (Fig. 1), and were undated in the case of the latter. Area 2 contained a sparse array of six ditches and seven pits, broadly datable to the 2nd–4th centuries AD; they produced 215 sherds (2,465g) of Roman pottery, 456g of animal bone and some iron hobnails. The repeated NE–SW and NW–SE alignments of the ditches suggests that they formed an enclosure system, but the remains were too heavily truncated to verify this, with only one feature more than 0.35m deep.

Structure of the report

Analysis of the contextual data recorded during the course of excavation enabled the site to be broken down into a series of chronological Phases. To assist the discussion of each Phase, the features within it were assigned to Groups, *e.g.* G25. An intermediate level of Land-use area (*e.g.* L4) was used to enhance spatial analysis of the larger dataset for Phase 2. Groups may contain just one feature or a collection of several; in the latter case, the feature numbers recorded on site, *e.g.* [5288], are occasionally used to clarify references to a specific feature within a Group.

The results of the excavations are presented below by Phase, split up by Land-use area in the case of Phase 2. For each Phase, the contextual evidence is presented first, followed by a description of the artefactual and ecofactual assemblages. The site is then discussed as a whole, with broad conclusions presented at the end. Two appendices contain information on the Bedfordshire Ceramic Type Series, and the methodologies used in examining the assemblages of artefacts and ecofacts.

THE EXCAVATION AT HILL FIELD

Although the excavation at Hill Field revealed evidence of human activity in the early Iron Age (Phase 1), significant colonisation of the area did not take place until the end of the Iron Age (Phase 2). Low-level occupation of the farmstead that was established there continued throughout the early and mid-Roman periods, after which the intensity of activity decreased. The site remained in use for livestock throughout the late Roman, Saxon and Saxo-Norman periods (Phases 3–4), during which time a number of pits, water-holes and wells were dug. The presence of ridge and furrow cultivation indicates that Hill Field continued to be used for agricultural purposes in the medieval and post-medieval periods (Phase 5).

The presence of furrows across the site has led to many features' appearing disjointed in plan. For this reason, the truncated features have been reconstructed for figures on which furrows are not shown. Solid lines have been used in the reconstructions where little doubt exists about a feature's original course, whereas dashed lines represent the presumed course of features that were more extensively truncated.

Phase 1: early Iron Age

The only feature that could be dated to the early Iron Age was an oval pit G1 (Fig. 2), which was 1.7m long, 1.1m wide and 0.1m deep. It yielded forty-nine handmade sherds of late Bronze

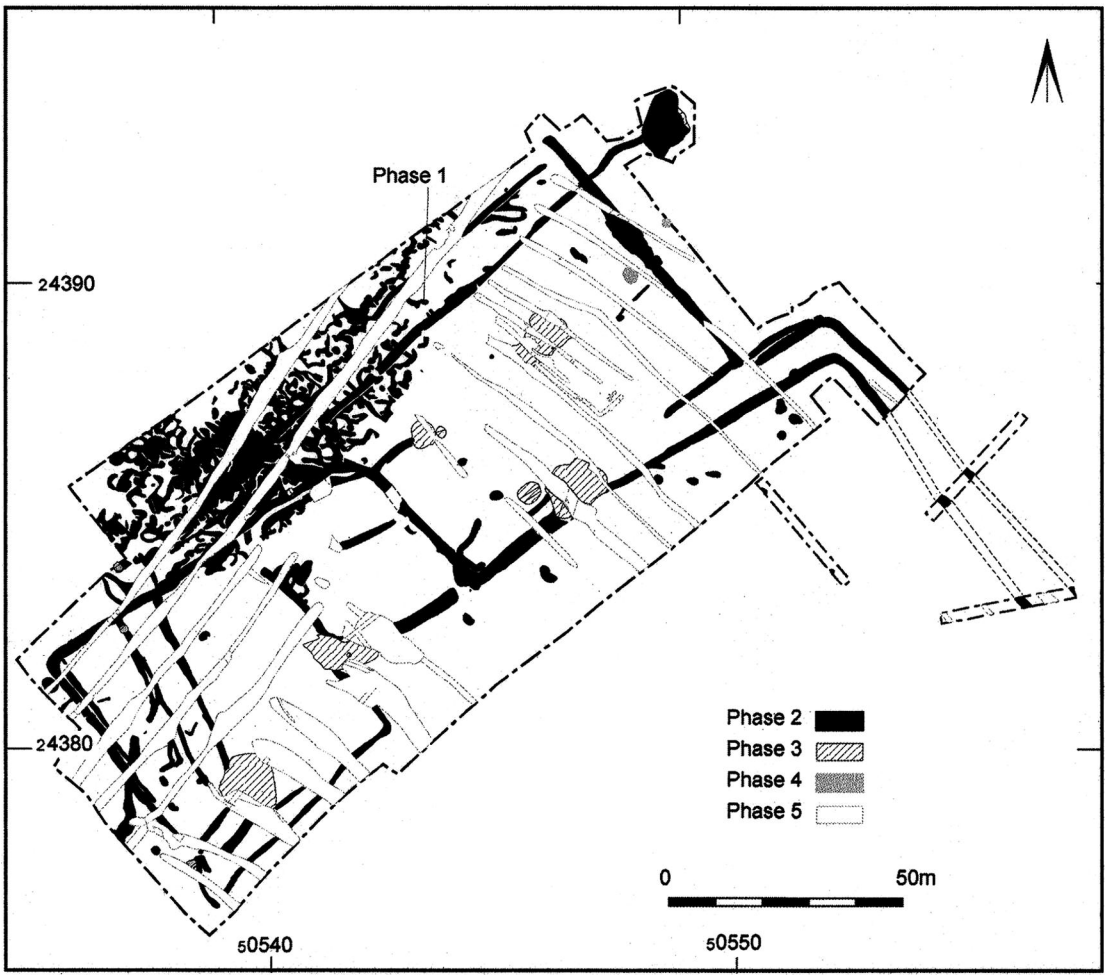

Figure 2: All-features plan

Age/early Iron Age pottery (510g), representing eight vessels in fabric types F01C, F02 and F22 (Appendix 1). Diagnostic elements include a rounded, slightly tapering rim, and a rim with an internal bevel (*cf*. Knight 1984, 21). Decoration comprises fingernail ornament along vessel rims, and fingertip impressions on vessel bodies. The pit also contained a small amount of very fragmented charcoal, and an unidentifiable cereal grain.

Phase 2: late Iron Age to mid-Roman

Most of the excavated ditches and pits relate to a farmstead that was established at Hill Field in the late Iron Age (Fig. 2). The volume of finds recovered and the paucity of structural remains suggest that the farmstead was not intensively occupied, but the artefactual dating evidence does at least indicate that it continued to be occupied until the mid-Roman period.

At its greatest extent, the farmstead comprised three subdivided enclosures with a combined area of 0.75 hectares, the eastern one of which had a long, narrow subsidiary enclosure to the north and a drove-way to the south. However, it is uncertain how many of these were present when the farmstead was first established. The ditches that defined them were, in at least some cases, re-cuts of earlier ones; it is clear that the layout of the enclosures varied slightly over time, but it is unclear whether these alterations represent the redefinition of existing boundaries or the imposition of additional ones. There is also difficulty in determining how

long any of the boundaries remained in use; the continued use of the site through to the Saxo-Norman period suggests that at least the outline of the farmstead survived, but individual boundaries may have fallen out of use at any time before then. Ordinarily, the finds assemblages could be used to help date the changes to the farmstead's layout, but mixing of the deposits has made such dating evidence unreliable — late Iron Age pottery was frequently retrieved alongside Roman artefacts, often in comparable quantities. Although an approximate date range can be given for the lifespan of the farmstead, only the sequence of changes to its layout, not the date of each change, can be given within that period (Fig. 3). Equally, it is hard to determine which of the pits, structural slots and other features associated with this main phase of the farmstead correspond with which part of the sequence, or indeed were contemporary with each other. It is even difficult to be certain that some of these features belonged to this phase, rather than a later one; this problem is discussed below in Phase 3.

Contextual evidence

The following text describes each area of the enclosed farmstead in more detail, while also examining the features that lay primarily beyond its northern and southern limits.

Western enclosure (L2, Fig. 4)

The earliest potential evidence for an enclosure at the western end of the site is G9, a sinuous ditch which continued beyond the limit of excavation. There was a break of 4m in the ditch, to the south of which it was appreciably wider, though only *c*. 0.3m deep. However, the function of this ditch is unclear. The pottery recovered from it was

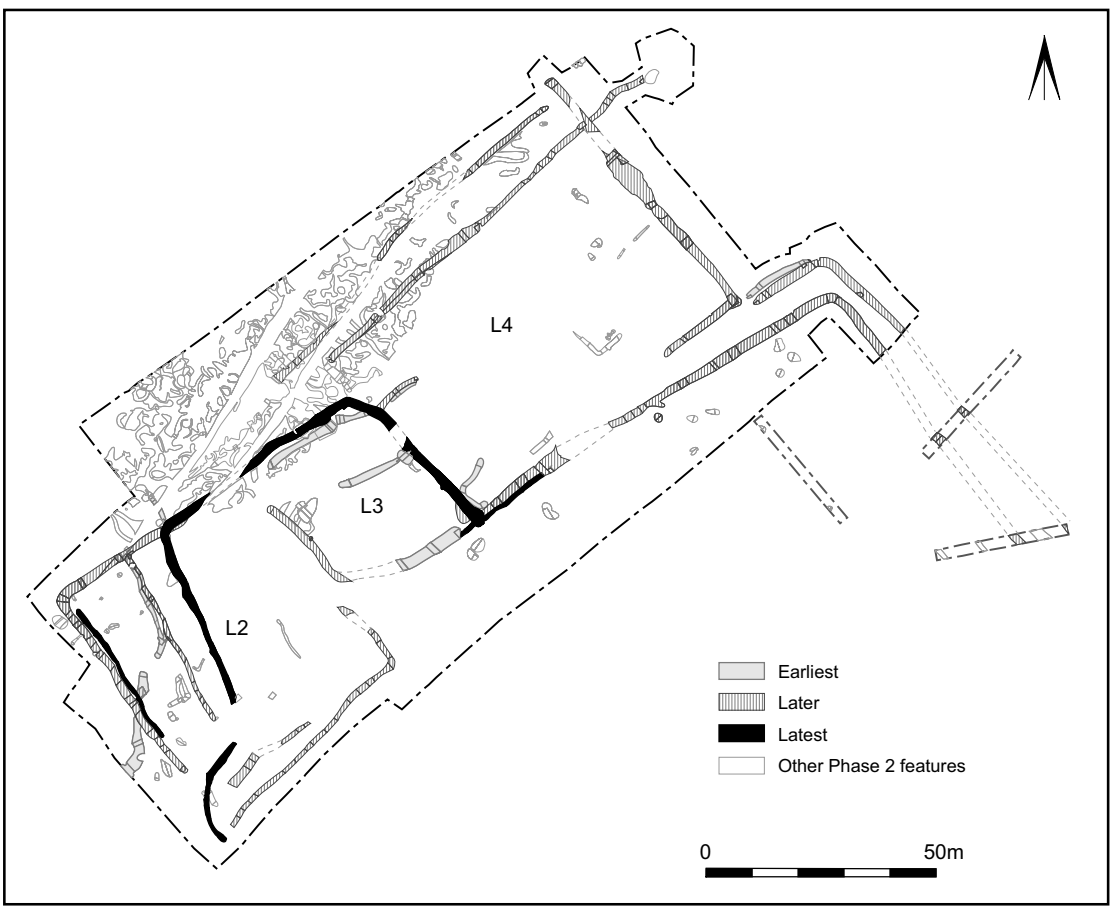

Figure 3: Sequential development of Phase 2 enclosures

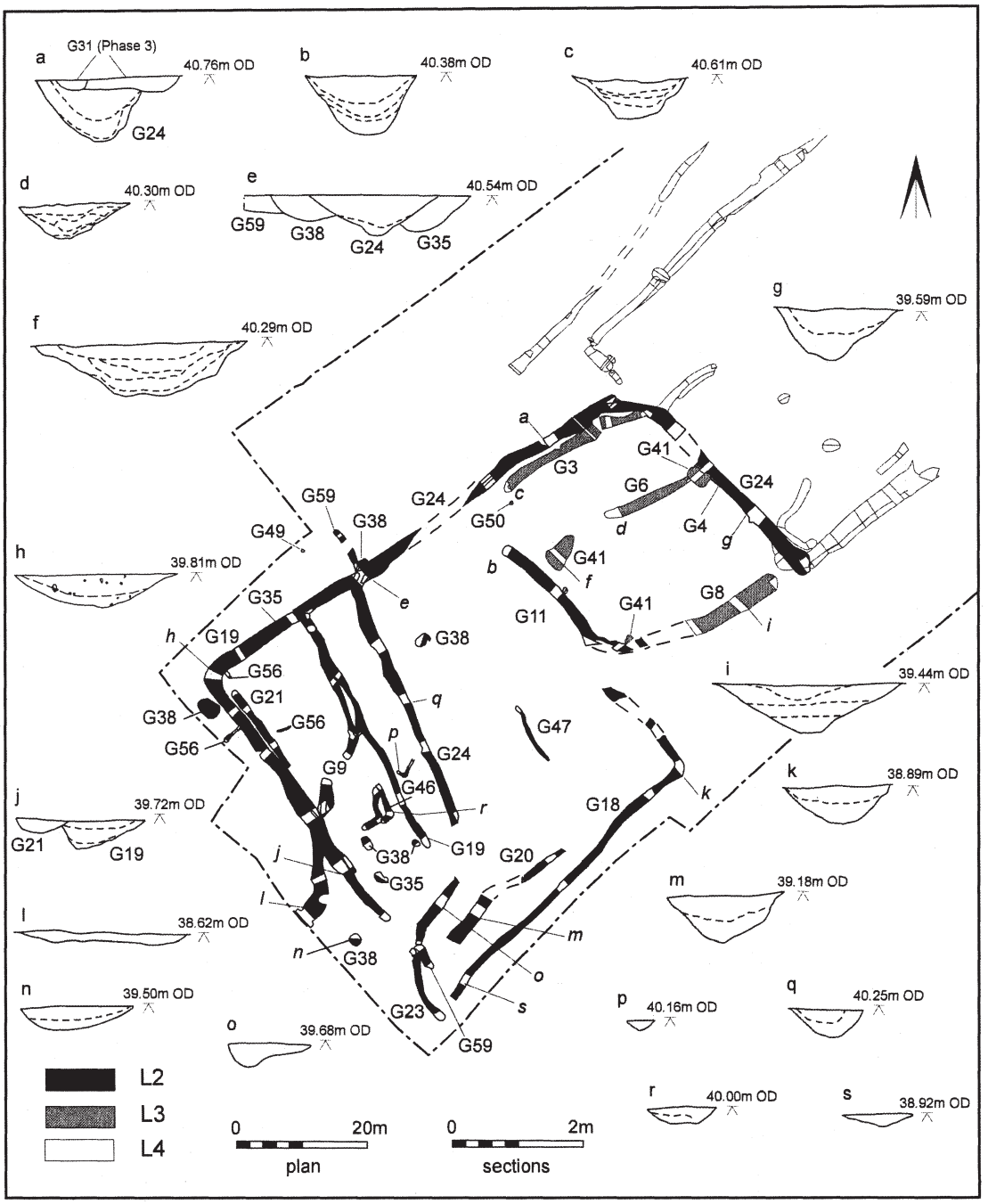

Figure 4: Plan of L2 and L3 (Phase 2)

nearly all late Iron Age/early Roman, suggesting it was earlier than the other ditches within L2 and therefore unconnected with them; this makes its interpretation as an enclosure ditch problematic, as the length of it that was revealed did not enclose anything on its own. It is possible that the ditch was related to other features that lay beyond the site's western limit, but a more likely explanation

is that it was a precursor to ditch G19 (and possibly G11/G18 as well). G19 was a larger ditch, up to 2.5m wide and 0.5m deep, and may have removed all trace of its predecessor — little remained of ditch G14 in the eastern enclosure after it was re-cut by G15 (Fig. 6).

More tangible evidence for a western enclosure is provided by ditches G11, G18 and G19, which formed a roughly square enclosure that was *c*. 55m wide, cutting across the line of the earlier ditch G9. The enclosure's perimeter ditch ranged in width from 1.1m to 2.2m but remained mostly constant in depth at *c*. 0.6m, varying only at the western end of G18 (0.2m) and the northern end of G11 (0.9m). Ditch G19 also subdivided the western end of the enclosure, partitioning off an 11–15m wide area that tapered towards the south. A second subdivision along the southern edge of the enclosure, formed by ditch G20, was less than 4m wide, and is likely to have been an internal funnel for separating off stock. The enclosure had at least two entry or exit points: a *c*. 9m wide opening at the northern corner, which led into the central enclosure L3; and a 15m wide one at the southern corner. A later water-hole on the eastern side of the enclosure may have obscured evidence of a third. The southern opening appears to have been subdivided by a short length of ditch in the middle (G59), forming two separate entry or exit points, each *c*. 5m wide, that would have helped to control stock movement. The northern of the two short ditches represented by G59 may also have been used to help control stock movement; its position suggests that it may have marked the western side of an entrance to the enclosure, evidence for which was subsequently erased by ditch G24.

The western enclosure was subsequently redefined by ditch G24, which also re-cut the northern and eastern sides of the central enclosure L3. This ditch was similar in width to G19 which it re-cut, but was 0.45–1m deep, generally becoming shallower towards the south (Fig. 4, a, e, g and q; Pl. 1). Its eastern terminus was enlarged, possibly to act as a sump. Ditch G23 was also dug at this point, further controlling access through the southern entrance; it may have been a continuation of G24, but truncation by a later water-hole makes the point uncertain.

Consideration of the western enclosure's layout at the time when ditches G23 and G24 were dug is complicated by uncertainty regarding how many of the earlier boundaries and subdivisions were still in use. It is possible, for example, that G11 had silted up by this point, meaning that the western

Plate 1: Ditch G24 and potential sunken-featured building G31, looking south-west. Scale 1m

and central enclosures had merged into one. However, the absence of a new southern boundary ditch suggests either that the earlier ditches were still in use, or that the boundaries continued to be defined by an archaeologically invisible feature such as a hedgerow. It is clear that at least some of the ditches in the western enclosure had silted up by this point, hence the need to re-cut the western boundary; yet the comparatively small size of this re-cut G21 — no more than 1.1m wide and 0.25m deep — and the fact that it only re-cut part of the boundary to the west of G24 suggest that the boundary was principally defined by a hedgerow, with the ditch serving only a drainage function.

The structural features associated with the western enclosure were mostly concentrated in its western half. Three L-shaped features G46 appear to constitute the remains of buildings (Fig. 5), the larger two representing different phases of the same structure. The latter may have held ground beams — the base of each was flat and *c*. 0.4m wide, although the western one may have been too sinuous for this purpose — or alternatively they may have been drainage gullies along two sides of a building. The smallest of the three L-shaped features was only 0.4m wide in total, and its V-shaped profile (unsuited to holding ground beams) suggests a drainage gully as the more likely interpretation. The potential remains of three further structures G56 were excavated near the western corner of the enclosure, the most convincing of which was a 2.2m long slot that was 0.3m wide and 0.1m deep, with two adjacent post-holes. A similar, slightly larger feature to the west and a shorter one to the north were truncated by the enclosure ditch G19. These are unlikely to have been substantial structures, and may have been associated with animal pens. G47 in the eastern half of the enclosure may also have had a structural function, or it may represent the heavily truncated remains of a further subdivision to the enclosure.

The nine Phase 2 pits that were associated with the western enclosure (G35 and G38) varied considerably in size. The smallest was only 0.8m in diameter and 0.2m deep, whereas the largest was 3.4m long, 2.5m wide and 0.5m deep. Although a large amount of animal bone was recovered from the irregularly shaped southern pit in G35, the volume of finds from the others is relatively small, and there are no obvious indications of what any of the pits were used for. Phase 3 water-hole G26 might have had its origins in Phase 2, however; even though it clearly truncated some of the Phase 2 ditches, this may be the result of later expansion.

The other feature associated with the western enclosure in Phase 2 was cremation G49, one of three cremations recorded across the site (the others were in the central and eastern enclosures). The cremated bone was contained within an urn, accompanied by two other ceramic vessels, which had been placed within a pit that was 0.4m in diameter.

Central enclosure (L3, Fig. 4)

The central enclosure was initially defined to the north, east and south by ditches G3, G4 and G8 respectively. It is assumed that the western boundary was also ditched, but that all trace of the original ditch was destroyed when it was re-cut by G11, which also defined the eastern boundary of the western enclosure. The ditches that defined the central enclosure were mostly similar in size to those of the western one, although the southern ditch G8 was larger, measuring 3m wide and 0.75m deep. The enclosure was 28m wide and 33m long overall, though the presence of ditch G6 indicates that it was partitioned. An 8m-wide opening linked the central enclosure to the western one, whilst there was also a narrower opening at its eastern corner.

As stated above, the northern and eastern boundaries of the central enclosure were later redefined by ditch G24; it is possible that the central and western enclosures merged into one, but perhaps more likely that the southern and western boundaries of the central enclosure were defined only by hedges at this point. It is at least clear that the southern ditch G8 had silted up by the time that the northern and eastern boundaries were redefined; the pottery recovered from G8 is nearly all late Iron Age/early Roman in date, whereas the assemblage from G24 includes later Roman material.

Despite the comparatively high amount of finds recovered from the ditches that defined the central enclosure, no structural remains were found within it, although this may simply be the result of plough-truncation. Three pits G41 were located around the inner edge of the enclosure, the southern and eastern ones truncating the original boundary ditches. The southern pit was too heavily truncated by a later water-hole to determine its full extent, but the other two were 3.6–5.5m long, *c*. 2.6m wide and 0.7–0.9m deep. In addition, an

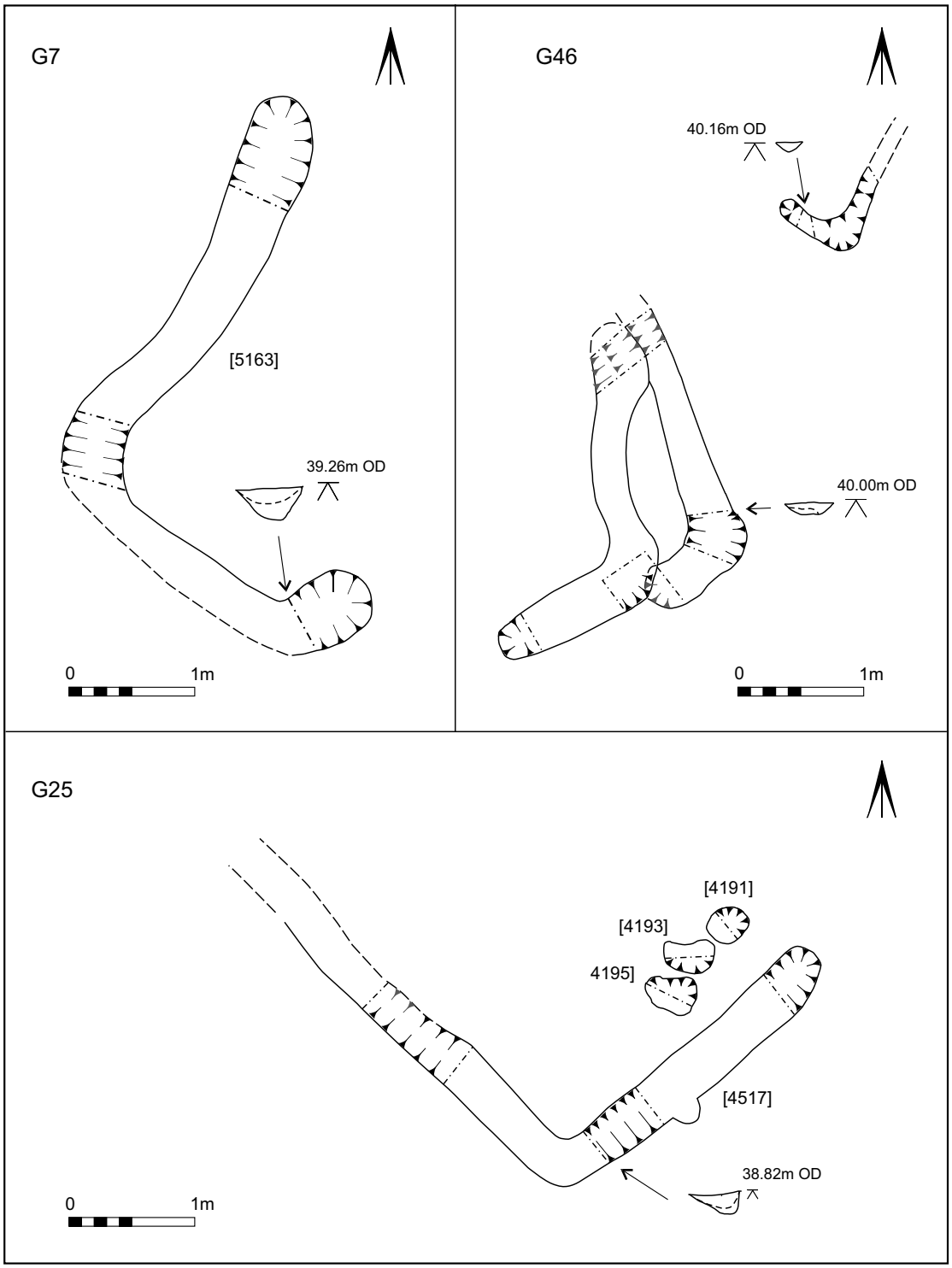

Figure 5: Detailed plans of possible building remains from Phase 2

urned cremation G50 was located in the northern corner of the enclosure; it had been placed alongside a grey ware platter and a rouletted beaker within a pit that was 0.55m in diameter.

Eastern enclosure (L4, Fig. 6)

At its greatest extent, the eastern enclosure was similar in size to the western one, though rectangular rather than square, measuring *c*. 70m by *c*. 45m. However, it is unclear how much of its layout was established at the same time as the initial development of the central and western enclosures. Its western edge G4 was a shared boundary with the original central enclosure L3, and the assemblage of exclusively late Iron Age/early Roman pottery within its fill indicates that G5 was broadly contemporary with it. The only other boundary ditch that can be dated by its pottery assemblage to this initial phase, and then only by a few sherds, is drove-way ditch G10. In view of how mixed the deposits were across the site, with a widespread distribution of late Iron Age/early Roman pottery in deposits of all ages, the dating evidence for G10 is potentially unreliable; this would leave little evidence for activity to the east of the central enclosure when the farmstead was established. However, if the dating evidence for G10 can be believed, then the drove-way was also part of the eastern enclosure's initial layout; furthermore, the spatial relationship between G10 and eastern boundary ditch G15 suggests contemporaneity, or at least that G10 was not the earlier of the two. Although the infill of G15 can confidently be dated to the Roman period, its predecessor G14 could have been established in the late Iron Age; even though 11% (by weight) of its pottery assemblage is Roman, this came mostly from its upper fill, and could partly result from a mixing of deposits after the ditch was re-cut. It seems more likely, therefore, that the layout of L4 was largely established in the early stages of the farmstead, its form almost entirely unchanged by the subsequent cleaning out and re-cutting of its ditches.

Little survived of the original ditch G14 that defined the enclosure; its re-cut G15 appears to have followed its predecessor very closely, removing all trace of it except for a short stretch along the northern side of the enclosure. G15 was 0.35–0.55m deep and mostly *c*. 1.1m wide, although its width increased to as much as 2.3m to the east, where its upper edge splayed out due to erosion on either side. It is unknown how far west G15 continued along the southern edge of the enclosure: the apparent terminus in fact marks the point where the ditch became completely truncated by ploughing, although it is possible that G55 represents a continuation of it. Some of the southern boundary and perhaps the western boundary as well — re-cutting by G24 (L2) obscures this point — may have been defined instead by G13, which was 1.7–2.5m wide and 0.3–0.6m deep. Part of the ditch was re-cut by G22, which was much smaller. The north-eastward continuation of G15 beyond the northern corner of the enclosure is likely to have been for drainage, leading towards water-hole G60.

Both the drove-way to the south, defined by ditches G13 and G15/G17, and the subsidiary enclosure to the north, defined by G15 and G16, ranged from *c*. 3m wide at their narrowest up to 8.5m. G16 and G17 were both similar in size to their partners, although G10, the predecessor to G17, was smaller than its replacement. The drove-way led from the interior of the enclosure down the hill (Fig. 1), while there was also a narrow opening in the drove-way by the eastern corner of the enclosure, perhaps used for stock-sorting purposes. The corner of the ditch had splayed out in this entrance, perhaps due to erosion caused by the repeated passage of people and animals, prompting the insertion of a rough cobbled surface that had partially slumped into the ditch. The subsidiary enclosure ran along the northern edge of the main one, with a 3m-wide entrance at its eastern end and a wider one to the west, the location of which corresponded approximately with the entrance to the main enclosure.

The western side of the enclosure was partially partitioned by ditch G5, which was re-cut by G12. This subdivision may have been defined further by an archaeologically invisible boundary such as a hedgerow or hurdles. The Phase 2 pits that were associated with the eastern enclosure were mostly located along its margins, and it is possible that the two pits in G42 were on the line of a boundary of which there is otherwise no trace. The function of G7 within this partitioned area is uncertain, although its shape in plan suggests a structural association (Fig. 5); at 0.7–1.3m wide and *c*. 0.5m deep, it seems too large to have been designed to hold either posts or ground beams, yet it may have acted as a rainwater gully around a small building.

Further evidence for structural remains comes from the eastern half of the enclosure (Fig. 5). The unusual profile of G25, with its vertical inner edge (Fig. 6, i), suggests it may have held ground beams; if this were so, then the building would

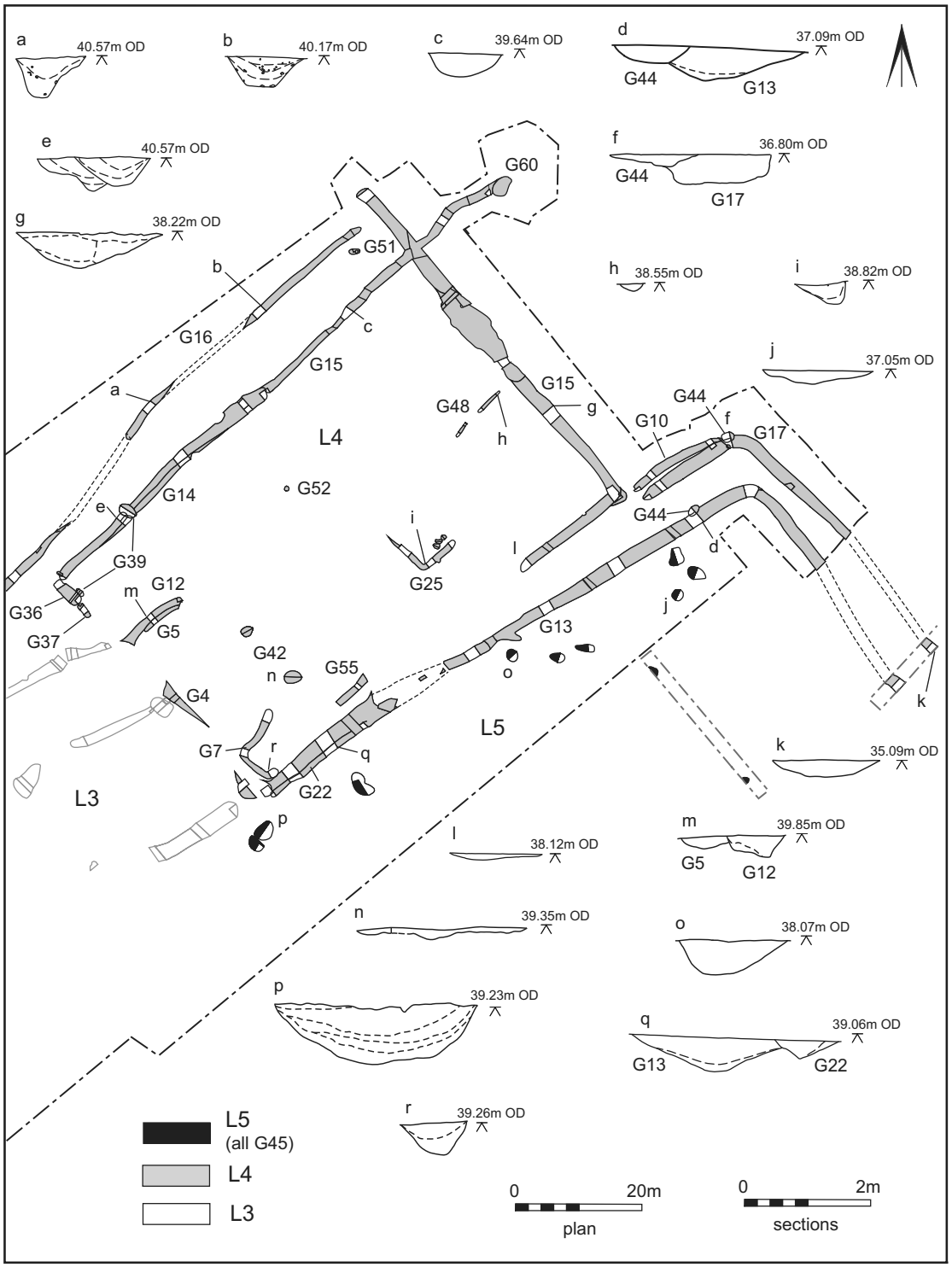

Figure 6: Plan of L4 and L5 (Phase 2)

have been approximately 6.5m by 7.5m in size. No evidence survived for how the other sides of the putative building were constructed. The three features recorded within the area of the building were all less than 0.1m deep; they may have been pits or possibly post-holes, yet the irregularity of at least one of them suggests their origin lay in bioturbation. Two further probable beam slots G48 were recorded to the north of G25; they were 2.8–4.7m long, 0.4m wide and 0.1m deep and were 2.4m apart.

Stratigraphic evidence indicates that at least half of the pits associated with the eastern enclosure were created towards the end of Phase 2. Four of these (G44) were dug through the partially infilled ditches of the drove-way, whilst two more (G39) were dug into the northern enclosure ditch. The other pits included two (G42) that were 1.6–2.7m long, 1.5–1.9m wide and 0.2m deep, and three elongated pits (G36 and G37) in the entrance to the enclosure. G36 was the largest of these, measuring 4.95m long, 1.95m wide and 0.65m deep, whereas the two pits in G37 were only 0.3m deep. The presence of G36 and the southern pit in G37 narrowed the entrance into the enclosure considerably; exactly how narrow it became depends on whether the pits were contemporary with the re-cut of the central enclosure (G24) or not. No specific function was apparent for any of these pits, but the presence of a dog skeleton and part of a glass bowl in G36 hint at a ritual deposit.

Three further pits were associated with the eastern enclosure: G52 near its centre; G51 in the subsidiary enclosure; and G60 just to the east of the main enclosure. G52 was less than 0.1m deep, but contained a concentration of charcoal and burnt clay that derived from a feature such as a hearth. It is unclear whether the material was *in situ* or had been backfilled into the pit from another feature nearby. Pit G51 was unremarkable in itself, measuring 1.7m long, 0.8m wide and 0.17m deep, but contained an urned cremation accompanied by a grey ware jar. The precise extent of water-hole G60 was difficult to determine due to re-cutting in Phases 3 and 4, but it was 0.7m deep.

Southern pits (L5, Fig. 6)

Eleven pits G45 were identified to the south of the eastern enclosure L4, two of them in a trial trench beyond the main excavation area. They were 1.1–2.3m wide, 1.8–4.4m wide and mostly 0.2–0.3m deep, although the two largest were deeper (Fig. 6, p). The pits are likely to have been associated with the activities that took place within the eastern enclosure (or possibly the central enclosure L3 in the case of the westernmost two), although there is no positive evidence for what functions they served.

Northern pits and features of natural origin (L6, Fig. 7)

Six pits were located near the northern edge of the excavated area, three at the western end (G40) and three at the eastern end (G43). The two northern ones in G40 were the largest, measuring 2.5–3.6m long, 1.5–2.9m wide and 0.6–0.95m deep, whereas the other four were much smaller. The function of these pits is uncertain, although the slightly irregular form of the two largest ones in G40 may denote that they were quarry pits.

A range of features thought to be natural in origin were revealed. They can be split into two groups: tree-throws G54, or possibly just areas of ground that had been disturbed by root action; and a spread of features G1 across the northern part of the site whose interpretation is more problematic. The possible tree-throws were spread widely across the site, but at a low density. Neither their shape in plan nor their profile were characteristic of those traditionally associated with tree-throws, and in most cases they are more likely to have been formed by small trees or bushes growing along the edges of the enclosures, than by large trees. Where stratigraphic relationships existed, these features appeared earlier than the ditches by which they were cut; however, this could be a result of the ditches' having been cleaned out or re-cut, rather than an indication of clearance prior to the establishment of the farmstead.

The origin of the features in G1 is more obscure, although it is at least clear that they predated the creation of the farmstead. Their inclusion in Phase 2 is based on the likely date of their infill, which the artefactual assemblage recovered from them suggests accumulated during the earlier part of Phase 2. It is thought to be significant that they were located almost exclusively in the area of gravelly clay along the northern side of the excavated area, rather than in the less mixed clay to the south.

The features comprised gravel lenses surrounded by darker and fine-grained sediment, forming an irregular, polygonal pattern (Pl. 2). Similar patterns can occur when cracks in permanently frozen ground become infilled with sands and silts, producing ice-wedge polygons (Lowe and Walker 1997, 102–5). However, excavation

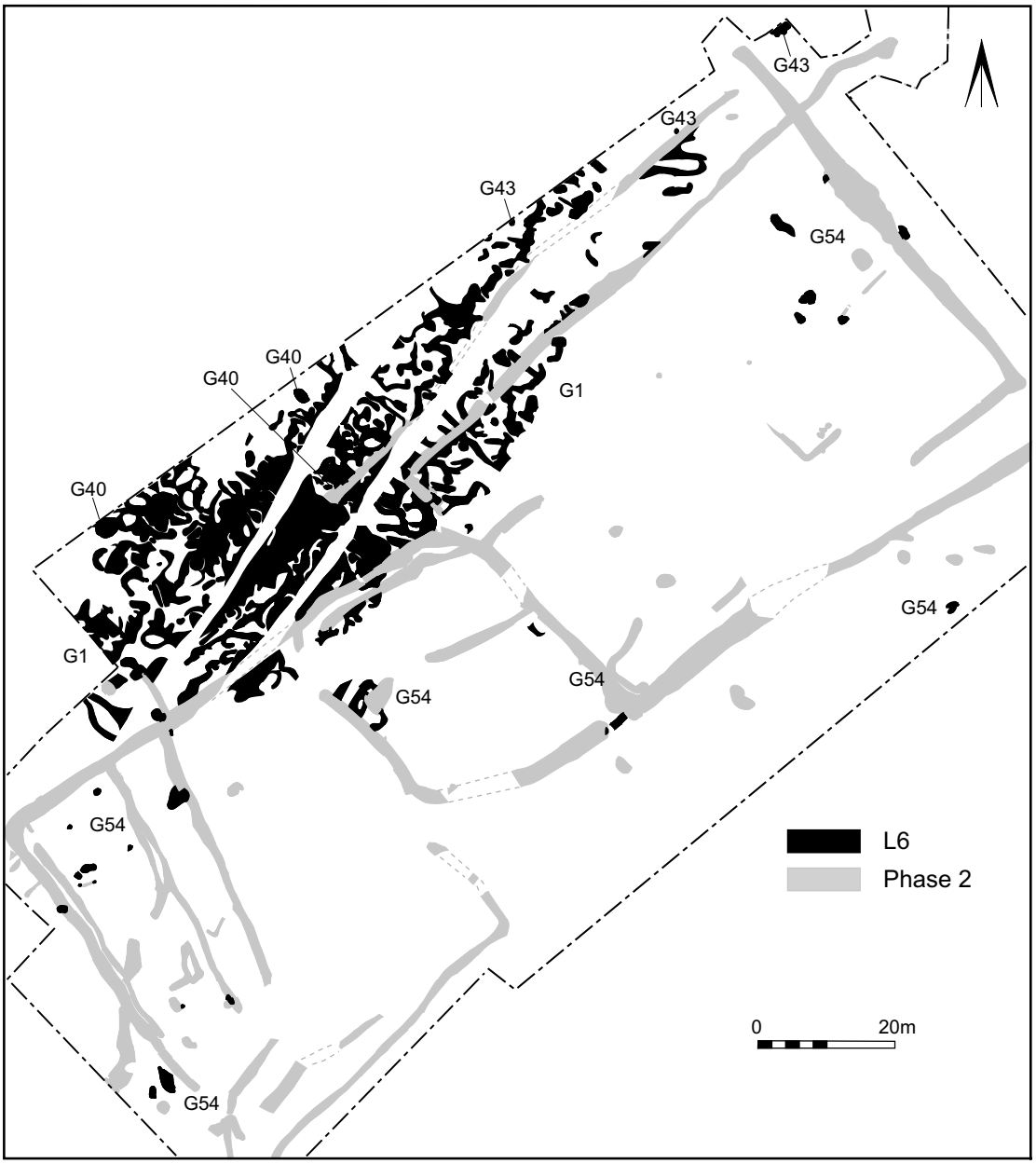

Figure 7: Plan of L6 (Phase 2)

demonstrated that the darker, fine-grained rings round the core of denser clay and/or gravel contained artefacts, including large, relatively unabraded pieces of pottery. Below the darker surface sediment, the infill of the features was difficult to differentiate from the sediment through which they cut, except that it was more weathered; it also tended to be paler in colour and contained either no pottery, or only small, abraded sherds, as did the fills excavated further away from the enclosures. The features varied considerably in depth and profile; some were less than 0.1m deep, others more than 0.5m, whilst their bases varied between flat, rounded and irregular.

Evidence for freeze-thaw activity at Hill Field is demonstrated in the contorted flares of gravel

Plate 2: Aerial view of geoarchaeological features G1, north-west of ditch G24

penetrating into the underlying clay in several exposures across the site, suggesting that these patches of gravel probably predate the last cold stage, when cryoturbation deformed the surface sediments. The evidence for cryoturbation suggests that other forms of freeze-thaw activity are likely to have occurred, and supports the interpretation of G1 as ice-wedge polygons. The elongation of the features downslope is also a characteristic of ice-wedge polygons, which tend to be more circular on level ground and elongated downslope as a result of slope processes. The bases of the gullies were not pointed as might be expected with ice-wedge features, yet this may be due to the clayey sediment in which they formed, which is likely to have different properties to silts and sands.

Although the features in G1 are almost certainly geological in origin, some may subsequently have been enhanced by quarrying. Large cobbles were frequently found across the site, presumably used for surfaces and hearth stone; the geology on the rest of the site was clay, and these exposed pockets of gravel and cobbles may gave been regarded as an important resource. The explanation behind the presence of significant numbers of artefacts in them, however, is less apparent. The ground surface in the late Iron Age is unlikely to have been level (unless ploughed flat prior to the establishment of the farmstead), and slight hollows may have characterised the gullies of the polygons. These hollows may then have been filled by upcast material from digging and cleaning out ditches nearby, perhaps in a deliberate attempt to level the ground surface; the greatest recovery of finds from these features was in the vicinity of the ditches. Bioturbation may also have contributed to the translocation of cultural material down into the features; the presence of larger sherds in the upper fills is difficult to account for by this method, but the small sherds found in the lower fills may have been transported there in this way. However, there is little direct evidence to indicate the growth of trees along the northern side of the farmstead, although the presence of hedges along the ditched boundaries is likely.

Non-ceramic artefacts
Holly Duncan, Hilary Cool (vessel glass) and Peter Guest (coins)

The assemblage recovered from Phase 2 deposits is not numerous; all items are incomplete, and, as with all phases, much of the metalwork is in poor condition. The assemblage is discussed below by the area of the farmstead from which the items were recovered.

The finds from the western enclosure L2 comprise a loop-headed spike, a possible whetstone of

fine-grained sandstone, and a penannular earring of Allason Jones type 1. This earring type has a long history, with examples known from the Bronze Age into the Roman period (Allason Jones 1989, 2–3). The central enclosure L3 produced a fragmentary strip of iron and the remains of a possible bracelet or armlet. The latter item survives in very poor condition, but appears to have been at least partially straightened prior to deposition. The D-shaped cross-section of the strip is suggestive of either a bracelet or armlet; no decoration nor terminals survive. In addition, a body sherd from a prismatic bottle, a very common form in the late 1st to the early 3rd centuries, and three nails were recovered from ditch G24. One nail survives only as a portion of shank, but two conform to Manning's type 1B general purpose nails with flat rectangular heads (Manning 1985, 134).

Eastern enclosure L4 yielded a slightly larger assemblage of artefacts, but the quantity and range is still limited. They were mostly recovered from pits or from subdivisions within the enclosure. The enclosure ditch itself produced just a small fragment of a nail shank, although its possible continuation G55 did contain what has tentatively been identified as a semi-cylindrical spring cover, with open back but closed ends, from a brooch. In addition, drove-way ditch G17 contained part of the bow and start of the head coil of a silver La Tene III or Knotenfibeln variant brooch (RA433), probably dating to the 1st century AD. The use of silver in brooches is comparatively rare when compared to copper alloy, and this would suggest the owner was of some status. Hattatt (1987, 26) has noted that amongst the Knotenfibeln, there are a surprising number of finely made silver examples.

Part of the worn grinding surface of a Hertfordshire Puddingstone quern was recovered from gully G7 in the interior of the eastern enclosure. Although not enough of the quern survives to determine if it formed part of the upper or lower stone, it is likely to have been of bun-shaped form. Hertfordshire Puddingstone quern production is thought to have started early in the 1st century AD (King 1986, 71), and current evidence suggests that production may have ceased by the mid-2nd century (Buckley and Major 1983, 76). The same feature also yielded a fragment of iron, the convex cross-section of which may indicate it derived from a ferrule or perhaps a socketed tool, as well as part of a prismatic bottle, as did probable structural gully G25. The fragment from the latter (RA442) retains part of the basal pattern. The tip of the pointed moulding preserved seems most likely to have come from a square moulding made of four concave sides, with the corners forming points. These are normally combined with other moulded patterns, as can be seen on those from Sheepen (Harden 1947, 306 no. 98f, pl. LXXXVIII) and Wroxeter (Cool 2000, 176 no. 529, fig. 4.43). The other alternative is that it came from a base with intersecting arcs of a circle forming petals in a flower design. This type of pattern, though, is normally framed by a circular moulding which the tips of the petals touch, as can be seen on several from Corbridge (Charlesworth 1959, fig. 9). In the former type of pattern, there is normally free space beyond the points, as on the fragment from this site, making that pattern more likely.

Other artefacts from the eastern enclosure include a small circular mount (RA410) with integral rivets, and two circular notches on opposing edges, forming a pelta-like shape. This mount bears some similarities to later 2nd- and 3rd-century military harness mounts, although it has a smaller diameter (Taylor 1978, 240–42).

Sixteen sherds of glass recovered from pit G36 in the entrance to the eastern enclosure are from the upper part of a large shallow bowl (RA440), which is an uncommon form in several respects. This example has obvious similarities with the shallow form of the tubular-rimmed bowl (Price and Cottam 1998, 77), but differs from that in having a fire-rounded rim edge. Shallow bowls with fire-rounded rim edges are not common from Roman Britain, and also tend to have sloping sides (see Cool and Price 1995, 103), unlike the vertical sides of this vessel. The shape appears to be a 1st-century form, and one that was going out of use during the latter part of that period; the deeper form was preferred on sites of the final third of the 1st century and into the middle of the 2nd century. Shallow tubular-rimmed bowls tend only to occur on sites occupied in the middle third of the 1st century in Britain. Finishing a rim by fire-rounding, however, is a technique that came to prominence in the later 2nd century; it did occur in the 1st century, but other techniques were often preferred. On balance, a 1st-century AD date for the manufacture of the vessel, and possibly one in the middle of the century, seems most likely. It is possible that the bowl represents an instance of structured deposition; the amount of the vessel present (*c.* 10%) is much larger than is normally found in a domestic context, whilst the fragments retain a fracturing

pattern that may have been the result of a deliberate blow. Even though the farmstead's inhabitants would probably not have seen enough glass vessels to have known that the fire-rounded rim was unusual, the vessel's presence is at least a little out of the ordinary for a low status Bedfordshire farmstead, as is that of the silver brooch.

Pits L5 to the south of enclosure L4 produced a flat, square-headed nail and a coin. The latter unfortunately survives in poor condition, and can only be dated to the 1st–2nd centuries. To the north of the enclosures, a number of features of natural origin (G1, L6) produced a very mixed assemblage, including a possible stylised snake bracelet (RA449) of 2nd- to 3rd-century date, as well as a presumably intrusive post-medieval crotal or rumbler bell and lead fishing weight.

Catalogue of illustrated items (Fig. 8)

RA442: Bottle. Glass. Base fragment from a prismatic bottle. No original edges, but retains small portion of moulded base pattern-tip of a pointed moulding. Dimensions 25mm by 18mm, thickness 8mm. G25; L2

RA410: Strap mount. Copper alloy. Poorly preserved, domed mount of circular plan with two oval notches cut out along the circumference, creating a 'pelta-like' shape. Two integral rivets on the reverse, bent over to clasp the strap or cloth. White metal plating? Diameter *c*. 15mm. G12; L4

RA433: Brooch. Silver. Incomplete, part of bow and start of head coil remaining, no foot or catch plate. Bow is of diamond- or lozenge-shaped section, with hemispherical 'button' with

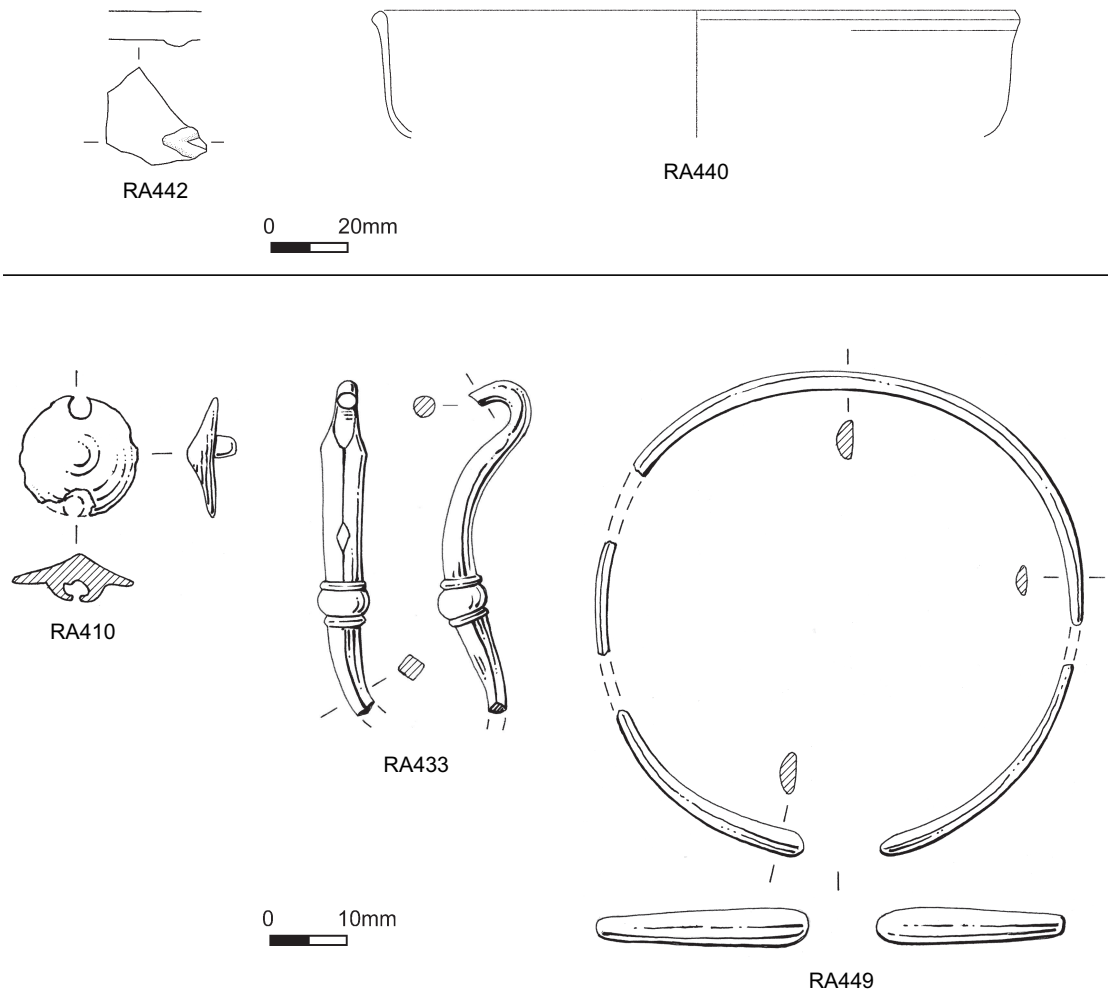

Figure 8: Selected non-ceramic artefacts from Phase 2 deposits

small neat cordon above and below. The bow widens towards the head, and thins towards where the foot would have been. The lower bow is broken and twisted out of alignment. This example has a more gentle curve approaching the head than normally seen on a Knotenfibeln. Length 44.3mm; width of bow 6mm; thickness 3.7mm. G17; L4

RA440: Shallow Bowl. Glass. Translucent blue/green glass. Three rim and thirteen body fragments, many joining in four groups. Vertical rim, edge fire-rounded with external thickening, straight side with rounded carination to lower body. Fracture pattern radiates out from blow to the carination. Lower body and base missing and thinning to either side. This could be the central part of the base but equally the features are consistent with it being a wall fragment from a small prismatic bottle. Rim diameter 170mm, wall thickness 2mm, present height 34mm. About 22% of circumference extant. G36; L4

RA449: Bracelet. Copper alloy. Stylised snake bracelet. The terminals expand in width and thickness; the hoop is D-shaped in section and narrows in width on the sides of the bracelet. Oval in plan. Surfaces and terminals may be decorated but the poor state of preservation precludes certainty. In four joining pieces. External dimensions *c*. 65mm by 54mm. Hoop varies in width from 5.3mm at the 'back' of the bracelet, to 3mm on the sides and 5.3mm on the expanded terminals; thickness varies from 2.8mm at the back of the bracelet, to 2mm on the sides and 2.6mm on the terminals. G1; L6

Pottery

Jackie Wells and Felicity Wild (samian)

Features assigned to Phase 2 yielded 4,285 sherds (50.6kg), representing 1,983 vessels and constituting 69% (by sherd count) of the total ceramic assemblage (Table 1). Although the degree of fragmentation is high, indicated by a low average sherd weight of 12g, a proportion of the late Iron Age and Romano-British vessels are represented by more than single sherds, and a number of full vessel profiles can be reconstructed. This suggests that, despite the evident mixing of deposits that was widespread across the site, much of this material occurred in or near its primary context, close to areas where the pottery was used. Both late Iron Age and Roman pottery survives in a similar condition, and their consistent association in features across the site attests the longevity of the Iron Age tradition. This is consistent with the established local pattern, where the use of late'Belgic' Iron Age wares is known, in some instances, to have extended into the early 2nd century (*cf*. Stagsden, Dawson 2000a; Biddenham Loop, Luke 2008; and Marsh Leys Farm, Luke and Preece in prep.).

Late Iron Age

The assemblage is characterised by the prevalence of late Iron Age 'Belgic' pottery forms, the appearance of which in the south-east Midlands is conventionally dated to *c*. 50 BC, although the adoption of the tradition may not have become widespread until *c*. 40–50 years later (Hill 2002). Diagnostic vessel forms constitute 27% of the pottery and are dominated by jars of varying sizes, 120–260mm in diameter, which include bead rim (type C1-1 (Fig. 9, P1), C1-4; after Thompson 1982), cordoned (type B3), everted rim (types B1-1, C2-3), lid-seated jars (types C5-1, C5-2), and large 'storage' vessels (type C6-1). Other forms are wide-mouthed bowls (type D1-4), plain or cordoned lid-seated bowls (types D3-3 and D3-4), butt beakers (types G5-1 (Fig. 9, P4), G5-6), lids (types L1, L2, L4, L6), pedestal urns (type A1), and single examples of a platter (type G1), carinated wide-mouthed cup (type E1-2; Fig. 9, P3) and strainer (type S1). Decorative elements are linear and random combing, fingernail and fingertip impressions, and burnishing. Six vessels have been modified by the drilling of post-firing holes in base and body sherds (for example Fig. 9, P5), and a number of shelly vessels are heavily sooted or have internal sooty residues, indicating their use as cooking pots.

The range of jar and bowl forms, coupled with a paucity of specialised tablewares such as cups, beakers and platters, broadly reflects the composition of contemporary assemblages in the Great Ouse Valley, such as Biddenham (Wells 2008), Great Barford (Webley 2007) and Stagsden (Slowikowski 2000). This may suggest the adoption of only a limited range of 'Belgic' vessel types by the local inhabitants.

Half of the late Iron Age assemblage comprises grog-tempered vessels (fabrics F06A/B/C and F39) which are characteristic of the period; vessels in shelly fabrics F07 and F05 total 30%, while mixed grog-tempered and/or sandy fabrics F03, F09 and F34 constitute the remainder. All are likely to be of local origin; a number of kilns producing shelly vessels during the mid-1st century AD are known in north Bedfordshire (*e.g*. Stagsden, Dawson 2000a; Bromham, Tilson 1973; Harrold, Brown 1994; Biddenham, Luke 2008), although the other fabrics' provenance remains unclear. The majority of the pottery comprises wheel-thrown vessels in fabric types F06A/B, F09, F34, and F39. Handmade coarse ware vessels mainly occur in fabric types F07, F05, F03 and F06C, and generally represent the largest vessels in the assemblage (storage jars and cooking pots).

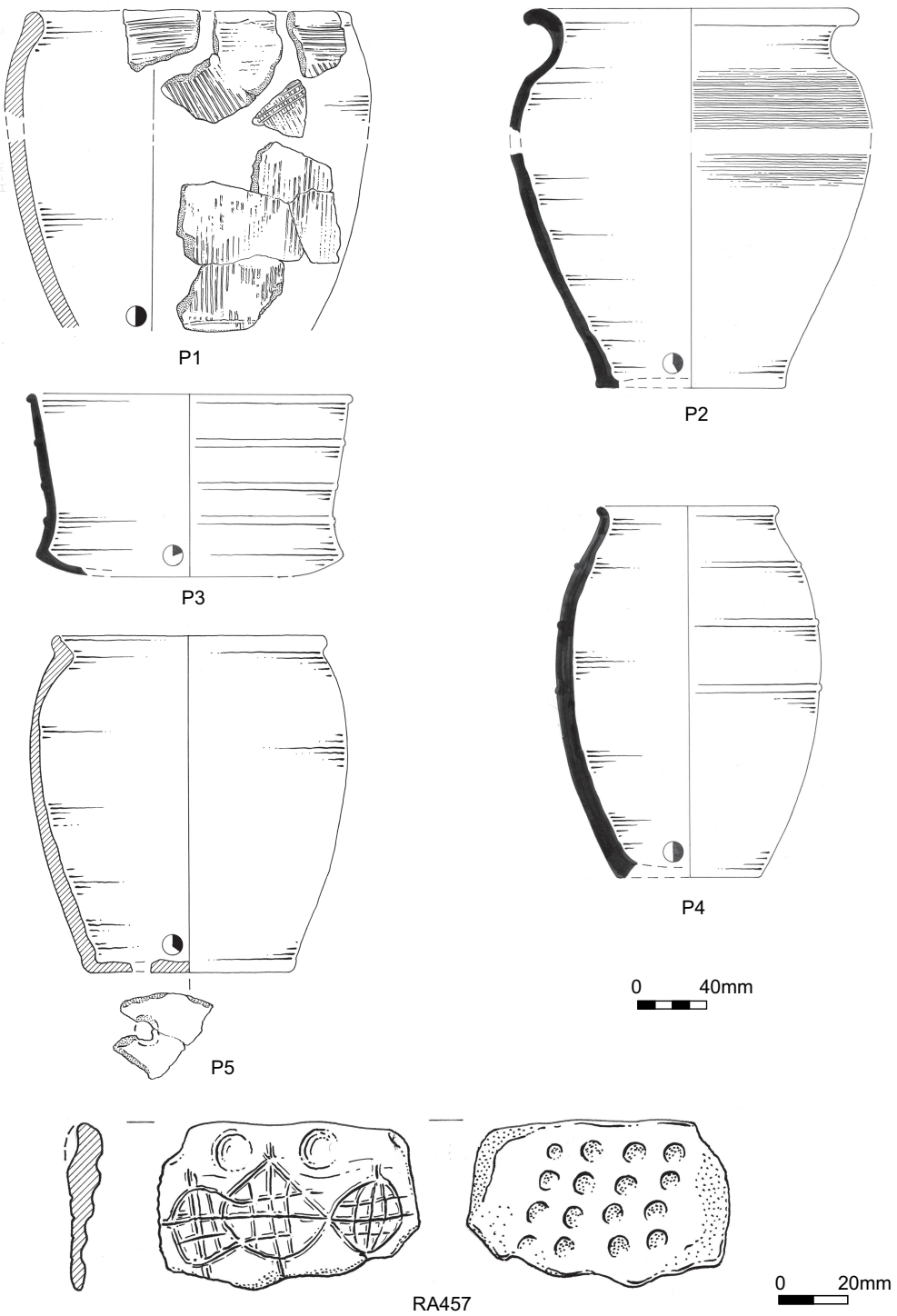

Figure 9: Selected pottery from Phase 2 deposits

Land-use area	G No.	Pottery Date			Total
		Late Iron Age	Roman	Post-Roman	
Western enclosure (L2)	9	2,120	115		2,235
and associated features	11	367	497		864
	18	246	588	2	836
	19	2,669	395		3,064
	20	88	134		222
	21	34	86		120
	23	169	50		219
	24	5,259	3,087	21	8,367
	35	489			489
	38	238	169	29	436
	46	130	241		371
	47		38		38
	49		578		578
	56	23	2		25
	59	132	24		156
Central enclosure (L3)	3	432			432
and associated features	4	65	80		145
	6	1,687	29		1,716
	8	3,586	53		3,639
	41	1,114	350		1,464
	50	125	517		642
Eastern enclosure (L4)	5	538			538
and associated features	7	136	56		192
	10	18			18
	12	567	52		619
	13	2,105	628		2,733
	14	1,176	130		1,306
	15	3,682	3,477		7,159
	16	189	573	7	769
	17		25		25
	22	140	337		477
	25	25	1,712		1,737
	36	362	281	7	650
	37	118	28		146
	39	175	605	74	854
	42	13	1,505		1,518
	44		13		13
	48		109		109
	51	3	156		159
	52		3		3
	55		20		20
Pits (L5)	45	149	1,281	50	1,48
Geoarchaeological features,	1	3,002	263		3,265
tree-throws and pits (L6)	40	78	111		189
	43	25	22		47
	54	288	224	14	526
Total		**31,762**	**18,644**	**251**	**50,657**

Table 1: Phase 2 pottery quantification, by weight (g)

G No.	Illustration No.	Ware	Comments
12	P1	F06B	C1-1; oxidised; sherds split between ditch G5 and re-cut G12
42	P2	R13	rilled
13	P3	F09	E1-2 carinated wide-mouthed cup
8	P4	F06B	G5-1 plain barrel-shaped butt beaker
6	P5	F07	ext soot; post-firing drilled hole in base
39	RA457	R13	decorated rim sherd; sail-maker's palm?

Table 2: Illustrated pottery from Phase 2 deposits

Roman

Roman pottery, the majority of which is datable to the 1st to 3rd centuries, accounts for 1,890 sherds, representing 759 vessels (18.6kg). A small quantity of late Roman sherds present in Phase 2 are considered intrusive. The assemblage comprises a comparable range of wares to those recovered from the contemporary nearby settlements at Marsh Leys Farm (Luke and Preece in prep.), Wilstead (Luke and Preece 2010), Kempston (Dawson 2004), and Great Barford (Webley 2007), and generally reflects the composition of Romano-British rural sites in the vicinity of the Great Ouse Valley. The assemblage suggests relatively low socio-economic status, with pottery mainly deriving from local sources and comprising mainly jars for storage and cooking. The small quantities of imported fabric types, however, indicate wider contacts and a certain degree of higher-status consumption.

The assemblage comprises a diverse range of fabric types, the majority of which are of local origin. Shelly ware R13 dominates, constituting 52% (by weight), followed by sand-tempered grey wares R06C and R06B, which total 10% and 8% respectively (pottery in the generic grey ware group R06 constitutes 27% of the total assemblage). A proportion of the shelly wares are recognisable products of the Harrold kilns (Brown 1994), operational throughout the entire Roman period; 4% are macroscopically similar to fabrics recovered from recently excavated early Roman kilns near Willington, although this identification remains unsubstantiated. Grey wares are known to have been produced at a series of sites to the south-east of Bedford, notably at Mile Road (Dring 1971), although other kilns have been identified at Cardington and Eastcotts (Simco 1984; Albion Archaeology 1995).

Smaller quantities of reduced (R07B, R08, R14) and oxidised (R05A/B, R10A/B) sand-tempered wares, as well as regional and continental imports, constitute the remainder of the assemblage. The imports each total less than 4% of the assemblage, with samian dominating those types occurring. Regional imports include white ware from the Verulamium (St Albans) industries (R03A–C, R18, R33); pink grogged vessels from either Caldecotte, Bucks or Towcester, Northants; Nene Valley grey wares (R06A); colour-coated wares (R12B); and small quantities of material from the Oxfordshire (R11) and Mancetter-Hartshill (R20) industries. The central and south Gaulish samian assemblage and a single Spanish amphora sherd (R19A) represent the only continental imports.

A range of vessel forms associated with the storage, preparation and consumption of food and drink are represented. Diagnostic sherds are dominated by jars of varying sizes (78%), which measure 180–220mm in diameter. Jars are cordoned, narrow-necked and neckless, and have plain everted, undercut, triangular or bead rims. Lid-seated and large storage jars occur exclusively in shelly fabric R13. Bowls constitute 8% of the assemblage, and measure 140–340mm in diameter, with shelly examples generally falling at the larger end of the range. Bowls have plain everted, flanged, or lid-seated rims. One Nene Valley colour-coated example is an imitation of samian form 36. Decoration is rare, and comprises rouletting, rilling, incised wavy lines, horizontal and vertical combing, barbotine, burnishing (overall and lattice design), and slipping. The curation of vessels is evidenced by post-firing holes drilled through neck, shoulder and body sherds, to facilitate repair. Less prevalent vessel forms are plain rim and folded beakers, 'dog' dishes, mortaria, lids, plain-necked flagons, and single examples of a platter, cup, and Dressel 20 olive oil amphora.

Samian ware (forty sherds) is predominantly of Hadrianic to Antonine date and of central Gaulish origin, with three joining sherds from south Gaul datable to the Flavian or Trajanic periods. Central Gaulish forms are conical cups (form 33) and bowls (forms 18/31, 18/31R, and 31 or R variant). Two stamps of the central Gaulish potters Aricus ii and Paterclus ii were identified. Two vessels have been repaired with lead rivets, indicating that samian may have been difficult to obtain and was, therefore, carefully curated.

The assemblage includes three modified sherds, two of which are coarse ware body sherds that have been crudely chipped to form gaming counters. The third (Fig. 9, RA457) comes from the eastern pit in G39 (the infill of which might not have accumulated until Phase 3), and was formed from a rim sherd in a shell-tempered fabric (R13). In addition to the thumbed decoration along the rim, the sherd has post-firing incised/scratched decoration comprising three roughly drawn diamonds, the interior of each diamond cross-hatched by three horizontal and three vertical lines. The interior surface of the sherd has been shaved off, and there are four rows of four circular or cup-shaped depressions; these appear to have been

created post-firing, possibly by partially drilling or grinding. The sherd is worn smooth along the edge of the rim, suggesting it was handheld in use, although what the sherd was used for remains uncertain. The series of depressions could suggest its use as a soldering plate or heating tray, yet the sherd has no metallic residues visible, nor has it been exposed to heat. Instead, it may have been a sail-maker's palm, which would have provided assistance in pushing a needle or perhaps bodkin through heavy material.

Spatial distribution

Table 1 shows the Phase 2 pottery assemblage in terms of its spatial distribution across the site. Similar densities of pottery were recovered from each of the three enclosures (Fig. 10). Although the central enclosure (the smallest of the three) superficially appears to have produced a smaller volume of material, ditch G24, which was assigned to L2 and produced the largest assemblage of any Group, straddled both the western and central enclosures.

Over 76% of the Phase 2 assemblage came from enclosure ditches, with just 13% from pits, and smaller quantities deriving from other feature types. There was no apparent variation between the distribution of different vessel forms or fabrics across different types of feature.

The pottery recovered from each enclosure is broadly comparable. All yielded late Iron Age/early Roman assemblages with similarly low average sherd weights (12g) and vessel to sherd ratios (1:2), indicating the fragmented nature of each group. The central enclosure yielded the least diagnostic assemblage, with few classifiable vessel forms (Table 3). Each assemblage is dominated by coarse ware jars, with smaller quantities of other utilitarian forms associated with the storage, preparation and consumption of food and drink. The absence of mortaria from the western and central enclosures, in contrast with the eastern enclosure, may imply some functional differences. The absence of samian and regional imports from the central enclosure supports the suggestion that the infill of the excavated features in L3 accumulated at an earlier date than those in the other enclosures, which were more subject to cleaning out and re-cutting. Samian recovered from L2 and L4 is broadly contemporary and comprises eight central Gaulish vessels. These include a form 33 cup with the stamp ARICIM of the potter Aricus ii, datable to *c*. AD 150–190 (G24, L2), and a gritted mortarium sherd (form 45), datable to *c*. AD 170–200 (G25, L4). A single sherd of 2nd-century olive oil amphora occurred within the eastern enclosure.

Three residual late Bronze Age/early Iron Age sherds (18g) were recovered from the western (G46) and eastern (G13, G15) enclosures. Pottery of Saxon and Saxo-Norman (total weight 117g) also derived from these enclosures, primarily from the eastern pit in G39, where it is thought to have accumulated in a feature that survived as an earthwork hollow after it had fallen out of use.

Single cremation burials were recovered from each enclosure, the associated vessels from which survive in poor condition due to plough damage. In the western enclosure L2, cremation G49 appeared to be contained within a grey ware jar, and was accompanied by two accessory vessels. One of the latter is a central Gaulish form 18/31 samian bowl with a partial stamp [PATER]CLOSFE of the potter Paterclus ii, datable to *c*. AD 110–125. In the central enclosure, G50 contained a grog-tempered urn and accessory

	Western enclosure L2		Central enclosure L3		Eastern enclosure L4	
Vessel form	Sherd	Wt (g)	Sherd	Wt (g)	Sherd	Wt (g)
Amphora					1	277
Beaker	30	91	41	992	70	297
Bowl	34	699			63	686
Cup					7	133
Dish	5	81			3	37
Flagon	1	10				
Jar	299	5,365	232	2,675	412	7,208
Lid	2	71			4	78
Mortaria					5	108
Platter			36	397	1	4
Pedestal urn	1	31			2	46

Table 3: Phase 2 vessel forms by enclosure

Figure 10: Distribution of pottery by date

vessels, including a grey ware platter and rouletted beaker. The base and lower portion of a Roman grey ware jar were associated with unurned cremation burial G51 to the north of eastern enclosure L4.

Pits to the south of the enclosures (L5) yielded a mixed late Iron Age and Roman assemblage weighing 1.4kg, of similar composition to those recovered from the enclosures. The pottery comprises a fragmented collection with few diagnostic vessel forms; sherds are small, and few vessels are represented by more than single sherds. Coarse ware vessels predominate. Samian ware comprises fragments of a south Gaulish form 18 of Flavian or Trajanic date, and a central Gaulish form 18/31 datable to the Hadrianic period, both with evidence for repair. Five Saxon and Saxo-Norman sherds (50g) were recovered, which are thought either to be intrusive, or to derive from deposits that accumulated after the features had fallen out of use.

A mixed and abraded late Iron Age and Roman assemblage (3.8kg) dominated by early Roman coarse wares derived from pits G40 and G43 and geoarchaeological features G1 to the north of the enclosures (L6), the majority associated with the latter. Three residual late Bronze Age/early Iron Age sherds (6g) were also identified. Tree-throws G54 yielded fifty-three late Iron Age/early Roman coarse ware sherds (526g), and a handle fragment from a late medieval/early post-medieval jug (14g). Sherds are generally small and abraded, with an average weight of 9g, consistent with their recovery from features of this type.

Ceramic building material
Jackie Wells

Five pieces of shell-tempered *tegulae* and a sand-tempered fragment of brick (total weight 550g) were recovered, the majority deriving from the eastern enclosure L4. The shelly tile fabric is similar to pottery fabric R13, and some examples may be products of the Harrold kilns (Brown 1994). Pieces have an average weight of 92g, and are generally abraded. The *tegulae* are 16–25mm thick, one with a partial flange, and the brick fragment is 30mm thick. The quantity of brick and tile is too small to imply the presence of tiled buildings, and is more likely to reflect re-use in structures such as corn driers or ovens.

The fired clay assemblage weighs 2.9kg, and derives mainly from ditch G24 and pits G38 in the western enclosure L2. 94% of the material (by weight) occurs in an oxidised sandy fabric to which organic matter has been added, five percent in an organic fabric, and the remainder in a purely sandy fabric. The assemblage is largely amorphous, although a number of pieces have finger-smoothed surfaces and/or edges. Portions of approximately twelve handmade slabs and four perforated plates, one with a curved edge, were identified; those with a complete surviving thickness measure between 15mm and 25mm. The assemblage is likely to derive primarily from surface constructions such as domestic cooking hearths or ovens.

Human bone
Michael Henderson

All three cremation burials had been truncated by agricultural activity in the medieval and post-medieval periods; burial G49 had also been disturbed by the roots of a modern hedgerow which had grown over the top of it. Pottery vessels associated with the cremations indicate that they were Roman, probably dating to the 1st or 2nd centuries. The burnt bone was moderately well preserved, but a high level of fragmentation had resulted in numerous unidentified bone elements. Some fragments of joint surface survived, but in most cases it was not possible to assign these to a specific body area. No evidence of weathering or erosion was observed. The low total weight of burnt bone from each burial — 70.8g to 247.6g, with an average weight of 164.8g — and the lack of repeated elements suggest that each vessel contained the remains of a single, incomplete individual, although it is possible that some material was lost due to truncation.

Urned cremation burial G49 contained identifiable fragments of cranial vault, mastoid process, acetabulum, auricular surface, vertebrae (neural arch and apophyseal facet), ulna, radius, humerus, femur, and tibia. This included identifiable fragments of radial head, proximal ulna joint surface, and femoral and tibial joint surfaces. Identifiable burnt bone fragments from urned burial G50 included cranial vault, cervical vertebral body, neural arch, apophyseal facet, radius, ulna, tibia, and femur. Fragments of distal femoral joint surface were also observed. Three fragments of calcined animal bone were also recorded, consisting of sheep or goat astragalus (1.7g), while an unburnt sheep phalanx was also recovered from

the same deposit. Cremation burial G51 was not contained within an urn, but did have an associated ceramic jar. It contained the highest percentage of identifiable elements (56.9%), including a maxillary canine root, pre-molar crown and unidentified single rooted tooth crown. Fragments of cranial vault, ilum, vertebrae, radius, ulna, humerus, femur and tibia were also recorded.

Partial fragments of auricular surface indicated an adult age estimate for G49. The small size of the fragments precluded greater precision. It was not possible to determine age for G50; however, the size of the cervical body and neural arch fragments suggested a probable adult. The presence of a completely formed maxillary canine root and premolar crown also suggested an adult age for cremation G51.

The fragmentation sizes were within expected ranges, and were consistent with contemporary cemeteries (McKinley 1994). There was an overall under-representation of axial elements in all cremations when compared to expected values, and cremation G49 showed lower percentages than expected of identifiable bone for cranial, upper and lower limbs. The burnt bone from this cremation showed the highest level of oxidation, thereby indicating the most complete cremation. This may have affected fragmentation and which identifiable elements were present. A prevalence of lower limb fragments was noted for G51, but this may have been due to taphonomic factors resulting in the prevalence of robust cortical bone fragments and poor preservation of spongy trabecular bone.

Animal bone
Stephanie Vann

Phase 2 deposits yielded an assemblage of 3,054 fragments of animal bone (including 534 recovered from soil samples), only 702 of which could be identified. The composition of the assemblage is fairly standard for faunal material from a domestic late Iron Age to mid-Roman site. The numerically dominant species, cattle and, to a lesser, extent sheep/goat (Fig. 11), were regularly exploited throughout the Iron Age and the Romano-British period, as were the horse and pig, albeit not generally in the same numbers (Maltby 1981). The good survivability of large, strong bones such as those of cattle and horse can sometimes be a reflection of preservation conditions rather than husbandry practices; unfortunately, too few of the bones recovered by sieving are identifiable to help illuminate this potential point of bias.

The assemblage is skewed by the number of dog bones present: forty-nine of the sixty-one came from pit G36, and probably represent a single individual. The rest of the dog remains mostly constitute single, isolated elements; in addition, thirty-nine other bones from this assemblage also show evidence of canid gnawing. No wild

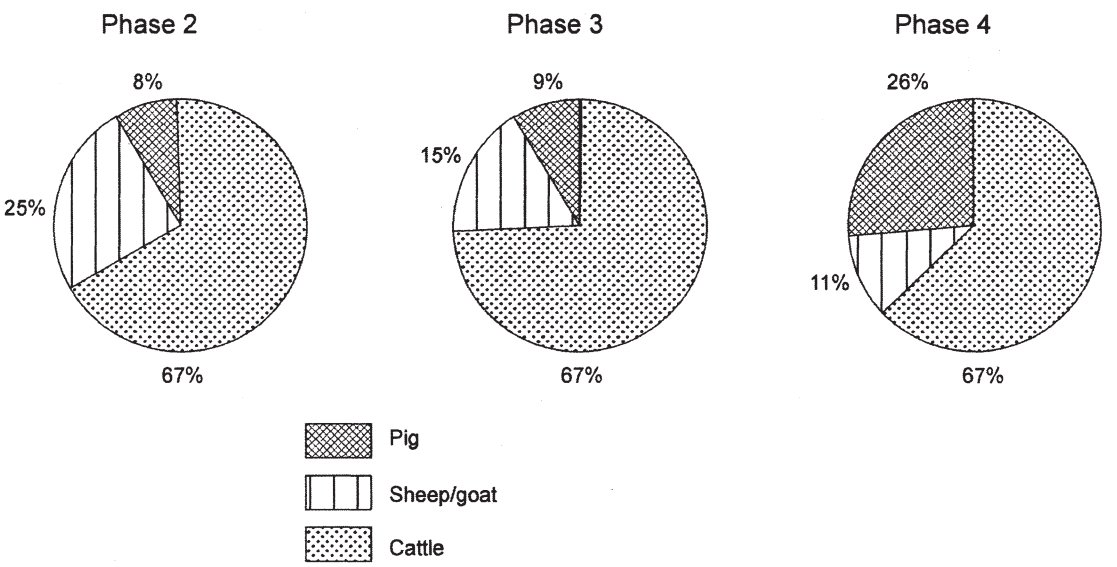

Figure 11: Relative proportion of three main domesticates in Phases 2–4

taxa are present, although five bird bones were recovered, all domestic fowl.

The skeletal maturity data show a range of ages for the cattle, sheep/goat and pigs identified (Table 4). They indicate the presence of juvenile cattle within the assemblage, at least one individual being under seven months of age at the time of death. Other individuals may have been older, potentially up to seven years or more, although the majority appear to have been less than four years old. Sheep and pigs are represented by both immature and adult animals, as also evidenced by the ageing data based upon tooth wear; a fairly high proportion of the pigs were less than a year old at the time of death.

Seven elements from the Phase 2 assemblage permit the calculation of the height at the withers for cattle, horse and dog. The height range for cattle is 1.08–1.20m; cattle resembling the Kerry cow or Irish shorthorn are widely found on both pre-Roman and Roman sites (Applebaum 1958, 74), and this height range is fairly normal. A dog femur gives an estimated height at the shoulder of 0.62m; this puts it at the taller end of the range of shoulder heights for dogs from late Iron Age Britain as given by Clark (2006, fig. 4.1), and would be comparable to modern breeds such as the Boxer (Clark, K.M. 1995, table 3). The height range for horse is 1.24–1.53m, which is comparable to that of modern ponies.

Evidence of butchery was found on cattle and horse remains. A cattle radius from G1 displays a triangular hole in the centre of the medial facet, which may have been made by a tool. A cattle astragalus and a horse phalanx exhibit cut marks, which may be indicative of filleting (Binford 1981). The remainder display chop marks that are most likely due to dismemberment of the carcass and marrow extraction (Binford 1981). These chop marks may support the conclusion that Romano-British butchers used the cleaver more often than the knife, as suggested by other authors (*e.g.* Seetah 2006, 112), perhaps as a result of a need to reduce the amount of time spent processing each carcass.

Bone burnt both to black (carbonised) and white (calcined) was recovered from twenty-six different deposits. Most contained only a few isolated burnt fragments; however, the southernmost pit in G35 produced a particularly high concentration, accounting for 29.9% of the burnt material from this phase.

Molluscs
Alan Pipe

The assemblage provides a moderately abundant terrestrial group, largely derived from species known to be common throughout lowland southern Britain, particularly in base-rich areas. Although essentially derived from four species, *Vallonia pulchella*, *Columella edentula*, *Vertigo pygmaea* and *Zonitoides nitidus*, the core of the assemblage is provided by smooth (or beautiful) grass snail *V. pulchella*, which is very much to be expected in moist, base-rich grassland. The amphibious shiny glass snail *Z. nitidus* was recovered from ditches G11 and G24 in the western half of the site; this probably indicates grassland liable to flooding, rather than long-term standing or flowing water. The recovery of two freshwater species from G24, the button (or white-lipped) ram's-horn snail *Anisus leucostoma* and the dwarf pond snail *Lymnaea truncatula*, supports the theory that the ditch periodically held standing water on a temporary basis.

Plants
John Giorgi

The nine analysed samples produced 435 quantified charred items. This material consists mainly of cereal grains (72%), with smaller amounts of chaff fragments (11%) and wild plant/weed seeds (18%). The cereal grains are poorly preserved; 52% of the grains could not be identified, while all the productive flots contain varying amounts of very fragmented and unquantifiable grain (smaller than 2mm). Wheat grains (*Triticum* spp.) account for 85% of those that are identifiable, and are present in eight of the nine samples. Almost half belong to free-threshing wheat (*T. aestivum*), while there are just seven hulled wheat grains of emmer/spelt (*T. dicoccum/spelta*), one of which was tentatively identified as emmer. The presence of hulled wheat in Phase 2, however, is confirmed by the chaff fragments, which consist almost entirely of wheat glume bases and rachis fragments, much of which was identified as spelt. Only one glume base of emmer was identified, although a large number of wheat glume bases remain unidentifiable. Other identified cereals in Phase 2 are represented by much smaller amounts of material, with only twelve barley (*Hordeum* spp.) grains (including hulled examples *H. vulgare* L.),

	Element	Cattle or Large Mammal						Sheep/Goat						Pig					
		Phase 2		Phase 3		Phase 4		Phase 2		Phase 3		Phase 4		Phase 2		Phase 3		Phase 4	
		U	F	U	F	U	F	U	F	U	F	U	F	U	F	U	F	U	F
Early-rising	Humerus, distal	2	2		3				1					1				1	
	Scapula, distal	1			3									3	1				
	Radius, proximal	4	7		5		1		1					1					
	Acetabulum				1				1		1			1					
	Metapodium, proximal		10		10		1				1		1						
	Phalanx 1, proximal		6		2	5		1	2			2	2						
	Phalanx 2, proximal	1	2		1	3	2	1	2							1			
Middle-fusing	Tibia, distal		5	1	5				2						1				
	Calcaneum, proximal		1	3				1		1								1	
	Metapodium, distal		11	2	10	13	3	1		2				1	1				
Late-fusing	Humerus, proximal			1															
	Radius, distal		3	1	2									1		1			
	Ulna, proximal	3	2											1					
	Femur, proximal	1	2	1	1														
	Femur, distal	1	1		1														
	Tibia, proximal	3	2		1											1			
	Vertebral centrum	54		4	1	4													

U: unfused; F: fused

Table 4: Total number of fused and unfused skeletal elements by species (after Reitz and Wing 1999, table 3.5)

In cattle, fusion is believed to be complete for the distal scapula at 7–10 months, and for other early-fusing elements at 12–24 months. Fusion of middle-fusing elements is complete at 24–30 months; fusion of late-fusing elements is mostly complete at 42–48 months, with the vertebral centrum amongst the last to fuse at 84–108 months. For sheep/goats, the proximal phalanges typically fuse at 6–16 months, and the acetabulum at 6–10 months. Distal metapodia, on the other hand, are completely fused at 18–28 months, and the proximal calcaneum at 30–36 months. For pigs, fusion of early-fusing elements is complete by 12 months, whereas fusion of the proximal calcaneum is complete at 24–30 months, and fusion of the distal radius and proximal ulna at 36–42 months.

plus eleven oat grains (*Avena* spp.) and a few awn fragments.

Seventy-seven charred wild plant/weed seeds were recovered, with a moderate range of species represented, including a number of characteristic arable weeds. There is good representation of docks (*Rumex* sp(p).), stinking chamomile (*Anthemis cotula* L.), leguminous seeds and grasses (Poaceae indet.), including brome (*Bromus* sp(p).).

The only feature that contained a substantial concentration of charred plant items was the eastern pit in G39, which produced just over 200 items (10.3 per litre of processed soil). The assemblage is indicative of a virtually cleaned crop of free-threshing wheat, which may have become accidentally burnt while being dried before storage or milling, or while being cooked over open fires. Free-threshing wheat is rarely found in pre-Saxon deposits, and its presence in the upper fill of this pit suggests that the feature did not become fully infilled until Phase 3.

Charcoal
Dana Challinor

Seven taxa were positively identified: *Quercus* sp. (oak); *Corylus avellana* (hazel); *Populus/Salix* (poplar/willow); *Prunus* sp. (cherry/blackthorn); Maloideae (hawthorn, apple, pear, service); *Acer campestre* (field maple); and *Fraxinus excelsior* (ash). Incomplete round-wood fragments are present in several of the samples. The charcoal is likely to represent spent fuel-wood debris, which was either dumped deliberately or, in the case of samples with only a few fragments, was blown in by the wind.

Phase 3: mid-Roman to mid-Saxon

Few of the features at Hill Field could confidently be assigned to Phase 3. It is unclear how much this is due to a genuine decline in activity, and how much it is a factor of the imprecise nature of much of the ceramic dating evidence: the majority of the Roman pottery cannot be closely dated. However, most of what can be closely dated belongs to the first half of the Roman period, with little late Roman material (Fig. 10); it may be reasonable to adduce a similar ratio within the less closely datable assemblage, supporting the broad picture of a late Roman decline.

The widespread mixing of deposits that occurred across the whole site due to the repeated cleaning-out of ditches has meant that residuality is a particular problem. This may have caused an underrepresentation of activity in Phase 3, with the finds assemblages from late Roman or Saxon features dominated by late Iron Age or early Roman material. It is possible, therefore, that some of the pits and ditches assigned to Phase 2 were in fact created, or at least still existed as significant earthwork hollows, during Phase 3 — the most likely candidate for this is the easternmost pit in G39 (L4), the upper fill of which contained sherds of Saxon pottery and grains of free-threshing wheat, a variety usually found in post-Roman assemblages. Its stratigraphic relationship with the enclosure ditch indicates that it was dug near the end of Phase 2, at least.

Contextual evidence
Of the boundary ditches that were established in Phase 2 (Fig. 2), G24 is the only one that clearly remained open in Phase 3, with several sherds of early Saxon pottery recovered from its upper fill G24.1. However, six large water-holes were dug across the site (G26–30 and G53), with five positioned on the line of the earlier boundary ditches (Fig. 12). Their location seems more than coincidental, and they may well have been fed by the ditches, even if the boundaries were primarily marked by hedgerows by this time. The presence of these water-holes implies that significant numbers of animals were brought to pasture here, making it likely that the layout of the Phase 2 farmstead was essentially retained, in order to facilitate stock control.

Five of the six water-holes (G26–30) lay within the area defined by the Phase 2 farmstead, while the sixth (G53), a re-cut of the Phase 2 water-hole G60, lay to the east. The largest of those within the area of the farmstead were G26 and G29, which were 12.5–14m long, 9.5–11.5m wide and 2.05–2.25m deep (Fig. 13, c and g). G27 and G28 were only slightly smaller in plan (Pl. 3), but their depths of 1.3–1.45m were similar to that of G30, which measured just 5.2m by 4m in plan. In addition, several small pits had been dug either next to water-hole G29 or through its infill; they were all about 1m wide, with no obvious indication of their function.

The composition of the finds assemblage from water-holes G26–30, along with the recovery of spelt wheat from some of them, suggests that they

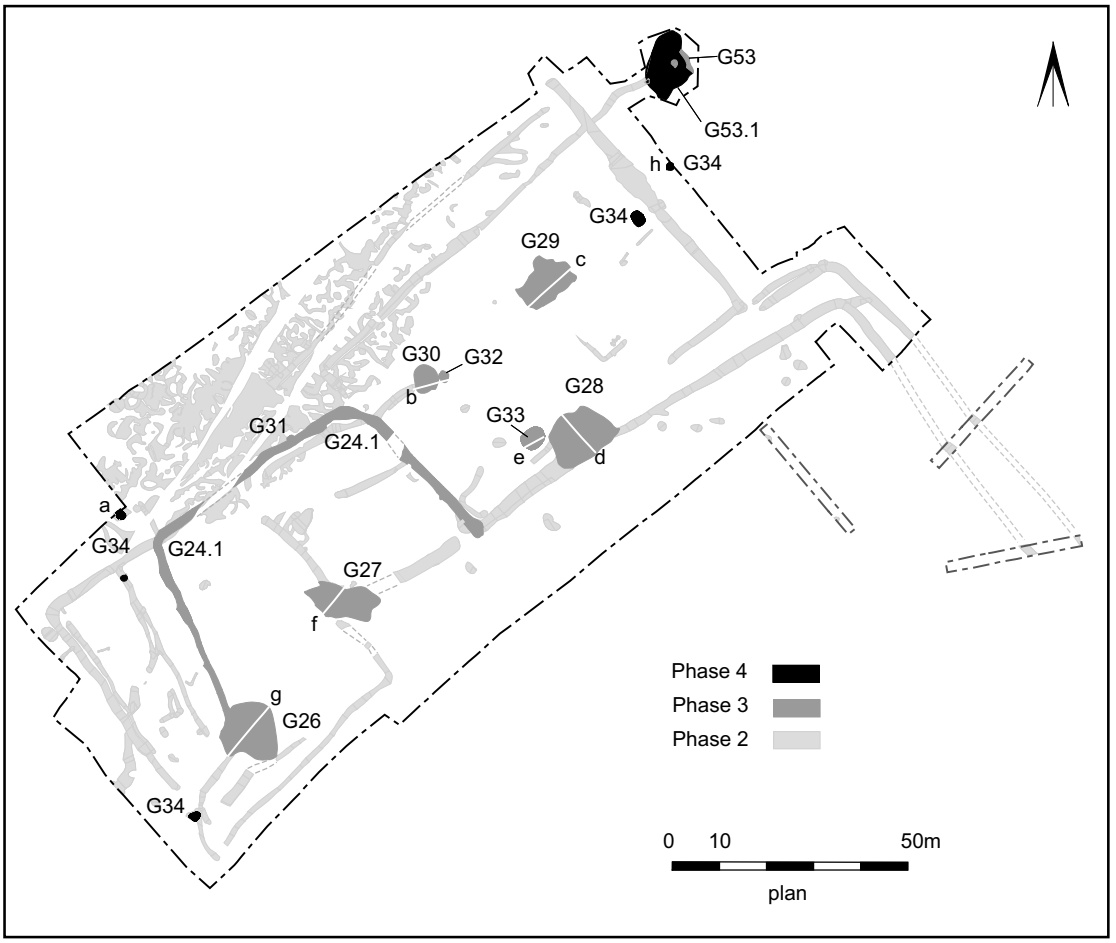

Figure 12: Plan of Phases 3 and 4

were mostly dug in the mid-Roman period, whilst the presence of Saxon pottery in their upper fills is testament to the longevity of their infilling. Some, however, might have been dug earlier in the Roman period; late Roman and Saxon pottery constitutes only a small proportion of the assemblages from G26 and G29 (Table 5), with none from the lower fills, suggesting at least that they became infilled at an earlier date than the others. More Saxon pottery was recovered from G28, yet the volume of late Iron Age material alongside it suggests that this also had an early origin. The relationships between G26/G28 and the surrounding Phase 2 ditches imply a mid- to late Roman construction date, but this may be due to subsequent expansion of two early Roman features. Intriguingly, the potentially earlier water-holes G26, G28 and G29 all had shallow profiles that would have allowed animals direct access to the water, whereas G27 and G30 had steeper profiles that would have prevented this unless the water-holes were full. The molluscan evidence suggests that the water-holes only held standing water on a temporary basis, which implies that people would have had to draw water out of these by hand, perhaps indicating a greater use of water troughs in the latter part of Phase 3.

The sixth water-hole G53, located to the east of the enclosures, was the only one to undergo distinct episodes of re-cutting (Pl. 4). The Phase 2 water-hole G60 was re-cut by [5304], which in turn was re-cut twice during Phase 3, first by [5294] and then by [5213] (Fig. 14; Table 7). Little survived of these re-cuts — all three were heavily truncated by further re-cutting during Phase 4 — though it can at least be said that the third one [5213] appears to have been the deepest, at 2.3m. The dates at which the first two re-cuts of

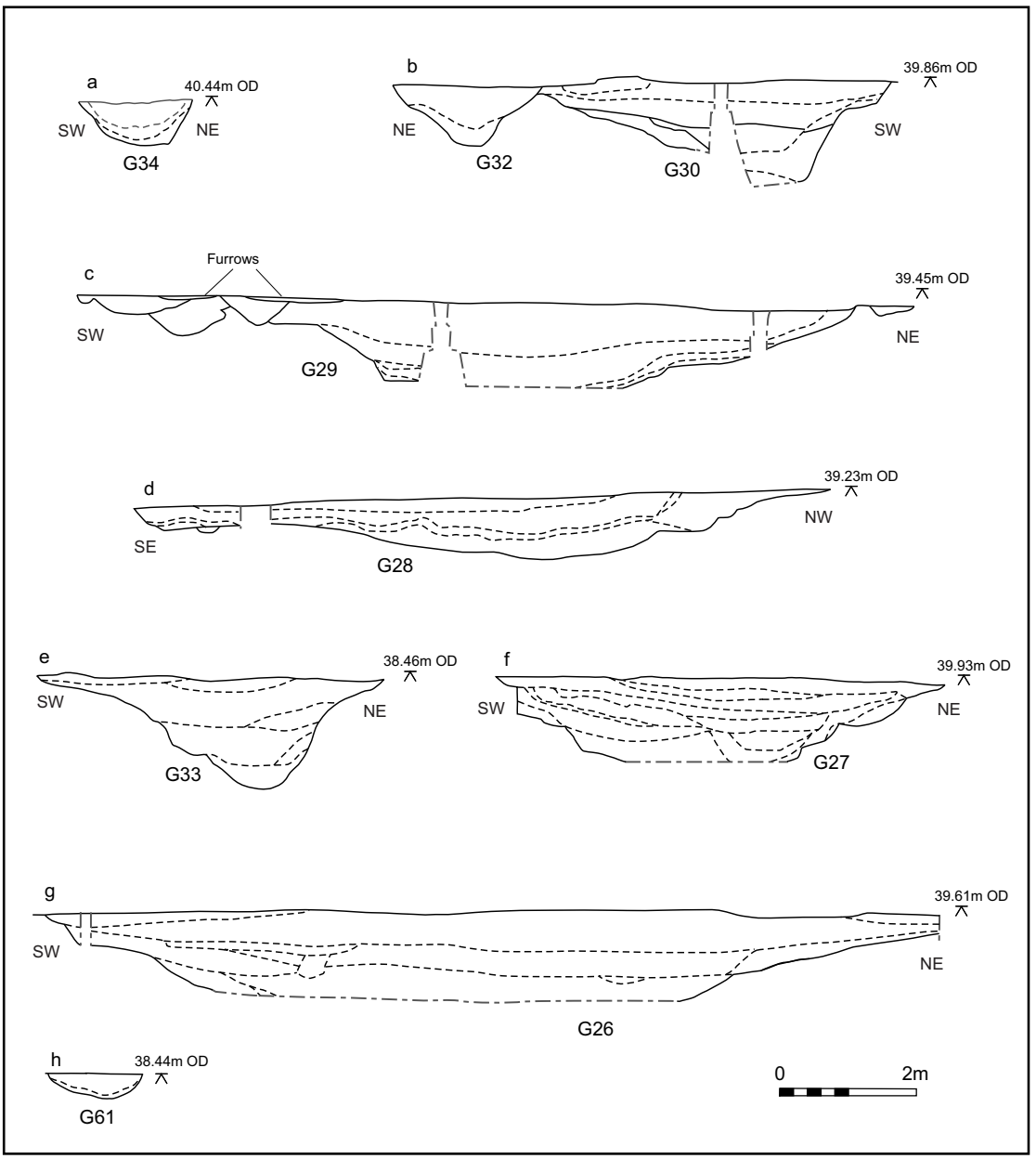

Figure 13: Sections relating to Figure 12

the Phase 2 feature occurred are uncertain, and the earliest [5304] may have occurred in Phase 2. However, we can be more precise about the date of the third re-cut: radiocarbon dating of two fragments of wood recovered from the fill of [5213] date the deposit to the late 6th century. More detailed consideration is given to the dating evidence for this series of features in relation to G53.1, Phase 4.

Whereas the six water-holes all originated in the Roman period, ceramic and stratigraphic evidence points to a Saxon origin for three further pits. One of them may, in fact, have been another water-hole: at 5.1m long, 4m wide and 1.6m deep (Fig. 13, e),

Plate 3: Phase 3 water-hole G28, looking south-east. Scales 1m. The nearby site at Luton Road, Wilstead (Luke and Preece 2010) lay beneath the houses that can be seen in the top left corner.

Plate 4: Excavation of Phase 3 and 4 water-holes and wells G53/53.1

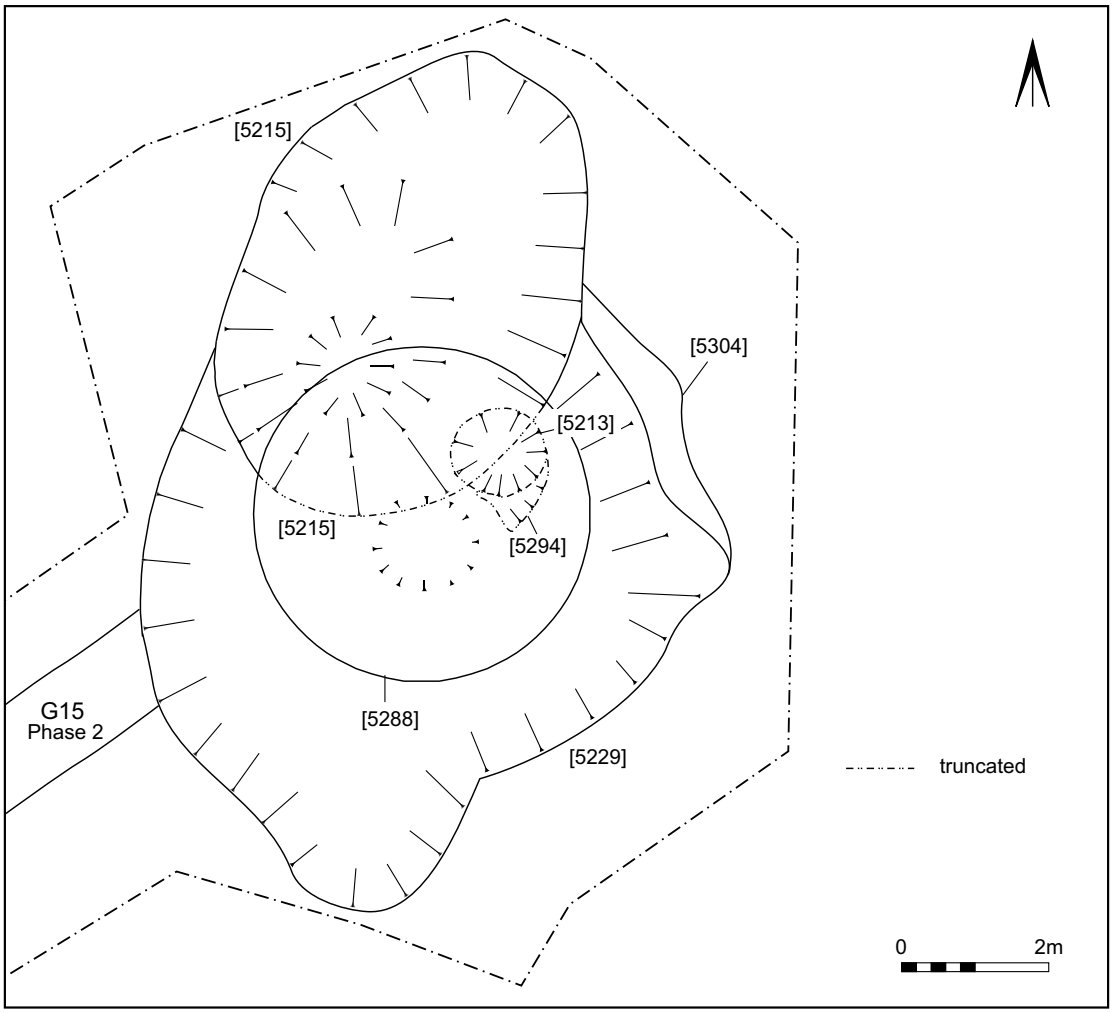

Figure 14: Plan of water-holes and wells G53/53.1

G33 was very similar in size to G30. Its greater regularity in plan and profile, however, suggests that G33 served another function, though it may simply have suffered less from animals' churning the ground around its edge. Pit G32, in contrast, was much smaller (Fig. 13, a), and was more comparable with those from Phase 2. Intriguingly, the third pit G31 was shallow, rectangular in plan, and was accompanied by a post-hole. The two features, dug into the top of ditch G24 once it had fully silted up (Fig. 4, a; Pl. 1), are reminiscent of a sunken-featured building when taken together. The pit was 1.6m wide and 0.25m deep, but its length is uncertain; it appeared to be slightly longer than it was wide, but relationships with other features made it hard to distinguish its outline in plan. The post-hole was 0.5m in diameter and 0.15m deep, and showed signs of burning in its fill. The dimensions are admittedly rather small for a sunken-featured building; however, the pit was different in shape and profile to any of the others excavated at Hill Field, and its association with the post-hole means that this interpretation, albeit unlikely, cannot be completely ruled out.

Non-ceramic artefacts
Holly Duncan and Peter Guest (coins)

In view of the large degree of residuality within the ceramic assemblage, it is likely that the non-ceramic artefacts from Phase 3 features are all similarly residual; the few from Phase 3 deposits that

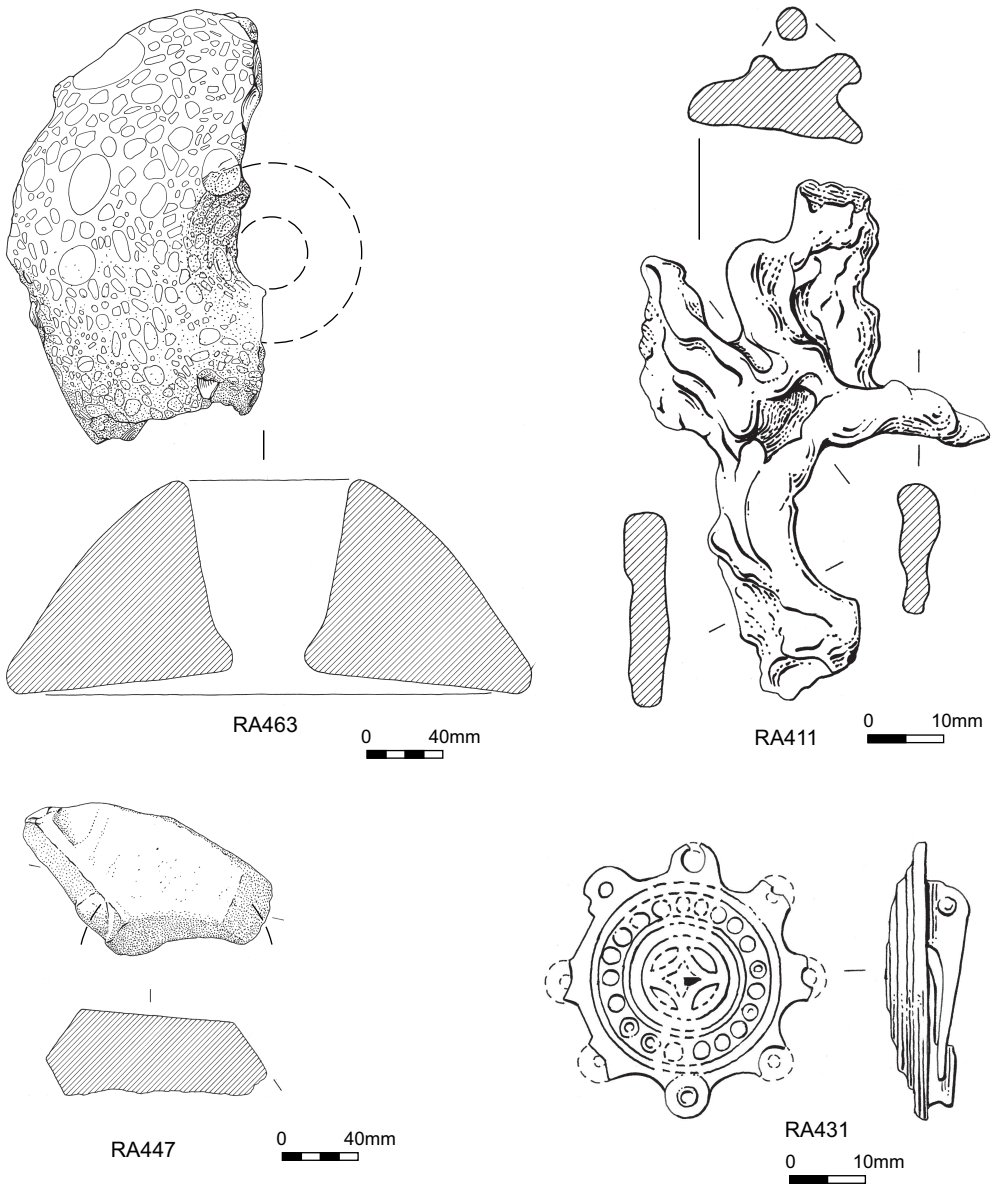

Figure 15: Selected non-ceramic artefacts from Phase 3 deposits

are typologically datable derive from the later 1st or 2nd centuries, with no clear Saxon examples. For this reason, the assemblage appears to offer little elucidation of the site's history during Phase 3, but may offer further insight into the activities that took place during Phase 2.

Eight iron nails, including general purpose nails (Manning type 1B) and a flat-headed tack (Manning type 7; Manning 1985, 134–5), were recovered from a range of features, with no concentrations. An enigmatic lead alloy object (RA411), with four radiating arms emerging from a small central hollow hub, was recovered from water-hole G27; its underside has irregular and unfinished surfaces, suggesting it was not visible when in use. This may have served as jointing or caulking for a structural fitting on a building or perhaps a gate. Six other fragments of lead were

recovered: a small piece of folded lead alloy sheet from the same feature; and five fragments from water-hole G29.

Three fragments of quern were found. One (RA463) from water-hole G26 is the upper stone from a bun-shaped rotary quern of Hertfordshire Puddingstone, a type that was used in the 1st to mid-2nd centuries AD; another example was recovered from a Phase 2 deposit in the eastern enclosure. The other two fragments, both flat rather than bun-shaped, were from water-holes G28 and G29, and are made of millstone grit, probably from the Pennine regions (King 1986, 86) — a pattern noted on other sites in Bedfordshire (King 1986, 114; Cool in prep.). Flat rotary querns were introduced following the Roman conquest, probably by the late 1st century AD (Welfare 1985, 157). Two possible millstone fragments were also tentatively identified, both from G29. One is a fragment of an upper stone retaining about a third of the central feeder/hopper, which has an estimated diameter of 120mm. The diameter of the feeder seems too large to have served on a hand quern, hence the suggested identification as a millstone. The second millstone (RA447) is more tentatively identified; it comprises a portion of the central feeder (estimated diameter 140mm) and what appear to be parts of two rynd sockets, both incomplete. A survey carried out by King in the 1990s produced evidence for 170 Roman sites in Britain where millstones larger than 600mm in diameter, and therefore probably power-driven, have been found, with a significant number on rural sites (Watts 2002, 58). The presence of millstones would suggest that grain processing may have formed an important part of the economy.

Water-hole G27 contained the head from a Colchester B brooch, dating to the second half of the 1st century AD, (Crummy 1983, 12; Olivier 1988, 46). A 2nd-century enamelled disc brooch with peripheral lugs (RA431) was found in water-hole G29; Johns (1996, 171) comments that these often gaudily coloured brooches were intended less for use than ornament, which may suggest a modicum of disposable wealth. Its nearly complete state potentially suggests deliberate deposition, perhaps as a votive offering in a water feature; three 2nd-century coins were also recovered from the surface of G29. The deposition of these four items was perhaps intended to mark the end of use of the water-hole; the coins' presence may be an example of their being exchanged as votive offerings rather than as money (Guest 2008, 135–48; Guest 2009, 113). G29 also contained an antler tine offcut, one of the few indications of craft activity within the assemblage.

Catalogue of illustrated items (Fig. 15)

RA463: Quern. Hertfordshire Puddingstone. About one third of an upper bun-shaped rotary quern stone with central tapering feeder, rounded V-shaped in section. Worn, slightly convex grinding surface. Finely made. Estimated diameter 280mm; thickness 100mm. G26.

RA411: Uncertain. Lead. Caulking? In elevation it has four radiating arms with central hollow hub. Each 'arm' has an irregular flat cross-section. Possibly caulking for iron tie or pintle? Length 57mm; 36.8mm; maximum height of arm 28mm. G27.

RA447: Millstone? Fine-grained micaeous sandstone. Possible portion of a runner stone, retaining a portion of the central hole, estimated diameter *c*. 140mm, with remains of two rynd sockets(?), both having only one edge surviving. The grinding surface is somewhat worn. The upper face of the stone does not survive. Maximum thickness 57mm. Identification very tentative. G29.

RA431: Brooch. Copper alloy (tinned?). Flat, enamelled disc brooch with eight peripheral lugs, indented presumably to take enamel. Only one lug complete, others survive as stubs. The disc appears to be tinned. Two concentric circles form a 4mm wide border which has a series of up to nineteen small rings within it (possibly enamelled originally). A raised ridge demarcates a central circular zone which encircles a lozenge-shaped compartment still retaining blue enamel. Hinged pin and catch plate survive. Diameter including lugs, 36mm. G29.

Pottery

Jackie Wells and Felicity Wild (samian)

Features assigned to Phase 3 yielded 1,769 sherds (24.9kg), representing 1,185 vessels. The sherds are moderately abraded and survive in fair condition, with an average weight of 14g and a vessel to sherd ratio of 1:4. A degree of residuality is evident, with all features except G31 containing late Iron Age/early Roman pottery (Table 5); however, the similar condition of this material makes it difficult to determine the full extent of the residuality. More than two-thirds of the assemblage (by weight) was recovered from water-holes G26–29, 35% of it coming from G29, including a 2nd-century stamped olive oil amphora handle (Fig. 16, P10). Pit G32 was the only feature in which Saxon pottery formed the majority.

Roman

The Roman pottery assemblage comprises 1,258 sherds (17.9kg), representing 838 vessels, and is broadly datable to the 2nd–4th centuries. While

	Pottery Date				
Features	**Late Iron Age / early Roman**	**Roman**	**Saxon**	**Saxo-Norman**	**Total**
G24.1	2,454	3,779	108	5	6,346
G26	195	1,671	15		1,881
G27	92	3,090	87	1	3,270
G28	1,372	1,503	178		3,052
G29	1,618	7,009	202		8,829
G30	38	526	320		884
G31		175	7	2	184
G32	9	136	251		396
G33	7	82	11		100
Total	5,785	17,971	1,179	8	24,942

Table 5: Phase 3 pottery quantification, by weight (g)

similar in composition to the Phase 2 material, the pottery includes a greater quantity of later Roman types.

The assemblage contains a wide range of fabric types, mostly of local origin. As in Phase 2, shelly ware R13 dominates, constituting 44% (by weight), followed by sand-tempered grey wares R06C and R06B, which total 16% and 10% respectively (pottery in the generic grey ware group R06 constitutes 36% of the total assemblage). Smaller quantities of reduced (R07B/C, R14) and oxidised (R05A/B, R10A/B) sand-tempered wares, alongside regional and continental imports, constitute the remainder of the assemblage. Imports, although poorly represented in terms of quantity, occur in a diverse range of fabric types. Regional imports constitute 6% of the assemblage, Nene Valley grey wares (R06A) dominate, supplemented by white wares from the Verulamium (St Albans) industries (R03A–C, R18, R33); pink grogged vessels from either Caldecotte, Bucks or Towcester, Northants; Nene Valley colour-coated wares (R12B); and small quantities of material from the Hadham (R22) and Oxfordshire (R11, R11D) industries, the latter including colour-coated and white wares. Continental imports account for 3%, and comprise samian ware, plus two sherds of amphora (R19A) from the Roman province of Baetica in southern Spain.

The diagnostic element of the assemblage is dominated by jars of varying sizes, which account for 55%, and mostly measure 120–260mm in diameter. Two large storage vessels have diameters in excess of 300mm. Jars are narrow-necked or neckless, and have plain everted, undercut, triangular or bead rims. A small number of lid-seated vessels occur exclusively in shelly fabric R13. Bowls and dishes respectively constitute 17% and 9% of the assemblage and measure 200–300mm in diameter, although in contrast with the Phase 2 pottery, sand-tempered bowls are the largest examples. Bowls have plain everted, flanged, bead, triangular or reeded rims. Mortaria are entirely absent. Decoration is again rare, comprising combing, rilling, rouletting, burnishing and incised diagonal motifs; one grey ware body sherd has stamped decoration (Fig. 16, P6). Sooting occurs predominantly on shell-tempered vessels, suggesting a preference for them as cooking vessels. One shelly vessel has post-firing holes drilled in the base and lower body.

Less prevalent vessel forms are folded beakers, plain- and ring-necked flagons, strainers, and amphorae. One of the latter is a stamped handle fragment from a Dressel 20 form (Fig. 16, P10). The stamp is probably part of a Callender n° 1573, SAX[VM FERREVM] (Callender 1965, 242 and fig. 16, nos. 24, 27–9 and 31–2), dated to *c*. AD 110–160 (R. Symonds, pers. comm.).

Samian ware (thirty-two sherds) is predominantly of Hadrianic to Antonine date and of central Gaulish origin, with two joining sherds from east Gaul, and two late 1st–early 2nd-century sherds which may be south Gaulish. Central Gaulish forms are a conical cup (form 33), dish (Curle 23), globular enclosed form (flagon or beaker), and bowls (forms 18/31 or 31 and form 31R). One of the latter is burnt, and has a swallowtail rivet slot. East Gaulish samian (probably from Rheinzabern) comprises two joining sherds from the base of a very thick dish with a step externally at the junction of the wall and floor, and a circle of crude rouletting on the interior, above the foot-ring. The form is a variant of Ludowici TgR, Tg and Tx (Oswald and Pryce 1920, pl. LX) dish and cup set.

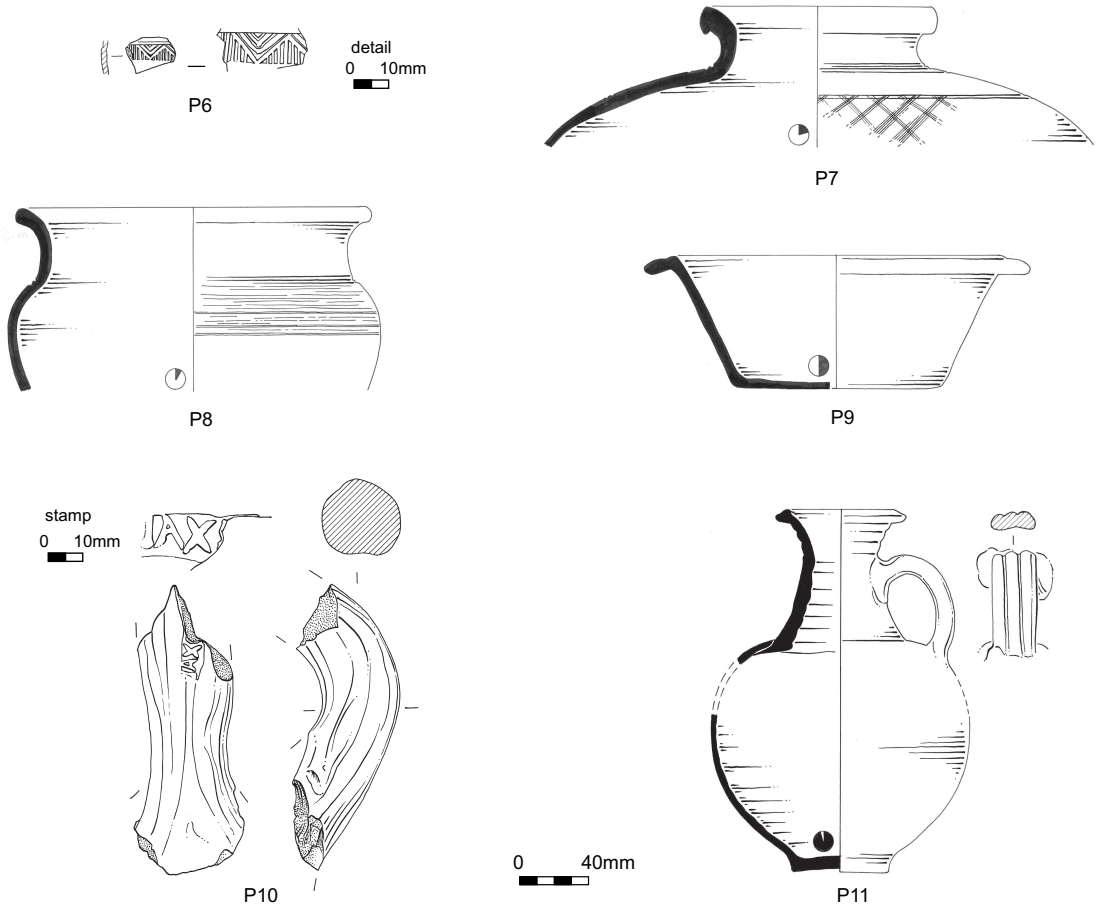

Figure 16: Selected pottery from Phase 3 deposits

G No.	Illustration No.	Ware	Comments
24.1	P6	R06C	stamped body sherd II\V/II
27	P7	R06C	burnished exterior; fire mark
27	P8	R06A	incised diagonal linear
27	P9	R06I	
28	P10	F06B	D1-4; wide-mouthed bowl; external soot; repair hole in neck
29	P11	R19A	stamped handle [-SAX-]; fine buff micaceous
29	P12	R18B	

Table 6: Illustrated pottery from Phase 3 deposits

The dish, Tg (Oswald and Pryce 1920, pl. LX, 1), shows the external step, but the junction of wall and floor here is more angular, as on the cup forms Ludowici. Ob and Tx (Oswald and Pryce 1920, pl. LX, 7, 8). The rouletted circle is sometimes present on the dish form, as here. The forms date to the late 2nd century and into the 3rd.

Saxon

Early to middle Saxon pottery (*c*. AD 450–850) constitutes approximately 5% of the assemblage from Phase 3. A total of 113 sherds (1.2kg) were recovered, representing seventy vessels. The pottery comprises hard-fired, undecorated wares in a range of quartz- (A16, A18, A26, A32), sandstone-

	G No.	Feature	Radiocarbon dates	Datable artefacts
Earliest	60	[5280]		
	53	[5304]		• 1 fragment Roman CBM
	53	[5294]		
	53	[5213]	Cal AD 460–650 / Cal AD 420–650	
	53.1	[5229]	Cal AD 690–970 / Cal AD 980–1170	
	53.1	[5215]		• AD 11th-century leather shoe RA466 • 2 sherds Roman pottery • 11 sherds Saxo-Norman pottery • 2 fragments Roman or Saxon/Saxo-Norman quern • 2 sherds medieval pottery
	53.1	[5288]		• 1 sherd Saxo-Norman pottery
Latest	53.1	Lining of [5288]	Cal AD 780–1020 / Cal AD 720–1030	

Cal: Calibrated radiocarbon date (95% confidence)

Table 7: Stratigraphic sequence and dating evidence for water-holes and wells G60/G53/G53.1

(A23), oolitic- (A24) and organic-rich fabrics (A01, A19), likely to be of local origin. A single sherd containing Mountsorrel granite from the vicinity of Charnwood Forest, Leicestershire was also identified (A25). Diagnostic forms constitute jars and bowls with either simple upright or everted rims. No bases survive. One sherd is decorated with a horizontal groove and finger impressions. The surfaces of most sherds are untreated apart from simple hand-wiping, although several are burnished.

Ceramic building material
Jackie Wells

Fourteen fragments of Roman brick and tile (1.3kg) in mostly shell-tempered fabric types were recovered, the majority from water-holes G28 and G29. The pieces have an average weight of 94g, and are generally water-worn and abraded. Diagnostic material comprises portions of eleven *tegulae*, and single fragments of brick and combed flue tile. The *tegulae* are 17–25mm thick, and one has a complete flange.

The fired clay assemblage, virtually all of it in an oxidised organic- and sand-tempered fabric, weighs 2.3kg, and derives mainly from water-hole G29. It includes portions of approximately eight handmade slabs of fired clay, which are 20–25mm thick and have finger-smoothed surfaces and edges. Pieces include fragments of perforated slabs or plates, which may have derived from ovens or similar structures; their recovery from water-hole G29 is the result of secondary deposition.

Animal bone
Stephanie Vann

Phase 3 deposits yielded an assemblage of 1,009 fragments of animal bone (including 126 recovered from soil samples), 768 of which could not be identified. A small part of the assemblage was burnt, but this material was spread widely across the site, with no concentrations.

The assemblage is dominated by the three major domestic species, cattle, sheep/goat, and pig (Fig. 11). Horse and dog are present, but in much lower numbers; however, thirty instances of canid gnawing also support the presence of dogs during this period. Bird, probably domestic fowl, is represented by a single bone. The infrequency of wild species such as red deer suggests that they were utilised only intermittently for meat and skins; deer bones are also relatively rare at other early Saxon sites such as West Stow, Suffolk, suggesting that hunting played only a limited role in subsistence patterns of the time (Crabtree 1989, 208).

Nineteen elements from the Phase 3 assemblage have unfused epiphyses; they derive from pig, sheep/goat, cattle, or large mammals comparable in size to cattle. The skeletal maturity data for cattle thus indicate the presence of sub-adult individuals, with several under two years of age at the

time of death, although others were potentially up to seven years old or more (Table 4). The data for sheep/goats indicate the presence of sub-adult to adult animals; there is no evidence for juveniles amongst the fusion data, even though their presence is attested by the tooth wear data from a single mandible. Pigs less than one year old were present, although there is also evidence from the skeletal maturity and tooth wear data for adult animals.

Biometric data was retrieved from twenty-one elements of the assemblage. Of these, four cattle bones permitted the calculation of the height at the withers, giving a range of 1.11–1.18m that is broadly comparable with the range from the late Iron Age to mid-Roman deposits.

Evidence of butchery was found on the remains of cattle, and on other large mammals of similar size. These cut and chop marks are most likely due to dismemberment of the carcass and marrow extraction (Binford 1981). The chop marks indicate the continued use of the cleaver, previously noted in the Phase 2 assemblage.

Molluscs
Alan Pipe

The molluscan assemblage is dominated numerically by freshwater snails, in particular the truly aquatic species, the button (or white-lipped) ram's-horn snail *Anisus leucostoma*; this occurred as thousands of juveniles and adults, particularly in water-hole G26. The only two shells in the whole assemblage of a ubiquitous aquatic species, common (or wandering) pond snail *Lymnaea peregra*, were also recovered from G26, while the dwarf pond snail *L. truncatula* was recovered in greater numbers, predominantly from the water-holes but also from ditch fill G24.1. All three freshwater species have the ability to tolerate seasonal desiccation, although this is particularly marked in *A. leucostoma* and *L. truncatula*. This, together with the absence of other aquatic species, including those known as their ecological associates — moss bladder snail *Aplexa hypnorum*, marsh pond snail *L. palustris* and the pea shell *Pisidium personatum* — may suggest that the water-holes did not contain permanent standing water, and were prone to some degree of seasonal desiccation.

The terrestrial assemblage comprises a snail group largely derived from species known to be common throughout lowland southern Britain, particularly in base-rich areas. The bulk of the assemblage comprises smooth (or beautiful) grass snail *Vallonia pulchella*, which is very much to be expected in moist, base-rich grassland; moderate numbers of *Columella edentula* were also recovered, with only occasional representation of *V. excentrica* and *Vertigo pygmaea*.

Plants
John Giorgi

The eleven analysed samples produced a total of 228 quantified charred items, consisting mainly of cereal remains: chaff fragments account for 56%; grains for 27%; and wild plant/weed seeds for 17%. The three samples from 6th-century water-hole [5213] (G53) yielded an almost entirely waterlogged assemblage; uncharred seeds were also recovered from a number of other features, but these are likely to be intrusive in all but water-holes G26 and G27, where they occurred in larger numbers.

Despite almost 70% of the cereal grains' being unidentifiable, fifteen wheat grains were positively identified, including a small number that represent hulled wheat, both emmer and spelt, and several free-threshing wheat grains. The presence of hulled wheat is confirmed by the 128 chaff fragments, mainly from spelt, with just one emmer glume base identified. Three barley grains (including one hulled grain) were also recovered, together with a single grain of oat. The thirty-nine charred wild plant/weed seeds that were identified represent a modest range of plants including scentless mayweed (*Tripleurospermum inodorum*), docks and stinking chamomile, plus leguminous seeds and grasses including brome and rye grass/fescue (*Lolium/Festuca* sp.). A charred fruit stone of sloe/blackthorn (*Prunus spinosa*) was found in water-hole G27.

The vast majority (92%) of the quantified charred remains from Phase 3 came from water-hole G29, albeit at an item density of only 3.5 per litre. Cereal remains make up the bulk of the 209 items, mainly chaff fragments (60%) and grains (23%); hulled wheat can be identified — primarily spelt, but including emmer — while the presence of barley is probable. There are also thirty-six charred wild plant/weed seeds. The bulk of these remains are from the de-husking of hulled wheat before storage or use; the chaff was often used as tinder, along with the weed seeds from crop-processing. The grains may have accidentally been

		Sample	486	485	484	476	475	473	474	472	471	470	469	468	467	466	465
		Phase	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4
		Group	53	53	53	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1
		Feature	5213	5213	5213	5288	5288	5288	5288	5288	5288	5215	5215	5215	5215	5215	5215
		Vol. processed (l)	10	10	10	20	5	5	10	5	5	20	5	5	5	5	5
		Vol. flot (ml)	8	5	5	30	25	110	50	30	40	5	2	8	5	8	4
Chara spp	stoneworts		++++	++++	+++	+++	+++	++	++	+++	++	+	+	+		+	+
Ranunculus acris/repens/bulbosus	buttercups		+	+			+	+	+	+	+						
R. subgen. *Batrachium* (DC) A Gray	crowfoots		+++	++++	++++	+	+	++	+++	+++	++++			+		++	+
Fumaria sp.	fumitory		+														
Urtica dioica L.	stinging nettle			++	+	++	++	++	+++	+++	+++	+	+	++	+++	++	++
U. urens L.	small nettle									+							
Corylus avellana L.	hazel nut shell								+								
Chenopodium spp.	goosefoot *etc*.		++	++	++	+	++	++	++++	+++	+++			+		++	+
Chenopodium album L.	fat hen			+		++	+	++	++	++	++					+	
C. rubrum/glaucum	red/glaucous goosefoot		++	+++	++		++	+	+++	+++	++					+	+
Atriplex spp.	orache		++	++	++	+	+	++	++++	+++	++			+	+	+	
Stellaria media (L.) Vill.	common chickweed								+			+		+	+	+	
Polygonum aviculare L.	knotgrass		+	+		+	+	++	++	++	++	+	+	+	+	+	
Rumex acetosella L.	sheep's sorrel			+													
Rumex crispus	dock tepals								+	+							
Rumex spp.	dock tepals								++	++	+						
Rumex spp.	dock		+	++	+	++	++	+++	++++	+++	+++			+	+		
Coronopus squamatus (Forssk.) Asch.	swine-cress		+	+	+				++	+	++				+		
Reseda luteola L.	dyer's rocket									+							
Rubus fruticosus/idaeus	blackberry/raspberry					+	+		+	+							
Potentilla spp.	cinquefoils								+								
Prunus spinosa L.	sloe/blackthorn					+			+								
Prunus spp	shell fragments																+
Rosaceae														+			
Linum cartaticum L.	fairy flax					+				+							
Conium maculatum L.	hemlock													+		+	+
Aethusa cynapium L.	fool's parsley					+	+	+	+	+							
Apiaceae indet.	-					+					+						
Apium spp.	marshworts															+	
Hyoscyamus niger L.	henbane								+					+		+	+
Solanum nigrum L.	black nightshade					+				+						+	
Mentha spp.	mints													+			
Anthemis cotula L.	stinking chamomile					+		+	++	++	++	+		+	+	+	

Chrysanthemum segetum L.	corn marigold				+											
Torilis spp.	hedge-parsleys				+	+	+		+							
Daucus carota L.	carrot			+	+		+	+	+							
Galeopsis tetrahit L.	common hemp nettle									+						
Lamaiceae indet.								+								
Plantago major L.	greater plantain									+						
Carduus/Cirsium spp.	thistles	+	+		++	+	+	+	++	++			+		+	
Alisma spp.	water-plantain	+														
Lapsana communis L.	nipplewort				+	++	+	+	+							
Leontodon spp.	hawkbit							+	+							
Sonchus asper (L.) Hill	spiny milk-/sow-thistle				+		++	+	+							
Sonchus spp.	milk-/sow-thistle				+		+	+	++	+						
Bidens cernua L.	nodding bur-marigold							+								
Bidens spp.	bur-marigolds						+	++								
Potamogeton spp.	pondweeds	+	++													
Zannichellia palustris L.	horned pondweed		+					+								
Lemna spp.	duckweed	++++	+++	++	+	+	+	+	++	++++			++		++	+
Juncus spp.	rushes	++	++	++	+	+		++	++	++	+	+			+	++
Eleocharis palustris/uniglumis	spike-rush	+	+							+						
Carex spp.	sedge	+	+			+	+	+	+	+	+	+	+			+
Cypercaeae indet.	sedges *etc*.						+									
Poaceae indet.	grasses		+	+	+	++	+	+	+	++		+		+	+	
indeterminate	-	+	+	+	+	+	+	+	+		+	+	+	+	+	+
indeterminate	bud fragments							+						+		
indeterminate	thorn fragments		+		+		+						+			
indeterminate	wood	+++	+++	++++	++++	++++	++++	++++	++++	++++	+++	+++	+++	+++	+++	+++
Bryophyta indet.	moss	+		+	+++	++++	++	+++	+++			+	++	++	+++	+

Key: + = 1–10 items; ++ = 11–50 items; +++ = 51– 250 items; ++++ = >250 items

Table 8: The waterlogged plant remains from G53/G53.1

burned during de-husking, or during other crop-processing or food preparation activities.

The waterlogged assemblage from water-hole [5213] (G53) is dominated by the remains of aquatic plants (Table 8): stoneworts (*Chara* spp.), which are freshwater algae; duckweeds (*Lemna* spp.), floating aquatic species very common in still and stagnant water; and crowfoots (*Ranunculus* subgen. *Batrachium*). Rushes (*Juncus* spp.) were also identified, along with occasional records of spike-rushes (Eleocharis palustris/uniglumis) and sedges (*Carex* spp.), and moderate seed numbers of another aquatic plant, pondweeds (*Potamogeton* spp.), species of which are submerged either permanently or almost permanently. Two other mainly aquatic plants were also recovered: horned pondweed (*Zannichellia palustris*), which is found in brackish and freshwater habitats; and water plantain (*Alisma* sp.). The remainder of the assemblage comprises a fairly wide range of plants that are mainly from disturbed (including cultivated) ground and waste places, although individual representation of these species is poor. Woodland/hedgerow species are absent.

The assemblage from G53 confirms the presence of standing water within the water-hole, albeit on a temporary or seasonal basis; this is further supported by the presence of very large amounts of Cladoceran ephippia. The good representation of stoneworts and duckweeds points to eutrophic conditions within the water-hole, which may have developed because of decaying plant matter, or possibly due to the presence of human or animal waste. The better represented disturbed/waste ground plants are indicative of nitrogen-rich soils; this may be a reflection of human or animal activity nearby, with enrichment possibly occurring through the excrement of livestock feeding at the water-hole or by the presence of dung heaps or refuse tips nearby.

The presence of standing (albeit perhaps temporary) bodies of water is also indicated within water-holes G26 and G27. Duckweeds were recovered in large numbers from both, while G26 also contained other aquatic species including crowfoots, horned pondweed, gypsy-wort (*Lycopus europaeus*) and sedges, as well as occasional instances of Cladoceran ephippia. The disturbed/waste ground plants from both indicate similar ground conditions around the water-holes to those surrounding G53.

Charcoal
Dana Challinor

The same seven taxa were positively identified as from the Phase 2 samples, with the addition of *Populus/Salix* (poplar/willow). Incomplete roundwood fragments are present in several of the samples. A large amount of charcoal recovered from water-hole G26 appears to be composed entirely of oak, including some large fragments of slow-grown trunk-wood. The charcoal is likely to represent spent fuel-wood debris, which was either dumped deliberately or, in the case of samples with only a few fragments, was blown in by the wind.

Pollen
Gill Cruise

Pollen samples were taken from water-hole G29 (Fig. 17). The pollen frequencies of trees and tall shrubs are slightly higher (12%) than they are from the Phase 4 wells, but this is probably due to the slightly larger catchment area of the water-hole than that of the wells, giving rise to slightly better representation of wind-pollinated, regionally-derived arboreal taxa (*e.g. Pinus, Salix*). *Pinus* is often over-represented in pollen diagrams, so is not considered to be significant here. A few spores of bracken (*Pteridium*) and a single record of heather (*Calluna*) are most likely to have derived from the heaths of the acid soils of the Greensand Ridge.

Much more locally, *Apium inundatum* t. (lesser marshwort) is a member of the Apiaceae (carrot family) that colonises muddy pond edges. Clumps of both grass pollen (Poaceae) and Chenopodiaceae suggest that these grew around the edges of the water-hole. While some Chenopodiaceae are weeds of nutrient-enriched, disturbed ground, others occur on periodically flooded, nitrogen-enriched, trampled ground at the edges of ponds where stock drink (*e.g.* Rodwell 2000, 321). Polygonaceae (knotweeds) are also frequent in such communities, and in such environments, some grasses may themselves be palatable and attractive to stock (*e.g.* Rodwell 1995, 153); it is possible that the iron-enriched organic matter in the cores from the water-hole G29 may well be relict dung. Other characteristics that are consistent with the presence of dung are the highest pollen concentrations and some of the best pollen preservation from the site, together with records of pasture-type pollen taxa (*Calluna*, *Lotus* t., *Onobrychis* t., *Stellaria* t., *Urtica pilulifera* t.) not

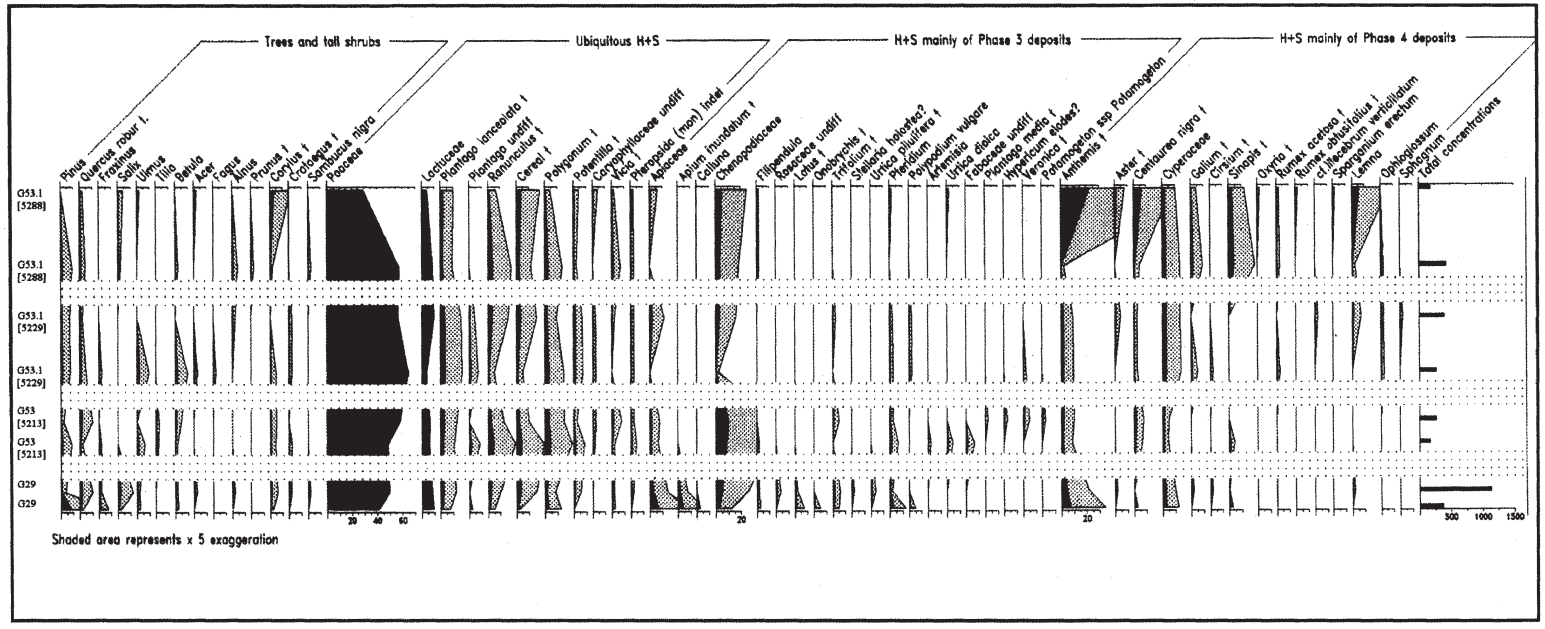

Figure 17: Pollen diagram

Laboratory code	Sample number	Material and context	Radiocarbon Age (BP)	$\delta^{13}C$ (‰)	Calibrated date (95% confidence)	Posterior Density Estimate (95% probability)
Beta-245426	WX1254-5267	*Prunus* sp, sail from well lining in [5288]	1130±60	–28.0	cal AD 720–1030	*cal AD 900–1020*
Beta-245427	WX1254-5277	*Corylus* sp, loose stake lying horizontal in lower part of [5288]	1030±40	–27.2	cal AD 890–1120	*cal AD 880–990*
Beta-245428	WX1254-5278	*Quercus* sp, sail from well lining in [5288]	1110±40	–25.7	cal AD 780–1020	*cal AD 900–1010*
Beta-245429	WX1254-5286	*Corylus* sp, piece from well [5229]	1190±40	–25.4	cal AD 690–970	*cal AD 690–900*
Beta-245430	WX1254-5287	Maloideae, from well [5229]	980±50	–26.6	cal AD 980–1170	
Beta-245431	WX1254-5302	*cf. Salix/Populus* from water-hole [5213]	1480±40	–27.5	cal AD 460–650	*cal AD 530–650*
Beta-245432	WX1254-5303	*Fraxinus* sp, from water-hole [5213]	1510±50	–26.9	cal AD 420–650	*cal AD 460–650*

Table 9: Radiocarbon results

recorded in any of the other samples, but which may derive from the dung of wide-ranging grazing stock.

Phase 4: mid-Saxon to Saxo-Norman

Hill Field remained in agricultural use throughout the later Saxon period into the 11th century, but with a reduced level of evidence for what activity took place there. Although the series of Roman to Saxon water-holes G60/G53 continued to be reworked, the only new features elsewhere that can confidently be dated to this period are five pits G34, two at the eastern end of the site and the other three to the west. Whereas the layout of the enclosures established in the late Iron Age was probably retained to a large extent in the late Roman and Saxon periods, it is unclear whether they were still extant in the late Saxon period, or whether the landscape had reverted to a more open aspect.

Contextual evidence

The sequence of water-holes G60/G53, which had been established during Phase 2 and remained in use throughout Phase 3, continued to be reworked (G53.1) during Phase 4 (Fig. 14; Table 7). Rather than continuing as a water-hole, however, the feature was converted into a well: [5229] was 2.8m deep and had a roughly circular central shaft that was 1m deep and about 2m in diameter. This in turn was re-cut by [5288], which was equally as deep but had a narrower shaft (Pl. 5). A wattle lining was subsequently inserted into [5288], narrowing the diameter of the shaft again (Pl. 6); radiocarbon dating suggests that the lining was inserted in the late 10th century. The dating for the whole sequence in G53/53.1 is discussed below.

A water-pit [5215] was identified as part of the sequence, centred slightly farther to the north and measuring 1m deep. Its precise extent in plan and its relationship with [5229] were unclear, but the pottery recovered from it suggests it was the later of the two. Unfortunately, the features' stratigraphic relationship could not be determined with confidence. The depth of the features meant that some of their upper extent was removed by machine to enable safe hand excavation of their lower halves, as had been done successfully with the other water-holes across the site; however, the complexity of G53/53.1 was not discernible until after the machine excavation, which meant that the features' upper portions had to be devised retrospectively.

Five other pits (G34) were spread across the site, the largest of which was 3.2m long, 2.45m wide and 0.9m deep (Fig. 12; Pl. 7). The other four

Plate 5: Phase 4 wattle-lined well [5288]. Scale 2m

Plate 6: Wattle lining in well [5288]. Scale 0.2m

Plate 7: Easternmost pit in G34, looking south-east. Scale 1m

Plate 8: Cattle skull in Phase 4 pit [4775]. Scale 0.25m

were 1.3–1.9m wide and 1.4–2.4m long, and ranged from 0.25m to 0.65m deep. One of these [4775] (Fig. 13, a) may have been used as a rubbish pit, judging by the relatively large amount of animal bone recovered from it, including a cattle skull (Pl. 8).

Dating sequence for water-holes and wells G53/53.1 (Phases 3–4)
Peter Marshall

The survival of waterlogged wood within water-holes and wells G53/53.1, some of it *in situ*, prompted the selection of seven samples for radiocarbon dating. The results are given in Table 9, along with calibrations relating the radiocarbon measurements directly to calendar dates, and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages (Stuiver and Polach 1977). All calibrations have been calculated using the calibration curve of Reimer *et al*. (2004) and the computer program OxCal v4.0.5 (Bronk Ramsey 1995; 1998; 2001; in press). The calibrated date ranges cited in the text are those for 95% confidence. The ranges quoted in italics are posterior density estimates, derived from mathematical modelling of the data. Ranges in plain type in Table 9 have been

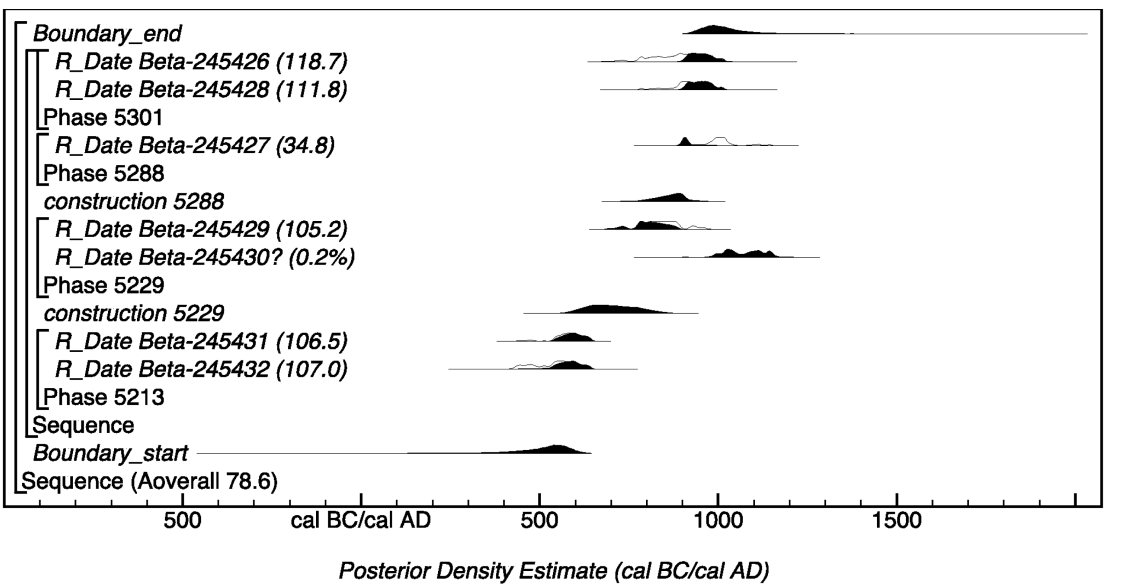

Figure 18: Probability distributions of dates. Two distributions have been plotted: one in outline, from simple radiocarbon calibration; and a solid one, based on the chronological model used. Distributions other than those relating to particular samples correspond to aspects of the model, *e.g*. 'construction 5288' is the estimated date for the construction of well [5288]. A question mark indicates that the result has been excluded from the model. The OxCal keywords and the brackets down the left hand side define the model exactly

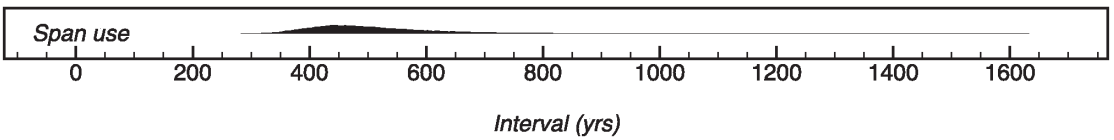

Figure 19: Probability distribution for the combined lifespan of the dated sequence of water-holes and wells in G53/G53.1

calculated according to the maximum intercept method (Stuiver and Reimer 1986); all other ranges are derived from the probability method (Stuiver and Reimer 1993). It should be emphasised that the posterior density estimates produced by this modelling are interpretative estimates and are not absolute: they will change as further data become available, and depend upon the perspective used to model the data.

A Bayesian approach was adopted to interpret the chronology from the wells and water-holes in G53/53.1 (Buck *et al*. 1996). This allowed the absolute dating information from the radiocarbon measurements to be combined with the stratigraphic relationships between the samples, in order to date the archaeological events rather than just the samples. The technique used was a form of Markov Chain Monte Carlo sampling, and was applied using the program OxCal v4.0.5 (http://c14.arch.ox.ac.uk/).

Material was selected from lining 5301 which was inserted in well [5288], since this was demonstrably contemporary with the feature from which it was recovered. Other samples with a less certain taphonomic origin comprised waterlogged wood taken from primary fills. Where possible, duplicate samples from these contexts were submitted to test the assumption that the material was of the same actual age. This allowed the analysis to demonstrate that, whereas the two samples from water-hole [5213] were statistically consistent and could therefore be of the same actual age, the two samples from well [5229] were not statistically consistent. For this reason, sample Beta-245430 from [5229] was excluded from the statistical model shown in Figure 18, since its date clearly showed that it was intrusive within the well.

The model in Figure 18 shows good agreement between the radiocarbon results and stratigraphic information ($A_{overall}$ = 78.6%). It provides an estimate for the construction of well [5229] of cal. AD 580–840 (95% probability) and probably cal. AD 620–780 (68% probability), and for the initial construction of well [5288] of cal. AD 760–960 (95% probability) and probably cal. AD 830–910 (68% probability). The span of use of the radiocarbon-dated features is estimated to be 320–770 years (95% probability; Fig. 19) and probably 380–580 years (68% probability); this is in addition to the three earlier phases of water-hole at the start of the sequence.

Non-ceramic artefacts

Holly Duncan and Quita Mould (leather)

Metalwork from the Phase 4 deposits is restricted to a group of up to eight nails (four with flat heads and four shank fragments) from the smallest pit in G34, plus a shoeing nail from the easternmost one. The shoeing nail has a T-shaped head, a type thought to represent very worn examples of 'fiddle-key' nails, dating to the 10th and 11th centuries (Ottaway 1992, 707; Clark, J. 1995, 85).

Four small, degraded fragments of lava (total weight 56.2g) were recovered from water-hole [5215] (G53.1); none retain diagnostic features, but it is presumed they originally derived from a quern. The importation of lava querns in this region began *c*. AD 50 and continued into the 17th century, but with an apparent hiatus in the earlier Saxon period, importation recommencing in the 8th century (King 1986, 95). Due to the condition of the lava fragments, it is impossible to say whether they represent Roman or late Saxon/Saxo-Norman querns.

At least fourteen small fragments of delaminated bovine leather were recovered from well [5288]; the fragments lack any diagnostic features, but the thickness and wear suggest they were broken from a shoe upper. Adjacent water-hole [5215] also yielded part of an upper that had deliberately been cut away from a heavily worn shoe of sheep/goatskin, presumably to salvage any reusable leather before it was thrown away (Fig. 20). This suggests that the community was actively collecting leather from unwanted items in order to repair or refurbish other leather objects. The remains of the shoe upper have a curved seam sewn with whip stitching, and a line of sixteen

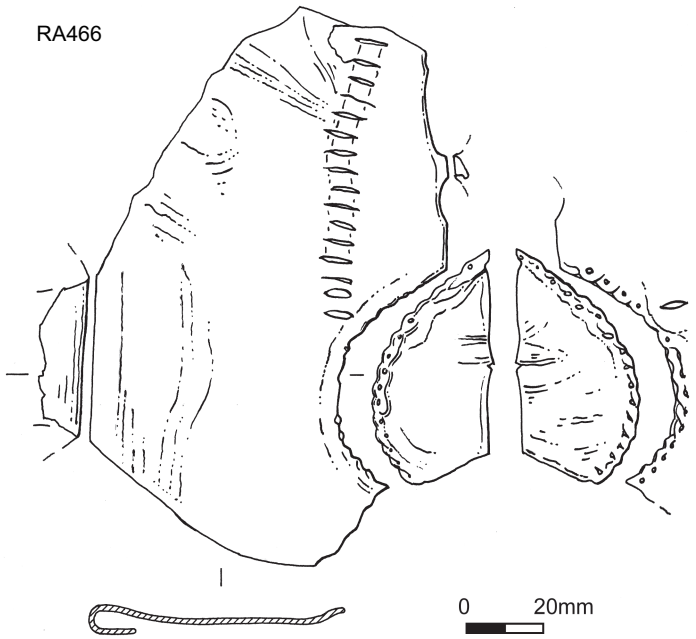

Figure 20: Leather shoe from water-hole [5215]

closely-spaced thong slots. The majority of the slots are pulled and have been used, though at least two are closed and have not had a thong passed through them. The impression of a thong or drawstring is present on the grain side of the leather.

Ankle shoes with closely-spaced thong slots of this general type form a distinctive group of footwear found in this country and other parts of north-west Europe, principally in 11th-century contexts (Mould *et al*. 2003, 3296). While many of these shoes have a line of closely-spaced slots for a drawstring-fastening running around the top of the ankle opening, others, such as the Hill Field shoe, have the row of slots running some distance below the top edge. These shoes, extending just above the ankle in height, have a characteristic concave seamed throat, often with a separate insert piece at the throat, a feature seen on this example. Shoes of this style have been found in late 11th-century contexts in London (Pritchard 1991, 224–6, 3.109 no. 288, 3.111 no. 296), although a well preserved example from New Fresh Wharf had constructional features which quickly fell out of fashion in this country following the Norman conquest, perhaps indicating that the London examples were at least a generation old when thrown away, or were slightly residual (Pritchard 1991, 224–6, 3.111 no. 296).

Ceramics
Jackie Wells

The Phase 4 assemblage comprises 144 sherds (886g), representing 100 vessels, with the majority deriving from pits G34. The fragmentary nature of the assemblage is demonstrated by its low average sherd weight of 6g, and the fact that few vessels are represented by more than single sherds. Saxon pottery (39g) comprises four undiagnostic sherds (fabric types A16, A23 and A24) from G34. Eighty sherds, representing forty-three vessels (462g), are datable to the Saxo-Norman period (*c*. AD 850–1150). They comprise shell-tempered, wheel-thrown vessels in the St Neots-ware tradition (fabric B01) and its variants (types B01A/B/C). Vessel forms are bowls with inturned and simple upright rims, everted rim jars, and single examples of a spouted vessel and 'top hat' jar. Residual late Iron Age/early Roman pottery (fifty sherds, weighing 380g) constitutes the remainder of the assemblage.

A single piece (1,680g) of vitrified clay was recovered from the deposit in the top of the depression that had been formed by G53.1. Almost certainly residual, it is thought to be the remains of a kiln or oven structure, although no such structure was found during excavation.

Wood

Damian Goodburn, with contribution by Dana Challinor

Lining of well [5288] (G53.1)

The stakes from the lining inserted into well [5288] measured *c*. 32–50mm in diameter and were mostly well preserved. Their ends had been formed into points by an edged tool that was at least *c*. 60mm wide, with some of the chisel-form points showing deep and rough cuts that suggest forceful, hurried work, with no trimming afterwards; a general-purpose, narrow-bladed woodman's axe (Wheeler type 1; Wheeler 1927, 22) or possibly a small hatchet was probably used. These narrow axes are well evidenced from a number of sites in London and elsewhere, including on the timber tank found at Haynes Park in Bedfordshire (Goodburn 1992, 108; Gale and Darrah 2004, 111), and most households are likely to have had such a tool. A deep 'L' shaped mark on one of the larger ones (Fig. 21, 5265), caused by the corner of a fairly square-ended axe, reveals that the woodworkers had used an axe for felling and trimming the stems used for these stakes, rather than the heavy billhook typically used by modern woodsmen.

Fourteen of the stakes from the well lining and those that had fallen in were of the chisel shape with one broad facet; one was formed of two adjacent facets; three were formed with three facets; and three had four facets forming a square-section point. The predominance of simple chisel-form points shows that the ground was relatively soft, so that fairly blunt points could be driven into it.

The hazel and ash rods used for weaving around the stakes were very regular, free from large side branchlets and of less than 20mm diameter. The form suggests that they were of coppiced or pollarded origin, although other characteristics, *e.g.* their age (up to 7–8 years), are atypical of such an origin — modern coppiced or pollarded ash or hazel taken from moderately open, managed areas would be expected to reach up to three times that maximum diameter. The stakes were far more varied in size and form, and probably represent branches selected from larger trees or saplings. They were of several species and ages: in the case of the well lining, thirteen of the twenty-two sampled stakes were of oak (4–22 annual rings), two were of prunus (15–26 annual rings), and the rest were hazel or willow/poplar (see Fig. 22). The age, species, and kinkiness of the oak and prunus stakes are most indicative of a branch origin — stockpiled leftovers from lopping larger trees used for other purposes — whereas the hazel and ash may have been coppiced or pollarded from stems that were growing in a more open setting.

With too little space to weave the lining *in situ*, the conical lining must have been woven at ground level, with the stakes driven into the ground in a circle at *c*. 150–200mm centres, many of them paired, as is typical of so much Saxon wattle-work. The stakes would have had to be driven in at an outward-sloping angle to form the cone, which was *c*. 0.6m wide at its base and expanded to *c*. 0.9m diameter as it survived, with a total surviving depth of 0.6m. The rods would then have been woven round them in what appears to have been a straightforward in-and-out weave. The roundwood used for this lining could not have lasted at the upper levels for more than about three years before repairs would have had to be woven in. The well may have been used by a nearby peasant family who did not have the resources to make a lining of solid oak which would have lasted for decades, or who only lived there on a temporary basis while carrying out a seasonal or specialist activity, and did not feel that a more durable lining was worth the expenditure.

Other worked wood

A stake-like piece of hazel round-wood (Fig. 21, 5277) was found lying horizontally in the lower part of well [5288], measuring 0.657m long with a maximum diameter of 27mm. One end had been whittled roughly straight across, whilst the other had been very gently cross-cut with repeated blows from a small hatchet or possibly a knife, in order to form a point. Close to this end, the rod had been very carefully shaved round with a tool, possibly a spoke shave or small, fine-bladed draw knife, which left elongated flat facets, 3–5mm wide, running along the grain. The length of rod was probably an off-cut from making a fine shaft such as might be needed for a throwing spear or similar tool. A similar cleft section of hazel pole, 0.245m long, was recovered from well [5229], the precursor to [5288]. It had been left untrimmed at one end, measuring 44mm by 23mm, but was trimmed down to a roughly round section *c*. 23mm in diameter at the other. This item could also have been an off-cut from a long, round shaft, but might also have been an off-cut from making something like a rake tine or even some form of wooden peg or treenail.

An ash woodchip was recovered from waterhole [5215]. It had been hewn from a parent log at

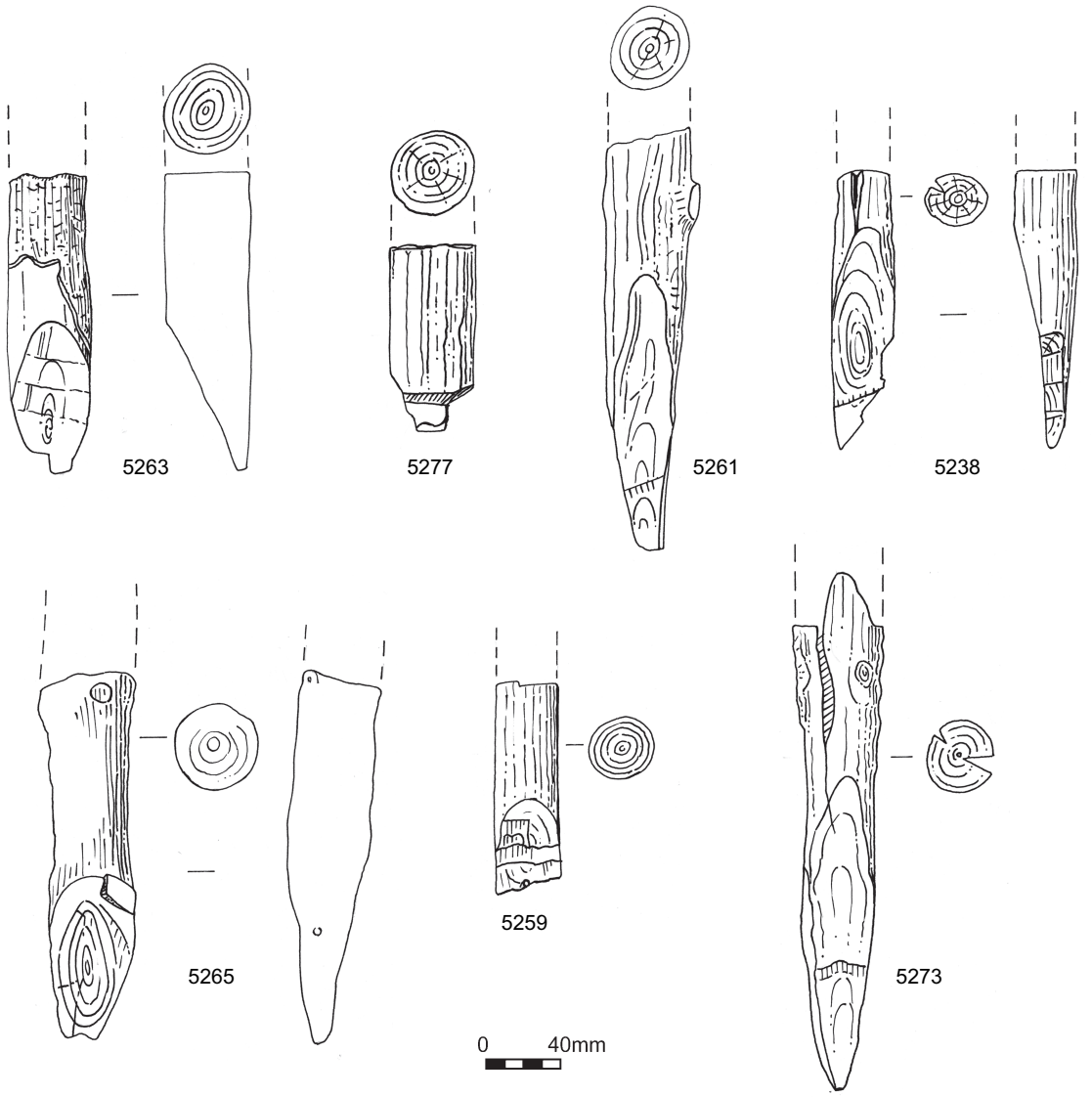

Figure 21: Worked wood from well [5288]. 5277 was found in the base of the well; the others are from the lining

least 150mm in diameter, the largest parent tree evidenced in the whole assemblage. Ash logs of this size could have been used for constructional purposes.

Animal bone
Stephanie Vann

Phase 4 deposits yielded an assemblage of 364 fragments of animal bone, 236 of which (including all thirty-nine recovered from soil samples) could not be identified. Cattle again predominate; however, pig remains are also significant, being present in greater frequency than sheep/goat (Fig. 11). Horse and bird (most likely domestic fowl) are represented by individual elements. There are no wild taxa or dogs in the assemblage, although a single instance of canid gnawing from G34 indicates the presence of dogs at the site on at least one occasion. Two of the large mammal bones in the

assemblage display cut and chop marks, which are most likely due to dismemberment of the carcass (Binford 1981).

The skeletal maturity data for cattle indicate the presence of immature individuals, with several individuals under eighteen months old at the time of death, although other individuals were older (Table 4). This is compatible with the ageing data based upon tooth wear, which also indicate the presence of individuals ranging from immature to sub-adult; other mid- to late Saxon sites, such as Chopdike Grove in Lincolnshire, show similarly high frequencies of sub-adult cattle (Baker 2002, 5). The data for sheep/goat also indicate the presence of juvenile individuals within the assemblage, possibly under ten months old; the remains of juvenile sheep of a similar age were also recovered from the Saxo-Norman deposits at Ingleborough, Norfolk, (Baker 2002, 7). Fusing data suggests that some of the pigs at Hill Field were less than a year old at the time of death, though others may have been older — ageing data based upon tooth wear also indicate the presence of adult animals.

Plants
John Giorgi

The charred plant remains from Phase 4 were nearly all concentrated in the eastern two pits in G34, which produced 171 quantified charred plant items, with cereal grains accounting for 70% of them, along with twenty-three weed seeds. Almost 60% of the grains are unidentifiable, however, although small numbers of wheat grains could be identified, including free-threshing wheat and barley, with one hulled grain of the latter. The twenty-three weed seeds include stinking chamomile, leguminous seeds (vetch/tare (*Vicia/Lathyrus* spp.) and medick/clovers (*Medicago/Trifolium* spp.)), and grasses (rye-grass, brome, meadow grass (*Poa* spp.)).

The samples from the wells and water-hole in G53.1 yielded rich assemblages of waterlogged plant remains (Table 8). Those from water-hole [5215] consist mainly of low numbers of seeds from wetland (including aquatic) species, with slightly better representation of plants from disturbed (including cultivated) ground and waste places. These waterlogged remains suggest the presence of standing water within the water-hole, albeit perhaps on just a seasonal or temporary basis. Fairly large numbers of Cladoceran ephippia in all five flots further attest to the presence of aquatic conditions. A wide range of the disturbed/waste ground plants in the samples, including stinging nettle (*Urtica dioica*), goosefoots (*Chenopodium* spp.), oraches (*Atriplex* spp.), chickweeds (*Stellaria media*), henbane (*Hyoscyamus niger*), and black nightshade (*Solanum nigrum*), all point to the presence of nitrogen-rich soils in the immediate vicinity of the water-hole. The presence of a few seeds of stonewort and duckweed may tentatively suggest eutrophic conditions within the water-hole. This may be a reflection of human or animal activity nearby, perhaps indicating the water-hole's use by livestock and/or the possible presence of refuse deposits nearby. There is very little evidence to suggest a wooded/shady environment in the vicinity of the water-hole, thus suggesting a fairly open habitat.

The samples from well [5288] produced very rich botanical assemblages, similar in composition to those from [5215] but with larger numbers of seeds and fruits and generally high species diversity. Three aquatic plants — stoneworts, duckweeds and crowfoots — are well represented, while other wetland species such as sedges and rushes appear only in small numbers. There are occasional seeds of other wetland species such as horned pondweed and bur-marigolds (*Bidens* spp.). A very wide range of other plants are represented, with the majority coming from disturbed (including cultivated) ground and waste places. Stinging nettle is well represented, along with *Chenopodium* species, oraches, knotgrass and various docks. Some of the disturbed/waste ground plants often grow as arable weeds, including stinking chamomile, prickly sow-thistle (*Sonchus asper*) and fool's parsley (*Aethusa cynapium*). There is also tentative evidence for woodland or hedgerow vegetation, with occasional records for blackberry/raspberry (*Rubus fruticosus/idaeus*) and sloe/blackthorn, plus occasional hazel nut (*Corylus avellana*) shell fragments. These remains may, however, simply represent food residues of wild fruits collected elsewhere.

The botanical assemblage from well [5288] points to the presence of standing water within the well, again supported by large numbers of Cladoceran ephippia. The environment around the well appears to have been similar to that surrounding [5215], with the good representation of stoneworts and duckweeds providing more conclusive evidence for eutrophic conditions within the well. There is again not much evidence to suggest a

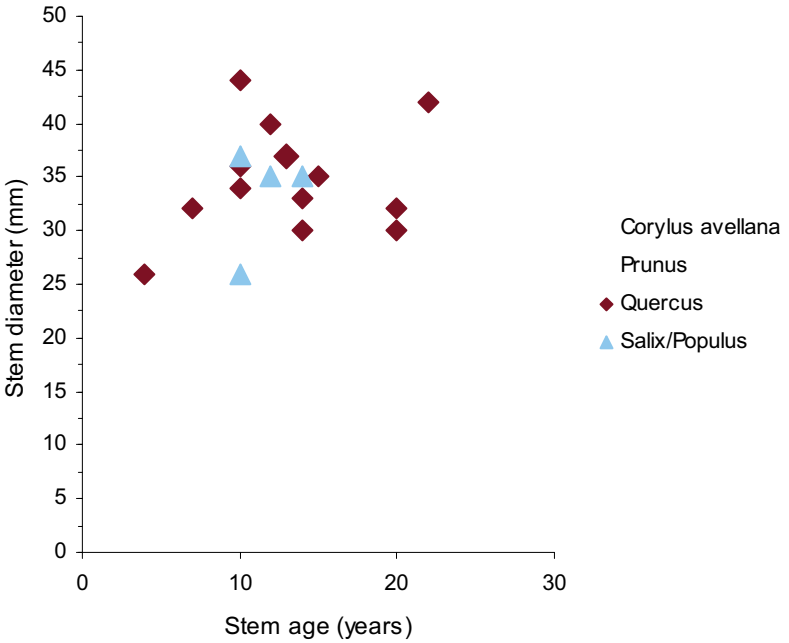

Figure 22: Sail chart showing the age, diameter and species of the stakes used in the lining of well [5288]

wooded or shady environment nearby; the fruits of the few woodland or hedgerow plants identified are potential wild food resources, and may have been collected off-site.

Pollen
Gill Cruise

Well [5229] (G53.1) contained clumps of grass pollen, suggesting the presence of grassy vegetation right up to and possibly within the well itself (Fig. 17). It also contained *Ophioglossum* (adder-stongue), a small fern associated with old, species-rich pastures and meadows (Rodwell 1992, 65) which is found in moist grassy places and is much favoured by cattle (Dony, 1953). Slight increases in Cyperaceae pollen are also consistent with the presence of damp grassland. The records of arboreal taxa are interesting, but it is impossible to say whether they indicate an increase in distant hedgerows or copses (*Ulmus, Acer, Fagus*), regeneration on distant sandy soils (*Betula*), or woody material imported on to the site for woodworking close to the well.

The best pollen preservation came from well [5288], and shows a slight increase in *Corylus* t., with enhanced frequencies for herbaceous taxa Asteraceae, *Centaurea nigra* t. (knapweed), *Galium* t., *Sinapis* t., and the aquatic *Lemna* (duckweed). The uppermost sample is noteworthy by having several clumps of pollen of *Anthemis* t. (chamomile, yarrow, oxeye daisy *etc*.), *Centaurea nigra* t. and *Lemna* — the presence of clumps indicates a very local presence for these plants. The assemblage suggests a weedy and herb-rich grassy environment consisting of a patchwork of trampled and disturbed, moist soils, with some nutrient enrichment. The marked difference in the pollen spectra from this core may have been caused by the introduction of at least some pollen in dung. Again, it is difficult to know whether the slight increase in hazel pollen (*Corylus* t.) is due to an increase in managed hedgerows or copses, or to importation of hazel on to the site for woodworking close to the well.

PHASE 5: MEDIEVAL / POST-MEDIEVAL

Evidence for activity at Hill Field in the medieval/post-medieval period is confined to the remnants of ridge and furrow cultivation G57 (Fig. 23). The ones aligned NE–SW were spaced at intervals of *c*. 8m, as were most of the eastern group aligned

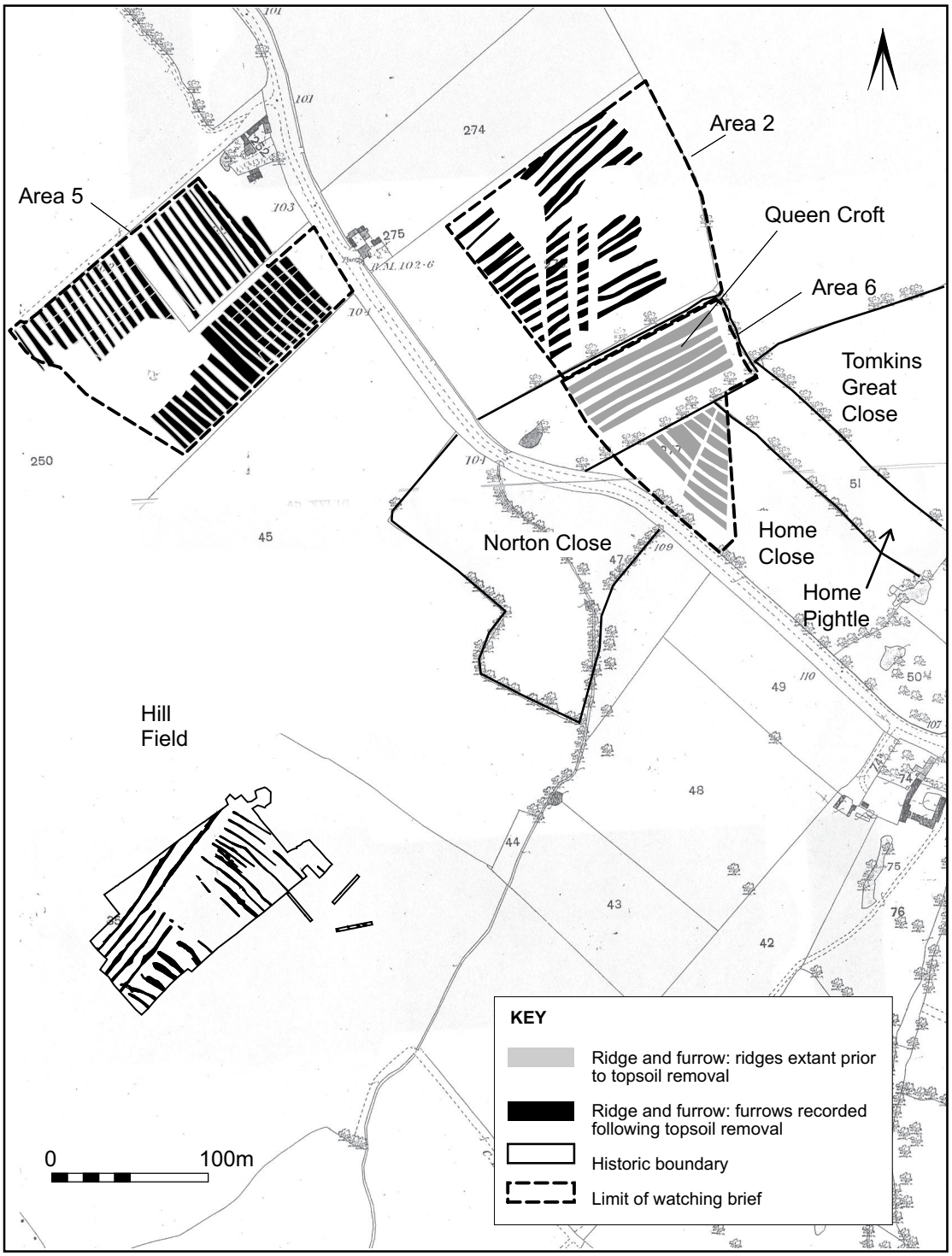

Figure 23: Plan of furrows recorded at Hill Field and in Areas 2, 5, 6 and 9

NW–SE; variations in the latter are likely to have resulted from different episodes of ploughing. The set of furrows aligned NW–SE at the western end of the site were spaced at more irregular intervals, with no apparent standard. There was no indication of overlap between the two alignments; this suggests that they were contemporary, from which it can be inferred that the land was split into at least two separate fields. No artefactual evidence was recovered to help determine when the ridge and furrow was established, but the close correlation in position and alignment between the furrows and the 19th-century ceramic land drains suggests that they at least maintained a significant presence as earthworks until recent times.

Non-ceramic artefacts
Holly Duncan and Peter Guest

A wide variety of non-ceramic artefacts, covering an equally wide date range, were recovered from the fills of plough furrows and the overlying subsoil. The assemblage includes livery/blazer buttons from the 17th to 19th centuries, carbine or pistol balls from the 17th century, fencing wire, and an angled strut from a cast copper alloy skillet of late medieval or earlier post-medieval date. In addition, five Roman coins were also recovered. Two of these mirror the date of the stratified assemblage from Phases 2 and 3, but there are also coins of the later 3rd century present, which are the only indications from the non-ceramic assemblage of activity during the late 3rd and early 4th centuries.

DISCUSSION

Excavation at Hill Field revealed the remains of an enclosed farmstead, which was established in the late Iron Age and survived into the first half of the Roman period. Although subsequent evidence for occupation is more limited, the site appeared to remain in use as a series of stock enclosures, with the creation of a number of water-holes, before being turned over to arable cultivation in the medieval period.

The following discussion considers the layout, development and socio-economic status of the farmstead; how the land was subsequently employed; evidence for change or continuity in the environment; and signs of ritual significance in what was found. For ease of description, the report has so far been broken down into five chronological phases of activity. However, the following discussion addresses the site as a whole, in order to recognise the essential fluidity and continuity that existed in the use of Hill Field throughout the first millennium AD.

Settlement morphology and chronology

The earliest evidence for human activity at Hill Field comes from a single pit dating to the early Iron Age (Phase 1). In addition, three residual sherds of similarly dated pottery were recovered from other features across the site. With a complete absence of struck flint amongst the finds assemblage, there is no indication that Hill Field was substantially used before the late Iron Age farmstead was established. The pit may have been associated with sporadic activities in the clay vale that were peripheral to the major prehistoric settlement and farming areas on the river gravels to the north. The sporadic nature of the activities is further evidenced by the lack of any middle Iron Age remains at Hill Field.

Dating evidence relating to the farmstead is, unfortunately, rather imprecise. Indeed, the assertion that it was created in the late Iron Age may even be erroneous, relying as it does on the date of the ceramic assemblage: the use of late 'Belgic' Iron Age wares is known in some instances to have extended into the early 2nd century (*cf.* Stagsden, Dawson 2000; Biddenham Loop, Luke 2008). There is certainly nothing to suggest that the farmstead was established before the 1st century AD, which is when the adoption of 'Belgic' pottery forms is thought to have become widespread (Hill 2002). It is clear from the quantity of late Iron Age wares recovered that there was domestic occupation of the site in the 1st century AD (Fig. 10); however, the amount of Roman pottery that could be assigned no more than a broad date makes it difficult to establish when domestic activity was at its greatest during the Roman period.

As far as can be told from the ceramic dating evidence, the three enclosures and associated subsidiary enclosure and drove-way that constituted the enclosed element of the farmstead at its greatest extent (Phase 2) were established at an early stage in its development. The precise sequence is hard to detect due to the repeated cleaning out or re-cutting of ditches — a ditch in its original stage of construction is rarely distinguishable from one

that has been re-cut in such a way that all trace of its previous form has been destroyed. It is unusual for re-cuts to follow the line of their predecessors so closely, and this may be an indication that the ditches were accompanied by hedgerows from an early stage, which closely defined their course thereafter. Ditch G9 in the area of the western enclosure (Fig. 4) is the only one that was incompatible with the subsequent layout of the farmstead, indicating that it belonged to an initial, poorly defined phase of enclosure. The absence of samian and regionally imported pottery from the initial layout of the central enclosure suggests that this may have predated its neighbours, but this may instead be the result of a lesser degree of recutting of these ditches. However, the concentration of late Iron Age pottery from the central enclosure (Fig. 10) does at least suggest a focus of domestic activity there during the initial phase of the farmstead.

No substantial evidence was found for differentiation in use between the three enclosures, although the possibility that they were used for different types of livestock is discussed below. However, the eastern enclosure (L4) does appear to have had a more domestic function: it was the only one to yield fragments of mortaria, and also contained the largest (albeit still fairly small) assemblage of non-ceramic artefacts, including a silver La Tene III or Knotenfibeln variant brooch (Fig. 8, RA433). The eastern enclosure also contained the most likely candidates (G7 and G25) for the remains of domestic buildings (Fig. 5), with fragments of quern stone recovered from the vicinity of both. The three L-shaped shaped features (G46) in the western enclosure (Fig. 4) may also have been associated with buildings, but they were less substantial, and perhaps represent the remains of agricultural buildings. The structural features in the western corner of the same enclosure were even more ephemeral, and, like G48 in the eastern enclosure, were perhaps associated with animal pens. The assemblage of non-ceramic artefacts shows scant evidence for the presence of structures on the site as a whole: little was recovered in the way of building fastenings, fittings or furnishings; and the few nails that were found were dispersed widely across the site.

Although cleaning out and re-cutting of the ditches seems to have ceased in the mid-Roman period, the layout of the enclosures was probably maintained into the Saxon period (Phase 3), with the boundaries marked solely or primarily by hedges. The presence of hedgerow-type taxa in the charred plant assemblage supports this. At the least, it can be assumed that the majority of the ditches continued to exist as earthworks; the close spatial correlation between the ditches and the water-holes that were dug in the Roman period means that, even if the ditches were no longer respected as boundaries, they would still have been useful for draining groundwater into the water-holes (Williamson 2006, 170). It is unlikely that the site was occupied in the late Roman to mid-Saxon period on anything other than a temporary basis; G31 (Fig. 12) possibly represents the remains of a sunken featured building, albeit an exceptionally small one, but there are no other indications of permanent or lengthy habitation from the contextual record or the artefact assemblages. Small amounts of Saxon pottery were recovered from across the site (Table 5), and three coins from the subsoil are late Roman, but none of the other artefacts can typologically be dated to either period.

There is equally little artefactual support for permanent occupation in the late Saxon to Saxo-Norman period (Phase 4), although there may have been temporary or seasonal occupation. In addition to five pits that were spread across the site, a sequence of water-holes that had been established in the early to mid-Roman period (G60) continued to be maintained and re-cut (G53), before being transformed into a well (G53.1). This well in turn was re-cut, and then had a wattle lining inserted into it. The change from water-hole to well suggests a shift from animals to humans as its primary user. The wood used to construct the lining would probably have needed to be replaced about every three years: this suggests either that the people who constructed the well could not afford, or did not have access to, a more durable material such as oak; or that the activities for which the well was used did not warrant greater expenditure of time and resources. It is reasonable to assume that the people who used the well lived nearby, in easy reach of it, even if not within the excavated area at Hill Field; the presence of the cut-up shoe (Fig. 20) in the wattle-lined well also supports the presence of domestic activity nearby. The lack of structural remains and paucity of domestic artefacts recovered from the vicinity of the well suggest that occupation here was only on a temporary basis, perhaps to undertake a seasonal activity for which this location near the top of the hill was particularly suitable.

The sequence of water-holes and wells was used over an exceptionally long period of time. Statistical modelling of radiocarbon dates indicates that the sampled part of the sequence is likely to have spanned a period of 380–580 years (Fig. 19), with an end date in the 11th century, yet the earliest sampled feature (dated to the 6th century) was at least the third re-cut of the original water-hole G60, which is thought to have been dug in the early to mid-Roman period. The evidence for this is slight, but the short north-eastward spur of ditch G15 from the nearby corner of the eastern enclosure strongly suggests the presence of a contemporaneous water-hole into which it drained. This implies a span potentially of 900 years — broadly comparable sequences are known from other sites, *e.g.* the 500 year Bronze Age sequence at Swalecliffe, Kent (Masefield *et al.* 2003), but such a lengthy span is still far from usual. It is impossible to tell whether the features were in use continuously, yet the repeated use of this location suggests no significant break of activity in the sequence.

As with most rural sites in Bedfordshire, ridge and furrow cultivation was adopted in the medieval period (Phase 5); the remains of it are widespread in the vicinity of Hill Field (Fig. 23). It is rarely possible to date its formation within the confines of an archaeological excavation; however, changes in the weed flora recorded in pollen samples from the wattle-lined well might be an indication of an increase in, or closer proximity to, arable soils. This suggests a possible date in the 9th or 10th century for the adoption of ridge and furrow cultivation around Hill Field, although the palynological evidence is only tentative. However, the continued use of the well in the 11th century and the occasional presence of similarly-dated pits across the site suggest that ridge and furrow was not established on the upper part of the hill until later, perhaps during the 12th- to 13th-century high-water mark for arable cultivation. The establishment of ridge and furrow at Luton Road, Wilstead is also believed to date to the 12th–13th centuries (Luke and Preece 2010).

Layout of the enclosures in relation to stock control

The layout of a farmstead concerned primarily with pastoralism was particularly important, and often complex, due to the need to control the movement of livestock. Much analysis has been carried out in recent years into how the layout of field-systems and enclosures relates to the management of livestock, particularly following the efforts of Francis Pryor with regard to the interpretation of Bronze Age drove-ways and enclosure/corralling systems at Fengate (*e.g.* Pryor 1999, 100–5). Pryor argues that the ditches identified on archaeological sites must have been associated with hedges to work as stock control features, and this is also assumed for the following text. Hedgerow taxa are certainly present in the botanical assemblage from Hill Field, and it is clear that some of the boundaries by the late Roman period were marked primarily by hedges, their ditches having largely silted up. Evidence for batching, inspection and sorting of livestock is now increasingly recognised across all archaeological periods in Britain, and evidence for stock holding, manipulation and droving can be seen in the layout of the Hill Field farmstead. The following text, in combination with Figure 24, attempts to put interpretive flesh on the skeletal ditch layout, in order to consider how, in combination with associated barriers such as hedges or hurdles, the system may have functioned.

One aspect of a pastoral as opposed to arable landscape is that entrances into and out of enclosures/fields are usually *via* corners, as it is much easier to funnel herds or flocks into them (Pryor 1999, 101). The south-eastern opening in the central enclosure is a good example of such an exit; conversely, however, it could not easily have been used as an entrance for livestock without the use of hurdles, being central to a long length of a flat boundary. A more practical entrance would have been at the western end of this boundary, where it intersected with the western enclosure; the angle of the two ditches would have created a funnel, thus enabling stock to be directed into the western enclosure and through to the central one from the fields to the south. The existence of an entrance at this location is only theoretical — a later water-hole removed all evidence of whether such an opening may have existed — yet the apparently exit-orientated nature of the south-west corner of the western enclosure suggests that it was entered primarily from another point.

Interpretation of the western enclosure's complex arrangement of internal ditches is clouded by the question of contemporaneity. It is unlikely that all the ditches were created in a single event. However, it is plausible that all the boundaries represented by them came to be in use at the same time, creating the means by which the movement of animals could be manipulated. The two long,

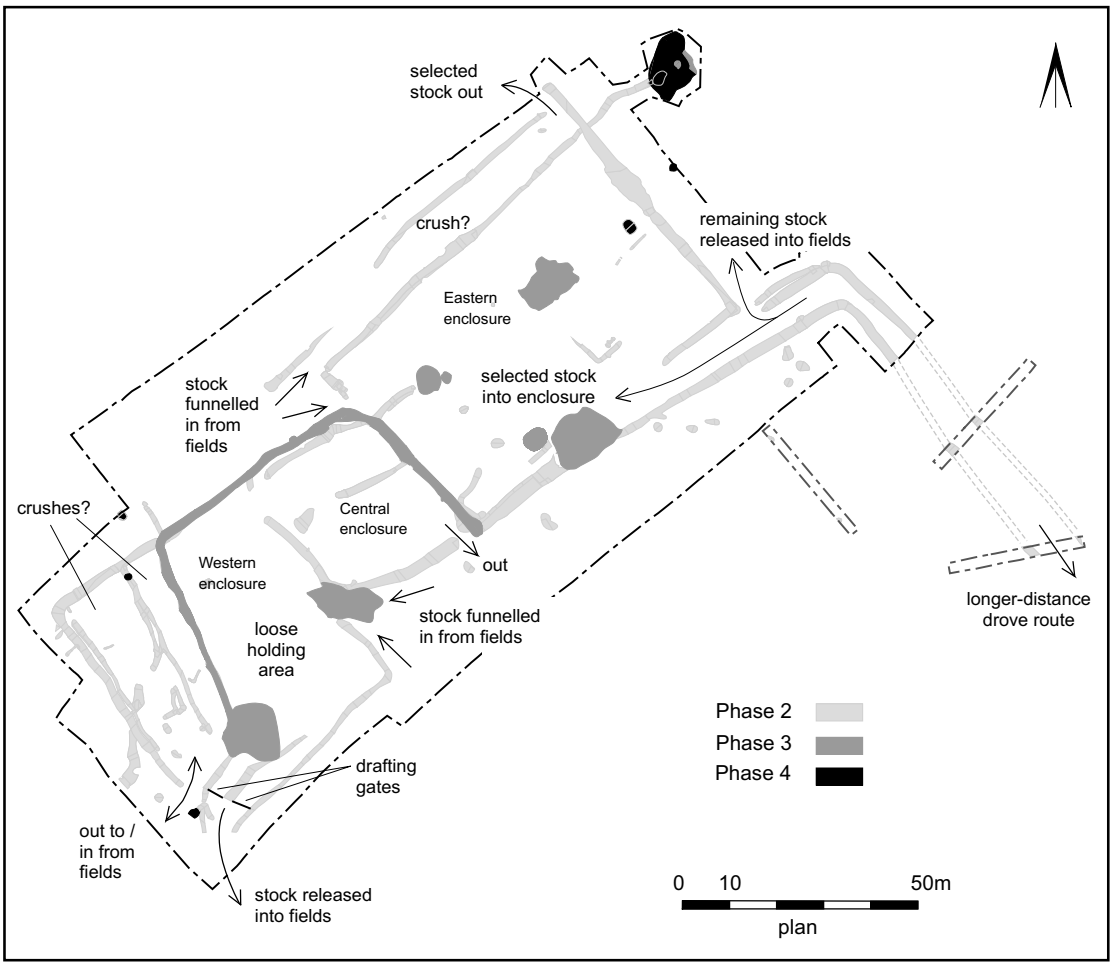

Figure 24: Hypothetical patterns of stock movement

narrow internal divisions in the western half of the enclosure could have been used as a 'crush' for the close confinement of livestock, for example; modern flocks or herds are routinely compressed into a restricted space in order to reduce their ability to bolt when being inspected (*e.g.* for signs of disease or pregnancy). Alternatively, this elongated layout may have been designed for ease of inspection from the sides of the sub-enclosure without necessarily needing to enter it. The eastern half of the enclosure may have been used for general loose corralling of the animals overnight and possibly during winter, at which times their diet could be supplemented with hay and/or silage. Keeping them in enclosed spaces would also have facilitated the collection of animal dung for spreading on to arable land.

The three main subdivisions of this enclosure may also, or alternatively, have been used to hold different species, or as separate areas for the temporary subdivision of stock of the same species, for example ahead of selective culling or separating stock to be taken to market. The means by which stock could be separated off would probably have been *via* the narrow corner exits out of the enclosure. The funnel effect of the layout would have meant that stock were potentially forced into something approaching single file as they passed through the narrow gap towards the external pastures. A farmer or shepherd in control of the (hypothetical) drafting gate could in theory at that point grab or redirect any stock that needed to be separated out (*e.g.* rams from ewes or ewes from lambs), allowing the remainder through into the

field beyond. The selected stock could potentially have been returned *via* one of the other two entrance gaps (using mobile hurdles as required) into another compartment of the western enclosure for whatever purpose was required. The most obvious location for such drafting gates is marked on Figure 24.

The subsidiary enclosure running along the northern side of the main eastern enclosure may also have acted as a crush (Pryor 1999, 101–2), designed potentially to process a herd or flock. Stock may have been brought into the elongated enclosure from open pasture to the north *via* the funnel created to the west (Fig. 24). The herd/flock could have been divided at this point, if required, with stock either entering the eastern enclosure *via* the narrow entrance, or being directed into the crush to the north, where they could have been held for inspection. When the inspection was complete, the stock could then have been released back into the field to the north *via* the exit at the eastern end of the crush. A possible subdivision within the eastern enclosure may also have been for detaining stock, whilst the main open area of the enclosure was large enough to contain a sizeable herd of cattle overnight and potentially through the winter, provided that any areas of human habitation were fenced off.

The drove-way to the south of the eastern enclosure is probably indicative of a long-distance route that was used to transport animals to or from pastures to the south-east. The route could also have been used to transport stock to the local market, and to bring in fresh stock, including new rams or bulls, to maintain the breeding herd's genetic viability. There is a potential stock-sorting gap in the northern side of this drove-way, which may have provided means by which the farmers could subdivide those animals brought towards the eastern enclosure, with some continuing into the enclosure, and others being released into the field to the east. This track appears to have been the main route of communication to and from this farm, and it is interesting to note that it projects south-east towards the Greensand Ridge rather than north towards the Great Ouse.

The water-holes that appear to have dominated the site from the mid-Roman period may in some cases have been established earlier. This appears to have been the case with the two largest examples in the eastern enclosure and the one within the western enclosure; two of these truncated the earlier enclosure ditches, but this may be the result of later expansion of the original features. It is logical that water-holes would have existed contemporaneously with the earlier phase of the farmstead, since the livestock known to have been present then, from both the faunal assemblage and the stock systems defined by ditches, would have required watering. The location of these water-holes primarily on the line of the earlier enclosure ditches also supports the assumption that the enclosures were still marked by hedges once the ditches had silted up. Some of these water-holes would have allowed animals to access the water directly, whereas the steep profile of others would have required the water to be drawn by hand — the ones that are believed to be earliest are also the ones with shallowest profiles, perhaps suggesting a change of approach in the later Roman period.

Finally, it is worth considering the three enclosures in relation to each other. The apparently planned nature of the farmstead may indicate that each enclosure was occupied by different groupings within the family clan, and/or that each had a separate function in relation to stock — for example, the large eastern enclosure might have been used predominantly for cattle, with the intricate subdivisions in the western enclosure perhaps more suited to sheep-handling. Although the central enclosure's ditches produced a substantial pottery assemblage (Fig. 10), the paucity of other domestic debris and internal features may indicate that this enclosure held the pigs and/or fowl known to have been present, rather than forming the domestic core of the settlement. As indicated above, use of the enclosures for stock would not have precluded human habitation within the same enclosures.

Comparison with other sites

The excavated remains at Hill Field share similarities with contemporary sites excavated elsewhere on the claylands of the Marston Vale and beyond, yet there are differences in the representation of chronological periods and in the level of continuity. The nearest site, at Luton Road, Wilstead (Luke and Preece 2010), also revealed evidence of human activity from the early/middle Iron Age to the Saxo-Norman period, but with more of an even representation throughout. The earlier Iron Age remains, although fragmentary, were more numerous than at Hill Field and possibly indicate a small open settlement. The greatest evidence for domestic activity also came from the late Iron Age and early Roman period, with two roundhouses

revealed, yet the layout of the settlement appeared less organised and also betrayed aspects of discontinuity. The suggestion of sacrificial or ritual activity in relation to a late Roman water pit is interesting, in view of the potentially votive or ritual deposits from some of the water-holes at Hill Field (see below); the sites also share a lack of evidence for substantial domestic activity at this time. In contrast, however, the site at Wilstead displays no evidence for continued activity in the Saxon period, whilst the pits, ditches and possible structural features recorded for the Saxo-Norman period are more obvious evidence of settlement activity than was evident at Hill Field. This is probably to be expected, in view of the Luton Road site's greater proximity to the main settlement in the centre of the parish. Despite this, however, the Saxo-Norman settlement at Luton Road was succeeded by ridge and furrow, implying that the main settlement became more nucleated as arable cultivation expanded in the 12th to 13th centuries.

Other sites excavated on the claylands in Bedfordshire also produced evidence for settlement activity in the late Iron Age and early to mid-Roman period, but generally with no evidence for continued activity into the Saxon period. Excavation along the route of the Willington to Steppingley pipeline in the vicinity of Hill Field revealed Roman remains to the south-west of Wilshamstead (Network Archaeology in prep.); Iron Age remains were also recorded to the south and east, but these are likely to predate the farmstead at Hill Field. Settlement remains that date from the middle Iron Age to the late Roman period were found to the north-west of Hill Field on the route of the Stagsden bypass (Dawson 2000a). Those from East Stagsden bear the greatest similarity: a number of enclosures were established in the late Iron Age, which were retained and subdivided in the early Roman period, but with no evidence for their continued use beyond the 2nd century (Dawson 2000a, 21–59).

Similar remains were also found along the Great Barford bypass to the north-east (Timby *et al*. 2007); Sites 1, 2, 4 and 7 all contained late Iron Age enclosures. Sites 2 and 7, however, had their origins in the middle Iron Age and did not continue into the Roman period. Site 4 bears the closest comparison with the Hill Field farmstead (Timby *et al*. 2007, 37–41; 78–90): although on a larger scale and with more evidence of structural remains than at Hill Field, this low-status settlement included a combination of enclosures and droveways, with seven (mostly urned) cremation burials and no evidence for continued settlement beyond the 2nd century. Site 8, a larger Roman settlement with no Iron Age precursor, was the only one to produce evidence for continued activity into the Saxon period, with pottery from the 5th to the 10th centuries (Timby *et al*. 2007, 159–61), although Site 9 revealed a settlement that began in the Saxon period (Timby *et al*. 2007, 161–77).

The remains at Hill Field can thus be seen to fit in with the pattern of late Iron Age and Roman settlement on the Bedfordshire claylands, but without the same degree of earlier Iron Age settlement that is often seen. In contrast, however, the site was more durable than most, remaining in use throughout the Saxon period; its continuity marks it out from many of the other sites, which tended to be shorter-lived and where the location of human activity tended to move around with the course of time.

Environment

Human activity at Hill Field can be traced continuously in the archaeological record for a period of about a millennium, from the end of the Iron Age to the end of the Saxon period. This enables an examination of how the landscape changed or stayed the same during that time, both within the area of the enclosed farmstead itself, and in the area of Hill Field more generally.

The overwhelming impression is that Hill Field was primarily an open, grassy environment. This supports the picture drawn by other sites in the wider region: 'where there is environmental evidence available, this seems to indicate a greater emphasis on the use of claylands for pastoral farming [by the late Iron Age]' (Clay 2002, 116). The dominance of the molluscan assemblage from Hill Field by *Vallonia pulchella* suggests that the site itself comprised moist grassland during the Roman period, while pollen samples for the Saxon period produced high percentages of grasses and herbaceous taxa. The botanical evidence is similar, suggesting a fairly open environment; there is little material from woodland or hedgerow species except for a few wild fruit remains from the Saxon and Saxo-Norman periods. Although these wild fruit remains may represent food gathered off-site, the contextual data suggest that the early Roman ditched boundaries

were either accompanied or replaced by hedgerows, support for which is provided by taxa such as hawthorn group and cherry/blackthorn in the charcoal assemblage.

More detailed evidence is available for the immediate environment surrounding the Saxon to Saxo-Norman sequence of water-holes and wells G53/53.1 at the eastern end of the site. As with the other water-holes across the site, the ground around the features was disturbed and trampled, with numerous species that are indicative of nitrogen-rich soils, probably due to the use of these features by livestock. The species composition of the well lining in [5288] also gives an indication of what trees were growing within range of the site (Fig. 22). Oak, sloe/blackthorn, hazel and willow/poplar are all represented, as they are in the charcoal assemblage, although it is unclear whether these were from the hedgerows on site or from woodland further away; the low overall frequencies of arboreal pollen indicate that supplies of wood were primarily imported from managed hedgerows or woods located some distance away. Willow/poplar is a species that usually grows along watercourses; a modern stream runs along the southern side of the hill, suggesting a possible source, although the similarity in the restricted species composition of the molluscan fauna with examples from floodplain pastures and wet-meadows on the River Test, Hampshire and in the Thames valley (Davies 2008, 31) may indicate that areas of the site itself were damp enough for this species of tree to grow there.

Socio-economic structure

The overwhelming impression of the farmstead at Hill Field is that of a small, low-status settlement with a pastoral economic base, which was used solely for pastoral purposes once domestic activity had ceased in the mid-Roman period. However, the finds assemblage does include a few anomalies such as the silver brooch and glass bowl from the eastern enclosure, and these are considered below. In terms of the ceramic and non-ceramic assemblages, the balance of probability suggests that the items recovered from Phase 3 deposits are likely to be either residual or curated, and are therefore considered alongside the Phase 2 assemblages as evidence for activity in the early to mid-Roman period.

Status and economic basis

The non-ceramic assemblage suggests a rather basic standard of living. The majority of the jewellery is of copper alloy, and may have been fairly accessible in terms of costs, although the 1st-century silver brooch could suggest the presence of an individual of some social standing. The rarity of glass recovered from Hill Field fits the pattern from elsewhere: the inhabitants of rural sites of the 1st and 2nd centuries appear to have been very selective about the types of glass vessels they used, with no evidence that they did use it on many sites. Where they did use glass, they seem to have preferred blue/green bottles and large bowl forms (Cool and Baxter 1999, 84–5), as were found at Hill Field.

The ceramic assemblage is similarly indicative of relatively low socio-economic status, with few fine wares or imports. The assemblage is generally comparable with those from contemporary rural sites in the vicinity of the Great Ouse Valley, including the nearby settlements at Marsh Leys Farm (Luke and Preece in prep.), Wilstead (Luke and Preece 2010), Kempston (Dawson 2004), and Great Barford (Webley 2007).

There is little in the finds assemblage to indicate the economic basis of the settlement. No tools were found, either agricultural or craft-related, and the only representation of craft activity from the Iron Age or Roman period comes from a single sawn tine that would have been used for antler working. The possible 'sail-maker's palm' (Fig. 9, RA457) might suggest leatherworking, but the function of the object remains uncertain — it also came from a deposit that might not have accumulated until the Saxon period; leatherworking from the Saxo-Norman period is attested by the presence of a deliberately cut-up shoe (Fig. 20) from the wattle-lined well.

Two possible explanations can be adduced to account for the anomalous presence of items that are either expensive or attest extensive trading links, within a low-status, locally derived artefactual assemblage. The first is that the settlement was relatively prosperous in the 1st century AD, farmed by someone who had a modicum of social standing — this would also account for the apparent conversion of the few fragmentary remains that can be dated to the settlement's initial establishment, into a series of three regular, linked enclosures with a drove-way and subsidiary enclosure attached. The settlement then dwindled, with domestic activity largely ceasing at about the

end of the 2nd century, after which the site appears to have been used for grazing livestock by people living primarily elsewhere in the later Roman and Saxon periods. This theory, however, fails to take explain the presence of 2nd-century samian and a sherd of amphora within the ceramic assemblage — both attest to the sort of long-distance trading links that are not evidenced by the remainder of the artefactual assemblage. An alternative possibility is that the farmstead was not a self-contained unit, but one of a series of tenant farms within a larger estate that was owned by someone of greater social standing, perhaps centred on one of the higher-status settlements along the Great Ouse.

Arable/pastoral balance and diet

Pastoral

The layout of the Hill Field farmstead strongly suggests a primarily pastoral economy, as discussed above. The faunal assemblage that was recovered comprises 4,435 fragments, although only 1,080 (24%) could be identified. Most of these (69%) derive from the late Iron Age to mid-Roman deposits; some of the 23% from the mid-Roman to mid-Saxon deposits may also originate from the same period, as seems to have been the case with the finds assemblages. The range of species present is limited: the major domesticated species — cattle, sheep/goat, pig, horse and dog — are all present, but birds, rodents and red deer are all represented by just a few bones, with no recovery of fish. This may simply be an artefact of preservation, but it may alternatively indicate that there was little exploitation of wild and aquatic resources at the site.

The three main domesticates — cattle, sheep/goat and pig — dominate in all periods, with their proportionate representation following trends seen elsewhere in the country. The importance of sheep/goat and cattle nationally during the earlier phases of occupation at Hill Field is such that one author has suggested that the late Iron Age deserves to be called the 'Sheep Age', which is then succeeded by the 'Cattle Age' following the transition to the Roman period (Albarella 2007, 389). Whilst this is undoubtedly simplistic, it does highlight the dominance of those two species in the archaeozoological record during these periods. Cattle are present within the assemblage from Hill Field much more than sheep/goats; this is largely due to the fact that cattle are better suited than sheep/goats to damp, heavy soils (Williamson 2006, 170), yet it may also be a further sign that occupation at Hill Field began only at the very end of the Iron Age.

Cattle remained the dominant species in the late Saxon to Saxo-Norman period, yet sheep/goats were overtaken in second place by pigs during this period. This reversal is comparable with other contemporary sites; an increase in pig exploitation has also been noted in the Saxon layers at Middleton Stoney in Oxfordshire, for example (Levitan 1984, 108).

Ageing data indicate a mixture of both immature and adult animals during all phases. This suggests a mixed economy, with some animals being slaughtered for meat whilst immature, and others being kept until they were mature in order to provide secondary products such as milk, wool, traction, and manure.

Arable

While there is plenty of evidence for pastoral activity, both from the faunal assemblage and from the wealth of features associated with the control and movement of livestock, indications of arable farming are much fewer. Five fragments of quern stones were recovered, four of which were probably used for grinding grain in the early Roman period; yet 'querns of themselves do not prove local cultivation' (Fowler 2002, 124). Only a small assemblage of charred plant remains was recovered, with just two samples that produced dense enough remains to indicate more than just background levels (yet even these yielded no more than *c*. 10 items per litre).

The main cereal that was identified throughout all phases is wheat, predominantly spelt during the late Iron Age and Roman period, and free-threshing in the Saxon and Saxo-Norman periods. Spelt appears to have been the main variety of wheat grown on Iron Age and Romano-British sites (Greig 1991, 306 and 309), after which free-threshing wheat took over, and the results from Hill Field tally with this. The other cereals from Hill Field are only represented by small amounts of barley and oats. Hulled barley is a common cereal throughout these periods, whereas oat does not appear to have been widely cultivated as a cereal until the post-Roman period (Greig 1991, 315): the earlier finds of oat in Phase 2 may represent cereal weeds.

Evidence on other crop husbandry practices, such as sowing and harvesting times and the range of soils used for cultivation, is limited by the small

amounts of charred weed seeds in the samples, and because the majority cannot be reduced to species. Most of the charred wild plant/weed seeds are probably cereal weeds, in view of their association with cereal grains in virtually all the samples. Scentless mayweed, a widespread arable weed, is only represented in samples containing hulled wheat; this plant also grows mainly in clay soils, suggesting the use of such for the cultivation of the hulled wheats. A similar correlation exists between stinking chamomile and free-threshing wheat in the post-Roman period, indicating that both types of wheat may have been grown in the immediate vicinity of Hill Field. The remaining charred weed seeds cannot provide any further information on crop husbandry, although the presence of spike-rushes and sedges in a few Roman samples tentatively suggests the cultivation of damp areas of ground, or the wetter parts of the valley.

Most of the charred plant assemblage represents burnt residues from the advanced stages of crop-cleaning and food preparation before consumption, with no definite evidence for the residues from earlier stages of crop-processing. The hulled wheat grains may have been burned accidentally during the de-husking of the cereals, as spikelets require light parching to separate the grains from the tough glumes; the chaff fragments may also have become charred during this process, or as a result of being used for tinder. All the different cereal grains may have accidentally been burned as a result of cooking accidents, or while being dried by heating before storage or milling. The weed seeds would have been separated from the grains by the use of large and small sieves, and may have become charred by being used as tinder. The low densities at which the material was recovered, however, suggests that the charred remains relate to crop-processing and food preparation activities that took place primarily at some distance away, and are mostly from background debris blowing around the site.

The poverty of the charred plant assemblage from Hill Field fits a general pattern for sites excavated on areas of clay geology in the region. Iron Age sites have proved to be particularly unproductive: recent excavations at Scotland Farm, Dry Drayton (Abrams and Ingham 2008; Ingham 2008), the Great Barford bypass (Timby *et al*. 2007, 365) and Twinwoods Business Park, Milton Ernest (Ingham 2010) have generated more than 100 soil samples, yet no more than a handful have produced more than background levels of charred plant material. Slightly more evidence has been forthcoming from Roman sites, yet only Site 8 at Great Barford (which contained kilns and a corn drier) consistently produced abundant charred plant assemblages (Timby *et al*. 2007, 365). The nearby excavations at Luton Road, Wilstead produced large quantities of chaff from three Roman deposits, but most of the remainder were as unproductive as those from Hill Field (Luke and Preece 2010). Questions of taphonomy and queries regarding sampling strategies inevitably haunt the recovery of sparse charred plant assemblages, yet the consistency of the overall pattern suggests that the results portray an accurate picture.

Diet

The wheat and barley grains may have been used for bread, porridge, gruel and cakes during the late Iron Age and the Roman period (Wilson 1991, 234); spelt wheat had particularly good properties for baking and milling (Jones 1981, 107). Spelt wheat or barley was also used during the Roman period in a gruel known as *puls* or *pulmentus,* which was roasted, pounded, and cooked in water to make porridge, similar to Italian polenta (Renfrew 1985, 22). Bread was the staple food during the Saxon period, with wheaten loaves regarded as the best bread (Hagan 1992, 20).

Little evidence was recovered to suggest that the gathering of wild foods played a significant part in the food economy of the site at any time. The only potential evidence comes from the Saxo-Norman wattle-lined well, which yielded the waterlogged remains of a few blackberry/raspberry and elder seeds, hazelnut shell fragments, and sloe/blackthorn fruit stones (also found as a charred example in Phase 3 water-hole G27). There is a similar lack of wild species within the faunal assemblage, suggesting that the inhabitants relied primarily on the main domesticated species (cattle, sheep/goat and pig) for their meat diet, even though evidence for butchery of these is low.

Ritual activity

Human burials

Three Roman cremation burials were recovered, each of a single, adult individual. This was the most common form of burial practice in the early Roman period (Taylor 2001), generally of 1st- to mid-2nd-century date, representing the continuation of late Iron Age traditions (Zeepvat 2003, 57).

A similar date can be adduced for the Hill Field burials from the pottery vessels that accompanied them; two were contained within an urn and were accompanied by two accessory vessels, while the third had no urn, but was accompanied by a ceramic jar. Similar cremation burials with up to three accessory vessels are known from a nearby cremation cemetery on the northern edge of the Biddenham Loop (Luke 2008, 218), where it was suggested that the vessels themselves may have held greater importance in the burial rite than the human bone.

Sorted burnt bone with no accompanying pyre material appears to have been the most common category of cremation burial in the early Roman period (Weekes 2008, 79). The remains of an entire body were rarely included in burial (McKinley 2000b, 67); however, the inclusion of elements of skull, axial, upper and lower limbs shows that all skeletal areas were represented, with no clear preference for selection in the recovery of particular bones.

The presence of burnt animal bone in cremation G50 may suggest the inclusion of animal foodstuffs on the cremation pyre. Inclusions of food offerings appear common practice, but may also indicate residual bone, incorporated accidentally into the cremation burial (McKinley 2000a).

Structured deposition

The inference of ritual activity to explain the deposition of particular artefacts or ecofacts, often in particular locations, is one of the more contentious issues amongst archaeologists. Distinctions between structured deposition and domestic refuse, though clear-cut in some cases, are often hard to determine (*e.g.* the cattle skull in Saxo-Norman pit [4775], Pl. 6); this is particularly true for the Roman period, where instances of structured deposition may be lost among the generally higher numbers of artefacts that are recovered.

The most compelling evidence for structured deposition at Hill Field comes from mid-Roman pit G36, which was located in the entrance to the eastern enclosure. Sixteen sherds of an unusual glass bowl were recovered from the pit; as well as being an object of higher status than was characteristic of the farmstead at Hill Field, the amount of the vessel present (*c.* 10%) is much larger than normal for a domestic context, whilst the sherds retain a fracturing pattern that may have been caused by a deliberate blow. Whilst not conclusive on its own, the recovery of a large proportion of a canine skeleton from the same pit is strongly suggestive of ritual deposition.

Further evidence comes from water-hole G29, which contained a 2nd-century enamelled disc brooch with peripheral lugs (Fig. 15, RA431) and three 2nd-century coins in its upper fill. The nearly complete state of the brooch suggests that it was deliberately deposited rather than lost, while the coins' presence may be an example of their being exchanged as votive offerings rather than as money (Guest 2008, 135–48; Guest 2009, 113). Recovery of these four items from the upper fill of the water-hole is perhaps an indication that they were used to mark the end of use of the water-hole in the late Roman or early Saxon period. A similar purpose might explain the recovery of four of the site's five quern fragments from water-holes.

CONCLUSIONS

Excavation at Hill Field revealed the remains of a low-status farmstead, occupied primarily in the 1st and 2nd centuries AD. Little evidence was uncovered for structural remains, but this was perhaps to be expected: building remains securely dated to the Roman period are surprisingly rare in rural Bedfordshire (Luke 2008, 58). The pottery assemblage is dominated by utilitarian, locally produced vessels, with a generally similar lack of ostentation amongst the non-ceramic artefacts, which also provide little evidence for the presence of buildings. The farmstead's economic base was pastoral, with cattle the dominant species, whilst little conclusive evidence was found for any other economic activities.

Even though occupation appears to have taken place on no more than a temporary basis after the 2nd century AD, the layout of the farmstead appeared to survive. The water-holes that are likely to have been integral to the early Roman farmstead were seemingly long-lived, and remained in use into the Saxon period. In addition, others were dug along the line of the earlier ditches, while the ditched boundaries came to be marked solely or primarily by hedgerows. The provision of water-holes attests to the continued importance of cattle, even at a time when sheep were attaining greater importance on many sites across the country. This situation continued into the late Saxon and Saxo-Norman periods, though perhaps on a smaller

scale: the water-holes that were dug in the Roman period appear to have fallen out of use by this time, with water supply restricted to the exceptionally long-lived sequence of water-holes and wells at the eastern end of the site. A suggestion from the palynological evidence that arable cultivation was becoming more important in the wider area, if not necessarily the immediate vicinity, may help to explain a reduced reliance on cattle. The presence of a wattle-lined well here suggests the presence of domestic activity nearby, although it was probably associated with a seasonal or specialist activity that would only have required temporary occupation. There is no evidence, however, of how the site related to the rest of the township; it was anticipated before excavation that evidence might be forthcoming that would relate to local place names such as 'Dane Lane' and 'Dane Farm', yet there is also no indication that Danish camps in the vicinity had any direct influence on the site, which appears to have witnessed a millennium of peaceful continuity.

There have been an increasing number of excavations taking place in areas of clay soils in the last few decades, which has helped to redress the imbalance between archaeological evidence from the claylands and that from the more intensively studied river valleys and chalk downs. Archaeologists have come to realise that areas of clay geology, traditionally overlooked due to the greater difficulty of detecting archaeological remains there, are often densely populated with farmsteads from the Iron Age and Roman period, as well as remains from earlier prehistory. This was particularly helped in Bedfordshire by a series of aerial photographs taken in 1996, which identified a vast number of sites that were previously unknown (Palmer 2007).

In view of the increasing belief that many areas of clay geology were as densely populated as anywhere else, it is noteworthy that the excavated evidence from the overall Wixams development appears to strike a discordant note. The farmstead at Hill Field is indeed another example of late Iron Age and Roman activity on the claylands, yet the density of settlements being revealed elsewhere does not seem to be replicated here. The nearest known farmstead, at Luton Road, Wilstead, is situated nearly a mile away, with no other examples revealed within the area covered by the Wixams development. The evidence from the Wixams development is not definitive, with only a limited amount of excavation having taken place, yet even the most promising of the other areas identified by the evaluation (Area 2) proved to have no more than fragmentary remains, with no clear indication of permanent occupation. The drove-way leading to the south-east is evidence that the farmstead at Hill Field did not exist in isolation, but the surrounding land appears to have been open countryside, used for farming rather than settlement.

Anomalous instances of high-status items within otherwise low-status ceramic and non-ceramic assemblages perhaps indicate that the farmstead was part of a larger estate rather than a self-sufficient unit, functioning as a series of stock enclosures that were used by shepherds and drovers on a temporary basis; this would also explain the absence of evidence for any substantial buildings. It may therefore be possible to characterise Hill Field and the surrounding area as predominantly open pastoral land during the late Iron Age and the Roman and Saxon periods: the site at Hill Field is not so much an example of the colonisation of the claylands, as an outpost used as a temporary camp by pastoralist farmers.

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APPENDIX 1: CERAMIC TYPE SERIES

POTTERY

Pottery fabrics, based on surface appearance and major inclusion types, are summarised in Table 10 by chronological period, using type codes and common names in accordance with the Bedfordshire Ceramic Type Series, currently maintained by Albion Archaeology. Detailed fabric descriptions are available from Albion Archaeology; published references are noted in Table 10. Full fabric descriptions are only provided where examples have not been previously published. Bracketed numbers after each fabric code denote sherd numbers. No new fabric types were identified.

Fabric code	Common name	Reference
Late Bronze Age/early Iron Age		
F01B (1)	Fine flint	Wells (2008, 294)
F01C (28)	Flint and quartz	Wells (2008, 294)
Early – middle Iron Age		
F02 (19)	Grog and flint	Slowikowski (2000, 61)
F19 (1)	Sand and organic	Parminter and Slowikowski (2004, 445)
F22 (9)	Grog and organic	Slowikowski (2005, 102)
F28 (3)	Fine sand	Wells (2008, 296)
F29 (3)	Coarse sand	Wells (2008, 296)
Late Iron Age		
F03 (33)	Grog and sand	Parminter and Slowikowski (2004, 443)
F05 (295)	Grog and shell	Parminter and Slowikowski (2004, 443)
F06A (30)	Fine grog	Parminter and Slowikowski (2004, 443)
F06B (1141)	Medium grog	Parminter and Slowikowski (2004, 443)
F06C (179)	Coarse grog	Parminter and Slowikowski (2004, 443)
F07 (561)	Shell	Parminter and Slowikowski (2004, 444)
F09 (509)	Sand and grog	Parminter and Slowikowski (2004, 444)
F34 (17)	Sand	Wells (2008, 296)
F39 (6)	Grog and mica	See detailed description
Roman		
R01A (70)	Samian (Central Gaulish)	Tomber and Dore (1998, 30–32)
R01B (3)	Samian (Southern Gaulish)	Tomber and Dore (1998, 28)
R01C (2)	Samian (Eastern Gaulish)	Tomber and Dore (1998, 39)
R03A (5)	Fine white ware	Tomber and Dore (1998, 154)
R03B (46)	Gritty white ware	Marney (1989, 186, fabric 39)
R03C (12)	Smooth white ware	Wells (2008, 297)
R05A (29)	Orange sandy	Wells (2008, 297))
R05B (85)	Fine orange	See detailed description
R05C (1)	Orange micaceous	See detailed description

Fabric code	Common name	Reference
R06A (84)	Nene Valley grey ware	Marney (1989, 179, fabric group 14)
R06B (328)	Coarse grey ware	Wells (2008, 297)
R06C (602)	Fine grey ware	Wells (2008, 297)
R06D (204)	Micaceous grey ware	Wells (2008, 297)
R06E (10)	Calcareous grey ware	Wells (2008, 297)
R06F (136)	Grey ware grog and sand	Parminter and Slowikowski (2004, 449)
R06G (78)	Silty grey ware	See detailed description
R06H (8)	White-slipped grey ware	See detailed description
R06I (5)	Black-slipped grey ware	See detailed description
R07B (146)	Sandy black ware	Wells (2008, 297)
R07C (3)	Gritty black ware	Wells (2008, 297)
R08 (1)	Black micaceous	Wells (2008, 297)
R09A (6)	Pink grogged	Tomber and Dore (1998, 210)
R10A (2)	Coarse buff gritty	Wells (2008, 297)
R10B (6)	Fine buff gritty	Wells (2008, 298)
R11 (20)	Oxford oxidised wares	Young (1977, 185)
R11D (1)	Oxford colour-coat	Young (1977, 123)
R12A (1)	Nene Valley mortaria	Tomber and Dore (1998, 119)
R12B (69)	Nene Valley colour-coat	Tomber and Dore (1998, 118)
R13 (1005)	Shell	Brown (1994, 57–8)
R13B (63)	Shell with limestone and sand	See detailed description
R14 (123)	Sand (red-brown harsh)	Parminter and Slowikowski (2004, 452)
R17 (1)	Smooth orange ware	Wells (2008, 298)
R18A (5)	Pink gritty	Parminter and Slowikowski (2004, 453)
R18B (29)	Pink fine	See detailed description
R19A (3)	Dressel 20 Amphora	Tomber and Dore (1998, 84)
R20 (3)	Mancetter/Hartshill mortaria	Tomber and Dore (1998, 189)
R22A (3)	Hadham oxidised ware	Tomber and Dore (1998, 151)
R31 (13)	Lumpy white ware	Parminter and Slowikowski (2004, 454)
R33 (1)	Verulamium region mortaria	Tomber and Dore (1998, 154)
R (1)	Non-specific Roman	Described in site archive
Saxon		
A01 (1)	Organic	Baker and Hassall (1979, 152)
A16 (50)	Mixed coarse quartz	Wells (2005, 30)
A18 (23)	Fine quartz	Wells (2005 30)
A19 (9)	Quartz and organic	Wells (2005 30)
A23 (32)	Sandstone	Wells (1996, 110)
A24 (2)	Oolitic	Wells (1996, 110)
A25 (1)	Granite tempered	See detailed description
A26 (1)	Mica, sand and organic	Wells (2005, 31)
A32 (1)	Red quartz	Wells (2005, 31)
Saxo-Norman		
B01 (48)	St Neots-type ware	Wells and Slowikowski (1996, 84)
B01A (11)	St Neots-type (orange)	See detailed description
B01B (39)	St Neots-type (fine)	Wells and Slowikowski (1996, 84)
B01C (1)	St Neots-type (mixed inclusions)	Wells and Slowikowski (1996, 84)
Early medieval		
B07 (1)	Shell	Baker and Hassall (1979, 167)
B13 (1)	Chalk	See detailed description
Late medieval		
E03 (1)	Oxidised smooth	Wells and Slowikowski (1996, 113)
Post-medieval		
P01	Fine glazed red earthenware	Baker and Hassall (1979, 220)

Table 10: Ceramic Type Series

Late Iron Age

F39 Grog and mica: Hard fabric with variable surface colour containing frequent, sub-rounded grog, up to 2.5mm in length, and moderate to frequent fine silver mica. Rare red-brown ferrous inclusions, up to 3.5mm in length, and natural clay pellets, up to 2.5mm in length, are visible in some sherds. Generally wheel-made.

Roman

R05B Fine orange: A finer version of R05A. Hard fired fabric, orange-buff throughout, although surfaces are often white-slipped. Contains frequent subangular quartz *c*. 0.1–0.5mm. Wheel-made.

R05C Orange micaceous: As R05B, although no slipped examples occur. Characterised by abundant well-sorted mica visible on surfaces.

R06G Silty grey ware: Soft fired, dense, dark buff-grey fabric with smooth fracture; smooth and soapy to the touch. Characterised by sandwich appearance in break. Contains sparse clear, well-rounded milky quartz, *c*. 0.5–1mm, sparse decayed (?)shell and rare dark red iron oxides. Wheel-made.

R06H White-slipped grey ware: Hard fired dark grey fabric, sometimes with a light grey core, characterised by an external white slip and occasionally an internal slip. The slip is always thick and extends well down the vessel profile. Irregular to finely-irregular laminated fracture Contains moderate well-sorted white quartz *c*. 0.1–0.5mm, sparse iron oxide and rare angular shell. Wheel-made.

R06I Black-slipped grey ware: As fabric R06H, but characterised by an external black slip and occasionally an internal slip.

R13B Shell with limestone and sand: Hard fired fabric with distinct orange surfaces and a rough texture, due to the sand content. Contains abundant poorly sorted sub-angular shell *c*. 0.2–0.5mm and moderate, poorly sorted sand and limestone lumps in varying amounts. Wheel-made.

R18B Pink fine: Smooth, fairly hard fired pink-buff fabric, with an even, irregular fracture and powdery surfaces. Characterised by abundant, well sorted subrounded/subangular glassy and rose pink quartz *c*. 0.1–0.2mm, and common poorly sorted red and black iron oxides. Wheel-made.

Saxon

A25 Granite: Hard, uneven fabric usually dark grey-black in colour, although some examples can be oxidised. Characterised by distinctive gold mica flakes visible on surfaces. Also contains abundant poorly sorted subangular quartz *c*. 0.3–0.6mm, some ranging up to 1.5mm.

Saxo-Norman

B01A St Neots-type (orange): Fairly hard, smooth fabric, characterised by at least one bright orange surface and a dark grey core. Contains abundant finely pounded angular shell; sparse subrounded red iron ore, *c*. 0.5mm; sparse subangular light grey limestone fragments, *c*. 2mm; and sparse subrounded clear quartz, *c*.1.0mm. Wheel-made.

Early medieval

B13 Chalk: Fairly smooth, patchy buff-orange to grey-brown fabric characterised by chalky inclusions, *c*. 0.2–1.5mm. These are clearly visible on the surfaces as white sub-rounded speckles, although are occasionally dark grey in colour, especially in the break. Also contains moderate well sorted rounded quartz, *c*. 0.5mm and occasional black elongated voids where organic matter has incompletely fired out.

BRICK AND TILE

Sand: fine and hard fired, orange throughout, turning to brick-red where over-fired. Generally finely tempered, although some fragments are coarsely made and contain angular quartz of up to 6.0mm in size. Contains frequent, well-sorted, sub-angular multi-coloured quartz *c*. 0.2–0.5mm and dark red and black iron ore *c*. 0.1–0.3mm. Also rare angular flint inclusions of up to 5mm in size.

Shell: hard fired, fairly smooth fabric with bright orange to buff-brown surfaces, and sometimes a paler core. Contains abundant ill-sorted, sub-angular shell, some ranging up to 10mm, visible throughout the fabric and on the surfaces. Also rare, poorly sorted limestone c. 0.2–0.5mm. Harrold tile fabric is described by Brown (1994, 79).

FIRED CLAY

Sand: fine, hard fired mid to dark orange-red fabric with variable dark grey-black patches where reduced. Inclusions are abundant sub-rounded and sub-angular quartz *c*. 0.1–0.5 mm and rare red iron ore *c*. 0.5 mm. Some larger fragments contain sub-angular/angular flint or chert pebbles ranging in size between 1–2 cm.

Sand and organic: fine orange-buff fabric, dark blue-grey where reduced. Inclusions are moderate, poorly sorted, sub-angular, multi-coloured quartz *c*. 0.1–0.5 mm, occasionally ranging to 1.0 mm, and frequent organic material (?straw), evidenced by elongated voids where the latter has burnt out.

Organic: soft variable buff-brown fabric with soapy texture, containing abundant poorly-sorted organic material evidenced by elongated voids where the latter has burnt out. Also occasional poorly-sorted mica.

APPENDIX 2: ANALYSIS METHODOLOGIES

A summary of the methods use for analysis of the artefact and ecofact assemblages is given below. In all cases, standard procedures were used unless otherwise stated.

Artefacts

Non-ceramic

Each non-ceramic artefact was identified, assigned a functional category, and quantified by number and/or weight. Where applicable, a date range was assigned. A full catalogue description was entered into the project database. All ironwork and selected non-ferrous objects were x-rayed to assist their identification; one coin also required specialist cleaning.

Leather

A basic record of the leather assemblage was made, including measurement of relevant dimensions and species identification, where possible. No allowance has been made during measuring for shrinkage. Any shoe-sizing has been calculated according to the modern English Shoe-Size scale. Leather species were identified by hair follicle pattern using low powered magnification. Where the grain surface of the leather was heavily worn, identification was not always possible. The grain pattern of sheep and goat skins are difficult to distinguish, and have been grouped together as sheep/goatskin when the distinction could not be made. Similarly, the term 'bovine' is used where there is uncertainly between mature cattle hide and immature calfskin.

Ceramic

The ceramic assemblage was examined by context, and fabric types and form codes identified in accordance with the Bedfordshire Ceramic Type Series (see Appendix 1). Quantification of pottery was by minimum vessel and sherd count, and weight; of ceramic building material, by fragment count and weight, with recording of any measurable dimensions. The condition of the pottery from each context was noted, and attributes such as decoration, manufacture, levels of abrasion, and evidence of function (residues, sooting and wear marks *etc*.) were recorded. Selected pottery is illustrated in Figures 9 and 16; vessels are shown at one quarter size, external view on the right and internal view on the left. Handmade vessels are illustrated with hatched sections, and wheel-thrown vessels with solid sections. The pie diagram accompanying each illustration indicates the proportion of the vessel recovered.

Wood

After preliminary recording and sketching, the full length stakes in the assemblage of waterlogged wood were cut down to the worked ends for ease of storage. Samples for wood species identification and radiocarbon dating were taken at this point. Detailed analysis was then carried out on the twenty-four worked ends that were sufficiently well preserved to merit further examination. The samples were washed of any concretion that had formed, and were examined in raking daylight to highlight fine tool mark details. Eight items were selected as a representative sample for scale drawing on film.

Ecofacts

Human bone

Analysis of the human bone was carried out with reference to current guidelines (McKinley 2004). The material was examined in relation to its weight, fragment sizes, representation of skeletal areas, and colour. The minimum number of individuals present and their age and sex were all calculated where possible. Age at death was based upon observations of the auricular surface (Lovejoy et al. 1985), skeletal maturation and epiphyseal fusion (Scheur and Black 2000), and dental development and eruption of teeth (Gustafson and Kock 1974).

Animal bone

Species identification of the animal bone was undertaken at context level, using the comparative reference collection of modern specimens at the School of Archaeology and Ancient History, University of Leicester. Fragments of mammal bone that could not be attributed to a taxonomic group at least equal to genus were categorised as either 'large mammal' or 'medium mammal'. For the three main domestic species — cattle, sheep/goat and pig — tooth wear on mandibles was recorded according to Grant (1982). Fused and unfused elements were also recorded. Measurable bones were measured to the nearest tenth of a millimetre using Vernier callipers; the measurements taken were as defined by von den Driesch (1976).

Molluscs

Mollusc shells were examined under a low-powered binocular microscope, and all sufficiently well-preserved shells were identified following Cameron and Redfern 1976, Macan 1977, and with reference to the MoLAS environmental archaeology collection. Ecological interpretations

follow Cameron and Redfern 1976, and Kerney 1999.

Plants

Although the botanical remains from all seventy-six soil samples were considered when analysing the overall assemblage, only the thirty-five soil most productive samples were selected for detailed analysis. The remains were identified using a binocular microscope with a magnification of up to 40x, together with the seed reference collection housed in the Environmental Section, MoLAS, and various seed reference manuals (Berggren 1969 and 1981; Beijerinck 1947). Identifiable charred plant remains were extracted and quantified in absolute numbers, with the exception of small cereal grain fragments (<2mm), awn fragments, charcoal, and indeterminate plant items; the quantities of these remains were estimated. The waterlogged plant assemblages were scanned wet, and the approximate abundance of different species was recorded. Taxonomy follows Stace (2005), while ecological/habitat information follows Ellenberg (1988), Hanf (1983) and Stace (2005).

Charcoal

A detailed assessment of the charcoal was undertaken, rather than full analysis: little of the charcoal from the fifteen samples is identifiable (>2mm), with most producing fewer than twenty fragments; and the species diversity for the only two that produced abundant fragments is very limited. Representative fragments from each sample were examined in longitudinal sections, using a Meiji incident-light microscope at up to x400 magnification. Identifications were made with reference to Schweingruber (1990), Hather (2000) and modern reference material. Nomenclature and classification follow Stace (2005). An estimate of the relative abundance of the charcoal was made where possible.

Pollen

Estimates of pollen concentrations and pollen preservation characteristics are based on the methods and criteria outlined in Delcourt and Delcourt (1980) and Stockmarr (1971). Pollen identifications are based on Moore *et al*. (1991) and modern reference material. Pollen counts are a minimum of 200 pollen and spores. Large numbers of pollen grains were too badly deteriorated for identification, and were recorded as unidentifiable. The slides were also scanned for pollen types which may have been missed during routine counting, and these were recorded as single occurrences. Pollen nomenclature is based upon Moore *et al*. (1991), Stace (1991) and Bennett et al. (1994).