Excavation at George Lane, Wyre Piddle, Worcestershire

ARCHIVE REPORT

Project reference: P2852; EH 4841
Date: 9 March 2012
Status:
Contact: Derek Hurst

Historic Environment and Archaeology Service,
Worcestershire County Council
Woodbury,
University of Worcester,
Henwick Grove,
Worcester
WR2 6AJ

www.worcestershire.gov.uk

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Derek Hurst

With contributions by Nick Daffern, Christine Elgy, Laura Griffin, Katie Head, N Humphreys, Rachel Ives, Robin Jackson, Cathy King, Andrew Mann, Elizabeth Pearson and Sylvia Warman

Summary

The George Lane site is notable for being the only proven site of a purpose-made, pre-medieval pond in Worcestershire. This pond originated in the later Iron Age, when it exploited a spring-line on the hill-side above the River Avon. It formed part of a small complex of features, all set up at the same time on a new site, and was accompanied by a roundhouse with an associated compound, and larger enclosures. However, its tendency towards silting, in common with other open features on the site, indicated that surface water was always a problem on the impermeable Jurassic clays.

The pond was notably associated with a rich assemblage of material culture and environmental remains. On analysis this assemblage does not seem to represent activity at a shrine, nor any particular industrial use, for instance associated with exploiting the slight salinity of the spring water. Much of this material was deposited towards the end of the life of the pond, and so it is suggested that towards the end of the 2nd century AD, and during the final silting of the pond, a feasting event may well have contributed to this accumulation.

The site has provided a unique opportunity to examine a new type of later prehistoric to Roman site situated on the clay lands which cover a large part of south-east Worcestershire. Environmental evidence has conclusively shown that it lay in a grassland landscape, and the implication is, therefore, that the site was part of the farming system giving rise to this landscape, and, therefore, represents one expression of pastoral farming in this era. Whether it was really that unusual or, alternatively, widely replicated across the area, has yet to established.

Following abandonment the site was never re-settled, and the tendency to silting, observed throughout its life, could indicate that this type of site on clay was not easily sustainable, and so was generally abandoned. Instead, the site was absorbed into a field system which now stretched across its infilled features, perhaps marking the wider partition of the landscape going into the 3rd century. Much later the area was subject to medieval ridge and furrow agriculture, which would have aided land drainage, and today the general area of the site is laid down to arable agriculture, except where it has become used for landfill.

1 Site background

Geology and topography

The site is located to the north-east of the village of Wyre Piddle (Fig 1; NGR SO 9707 4808) and on a gentle slope above the flood-plain of the River Avon, at a height of *c* 27m AOD. The underlying geology is Jurassic clay and the soils comprise calcareous soils (Evesham 2 Association – useful for summer gazing but of limited use in Autumn and Winter due to their tendency to waterlogging) over most of the site, and typical brown earths (Wick 1 Association – well-drained and useful for arable production) at the southern end of the site (Ragg *et al* 1984).

Figure 1 Location of site

Archaeological sites in the vicinity

Archaeological interventions on the line of the adjacent Wyre Piddle by-pass prior to its construction revealed prehistoric and Roman remains (Cook and Ratkai 1995; Napthan *et al* 1997), with subsequent additional work at its eastern end revealing further, but localised, evidence for the Bronze Age onwards (Vaughan 2005; Cook 2010). Metal-detector survey in the adjacent field to the west (WSM 29101) produced a number of Roman brooches; fields to the east of the site had also been fieldwalked (Darch and Jackson 2003; Crawford 2005) and produced quantities of Roman material, suggesting that the main George Lane site activity (ie North Area) may have also extended in this general direction (ie south-eastwards). The nearest other known site is a single-ditched and square enclosure (WSM 32491) 350m to the south-east and near the 25m contour line. Middle Iron Age roundhouses associated with small irregular enclosures and Roman ditches and surfaces have also been noted in separate areas 0.8km to the north at Throckmorton (WSM 30519, 30861–2; Griffin *et al* 2005).

2 Reasons for the project

Following a planning application (ref 407522) made by Mercia Waste Management Ltd to Worcestershire County Council for a new access road to their landfill site (initiated in the 1960s on low grade land), and in response to a brief produced on 7 September 2005 (WHEAS 2005a), a staged programme of archaeological works was instigated (WHEAS 2005b). Evaluation comprising five trenches, each 30m long (WHEAS P2807; 2.5% of the development area) was undertaken between 17–21 October 2005 (WSM 34755), and based on the results then further mitigation was defined by a further brief (WHEAS 2005c with specification by 2005d). This also involved an auger survey of the 'pond' in November 2005 (P2833; WSM 34764) in order to further define the extent of this feature. Other available data was also used to assess the findings: fieldwalking survey to the east showed a concentration of Romano-British finds decreasing towards this area, and so when features of this period appeared they were (wrongly) not initially interpreted as settlement-type activity. Further mitigation was, however, needed given the scale of the pond (WHEAS 2005e; WHEAS 2005f), and two further areas were, therefore, excavated (P2852) in January to April 2006 (WSM 35053), followed by a watching brief in October 2006. At the same time, since the area of the pond extended beyond the development area, Severn Waste Management Ltd undertook to protect its continuation outside the immediate development area by the constructing a clay dam to try and retain water levels within the surviving feature.

During the excavation it became clear that the density and nature of occupation had been underestimated, especially to the north of the pond. As a result it became necessary to seek additional funding from English Heritage for grant aid (PPG16 (now PPS 5)-assistance) to complete the project.

3 Original project aims and objectives

Due to the incomplete understanding of the site achieved through the evaluation no specific research aims were identified other than to establish the character of this unusual site as far as possible.

4 Fieldwork methods

Evaluation (including auger survey)

Five trenches were excavated (four 1.6m by 30m and one 1.6 by 12.3m) with extensions added to the sides of Trenches 1 and 4 to test specific features. The total area of evaluation trenching amounted to just over 150m² in area (Fig 2). Trenches 1–4 were situated in the field to the west of George Lane while Trench 5 was located in a triangle of land at the north end of the lane. A gas pipe affected the location of Trench 5 and the latter was moved to the south and shortened to avoid this. As this trench was shorter than originally intended, an extra trench was opened on the other side of the hedge to the west but was abandoned due to the presence of a sewage pipe.

Deposits considered not to be significant were removed using a JCB 3CX mechanical excavator, employing a toothless bucket and under archaeological supervision. Subsequent excavation was undertaken by hand. Clean surfaces were inspected and selected deposits were excavated to retrieve artefactual material and environmental samples, as well as to determine their nature. Deposits were recorded according to standard Service practice (CAS 1995). On completion of excavation, trenches were reinstated by replacing the excavated material.

The auger survey was conducted to better define the extent of the pond, a hand-operated auger being used. The samples were located radiating out from the known location of the pond identified in Trench 5. Sampling was conducted to establish the depth of the base/sides of the feature and/or to locate natural deposits, a total of 21 auger cores being undertaken. There were obstacles to the full surveying of the site, as the surface of the old lane across proved impossible to break through, and so it was not possible to define the southern extent of the pond as accurately as its northern and western edges.

Figure 2 Location of evaluation trenches and excavation areas

Excavation

A 21-ton tracked excavator stripped the excavation areas of topsoil/subsoil between 0.49–0.79m in depth (eg in Area 1) and old lane make-up. A metal-detector was used throughout the excavation project. An initial scan was conducted of the site before stripping commenced, and thorough scanning of the topsoil/subsoil then took place

during the stripping and afterwards over the exposed areas. Finds were bagged and located on plans to support subsequent plotting of distribution patterns. All deposits were then fully or partially excavated to determine their nature, and to recover artefactual material and environmental samples. The sampling levels of deposits were designed to meet the aims of the Brief *viz* all structural remains and burials; 50–100% of pits (depending on quantity of material culture present); and 10–50% of linear features.

North Area (Fig 2)

Originally the excavation boundary in this area was to be 5m beyond the edge of the pond, but it was quickly obvious that more archaeology was present here than anticipated and that it existed well beyond this boundary. The trench was, therefore, extended after the excavation of the pond, the new eastern boundary being dictated by a gas main. The northern boundary was 30m from a badger set which prevented a larger area from being stripped here. An old lane crossing this north part of the site was intended to be removed on the presumption that the western edge of the pond was beneath it, but removal was aborted once it was realised that numerous services were present. Fortunately the edge of the pond on this side was then established to be within the trench. A small area was opened west of this stretch of lane but proved highly disturbed and was abandoned. Overall this covered an area of *c* 1.20ha.

Pond

The large Iron Age/Roman pond was excavated by a 14-ton tracked excavator employing a 5-foot toothless ditching bucket in 0.30m spits and on a 3 x 3m grid from the highest point of the fills, with finds being retrieved where most in evidence. A 5-inch pump was used throughout to remove the spring water that welled up at this location.

South Area (Fig 2)

The southern area comprised *c* 1.34ha.

Watching brief

The watching brief traced the continuation of features beyond the excavated areas and included the area to the north, as well as the unexcavated portions to the south of the North Area (ie where the existence of services and a bridleway had prevented earlier excavation).

Finds recovery

For finds retrieval strategies and practice see the relevant specialist reports. In particular, given the wet conditions on site, environmental sampling rapidly became a primary focus **during** excavation, and, with resources being scarce, this was then tightly focussed.

5 Structural evidence (*by* Derek Hurst)

This report covers all stages of work (evaluation, excavation, assessment and watching brief). Following assessment (Hurst *et al* 2010) the final analysis and reporting was focussed especially on the Roman period.

Evaluation and watching brief

The evaluation located Roman and potentially earlier features (both shallow and deep) in two areas either side of a now disused roadway including a possible pond (507; CG5). The evaluation also explored the area up to 200m further south which revealed little except the general presence of land drains. Deep soils of 0.5m or more were noted which suggested heavy cultivation as indicated by extensive medieval ridge and furrow, while soil movement (colluvium) may have also contributed, as rapid silting was indicated by the archaeological remains. In general evaluation and watching brief finds were included in the assessment and final specialist reporting (though a small amount of animal bone, other than that from the pond, was not included).

Excavation

Full analysis of the site archive was undertaken in accordance with the recommendations of the assessment (Hurst 2010), with the proviso that the pond was adopted as a primary area of interest and that post-Roman remains were not subject to any further analysis.

record/catalogue type	quantity
context record sheets	306
fieldwork progress	119
photographic	10
drawing number	6
context number	9
sample	7
drawings	203
small finds list	1
digital photographs	957
matrix	1
boxes of finds	31

Table 1 Quantification of the all site archive

Site phasing was executed primarily with reference to context/feature dating but also secondarily based on location (both in plan and stratigraphically) and orientation. However, the site was not easy to phase in some respects, as its shape and its being constrained to a given area of development meant that it included many ditches which could not be pursued in order to record a sufficient length to enable a more reasonable interpretation. This difficulty was compounded by the complexity of parts of the site and the generally wet conditions that prevailed throughout (mainly arising from the associated saturated clay geology) sometimes leading to problems with layer/feature definition and with the accurate resolution of feature relationships.

Though there was no shortage of pottery, the sequence of site activity was too rapid and the precision of the pottery insufficient to enable complete confidence in some key parts of the site when it came to defining phases. Black-burnished ware and samian ware (including presence and absence) were used extensively to calibrate the dating

sequence. It was considered that the tendency of features on the site to relatively rapidly silt up means that cuts and fills are effectively closely associated in date. Virtually all deposits on the site consisted of 'use' or, probably more accurately, 'disuse' fills, as no occupation layers were definitely identified. Neither were any 'construction' deposits certainly identified, though the primary deposits of some of the larger ditches probably constitute such remains due to the potential rapidity of silting.

In general both features and associated finds groups were well sealed by deep soils and, therefore, represented high quality evidence, and individual features had not been much disturbed by contemporary or later activity and, therefore, there was also generally a low level of residuality. The scale of some features has enhanced this quality of remains, as the associated finds were deeply buried, particularly in the pond, thereby providing very secure contexts for large quantities of material culture.

There was a total of 420 contexts. Where cited below all dimensions are maxima and are recorded below stripped level which on this site is typically from the top of the natural geology. Where context numbers are referenced below, the cut rather than specific fill numbers are usually given. Where associated finds are listed they are indicated in order of numerical quantity, the greatest being first. Finds in this section are commented on only in summary here and only where quantities seemed sufficient to merit comment – see finds reports for any greater detail.

General note on burnt stone

Quantities of burnt stones were noted on the site and these were rather spasmodically quantified by estimation – reference is made in this section to this material where it formed a major component in the fill of a feature.

Phase 1 (late Iron Age; Fig 3)

With the more general presence of transitional Iron Age/Roman pottery the later Iron Age date of this phase was defined primarily by the absence of Severn Valley ware. Though, admittedly, such groups were generally quite small, they were, however, quite consistently found across the site in the lowest fills of some larger features, including in the pond (CG5). Open features, such as ditches in the South Area, had generally fully silted up during this phase, and so then became disused.

Figure 3 Phase 1 plan (context groups indicated)

North Area (Figs 3 and 7)

Pond (CG5)

This substantial feature was only partially excavated, as its southern and eastern continuations extended off the site. A large portion of this feature (c75m^3; max dimensions of which were 15 x 33m; Figs 3–4, 7) was fully excavated; it had a maximum depth of 1.5m and would have held a large body of water. The basal layer (2019) was noticeably organic and the feature was generally associated with a lot of finds. In plan it seemed to form a coherent unit with the circular enclosure and its annexe, as they had a similar orientation, and this association seemed compatible with the finds dating.

Within the substantial pond fill there was a good stratigraphic sequence, apart from localised contamination where the evaluation trench had first encountered it. The fills were also demonstrably well sealed, as a much later cobbled layer (1095) covered the pond and beyond. There were relatively few finds from the bottom level of the pond (ie in this phase) and here the pottery was all Malvernian handmade ware (fabric 3), with some animal bone and fuel ash slag.

Figure 4 Pond (CG5) during excavation with fills exposed (pond edge viewed from west from front left to left of centre in background)

Early ditches at north-west corner of pond (CG6)

Short and parallel ditches (Fig 5) located at the north-west corner of the pond in the vicinity of where the spring feed was located were associated with (shallow) post holes, the purpose of which were possibly related; and the fills contained Iron Age pottery and animal bone.

Figure 5 Ditch (CG6 part) at north-west corner of pond

Circular ditch – site of possible roundhouse (CG8 early, P1)

This circular ditch (internal diameter *c* 16m and *c* 0.40m deep; Fig 6) only partially survived. Finds were Palaeozoic limestone-tempered ware (fabric 4.1) mainly with a small amount of Severn Valley ware in the upper part of the fill; also potboilers, fired clay and animal bone. Only a few slight possible internal features were identified, and these did not help with its interpretation.

Figure 6 Earliest phase of circular enclosure (CG8); west facing section

Annexe (1st stage) (CG7, P1–2a) to circular enclosure CG8

This ditch was U-shaped in plan (0.55m deep and 0.90m wide; Figs 7–8) and was apparently contemporary with CG8, as the latter closed off the open site of the ditch with narrow entrances left where it linked; no finds.

Figure 7 Annexe to circular enclosure (CG7; Phases 1–2a)

Figure 8 Annexe CG7 (north side; east facing section; section 159)

Ditch adjacent to annexe (CG37)

A short straight length of ditch (0.60m wide and 0.20m deep, and almost parallel to one side of the annex CG7; Fig 7) was interpreted as contemporary, thereby forming a corridor alongside the annexe. Finds were only Malvernian handmade (fabric 3) pottery; potboilers and animal bone.

Pits (CG9)

Two pits up to 0.08m deep and 0.50m wide situated outside the circular enclosure and annexe. No finds except fired clay and animal bone.

South Area (Figs 3 and 11)

Figure 11 Ditch complex in southern area

Ditch (CG1)

Straight length of ditch (0.10m deep; Fig 19) with spurs – may form part of a wider system as it may continue as ditch CG4. No finds except for Malvernian handmade pottery, including from 650, possibly a separate pit.

Ditch (CG2)

A short length of curved ditch almost totally truncated; 0.30m deep and 0.70m wide. This should be one of the earliest features on the site; no finds.

Figure 9 Ditch CG1 (north facing section)

Pit (CG3)

Possible solitary pit (Fig 10) – relationship with ditch CG4 is unclear; no finds.

Figure 10 Ditch CG4 (right) and possible pit CG3 (left) (north facing section)

Curved ditch (CG4)

An irregular ditch at least 20m long and with variable depth (up to 1.40 wide and 0.65 deep; Fig 10), the segments of varying depth being sharply differentiated along its length. It is not certain that this concatenation was all contemporary and related in function. It cuts CG2 and possibly CG3. Few finds; pot is mainly Iron Age fabrics with a small amount of Severn Valley ware in secondary fills.

Figure 12 Ditch CG4 (west facing section)

Phase 2a (mid to late 1st century AD; Fig 13)

The dating of this phase was particularly marked by a preponderance of grog-tempered fabrics, some of which exhibited the earliest characteristics of Severn Valley ware (wheel-made though rather brown in colour compared with the classic type), with transitional later Iron Age/early Roman wares continuing well in evidence. Standard Severn Valley forms begin to show prominently, especially tankards. As the pottery styles changed the overall site plan saw a greater intensity of activity around the pond. However, the tendency for any open features to silt up continued. The largest feature,

the pond, was also being similarly adversely affected by silting, though its size meant it remained open.

Figure 13 Phase 2a plan

North Area

Pond (CG5)

Lower silting of the pond occurred (2004), which contained mainly pottery, predominantly Severn Valley ware (jars and drinking vessels) with some of the Malvernian handmade ware now imitating early Black-burnished ware (BB1; ie flanged bowls), but as the pond was excavated in spits some later pottery may have been incorporated. Other finds included clay oven, fuel ash slag, ceramic roof tile, and animal bone.

Circular ditch – site of possible roundhouse (later CG8, P2a–2b)

Recutting of the Phase 1 feature took place on slightly different position showing slight drift southwards towards the pond. This newly more substantial ditch was now 1.23m wide and 0.77m deep, but truncated at the top, so its original proportions remained uncertain. Moderate quantities of pottery (mainly Severn Valley ware) and animal bone were associated.

Figure 14 Circular enclosure CG8 (Phases 2a–b; for section 180 also see Fig 24)

Annexe (1st stage; CG7)

Annexe upper fills have some earliest Severn Valley ware.

Curved ditch (CG18)

An evenly curved segment of ditch immediately adjacent to the north side of the pond and with two recuts, the last being 0.90m wide and 0.41m deep (Figs 15 and 26). At the west end it connected into the pond via a gap at their junction, which led the excavator to speculate about water in the pond being integral to the operation of this feature.

Finds were mainly pottery (mainly fabric 16.2 with fabrics 3 and 4.1 with a small amount of Severn Valley ware) and animal bone; the earliest fill in the sequence only had fabric 16.2 (grog-tempered) sherds.

Figure 15 Curved segment of ditch CG18 on north side of pond CG5 (south-east facing section)

South Area

Pits (CG12)

Two pits (up to 0.75m wide and 0.40m deep) widely separated; one (744) with an uncertain relationship with CG4; pottery mainly Severn Valley ware.

Curved ditch (CG13)

Irregular curving ditch (0.52m wide and 0.06m deep; Figs 16–17) *c* 5m in diameter; pottery (mainly fabrics 3, 12, and 43) and some fired clay.

Figure 16 Curved ditch CG13 (view looking south-west)

Ditch (CG14)

Straight length of ditch (0.32m wide and 0.10m deep); small amount of pottery (fabric 16.2) and animal bone.

Pit (CG15)

Possible posthole (0.5m diameter and 0.20m deep); pottery (mainly fabric 16.2, but also Severn Valley ware) and fired clay.

Ditch (CG17)

Straight length of ditch (0.9m wide and 0.25 deep; Figs 17–18) with uncertain relationships; Severn Valley ware only.

Figure 17 Ditches CG13, 17 and 39

Figure 18 Ditch CG17 (east facing section)

Curved gully (CG21)

Narrow curving gulley (0.35m wide and 0.08m deep) extending beyond edge of site. Severn Valley ware only.

Curvilinear ditch (?roundhouse; CG38)

Substantial curved length of ditch (1.05m wide and 0.45m deep; Fig 19) extending beyond site. The fill contains a lot of pottery including in its primary level (proportions of fabrics 16.2 and 12 are similar, with fabrics 3 and 4.1 also being well represented). A notable feature is the amount of fuel ash slag with an iron-smithing hearth base, and fired clay. A stone quern represents domestic activity, and animal bone was also relatively well represented.

Figure 19 Ditch CG38 (north-east facing) section viewed over ditch CG1 (foreground)

Ditch (CG39)

Corner of a substantial ditch (1.35m wide and 0.54m deep; Fig 17); a second phase of the same structure may be represented by CG16 (see below), which was more substantial still. CG39 was associated with finds of pottery, animal bone and fired clay. The pottery included only 3% Severn Valley ware, being mainly fabrics 3 and 4.1.

Figure 20 Ditches CG16 (left) and CG39 (right) – see also section 6

Phase ?2a

Pits (CG40)

A pair of similar small pits (up to 0.32m wide and 0.10m deep) on either side of ditch CG14; only fired clay associated.

Phase 2a/b

Cremation (CG33)

An elongated oval pit (0.90 x 0.50 x 0.18m deep; Fig 26) with cremated bone, abundant small charcoal, fired clay, and nine iron nails. Dating was based on the presence of a single abraded sherd of Severn Valley ware and a rim sherd from a Malvernian tubby cooking pot, which would typically suggest somewhere in a mid 1st–2nd century date range for deposition.

Phase 2b (early to mid 2nd century AD; Fig 21)

Features around the pond continued in use as shown by the recutting of the ditches (and/or redesign) of the annexe, and of the main circular enclosure. During this period the greatest intensity of dumping of material occurred in the pond, as it became completely silted up. Further down-slope (south) new straight ditches were dug replacing the early curvilinear ditch systems.

Figure 21 Phase 2b plan

North Area

Pond (CG5)

The infilling of this large feature seemed to continue gradually over time, as there was no obvious signs of recutting or desilting, and the finds dating throughout the sequence seemed to be broadly consistent in date by depth (Figs 22–3). During this phase there was a great deal of deposition in the pond both in terms of its silting and the addition of other material through human agency – as this material was found throughout the depth of the fill, it seems it was being added during silting rather than being deposited while the pond held water with silting only following final abandonment, as in that case most of the finds would have accumulated at one level. The incorporation of so much artefactual and ecofactual material must have served to have speeded up its demise, and, therefore, may indicate that it was no longer functioning as a useful pond during much of Phase 2b.

Figure 22 Excavating deep pond silts (view looking south over northern edge of pond)

The associated finds comprised from bottom upwards:

> 2003 - a great deal of pottery (for dating purposes the samian with a *tpq* date of AD 120, and the 2nd century BB1 were most useful, and by this period Severn Valley ware was predominant accounting for 71% of pottery at this level), and animal bone, but there was also fired clay (including oven pieces), ceramic objects (Malvernian slab-built components of an ?oven), coal, at least three smithing hearth bottoms, >1kg of miscellaneous ironworking slag, and some fuel ash slag;
>
> 2002 - a great deal of pottery (for dating purposes the samian with a *tpq* date of AD 150 and mid 2nd century BB1 was most useful, though broadly the dating was similar to that for 2003), animal bone, at least one smithing hearth bottom, a small amount of miscellaneous ironworking slag, and fuel ash slag (and possible hearth lining);
>
> 2001 – a lesser amount of pottery and animal bone compared to the spits below, but the presence of BB1 still suggested a 2nd century date.

Figure 23 Section through pond fill (CG5) and overlying soil profile

Circular ditch – site of possible roundhouse (CG8)

The original ditch was now recut again (twice; 1149; 1075/1152/1192, 3.63m wide and 0.86m deep; Fig 14) in more or less the same position and after the complete silting of the original. Associated finds were as follows:

> 1149 (largely truncated) – mainly pottery (late 1st century AD samian and BB1 indicated AD 120+ *tpq* date), and a smaller amount of animal bone and fired clay;
>
> 1075/1152/1192 (final ditch) – 1075: mainly pottery (high proportion of vesicular Severn Valley ware, and samian ware, the latter suggesting a AD 120+ date), fired clay, fuel ash slag, and animal bone; 1152: mainly pottery (predominantly Severn Valley ware with pot *tpq* of AD 100+ with BB1 indicating AD 120+, and some worked bone objects); 1192: mainly pottery (predominantly Severn Valley ware and mainly jars) with samian indicating late 1st century *tpq* and other wares 2nd century AD at earliest), animal bone, fuel ash slag, and more fired clay than elsewhere in this sequence.

Figure 24 Final infilling of circular ditch – ?roundhouse gulley (CG8; section 172)

Annexe (2nd stage) (CG24 and CG36)

With the infilling of the original annexe ditch new ditches (0.95m wide and 0.50m deep) were excavated partly in the same position, but to a new plan providing a funnel entrance, with another break in the perimeter to the north. Associated finds were mainly pottery, fired clay, animal bone, and a concentration of burnt stones.

One length of ditch (CG24; 0.76m wide and 0.33m deep; Fig 25) contained more fired clay than pottery sherds, the latter containing a range of fabrics typical of the Conquest period and a Severn Valley carinated beaker indicating a mid–late 1st century *tpq* date, with an early Roman copper alloy brooch (Fig 41, no 1), but otherwise material was of 2nd century AD date.

Figure 25 Butt end of ditch CG24 (west facing section)

Shallow pits (CG25)

Shallow (<0.20m deep) pits located within the circular enclosure and just outside the annexe (the latter being 1158 where burnt cobbles and fired clay suggested a possible hearth).

Pit (CG27)

A pit (1.18m wide and 0.26m deep) on the inner edge of circular ditch CG8, the associated finds mainly being pot sherds (2nd century AD at latest), and a lesser amount of fired clay and animal bone; also a fine decorated bone handle (Fig 43).

Possible hearth (CG35)

A shallow pit (0.53m diameter and 0.07m deep) contained flat burnt stone and abundant charcoal. Situated on the outer edge of circular ditch CG8, and possibly postdating its infilling, and so may be later than Phase 2b; no other finds.

South Area

Ditched ?enclosure (CG16; Fig 20)

A substantial corner of a ditch (625: 1.45m wide and 0.65m deep; 616: 0.80m wide and 0.20m deep) with a continuation westwards (620: 0.89m wide and 0.28m deep). Finds were as follows:

> 616 – few pottery sherds (mainly Severn Valley ware);
>
> 625 – mainly pottery (moderate quantity including BB1 suggesting AD 120+), one iron-smithing hearth bottom, miscellaneous ironworking slag, some fired clay and animal bone;
>
> 620 – mainly animal bone and some pottery (mainly Severn Valley ware).

Postholes (CG10)

A line of three postholes of equal size (0.38m diameter and 0.19m deep) and parallel to ditch CG19. No finds

(?Rectilinear) enclosure (part only; CG11)

Short length of ditch (dimensions uncertain) extending off site to the south-west and which may be continuation of ditch CG41 to the north-east; no finds.

(?Rectilinear) enclosure (part only; CG19)

Long straight length of substantial ditch (2.85m wide and 0.55m deep; Fig 26) extending off site at both ends. Associated finds comprised mainly pottery (some indication of a 2nd century AD *tpq*, but most of the pottery could be 1st century AD) and a lesser amount of animal bone and fired clay.

Figure 26 Phase 2 sections (for locations see phase plans). Note: section 97, CG41 (left), CG19 (right)

Large ditches (?enclosure; CG20)

Length of substantial ditch (1.6m wide and 0.66m deep; Figs 26–7) extending off site to the north, which is at right-angles to ditches CG41 and CG19. Only moderate quantity of finds, and with similar amounts of pottery, animal bone, and fired clay. Pottery dating suggested AD 120+ for infilling.

Figure 27 Ditch CG20 (south-east facing section; section 1)

Ditch (CG22)

Straight length of a narrow and shallow (0.25m deep) ditch; the NW–SE limb peters out to the NW and there is a suspicion that this element may be orientated more in keeping with the later ridge and furrow. Finds are all from a single Severn Valley ware vessel.

Large ditches (?enclosure or axial field system; CG41)

A straight length of a substantial ditch (1.40m wide and 0.32m deep; Figs 26, 28) terminating to the south-west just before reaching ditch CG20, and set on the same alignment as ditches CG19/20. Only limited excavation seems to have occurred and no finds were retrieved, though the field record mentions fired clay and occasional fire-reddened stone.

Figure 28 Ditch CG41 (south-west facing section; section 97)

Phase 2c (later 2nd/early 3rd century)

The earlier focus of activity around the pond and the pond itself are now largely abandoned, and only the faint traces of a new field layout seem to indicate continuing use.

Figure 29 Phase 2c plan

Pit and ditches across infilled pond (CG23)

This context group consisted of features which seemed to postdate the pond silting, but there were problems of definition in the field (see more below).

A pit (1088; 1.00m wide and 0.42m deep) was associated with a small amount of pottery (fabrics 3, 4.1, 12), fired clay and some burnt stones. Just to its south there were several ditches, all extending beyond the site, some possibly conjoining on the west edge of the excavation area. Field recording was not conclusive about the precise stratigraphic relationship of these features with the pond fills and there were also signs that the pond fills were difficult to distinguish from the ditch fills, so it remained possible that the latter might have been lost as they proceeded across the pond area. The ditches were sometimes substantial: (1091: 1.6m wide and 0.44m deep; 1107: 1.15m wide and 0.40m deep (Fig 26); 1109/1162/1165: 0.50m wide and 0.08m deep (*ibid*); 1198: 3.4m wide and 0.70m deep; 1202/1204: 0.85m wide and 0.27m deep). Associated finds were as follows:

> 1091 – mainly pottery (*tpq* date of AD130), but some miscellaneous ironworking slag;
>
> 1107 – mainly pottery (2nd century material well represented and samian ware is AD 150+), plentiful burnt stones, and some animal bone;
>
> 1109/1162/1165 – almost entirely pottery (which seemed to be of mid to late 1st century AD date and included an unusual lamp; for latter see Fig 35, no 7);
>
> 1198 – small quantity of finds (pot, a small quantity of ironworking waste with fuel ash slag, and fired clay in diminishing quantities);
>
> 1202/1204 – few finds: pot, fuel ash slag.

Ditches (possible enclosure or axial field system; CG28)

This feature is likely to have extended further across the site, as it could also have been lost within the pond fills. Though the E–W and N–S elements were of similar length far more finds were associated with the latter, though this may be explained by differing extents of excavation:

> E–W element – 1116 (0.38m wide and 0.13m deep) with finds of pottery, animal bone, and fired clay. Associated finds comprised mainly pottery (including 2nd century BB1) and animal bone;
>
> N–S element – 1003 (0.54m wide and 0.38m deep)/1058 (0.68m wide and 0.19m deep)/1114 (0.45m wide and 0.07m deep). Associated finds comprised mainly pottery (including BB1) and animal bone; there was also a decorated bone pin (Fig 44, no 1), and the 1003 field record mentions ‘frequent fire-cracked stones’.

Phase 3 (medieval)

Figure 30 Phase 3 plan

Ridge and furrow (CG29)

The ridges were about 5–6m wide (furrow base to furrow base) and were best preserved in the South Area; to the east ridge and furrow at right-angles may have been present (eg part of CG22). Most of the finds were residual and largely comprised Phase 2-style Roman pottery, except for possible mid–late 4th century shell-gritted ware (1 sherd), and occasional medieval, and 17th–18th century sherds.

The ridge and furrow had severely impacted on earlier deposits, especially in the South Area. As this was combined with deep soils here this suggests that the ridge and furrow must have been very developed across the site. In the North Area the ridge and furrow had also impacted below the top of natural (ie features were truncated), but the greater accumulation of soils in the depression formed by the pond protected the pond fills.

Phase 4 (post-medieval and modern)

Figure 31 Phase 4 plan

Cobbled surface (CG26)

A cobbled surface sealed the west side of the pond and extended beyond its edge in places (Fig 32). This was constructed largely of stone cobbles up to 150mm in size, but also included lumps of post-medieval ceramic building materials. The associated pottery was mostly residual Roman, as typical of Phase 2, apart from a single post-medieval sherd. This assemblage was consistent with the surface being embedded in the top of the pond, where it presumably reinforced a soft area to allow passage across it, and its position corresponds with the trackway shown on the 1841 tithe map, though the precise date of its construction remained unclear.

Figure 32 Cobbled surface (CG26) across the infilled pond

Ditch (roadside; CG30)

Eventually the cobbled trackway was confined to a narrower line and this was demarcated by a ditch (1080/1082) 0.31m wide and 0.14m deep – the same alignment then continued up to the modern day as shown on late 19th century and later mapping. Associated finds were mainly animal bone and pottery, the latter being early to mid Roman at the latest.

Field drains (CG31)

An extensive system of field drains crossed both areas of the site, in the South Area being laid in the base of the ridge and furrow furrows; 17th century pottery was associated.

Plough-marks (CG34)

A series of shallow gulleys (0.12–0.24m wide and 0.02–0.10m deep) were uncertainly interpreted as late plough-marks, and, if correctly identified, all the associated pottery was residual.

Top/subsoil (CG32)

No finds information available:

North Area - on the north side of this area there was a combined thickness of top and sub-soil of 0.33m, but over the pond area this increased to up to 0.87m;

South Area - thickness varied between 0.79m at the north end, but was more generally *c* 0.50–0.60m thick.

6 Worked flint (*by* Robin Jackson)

Methodology

All flint was examined and recorded following standard Service practice (CAS 1995 as amended). Terminology and classification used here broadly follows that provided in Inizan *et al* (1992) and Butler (2005).

Results

All flint (11 pieces) was recovered as either residual or unstratified material. The raw material used was generally poor in quality with many pieces being mottled or flawed. Patination was present on a few pieces and, where cortex survived, this was typically abraded and either brown or pale buff coloured. No high quality raw material was present with the flint varying from brown through to mid to dark grey in colour, as typifies gravel derived flint in this region. Utilisation of flint raw material from such secondary sources has been commonly observed at sites in Worcestershire and surrounding counties, as at Lightmarsh Farm (Jackson *et al* 1996) and Aston Mill, Kemerton (Saville 1990) in Worcestershire, Kinver in Staffordshire (Bevan 1993) and Wasperton in Warwickshire (Bevan 1995), as well as in the only recent wider consideration of flint utilisation in the West Midlands (Barfield 2009).

The only items of interest within the assemblage were a small bladelet core (context 1000, P4) probably of Mesolithic or Early Neolithic date, and a thumbnail scraper of Late Neolithic/Early Bronze Age date (damaged; 2003, CG5, P2b). Otherwise the only retouched object was an irregularly retouched flake (600, P4), with the remaining material comprising débitage (7 flakes and a flaked lump). The paucity of tools and the presence of only a single burnt piece (1137, CG24, P2b) suggests that the flint does not directly relate to any settlement, and thus can either be attributed to stray losses or to the testing of gravel flint for suitability for use as a raw material.

7 Pottery (*by* Laura Griffin)

The total pottery assemblage from the site comprised 4189 sherds, weighing 69.6kg. The bulk of the assemblage was of Roman date, the quantity signifying significant activity in this period, but there were also smaller amounts of ?late Iron Age, medieval and post-medieval sherds, reflecting much lower levels of activity during these periods.

Methodology

All hand-retrieved pottery was examined and identified, quantified and dated to period. Where possible, a *terminus post quem* (*tpq*) date was produced for each stratified context, which was used for determining the broad date of structural phases. Records from both evaluation and excavation stages were entered into a Microsoft Access 2000 database.

Pottery was examined under x20 magnification and recorded by fabric type and form. All fabrics were referenced to the fabric reference series maintained by Worcestershire Historic Environment and Archaeological Service (Hurst and Rees 1992; www.worcestershireceramics.org). Sherds which could not be identified or were too small to be identified accurately by fabric were grouped within miscellaneous fabric categories 97 and 98. The preservation of sherds was variable ranging from those displaying very low surface abrasion to a small number that had very little surface surviving. However, taking the assemblage as a whole, the level of preservation was generally good. During reporting the results from analysis of this assemblage have, where possible, been compared to assemblages from other local and regional sites in an attempt to identify any common themes.

Late Iron Age Pottery

The total pottery assemblage from late Iron Age contexts comprised 136 sherds, weighing 464g. Further sherds of this period are also likely to have been residual within contexts of Roman date. Unfortunately, due to the continuity in fabric and form between the late Iron Age and early Roman periods in this region and also the later re-cutting of Iron Age features on the site, it has not been possible to identify such sherds individually. Therefore, some sherds of late Iron Age date will have been included within the Roman pottery quantification below.

Fabrics

A very narrow range of fabrics could be attributed to sherds of this period (see Fig 34). All were locally produced types commonly identified in late Iron Age assemblages found in Worcestershire. Handmade Malvernian ware (fabric 3) formed the largest group totalling 73 fragments with diagnostic sherds being from jar forms, including a heavy, thick-walled example (context 681, CG4). Palaeozoic limestone tempered ware (fabric 4.1) formed the next largest group, totalling 58 sherds (708, 754 from CG4; 1063, CG6, and 1145, CG8). These included 17 sherds from a jar with a small, everted/beaded rim (Fig 35, no 1). Other fabrics identified in small quantity were sand-tempered ware (fabric 5.1; 754 and 758, CG4), and a single sherd of an unidentified sand and grog-tempered fabric (fabric 97, 1063, CG6).

Roman pottery

The total Roman pottery assemblage from the site comprised 3370 sherds, weighing 61.9kg (81% of all pottery recovered). In many aspects, the assemblage was of standard fabric and form composition for a rural site of Roman date in this region, being dominated by locally produced coarse wares, primarily Severn Valley wares. Together the volume and quality of Roman pottery across the site have enabled a fairly tight sequence to be established in conjunction with the stratigraphy. The pottery was retrieved from two separate areas of the site. Of the two areas, the North Area appeared to be the main focus of Roman activity

Overview of the assemblage

Fabrics

The range of fabrics identified was relatively narrow with locally produced Severn Valley ware (fabrics 12, 12.1, 12.2, 12.3 and variants) and Malvernian ware (fabrics 3 and 19) dominating. Another small but significant group was made up of sherds of a handmade grog-tempered ware (fabric 16.2). The assemblage was early in character with the range

of fabrics and dating of diagnostic sherds indicating a continuation in occupation of the site from the late Iron Age to the first half of the Roman period, peaking in the 2nd century with the latest material being of mid 3rd century date. A quantification of fabric by sherd count and weight can be seen below in Table 2, and the main fabric types are discussed in more detail below.

fabric	fabric common name	count	weight (g)
3	Malvernian ware	357	6687
3.1	Slab-built Malvernian ware	53	1300
3/19	Malvernian ware	1	11
3/3.1	Malvernian ware	1	25
4.1	Palaeozoic limestone-tempered ware	6	51
5.2	Sandstone tempered ware	4	10
12	Severn Valley ware	1816	32207
12.1	Reduced Severn Valley ware	74	1045
12.2	Oxidised organically tempered Severn Valley ware	308	6831
12.3	Reduced organically tempered Severn Valley ware	60	1603
12.6	Severn Valley ware variant	6	366
13	Sandy oxidized ware	72	1055
14	Fine sandy grey ware	115	2191
15	Coarse sandy grey ware	17	680
16	Grog-tempered ware (BD32/33)	11	185
16.2	Handmade grog-tempered ware	106	2574
17	Mudstone tempered ware	2	77
19	Wheel-thrown Malvernian ware	61	1030
21	Micaceous ware	7	37
21.3	Early micaceous ware	41	350
22	Black-burnished ware, type 1 (BB1)	137	1155
29	Oxfordshire red/brown colour-coated ware	1	8
30	Oxfordshire white colour-coated ware	1	11
31	Brown colour-coated ware	1	3
32	Mancetter/Hartshill mortarium	12	377
34	West Midlands mortarium	1	99
35	Brockley Hill/Verulamium mortarium	1	71
37	Severn Valley mortarium	2	148
38	Oxfordshire white ware	8	99
38.1	Early Oxfordshire ware	7	58
41	Unprovenanced white ware	6	80
42.3	Pélichet 47-type amphora	2	255
43	Samian ware	5	32
43.1	Southern Gaulish samian ware	9	46

43.2	Central Gaulish samian ware	26	447
98	Miscellaneous Roman wares	30	346
154	Oxfordshire grog-tempered ware	3	27

Table 2 Quantification of the Roman pottery by fabric type

Severn Valley wares (fabrics 12, 12.1, 12.2, 12.3 and variants)

Oxidised fabrics of this ware formed the largest proportion of the local wares totalling 2264 sherds, and a significant proportion was the organically tempered type generally datable to the mid 1st–mid 2nd century, as indicated by other assemblages found across the region, and most recently by that from St Johns, Worcester (Evans 2010). This dating of the sherds from George Lane was supported by the range of forms identified within the group which included necked and carinated jars, carinated beakers and upright tankards.

Further Severn Valley Ware fabric variants thought to be of early date included examples containing grog, a smaller number containing shelly limestone and also, a distinctive fine, highly micaceous version commonly brownish orange in colour. Once again, forms and *terminus post quem* dates of contexts confirmed these fabrics to be of 1st–mid 2nd century date. Decorated sherds amongst the group also displayed traits characteristic of the early Roman period with a high number of cordons, foot-rings and grooved bases and fine burnishing.

Reduced Severn valley wares formed a far smaller proportion of the assemblage than their oxidised counterparts at just 134 sherds. Once more, those of the organically tempered variant (fabric 12.3) are considered indicative of earlier date. The range of forms identified was very narrow, consisting of a small number of jars and tankards. Diagnostic sherds identified amongst the organically tempered variant were dominated by rims from large, thick-walled storage jars, a pattern also identified within the early assemblage from St Johns, Worcester (Evans 2010).

Malvernian wares (fabrics 3, 3.1 and 19)

Vessels of Malvernian wares comprised 410 sherds of the handmade fabric (fabric 3 and 3.1) and 61 of the wheel-thrown (fabric 19). Traditionally, vessels of the handmade fabric date between the 1st and early 3rd centuries, whilst those of the wheel-thrown version were produced later in the period between the later 2nd and mid 4th. However, the presence of sherds of wheel-made fabric within contexts from Phase 2b would suggest that this start date needs to be pushed back to at least the mid 2nd century.

Where identifiable, vessels of handmade fabric consisted primarily of jar forms ranging from small tubby cooking pot types through to slab-built large, heavy storage jars often with facetted rims (eg examples from context 700, CG38). Such forms are characteristic of late Iron Age/early Romano-British assemblages across the region. Other handmade vessel types included lids (1092, CG23; 1095, CG26; 2003-C3, CG5) and two imitation Black-burnished ware flange-rimmed bowl forms (1108, CG23; 2004, CG5).

Identifiable forms within the wheel-made fabric were of an equally narrow range consisting primarily of everted rim jars (eg context 2003-C3 and D2, CG5) and a small number of bowls (eg 2003-C3) which appear to have been local imitations of Black-burnished ware 1 forms.

Handmade grog-tempered ware (fabric 16.2)

Sherds of this fabric formed a small but significant proportion of the assemblage and are thought to be of local production. The fabric bore similarity to both Severn Valley and Savernake wares being fine and micaceous with frequent grog inclusions identifiable within the matrix. Firing was variable with colour ranging from pale pinkish orange to pale grey. Few diagnostic sherds were present but those that could be identified were exclusively from large, thick-walled storage jars similar to those seen in the organically tempered reduced Severn Valley ware fabric. The high proportion of this ware at George Lane, in comparison to nearby Furzen Farm and Throckmorton would indicate it to be of early Roman date. Indeed similar grog-tempered fabrics identified within the assemblage from nearby Beckford were of equally early Roman date (Jane Evans, pers comm).

Early micaceous ware (fabric 21.3)

This fabric type was first identified on the New Police Station site (Griffin 2002) and Magistrate's Court (Jones and Vyce 2000) sites on Castle Street, Worcester. A single waster sherd was also identified within the assemblage from the latter (Jeremy Evans, pers comm), although a specific source of production has not been ascertained. Identifiable forms from both of these sites were consistently of an early Roman date, with rusticated jar and carinated bowl forms of mid 1st–2nd century predominating. This dating has been further reinforced by forms identified in this assemblage. Although few diagnostic sherds were identified within this group at George Lane, they included rusticated jar fragments (eg 1153, CG8) consistent with this early Roman date range.

Black-burnished ware 1 (fabric 22)

Sherds of Black-burnished ware 1 were particularly instrumental in the phasing of the site and dating of individual features with presence being indicative of post AD120 occupation. Forms present were primarily of mid–late 2nd century in date comprising everted rimmed jars with upright-, moderately everted rims (Wessex Archaeology (WA) type1 and 2; Seager-Smith and Davies 1993), miniature jars/beakers (WA type 10) plain-rimmed dishes (WA type 20) and flanged bowls (WA type 22), a small number of which had a proto-beaded rim (eg. context 2003 C3) taken to be the earliest form of the drop-flanged rim form (WA type 25).

Range of forms

The range of forms identified at George Lane fits into established general patterns for rural settlement with jars dominating (Evans 2003). This high frequency of jar forms can be attributed to the versatile nature of the form serving a variety of functions including the storage, cooking and serving of foodstuffs. Jar types ranged from the standard narrow-mouthed form seen in Severn Valley ware, commonly associated with storage through to 'cooking' forms in Malvernian and Black-burnished ware. Large storage jars were particularly common in the reduced grog-tempered fabrics and in the organic tempered Severn Valley ware.

Drinking vessel forms were primarily identified in oxidised Severn Valley ware fabrics and included upright tankard and carinated beaker forms, both of which are characteristic of the early Roman period. As well as having straight sides, many of the tankard bases also displayed grooves on the underside of the base – another feature commonly associated with early vessels. In addition, two examples appeared to have taken this groove to a more exaggerated level with a distinctive deep foot-ring (Fig 35, nos 8–9). As noted at St Johns, Worcester, carinated beakers which are thought to be Belgic derived in form were most commonly identified in oxidised organically tempered Severn Valley ware (fabric 12.2; eg Fig 35, no 14), although the variety of waisted forms

seen at the aforementioned site were not noted at George Lane, with the upright walled form the only type in evidence. In contrast, proportions of tankard sherds were similar in both the fine and organically tempered fabrics.

Where identified, bowl and dish forms were almost exclusively of Black-burnished ware 1 fabric and are therefore of mid 2nd century onwards. Prior to this, it is likely that necked and carinated jar forms in Severn Valley ware (Webster 1976, forms 19 and 20) served an equivalent purpose. Flanged bowls in Severn Valley ware (2003-C1 and C3) are generally considered to be 3rd century in date . Amongst these bowls was one with a distinctive frilled rim which has been tentatively identified as a tazza (possibly a ritual vessel; Fig 36, no 17).

The mortaria identified within the assemblage formed a small but significant group indicating the availability and use of more 'Romanised' forms but only on a relatively small scale.

Dating of main site activity

The pottery from this site indicated the site to have been used over a fairly short period between the latest part of the Iron Age and early 3rd century, peaking in the early/mid 2nd century. As mentioned above, one of the most useful indicators for distinguishing phases was Black-burnished ware 1, with its presence or absence determining contexts of later than *c* AD 120 and the forms present providing relatively tight date ranges.

Discussion of pottery by phase

There is a marked peak in Phase 2b, indicating that the main period of site deposition occurred in the early/mid 2nd century (Fig 33).

Figure 33 Proportion of pottery by phase

Phase 1 – late Iron Age

Only a restricted range of fabrics were present at the outset of site occupation with palaeozoic limestone-tempered (fabric 4.1) and Malvernian (fabric 3) wares being the main types. It is perhaps significant that no Droitwich briquetage was apparently absent. The dating of this phase also rested primarily on the absence of Severn Valley ware, however, assemblage quantities were low and so some uncertainty must remain about this dating.

Figure 34 Pottery fabrics (Iron Age) from Phase 1

Figure 35 Iron Age and Roman pottery

Figure 36 Roman pottery from pond fills (CG5)

Catalogue of illustrated pottery

Figure 35

1 Bead-rimmed jar in palaeozoic limestone-tempered ware, late Iron Age (fabric 4.1; 754, CG4, P1)

2 Jar in sandstone-tempered ware late Iron Age–1st century (fabric 5.2; 1200, CG23, P2c)

3 Jar in oxidised sandstone-tempered ware, late Iron Age–1st century (fabric 5.2; 2021, CG0, unphased)

4 Jar in handmade Malvernian ware with rivet hole, 1st–early 2nd century (fabric 3; 1141, CG7, P2a)

5 Large storage jar in handmade Malvernian ware with pattern burnish, late Iron Age–late 1st century (fabric 3; 1110, CG23, P2c)

6 Jar in palaeozoic limestone-tempered ware, late Iron Age–1st century (fabric 4.1; 1110, CG23, P2c)

7 Lamp in oxidised Severn Valley ware, ?1st century (fabric 12; 1110, CG23, P2c)

8 Tankard in oxidised Severn Valley ware, 1st century (fabric 12; 1110, CG23, P2c)

9 Tankard in oxidised Severn Valley ware, 1st century (fabric 12; 1137, CG24, P2b)

10 Jar in oxidised Severn Valley ware, 1st–2nd century (fabric 12; 1122, CG28, P2c)

11 Large storage jar in handmade grog-tempered ware, mid 1st–mid 2nd century (fabric 16.2; 626, CG16, P2b)

12 Large storage jar in handmade grog-tempered ware, mid 1st–mid 2nd century (fabric 16.2; 1108, CG23, P2c)

13 Decorated sherd of early Oxfordshire ware, ?2nd century (fabric 38.1; 1151, CG8, P2b)

Figure 36

14 Carinated beaker in organically tempered oxidised Severn Valley ware, 1st–2nd century AD (fabric 12.2; 2002-D5, CG5, P2b)

15 Beaker in early micaceous ware, mid 1st–2nd century (fabric 21.3; 2003-C3, CG5, P2b)

16 Beaker in early micaceous ware, mid 1st–2nd century (fabric 21.3; 2003-C4, CG5, P2b)

17 Bowl with frilled rim (a possible tazza) in oxidised Severn Valley ware, 2nd–3rd century (fabric 12; 2003-C3, CG5, P2b)

18 Flange-rimmed bowl in Palaeozoic limestone-tempered ware, late Iron Age–1st century AD (fabric 4.1; 2003-D2, CG5, P2b)

19 Large tankard in organically tempered oxidised Severn Valley ware, 1st century AD (fabric 12.2; 2004-B5, CG5, P2a)

20 Tankard in oxidised Severn Valley ware, 2nd century (fabric 12; 2001-I3, CG5, P2b)

21 Slab-built Malvernian ware, 2nd century (fabric 3.1; 2003-D2, CG5, P2b)

Phase 2a – Early Roman (mid to late 1st century)

A total of 507 sherds were identified as coming from contexts of this phase (Fig 33). As would be expected, a narrow range of pottery fabrics were represented with majority being of local production (see Fig 37). In addition, a continuation of use of fabric types

commonly associated with the late Iron Age (fabrics 3, 4.1, 4.8 and 5.2) could also be detected within this group, indicating a continuation in production and use, certainly in the earliest years of Roman occupation. Diagnostic sherds of these fabric types were all from jar forms but varied from small tubby cooking pots to large, thick-walled storage vessels.

Figure 37 Pottery fabrics from Phase 2a

The Severn Valley wares included a high proportion of organically and grog-tempered sherds typically associated with the earliest period of production. In addition, occurrence of the fine, micaceous brownish orange brown variant was also noted within this early phase, confirming its early date. Diagnostic sherds within the group consisted of a narrow range of classically early forms including carinated cups (Webster 1976, nos 60–1), upright tankards (*ibid* nos 38–9), necked and carinated jar forms (*ibid* nos 19–20), and a rusticated jar (fabric 12.1; 1147, CG8), the latter being of the late 1st and early 2nd century.

Sherds of handmade grog-tempered ware (fabric 16.2) also formed a small but important component of the pottery assemblage from this phase. As with the fine brown Severn Valley ware above, the occurrence of this ware within the early phase on this site confirms the long-held belief that this fabric was produced from the start of the Roman period.

Phase 2b – Roman (early–mid 2nd century)

The quantity of pottery associated with this phase indicated a peak in activity in the first half of the 2nd century (Fig 33). A total of 2291 sherds (Fig 38) were retrieved with a substantial proportion coming from contexts within the pond feature.

Figure 38 Pottery fabrics from Phase 2b

Dating of the pond use/disuse

The excavated part of the pond accounted for 1337 sherds weighing 30.696kg. Despite being excavated in a series of spits, it was possible to identify separate layers and phases from the pottery assemblage, and demonstrate that the feature had infilled steadily throughout its period of use. The earliest datable sherds included a large upright tankard of 1st century date (2004-B5; Fig 36, no 19) and the latest were assigned to Phase 2b (2001), including a tankard with slightly splayed sides and so indicative of the 2nd century (2001-I3; Fig 36, no 20).

Overall

Once more, the greater proportion of these sherds from this phase were of local production, but a far greater range of non-local types could also be noted in this phase, along with a significant increase in the amount of samian ware, and particularly that of Central Gaulish production. Furthermore those wares of a native tradition such as the handmade Malvernian wares (fabrics 3 and 3.1) and Palaeozoic limestone-tempered ware (fabric 4.1) could be seen to be in decline at this period with a high proportion likely to be residual, whilst the more ‘Romanised’ Severn Valley wares were becoming more

dominant. In addition, a small amount of wheel-thrown Malvernian ware could be identified within this phase with everted rimmed jars and flanged bowls identified amongst the diagnostic sherds. Traditionally, this fabric is thought to date from the late 2nd century, so the presence of these sherds within contexts potentially dated to the first half of that century may be indicate a longer date range.

Another important change in this phase was the appearance of Black-burnished ware 1 (BB1). This ware is thought to have first come into the west Midlands region around AD 120 and, therefore, presence or absence within this assemblage has been instrumental in the dating and phasing of contexts. Forms of this phase typically included jars with moderately everted rims and acute lattice (WA types 1 and 2), miniature jars (WA type 10) and flange-rimmed bowls (WA type 22).

Other fabrics present include the handmade grog-tempered ware (fabric 16.2, Fig 35, nos 11–12) first seen in Phase 2a and also sherds of fine early micaceous ware (fabric 21.3; Figs 35–6, nos 13–14). This latter fabric has generally dated from the mid–late 1st century based on evidence from assemblages found in Worcester. However, the increased presence of sherds within Phase 2b on this site may indicate that it was not reaching rural sites to the south of the County until later.

Some possible early Oxfordshire ware was unusual: a ring-necked flagons in white fabric (1151 and 1153, CG8; Young type W3) and either a single small jar/beaker or two examples of the same vessel type in oxidised fabric (1151 and 1154; CG8). These latter sherds are of particular interest due to their being decorated with barbotine circles (Fig 35, no 13). A similar vessel (but in white fabric with orange barbotine circles) was present at a villa site in Childswickham, just 13km to the south-east, where dated to late 1st–early 2nd century (Timby 2004, 27).

Mortaria was also first identified within contexts of this phase with sherds of Mancetter/Hartshill (fabric 32), West Midlands (fabric 34) and Severn Valley (fabric 37) vessels identified. Therefore, it can be seen that not only the range of fabric types, but also of vessel types, widened in the first half of the 2nd century.

Phase 2c – Roman (later 2nd/early 3rd century)

This phase sees a significant decline in the quantity of pottery with 599 sherds recovered (Fig 33). The group was still dominated by locally produced sherds (see Fig 39), although a significant proportion of the handmade Malvernian wares (fabric 3) and Palaeozoic limestone-tempered wares (fabric 4.1) were almost certainly residual by this date, as were the organically tempered Severn Valley wares (fabrics 12.2 and 12.3). In addition, the proportion of Malvernian ware was skewed by 88 sherds coming from just two individual vessels (1108, CG23; 1051, CG28). There were large, thick-walled storage jars in fabric 3 (eg Fig 35, no 8), as well as everted rimmed jars and bowls imitating Black-burnished ware 1 forms and decoration (eg 1108, CG23; 1114, CG28).

Figure 39 Pottery fabrics from Phase 2c

Other fabrics thought to be of earlier Roman date such as the handmade grog-tempered ware (fabric 16.2; 1108, CG23, and 1110, CG23) and early micaceous ware (fabric 21.3; 1052 and 1114, CG28) were now represented by just a few sherds each, providing firm evidence that they were not being produced after the mid 2nd century. Other locally produced wares identified within this phase included fine grey ware (fabric 14), coarse

grey ware (fabric 15) and wheel-thrown Malvernian ware. Sherds of this latter fabric were still relatively low in number, but help to confirm the production of this ware as during the 2nd century. Where identifiable, vessels were generally everted rim jars imitating those commonly seen in Black-burnished ware 1.

The levels of Black-burnished ware 1 (fabric 22) increased during this period and identifiable forms were instrumental in dating contexts. These included flanged bowls (WA type 22) and proto-bead rimmed bowls (WA type 25) and jars with a moderately everted rim, and acute or right-angled lattice (WA type 2), all typical of the 2nd half of the 2nd century AD. Sherds from mortaria were all of Hartshill/Mancetter fabric (fabric 32) and represented two individual vessels; one of hammerhead type (1092, CG23) and one hook-rimmed (1115, CG28) in form.

All samian ware in this phase was of Central Gaulish origin (CG23 and 28), and no other imported wares were present in this phase.

Pottery supply to south-east Worcestershire during the Roman period

The site at George Lane was just one of a series which have been excavated in and around Wyre Piddle in recent years. As a result, it is now possible to look at the patterns of pottery supply, consumption and contact in the area throughout the Roman period.

George Lane

The pottery retrieved from George Lane forms a significant group due to the relatively tightly dated phases and early date of the fabrics and forms represented. The range of fabrics and dating of identifiable forms indicated a strong peak in occupation on the site between the early–mid 2nd century, with earlier and later material represented in much smaller quantity. As the site is so relatively short-lived, appearing to go out of use in the earlier part of the 3rd century, the range of fabric types present in each phase remains fairly consistent with the proportions of these types and associated forms being the main variant.

Non-local wares consisted primarily of sherds of Black-burnished ware 1, although this only formed 4% of the overall assemblage and was only present in any significant proportion during Phase 2c, when it amounted to 11% of the pottery dating between the mid 2nd and early 3rd century. This was perhaps the most striking change in the assemblage and coincides neatly with the known date for a growing use of the ware in the region.

The paucity of imported and fine wares within the assemblage is consistent with that expected from a rural settlement, being the pattern seen at other nearby sites, such as Furzen Farm and Throckmorton. However, the presence of a small number of early Oxfordshire sherds is of particular note, primarily due to this type of pottery being largely associated with late Roman assemblages in this region. However, the presence of a similar vessel at Childswickham (Timby 2004) would indicate that the supply was there during the first half of the Roman period, particularly towards the south of the county.

Overall, therefore, the George Lane site followed the standard pattern for a rural site of this type within the region, which is for the overwhelming dominance of locally produced Severn Valley wares, with other wares (both local and non-local) occurring only in small amounts.

Furzen Farm (Wyre Piddle bypass; unpublished)

The range of fabrics and dating of identifiable forms within the assemblage from the nearby Furzen Farm site (just 1.4km to the west) indicated a strong peak in activity there during the 2nd–3rd centuries. The earlier Roman period was also relatively well represented as follows: variant micaceous ware, grog-tempered ware and coarse sandy greyware, organically tempered Severn Valley ware, and handmade Malvernian ware. Mortaria and fine wares used prior to this later period consisted of Hartshill/Mancetter and Severn Valley mortaria and Samian wares. Very little material of later Roman date was identified, indicating a steep decline in occupation by the mid 4th century. It is possible that this decline was related to a shift in the focus of settlement in the area to the nearby Upper Moor site which had a large assemblage of later 4th century pottery (Griffin 2005a).

Sherds of Black-burnished ware formed a relatively small group forming just 11.4% of the assemblage. The latest Roman pottery was just two sherds of South Midlands shell-tempered ware and eighteen of Oxfordshire wares (fabrics 29, 33 and 38). Vessels of South Midlands shell-tempered ware became the most widely used cooking vessels from the late 4th century, following the decline of the Black-burnished ware industry, and, therefore, the presence or absence of such sherds has been widely used as a marker for post mid 4th-century occupation (eg at Droitwich; Barfield 2006, 149–50, and 154). As seen at nearby Throckmorton, the use of Hartshill/Mancetter mortaria may have continued alongside those of Oxfordshire manufacture in the earlier 4th century. The levels of fineware pottery at Furzen Farm were also notably low, as at George Lane, and once again consistent with those of a rural settlement with just 28 sherds of samian ware and two of Oxfordshire colour-coated ware.

Upper Moor (Vaughan 2005)

The assemblage from the Upper Moor site (0.5km to the east) included a well-preserved group of late Roman vessels typical of the late 4th century onwards (Griffin 2005a), the earliest pottery from here dating from the 3rd–early 4th century, and, therefore, largely of a later date than that from Furzen Farm. Once more, there was an overwhelming dominance of locally produced Severn Valley wares from contexts predating the later 4th century, and a marked increase in non-local wares, such as South Midlands shell-tempered and Oxfordshire products, after that date.

Perhaps the most interesting aspect of this assemblage was the occurrence of a new and apparently locally produced fabric type appearing to closely imitate Black-burnished ware 1 both in appearance and form types (fabric 149). Sherds of this fabric have not been identified on either of the nearby sites of Throckmorton (Griffin 2005b) or Furzen Farm, despite the occurrence of both South Midlands shell-tempered and Oxfordshire wares within these assemblages, suggesting it to be of later rather than mid 4th century date.

The levels of fineware pottery on this site were relatively high for a rural settlement (6.2%), which was the result of an influx of Oxfordshire vessels during the latest period of habitation. This peak in finewares during the later Roman period appears to be typical of very late settlement across the country (Jeremy Evans, pers comm). In contrast, finewares from the earlier features had been consistent with the pattern observed at George Lane and Furzen Farm, where there were just a few sherds of Central Gaulish Lezoux samian, the most common samian source represented on 2nd century rural sites in Britain.

Patterns of consumption

It is now possible to draw some general conclusions about Roman pottery supply/consumption in this part of south Worcestershire. As stated above, all the assemblages considered here were of a standard rural type, with primarily locally produced pottery types and basic forms such as jars and bowls dominating. The local wares were supplemented by smaller amounts of more specialised non-local types such as mortaria from Hartshill/Mancetter and Oxfordshire, and also cooking wares such as Black-burnished ware 1 – all of which are known to have been widely available in the area, and have regularly been found within other assemblages in Worcestershire.

Seven Valley ware was the one constant which was found in high proportion across all sites between the mid 1st and mid 4th centuries, and neutron activation analysis has indicated that the most common source of these wares, as found on sites in Worcestershire, were the well-documented kiln sites at Malvern were. Sherds of the coarser handmade and wheel-made Malvernian wares (fabrics 3 and 19) are also known to have been produced on these same sites (Evans *et al* 2000), but the proportion of these wares was far lower, a pattern noted generally on sites across the region, possibly resulting from the more specialist function of these vessels as cooking wares, and their earlier dominance as local cooking wares in the 1st and 2nd centuries eventually gave ground to Black-burnished ware 1 from Dorset. Despite this later dominance of Black-burnished ware from the 3rd century, it formed a relatively small group at just 11.4% of the assemblage at Furzen Farm, and comparison with other sites within the county indicate that proportions of this ware vary greatly ranging from just 5.8% at Throckmorton (Griffin 2005b) to 17% at Hoarstone Farm, Kidderminster (Hurst 1994). Previous analysis of Black-burnished ware figures from sites in the wider west Midlands region has led to the conclusion that the proportion typically varies from site to site, in part due to transportation routes but also influenced by site status, identity and exchange relationships (Allen and Fulford 1996). Indeed, this would appear to be the case for Worcestershire, although it could be asserted that rural sites in the south of the county have consistently low numbers of these vessels (cf Timby 2004; Griffin 2005a and b).

Finewares in the form of Nene Valley and Oxfordshire colour-coated wares were few and far between at both George Lane and Furzen Farm, and similarly low levels of these wares were also been noted at Throckmorton (Griffin 2005b), Strensham (Ratkai 1995) and Shire Farm Hawford (Buteux 1995). Two exceptions are Childswickham villa site which had a far wider range of finewares, both imported and regional (Timby 2004), and the later 4th century assemblage from Upper Moor (see above). As with the Black-burnished ware, supply into the region does not appear to have been the overriding factor for the general paucity of these wares in south Worcestershire area, since status could have been an influencing factor at Childswickham, and,in the case of the Upper Moor site, its later Roman date.

It can, therefore, be seen that the study of pottery supply/consumption across a range of sites in a larger region can allow trends to be observed.

The pottery reaching south Worcestershire during the Roman period was largely limited to a relatively narrow range of suppliers, primarily relying on local production sources (Malvern area). Furthermore, it would appear that the presence/absence of wares, as indicated by the differing proportion of ware types from some sites in the locality, was most likely to be the result of preference rather than any problems with supply. In addition, it would appear that the range of wares available only increased significantly during the second half of the 4th century following the decline of many larger industries, including Severn Valley ware production.

Medieval pottery

Just two fragments of medieval pottery were retrieved: sandy glazed Worcester-type ware (fabric 64.1), and Southern white ware (fabric 70).

Post-medieval pottery

A total of 14 sherds of pottery could be identified as post-medieval, dating from the 17th century onwards including: black-glazed red sandy wares (fabric 78), buff ware (fabric 91), Midlands purple ware (fabric 108) and stonewares (fabrics 81, 81.2 and 81.4). The majority were from the southern area of the site, and came from the surface deposits and plough-soils.

8 Ceramic objects (*by* Laura Griffin)

Flat plates

A small assemblage (16 fragments weighing 1766g) of handmade Malvernian plates mainly came from Phase 2b. With the same fabric commonly being used for the production of pottery vessels, more plates might be present but not recognised as such. Such pieces were used for cooking of food as sooting and burning can be present on the surfaces (ie soot and carbonised deposits on the upper surface and burning on the underside – a pattern noted on this type of object elsewhere cf Cool 2006a, 41). Although a number fragments appeared to display an edge, it was not possible to measure any diameters in the George Lane assemblage. However, it can be seen from parallels elsewhere that this was very variable at *c* 140–500mm across (*ibid* 41). They are also known to come in a range of forms, with some being more ovoid in shape or having straight sides and rounded ends.

Examples from outside of the county seem to be confined to Oxfordshire and Warwickshire and are all Roman in date, with the majority found on rural sites dating to the latter half of the period (*ibid* 41), making this largely early 2nd century assemblage relatively unusual.

Lamp

An unusual small, round-bottomed vessel of oxidised Severn Valley ware fabric (fabric 12; CG23; Fig. 36, no 7) had distinctive blackening concentrated in one area of the internal surface – presumably from a wick indicating its use as a lamp, and its form indicated that it would most likely have been held in a stand.

9 Ceramic building material (*by* Laura Griffin)

A total of 31 pieces of Roman brick and tile were all highly abraded and displayed no diagnostic features as to specific forms or markings such as signature or tally marks. A range of different fabrics were all fine and oxidised, and varied primarily in the proportion of sand. Three fragments could be provenanced due to visible inclusions of Malvernian rock (2002 (G4), 2003 (B4, F2); pond CG5, P2b). Although no definite structures were identified during excavation of the site, the presence of this material may suggest the presence of a substantial dwelling with a tiled roof somewhere in the general vicinity.

phase	context group	context	grid	material	type	total	weight (g)
2a	5	2004	B4	tile	Roman	3	54
2a	5	2004	E2	tile	Roman	1	10
2b	16	693	-	tile	Roman	1	4
2b	5	2002	B4	tile	Roman	1	139
2b	5	2002	F3	tile	Roman	1	74
2b	5	2002	F3	brick	Roman	1	77
2b	5	2002	G3	tile	Roman	3	93
2b	5	2002	G4	tile/brick	Roman	1	260
2b	5	2002	H3	tile/brick	Roman	1	105
2b	5	2002	I3	tile	Roman	2	128
2b	5	2003	B4	brick	Roman	1	226
2b	5	2003	C3	tile	Roman	1	389
2b		2003	F2	tile	Roman	2	97
2b		2003	F4	tile	Roman	2	34
2b		2003	I4	tile	Roman	1	26
3		613	-	tile	Roman	5	66
4		611	-	tile	Roman	1	56
4		1095	-	brick	Roman	1	368
4		1095	-	brick	Roman	1	167
0		1209	-	tile	Roman	1	75

Table 3 Quantification of Roman ceramic building material

Other ceramic building material was all of post-medieval and modern date, coming primarily from the cobbled layer sealing the pond (CG26), and plough-soils of the site.

10 Fired Clay (*by* Laura Griffin)

The total fired clay assemblage from the site comprised 1336 fragments, weighing 8.683kg. The majority of pieces were small, abraded fragments and could not be identified as being from any particular type of object. However, based on other local assemblages of similar date, it can be assumed that these fragments represent oven structures, loomweights, and daub.

Fabrics

A representative sample of fragments was looked at in more detail to identify any difference in fabric type. Fragments from the earliest and latest phases were then isolated to see if any correlation between fabric and date could be noted. Two fabric types were identified within the assemblage. Both were of locally available Lias clay but could be separated on the basis of a differing range of additional inclusions:

> Fabric A: fine Lias clay with some white banding, moderate shell, moderate rounded red pellets and occasional dark grey/black pellets;

Fabric B: fine Lias clay with occasional shell and rare rounded red pellets.

Forms

The majority of the assemblage was made up of small, undiagnostic fragments. However, a small group of larger, curved pieces could be identified as from oven-type structures, such as recorded at Childswickham (Hurst 2004) and Beckford (Hurst forthcoming). At the former substantial parts of a domed oven had been formed using a coil technique (*ibid* 42). The fragments from George Lane were too small to allow any comment on form, but finger impressions and smoothing marks were in evidence indicating a similar production technique.

Dating

The amounts of fired clay by phase followed the same pattern as for Roman pottery with a marked peak in quantity in Phase 2b (Fig 40) suggesting that it was a regular and constant component of the site assemblage, as might be expected given its presumed functions.

Figure 40 Proportions of fired clay by phase

11 Metalwork (*by* Laura Griffin)

Metalwork consisted of a range of iron and copper alloy objects of varying preservation and date, including commonly identified objects such as nails and fragments so heavily corroded that visual identification was not possible. A number of objects were radiographed (plate ref x6729; York Archaeological Trust Conservation Lab) as an aid to identification.

Iron

The ironwork retrieved from the site is summarised below in Table 4, and objects of note or from well-dated contexts are discussed below; most objects were in fragmentary condition.

phase	context group	context	grid	type	total	weight (g)
1	4	705		nail	3	12
2	0	1010		nail	1	10
2a	39	630		?ring	1	1
2a/b	33	719		nail	1	1
2a/b	33	719		nail	8	46
2a/b	33	719		nail	9	16
2a/b	33	720		object	1	2
2b	24	6		nail	1	2
2b	16	10		nail	1	1

2b	8	1143		hobnails	53	39
2b	8	1151		hobnails	0	688
2b	8	1153		hobnails	11	30
2b	8	1156		object	1	10
2b	5	2001		horseshoe	1	311
2b	5	2002	D4	nail	1	6
2b	5	2003	C1	?nail	2	121
2b	5	2003	B4	nail	1	5
2b	5	2100	G4	object	4	410
2c	28	1051		?bar	1	16
2c	28	1058		nail	1	2
2c	28	1115		nail	1	3
3	29	607		nail	1	6
3	29	1105		nail	1	12
4	0	600		hinge	1	50
4	0	600		nail	1	2
4	30	1083		nail	1	11
1	5	2020		spring	1	10
0	0	0		nail	1	90

Table 4 Iron objects

Phase 1

A single nail was retrieved from ditch 705 (CG4). Although rare in pre-Roman contexts, the assemblage from Beckford also had nails within contexts securely dated to the late Iron Age.

Phase 2a

A fragment of a plain finger ring with an oval section (D:20mm, W:5mm, T:3mm) was retrieved from the primary fill of a ditch (630, CG39).

Phase 2b

The most numerous iron objects from this phase were a large number of shoe hobnails totalling 158 plus fragments from a circular ditch (1143, 1151, 1153; CG8); associated pottery indicated a *terminus post quem* of the early 3rd century AD. Complete shoes indicate that a large number of nails were frequently used on each individual sole (Crummy 1983, 53; Waterer 1976, 182).

Two large and highly corroded objects were difficult to identify: either a very large nail or a tool (2003-C1, CG5) and three adjoining amorphous lumps of iron bar (2100).

A horseshoe was found within the upper levels of the pond (2001). The large size of this indicated that it may have come from a cart-horse. Examples of similar appearance can be seen within the material recovered from South Shields Roman fort and, although they cannot be dated by shape alone, it is commonly accepted that the horseshoe was

introduced to Britain by the Romans (Allason-Jones and Miket 1984, 294). Also from the same phase were nails (2002-D4 and 2003-B4) and an unidentified iron object (1156, CG27; too corroded to illustrate).

Phase 2c

Two nails (1058 and 1115; CG28) and a highly corroded iron bar similar in form to that from Phase 2b above (1051, CG28).

Phase 3

Two nails were retrieved from this phase (607 and 1105; CG29).

Phase 4

Three nails (600, and 1083, CG30) and a large hinge fragment (600) were identified from post-medieval contexts.

Copper alloy (*by* Laura Griffin) (see also Coins)

phase	context group	context	type	total	weight (g)
2b	24	27	brooch	1	7
?2	0	612	stud head	1	1
?2	0	612	coin	1	2
3	29	606	button	1	6
4	0	610	coin	1	9
0	0	0	bracelet	1	15
0	0	0	object	1	4
0	0	0	brooch	1	2

Table 5 Copper alloy objects

Roman (Fig 41)

1 An almost complete and well preserved Polden Hill-type brooch but minus the pin and spring (27, CG24, P2b; cf Hattat 2000, fig.159, type 26).

2 A small, corroded fragment from the bow of either an Aucissa or Hod-Hill form brooch, with visible iron corrosion products around the hinge, where the iron axis bar would have fitted (unstratified).

3 An armlet (unstratified) with well preserved and displayed notched decoration along the edges, which is similar to that seen on examples from Colchester (cf Crummy 1983, 38; types 1652–1671).

4 A small stud head (612, ?P2).

Figure 41 Copper alloy objects

Phase 3 – medieval

A flat button (606, CG29, P3), 20mm in diameter, with an integral loop.

12 Coins (*by* Cathy King)

Two coins were recovered from this site, one Roman and one 18th century (Table 6; both were worn and corroded.

context	ruler	denom	obv legend	rev legend	mint	MM	date
610, CG0	George	halfpenny	[ ]VS [ ]	Britannia std. 1.			*c* 1746–54
612, CG0, ?P2	Constantine I	Nummus	IMP CONSTANTINVS AVG	[SOLI INVICTO] COMITI, Sol stg. left	T/F II?	Illeg.	310–16

Table 6 Coins

These coins conform to the pattern of finds from the area, as Roman coins of 4th century date are common on British sites, as are casual losses of low-value copper coins.

13 Worked stone (*by* Derek Hurst)

type	total	weight (g)
quern	1	1628
?quern	2	1853
roof tile	2	684
?roof tile	1	48
spindle whorl	1	2
?tesserae blanks	2	365

Table 7 Overall quantification of worked stone by object type

phase	group	context	type	total	weight (g)
2a	5	2004	roof tile frag	1	431
2a	8	1148	?quern frag	1	39
2a	38	31	?tesserae blanks	2	365
2a	38	698	quern	1	1628
2b	5	2003	?quern rubber	1	1814
2b	5	2003	roof tile frag	1	253
2b	19	759	?roof tile (burnt)	1	48
2c	23	1092	spindle whorl	1	2

Table 8 Quantification of worked stone by phase and context group

There was only a small amount of worked stone (Tables 7–8) and this was either domestic objects or building materials, except for two unusual pieces items, which were possibly indicative of the manufacture of tesserae (see below); all was from Roman contexts.

Worked stone objects (Fig 42)

1 Stone rods, possibly for the manufacture of tesserae; 31, CG38, P2a.

The proportions of the pieces were consistent with the making of four tesserae of 27 x 27 x 27mm from each piece. The overall size, however, seems larger than standard mosaic cubes which were up to 20mm square for instance at the Bays Meadow villa in Droitwich (Johnston 2006). These may be rare examples of waste from this industry.

2 Spindle whorl (Blue Lias); 1092, CG23, P2c

3 Part of the upper stone of a beehive quern (possibly May Hill sandstone) with handle attachment partly intact; 698, CG38, P2a. (Not illustrated)

Another fragment from CG8 (1148) was based on the similarity of the stone type.

4 Rubber for use with a saddle quern; irregular lump with one very smoothed face (Oolitic limestone); 2003-D2; CG5, P2b (not illustrated).

Cotswold limestone does seem to have had some limited use for saddle querns and rubbers, though there is also the possibility that it was used for some purpose other than the grinding of corn (F Roe, pers comm).

Figure 42 Worked stone objects

Roofing stone

There were also several pieces of roof tile in two stone types: a fine laminar limestone and a fine micaceous sandstone. Both types of stone were closely matched to roof tile types at the Childswickham villa site (Hurst and Roe 2004), where they formed a minor component of the overall site stone assemblage, and where they mainly occurred in a 3rd–4th century context.

Burnt stone

Quantities of burnt stone were noted especially in the North Area. These were in two main types either as pot boilers (ie fire-cracked cobbles/pebbles) or reddened stone (usually limestone). Records of presence on site were unfortunately not kept consistently and so the distribution of these cannot now be studied, but it is clear from the available record that some features were particularly associated with dumps of this material (eg pit CG25, P2b and ditch CG23, P2c). Such material was present from the earliest occupation of the site.

Coal

Only a sparse amount was noted, all in the North Area, and mainly in the Phase 2b pond fills.

14 Worked bone (*by* Laura Griffin with bone identifications *by* Sylvia Warman)

A small assemblage of worked bone items was retrieved from the site and included both finished objects and examples which had been discarded before completion. The latter indicates small-scale bone working on the site as an off-shoot of the animal husbandry.

?Handle (Fig 43)

This unusual handle (1156, sf 10, CG27, P2b) was difficult to parallel (but cf MacGregor 1985, 168, fig 88d). It was carved from a single, solid piece of bone (S O'Connor, pers comm) with a small hole drilled through at one end, which was clearly intended to have some sort of strap or twine threaded through it and is decorated with simple scrolling. The body gradually tapers towards the opposite end, which has the stub of a fine iron rod inserted into it. The object was retrieved from a small pit in Phase 2b, indicating an early–mid 2nd century date.

Figure 43 Bone ?handle

Other bone objects (Fig 44)

1 A pin having transverse grooves beneath a conical head (cf Crummy 1983, 21; fig 18, no. 159 ie Colchester type 2); 1115, CG28, P2c

2 A crudely made pin most closely resembling an example from South Shields, where identified as a probable bag fastener rather than a hair pin (cf Allason-Jones and Miket 1984, 68; no. 2.337); 2021, watching brief, unstratified

3 A tool with knife-shaped ends where polished; resembles a modern wooden modelling tool (621, CG16, P2b).

Figure 44 Other worked bone objects

Possible manufacturing waste (not illustrated)

Four pieces of worked bone appeared unfinished and it is thought that these were either practice pieces, off-cuts or objects that broke before completion, as follows:

4 Fragment of a right cattle tibia (1108, CG23, P2c) sawn through the proximal shaft and with two neatly drilled holes at the sawn end with all original outer surfaces now much smoothed.

5 A length sawn from a cow-sized limb shaft, possibly metapodial (2003 (B3), CG5, P2b) and shaped on either side to create a parallel-sided strip, except for at one end where wider ?for holding; broken at the other end.

6 A metatarsal from a not fully adult sheep with very smooth surface to the shaft suggesting lots of handling here to within 20mm of the surviving end (ie broken; 1100, CG24, P2b).

15 Slag (*by* Derek Hurst)

type	total	weight(g)
fuel ash	202	4141
?fuel ash	6	114
miscellaneous ironworking slag	84	1605
smithing hearth base	11	1930
?smithing hearth base	16	1281

Table 9 Overall quantification of slag by type

phase	type	total	weight(g)
1	fuel ash	29	1382
	miscellaneous ironworking slag	1	2
2a	fuel ash	118	1452
	smithing hearth base	1	55
	miscellaneous ironworking slag	2	7
2b	fuel ash	45	751
	smithing hearth base	8	1824
	?smithing hearth base	4	581
	miscellaneous ironworking slag	58	1290
2c	fuel ash	4	536
	?smithing hearth base	11	700
	miscellaneous ironworking slag	16	269
	uncertain type	1	50
?2c	fuel ash	1	1
3	fuel ash	5	19
4	fuel ash	1	18
	smithing hearth base	2	51
	miscellaneous ironworking slag	2	32

Table 10 Quantification of slag type by phase

Fuel ash slag was present in all phases of the site, but the significance of this material is limited as it was not indicative of any specific burning activity, and could be derived from ordinary domestic fires. Much more significant was the ironworking slag which was especially a feature of the site in Phases 2a–2b, when a number of iron-smithing hearth bases occurred, mainly in association with the pond (CG5) fills. In addition there was also some miscellaneous ironworking slag from the same levels, and several large lumps of fuel ash (*c* 200mm across), the latter being unusually large pieces compared to other fragments of this material elsewhere across the site and on other sites, probably

reflecting that deposition in the pond offered a high level of protection from degradation. There were also occasional pieces where vitrified fired clay was associated from Phases 2b–c, which might have related to similar activity, as could coal from Roman levels (eg from Phase 2b pond fills). This evidence would, on the face of it, suggest that iron smithing occurred in the general vicinity of the North Area in particular, but no significant amount of hammerscale was present on site to corroborate this. A similar combination of material occurred in the fills of curved ditches CG38 (P2a), and CG16 (P2b) of the South Area (Figs 13 and 21), but in much smaller quantities.

16 Animal bone (*by* Sylvia Warman)

Animal bone formed a major component of the site finds assemblage, and quantities from the Roman levels of the pond were especially notable.

Methods of analysis

Specimens were identified to element and species, with ribs and vertebrae (apart from atlas, axis and sacrum) not being included in the analysis. Other data recorded included: side, sex, weight, parts present, fusion, tooth wear, pathology, burning, butchery and weathering. Where possible sheep and goat were distinguished using Boessneck (1969) and Payne (1985); this was not possible for the majority of specimens so the category of 'sheep/goat' was used. In addition to fragment counts and weights NISP (number of identified specimens) values are used to assess the relative contribution of each species to the assemblage. 'Specimens' included part or whole bones that could be fully identified; some comprised numerous fragments resulting from both ancient and modern breakage, wherever re-fitting was achieved. Numbers of animals represented by the assemblage were estimated using the MNI (minimum number of individuals) method. Age at death was estimated using epiphyseal fusion of long bones following Silver (1969) and from mandibular tooth eruption and wear following Grant (1982); and, for horse, dental ageing used crown heights following Levine (1982). Measurements follow those of von den Driesch (1976) unless otherwise stated. Estimations of the shoulder or withers height of domestic stock species were made following Teichert (1975) for sheep, Matolsci (1970) for cattle, and Kiesewalter (1888) for horse. Further information on the methodology employed, and the data collected for assessment and analysis, are provided in the site archive.

Following assessment (Hurst *et al* 2010) only animal bone from deposits securely dated to Phases 1–2c were then subjected to full analysis, which was to enable further information on the proportion of the various species, the age and size of individuals to be obtained, which could potentially contribute towards understanding the principal phases of site activity in more detail.

Results

The entire hand-collected assemblage comprised 3852 fragments from 2897 bones, weighing over 50kg, and of these 721 were identifiable to species, and animal bone was also present in the residues of 22 processed bulk samples. The animal bone assemblage that was fully analysed was from Iron Age and Roman deposits (Phases 1, 2a–2c) totalled 715 bones (1413 fragments weighing 33kg), the larger part (662 bones) being recovered through hand-collection during excavation (Table 11), and a much smaller fraction (53 bones) from processed bulk environmental samples (Table 12).

species	number of bones	number of fragments	weight in grams
horse	116	279	11540
cattle	320	708	19835.5
sheep/goat (sheep)	170 (7)	257 (28)	1137 (66)
pig	42	71	471
dog	7	9	105.5
totals	662	1352	33155

Table 11 Hand-collected animal bone by species from Phases 1–2c (figures in parentheses indicate positive sheep identifications)

The species present in the hand-collected assemblage comprised horse, cattle sheep/goat, sheep, pig, dog and chicken (Table 11), while that recovered from the samples included cattle, sheep/goat, pig, chicken, mouse, frog, and toad (Table 12).

species	number of bones	number of fragments	weight (g)
cattle	2	4	121
sheep/goat	21	27	25
pig	2	2	0.75
chicken	1	1	0.5
mouse	5	5	0.05
frog/toad	9	9	0.12
frog	12	12	0.12
toad	1	1	0.02
totals	53	61	147.56

Table 12 Animal bone from samples by species from Roman deposits

Phase 1

The assemblage from the later Iron Age deposits was not large but included the main domestic species. Using percentage NISP as a measure ovicaprids (sheep/goat) were most numerous, closely followed by cattle, horse and pig. In contrast, when the MNI (minimum number of individuals) was calculated there were very even numbers across the species. It was apparent that only sheep/goat and cattle included a wide range of body parts (see Appendix Table A.1).

Much of the animal bone assemblage from this phase was derived from deposits from ditch CG4 (eg 674 [673], 681 [680] and 708 [706]), all the species present in this phase being present here but there was a bias towards teeth. Usually a preponderance of teeth would be taken as a proxy for poor preservation, however, other evidence here, such as weathering, did not support this, as other elements were present and moderately well-preserved, and so it would seem that more cranial parts were actually deposited, and the frequency of ancient breakage was quite high, suggesting damage or sub-division pre- or during deposition leading to more loose teeth.

This phase included the earliest deposit of animal bone within the pond (2005, CG5), which comprised mostly cattle and horse limb bones, although pig skull fragments were

also present with this material was in better condition than that from the other Phase 1 features.

No animal bone was recovered from samples dating to Phase 1.

species	nisp	number of fragments	weight (g)	mni	% nisp
Phase 1 (later Iron Age)					
horse	5	20	658	3	8.5
cattle	23	45	931.5	3	38
sheep/goat (sheep)	26 (1)	37 (1)	138 (2)	2	45
pig	5	6	55.5	2	8.5
Phase 1 totals	**60**	**109**	**1785**	**10**	**100**
Phase 2a (early Roman; 1st c)					
horse	15	50	1055	3	12
cattle	39	118	2296	3	30
sheep/goat	61	92	345	6	48
pig	10	14	80	2	8
dog	3	5	92	1	2
Phase 2a totals	**128**	**279**	**3868**	**15**	**100**
Phase 2b (Roman; early–mid 2nd c)					
horse	88	163	8325	8	22
cattle	224	459	14047	10	57
sheep/goat (sheep)	76 (2)	119 (4)	495.5 (30)	5	20
pig	22	37	283.5	4	6
dog	4	4	13.5	1	1
Phase 2b totals	**394**	**786**	**23194.5**	**28**	**100**
Phase 2c (Roman; later 2nd–early 3rd c)					

horse	8	46	1502	2	12
cattle	34	86	2561	3	49
sheep/goat (sheep)	18 (4)	20 (23)	175 (34)	4	32
pig	5	14	52	2	7
Phase 2c totals	**69**	**189**	**4324**	**11**	**100**

Table 13 Hand-collected animal bone from Iron Age and Roman deposits by phase

Phase 2a

Sheep/goat was again the most numerous taxon followed by cattle, and horse, pig and dog. If the elements present were considered (Appendix Table A.2) sheep/goat and cattle material included a wide range of body parts, and horse showed a wider range than in the previous phase. Pig remains were largely skull and forelimb specimens. Dog was only represented by skull and tooth fragments. The MNI values suggest that sheep/goat were now most numerous followed by cattle and horse.

Animal bone from pond fills (2004, CG5) made up much of the Phase 2a assemblage. Horse, cattle, sheep/goat, pig and dog bones were present and continued to show good preservation when compared with animal bone from other feature types (ie non-pond deposits such as pit and ditch fills showed slightly higher levels of weathering, and more signs of root etching, the more weathered bones being largely sheep/goat limb bones but a cattle mandible from CG38 (678 [677]) was the most weathered in this phase).

Phase 2b

Much of the animal bone assemblage was recovered from deposits dated to this phase of occupation. The animal bone included the full range of domestic species and the widest range of elements within species (see Appendix Table A.3). Cattle was the most numerous taxon by NISP, weight and MNI. Horse specimens now outnumbered sheep/goat, whilst pig and dog were present in small numbers. Pig shows the widest range of elements for any phase with both fore and hind limbs represented in addition to teeth and mandible fragments, while dog specimens were restricted to cranial parts. Additional sheep/goat teeth were recovered from processed samples.

The features from which animal bone was recovered from this phase include pits, ditches and, most significantly, the pond. The pond deposits (2001, 2002, 2003, and 2100, CG5) were dominated by cattle and horse bones both cranial and post-cranial; sheep/goat was also present comprising mandible and limb bones, while pig bones were largely skull mandible and teeth, but meat-bearing limb bones were also present (see more below). The ditches of the adjacent annex enclosure (1100, 1101, 1137, 1097, 1119 and 1106; CG24) produced horse, cattle and sheep/goat limb bones and some mandibles, the horse and cattle specimens being largely from adult animals but the sheep/goat including juveniles.

In the South Area animal bone, including cattle sheep/goat and pig, was mainly from ditch CG16 (621, 627, and 693). Of particular interest were a juvenile sheep/goat shoulder blade, and a skull from an infant pig.

The pond (see also Appendix Table A.5)

This feature yielded around half of the identified animal bone assemblage (by weight), deposition within this feature spanning several phases. The animal bone was well preserved compared with that from other features, much being identified to species, and quantities of each species are summarised in Table 14. Both cattle and horse showed a full range of body parts, but the MNI values reveal that only a relatively small number of living animals were required to create the assemblage. Sheep/goat, although contributing fewer actual bones than horse or cattle, represented six individuals in total. Pig and dog were present in much smaller quantities and represent just a handful of animals. What was clear was that a much wider range of cattle and horse body parts were disposed of in the pond than for sheep/goat.

species	NISP	number of fragments	weight (g)	MNI
horse	76	148	6770	7
cattle	150	255	10339	9
sheep/goat (Sheep)	22(1)	38(1)	219 (17)	6
pig	15	22	271	3
dog	2	3	88	1
	266	467	17704	

Table 14 Animal bone from pond deposits (CG5) – all phases

For the purpose of spatial analysis animal bone for pond Phases 1-2b is presented by grid square in Figure 45, with NISP values given by species. Where phase assemblages were sufficiently large these comprised cattle, horse, pig and dog (2004; P2a); cattle, horse, sheep/goat and pig (2003; P2b); and cattle horse, sheep/goat and pig (2002; P2b), the latter being the greatest quantity of identifiable animal bones from the widest range of grid squares. Overall there was a greater dominance of cattle bones in the north-west corner of the pond (Fig 45, grids A3–5, B3–5, C3–5 and D3–5), well away from the edge of the pond, with horse bone more numerous along the margins of the pond. Pig and dog, only present in very small quantities, rarely occurred on the pond margins and instead tended to be towards the middle of the pond. It was not clear how these observations relate to the deposition of this material during the formation of these deposits, except perhaps to say that the bones of a greater range of smaller animals tended towards the pond interior.

Unstratified animal bone from the pond, comprising cattle limb bones, mandibles and teeth and a single dog tooth, was not included in this analysis (preservation and condition was very similar to that recovered from the stratified pond deposits).

Figure 45 Identified animal bone (NISP) from pond deposits by grid square

Phase 2a/b

Cremation burial

A cremation deposit (also see Human Bone report; 719/720, CG33) included burnt animal bone, a small quantity of hand-collected animal bone being sheep/goat skull, limb and toe fragments, and sample processing (sample 65) added sheep/goat skull, tooth and limb fragments, and a chicken phalange. The latter was the only evidence for fowl

from the entire assemblage. The bones were burnt to grey/white colour, and some shrinkage and calcination was visible, which suggested that it had been heated above 800° Celsius, consistent with pyre rather than domestic cooking fire temperatures (Lyman 1994).

Phase 2c

Sheep/goat and cattle remained the most numerous taxa and show the widest range of elements (Appendix Table A.4), horse being present in small numbers comprising limb bones and mandibles, and pig being restricted to skull and teeth. Dog was now absent. Ditches CG23 (1089, 1108, 1110, 1164, 1169 and 1200) and a pit at the western edge of the pond accounted for most of the bone, which included mostly cattle and horse with some sheep/goat and pig, and so was very similar to the earlier pond deposits. This deposit included a well preserved horse mandible from a juvenile animal. Additional animal bone was recovered from samples taken from CG23 (1108) including sheep/goat teeth, mouse, and frog limb bones. Animal bone was also recovered from ditches CG28 (1002 1007 1052 1115 1118) including cattle, sheep/goat and pig, and for all species there was a bias towards mandibles and teeth; the latter possibly due to variable preservation, as the material also showed moderate levels of ancient breakage, which could account for the elevated levels of teeth.

Age at death

During the assessment the presence and quantities of long bone epiphyses and mandibles of the main domestic species were recorded, as these can be used to estimate age at death through the processes of fusion (long bones), and eruption and wear of teeth (mandibles). The assemblage once fully recorded did provide sufficient data for these methods; but only if all phases under study were pooled together. If split by phase the sample sizes became so small as to be non-viable thus the ageing data is presented below for the Iron Age and Roman material as a whole.

Age at death using long bone fusion (Appendix Tables A.6–A.9)

Horse (Appendix Table A.6)

All of the early fusing long bone epiphyses present were fused, so there was no evidence for mortality prior to 18 months old. Over 90% of the middle fusing epiphyses present were fully fused, indicating that few specimens died before 2 years old. Finally 90% of the late fusing epiphyses present were fused indicating that most horses survived beyond 3.5 years of age. The fusion data suggest that the majority of horses were fully adult animals exceeding 3.5 years of age.

Cattle (Appendix Table A.7)

All of the early fusing long bone epiphyses present were fully fused indicating that cattle survived beyond 1.5 years of age. Over 70% of middle fusing epiphyses present were fused indicating that most individuals survived beyond 2.5 years. Over 70% of the late fusing epiphyses present were fused indicating that most individuals survived to full skeletal maturity (ie beyond 4 years of age).

Sheep/goat (Appendix Table A.8)

For the purposes of age estimation it has been assumed that the sheep/goat category was predominantly formed of sheep. Over 60% of early fusing epiphyses had fused (ie

these animals had lived beyond their first year). The middle fusing epiphyses were fused in 75% of cases suggesting the majority of animals survived beyond 2 years of age. None of the small sample of late fusing epiphyses were fused, thus there was no fusion evidence for sheep/goat reaching 3.5 years of age. The fusion evidence for sheep/goat, therefore, suggests that some were killed around 1 year old and the remainder between 2.5–3.5 years old.

Pig (Appendix Table A.9)

The early fusing epiphyses had fused indicating animals survived their first year, but none of the middle fusing epiphyses were fused and no late fusing epiphyses were present. Pigs, therefore, were killed between 1–2.5 years of age.

Dog

Dog remains were entirely cranial, and so no epiphyses were present.

Age at death using tooth eruption and wear

Horse (Appendix Table A.10)

Horse teeth where sufficiently well preserved were measured to enable the age estimate method of Levine (1982) to be used. Most of the horses present were between 5 and 9 years old at death. However, one specimen with significantly more worn teeth (1194, CG8, P2b) has measurements consistent with an age of 11–13 years. In addition a near-complete mandible from a juvenile horse was recovered (1169 [1168], CG23, P2c), the state of eruption of its dentition being consistent with a 2-year-old or younger animal.

Cattle

Although cattle was the most common species in the assemblage surprisingly few mandibles were sufficiently complete for the wear-based ageing method (Grant 1982) to be applied. Only three were measurable, indicating a juvenile, a sub-adult and an adult.

Sheep/goat

A larger number of sheep/goat mandibles were sufficiently well preserved to enable the MWS (mandible wear stage) to be calculated. This was consistent with two separate age groups at slaughter: firstly lambs, and secondly adults. These complement the fusion data confirming that fully mature specimens were in fact also present in the population. Thus taking both fusion and tooth wear into account it appears that both adults and juveniles were present in the ovicaprid assemblage.

Pig

The assemblage did not include any sufficiently well preserved pig mandibles, but specimens were largely from juvenile and sub-adult animals.

Dog

All of the dog remains were cranial and included teeth, and all were from the adult dentition, some showing some signs of wear.

Size estimation of livestock (Appendix Table A.11)

The assemblage included a small number of complete or near-complete long bones from which length measurements could be taken, and used to calculate the animal's withers height (height at the shoulder). This gave a height of 1290mm for a horse (equating to 12 hands 2 inches), a similar size to a native pony such as the Dartmoor breed. The two cattle specimens give values of 1.058m and 1.114m, slightly smaller than the modern Jersey breed. The sheep specimen greatest length gave a withers height of 0.60m, similar to a modern animal of the Welsh Mountain breed.

Estimating sex

The assemblage allowed a few observations on animal gender. Pig canine teeth can be sexed and the assemblage included both male and female specimens. Several well preserved cattle pelvis fragments with complete acetabula indicate, following Grigson (1982), that both male and female animals were present in the population. The horse teeth from 1194 (CG8, P2b) included two canines which were well worn, their presence suggesting that this individual may have been male, as these teeth are often absent in mares (Hillson 1986).

Assessing the health of livestock

Some types of damage and disease can lead to changes in the bone structure and appearance, though it must be remembered that many conditions do not leave a trace in the skeleton, and so examples of pathology tend to show just the most severe cases. Within the identified assemblage a total of six specimens were noted with possible pathological changes visible in the bone (Appendix Table A.12). This equates to an incidence of less than 1% of the assemblage with instances as follows:

a sheep mandible (679, CG38, P2a) with a malocclusion in the cheek tooth row; upper jaw not present so the full extent of the changes to the teeth could not be determined;

a cattle skull (1101, CG24, P2b) exhibiting several small rounded holes in the parietal bone, as often observed in archaeological material and previously described (Brothwell *et al* 1996);

a cattle metapodial (2002, CG5, P2b) displaying an uneven proximal articular surface, where bone had been lost leaving a rough patchy appearance;

a cattle pelvis (2003, CG5, P2b) exhibiting disorganised new bone growth about the acetabulum (hip socket);

a cattle mandible (2003, CG5, P2b) where the second premolar exhibited a malocclusion and the third premolar was missing, the alveoloar bone having reformed and filled in the empty socket within the jaw, and;

a metatarsal from a horse (2003, CG5, P2b) with a porous area of new bone growth in front of the proximal articulation at the top of the shaft.

In general such a low number of pathological specimens tended to indicate that stock here had a low incidence of genetic abnormalities and injuries.

Bone modification

Clear evidence for butchery, rather than bones which had been broken in antiquity, was not particularly common with just 58 specimens (9%) from the hand-collected

assemblage. These were largely cattle and sheep/goat bones with occasional horse and pig. Horse bones tend to have their shafts chopped or smashed. Cattle long bone shafts had also been chopped through, but in a transverse rather than longitudinal direction. Sheep/goat bones revealed fine cut (knife) marks rather than chop marks. The only evidence for butchery on pig bones was a single mandible chopped down the mid-line.

Before bones were incorporated into deposits/buried, they could be made available to dogs so that gnawing marks can be observed. This was seen in 90 specimens (14% of the hand-collected assemblage).

Weathering was also in evidence, where exposure prior to burial has led to varying degrees of erosion to the bone surface (recorded via a scoring system devised by Behrensmeyer 1978). Over half of the assemblage showed no sign of weathering at all suggesting rapid burial; the remainder was low to moderate. For the hand-collected assemblage from non-pond deposits 30% of specimens showed signs of weathering, while within the pond the percentage dropped to 22%.

Once included within a deposit other factors can further damage animal bone. Root etching where the roots of plants grow touching the animal bone surface and the transfer of very slightly acid liquids etch small channels into the bone surface. This effect was observed on 150 specimens at a low to moderate level, the majority (124) from the non-pond deposits.

Almost half of hand-collected specimens showed signs of ancient breakage, and modern breakage was seen in two-thirds of the hand-collected assemblage. The higher levels of modern breakage are typical of relatively well preserved assemblages found within thick clay deposits; the sticky clay holding the bone firmly so that damage was sustained by the bones during extraction.

Several specimens from Roman deposits also showed very smooth surfaces, as if much handled or worked (see Worked Bone report), and these were most commonly sheep/goat metapodials.

Discussion

It is generally accepted that the transition from late Iron Age to Roman in terms of livestock exploitation sees a shift from a sheep/goat based system to one where greater emphasis was placed on cattle (King 1978; Dobney 2001). If the numbers of bones (NISP) are used as a measure, then this is the case for this site moving from Phase 1 to Phase 2a. The MNI values, however, give opposite results with cattle more numerous in the Iron Age and sheep/goat more numerous in the early Roman Period. It is clear that both taxa were important through the Late Prehistoric and early Roman occupation of the site. Pig was present in all phases but never numerous; a situation noted in many Romano-British animal bone assemblages (Dobney 2001), but seemingly at variance with the historic documentary sources which reveal a reliance on pork (*ibid*).

An intensive and ubiquitous system for butchery of cattle bones has been identified in Roman animal bone assemblages, particularity those from large urban sites (*ibid*; Maltby 2007). The usual interpretation for the heavy chopping and subdivision, including longitudinal splitting of long bones, within Roman butchery practice is that it relates to the extraction of the bone marrow from the insides of the long bones. It was clear that this was not what was happening at George Lane where the bone fragments were large with the presence of some complete long bones. Where these have been split, this has been in the transverse rather than longitudinal plane. One explanation was that the

material seen in the deposits from the pond may reflect the earlier stages of carcass reduction (this is the process of the utilisation of the parts of an animal starting with the complete dead body of the animal as described by O'Connor (1993), rather than the more intensive stages of butchery. It was unclear why this might be necessary; possibilities include animals which had died from disease rather than deliberate slaughter, or the disposal of spoiled joints. Equally larger portions of meat with fewer butchery marks could arise from the remains of animals killed for feasting. Why these should be deposited into the pond was unclear. If, as indicated by occasional articulation, the material deposited into the pond still had some soft tissue attached, it surely post-dated the use of the feature as a water source. Other Roman water sources, such as wells, do often include structured deposits that have been interpreted as symbolic of the closure of the feature as a water source, for instance examples including dog skulls at Silchester (Fulford 2001).

In contrast, the limited butchery evidence on the ovicaprid bones takes a different form by comprising of small fine cut (knife) marks which indicate the careful disarticulation of the carcass rather than intensive reduction or jointing. One explanation is that the smaller size of the sheep/goat carcases lent themselves to a more delicate method of butchery, alternatively the sheep were butchered on-site as part of the day-to-day food supply and this form of butchery possibly reflecting continuity of earlier Iron Age butchery practice.

In Phase 2a the ovicaprid remains were from mostly ditch and pit fills further to the north of the pond, whilst the pond fills were dominated by cattle and horse. This suggests some zoning of activities. And when the pond itself was considered as a whole there did appear to be variations in terms of the species present in discrete areas of the fill (see above). If the pond had straightforwardly been used for the dumping of waste, it would be expected that larger items, such as cattle skull and cattle/horse limb bones, would be found close to the edge, as more effort would have been required to fling them far in. By the same reasoning then sheep/goat and pig might be regarded as more likely to cluster further out towards the centre of the pond, as being easier to throw. And, if the animal bone had been brought into the pond deposits as a result of flooding washing in surface bones, then a similar pattern might also be expected. But such a pattern of deposition was not in evidence, and so other factors must have been involved.

The levels of butchery marks were low, particularly for horse; and the large limb bones, although rarely 100% complete, were not highly fragmented. One possibility is that these remains might be the result of specific consumption of large quantities of meat for example feasting and so the material reflects a level of over supply for this purpose with substantial parts of carcasses discarded as a result. This will be revisited in relation to assemblages from other sites (see below).

Certain aspects of the assemblage were, therefore, not as expected if the material was simply butchery or domestic waste. In this context indirect use of the bone might also be considered, for instance, the use of large bones as weights, perhaps as part of an industrial process such as retting flax or hemp, or activities associated with hide preservation or tanning. However, none of the other lines of environmental evidence supported this scenario, and so it seems unlikely, and besides it would only account for some bone, leaving the smaller bones unexplained.

Animal bone associated with the cremation

The cremation deposit contained a mix of animal and human bone, the former being sheep and chicken. The sheep remains included skull, teeth, limb and foot bone

fragments, which suggest a substantial part of the animal carcasses was included within the pyre; the chicken bone was a single foot bone. The inclusion of cuts of meat or even whole animal bone carcasses within Roman cremation deposits was relatively common and well documented (Philpott 1990). The sheep may have been viewed simply as a food offering, whereas the presence of chicken in burial contexts has been linked with Mercury who guided the spirits of the departed in the underworld (Sidell and Rielly 1997). The presence of a cremation is consistent with the site being permanently occupied. Potential ritual deposition was also present in at least one other feature, as a near-complete cattle skull was noted in the primary fill 1101 of a ditch terminal (CG24, P2b) on the southern side of the annex to the enclosure. Such activity has been identified on Iron Age sites possibly continuing into the Roman period (Grant 1989), although in this case there were no accompanying foot bones.

Consideration of animal bone by species

Cattle

The cattle were largely killed as adults once their full meat weight was achieved around 4 years of age, apart from some juvenile and sub-adult animals. The lack of very young calves suggests that cattle were not being bred or born on site but simply pastured there for a time. The presence of lower limb and foot bone pathologies associated with joint over use might indicate either the presence of more mature animals, or that they had been used for traction (cart or plough) or had been driven some distance, though the identification of such conditions has been brought into question (O'Connor 2008). A quasi-continuous genetic trait in cattle (1101, CG24, P2b), perforations in the parietal bone, could be just a local feature.

Horse

Horses were presumably used for riding, traction or as pack-animals – it has been suggested that horses were not thought of as a source of food at this time (Grant 1989). The evidence from George Lane seems to support this, as butchery marks on horse bones were rare here, and tend to take the form of bones smashed or chopped through transversally. The lack of very young foals suggests that horses were not bred or born on site but simply pastured there for a time. Most horses in the assemblage were 5–9 years old, except for an older individual of 11–13 years and a 2-year-old. Thus most horses would have been animals at the peak of their working life. The 2-year-old would yet to have been fully trained and able to take substantial loads. The use of horses for riding traction or as pack-horses was further supported by the nature of the observed pathologies, as these were associated with damage or wear and tear on the joints, brought about, either as a result of advanced age, or by excessive use such as being ridden or driven some distance with heavy loads.

Sheep

It was known that sheep's milk was favoured over that of cattle in Roman Britain (Dobney 2001), and the presence of infant sheep could be an indication of dairying. The sheep/goat material includes limited evidence for stock rearing as infant specimens have been identified; although no new born or foetal specimens were present several infant lambs suggest the presence of lambs still feeding from their mothers. The juvenile animals killed prior to one year of age may have provided that summers meat. The remainder of sheep (based on fusion data) were culled between 2.5 and 3.5 years old, which may reflect animals being consumed to reduce the flock size before the winter months to save on feed. Tooth wear data indicates that the population included fully

mature animals in excess of 3.5 years, which could have been for breeding and milk production; or may represent animals kept for their fleeces. Evidence from observed pathologies suggests that the flock was a healthy one. Some dental pathologies were present (malocclusion or lost teeth), these specimens showing signs of healing; and so the animals had lived for some time with these problems suggesting they were well cared for and had a reasonable diet. Conversely there was no evidence for periodontal disease.

Pig

Pigs were obviously kept for meat and culled at a young age (1–2.5 years). The quantity of pig in the assemblages (measured by %NISP) was remarkably even across all phases at the site. There was some evidence for the rearing of this species, as infant specimens were present. The environs, as indicated by other lines of environmental evidence (see pollen report), comprised relatively open pasture suitable for grazing cattle, horses and ovicaprids. Pigs on the other hand would have preferred woodland especially towards the end of the summer and into autumn when acorns and beech mast would have been plentiful.

Dog

Dog remains were present in Phases 2a–2b. Dog was only represented by cranial parts, comprising skull and mandible fragments along with loose teeth. Although no dog specimens were found in Phases 1 and 2c, their presence was attested by the gnaw marks left on the bones from livestock species. If seasonal occupation was occurring then it was likely that the dogs would be adult and fully trained for guarding, herding or hunting, although the lack of game species makes the latter less likely.

Other species

The single chicken bone within the cremation is the only evidence for domestic fowl and may have been part of a chicken placed on the pyre as a symbolic offering. The other smaller vertebrates (mouse, frog and toad) are likely to have lived within the site in parts that provided an ideal habitat for them, and so are unlikely to reflect direct deposition by human agency.

Assemblage in its local and regional setting (comparative sites)

A number of late Iron Age and Roman date sites in the locality have produced animal bone assemblages, though their small assemblage sizes only allows limited comparison with the current assemblage. Phase 1 of the latter was broadly contemporary with an assemblage from the Wyre Piddle bypass (unpublished data), where sheep/goat outnumbered cattle and a small quantity of pig bones were also present, but with no horse here unlike at the George Lane site. Phase 2a of the latter site roughly equated with Period 4 of another nearby site (Throckmorton) which comprised a much smaller assemblage of cattle sheep/goat and horse (Baxter 2005; NISP of just 13 compared with the George Lane NISP of 128).

Settlement remains recorded along the Wyre Piddle bypass produced two inhumations, as well as a tentative cremation deposit from the evaluation (unpublished data), and the inclusion of a new-born sheep/goat within one of the graves is of interest, as this appears to be an example of deliberate placement/offering, just as proposed for the sheep and chicken remains within the cremation deposit from the George Lane site.

Phase 2b of the George Lane site was roughly comparable in date with Period 5 at Throckmorton (Griffin *et al* 2005) with only single examples of sheep/goat and pig present (Baxter 2005a). The much more substantial mid-Roman animal bone from George Lane was more comparable to the larger assemblage from Longdon Marsh (near Tewkesbury; Simmons *et al* 2010), where the latter's contemporary Phase 2 assemblage showed the same restricted range of domestic species, with cattle very much the most numerous species, and the same complete lack of wild species (Poole 2010).

The George Lane Phase 2c assemblage could be compared with that from Upper Moor (Baxter 2005b), which continued to a much later date, its range of species being similar, except it also included dog, red deer and chicken. At both sites cattle were most numerous by NISP, but the MNI for George Lane suggested that sheep/goat remains may represent more animals; unfortunately an MNI was not available for the Upper Moor assemblage.

In terms of the size of the livestock only a few complete long bones were present so metric data was limited, and likewise few sites in the locality have produced measurable bones. The withers height for George Lane sheep at 600mm was considerably greater than those for sheep from the late Iron-Age/early Roman Tewskesbury site of Rudgeway Lane (Warman 2008). The withers height for its cattle at 1058mm and 1114mm were slightly smaller than those from Upper Moor (Baxter 2005b), but larger than those from sites along the Wormington to Tirley pipeline (Higbee 2006). The horse withers height of 1290mm (12.2 hands) was within the range seen at both Rudgeway Lane and Wormington to Tirley (Warman 2008 and Higbee *ibid* respectively).

Dog is present at some of the other sites in the locality, for example at Upper Moor where both cranial and post-cranial elements were identified (Baxter 2005b). At George Lane only cranial parts were present, and, though there were no local parallels for this, dog represented by mostly or solely cranial elements has been observed recently at Cleeve to Hagborne Hill pipeline (Oxfordshire; Warman forthcoming), which was of a comparable date.

No parallels, therefore, for such a large, well preserved and well dated Roman assemblage, and certainly none with similar characteristics (ie low levels of butchery), as at George Lane, were available locally. Looking further afield, a large well preserved assemblages of cattle and horse bones showing low levels of butchery have been located at Nantwich where salt production was carried out (Gidney forthcoming). However, at George Lane the levels of salinity, and the absence of any other obvious indicators of salt production, suggested that this was not a profitable line of investigation. Another explanation could be that the animal bones were deposited as a result of feasting activity, the lack of butchery relating to the preparation of bulk quantities and possible over-supply. Similar assemblages of comparable date have been identified in the Netherlands where feasting has been proposed here as an explanation (Groot 2008), though somewhat at variance with the suggestion that horse was not widely consumed at this time (Grant 1989). British example of animal remains interpreted as evidence of feasting activity are dated much earlier, for instance at High Post (near Salisbury, Wilts; 470–390 cal BC; Barclay and Stevens 2011) were a large number of minimally butchered cattle sheep/goat, pig and horse bones were found in a deposit associated with an enclosure (Higbee 2011), and include a partial human skeleton (McKinley, 2011). Deposits of horse, cattle and pig bones have been recovered associated with the Iron Age chariot burials at Ferrybridge (West Yorks) indicating that all these species held ritual as well as economic significance to the Iron Age inhabitants of Britain (Boyle 2004). It is possible, therefore, that the animal bone from George Lane

indicates that practices more typical of the Iron Age continued amongst the Romano-British population.

Conclusion

The further examination and analysis of the animal bone from the late Iron Age and Roman phases at the site has supplied a useful data-set for the area, particularly as previous work in the locality has produced only very small assemblages. The assumption that late Iron Age assemblages were dominated by sheep/goat, although supported by NISP counts, has been brought into question by the MNI figures. The Roman phases at the site reveal the exploitation of cattle, sheep/goat, horse, and pig, but with cattle generally the dominant species. Horses appear to have been exploited as working animals rather than for food production. The presence of dogs for herding or guarding was noted, and was, therefore, compatible with the pastoral activity. The reasons for deposition in the pond of such a large quantity of animal bone with a low level of butchery remained unclear, but, and, in the absence of any obvious evidence for an industrial use, the material could be considered domestic waste and potentially explained as the result of feasting.

All the species present were in good condition and livestock husbandry must have been of a good standard. The main activities at the site were pastoral, working with a wide range of animals, and with a potential element of horse breaking/training. There was also some limited evidence for craft activities with the presence of worked and smoothed sheep/goat metapodials. All this was compatible with the other environmental evidence showing that the local Roman landscape was grassland, and therefore, being heavily grazed.

17 Cremated human bone (*by* Rachel Ives)

Methods of analysis

Analysis of two samples aimed to consider the origin of the burnt bone and determine, where possible, whether the remains represented a human cremation burial and, therefore, provide an interpretation on the function of pit CG33 ([718]).

The burnt bone was received fully processed. Osteological analysis followed the guidance and methods presented by McKinley (1994; 2000; 2004), Brickley and McKinley (2004), and followed standards outlined in English Heritage (1991; 2002). The total weight of the cremated human bone present was determined prior to being passed through three sieves of 10mm, 5mm and 2mm sized mesh. The weight at each fraction was determined as the level of fragmentation of cremated bone can be related to the pyre conditions, as well as any ritual activity related to burials and additional taphonomic variables acting on the burial environment.

The cremated bone was hand-sorted and identified into grouped regions of the skeleton comprising the cranium, axial skeleton, upper or lower limb, as well as identified to individual elements where possible. The weight of each grouped unit was compared to the total weight of the cremation deposit to gauge an indication of the fragmentation and preservation of the skeleton following cremation and burial. Table 16 outlines the percentage weight of each grouped skeletal region estimated from an adult individual. Identification of the bones present enables identification of potential patterns of preferential selection of bone elements for burial. The maximum size of human bone fragments within each cremation deposit was also recorded.

The variation in colour of the burnt human bone was recorded and correlated with the bones affected where possible. McKinley (2004, 11) has stated that the colour of cremated bone can reflect the degree of oxidation of the organic component of bone and, therefore, temperature, and as such can reflect the efficiency of the cremation (see also McKinley 1989; Walker & Miller 2005). The colour changes in cremated bone can be broadly interpreted as outlined in Table 15.

colour	implication
brown/orange	unburnt
black	charred *c* 300 °c
blue/grey	incompletely oxidised, up to *c* 600°c
white	fully oxidised, over 600°c

Table 15 Colour variation of cremated human bone (following McKinley 2004, 11)

Where possible, standard osteological recording were employed to determine the sex and age of individuals within the burial deposits following methods outlined in Buikstra and Ubelaker (1994), Bass (1995) and Brickley and McKinley (2004), although these factors can be extremely difficult to determine based on such fragmentary remains.

Results

bone group	weight (%)	bone group	weight (%)
skull	18.2	upper limbs	23.1
axial	20.6	lower limbs	38.1

Table 16 Estimated percentage weight of grouped skeletal regions from an adult individual (following McKinley 1994, 68)

The samples derived from a primary fill (719) and a merged primary and secondary fill (719/720) sample from an irregularly oval pit (CG33). The pit was located approximately 50m away from the main focus of settlement activity at the site, and was identified as containing burnt bone fragments, suspected to be a cremation burial, during the excavation. It was adjacent to a straight ditch which may represent an enclosure boundary or field system, and the fill was dated between the 1st and 2nd century AD on the basis of associated pottery.

The burnt bone samples contained both human and animal bone elements, the identified animal bone having been removed prior to the analysis of the human bone. Small unidentifiable, residual fragments of animal bone are likely to remain mixed with the unidentified portion of burnt human bone as represented in the total weights of the sample shown in Appendix Table B.1. The burnt bone varied between white and a blue-grey colour. Both samples (719) and (719/720) contained cranial bone and axial bone largely represented by vertebral fragments. Long bone fragments from both the upper and lower limbs were also present (Appendix Table B.1). Elements included two distal hand phalanges, an incomplete talus from the ankle, a patella or kneecap, as well as a fragment of cervical vertebra. Single roots from three teeth were also found, most likely representing a canine and two incisors, but these were incomplete and could not be identified to a specific tooth with certainty. There was no duplication of the identified human bone indicating that the cremated remains of one individual were buried in the pit. All of the identified bone fragments were fully developed confirming the burial was that of an adult. There were no identifiable skeletal fragments to enable an estimation of

the sex of the individual. No pathological changes were observed on any of the burnt bone fragments.

Fill derived from the merged primary and secondary fills (719/720) contained a higher proportion of larger fragments (10mm) of human bone, and these fragments were more identifiable than the smaller size (5mm) of burnt bone pieces found in the primary fill (719). All areas of the skeleton (eg cranial, axial, long bones) were represented in the samples, and so there was no evidence for deliberate selection of bone elements for burial.

Discussion

The cremated human bones were generally quite fragmented between the 10mm and 5mm levels, though large fragments of cranial bone and identifiable fragments of the lower limb and ankle, as well as the hand, were present. The degree of fragmentation prevented more detailed determination of adult age and sex. The total weight of the cremated human bone recovered from a deposit can vary substantially. Previous studies have noted variation of adult cremated burial contexts between 200g and to almost 2000g, with an average of approximately 800g (McKinley 1994, 69). The weight of the burnt bone from George Lane (733g) was close to the adult average, but it is extremely likely that fragments of residual and unidentifiable animal bone were present together with the human bone, thereby inflating the weight of the latter. Besides the deposits had been truncated and it is likely that more cremated bone may once have been present, but, based on the total weight of the burnt human bone, it does appear that a significant portion of the cremated human remains representing an adult burial had been gathered from the cremation pyre. The whereabouts of the pyre site remained unknown, but the colour of the burnt bone largely indicated that it had burnt efficiently maintaining high temperatures around 600°C. Though the presence of grey-blue colouration on some of the bone fragments suggests that it may have taken time to reach an efficient burning temperature with good oxygen flow. There was no clear division between skeletal elements that were less efficiently burned than others across the fragmented remains showing that the entire pyre had burnt equally well.

The inclusion of burnt and highly oxidised animal bone in both the fills (see Animal bone report) suggests that animal remains were also placed on the funerary pyre, and had been collected and then buried together. The deliberate cremation burial had been finally located away from the main settlement focus at the site.

18 Sampling for environmental remains (by Elizabeth Pearson, Nick Daffern, Katie Head and Sylvia Warman)

Site sampling policy

Large animal bone was hand-collected during excavation. Samples of 10–40 litres were taken from 153 contexts, from ditches and a large infilled pond. Some of the key extensive deposits were sampled at several different points resulting in multiple samples from some fills. Samples (usually 10L) were individually numbered (Table 17), and consolidated quantities were matched to sampling level requirements, the consolidated sample size for each feature being shown in Table 18.

context	sample	sample type	context type	feature type	description	phase	sample volume (L)	volume processed (L)
607	1	general	fill	ditch	furrow (south)	3	20	0
613	2	general	fill	ditch	furrow (north)	3	10	0
615	3	general	fill	ditch	fill of 614	2a	10	10
619	4	general	fill	ditch	fill of 614	2a	10	0
621	6	general	fill	ditch	fill of 628	2b	10	0
626	8	general	primary fill	ditch	fill of 625	2b	10	0
629	7	general	fill	ditch	fill of 620	2b	10	0
630	5	general	primary fill	ditch	fill of 628	2a	10	0
633	9	general	fill	pit	fill of 618	2a	10	10
635	68	general	fill	pit/posthole	fill of 634, same as 636	2a	10	0
637	16	general	fill	pit/posthole	roundhouse drip gully	2a	10	0
641	10	general	fill	ditch	fill of 640	3	10	0
643	153	general	fill	ditch		2a	10	0
649	11	general	fill	ditch	fill of 648	1	10	10
651	12	general	fill	gully	unknown feature 650	?1	10	0
653	13	general	fill	gully	fill of 652	?1	10	0
657	14	general	fill	ditch	fill of 603	2b	10	10
658	15	general	fill	ditch	fill of 603	2b	10	0
660	17	general	fill	ditch	fill of 659	2b	10	0
662	18	general	fill	ditch	fill of 601	2b	10	10
663	19	general	fill	posthole	fill of 664	2b	10	0
665	20	general	fill	posthole	fill of 666	2b	10	0
667	21	general	fill	posthole	fill of 668	2b	10	0
674	22	general	fill	ditch	fill of 673	1	10	0
675	23	general	fill	ditch	fill of 673	1	8	8
678	25	general	secondary fill	ditch	fill of 682	2a	20	0
679	26	general	primary fill	ditch	fill of 677	2a	10	0
681	28	general	fill	ditch	fill of 677	1	10	0
683	27	general	fill	ditch	fill of 682	1	10	0
684	24	general	fill	linear	fill of 685	1	10	0
686	29	general	fill	posthole	fill of 687	?2b	10	0
688	30	general	fill	pit/posthole	roundhouse	2a	30	30
689	31	general	fill	ditch		3	10	0
691	32	general	void	ditch		0	10	0
692	149	general	primary fill	ditch	primary fill of 625	2b	10	10
693	150	general	secondary fill	ditch	secondary fill of 625	2b	10	0
694	151	general	fill	ditch	primary fill of 628	2a	10	10
695	152	general	fill	ditch	secondary fill of 628	2a	10	0
697	33	general	secondary fill	ditch	fill of 696	2a	10	10
698	34	general	primary fill	ditch	primary fill of 696	2a	10	10
700	65	general	secondary fill	ditch	secondary fill of 677	2a	10	10
701	66	general	primary fill	ditch	primary fill, same as 683	1	10	0
702	67	general	primary fill	ditch	fill of 626	2a	5	0
708	77	general	secondary fill	ditch	upper fill of 706	1	10	0
710	76	general	secondary fill	ditch	secondary fill of 709	2b	10	10
711	75	general	primary fill	ditch	primary fill of 709	2b	10	0

context	sample	sample type	context type	feature type	description	phase	sample volume (L)	volume processed (L)
712	73	general	secondary fill	ditch	secondary fill of 677 & 680	2a	10	0
713.715	74	general	secondary fill	ditch	secondary fill of 714	1	10	0
719	80	general	primary fill	pit	primary fill of cremation	2a/b	30	30
719.72	78	general	primary fill	pit	fill of cremation	2a/b	30	30
720	79	general	secondary fill	pit	secondary fill of cremation	2a/b	10	10
721	81	general	secondary fill	ditch	secondary fill of 709	2b	10	10
722	82	general	primary fill	ditch	primary fill of 709	2b	10	0
723	83	general	secondary fill	ditch	secondary fill of 603	2b	10	0
724	84	general	primary fill	ditch	primary fill of 603	2b	10	0
725	85	general	fill	ditch	fill of 726	2b	10	0
729.73	86	general	fill	ditch	fill of 727 & 729	2a	10	0
732	89	general	fill	posthole		2a	10	0
734	87	general	fill	ditch	fill of 733	1	10	0
736	88	general	primary fill	ditch	fill of 735	1	10	0
754	94	general	fill	ditch		1	20	0
756	95	general	fill	linear		1	10	0
766	148	general	fill	ditch	fill of 765	2b	10	0
1001	55	general	layer	natural	fill of 1026	0	10	0
1002	35	general	fill	linear	fill of 1003	2c	10	0
1004	36	general	fill	circular feature	fill of 1005	2b	10	0
1007	37	general	fill	ditch	fill of 1006	?2c	20	0
1009	38	general	fill	ditch	fill of 1008	3	10	0
1010	39	general	fill	hollow	-	0	20	0
1012	40	general	fill	gully	fill of 1011	4	10	0
1014	58	general	fill	ditch	fill of 1013	2a	10	0
1015	41	general	fill	ditch	fill of 1008	3	10	0
1016	42	general	fill	ditch	fill of 10030	2c	10	0
1023	44	general	fill	ditch	fill of 1022	2a	10	0
1025	45	general	fill	ditch	fill of 1024	2a	10	0
1027	46	general	primary fill	ditch	primary fill of 1026	2a	9	9
1028	47	general	secondary fill	ditch	secondary fill of 1026	2a	20	20
1029	43	general	fill	ditch	fill of 1024	2a	10	0
1030.1	49	general	fill	ditch		2a	10	0
1030.2	56	general	fill	ditch	fill of 1024	2a	10	0
1056	49	general	fill	linear	fill of 1033	4	10	0
1058	151	general	fill	ditch	fill of 1057	2c	10	10
1063	52	general	fill	ditch	fill of 1062	1	20	0
1065	53	general	fill	beam slot	fill of 1064	1	10	0
1072	54	general	fill	ditch	fill of 1071	3	10	0
1073	57	general	secondary fill	ditch	fill of 1075	2b	20	0
1074	59	general	secondary fill	ditch	fill of 1075	2b	10	0
1077	60	general	fill	ditch	fill of 1077	3	20	0
1083	61	general	fill	ditch	fill of 1082	4	10	0
1084	64	general	primary fill	ditch	primary fill of	4	10	0

context	sample	sample type	context type	feature type	description	phase	sample volume (L)	volume processed (L)
					1076			
1085	63	general	secondary fill	ditch	secondary fill of 1076	4	10	0
1087	62	general	fill	ditch	fill of 1086	1	10	0
1089	69	general	secondary fill	pit	secondary fill of 1088	2c	20	0
1090	70	general	primary fill	pit	primary fill of 1088	2c	20	0
1092	72	general	fill	linear	fill of 1091	2c	40	40
1094	71	general	fill	posthole	fill of 1093	2c	10	0
1097	90	general	fill	linear	fill of 1096	2b	10	0
1099	91	general	fill	linear	fill of 1098	3	10	0
1100	92	general	secondary fill	ditch	fill of 1102	2b	10	10
1101	93	general	primary fill	ditch	fill of 1102	2b	20	0
1105	102	general	fill	ditch	fill of 1078	3	10	0
1106	104	general	fill	ditch	fill of 1102	2b	10	0
1108	127	general	fill	ditch	fill of 1107	2c	10	10
1110	126	general	secondary fill	ditch	fill of 1109	2c	10	10
1113	96	general	primary fill	ditch	fill of 1111	2b	10	0
1115	97	general	fill	linear	fill of 1114	2c	10	0
1117	98	general	fill	linear	fill of 1116	2c	10	0
1118	99	general	fill	linear	fill of 1116	2c	10	0
1119	103	general	primary fill	ditch	fill of 1102	2b	20	0
1121	107	general	fill	sub-rectangular feature		2b	10	0
1122	101	general	fill		fill of 1075	2c	10	0
1124	105	general	secondary fill	pit	fill of 1123	2b	10	0
1125	132	general	primary fill	pit	fill of 1123	2b	10	0
1126	106	general	cut	ditch	fill of 1125	1	10	0
1129	108	general	tertiary fill	ditch	fill of 1131	1	10	0
1130	109	general	secondary fill	ditch	fill of 1131	1	10	0
1132	110	general	fill	ditch	fill of 1102	2b	10	0
1134	111	general	primary fill	ditch	fill of 1131	1	10	0
1137	112	general	fill	ditch	contaminated	2b	10	0
1143	113	general	fill	ditch	fill of 1075	2b	10	0
1145	120	general	fill	ditch	fill of 1144	1	10	0
1147	122	general	fill	ditch	fill of 1146	2a	10	10
1148	121	general	fill	ditch	fill of 1146	2a	10	0
1151	123	general	fill	ditch	fill of 1149	2b	10	0
1153	124	general	fill	ditch	fill of 1152	2b	10	10
1154	125	general	fill	ditch	fill of 1152	2b	10	0
1156	115	general	fill	pit	fill of 1155	2b	10	0
1157	114	general	fill	pit	fill of 1158	2b	10	0
1159	116	void	void			0	0	0
1173	119	general	fill	linear	fill of 1172	1	10	0
1174	117	general	fill	pit	fill of 1175	1	8	8
1176	118	general	fill	pit	fill of 1175	1	10	0
1179	129	general	fill	pit	fill of 1178	2b	10	0
1181	128	general	fill	linear	fill of 1189	4	10	0
1183	130	general	fill	linear		4	10	0
1184	131	general	fill	ditch	fill of 1126	1	10	0
1193	135	general	primary fill	ditch	primary fill of 1192	2b	10	0

context	sample	sample type	context type	feature type	description	phase	sample volume (L)	volume processed (L)
1194	134	general	secondary fill	ditch	secondary fill of 1192	2b	10	0
1200	133	general	secondary fill	ditch	fill of 1198	2c	10	0
1206	136	general	secondary fill	ditch	fill of 1204	2c	10	10
1207	137	general	tertiary fill	ditch	fill of 1204	2c	10	0
1209	138	general	fill	ditch	fill of 1208	0	10	0
2019.1	139	organics	fill	pond	0.00–0.10m spit	2b	10	10
2019.2	140	organics	fill	pond	0.10–0.20m spit	2b	10	0
2019.3	141	organics	fill	pond	0.20–0.30m spit	2b	10	0
2019.4	142	organics	fill	pond	0.30–0.40m spit	2b	10	10
2019.5	143	organics	fill	pond	0.40–0.50m spit	2b	10	0
2019.6	144	organics	fill	pond	0.50–0.60m spit	2b	10	1
2019.7	145	organics	fill	pond	0.60–0.70m spit	2b	10	0
2019.8	146	monolith	fill	pond		2b	0	0
2019.9	147	general	fill	pond	pond fill	2b	40	10

Table 17 List of environmental samples (assessed samples are highlighted)

feature	context group	phase	feature type	overall sample size (L)
603	20	2b	ditch	40
625	16	2b	ditch	40
628	39	2a	ditch	40
709	19	2b	ditch	40
1026	18	2a	ditch	39
1102	24	2b	ditch	50
1146	8	2a	ditch	30
1204	23	2c	ditch	30
680, 682, 696	2/4/38	1/2a	ditch	40
673, 706, 735	4	1	ditch	38
1075, 1152	8	2b	ditch	40

Table 18 Consolidated sizes of environmental samples from features other than pond with assessed samples indicated by highlighting

A 1.30m monolith (Monolith 1; Fig 47) was taken through an exposed organic section of the pond fill, from which four pollen and seven diatom sub-samples were taken. A second monolith, approximately 0.70m in length, was taken from a different area of the pond and five diatom sub-samples extracted.

Assessment

As some of the key extensive deposits had been sampled at several different points (ie separate slots; resulting in multiple samples from some contexts), one sample from each key deposit was prioritised for assessment. A total of 26 contexts were, therefore, assessed (see Tables 17–18). Where the larger features were multiply sampled (eg across several different slots) the samples had been individually numbered, but consolidated quantities could be matched to sampling level requirements (40 litres per feature; see Table 18).

The environmental evidence, as collated during assessment, is summarised in Table 19.

Context	Context group	phase	Sample	large mammal	human bone	small mammal	fish	frog/td	bird	mollusc	insect	charcoal	charred plant	waterlog plant	hammerscale	Comment
0615	17	2a	3	occ		occ				occ		occ				
0633	12	2a	9	occ		occ										
0649	1	1	11	occ												
0652	1	?1	14	occ												
0657	20	2b	14	occ									occ			
0662	22	2b	18	occ						abt		occ			occ?	
0675	4	1	23	occ		occ				occ		occ	occ	occ		
0688	13	2a	30	occ						occ		occ	occ		occ?	
0692	16	2b	149	occ		occ				occ		occ		mod		
0694	39	2a	151	occ										occ–mod		
0697	38	2a	33	occ–mod		occ				occ						
0698	38	2a	34	occ						occ						
0700	38	2a	65	mod –abt		occ				occ						
0710	19	2b	76	occ						abt						
0719	33	2a/b	80		abt	occ				occ			occ			cremation frags
0720	33	2a/b	79		mod					occ						cremation frags
1027	18	2a	46	occ						occ			occ	occ		
1028	18	2a	47	mod		occ				occ–mod						
1058	28	2c	51	occ						abt						
1100	24	2b	92	occ						occ			occ			
1108	23	2c	127	occ		occ				abt			occ			
1110	23	2c	126	occ			occ			mod				occ		
1147	8	2a	122	occ		occ–mod				occ			occ			
1153	8	2b	124	occ		occ		occ								
1174	9	1	117	occ						occ						
1206	23	2c	136	occ									occ			
2019.1	5	2b	139, 0–10cm							occ						
2019.1	5	2b	139, 30–40cm													No remains identifiable
2019.1	5	2b	139, 50–60cm													No remains identifiable
2019.9	5	2b	147	occ		occ										

Table 19 Summary of environmental remains (based on assessment). Key: Occ = occasional, mod = moderate, abt = abundant

19 Plant macrofossils, by Elizabeth Pearson

Site strategy

Field sampling policy was focussed on the main period of site activity associated with the pond. This was also the wettest part of the site and so was felt to offer the highest potential. These features remained the focus of the full analysis. This approach was adopted because of the scarce resources available, and accounts for why pits were not

extensively sampled but ditches were, as the latter constituted (with the pond) by far the largest element of the site.

Methods of analysis

A total of 10 litres was processed from the majority of the major features by flotation followed by wet-sieving using a Siraf tank. The flot was collected on a 300µm sieve and the residue retained on a 1mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds. The residues were fully sorted by eye and the abundance of each category of environmental remains estimated. The flots were scanned using a low power EMT stereo light microscope and plant remains identified using modern reference collections maintained by the Service, and seed identification manual (Beijerinck 1947). Nomenclature for the plant remains follows the *Flora of the British Isles*, 3rd edition (Stace 2001).

Pond deposits

For organic samples from the pond, a sub-sample of 1 litre was processed by the wash-over technique as follows. The sub-sample was broken up in a bowl of water to separate the light organic remains from the mineral fraction and heavier reside. The water, with the light organic faction was decanted onto a 300 µm sieve and the residue washed through a 1mm sieve. The remainder of the bulk sample was retained for further analysis. A magnet was also used to test for the presence of hammerscale.

Results

Assessment showed that preservation of plant macrofossil remains was generally poor across the site (Table 19). Occasional plant remains, which survived as a result of anoxic (oxygen-reduced) conditions, are thought to be contemporary with the deposits on account of the heavy clay soils. However, few species were identified (Table 20) even within the pond which appeared to be visibly organic, and so all the assessed samples were, therefore, from ditches across the site. However, little information could be gained from these about the surrounding environment or human activity on the site.

phase			1	2a						2a/b	2b	
Latin name (Family)	common name	habitat	0675, CG4	0694, CG39	0698, CG38	1027, CG18	1108, CG23	1110, CG23	1147, CG8	0719, CG33	0692, CG16	1100, CG24
charred plant remains												
Triticum dicoccum/spelta grain (Poaceae)	emmer/spelt wheat	F			+				+	+		+
Triticum sp grain (Poaceae)	wheat	F					+			+		
Cereal sp indet grain (Poaceae)	cereal	F	+				+					
Atriplex sp (Chenopodiaceae)	orache	AB								+		
Vicia sp (Fabaceae)	vetch	ABD				+	+					
cf Cyperaceae sp indet (Cyperaceae)	sedge	CDE										+
waterlogged plant remains												
Poaceae sp indet grain	grass	AF					+					

(Poaceae)												
Ranunculus acris/repens/bulbosus (Ranunculaceae)	buttercup	CD						+				
Chenopodium album (Chenopodiaceae)	fat hen	AB				+						
Lemna sp (Lemnaceae)	duckweed	E		+/++							++	
Carex sp (Cyperaceae)	sedge	CDE						+				
unidentified herbaceous fragments							+++	+++	+++	+++	+++	+++

Table 20 Plant remains from late Iron Age to Roman contexts (assessment data). For key see below

habitat	quantity
A= cultivated ground	+ = 1–10
B= disturbed ground	++ = 11–50
C= woodlands, hedgerows, scrub etc	+++ = 51–100
D = grasslands, meadows and heathland	++++ = 101+
E = aquatic/wet habitats	
F = cultivar	

Occasional charred plant remains were noted which included grains of emmer/spelt wheat (*Triticum dicoccum/spelta*), other unidentifiable cereal grains and vetch (*Vicia* sp) seeds. This material is of limited value for providing information on the relative importance of crops cultivated and the distribution of crop processing activities on the site. Evidence for cereal crop processing or waste disposal may well be limited because this does not appear to have been an area where crop processing or disposal of waste from domestic or agricultural hearths was taking place. Moreover, the pollen evidence is suggestive of a largely pastoral landscape around this site (see below). Charcoal was generally sparsely distributed and fragmented.

No further work on plant macrofossil remains was carried out beyond assessment.

20 Pollen (*by* Nicholas Daffern and Katie Head)

Methods of analysis

Seventeen 2cm^3 samples were taken from Monolith 1 (Figs 46–7) from the pond for analysis, the exact depths of which are given within the results section below. The samples were submitted to the laboratories of the Department of Geography, Earth and Environmental Sciences, University of Birmingham for chemical preparation following standard procedures as described by Barber (1976) and Moore *et al* (1991).

Where preservation allowed, pollen grains were counted to a total of 500 land pollen grains (TLP) for full analysis using a GS binocular polarising microscope at x400 magnification. Identification was aided by using the pollen reference slide collection maintained by the Service, and the pollen reference manual by Moore *et al* (1991). Nomenclature for pollen follows Stace (2010) and Bennett (1994). The pollen diagram (Fig 48) was constructed using TILIA, TILIA.GRAPH, and TGView 2.0.2 software (Grimm 1990; 2004).

Figure 46 Section through pond fill (CG5) at location of monolith sampling

Figure 47 Cross-correlation of auger-hole B5, excavated spits and monolith 1 in pond (CG5)

Results

Of the seventeen sub-samples analysed from the pond, in only one (0.90m) was the full analysis count of 500 TLP grains not achieved due to poor preservation and excessive mechanical damage of grains. The results of the pollen analysis are shown in Figure 48 and detailed data on counts is held in archive.

Figure 48 Pollen diagram

GLWP-1 (1.28–0.80m) *– corresponding with Phases 1–2a*

Main taxa: Poaceae – Caryophyllaceae – *Pinus sylvestris*

This zone is dominated by herbaceous species in excess of 90% TLP for the majority of the zone with Poaceae indet (grasses) contributing greater than 60% TLP. Caryophyllaceae (pink family) make a significant contribution of greater than 20% TLP at the base of the zone before declining gradually throughout the zone.

Herbaceous species diversity is high throughout the zone with lesser contributions by species including Apiaceae (carrot family), *Cichorium intybus*-type (chicory/dandelion), Cyperaceae undiff (sedges), *Papaver argemone* (prickly poppy), *Plantago lanceolata* (ribwort plantain) and Rosaceae (rose family). The decline in Caryophyllaceae at the top of the zone is contrasted by minor increase in *Ranunculus acris*-type (meadow buttercup) *Rumex acetosella* (sheep's sorrel) and *Solidago virgaurea*-type (daisies/goldenrods) although their contributions are still limited in comparison to Poaceae. Solitary or limited identifications of herbaceous species included *Filipendula* (meadowsweet/dropwort), *Primula veris*-type (cowslip/primrose), Saxifragaceae (saxifrage family), *Scleranthus* (knawels) and *Succisa pratensis* (devil's-bit scabious). The sole heath species identified in this zone was a solitary grain of *Calluna vulgaris* (heather).

Trees and shrub pollen is poorly represented in this zone, particularly in the base of the sequence, contributing less than 10% TLP, with *Pinus sylvestris* (Scots pine) accounting for half of this figure *c* 6% TLP, gradually increasing to 13% TLP at the top of the zone. Grains of *Alnus glutinosa* (alder), *Betula* (birch), *Corylus avellana*-type (hazel), *Ilex aquifolium* (holly), *Quercus* (oak) and *Salix* (willow) were also identified throughout the zone but their contribution is limited.

The most prevalent aquatic species identified in this zone was *Potamogeton natans*-type (broad-leaved pondweed). Grains of Lemnaceae (duckweed family) were also identified but they were present in lower quantities and more sporadic. The spores of *Polypodium* (polypody), *Pteridium aquilinum* (bracken) and *Pteropsida* (mono) indet (ferns) were also identified with the latter increasing in prevalence towards the close of zone GLWP-1.

GLWP-2 (0.80–0.04m) *– corresponding with Phase 2b*

Main taxa: Poaceae – *Cichorium intybus*-type – *Pinus sylvestris* – Caryophyllaceae

The trend of domination by herbaceous species from the previous zone continues with values of 82% TLP at the base of the zone which, aside from a single fluctuation at 0.34m, increases toward the top of the zone to *c* 95% TLP. Poaceae indet is again the major contributor of herbaceous grains accounting for *c* 60% TLP at the base of the zone, peaking at 73% TLP at 0.58m before declining to 45% TLP at the top of the sequence.

The decline of Caryophyllaceae from the previous zone continues with values reaching as low as 1% TLP before fluctuating at low levels throughout the zone contributing no more than 6% TLP. The declines in Caryophyllacae and Poaceae indet are mirrored by an increase in *Cichorium intybus*-type increasing from 4% TLP at the base of the zone to 32% TLP at the top of the sequence. Despite herbaceous species diversity remaining high in this upper zone, the contribution of these species is still sporadic and low in quantity with Apiaceae, Chenopodioideae (goosefoot subfamily), *Cirsium*-type (thistles), Cyperaceae, *Montia fontana* (blinks), *Plantago lanceolata*, *Ranunculus acris*-type, *Rumex acetosella*, *Solidago virgaurea*, *Urtica dioica* (stinging nettle). Infrequent identifications of *Achillea*-type (yarrows/chamomiles), *Centaurea nigra* (common knapweed), *Chelidonium majus* (greater celandine), *Filipendula*, *Persicaria maculosa*-type (redshank), *Scutellaria*-type (skullcaps/ bugles), *Thalictrum* (meadow-rue), *Trifolium*-type (clovers), *Valerianella* (cornsalads), *Vicia* undiff (vetches) and *Viola palustris*-type (marsh violet) also occurred. Of note in this final zone is the very limited and sporadic presence of cultivated species, *Cerealia* indet (indeterminate cereals) and *Avena/Triticum*-type (oat/wheat).

Tree and shrub species account for 17% TLP at the base of the zone, with *Pinus sylvestris* contributing the majority of this figure (*c* 13%). This figure of 17% is the peak value for tree and shrub species in this upper zone with the figure dropping to 4% TLP at 0.50m, increasing to 13% TLP at 0.34m before declining to *c* 3% TLP the top of the zone. This fluctuation can purely be attributed to fluctuations within *Pinus sylvestris* and *Quercus* pollen which are the two main contributors of arboreal pollen. In addition to the tree and shrub species identified in the previous zone, grains of *Fraxinus excelsior* (ash), *Hedera helix* (ivy), *Ligustrum vulgare* (wild privet), *Sorbus*-type (whitebeam) and *Tilia cordata* (small-leaved lime) were identified in this upper zone.

Calluna vulgaris was again the sole heath species identified within this zone although it was more prevalent than in the previous zone. Aquatics were better represented in this upper zone with grains of *Butomus umbellatus* (flowering-rush) and *Sagittaria sagittifolia* (arrowhead) being identified for the first time in addition to grains of *Potamogeton natans*-type and Lemnaceae. A peak in pondweed pollen at 0.18m was probably due to the clumping of grains suggesting that part of the parent plant was incorporated into the sediment of the feature, a trait previously observed in this species (Moore *et al* 1991, 90). Spores were similarly more abundant within this zone with identifications of *Polystichum* (shield-fern) and *Sphagnum* (peat moss) in addition to *Polypodium*, *Pteridium aquilinum* and *Pteropsida* (mono) indet.

Discussion

The palynological remains identified from the pond sequence (Fig 48) indicate an open, grassland landscape which is pastoral in character from the beginning of the sequence. The domination of pasture and grassland herbaceous species tends to indicate that the open character of the landscape is well established suggesting an element of management, most likely in the form of animal grazing, thereby giving rise to a rich

grassland habitat as indicated by the diversity of grassland and pasture taxa that were recorded.

This open, pastoral landscape character of this part of later prehistoric and Roman Worcestershire has previously been identified in other palynological investigations undertaken along the Avon Valley, such as immediately to the south on the Wyre Piddle bypass (Greig 2005), to the north-east at Salford Priors (Greig 2000), and at Broadway to the south-east (Greig 1997). All of these sequences have shown similar domination of herbaceous species with many of the families, genera and/or species being identified at multiple, if not all, sites.

The contribution of tree and shrub throughout the sequence is relatively low suggesting that there were pockets of established woodland within the environment as indicated by the presence of oak, ash and lime but that these are peripheral to the site. The frequency of Scots pine throughout the sequence is an interesting and unusual feature, as a one-off peak would suggest that the pine was part of the regional vegetation and had been incorporated into the feature as part of the rainfall component (Tauber 1965), yet given the small size of the feature, estimated to be 35 x 20m, the regional vegetation is unlikely to have had a large input into the pollen spectrum present (Jacobson and Bradshaw 1981; Prentice 1985). It is, therefore, suggested that the pine is from a local source, and this is supported by the work of Greig (2005) some 500–1000m to the south-west from which only a single pine grain was identified for, if it were a regional source, its presence is likely to have been also identified here. Some of the pine grains present within the sequence were immature grains suggesting that either parent material of the plant had been incorporated into the sediments or that they had been incorporated through gravity fall, yet given that the soils surrounding the feature were very clayey, it is unlikely that the pine were growing directly adjacent to the feature. Pine is a prolific producer of pollen (Faegri and Iversen 1989, 142) and the saccate nature of its pollen grains would allow even immature grains to be transportable a short distance and thus a small number, or possibly even a solitary tree, would have had the ability to produce the quantity of grains identified in this sequence. The work of Robeldo-Arnuncio and Gil (2005, 20–21) has shown that small populations/stands of Scots pine have ‘an average dispersal distance of 135m, with 50% of the pollen being dispersed more than 30m from the source, and 5% beyond 180m’. This suggests that the origin of the pine pollen identified at George Lane is likely to have been located within an approximate 180m radius of the pond depending upon prevailing wind direction, thus accounting for its absence in large quantities at contemporary sites in the general vicinity (ie Greig 2005).

The character of the pond and its immediate environs were well represented by both the herbaceous and aquatic species identified by pollen analysis. The aquatic species identified indicate that water in the pond was stationary or slow flowing, and the feature appears to have been permanently wet, given the presence of these particular aquatic plants, as well as its organic basal layer.

21 Diatoms (*by* Katie Head)

Methods of analysis

Twelve diatom samples were taken from two monoliths located at different points in the pool, in order for differences in species composition to be compared. Seven samples (depths: 26cm, 42cm, 58cm, 74cm, 90cm, 106cm, 122cm) were taken from Monolith 1 and five (depths: 4cm, 20cm, 36cm, 52cm, 68cm) from Monolith 2. Samples of 2g of wet

sediment were digested using 50% Hydrogen peroxide. This involved each sample being placed in a beaker with 50% Hydrogen peroxide and heated slowly for three hours at 90°C until all the organic matter had been oxidised. Once cool, the samples were transferred into tubes, leaving any coarse sand behind, topped up with distilled water, and centrifuged at 1200rpm for four minutes. This was repeated four times in order to wash the samples. A few drops of weak Ammonia solution of 1% was added to the last wash in order to decant off any clays.

Slides were made by diluting the cleaned diatom suspension and pipetting it onto to cover slips placed on a metal settling-out tray. The samples were left undisturbed to evaporate for 24 hours. The dried cover slip containing the diatom sample was then inverted onto a slide containing a drop of Naphrax diatom mountant. The slide was then heated on a hotplate to 130°C for 15mins, and then left to cool. Once set, the slides were examined under a GS binocular polarising microscope at 1000x magnification using oil immersion.

Results

Twelve samples were scanned for diatoms in order to assess whether salinity was historically attestable, but none were found. It is possible that site conditions were against their presence as they survive best in well-waterlogged conditions (Ryves *et al* 2006), and even in the salt production area at Droitwich their preservation was highly variable (Juggins 1997).

22 Mollusca (*by* Andrew Mann)

Methods of analysis

Following assessment, four samples of 10 litres were selected for full analysis.

Results

The mollucscan evidence recovered is summarised in Table 21.

context	710 (CG19, P2b)	720 (CG33, P2a/b)	1058 (CG28, P2c)	1108 (CG23, P2c)
feature type	ditch	cremation pit	ditch	ditch
sample number	76	78	51	127
sample volume (L)	10	10	10	10
SPECIES				
LYMNAEIDAE				
Lymnaea truncatula	49	22		
Lymnaea palustris		2		
PLANORBIDAE				
Anisus leucostoma		2	1	32
COCHILCOPIDAE				
Cochlicopa lubrica			6	

Vertigo pygmaea	7	2	6	1
PUPILLIDAE				
Pupilla muscorum	19	9	126	2
VALLONIIDAE				
Vallonia costata			61	24
Vallonia pulchella	12	26	36	9
Vallonia excentrica	7	4	35	6
Vallonia sp	10	12	14	3
PUNCTIDAE				
Punctum pygmaeum			1	
DISCIDAE				
Discus rotundatus			1	1
ZONITIDAE				
Oxychilus cellarius			4	
HELICIDAE				
Hellicella itala	2			
Trichia hispida	9	18	82	13
Cepaea sp				2
totals	**115**	**97**	**373**	**93**

Table 21 Mollusca – minimum numbers of individuals

The assemblages contain relatively restricted faunas that are dominated by open country species, namely *Vallonia* sp and *Pupilla muscorum* that are indicative of dry, short-sward grasslands. The low diversity of the assemblages and the dominance of *Pupilla muscorum*, *Vertigo pygmaea, Vallonia costata* and *Vallonia excentrica* are also indicative of short turfed grassland that has been trampled and heavily grazed. Specifically *Pupilla muscorum*, finds trampled and or rutted ground advantageous and disappears from assemblages when the grassland is no longer grazed and becomes longer. It may also prefer cattle-grazed rather than sheep-grazed grassland (Davis 2008).

Denser less grazed vegetation around and within the ditches is likely to have provided habitats for the more shade-tolerant species, including *Punctum pygmaea*, *Discus rotundatus* and *Oxychilus cellarius*, although these are present in very low numbers.

The presence of *Lymnaea truncatula* in ditch CG19 indicates stagnant/poor quality water or wet grassland. The presence of *Anisus leucostoma* in ditch CG23 also suggests that this had also contained stagnant water, probably on a seasonal basis.

In addition four samples containing moderate to abundant mollusc remains (602, CG32, P4; 710, CG19, P2b; 1085, CG30, P4; and 1102, CG24, P2b) had been scanned for the assessment, and, being dominated by *Vallonia* sp, *Pupilla muscorum* and *Vertigo pygmaea*, were also characteristic of short-turfed grassland environments, with two species also suggesting standing water at least during the wetter months of the year (ie *Anisus leucostoma* inhabiting slum water prone to seasonal desiccation, and *Lymnaea truncatula* living mostly on bank-side vegetation next to ephemeral ponds and small bodies of water, as also cited above).

Discussion

The assemblages were indicative of open short-turfed, dry grassland and are comparable to the molluscan assemblages from the Iron Age/Roman sites at the Wyre Piddle Bypass (unpublished data) and Throckmorton Airfield (Griffin *et al* 2005) which lie approximately 0.5 km to the south-west and 1.2km to the north respectively. Both sites contained molluscan assemblages suggesting that by the mid to late Iron Age the surrounding landscape had been cleared for pasture. All three sites produced molluscan assemblages that contained few shade-tolerant species and, those that were present, are thought to have inhabited the denser vegetation within ditches or discreet areas of longer grassland. As with the other sites the George Lane assemblages also contained slum water and aquatic species that suggest the features were seasonally water-filled, all three sites being likely to have contained semi-permanent pools of water due to the impermeable clay substrate.

On a national level the molluscan assemblages from the three sites are similar to those from Farmoor (Lambrick and Robinson 1979), Watkins Farm (Allen 1990) and Mingies Ditch (Allen and Robinson 1993) within the Thames Valley. Similarly the molluscan assemblages from the south Worcestershire sites discussed here all suggest that many features held standing stagnant water within a surrounding environment of open grassland/pasture, with little or no shade.

23 Synthesis of environmental evidence (*by* Elizabeth Pearson and Nick Daffern)

Pollen from the pond and molluscan remains from other features on the site indicate that the broad local landscape was relatively open during the late Iron Age/Romano-British period and, hence, largely pastoral in character. Sitting in this landscape the pond went through a transition in deposition of organic material in the feature from basal laminated peats, in which there were high levels of Caryophyllaceae species at the base, to a non-laminated organic clay in which Caryophyllaceae pollen levels are much lower and other herbaceous species are more evident. The significance of this is unclear, but it is likely that trampling and general use of the site contributed to silting up of the pond and deposition of the organic clay layer. Seasonal wetting and drying and partial soil formation may have obscured any micro-structure such as lamination in this upper layer. There was some evidence from the mollusc and pollen analysis that the pond contained stagnant/slow-moving water.

No direct evidence of salt-tolerant vegetation was noted bearing in mind the salty nature of the local spring water. Nor was any beneficial effect of this noted in terms of the enhanced preservation of plant material, as would be expected if this had been a significant local feature of the environment. Salinity has, therefore, been presumed on this evidence to have always been low (as today), and, in the light of that, it is unlikely that activities related to salt-production or use of the brine, for example, for food preservation were taking place.

The low level of charred cereal crop debris recorded here (and at nearby Wyre Piddle bypass) contributes to the interpretation of this being a largely pastoral landscape. It suggests that if crop processing was taking place at all, it was only on a small scale, or that any remains just represent occasional debris from domestic fires. Cereal crop cultivation was, therefore, unlikely to have been a significant part of the local economy in the later prehistoric to Roman periods in this region.

Where livestock husbandry is concerned it is generally accepted that there is a pattern of a shift in emphasis from a sheep/goat dominated husbandry during the Iron Age to a cattle-dominated livestock economy in the Roman period (King 1978; Dobney 2001), but at George Lane, MNI data suggests the opposite for the Iron Age to early Roman period (Phase 1 to 2a). Nevertheless, cattle were dominant by Phase 2b.

Animal bone has turned out to be, potentially, the most useful strand of the environmental evidence for suggesting a function for the pond, at least, that is, during its silting up phase, but whether this represented final 'disuse' was unclear. Larger anatomical parts, particularly of horse and cattle, and the relative rarity of butchery, suggested the disposal of animals which had died from disease, or, just possibly, the conspicuous disposal of surplus joints from feasting. Overall there was no environmental evidence for industrial activities such as flax retting, dyeing or use of plant material for tanning, but this evidence is most likely to be found in better waterlogged conditions, and on this site the waterlogged plant remains were only poorly preserved and scarce.

Comparison with other sites

The George Lane environmental evidence thoroughly corroborated the largely pastoral landscape range suggested by other Iron Age and Roman sites in the general vicinity, such as the insect remains from an Iron Age/Roman ditch and a Roman pit along the Wyre Piddle bypass (Smith 2003) which had indicated short-grazed grassland and cultivated ground dominating, with a relatively large proportion of various genera and species associated with dung of either sheep or cattle such as *Aphodius*, *Cercyon*, *Histeridae* and *Platystethus arenarius*. The molluscan evidence from Throckmorton (Head and Mann, 2005), Upper Moor, Pershore (Head 2005) and Wyre Piddle bypass (Mann 2005) had also previously hinted at an open, short-turfed, pastoral landscape because of the presence of species such as *Helicella itala*, *Vallonia excentrica*, *V. costata* and *V. pulchella*, while that of the dwarf pond snail, *Lymnaea trunculata* (an intermediate host of *Fasciola hepatica*, the liver fluke), at Upper Moor (Head 2005) had tentatively indicated the presence of sheep or cattle.

It is now becoming clear that historically damp areas have a great contribution to make in terms of establishing the broader picture of landscape use within which individual sites can be placed, but not so much on the basis of any waterlogged remains, as on the valuable pollen sequences they may contain, especially where more intimately involved with human activity, and, in that regard, ponds would seem a key site type. However, the preservation of organic remains from waterlogged deposits within the pond on this site was much poorer than from the deep pits along the route of the bypass (Griffin *et al* forthcoming), and so the preservation of plant macrofossil remains can be very variable across any given area, even in visibly peaty deposits, so that any environmentally based comparison between adjacent sites can still be highly problematic. The reason for poor preservation at any one location can remain uncertain, such as when, for instance, equally poor preservation of plant macrofossil remains was noted in rich peaty deposits of earlier prehistoric date at Impney Farm near Droitwich (Williams *et al* 2005).

24 Spring water select analysis (*by* N Humphreys and Christine Elgy)

pH	7.6
electrical conductivity	5950 uS/cm

Ammoniacal nitrogen	1.5mg/l
chloride	1120g/l

Table 22 Results of analyses of George Lane spring water (by N Humphreys)

Explanation (*by* Christine Elgy)

Electrical conductivity certainly confirmed the presence of dissolved salts in the water. The Ammonia levels were low, and the conductivity appeared to be due almost entirely to Sodium chloride in the water. From the chloride levels, the concentration of total dissolved Sodium chloride would be 1.85 gram/litre. For comparison seawater has 35g per litre Sodium chloride, so the level of salt from the George Lane spring is just over 5% that of seawater, which is itself normally taken to be only a 3% concentration.

25 Overall interpretation of the site

The George Lane site lies within an area where surviving evidence for Roman activity covering the entire period from the later prehistoric through to late 4th centuries AD has been recovered during recent interventions. The opportunity has, therefore, been taken below to take an overview of the surrounding area, by including reference to these newly discovered sites: Wyre Piddle by-pass (eg Vaughan 2005 and unpublished), Throckmorton (Griffin, Griffin and Jackson 2005), Broadway by-pass (unpublished) and, slightly more distantly, Childswickham villa (Patrick and Hurst 2004).

The George Lane site today does not offer any obvious advantages for settlement and so the reasons for activity in the past must be sought in terms of a specific purpose. Since the activity seems to be primarily centred on a pond, then topography and geology are liable to offer a reason for its original location. Any large hole excavated on the Jurassic clays is liable to have filled up with surface water but the northern edge of the pond revealed an outcropping of a Blue Lias rock, and dependent on its inclination, this might well mark a spring line along the slope by acting as a reservoir for collecting groundwater at its boundary with the underlying Lias clay, therefore providing the main source of water to the pond. The presence of such a spring line may be confirmed by a modern spring being mapped along the same contour line about 350m to the south-east. The brackish character of the ground water from the Lias in this vicinity was recorded by Richardson (1930), but the reasons for this are currently unclear, especially since the possible spring would be drawing on groundwater which was apparently sourced in the Lias, and, therefore, had no connection with underlying Triassic salt deposits.

Foundation of the site

The earliest evidence of human activity is represented by a thin background scatter of worked flint, indicating that the site had no special significance in this early period, and the earliest occupation was, therefore, in the later Iron Age. The more exact dating of this is problematic, but it can be noted that there was no Droitwich briquetage present as would normally be expected until the earliest Roman period (possibly up to *c* AD 60 based on recent evidence from Worcester St Johns where it was absent; C J Evans, pers comm), though its absence could, no doubt, be otherwise explained, for instance by the site not being related to any normal year-round domestic activity.

General character of site activity

However, it is also notably atypical, as it was focussed on a large artificial pond. The purpose of the pond and the determination of whether any of the adjacent features were associated in its use must be key to any account of this unusual site. However, it should also be considered that such sites were actually not so rare as they might seem at the moment, as the focus of archaeology has typically been on terrace deposits, and so few sites on clay geology and also in similar landscape positions have yet been explored.

The pond and its immediate environs

Pond origins

The pond seems to have been an entirely new feature in the landscape, as there was no indication that any natural depression was being modified or enhanced. The location was probably determined by the presence of a natural spring, though where such springs occur they often erupt at several nearby places depending on flow. Today the spring water at this location has a noticeable mineral content (most evident by the layer of salts left by natural evaporation), including a low level of Sodium chloride (common salt), and this brackish character has been noted as a regular feature of wells on the Lower Lias 'in the outlying parts of the parish' (Richardson 1930, 94). Modern analysis of the spring water shows it today to be only 5% as salty as sea water, which seems too low for its being viable as a commercially viable salt source. It is unclear how far this affected the drinking quality of the spring water assuming it was being consumed to any extent, and it may encourage the view that the water was mainly used for animals.

The construction of the pond was tentatively dated to the later Iron Age/earliest Roman period, as, in common with the other earliest features on the site, its primary fill was associated only with handmade Malvernian ware (unfortunately no forms were identifiable), and since Severn Valley ware was absent, an Iron Age date has been mooted. On balance, therefore, the pond is considered to have been first constructed in the later Iron Age. This dating also assumes that any earlier fills had not been cleaned out – the later tendency of the pond to silt up seems a good indication of the amount of surface water that also found its way in, perhaps washing in spoil from its original excavation. Nor was any later evidence of any periodic cleaning later during the life of the pond, as once created the pond seems to have been left to gradually silt up – this is reflected in the associated finds dating which shows a gradual but constant chronological progression. Therefore, the pond seems to have been deliberately created but, thereafter, not particularly maintained, and so the objective of the pond from the outset had been to have a large reservoir of water rather than a small basin for collection of spring water. This again suggests that the purpose may have been to provide drinking water for animals, or some other larger scale use.

Difficulties of excavation

When the specific characteristics of the George Lane pond were examined, there were some aspects that remained uncertain largely due to the difficult conditions of excavating in such a wet environment and to the constrained area of excavation. Thus only the north edge of the pond was well defined, and even this could not be fully recorded further to the east, which left the overall shape of pond in doubt. The homogeneity of pond fills and adjacent ditch fills also meant that these were not readily distinguished from each other, adding to further uncertainty about their definition and relationships. Apart from that the major fills within the pond were difficult to distinguish during excavation, except for the more obvious basal organic layer, and this resulted in pond contents being excavated in artificial spits, with some potential loss of dating precision. However, the fieldwork did succeed in establishing the large scale of the

pond, and the full excavation of the available fills provided for as good a retrieval of data as possible during full analysis.

Adjacent features

The considerable size of the pond, and of some of the features adjacent to it, suggest a joint association in whatever was originally planned, and taking these features together as a group may give the best chance of determining site function. The adjacent circular ditch (CG8) would seem best explained as the gully of a roundhouse with a diameter of *c* 10m, a typical size in this locality (cf at nearby Throckmorton; Griffin *et al* 2005), and its annexe seemed to be contemporary, and, as if they were closely associated, they have similar compositions of primary pottery, and a closely shared alignment with the pond. Lesser features may have also been of some importance to its function (eg CG6) but their slight remains were inscrutable, and the finer structural workings of the pond could not, therefore, be readily elucidated.

At first sight the number of adjacent ditches on the south side of the pond might be taken to indicate that there had been elaborate water control system here (ie down-slope) but this may well be a false impression, as the site was reorganised several times over about 200 years and so ditches, possibly associated with new uses, were repositioned giving this semblance of complexity (see more below).

Where features apart from the pond stayed more or less in their original positions over a long period (ie the North Area circular ditch and annexe) they were renewed in Phases 1 to 2b, either being re-organised (annexe) or enlarged (?roundhouse drainage), in either case suggesting improvements but continuation of their original function. The comparative scale of these features may have given them greater permanence but it is also likely that their (?inter-related) function in association with the spring gave them greater fixity in the landscape as the main focus of activity. There was no obvious evidence of the pond being cleaned out during this extended period, and so, perhaps, this was the only feature on the site that did not go through this process of renewal, perhaps because it was still functioning well enough that change was unnecessary.

To the south of the pond (South Area) ditches/small enclosures also saw revision in Phases 2a–b, but in their cases they were relocated and the tendency to be curving gave way to greater rectilinearity, perhaps reflecting a wider change in design in keeping with the more Romanised attitude to landscape planning that had probably gained ground by the later 2nd century. Though the fresh laying out of ditches may not seem that significant, on the heavy clay geology, and when combined with wet conditions, it must have represented a great investment in effort, and presumably was only done for very good reason.

Though there was a general impression that there was a greater density of finds in the North Area (especially in the pond) than further south, this turned out to be more a function of larger feature size, as, in actuality, there were features with higher concentration of pottery to the south (*viz* ditches CG17, and 38; the latter reaching 90 sherds (weighing 865g) per m^3 excavated. The initial impression that the main occupation was focussed to the north of the pond is probably misleading, and, especially in Phase 2a, occupation probably extended to its south.

Finds evidence

Both artefactual and ecofactual evidence were well represented in the pond. The artefactual assemblage from the pond was particularly striking for both the absolute

quantity and quality of the remains (but see also above), but overall there was little to distinguish it from standard domestic debris. It was observed that none of the artefacts in the pond showed any evidence of wear, and so there was no running water (ie corroborating its identification as a pond). One outstanding feature of some of the artefactual material in the pond was its size when deposited. For instance, large parts of pottery vessels were present and some of the lumps of fuel ash slag were quite exceptional in size. But this particular characteristic in itself did not indicate any special activity, reflecting instead the relatively undisturbed environment of original place of deposition.

Iron-smithing hearth bases were also found in Phase 2a–b pond fills (as contemporarily elsewhere on the site) and, though not inherently domestic, they turn up often enough on sites of this date (eg at Worcester; Evans and Williams 2010) to be a typical accompaniment to domestic activity – the fuel ash may also have originated from this rather than domestic activity. Otherwise there was little reason to associate the pond area with iron working, as there was generally no clear sign of hammerscale on the excavated parts of the site, and none from the North Area (ie pond environs). There may be a case here, therefore, for the identification of material deliberately brought to the pond for disposal, so suggesting that the pond held some special significance for the depositor. It might even have been accompanied by more ephemeral related material (coal), which in the normal course of discard would not seem likely to need special arrangements being made for its disposal.

The surviving environmental evidence (pollen ie aquatics; molluscs) – though compromised by the absence of sustained waterlogged conditions – showed, unsurprisingly, that the pond area had been wet in antiquity, as might be expected today from its location and size. The formation of an organic deposit at the very bottom at the bottom of the feature showed that a pond was indeed its likeliest identification. Importantly these sources of evidence strongly suggested that the pond was situated in treeless grassland, in fact a landscape in which a supply of water was likely to be at a high premium, especially where animals, especially cattle, were being grazed. There was also evidence that the silted-up pond was prone to drying out, but it is unknown whether this applied during the life of the pond, as well as after it was disused, when a generally lowered water table might also have accounted for the state of the excavated remains.

At the moment the animal bone assemblage seems to hold the best potential to help explain the site, as this assemblage was also somewhat out of the ordinary, but not in terms simply of quantity and quality, as in the case of the artefactual assemblage. In this case the character of the material itself seemed to rule out ordinary domestic waste, as some sizeable portions of *in situ* articulated animal were noted. If exploitation of the 'brine' for food processing can be ruled out (see below) then, if it is not random discard of unwanted parts of animals following limited butchery, then it would seem possible that the remains represent one or more feasting events at least towards the end of the life of the pond (Phase 2b); but these might also then be part of a closure event, and so may not particularly shed any light on the original purpose or use of the pond. Other possible uses for the pond are now considered below.

Domestic activity?

As has already been touched on, assuming the salinity of the spring water was not a particular advantage, the pond could have functioned as an ordinary water supply for people to use, or, perhaps more likely, for stock. This may fit with aspects such as the development of the annexe (CG7, 24), and the possibility that the circular ditch CG8 is

the drainage gulley for a roundhouse. In this scenario the ditches to the south would have been useful for removing any surplus water and helping to drain the vicinity. Stock probably had direct access to the pond, at least on the north side as the sides seem graded for their easy access (Fig 22). The size of the pond could then be seen as reflecting the size of herds being managed, the pond also collecting a large head of water against drier periods, this expanse of water also having the beneficial effect of allowing any solid impurities to settle out. Grassland predominated according to the available environmental evidence which fits with a landscape dominated by animal husbandry.

Irrigation?

That the main ditch system was down-slope to the south would be compatible with their being deliberately fed by a head of water in the pond. That the ditches also seemed to be arranged with varying depths and with offshoots encouraged the view during excavation that an elaborate system of sluices and filtering of the water was being practiced – detailed evidence for this was not, however, forthcoming. However, this apparent pattern might also be explained by enclosure ditches being amended in design and by pits coinciding with the ditches (either earlier or later, but with relationships not being established due to the poor excavation conditions). Since environmental evidence strongly indicates that grassland predominated, any intensive crop production in the immediate vicinity using irrigation seems highly unlikely, though once channelled it is possible any water could have been sent to more distant destinations. It is possible that it would then have connected with the water channel recorded during the construction of the Wyre Piddle by-pass (unpublished data), serving to drain the higher ground, much as the later ridge and furrow was to do.

Fish pond?

Fish ponds generally require a flow of water and control by channels and sluice gates, and have related buildings where part of a large farmstead or villa (see MPP monument class description 1989; and elsewhere as rectangular structures eg Italy – Claridge 2010). The same counter-arguments seem to apply as in consideration of the industrial possibilities – see below. Besides not a single fish bone was recovered from environmental samples, though this is far from conclusive, as bone was generally in poor condition, and such small bones were unlikely, therefore, to have survived.

Industry (salt making)?

The slight salinity of the spring water could potentially have been a factor in determining site function, but this is more difficult to judge for the past as it would depend heavily on the nature and hydrology of the spring. Having a large body of water to evaporate could have naturally concentrated any salts in imitation of coastal salterns where sea water with its low salt content was being exploited, however, such features are usually quite shallow and the sheer depth of the George Lane pond would seem to virtually negate any such effect (see more below). In general the depth to the ditches seems to decrease as they proceeded down-slope away from the pond which would have been compatible with increasing concentration effect, but the absence of any lining and the small scale of the ditches (compared to the pond) make this purpose unlikely. If this was the intention surely a more effective design would have been to replicate the pond down-slope in a series of shallower and shallower pools. Better still, a lined construction (ie a tank) would also have been needed to stop the collapse of the sides and to reduce contamination of any salt (cf the wood-lined later prehistoric tanks at Droitwich; Woodiwiss 1992). Though the quantity of potboilers at the site was commented on at the time of excavation in this

regard (ie salt production) the quantities do not really seem out of the ordinary for ordinary domestic habitation. Also there were no great quantities of charcoal to signify industrial activity in the course of concentrating the mineral content of the water, as typically practiced during British salt production until the post-medieval period, whether at inland or coastal sites. A tentative parallel of sorts could be drawn with evidence from a recent Roman site in Nantwich (Cheshire) where some aspects of the animal bone assemblage seemed similar to that at George Lane (see Animal bone section above). However, apart from that, any function relating to the salt content of the spring would seem to be very far from proven.

The details of salt production technology for the early Roman period are better known for coastal salterns than inland sites. In the former case the Iron Age technology continued and only changed in the later Roman period (East Anglian Fenland; Lane and Morris 2001). Whether such a pattern applied to inland sites is unknown, as the early Roman production area at Droitwich has not been clearly defined, though the general impression from briquetage is that these containers did not continue much, if at all, into the Roman period, which might imply that a fundamental change in production technology had occurred at least in the case of inland centres. In both inland and coastal production prominent features of the industry were large tanks and ovens/clay-lined hearths, and large quantities of industrial waste, including fired clay much of which had evidently been fashioned into specialised forms. Such a combination of features was not found around the George Lane pond, and so salt making here seems highly unlikely from these points of view, as well as because the salt content was low (assuming that today's salt levels reflect historic levels).

In much later times clay Lias deposits have been associated with generally poor (ie mineralised) drinking water quality, and have sometimes been associated with commercial uses, for instance in south-east Somerset, where several springs were exploited by the 17th century for spas, though with limited success. Occasionally they were also used for salt making, as at East Chinnor in the 19th century where the waters contained c 6000ml NaCl/litre, but here the salt source was attributed to the overlying Inferior Oolite (Mather and Prudden 2005, 1).

Shrine?

The presence of a tazza and a lamp at George Lane is unusual for the Midlands, and such items have been regarded as indicative of funerary contexts and, on occasion, temples (R Philpott, pers comm). However, where such shrines have best been recognised there have usually been very obvious indicators, such as very large quantities of bones usually from specific animals or birds (eg Uley, Gloucs), and where such sites originated in the Iron Age they may in the later Iron Age become clear *foci* of donative activity, often involving coins (Curteis 2006, 69). On balance, therefore, there is presently no firm evidence for the site having any such tfunction.

Feasting?

Though perhaps not at all accounting for the installation of the pond and its normal use it is possible its final infilling was accompanied by a special purpose. There are sites where the character of the animal bone assemblage has been taken to be indicative of feasting on a large and extravagant scale, possibly for some important social occasion. This has been recognised at some earlier prehistoric sites but also at later prehistoric sites (eg Arnold 1999), though it has not been particularly associated with the Roman period. However, the great amount of pottery, especially drinking vessels (mainly tankards) amounting to *c* 40% of Severn Valley ware by rim sherd count (compared to

10% on the bypass settlement; L Griffin, pers comm), and animal bone, including large jointed chunks, does seem to suggest a social event (or series of events) like this may have significantly contributed to the creation of the final deposits in the pond.

Comparison with (possible) Roman ponds elsewhere

A pond of late Iron Age/Roman date has only infrequently been encountered elsewhere, and so few examples are available for comparison. For instance, Upex (2004) has examined the location and dating of all ponds in several Cambridgeshire parishes, and concluded that most were to be assigned a medieval or later date in association with watering stock and aiding drainage, though the origins of some of these later ponds and of others were unknown. A correspondence with certain geology (ie clay) and increasing incidence away from the main watercourses was generally noted, with many of the ponds being just over 1km away from a good natural water source (Upex 2004, 131). The George Lane pond can only be seen to approximate to this pattern for, though it meets the geological and distance criteria, it is presently the only pond of this early date known in the area, and so any observation on the frequency of such features across the landscape is not possible. The present picture both in pre-medieval Cambridgeshire and Worcestershire would seem, however, to be quite different from the medieval one, by which time ponds had become relatively common, which would in turn indicate a significant difference in land use in these areas between these periods.

The site – in its wider archaeological landscape

The George Lane site is situated close to where a number of other archaeological observations have been made in recent years, and so it is worthwhile considering the wider landscape, especially in the light of where the environmental evidence gives some clues to this. Topographically all the sites mentioned below sit on the Lias clays which shows that such a location was far from disregarded, whereas the gravels have usually been presumed to be the favoured locations for settlement simply because remains are most visible there. Apart from a Bronze Age enclosure and associated burials on the Wyre Piddle by-pass, the principal prehistoric evidence is of Iron Age date and mainly from the middle and late Iron Age. The middle Iron Age sites (typically roundhouses within enclosures, the latter generally curved or irregular rectangles) were not occupying defensive positions and seem mainly to be located at *c* 30m AOD (ie not necessarily on the highest ground in the vicinity, but above the floodplain), having good access to water in the form of the small spring-fed streams in which the area abounds. So far such sites have been identified (a) on the former Throckmorton air-field, which, as might be expected, is a wide area of raised and fairly flat land, and (b) towards the centre of the by-pass route. A large and newly discovered site at Allesborough 4km to the west is probably of similar date judging by fieldwalking data, and this was also located in a similar topographical position and also on clay land (Hurst and Leins forthcoming).

Though far from certain, the move to greater use of the clay lands and, therefore, the generally more intensive use of land, seems presently to have happened by the middle Iron Age. This might indicate, therefore, a change in agricultural/social practice with communities choosing to be closer to the land and the animal resources in their possession, and/or it may be that agriculture was expanding its extent, perhaps as a result of population increase or other pressure on local resources. So far contemporary environmental evidence is relatively scarce for establishing the backdrop and then impact of these new settlements on these clay lands. However, once the settlement was present at Throckmorton, most likely by the middle Iron Age, molluscan evidence suggests that the local environment was dominated by grassland (Mann 2005, 39–41).

The later Iron Age activity is less well defined, as any settlement was apparently not so concentrated, and the earlier Iron Age sites seem to have been abandoned, though without any obvious evidence of any catastrophic event to precipitate this. For the moment the most convincing evidence of this period is a fairly rectangular enclosure towards the east end of the by-pass– associated with a single roundhouse though only part of the enclosure was revealed (unpublished). At George Lane the pond and various enclosures have been attributed to the latest part of this period, and, though no specifically late Iron Age environmental evidence was available here, there is presently no reason to think that the open landscape characterising the preceding period had significantly changed.

Activity becomes more highly visible after the Roman Conquest when the new material culture is robust and plentiful, and when ditches remain prevalent, particularly, as earlier, for drainage around houses and for making enclosures. There are clear indications that during this period some sites continued from the later Iron Age, whereas others seem to have been freshly initiated. Some have potentially broad dates encompassing most of the Roman period whereas others have specific time spans (factors such as imprecise dating for lack of finds or truncation could, respectively, account for such patterns). However, some Roman sites can now be seen to have limited lives, so, for instance, George Lane can be largely datable from about the Conquest period to the later 2nd century, and at the east end of the bypass another site (Upper Moor) is mainly of 4th century date (Vaughan 2005).

The environmental evidence (pollen) from several sites in the vicinity now strongly suggests that the surrounding Roman landscape was almost exclusively grassland, and, therefore, presumably, was being well grazed by large numbers of animals. At Throckmorton molluscan evidence from 3rd century AD deposits suggested the same grassland environment (Mann 2005, 41–2), and, less well dated general plant macrofossil evidence from the bypass work (WSM 30576) suggested the same once again, though here was also here some suggestion of cultivated ground, whereas the pollen evidence indicated a largely treeless grassland with some cereal production (unpublished data).

At George Lane occupation was being consolidated from the early to mid Roman period as the size/depth of ditches increased, as if to make these features more durable, and features here were also modified, suggesting changing practices and/or improvements. But then during the mid Roman period a fundamental reorganisation occurred on a large scale, which was also reflected in the silting up of the pond, and disuse of other features. (?)Enclosure/field boundaries were laid out on an entirely new alignment and any settlement George Lane was deserted, or more likely relocated, perhaps to the east (upper Moor; Vaughan 2005) where a new occupation site had emerged, suggesting some wholesale re-organisation. It was noticeable that, despite the continuing Roman activity, there was still little sign in the immediate area of any more highly Romanised structures (ie incorporating Roman styles of building), and, more surprisingly still, the 4th century habitation at Upper Moor still seemed to be primarily based on the roundhouse.

Presently it is entirely uncertain how the landscape was organised in terms of ownership and whether the occasional villa exercised a disproportionate effect on the management of land over very large areas. On the basis of recent discoveries, it can be seen that the more villa-orientated settlement of the Cotswolds had reached the Avon valley (ie Childswickham; Patrick and Hurst 2004), but it is unclear whether it had infiltrated much further into the vale of Evesham, and could have been having a major bearing on settlement. But, as it stands, there does seem to be a great range in types of contemporary rural site, as well as evidence for its changing locations, and the future

challenge would be to now explain the reasons for this pattern, now that it has been established within its landscape.

Later periods

When seen in the context of the wider landscape the complete absence of any sign of post-Roman to Saxon/early medieval activity is remarkably striking, after such a prolific span of nearly 1000 years of continuous habitation and farming with its various impacts and above all the creation of sustainable archaeological deposits in the process. The buried Roman soils noted at Throckmorton (Griffin *et al* 2005, phase 6) provide some hope that the careful study of these might provide ultimately some trace of this lost period, but such remains are extremely rare, and none were found at George Lane. There is an urgent need for datable environmental deposits to be discovered in south Worcestershire which would at least enable the landscape history to be recovered for this lost period, and hence perhaps some clues about the nature of human interaction with it.

Though its inception is poorly dated ridge and furrow clearly became widespread across the area in the medieval period, and the depth of soils today attest to a major effort at arable production, and this probably reflects the 16th century reputation of the Vale of Evesham as a bountiful area (Drayton as quoted by Buchanan 1944). With the right placement of the ridge and furrow it is likely that the naturally poor drainage could be turned to advantage in the production of corn, so that, despite the heavy nature of the ground, the land could have been profitably cultivated. The immediate area of Roman pond must have remained damp and so naturally been left on the boundary of different parcels or even incorporated into a headland, so as to have been largely avoided with all the recorded ridge and furrow passing to the north and west – though in the latter case just clipping the north-west pond corner. With settlement now nucleated into the medieval and later villages the former settlement sites referenced above had all, probably long, been subsumed into the countryside, and their locations lost until recent development plans brought them back to light.

26 Acknowledgements

The fieldwork was largely supervised by Jon Millward and Sarah Phear with the assistance of Christine Elgy, Adam Lee, Stephen Potten, and Emily Hathaway, during the winter of 2005–6. The assistance of the John Harper (site foreman) and Ian Barber (Severn Waste Services) is gratefully acknowledged.

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Figures

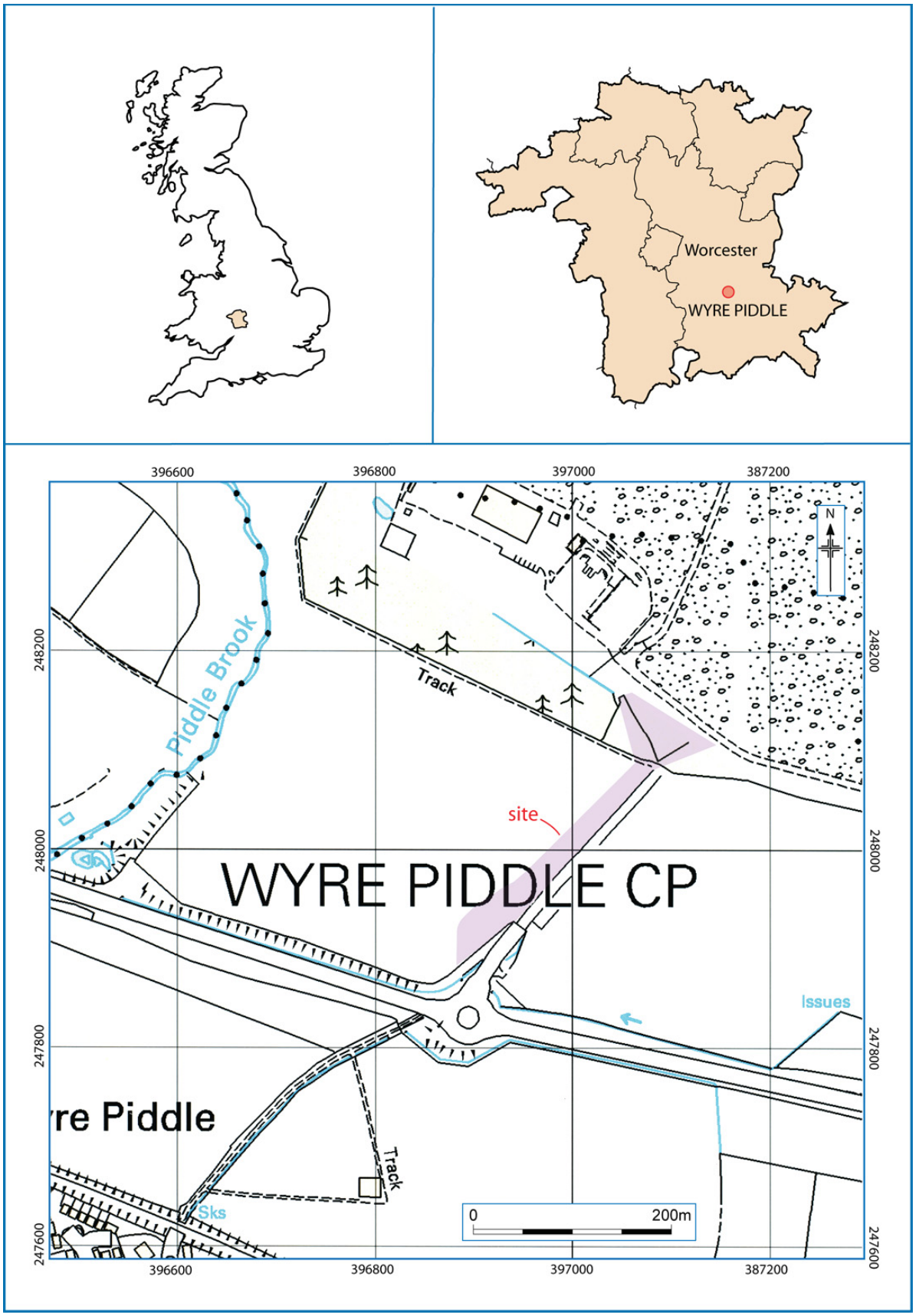

Figure 1 Location of site

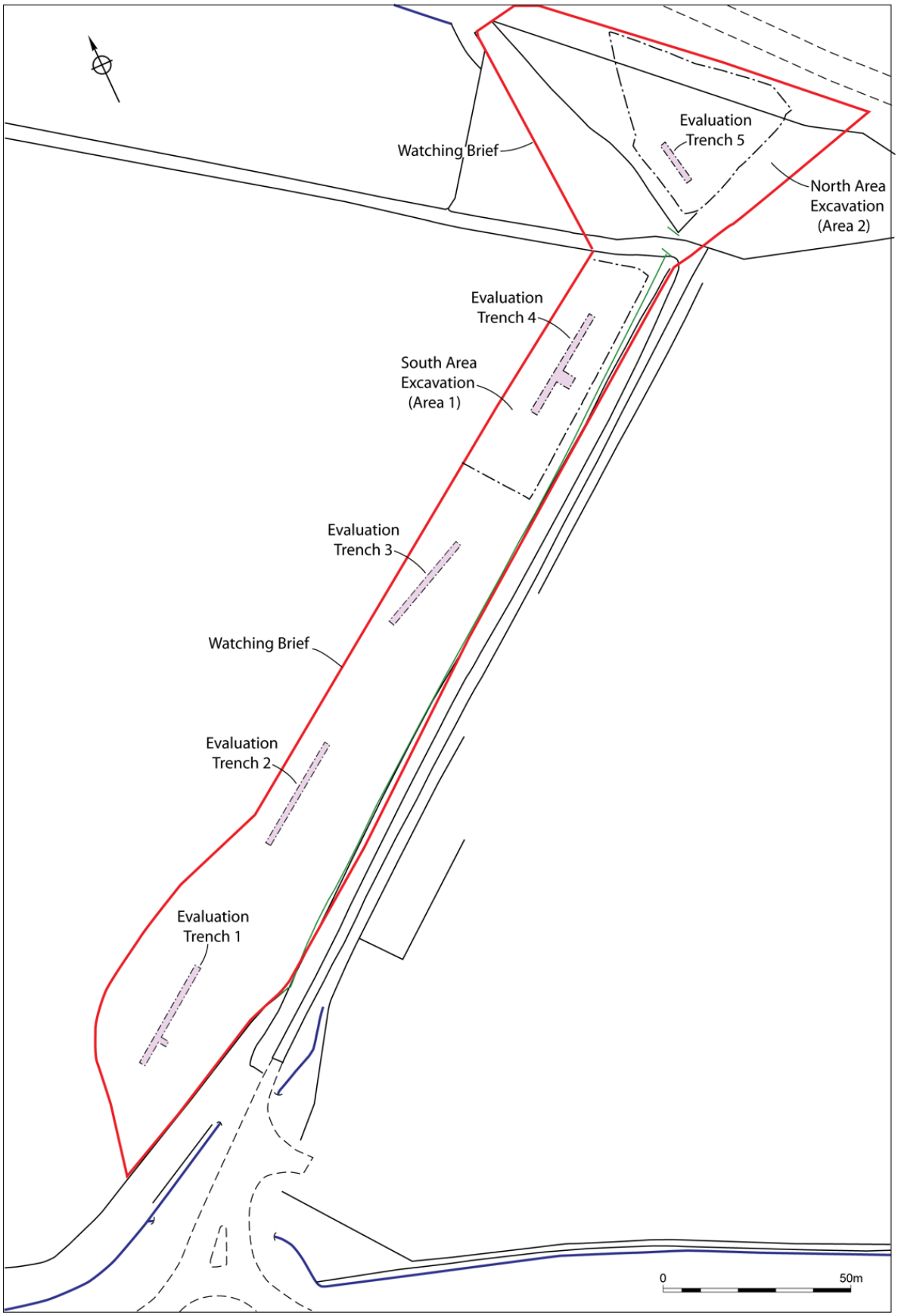

Figure 2 Location of evaluation trenches and excavation areas

Figure 3 Phase 1 plan (context groups indicated)

Figure 4 Pond (CG5) during excavation with fills exposed (pond edge viewed from west from front left to left of centre in background)

Figure 5 Ditch (CG6 part) at north-west corner of pond

Figure 6 Earliest phase of circular enclosure (CG8); west facing section

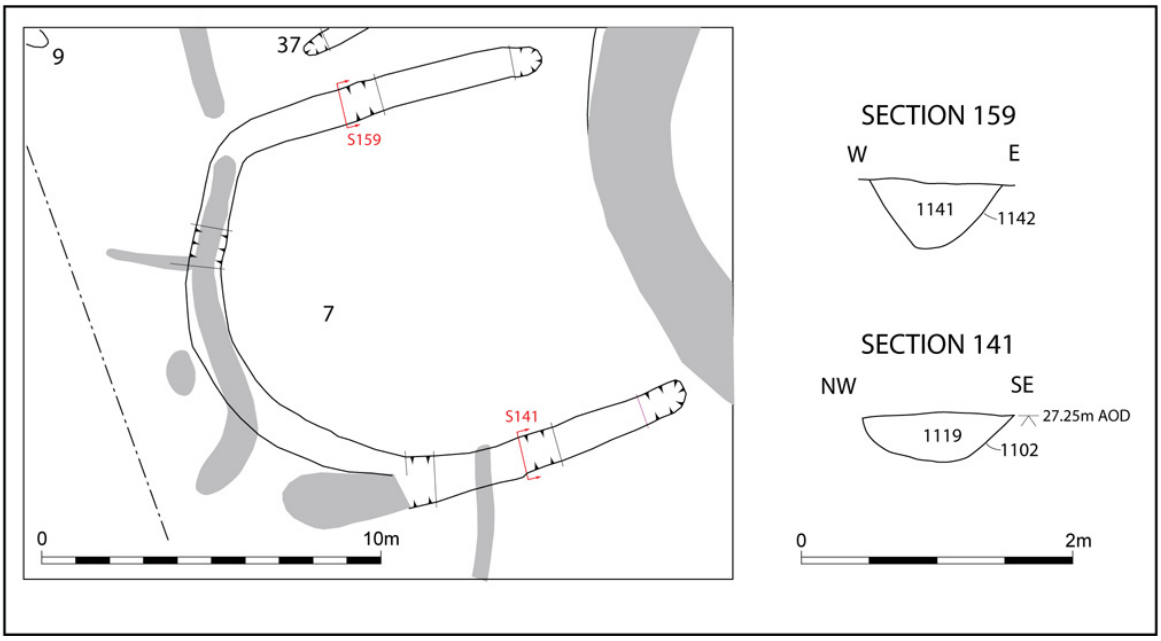

Figure 7 Annexe to circular enclosure (CG7; Phases 1–2a)

Figure 8 Annexe CG7 (north side; east facing section; section 159)

Figure 9 Ditch CG1 (north facing section)

Figure 10 Ditch CG4 (right) and possible pit CG3 (left) (north facing section)

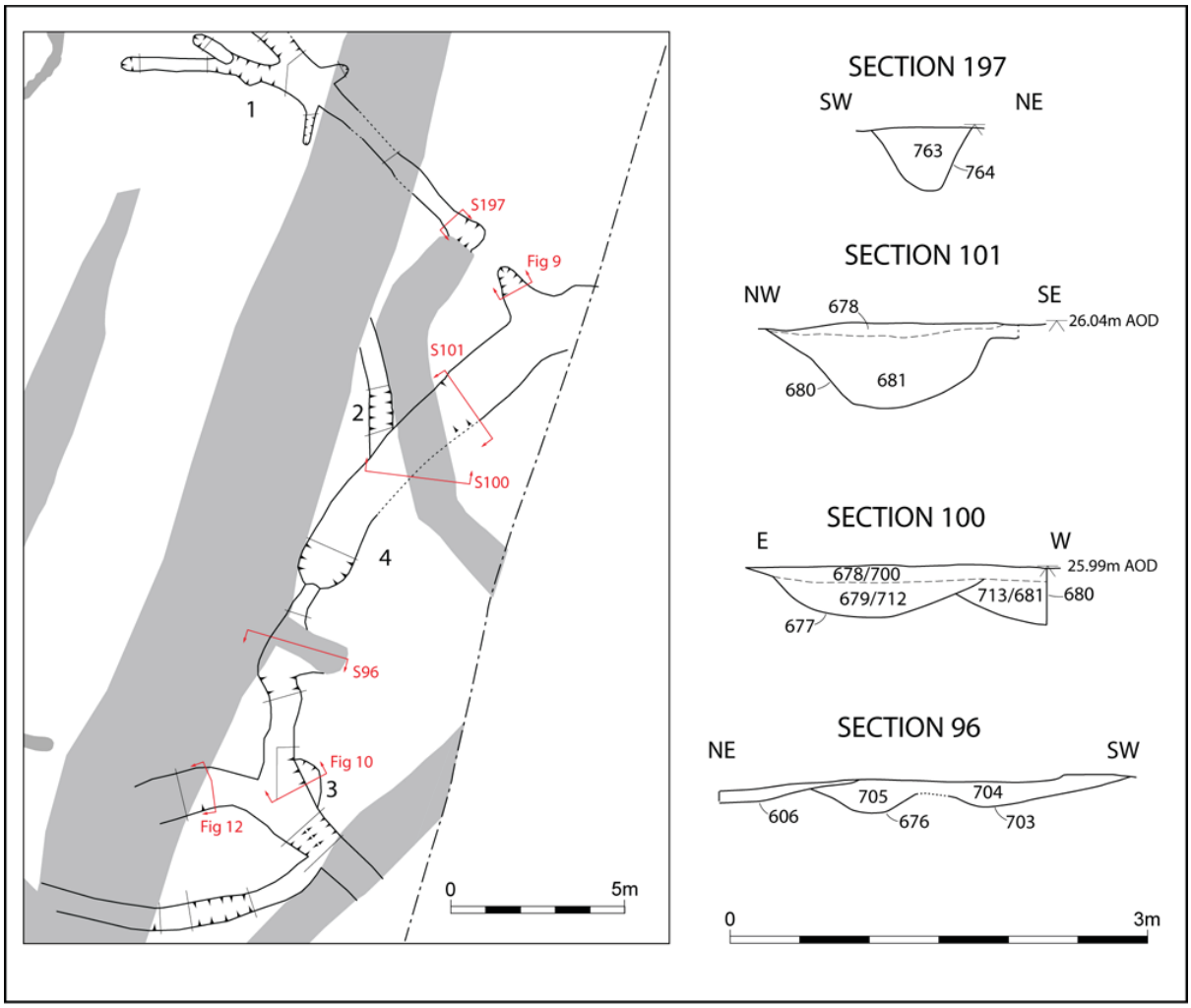

Figure 11 Ditch complex in southern area

Figure 12 Ditch CG4 (west facing section)

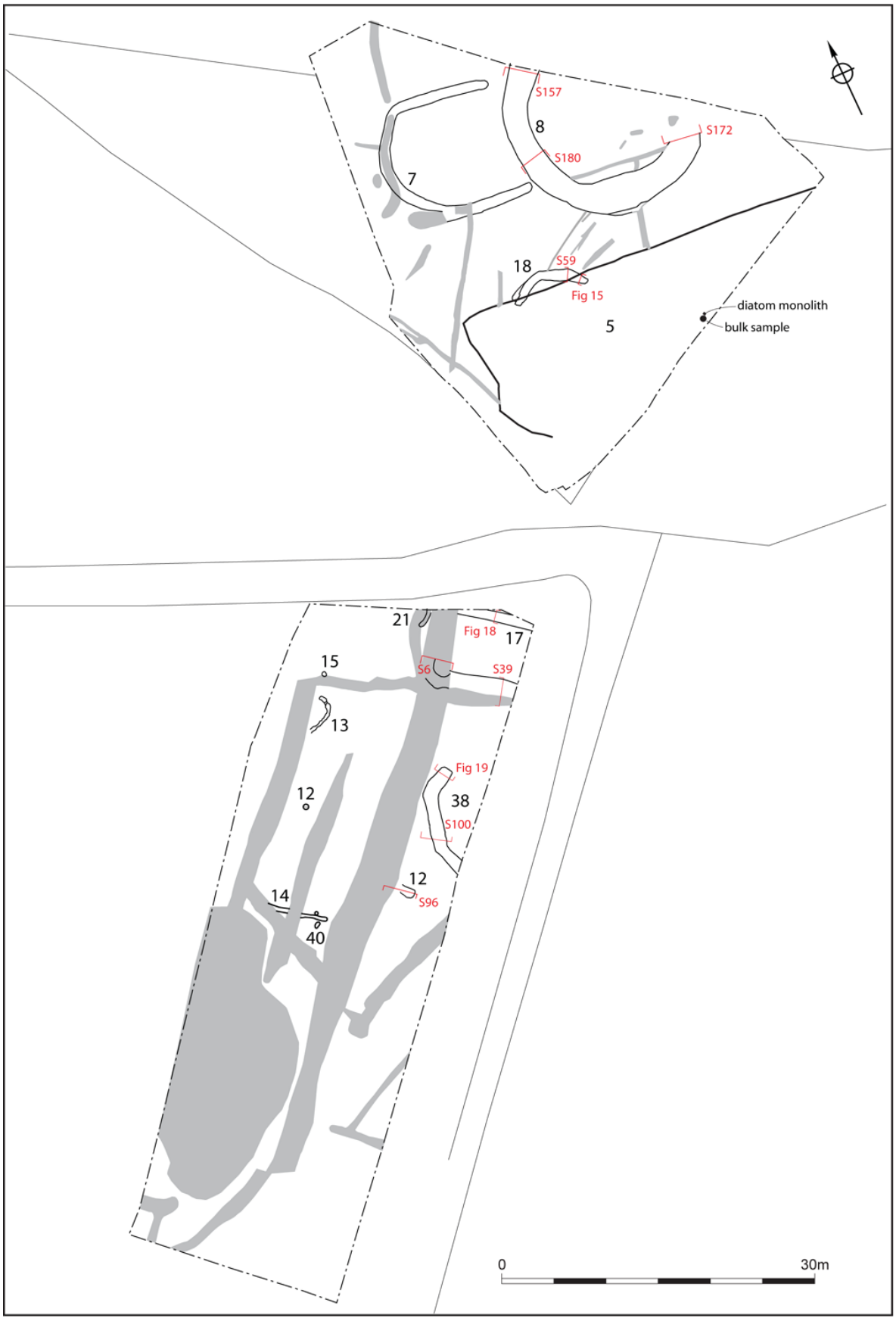

Figure 13 Phase 2a plan

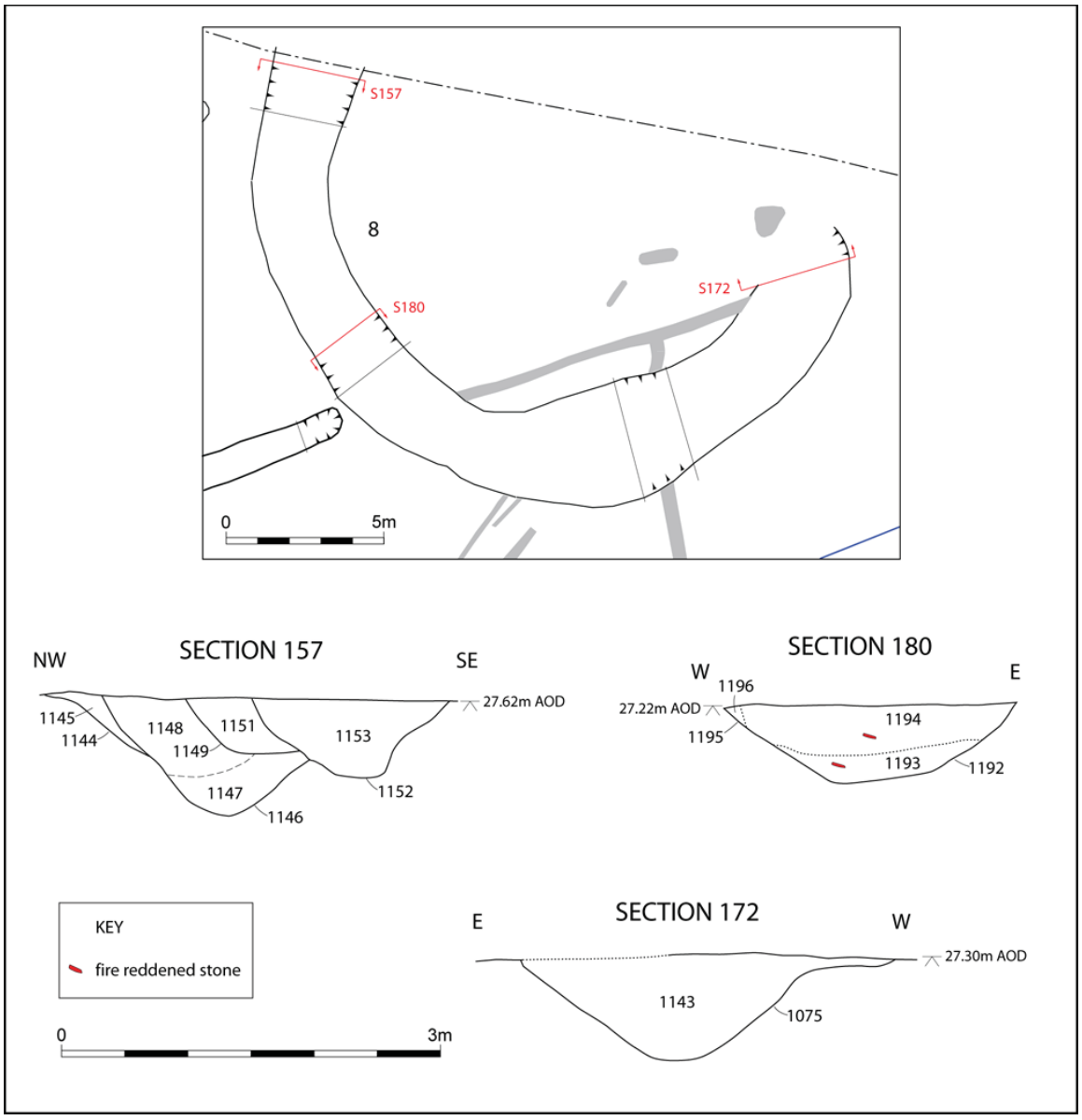

Figure 14 Circular enclosure CG8 (Phase 2; for section 180 also see Fig 24)

Figure 15 Curved segment of ditch CG18 on north side of pond CG5 (south-east facing section)

Figure 16 Curved ditch CG13 (view looking south-west)

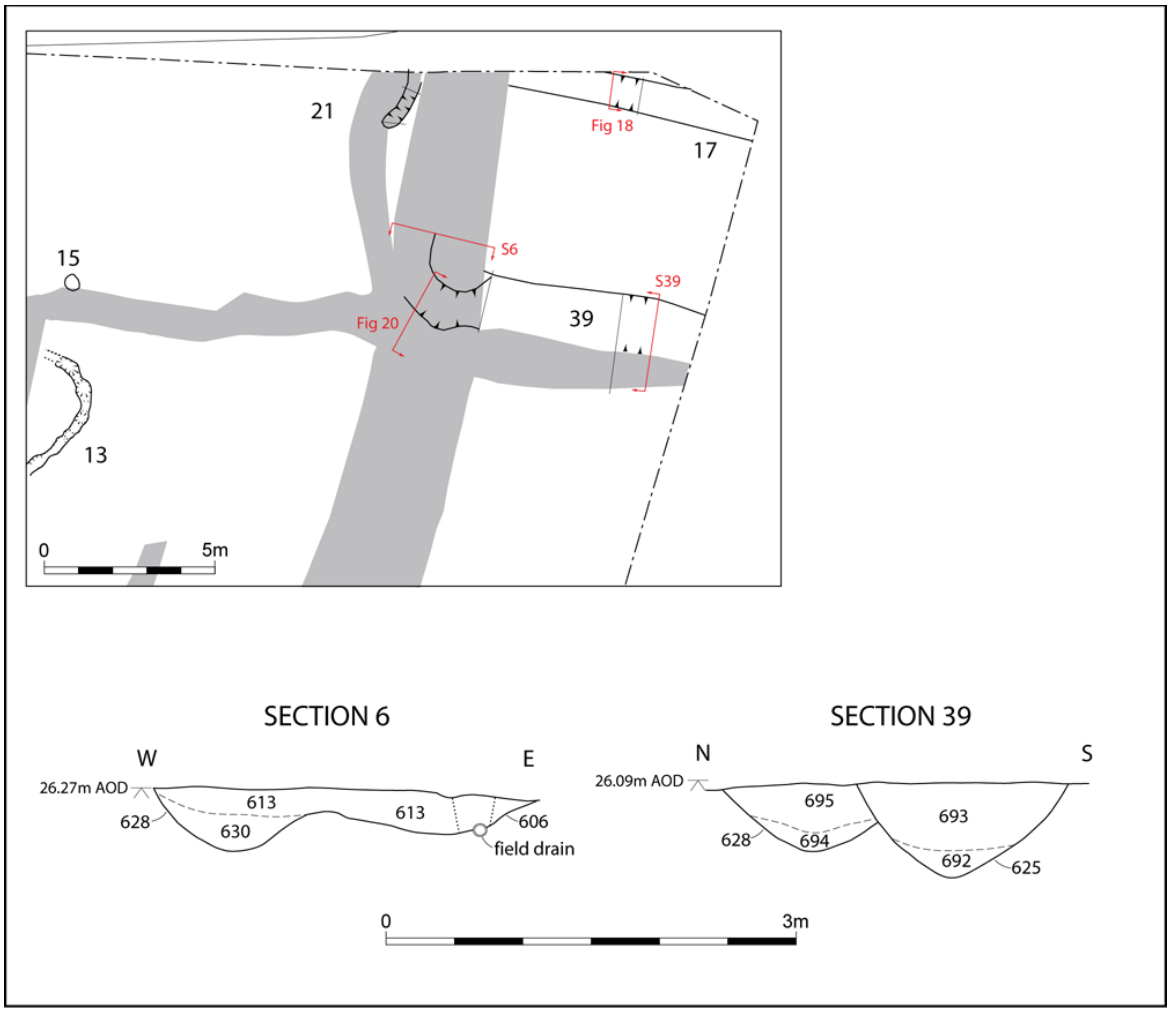

Figure 17 Ditches CG13, 17 and 39

Figure 18 Ditch CG17 (east facing section)

Figure 19 Ditch CG38 (north-east facing) section viewed over ditch CG1 (foreground)

Figure 20 Ditches CG16 (left) and CG39 (right) – see also section 6

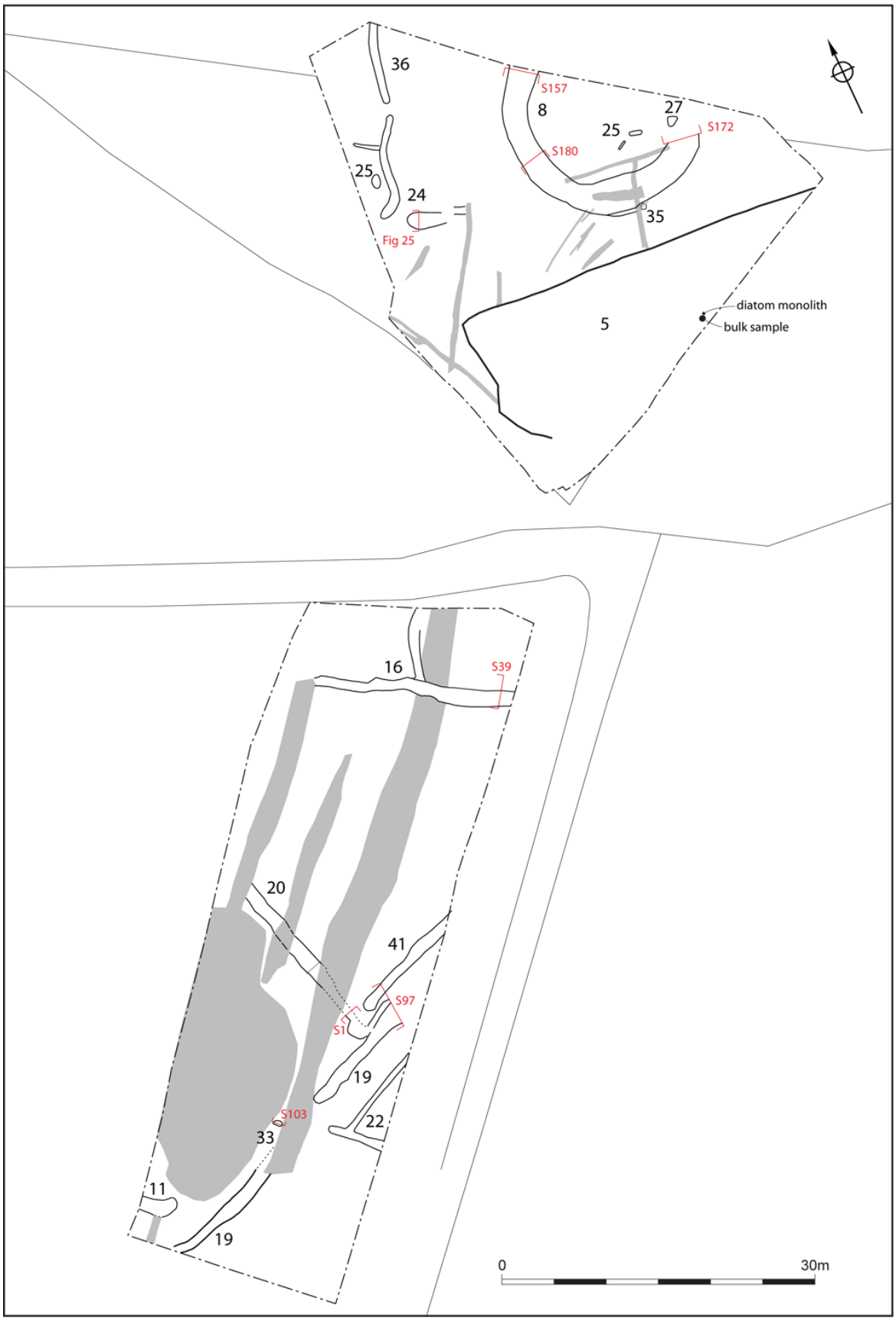

Figure 21 Phase 2b plan

Figure 22 Excavating deep pond silts (view looking south over northern edge of pond)

Figure 23 Section through pond fill (CG5) and overlying soil profile

Figure 24 Final infilling of circular ditch – ?roundhouse gulley (CG8; section 172)

Figure 25 Butt end of ditch CG24 (west facing section)

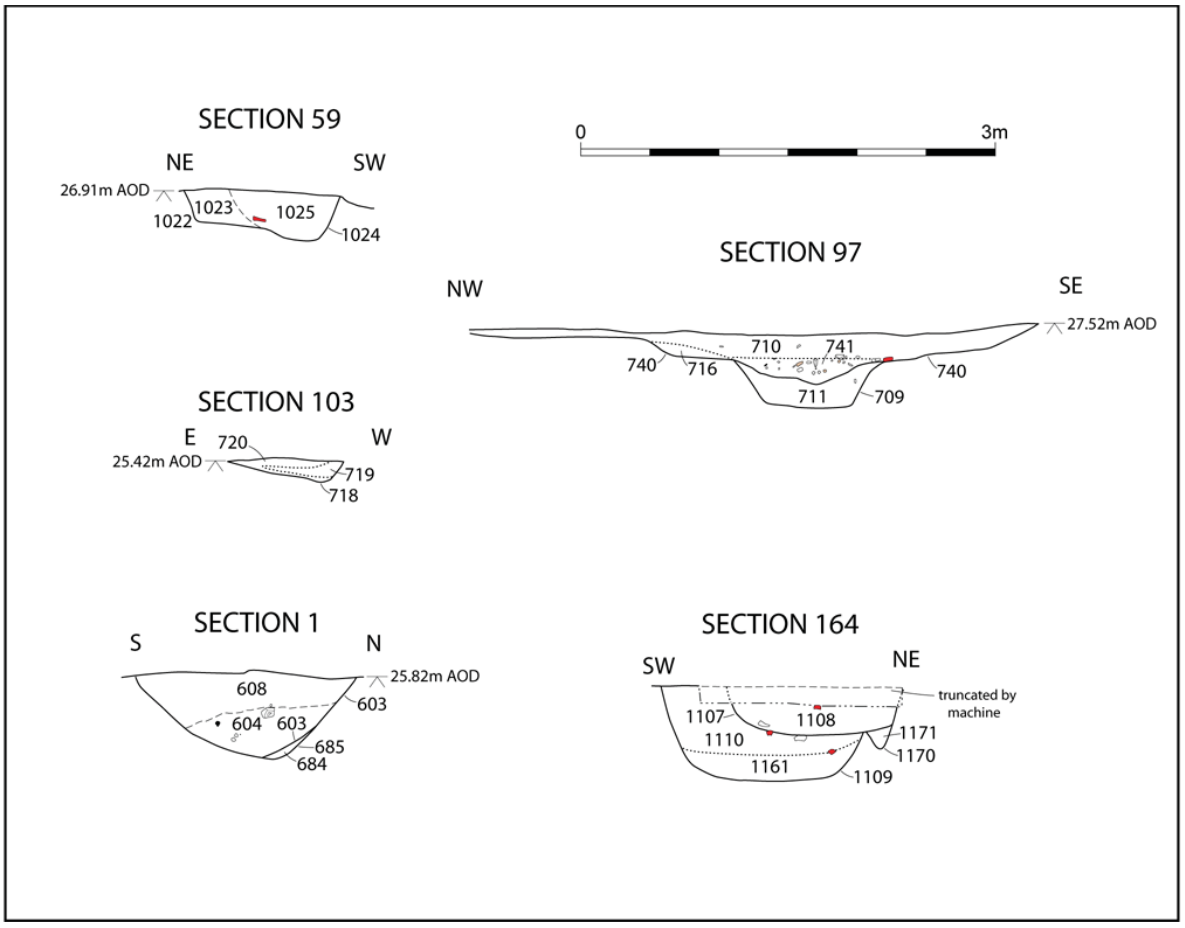

Figure 26 Phase 2 sections (for locations see phase plans). Note: section 97, CG41 (left), CG19 (right)

Figure 27 Ditch CG20 (south-east facing section; section 1)

Figure 28 Ditch CG41 (south-west facing section; section 97)

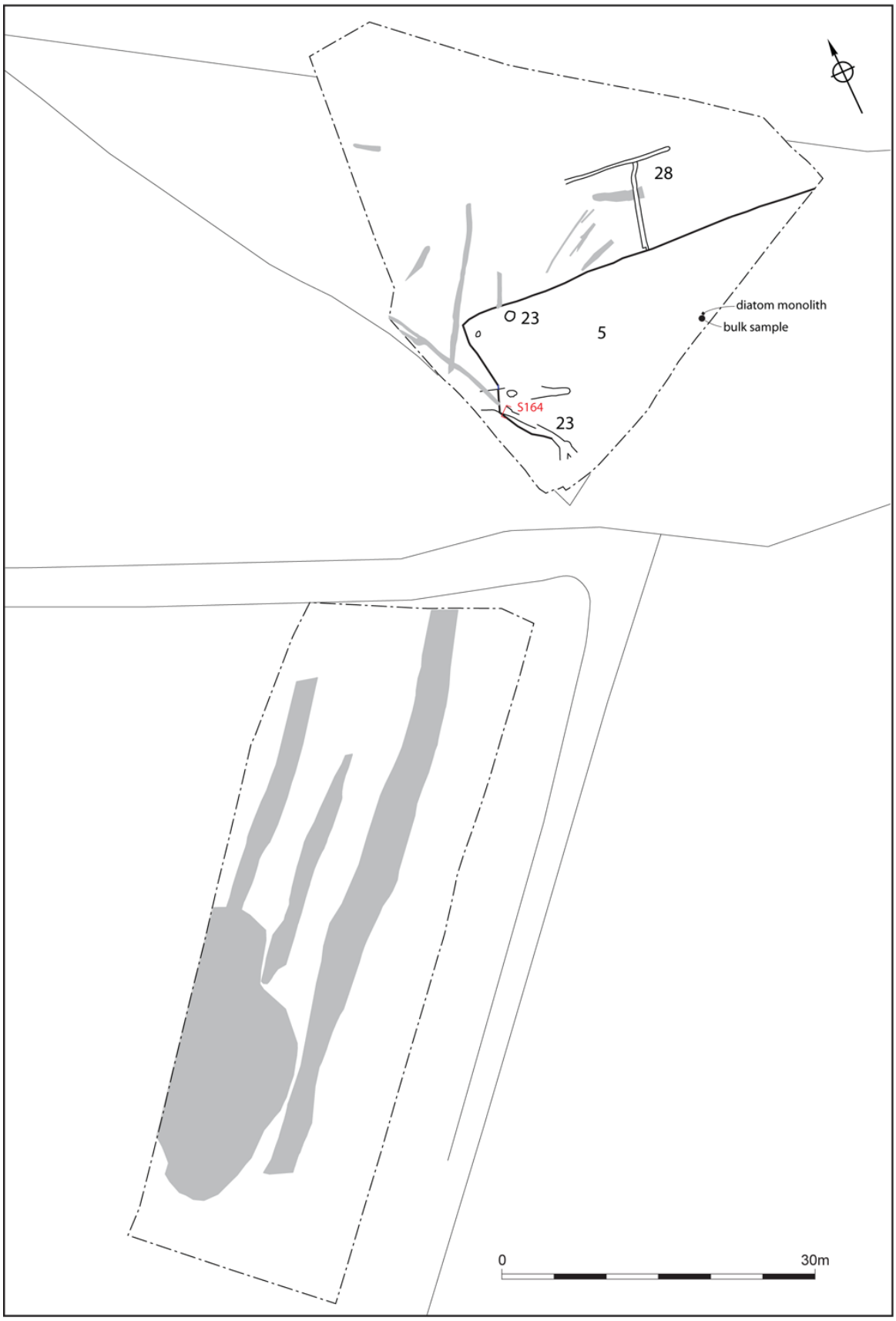

Figure 29 Phase 2c plan

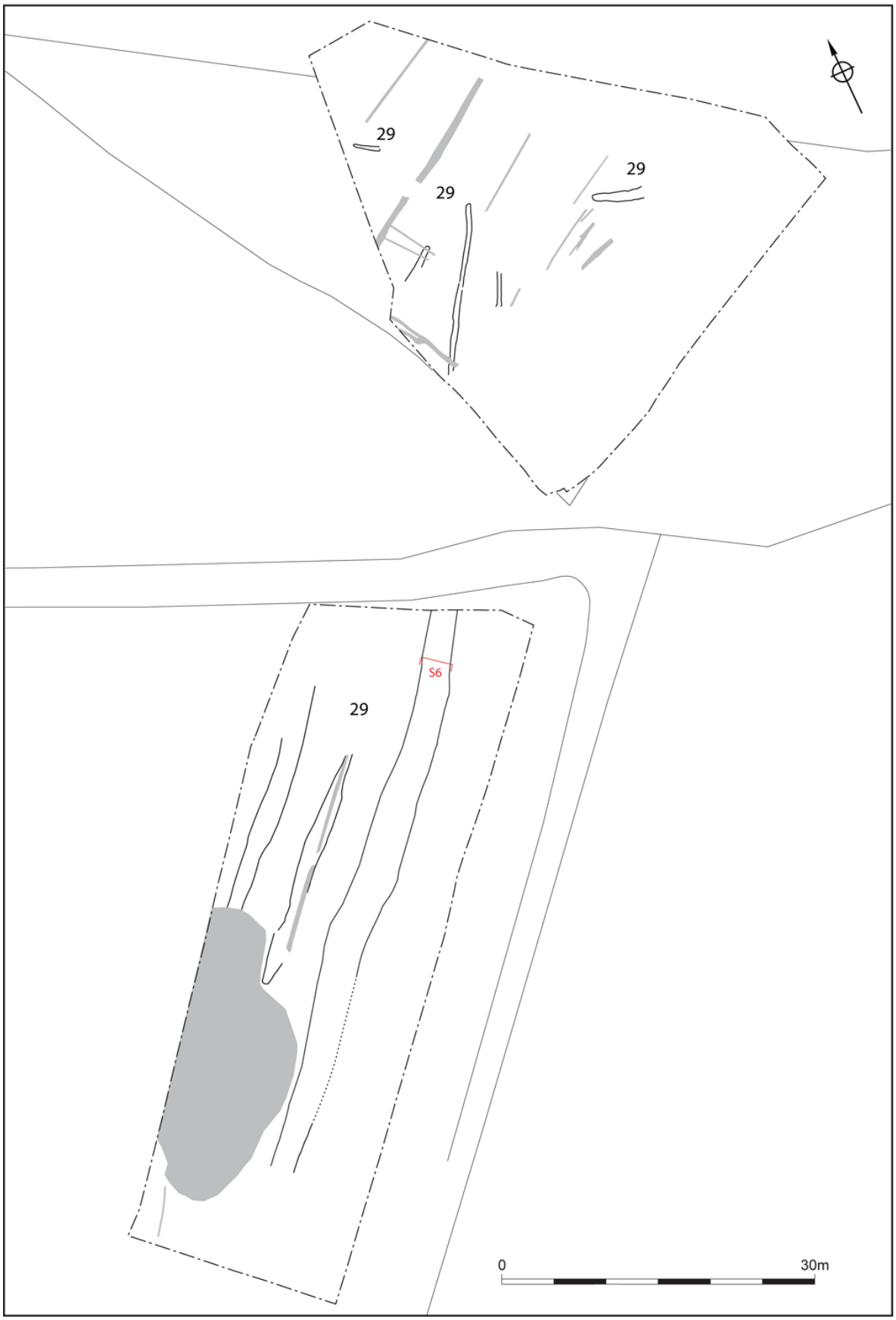

Figure 30 Phase 3 plan

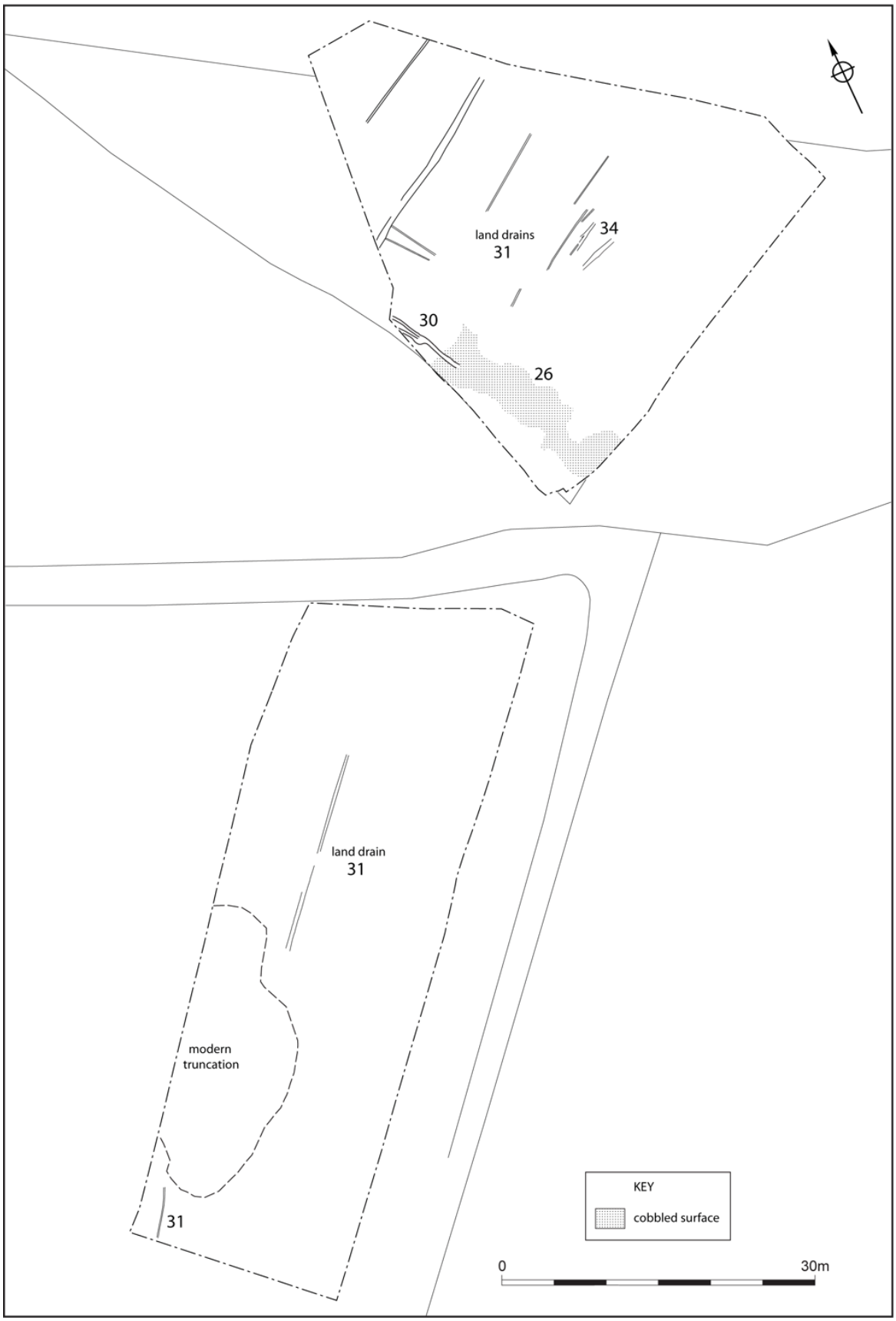

Figure 31 Phase 4 plan

Figure 32 Cobbled surface (CG26) across the infilled pond

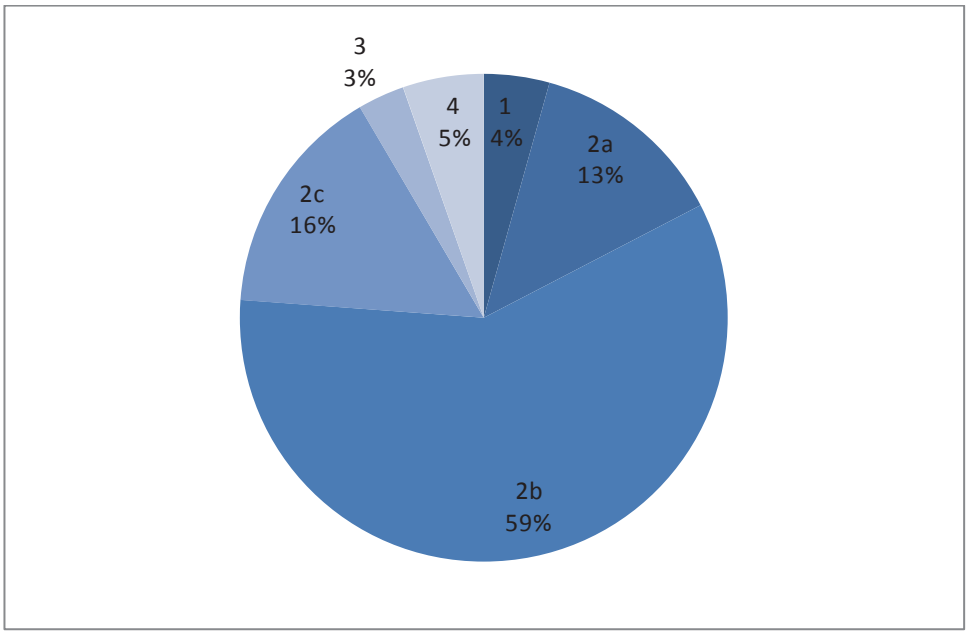

Figure 33 Proportion of pottery by phase

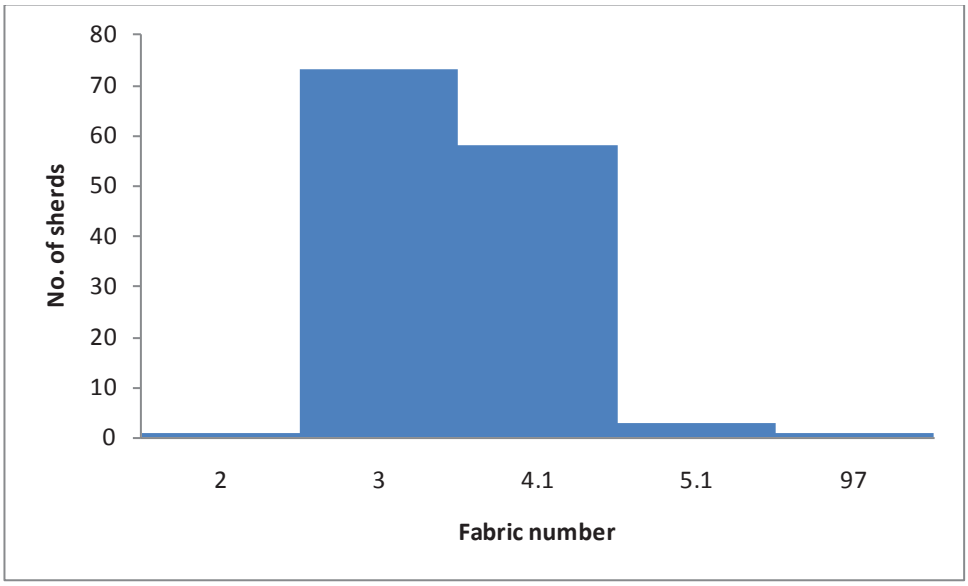

Figure 34 Pottery fabrics (Iron Age) from Phase 1

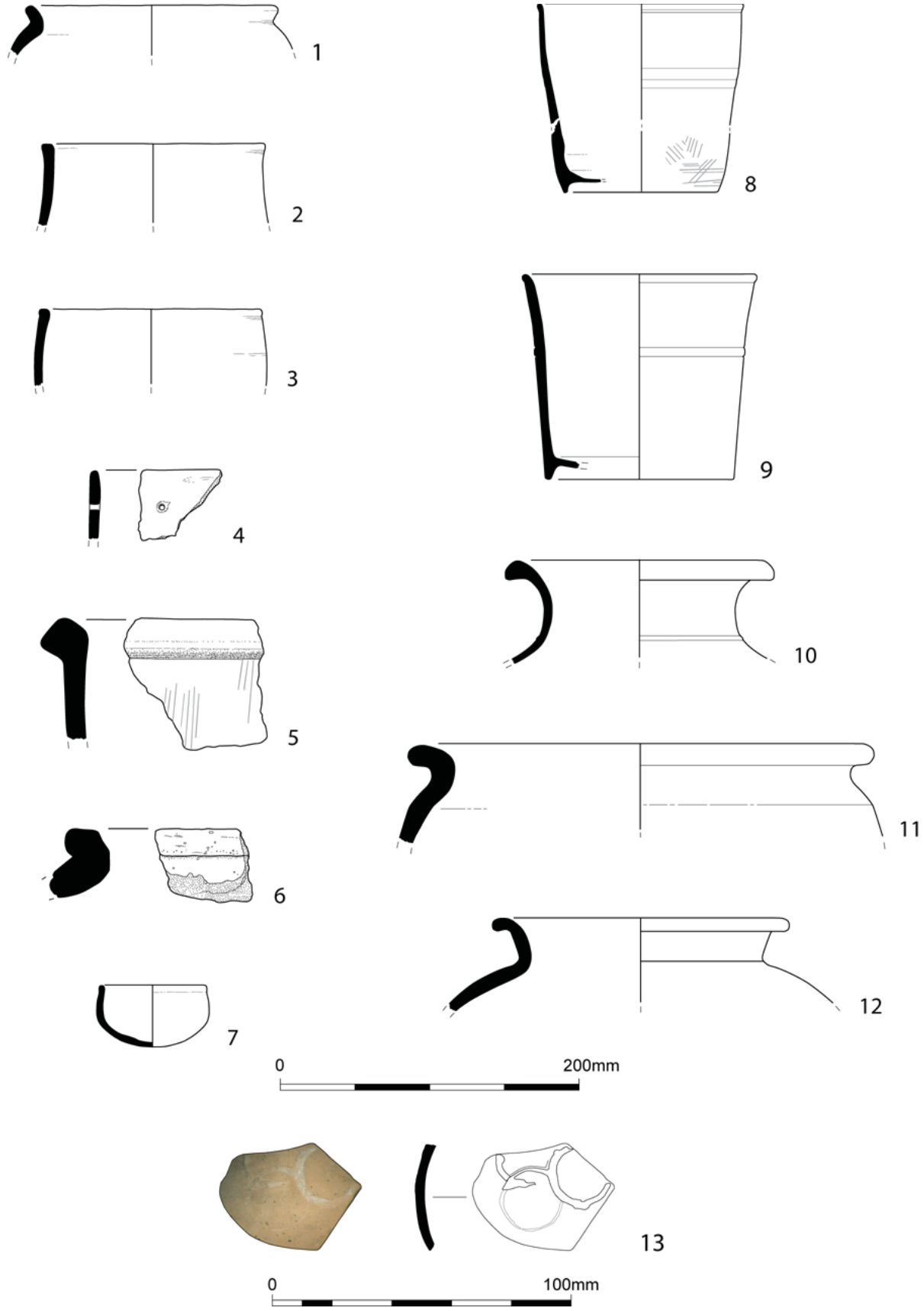

Figure 35 Iron Age and Roman pottery

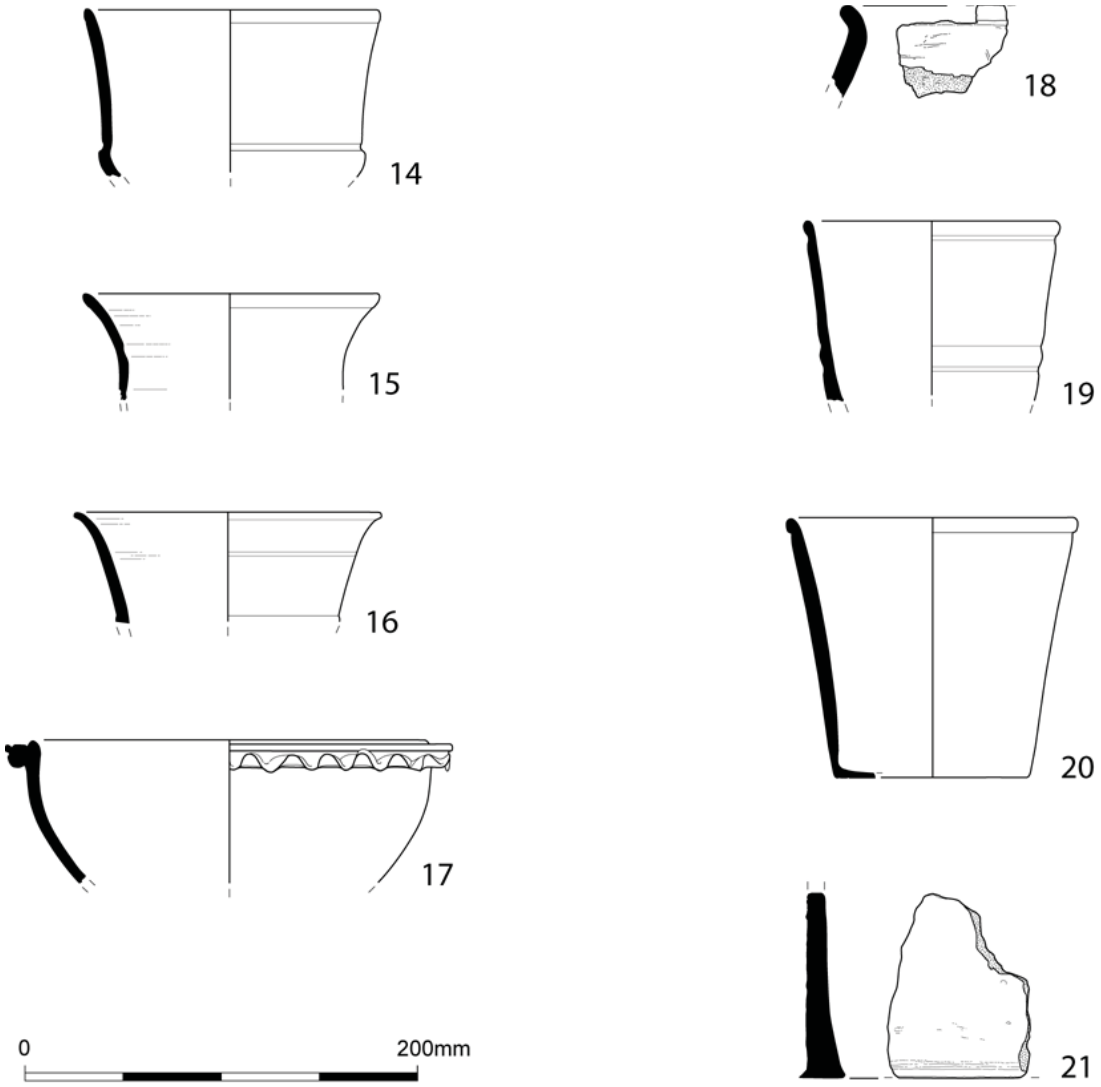

Figure 36 Roman pottery from pond fills (CG5)

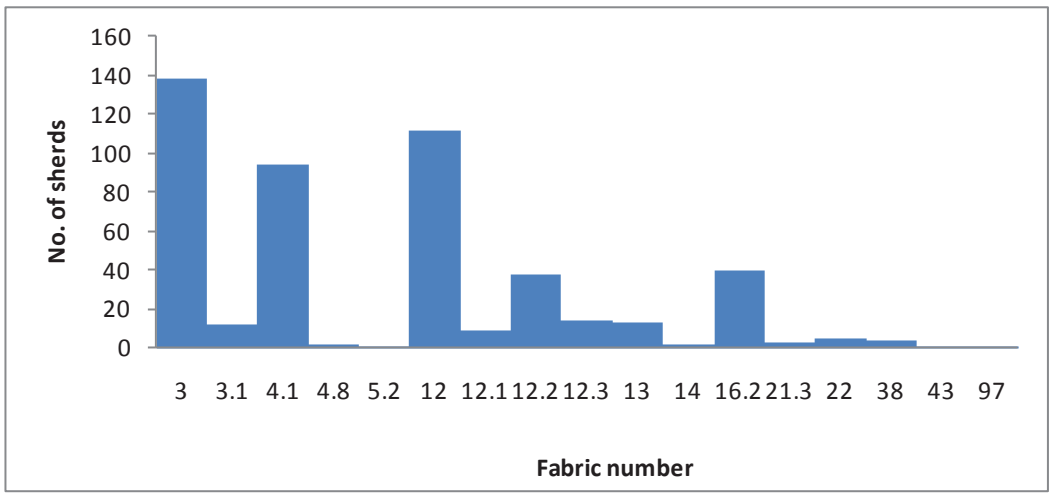

Figure 37 Pottery fabrics from Phase 2a

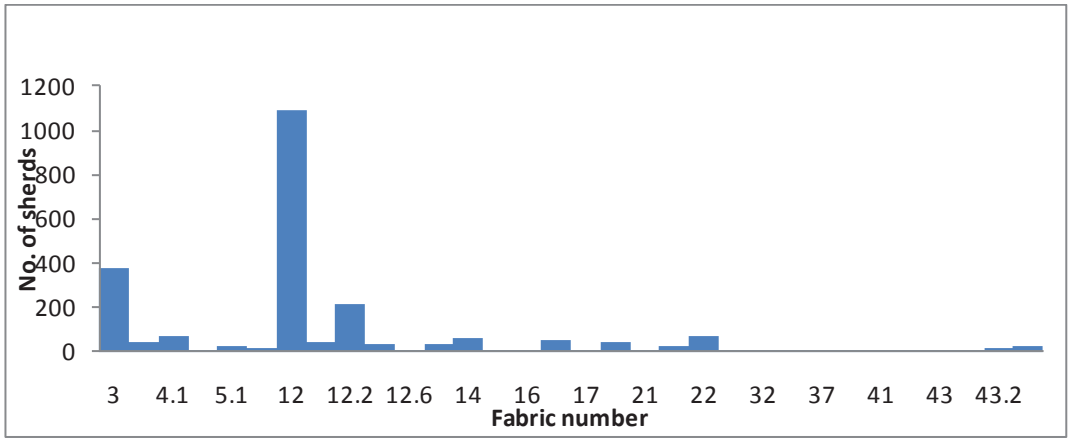

Figure 38 Pottery fabrics from Phase 2b

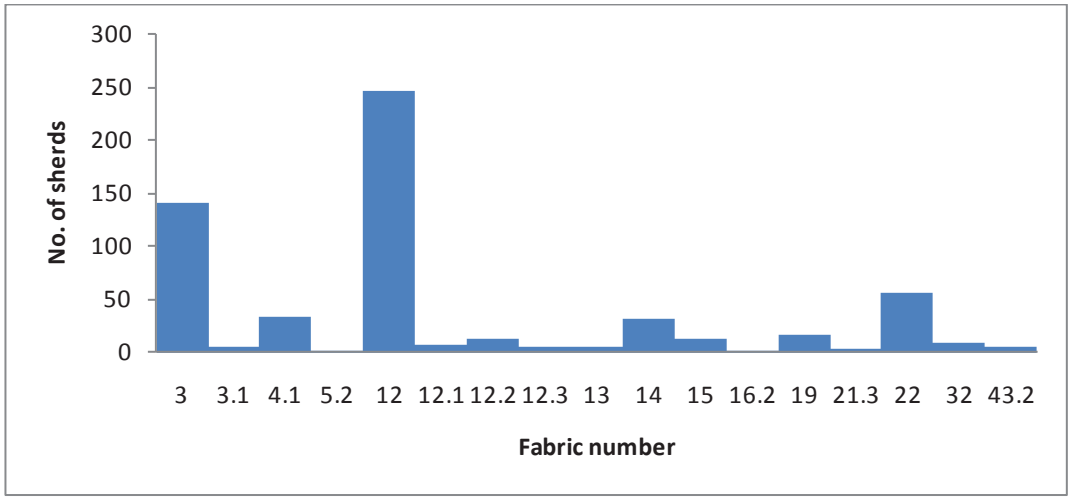

Figure 39 Pottery fabrics from Phase 2c

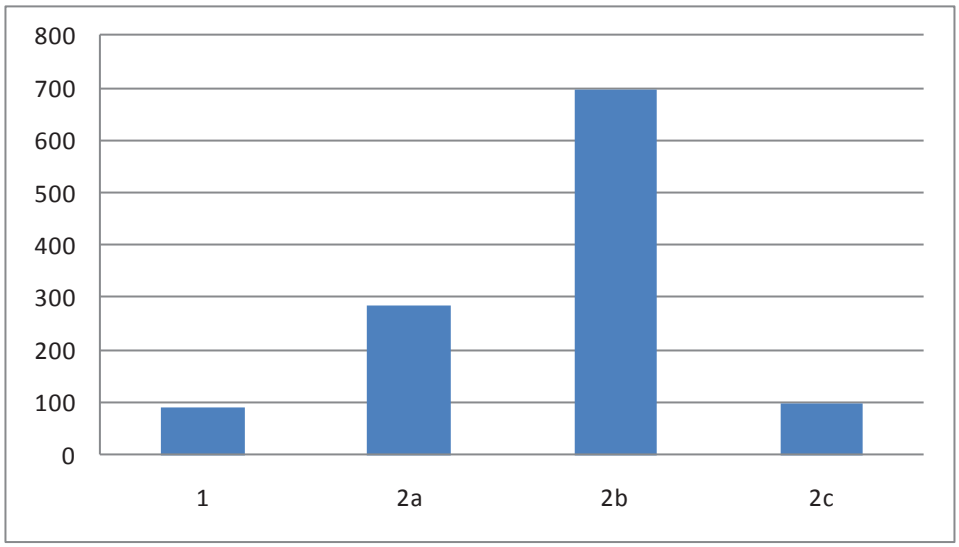

Figure 40 Proportions of fired clay by phase

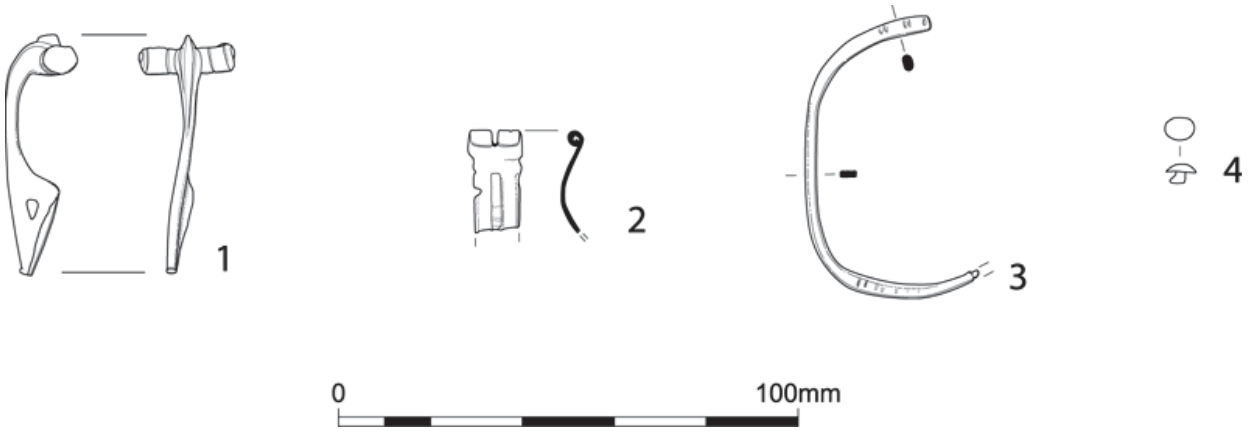

Figure 41 Copper alloy objects

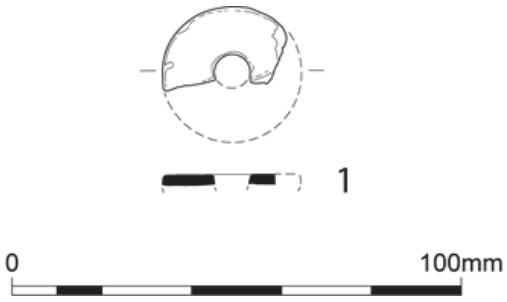

Figure 42 Worked stone objects

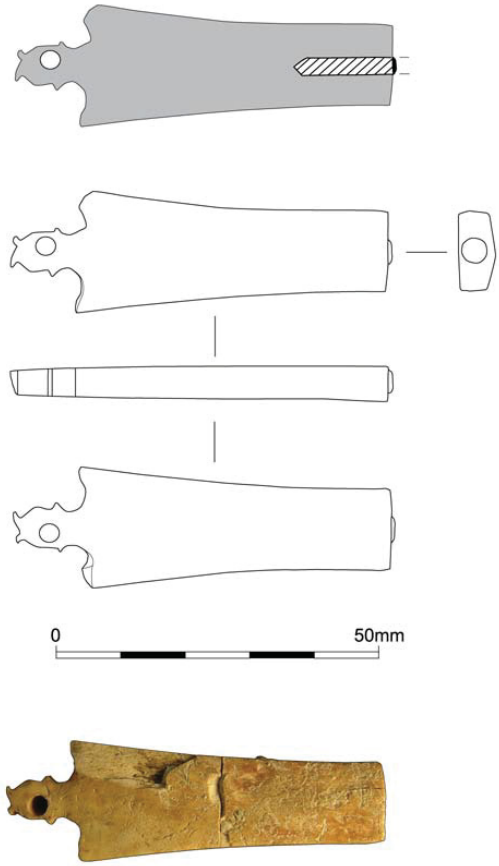

Figure 43 Bone ?handle

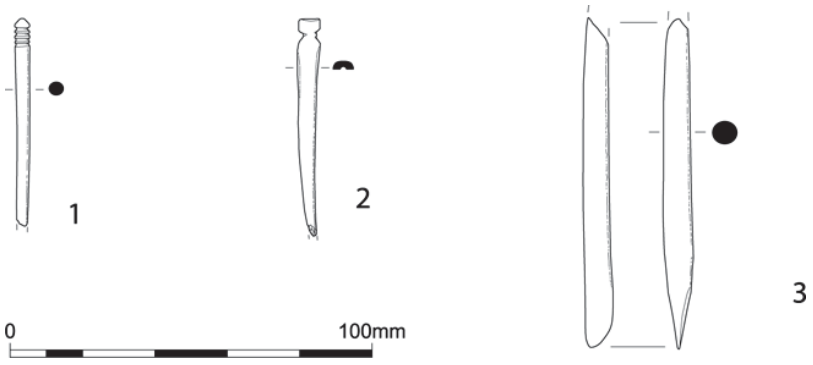

Figure 44 Other worked bone objects

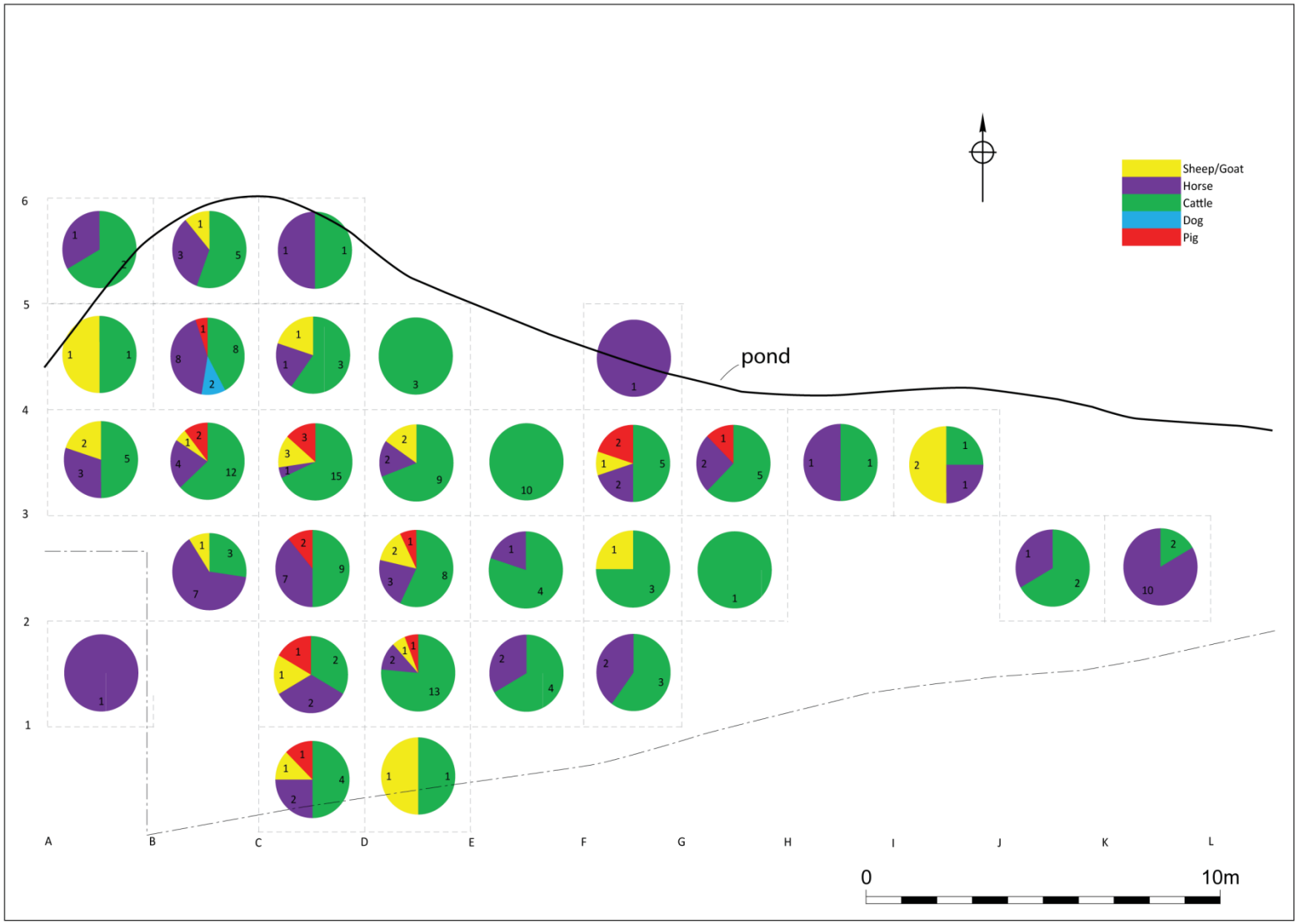

Figure 45 Identified animal bone (NISP) from pond deposits by grid square

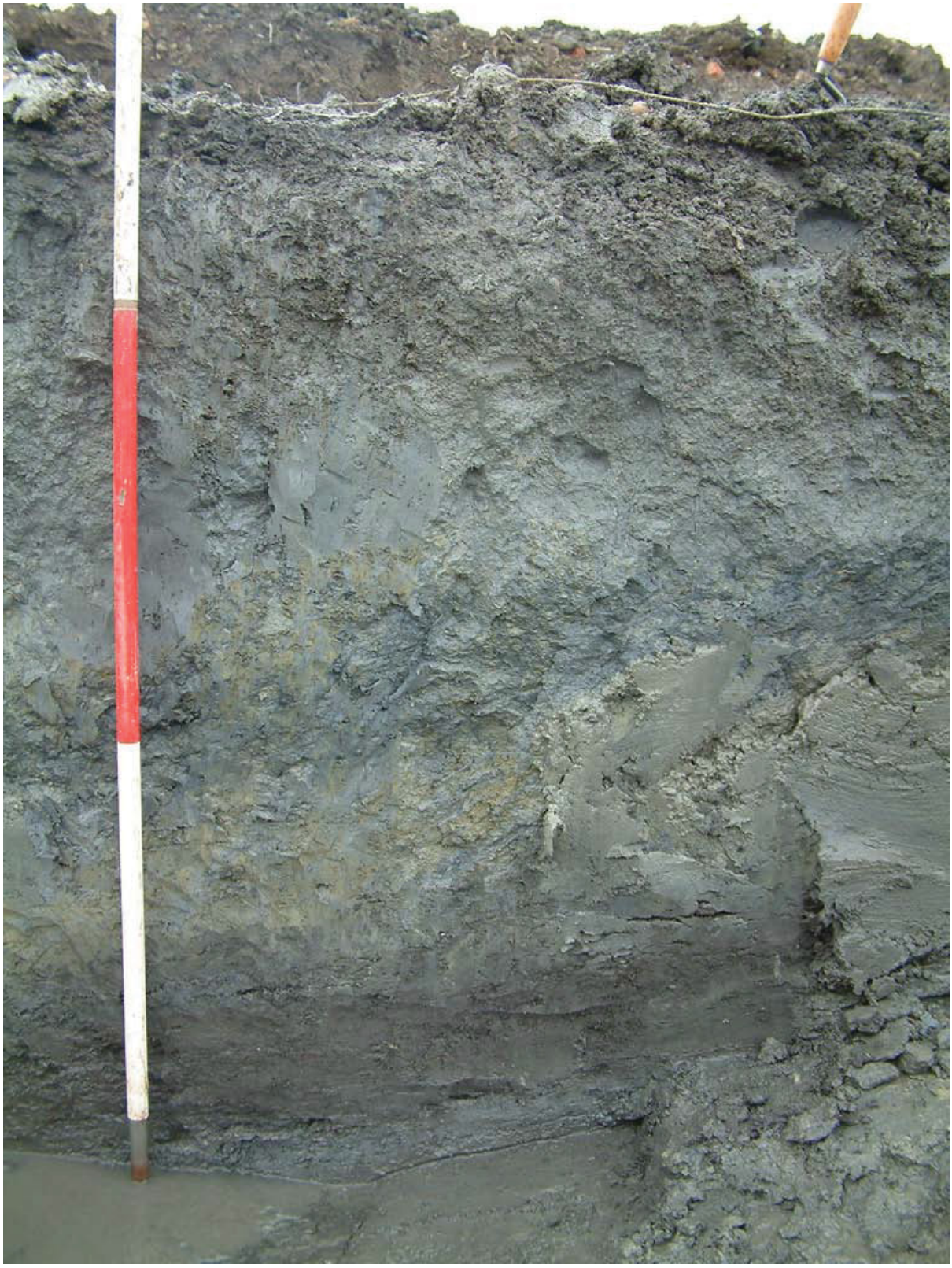

Figure 46 Section through pond fill (CG5) at location of monolith sampling

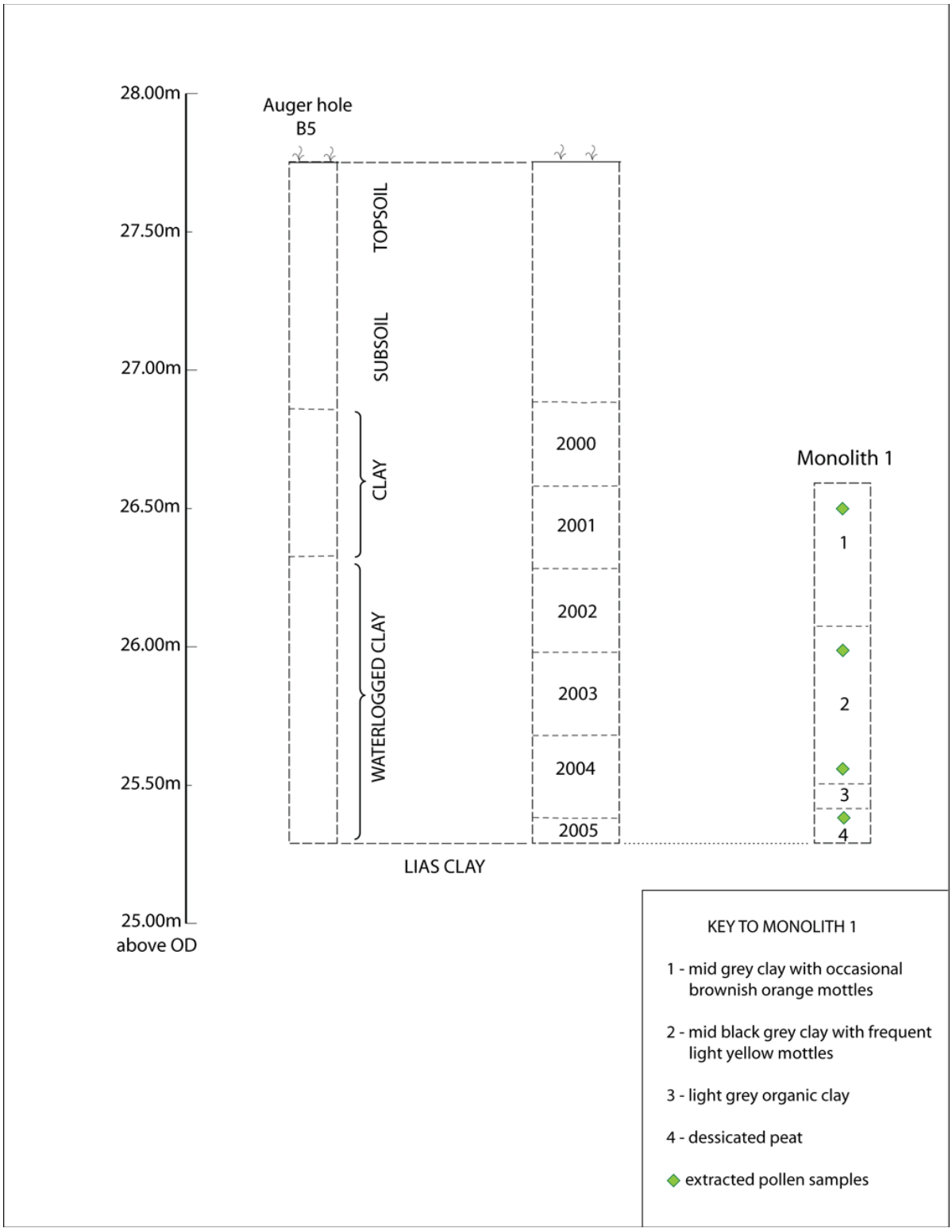

Figure 47 Cross-correlation of auger-hole B5, excavated spits and monolith 1 in pond (CG5)

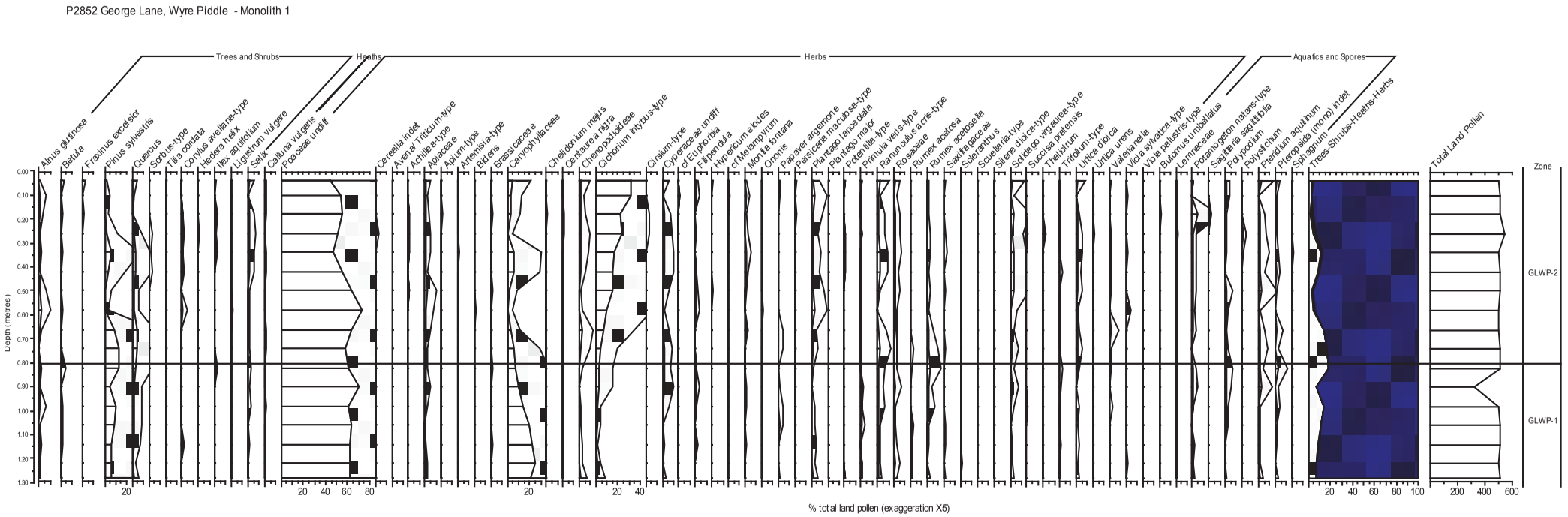

Figure 48 Pollen diagram

APPENDIX

ANIMAL BONE

Table A.1 Phase 1 Late Iron Age animal bone by element and species

element/species	horse	cattle	sheep/goat	pig
horn core				
skull		4		1
mandible		1	2	
upper teeth		3	10	
lower teeth	1	2	3	1
teeth		1		
atlas				
axis			2	
sternum				
scapula		1		
humerus		1		
radius+ulna		2		
radius			2	
ulna		1		
carpals			1	
innominate	1	3	3	1
femur				
tibia	3	1		
fibula		1		
astragalus		1		
calcaneus		1		
tarsals				
metacarpal			1	
metatarsal				1
metapodial				
proximal phalange			2 (1)	1
intermediate phalange				
distal phalange				
NISP	5	23	26 (1)	5
total weight	658	931.5	138 (2)	55.5
MNI	3	3	2	2

Table A.2 Phase 2a hand collected animal bone

element/species	horse	cattle	sheep/goat	pig	dog
horn core		2			
skull		1	2	2	1
mandible	1	7	15	1	2
upper teeth	1	7	8		

lower teeth	2	3	4	3	
teeth	1	1	1		
atlas				1	
axis					
sternum					
scapula		1	1	1	
humerus	1	2	6	1	
radius+ulna	2	1			
radius	1	4	1		
ulna		1			
carpals	1				
innominate	1	1	2		
femur		1			
tibia	1		3		
fibula					
astragalus					
calcaneus		1	1		
tarsals					
metacarpal		3	1		
metatarsal	2	1			
metapodial	1		2		
proximal phalange		1	1		
intermediate phalange			2	1	
distal phalange		1			
NISP	15	39	61	10	3
total weight	1055	2296	345	80	92
MNI	3	3	6	2	1

Table A.3 Phase 2b animal bone by species and element

element/species	horse	cattle	sheep/goat (sheep)	pig	dog
horn core		1			
skull	4	15	3		2
skull + horn core		2			
mandible	6	31	15	6	
upper teeth	15	20	11		2
Lower teeth	10	18	13	3	
teeth		4	1		
atlas		3			
axis					
sternum					
scapula	2	15	3		
humerus	2	6	2	1	
radius+ulna	2	3			
radius	8	14	2		

ulna		3			
carpals	1			1	
sacrum		1			
innominate	9	7	2	1	
femur	7	8	3		
tibia	11	16	10		
fibula					
astragalus	1	6		1	
calcaneus		2			
tarsals	1				
metacarpal	2	12	2 (1)		
metatarsal	3	22	7 (1)	1	
metapodial	1	5			
proximal phalange	1	7	1		
intermediate phalange	1	2		1	
distal phalange	1	1			
NISP	88	224	78	22	4
total weight	8325	14047	525.5	283.5	13.5
MNI	8	10	5	4	1

Table A.4 phase 2c by species and element

element/species	horse	cattle	sheep/goat	pig
horn core				
skull		1	(2)	3
skull + horn core		1		
mandible	2	6	9 (2)	1
upper teeth		1	1	1
Lower teeth			2	
teeth		1		
atlas				
axis				
sternum				
scapula		3		
humerus		2	1	
radius+ulna				
radius		5	1	
ulna				
carpals				
innominate	1	3		
femur		3		
tibia	3	4		
fibula				
astragalus			1	
calcaneus				

tarsals				
metacarpal		2	1	
metatarsal	1	2	1	
metapodial				
proximal phalange				
intermediate phalange			1	
distal phalange	1			
NISP	8	34	22	5
total weight	1502	2561	209	52
MNI	2	3	4	2

Table A.5 Hand collected animal bone from the pond all phases

element/species	horse	cattle	Sheep/goat (sheep)	pig	dog
horn core					
skull	3	3		4	
skull + horn core		2			
mandible	6	21	4	5	2
upper teeth	11	3	4		
Lower teeth	11	7	2	1	
teeth					
atlas		3			
axis					
sternum					
scapula	2	10		1	
humerus	3	5		1	
radius+ulna	6	3			
radius		13			
ulna		3		1	
carpals					
sacrum		1			
innominate	8	6	1	1	
femur	6	8			
tibia	11	16	6		
fibula					
astragalus	1	6		1	
calcaneus		1			
tarsals	1				
metacarpal	1	9	2 (1)		
metatarsal	2	18	3		
metapodial	2	4			
proximal phalange	1	6			
intermediate phalange		1			
distal phalange	1	1			
NISP	76	150	23	15	2

total weight	6770	10339	236	271	88
MNI	7	9	6	3	1

Table A.6 horse long bone fusion table

element	number present	number unfused	number fusing	number fused	age at which fusion typically occurs in months	% fused
Early fusing						
Distal humerus	3			3	15-18 months	100
Proximal radius	4			4	15-18 months	100
Proximal first Phalange	1			1	15-18 months	100
Early fusing totals	6			6		100
Middle fusing						
Distal tibia	12			12	16- 20 months	100
Distal metatarsal						
	3	1		2	20 -24 months	67
Middle fusing totals	15	1		14		93
Late fusing						
Distal femur	4			4	3-3.5 years	100
Proximal tibia	6	1		5	3-3.5 years	83
Proximal humerus	1			1	3-3.5 years	100
Late fusing totals	11	1		10		90

Table A.7 Cattle long bone fusion

Element	Number present	Number unfused	Number fusing	Number fused	Age at which fusion typically occurs in years/ months	% fused
early fusing						
distal humerus	11			11	12 – 18 months	100
proximal radius	17			17	12-18 months	100
proximal first phalange	6			6	1.5 years	100
early fusing totals	34			34		100
middle fusing						
distal tibia	14	1	2	11	2-2.5 years	79
distal	5	1	1	3	2.25-2.5 years	60

metatarsal						
distal metacarpal	6	1	1	4	2-2.5 years	67
middle fusing totals	25	3	4	18		72
late fusing						
distal femur	6	1		5	3.5 – 4 years	83
proximal tibia	5	1	1	3	3.5 -4 years	60
calcaneus	2	1		1	3 – 3.5 years	50
proximal humerus	1			1	3.5 -4 years	100
late fusing totals	14	3	1	10		71

Table A.8 Sheep/goat long bone fusion

element	number present	number unfused	number fusing	number fused	age at which fusion typically occurs in years	% fused
early fusing						
distal humerus	8	2	1	5	10 months	63
proximal radius	3	1		2	10 months	67
proximal first phalange	5	2		3	13-16 months	60
early fusing totals	16	5	1	10		63
middle fusing						
distal tibia	10	3	1	6	1.5 – 2years	60
distal metatarsal	3			3	20-28 months	100
distal metacarpal	3			3	18-24 months	100
middle fusing totals	16	3	1	12		75
late fusing						
distal femur	1	1			3.5 years	0
proximal tibia	2	2			3-3.5 years	0
proximal humerus	1	1			3-3.5 years	0
late fusing totals	3	3				0

Table A.9 Pig long bone fusion

element	number present	number unfused	number fusing	number fused	age at which fusion typically occurs in years	% fused
early fusing						

distal humerus	2			2	1 year	100
proximal radius						
proximal first phalange	1	1			2 years	0
early fusing totals	3	1		2		67
middle fusing						
distal metatarsal	1	1			2.5 years	0
middle fusing totals	1	1				0

Table A.10 Horse tooth dimensions and age estimates based on Levine 1982

context no	P2 md	P2ht	P3md	P3 ht	P4 md	P4 ht	M1 md	M1 ht	M2 md	M2 ht	M3 md	M3 ht	Levine based age estimate
mandibular: md= mesiodistal diameter. Ht – height of crown following Levine 1982													
2003	28.75	47.91	26.33	61.11	0	0	0	0	0	0			6-7 years
2003	0	0	0	0	26.43	53.68	27.09	60.81	0	0			6-9 years
2002	30.65	36.62	0	0	0	0	0	0	0	0			8-9
2002	0	0	26.27	52.86	0	0	0	0	0	0			7-8
maxillary md= mesiodistal diameter. Ht – height of crown following Levine 1982													
context no	P2 md	P2ht	P3md	P3 ht	P4 md	P4 ht	M1 md	M1 ht	M2 md	M2 ht	M3 md	M3 ht	Levine based age estimate
2001	0	0	0	0	24.6	72.2	0	0	0	0			6-7
2001	0	0	26.42	74.36	0	0	0	0	0	0			5-6
2001	0	0	26.28	72.63	0	0	0	0	0	0			5-6
2001	0	0	0	0	24.4	70.24	0	0	0	0			6-7
725	0	0	0	0	25.25	62	0	0	0	0			7-8
1194	35.18	21.66	25.24	34.12	25.42	36.27	23.61	36.55	22	31.93	28	37	11-13

Table A.11 Limb bone length measurements and withers height calculations

context no	element	taxon	GL	LL	factor	source	estimated withers height
2002	metacarpal	sheep	123.69		4.84	Teichert	600mm
712	metatarsal	horse		242	5.33	Keiswalter	1290mm
712	radius	cattle	259		4.3	Matolcsi	1114mm
2100	radius	cattle	246		4.3	Matolcsi	1058mm

Table A.12 Pathology

context	taxon	element	part	side	pathology description
679	O/C	MAN	MID	R	Malocclusion front of dp4 rises to point all other teeth very heavily worn only m3 looks normal
1101	B	SKL	MOS	B	Several small holes to the posterior of the skull where parietal meets frontal - like those described by Brothwell - probably genetic variation rather than

					disease
2002	B	MTT	P+PS	R	Uneven bone surface on anterior part of articulation - bone loss greater than bone production possible infection
2003	E	MTT	P+S	L	Porous area of new bone growth to anterior of artic at top of shaft hard to see due to gnawing
2003	B	INN	MID	R	Disorganised bone growth above acetabulum
2003	B	MAN	ANT	L	P2 maloc; P3 missing bone regrown

HUMAN BONE

context number	total wt (g)	10mm wt (g)	% total wt	5mm wt (g)	% total wt	2mm wt (g)	% total wt	max frag mm	id wt. (g)	% total wt	skull wt (g)	% id. wt	axial wt (g)	% id. wt	limb wt (g)	% id. wt
719	632	105	16.6	285	45	121	19.1	38.75	143	22.6	45	31.4	12	8.3	86	60
719/720	101	80	79.2	10	9.9	1	0.9	34.53	90	89.1	28	27.7	1	0.9	61	60.3

Table B.1 Cremated bone from pit 718 (CG33); weights and percentage distribution by fraction size and skeletal area, and maximum fragment size. The total weight, weight by fraction and identified weights are shown (mm = millimetres, wt =weight in grams, max frag = maximum fragment size, id = identified)