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(incorporating the Cambs and Hunts Archaeological Society)

Volume XCII
for 2003

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THE CONDUIT: *local history and archaeology organisations and events*

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Editor Alison Taylor

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Editorial

These Proceedings have a more strongly archaeological bias than normal, though still reflecting only a minute portion of archaeological discoveries in Cambridgeshire, as the 'Fieldwork' section makes clear. This bias does mean we can afford a very substantial volume, because the reports attract grant-aid, but rest assured that there is no intention to ignore local history and architecture in the future. 'Fieldwork in Cambridgeshire 2002' was in itself rather problematic this year, as the County Council decided they could neither grant-aid it as in previous years nor supply data in a publishable format. With help from the excavating units and a County Council list we think we have constructed a reasonable record, but are aware there could be gaps.

Including *Conduit* as part of the *Proceedings* was well received last year, and was far cheaper than separate publications, so we have continued with this format, which was only possible thanks to considerable work by Sue Oosthuizen and Vicky Faupel. This catalogue of future events, accounts of our Annual Conference plus the huge amount of work in Fieldwork in Cambridgeshire give an impressive picture of lively and productive work routinely carried out in Cambridgeshire by amateurs and professionals alike.

Alison Taylor

Joyce Pullinger

Last year saw the sudden death of Joyce Pullinger, who will be long remembered in Cambridge Antiquarian Society. She was active in its affairs for 26 years and, almost single-handedly over that period maintained its reputation for carrying out and publishing field research in and around Cambridge. In the days before full-time archaeologists were employed in local units she saved and published much evidence that would otherwise have been destroyed. She may well prove to have been the last of those who, troubled by the wholesale destruction of archaeological sites equipped themselves to locate, excavate and publish unrestricted by governmental restrictions or the need for formal qualifications.

She was born at Middleton St. George Co. Durham, the youngest of the four children. At the outbreak of war she went first to relations in Kelso and then to the Hunmanby Hall School. Allergies forced her to abandon a proposed career in nursing, and in 1948 she married John Pullinger, withdrawing from a course of study at the Froebel College, in Bedford.

It was only after 1960 that the care of a large family (she had eight children) allowed her to develop a career in archaeology. The skills she developed and the results she obtained show it to have been much more than a hobby or part-time interest. Her achievements fall into two periods, between 1961 and '87 in and around Cambridge and 1987-2002 in Gwent. When living at Orwell and in Cambridge she was an active member of the Society, attending courses on Landscape Studies and showing, in the University's Field Archaeology Training Excavations, a marked aptitude for fieldwork. This was especially noted in the 1960-65 excavations between Castle Street and Shelly Row inside the walled Roman settlement. Here she made a major contribution by organising around her other members of the Society and excavating the 2nd - 3rd century shrine. She found herself especially attracted to ceramics and under the guidance of Rex Hull, Curator of Colchester Museum and a leading authority on Roman pottery, she became adept at its interpretation and dating. Her outstanding achievement however came when development east of Castle Street, still within the Roman walls, took place. Here only limited research had been possible before the destruction of the existing buildings and the construction of the new. Voluntarily for over two years Joyce carried out the essential daily watching brief and the negotiating with building contractors which enabled her to locate and test-evaluate, with the help of the Society's field group, evidence of Roman occupation. The results were published by the Society in 2000 in our joint volume on Roman Cambridge. In the years before 1987 she became increasingly involved in the affairs of the Society, serving on its council and as a vice-president. She also undertook various local projects, most notably at Teversham with Pat White, and on sites to be destroyed by the M11 motorway. Nationally she was elected to the Council for British Archaeology and was active in the Roman Pottery Research Group.

When she and her husband moved in 1987 to Stroat near Chepstow there was no diminution in her concern for archaeological rescue work. She and John, whose surveying and photographic skills had long supported her, were founder-members of the (Forest of) Dean Archaeological Group, and located, excavated and arranged the scheduling and preservation of a previously unknown megalithic tomb and other sites.

As one with whom she worked closely for many years I had many opportunities to observe her ability and dedication. She continued the tradition of those who, like Cyril Fox forty years earlier, demonstrated when they came to be field archaeologists in their thirties and forties that they could contribute as much if not more than those with longer service but less local knowledge. Her achievements should long be an inspiration to those, who like the present Cambridge Archaeological Field Group, wish to carry out field research in ways and in areas beyond the remit of professional units.

John Alexander

An Iron Age and Romano-British settlement at Prickwillow Road, Ely, Cambridgeshire: Excavations 1999–2000

Rob Atkins and Andy Mudd
with contributions by Trevor Anderson, Wendy J Carruthers, Steve Critchley, Karen Deighton, Kay Hartley, Dennis Jackson, Donald Mackreth, Ian Meadows and Alex Thorne

Excavation on land between Prickwillow Road and High Barns, Ely, found part of a rural settlement, occupied intermittently from the 5th to the 3rd century BC and then continuously into the second half of the 4th century AD. The main settlement focus throughout the occupation may have been outside the excavation area on higher ground to the north-west and north. Evidence from animal bones, artefacts and environmental samples suggests a mixture of arable and pastoral farming in both the Iron Age and Roman periods.

Within the excavation area, Iron Age occupation was limited to the north-west corner. It consisted of a fragmentary ditch, a few pits, two crouched inhumations and a dog burial. Later (c. 3rd century BC) a rounded enclosure was constructed with an entrance way facing west, though there was little surviving internally apart from a fragmentary probable eaves-drainage gully. Outside the enclosure there was a midden on the north side. The Iron Age enclosure continued in use into the early Roman period.

The Roman enclosures and field systems covered much of the excavation area by the 2nd century AD. Roman features up to the 3rd century mostly consisted of linear and curvilinear ditches. From the 3rd century there was a series of rectilinear enclosures, supplanted in the 4th century by a D-shaped enclosure with evidence of other ditches. Two ovens were the only structures which survived later truncation. To the south-west was a small mixed cremation/inhumation cemetery probably in use from the early 2nd century to the 4th century AD

Introduction

Excavations on land between High Barns and Prickwillow Road, Ely (TL 553 813) took place on a development area which covered over 37 acres (c. 15 ha) on the north-east side of the city just over a kilometre from the cathedral (Figs 1 and 2). There was a four stage programme of archaeological investigations which comprised a desk-based assessment (JSAC 1998), geophysical survey (GSB 1998; Fig. 3), a trial trench evaluation and an excavation (Meadows 1999; Atkins and Mudd 2001) The excavation was focused on a limited area of archaeological interest identified in the evaluation covering 4.25 acres (1.79 ha).

Archaeological background

Two previous archaeological assessments had been undertaken within the development area as part of wider investigations. The site was fieldwalked as part of the Fenland Survey on 30m transects in good conditions (Hall 1996). The survey did not find significant concentrations of finds. The desk-based assessment found that the site was within parts of five agricultural fields in 1780 though by the present day it had become a single large field (JSAC 1998). Several of the post-medieval boundaries were uncovered in the excavations. A gradiometer survey comprised an initial site scan and then detailed survey of a number of areas (GSB 1998). In the north-west corner of the study area an extensive scatter of linear and irregular anomalies indicated probable settlement comprising a series of enclosures or paddocks (Fig. 3).

The trial trench evaluation consisted 51 trenches with an overall length of over 2000m (Fig. 2; Meadows 1999). Some trenches were targeted at specific anomalies identified in the geophysical and others were distributed to provide a representative cover of the study area. This evaluation confirmed that the archaeological area of interest with Roman remains uncovered was within the north-west part of the study area.

Geology and Topography

Steve Critchley

The site lies between 21.7m and 17.9m OD (Fig. 4). The land falls away gradually towards the fen edge to the east. The solid geology consists of Cretaceous Lower Greensand and Jurassic Kimmeridge Clay. These outcrop in the upper third of the excavation area, the rest of the site being covered by chalky tills of the Anglian glaciation. The Lower Greensand beds are of medium to coarse grained yellowish-brown sands with pebble layers. These beds uncomformably overly the dark blue/grey Kimmeridge Clay. Outcrops of the Kimmeridge Clay on the site were much disturbed by periglacial cryoturbation. The porosity and hydraulic transmissivity of the Lower Greensand outcrop allows it to form a minor local aquifer with seeps at the interface with the Kimmeridge Clays affecting the central part of the site, as was demonstrated during the autumn of 2000. The Anglian tills are stiff grey to yellow-brown clays with abundant erratics of Cretaceous and Jurassic age, as well as subordinate exotic erratics.

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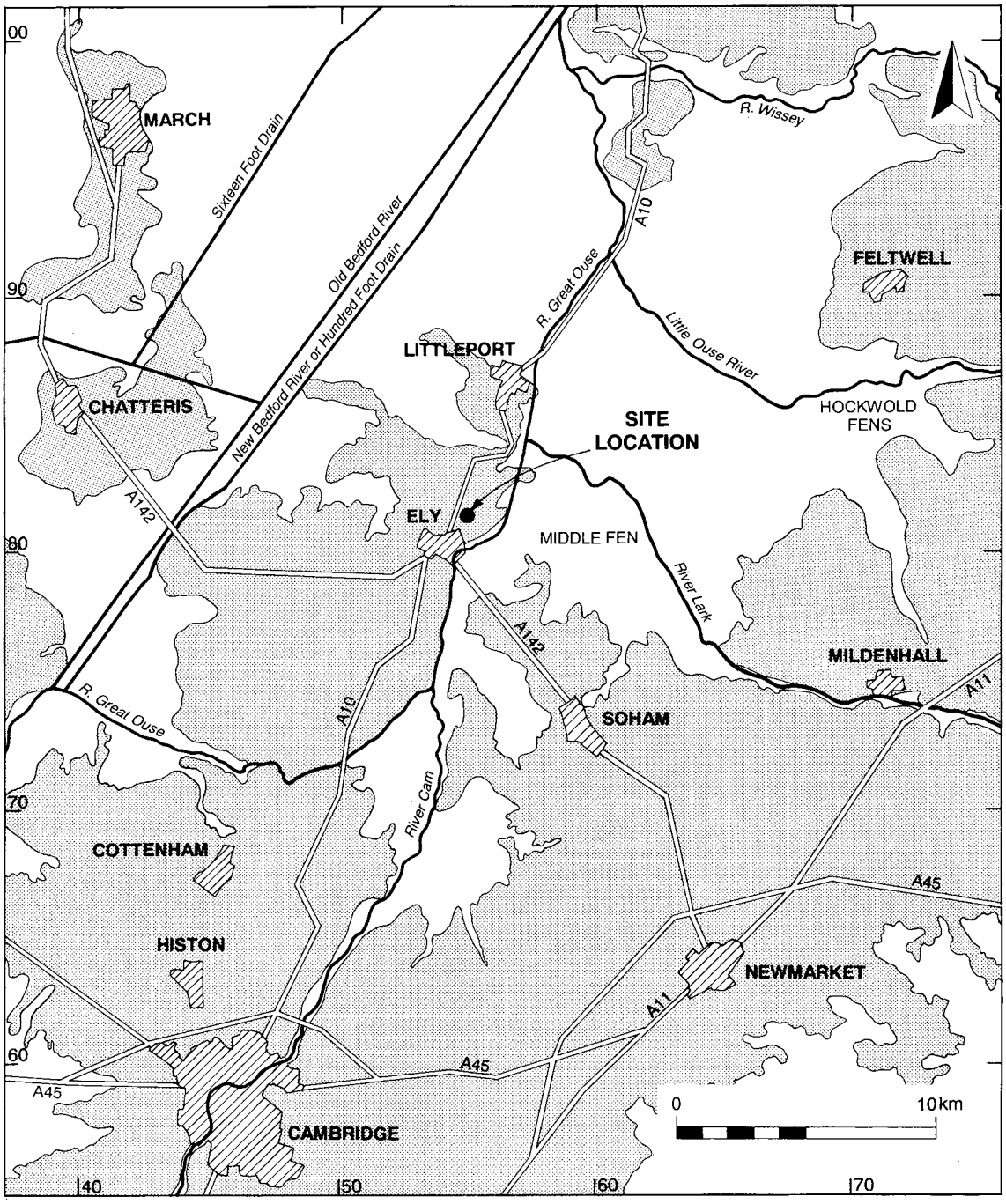

Figure 1. Location of site and Ely in relation to alluvial soils of Fenland. Solid geology shaded.

Excavation strategy

The overburden consisted of modern topsoil and a subsoil of varying depth sealing all archaeological features. The pattern of archaeological features was complex, particularly in the higher north-west part of the site (Fig. 4). A series of shallow plough furrows were found across the site running roughly north-south (not illustrated). Two areas of probable post-medieval quarrying, identified in the evaluation, were also defined but were not excavated to any extent other than to confirm the nature and course of the major ditches in this area. On the lower ground to the east and south features were sparser. A small cemetery was located in the south-west corner of the site. This was the subject of additional works undertaken

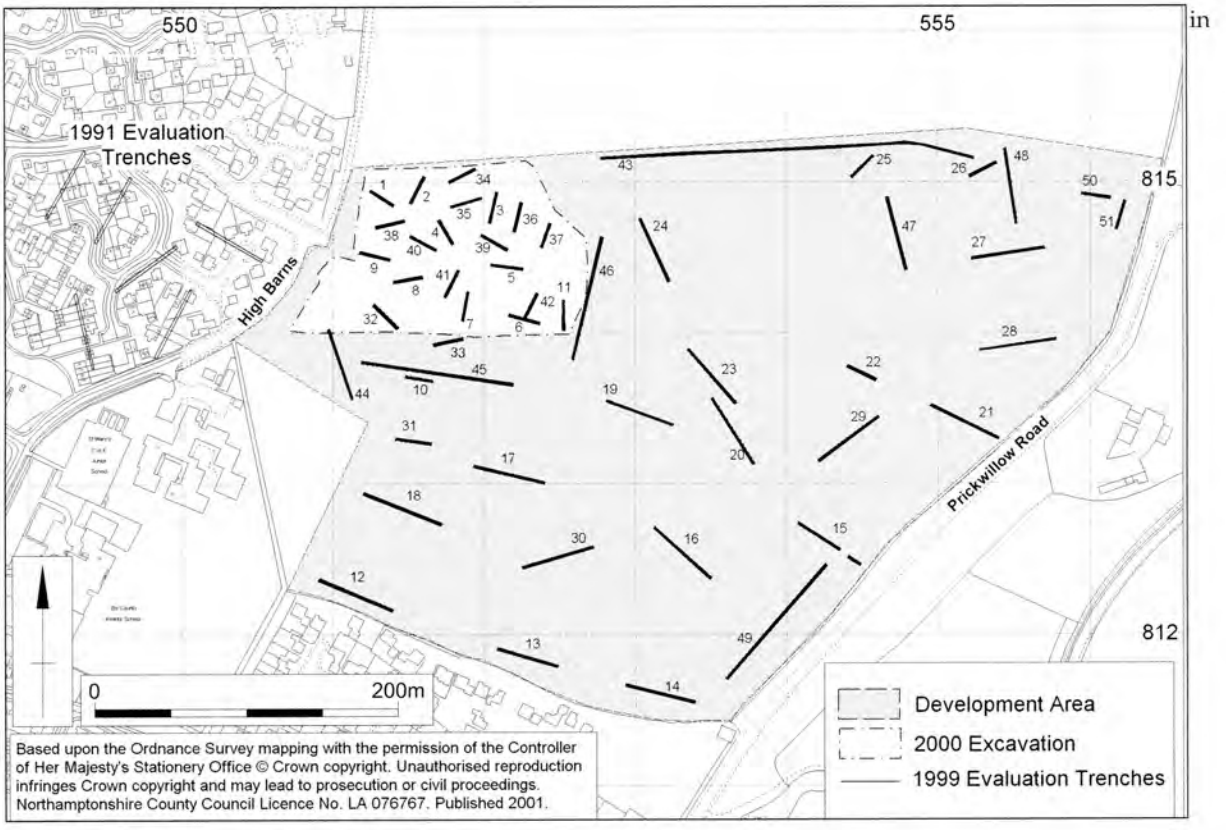

Figure 2. *Development area and trial trench locations*

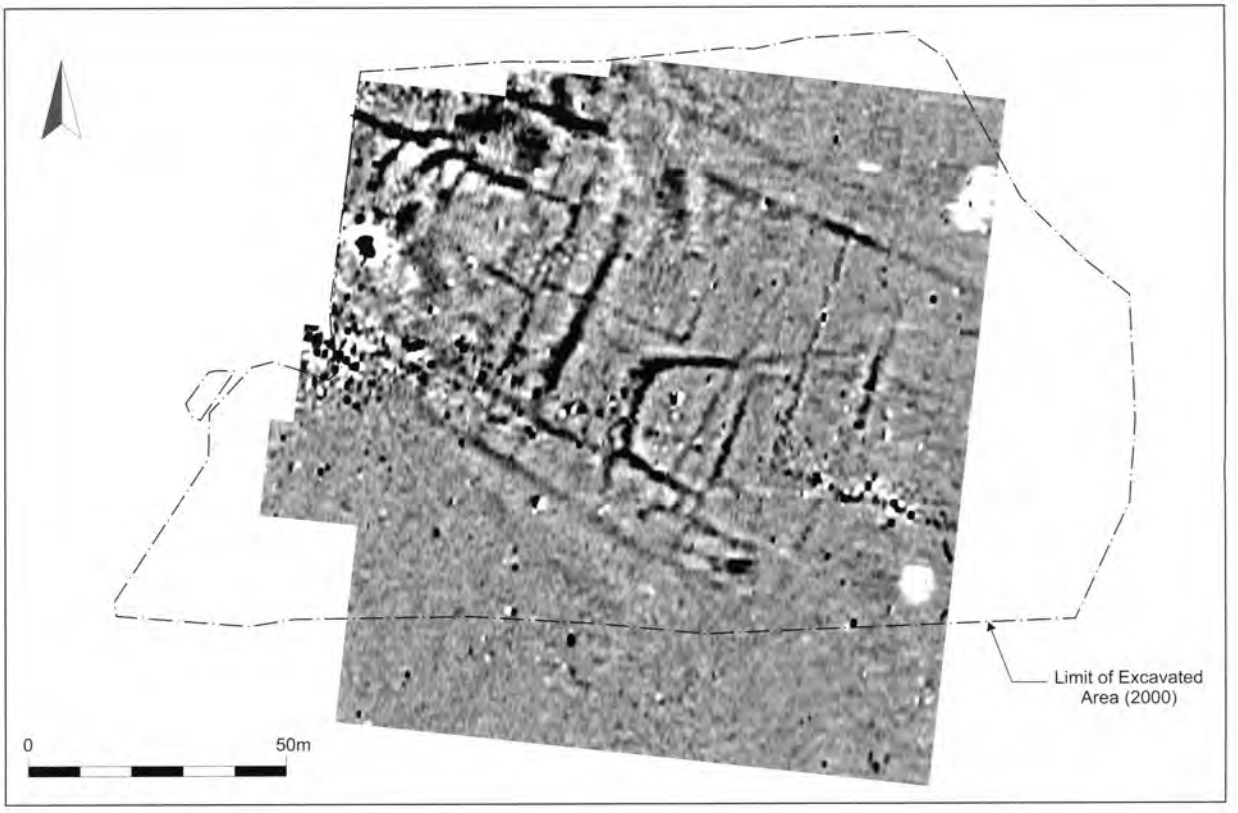

Figure 3. *Geophysical survey*

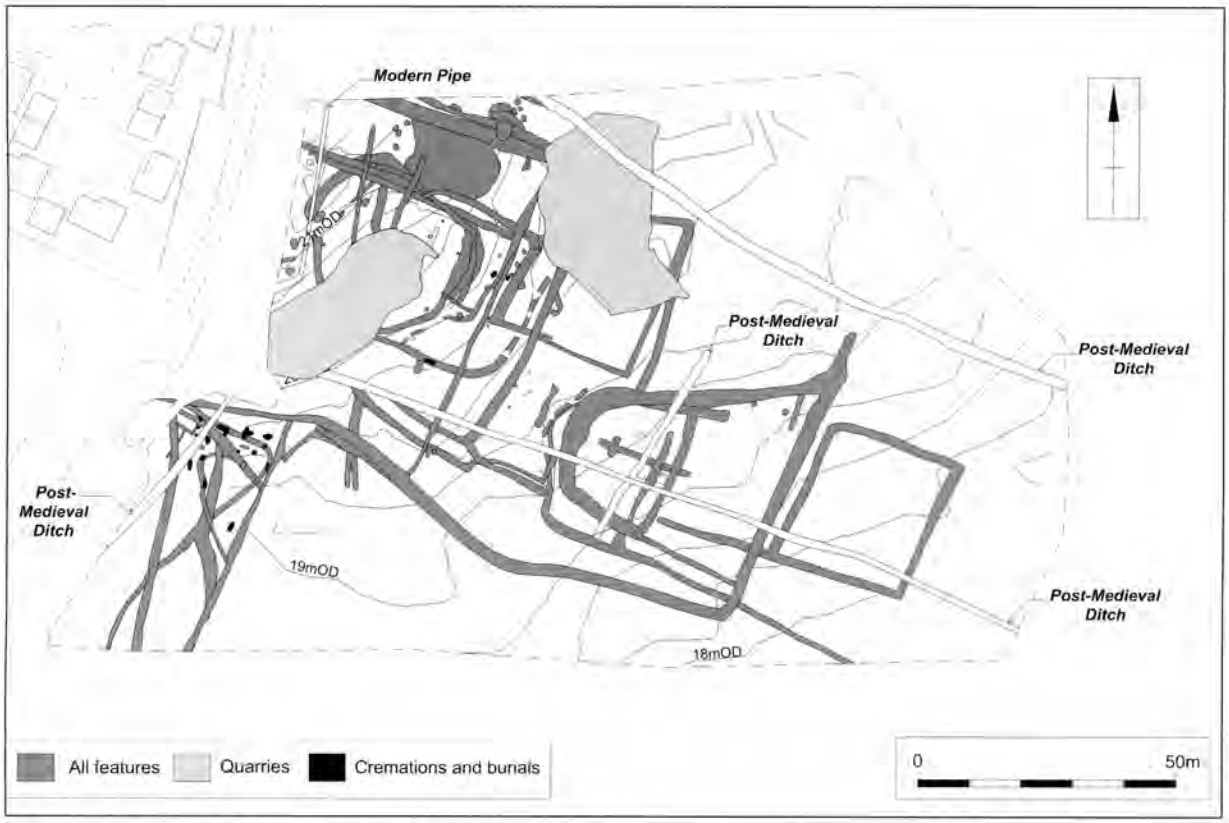

Figure 4. *Plan of all features and burials with contours*

order to confirm its extent, and, as far as can be judged, it was fully defined.

Summary of archaeological results

General character and phasing of the site

The site was characterised by a densely intercutting series of enclosure and boundary ditches spanning a period from at least *c.* 300 BC until around AD 400. There was also some evidence for earlier occupation, from about 500 BC, although the nature of this occupation is unclear and it appears to be represented mainly by a scatter of pits. A collection of worked flint indicates some earlier prehistoric activity on the site, although the flints all appear to have been residual in later features. There were a number of pits, postholes and other features on the site, but no clear evidence of structures. A number of factors probably account for this, one being the truncation of large areas of the site by ditches and the quarry pits.

The dense pattern of ditches, many of which showed evidence of recutting, has inevitably resulted in some uncertainty in correlating features across the site, and also a degree of mixing and redepositon of material. The site phasing in this report takes into account a combination of pottery dating, stratigraphic relationships and the overall sense of the site layout. The resulting broad picture is reasonably clear although there are some uncertainties in the detail. Significant uncertainties are brought to the fore in the descriptions below, although generally the justification for the phasing of features is not presented, nor are alternative interpretations offered.

Phase 1: earlier Iron Age activity (5th to 3rd centuries BC, Fig. 5)

Introduction

A scatter of features were assigned to this phase on ceramic grounds (Jackson, this report). These comprise a ditch, 19 pits, two human burials and a dog burial. Some pottery of this date also came from the early phases of Enclosure 1 (Fig. 8; Phase 2). This may be residual, but it is possible that the enclosure was originally laid out in the 3rd century BC or earlier.

Ditch 1

Ditch 1 (Fig. 5, D1) predated the later Iron Age enclosure (Enclosure 1) and was sectioned in two places where it was up to 0.36m wide and 0.36m deep. The length of the ditch is unknown as it was cut by later features. Early Iron Age pottery sherds were recovered from the fill (Fig. 19, 6). Also in the backfill was part of a human skull fragment. It is possible that Ditch 1 represents an early phase of Enclosure 1.

Pits

The 19 pits were dispersed over an area 50m by 50m in the north-west part of the site except for Pit 7 50m further to the south. They seem to be unrelated and

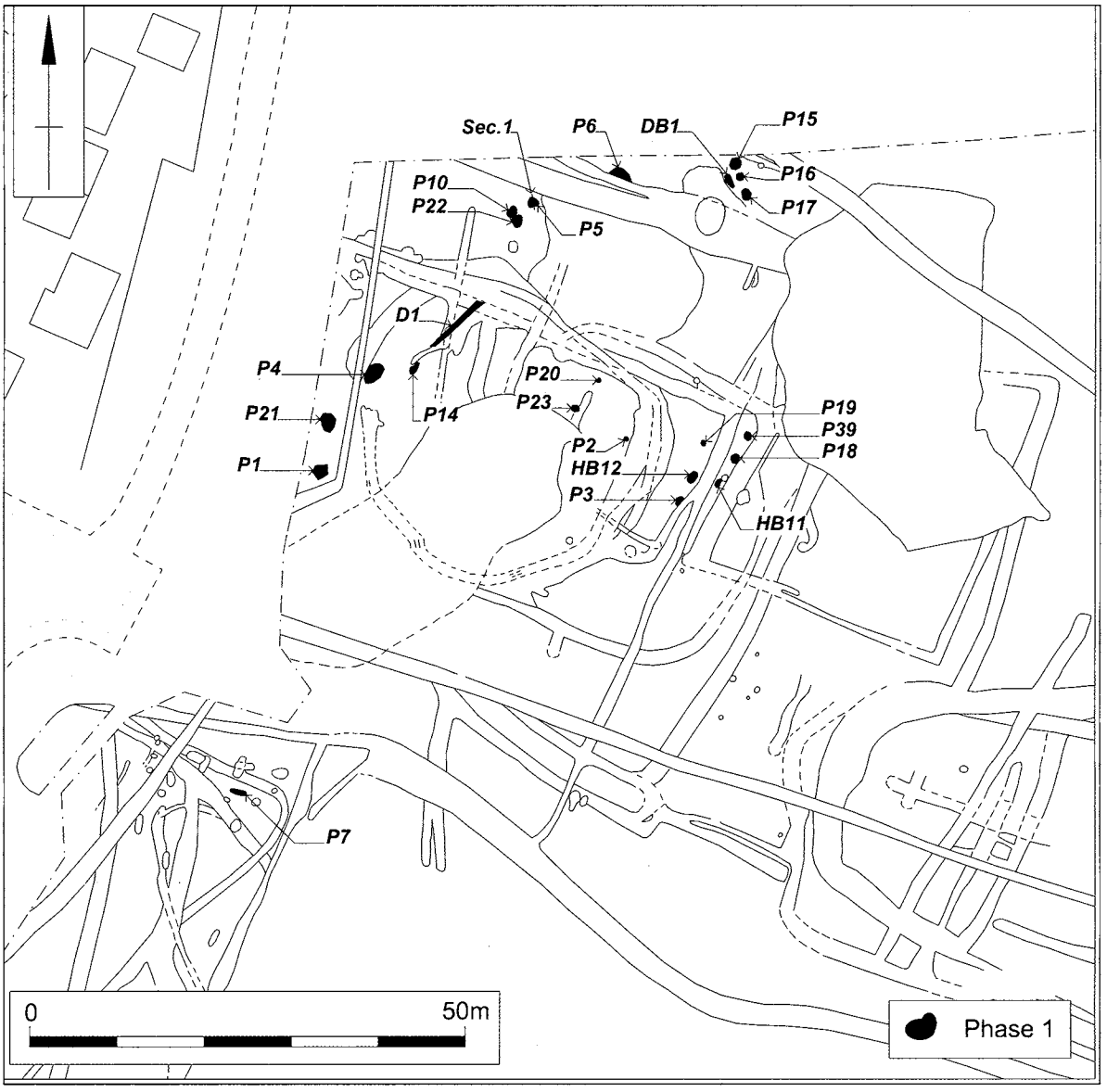

Figure 5. Iron Age features, Phase 1

only Pit 4 was dated stratigraphically as it was cut by the terminal of the later enclosure ditch. The pits' dimensions varied significantly, with lengths from 0.25m to 2.80m and depths of 0.10m to 0.75m. Most of the pits were fairly shallow and sub-rounded in shape. Several were more irregularly shaped and may have been tree throws (for example P10, P13, P14, P21, P22 and P23).

The fills of these pits were broadly similar. The majority (16) had a single uniform fill, in two pits two fills could be distinguished, while two further pits (P5 and P16) had been backfilled with several layers. Overall, the fills varied from orange brown to dark grey brown silty sands with a little gravel and there was no evidence of organic deposits. Only two pits (P5 and P7) contained more than 10 sherds of Iron Age pottery, while most pits only yielded a handful of sherds. Four pits were undated by pottery but were assigned to this phase as they were near other dated pits and would not be out of place in this group. Several early sherds from P1, P2, P3, and P7 have been illustrated (Fig. 19; 1, 2, 3 and 5).

The high water table means that the pits were unlikely to have been for grain storage and none are the right dimensions for watering-holes. There was limited evidence that the pits were used for rubbish disposal. A possible exception was P5 which was sub-circular, 2m in diameter and 0.75m deep (Fig. 18, S1). The pit was filled by a series of soil lenses with tip lines from the north and south sides. The fills contained 13 sherds of pottery, including some with flint tempering, and several animal bones including those of small mammals. A soil sample from Pit 6 produced negligible evidence with only three charred grains recovered.

Human Burials 11 and 12

Two crouched inhumations, 2.5m apart, with were

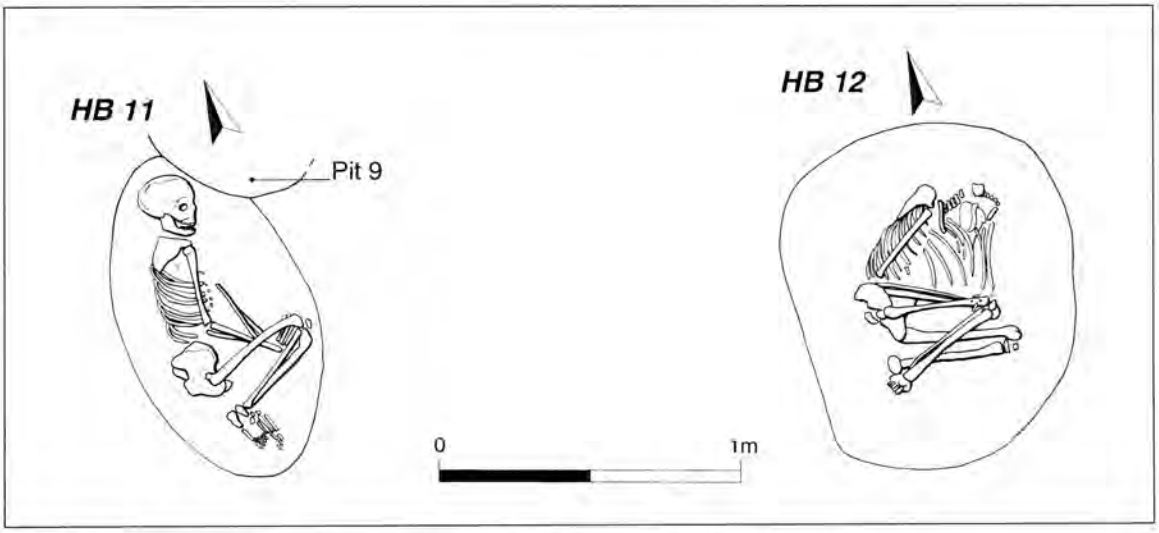

Figure 6. *Iron Age burials. HB 11 is the skeleton of an adult woman, HB 12 a young man.*

found in shallow sub-circular pits (Figs 5 and 6, HB11 & HB 12). The machining damaged the cranium of burial 12 which was originally complete. The burials had been placed crouched on their left side with their heads to the north. Burial 11 was a female adult 35–45 years old while burial 12 was a male juvenile 16 to 18 years old. The burials have been dated by associated pottery. A sherd of diagnostic early Iron Age pottery was found with burial 11 and five sherds, including diagnostic early Iron Age pottery, came from burial 12. An intrusive very small undiagnostic scrap of possible Roman pottery was also in the fill of burial 12. It is possible that the Iron Age sherds are residual in later graves, but this is considered to be a less likely option. Burial 11 was cut by pit P9 which appears to be securely Iron Age (Phase 2), and at face value the burials would seem to belong to Phase 1. It can be noted that congenital abnormalities, recorded in these and some of the late Roman burials, give a strong indication of genetic linkage between the two groups (Anderson, this report).

Figure 7. *Iron Age dog burial (DB1), looking north. Associated with some early Iron Age pottery and therefore thought to belong with Phase 1. (Scale 1 m).*

Dog Burial

A complete dog burial (DB 1) was found in a pit *c.* 0.75m in length and 0.30m deep near the north edge of the site (Fig. 7). Three Iron Age sherds, including early pottery, were found in the grave fill.

Phase 2: middle Iron Age enclosure (3rd to 1st centuries BC, Fig. 8)

Introduction

In Phase 2, settlement comprised a sub-circular enclosure which was probably dug in the 3rd century BC and subsequently recut. Very few internal features survived due to later truncation though there was the possible surviving fragment of a gully or eaves drainage ditch from a roundhouse. There was a large external midden on the northern side the enclosure.

Enclosure 1

The enclosure was sub-circular measuring 34m east to west and 33m north to south. There was a 2.50m wide entranceway on the western side. Twenty sections (including Evaluation Trench 1) were cut across the enclosure. The enclosure had been disturbed, and in some cases removed, by Roman boundary ditches cutting its northern and eastern sides (Fig. 18, S4). Over half of the interior and most of the southern ditch section had been quarried, with at best only the lower parts of the southern side enclosure ditches surviving.

The enclosure ditch was recut twice on its exterior side. All the ditches seem to have had a roughly similar V-shaped profile with sides about 65° and a slightly concave base. The ditch remains survived best on the higher west side where the latest recut was up to 1.05 m wide and 0.78 m deep (Fig. 18, S2). On the eastern side of the enclosure, the ditches were up to 0.70m wide and mostly between 0.30m and 0.40m deep. The fills of the western ditches were dark brown silty sands with a small clay content and few inclusions. The eastern ditches were filled with cleaner soil consisting of a lighter grey-brown silty sand with very

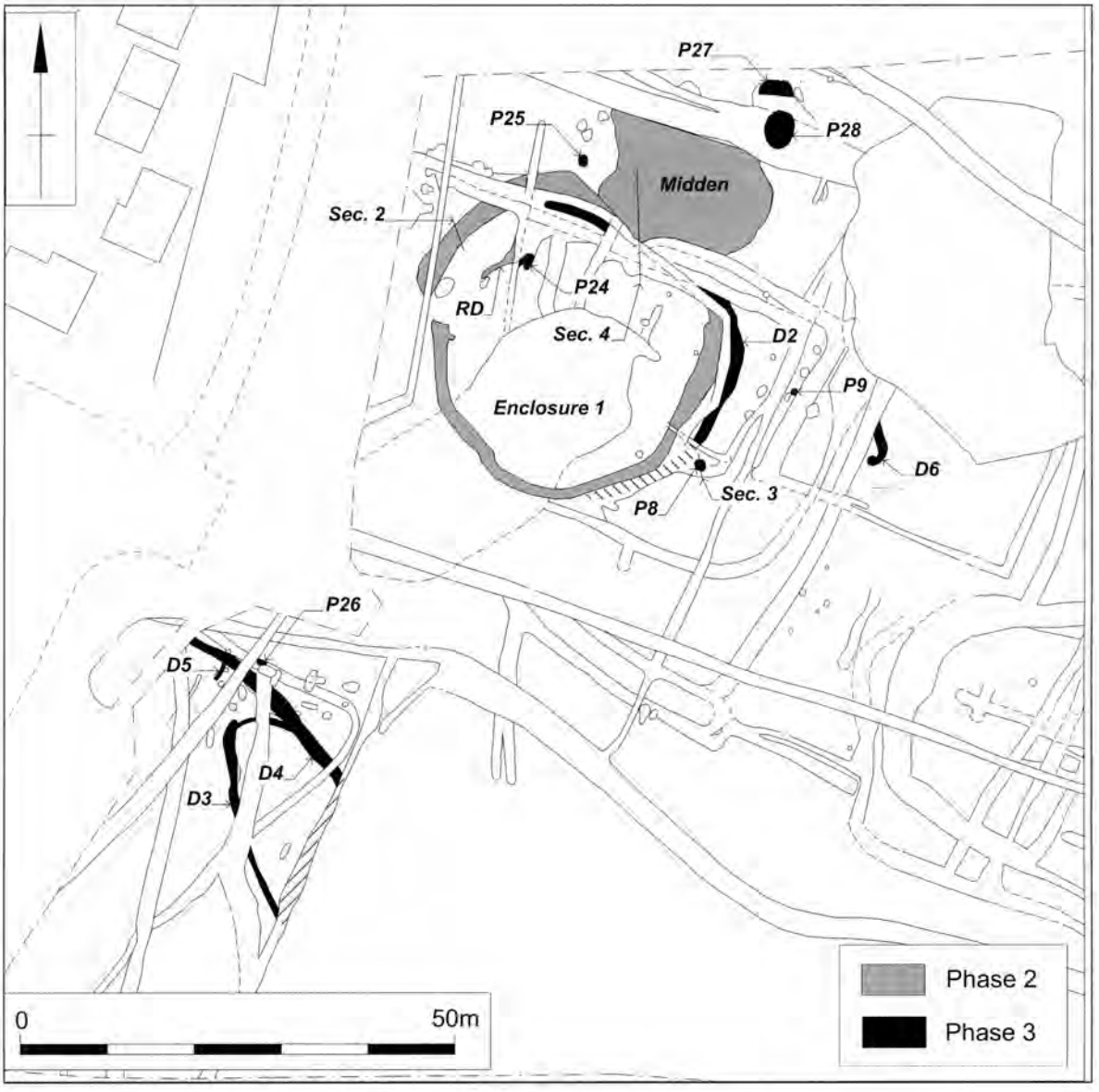

Figure 8. Iron Age features, Phases 2 and 3

few small stone inclusions. Most of the pottery and animal bone came from excavated sections on the same western side. The quantities may imply deliberate dumping of household waste within this sector of the ditch presumably after the enclosure went out of use. There seems to have been some early pottery in the ditches especially the early phase (Fig. 19, 8), as well as the later pottery (Fig. 19, 15). A small amount of fuel ash residue (17g) and burnt clay/daub (80g) probably relates to domestic activity (Meadows, this report).

Four soil samples were taken for preliminary assessment from all three ditches on the western side of the enclosure. Two samples (12 and 14) from the primary fill and first recut of the enclosure ditch were analysed in detail and yielded several cereal grains, including emmer/spelt, hulled barley and an oat grain (Carruthers, this report). Very little was found in the assessment of two samples from the latest recut of the ditch.

Possible ring ditch

A possible ring ditch (RD) lay six metres from the entranceway to the enclosure within its north-western quarter. The northern terminal of the ditch survived and curved northwards for about 5m before being truncated by later features. The absence of a southern return to the ditch may be explained by the fact that it was situated on sloping ground and only survived on the higher area. Its dimensions (0.47m wide and 0.32m deep) reduced in depth to only 0.18m as it curved north-eastwards. The curvature and profile of the feature may mean it was an eaves-drainage feature with an entrance facing west, like the enclosure itself. The fill was a dark grey silty sand with some small stones. A few sherds of pottery were recovered including some early flint-tempered pottery.

Midden

The midden comprised an irregular area measuring *c.*17m by 13m, about 10% of which was excavated. The gradual slope of the natural subsoil implies there was a natural depression north of the enclosure which was used for rubbish disposal. It was up to 0.41m deep, with two similar fills. The upper was a very dark brown sandy loam with charcoal inclusions, while the lower was a mid greyish brown sandy loam with less charcoal (Fig. 18, S4). There were lenses of orange/yellow sand along the base of deposit. The relationship between the midden and the Iron Age enclosure was obscured by later Roman ditches. It yielded a large quantity of pottery and animal bone, but few other finds except a small amount (186g) of fuel ash residue. There were 195 sherds (3917g) of pottery (25% of the entire Iron Age assemblage by number and 32% by weight). A lot were fairly unabraded and many are reasonably large sherds (Fig. 19; 9–12, 17). There were no diagnostically early sherds and the group is broadly dated to Phase 2. A few sherds characteristic of the 1st century AD may mean that pottery was being deposited in Phase 3, although Roman features cut the midden and there may be a certain amount of intrusive material.

Phase 3: late Iron Age enclosure
(1st century BC to 1st century AD, Fig. 8)

Introduction

The phase shows some continuity between the pre-conquest occupation and the Roman activity afterwards. Five ditches and seven pits are assigned to this phase. The ditches are largely fragmentary with, in most cases, no clear plan emerging. These features were mostly discrete and spread over the north-west part of the site, slightly expanding in activity area from the previous phase. The Iron Age enclosure ditch was recut on its eastern and northern sides. The pits were spread out with no real clusters and include a possible water-hole (P28). The pottery is a mixture of handmade vessels in the Iron Age tradition and early Roman wheel-thrown wares, some features containing exclusively one or the other.

Ditches

Ditch 2 followed the former Iron Age enclosure ditches on the northern and eastern sides, presumably respecting the bank of Enclosure 1 after the ditch had gone out of use and had largely filled in. It survived intermittently as it was cut by later Roman ditches. The ditch was between 0.50m and 0.68m wide and 0.18m to 0.40m deep and its fill varied from mid to dark grey brown silty sand on the north side to orange brown silty sand on the eastern side. There were few finds, only five Iron Age sherds including residual early sherds with flint temper.

Ditches 3, 4 and 5 in the south-west part of the site comprised three straight or curvilinear gullies. Ditch 4 was later than the other two, but all appear to fall within this phase. Ditches 3 and 5 were very insubstantial, but Ditch 4 was slightly broader and deeper (up to 0.78m wide and 0.41m deep). The ditches were sectioned at several places, but the only pottery comprised one Roman sherd from Ditch 3, one Iron Age sherd from Ditch 4 and one Iron Age and two late pre-Roman Iron Age type (LPRIA) Roman sherds from Ditch 5. The lack of pottery and animal bone seems to imply that the features lay away from the settlement and were possibly used as small horticultural plots or paddocks.

A possible ditch/gully (6) was an irregular feature to the east of Ditch 2 surviving for a length of *c.*5m. It was 0.93m wide and only 0.19m deep and was cut by later features. The terminal was excavated uncovering a cow skull and a sherd of probable 1st century AD pottery.

Pits

There were four sub-circular pits which yielded only late handmade Iron Age pottery (P8, P9, P24 and P25). Pit 8, to the south-east of the Iron Age enclosure, was subcircular, 0.70m in diameter and 0.66m deep (Fig. 18, S 3). The pottery included early flint-tempered and late handmade wares. The pit contained the only complete handmade Iron Age vessel from the site (Fig. 19, 19) as well as possible handmade 'Belgic' pottery (Fig. 20, 1). The animal bone included part of a horse's skull.

Pit 9 was 0.55m in diameter and 0.16m deep and contained four Iron Age sherds, including a late one with a S-profile (Fig. 19, 14). It cut burial HB 11. Pit 24 was an irregular 0.50m in diameter and 0.20m deep. It was backfilled with a dark brown-grey sandy silt with two pottery sherds. Pit 25 cut Phase 2 midden and was *c.* 1.3m in diameter and 0.36m deep with a light grey brown sandy silt fill from which three sherds were recovered.

There were three pits containing wheel-thrown LPRIA pottery. Pit 26, just to the north of Ditch 4, was 0.50m long and 0.40m deep and had seven sherds of pottery dating to AD 50–75 in its fill (eg Fig. 20, 3). Pits 27 and 28 were in the extreme north part of the site. Pit 27 was undated by pottery but was cut by a Phase 5 pit and was assigned this phase. Pit 28 was more than 3.30m in diameter and 1.30m deep with five fills ranging from medium yellowish grey clayey sand to dark grey clay with dense charcoal inclusions. The pit could be a well pit or a quarry (for blue clay). A soil sample from the dark fill was assessed but produced little apart from charcoal.

Pit 28 contained a relatively large assemblage of 35 Iron Age and 29 Roman sherds. The handmade Iron Age pottery included two early forms, such as the high-shouldered jar (Fig. 19, 7). The Roman group is almost entirely wheel-turned pottery of LPRIA type dated to the mid-late 1st century (eg Fig. 20, 2). Two sherds have been dated as possibly earlier 2nd century, but these may be intrusive as the feature was cut by later Roman ditches (14 and 18). Other finds recovered from the pit included roof tile, three similar plain copper alloy rings found together (possibly originally in a bag) and a fragment of a spacer from a pottery kiln.

Phase 4: early Roman enclosures (later 1st into 2nd century AD, Fig. 9)

Introduction

This phase shows strong continuity from the earlier phase with Ditch 2 redefined (as Ditches 15 and 16), and further ditch digging in the south-west part of the site. The only new element to the layout appears to have been a substantial east-west ditch across the northern part of the site (D14), which may have been intended to demarcate activity to the north. For the first time features were dug in the damper clayey area to the east (D12 and D13) although it is not clear what these features represent.

Northern area

A linear ditch (D14) ran east to west into the north baulk of the trench. It was a substantial U-shaped ditch near the north baulk (2.40m wide and 1.00m deep) though shallowing on lower ground near the quarry (1.10m by 0.76m). The western end showed a predominantly dark grey-brown fill over a lighter primary silting (Fig. 18, S5). Nearly all the pottery from it can be dated to before AD 150. Part of a pottery kiln bar was also found.

Two fragments of curvilinear ditches (15 and 16) ran east to west before curving to the south (Fig. 18, S4 and S6). They seem to represent a re-digging of D2. D15 was U-shaped, 1.80m wide and 0.70m deep at the north baulk, though its size declined on lower ground to the east where both ditches were 0.30–0.40m deep. Both had substantial amounts of pottery from their fills, and in both cases the vast majority of the pottery dated from the 1st to 2nd centuries (Fig. 20, 6–8). Fired clay/daub was found in small amounts in both ditches (43g and 52g respectively). A glass vessel fragment was also recovered from Ditch 15, while a pair of tweezers, a copper alloy hair pin and some wall plaster came from Ditch 16.

There were seven discrete pits in this phase (P29–P35), spread over an area *c.* 60m by 40m. The pit diameters varied from 0.50m to 2.60m and their depths from 0.10m to 0.85m. Six of the pits contained fewer than ten sherds of pottery, though Pit 32 had 33 sherds. Collectively there were 9 Iron Age sherds, including early Iron Age types in Pit 29 (Fig. 19, 4) and 45 Roman sherds, all of which dated from the 1st century to the 2nd century AD. Other finds included 95g and 293g of fired clay/daub from Pits 31 and 32, and wall plaster and part of a glass vessel from Pit 32.

South-western area

In this area there were parts of five straight and curvilinear gullies/ditches (D7, D8, D9, D10 and D11) which mostly ran north to south. These gullies were similar to the Phase 3 gullies and were mostly shallow in character. The Phase 4 ditches were between 0.10m and 0.50m deep. Only two had pottery within their fills. That in Ditch 7 dated to the 1st/2nd century and Ditch 11 had a single mortarium sherd of probable

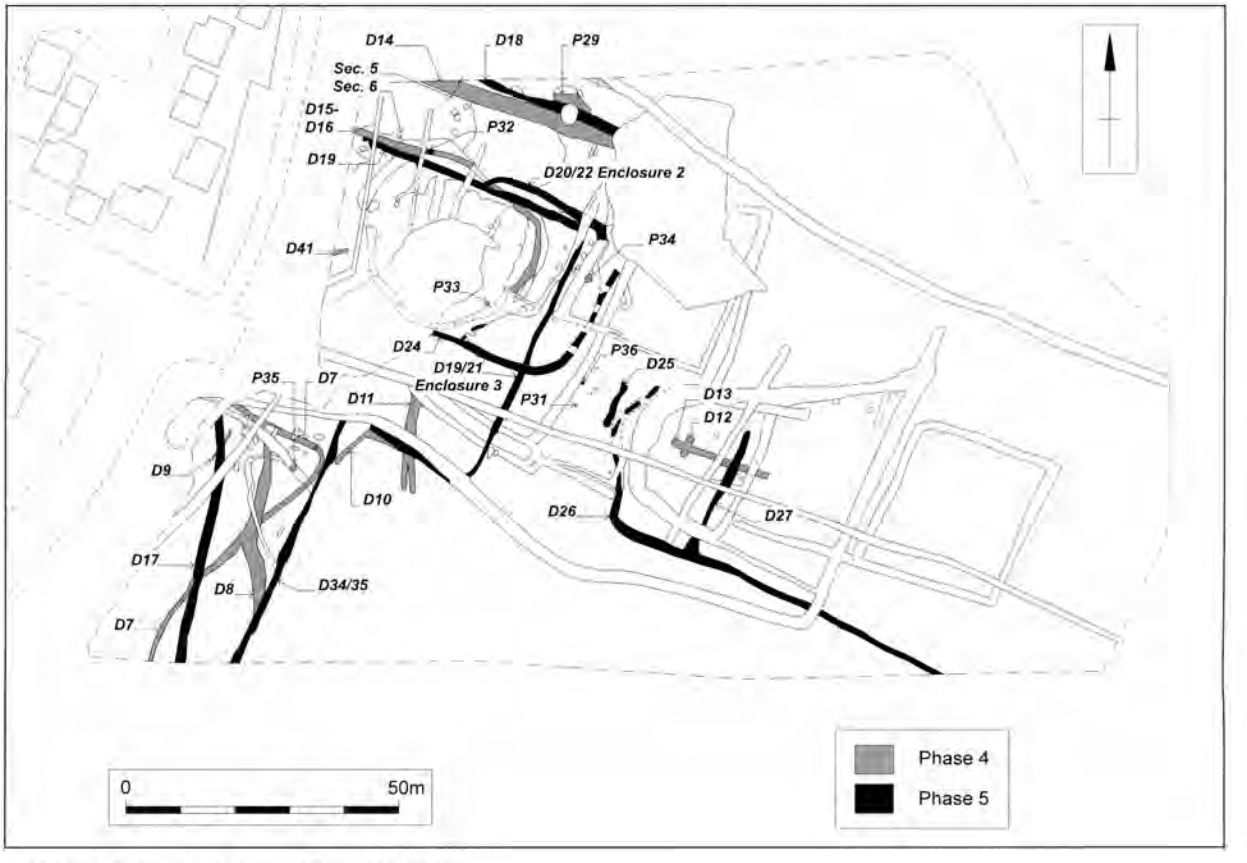

Figure 9. *Roman features, Phases 4 and 5*

later 2nd century date. As with the earlier gullies here, the lack of pottery and animal bone suggests that the features lay away from the settlement.

Middle area
Two ditches (D12 and D13), *c.* 5m and 20m long respectively, crossed each other in the middle of the site. They were 0.37m and 0.60m deep respectively, with two 2nd century pottery sherds from the fill of D13. It is possible that they were related to a structure predating the enclosures here.

Phase 5: Roman enclosures
(later 2nd into mid 3rd century AD, Fig. 9)

Introduction
In this phase there is a change in the layout of the site with a new sub-rectangular enclosure (E2) positioned to the east of Ditches 15 and 16, abandoning the alignment of the original Iron Age ditch. This enclosure appears to have been short-lived and was replaced by a much larger one (E3). Enclosures, or partial enclosures, were also laid out on the lower ground to the east. The south-western area was used as a small cemetery during the 2nd century, defined by two north-south boundary ditches D34/35 and D17. The earliest burials here were five cremations.

Enclosure 2
Enclosure (E2) comprised curvilinear ditches 20/22 and 24 forming part of an enclosure about 30m across. The ditches were 1.10m and 0.70m wide and 0.52m and 0.20m deep respectively (Fig. 18, S4). Ditch 24 was recut twice. There were 11 sherds of pottery, dating to the 1st to 3rd centuries AD (eg Fig. 15, 12) and five residual Iron Age sherds. Other finds included a quern fragment from Ditch 24.

Enclosure 3
A possible large rectangular enclosure (E3), about 50m across north-south, seems to have replaced Enclosure 2. It consisted of Ditches 19 and 21 (Fig. 18, S4 and S6). These survived best on the higher ground on the north-western side where Ditch 19 was 1.80m wide and 0.70m deep with 45° edges and flat base. At the north-eastern corner it turned a right-angle and shallowed to 0.40m as it ran south. There were at least two phases of use with probable recuts along the northern boundary. No contemporary internal features survived. A significant amount of pottery were recovered from the enclosure ditches comprising 38 Iron Age and 197 Roman sherds (eg Fig. 20; 9, 10 and 13). A large quantity of wall plaster (2105g) and fired clay (2699g) and a little fuel ash residue were deposited in Ditch 19 implying that domestic waste/demolition rubble was being disposed of, probably from buildings north of the site. A soil sample from Ditch 19 on the eastern side produced evidence for the cultivation of emmer/spelt and barley. Other finds from Ditch 19 included a D-shaped buckle and a coin of Claudius II (268–70) found in the top of the ditch, suggesting that it had gone out of use by the later 3rd century.

Northern boundary ditches 18 and 28
North of the enclosure was a boundary ditch (D18) which ran east to west roughly parallel to the earlier Phase 4 boundary ditch (D14). It was U-shaped and measured 1.40m wide by 0.40m deep. In the middle of the site it was truncated by a large post-medieval quarry. A large collection of pottery was recovered from its fill including a few residual sherds of Iron Age (Fig. 19, Nos 16 and 18) as well as Roman (Fig. 20, 4) pottery. A soil sample from its fill produced evidence for the cultivation of emmer/spelt and barley.

Ditches in south-western area
A cemetery defined within a 20m wide area was bounded on the western side by Ditch 17 and to the east by Ditch 35 and its recut 34. The recut may mean the eastern boundary was long-lived beyond Phase 5. These three ditches were dated on stratigraphic grounds (they cut Phase 4 ditches D7 and D8) and through pottery. Ditches 17 and 35 were similar sizes: 1.80m wide and 0.35m deep and 0.90–1.70m wide and 0.45m–0.9m deep, respectively. The recut Ditch 34 was smaller. The pottery from Ditch 17 dated from the 1st to 2nd centuries, whereas Ditches 34 and 35 were dated to between the 1st and 3rd centuries.

Cremation cemetery (Fig. 10)
There were five cremations (C1–C5) within the northern end of a mixed cremation/inhumation cemetery. Their phasing is for the most part clear both stratigraphically and through vessel typology (Table 1). Only C5, in a 1st/2nd century vessel may date to Phase 4. None of the vessels need date to later than the 3rd century. There were no stratigraphic relationships between the cremations and the later inhumations, but the inhumations are likely to be of 3rd or 4th century date.

All five cremations had been placed within individual sandy ware type vessels, though C1 also had an associated miniature Nene Valley beaker placed

Table 1. *Cremations*

Cremation	Pottery Vessel	Date	Sex	Age	Other Objects	Stratigraphic Relationship
C1	Sandy Ware 1	2nd into 3rd	M	Adult	Nene Beaker	-
C2	Sandy Ware 1 or 2	2nd into 3rd	M	?<40	3 hobnails	cuts D7
C3	Sandy Ware 1	pre 150	?	?<40	-	cuts D7
C4	Sandy Ware 1	2nd	?	?	-	cuts D4
C5	Sandy Ware 2	later 1st into 2nd	?	?	2 hobnails	-

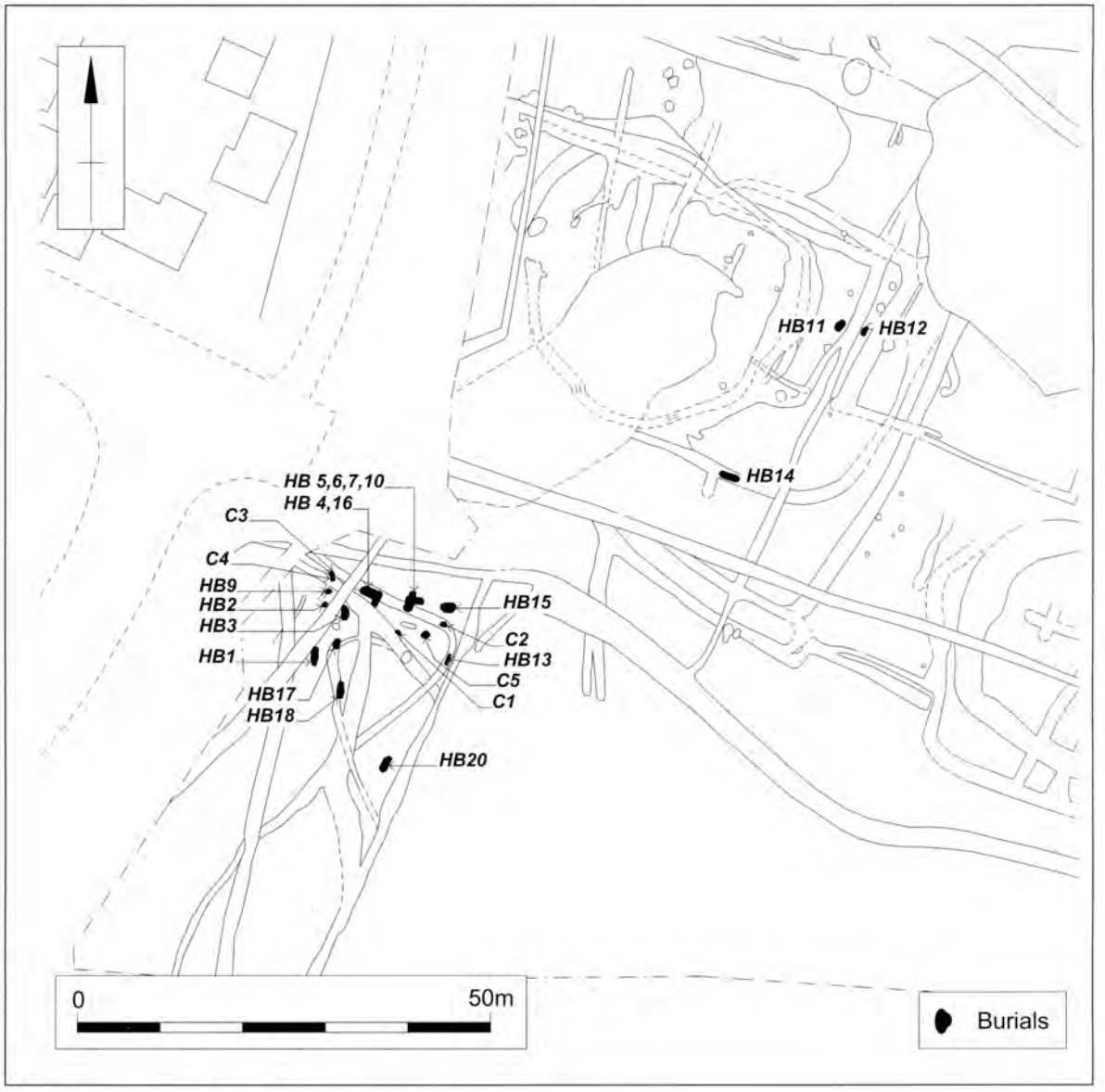

Figure 10. *Location of human burials*

directly to the east of the main cremation vessel (Fig. 21, 27 and 28; Fig. 11). Two of the cremations (C2 and C5) also contained three and two hobnails respectively (Table 1). The only other hobnails recovered from the site were associated with inhumation HB1.

All the vessels seemed to have been placed upright, though only the two vessels of C1 survived without modern damage. The others were affected by modern ploughing, and in the case of C4, a modern drain. Both C1 vessels had a fragment missing in antiquity. These may have been already damaged vessels, or were deliberately 'killed' as part of the burial ritual.

There was no indication that any of the vessels contained more than one body (Anderson, this report). Despite C1 being intact, it only contained 566 grams of human bone (less than half a person), whereas C3 contained 1357 grams. This may mean that there were different retrieval policies from the various funeral pyres.

Figure 11. *Cremation C1, looking west. The cremated remains of an adult man were placed within a Sandy Ware vessel, accompanied by a miniature Nene Valley beaker. (Scale 1m)*

Eastern fragmentary ditches and a pit
To the east, there were two ditches (D26 and D27) forming a partial enclosure. Aligned north to south Ditch 27 ran into a large 80m long curvilinear ditch (D26). This ditch was between 1.20m and 1.70m wide, and 0.40m to 0.90m deep, and may represent a large boundary. The fill varied from grey brown to dark brown to black silty clay. Finds from ditch (27) included a copper alloy spoon. A north to south ditch (D25) was directly to the west of Ditch 26 and to the west of this was a very shallow pit (P36).

Phase 6: late Roman enclosure (mid 3rd into 4th century AD, Fig. 12)

Introduction
During the 3rd century the earlier enclosures were replaced, apparently by enclosures of more standard form, and a further small rectangular enclosure added to the east of the group. At the same time inhumation burial replaced cremation as the burial rite in the south-western cemetery. The burial area was restricted and the cemetery may have continued to have been bounded by ditches 17 and 34.

South-western area
The inhumation burials were placed in a very restricted area *c.* 20m by *c.*15m. It is possible that it was still physically bounded by Phase 5 ditches D17 and D34, and perhaps by an early version of the Phase 7 boundary ditch (D44) to the north.

Inhumation cemetery (Fig. 10)
There were 15 human inhumations within a burial area. A separate tibia of another human was found in the subsoil which presumably came from a disturbed inhumation. The tibia is of interest as it shows a healed fracture (Fig. 25). The human skeletal remains are reported by T Anderson (below). The burials are summarised in Table 2, and illustrated in Figs 13 and 14. There was also an undated dog burial in the centre of the cemetery.

Inhumations comprised seven males, five females, a probable female and two too young to be identified to sex. Their ages ranged from an infant 2–5 months old (HB 9) to a male 50 or more years old (HB 5). Most of the inhumations were supine though one was prone with legs flexed (HB 3), another prone and extended (HB 16), one crouched on left side (HB 17) another crouched on right side (HB 9). There was a single inhumation buried with hobnailed boots (HB 1) with 40 and 38 individual nails surviving directly below each foot. At least four inhumations were buried in coffins, as some of the iron nails survived (HB 1, HB 5, HB 10 and HB 13). The orientation of the bodies varied enormously with eight inhumations buried with head to the east, four to the south, three to the north and one to the west.

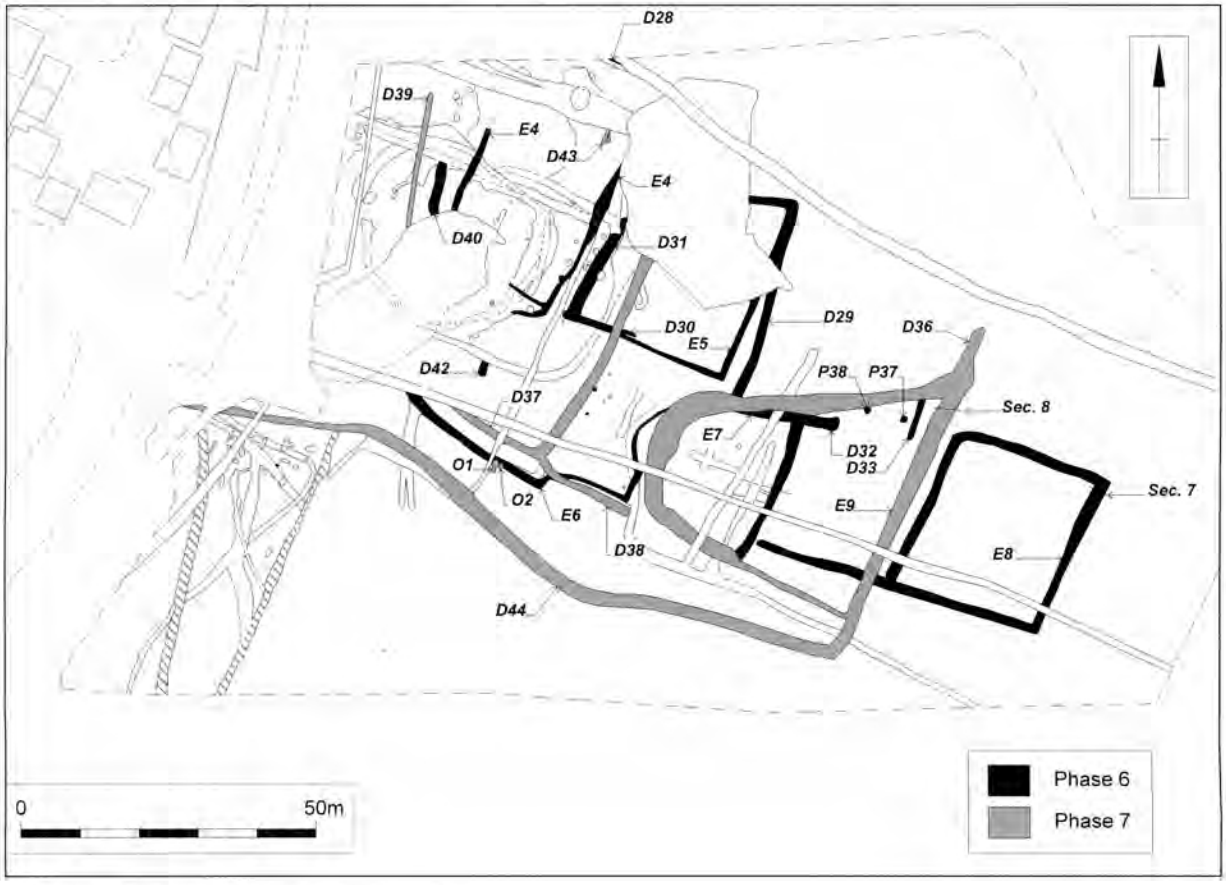

Figure 12. *Roman features, Phases 6 and 7*

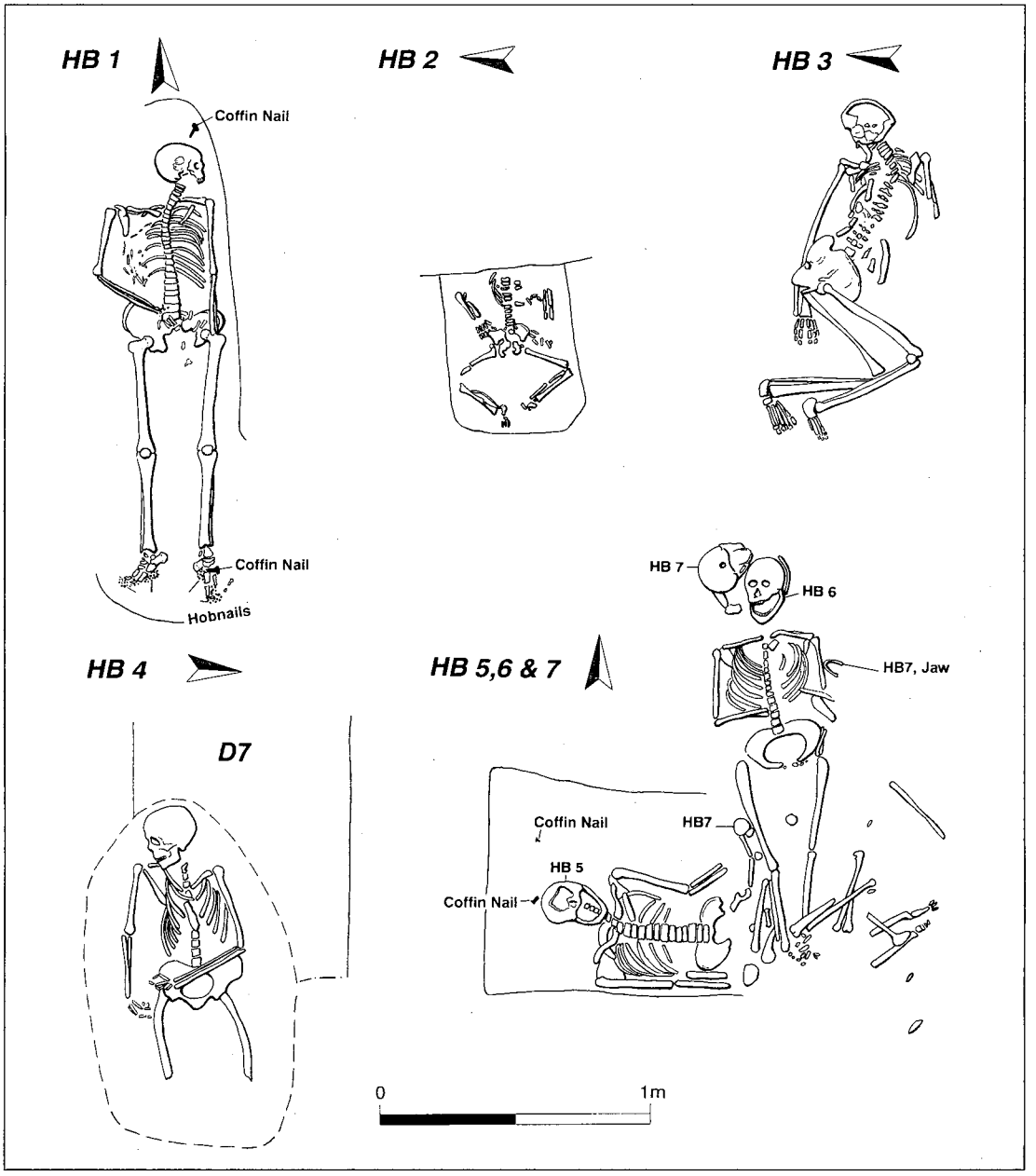

Figure 13. Roman burials, HB1–HB7

Stratigraphically, eight of the inhumations cut earlier ditches of Phases 4 and 5. Most of the burials were without artefactual dating evidence although pot sherds from two provide a *tpq* (HB 6, 2nd/3rd century AD and HB 13 2nd century? AD), and three of the burials had grave goods. The bracelets with burials HB 10, HB 17 and HB 18 are typologically dated to the 3rd or 4th centuries AD. One burial of a women aged between about 22 and 27 (HB 10) had particularly elaborate grave goods comprising five interwined bracelets under the neck/head (Fig. 22, 3–7; Figs 16 and 17). There were two single copper alloy bracelets found next to the skeletons of two adult females HB 17 and 18. A coin of Constantine I (307–337) came from the backfill of either burial HB 4 or HB 16, which intercut. A damaged copper alloy composite tool was found in the backfill of HB 4. This may represent a loss and not a grave good as it was incomplete (Fig. 23, 12).

There were two intercutting groups of burials. In one group HB 4 was disturbed with its lower legs removed by a later burial (HB 16). The other was a possible family plot which involved four intercutting burials (Fig. 15). There was a double burial aligned east to west with an elderly male aged more than 50 (HB 5) placed directly above a young adult female aged 22–27 (HB 10). These burials were cut by a double burial aligned south to north. This comprised a female adult (HB 7) disturbed by the latest burial of a mature female (HB 6).

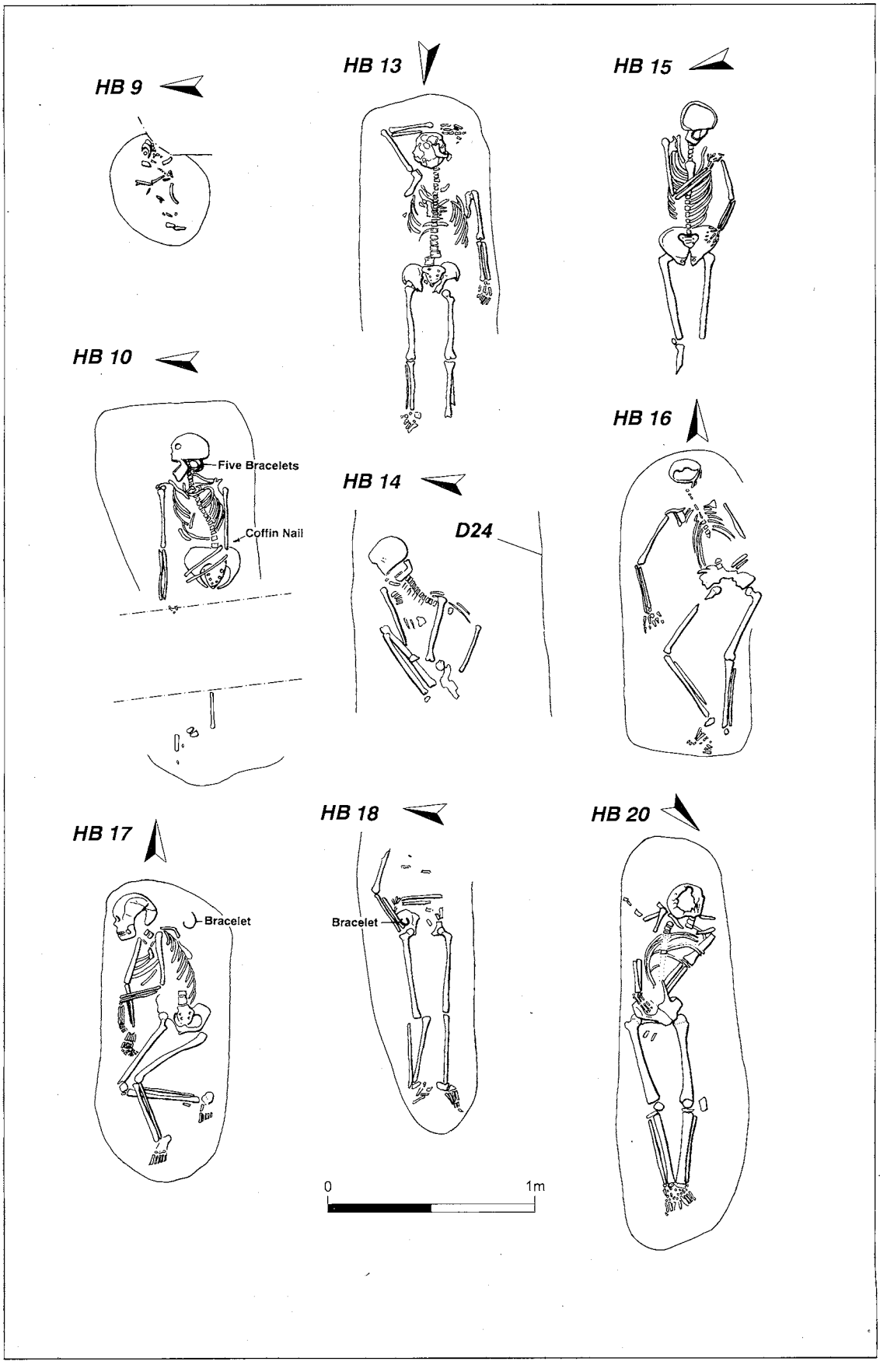

Figure 14. Roman burials, HB9, HB10, HB13–18 and HB20

Figure 15. *Intercutting burials HB5 – 7, looking south. The earliest burials lay east-west and comprised an elderly man (HB5) directly overlying a young woman (HB10, not visible at this stage). These were later cut by the north-south burials, both adult women, HB7 overlaid and disturbed by HB6. (Scale 1m)*

Outlying burial

There was an additional human burial (HB 14) which was on its own, cut into a Phase 5 ditch (24), 30m to the north-east of the cemetery. He was a mature male aged between 40 and 50 years old and placed in a flexed position, with its head to the east. There was a large amount of domestic waste in the grave's backfill. The pottery was dated as later 3rd to 4th centuries AD, contemporary with the cemetery.

Rectilinear enclosures

Parts of at least five separate, though similarly shaped rectilinear enclosures (E4–8), are identifiable in a roughly east-west linear arrangement. Four are of an approximately similar size around 29m long by 25m wide. The most complete was the easternmost (Enclosure 8) whose ditches survived between 1.40m and 2m wide and 0.46 to 0.57m deep (Fig. 18, S7). The lack of finds from the ditch sections imply that this enclosure was agricultural and not settlement-related, although the purposes of this, and the other enclosures, is unclear.

The four enclosure ditches on higher ground to the west all contained a reasonable amount of pottery and animal bone. The ditches of Enclosure 5 seems to have been recut on the south and east sides (D30 and D31) and possibly on the eastern side (D29). These ditches contained some very dark brown silty clay and some burnt clay, implying some ovens or hearths nearby. Some of the pottery was residual 2nd century sherds (Fig. 20, 16–19). A metal detected coin of Valentinian II (364–75) from the top of its fill suggests final infilling towards the end of the 4th century. Two soil samples from the enclosure's ditches (samples 21 and 30) produced evidence for the cultivation of spelt wheat and small amounts of bread type wheat or barley and it is possible that crops were being processed nearby (W Carruthers, below).

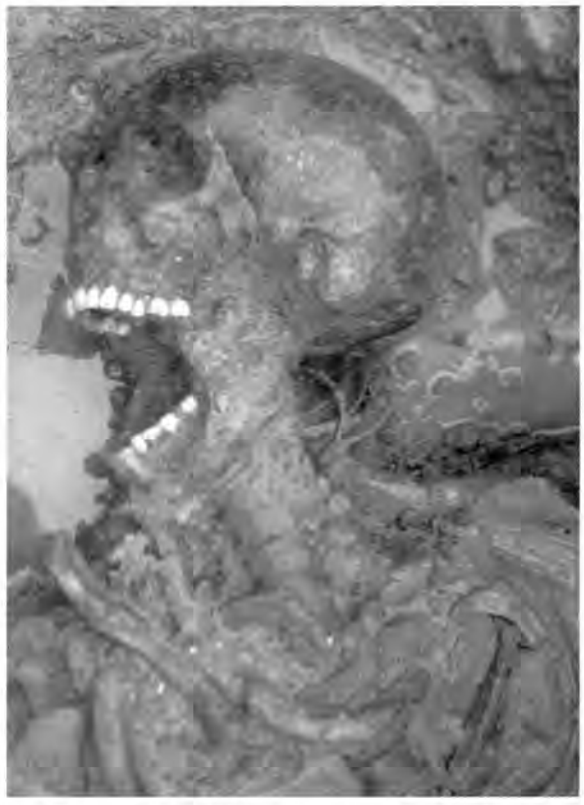

Figure 16. *Burial HB10, a young woman, with intertwined bracelets under head, looking east*

Figure 17. *Intertwined bracelets from Burial HB10. One is shale, three copper alloy and one a mixture of copper alloy and iron (Scale 5cm)*

The remains of Enclosure 4 were fragmentary and possibly of two phases of which D40 on the western side may have been a part. The north/south ditches were between 0.70m and 1.24m wide and 0.40 to 0.60m deep though the east/west ditches did not survive on the whole, and where they did, were very shallow (0.18m deep; Fig. 18, S3). A sherd of Horningsea cooking vessel came from Ditch 40 (Fig. 20, 15). A soil sample from the eastern ditch produced similar charred grain to Enclosure 5 (Table 16 sample 28). Enclosure 7 is tentatively postulated with parts

Table 2. *The Roman skeletons*

Burial No.	Sex	Age	Stature	Orientation	Burial goods
1	m	30-40	1.694m	N-S	hobnails
2	?	3-5	-	E-W	-
3	m	30-45	1.644m	E-W	-
4	m	40-50	1.724m	W-E	-
5	m	50+	1.645m	E-W	-
6	f	35-45	1.556m	S-N	-
7	f	30-35	1.611m	S-N	-
9	?	2-5mths	-	E-W	-
10	f	20-27	1.531m	E-W	5 bracelets
13	?f	27-32	1.557m	S-N	-
14	m	40-50	1.699m	E-W	-
15	m	25-30	1.661m	E-W	-
16	m	40-50	1.829m	N-S	-
17	f	35-45	1.569m	N-S	1 bracelet
18	f	grown	-	E-W	1 bracelet
20	m	35-45	-	S-N	-

only surviving on the north, east and west sides. It was heavily cut by the Phase 7 D-shaped enclosure (E9). Domestic finds included a bone pin dated on stylistic grounds to the 3rd century or later as well as 3rd to 4th century pottery (eg Fig. 20, 20). Further to this west was possible enclosure (E6) whose southern and eastern ditches survived. Finds recovered included pottery sherds (eg Fig. 20, 11).

Fragmentary remains of gullies and ditches (D32, D33, and D42) and two pits (P37 and P38) were found and were dated stratigraphically or by pottery. D32 and D33 may be associated with Enclosures 7 or 8, and the pits were also in this area. A reasonable amount of pottery came from these features with, for example, 141 sherds from Ditch 33. A small east to west ditch (28) of unknown function was seen on the extreme northern part of the site and was 1.00m wide and 0.45m deep. Pottery from it included a mortarium sherd (Fig. 20, 14).

Phase 7: late Roman D-shaped enclosure (4th century AD, Fig. 12)

Introduction

During the 4th century, the rectangular enclosures were replaced by larger enclosures, including a D-shaped enclosure attached to a boundary ditch on the south side. The inhumation cemetery seems to have continued in the south-western area. The site activity seems to finish in the later 4th century. Two ovens found in the central area may relate to domestic activity.

Ovens

Two ovens, next to each other, cut Phase 6, Enclosure 6. Oven 1 was oval in shape 1.88m by 0.95m and only 0.17m deep while Oven 2 was sub-rounded 0.60m in diameter and 0.10m deep. The remains included a burnt clay lining around a shallow dark grey black loamy clay fill. The ovens may have been within a structure but no evidence of this was found. A soil sample from Oven 1 produced some evidence for crop processing waste as well as 24 great fen sedge nutlets. Sedge has been used as a fuel for bakers ovens in historic times (W Carruthers, this report). It is not impossible that the ovens were the remains of pottery kilns. Kiln bars were found in a nearby ditch (37) about 5m to the north.

Boundary ditch

A large boundary ditch (D44) demarcated the southern and possibly eastern boundary of the settlement running more than 120m east-west and possibly a further 60m northwards where it formed the straight arm of Enclosure 9. The ditches were substantial measuring up to 2.30m wide and 0.75m deep and recut at least once (Fig. 18, S8). A substantial amount of pottery, probably domestic rubbish, was recovered from its fill, including pottery dated to the late 4th century and later (eg Fig. 21, 22). Other finds recovered include fired clay/daub (319g), Roman roof tile, a pair of tweezers, a little fuel ash slag as well as a coin of Constantine II (317–337). A soil sample (Table 16, Sample 2) produced quantities of cereal grains, chaff fragments and weed seeds. There was evidence for the cultivation of emmer/spelt and hulled barley.

Enclosure 9

A possible D-shaped enclosure (E9) was joined onto the above boundary ditch (D44). The enclosure ditch was 1.40m wide and 0.40m deep. In common with the other enclosures, no internal features survived. Pottery included late 4th century sherds (Fig. 21, 24). A soil sample (Table 16, Sample 3) yielded a similar range of species as the sample from the boundary ditch (above) but was dominated by chess, which was probably an arable weed.

Ditches

East of Enclosure 9, the site was subdivided by Ditches 37 and 38, both of which were substantial.

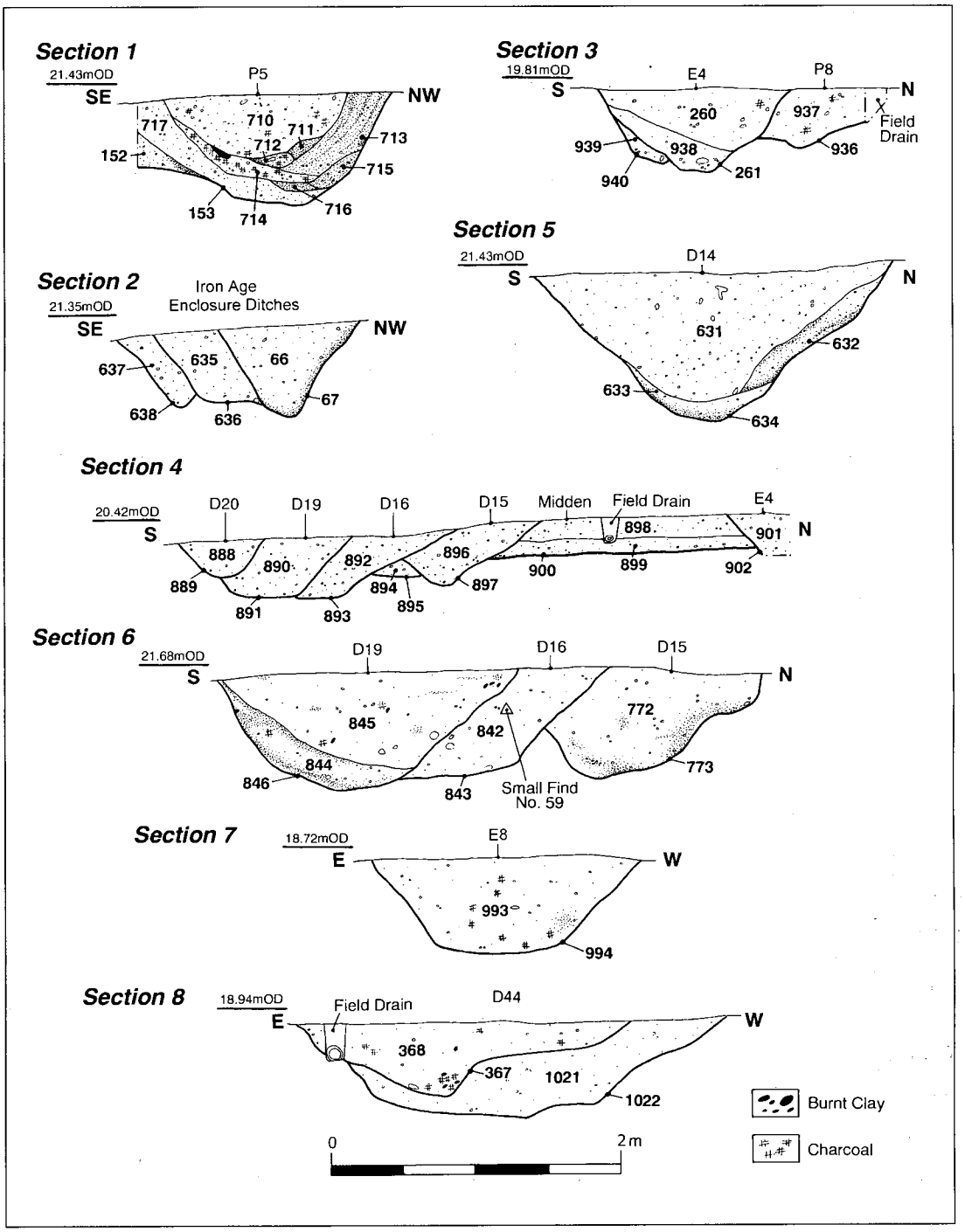

Figure 18. Sections of features. See Figs 5, 8, 9 & 17 for section locations

Ditch 37 may have been long lived as it was possibly recut twice, and was up to 2m wide and 0.96m deep. Ditch 38 was 0.60m wide and 0.45m deep. A substantial amount of mostly 4th-century pottery was recovered from the recut of D37 (192 sherds), including a residual sherd of stamped mortarium by the potter Ancoraetus (Fig. 21, 26). A soil sample (Table 16, Sample 22) from Ditch 37 yielded a similar range of crop and weed seeds to the other samples from this phase. A quern stone from Ditch 38 and two quern fragments from Ditch 37 and its recut suggests that cereal grinding was undertaken nearby. Two kiln bar fragments also may indicate local pottery production. A coin of Constantine I or II (317–33) was recovered from Ditch 38.

Ditch 39 ran north to south and was 0.75m wide and 0.25m deep. It cut Phase 5 Ditch 19. A fragmentary small north-south gully (43) at the extreme north of the site is of uncertain function, but yielded pottery to the late 4th century (eg Fig. 20, 21 and Fig. 21, 23) together with two horse skulls and two cattle skulls (Deighton, this report).

Post-medieval and modern (Fig. 4)

Quarry

There were two main quarry areas in the site, both irregular in shape up to 40m in length and 23m wide. Both can be seen as clouded terrain in the geophysical survey (Fig. 3). They were sampled in the trial excavation where they were found to be up to 2m deep. The quarry in the middle of the site contained 18th century brick rubble and pottery. The latest material from the other quarry was 4th century Roman pottery, but the quarry is likely to have been much later. There are no indications of quarrying on any maps. They are likely to be 18th century sand pits.

There was widespread evidence of medieval ploughing on the site with furrows running north to south. Frequent irregular tree throw holes/planting pits were recorded especially on the extreme north-west corner of the site. Three post-medieval boundary ditches were uncovered. A north-south ditch at the south-western part of the site was infilled in the 18th century. Two roughly east-west ditches are recorded as field boundaries on 1780 and 1888 maps (Survey of the Manor of New Barns in the parish of Trinity in Ely; Six-inch County Series Cambridgeshire Sheet 26SW/SE, respectively). In the extreme north-western part of the site was a 20th-century water pipe which had partly removed the northern terminal of Enclosure 1.

Finds

Worked flint

Alex Thorne

Ninety-seven worked flint were recovered during the evaluation and excavation. The general character of the assemblage is later Neolithic/early Bronze Age. No early prehistoric features were identified and the flint appears to be residual, reflecting a general background scatter of activity. There is a fairly high proportion of specific tools within the assemblage (23 out of 97).

Table 3. *Flint by type*

Cores (1 fire cracked)	6
Core rejuvenation flakes	2
Shattered pieces	13
Waste flakes (1 fire cracked)	25
Blades/bladelets	1
Utilised blades	8
Utilised flakes	17
Scrapers *2 are notched*	11
Knives	4
Serrated blades	1
Notched flakes (2 of these are also scrapers, included above)	5
Misc. retouched	1
Flint axe fragment (burnt)	1
Other ?burnt flint	2
TOTAL	97

There are two broad categories of flint working represented by this group. The larger proportion is the production of small blades and primary flakes struck from prepared cores using a soft hammer. The majority of these have been utilised, or further worked to form tools, characteristic of Neolithic material. The other group comprises hard hammer struck flakes which are generally shorter and broader. There is very little fine debitage from the site. Whilst the paucity of cores may reflect the scarcity of flint as a raw material, it could, with the lack of debitage simply show there was little flint working taking place on this site. No flint hammer stones were recovered.

Iron Age pottery

Dennis Jackson

A total of 748 sherds of handmade Iron Age pottery, weighing 12, 253gm, was recovered from the excavations. The overall total is quite small when compared to other sites in the region such as Wardy Hill where 5311 sherds were found (Hill and Horne forthcoming). However at Wardy Hill the total includes both handmade and wheel-turned late Iron Age pottery, whereas in this report the wheel-turned late Iron Age pottery sherds are not included as they are assessed with the Roman material (D Mackreth below).

There was considerable Roman activity in the excavated area and it is not always easy to decide if features that contain a few sherds are likely to be Iron Age in date or if Roman sherds found in Iron Age features are intrusive. No less than 36% (262 sherds) of the handmade Iron Age pottery is associated with wheel turned material and the majority of this pottery may date to the 1st century AD. Without this group the assemblage of EMIA and MIA pottery from the site consists of only 486 sherds.

The handmade Iron Age pottery came from 128 contexts, but of these only 18 contained 10 or more sherds. Within the total pottery assemblage some 24% by sherd number and 30% by weight came from a single feature defined as a midden or hollow.

Dating the features is made difficult by the low number of sherds from many contexts and their small size. There are 44 rim sherds in the assemblage but only six rim to shoulder profiles survive. It seems likely that the excavated features at Prickwillow Road represent only part of the total settlement area and because of this, and the limited amount of diagnostic material, the statistics and percentages in the report are kept to a minimum.

A number of Iron Age sites have been excavated in this region of Cambridgeshire in recent years, but few have yet been published. The handmade Iron Age from Prickwillow Road has some similarities to the material from the site at West Fen Road, Ely, but there are differences in the fabric, perhaps suggesting local clay sources were used in its manufacture. In his assessment of the pottery from the West Fen Road site, JD Hill assigns most of it to the later Iron Age period *c.* 400/300 BC to AD 60/70± (Hill 2000). Hill compares

the pottery to other sites on or near the Isle of Ely such as Wardy Hill, Little Thetford and Hurst Lane.

The pottery from Prickwillow Road seems to suggest there was activity on the site from at least the 5th or 4th centuries BC but this activity may not have been continuous. This would explain why some pottery forms are not represented in the assemblage. The majority of the pottery can be assigned to four stratified groups.

Table 4. The distribution of the Iron Age pottery

Group	Location	No. of Sherds
1	The pits, burials etc.	121
2	The midden	195
3	The enclosure ditches	103
4	LIA or RB contexts	262
5	Unstratified or Post-medieval contexts	67

Fabrics

The following six broad fabric types have been defined for the Prickwillow pottery:

Fabric 1 SH.1 Pottery containing rare to moderate fine shell (37.5%)
Fabric 2 SH.2 Sherds containing predominantly medium sized shell (12%)
Fabric 3 SH.3 Pottery containing coarse shell (7%)
Fabric 4 FL.1 Pottery where crushed flint is the dominant inclusion (3.0%)
Fabric 5 FL.2 As Fabric FL.1 but containing numerous other stone grits (3.5%)
Fabric 6 GT Pottery that contains quartz or grits but has no obvious shell or flint (37%)

The percentages given above are for sherd count and not weight. Percentages for weight, in a relatively small assemblage, can be distorted by the presence of a few large thick walled sherds. To some extent the same is true of the sherd count where 22 sherds from one vessel distort the percentage of Fabric 5. Percentage of fabric types within groups have not been calculated as this would be distorted by the small number of sherds involved.

Initially the shelly fabrics were divided into 20 separate types, as listed by the PCRG (1997, 29), but it was found there was no clear division between them and the three main types listed above encompass the majority of the sherds in the assemblage. The quantity of shell, particularly in Fabric 1 is often quite small. In Phase 1, the fabrics have more shell inclusions than Phase 2 and the number of shell inclusions increases again in the late Iron Age/early Roman period.

The main inclusions in the fabric are listed above, but a proportion of both the shelly and flint gritted sherds also contain other material that probably occurs naturally in the clay used in the manufacture of the pots. This includes quartz sand, stone or calcite grits of varying size and density, as well as organic matter. This is more obvious amongst the sherds containing flint from the midden (Fabric 6). Again, in Phase 1 the fabrics have more flint inclusions. All the flint from Prickwillow Rd is white in colour and shattered with sharp profiles, indicating that it had probably been heated prior to crushing,

The finer wares contain few coarse grits, however, so presumably there would have been some selection or grading of the clays. Very few sherds contain any obvious grog (unlike some early sherds found in D Mackreth's report below). There are sherds in a dense black fabric, with few if any grits, which may represent a further fabric division. Overall, analysis has shown that local clays were used in the manufacture of much of the middle and LIA pottery in the Ely area (Williams in Hill and Horne forthcoming).

The Forms

Rims and rim to shoulder profiles found in East Anglia have been given a coded description in the forthcoming Wardy Hill report (Hill and Horne). For comparative purposes the few rim to shoulder survivals from Prickwillow are described below and illustrated (Fig. 19).

1) Vessels with angular profiled shoulder and neck (carinated) Form J.1 (Fig. 19,1)
2) Jars with an upright neck and rim rising form a pronounced 'dog-leg' shoulder Form B.2 (Fig. 19, 6 and 7)
3) Ovoid or rounded vessels with no neck and direct rims. Forms K.1 and K.2 (Fig. 19, 9 and 13)
4) Slack shouldered or ovoid necked vessels with everted and/or expanded rims. Forms D.4 and D.6 (Fig. 19; 5, 9 and 11)
5) Round shouldered vessels with round necks and everted rims (S-profile types). Form F.1 (Fig. 19, 14 and 15)

There is only one complete profile in the pottery assemblage from Prickwillow Road and this is the small neckless bowl from Pit 8 (Fig. 19, 19). The vessel is only 8.5cm in diameter and 6cm deep. It is a type that occurs throughout the LBA and Iron Age period, and is not diagnostic for dating purposes.

Vessels of early type represented in the assemblage include carinated bowls, and long necked jars, whereas the types from the midden include ovoid or round shouldered jars with flat topped and expanded rims, both plain and decorated. A number of small rim sherds from the site probably derive from bowls or small jars with short upright rims, but there appear to be few of the globular forms common on other local sites such as Wardy Hill.

Most of the handmade pottery found in association with LIA or early Roman wheel-turned material is probably of the same period. Although there are few rim to shoulder profiles surviving, they include those from vessels of S-shaped profile or other round necked forms, usually in dark sandy wares, as well as rims rounded and expanded externally.

Surface treatment and decoration

There are four examples of finger ornament on the shoulder, but only three with decoration on the rim. The latter includes the finger impressions on the large scored jar from the Midden which could perhaps equally be described as a moulding (Fig. 19, 9).

There are only three decorated sherds of note. One has slash decoration on the body, and the two other have traces of shallow tooling of probable La Tène type (Fig. 19, 2–4). Scored ware is present in the assemblage but is not common. Apart from the sherds from the large jar referred to above, there are only four other sherds from the site. There are few sherds where a burnished surface survives, but there is an example from a vessel in an unstratified context, with a broad burnished band on the neck.

Use

There appears to be the normal ratio of fine and coarse wares at Prickwillow Road, although thick walled sherds that are likely to derived from large jars are not common. Sherds with food residues are rare (around three examples). The small complete pot from Pit 8 is likely to have served as a bowl or perhaps a drinking vessel. It is possible that the large scored jar found in the midden, with a rim diameter of 45cm, may have been a container for goods brought to the site (see below).

Phases and dating

Early pottery (*c.* 5th–3rd centuries BC)

Most of the pottery from the Prickwillow Road can be dated to the middle or late Iron Age period but there is evidence of activity beginning in the excavated area perhaps from the 5th century BC. Most of the early pottery was recovered from the pits or the first two phases of Enclosure 1. Most of the pits had no later Iron Age pottery. This implies that most of the pits within the excavation are from Phase 1 though a few such as Pit 8 are clearly from Phase 3.

Potentially early pottery is illustrated by the presence of four sherds with finger tip decoration, one with diagonal slash ornament on the shoulder or body, and two sherds from carinated bowls (see Table 2). Pottery of this type can be found on sites dating from the beginning of the LBA–EIA period until the end of the 4th or early 3rd century BC. However, there is no post Deveril Rimbury decorated wares in the assemblage and in the context of the site the early pottery is likely to date from the 5th/4th centuries BC. A vessel with slash decoration on the body occurred in an assemblage from Gretton, Northamptonshire in a feature which was dated by radiocarbon to almost certainty before the 3rd century BC (Jackson and Knight 1985, Table 1). It has been found on two other Northamptonshire sites at Brafield (unpublished in Northampton Museum) and Wilby Way (Thomas and Enright forthcoming).

In addition to the early forms and decoration the sherds in flint gritted fabrics appear to be of early date (fabric 4). They occur mainly in the pits and burials clustered in and around the circular enclosure (Table 2). There is a maximum of three flint gritted sherds in each context, with most contexts containing only one. There are six sherds, presumably residual, from features clearly LIA or Roman in date. There are also a higher percentage of shelly fabrics from the features with early pottery in.

Table 5. *Distribution of early Iron Age diagnostic pottery and Fabric 4*

Feature	Body Decoration/ Carinate bowls	Fabric 4
Pit 1	*	
Pit 2	*	*
Pit 3	*	
Pit 5		*
Pit 6	*	*
Pit 8		*
Pit 16		*
HB 11		*
HB12	*	
Dog burial		*
Ring ditch		*
Enc Ditch		*
Ditch 2		*

The midden

There were 15 rim sherds in the assemblage from the midden or hollow and most are of MIA type. However, a few of the rim forms appear to date to the LIA-early Roman period, perhaps suggesting that the feature either filled over a long period of time or the late pottery is intrusive.

Several of the rim sherds, particularly those that are flat topped and expanded externally are probably more common in the period between the mid 3rd century BC and the end of the 2nd century BC than they are in the later MIA (Fig. 19, 9–12). This is true with from the local sites as well as from Northamptonshire, where in the later MIA direct rims and globular forms predominate for example at Hunsbury (Fell 1936) and Weekley (Jackson and Dix 1986/7). At Wardy Hill similar rim forms are associated with 2nd century BC radiocarbon dates (Hill and Horne forthcoming).

Shelly fabrics are less common in the midden group than they are in the early pottery material group (40% as opposed to 78%). The sherds from a large scored jar found in the midden contain abundant flint and other grits (Fabric 5) as well as a finger impressed rim (Fig. 19, 9). The vessel has a long rim in an early tradition but radiocarbon dates from Northamptonshire from sites such as Gretton where scored ware was absent (op. cit.) and Twywell (Harding 1975), suggest that vessels with deep random scoring are unlikely to be any earlier than the early 3rd century BC.

The Enclosure Ditch

Most of the pottery from the enclosure ditch came from the upper levels, particularly from the outer ditch, and the small amount of diagnostic pottery recovered appears to be of mixed date, including a little wheel-turned material. There are only 10 sherds in total from the inner ditch, including a rim sherd from a vessel with a direct rim and long upright neck of early type (Fig. 19, 8). Some 56% of the pottery from the enclosure ditch contained shell.

Pottery from LIA and Roman features

The wheel turned LIA and early Roman pottery is described with the Roman material (D Mackreth below). There is little obvious residual material amongst the handmade pottery and much of it probably dates to the 1st century AD. Rim forms are typical of this period and include examples that are rounded and expanded externally, and necked jars or bowls in dark grey ware. There is little evidence of 'Belgic' grogged wares in the assemblage but there is an increase in pottery containing coarse shell (Fabric 3).

Discussion

Although it is a relatively small assemblage the pottery from Prickwillow Road has raised a number of interesting points for discussion. For example, although possible EMIA sherds have been found locally at Watsons Lane (Bradock and Hill forthcoming) and West Fen Road (Hill 2000), no EIA sites have yet been identified in the Ely area. Hurst Lane, Ely, however, probably has occupation from at least the 4th century BC (JD Hill pers comm). It seems likely, however, that some of the pits at Prickwillow date to the latter end of the EIA period. Again Dr Hill has found that flint gritted sherds from the area are generally Bronze Age in date, but at Prickwillow Road part of the Iron Age assemblage is flint gritted. The scored ware jar from the midden, with a fabric that contains flint, is unlikely to be much earlier than the 3rd century BC.

Although shell is common in the pottery from Haddenham V, to the east of Ely, there appear to be more shelly fabrics in the Prickwillow Rd assemblage, particularly in the early pottery assemblage, than there are from other local sites such as Wardy Hill and Watsons Lane. In a petrological report on the pottery from Wardy Hill and Haddenham V, Dr Williams states that although some fabrics are not local, the majority of the pottery is made from clay found in the vicinity of the site. It is important to note, however, that only one or two clay sources were probably in use at any time (JD Hill pers comm). This could explain differences in the fabric from sites in the same general area, and even different inclusions in different phases from the site.

Vessels that may have been imported from elsewhere include jars that may have been used as containers for goods, and perhaps specially made for this purpose. The large flint gritted and rather crudely made jar from the midden may have been such a vessel. There are several unpublished assemblages from Northamptonshire where most of the scored ware derives from one or two thick walled vessels from few contexts.

Globular forms with simple rims predominate in the local assemblages such as Wardy Hill, but this type is poorly represented at Prickwillow Road. This need not be significant, however, as at various times the main area of activity or occupation may have been outside the excavated area.

Illustrated Iron Age Pottery (Fig. 19)

(Colour of exterior, core, and interior coded in order: br=brown, gr=grey, bl=black, or=orange and dk=dark)

Early pottery sherds 1–10 (5th to 3rd century BC)

1. Carinated bowl. Smooth dark grey ware. Fabric 1. (Pit 1)
2. Decorated body sherd. Smooth. Fabric 4. (Br, dk gr, dk gr) (Pit 2)
3. Decorated body sherd. Fabric 1. (Br, dr gr, dk gr) (Pit 3)
4. Decorated body sherd. Fabric 4. (Br, bl, bl) (Pit 29-Phase 4 residual)
5. Bowl? In burnished black ware. Fabric 4. (Pit 7)
6. High shouldered jar. Hard and gritty. Fabric 6. (Dk,br, dk gr, dk gr) (Ditch 1)
7. Similar to No.6. Residual in phase 3. (Dk br,dk gr, br) (Pit 28-Phase 3 residual)
8. Bowl? In fine dark grey to black ware. Fabric 1. (Enclosure 1)

Later pottery sherds 9–19

9. Coarse ware ovoid or round shouldered jar. Grooved scoring, particularly in the neck area. Finger impressions moulding and/or decorating the rim. Fabric 5. (or-br, gr, gr-br) (Midden)
10. Slack sided jar? Deep finger tip/nail impressions on the outer edge of the rim. Fabric 2. (br, dk gr, dk gr) (Midden)
11. Expanded rim of a jar. Fabric 1 with sparse flint. (Or-br, gr, dk gr) (Midden)
12. Rim sherd with finger tip impressions on top of the rim. Fabric 6. (Br, gr, dk gr) (Midden)
13. Vessel with broad burnished band on the neck. Fabric 6 (sand and sparse grits). (Bl/br, bl, dk gr) (Tree-throw pit?)
14. Round necked vessel (S-profile?). Fabric 6 (Bl, bl, dk gr) (Pit 9)
15. Jar with out-turned rim. Fabric 6. (Bl, dk gr, dk gr) (Enclosure 1)
16. Body sherd with shallow tooled decoration. Fabric 6? (sparse quartz). (Bl/br, bl, bl) (Ditch 18-phase 5 residual)
17. Base sherd. Fabric 6. (Gr/br, dk gr, dk gr) (Midden)
18. Fine ware jar or bowl. Possibly wheel turned. Fabric 6. Dark grey ware. (Ditch 18-phase 5 residual)
19. Small bowl or drinking vessel. Dark grey ware. Fabric 1/2. (Pit 8)

Roman pottery

DF Mackreth

The Roman pottery has been defined as the wheel-turned, as opposed to handmade pottery from the site. This comprised 3 215 sherds (58.55 kg). In reality the distinction between the Iron Age and Roman (1st to 4th century) pottery is somewhat artificial, as some of the early wheel turned pottery is probably

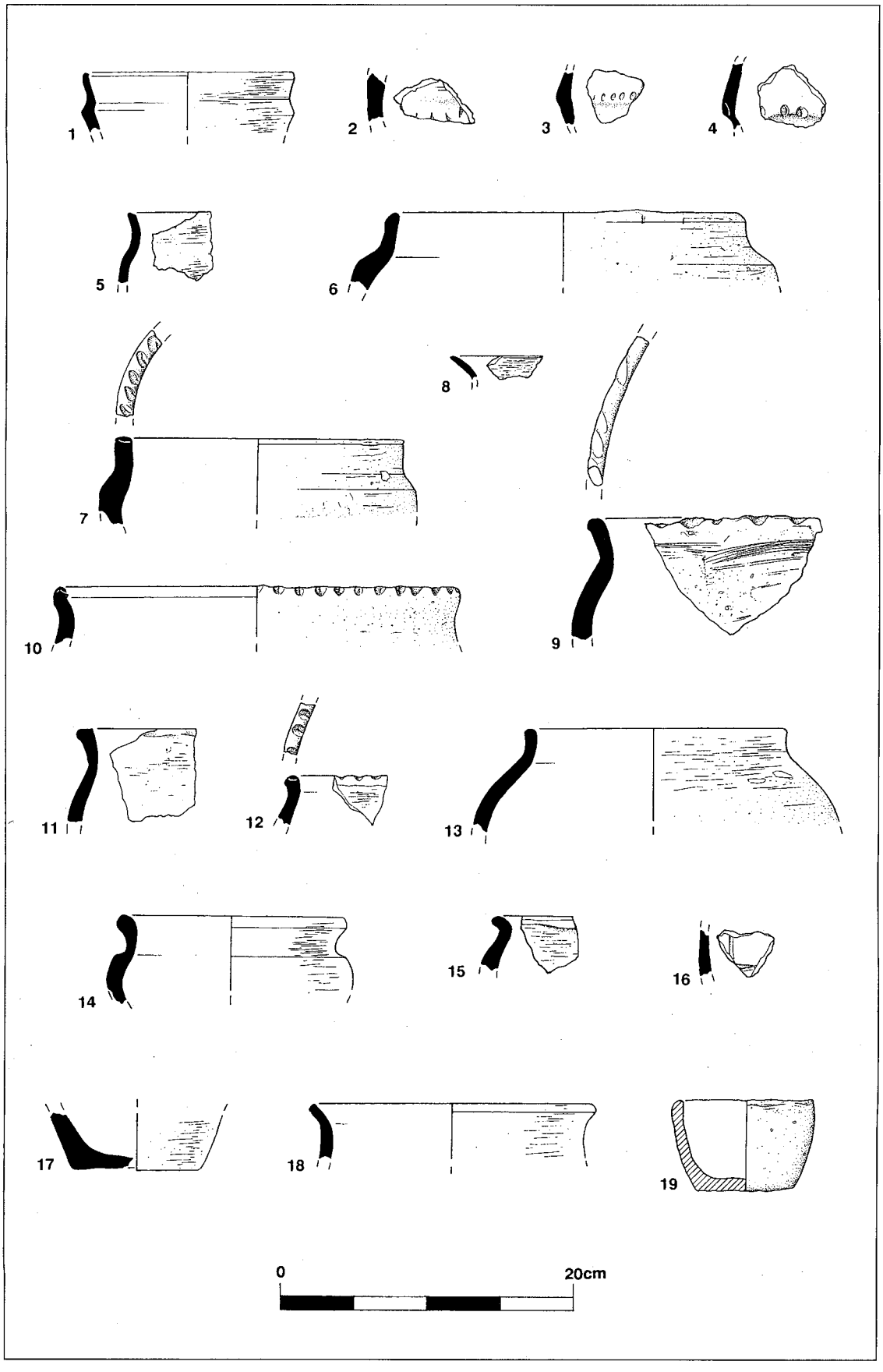

Figure 19. Iron Age Pottery

contemporary with the late handmade Iron Age pottery. A few features on the site contained both late handmade Iron Age and early wheel-turned Roman pottery. Recent indications are that both wares were used side by side until well into the Roman period in the Fenland. For example, at Wardy Hill 1st-century AD wheel-made forms commonly occur alongside later Iron Age handmade wares.

The pottery collection is typical for a generalised rural site. The absence of any 1st-century samian tends to suggest that the settlement was not of high status, though it must be pointed out that the core of the settlement was initially to the north and north-west of the excavation area.

The analysis of the pottery is given in a set of tables covering Phases 3–7 giving the fabrics against features.

The principal fabrics are the local ones: the two types of sandy ware and Horningsea. One might add the shelly wares, but there are reasons for thinking that they are not particularly local (see discussion of Phases 5–7). In the tables, S1 stands for sandy grey, and S2 for sandy grey with firing effects giving on the whole a red or brown tinge to all or most of the core, the usual finish for each being a reduced or fumed surface. The sandy wares are the commonplace wares of the 1st century onwards. Five kiln bars and a kiln spacer were recovered from Phase 3 to 7 contexts. It is likely that production of pottery would be sandy grey wares. It is unlikely pottery production on the site continued beyond the 2nd century. Small pottery kilns normally date from the 1st to the 2nd centuries when larger scale pottery centres dominated production.

Horningsea (HG) is a different matter. The fabric is again sandy, but often has inclusions which, with the manufacturing and firing techniques, make the ware, or wares, distinctive. The most famous form is the giant storage jar with its exaggeratedly splayed rim and the combing found inside and out. Horningsea was in local production from at least the later 1st century onwards. The difficulty is working out just how much of the undistinguished S1 and S2 wares also emanated from this production centre which is only about 20 km away.

The first two form 77% of the sherds in Phases 3, dropping to *c.*40 % in Phases 6 and 7. Horningsea, on the other hand, begins at 12%, in Phase 3 (and this may be contamination) rising to 19% in Phase 5 and ends up as 24% in Phase 7, the high 38% in Phase 6 being largely due to one pot.

The same pattern as Horningsea is also true of Black-Burnished ware (BB) which assumes a minor impact in Phases 5–7. It is, however, an exotic in the same sense that Oxford (OX) and Hadham (HD) are as well, the latter two forming an important dating horizon for Phases 5–7. The table for Phase 7 has one sherd labelled Huntcliff. It is a rim, but lacks the groove of the type pottery. However, it is noticeably black and, unlike all the other shell-tempered wares, has large pieces of shell. A similar ware appeared at Orton Hall Farm and, along with Trent Valley ware on that site, seems to mark the last assemblages to be expected.

The major centre which should have been expected to have supplied a significant quantity is the Lower Nene Valley Industry (NVCC, NVGW). The first is prominent in its way, the second is more difficult to assess. The grey ware is characterised by an almost white body with a fumed surface, often a silvery grey. In this, it may be counted as a terra nigra derivative and it is certain that there were other centres in the later 1st and 2nd centuries. In effect, however, these are not significant until Phases 5–7. In the last phase, NVGW is only 12.5% of the colour-coat content falling from the 14–15% of Phases 5–6.

The typical Roman utilitarian pot, the mortarium, does not seem to arrive until Phase 5, but the stamp from Phase 7 must belong to Phase 4 to mid Phase 5. On the whole, mortaria were not common, the very small number of sherds, 12 for all the Phases. The other wares, grogged (G) and samian (TS) are not important, all the samian being 2nd century.

All in all, the pottery spectrum reflects that found elsewhere. The local manufactories were replaced to some extent by products from big centres such as the Nene Valley, Oxfordshire and Hadham from the later 2nd and 3rd centuries.

Shell-tempered ware (SH) did not really start appearing until Phase 5 when it formed *c.*15% of the total, falling to about 9% in Phase 7. There is no sign that it had formed a proper early Roman presence, which might have been expected, and it seems probable that it was of non-local manufacture.

Key to pottery tables: S 1 (Sandy ware 1); S 2 (Sandy ware 2); G (Grog); SH (Shelly); HG (Horningsea); HD (Hadham); NVCC (Nene Valley Colour Coated); NVGW (Nene Valley Grey Ware); TS (Samian); BB (Black Burnished); OX (Oxford); O (other); M (Mortarium); Hunt (Huntcliff).

The 262 hand made sherds found in Roman contexts have not been added to the tables.

Table 6. *Phase 3 Roman pottery (1st BC- mid 1st AD)*

Context	S 1	S 2	G	SH	HG	HD	NVCC	NVGW	TS	BB	OX	O	M	Total
D3											1			1
D5	1	1												2
D6		1												1
Pit 8												4		4
Pit 26		6		1										7
Pit 28	19	20			8									47
Total	20	28		1	8						1	4		62

Table 7. *Phase 4 Roman pottery (later 1st century - mid 2nd century)*

Context	S 1	S 2	G	SH	HG	HD	NVCC	NVGW	TS	BB	OX	O	M	Total
D7		1		4										5
D11													1	1
D13	3								1					4
D14	7	12												19
D15	20	17			10		1		4			8		60
D16	7	11			2		2	1						23
D41	2													2
Pit 29		2												2
Pit 30		1												1
Pit 31	3													3
Pit 32	19	8												27
Pit 33					5									5
Pit 34		2												2
Pit 35		2												2
Total	61	56		4	17		3	1	5			8		156

Table 8. *Roman Pottery Phase 5 (mid 2nd century - mid 3rd century)*

Context	S 1	S 2	G	SH	HG	HD	NVCC	NVGW	TS	BB	OX	O	M	Total
C1	1							1						2
C2	1	1				1								3
C3	2													2
C4		1												1
C5	5													5
D17		2										1? cc		3
D18	5	15	1				7					2		31
D19	19	19	1	35	39	1	6	2	3		2	Slip	1	128
D20	1	1		3										5
D21	1	3			1		1							6
D24		6		1		2								9
D25	1	7	2		3		2							15
D26	5	11			9		2					11+1 mica		39
D27	1													1
HB14	6	3		2	1		3				1			16
Pit 36		1								1				2
Total	48	73	4	41	54	4	21	3	3	1	3	16	1	271

Table 9. *Roman pottery Phase 6 (mid 3rd century–4th century)*

Context	S 1	S 2	G	SH	HG	HD	NVCC	NVGW	TS	BB	OX	O	M	Total
Enc 4	7	5		1	3	1	2	1?	1	2	1			23
Enc 4	1	4		2	1	3	1		1					13
Enc 5	7	19		7	10	1	4	2?		1	3	2	1 OX	57
Enc 6	9	4		3	7	1	1	1		2	1	Slip		30
Enc 7	5	7	1	2	1?	1	2		1	3	1			24
Enc 8	8	14			1		3			1?	1			28
D28	1	5		1		1					1	1	1 OX	11
D29	5	5			4	1	1		1	1			1	19
D30	2				1									3
D32	1	1		2			2							6
D33	13	5		1	106 + 3?	2	3							133
D40	3	9			4 ?+2		3							21
D42	3	11					1							15
Pit 37	3	7			18									28
Pit 38	1									1?			1 NV	3
HB6				1			3							4
HB13			1											1
HB20	1													1
Total	70	96	2	20	161	11	26	4	3	11	8	4	4	421

Table 10. *Roman pottery Phase 7 (4th century). * recut; ** 2nd recut*

Context	S 1	S 2	G	SH	HG	HD	NVCC	NVGW	TS	BB	OX	O	M	Total
Enc 9	14	15		13	10	9	10	2	2	1	2?	4	1 OX	83
Enc 9*	6	2		2			2			1				13
D44	27	22	1	8	17	2	14	4	2	3		47	2NV	149
D34	2			3	1	1						1		8
D36					1									1
D37	15	31		3	19			2	2	2				74
D37*	42	28		5	103	1	4							183
D37**	17	14		4	23		6		3	1		1+Hunt.	2	72
D38	4		2	8		4	13		1			11	1	44
D39	1	14												15
D40	20			15		9	13						1 OX	58
O1	1													1
Total	149	126	3	61	174	26	62	8	10	8	2	65	7	701

Key to pottery tables: S 1 (Sandy ware 1); S 2 (Sandy ware 2); G (Grog); SH (Shelly); HG (Horningsea); HD (Hadham); NVCC (Nene Valley Colour Coated); NVGW (Nene Valley Grey Ware); TS (Samian); BB (Black Burnished); OX (Oxford); O (other); M (Mortarium); Hunt (Huntcliff).

The 262 hand made sherds found in Roman contexts have not been added to the tables.

Illustrated Roman Pottery (Figs 20 and 21)

1 Bowl, hand made, burnished inside and out, tall slightly everted rim, two cordons on shoulder and possibly a cordon marking the carination. Fine sandy with red grits and some finely crushed shell, fired black. The form is slacker than the standard 'Belgic' bowl which develops into the well-known concave-necked bowl (see 2) and is not properly represented at such fairly well-dated Late pre-Roman Iron Age sites as Foxholes Farm (Partridge 1989), Skeleton Green (Partridge 1981), and the King Harry Lane cemetery (Stead and Rigby 1989). This suggests that the pot is 1st century BC and probably before 50/25 BC. Hardly any other sherd was seen. Phase 3 (Pit 8).

2 Concave-necked bowl/jar. Although the rim is lost, this is a fairly typical of the late pre-Roman Iron Age tradition. Hard, fine sandy with grits, fired black with traces of burnishing on the outside, and probably wheel-thrown. Mid 1st century AD. Phase 3 (Pit 28).

3 Mainly very fine sand with grits, reduced firing conditions finishing with an oxidising episode resulting in an orange skin. Extravagant form almost certainly from or near Rushden, Northants (Wood and Hastings 1984, 100, fig.9.39,201). The slightly outwardly splayed bulge at the top is decorated with finely and lightly incised vertically combed bands. Above the bulge is a constriction with the remains of three fine cordons, below there is another with four more, then a pentice with a cordon on a carination beneath which had been the base. The date range is likely to lie between AD50 and 75. Phase 3 (Pit 26).

4 Reeded-rim bowl form, most probably with no carination, and with roughcast on the interior. The latter is not really to be expected at the end of the 1st century. This may be earlier than AD70/80 and should have derived from a phase 3/4 deposit. Very sandy with occasional grits, fired hard with reduced core and oxidised range skin. Phase 5 (Ditch 18)

5 Cook-pot-plain bifid cavetto rim with smudged groove at the base of the shoulder. Very sandy, hard fired, basically reduced but with an oxidised phase. Phase 4 (Pit 30).

6 A cook-pot, the lack of a neck is an early trait. Fine sand and oxidised to a very pale grey, the surface is fumed and the top of the rim and exterior smoothed. This is in effect a terra nigra imitation fabric. Late 1st–early 2nd century. Phase 4 (Ditch 16).

7 Bowl. Sandy with many grits, and oxidised to an orange. The form is that of a bowl with a slight inturn at the rim which is pressed down outside and a groove along the top. There is a blob of paint on the rim. The whole may once have been cream, refired to its present colour. A later more open form, also with blobs of paint, made in the Nene Valley in cream ware is dated to the 3rd century (Mackreth 1996, 152, fig. 96,388; Perrin 1999, 33, fig. 19,146), but could have a range at the earlier end of *c.* 150–225 (*ibid*, 111, 66, fig. 45,349–50). Phase 4 (Ditch 16).

8 Dog dish in a version of terra nigra ware, (see 6). There is a groove on the outside which reduces the top of the rim to a bead. Shallow with a knife-trimmed chamfer, late 1st–2nd century. Phase 4 (Ditch 16).

9 A bottle of some form whose shoulder seeps up to a plain rim. Hard-fired, basically grey, sandy with very sparse white inclusions which look like fragments of shell: possibly Horningsea. Phase 5 (Ditch 19).

10 Classifiable as a cook-pot. Hand-made, this is close to the last in form but with a wider opening. Buff-orange with a reduced core, the fabric is like the last but with more white inclusions and some black grits. Possibly 1st century. Phase 5 (Ditch 19).

11 Cook-pot with simple cavetto rim. Possibly Horningsea, probably 2nd–3rd centuries. Sandy with mixed clear and dark grits and the very occasional white inclusion, oxidised orange with reduced skin. Phase 6 (Enclosure 6).

12 Cook-pot with a cavetto rim whose outer edge is squared. Ogee neck and shoulder, the latter having some grooves at the beginning of the body. Hard-fired, shell-tempered, possibly with a little sand. Probably late 2nd and 3rd centuries. Phase 5 (Ditch 20).

13 Cook-pot with an out-turned rim almost squared, whose shoulder is a slope and whose upper body has a series of facets, the date may be slightly earlier than the last. Fairly hard-fired, shell-tempered with some sand, Phase 5 (Ditch 19).

14 Oxford mortarium, rim of bowl with cordon. 3rd–4th centuries. Phase 6 (Ditch 28).
15 Cook-pot with a squared-off everted rim with a slight groove at the base of the outer face. The short neck ends with a series if cordons, or rillings, down the shoulder. Same fabric as 11, Horningsea, but no white inclusions, date: 3rd–4th centuries. Phase 6 (Ditch 40).
16 Storage jar rim, typical Horningsea. Sandy fabric with grits, including occasional crushed flint, reduced pale grey core with oxidised orange skin. 3rd into 4th century. Phase 6 (Enclosure 5).
17 Bowl/jar with cavetto rim and a rounded shoulder finished below with a groove. Fired a dark grey, the fabric is tempered with a very fine sand and plentiful mica which gives a generous sparkle to the surfaces. Probably residual in this phase. Phase 6 (Enclosure 5).
18 Basically a flanged pie dish, the fabric is charged with a finely crushed shell with no obvious sign of any sand. The flange is slight with a groove on top, the main part of the rim is reeded. The style is found in the later 3rd and the 4th centuries. Phase 6 (Enclosure 5).
19 Dog dish in a type of Black Burnished fabric and finished with burnished lines, possibly handmade. The dish is deep and should be later 2nd century and later. Phase 6 (Enclosure 5).
20 Nene Valley colour coat; the interior is fired a red-brown, the outside is a very dark brown and has a fine cracalure. The interior has the white painted decoration to be expected on this form. Mainly 4th century. Phase 6 (Enclosure 7).
21 Cook-pot, fired in reducing conditions except at the end when it was oxidised to a dark red-brown. The rim is slightly everted and is thickened at the end; the neck is upstanding with a slight mark at the top of the shoulder which is faintly combed horizontally, this getting stronger on the body. Moderately tempered with crushed shell, A fairly typical product for the later 3rd and 4th centuries. Phase 7 (Ditch 43).
22 Nene Valley mortarium, there is no trace of colour coat. The standard reeded flange has gone, there being only a slight cordon next to the bead. The nearest parallel at Orton Hall Farm is dated 250–350+ (Mackreth 1996, 196, fig. 116,142), while a closer one from Durobrivae is dated as probably 350–400?+ (Perrin 1999, 132, fig. 78,M52). Phase 7 (Boundary Ditch).
23 Nene Valley bowl, complex rim, over-fired. This has parallels in the Stibbington well deposit and occurs in very late contexts at Great Casterton (Perrin 1981, 457, fig. 27.2,23: Perrin 1999, 104, fig. 64,263): late 4th century and later. Phase 7 (Ditch 43).
24 Hadham bowl jar, small in size. There is a short neck under the everted rim, a sharply defined and narrow shoulder. The body of the pot was decorated in a series of diagonal slashes with a dot in each triangle so formed. This type appears late on sites on the western margins of the Fens. Phase 7 (Enclosure 9).
25 Oxford hard-fired ware, a bowl of exaggerated f36 form whose rim has a bifid end. There is no trace of slip and the rim is decorated on top with a three-strand wavy pattern in relief whose outer margins have been damaged in finishing. Green's C50.3; he gives the date as being after 325 (Green 1977, 160, f.59, C50.3). Unphased, probably derived from Phase 7.
26 Mortarium and stamp by *Kay Hartley*. Heavily worn and slightly burnt mortarium with stamp reading [,]\NCOR (or *lambda* L)| [,]\ETVS. Another example from Godmanchester is unpublished. The name was probably Ancoraetus. Form and fabric indicate production in the upper Nene valley and are so identical with those of Vediacus that he must have been contemporary and could well have worked in the same workshop. Vediacus probably worked in the Piddington/Wellingborough area AD 140/150–180. See Hartley in Rollo 1994 18–20. Phase 7 (Ditch 37 recut).
27 Bowl/jar, pale grey, 2nd–3rd centuries. Complete profile, very little sand with white inclusions, Phase 5 (C1).
28 NVCC beaker, Complete profile, small; 2nd century after 150. Phase 5 (C1).

Other finds

Ian Meadows

A total of 201 small finds were recorded (excluding flint, above). Each has been described and measured and a full descriptive catalogue is retained in the archive. The site was thoroughly metal detected both during and after machining and most of the metal finds were recovered by this means. The metal assemblage is typical of many sites of Iron Age and Roman date with few unusual items. The non-metal finds include glass, fuel ash residue, pottery kiln furniture, wall plaster and quern stones. They are listed (Table 11) and described below by functional category.

There was little evidence for industrial activity on the site. A small amount of fuel ash found in Iron Age and Roman contexts could be from heating or cooking. Fragments of kiln bars and a kiln spacer indicate Roman pottery production. Quern stones were found particularly in later Roman contexts but suggest flour production only on a domestic scale. There were only a handful of tools and fittings. The only iron objects, other than nails, were two iron rod fragments of uncertain function and a single stylus. Personal items included a number of pieces of jewellery. Two Iron Age brooches were recovered and seven bracelets were found in the graves of the Roman cemetery.

Personalia

Iron Age brooches

DF Mackreth

There were a copper alloy and an iron brooch from unstratified contexts. Both were Late La Tène and have an integral four-coil-internal-chord bilateral spring (Fig. 22, 1 and 2). The copper alloy one has all the hall-marks of having been a classic Nauheim, only the absence of an open-framed catch-plate preventing absolute certainly. However, the remains of the decoration should show that it had been a Nauheim as it is hard to find this kind of ornament on brooches with solid catch-plates. There is one example from Fox Holes Farm, Little Amwell, Herts, (Partridge 1989, 132, fig. 76,5). The date is likely to be 70/60–30/20 BC. The iron brooch bow has a high arc and a thin, almost circular, section. The catch-plate is largely missing, but had at least one large piercing. The form is in effect that of a *'Drahtfibel'*, the lack of a truly circular-sectioned rod-like bow is almost certainly due to the material used. This brooch seems similar to one

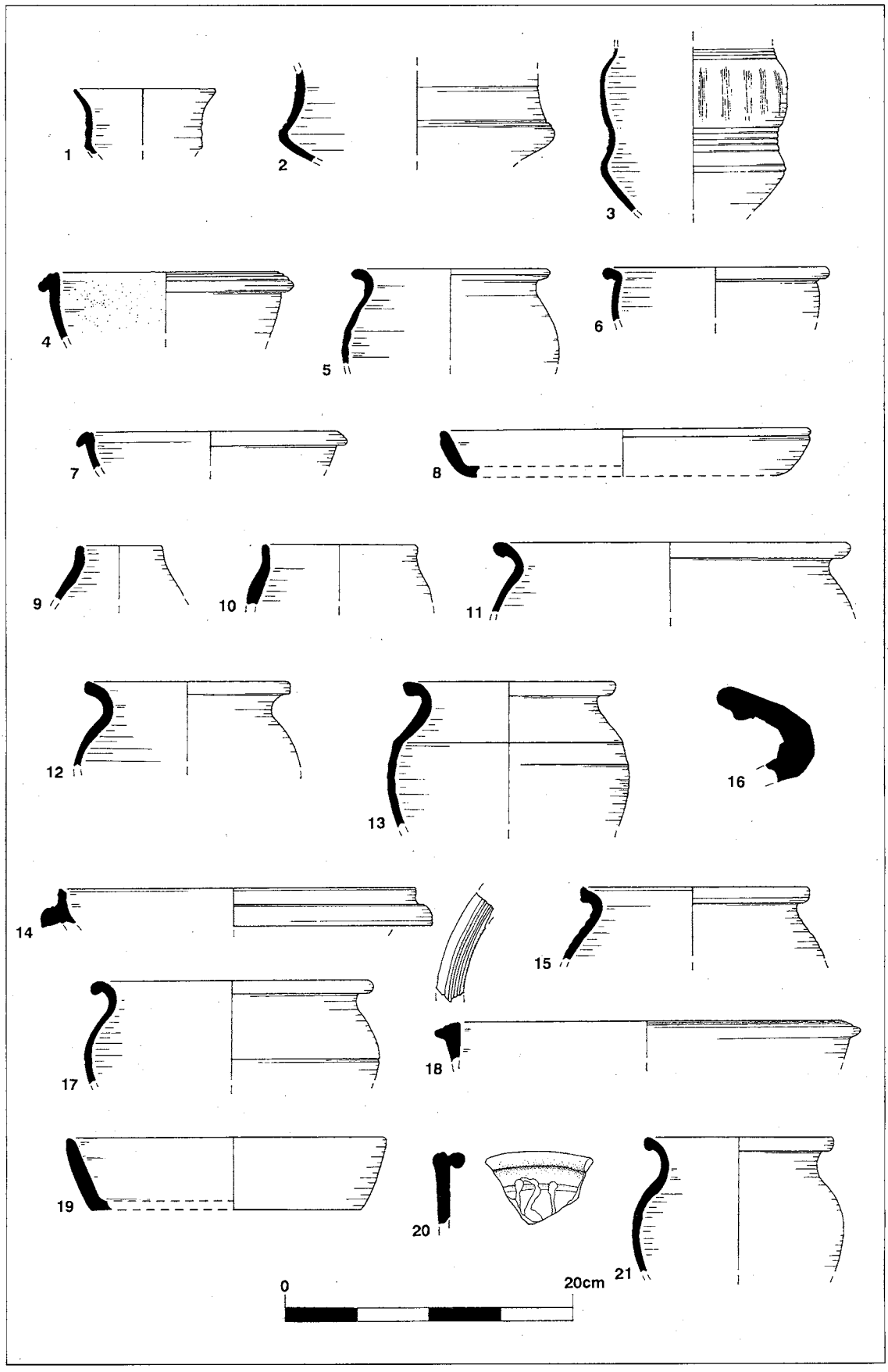

Figure 20. Roman pottery

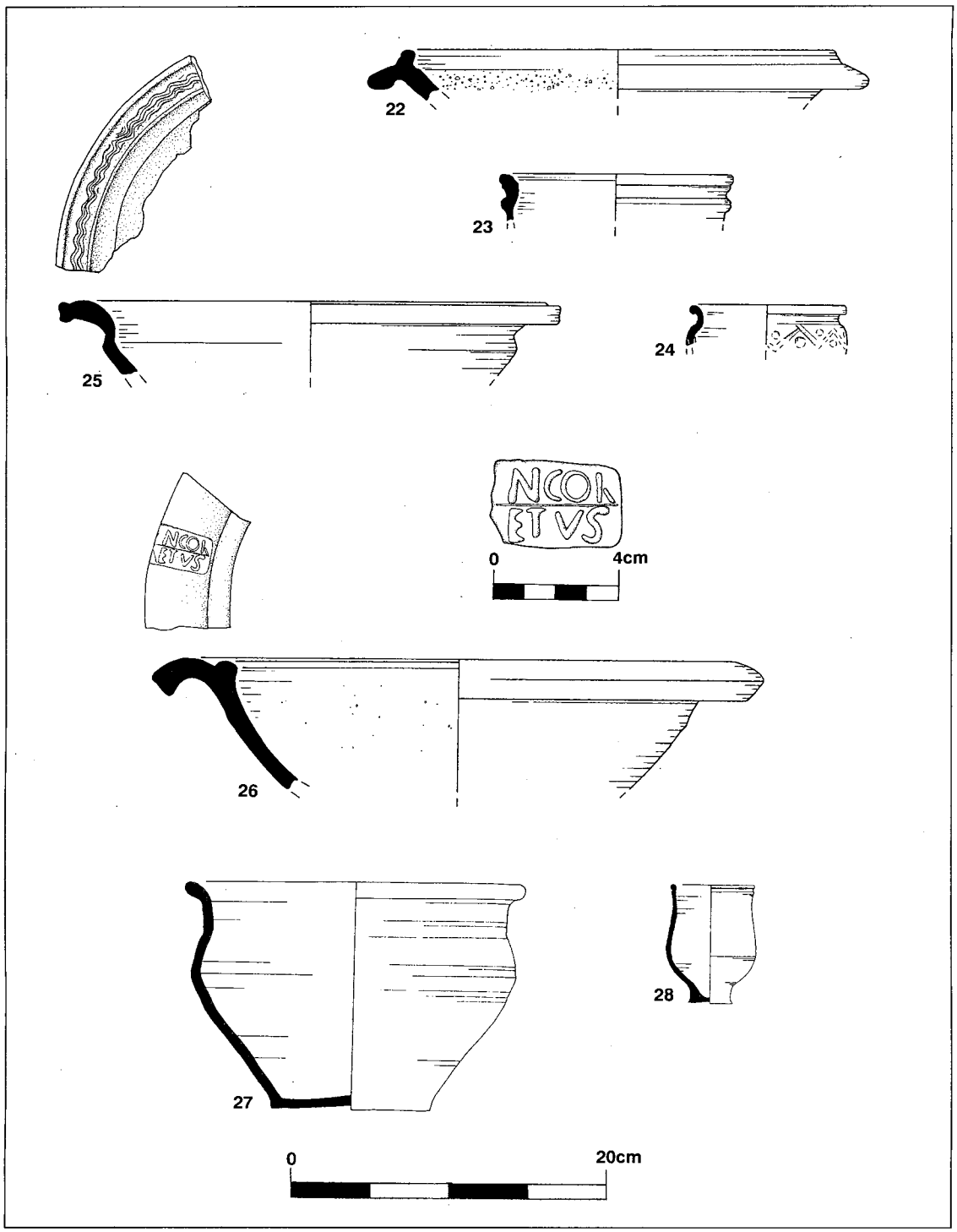

Figure 21. Roman pottery

represented on the coins of Criciru (Allen 1972) which means that it should date to *c.*40–60 BC.

Iron Age bead

A possible Iron Age bead was found in Pit 6 (Phase 1). It was a small, annular, and of opaque red glass with an external diameter of 2.5mm. This piece does not readily conform to the types in Guido 1978.

Roman grave goods and hobnails

Seven Roman bracelets were recovered from three separate Phase 6/7, inhumation graves. Five were intertwined, 1 shale, 3 copper alloy and one a mixture of copper alloy and iron, and buried behind the head of Burial 10, a woman aged 22–27 (Fig. 22, 3–7; Figs 16 and 17). The presence of mineralised organic remains on the iron element perhaps suggests they were buried in a bag. Four of the bangles had internal diameters between 60 and 65mm but one was only

Table 11. Other finds by function

Functional Category	Quantity
Personalia	
Costume and jewellery	21
Hobnails	84
Equipment and Furnishings	
Household equipment	5
Coins	30
Carpentry nails	26
Vessel glass	5
Miscellaneous copper alloy	8
Antler/peg	1
Industry	
Pottery kiln furniture	6
Fuel ash residue	714(g)
Lead weight	1
Lead pot mend	1
Quernstones	11
Structural	
Wall Plaster	3990(g)
Fired clay/daub	3734(g)
Tile	1120(g)

49mm. The smallest example was plain while two of the bangles were decorated with alternating notches, similar to that described by Crummy 1983, (no 1654), which was of late 3rd century date.

Single, unworn, bracelets were found next to two adult females (Burials 17 and 18). A bangle made from three strands of wire twisted together to form a tight spiral was found with the former, it was similar to Crummy's no. 1628 (*ibid*, 38). The majority of this type of armlet are of 3rd or 4th century date. A second three-strand bangle came from Burial 18. Its ends were sleeved in thin sheet metal from which originally extended a pair of hooks or a hook and eye (Clarke 1979, G188 249).

There were 84 hobnails, 78 of which came from Burial 1. Three small hobnails were found in Cremation 2 and two in Cremation 5. A single intrusive hobnail was found in the top of the Iron Age enclosure ditch.

Other personalia

There were 11 other items of Roman personalia were found on the site. Nine were of copper alloy. Two of these were buckles, one a D-shaped buckle from Ditch 19 (Phase 5) and the other, unfortunately unstratified, a large composite zoomorphic piece comprising a pair of dolphins or hippocamps rising to a pellet with an open work plate over a white metal plate (Fig. 23, 8). This type of buckle is characteristically of the 4th century and is normally dated to the second half (Clarke 1979, 275–9). The remaining pieces comprised a single hairpin of Cool Type 10 (Cool 1990, 160, fig. 7 no. 1), found in Phase 5 (Ditch 16; Fig. 23, 9); an unstratified seal box lid (Fig. 23, 10); a pair of tweezers from Ditch 16 Phase 5 (Crummy 1983, 59 no. 1883); and a casket fitting from Boundary Ditch (D44) Phase 7. In addition, three copper alloy finger rings 22mm diameter externally, 17mm internally were found together in Pit 28 (Phase 3).

A Crummy type 3 bone hairpin came from Enclosure 4, Phase 6 (Fig. 23, 11; Crummy 1983, 22) and a small fragment of a plain shale (or jet) armlet, 9mm x 4mm and 2mm thick was also recovered. Several fragments of copper alloy sheet, perhaps decorative mounts from wood or textiles were also found.

Equipment and furnishings

Iron Age antler peg

An antler tine trimmed to form a peg was recovered from the middle ditch of the Iron Age enclosure.

Roman household equipment

Five examples of Roman household equipment were recovered, including a Crummy Type 3 mandolin copper alloy spoon bowl from Ditch 27 phase 5 (Crummy 1983, 69–70 no 2016–19). An iron stylus was recovered from a post-medieval feature (Manning 1985 Type 3), a fragment perhaps a belt stiffener, and a (?) square sectioned object possibly a meat hook but most likely an L-shaped lift key, the closest parallel comes from Great Wakering, Essex (Manning 1985, 90, no. 026).

In addition a unusual find was a 'Swiss army' type composite tool from the backfill of Burial 4 (Phase 6 or 7; Fig. 23, 12). Very few examples of this type of object are known (Sherlock 1988). The Fitzwilliam Museum Cambridge houses one of unknown provenance and Sherlock cites two other examples, including one from London. The piece was possibly used for eating shellfish, as it was too small, at 61mm long, to be comfortably held for long periods. Originally five separate hinged tools were attached to a lion couchant. Its design was partly functional and partly for aesthetics. The lion was roughly modelled with eyes, ears and a snout. The surface of the front paws and mane had been detailed with a series of shallow and short notches. Under binocular microscope examination traces of tinning or other white metal coating could be seen on parts of the lion, but the tools were not similarly treated.

To the rear of the lion there were originally four hinged elements, and a further element below its front paws. The edges of each of the hinge points were decorated with incised notches and all the tools were hinged on copper alloy rivets. Each arm or wing extended 6mm. The 'top' tool extended over the back of the lion to form/represent its tail. This tool is 25mm long and hooked at its end. That the whole item was originally suspended is suggested by the presence of a perforation at the extended end of the paws. Only parts of the individual accessories survived. The tool on the lion's left was complete, 46mm long, and comprised a probe that tapered from a 6mm wide flat piece to a 1mm diameter end. The item that lay underneath the lion was broken, but as the piece tapered it took on a 2mm circular cross section. It was, however, of heavier gauge than the other tools.

The tool on the lion's right was completely missing, but unlike the others, from the corrosion evidence, it had been iron. A single groove along the side of the central piece also suggested that this might have been a small iron knife. The fifth tool was almost completely missing, but it was probably designed to fold back, under the lion and alongside the other tool under the lion so that both would have rested between its thighs.

Coins
Thirty copper alloy Roman coins were found on the site (five from the evaluation and 25 from the excavation). Three of the coins were probably early 2nd century, the remaining 27 all dating *c.* AD268–370. The coin loss pattern roughly mirrors many rural sites of this period.

Nails
Twenty-six larger carpentry nails were found across the site.

Glass
No window glass was recovered but fragments of glass vessels came from five contexts. With only a single exception they were blue glass mould blown bottles common from the mid 1st to later 2nd century, the exception was a splinter of finer glass recovered during sieving.

Whetstones
(Petrological identification by Steve Critchley)
There were two fragments of whetstones including one from Ditch 37 recut (Phase 7). The whetstones are a well-sorted micaceous quartz arenite and a coarse grained metamorphic rock called phyllite (a rock common in Scotland and Scandinavia). Both were probably reused glacial erratics.

Craft/Industry
Pottery kiln furniture
Fragments of five kiln bars, a maximum of 40mm square and a kiln spacer of both reduced and oxidised finish were recovered. They were made from fossiliferous clays, often incorporating chaff and grain. Their presence indicates pottery production on the site, but neither the kiln products or the kilns themselves were identified. The kiln furniture came from contexts spanning a number of Roman phases. The kiln spacer came from Pit 28 (Phase 3), and the kiln bars came from Ditch 14 (Phase 4), Enclosure 5 (Phase 6) and two pieces from Ditch 37 (Phase 7). The small size of the bars and the presence of agricultural material in their fabric might suggest these pieces denote a domestic level of production rather than a part of larger industry.

Fuel ash residue
A few fuel ash residues weighing just 714g were recovered from Iron Age and Roman features across the site. The Iron Age contexts were Enclosure 1 and the Midden. Fuel ash only came from later Roman contexts: Ditch 19 (Phase 5), HB1 and Enclosure 6 (Phase 6) and Boundary Ditch 44 (Phase 7). It is important to note that no iron slag was found. The fuel ash deposits are likely to be from domestic use.

Quern stones
(Petrological analysis of quern stones by Steve Critchley)
A collection of 11 quern stones was analysed; 10 rotary stones (of which two were lava), and one saddle quern. All the stones came from Roman or post-medieval contexts. Seven came from later Roman contexts: two from Ditches 24 and 26 (Phase 5), one from Ditch 32 (Phase 6); three including a complete upper rotary quern, from Ditch 37 or its recuts (Phase 7); and one from Ditch 38 (Phase 7).

Geologically, eight of the quern fragments were of medium to coarse grained sandstones typical of those found within the Carboniferous Millstone Grit and Coal Measures of the South Pennine area. Two were lava quern fragments from Northern Europe, and a probable saddle quern derived (probably locally) from glacial deposits.

Other
A lead weight and lead pot mend were found in Roman contexts.

Structural
Wall plaster
Wall plaster weighing 3.99kg was recovered from the site. It consisted of white wall plaster 2mm thick attached to fired clay daub. All the plaster came from Phase 5 and 6 pits and ditches in the extreme north-western part of the site; over half was found in Ditch 19. The quantity of plaster from the site may imply the presence of a 'romanised' building in the vicinity, possibly on higher ground to the north beyond the excavation. The wattle impressions in the reverse indicate, however, that the building was not of masonry construction and need not have been particularly grand.

Fired clay/daub
Fired clay/daub weighing 3734g was found, of which 2699g came from one ditch (D19), this feature also contained much of the wall plaster. The remaining fired clay/daub was founding small quantities across the site in both Iron Age and Roman contexts.

Tile
14 pieces of Roman tile including 3 sherds of P28 (Phase 3) may be intrusive as Roman Ditches 14 and 18 cut the pit. The other contexts were Ditches 13 and 41 (Phase 4), Boundary Ditch 44 and Ditch 37 (Phase 7). None were in the same contests as the wall plaster.

Catalogue of Illustrated Other Finds (Figs 22 and 23)
1) Brooch, Late La Tène. Copper Alloy, probably Nauheim 70/60–30–20BC. U/S
2) Brooch. Late La Tène. Iron *c.* 40–60 BC. U/S
3) Bracelet, shale, 3rd/4th century, Phase 6/7 HB 10
4) Bracelet, copper alloy, 3rd/4th century Phase 6/7 HB 10

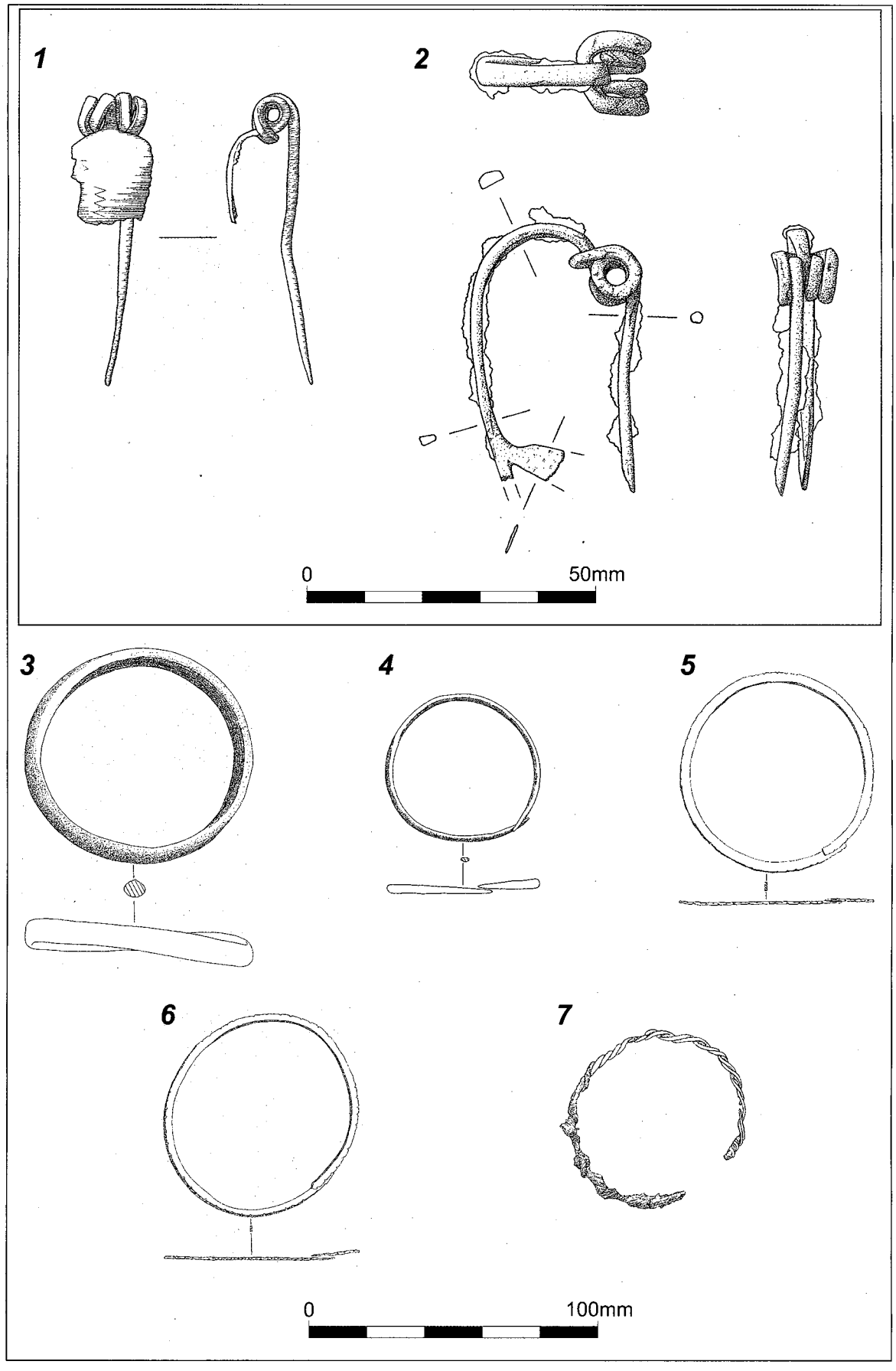

Figure 22. *Small finds. Nos 1 & 2, Late La Tène brooches; Nos 3-7, Bracelets from Burial HB10*

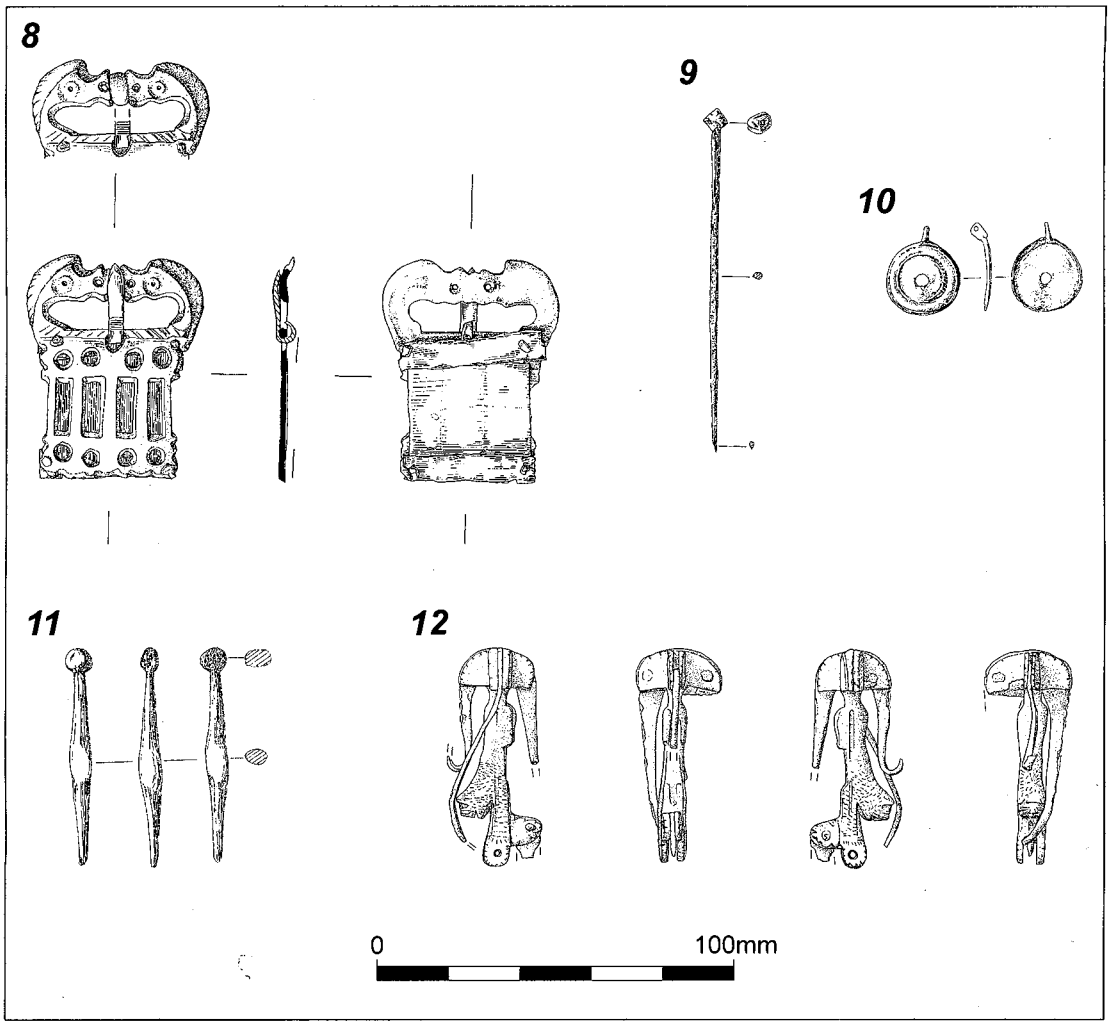

Figure 23. *Small finds. No. 8, buckle; No. 9, copper alloy pin; No. 10, seal box lid; No. 11, bone pin; No. 12, composite set*

5) Bracelet, copper alloy, 3rd4th century Phase 6/7 HB 10
6) Bracelet, copper alloy, 3rd/4th century Phase 6/7 HB 10
7) Bracelet, copper alloy/ iron, 3rd/4th century Phase 6/7 HB 10
8) Buckle, copper alloy, zoomorphic, ?4th century U/S
9) Pin, copper alloy, Phase 5 (Ditch 16)
10) Seal box lid, copper alloy, U/S
11) Pin, bone, Phase 6 (Enclosure 4)
12) Composite set, copper alloy, Phase 6/7 HB 4

Human bone

Trevor Anderson

The human bone represents 5 cremations and 18 inhumations. These comprised two Iron Age burials, a burial in a Roman boundary ditch, and 15 inhumations and five cremations within a small cemetery. In addition, there was part of a skull in a Phase 1 Iron Age ditch (D1) and a fragment of leg in the subsoil within the Roman cemetery area.

Iron Age Burials

HB11 (Fig. 6)

Apart from the damaged cranium, the bones are solid and well-preserved. The skull is rather masculine, the pelvic morphology and post-cranial bone measurements (Bass, 1987; Ferembach *et al* 1980) indicate that the remains are female. Age was assessed as 35–45 years (Ferembach *et al* 1980). Stature estimation was 1.495m (4' 11") (Trotter & Gleser 1958). The extremely broad nasal index (61.0) may be evidence that the individual grew up in warm, moist climatic conditions (Thomson & Buxton 1923). An index of under 48 is classified as narrow-nose and an index of 53 or over is broad-nose (Bass 1987, 76). Nasal indices from other Iron Age sites all fall within the narrow and medium range. There is marked discrepancy between the maximum length of the humeri, with the left bone being 11mm shorter than the right. It is well-known that the humerus is the most asymmetrical bone in the body, with the right generally being longer than the left (Schultz 1937). However, a difference of 11mm, without pathological involvement, is unusual. The distal tibiae display squatting facets.

The following pathological conditions were noted. An open sacral canal, representing an asymptomatic *spina bifida occulta*. Limited spinal degeneration. A well-healed fracture of the shaft of the fifth left metacarpal, possibly due to direct violence or a fall on

the hand (Adams 1965, 178). A larger than normal tubercle on the right second rib for the serratus anterior (Williams & Warwick 1980: fig 3.58). This muscle is important in actions such as thrusting, pushing and punching where the scapula is driven forward (Plastanga *et al* 1989, 80). In this case the right is more developed than the left, suggesting a right sided dominance. It is possible that it is caused by repetitive actions such as grinding corn using a saddle quern. Oral health was of a very low standard with marked *ante-mortem* tooth loss; carious cavities of available molars and abscess formation involving maxillary and mandibular incisors.

HB12 (Fig. 6)
The fragmented but repairable bones appear to belong to a 16–18 year old male (Ferembach *et al* 1980). A mid-line cleft of the first sacral vertebra, a form of *spina bifida occulta*, similar to that seen in HB 11, was noted. Both knee joints display osteochondritis dissecans. This is when the area of bone and cartilage separates from the joint surface of a growing bone and this predominantly affect teenage boys (Resnick and Niwayama 1981, 2261). Dental disease was limited to minor deposits of calculus.

Cremated material
Five deposits (C 1–C 5) were identified, containing 2797gms of cremated bone, a mean of 559gm. In modern crematoria, an average adult body will yield *c.* 2.5kg of bone (range 1.6–3.6 kg) (McKinley 1989). C 3 was reasonably complete (1357gms); C 1 and C 2 were *c.* half complete (566gms and 744gms) and C 4 and C 5 were poorly represented (16gms and 108gms). There was no indication that any of the vessels contained more than one body. The majority of the bones are hard and off-white, although a few fawn brown (cranium of C 2) and dark blue (lower limb of C 1; cranium of C 2; small bones in C 3; C 4). In C 1 and C 2 the bones are lightly burnt. In the other cremations, the remains were smaller and more efficiently burnt (archive). A total of six tooth roots, with their crowns exfoliated, were recovered from C 1, C 2 and C 3.

Almost 65% of the material, by weight, could be identified (archive). The highest percentage of identified material being found in the lighter burnt cremations, C 1 and C 2. The largest individual element was 90mm long and weighed 38gms. In C 2, twelve vault fragments could be reunited to produce a bone *c.* 125 x 70mm, weighing 90gms. A metopic suture was identified, an anatomical variant which occurs in approximately 10% of British crania (Hooke 1926).

Cremations C 1 and C 2 appear to contain males; the other three cremations cannot be sexed. The presence of fused bones in cremations C 1, C 2 and C 3 confirms that they are definitely adult. Based on the visibility of cranial sutures, two individuals (C 2; C 3) were probably under 40 years. The only identified pathology was spinal degeneration in cremation C 1.

Roman Burials (Figs 13 & 14)
The sixteen Roman burials are largely complete but rather fragmented. One mature male (HB 14) was an outlier to the north-east, close to the two Iron Age inhumations (HB 11 & 12). Three-quarters of the burials were supine. The mature male (HB 14) was buried in a foetal position. A child (HB 9) and an adult female (HB 17) were crouched burials. Two males (HB 3 and HB 16) were buried prone; the latter had cut a mature male burial (HB 4). A young adult female (HB 13) was buried with her right arm raised and flexed so that the hand was above the head. Four inhumations: (HB 5–7; 10) were buried in close proximity (Fig. 14).

Demography
Some 87.5% of the sample reached adulthood, with eight males and six females (Table 2). Female life expectancy was shorter than male. Two children, both in the west side of the cemetery, were recovered, a 2–5 month old (HB 9) and a 3–5 year old (HB 2).

Metric analysis

i) Stature reconstruction
Stature could be calculated for all but two adults (Table 2). The mean male stature was 1.7m with a range 1.644m [HB 3] to 1.829m [HB 16]. Mean female stature was 1.565m, with a range of 1.531m [HB 10] to 1.612m [HB 7] (Table 2). Similar mean stature have been recorded from larger Roman urban sites (Conheeney 2000, 280; Kunitz 1987; Warwick 1968: fig. 42; Wells 1982, table 50). However, at the large rural Roman cemetery of Poundbury the mean male stature (1.662m) was shorter and the female (1.609m) taller (Molleson 1993).

ii) Cranial metrics
The measurements and the calculated indices fall within the bounds of normality (archive).

iii) Post-cranial metrics
The post-cranial metrics and indices are presented in the archive. A very interesting finding was the marked asymmetry in the length of the female humeri, with the right bone being between 13mm to 19mm longer than the left (Table 12). Males do not display significant asymmetry in length. The Iron Age female (HB 11) also presents with definite asymmetry (Table 12). There was no evidence that underlying pathology was responsible. A longer right humerus appears to be a constant finding regardless of geographical location or ethnicity (Larsen 1997, 210; Ruff & Jones 1981; Schultz 1937). However, the variation in length is normally just 1–3% (Ruff & Jones 1981; Schultz 1937).

Possibly girls, but not boys, were carrying out activities which involved marked use of the right arm. However, the lower arm bones and the mid-shaft humeral measurements do not display marked asymmetry (archive) which would support activity related variation. It is therefore more likely that the

asymmetry includes a high genetic component. This appears to support a direct genetic link between the Iron Age and the Roman sample. It may be that we are dealing with a small native population, which continued to intermarry locally, or at least a population of genetically related local native girls into which non-local males married.

Non-metric variation
The minor anatomical variants fall within the established ranges, with no obvious familial grouping (archive). There is no skeletal evidence to support that the group of burials HB 5, 6, 7 and 10 are related. However, it is very rare to be able to indicate a genetic relationship between skeletons.

Palaeopathology
I Congenital
No major congenital anomalies were identified. A young adult female (HB 13) presented with a mid-line cleft of the first sacral vertebral arch. A similar cleft was noted in the Iron Age juvenile and the adult Iron Age skeleton displayed *spina bifida occulta*. One adult female (HB 7), displays attempted sacralisation which is probably asymptomatic (Barnes 1994, fig 3.37). Bilateral antero-posterior bowing of the fibulae in HB 13, may also be congenital in nature (Beighton 1988, 243).

II 'Arthritic' Conditions
a) Primary osteoarthritis (OA)
The spine is the most frequently involved site (see below). Extra-spinal OA was not seen in adults under 30 years of age. However, it is a frequent finding with 64.3% of adults affected (archive). Both sexes are equally involved (male: 62.5%; female: 66.7%). All but two individuals, both male (HB 3,4), presented with a multiple joint involvement (several joints arthritic). The most widespread degeneration occurred in an adult female (HB 6); both temporo-mandibular joints (TMJ) wrists, hips, and right elbow were affected. The female buried below her (HB 7) presented with bilateral knee involvement as well as unilateral TMJ and pedal degeneration.

The fact that the right hands and wrists (HB 6, 17, 18) and hips (HB 6) display more marked changes may be related to right limb dominance. The high frequency of TMJ degeneration may be related to a coarser diet, more vigorous chewing, atypical attrition and low standard of oral health. All the individuals with TMJ OA display *ante-mortem* loss of several molars and in HB 6, asymmetrical tooth loss may have led to degeneration. OA would unlikely to be influenced by fen edge location.

b) Vertebral degeneration
Osteoarthritis (OA)
Only the two young adult females (HB 10, 13) are free of spinal OA. Some 7.3% (105/1440) of all joint surfaces are involved, with a slight female predilection (archive). The highest frequency of OA occurs in the cervical spine (10.4%), with females involvement being twice that of males (archive). The thoracic spine is largely spared and only a single lumbar vertebral facet was involved (archive). This suggests that severe lower back strain was not a problem. OA of the upper spine may be related to compressional forces, such as carrying loads on the head (Kennedy 1989, table 1).

Osteophytes
Osteophytes (bony overgrowths) are found in all skeletons except for the two young adult females (HB 10, 13). Some 18% (142/791) of all joint surfaces are involved (archive). The lumbar spine, followed by the lower cervical and mid thoracic are the sites of predilection (archive). There is clear evidence that males are more frequently involved than females (archive). The majority of the osteophytes are small, with only 5.6% classed as large and no cases of vertebral fusion (archive). A similar male bias (26.8%; 15.2%) has been noted at Cirencester (Wells 1982, table 75). The outgrowths are thought to be a response to excessive pressure on the spine and are thus indicators of mechanical stress. It is generally related to compression and over-use, also possibly a repeated bending, active lifestyle.

Schmorl's Nodes
Some 72.7% (8/11) of adults displayed evidence of Schmorl's nodes (vertebral body cavitations) with 7.7% (32/415) of superior and inferior body surfaces involved (archive). Females were involved twice as frequently as males (archive). A *chi*-square test indicated that the sexual difference is significant at the 0.05 level ($?^2 = 4.37$, $df = 1$). The inferior surfaces of the lower thoracic and superior surfaces of the upper lumbar spine are the sites of predilection (archive). Node formation is related to severe strain, especially compressional forces, which cause the intervertebral disc to rupture (Knowles 1983). Generally, node formation is more frequent in males (Knowles 1983). A similar prevalence, 7.1% (419/5930), with a slight male bias 7.7% to 5.6% was noted at Roman Cirencester (Wells 1982, table 75).

Other vertebral abnormalities
a) Spondylolysis
One case was noted, involving the fourth lumbar vertebra of a young adult female (HB 13). The favoured interpretation of the defect is a stress or fatigue fracture that fails to heal (Adams, 1990: 191) and the fifth lumbar vertebra is the site of predilection (Hensinger, 1989).

III Trauma
a) Fractures
Three males presented with healed fractures (HB 1, 4, 15). A disarticulated femur also displays evidence of healed fracture. The sites of predilection being the left ribs (HB 1, 15) and the left clavicle (HB 1, 4), all are well-healed.

Typically, rib fractures occur due to a fall against a hard object (Adams 1965, 108) and, as here, they reunite spontaneously without severe displacement

(Adams 1965, 109). At Cirencester, ribs account for 32.6% (25/86) of all fractures and several cases were thought to be the result of direct violence (Wells 1982, table 86). Clavicle fractures are frequently the result of a fall on an outstretched hand (Adams 1965. 111; Watson-Jones 1943, 424). In the case of HB 1, it is possible that the costal and clavicular fractures may both have occurred due to a single traumatic event.

A mature male (HB 4), displays a well-healed oblique nasal fracture (Fig. 24), evidence of direct violence. Two males at Cirencester also displayed healed nasal fractures (Wells 1982 table 86). The same individual (HB 4) displays marked medio-lateral angulation and anterior posterior bowing of the right upper femur. The unilateral nature and the normal bone texture does not support a nutritional problem. The changes may represent congenital bowing (Tachdjian 1972, 198–200) or the sequela of a childhood fracture (Anderson *et al*, forthcomimg; Stuart-Macadam *et al* 1998). A condition which, under the name of acute plastic bowing deformity (APBD), is recognised as a clinical entity (Borden 1975; Cail *et al* 1978).

A disarticulated left femur (from subsoil layer within cemetery), displays a solidly reunited trochanteric fracture (Fig. 25). There was mild reduction in the angle of the femoral neck (coxa vara) and the shaft had been rotated laterally by *c.* 40°. Today, this is a common fracture in the elderly and is normally the result of a fall (Adams 1965, 210). The fracture readily reunites and, without internal fixation, the complications seen here, coxa vara and lateral rotation, would be expected.

Figure 24. *HB 4, a mature male with an oblique linear nasal depression, evidence of a healed nasal fracture.*

Figure 25. *Disarticulated adult left femur: anterior view, displaying a healed trochanteric fracture, with new bone around the fracture site (note: the majority of the femoral head has been damaged post-mortem and was not recovered).*

Oral Health

i) Adult Oral Health

All adult dentitions displayed evidence of calculus. All except two young adults (HB 10, 15) suffered from *ante-mortem* tooth loss; caries and abscess formation.

a) *Ante-mortem* tooth loss

Based on individual tooth positions, overall *ante-mortem* tooth loss was 22%, with a higher male figure (28.6%) than female (12.4%) (archive). The sexual difference is probably related to the younger age at death in the female sample. At Ancaster 15.6% (580/3735) (Cox, 1989) and at Bletsoe, 19.7% (209/1062) of teeth had been lost during life (Dawson 1994) and at Towcester the figure was 6.6% (28/425) (Anderson & Andrews forthcoming, table 12).

b) Caries

A total of 41 carious cavities were recorded, male carious experience (23%) was much higher than female (9%) (archive). Lower figures occur at major urban Roman sites: London (3.1%) (Waldron, 1989: 115); York, (4.6%) (Cooke & Rowbotham 1968, table XVII) and Cirencester (5.1%) (Wells, 1982); as well as Towcester (8.1%) (Anderson & Andrews forthcoming, table 13). Only Poundbury presents with a similar figure (15.8%) and this may be related to the high percentage of mature adults in the sample (Molleson 1993, 183). Widespread destruction of the tooth crown, was the most frequent presentation, 53.7% (archive). Interstitial involvement was frequent (39.0%). Occlusal (2.4%) and palatal/lingual (2.4%) cavities were rare (archive). A similar pattern occurred at West Tenter Street (Waldron 1989). The rarity of occlusal cavities is almost certainly due to the greater attrition and coarser Roman diet. The interstitial cavities are probably related to poor oral hygiene and build-up of food debris between the teeth.

c) Calculus

Some 69.5% of individual teeth were involved, with no significant sexual difference (archive). Comparisons are handicapped by the fact that soil conditions and lack of care in cleaning may mean that several deposits have been lost post-mortem. Consequently, the lower prevalence at Ancaster: 75% of males and 61% of females need not be significant (Cox 1989).

d) Abscesses

Based on available tooth positions, 7.8% of teeth were affected, with males involved twice as frequently as

females (archive). At Ancaster, only a quarter of males and less then 30% of females displayed abscess formation (Cox 1989, table 49).

e) Malocclusion
The young adult male (HB 15) displayed overcrowding of the mandibular anterior teeth.

f) Congenital absence
Two females (HB 10, 17) displayed congenital absence of third molars. Higher frequencies were noted at Water Lane (Anderson & Andrews forthcoming) and at Trentholme Drive (Cooke & Rowbotham 1968, 192), both 27.8%. At Poundbury 39% of the sample presented with third molar agenesis (Molleson 1993, table 29).

There is some evidence for a familial link in congenital absence, with high frequencies of missing teeth occurring in small, isolated communities (Graber 1978). At Poundbury, individuals with congenitally absent third molars were buried in close proximity, possible evidence of family burial plots (Molleson 1993, 146). Absence in just two individuals at Prickwillow Road is insufficient evidence of a genetic relationship.

g) Supernumerary teeth
A supernumerary tooth was located between the right maxillary incisors of a young adult female (HB 13). It was fully erupted but displaced palatally from the normal arcade. Supernumerary teeth occur in 0.3–3.8% of individuals (Sylvester 1984, 226). The majority (90%) develop in the maxilla and predilect the incisor and the third molar regions (*ibid*).

Table 12. *Humeral asymmetry in human bones*

Roman Male

Young Adult	R	L	difference
SK 15	317	311	1.9%
Adult			
SK 1	336	334	0.6%
SK 3	-	332	-
SK 20	-	-	-
Mature			
SK 4	338	336	0.6%
SK 5	323	319	1.6%
SK 14	329	-	-
SK 16	-	369	-

Roman Female

Young Adult	R	L	difference
SK 10	293	290	1.0%
SK 13	298	284	4.9%
Adult			
SK 6	302	283	6.7%
SK 7	318	305	4.3%
SK 17	294		-
Grown			
SK 18	-		-

Iron Age Female

Adult	R	L	difference
SK 11	287	276	4.0%%

Conclusion
Sixteen reasonably preserved burials of 3rd to 4th century date were recovered. It is a small sample so generalisation should be treated with caution. Two children, a 2–5 month old and a 3–5 year old, were retrieved. Female life expectancy was shorter than male. Sacral clefting, as well as marked female humeral asymmetry in both the Iron Age and the Roman material suggests a genetic linkage between the two populations.

Despite a shorter life expectancy, females displayed widespread extra-spinal osteo-arthritis as well as higher frequencies of vertebral degenerative changes. Temporo-mandibular joint degeneration may be related to a coarse diet and heavy chewing and also the high percentage of *ante-mortem* molar loss. Evidence of trauma was confined to males. A nasal fracture indicates direct violence, a punch to the face. Other fractures were probably due to accidents or falls. No chronic infection was noted which might support a low population density. Oral health was poor, males especially suffering from high levels of *ante-mortem* tooth loss; widespread, extensive carious destruction and abscess formation. Marked malocclusion and hypoplastic enamel defects were not seen.

Animal bone

Karen Deighton

Method
Approximately 135 kg of animal bone hand collected from phased contexts was analysed. Where possible these were identified to species following Schmidt (1972) for large mammals and Lawrence and Brown (1973) for small mammals. Recording follows Halstead (1985) and uses Minau (Minimum anatomical unit). Tooth ageing follows Payne (1973) for ovicaprids, Grant (1982) for pigs and Halstead (1985) for cattle. Fusion is after Silver (1969) and butchery follows Binford (1981). Pathologies follow Baker and Brothwell (1980). Ribs and vertebra (*c.* 306 elements) were noted but not included in quantification due to their multiple nature. Skeletons and partial skeletons were dealt with separately to prevent species bias.

Preservation
Fragmentation was high (82.7% of bone exhibited old breaks). There was little difference in fragmentation levels between phases. Canid gnawing was fairly moderate at 13.5% and a single bone showed evidence of having been digested. There were only five incidences of burning suggesting that it was not a preferred method of waste disposal. Evidence of weathering was noted on only three elements. Evidence of butchery was low with only 3.5% of bone showing cut marks. There was little difference in butchery levels between phases. A single possible instance of worked bone was noted.

Results
A total of 1399 fragments were identified to species

level (Tables 13 and 14) in addition there were 12 bird and small mammal bone (Table 15). The minimum AU (Anatomical Unit) per phase was as follows; Phase 1 (16), Phase 2 (517), Phase 3 (172), Phase 4 (154), Phase 5 (162), Phase 6 (179) and Phase 7 (199). Tables 13 and 14 record these fragments in Phases 1–3 (705 fragments) and Phases 4–7 (694 fragments).

There is apparent continuity in the range and relative abundance of species throughout the Iron Age and Roman periods. This continuity was also seen in individual phases for the Roman period (tables in site archive). There would, however, appear to be a greater rate of deposition in Phases 6 and 7 (3rd/4th centuries) compared with the earlier Roman phases (Table 17). In the Iron Age the vast majority of the bone came from Phase 2 deposits, particularly the midden. Phase 1 had only 16 elements (1 horse, 10 cow and 5 ovicaprid).

Neonates

Evidence for neonates was seen only in Phase 2, a *Bos* metatarsal; Phase 4, a *Bos* metatarsal and an ovicaprid tibia; and in Phase 8, an ovicaprid metatarsal.

Skeletons

There were five dog skeletons including one from an Iron Age Phase 1 context (Fig. 7). This was a complete articulated skeleton which appeared to have been a fairly large animal (possibly of a breed used for stock control). There was no evidence of butchery. All permanent mandibular teeth were present and just coming into wear and all long bones were fused suggesting an animal of 18 or more months. Two partial dog skeletons were noted in two separate areas of Ditch 26 (Phase 5). One was a fairly large animal which fusion suggests was under 6 months of age, the other was a small dog (possibly lapdog size) with a healed fracture of the femur. Within the human cemetery there was the majority of a fairly large dog skeleton with all long bones fused and adult dentition present and in wear. A complete dog skeleton was within the Phase 6, Enclosure 5 ditch. Adult dentition is present and in wear, the proximal tibia and proximal humerus are fusing which suggests an animal of 15–18 months. In Phase 4 contexts there were three partial cattle skeletons, these consisted of mandibles, skull fragments, ribs and some articulated limbs.

Key to tables and figures: Eq (*Equus*), Bos (*Bos*), Ovi (Ovicaprid), Fel (*Felis*), Ca (Canid), Lep (*Lepus*), Lu (*Lutra*), Ce (Cervid), O/C (Ovicaprid/*Capreolus*) and B/C (*Bos*/*Cervus*).
P (proximal), D (distal), Md (mandible), Sc (scapula) hm (humerus), rd (radius) Pl (pelvis), tb (tibia), mc (metacarpal) ,mt (Metatarsal), Cal (Calcaneum), Ast (Astragulus), Ph1-Ph3 (phalanx 1-3),Occ cond (occipital condyle), mp (metapodial). Elements are listed in descending order of meat utility (after Binford 1978)

Table 13. *Animal bone by element and type Phases 1–3 (c.300BC–AD50)*

Element	Eq	Bos	Ovi	Sus	Ca	Lep	Ce	O/C	B/C
Pfm		19	10	2					
Dfm		18	10	2		1		1	
Ptb	7	47	24	9				1	
Pl		16	2	2					
Dtb	6	47	25	9					
Sc		10	4	2					
Phm		15	4	6	1			3	1
Dhm		20	5	6	1			3	
Cal		7	1						
Ast	1	7	1						
Pmt	2	13	24						
Dmt	2	14	24						
Prd		17	18	4	1			1	
Drd		15	18	4	1			1	
Ulna		8	3	2	1				
Md		21	15	8					
Ph1	1	6	1	1			1		
Ph2									
Ph3		2							
Pmc	2	15	16						
Dmc	2	14	16						
Axis				1					
Atlas		2							
Occ cond		1			1				
Horn core		8	10						
Teeth	1	4	3	5					
Pmp		2	1	3				3	1
Dmp		3	1	3				3	1
Total	24	351	236	69	6	1	1	16	3
%	3.4	49.8	33.5	9.8	0.9	0.14	0.14	22.7	0.43

Key to tables and figures: Eq (*Equus*), Bos (*Bos*), Ovi (Ovicaprid), Fel (*Felis*), Ca (Canid), Lep (*Lepus*), Lu (*Lutra*), Ce (Cervid), O/C (Ovicaprid/*Capreolus*) and B/C (*Bos*/*Cervus*).
P (proximal), D (distal), Md (mandible), Sc (scapula) hm (humerus), rd (radius) Pl (pelvis), tb (tibia), mc (metacarpal) ,mt (Metatarsal), Cal (Calcaneum), Ast (Astragulus), Ph1-Ph3 (phalanx 1-3),Occ cond (occipital condyle), mp (metapodial). Elements are listed in descending order of meat utility (after Binford 1978)

Table 14. *Animal bone by element and type Phases 4–7 (c.AD50–400)*

Element	Eq	Bos	Ovi	Sus	Fel	Ca	Ce	Le	Lu	O/C	B/C
Pfm	1	19	11	1						1	1
Dfm	1	20	11	1						1	1
Ptb		26	33	4						1	
Pl	2	23	12				1				
Dtb		25	35	4						1	
Sc	1	23							1		
Phm	1	24	5	1			1		1		
Dhm	1	19	5	1	1	1			1		
Cal		5	1					1			1
Ast		5									
Ulna		8	2	2							
Pmt	3	24	20							2	
Dmt	3	21	20							2	
Prd		14	22	8						2	
Drd		13	22	7						2	
Md	1	31	9	4	1	1					
Ph1	2	9	2								
Ph2											
Ph3											
Pmc		24	6								
Dmc		21	6								
Axis		2									
Atlas		2	1								
Occ cond		1									
Horn core		6	4								
Teeth	2	5	2	3							
Pmp		4	1	2						1	
Dmp		4	1	2						1	
Total	18	378	231	40	2	2	2	1	3	14	3
%	2.6	54.7	33.3	5.8	0.29	0.29	0.29	0.14	0.43	2.0	0.43

Isolated skulls

In the Iron Age enclosure there were two posterior cattle skulls with horn cores found together in the excavation of one section of the early ditch on the eastern side of the enclosure. In Pit 8 (Phase 3) there was a partial horse skull. This pit contained five other bone fragments of assorted domestic species. In Ditch 24 (Phase 5) there was a posterior cattle skull with horn cores. In Ditch 43 (Phase 7) there were two horse skulls and two posterior cattle skulls (one with horn cores) positioned together as a group. The context contained a few other bone fragments. An isolated cow skull was found in Ditch 6 (Phase 3).

Pathologies

Three pathologies were noted: in Pit 28 (Phase 3) there was an ovicaprid mandible right side which had a misaligned permanent fourth premolar causing the mandible to bulge. In Ditch 15 (Phase 4) a *Bos* second premolar was absent from the left mandible. This was possibly congenital. In Ditch 26 (Phase 5) a dog femur, showing bending and ossification, may have had a healed fracture.

Table 15. *Small mammals and birds*

Phase	Context	Species	Element
2	Midden	*Anser*	Tibio-tarsus
5	Ditch 19	Indet	Ulna
5	Ditch 26	?*Anser*	Prox.femur
5	C 4	*Microtus*/ *Arvicola*	Mandible
5	Ditch 19	Indet	Limb bone
6	Enclosure 4	Corvidae	Carpo-metacarpus
6	Enclosure 4	?*Anser*	Tibio-tarsus
7	BD	*Anser*	Humerus
7	Enclosure 9	Small passerine	Tarso-metatarsus
7	Enclosure 9	Indet	Pelvis Frag.
7	Enclosure 9	Indet	Tibia +fibula
7	Enclosure 9	?*Mustela putorius*	Skull + humerus

Discussion

Cattle dominate all phases followed by ovicaprid with smaller numbers of pig. No goats were positively identified, so all the ovicaprids are likely to be sheep. A low frequency of horse is consistent throughout. Dogs are largely represented by complete or partial skeletons. Wild species are present in very small numbers, suggesting that hunting was not used to any extent as a means to supplement the diet. Birds are restricted to goose and small species which would have lived around the site. The lack of cattle neonates would suggest dairy farming was never the prime concern of animal husbandry. The skulls indicate that cattle were horned.

The uneven distribution of identified fragments made the detailed discussion of body part representation for each phase difficult. However, all phases show an absence of phalange 2 and 3 for ovicaprid and pig. This is possibly due to preservation (Payne and Munsen 1985 and Lyman 1992) and recovery biases (Payne 1975).

For the Iron Age Phase 2, a more detailed study of body parts was possible. Frequencies of elements were plotted against a preservation index (Brain 1981) to show any evidence for selection (Fig. 26). For cattle, all elements except second phalange are present and follow the general trend for survival from low to high. However, the relatively fragile proximal tibia (Ptb) appears over-represented. A slight over-representation is also seen for femur (Pfm and Dfm). These are among the bones carrying the highest meat yields (Binford 1978). Again the lower value elements such as mandible (Md), atlas and axis appear under-represented. This could suggest that although whole carcasses are present these were supplemented with choice joints. For ovicaprid a similar anomaly is seen and a high level of metapodia is also observed which could imply disposal of butchery waste. Pig follows the same general pattern but any over-representation is less dramatic.

Due to the low level of evidence any statements regarding butchery are tentative, although chopping appears to be most common for all phases, suggesting the jointing and dismembering of carcasses. Some possible evidence of skinning was noted on a few cattle metapodia and some evidence of filleting. There was a possible example of marrow extraction, but no evidence for tongue extraction was observed.

Tooth wear analysis is rough and tentative due to the low numbers of assignable mandibles in each phase. A coherent pattern can only be tentatively surmised (based on 11 mandibles and one third molar) for ovicaprids in Phase 2. Here most animals appeared to be slaughtered between one and three years and no mandibles from animals under six months were noted. This could suggest husbandry was geared towards meat production.

Temporal comparisons for carcass utilisation, butchery techniques and slaughter patterns are limited due to the lack of evidence for most phases. However, a pattern similar to that demonstrated in Phase 2 emerges for cattle remains in Phases 5 and 7 when elements are plotted against a preservation index (Fig. 27). This suggests that, for cattle at least, little change in carcass utilisation occurred though time. Comparisons of Phase 2 can be tentatively made with nearby Iron Age sites at West Fen Road (Higbee 2001) and at Hurst Lane (Knight 2000) where the assessments suggest a similar dominance of cattle. Cattle are also seen to dominate at West Stow and Haddenham Delphs (Murphy 2000). Again at West Fen Road, the assessment found a similar body part representation for cattle and sheep, but the use of pig at Prickwillow Road appears less selective. The same heavy-handed butchery techniques are also noted at West Fen Road. Hare and deer are also seen at Hurst Lane. Otter, polecat and goose have recorded elsewhere (Robinson and Wilson 1983). Comparisons of

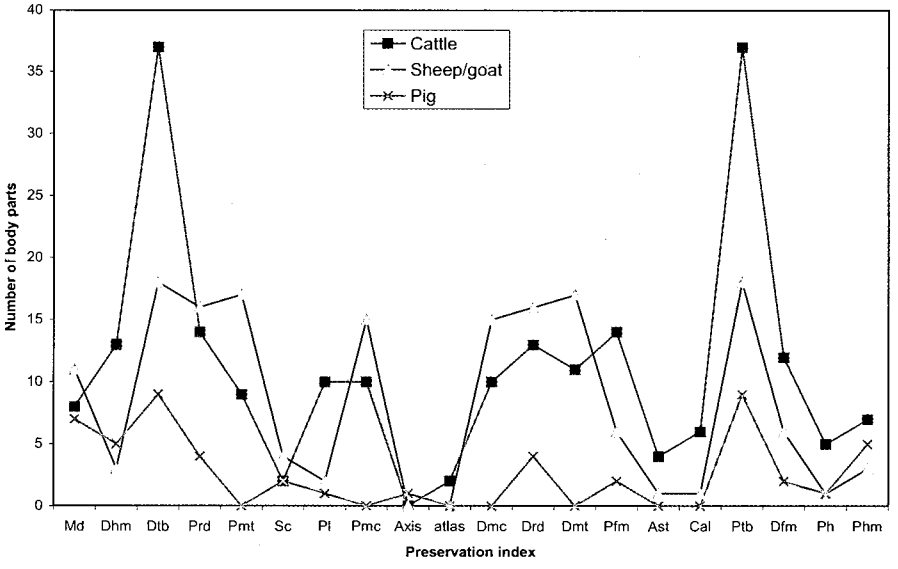

Figure 26. *Survival of body parts for major domesticates in Phase 2 compared to Brain's (1981) index in which preservation decreases from left to right.*

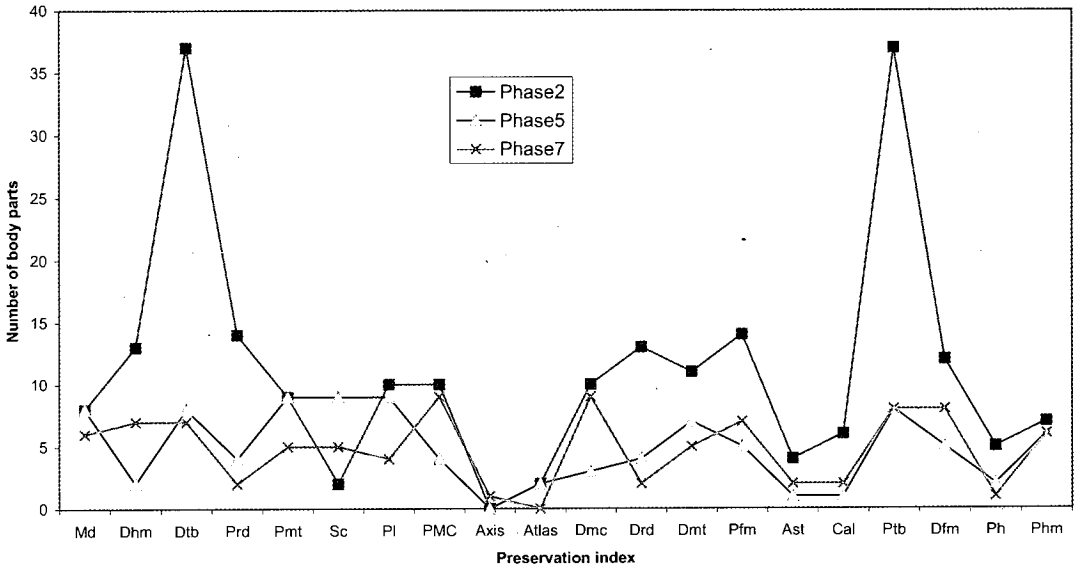

Figure 27. Preservation of body parts for cattle in Phases 2, 5 and 7. Preservation decreases from left to right.

husbandry in terms of age are difficult due to the thin distribution of mandibles through the phases at Prickwillow Road, although Higbee suggests the slaughter of ovicaprids in their prime at West Fen Road.

Dog burials are well recorded elsewhere for both Iron Age and Roman periods (Robinson and Wilson 1983; Dobney 2001). The burial of skulls is also well documented for both periods for example cattle at Creke Beck (Gidney 1998) and horses at Wavendon Gate, Milton Keynes (Dobney and Jacques 1996). Both phenomena are thought to be ritual (Dobney 2001) or the result of deliberate structured deposition (Hill 1996).

Conclusion

Phase 2 appears to be a domestic assemblage typical of the Iron Age. It is difficult to make statements about the other phases individually due to their small size, although most (Phase 1 excluded) show species and relative abundance typical of the Iron Age and Roman periods. The apparent continuity in husbandry in broad terms (ie range and relative abundance of species) at Prickwillow Road is not exceptional as there are other similar examples happening at small scale Iron Age/Roman rural sites (Robinson and Wilson 1983).

Snail remains

Karen Deighton

The assessment of soil samples recovered a range of snails. These are unremarkable and the results do not warrant detailed analysis. *Ceciliodes asicula* appears to be the dominant snail species for the assemblage. This is probably intrusive, as it usually lives on roots, although it can be found in flood debris. The presence of freshwater ostracoda are restricted to the possible watering hole Pit 28 Phase 3 and therefore contribute little to the knowledge of the general environment. The presence of *Bithynia, Valvata* and *Planorbis* suggest gently moving water and probably occurred in puddles forming in features. The occurrence of *C. lubrica* and members of the Zonitid family suggest a damp environment. Although *Vertigo pygmaea* is usually associated with calcareous grassy places it also occurs in marshes, which probably accounts for its presence here.

The charred plant remains

Wendy J Carruthers

Thirty-three bulk samples (30 litres soil) were taken from Iron Age and Roman features for the recovery of environmental information. The soil samples were processed by Northamptonshire Archaeology staff using standard methods of flotation. A Siraf tank was used, and 500 micron meshes were used to recover both the residues and flots. The flots were assessed by Karen Deighton (Deighton 2001), and 12 of the most promising samples were selected for the analysis of charred plant remains. These flots, together with two residues from ditches, a pit and an oven spanning Phases 1 to 7 were sent to the author for analysis. The flots were sorted under a binocular microscope. The residues were scanned to see whether mineralised remains were present, and also as a check on the efficiency of the flotation. However, although a few uncharred, modern seeds were present, no mineralised remains were observed in the flots or residues.

Results

Table 16 presents the results of the analysis. Nomenclature and most of the habitat information follow Stace (1991).

Discussion

The charred plant remains were generally well preserved, with few signs of erosion to suggest that they had remained unburied for any length of time. They

Table 16. *Charred plant remains*
Habitat preferences follow names: A = arable; C = cultivated; D = distubed/waste; E = heath; G = grassland; H = hedgerow; M = marsh/bog; R = rivers/ditches/ponds; S = scrub; W = woods; Y = waysides/hedgerows; a = acidic soils; c = calcareous soils; n = nutrient-rich soils; o=open ground; d=damp soils

	Sample	27	12	14	13	26	21	28	30	2	3	5	22
	Phase	1	2	2	5	5	6	6	6	7	7	7	7
Taxa	Feature type	Pit 6	E1	E1	D19	D18	E5	E4	E5	BD	E9	O1	D37
Cereals													
Triticum aestivum-type (bread-type free threshing wheat grain)							2	1	1				
Triticum dicoccum/spelta (emmer/spelt wheat grain)			8	12	12	7	38	32	31	46	79	7	75
Hordeum sp. (hulled barley grain)		1	1	1	1	3	3	3	2	2			7
Avena sp. (wild/cultivated oat grain)				1						4	2		
Avena/Bromus sp. (oat/chess grain)					1		5		2	2			6
Cf. Secale cereale L. (cf. rye grain)										1			
Indeterminate cereals		1	16	24	9	6	38	27	18	72	178	17	41
Chaff													
Triticum spelta L. (spelt glume base)							61	5	3	51	98	8	33
Triticum cf. *dicoccum* (cf.emmer glume base)			1		1	3	2			1			
Triticum dicoccum/spelta (emmer/spelt glume base)		1	10	8		3	145	11	27	65+	66+	45	119
Triticum dicoccum/spelta (emmer/spelt spikelet fork)				1		1	9	2		2	1		15
T. dicoccum/spelta (emmer/spelt rachis frag.)							5				4		7
Hordeum sp. (barley rachis frag.)			1	1									
Hordeum sp. (barley awn frag.)													+
Avena sp. (oat awn frag.)				+	+		+	+		+	++		++
Cereal-size culm node											*	1	
Cereal sprouts							+++			+	+++		
Weeds													
Ranunculus repens/acris/bulbosus (buttercup achene)	DG						1		1		*		1
Chelidonium majus L. (greater celandine seed)	DHY						1						
Urtica urens L. (small nettle achene)	CDn					1							
Corylus avellana L. (hazel nut shell frag.)	HSW		1			2							
Chenopodium album L. (fat-hen seed)	CDn				1	1					*	2	
Atriplex patula/prostrata (orache seed)	CDn										1		
Chenopodiaceae embryo			1					1					1
Agrostemma githago L. (corn cockle)	A										*		
Stellaria media (L.) Villars (common chickweed seed)	CD												1
Stellaria graminea L. (lesser stitchwort)	G												1
Caryophyllaceae cf. *Cerastium* sp. (mouse-ear)	CD							1					
Persicaria maculosa/lapathifolia (redshank/pale persicaria)	CD	1	1	1									
Polygonum aviculare L. (knotgrass achene)	CD												1
Fallopia convolvulus (L.) A.Love (black-bindweed achene)	AD									*		2	
Rumex acetosella L. (sheep's sorrel achene)	CEGas				1				1	1			1
Rumex sp. (dock achene)	CDG		1	1	2		10	3	2	11	35	1	15
Polygonum aviculare (knotgrass nutlet)	CD				1								
Brassica/Sinapis sp. (mustard, charlock etc. seed)	CD*								1				1
Raphanus raphanistrum L. (radish capsule frag.)	CDa			1									
Primulaceae							1						1
Trifolium/Lotus sp. (clover/trefoil)	DG				2		1	3	7		1		6
Medicago lupulina capsule frag. (black medick seed)	DG										*		
Vicia cf. *lathyroides* L. (cf. spring vetch)	E						1						
Vicia/Lathyrus sp. (small seeded weed vetch/tare)	CDG		1	1	2	2	1	1			4		4
Vicia/Lathyrus sp. (large seeded legume >3mm)	CDG				3			1					1
Aethusa cynapium L. (fool's parsley mericarp)	CW												1
Daucus carota L. (wild carrot)	Gc*										2		
Indeterminate Apiaceae													1
Hyoscyamus niger L. (henbane)	Dn								1		*		1
Galeopsis tetrahit L. (common hemp-nettle nutlet)	ADWod										1		
Galium palustre L. (common marsh-bedstraw)	GdPMF									*			

continued on next page

Table 16. *Charred plant remains, con't.*
Habitat preferences follow names: A = arable; C = cultivated; D = distubed/waste; E = heath; G = grassland; H = hedgerow; M = marsh/bog; R = rivers/ditches/ponds; S = scrub; W = woods; Y = waysides/hedgerows; a = acidic soils; c = calcareous soils; n = nutrient-rich soils; o=open ground; d=damp soils

	Sample	27	12	14	13	26	21	28	30	2	3	5	22
	Phase	1	2	2	5	5	6	6	6	7	7	7	7
Taxa	Feature type	Pit 6	E1	E1	D19	D18	E5	E4	E5	BD	E9	O1	D37
Plantago laceolata L.(ribwort plantain) Go											1		
Odontites verna/Euphrasia sp. (red bartsia/eyebright) CD							1						3
Sambucus nigra L. (elder seed frag.) HSW						1							
Centaurea cf. *nigra* (cf. common knapweed) DGY								1		5		1	
Centaurea/Cirsium/Carduus sp. (knapweed/thistle) CDG												1	
Lapsana communis L. (nipplewort achene) DHWo											1		
Anthemis cotula L. (stinking mayweed achene) ADhd			3				5	18	7	34	60	1	129
Tripleurospermum inodorum (L.)Schultz-Bip. (scentless mayweed achene) CD			1				4			1	5		6
Cladium mariscus (L.)Pohl. (great fen sedge nut) MFPcd1						6				1	24	2	
Eleocharis subg. *Palustres* (spike-rush nutlet) MPd				1			4	12	13	2	2		31
Carex sp. (sedgenutlet) MPd											1		1
Indeterminate Cyperaceae							1			1			1
Bromus sect. *Bromus* (chess caryopsis) ADG		3	4	5	2		14	11	5	42	439	5	23
Unidentified Poaceae A (3mm, elongate)							14	1		14			8
Poaceae (small seeded grass caryopsis) CDG			3	2	1		1	2			1		2
Arrhenatherum elatius var. *bulbosum* (Willd.) (onion couch grass tuber) DG			1										
NFI charred half fruit cf. *Malus sylvestris* (cf. crab apple)				1									
Total charred remains:		3	45	66	45	33	374	135	123	352	988	111	550
Sample size:		30	30	30	30	30	30	30	30	30	30	30	30
Fragments per litre:		0.1	1.5	2.2	1.5	1.1	12.5	4.5	4.1	11.7	32.9	3.7	18.3

were present in quite high concentrations in samples from Phase 7 onwards, perhaps suggesting an increase in the intensity of crop processing activities on the site from the mid 3rd century to the 4th century. This will be discussed further below.

Phase 1 (5th–3rd century BC)
One sample was collected from this phase from Pit 6 on the northern part of the site. The pit contained only 3 charred plant remains, including a hulled barley (*Hordeum* sp.) grain and an emmer/spelt (*Triticum dicoccum/spelta*) glume base.

Phase 2 (3rd–1st century BC)
Two samples (12 and 14) from this phase were examined both from Enclosure 1 on its western side. Sample 12 was from the backfill of the middle ditch (first recut) while sample 14 was from the early ditch. Two samples from the latest enclosure recut ditch were assessed as low potential and were not sent for further analysis. The ditch samples 12 and 14 were slightly more productive than Pit 6 (1.5 fragments per litre and 2.2 FPL). They produced several cereal grains including emmer/spelt, hulled barley and an oat grain. The oat may have been present as a contaminant rather than a crop, but the constant presence of small quantities of barley in ten out of the twelve samples from Prickwillow Road suggests that this cereal was grown as a crop. If used primarily for fodder it may have had fewer opportunities to become charred than the principal crop, emmer/spelt.

Chaff fragments and weed seeds were also recovered, indicating that charred crop processing waste had been deposited in the ditch. Unfortunately most of the glume bases were poorly preserved, so it was only possible to tentatively identify a few as probably being from emmer wheat (*Triticum* cf. *dicoccum*). No positive identifications of spelt wheat (*T. spelta*) were made in samples earlier than Phase 7, although this cereal was widely grown in England from the Late Bronze Age onwards.

As with all of the samples examined for this report, the type of processing waste represented was the fine sievings from a late stage in the processing (ie stage 12, Hillman, 1981). A sieve with a mesh size slightly smaller than the grain was used to separate the small, heavy chaff fragments such as glume bases, rachis fragments and small weed seeds from the prime grain. Hillman (1981) suggests that this type of waste would often have been thrown straight onto a fire in damp climates such as in Britain, rather than being saved for fodder, since small scale processing would probably have been carried out from day-to-day. The reason for this is that hulled wheats such as emmer and spelt would have been much less likely to get damp and sprout or go moldy if stored as semi-cleaned spikelets, rather than fully processed grain.

The presence of charcoal, a fragment of hazelnut (*Corylus avellana*) shell and an onion couch 'tuber' (*Arrhenatherum elatius* var. *bulbosum*, botanically speaking, the bulbous base of the stem or 'culm') suggest that other types of burnt waste had also been

deposited in the ditch. Onion couch often grows on land that has been cultivated in the past.

Phase 5 (mid 2nd–mid 3rd century AD)
Two samples (13 and 26) from ditches (19 and 18 respectively) close to the Phase 2 samples were examined. The assemblages were similar to the Phase 2 assemblages, producing evidence for the cultivation of emmer/spelt and barley (1.5 FPL & 1.1 FPL). Small quantities of crop processing waste were present, including possible emmer glume bases and several general weeds of waste/cultivated ground. Other types of burnt waste were being deposited in the ditches, since hazelnut shell, an elder (*Sambucus nigra*) seed and a possible fragment of charred crab apple (cf *Malus sylvestris*) were recovered. The recovery of remains of native woodland and or hedgerow species demonstrates that wild food resources were being exploited.

Phases 6 (mid 3rd–mid 4th century AD)
Three Phase 7 samples 21(Enclosure 5), 30 (Enclosure 5) and 28 (Enclosure 4) were analysed. Higher concentrations of remains were found in these samples (12.5, 4.1 & 4.5 FPL). There was also evidence for the cultivation of bread-type free-threshing wheat (*Triticum aestivum*-type), and the first positive evidence that spelt wheat (*Triticum spelta*) was being cultivated. This was probably due to better conditions of preservation and larger quantities of material being present, since it is very likely that spelt wheat was being grown during the Iron Age and Early Roman periods (see 'Comparisons with other sites').

Detached sprouts from germinated grains were fairly frequent in sample 21 (Enclosure 5). No clear evidence of sprouting was seen in the few grains recovered, ie grooves along the dorsal surface or collapsed grains. It is possible that many of the sprouts had become detached during processing, and the grains had been recovered and consumed. It is unclear, therefore, whether the grain had been deliberately sprouted for the production of malt, or whether it had happened accidentally during storage. In the author's experience of growing cereals in Wales, when cereals are grown under damp conditions sprouting can also occur in the ear, particularly with free-threshing cereals. It would be interesting to find out whether this can occur where cereals are grown on damp, poorly drained soils, such as occur in the fens around Ely. There is some indication from the weed taxa that cultivation on damp soils increased from Phase 6 onwards. Damp ground taxa such as spike-rush (*Eleocharis* subg. *Palustres*), great fen sedge (*Cladium mariscus*) and stinking mayweed (*Anthemis cotula*) were much more common in the Phases 6 and 7 samples. Of course, the general increase in information from this period onwards should be taken into account, as charred remains were present in much higher concentrations. However, as percentages of the total weed seeds, the wet ground taxa increased from an average of 15% (Phases 2 and 6) to 51% (phase 6) and 80% (phase 7). The presence of great fen sedge makes it fairly clear that the local soils were being used for cereal cultivation, presumably after drainage ditches had been dug. It is possible that fenland taxa such as these might survive as weeds for some time under an arable regime, and ploughing up rhizomatous plants such as great fen sedge and spike-rush might even help to propagate them, until the soil became too dry for them to survive.

Phase 7 (4th century AD)
The four samples (2, 3, 5 and 22) analysed from this phase came from the Boundary Ditch 44, Enclosure 9, Oven 1 and Ditch 37 respectively. Charred plant remains were again more frequent than in the earlier samples, particularly in the ditches (11.7, 32.9, 3.7 & 18.3 FPL). Cereal grains, chaff fragments and weed seeds were all frequent. There was evidence for the cultivation of emmer/spelt (probably mostly spelt judging from the well preserved glume bases) and hulled barley. The status of oats and rye (one cf. rye grain only) were more uncertain, although if cultivated as fodder crops, or even early bite crops (ie grazed green from the field), the charred seed record would only be slight.

Detached cereal sprouts were again common in sample 3 (Enclosure 9) and present in sample 2 (Boundary Ditch 44). There were no obviously sprouted grains observed, so, as in the Phase 6 samples, it is likely that the sprouts represent damp storage or growing conditions, rather than deliberate sprouting for the production of malt. However, there is evidence for the production of malt from spelt wheat during the Roman period in other parts of Britain, eg the Romano-British village at Catsgore (Hillman, 1982).

The most important crop contaminant on the site was chess (*Bromus* sect. *Bromus*), which was present in 11 out of the 12 samples examined in total, but which was dominant in sample 3 (Enclosure 9), outnumbering wheat grains by more than 5:1, chess: emmer/spelt. This large-seeded grass is thought to have been introduced as a weed of spelt in the Bronze Age (Godwin 1975). It is a particularly common component of crop processing waste in Iron Age and Roman deposits, presumably because spelt was then the major cereal cultivated. Some authors have suggested that it may have been grown as a crop (Hubbard 1975), and it is interesting to note that many of the chess caryopses at Prickwillow Road were particularly large and plump. However, because it was present amongst crop processing waste, and was not recovered as a clean prime grain sample, this cannot be proved. It is possible that chess was tolerated as a weed, and to some extent served as a failsafe mechanism in the way that other maslins were grown, ie in a poor year its increased vigour may have compensated for a reduced spelt yield. Besides which (as with wild oats), it would have been difficult to process chess out of a crop, because the seed size of spelt and chess are very similar.

The range of weed contaminants amongst the crop processing waste was much greater in the Phases 6 and 7 samples, including some of the more of the

specifically arable group of weed taxa such as corncockle (*Agrostemma githago*) and red bartsia/eyebright (*Odontites verna/Euphrasia* sp.). An unidentified grass (3mm, oblong, faint hilum) was present only in the Phases 6 and 7 samples. Further identification of this taxon is underway, in case it adds to the ecological information, although Poaceae is a difficult family to identify to species level.

As noted above, wet ground and fenland taxa such as great fen sedge were even more frequent in Phase 7 than Phase 6. Two additional wet ground taxa were recorded, common marsh-bedstraw (*Galium palustre*) and sedge (*Carex* sp). A sample from Oven 1 (sample 5) produced smaller quantities of crop processing waste than the three ditch samples, but a relatively large number of great fen sedge nutlets (24 nutlets). There are documentary records of sedge being one of the most valued uncultivated crop of the fens in the past, since it could be used for thatching or as a fuel for bakers ovens (Porter 1969).

Comparisons with other sites

An assessment of Iron Age to Middle Saxon charred and mineralised plant remains from West Fen Road, Ely (Carruthers 2000) produced evidence for the cultivation of emmer/spelt and barley during the Iron Age, with one large deposit of bread-type wheat being recovered from an enclosure ditch fill. These samples will provide a useful comparison with the Prickwillow Road samples when they are fully analysed. The nearby Iron Age ringwork at Wardy Hill, Coveney produced abundant evidence for the cultivation of emmer, spelt, some bread wheat, six row hulled barley and probably flax and a pulse crop (Murphy, 2000). The weed flora indicated that the crops were being grown locally on the poorly drained clay soils. Sedge had been collected as fuel or for thatching.

The charred evidence from Prickwillow Road appears to be fairly typical of sites in East Anglia (Peter Murphy, pers comm), with arable cultivation increasing in intensity into the late Roman period, and emmer wheat giving way to spelt and bread-type wheat. Although bread-type wheat was not recovered from the few Iron Age and earlier Roman samples examined at Prickwillow Road, the results from West Fen Road and Coveney suggest that it was being cultivated on some sites at this time. The examination of further sites in the area may help to clarify the picture. The preservation of charred plant remains was particularly good in these samples, providing a lot of information about the arable economy.

Summary

It is dangerous to make sweeping statements on the basis of only one to four samples from each phase of activity, spanning possibly six centuries of occupation. However, the pattern of low-level arable cultivation in the Iron Age, changing to higher intensity farming in the later Roman period is repeated elsewhere in the British Isles. At Prickwillow Road, Ely, the change appears to have occurred between Phases 5 and 6, ie from the mid 3rd century, consisting of an increase in the cultivation of spelt at the expense of emmer. Free-threshing bread-type wheat also appeared for the first time in the phase 6 samples and wet ground fenland weeds greatly increased. This suggests that new areas of the fen edge were being ploughed up from the mid 3rd century to the 4th century for the cultivation of additional, more hardy varieties of wheat. Spelt is more frost-hardy than emmer and could have helped to spread the workload more evenly by being winter sown. It also usually produces a higher yield than emmer. Bread-type wheat would have grown well on the mineral-rich fen-edge soils and would have been valued for its improved bread-making properties and ease of processing. These introductions and expansion onto new areas of the fen edge would have helped to increase arable production, as suggested by the increase in charred plant remains per litre of soil sieved. The results from the analysis of charred plant remains fit in with the fact that most of the quern stones in Roman contexts were recovered from the Phases 6 and 7 ditches, (Atkins, pers comm).

Discussion

Date of the occupations

The excavations uncovered part of an Iron Age and Roman rural settlement sited at *c.* 20m OD on an east-facing slope of a ridge about 500m from the fen edge (Fig. 4). A number of sites of this period are known from the region, but few have been examined to any extent and the present excavations represent a modest contribution towards an understanding of the fenland area at this time.

There is evidence of activity on the site in the Neolithic and Bronze Age periods. Ninety-seven worked flints were recovered, all from residual contexts. This appears to represent a background scatter of a type commonly regarded as evidence of transient activity of an uncertain nature. It has been recorded locally on clay land as well as more permeable soils (Whittaker 1997). There were reportedly a Bronze Age barrow and a Beaker cremation found on the high part of the ridge about 200m north-west of the present excavations (SMR No. 6136).

Occupation on the site appears to start around the 5th century BC and continued intermittently until the 3rd century BC. The scatter of Iron Age pits and a single gully of this period are difficult to interpret, but may be part of a more substantial occupation on the higher ground to the north-west. Two inhumations (HB1 and HB2) appear to belong to this phase. From the 3rd century BC the site seems to have been continuously occupied until the 4th century AD. This is one of a number of sites in the region which show settlement in both the Iron Age and Roman periods, but such continuous longevity does not appear to have yet been demonstrated elsewhere except at West Fen Road on the other side of the Isle of Ely (Mudd 2000; Regan 2001). In contrast to the latter site, however,

there was no evidence of Saxon or medieval occupation at Prickwillow Road.

Form of settlements

The complete plan and form of the settlement is not known for any of the phases and it is possible that the focus of settlement had always been on the higher and better drained ground to the north and north-west. The southern and eastern limits of the settlement appear to have been defined within the excavation area, while the absence of features in the 1991 evaluation to the west, where just four sherds of Iron Age pottery and a single Roman sherd were recovered (Fig. 2; Haley 1992), indicates that settlement did not extend far in this direction.

Internally the site had suffered from plough truncation and also from post-medieval quarrying which had destroyed about 6% of the site overall, but whose effect was particularly severe on the higher ground (Fig. 4). Much of the detail of the settlement, perhaps most significantly in the middle Iron Age (Phase 2), has therefore been lost, although there is enough evidence to suggest an overall pattern of features.

In Phase 1 (5th to 3rd centuries BC) the scatter of pits and the fragmentary ditch on the better-drained ground provide scant evidence for the form of the settlement, although an unenclosed one would be typical of the eastern region generally in this period (Bryant 1997, 25). Around the 3rd century BC a subcircular enclosure, about 34m in diameter, was constructed. The enclosure ditch was about a metre deep and there was a 2.5m wide entranceway on the western side between the ditch terminals. There was slight evidence of a roundhouse consisting of a possible segment of eaves-gully towards the north-west side of the enclosure. The disturbance to the interior of the enclosure was such that little can be said about the form of settlement within it. It is likely that it was a small enclosed farmstead, common in the eastern counties and elsewhere (Bryant 1997, 28), and no more than four roundhouses in contemporary use could have been accommodated within it. It is, however, unknown whether it was isolated or part of a larger agglomerated settlement. A midden occupied an apparently natural depression on the northern side of the enclosure. This contained substantial quantities of pottery and animal bone. This feature has no parallels known to the authors, although, since surface middens would normally have been levelled out over time, it is possible that this kind of feature was more widespread than has been recognised hitherto. The patterning of 'rubbish' disposal and the possible symbolic codes involved has been discussed by Parker Pearson (1996), although it is not clear that the midden at Prickwillow Road was significantly positioned.

The enclosure was a long-lived feature. Its ditch was recut at least twice and it may have continued in use until the 1st century AD. At around that time it was abandoned. A new ditch respected the old enclosure ditch (or perhaps its internal bank) on the northern and eastern sides (Fig. 8, D2), but it did not curve to complete the circuit. It is unclear whether the site remained the focus of settlement in the new phase or whether this lay to the north. The subsequent phase of this ditch (Fig. 9, D15 and D16) contained wall-plaster associated with 1st–2nd century pottery, suggesting that a Romanised building had existed, probably to the north of the excavation, perhaps as early as the 1st century AD. The deep east-west ditch (D14) may have formed a boundary specifically relating to this structure which is likely to have lain at the core of the settlement. At the same time there appears to have been some activity in the south-western part of the site where early drainage ditches were dug. There were several episodes of ditch digging in this area, perhaps as a response to poor drainage conditions, before a small cremation cemetery became established in the 2nd century (Phase 5). The cemetery continued in use until the later Roman period when it was used for inhumations.

There was some expansion of the enclosures eastwards onto clay subsoil in the 2nd century, but this becomes more marked from the mid 3rd century when a pattern of small rectangular enclosures was laid out. These appear to be quite tightly constrained on the northern and southern sides, perhaps forming a kind of 'ladder' settlement between fields – a type common in some parts of the country. These enclosures were later replaced by others, including a D-shaped enclosure attached to a southern boundary ditch.

Settlement functions

There was little evidence of structures to help elucidate the distribution of activity loci or the functions of the enclosures in the various phases of settlement. The evidence of a possible roundhouse within the Phase 2 enclosure has been mentioned. Only a 5m length of curving gully survived but it is possible to estimate that it would have enclosed an area about 10m across, which is fairly typical of roundhouses of this period. This, and more particularly the quantity of debris from the enclosure ditches and midden, suggests that this was an area of domestic occupation.

No posthole structures were recognised from this or the subsequent occupations, although this is not an unexpected situation on even moderately truncated sites of the later Iron Age and Roman periods, and cannot be taken as evidence that structures were not present. In Phase 7 two adjacent oval ovens survived close to the southern boundary of the site. They were just 0.17m and 0.10m deep. Their function is uncertain. Oven 1 yielded some charred cereal remains and also a quantity of great fen sedge nutlets. These suggest that sedge may have been used as fuel but does not clarify the function of the ovens. They are perhaps most likely to have been used for domestic cooking despite their somewhat peripheral location. There is no indication that they lay within a building although this is clearly possible.

The composition of the charred plant assemblages

indicates that arable production expanded on to wetter land from the mid 3rd century (Phases 5 and 6, Carruthers, this report). This may have been associated with the introduction of free-threshing bread-type wheat and the increased use of spelt wheat instead of emmer. The site layout at this time shows an extension of the enclosure system onto lower ground to the east. While there need not have been any association between the two developments, it is tempting to see these enclosures as being related to crop storage and processing. It can be noted that three particularly rich samples of charred plants came from the ditches of E4 and E5 (Table 16, samples 21, 28 and 30), while further rich samples came from E9 and the Boundary Ditch 44 (samples 3 and 2). These suggest that processing was carried out nearby. Ditched enclosures would presumably have been necessary to protect stored crops from cattle. It is worth noting that the enclosures themselves do not appear to show the degree of connectedness usually associated with controlling stock inside them.

Economy

The economic evidence from Phase 1 is too meagre to discuss but from Phase 2 onwards there is good evidence of both arable and pastoral farming. The animal bone assemblages from Phase groups 1–3 and 4–7 have been compared (Tables 13 and 14) and show a remarkable degree of continuity. Cattle dominate for both periods (49.8% and 54.7%), followed by sheep/goat (33.5% and 33.3%), with smaller numbers of pig and other animals. Patterns of butchery and carcass utilisation also remain very similar throughout the occupation (Deighton, this report). There were very few wild species and no fish. This in itself is of some interest, suggesting that the settlement was not a specific fen edge adaptation, but rather a typical Iron Age/Romano-British farmstead subsisting on mixed farming in a perhaps rather marginal location. The marginality of the site for cultivation is suggested in the wet ground weed assemblages, particularly from the 3rd and 4th century phases, which has led to the suggestion that new areas around the fenland were being ploughed at this time to increase arable production. It has been noted that more querns were also recovered from later Roman contexts, at face value indicating that grain consumption had become more important, although since the longevity of quern stones is not generally known, it is possible that some of these were in use earlier as well.

The increase in arable production in the 3rd and 4th centuries appears to be mirrored by the increase in pottery and bone deposition. Table 17 shows the approximate quantity of material deposited for each 50 year block of time from Phase 2 to Phases 6/7. It can be seen that pottery deposition between *c.* 300BC and AD250 is fairly constant, the slight increase perhaps accounted for by the greater presence of the later features, and/or the incorporation of residual material. However, in the 150 years of Phases 6 and 7 there is a dramatic increase in pottery deposition, accounting for around 50% of the entire site assemblage. There could be a number of reasons for this, including simply a greater availability of pottery, which was consequently valued less; an increased population; an incorporation of more residual material; different rubbish disposal patterns; and conceivably an underestimation of the duration of occupation, which may have started before AD250 and continued into the early 5th century. There is no way of comparing the merits of these explanations in this report, except to note that the deposition of animal bones also shows an increase but a less marked one. This suggests that an increasing quantity of pottery, rather than just increasing debris generally, was a significant component of this late Roman trend. It can also been seen that the number of unidentified bone fragments remains fairly constant throughout the Roman phases (at around a third of the total), perhaps an indication that redeposition was not a major factor.

Craft/industry

There was little evidence for craft or industry. A small amount of fuel ash from both Iron Age and Roman phases seems likely to have been a by-product of domestic rather than industrial fires. No iron slag was found and there were very few iron objects from the site, perhaps reflecting the rarity of the material in the area.

The Iron Age (handmade) pottery is likely to have manufactured locally although there was no physical evidence of this. Jackson (this report) has commented on the differences in fabric between this assemblage and the broadly contemporary one from West Fen Road only two kilometres away. This supports Hall's suggestion that Iron Age pottery on the Isle of Ely was locally produced with fabrics varying according to the local geology.

Table 17. *Deposition rates for pottery and animal bone per 50 year block of time*

Phase	Duration (years)	No. of pot sherds	No. of identified animal bones	No. of unidentified animal bones
2 (300–100 BC)	200	75	130	87
3 (100 BC–AD50)	150	86	57	28
4 (AD 50–150)	100	110	77	33
5 (AD 150–250)	100	136	81	42
6 & 7 (AD 250-400)	150	374	126	65

There was evidence for pottery production in the Roman period in the form of kiln furniture, although no kilns or pottery wasters were found. Five kiln bar fragments and a kiln spacer were recovered from features dating from Phases 3 to 7 (1st to 4th centuries). The type of kiln represented is likely to have been what Swan describes as 'Late La Tène-derived', possibly entirely surface-built or slightly sunken and with portable furniture (Swan 1984, figs viii and ix). These are commonly found in the eastern counties (*ibid*, 63). While they are mostly dated to the 1st and 2nd centuries, it is possible that this particular technology continued longer on local production sites. The bars found in 4th century contexts may have been residual, but this is by no means certain. The kilns were probably used to make sandy grey ware vessels which continued to be used throughout the Roman phases of the site. Notwithstanding the suggestion that the major regional manufactories dominated production in the later Roman period (Mackreth, this report), there would still appear to have been significant local production into the 3rd and 4th centuries (Tables 9 and 10).

Despite local pottery production in the Iron Age and Roman periods, and the general continuity of economic activity indicated elsewhere, it is interesting to note that the change in pottery manufacture from handmade to wheel-thrown wares in the 1st century AD had no obvious continuity of vessel fabric or form. This would seem to imply that pots were being produced by different groups of potters, perhaps the newer Romanised wares being provided by itinerant potters using portable kiln furniture.

Human skeletal evidence

The human bone assemblage comprised two Phase 1 Iron Age inhumations and 16 3rd–4th century burials, 15 of these within a small formal cemetery and one outside. There were also five cremations of 2nd–3rd century date and two miscellaneous human bones, one an unstratified tibia (probably from a disturbed inhumation) and the other a fragment of skull from the early (Phase 1) Iron Age ditch.

The Iron Age burials were in crouched positions and without grave goods. While their dating is not entirely secure, the burial rite was relatively common from the 3rd/4th century BC until the 1st century AD, especially in southern and south-eastern Britain (O'Brien 1999, 25–6) and there is no strong reason to doubt that they belong to the earlier part of this date range. The isolated skull fragment is also not an unusual find from this period and local examples have been reported from Hurst Lane (Knight 2000) and West Fen Road, Ely (Higbee 2001). It has been speculated that they might represent part of the wider cult of the severed head which was practised in southern Britain during the Iron Age (Bryant 1997, 27).

The Roman burials were interred in a variety of positions and had a range of associated grave furniture. The rites appear to be generally within the pagan Roman tradition. Three were in a crouched position, possibly a continuation of the Iron Age burial rite (Anderson, this report). Two were buried prone, both of them males. This was a minority rite with only a few instances recorded in any one cemetery. It is normally understood as an expression of censure or punishment, or as a means to prevent a person who was feared in life or who suffered an unusual death, from returning to haunt the living (O'Brien 1999, 5–6). Iron nails from four of the graves indicate that these were buried in wooden coffins. Only one of the inhumations, a mature man, was buried wearing hobnail boots, although it is interesting to note that small numbers of hobnails were recovered from two of the cremation vessels (Table 1), suggesting that the individuals had been buried with their boots, and presumably other articles of clothing. Grave goods were limited to bracelets accompanying females and a miniature vessel accompanying an adult male cremation. The bracelets included five intertwined (Figs 14, 22, 16 and 17) under the neck of a young woman (HB10). These items are not uncommon in the 4th century. At Lankhills there were 174 bracelets accompanying burials, including multiple bracelets in bags or containers (Clarke 1979).

Pathological traits on the skeletons include degenerative changes probably associated with work-related stress and poor oral health (Anderson, this report). While the sample is a small one, there would appear to be significant differences in pathology between the sexes. Women in particular show spinal osteoarthritis and Schmorl's nodes relating to compressional forces such as might have been caused by carrying loads on the head, while evidence of trauma (healed fractures of the nose, left ribs and left clavicle on three individuals) is confined to men.

There is a marked humeral asymmetry on the female skeletons suggesting either excessive strain on the right arm from childhood, or, more probably, a local genetic trait. The Iron Age female (HB 11) also shows this trait which suggests a direct genetic link between the two populations. This suggestion is supported by congenital sacral clefting in both the Iron Age juvenile male (HB 12) and a young Roman female (HB 13). It is likely that these abnormalities reflect intermarriage within a relatively isolated community. Furthermore, the fact that the marked humeral asymmetry is confined to females may perhaps indicate a predominantly matrilocal society into which non-local men married.

Animal burials and ritual deposits

There were a number of partial and complete animal burials on the site. As elsewhere it is often difficult to determine whether partial skeletons or individual bones should be considered as ritual deposits or casual discard, the distinction between the two largely dependent upon the apparent care with which the depositions were made and the surrounding context. There were five dog burials, the earliest from a Phase

1 Iron Age pit and most of the later ones within the ditches of the Roman settlement. One was buried in a grave within the Roman cemetery although it cannot be proven that it was contemporary with the human interments. Dog burials are common on Iron Age and Roman sites, although the context of burial – whether as some propitiatory rite or a simply a response to a natural death – is not generally clear.

Several animal skulls were recorded, the contexts of some suggesting ritual depositions. Groups of skulls were found in two places. In a section on the eastern side of the Iron Age enclosure (E1) there were two posterior cattle skulls with four horn cores, and in a late 4th century ditch (D43) there were two horse skulls and two posterior cattle skulls, apparently positioned as a group. A partial horse skull in Pit 8 (Phase 3) was associated with other animal bone and may have been a casual discard, but the recovery of a complete handmade bowl from the same feature (Fig. 19, 19) suggests that it too may have had ritual connotations.

The wider context

The emerging picture of Iron Age and Roman settlement on the Isle of Ely and nearby, based particularly on the Fenland Survey (Hall and Coles 1994; Hall 1996) and development-led work since, shows a great density of sites – roughly one every kilometre (Fig. 28). It is important to note that the Prickwillow Road site was not found in the Fenland Survey, either from surface material or cropmarks, and there are likely to be similar sites awaiting discovery. Like Prickwillow Road, many sites have both Iron Age and Roman material, but since most have not been excavated to any extent, continuity of occupation, such as that demonstrated at Prickwillow Road, cannot at present be assumed. It is worth noting that there is no detectable influence of the Roman military and administrative presence in the 1st century AD.

Likewise there is little evidence upon which to base an assessment of the status of this and other sites, nor how they interacted. It has been suggested that Wardy Hill acted as a local centre for sites in the Ely region in the Iron Age and early Roman period (Hall 1996, 50), but it remains uncertain how the relationship might have functioned. An appraisal of the role of Prickwillow Road in the settlement pattern is hampered by an incomplete view of the site, but at face value the evidence does not suggest that it was anything more than a mundane farmstead. White wall plaster from 2nd century AD contexts indicates a fairly early Roman influence, but there was insufficient building material to suggest the presence of a villa in the settlement. It can be noted that the plaster had been attached to a wattle construction which therefore need not have been particularly grand. The absence of oyster shells and amphorae of any sort, which are commonly taken as indications of a Romanised diet, may also be significant. It remains unknown whether the settlement might have had a relationship with a

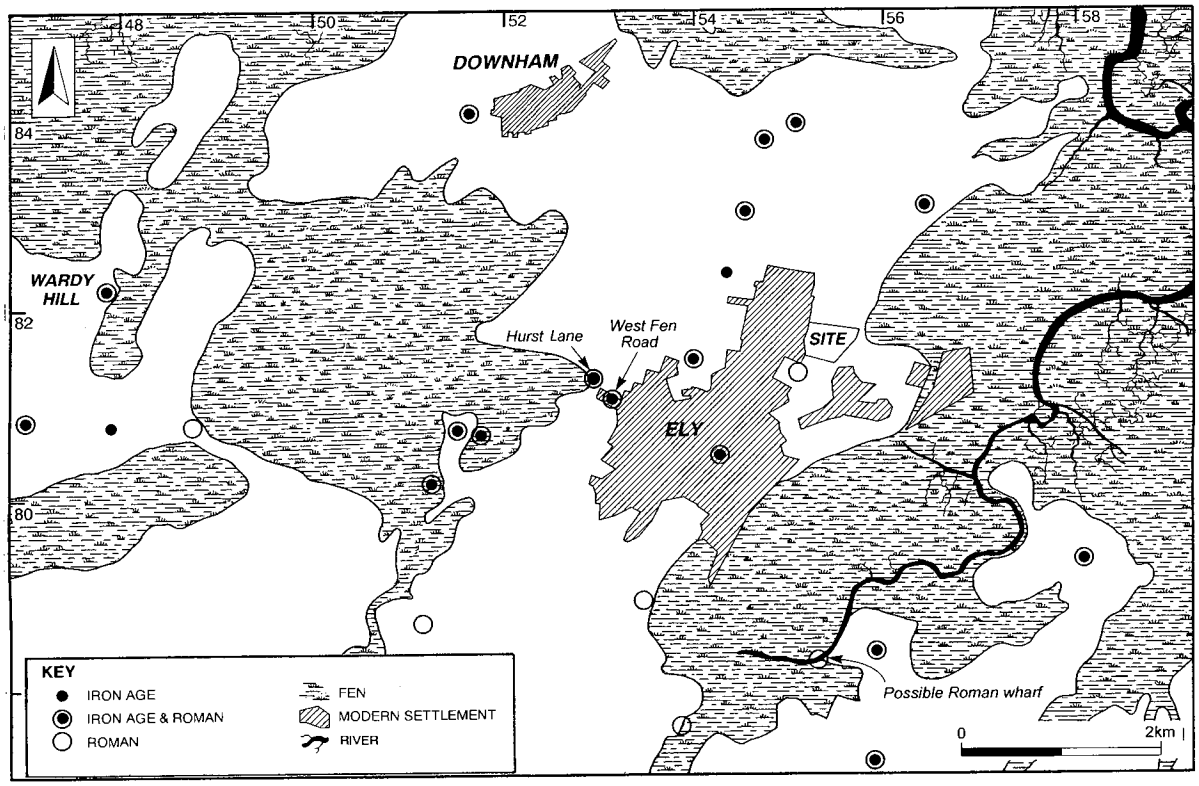

Figure 28. Known Iron Age and Roman sites, after Hall (1996) and recent discoveries

villa estate, or whether it would have been independent.

Several small items from the later phases of the site, particularly the composite set, casket fitting and buckle, are unusual and may indicate more cosmopolitan contacts at this time. A Roman iron stylus and a seal box lid, although found unstratified, would appear to indicate a degree of literacy and a need for book-keeping. These items may be linked to the occasional presence of officials concerned with collecting the *annona* or corn tax (Timby 1998, 292). In the context of Prickwillow Road, it is interesting to note the evidence for the expansion of arable in the late Roman period, which may have had more to do with official demands than local requirements. It is also worth noting the relative regularity of the mid 3rd century (Phase 6) enclosures (Fig. 17). Enclosures E5 and E8, for example are a very similar size with dimensions (25–30m across) close to the 27m standard module claimed for Barnsley Park (McWhirr 1981, 101), Roughground Farm, and other villa sites (Allen *et al.* 1993, 187). Again, it seems possible that this reflects some involvement of an authority above the level of the settlement itself. However, only further work on sites in the region can to help confirm or refute the suggestion of an official influence on production or commerce in the area.

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A Late Migration/Final Phase cemetery at Water Lane, Melbourn

Holly Duncan, Corinne Duhig and Mark Phillips
With contributions by Sarah Bates, John Hines, Matilda Holmes, Ruth Pelling, and Anna Slowikowski

Between January and June 2000 part of an Anglo-Saxon cemetery at Water Lane, Melbourn was investigated in advance of housing development. The cemetery was in use for around 100 years between c. *AD575 and* c. *AD675. It occupied an area of approximately 40m by 50m in the southern half of the site. Here, a total of 52 graves, containing the remains of 59 individuals, were excavated. One further isolated grave lay approximately 20m northwest of the main burial area.*

The graves were not laid out in rows, nor did the Bronze Age barrow on the southern fringes of the cemetery influence their layout. Instead, they were organised around a number of focal points, including a richly furnished, female, 'founder' burial and a variety of distinctive cemetery structures.

The juxtaposition of graves and structures is only one of a number of attributes of the cemetery which have allowed a greater insight into its development. Three-quarters of the burials were accompanied by grave goods, a relatively high proportion for the period. The assemblage of human bone, while not of great size, is highly informative, due to its good preservation and recovery. In terms of demography and pathology, it provides significant contrasts with earlier Anglo-Saxon cemetery populations in the south Cambridgeshire area. There is a high degree of reuse of grave plots, possibly with gender-related restrictions on this reuse. One grave was re-opened at least four times to allow the insertion of another body on top of the earlier, undisturbed interments.

No physical remains of boundary markers were found. Further burials undoubtedly existed to the west, beneath what is now an industrial estate and was formerly a chalk pit. Earlier excavations in the vicinity, conducted by Wilson (1956), uncovered 28 graves containing 30 individuals. The exact location and plan of these earlier investigations are now lost and it is impossible to determine if the two sites represent parts of two cemeteries or one larger cemetery occupying the low chalk ridge on the southern outskirts of Melbourn.

In addition to the Anglo-Saxon cemetery, a number of earlier features were investigated. These dated principally to the late Neolithic/early Bronze Age and the late Bronze Age/early Iron Age

Introduction and Background

Background to the Excavation

Location and historical setting

The site is located on the southern outskirts of the village of Melbourn, some 8 miles south of Cambridge. Melbourn lies at the source of the river Mel, one of the many tributaries which constitute the upper Cam basin, part of the distinct geographical zone of south Cambridgeshire, sandwiched between East Anglia and the Midlands (Malim and Hines 1998, 3).

Melbourn lies on a slight rise (*c.*40m OD) of Lower Chalk, part of the eastern tail of the Chilterns. It is 4–5km due south of Barrington and the Anglo-Saxon cemetery sites of Edix Hill (Barrington A) and Barrington B. The village is situated on Ashwell Street, an east-west route running parallel to the Icknield Way. It has been argued that Ashwell Street, possibly prehistoric in origin, was an important route in Roman and Saxon times (Malim *et al* 1997, 116: Malim and Hines 1998, 3–5). A branch road, lying immediately to the west of the village, may have run northeast from Ashwell Street, to join the prehistoric and possibly Roman road, Mare Way (Fox 1923, 150–1; Malim and Hines 1998, 3). Main lines of communication have run through this drier chalkland since prehistoric times, and during the earlier Anglo-Saxon period a series of linear earthworks were constructed across it (Malim *et al*, 1997).

The village straddles the old highway between Royston and Cambridge. It is thought to have originally comprised four hamlets which transformed into a long linear village. This transformation may have resulted from the development of the road between Royston and Cambridge, after the town of Royston was founded in the 12th century (Taylor 1997, 88). In the late 11th century there were some 50–60 tenants (Salzman 1938, 67) and by 1377, 323 poll-tax payers (Taylor 1997, 88). In the 16th century 80 households were recorded and by the 17th century it was referred to as a 'great towne' with 125 houses (Taylor 1997, 88). Of its extant remains, the church dates from the 13th century and various cottages and farm buildings date to the 14th century.

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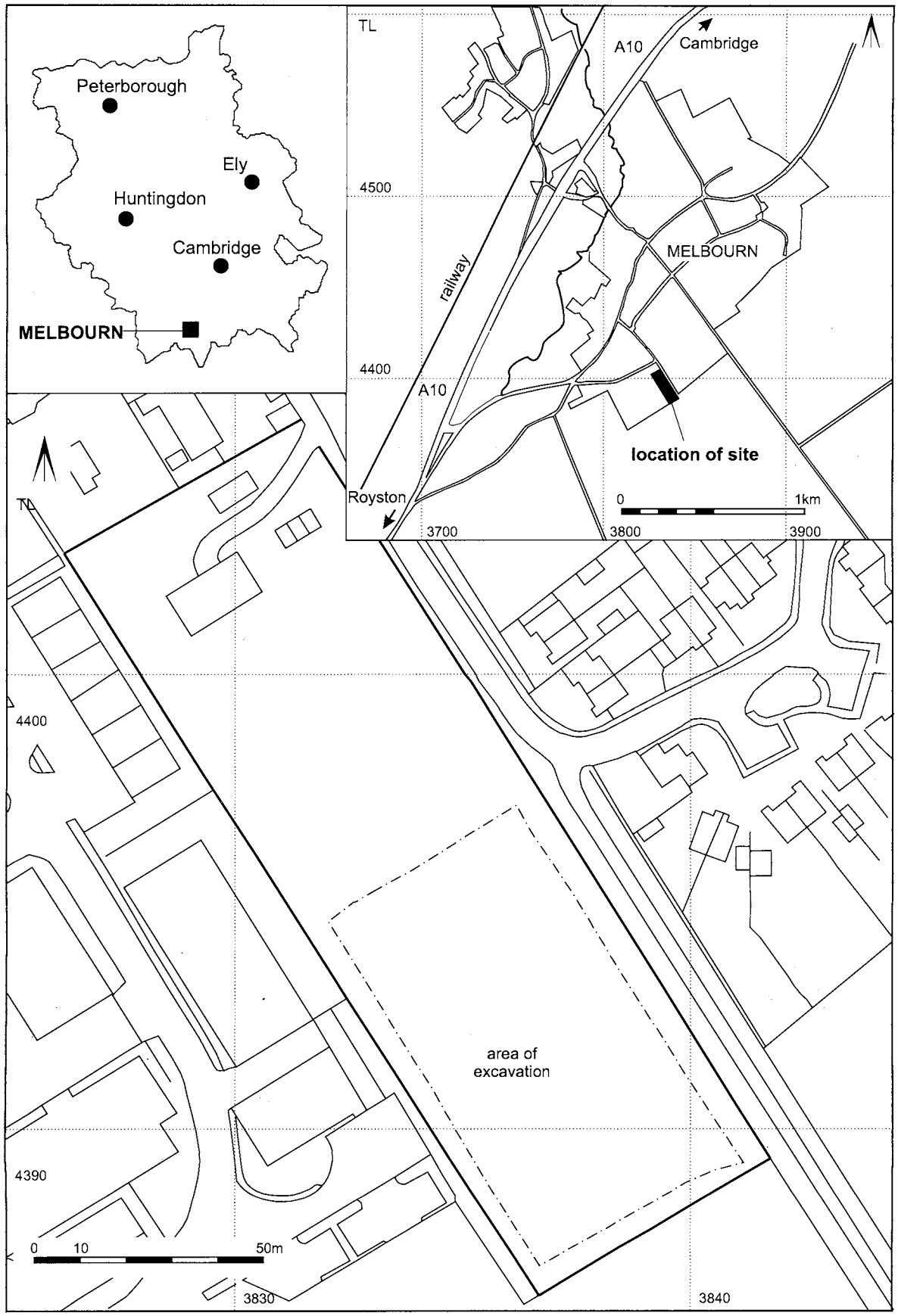

Figure 1. Location plan

Within the development area no structures were shown on the available historical maps, dating from 1839 to the early 20th century (CRO Q/RDc63). Prior to the Inclosure Award the site was located within Mill Field, one of the township's open fields. The perimeter of the development area does not appear to have altered since 1839 when the land comprised two allotments (CRO Q/RDz9 and CRO Q/RDc63). By 1885 these had been merged into a single plot as shown on the first edition OS 25 inch map. The orchard appears to have been planted after 1903. In the 19th century, a significant amount of quarrying work took place south of the village. However, this appears to have been restricted to the site of the modern-day industrial estate, immediately to the west of the development area (CRO Q/RDz9).

Topography and Geology of the Site
The development area was rectangular and approximately 1.2ha in extent. At the time of the investigations it was a disused orchard with a few barns and outbuildings at its northern end. The short northern boundary separates the site from a single residential plot. To the east the plot is bounded by Water Lane and to the west by the industrial estate. Arable fields lie to the south.

Within the development area the Lower Chalk was found at 0.3m to 0.5m below present ground level. Its upper surface was scarred by weathering and ploughing. Above the bedrock was a layer of relatively stone-free, mid grey, clay silt soil, which contained flecks of chalk throughout and moderate amounts of chalk pieces in the lower part of its profile. This layer was 0.15m to 0.3m thick over the majority of the site. It appeared to be a former ploughsoil that had remained relatively undisturbed since the planting of the orchard. The topsoil consisted of a dark brown silty loam containing occasional flecks of chalk and a dense mat of tree roots. This layer was 0.15m to 0.2m thick and represents the layer of turf and topsoil that developed during the use of the site as an orchard.

Archaeological Background
In 1951 the discovery of an Anglo-Saxon cemetery (SMR 03169) during quarry work, to the immediate west of the development area, led to a rescue excavation the following year (Wilson 1956, 29–44). The burials, thirty in total, were believed to date to the 7th century and thought to provide evidence for the transition from paganism to Christianity. The precise location of these graves remains uncertain. The SMR gives the location as TL3823/4386, some 110m west of the present site. It was emphasised at the end of the investigations that the cemetery was by no means completely excavated (Wilson 1956, 38) and that its full extent was unknown.

Other significant archaeological remains in the vicinity include: medieval field boundaries (SMR 09558 and 09540), two ploughed out early or middle Bronze Age barrows (SMR 03166, TL389/439) and scatters of Roman pottery (SMR 03116a TL389/439).

Circumstances of the present work
Cambridgeshire's County Archaeology Office advised the local planning authority that proposals to develop the site for housing could be archaeologically sensitive. Accordingly the local planning authority requested further information on the archaeological potential of the site. This was obtained through a desk-based assessment and archaeological field evaluation undertaken between December 1999 and January 2000, the results of which were sufficiently significant to require further archaeological investigation (Phillips and Wilson 2000 BCAS report no. 2000/08).

Open area excavation took place between 26th April and 9th June 2000. These excavations were permitted by Mrs S Gillings on behalf of the landowners, the Hagger family, who also generously donated the finds to Cambridgeshire County Council. The work was funded by Old Road Securities plc and Amber Developments (St Ives) Ltd.

The Excavations

Aims of the investigation
The overall aim of the project was to preserve any archaeological remains by record and to attempt a reconstruction of the history and use of the site. This specifically included identification of the main phases of activity and recovery of artefactual and ecofactual material to elucidate the types of activity on site, and its palaeoenvironment.

Excavation strategy and method
After clearance of the orchard, topsoil was removed by mechanical excavator under archaeological supervision. Machine stripped areas were cleaned by hand and pre-excavation plans compiled. Discrete features were half sectioned and at least 25% by length of linear features and posthole structures were examined. Inhumations were fully excavated and drawn at 1:10, while 1:1 plans were made of complex artefact groups. Photographs in monochrome, colour transparencies and digital format were taken. Specialist osteological advice was provided by Corinne Duhig who visited the site during excavation. Advice on Anglo-Saxon cemeteries was provided by many visiting specialists including Audrey Meaney, Alison Taylor, Tim Malim, Chris Scull and Martin Welch.

Format of publication and methodologies
'Prehistoric and pre-cemetery evidence' discusses the evidence for pre-cemetery activity at Melbourn. The contextual and finds evidence for prehistoric activity is presented in an integrated format (pp. 61–63). Features of indeterminate date are discussed on p. 6 and the ceramic evidence for late Iron Age and Roman activity follows.

'The cemetery' focuses on the Anglo-Saxon cemetery, including a catalogue of the individual graves and their contents. The structural features present within the cemetery and the morphology of the

graves are discussed on p. 92. The human skeletal evidence is examined in detail from p. 96, followed by the assemblage of finds accompanying the inhumations. Chronological and social aspects of the cemetery and its place within the regional context are explored in 'Development of the cemetery'.

The methodologies employed in analysing the contextual and material records are presented by dataset in Appendix 1. Appendix 2 comprises the ceramic fabric type descriptions encountered at the site.

Prehistoric and pre-cemetery evidence

Mark Phillips

Prehistoric activity

Introduction

Unlike some other Anglo-Saxon cemeteries in the region, eg Edix Hill (Malim 1998), the excavations at Melbourn did not produce a significant pre-6th century component. However, two phases of prehistoric activity were identified, together with undated features which may also be contemporary.

There is no firm evidence to suggest that the location of the Anglo-Saxon cemetery was influenced by previous use of the site. An early prehistoric barrow, itself perhaps part of a barrow cemetery (see SMR 03166; TL389/439 for two further round barrows), occupied the same ridgeline that attracted the founders of the Anglo-Saxon burial ground. Whether the barrow was still visible in the late 6th century (its remains were heavily truncated) or whether the juxtaposition of the cemetery is simply a topographic coincidence is uncertain.

Regardless of this issue, the prehistoric evidence is sufficiently interesting in its own right to merit discussion. The earliest phase of activity dates to the late Neolithic/early Bronze Age. In addition to the barrow, a number of small pits, yielding artefacts and faunal remains, were identified. These may be a late manifestation of the tradition, described by Thomas (1991, 59–78), whereby semi-nomadic people deliberately left 'structured deposits' on sites that were perhaps visited on a seasonal basis but were not permanently occupied (Thomas 1991, 75).

The second phase of prehistoric activity dates to the late Bronze Age/early Iron Age. It is characterised by post-built structures and pits, containing small quantities of pottery typical of the period. These may represent evidence for more permanent occupation but, if so, it is likely that the main focus of settlement lay beyond the limits of the excavated area.

Late Neolithic/Early Bronze Age

Evidence for late Neolithic/early Bronze Age activity was restricted to the western half of the excavated area. It comprised eight pits and part of the ditch (G49) of a heavily truncated round barrow. The ditch had a projected external diameter of 24m and, where best preserved, was 2.6m wide and 0.3m deep. The sides sloped at approximately 45° to a flat base. The primary fill (0.1m deep) contained frequent, medium to large flint nodules, possibly derived from material used to face the mound. The main fill was a mid-brown silt, containing one fragment of a sheep/goat tibia and 27 pieces of struck flint (mostly flakes, spalls and shatter pieces). If a central burial survived, it lay to the west beyond the limit of excavation.

Four of the pits (G41), lying 18m to the northeast of the barrow, formed a rectangular array, oriented NNW-SSE and demarcating an area of about 1m by 2m. The northern pair were *c.*0.7m in diameter and 0.4m deep with vertical sides and flat bases. The southern pair were up to 0.96m in diameter and 0.5m deep with concave profiles. Each pit had two main fills each containing flint, animal bone, pottery and charred plant remains. The flint assemblage comprised mainly debitage, with a low percentage of blades (7%) in comparison to flakes (93%). Four scrapers, three utilised and retouched flakes, a utilised blade, and a serrated blade and flake represented the only tools. The animal bone assemblage (84 pieces) was fragmentary. The majority was from unidentified, small to medium mammals, although pig, cow, and to a lesser extent, horse and sheep/goat were represented. The ceramic assemblage was too fragmentary to identify forms (52 sherds, weighing 85g). Two of the vessels may be collared urns on the basis of their limestone-tempered fabric, which is the same as the definitely identified urns from pit G13. Sherds from one of these vessels were found in two different pits, one to the north and one to the south. A large number of hazelnut shells and a lesser quantity of cereal grain, including barley (*Hordeum vulgare*), were also recovered.

The remainder of the pits were more widely scattered. Pits G2, G12 and G13 lay 35m to 77m north of the barrow. They were broadly similar in appearance, circular to sub-circular in plan with steep sides and concave or flat bases. They were 0.7m–1m in diameter and 0.1m–0.32m deep.

G2 and G13 each had a single fill. G13 produced 898 fragments of animal bone. Although 94% of the assemblage was too fragmentary to identify, pig, cow, sheep/goat, horse and dog were present, with pig predominating. The flint assemblage (287 struck pieces) largely comprised debitage. Flakes and flake cores predominated, with single instances of a utilised blade, a backed knife, an end scraper and a *petit tranchet* arrowhead. This pit also produced sherds from four ceramic vessels: two collared urns (Figure 3 nos 1–2) and two bowls (Figure 3 nos 3–4). All four vessels were decorated, the collared urns with either incisions or twisted cord and the bowls with incised motifs. One collared urn (Figure 3 no 1) was made up of 31 sherds from G13 and 20 sherds from G2, none of them joining.

Overall, the fill of G2 was similar in composition to that of G13. However, it yielded smaller quantities of finds: 48 fragments of animal bone, flint debitage (17 flakes), 2 retouched flakes, 3 scrapers and 21 collared urn fragments, one of which was from a different vessel to that found in the fill of pit G13.

The primary fill of G12 contained no finds.

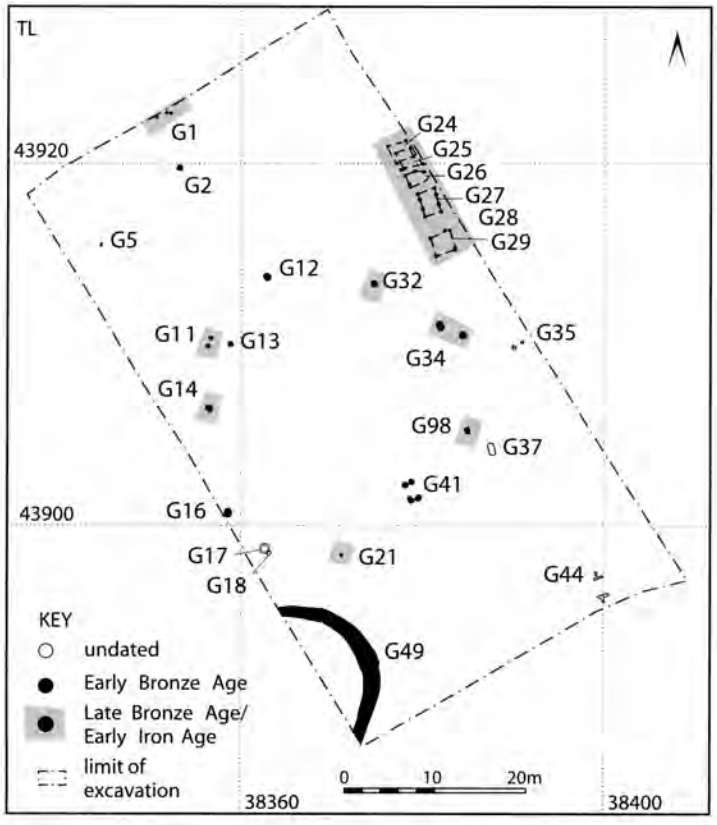

Figure 2. Prehistoric activity

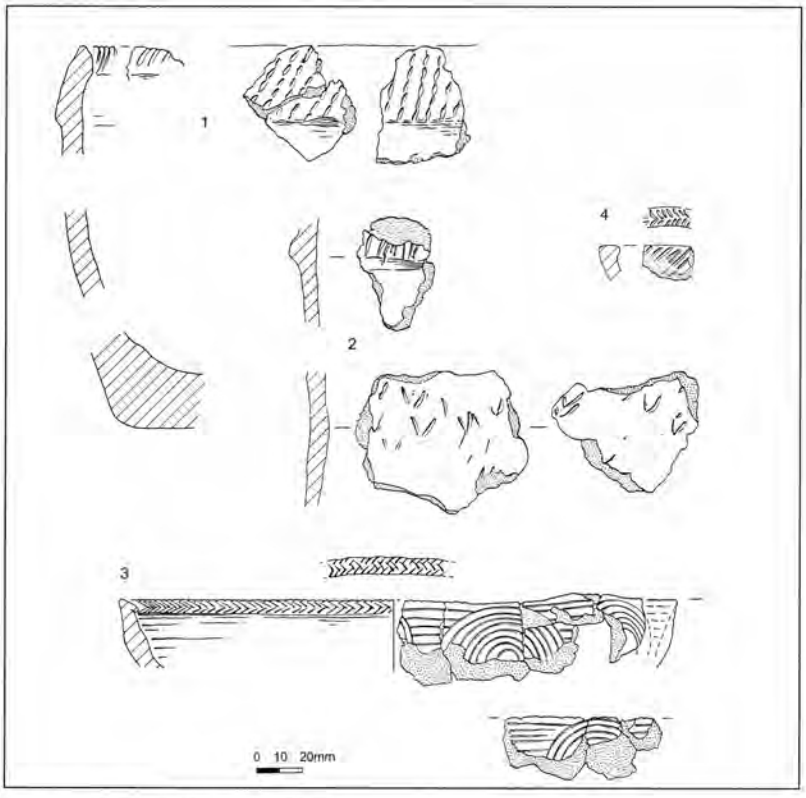

Figure 3. Early prehistoric pottery

However, its upper fill produced 337 fragments of animal bone. Within the 78 identifiable fragments, pig predominated (61.5%), with cow (32.1%), sheep/goat (5.1%) and dog (1.3%) less well represented. The flint assemblage (368 struck pieces) was dominated by debitage, with only 3 utilised flakes present. Fifty-one sherds of pottery were recovered, over 30% from soil samples. Three vessels were made up of relatively large numbers of fragments (4, 8 and 18 respectively), although they were still too fragmentary and abraded to identify forms. One of these vessels included a fragment of flat base.

Pit G16 lay *c.*14m NNW of the barrow. It was similar in form (sub-circular, steep sides, concave base) and size (1.1m in diameter, 0.47m deep) to the other isolated pits. Its single fill produced 61 pieces of struck flint, entirely debitage but for a utilised blade and a double-ended scraper. Of the 116 fragments of animal bone, the majority was unidentifiable, with pig (6%), cow (4.3%) and sheep/goat (2.6%) making up the remainder. Two sherds of pottery were found. One weighs only 1g but may be prehistoric in date. The other, weighing 3g is in late Bronze Age/early Iron Age fabric F01B and is likely to be intrusive.

Late Bronze Age/Early Iron Age activity

Evidence for late Bronze Age/early Iron Age activity comprised six pits (only two of which were close to one another) and a NNW-SSE alignment of five four-post structures (G24, G25, G27–G29) close to the northeast edge of the excavation. The structures ranged in size from 2.2m to 2.9m square. Their constituent postholes were 0.22m–0.32m in diameter and 0.08m–0.23m deep. Structures G24 and G27 appear to have been replaced by G25 and G28. An associated cluster of postholes G26 may represent evidence for further repair or replacement. As with all the features in this phase, finds were relatively sparse. A single F01B rim sherd was found in G24, while four F01B sherds and one F20 sherd were recovered from G27. All were small, with an average weight of 3g. The only other finds were a single flint flake spall and 8g of unmodified, burnt flint.

A cluster of three postholes G1 lay on the northern edge of the excavation, northwest of the row of four-post structures. The largest posthole, 0.25m in diameter and 0.19m deep, contained eight sherds of an F01B carinated jar and a single body sherd in fabric F16.

A two-post structure G11, comprising sub-rectangular postholes (0.47m by 0.3m and up to 0.04m deep) set 1m apart, was situated near the western edge of the excavation. Finds were limited to a single F01B sherd, weighing only 2g.

Of the six pits phased to this period only two, G34, were relatively close to one another. They were sited 3.3m apart, to the south of the row of four-post structures. One was circular (0.7m in diameter); the other oval (0.9m by 0.6m). They were 0.2m–0.4m deep. Both contained two fills, the lower one generally stonier. The only finds were one tiny sherd in fabric F20, one flint piercer and the fragmentary tooth of an unidentified mammal.

Pit G98, partly truncated by a later grave, had near vertical sides and a flat base. Its surviving dimensions suggest a diameter of up to 0.8m and a depth of 0.28m. The single, uncompacted fill contained five and eight sherds respectively from two vessels in fabric F16. In total, they weighed only 18g. Twelve fragments of unidentified mammal bone, a small assemblage of flint debitage (20 pieces) and 13g of unmodified, burnt flint were also found.

Pit G21 was sub-circular (0.5m by 0.4m) with a concave profile, 0.13m deep. Its sole fill contained sherds from 13 vessels, all in fabric F01B but for a single example in fabric F16. Only one vessel, a round-shouldered jar, was represented by a substantial number of sherds (16). Three pieces of flint debitage, 29g of unmodified, burnt flint and 26 fragments of mammal bone were also recovered.

Pit G14 measured 0.76m in diameter with a concave base, 0.28m deep. The single fill contained three sherds in fabric F01B and four sherds in fabric F01A from the same vessel. Four pieces of flint debitage, 16g of unmodified, burnt flint and a single fragment of bone from a large mammal were also recovered.

Pit G32, located 10m west of the row of four-post structures, was 0.78m in diameter and 0.07m deep. In common with most of the pits of this phase, the single fill produced a small assemblage of pottery, flint and animal bone. Three sherds of fabric F16 were recovered. The flint assemblage comprised 18 pieces of debitage and a single serrated blade. Much of the animal bone assemblage was fragmentary and unidentifiable. However, a near complete cow metatarsal and deer antler fragments were present. A water-worn quartzite pebble had a smoothed slightly dished edge suggesting use as a hone.

Features of indeterminate date

Twenty-two groups, comprising 36 contexts, could not be dated with certainty. Of these, fifteen groups yielded either no finds or, in one instance, charcoal and 2.9kg of burnt flint. A single pit (G33) contained the remains of two chicken legs, indicating that the fill is unlikely to pre-date the later Iron Age (Maltby 1996, 1997). These groups are not discussed further.

Six groups comprising four pits (G5, G17, G18 and G37), two postholes (G35) and two structural slots (G44) yielded small assemblages of finds, including one sherd each from G37 and G44. The pottery from both groups is in fabric F01B suggesting a possible late Bronze Age/early Iron Age date, but the size of the sherds, 3g and 2g respectively makes dating rather tentative. All this material suggests these features are prehistoric in date but greater precision is impossible.

Pit G5 was roughly rectangular in plan (0.47m by 0.25m), with near vertical sides and a rounded base, 0.22m deep. The fill contained three flint blades, one with denticulated edge, and two fragments of burnt flint (4g).

Pit G17 was circular, 1.45m in diameter, 0.58m deep, with vertical sides and a flat base. The configu-

ration of the fills suggested the pit was lined. A total of eight flint flakes, a tested core, a fragment of cow bone and one of unidentified mammal were found. Pit G18 adjoins G17 although their relationship was unclear. G18 was 0.5m in diameter and 0.36m deep and contained a single unurned cremation, weighing 648g.

Pit G37 was roughly rectangular in plan (1.6m by 0.9m). Its size and position within the bounds of the Anglo-Saxon cemetery initially suggested it was a grave. However, its irregular profile and very uneven, sloping base argue against this interpretation. The single sherd of Late Bronze Age/early Iron Age pottery came from the upper fill.

G35 comprised two postholes, one sub-rectangular (0.6m by 0.4m) with concave base (0.18m deep) and one circular (0.38m in diameter and 0.13m deep), set 1.4m apart. The sub-rectangular feature produced a flint flake, spall and a retouched blade.

On the southeast edge of the excavation two T-shaped slots, set 2.5m apart with the short stem of each 'T' facing outwards, were recorded (G44). The fills produced a flint piercer, a partial radius of a horse, five unidentified mammal bone fragments and a single sherd of late BronzeAge/early Iron Age pottery.

Evidence for late Iron Age and Roman activity

Evidence for activity in the late Iron Age and Roman periods is restricted to residual pottery sherds recovered from the Anglo-Saxon cemetery structures and grave fills. All the sherds are small and abraded and none had been reworked. The lack of consistency in colour or fabric type suggests that this material had not been deliberately collected. The paucity of this evidence, and the absence of any features of this date suggest that the excavated area was not occupied at this time. The fabric types present are listed in Appendix 2.

The Cemetery

Catalogue of graves

Introduction

During structural analysis, closely related contexts were assigned to a unique 'sub-group', representing a basic, indivisible unit of interpretation. In terms of the cemetery evidence, a sub-group may be defined as a 'burial event', typically comprising a grave cut, a skeleton, finds deposit(s) and fill(s). Sub-group numbers 55–110 were assigned to the graves and grave-like features. This numbering has been retained within the publication to facilitate retrieval of information from the site archive.

The catalogue is ordered by sub-group number (SG), with the grave cut and skeleton number indicated. The grave shape and dimensions (L = length; B = Breadth; D = depth cut into bedrock) are given as well as the orientation of the skeleton (head position indicated as degrees from 0° north). The preservation of the skeletal remains (scale of 1–5: 5 = complete apart from a few small or fragile bones, down to 1 = only one or two bones present), sex (male = M; female = F: immature = IMM), age and stature are indicated. The position of the body torso and arms and legs are noted and a summary list of grave goods provided. Skeletal remains and registered artefacts found within the fill of a grave are listed within square brackets. The grave cut, skeleton and grave goods are illustrated in Figures 4–24. Individual finds illustrations are indicated by grave number and drawing number, eg 55.1.

The Graves

Sub-group no: 55 (Figure 4)
- Grave no: 1013
- Skeleton no: 1015
- Grave shape: sub-rectangular
- Grave dimensions; L. 1.13m; B.0.77; D. 0.1m
- Body orientation: 197° north
- Skeleton condition: 1
- Sex: IMM; Age: 3.7–6.3 ; Stature: n/a
- Skeleton position: supine
- Arm position: extended
- Leg position: extended
- Grave goods:
  - Knife 55.1 Type C size-group 1 (L.105.4mm)

Sub-group no: 56 (Figure 4)
- Grave no: 1019
- Skeleton no: 1021
- Grave shape: pentagonal
- Grave dimensions: L. 2.41m; B. 1.62m; D. 0.65m
- Body orientation: 178° north
- Skeleton condition: 5
- Sex: F; Age: 21–30; Stature: 172.2cm
- Skeleton position: supine
- Arm position: right crooked
- Leg position: extended
- Grave goods:
  - Copper alloy vessel rim mounts 56.1–2 (L. 12.2mm)
  - Silver capsule bead 56.3 (L. 13.6mm)
  - Silver slip-knot ring 56.4 (Dia. 22mm)
  - [from grave fill: small-long brooch fragment RA16 and sherd of Roman window glass RA88, not illus.]

Sub-group no: 57 (Figure 4)
- Grave no: 1399
- Skeleton no: 1400
- Grave shape: sub-oval
- Grave dimensions: L. 1.3m; B. 0.74m; D. 0.27m
- Body orientation: 180° north
- Skeleton condition: 1
- Sex: IMM; Age: 3.7–6.3; Stature: n/a
- Skeleton position: n/a
- Arm position: n/a
- Leg position: n/a
- Grave goods:
  - Knife 57.1 Type A size-group 2 (L. 140mm)
  - [from grave fill: human remains 1401, preservation 1, sex IMM]

Sub-group no: 58 (Figure 5)

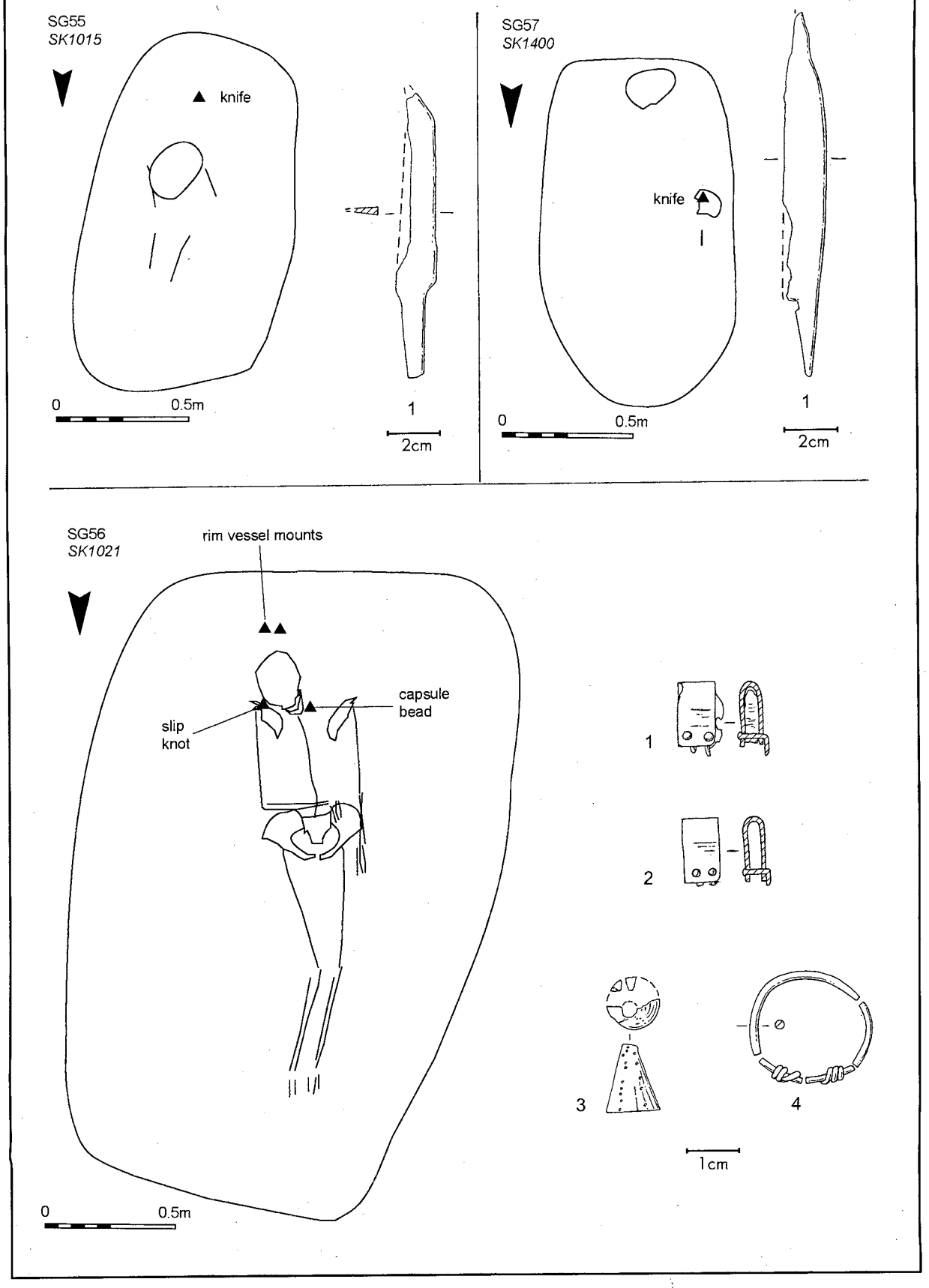

Figure 4. SG55-SG57

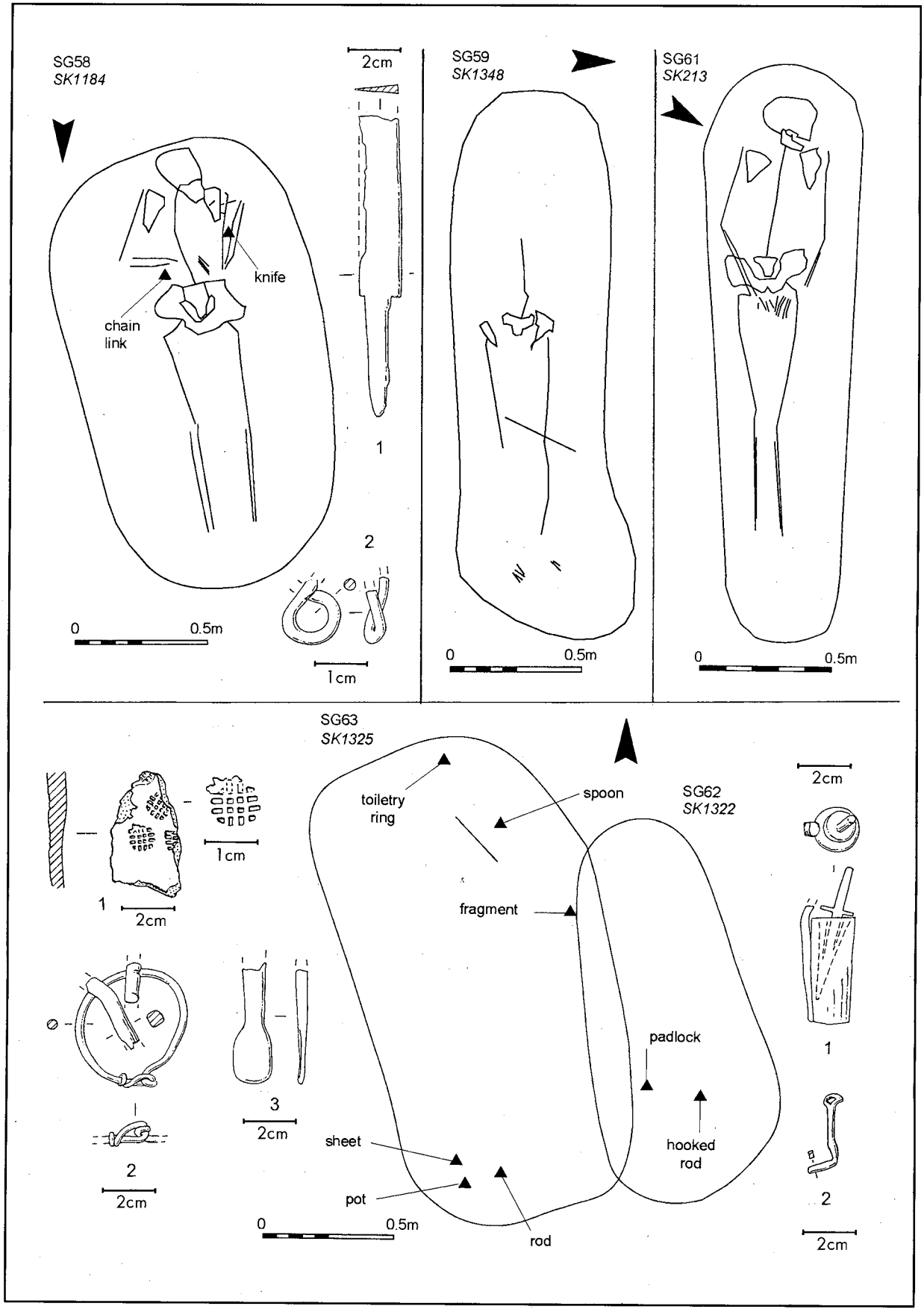

Figure 5. *SG58-SG63*

Grave no: 1181
Skeleton no: 1184
Grave shape: sub-rectangular
Grave dimensions: L1.7m; B. 0.96m; D. 0.52m
Body orientation: 170° north
Skeleton condition: 4
Sex: M; Age: 45–57; Stature: n/d
Skeleton position: supine
Arm position: crooked
Leg position: extended
Grave goods:
Knife 58.1 incomplete (L. 112.7mm)
Iron figure-eight chain link 58.2 (L. 15.1mm)

Sub-group no: 59 (Figure 5)
Grave no: 1194
Skeleton no: 1348 (see also 1544, sub-group 60)
Grave shape: sub-rectangular
Grave dimensions: L. 2.03m; B.0.66m; D: not measurable
Body orientation: 279° north
Skeleton condition: 2
Sex: M; Age: 23–57; Stature:170.9cm
Skeleton position: supine
Arm position: n/a
Leg position: extended
Grave goods: none

Sub-group no: 60
'Grave' no: 1412
Skeleton no: 1544 (part of skeleton 1348 (SG59))
'Grave' shape: sub-rectangular cut
'Grave' dimensions: L. 1.7m; B. 0.62m; D: not measurable
Interpretation: **robber cut** of grave 1194 (SG59)

Sub-group no: 61 (Figure 5)
Grave no: 214
Skeleton no: 213
Grave shape: Rectangular
Grave dimensions: L. 2.19m; B. 0.6m; D. 0.38
Body orientation: 243° north
Skeleton condition: 4
Sex: M; Age: 25–35; Stature: n/d
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods: none

Sub-group no: 62 (Figure 5)
Grave no: 1310
Skeleton no: 1322
Grave shape: sub-oval
Grave dimensions: L. 1.7m; B. 0.77m; D. 0.33m
Body orientation: n/a
Skeleton condition: 1
Sex: ?M; Age: n/a; Stature: n/d
Skeleton position: n/a
Arm position: n/a
Leg position: n/a
Grave goods:
Iron padlock 62.1 (L. 60.7mm)
Iron hooked rod fragment 62.2 (L. 32.2mm)
Iron fragment (chain fragment?) not illus.

Sub-group no: 63 (Figure 5)
Grave no: 1309
Skeleton no: 1325
Grave shape: sub-rectangular
Grave dimensions: L. 2.09m; B. 1.1m; D:0.28m
Body orientation: n/a
Skeleton condition: 1
Sex: ?; Age: adol/adult; Stature: n/d
Skeleton position: n/a
Arm position: n/a
Leg position: n/a
Grave goods:
Ceramic body sherds (9) fabric type A19: 2 stamped (one illus.) 63.1
Copper alloy toiletry ring & iron rods 63.2 (Dia. 44mm)
Iron spoon 63.3 (L. 44.6mm)
Iron sheet fragments not illus.
Iron rod fragment not illus.

Sub-group no: 64 (Figure 6)
Grave no: 208
Skeleton no: 205
Grave shape: sub-oval
Grave dimensions: L.1.78m; B. 0.89m; D. 0.42m
Body orientation: 178° north
Skeleton condition: 4
Sex: IMM; Age: 13; Stature: n/a
Skeleton position: supine
Arm position: crooked
Leg position: bent left
Grave goods:
Ceramic bowl fabric type A26 64.1
Girdle group 64. 2, 64.5–64.6: Iron chatelaine chain links, rod (key stem?), fire steel (L. 94mm), copper alloy suspension loop (L. 17mm) and two slip-knot rings (Dia. 16mm)
Shears 64.3 (L. 170mm)
Antler comb 64.4 single-sided composite (L. 172mm)
[from grave fill: copper alloy pin, head missing, not illus.]

Sub-group no: 65 (Figure 7)
Grave no: 1163
Skeleton no: 1165
Grave shape: sub-rectangular
Grave dimensions: L. 1.85m; B. 0.88m; D. 0.44m
Body orientation: 154° north
Skeleton condition: 4
Sex: F; Age: 25–35; Stature: 162.9cm
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Glass beads (10) 65.1–3 monochrome (Dia. 6.9mm; 7.7mm; 8mm)
Copper alloy riveted suspension loop 65.4 (L.17mm)
Copper alloy split pin with applied head 65.5 (L. 11mm)
Copper alloy pierced disc pin 65.6 (L. 56.3mm)
Knife 65.7 type A size, group 1 (L. 123.5mm)
Shears 65.8 (L. 213mm)
Antler double-sided composite comb 65.9 (L. 138mm)
Iron suspension ring 65.10 (Dia. 33.6mm)
Antler spindle whorl 65.11 (Dia. 39.1mm)

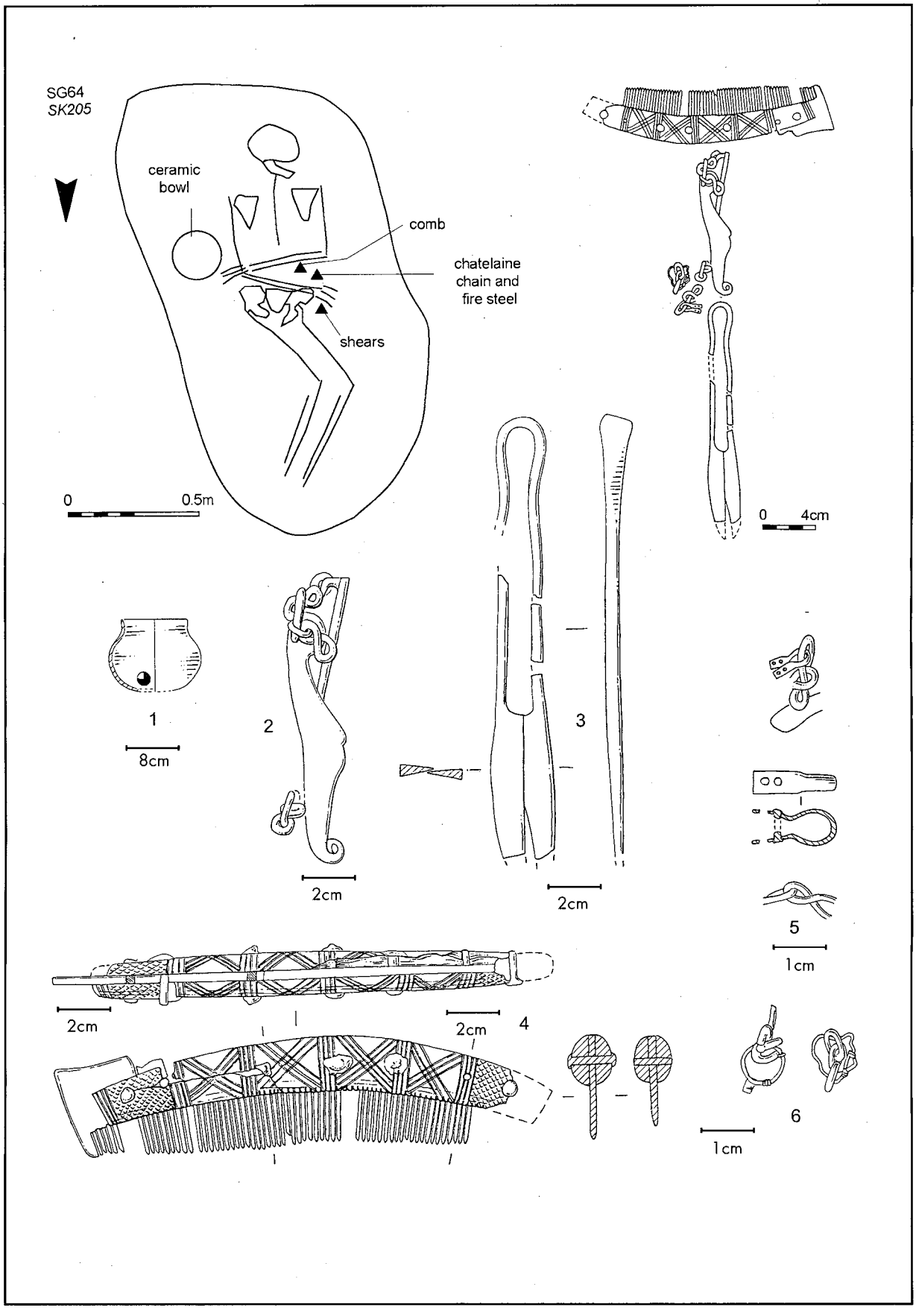

Figure 6. SG64

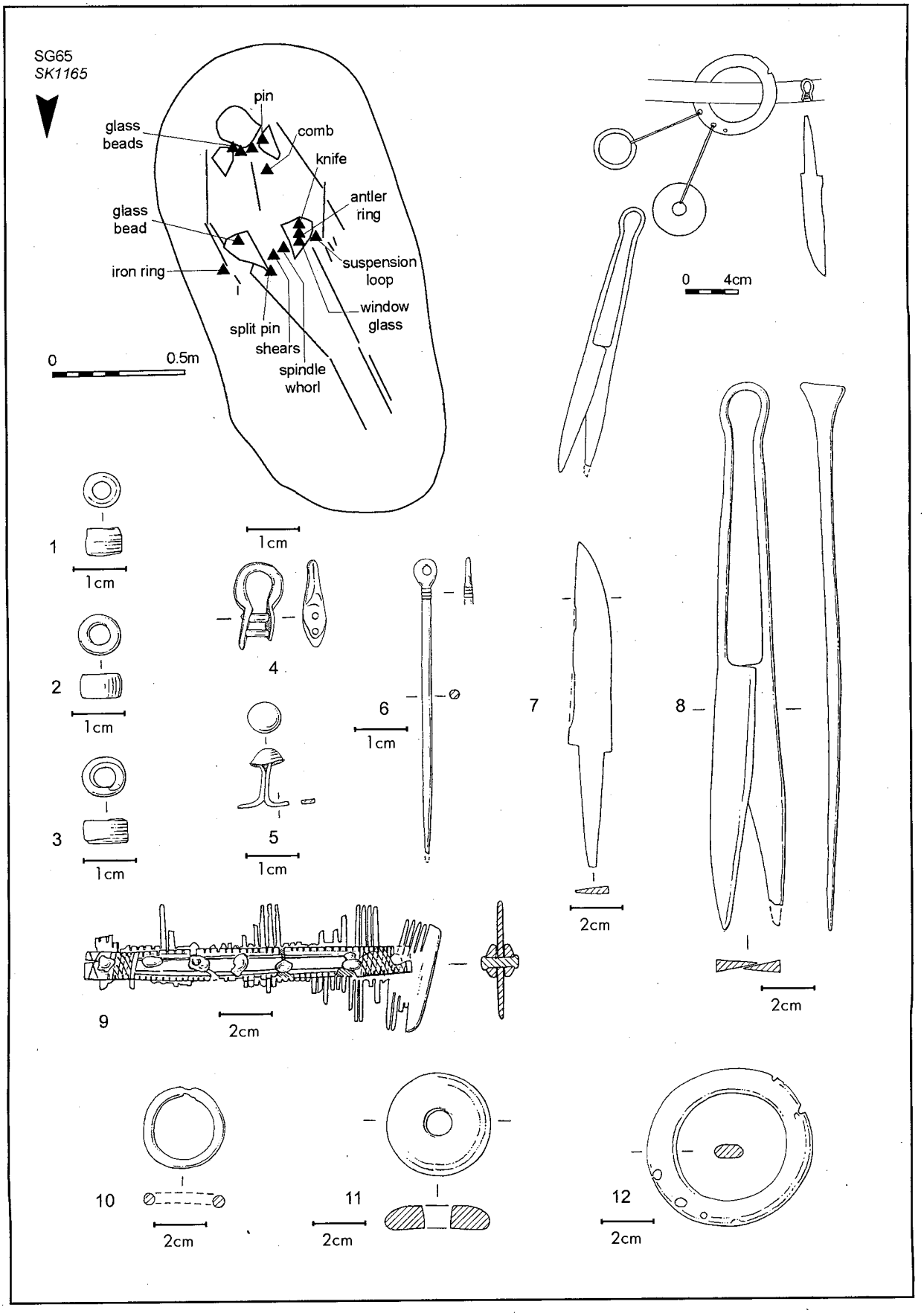

Figure 7. SG65. Monochrome bead colours 1-3 light green/turquoise

Antler suspension ring 65.12 (Dia. 63mm)
Window glass sherd not illus.
[from grave fill: human remains 1171, preservation 1, sex ?F, and partially complete lamb skeleton]

Sub-group no: 66 (Figure 8)
Grave no: 1144
Skeleton no: 1145
Grave shape: sub-rectangular
Grave dimensions: L. 1.96m; B. 0.8m; D. 0.45m
Body orientation: 188° north
Skeleton condition: 5
Sex: M; Age: 23–57; Stature: 177.3cm
Skeleton position: side
Arm position: crooked
Leg position: bent right
Grave goods:
Knife 66.1 Type A size, group 2 (L. 152mm)
Knife 66.2 incomplete size group 2/3 (L. 204mm)
Copper alloy oval buckle 66.3 (L. buckle 9mm)

Sub-group no: 67 (Figure 9)
Grave no: 1369
Skeleton no: 1370
Grave shape: sub-rectangular
Grave dimensions: L. 1.93m; B. 0.8m; D. 0.36m
Body orientation: 201° north
Skeleton condition: 5
Sex: ?F; Age: 20–25; Stature: 176.9cm
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Girdle group 67.1–5: iron chatelaine: chain links, rods (L. 90mm), fire steel (L. 89mm), T-shaped slide key (L. 156.1mm), L-shaped slide key (L. 120mm), copper alloy Y-shaped suspension mounts (2) (L. 41.5mm)
Copper alloy oval buckle 67.6 (L. buckle 8mm)
Ceramic body sherds (26) fabric type A26, not illus.
[from grave fill: human remains 1372, preservation 1, adol/adult]

Sub-group no: 68 (Figure 8)
Grave no: 1385
Skeleton no: 1386
Grave shape: sub-oval
Grave dimensions: L. 2.08m; B. 1.05m; D.0.44m
Body orientation: 176° north
Skeleton condition: 5
Sex: M; Age: 35–57; Stature: 170.4cm
Skeleton position: supine
Arm position: left crooked
Leg position: extended
Grave goods:
Iron D-shaped buckle 68.1 (L. buckle 14mm)
Knife 68.2 Type A size, group 1 (L. 138mm)
[from grave fill: human remains 1388, condition 1, sex M, age 25–35, stature 178.9cm]

Sub-group no: 69 (Figure 10)
Grave no: 1291
Skeleton no: 1293
Grave shape: sub-oval
Grave dimensions: L. 1.89m; B. 0.98m; D. 0.44m
Body orientation: 148° north
Skeleton condition: 4
Sex: ?; Age: 25–35; Stature: n/d
Skeleton position: supine
Arm position: right crooked
Leg position: bent left
Grave goods:
Glass beads 69.1–3 polychrome 1 (Dia. 17.8mm); monochrome 2 (Dia. 10.6mm; 10.8mm)
Cowrie shell beads (6) 69.4–6 (L. 12.9mm; 11.1mm; 10.4mm)
Silver slip-knot rings (3) 69.7–8 (Dia. 21mm; 25.5mm; double knot – not illus.)
Copper alloy pierced disc pin 69.9 (L. 45.1mm)
Knife 69.10 Type A size, group 2 (L. 159mm)

Sub-group no: 70 (Figure 10)
Grave no: 1303
Skeleton no: 1305
Grave shape: sub-rectangular
Grave dimensions: L. 1.49m; B. 0.52m; d. 0.47m
Body orientation: 257° north
Skeleton condition: 4
Sex: F; Age: 60–87; Stature: 156.6cm
Skeleton position: supine
Arm position: extended
Leg position: crossed at ankles
Grave goods: none

Sub-group no: 71 (Figure 10)
Grave no: 1050
Skeleton no: 1052
Grave shape: oval
Grave dimensions L. 2.22m; B. 1.04m; D. 0.65m:
Body orientation: 160° north
Skeleton condition: 2
Sex: M; Age: 35–40; Stature: 175.2cm
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Copper alloy sheet fragments, not illus.

Sub-group no: 72 (Figure 11)
Grave no: 1046
Skeleton no: 1045
Grave shape: oval
Grave dimensions: L.2.22m B. 1.04m; D. 0.6m
Body orientation: 145° north
Skeleton condition: 5
Sex: M; Age: 35–39; Stature: 165.6cm
Skeleton position: supine
Arm position: right crooked
Leg position: bent left
Grave goods:
Copper alloy oval buckle 72.1 (L. buckle 12mm)
Copper alloy slip-knot ring 72.2 (Dia. 20.5mm)
Knife 72.3 Type C size, group 2 (L. 149mm)
Knife 72.4 Type A size, group 1 (L. 106.9mm)
Copper alloy sheet fragments not illus.
[from grave fill: human remains 1047 = part of skeleton 1052 (SG71)]

Sub-group no: 73 (Figure 11)
Grave no: 1029
Skeleton no: 1032

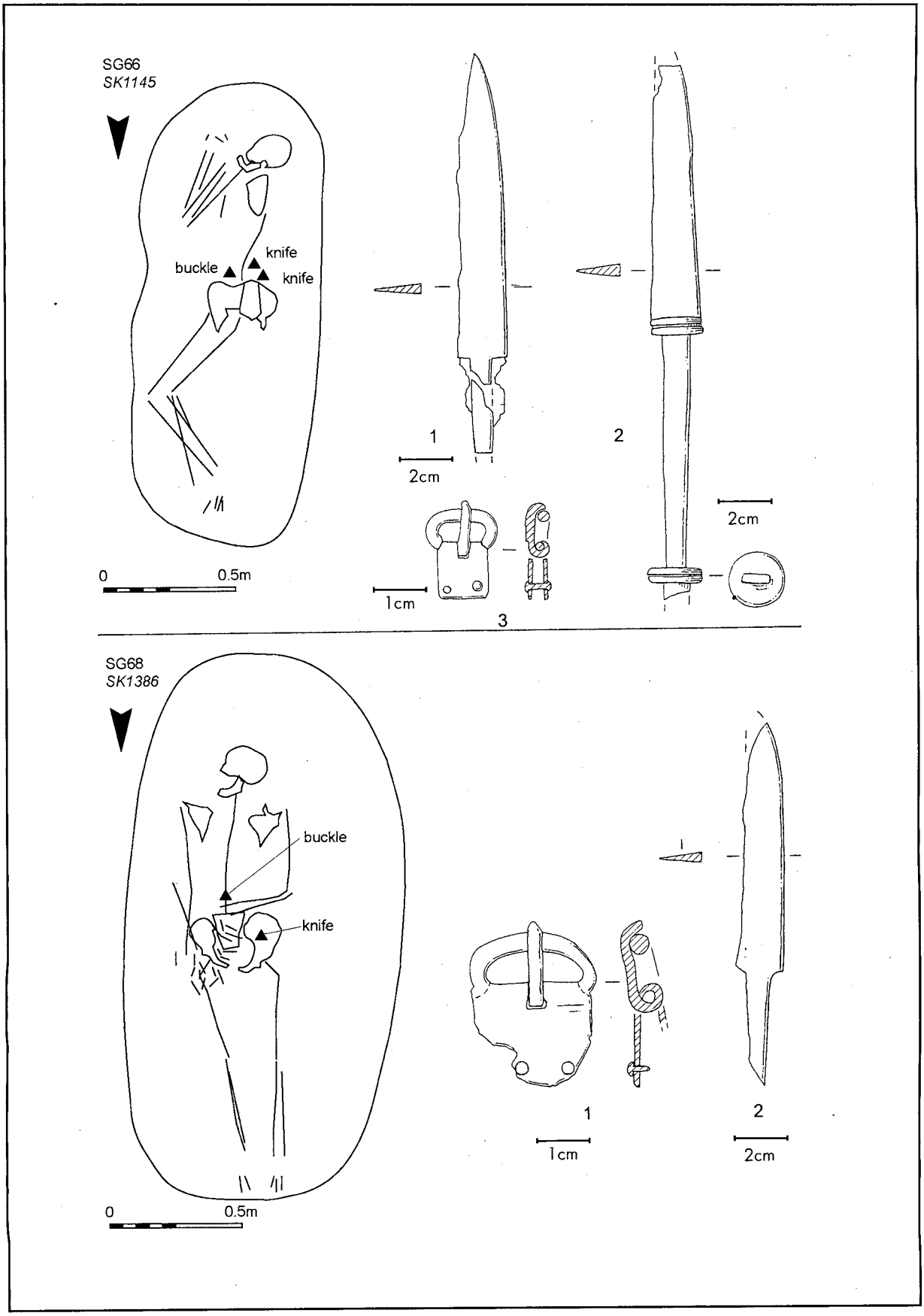

Figure 8. SG66 and SG68

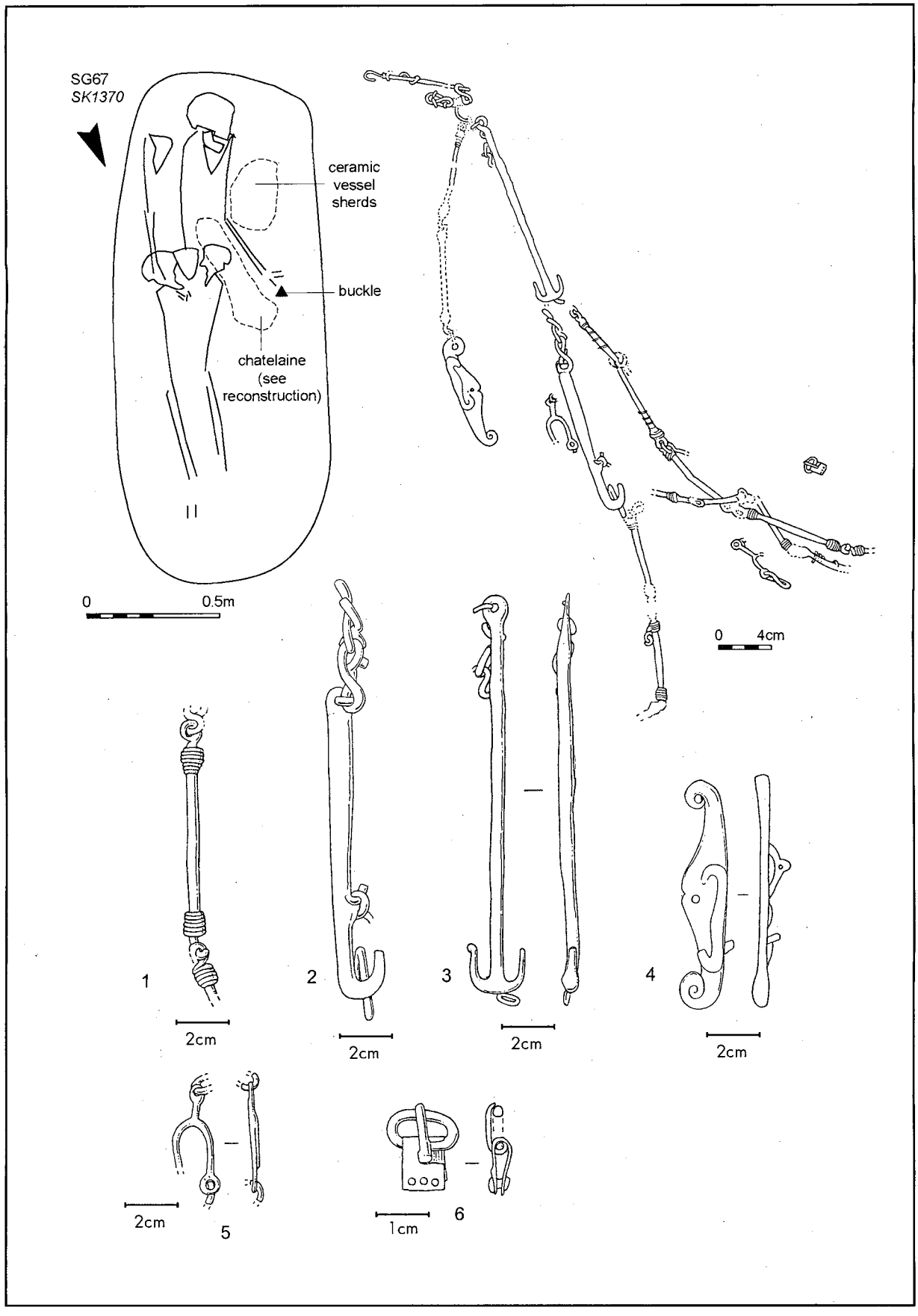

Figure 9. SG67

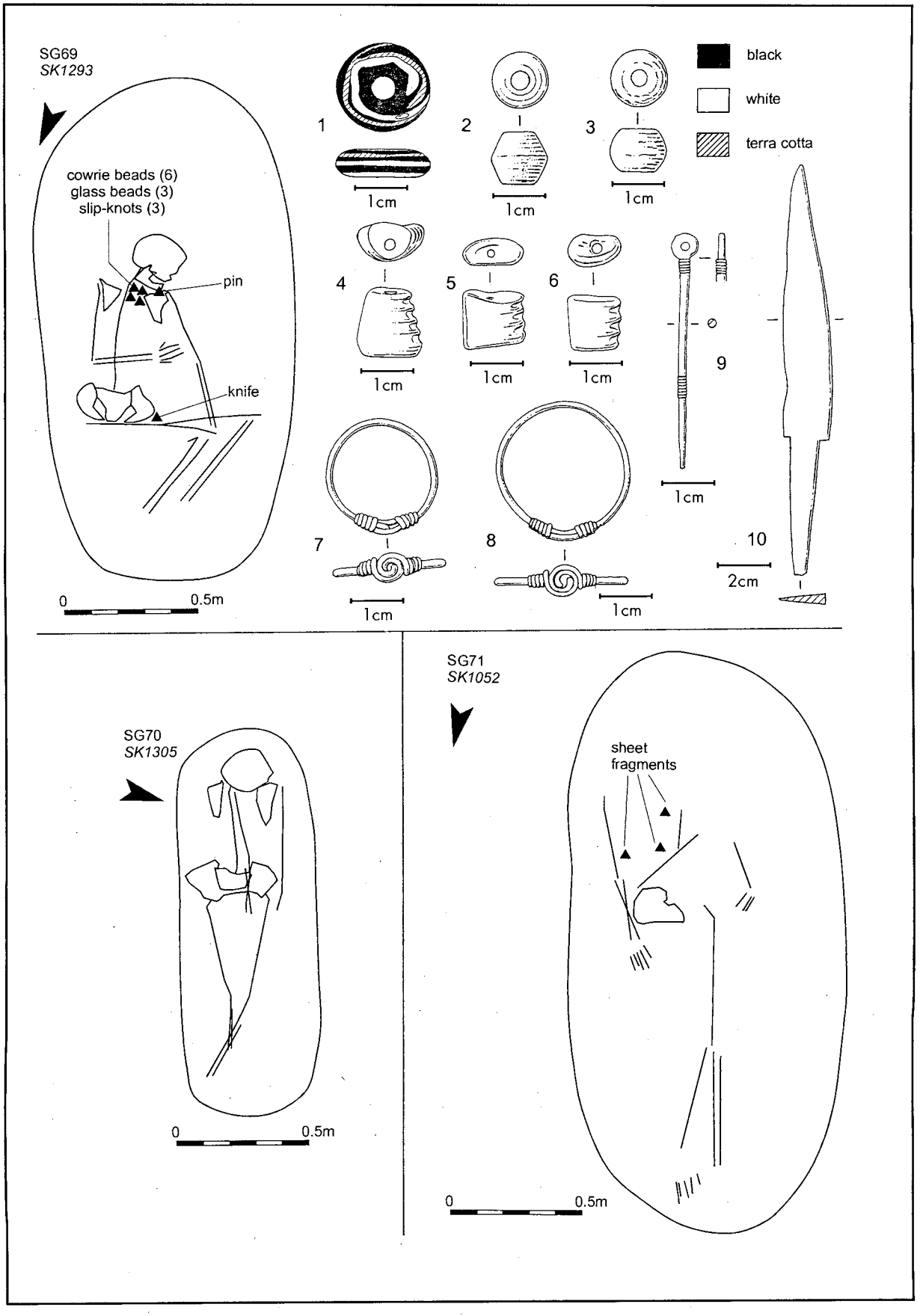

Figure 10. *SG69-71. Monochrome bead colours SG69 2 opaque black; 3 opaque orange*

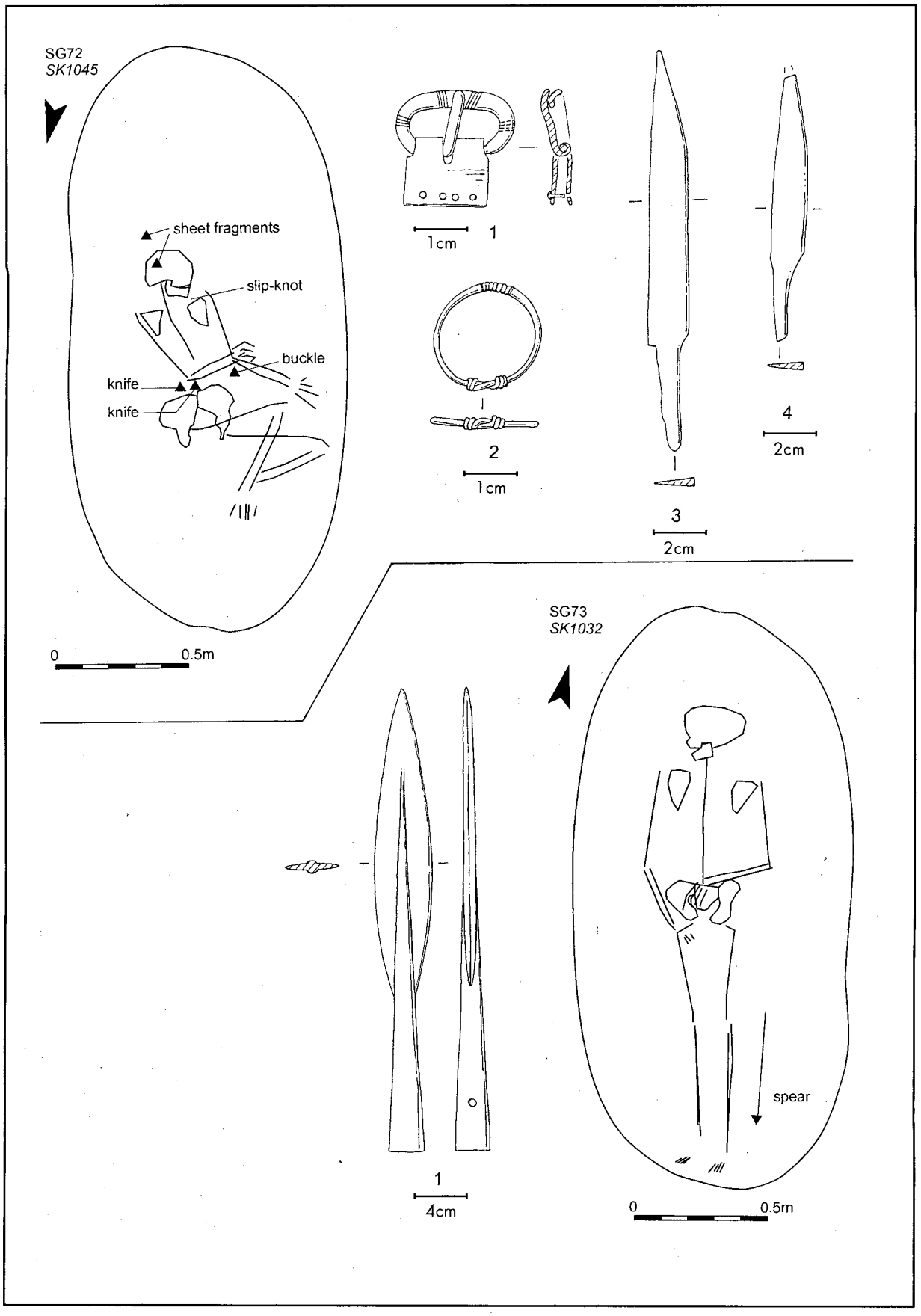

Figure 11. SG72 and SG73

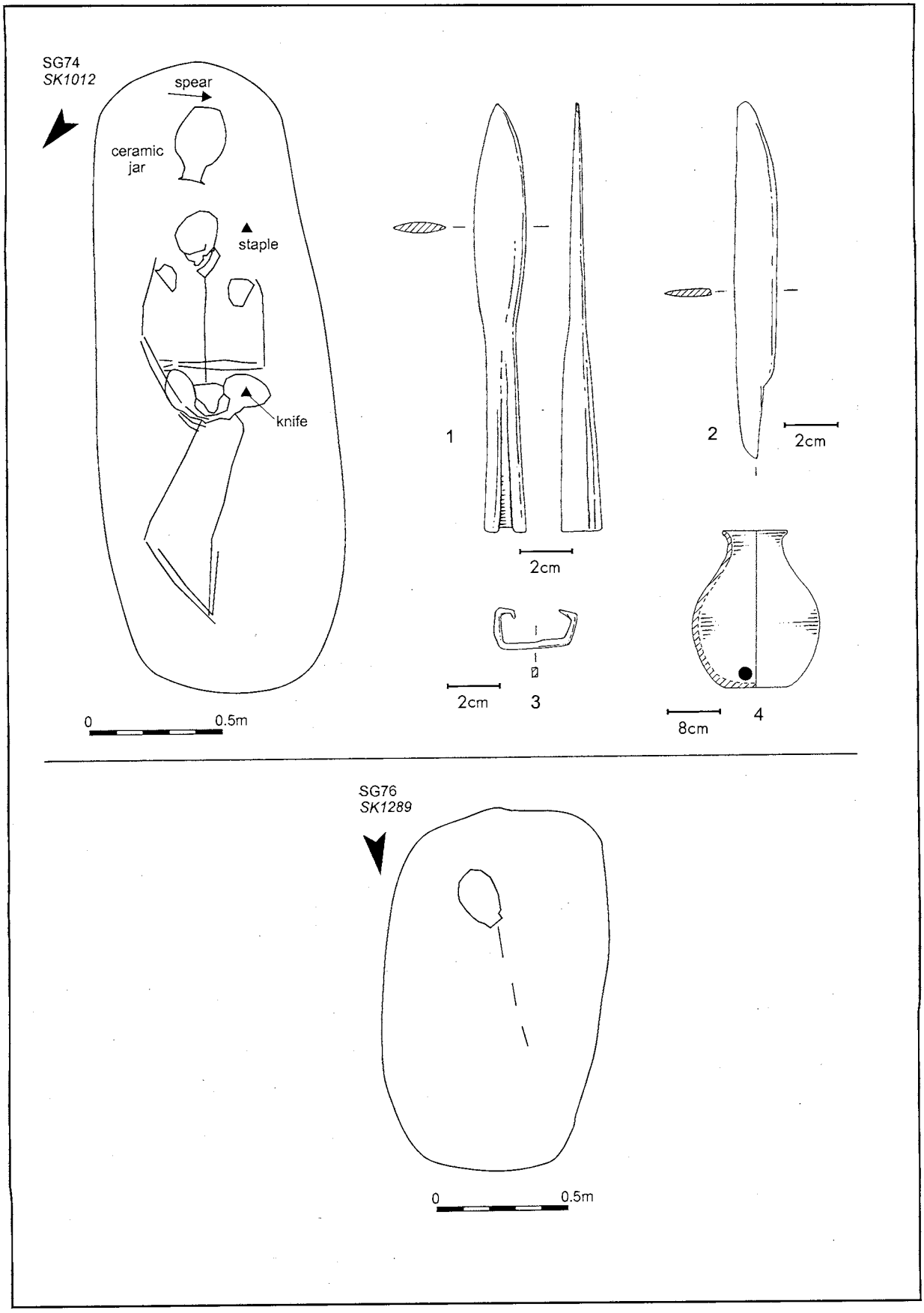

Figure 12. SG74 and SG76

Grave shape: oval
Grave dimensions: L.2.22m; B. 1.04m; D 0.45m
Body orientation: 346° north
Skeleton condition: 3
Sex: M; Age: 35–45; Stature:182.4cm
Skeleton position: supine
Arm position: left crooked
Leg position: extended
Grave goods:
Spear head 73.1 Swanton B2 (L. 355mm)
[from grave fill: human remains 1031 = part of skeleton 1052 (SG71)]

Sub-group no: 74 (Figure 12)
Grave no: 1009
Skeleton no: 1012
Grave shape: sub-rectangular
Grave dimensions: L. 2.37m; B. 0.9m; D. 0.55m
Body orientation: 139° north
Skeleton condition: 4
Sex: M; Age: 25–46; Stature: 183.4cm
Skeleton position: supine
Arm position: left crooked
Leg position: crossed at ankles
Grave goods:
Spear head 74.1 Swanton C1 (L. 162mm)
Knife 74.2 Type A size, group 2 (L. 134.4mm)
Iron rectangular staple 74.3 (L. 33.9mm)
Ceramic jar fabric type A26 74.4
[from grave fill: human remains 1010, preservation 1]

Sub-group no: 75 (Figures 13–14)
Grave no: 1306
Skeleton no: 1307
Grave shape: sub-oval
Grave dimensions: L. 1.48m; B. 0.72m; D. 0.32m
Body orientation: 56° north
Skeleton condition: 4
Sex: ?F; Age: 45+; Stature: n/d
Skeleton position: supine
Arm position: left crooked
Leg position: crossed at ankles
Grave goods:
Glass beads 75.1–24 monochrome 9 (Dia. 6.6mm; 7.6mm; 9mm; L. 9.8mm; Dia. 7.3mm; 11mm; 12mm), polychrome 48 (Dia. 16.9mm; 15.9mm; 16.3mm; 11.8mm; 10.2mm; 9.5mm; 9.8mm; 9.7mm; 15.5mm; 16.8mm; 15.3mm; 14.9mm; 14.2mm; 16mm; 8.2mm; 9.1mm; 16.1mm)
Amber beads (12) 75.25–29 (L. 8mm; 7.8mm; 8mm; 14.1mm; Dia. 18.8mm)
Gilded copper alloy great square-headed brooch 75.30 (L. 150mm)
Copper alloy radiate-headed brooch 75.31 (L. 88.3mm)
Gilded copper alloy saucer brooch 75.32 (Dia. 46.5mm)
Ceramic spindle whorl 75.33 (Dia. 36.3mm)
Copper alloy D-shaped buckle & shoe-shaped rivet 75.34 (L. buckle 22.3mm)
Knife 75.35 Type A size, group 1 (L. 132mm)
Mineralised textile remains, not illus.

Sub-group no: 76 (Figure 12)
Grave no: 1288
Skeleton no: 1289
Grave shape: sub-rectangular
Grave dimensions: L. 1.39m; B. 0.84m; D. 0.23m
Body orientation: 193° north
Skeleton condition: 2
Sex: IMM; Age: 2–4; Stature: n/a
Skeleton position: supine
Arm position: n/a
Leg position: n/a
Grave goods: None

Sub-group no: 77 (Figure 14)
Grave no: 1205
Skeleton no: 1204
Grave shape: sub-oval
Grave dimensions: L. 2.2m; B. 1.33m; D 0.85m
Body orientation: 191° north
Skeleton condition: 4
Sex: M; Age: 18.5–20; Stature: n/a
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Copper alloy oval buckle 77.1 (L. buckle 9mm)
Knife 77.2 Type C size, group 1 (L. 146mm)
Spear head 77.3 Swanton F2 (L. 260mm)

Sub-group no: 78 (Figure 15)
Grave no: 1222
Skeleton no: 1189
Grave shape: sub-oval
Grave dimensions: L. 2.2m; B. 1.33m; D. 0.4m
Body orientation: 189° north
Skeleton condition: 3
Sex: F; Age: 33–46; Stature: 157.7
Skeleton position: side
Arm position: right crooked
Leg position: bent left
Grave goods:
Bone disc-headed pin 78.1 (L. 34.3mm)
Silver scutiform pendant 78.2 (Dia. 30.6mm)
Foetus (skeleton 1203) of less than 6 months gestation buried with Skeleton 1189

Sub-group no: 79 (Figure 15)
Grave no: 1219
Skeleton no: 1188
Grave shape: sub-rectangular
Grave dimensions: L. 2.7m; B. 0.95m; D. 0.3m
Body orientation: 200° north
Skeleton condition: 4
Sex: M; Age: 60–70; Stature:179.6cm
Skeleton position: supine
Arm position: crooked
Leg position: crossed at ankles
Grave goods:
Copper alloy oval buckle 79.1 (L. buckle 10mm)
Knife 79.2 Type C size, group 2 (L. 153.7mm)

Sub-group no: 80 (Figure 15)
Grave no: 1172
Skeleton no: 1187
Grave shape: sub-oval
Grave dimensions: L. 2.2m; B. 1.33; D. 0.25m
Body orientation: 211° north
Skeleton condition: 4

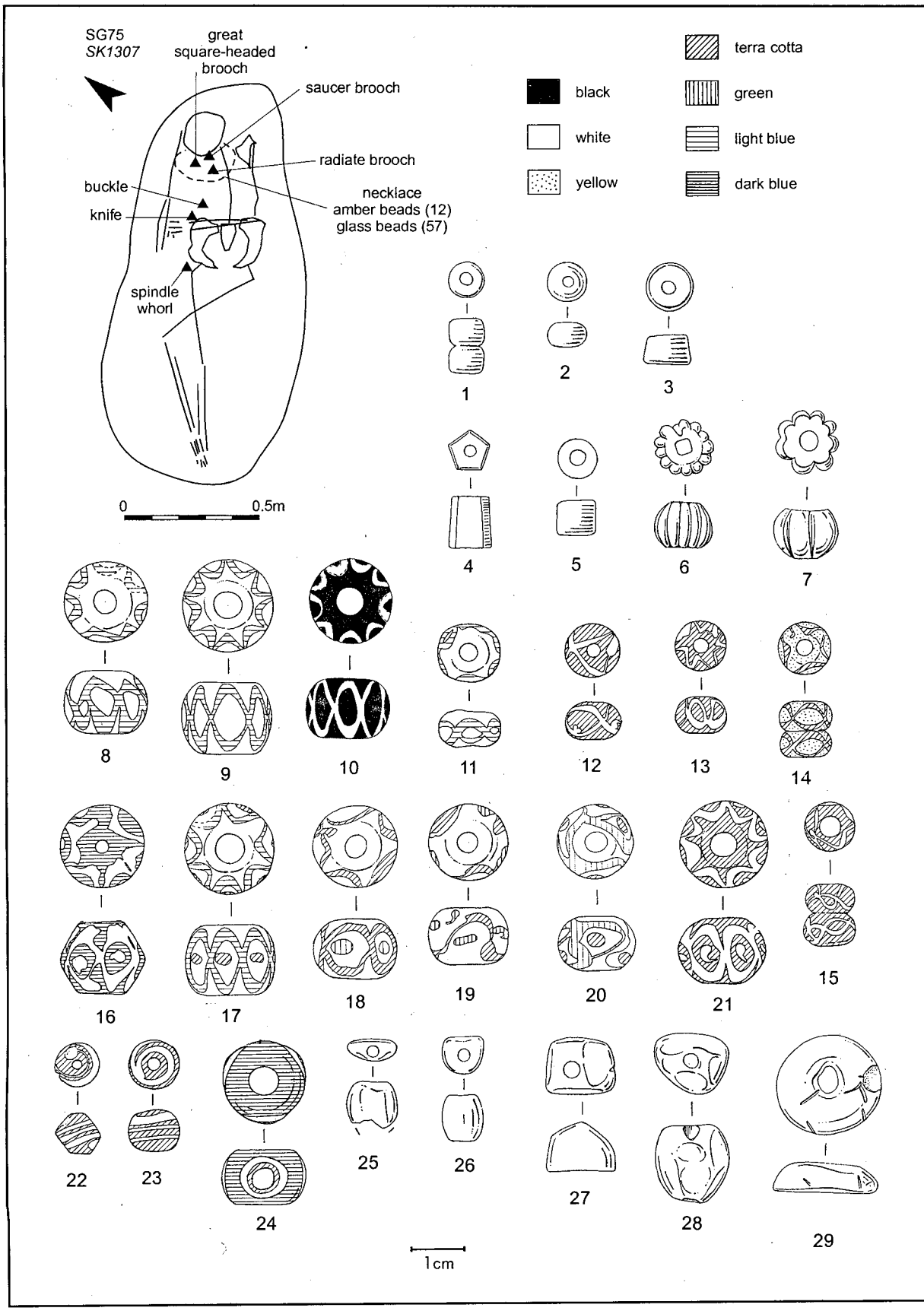

Figure 13. SG75. Monochrome bead colours 1-2 opaque white; 3 opaque yellow; 4-5 opaque terracotta; 6 translucent blue; 7 opaque black; 25-29 amber

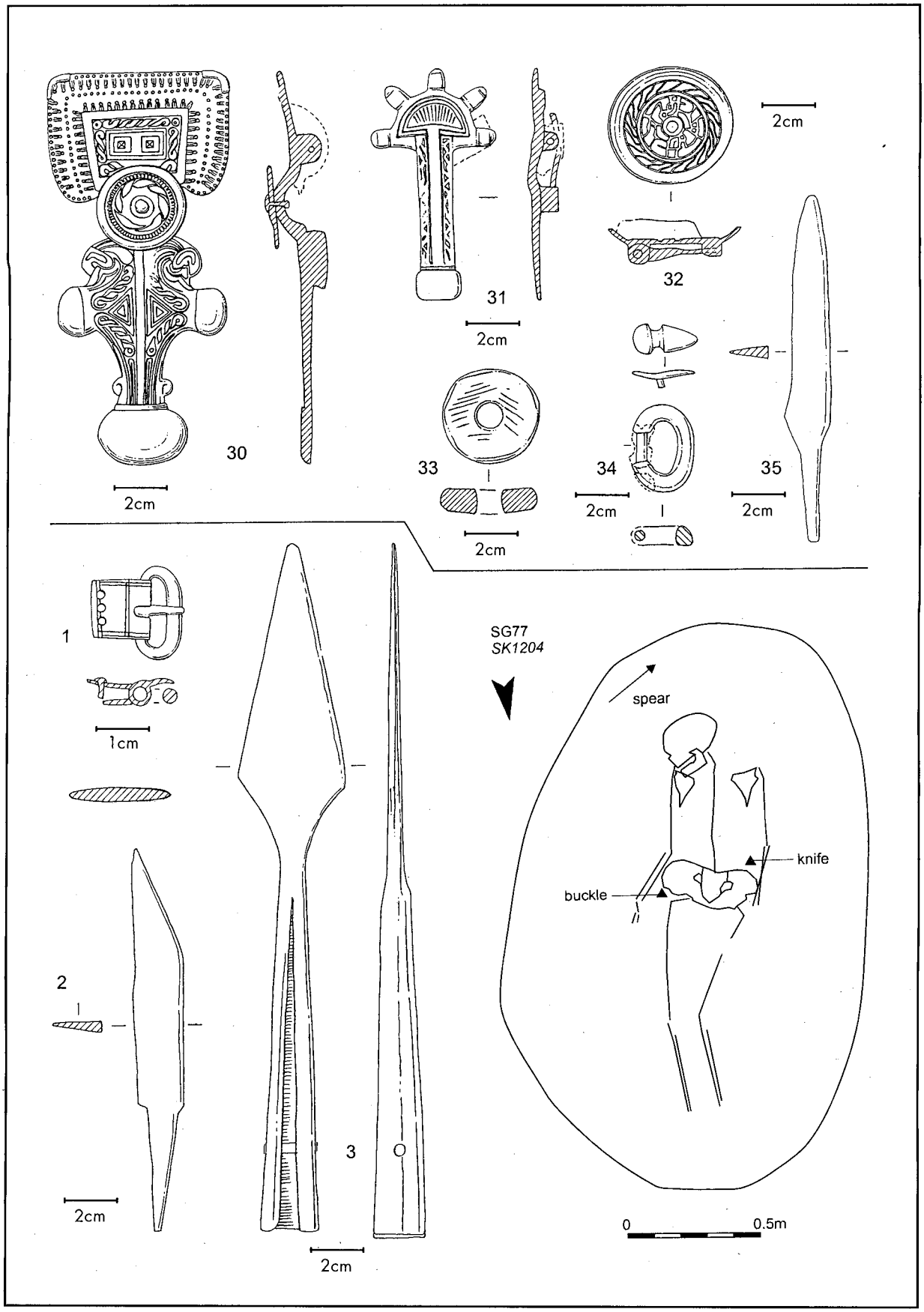

Figure 14. SSG75 (continued) and SG77

Sex: M; Age: 60+; Stature: 175.8cm
Skeleton position: supine
Arm position: left crooked
Leg position: extended
Grave goods:
Sharpening steel 80.1 (L. 130.1mm)
Knife 80.2 Type C size, group 1 (L. 105.4mm)
Copper alloy strap stiffener 80.3 (L. 21.9mm)
Copper alloy oval buckle 80.4 (L. buckle 11mm)
Iron (?knife tang) fragment, not illus.
[from grave fill: human remains 1174, condition 1]

Sub-group no: 81 (Figure 16)
Grave no: 1226
Skeleton no: 1224
Grave shape: sub-oval
Grave dimensions: L. 1.48m; B. 0.79m; D. 0.22m
Body orientation: 317° north
Skeleton condition: 3
Sex: IMM; Age: 7.5–12.5; Stature: n/a
Skeleton position: side
Arm position: crooked
Leg position: bent left
Grave goods:
Glass beads 81.1–2 monochrome 2 (Dia. 13.9mm; 5.5mm)

Sub-group no: 82 (Figure 16)
Grave no: 1227
Skeleton no: 1229
Grave shape: sub-rectangular
Grave dimensions: L. 1.94m; B. 1.15m; D. 0.67m
Body orientation: 232° north
Skeleton condition: 4
Sex: F; Age: 19–25; Stature: 159.4cm
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Copper alloy disc headed pin with glass 82.1 (L. 45.8mm)
Amber beads (2) 82.2 (Dia. 10.8mm)
Shell pendant bead 82.3 (L. 13.4mm)
Copper alloy & blue glass drop pendant 82.4 (L. 18mm)
Copper alloy oval buckle 82.5 (L. buckle 11mm)
Copper alloy toiletry ring & ear pick 82.6 (Dia. 24mm; L. ear pick 44.3mm)
Copper alloy annular brooch 82.7 (Dia. 32.8mm)
Knife 82.8 incomplete (L. *c.* 150mm)
Girdle group 82.9: iron suspension ring & chain links and T-shaped slide key (L. key 166mm)
Composite double-sided antler comb 82.10 (L. 130mm)
Mineralised textile remains, not illus.
Iron nail, not illus.

Sub-group no: 83 (Figure 17)
Grave no: 303
Skeleton no: 305
Grave shape: sub-rectangular
Grave dimensions: L. 2.05m; B. 1.05m; D. 0.4m
Body orientation: 190° north
Skeleton condition: 5
Sex: M; Age: 55–65; Stature: 185.3
Skeleton position: supine
Arm position: extended
Leg position: crossed at ankles
Grave goods:
Knife 83.1 Type B size, group 3 (L. 192mm)
Spearhead socket 83.2 (Dia. 24mm; L. 52mm)
Copper alloy oval buckle 83.3 (L. buckle 10mm)

Sub-group no: 84 (Figure 17)
Grave no: 314
Skeleton no: 316
Grave shape: sub-rectangular
Grave dimensions: L. 2.13m; B. 0.76m; D. 0.4m
Body orientation: 240° north
Skeleton condition: 3
Sex: IMM; Age: 14–15; Stature: n/a
Skeleton position: side
Arm position: right crooked
Leg position: bent left
Grave goods: None

Sub-group no: 85 (Figure 17)
Grave no: 1122
Skeleton no: 1124
Grave shape: sub-rectangular
Grave dimensions: L. 1.98m; B. 0.97m; D. 0.4m
Body orientation: 166° north
Skeleton condition: 4
Sex: M; Age: 45–57; Stature: 186.9m
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Copper alloy oval buckle 85.1 (L. buckle 10mm)
Knife 85.2 Type C size, group 2/3 (L. 172mm)

Sub-group no: 86 (Figure 18)
Grave no: 1119
Skeleton no: 1121
Grave shape: oval
Grave dimensions: L. 1.78m; B. 1.06m; D. 0.28m
Body orientation: n/a
Skeleton condition: 1
Sex: ?; Age: 17–25; Stature: n/d
Skeleton position: n/a
Arm position: n/a
Leg position: n/a
Grave goods: None
[from grave fill: human remains 1137, part of disturbed skeleton 1121]

Sub-group no: 87 (Figure 18)
Grave no: 1166
Skeleton no: 1169
Grave shape: sub-rectangular
Grave dimensions: L. 2.24m; B. 1.33m; D. 0.35m
Body orientation: 176° north
Skeleton condition: 4
Sex: ?F; Age: 17–25; Stature: n/d
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Copper alloy tack & mineralised wood 87.1 (L. 10mm)
Knife 87.2 Type C size, group 1 (L. 108.6mm)

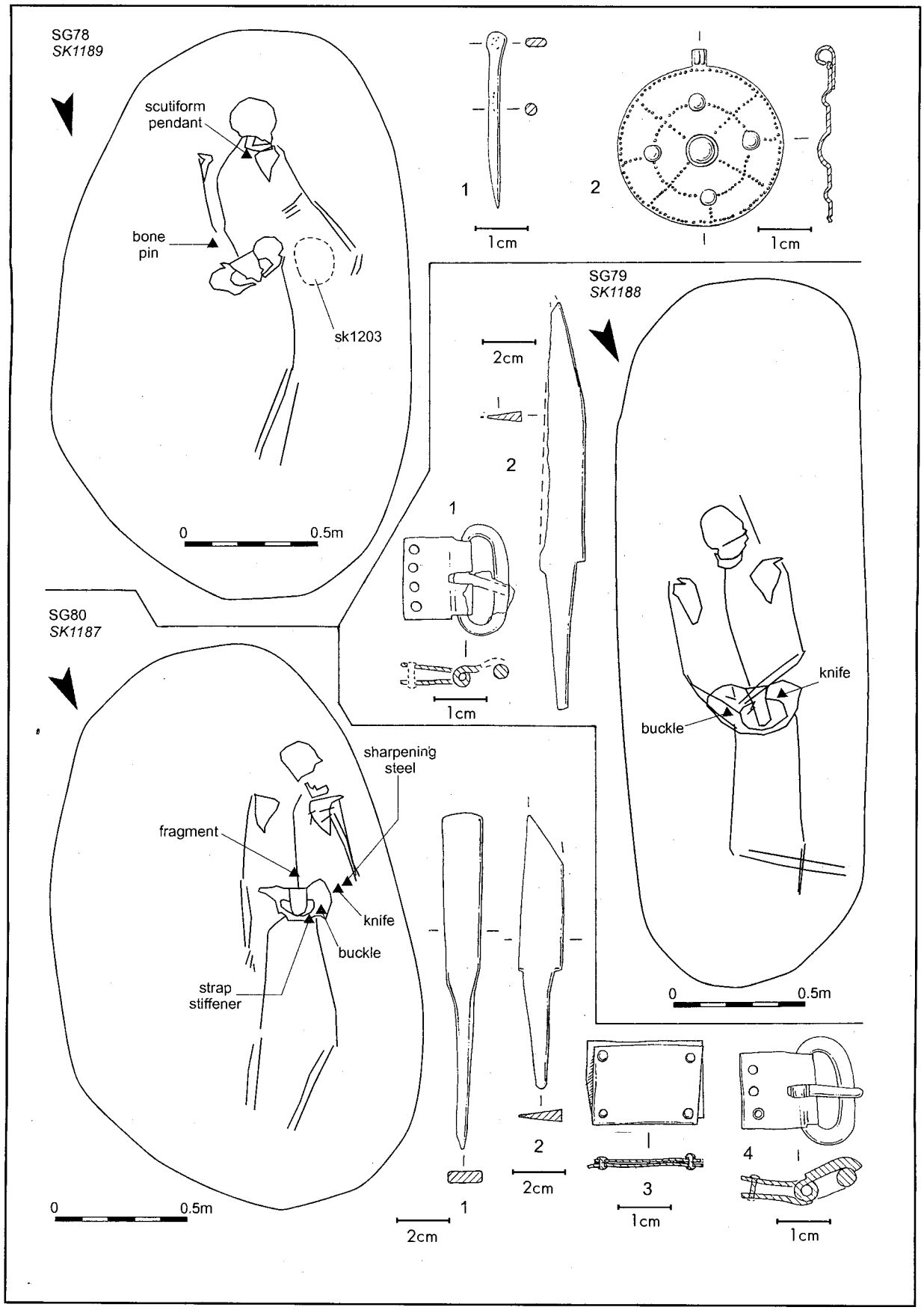

Figure 15. *SG78-SG80*

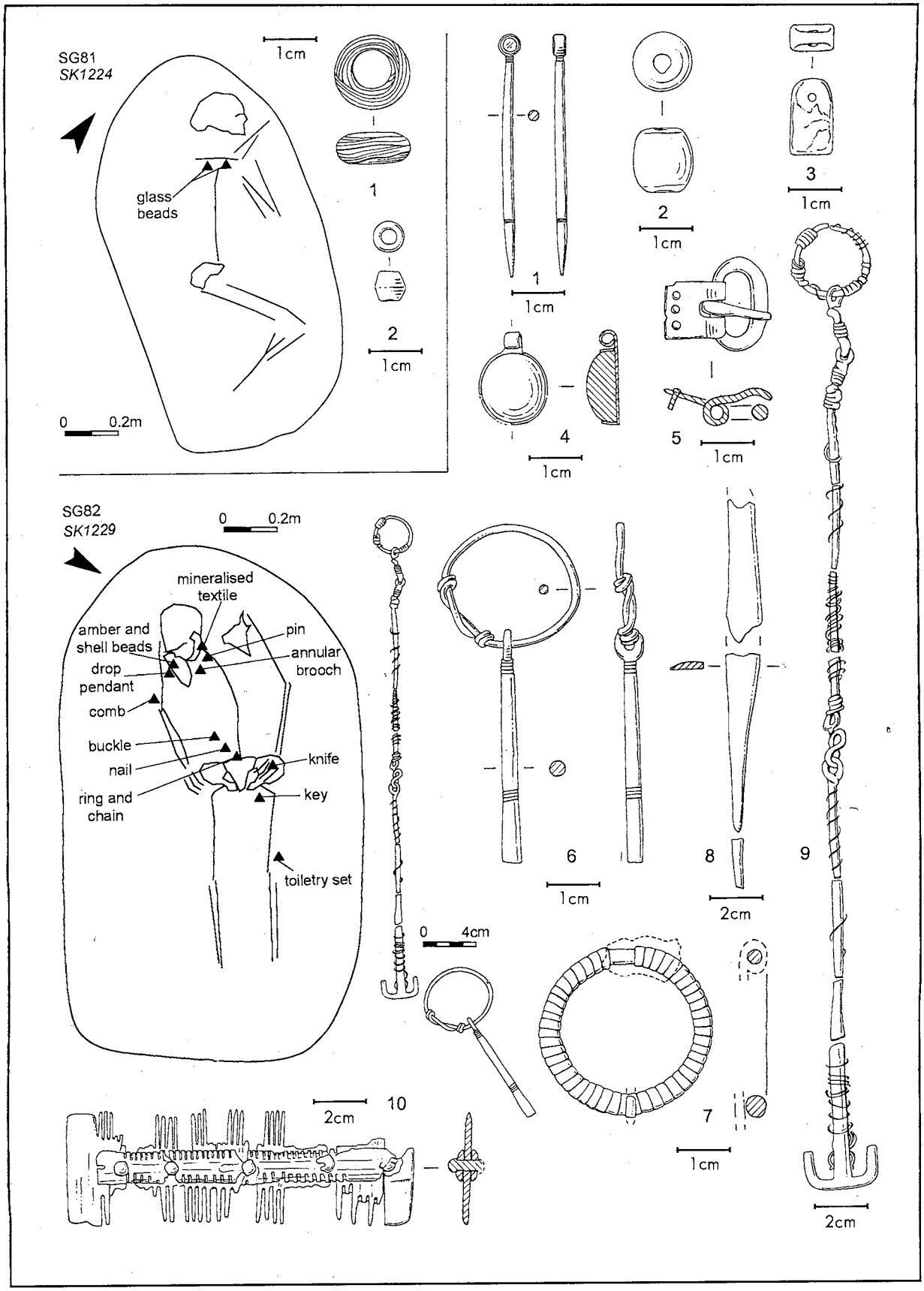

Figure 16. *SG81 and SG82. Monochrome bead colours SG81 1 translucent pale blue; 2 opaque yellow; SG82 2 amber*

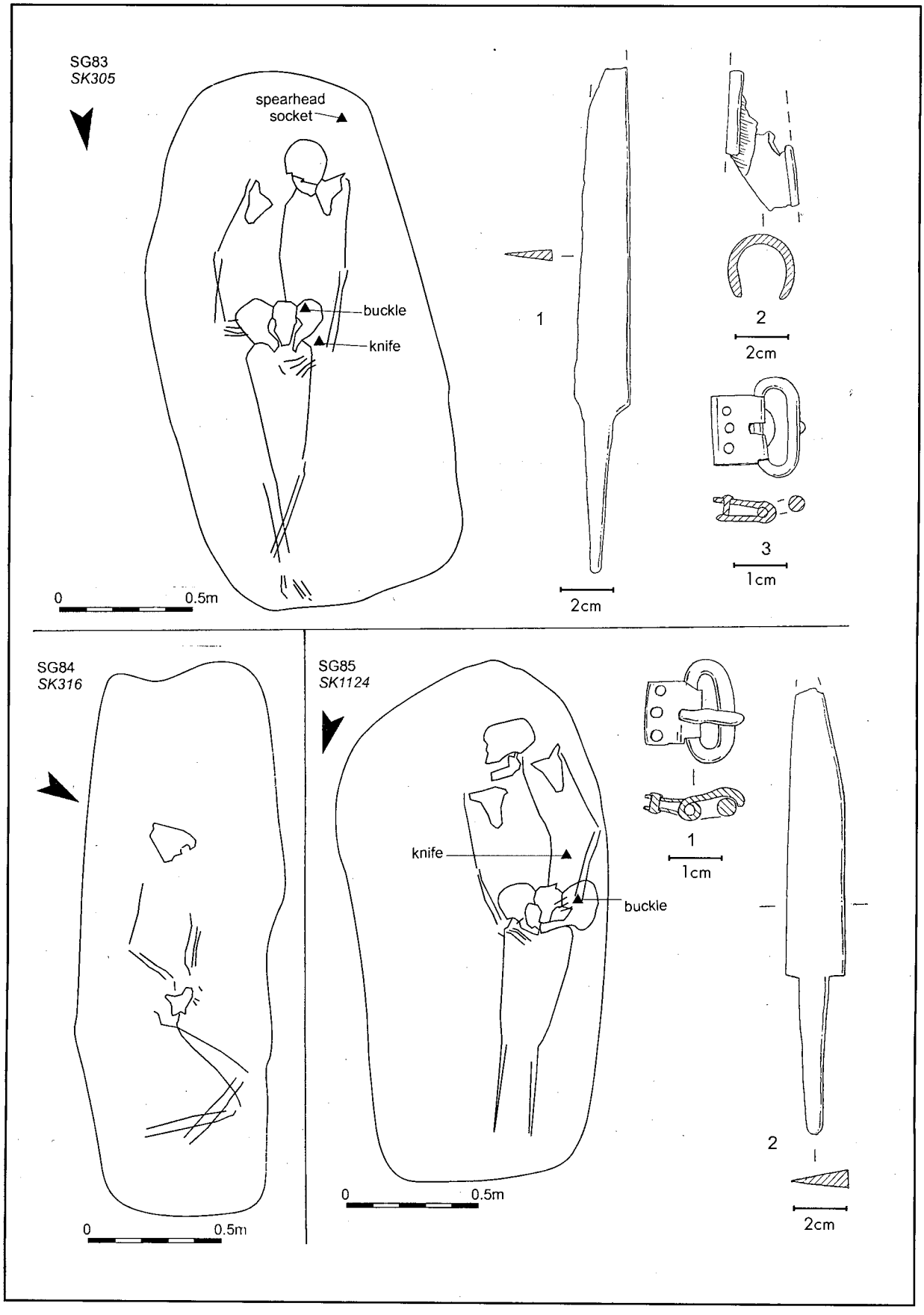

Figure 17. SG83-85

Sub-group no: 88 (Figure 18)
Grave no: 313
Skeleton no: 312
Grave shape: sub-rectangular
Grave dimensions: L. 2m; B. 1.2m; D. 0.4m
Body orientation: 173° north
Skeleton condition: 4
Sex: M; Age: 45+; Stature: 169.9cm
Skeleton position: supine
Arm position: crooked
Leg position: bent right
Grave goods:
Knife 88.1 Type A size, group 1 (L. *c.* 154mm)

Sub-group no: 89 (Figure 19)
Grave no: 1269
Skeleton no: 1271
Grave shape: sub-rectangular
Grave dimensions: L. 1.83m; B. 0.89m; D. 0.4m
Body orientation: 195° north
Skeleton condition: 1
Sex: F; Age: 25–30; Stature: n/d
Skeleton position: side?
Arm position: crooked?
Leg position: n/a
Grave goods:
Amber beads (6) 89.1–4 (Dia, 33.4mm; L. 14.4mm; 17.3mm; 8.6mm)
Glass beads 89.5–11; 89.15; 89.18–27 monochrome 10 (Dia. 10mm; 10mm; 5mm; 6mm; 8.5mm) and polychrome 26 (Dia. 9.1mm; 9mm; 8.3mm; 13.2mm; 8.2mm; 9mm; 13.4mm; 8.1mm; 7.3mm; 8.8mm; 6.9mm; 8.8mm; 7mm)
Silver capsule beads (2) 89.12 (Dia. 17.1mm)
Copper alloy capsule bead 89.13 (Dia. 11.3mm)
Silver slip-knot ring 89.14 (Dia. 16.2mm)
Silver spangles & slip-knot rings (2) 89.16 (L. 17.7mm)
Silver scutiform pendant 89.17 (Dia. 18.6mm)
Knife 89.28 Type C size, group 1 (L. 101.9mm)
Ceramic bowl fabric type A26 89.29

Sub-group no: 90 (Figure 20)
Grave no: 1006
Skeleton no: 1008
Grave shape: irregular
Grave dimensions: L. 1.74m; B. 0.81m; D. 0.14
Body orientation: 159° north
Skeleton condition: 4
Sex: M; Age: 23–30; Stature: 169.6cm
Skeleton position: supine
Arm position: extended
Leg position: crossed at ankles
Grave goods:
Spearhead socket 90.1 (Dia. 18.1mm; L. 66.5mm)
Iron oval buckle 90.2 (L. buckle 17mm)
Knife 90.3 Type A size, group 1 (L. 142mm)

Sub-group no: 91 (Figure 20)
Grave no: 1299
Skeleton no: 1301
Grave shape: sub-rectangular
Grave dimensions: L. 1.77m; B. 0.78m; D. 0.14m
Body orientation: 67° north
Skeleton condition: 3
Sex: ?F; Age: 30–35; Stature: n/d
Skeleton position: supine
Arm position: crooked
Leg position: extended
Grave goods:
Iron D-shaped buckle 91.1 (L. buckle 19mm)

Sub-group no: 92 (Figure 20)
Grave no: 1319
Skeleton no: 1321
Grave shape: sub-rectangular
Grave dimensions: L. 1.78m; B. 0.82m; D. 0.17m
Body orientation: 262° north
Skeleton condition: 3
Sex: ?; Age: 17–25; Stature: n/d
Skeleton position: side
Arm position: crooked
Leg position: bent left
Grave goods:
Iron tack, not illus.
Copper alloy sheet fragments, not illus.

Sub-group no: 93 (Figure 21)
Grave no: 1131
Skeleton no: 1132
Grave shape: sub-rectangular
Grave dimensions: L. 1.35m; B. 0.8m; D. 0.15
Body orientation: 208° north
Skeleton condition: 3
Sex: ?; Age: 25–35; Stature: n/d
Skeleton position: supine
Arm position: extended
Leg position: extended? [truncated by plough]
Grave goods:
Girdle group: purse or long belt – 93.1–5 copper alloy riveted suspension loop (L. 24mm), triangular slotted strap stiffener (L. 15.2mm), tacks (2) (L. 6.1mm; 8.6mm), bar-shaped strap stiffener (L. 22.8mm), iron tack (1) and sheet fragment, and copper alloy sheet fragments – last three not illus.)
Copper alloy long disc-headed pin 93.6 (L. 74mm)
Copper alloy oval buckle 93.7 (L. buckle 13mm)
Knife 93.8 Type B size, group 3 (L. 200mm)

Sub-group no: 94 (Figure 20)
Grave no: 1039
Skeleton no: 1041
Grave shape: sub-rectangular
Grave dimensions: L. 0.73m; B. 0.73m; D. 0.36m
Body orientation: 180° north
Skeleton condition: 3
Sex: ?; Age: 60+; Stature: n/d
Skeleton position: supine?
Arm position: left crooked?
Leg position: n/d [truncated by grave 1036]
Grave goods: None

Sub-group no: 95 (Figure 20)
Grave no: 1036
Skeleton no: 1038
Grave shape: sub-rectangular
Grave dimensions: L. 1.75m; B. 0.86m; D. 0.36m
Body orientation: 180° north
Skeleton condition: 2
Sex: F; Age: 45+; Stature: n/d
Skeleton position: supine?

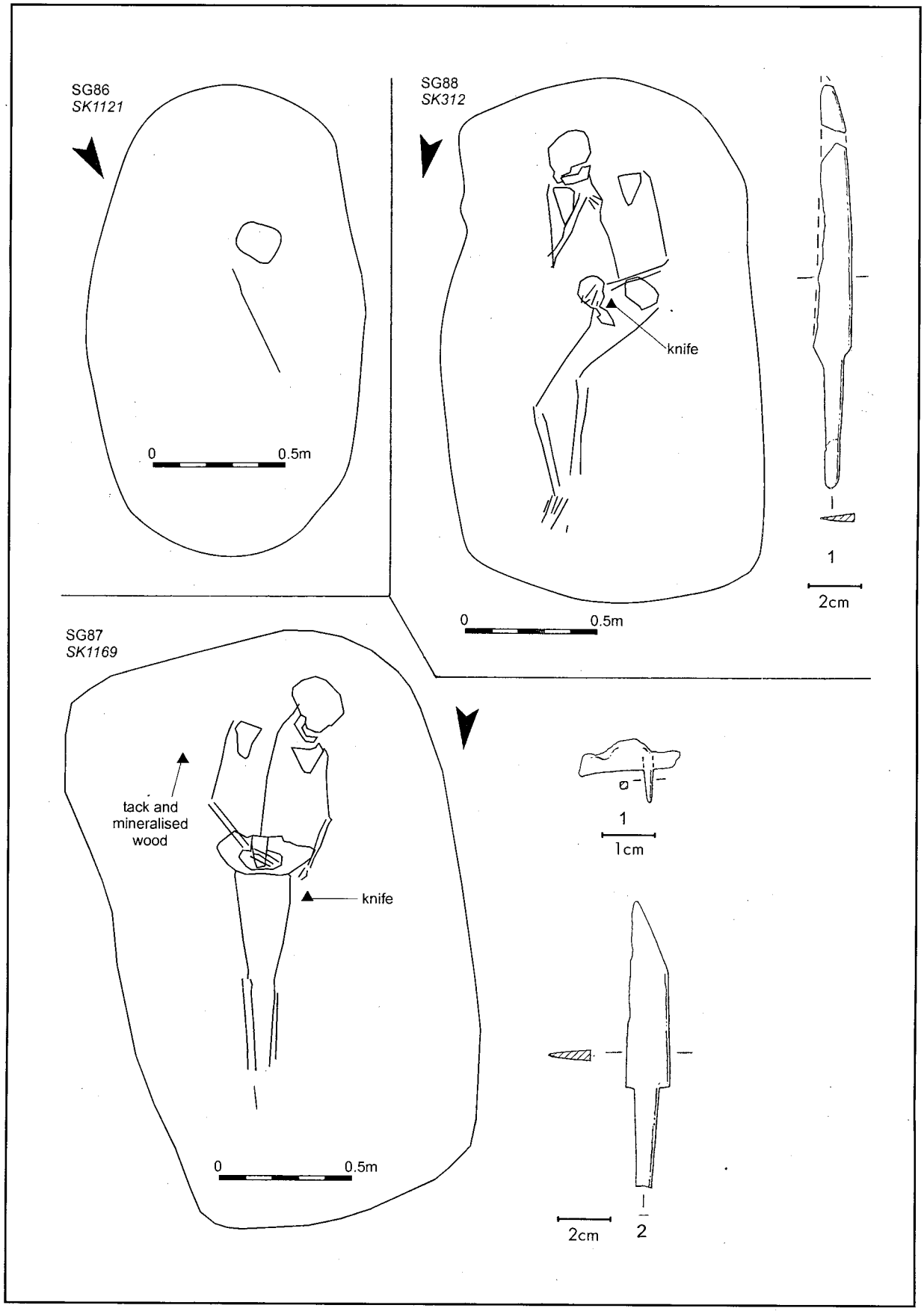

Figure 18. SG86-SG88

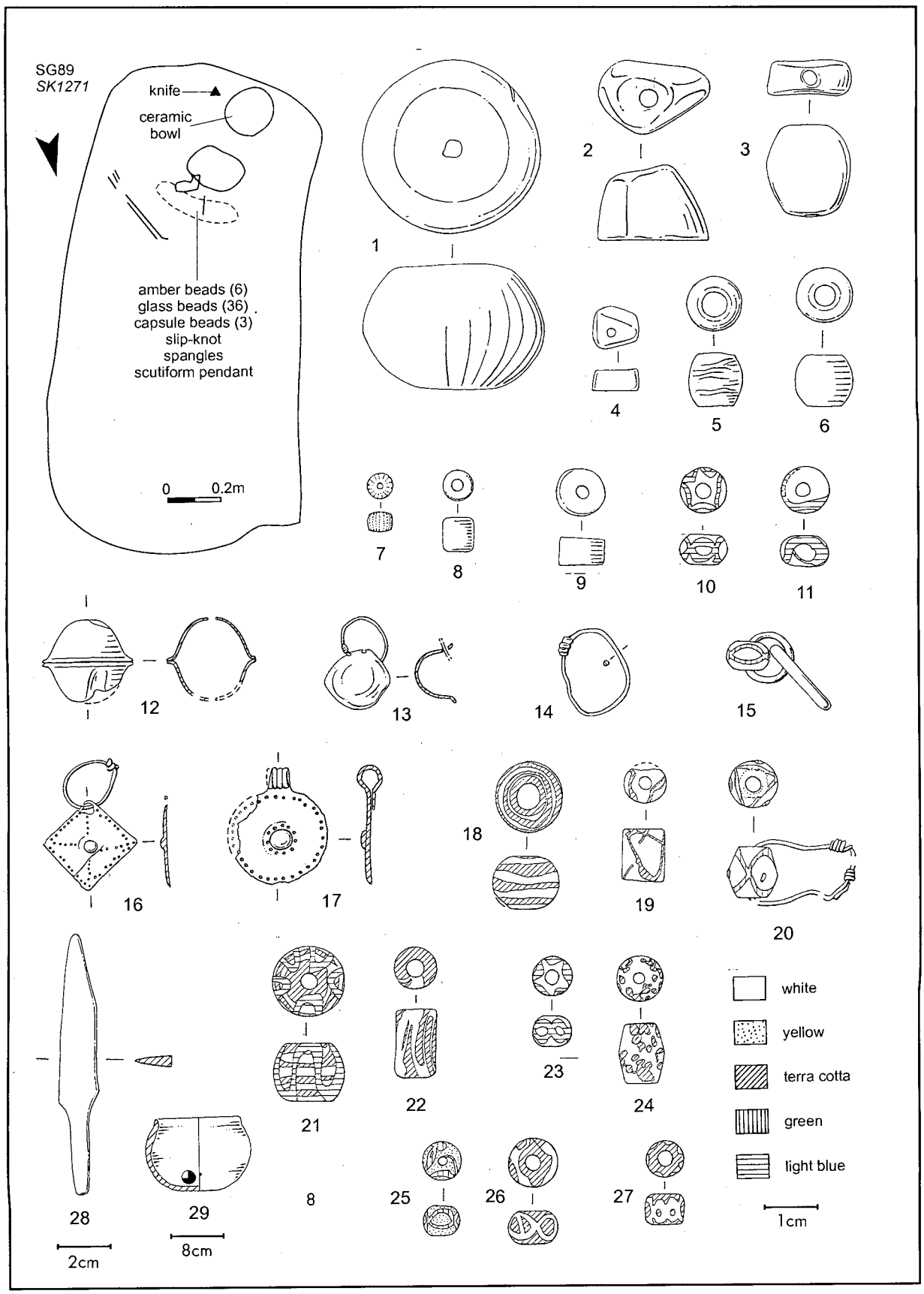

Figure 19. *SG89. Monochrome bead colours 1-4 amber; 5 opaque orange; 6 opaque black; 7 colourless; 8 opaque yellow; 9 opaque dark blue.*

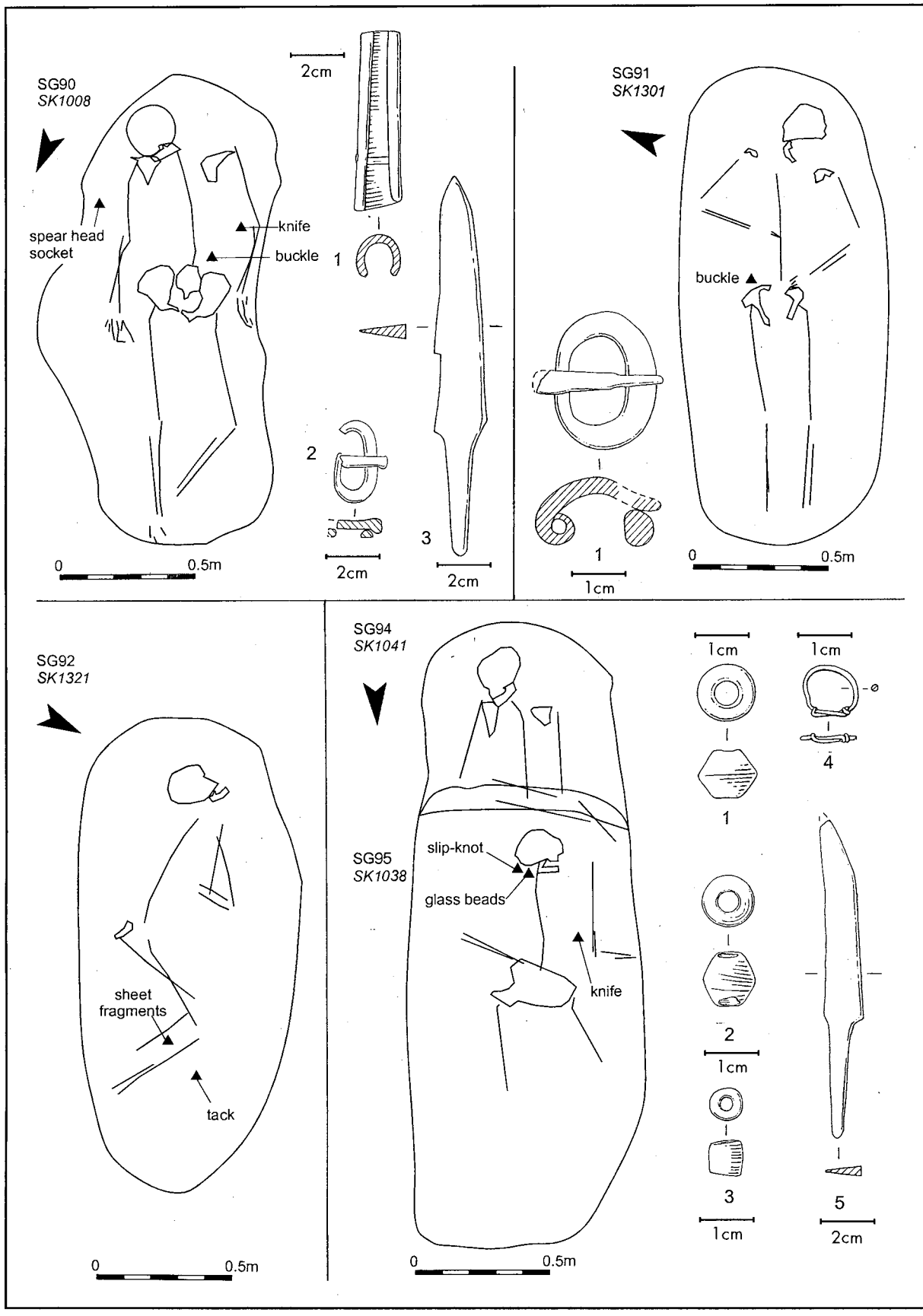

Figure 20. SG90-SG92 and SG94-SG95. Monochrome bead colours SG95 1-3 opaque orange

Arm position: crooked
Leg position: n/d
Grave goods:
Glass beads 95.1–3 monochrome 3 (Dia. 10mm; 9.9mm; 6.1mm)
Silver slip-knot ring 95.4 (Dia. 10.3mm)
Knife 95.5 Type C size, group 1 (L. 122mm)

Sub-group no: 96 (Figure 21)
Grave no: 1198
Skeleton no: 1199
Grave shape: sub-oval
Grave dimensions: L. 1.69m; B. 0.7m; D. 0.4m
Body orientation: 187° north
Skeleton condition: 1
Sex: F; Age: n/d; Stature: 162.4cm
Skeleton position: n/d
Arm position: n/d
Leg position: n/d
Grave goods:
Knife 96.1 Type A size, group 2 (L. 158.3mm)

Sub-group no: 97 (Figure 21)
Grave no: 1175
Skeleton no: 1176
Grave shape: sub-oval
Grave dimensions: L. 1.87m; B. 0.85m; D. 0.26m
Body orientation: 188° north
Skeleton condition: 4
Sex: F; Age: 45+; Stature: n/d
Skeleton position: supine
Arm position: crooked
Leg position: extended
Grave goods:
Silver slip-knot ring 97.1 (Dia. 23mm)
[from grave fill: human remains 1177, part of skeleton 1199 (SG96)]

Sub-group no: 98 (Figure 22)
Grave no: 1033
Skeleton no: 1034
Grave shape: sub-rectangular
Grave dimensions: L. 1.8m;B. 0.8m; D. 0.5m
Body orientation: 186° north
Skeleton condition: 4
Sex: ?M; Age: 35–39; Stature: n/d
Skeleton position: side
Arm position: right crooked
Leg position: bent left
Grave goods:
Knife 98.1 Type A size, group 2 (L. 163mm)

Sub-group no: 99 (Figure 22)
Grave no: 1026
Skeleton no: 1028
Grave shape: sub-rectangular
Grave dimensions: L. 1.35m; B. 0.48m; D. 0.19m
Body orientation: 245° north
Skeleton condition: 1
Sex: IMM; Age: 2.5–4.5; Stature: n/a
Skeleton position: n/d
Arm position: n/d
Leg position: n/d
Grave goods: None
[from grave fill: human remains 1027, part of disturbed skeleton 1028]

Sub-group no: 100
Grave no: 1407
Skeleton no: empty grave
Grave shape: sub-rectangular
Grave dimensions: L. 0.98m; B. 0.58m; D. 0.25m
[from grave fill: Knife Type A size, group 1, not illus.]

Sub-group no: 101 (Figure 22)
Grave no: 1016
Skeleton no: 1017
Grave shape: sub-rectangular
Grave dimensions: L. 1.76m; B. 0.78m; D. 0.2m
Body orientation: 175° north
Skeleton condition: 5
Sex: IMM(M); Age: 15; Stature: n/a
Skeleton position: supine
Arm position: crooked
Leg position: extended
Grave goods: None

Sub-group no: 102 (Figure 22)
Grave no: 1258
Skeleton no: 1259
Grave shape: sub-rectangular
Grave dimensions: L. 2.1m; B. 0.98m; D. 0.24m
Body orientation: 140° north
Skeleton condition: 1
Sex: F; Age: 21–25; Stature: n/d
Skeleton position: n/a
Arm position: n/a
Leg position: extended
Grave goods: None

Sub-group no: 103 (Figure 22)
Grave no: 1261
Skeleton no: 1263
Grave shape: sub-rectangular
Grave dimensions: L. 2.1m; B. 0.96m; D. 0.4m
Body orientation: 171° north
Skeleton condition: 5
Sex: ?F; Age: 17–25; Stature: 155.9cm
Skeleton position: supine
Arm position: crooked
Leg position: bent left
Grave goods:
Ceramic bowl fabric type A26 103.1
Bone spherical headed pin 103.2 (L. 26.6mm)
[from grave fill: human remains 1268, part of skeleton 1259 (SG102)]

Sub-group no: 104 (Figure 23)
Grave no: 1000
Skeleton no: 1002
Grave shape: sub-oval
Grave dimensions: L. 2.1m; B. 0.79m; D. 0.11m
Body orientation: 154° north
Skeleton condition: 4
Sex: M; Age: 45–66; Stature: 187.7cm
Skeleton position: supine
Arm position: left crooked
Leg position: extended
Grave goods:
Iron D-shaped buckle 104.1 (L. buckle 21mm)

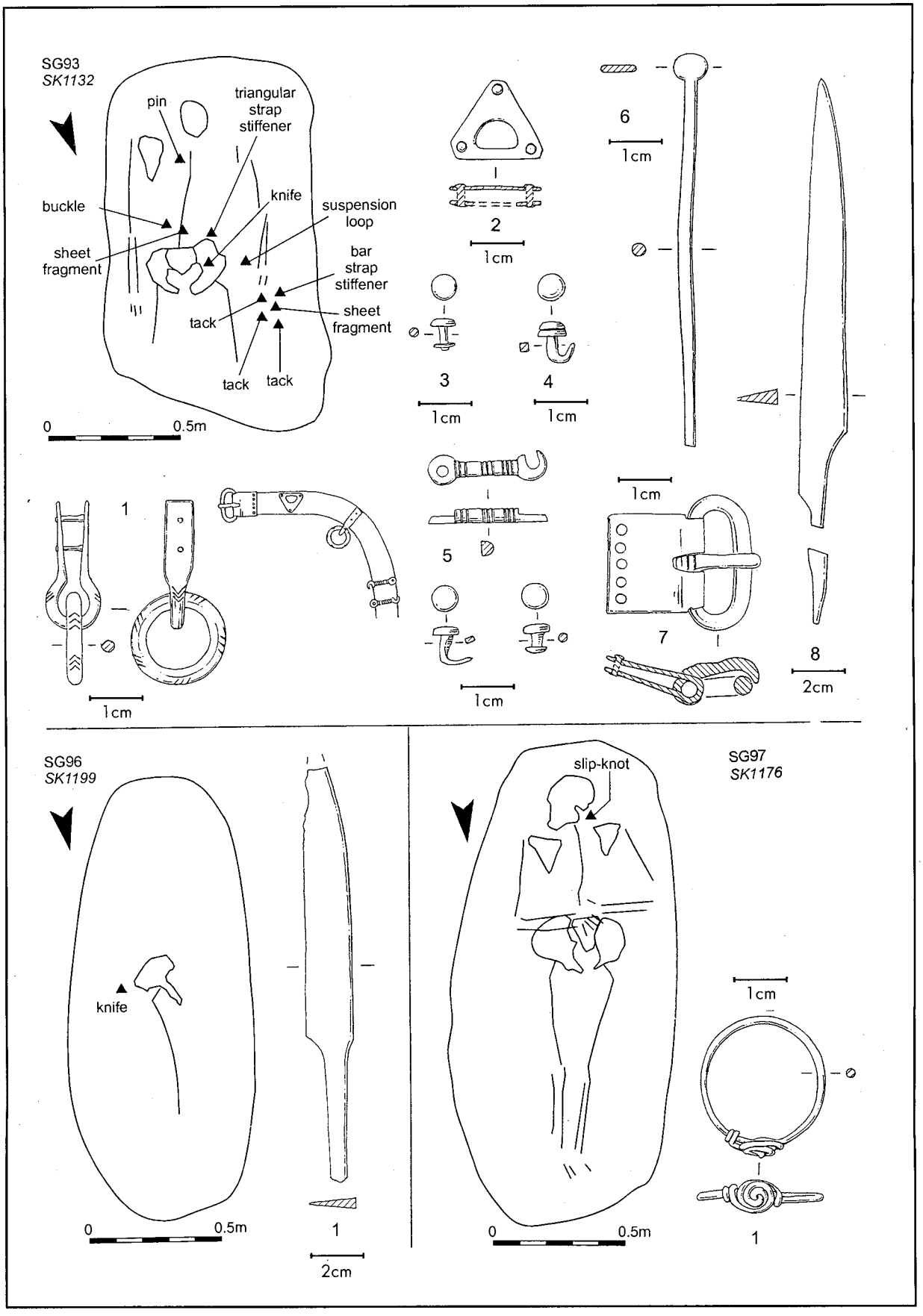

Figure 21. SG93 and SG96-SG97

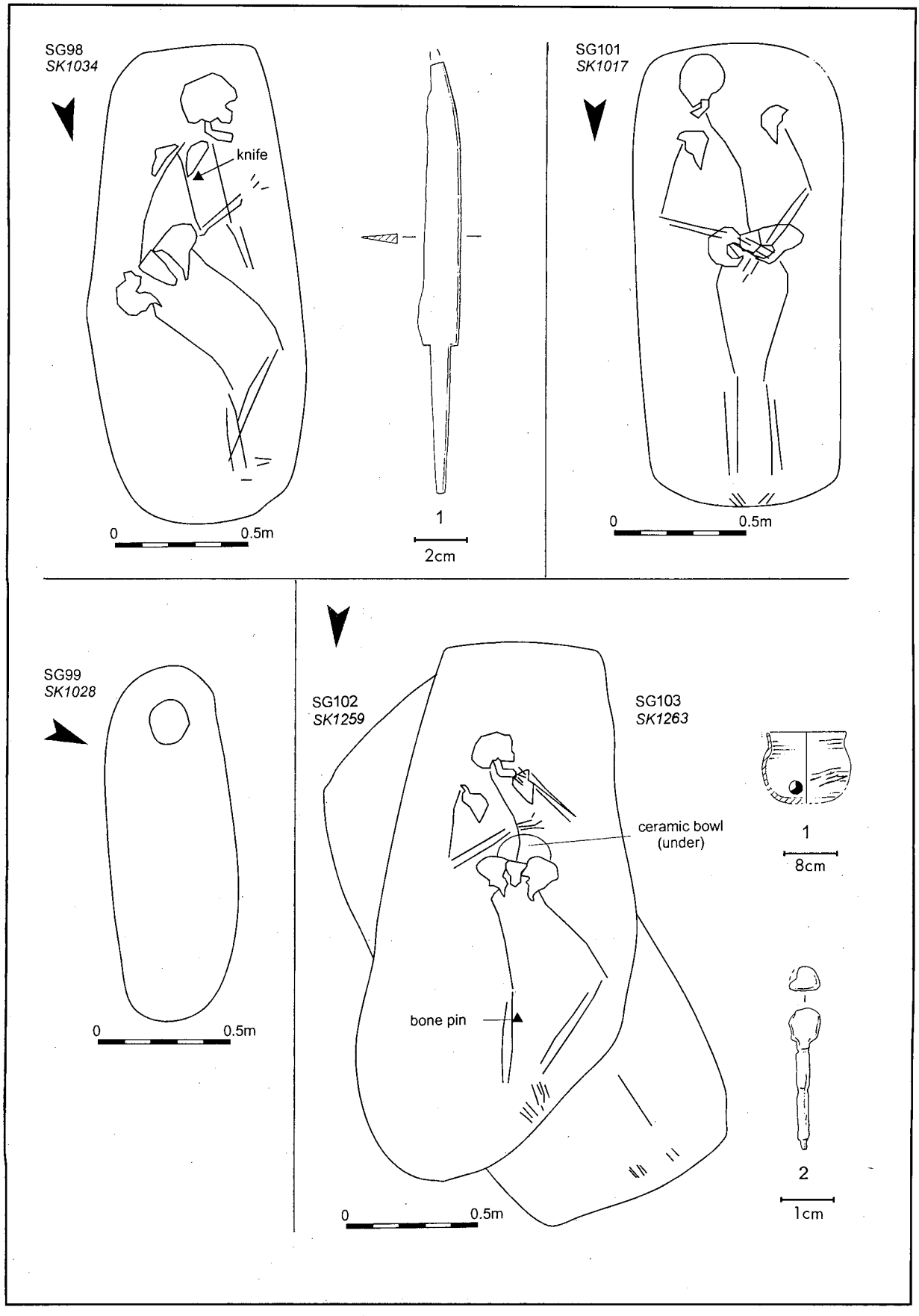

Figure 22. SG98-SG99 and SG101-SG103

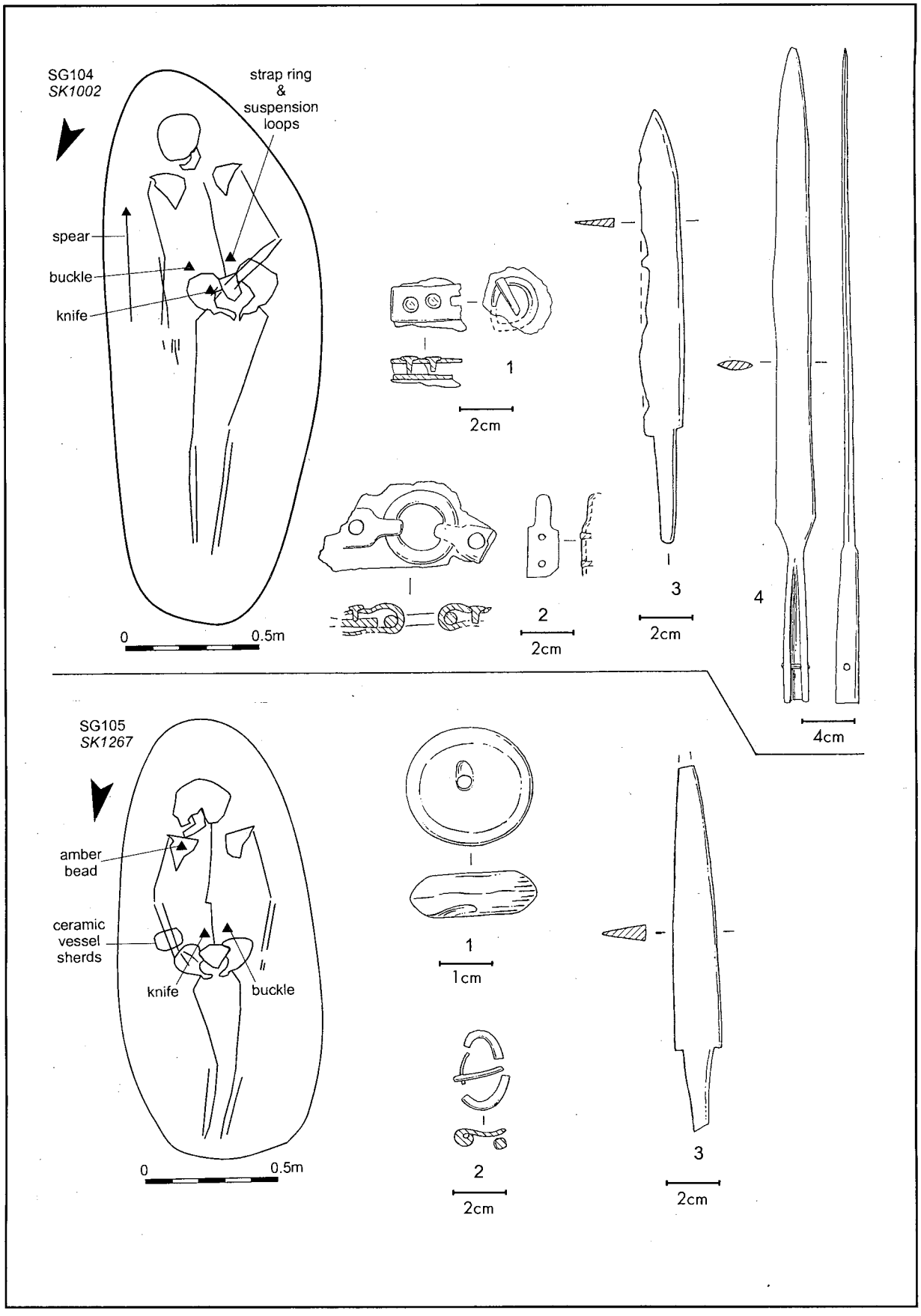

Figure 23. SG104-SG105

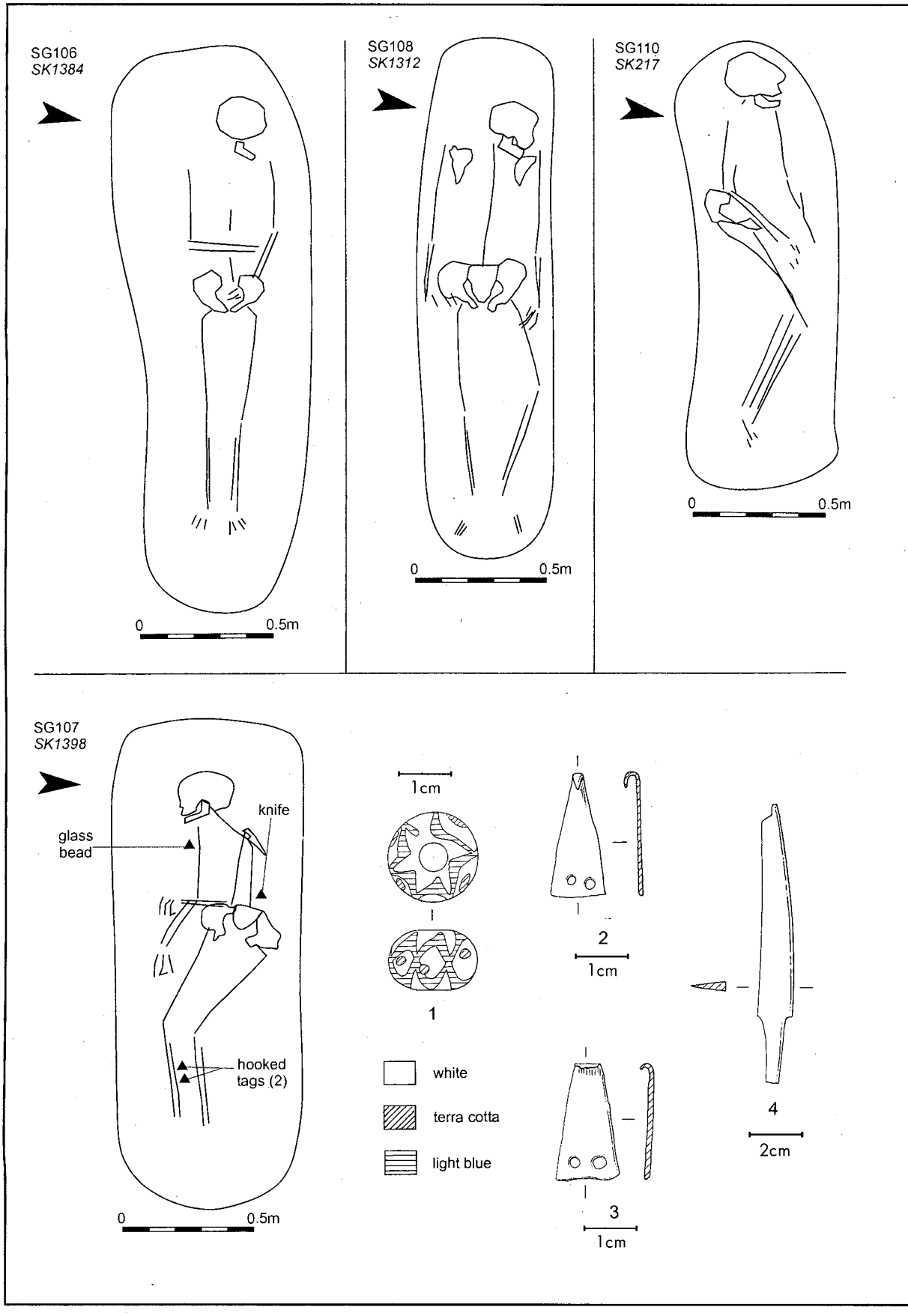

Figure 24. SG106-SG108 and SG110

Iron strap ring and riveted suspension loops (3) 104.2 (L. loop 32mm; Dia. Ring 28mm)
Knife 104.3 Type A size, group 2 (L. 164mm)
Spearhead 104.4 (Swanton E4) (L. 496mm)

Sub-group no: 105 (Figure 23)
Grave no: 1265
Skeleton no: 1267
Grave shape: oval
Grave dimensions: L. 1.67m; B. 0.75m; D 0.38m
Body orientation: 169° north
Skeleton condition: 5
Sex: IMM(F); Age: 17; Stature: 168.4cm
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods:
Amber bead 105.1 (Dia. 24.1mm)
Iron oval(?) buckle 105.2 fragmentary (L. *c.* 18mm)
Knife 105.3 Type B size, group 2 (L. 140mm)
Ceramic body sherds (9) fabric type A30, not illus.

Sub-group no: 106 (Figure 24)
Grave no: 1382
Skeleton no: 1384
Grave shape: sub-rectangular
Grave dimensions: L. 2.15m; B. 0.75m; D. 0.55m
Body orientation: 260° north
Skeleton condition: 3
Sex: M; Age: 30–44; Stature: 178.3
Skeleton position: supine
Arm position: right crooked
Leg position: extended
Grave goods: None

Sub-group no: 107 (Figure 24)
Grave no: 1396
Skeleton no: 1398
Grave shape: sub-rectangular
Grave dimensions: L. 1.86m; B. 0.71m; D. 0.75m
Body orientation: 273° north
Skeleton condition: 4
Sex: F; Age: 45–87; Stature: n/d
Skeleton position: side
Arm position: right crooked
Leg position: bent left
Grave goods:
Glass bead 107.1 polychrome (Dia. 16.1mm)
Copper alloy hooked tags 107.2–3 (L. 23.5mm; 22.4mm)
Knife 107.4 Type A size, group 1 (L. 108mm)

Sub-group no: 108 (Figure 24)
Grave no: 1311
Skeleton no: 1312
Grave shape: Rectangular
Grave dimensions: L. 1.98m; B. 0.52m; D. 0.6m
Body orientation: 259° north
Skeleton condition: 5
Sex: M; Age: 35–57; Stature: 185.9cm
Skeleton position: supine
Arm position: extended
Leg position: extended
Grave goods: None

Sub-group no: 109
Grave no: 1402
Skeleton no: empty grave
Grave shape: sub-rectangular
Grave dimensions: L. 1m; B. 0.5m; D. 0.33m

Sub-group no: 110 (Figure 24)
Grave no: 215
Skeleton no: 217
Grave shape: sub-rectangular
Grave dimensions: L. 1.69m; B. 0.54m; D. 0.35m
Body orientation: 259° north
Skeleton condition: 3
Sex: M; Age: 34–86; Stature: 175.5cm
Skeleton position: side
Arm position: right crooked
Leg position: bent left
Grave goods: None

Contextual evidence

Mark Phillips and Holly Duncan

Cemetery structures

Within the bounds of the main burial area, approximately 40m by 50m in extent, seven 'structures' were identified. Only two (G46 and G19) have firm dating and stratigraphic evidence for an association with the cemetery. The remainder are less certainly associated, although the spatial evidence for such a relationship is compelling (Figure 25).

G46 comprised a ditch delineating a lozenge-shaped area, 7.45m by 5.8m, oriented NNW-SSE (Figure 26). The ditch was 1.07m–1.37m wide and 0.54m–0.58m deep. Four postholes were positioned just inside its inner edge, one at each corner of the enclosure. The postholes, measuring 0.56m–0.7m in diameter and 0.24m–0.45m in depth, had flat bases and vertical sides. Traces of post pipes and packing survived in three of the postholes, and indicate that they held posts approximately 0.35m in diameter.

The primary fill of the enclosure ditch contained a small quantity of early Bronze Age pottery (3 sherds, weighing 11g), animal bone and flint, possibly derived from slumping. However, the presence of Roman and Anglo-Saxon pottery sherds, two iron rivets and a possible cosmetic brush handle within the main fills of the ditch and from post pipe deposits confirms that the structure is contemporary with the main period of use of the cemetery.

A cluster of three postholes (G19), forming an isosceles triangle in plan, lay immediately adjacent to the northwest side of the enclosure. These varied in size, two were up to 0.52m in diameter and 7.5mm deep, and one was 0.66m in diameter and 0.14m deep. Although no finds were recovered from this cluster, one posthole [1022] cut the fill of SG56, indicating it post-dates this grave or possibly that it served as some form of marker.

Five further groups of postholes or posthole structures (G15, G20 and G38–40) appear to belong to the cemetery. These structures had little or no dating

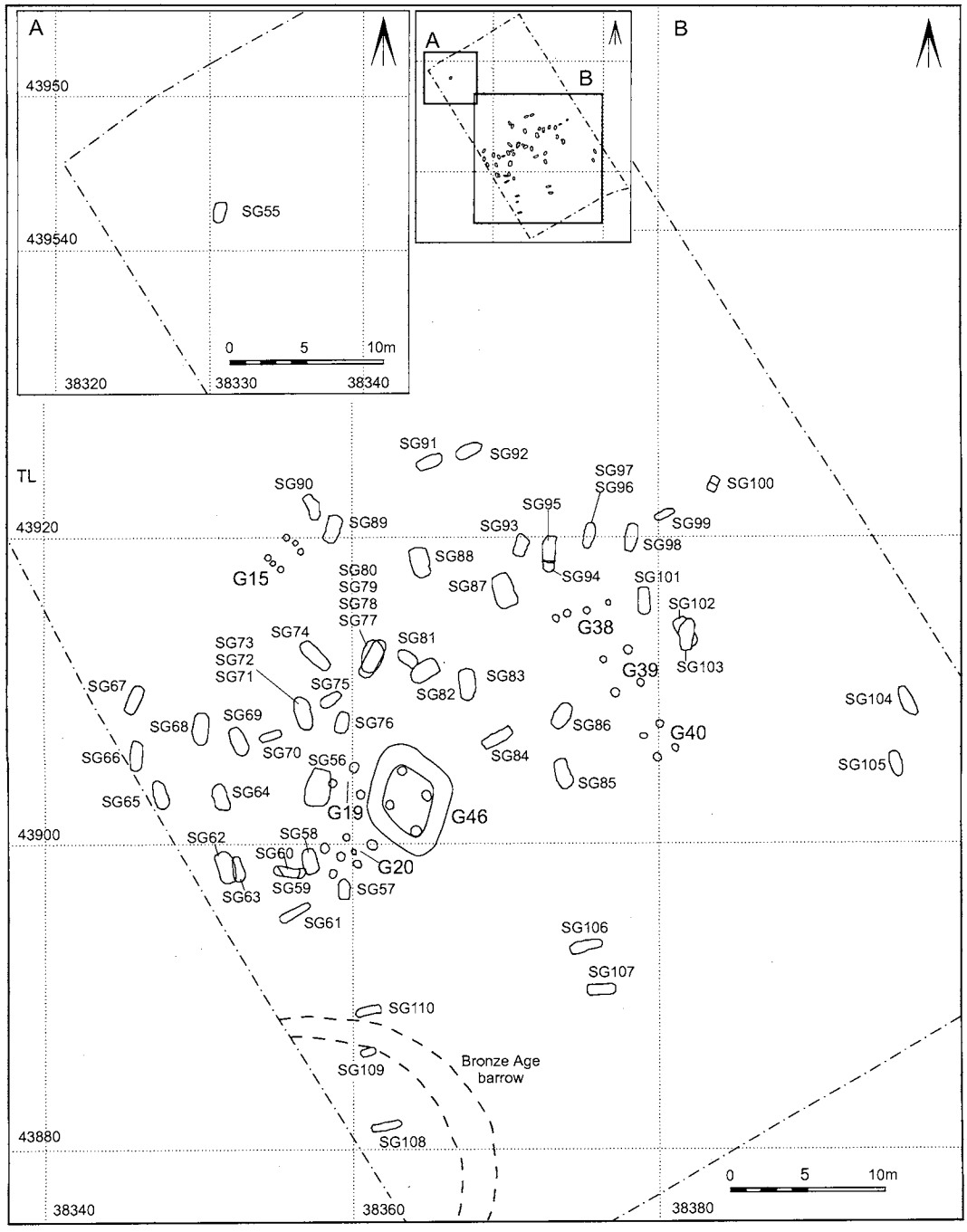

Figure 25. The Cemetery

evidence. However, the fact that they lay within the main burial area but were respected by the graves, suggests an association. In addition, morphological differences are apparent between these and earlier structures. The postholes making up the four-post structures of the late Bronze Age/early Iron Age (G24–29) were smaller in diameter, lacked evidence for packing and enclosed a larger area (see p 63).

A cluster of seven oval to sub-circular postholes (G20) was positioned on the southwest side of the lozenge-shaped enclosure G46. Two tiny sherds of pottery, one Roman and one of late Bronze Age/early Iron Age date, represent the only dating evidence. G15 situated about 13m NNW of G46 comprised a grouping of three paired postholes in a rectangular setting oriented northeast-southwest.

G39 and G40, two four-post structures, both oriented northwest-southeast, lay approximately 13m to the northwest of the lozenge shaped enclosure (G46). G38, a line of four post-holes oriented ENE-WSW, lay 3m north of G39. This whole complex of structures formed a 'T-shape' in plan. Dating evidence was limited to a single sherd of late Bronze Age/early Iron Age pottery, weighing 4g, from a post pipe in G39.

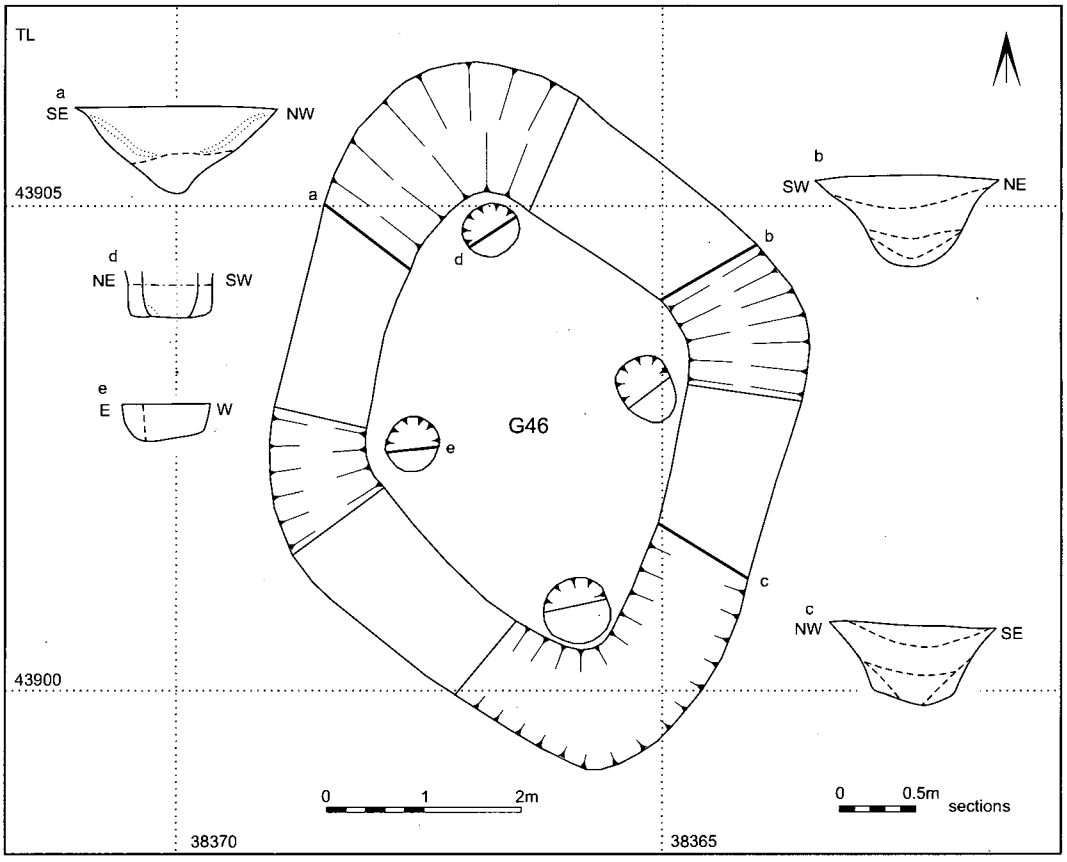

Figure 26. *Lozenge shaped structure G46*

Structural features, such as annular and penannular ditches sometimes with postholes, surrounding from one to three inhumations, have been noted from cemeteries in Kent, Norfolk, Sussex and Gloucestershire (Lucy 2000, 98–100). Similar features surrounding cremations have also been encountered in Essex and Sussex (Lucy 2000, 119). Four-post structures have been found over cremations at Apple Down, Sussex, Croydon, Surrey and Berinsfield, Oxfordshire. Those from Apple Down have been interpreted as mortuary houses (Down and Welch 1990, 25–33). Although similarities exist between these and some of the structures at Melbourn, in particular the four-post structures, none of the Melbourn examples overlie individual or groups of inhumations. Instead they appear to provide focal points for interment or designate burial areas. This is explored further in Chapter IV.

The Graves

Early Anglo-Saxon cemeteries typically provide only short and sporadic sequences of vertical stratigraphy between graves or other features. Despite its relatively short period of use, this site produced instances of stratigraphic relationships, including a few intercutting burials and some unique sequences of multiple, superimposed burials.

Fifty-five grave-like cuts were identified. Two (SG100 and SG109) did not contain inhumations, although a knife was found within the fill of SG100. Analysis of the skeletal remains indicated the presence of 60 individuals.

Stratigraphic relationships – superimposed and intercutting graves

Just over half of the graves (27 in number) contained single inhumations with no stratigraphic relationships with other graves. No two inhumations were laid side-by-side in the same grave, although SG78 contained an adult female and a foetus. There were, however, a number of instances of reused grave 'plots'.

This is most clearly seen in three groups of superimposed graves (SG96–97, SG71–73 and SG77–80). Here, the primary grave cut was succeeded by one to four later graves, each shallower than the previous one. Normally the succeeding grave cuts followed a similar line to that of the primary cut and the preceding inhumation was left *in situ*. The most reused grave 'plot' SG77–80 contained four superimposed inhumations but a fifth burial event may be indicated by the presence of adult remains in the fill of the final grave (SG80). A second form of reuse is illustrated by SG94–95 and SG102–103. Here, the original inhumations were truncated by the insertion of the second inhumation.

There were also five instances where the incomplete remains of a second individual were present

within the fill of a grave (SG57, SG65, SG67–68, SG74). These incomplete remains may represent the original occupant of a grave, which was re-opened for a later interment.

There appears to be a degree of correlation between gender and/or age groups within the same burial 'plot' (see Section 8.2.2). Out of the ten instances of reused burial 'plots' noted above, the gender of all inhumations within each group could be determined in six cases. Of these, same gender burials occurred in five instances (SG65, SG68, SG71–73, SG96–97 and SG102–103). There was also one case where two immature skeletons occupied the same plot (SG57). The cemetery population, however, is small and this correlation may not be statistically significant.

Three graves appear to have been disturbed at some point in the past, with remains of the same individual being found in both the grave and grave fill. Two (SG86 and SG99) contained very few skeletal remains at all. In grave SG59 the upper portion of the still partially articulated skeleton had been removed and deliberately replaced in the fill of robber cut (SG60). It is possible that these graves had been investigated for potential secondary interments or robbed. In the case of SG59 the disturbed but partially articulated bone suggests that a relatively short period of time had elapsed between interment and disturbance.

Three examples of intercutting burials were recorded, although in these instances only one edge of the graves overlapped (SG81 cut SG82; SG59 cut SG58). Disturbance and tree root action masked the relationship between graves SG62 and SG63.

Alignment and orientation

Despite its proximity, the graves were not concentrated on, or aligned with, the Bronze Age barrow. Only two graves (and one empty grave-like feature) were close to the barrow. SG108 was within the ditch circuit; SG110 was immediately outside.

The main concentration of graves lay about 6m to the north of the barrow and covered an area of approximately 40m by 20m. Six graves, forming three groups of paired burials, lay to the south (SG108 and SG110; SG106 and SG107) and southeast (SG104 and SG105) of the main concentration, four graves, forming two groups of paired burials, lay to the north, and a single burial about 20m to the northwest (SG55).

The graves were not in rows but appeared to cluster around the cemetery 'structures'. There was a particularly dense concentration to the north, west and east of the lozenge-shaped enclosure (G46). The T-shaped arrangement of structures (G38–40) provided a similar focal point for the eastern edge of the cemetery; again graves were positioned on all sides but the south. Smaller grave groups were noted near structural features G15 and G20.

Orientation could be determined in the case of fifty of the inhumations. The majority (70%) lay with heads to the south within a broad compass arc of southeast-southwest. Two each lay with heads to the ENE and NNW. Eleven (22%) lay with heads to the west. This variation in orientation is in contrast to the 1952 excavations at Melbourn where all 28 burials varied no more than ten degrees from the north-south line (Wilson 1956, 30).

No discernible gender-related pattern was apparent in the orientation of most of the graves. The two inhumations with heads laying to the ENE were female. Clearly, there are too few burials for this to be statistically significant. What is noteworthy, however, is that one of these graves (SG75) contained the earliest known (second half of the 6th century) assemblage of grave goods from the cemetery.

Within the groups of superimposed graves, the inhumations were normally oriented in a similar direction. One group (SG71–73), however, contained three inhumations, the two earliest lay with heads to the south while the uppermost body (Sk1032) lay with the head to the north. This inhumation was accompanied by a spear (resembling Swanton B2 form), and was the only example with the head of the spear pointing towards the foot of the grave.

Of the eleven inhumations with heads placed to the west only three had accompanying grave goods. Seven of these burials (SG59, SG61, SG84, SG106–108 and SG110) were further distinguished by their position on the southern edge of the cemetery. This group comprised five males, a female and one immature inhumation. Only the female was accompanied by grave goods: a knife, a bead and two hooked tags, the latter suggesting a date in the later 7th century (see p 116).

Grave shape and depth

Grave shape varied from rectangular to oval. The majority (58.5%) were sub-rectangular in form, having relatively straight sides and somewhat rounded ends. Two graves were of a noticeably narrow rectangular shape (SG61 and SG108), and these form part of a group of seven burials with heads placed to the west (see above). Oval and sub-oval shapes, with sides gently rounded, accounted for 18 graves. Single examples of five-sided and irregular outlines were also present. There was no discernible correlation between grave shape and depth.

The majority of the graves (37) were less than 0.5m deep. The eleven deeper graves were aligned either south-north (7) or west-east (4). Four of the deep inhumations with heads placed to the south were from groups of superimposed burials.

There was no discernible correlation between grave shape and burials with heads placed to the east, south or north. Burials with heads placed to the west, however, were exclusively interred in graves of rectangular to sub-rectangular shape. The seven burials with heads placed to the west, situated along the southern edge of the cemetery, formed a fairly cohesive group in size and shape. These graves were longer and narrower, lengths exceeding 1.65m and widths between 0.52m and 0.76m.

Arrangement of the body within the grave

In 41 instances the arrangement of the body (spine, legs and arms) within the grave could be determined.

Skeletons were supine with extended legs in 22 cases (53.7%), supine with legs crossed in 6 cases (14.6%), and supine with legs bent left (4 examples) or right (1 example) in 5 cases (12.2%). Only eight skeletons (19.5%) were positioned on their sides, with legs bent left (seven examples) or right (one example). No prone burials were identified.

A correlation between burials with crossed legs and 'rich individuals' was observed at Edix Hill (Malim and Hines 1998, 41). This pattern is not as definite at Melbourn. Of the six burials which exhibit this trait, three of the males were accompanied by either a complete spearhead or spearhead sockets (SG74, SG83 and SG90), while the fourth (SG79) had a buckle and a knife. Of the two females, SG75 was one of the 'richest' and earliest graves, whilst SG70 was unaccompanied by grave goods.

At Edix Hill the arms were used to enhance the display of certain types of artefacts accompanying the burials (Malim and Hines 1998, 34). A similar practice was noted at Melbourn amongst several of the female inhumations. Sk205 (SG64) had one of her crooked arms positioned as if holding the shears or the chatelaine chain. Sometimes extended arms bracketed a group of objects, for example the arms of Sk1165 (SG65) enclosed the girdle group. This was also particularly apparent with Sk1370 (SG67). Here the arms were extended and the hands were pointed to the left where a complex chatelaine extended down the side. Arms were not always used to display grave goods. In the case of Sk1189 (SG78) the arms were positioned as if protecting the accompanying foetus. More males had one or both arms crooked and these tended to be placed over the stomach.

The majority of inhumations were placed centrally within the grave. In a few instances the body was positioned to accommodate the accompanying grave goods, for example Sk1012 (SG74) was placed about a third of the way down the length of the grave with a ceramic vessel placed above the head. A few burials however were positioned off-centre and were not accompanied by surviving grave goods necessitating this placement. In two cases the inhumations were placed to the right of the grave (SG80 and SG85). Three inhumations (SG69, SG79 and SG84) were positioned closer to the foot than the head of the grave. It is possible that organic items may have originally accompanied these inhumations.

Human skeletal material

Corinne Duhig

Introduction

The cemetery is not of great size, containing in total the remains of 60 individuals, but is highly informative for its period due to good bone recovery and preservation. In general the bone is robust, with cortices undamaged by water- or root-erosion. Most long bones are broken and skulls are shattered, which has necessitated some reconstruction to facilitate examination of the skull and measurement of long bones. Unfortunately, the pubic bone, the uppermost part of the pelvis in an extended supine inhumation, is crushed or lost in many specimens, making determination of their sex and age problematical.

In its demography and pathology, Melbourn provides significant contrasts with earlier Anglo-Saxon cemetery populations from this area. The skeletal information is catalogued in Section 6 and discussed in detail below. The methods employed in the identification and analysis of the skeletal material are presented in Appendix 1.

Demography

Introduction

Only four individuals (6.7%) can be neither aged nor sexed. Despite the loss of pubic bones, the basically sound condition of the bones has made other skeletal areas available for reconstruction and assessment in most cases. This improves the information availability from this site despite its relatively small size; compare for example, Morning Thorpe in Norfolk with 365 inhumations but 19% unaged/unsexed and Castledyke in Humberside with 209 inhumations and approximately 30% unaged/unsexed (McKinley 1987; Wiggins *et al.* 1999).

Sex

The female:male ratio at this cemetery is 1:1.4, very close to the expected 1:1 pattern and well within the range of variation of ancient cemeteries. Two of the late adolescents show adult sexual features. Sk1267 (SG105) is that of a person of approximately 17 years, whose long bones were fusing and who had therefore reached full adult height but who had clearly female characteristics of skull and pelvis. Sk1017 (SG101) is that of a 15-year-old, still growing but with strongly male features to the skull (the pelvis is too damaged to be of value). Both are counted with the immature individuals because the 'adult' boundary has been set at 18 years, but as discussed below, this is somewhat arbitrary given the age variation for both physiological and social adulthood.

There is one possible discrepancy between the sexes as determined from the skeletons and from the grave goods. Sk1045 (SG72) is clearly male but is accompanied by a slip-knot ring which is more commonly found as part of a woman's necklace.

No discernible age or gender related pattern of burial was apparent within the cemetery. The multiple, reused and overlapping graves, however, show some tendency for use by a single age or sex group: SG65, SG96–97, and SG102–103 containing two females each, SG68 and SG71–73 containing two and three males respectively, and SG57 two immature burials. The quintuple grave SG77–80 contains three males, one female and one undetermined group of bones. If these age/sex groupings are not merely coincidental, they are unique in Anglo-Saxon material. It is unfortunate that the other multiple or reused graves have one individual who cannot be sexed by skeletal traits: SG94–95 (female with unsexed adult having slight predominance of female traits), SG62–63 (male

with adolescent or adult), SG67 (female with adolescent or adult), SG74 (male with unsexed adult).

Age

Immature individuals

It is to be expected that the proportion of immature individuals dying, especially neonates and infants, will be higher in ancient societies than in the modern, developed world (eg Stockwell 1993). The mortality profile of an undeveloped country has a U-shape with childhood deaths predominating. Developing countries show either a change towards the 'developed' pattern because of improved nutrition, sanitation and medical care or, due to increasing population nucleation and industrialisation, an increase in the infant/child peak as found in 19th-century London (Table 2). It is thought that the likely paradigm for much of the ancient world is the former, due to a lack of density-dependent infections. Brothwell gives the percentage of immatures as just over 30% for Anglo-Saxons, a figure similar to that found in many modern developing countries (Brothwell 1981; Waldron 1994). In Cambridgeshire, Brothwell's Anglo-Saxon norm is equalled by the mainly 6th-century Edix Hill but greatly exceeded by Oakington at 46% (Taylor *et al.* 1998: although this cemetery is rather small and exceptional in several ways).

There are only 11 immature skeletons in the Melbourn assemblage, representing 18.3% of the population, or 21.7% if the two 'adolescent/adult' skeletons are included. This, therefore, is an improvement in child survival for the area. The contemporary cemetery of St Peter's, Broadstairs, Kent (Duhig in prep.) has 21% immatures while the earlier Castledyke (Humberside) has 20%. When we consider the foetuses/neonates/infants, however, their proportion is even lower than modern London, and this is commonly found in ancient cemeteries worldwide. When bone preservation and recovery techniques are good, as here, fragility of infant skeletons cannot be invoked as an explanation. Molleson, among others, suggests disposal of infants in the domestic sphere, in and around the settlement (Mays 1993; Molleson 1993).

In the case of Melbourn, there are no neonates or infants at all, the percentage representing only the single foetus. It was found near the pelvis of the mother, Sk1189 (SG78), and is of less than 6 months gestation. In terms of grave recording it is not a separate individual (the foetus is counted as 'a pathology of the mother'), but is treated as such here because foetuses can manifest pathological conditions in their own right. It was not found within the pelvis. This might be because the small body or bones were disturbed when the right femur and tibia of Sk1189 were removed, but it might be that the foetus was stillborn and buried beside its mother. The one neonate from Edix Hill was also buried with an adult woman, assumed to be its mother, so this might have been the norm when both died together, and it is certainly paralleled by later practice. Stillbirths, neonates and infants whose mother was alive could also be kept close to her by burial in the settlement, if there were no other modes of disposal favoured at the time, and this is where we might expect our 'missing' children to be.

There are too few immatures to determine any mortality patterning. Table 1 shows that there are more child than adolescent burials, conforming to the expected U-shape mortality profile (but this is produced by the presence of only one more child). The 'age of majority' for Anglo-Saxons appears to be around 11 for girls and 13 for boys, based on legal codes and on the presence of sex-specific grave goods in child/adolescent burials (Crawford 1991; Duhig 1998; in prep.; Wiggins *et al.* 1999, quoting Clarke). The boundary appears to be flexible and could have been mediated by social status, physical maturity or practical constraints on the time of 'promotion'.

Adults

Female deaths predominate in the 'adult 1' group and decline through 'adult 2' and 'adult 3', then rise for the last group (Table 1 and Figure 27). The males, by contrast, have the number of deaths rising from 'adult 1' through to 'adult 4'. This is an unusual pattern in both the archaeological record and in most of the modern world. Males tend to have a greater death rate in all but the oldest age band and often peak in the earlier bands – when using a modification of the Brothwell system, we observe most male deaths before 35 years. Warfare is often suggested as the cause of this pattern, but even when formal warfare is absent males tend to be more vulnerable to constitutional and environmental/lifestyle hazards (WHO 2001). The Melbourn sample is not large, however, and these results might be merely an artefact of the small numbers of each sex in each age band.

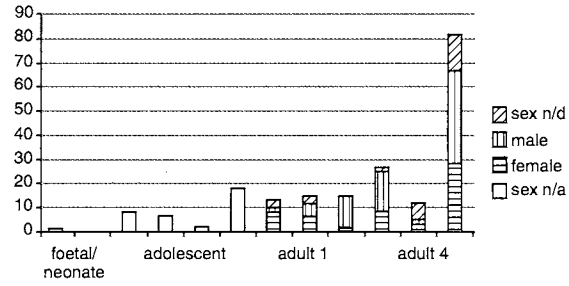

Figure 27. *Age at death (percentage of population)*

Stature

The statistics relating to the statures of the Melbourn population are shown in Table 3. The Melbourn people are tall for Anglo-Saxons, for example compare Edix Hill females at 151–171cm, males at 160–184cm. They appear to exceed all other reported Anglo-Saxon populations, even the average of the 7th-century cemetery of Headley Drive, Tadworth (171cm; although the Headley Drive minima are higher for both sexes at 158cm and 169cm and approach modern European norms). The means are not raised by exceptionally tall outliers; the spread of heights is regular.

Following Floud *et al* (1990), we should expect that 95% of the heights would be within two standard de-

Table 1. *Ages at death for the whole cemetery population*
1. Two of the four individuals which are both 'unaged adult' and 'sex n/d' are adolescent or adult, due to their adult size but absence of epiphyseal ends of bones from which to determine skeletal maturity.
2. Each percentage is calculated separately, and because all are rounded to the nearest decimal place, they do not add up exactly to the totals.

age band	sex n/a	%	female	%	male	%	sex n/d	%	TOTAL	TOTAL %
foet/neo	1	1.7							1	1.7
infant	0	0.0							0	0.0
child	5	8.3							5	8.3
adolescent	4	6.6							4	6.6
unaged imm	1	1.7							1	1.7
all imm	11	18.3							11	18.3
adult 1			5	8.3	1	1.7	2	3.3	8	13.3
adult 2			4	6.6	3	5.0	2	3.3	9	15.0
adult 3			1	1.7	8	13.3	0	0.0	9	15.0
adult 4			5	8.3	10	16.7	1	1.7	16	26.7
unaged adult			2	3.3	1	1.7	4	6.6	7	11.7
all adult			17	28.3	23	38.3	9	15.0	49	81.6
TOTAL									60	100.0

Table 2. *Comparative figures of immature death*

	Melbourn	Edix Hill	19th C London	modern London	developing countries
neonates/infants	1.7	3.0	*c.* 50.0	2.5	–
all immatures	18.3 (21.7)	31.1	–	–	*c.* 30.0

Table 3. *Statistics on the statures of the population (cm unless otherwise stated)*

	minimum	maximum	spread	median	mean	mean (ft)	SD	two SDs
females	155.9	176.9	21.0	162.4	163.6	5' 4½"	7.0	14.0
males	165.6	186.9	21.3	177.8	177.7	5' 10"	6.5	13.0
all	155.9	186.9	31.0	171.4	173.0	5' 8"	9.4	18.8
average populations	–	–	–	–	–	–	6.35–7.11	12.7–14.22

viations (SDs) of the mean, that is, 154.2–191.8cm. All the heights fall within this range, but only 22 (81%) fall within two SDs of the average range. Two reasons most commonly invoked for such a spread are mixed population with the two source populations having different means or environmental stress causing greater variation, particularly in males. In our case, however, the SDs for males and females are close to the average and it is the small amount of overlap between the sexes which accounts for the large spread, and therefore large SD, for the population. This may suggest that the males and females come from populations with different norms.

Pathological conditions

Disease prevalence is extremely difficult to determine in ancient skeletal material because bone itself has relatively few diseases and the predominant disorders, as in the modern world apart from the developed countries, would have been infections. These are often of short duration, sometimes rapidly fatal especially to the vulnerable young (worldwide, the commonest cause of death of infants is diarrhoeal disease) and consequently rarely affect the bones. Common, debilitating but non-fatal, skin infections of the 'tropical ulcer' variety only cause changes on bones where there is direct contact with the diseased soft tissue. Other disorders, however, are visible on skeletal material and can be examined easily, particularly the joint diseases grouped together as arthropathies, dental disease, fractures, and some congenital disorders and harmless developmental variants of the skeleton

('non-metric' or 'epigenetic' traits).

Diagnosis presents difficulties due to the limited range of responses of which bone is capable, exacerbated by taphonomic effects on the bones, so the tables accompanying each section describe the location, form, size and other features of each change and the potential differential diagnoses are discussed in the text. There are, however, very few contentious cases from Melbourn. Taphonomy, natural and due to human action, has caused loss of particular bones or skeletal areas. For this reason, the prevalence of a disorder is expressed as number of affected bones or areas/number of individuals with the relevant bones or areas present/the former as a percentage of the latter. For example, in a given assemblage, there might be 15 examples of trauma in 98 specimens with enough bone to be assessed for trauma; this is expressed as 15/98/15.3.

Arthropathies

Osteoarthritis, the joint degeneration of everyday wear and tear, is present at high levels in the whole population 29/59/49.2 of individuals (excluding the foetus) are affected by one or more changes and in adults 28/49/57.1. There are 18 males, including a teenager with clearly male skeletal characteristics, affected by at least one arthritic change, 10 females and one of undetermined sex. The distribution by sex and skeletal area is presented in Table 4, showing that the males again have twice as many arthritic changes as the women. 'Bilateral' indicates not merely instances both on left and right but bilateral joints in the same individual assumed to be affected by the same activity. A figure in parentheses in that column indicates an affected bone which could not be sided.

Rogers and colleagues (Rogers & Waldron 1995; Rogers *et al.* 1987) have established diagnostic criteria for joint change, and this has been followed in recording types of change: osteophytic (new bone nodule) lipping around joints or on surfaces; cysts (pitted joint surface showing where new cartilage was proliferating in response to damage); eburnation (bone-to-bone polish due to loss of cartilage); ankylosis (fusion). They are not followed, however, in their diagnostic protocol, which requires a particular combination of changes for a clear diagnosis of osteoarthritis or other arthritic condition; any one of the changes given above is taken as indicative of the cartilage deterioration and associated responses of osteoarthritis.

Vertebral osteoarthritis

Prevalence of this ubiquitous disorder is 26/45/57.8 in all spines which can be assessed, all but one of which are adult. This is considerably lower than the prevalence at Edix Hill, 85%, but higher than that of the contemporary St Peter's Tip, 31%. Males are affected twice as much as females.

The one non-adult with arthritis, the 15-year-old male Sk1017 (SG101), has a few osteophytes on the body of the lowest lumbar vertebra and what might be a Schmorl's node (explained below; although this is a dubious case) on the same vertebra. Perhaps the node, if such it is, has been produced by the stresses of heavy work on the developing spine.

Non-vertebral osteoarthritis

The distribution of non-vertebral arthritis changes has been recorded by region: temporo-mandibular, sterno-clavicular, shoulder, elbow, wrist, hip, knee, ankle, foot, and not by individual joint surfaces. This is because several bones participate in one joint and an action putting stress on one surface is likely to affect some or all of the others in the same joint capsule or area. Overall the prevalence is 28/59/47.5 affected individuals, 32/59/54.2 cases in individuals and 32/425/7.5 in joint regions available. The joints of the upper limb dominate with shoulders, elbows and wrists all affected, but only six cases affecting the

Table 4. *Sex- and joint-area distribution of osteoarthritis*

	males			females			sex n/d		
	left	**right**	**bilateral**	**left**	**right**	**bilateral**	**left**	**right**	**bilateral**
TMJ[4]	0	1	1	0	0	0	0	0	0
SCJ[3]	0	0	2	0	1	0	0	0	0
shoulder[2]	1	0	2	1	1	0	0	0	0
elbow[2]	0	1	2	0	2	0	0	0	0
wrist[1]	3	3	1	1	0	0	0	0	0
hand[3]	0	0	(1)	0	2	0	0	0	0
hip[1]	0	1	1	1	0	0	0	0	1
knee[4]	1	0	0	0	0	0	0	0	0
ankle[3]	0	0	0	0	0	0	0	0	0
foot[4]	0	0	0	0	0	(1)	0	0	0
TOTAL N/S	5	6	10	3	6	1	0	0	1
spine			17			8			1
TOTAL	5	6	27	3	6	9	0	0	2
		38			18			2	

lower limb, of which four are in the hip. There is no significant difference between left and right.

The most severe cases are, unsurprisingly, all in mature and older persons. Sk1187 (SG80) and Sk1188 (SG79) are males from the same multiple burial, the former with four and the latter with eight areas of arthritis. The vertebral osteoarthritis is particularly severe in Sk1187, extending through the entire spine, in addition to a whole suite of arthritic change consequent to traumatic damage to the left shoulder and right wrist. Sk1188 has symmetrical changes in shoulders, elbows, wrists, and hips as well as in one knee and the spine. The woman from the same grave, Sk1189 (SG78), around 40 years of age, has such severe lipping of the left hip joint that the thigh would have been partly fixed in adduction with little or no rotation; otherwise, however, her skeleton is reasonably healthy.

The male Sk305 (SG83) is affected in spine, shoulders, wrist and on the temporo-mandibular joint, the latter joint also being arthritic on one side in another male skeleton, Sk312 (SG88), along with shoulder, hip and spine. The female Sk1305 (SG70) also has four areas of arthritic change, that in the spine being quite severe in the lower cervicals but otherwise average, and the extra-spinal changes mild. All other individuals have fewer than four areas of osteoarthritis, and no other forms of arthropathy were found (eg DISH, inflammatory arthritis, etc., as found at other sites).

Schmorl's nodes

Schmorl's nodes indicate weight-bearing damage to the intervertebral disc; the soft central material herniates through the fibrous outer covering and the pressure of this material creates an indentation in the adjoining vertebral body. Changes that are unequivocally Schmorl's nodes are not common in this assemblage, found in only five spines with the potential for assessment, that is, having at least one intact vertebral body: 5/44/11.4. All are adult, including two males (Sk1008 SG90, Sk1388 SG68), two females (Sk1229 SG82, Sk1189 SG78), one sex-not-determined (Sk1293 SG69). The possible, immature case is mentioned above.

Enthesopathies

Although conventionally grouped with the arthropathies, enthesopathies are not strictly joint disorders, although they can occur near joints. They are ossifications into tendons and ligaments, caused by one-off or habitual severe stresses on the tendon of a particular muscle or by a 'bone-making' tendency in some physiologies. They are not listed in the section on habitual activity unless this cause is unequivocal, which is rare.

The three potential cases (Table 5) are all in the same individual, but at unrelated locations, the first two of which are areas of muscle attachment but the third of which is a bilateral affection of the ligament bridging the tibia and fibula. In view of the coincidence of these three cases, it is suggested that this individual was a 'bone maker'.

Dental disease

Descriptions of the aetiologies of the dental diseases follow mainly Hillson (1979), although for reasons of time and cost only macroscopic methods have been used, contrary to his practice.

Caries

Dental caries (decay) is caused by an acid pH in the mouth, usually produced by carbohydrate food and plaque, a mixture of bacteria, saliva proteins and bacterial and food debris. The acid condition demineralises the hard enamel and breaks through into the dentine. There is a direct relationship between the amount of sugar in the diet of a population and their amount of caries, which is the principal reason we have more caries than our distant ancestors. Tooth cleaning helps to remove plaque and contributes to caries resistance but individual variations in diet, saliva minerals, enamel formation and tooth placing (especially crowding) are very important in caries aetiology. In modern times it is the crevices of the molar crowns which are most affected. If there is periodontal disease (inflammation of the gums and supporting tissues of the tooth) tooth roots can become exposed and vulnerable to caries attack, a type of caries more common in ancient material than in modern.

Carious lesions are readily observable on the Melbourn material due to the good preservation and unstained condition of the teeth. Prevalence is calculated firstly as percentage of dentitions with at least one carious tooth, out of all dentitions with at least one tooth. In a few cases some teeth were recovered even though the jaws were smashed and unobservable, which is why the denominator is a larger number than for 'abscess cavities' and 'ante-mortem loss', below. Secondly, prevalence is determined as number of carious teeth out of all teeth recovered. The two figures are 20/54/37.0 and 38/1079/3.5. Hillson observes, and Brothwell illustrates, that Anglo-Saxons

Table 5. Enthesopathies

SG	Sk	Sex/Age	Description
77	1204	M 18.5–20	1. Occipital nuchal area: lipping and porosity
			2. L clavicle two-thirds lateral: lip of coarse ECNB at medial edge of deltoid origin- ?episode(s) of trauma
			3. L fibula interosseous line: small area of ECNB; R fibula interosseous line: large area of fine-grained ECNB 194cm long spalling away from cortex

are the exception to the trend of caries increase through British history, and the Melbourn population are certainly similar to some other Anglo-Saxon populations, for example 30.9% affected dentitions from Edix Hill and 30.8% from St Peter's Tip. Using the second method we can compare Brothwell's *c.* 6% for several Anglo-Saxon groups, Edix Hill 3.2%, Castledyke 5.1%, Addingham 5.4%, North Elmham 6.4% (Brothwell 1981; Duhig 1998; others listed in Wiggins *et al.* 1999).

Abscess cavities

It was mentioned above that bacteria contribute to acid conditions in the mouth, but these acid conditions also favour the growth of certain bacteria (eg *Streptococcus mutans*) and these can enter the tooth pulp through a severe carious lesion and cause inflammation and often an abscess cavity at the root. An abscess will eventually break through the bone and soft tissue to discharge pus, and it is the, usually, small pus-drainage holes (fistulae) which indicate the presence of the abscess cavity itself near a tooth root-tip, although sometimes the cavities are very large and occupy the whole socket.

Prevalence of abscess cavities in the Melbourn material is 13/49/26.5 in jaws and 34/1253/2.7 in individual alveoli. Compare 24.7% in jaws at Edix Hill and 0.8% in alveoli at Castledyke. Most instances are few per mouth and small. Exceptions include Sk1184 (SG58) with four small single cavities, Sk1124 (SG85) with one huge cavity above a maxillary molar which extends up into the antrum (the facial sinus) with a surrounding shell of bone, and Sk1312 (SG108) with three large cavities linking the alveoli of left and right maxillary and right mandibular molars.

Damage to enamel can be caused by coarse diets or abrasion by 'third hand' activity or tooth-grinding habits. To some extent secondary (reparative) dentine can protect against this but, if damage occurs too rapidly, the pulp is exposed and infections can enter and progress to abscesses. Modern populations in the developed world have fewer abscesses because of a non-abrasive diet, but severe attrition was a significant causative factor in the past. Attrition at Melbourn appears average for the Anglo-Saxon period, and where teeth are present above abscess cavities, they do not tend to be exceptionally worn.

Ante-mortem loss

Periodontal disease, inflammation in the supporting soft and hard tissues of the jaws, is caused by bacteria. If the tissues recede sufficiently, teeth can become loose and, ultimately, are shed. Abscesses also contribute to inflammation and damage to the supporting bone, as can irregular wear, which changes the stresses on the teeth during chewing, so contributing to loosening and loss.

Prevalences of ante-mortem loss are 23/49/46.9 in jaws and 140/1253/11.2 in alveoli in the Melbourn population. The prevalence at St Peter's Tip is 39.8% in jaws. Brothwell found *c.* 15% in the alveoli of several Anglo-Saxon groups, Edix Hill has 7.1%, Castledyke 7.7%. The ante-mortem loss is, therefore, greater than from these three large cemeteries but within Brothwell's range.

Calculus

Dental plaque often mineralises to calculus (or tartar) which modern experience shows can be resistant to regular tooth-cleaning. Severe calculus is found in Sk1307 (SG75), a woman of over 45 years. It extends well below the cemento-enamel junction and shows the recession of the gum in life. In Sk1312 (SG108), a male of similar age, calculus covers the whole outer face and most of the occlusal surface of a maxillary molar crown, in addition to the abscess cavities mentioned above. Sk1348 (SG59) has slight calculus on the anterior maxillary dentition but a severe deposit covers the occlusal surfaces of the mandibular 5 to 8 (second premolar to last molar) on one side and extends outwards overhanging buccal and lingual surfaces. There is considerable alveolar recession in the same area and one mandibular molar lost, but no other dental disease.

Stress indicators

A small group of changes can demonstrate in the skeleton the effects of environmental stresses such as specific or general dietary deficiency. One of them, *Cribra orbitalia*, is present in most ancient populations but aids comparison between populations by its variable prevalence. The aetiology appears to be iron-deficiency anaemia which causes the haemopoietic (red-blood-cell producing) tissue to over-develop; some is contained in the bone marrow and so the marrow space widens. In the skull vault and upper orbit, the central marrow-containing layer breaks through the dense outer layer of bone and is seen as a sieve-like or spongy appearance within or on top of the bone (called *cribra orbitalia* when in the orbit). This remodels when the deficiency episode is over, leaving just a trace in a worm-like pattern over the affected area. It is seen more often in children, whose iron needs are greater than adults although some researchers believe it can only develop in children because of their distribution of bone marrow.

Contrary to expectations, iron deficiency anaemia is not usually the result of inadequate diet but of two other causes. The protective 'anaemia of infection' in which the body withholds iron from infectious organisms is a valuable part of the body's response to infectious disease. Infection by parasites and the resultant loss of bulk blood and nutrients is the other major cause. Both are exacerbated in crowded conditions, which favour the transmission of microscopic infectious organisms and parasites.

A survey of Anglo-Saxon cemeteries had *cribra* prevalences from 3% at Portway, through 13% at St Peter's Tip, Broadstairs, a site contemporary with Melbourn, to a maximum of 18–20% at Edix Hill and Castledyke (Duhig in prep.; Wells 1985; Wiggins *et al.* 1999). The prevalence in the Melbourn population is 16/46/34.8 (Table 6), nearly double the highest of these figures, exceeding that of Romano-British

Poundbury (28%: Molleson 1993) and falling within the range of American sites where the cause is malabsorption of inaccessible nutrients in maize (31–52%: Lallo *et al.* 1977). For Melbourn, crowded conditions are unlikely, as is a general dietary inadequacy on the American model given the probable similarity of diet between Anglo-Saxon sites, but episodes of severe food shortage are possible.

There is one mild instance (1/53/1.9) of another stress indicator, dental enamel hypoplasia, a disruption in the enamel formation during childhood caused by periods of severe dietary deficiency or feverish illness. This prevalence is extremely low, the lowest Anglo-Saxon sites surveyed having 5% and 5.4% (Spong Hill and St Peter's Tip: Duhig in prep.; Putnam 1984). It does not support the implication of food shortage given above.

Infection/inflammation

The problem of identifying infection in ancient remains has been mentioned above. That being said, low population densities probably prevented the maintenance in the population of many of the major infectious diseases, the main pathogens for our age and period probably being those of diarrhoeal disease and those transmitted by domestic animals: cowpox, anthrax and bovine tuberculosis. In the Melbourn assemblage there are no identifiable cases of specific (named and systemic) infections such as leprosy or tuberculosis and all the six cases listed (Table 7) appear to be non-specific. They can be attributed to the introduction of an infectious organism to the bone or its surrounding membrane, the periosteum, by local trauma, or the proximity of infected soft tissue producing inflammation which has instigated reactive

Table 6. Stress indicators

SG	Sk	Sex/Age	Description
64	205	13	*cribra* stage 4
61	213	M 25–35	*cribra* stage 1+
83	305	M 55–65	*cribra* stage 3 remodelling to 1
101	1017	(M) 15	*cribra* stage 2
86	1121	? 17–25	*cribra* stage 2 remodelling to 1
85	1124	M 45–57	*cribra* stage 1
87	1169	?F 17–25	*cribra* ?stage 3 (erosion obscures)
79	1188	M 60–70	*cribra* stage 1
78	1189	F 33–46	*cribra* stage 2
77	1204	M 18.5–20	*cribra* stage 3
105	1267	(F) 17	*cribra* stage 4
89	1271	F 25–30	*cribra* stage 3
76	1289	2–4	*cribra* stage 5
75	1307	?F 45+	*cribra* stage 4
67	1370	?F 20–25	*cribra* stage 4
106	1384	M 30–44	mand dentition: enamel hypoplasia (diffuse bands visible on 3s)
68	1386	M 35–57	*cribra* stage 2 remodelling to 1

Table 7. Infection/inflammation

SG	Sk	Sex/Age	Description
64	205	13	lumbar arch: R lamina, ECNB and ?erosion
88	312	M 45+	L triquetral medial side: erosion and cavities
74	1012	M 25–46	L humerus dist, immediately prox to capitulum on palmar surface: hole c irregular network of bone 0.9 wide x 0.6 high
101	1017	(M) 15	mandible midline to R 6: alveoli and bone of corpus resorbed to below foramen, fine-grained ECNB on irregular resorption surface, internally ECNB over cortex from midline to below 7 (central area broken) — o/myelitis from ?abscess/periodontal disease
66	1145	M 23–57	R tibia lateral edge from neck to *c.* 16 cm: remodelled ECNB, break in shaft reveals expansion of cortex by ECNB 'shell'; at distal extremity of lesion, lip appears to adjoin vascular channel; no cloacae — ?inflammation from soft tissue trauma
65	1165	F 25–35	L5 sup facets: appear to have been fused to inf facets of L4 (L3–4 missing and breakage obscures); some shapeless masses of ECNB ?represent arches of L3–4

new-bone growth. This is perhaps seen in Sk1145 (SG66).

The last case, Sk1165 (SG65), has affected the arches of at least three contiguous vertebrae. Skeletal tuberculosis cavitates and collapses the vertebral body but has little if any effect on the arch, so this is an improbable diagnosis.

Trauma

Twelve fractures are present in eight skeletons (12/58/20.7), the multiples causing the over-representation of trauma in this assemblage (Table 8). It is probable that the three fractures of Sk305 (SG83) represent two accidents, one to the left leg and the other to the collarbone. The three fractures with resultant osteoarthritis and ankylosis of Sk1187 (SG80) could be the results of one or two accidents; certainly the broken collarbone and crushed humeral head in this specimen are likely to have been produced at the same time, but a severe fall on, or a blow to, the left shoulder might have injured the right forearm at the same time, if this were drawn up for protection. This would make a more realistic estimate of the trauma experience of the community as 10/58/17.2 or 9/58/15.5.

None of these changes can be clearly attributed to inter-personal violence and they can all be interpreted as reasonable examples of accidental fracture due to tripping and twisting the foot (Sk305, 1 and 2 (SG83)), falling on an outstretched hand (clavicle fractures, Sk1305 (SG70)), or the collapse of vertebral bodies in an older woman (Sk1398 (SG107)). The increased length of the affected tibia in Sk312 (SG88) is problematical, for a long bone fracture usually causes loss of length, or maintenance of normal length if well splinted. An osteomyelitic condition with local abscess (Brodie's or 'cold' abscess) can produce increased length in a diseased bone by affecting the growth plate; this could be demonstrated by x-ray but the absence of disorganised bone and/or a cloaca (escape hole for pus) near the fusiform swelling suggests osteomyelitis is unlikely (Ortner & Putschar 1985: 115, Figs. 146–8).

Changes due to habitual activity ('occupational changes')

It is probable that many small changes on bones and some of the major changes of, for example, osteoarthritis and dental disease, have been caused by the habitual activity of their owners. Given the poor correlation between known activities and patterns of skeletal damage, however, discussion of habitual activity or locomotion, so-called 'occupational change', can usually only be speculative (Stirland 1991; Waldron 1994: 98–9).

The over-development of muscle origins or insertions, such as found in Sk1312 (SG108) and Sk1386 (SG68), indicate considerable use of those muscles, but little more can be said (Table 9). The *os acromiale*, a separate bone formed by the non-fusion of the growing end of the acromion process of the scapula,

Table 8. Trauma

SG	Sk	Sex/Age	Description
83	305	M 55–65	1. L tibia dist third shaft: well-remodelled #, little loss of length, lateral shaft has deep indentation c perforation, ?cloaca or original wound 2. L fibula prox third shaft: well-remodelled # 3. L clavicle midshaft: well-remodelled spiral #, little loss of length
88	312	M 45+	L tibia dist third shaft: fusiform swelling medially; 1st groove & lip extending distally from cnemial crest, spiralling to medial side; 2nd groove & lip at post edge of swelling containing 3cm wide patch of raised bone (?ECNB); interosseous line at distal end extended laterally, widening shaft; NB this tib longer than R! — ?# or ??o/myelitis c epiphyseal plate involvement
73	1032	M 35–45	R ribs ?6, ?7, 12: irregularities — ?#s
98	1034	?M 35–39	L rib (6–10) prox third shaft: thickened c spur pointing medially on sup edge — ?well-remodelled #
80	1187	M 60+	1. L clavicle midshaft: angulation of distal half and loss of length (13.5cm cf. 15.1cm for R clavicle) — remodelled # 2. L humerus head: flattened (also arthritic changes on head and L scapular glenoid fossa) — remodelled # with resultant osteo-arthritis 3. R ulna distal shaft: thickened and misshapen c distal articulation angulated anteriorly and styloid process missing (also arthritic changes at distal radio-ulnar joint, fusion of ulna and ?lunate, fusion of carpal to mc3 or 4 and mc shafts x 3 misshapen c midshaft spurs) — remodelled #
70	1305	F 60–87	R ulna distal: small shapeless lump replaces articulation — trauma
68	1386	M 35–57	L clavicle distal shaft: loss of contour and cloacae — remodelled #
107	1398	F 45–87	T7, T10 bodies: wedged — compression #s

Table 9. 'occupational changes'

SG	Sk	Sex/Age	Description
73	1032	M 35–45	scapulae: ossa acromiale
66	1145	M 23–57	tibiae: lateral squatting facets
58	1184	M 45–57	tibiae: platycnemic (femora not measurable but appear platymeric)
77	1204	M 18.5–20	tibiae: lateral squatting facets
108	1312	M 35–57	humeri deltoid insertions: rugged; pps palmar aspects of shafts: lipped, habitual arm/hand activity
68	1386	M 35–57	mc1s palmar aspects of shafts: lipped, habitual hand activity
59	1348	M 23–57	tibiae: platycnemic

develops when there is severe stress on the shoulder joint before adulthood, and it is found in higher-than-normal percentages in archers (Stirland 1991). Sk1032 (SG73), therefore, might have been using the shoulder muscles to a great extent, although a wide range of shoulder movements involve the acromion process and archery is only one of them. Prevalence here is 1/45/2.1

Squatting facets are small flattened areas on the distal articulation of the tibia and the corresponding area of the talus, thought to be produced by extreme dorsiflexion of the foot in habitual squatting. Platycnemia is side-to-side flattening of the tibia, believed by some to be similarly caused. The aetiologies are still poorly understood, however, and the conditions can not yet be shown to present any significant cultural or sexual distinctions (Kennedy 1994). Prevalence of both conditions is 2/48/4.2.

In our society, caries, severe dental calculus and alveolar recession indicate poor dental hygiene and thus tell us about individual behaviour. In ancient populations, however, we do not know how far deliberate tooth cleaning was practised and we are obliged to attribute these conditions to individual physiological variations. Therefore, calculus and caries are dealt with above. Possible parafunctional wear in two dentitions is covered in 'Other conditions' below, because of its problematical diagnosis.

Epigenetic traits and congenital and developmental disorders

Epigenetic traits are minor skeletal variants of little or no clinical significance, which result from an interaction of genetic predisposition and the environment before and after birth. Their presence can assist determination of relatedness in a cemetery but interpretation must also include the effects of common environment, diet and life experiences in a community. Congenital and developmental disorders often have a simpler inheritance pattern but often only the degree of clinical severity distinguishes them from epigenetic traits, so they are grouped with them here.

Good preservation in the Melbourn cemetery has facilitated the recording of the non-dental traits, which can often be lost to erosion and damage to the fragile areas of the axial skeleton.

Dental Epigenetic traits

Dental epigenetic traits are more reliable as familial markers than skeletal traits, because tooth development is not particularly susceptible to environmental influences.

Several specimens have missing third molars (wisdom teeth) in at least one quadrant (Table 10). Up to 37% absence has been recorded for this tooth in modern populations, and 49% in ancient, and although inter-observer variation is likely in earlier studies, the percentage absence is still considerably greater than for the next teeth which tend to be congenitally absent: lateral incisors and lateral premolars at a maximum of 2% (Hillson 1990: 269). If there is no space for the alveolus, absence is likely to be congenital, but without x-ray this cannot be confirmed. Therefore, only one case has been listed here (Sk1263 SG103), where the breakage of the mandible demonstrates the absence of an alveolus for one of the third molars.

The commonest dental epigenetic trait in this assemblage is incisor shovelling, which is related to the presence of lingual tubercles and is combined with this trait in all three cases. When plotted on to the site plan, the three affected individuals are not buried close together. Similarly, there is no clustering of either the two skeletons with peg-shaped molars or the two with parallelogram-shaped molars, a condition which clusters at one contemporary cemetery (St Peter's Tip: Duhig in prep.). This does not mean, however, that the individuals are unrelated, for location in the cemetery might be organised by a system other than kinship groups, and exogamy would constantly separate related persons.

Non-dental Epigenetic traits

Numerical errors of segmentation (NES) and craniocaudal border shifting (CCBS) are grouped together because they are paraxial mesoderm field defects, that is, they are caused by errors in the formation of the elements which make up the vertebral column at an early stage of foetal development (Barnes 1994: 58–9, 78–116). The first indicates additional or missing vertebrae, most commonly an additional lumbar. The second indicates vertebrae which have taken up the form of the vertebral type immediately above or below, such as the last thoracic vertebra being of lumbar form (ie without ribs and with curved facet joints).

Table 10. Dental epigenetic traits

SG	Sk	Sex/Age	Description
64	205	13	R max 8: peg-shaped
61	213	M 25–35	R max 8: parallelogram-shaped molar
84	316	14–15	L max 2: shovelled c lingual tubercle
98	1034	?M 35–39	L max 3: malformed (thick) root; root apex just lateral to nasal aperture, tooth lies at 45° with crown at midline behind alveolus of 1; no alveolus for 2
65	1165	F 25–35	L max 3 and R 8: rotated
87	1169	?F 17–25	1. L max 2 shovelled (folded): L max 3: lingual tubercle
			2. R max 8: wrinkled enamel
			3. L mand 8: deformed (triangular), wrinkled enamel, 8 'cusps'
79	1188	M 60–70	maxilla on palate at and adjacent to alveolus of 7: cyst-like hole (resembling tooth roots) beneath partly-closed alveolus; on palate small nodule resembling tooth enamel and another cyst-like hole extending to it from floor of nasal cavity
77	1204	M 18.5–20	L max 8: parallelogram-shaped molar
103	1263	?F 17–25	1. R max c: retained as worn stub, displacing 3
			2. R max 8: peg-shaped
			3. R mand 8: absent, no crypt — congenital absence
105	1267	(F) 17	max incisors: shovelling, lingual tubercles and folding

Table 11. Non-dental epigenetic traits: numerical errors of segmentation (NES)

SG	Sk	Sex/Age	Description
83	305	M 55–65	S1–5 and Co1: fused or S1–6 — ?NES
90	1008	M 23–30	T13 or L6: present — NES
87	1169	?F 17–25	L5 and five L arches present, plus one half arch w fits above L5 or one above; T1–12 and L1–6 or T1–11 and L1–7! — NES
80	1187	M 60+	L6: present — NES

Both types of condition are often found together and there is some familial tendency to have one or both of the changes, without specificity as to location or type of defect. A Native American site with 27% CCBS is considered to be indicative of inbreeding (Bennett 1972). In the Melbourn assemblage, Sk1008 (SG90) and Sk1169 (SG87) have both NES and CCBS (Tables 11 and 12). Grouping the conditions together, we have a prevalence of 7/47/14.9, the denominator in this case being the number of spines having sufficient preservation of the lower thoracic and lumbar vertebrae (because these conditions predilect the lower spine). Reporting of prevalences from other sites is uncommon but Edix Hill has 9.2% and St Peter's Tip, contemporary with Melbourn, 8.5%, so the Melbourn findings are rather high.

Spondylolysis (Table 13) demonstrates the relationship between genetic factors and trauma: A congenital weakness of the attachment of the vertebral arch to the body can be turned to fracture by severe stress on the spine (eg Merbs 1983; Merbs 1994; Waldron 1991). The six cases noted here (6/47/12.8) give a similar prevalence to Castledyke (10.1%) but a markedly higher prevalence than modern populations (approximately 3–7%) and that found at other well-preserved sites such as Waldron's Anglo-Saxon, Roman and 18th-century cemeteries (3.74%, 4.55% and 1.42% respectively: Waldron, 1991, 501], Edix Hill, 4.1%, and St Peter's Tip, 3.2–5.3% (Duhig 1998; in prep.).

The affected arch is normally held in place by fibrous tissue, but if the arch slips, spondylolysthesis follows: false-joint formation with its own or adjacent vertebrae, deterioration of the intervertebral disc and contiguous surfaces of the vertebral bodies, sometimes narrowing of the spinal-cord space and consequent neurological damage. In the one case, there appears to be only slight slippage with the development of new articulating facets, but damage prevents assessment of the degree of damage to the body surfaces.

There is only one case of cleft neural arch, which is a relatively common trait with a familial tendency (found in up to 25% of spines and particularly predilecting the lower lumbar area: Barnes 1994, 117–22, Figs. 3.440c, 3.42). It should not be confused with *spina bifida*, which in its more severe form is clinically significant. It results from a delay in fusion of the two sides of the vertebral arch at a relatively late stage of development and is often found with spondylolysis (Fredrickson *et al* 1984). There is also an

Table 12. Non-dental epigenetic traits: cranio-caudal border shifting (CCBS)

SG	Sk	Sex/Age	Description
90	1008	M 23–30	T13 or L1: transitional c facets like lumbars, tiny nodules like rib facets; partial CCBS
74	1012	M 25–46	T12 sup facets: transitional c facets like lumbars; partial CCBS
87	1169	?F 17–25	T & L arches (most bodies absent): only 11 Ts present, one c L-type facets; CCBS
108	1312	M 35–57	T12 facets: transitional c facets like lumbars, rib facets present; partial CCBS
59	1348	M 23–57	T12 facets: transitional c facets like lumbars, T11 has curved inf facets only; CCBS

Table 13. Non-dental epigenetic traits: spondylolysis and neural arch deficit

SG	Sk	Sex/Age	Description
83	305	M 55–65	L5: spondylolysis (arch missing)
88	312	M 45+	L5: fissure between upper and lower facets, partial spondylolysis
73	1032	M 35–45	L5: spondylolysis
95	1038	F 45+	Ts x 2 arches: lower arch appears separate from body and has facets for articulation with body (damage obscures); spines and R side of arches articulate together at horizontal facet — spondylolysis and ?spondylolysthesis
80	1187	M 60+	L6 R arch: separated — spondylolysis
69	1293	? 25–35	L5: spondylolysis
80	1187	M 60+	L6 arch midline: spine is long, thin spur, open but not gaping — cleft neural arch

Table 14. Non-dental epigenetic traits: Wormian bones

SG	Sk	Sex/Age	Description
74	1012	M 25–46	sagittal suture: Wormians x 2
77	1204	M 18.5–20	sagittal suture: Wormians x 3
106	1384	M 30–44	vault at L asterion: Wormians x 2

Table 15. Non-dental epigenetic traits: Wormian bones

SG	Sk	Sex/Age	Description
86	1121	? 17–25	frontal: metopic suture
67	1370	?F 20–25	frontal: metopic suture
68	1386	M 35–57	frontal: metopic suture

Table 16. Non-dental epigenetic traits: sternal aperture

SG	Sk	Sex/Age	Description
58	1184	M 45–57	sternum body/xiphoid junction: sternal aperture; prob cleft/notch of last segment
77	1204	M 18.5–20	sternum body: sternal aperture

occasional coincidence of these two conditions and NES/CCBS, as in Sk305 (SG83) (spondylolysis with NES) and Sk1187 (SG80) (both spondylolysis and cleft neural arch with NES).

All the above spinal conditions appear to cluster in a north-central band in the cemetery, but this might be no more than the effect of a relatively high prevalence of these conditions and the concentration of graves in this area in a rather small cemetery.

Small additional bones within the sutures of the skull are known as Wormian bones (Table 14). They are blastemal desmocranium field defects of the type 'failure to coalesce'; in the foetus or infant, the delay in the growth of one skull bone towards another will trigger the development of a new growth centre to fill the gap, so producing a separate bone. They are present in variable percentages in all populations, and although there is a heritable tendency towards certain types of Wormian formation in some groups, their development is also triggered by individual metabolic disturbances, or by trauma (eg cultural deformation of the skull). (Barnes 1994, 138–42; Hauser & Stefano 1989, 84–94). Prevalences of sagittal ossicle, as two of the cases are, tends to be in the single figures, and ossicle at asterion is not quantified.

Another 'failure to coalesce' trait is the retention of the metopic suture which divides the frontal bone and which usually fuses and disappears by the age of two years (Table 15). Again, there are both heritable and random elements in its development and it is found worldwide although at very different percentages, 8–10% being an approximate average for Europeans.

The prevalences are 3/53/5.7 for both conditions and figures from other ancient cemeteries are surveyed elsewhere (Duhig 1998, 189–90). It is clear that both are found at Melbourn at an expected level, although Wormian bones are likely to be somewhat under-represented due to the shattered nature of the skulls, from which the small Wormian bones would have fallen.

Incomplete fusion of sternal segments leaves an aperture in the adult sternum (Table 16). The trait appears to have markedly different frequencies in Caucasoid and Negroid populations (Barnes 1994) but a familial element has not been recognised.

It is unclear whether palatine tori, mounds of bone along the midline of the palate, have a significant heritable element (Hauser & Stefano 1989, 176–9), but in this cemetery there is only one example (Table 17). Septal apertures in the distal humeri are recorded as epigenetic traits but tend to be found in lightly-built individuals or populations where the bone, naturally thin at this point, becomes so thin as to be perforated.

Neoplasia

The case of Sk1041 (SG94) is a common non-malignant bone overgrowth, usually of the skull vault, referred to as an 'ivory' or 'button' osteoma because of its usual form and composition (Table 18). They develop in life and are present in at least 1% of all autopsy material.

Sk1124 (SG85), on the other hand, shows a destructive condition of the arch of one neck vertebra, in which destruction of bone on the inner face of the arch was combined with repair on the outer face. It is restricted to this vertebra only and there is no other malignant change in the skeleton, so it has been suggested, with reason, that it has formed through contact with an expanding malignant condition of the spinal cord or one of its associated tissues (D Brothwell, pers comm).

Other conditions

The massive vesical calculus (bladder stone) which was found in the pelvis of Sk217 (SG110) is the subject of current research (Table 19). This excruciatingly painful and debilitating condition has exercised medical and surgical skill throughout history and was the subject of several superb medieval Arab surgical treatises (surveyed in eg Bitschai & Brodny 1956). The stone occasionally became so large that death could ensue from retention of urine, as is possible in this case. Calcification of soft tissue appears to be the explanation of the small tubular structures found with Sk1188 (SG79). They do not resemble ossified cartilage as sometimes found in the chest plate (these are the cartilages making a flexible joint between ribs and sternum), and perhaps they are calcified blood vessels, unsurprising in a man of the age of Sk1188.

The deviated nasal septum, apparently developmental in the absence of evidence of fracture, of Sk1312 (SG108) is not uncommon in ancient or modern populations, and correction of the deviation to enable breathing through the affected nostril is a frequent surgical procedure.

Sk1021 (SG56) and Sk1229 (SG82) have grooved enamel, and, in the first case, also dentine, in the front teeth. The grooves resemble those produced by the use of the teeth as a 'third hand' for holding objects or passing thread through (pipe wear is common, as is the holding of pins by dressmakers). They are thus listed as parafunctional wear, that is, wear produced otherwise than by biting or chewing. Skeletons 1187 (SG80), 1271 (SG89) and 1398 (SG107) have the condition this author describes as 'paint blobs': ovoid or streaked nodules of dense cortical bone clustering near the midline on the inner surface of the frontal bone. They resemble the earlier stages of the disorder called *hyperostosis frontalis interna*, but as this is a condition predilecting post-menopausal women, finding the condition in one male out of three affected individuals suggests that these cannot be HFI ('paint blobs' are also found in one male out of four individuals at Edix Hill: Duhig 1998).

Schmorl's nodes have been mentioned above. Sk1017 (SG101) and Sk1041 (SG94) might be such nodes, but their form, with somewhat sclerotic edges, is atypical. The remainder of these conditions (see Table 19) are inexplicable.

Table 17. Non-dental epigenetic traits: other traits

SG	Sk	Sex/Age	Description
61	213	M 25–35	maxilla: palatine torus
90	1008	M 23–30	T12 up L facet: double facet
55	1015	3.7–6.3	C3 central body on midline: perforation
56	1021	F 21–30	maxilla R palate post to alveolus of 8: bone nodule
66	1145	M 23–57	C1 R sup facet: bipartite facet
82	1229	F 19–25	humeri: septal apertures
75	1307	?F 45+	L humerus: septal aperture
106	1384	M 30–44	occipital: bunning
68	1386	M 35–57	L humerus: septal aperture

Table 18. Neoplasia

SG	Sk	Sex/Age	Description
94	1041	? 60+	occipital immediately below and to L of nuchal line: large pedunculate osteoma 1.9cm wide x 2.4cm long x 1.24cm high
85	1124	M 45–57	C5 arch on R, centre (incl spine) and half of L: rarefied and 'lacy' c mixed resorption and repair, more rapid destruction internally (sharp edges on some holes, external aspect all rounded edges) — contact effect from ca. spinal cord or associated tissues

Table 19. Other conditions

SG	Sk	Sex/Age	Description
110	217	M 34–86	large ovoid calcareous object found within pelvis — bladder stone
104	1002	M 45–66	T5–9 ant bodies: extended anteriorly to form ovoid bodies — ??
101	1017	(M) 15	L5 inf body: central: large defect — ?Sch node or ??
56	1021	F 21–30	max 1s central occlusal surfaces: narrow grooves extending a–p over enamel and exposed dentine (enamel chipped) — pf wear
94	1041	? 60+	T10 inf body central: narrow crack — ?Sch node or ??
80	1187	M 60+	frontal concentrated at midline: 'paint blobs' — ?HFI
79	1188	M 60–70	four lumps of ossified material, sub-tubular — ??calcified vessels
78	1189	F 33–46	L sca. lun, tri, cap, mc1, R sca, lun, tri, cap, ham: enlarged or new foramina — ??
82	1229	F 19–25	L max 1 central occlusal edge: crack in enamel, groove passing lingually — pf wear
89	1271	F 25–30	frontal concentrated at midline: 'paint blobs' — ?HFI
108	1312	M 35–57	ethmoid/vomer: deviated nasal septum
107	1398	F 45–87	frontal concentrated at midline: 'paint blobs' — ?HFI

Artefacts

Holly Duncan, with contributions by John Hines

Introduction

The following survey of the grave goods focuses on identification and classification of the finds. The grave catalogue (section 6) lists the artefact types in each grave. The grave goods and gender groups are discussed in Chapter IV.

No 'offerings' of complete animals or joints of meat were found in the graves. The animal bone recovered from grave fills was generally in a fragmentary condition. The single exception, a partial lamb skeleton in the fill of SG65, was not articulated and did not display any butchery marks. It seems probable that this, like the other faunal material, was residual and incorporated into grave fills by chance. The complete faunal report, undertaken by M Holmes, forms part of the site archive.

The artefacts are grouped into four main categories: personal adornment and costume, tools and personal equipment, vessels, and weaponry. Each of these categories is internally subdivided. Where objects from specific graves are referred to the sub-group (SG) number is given. The methodologies used in the study of the finds are presented in Appendix 1. Fabric

descriptions of the ceramic vessels are given in Appendix 2.

Personal adornment and costume

Necklaces and festoons

A total of 144 beads of five different materials were recovered from ten individual burials. The numbers of beads per person differed, as well as the material range within each individual assemblage (Table 20).

Glass beads

The glass beads were catalogued following Guido's corpus (1999). This delayed and posthumous publication is soon to be superseded by a newly completed study by Birte Brugmann, the results of which were kindly made available for comparison (Brugmann forthcoming). For the limited range of beads represented here, there is no serious discrepancy between either classification. A short summary of the additional insights provided by Brugmann's work is given by John Hines in the concluding part of this sub-section 'Necklace Composition'.

Bead shape was also recorded but as Evison (1987, 61) states the level of precision in the manufacture of glass beads is not always high and, therefore, it is not useful to apply a rigid method of classification to such material. The distinction between many of the shape categories can become blurred at the extremes of each class. Descriptions of the bead shape classifications used form part of the site archive.

Monochrome Glass Beads

Monochrome beads represented about a third of the glass bead assemblage. Colours and quantities by grave are presented in Table 20.

The pale, translucent and colourless beads were represented by two forms. A single annular bead of pale blue/green glass (Fig. 16, SG81.1) may have been fashioned from recycled Roman bottle glass. The remaining three beads of this category, all from SG89, were of tiny globular form and may have originally formed part of small segmented or cylinder beads. Their small size, diameters of 5mm or less, distinguish them from the remainder of the glass beads and are more reminiscent of small segmented beads of the Roman period (Guido 1978, 91–3). Two were of a smoky yellow colour, while the third although heavily decayed, may have been colourless.

Of the black beads only the opaque melon or submelon example within SG75 is paralleled in Guido's corpus (Type 2 iii). This form of bead, with a distribution limited to southern England and the south Midlands, is unlikely to pre-date the 5th century and is on the whole found in later deposits, including 7th century graves (Guido 1999, 21). The four other black beads are all barrel shaped, lengths and diameters ranging between 9mm and 11mm. These beads have a matt, porous appearance resembling pottery. In three instances the outer black surface of the bead is damaged revealing an underlying creamy white, or in one case light coppery green, under-surface. The matt-like surface bears similarities to the opaque orange beads (Guido's type 9) and similarities also exist in the shapes of these types (mainly globular, barrel or biconical). Type 9 beads are almost exclusively 7th century (Guido 1999, 68). It is possible the opaque black barrel beads had a black coating applied over an opaque white ground intended to imitate jet beads. Associated grave goods from the two graves producing these beads (SG69 and SG89) suggest a late 6th or 7th century date.

Monochrome opaque white beads (Guido type 3) are represented by three beads. A disc and double disc/cylinder bead occurred in SG75; the bead accompanying SG89 survived in a fragmented state. Type 3 beads are dated to between the 5th and 7th centuries. At Dover they were found within graves dated to between AD575–725 (Guido 1999, 32). Associated grave goods within Melbourn grave assemblages suggest a date range of the second half of the 6th century into the first half of the 7th century.

Opaque yellow beads are slightly better represented at Melbourn than their white counterparts. Of the five examples, four were short cylinders and the fifth more disc-like in shape. Guido suggests that these beads may have originated from Frankish sources, coming into England in the 6th century (Guido 1999, 39).

The most numerically popular monochrome bead at Melbourn is of green and turquoise glass; ten examples found in SG65 and one in SG89. The majority of these beads are of a light opaque, coppery green colour; only two examples occurred in translucent turquoise glass. The most common shape is short-cylinder with a wide perforation. Green beads were very common in the Roman period but the majority of the Anglo-Saxon examples occur in deposits dating to the 6th and early 7th centuries (Guido 1999 42–43).

A single translucent blue bead of melon or submelon form was found in SG75. This was a common type in the post-Roman period, occurring in later 5th century through 6th century deposits and possibly continuing beyond the 7th century with a distribution covering most of Anglo-Saxon England (Guido 1999, 53). The example from Melbourn occurs in a grave with items suggestive of a date in the second half of the 6th century.

Opaque terracotta beads do not appear to have a Roman ancestry. They suddenly became popular in the 6th century and continued in use into the 7th century (Guido 1999, 59). The two monochrome examples from Melbourn, a short cylinder and a pentagonal cylinder, were found in SG75.

The final type of monochrome bead is opaque orange in colour and occurs in barrel, biconical, disc and short cylinder forms. This type of bead, nearly always matt in texture, is almost exclusively attributed to the 7th century. The grave goods accompanying the three inhumations (SG69, SG89 and SG95) with these beads appear to conform to the suggested dating. They included slip-knot rings, spangles and a dress pin consistent with a late 6th to 7th century date.

		Sex	F	F	?	M	F?	F	IMM	F	F	F	F	F	F	
		Sub-group no	56	65	69	72	75	78	81	82	89	95	97	105	107	
		Skeleton no	1021	1165	1293	1045	1307	1189	1224	1229	1271	1038	1176	1267	1398	
Beads	**Ground**	**Motif**														**Totals**
Monochrome	Pale translucent								1		3					4
Monochrome	Black				1		1				3					5
Monochrome	Opaque white						2				1					3
Monochrome	Opaque yellow						3		1		1					5
Monochrome	Green/Turquoise			10							1					11
Monochrome	Blue						1									1
Monochrome	Terracotta						2									2
Monochrome	Opaque Orange				1						1	3				5
Polychrome	Black	Swirls			1											1
Polychrome	Black	Crossed waves					3									3
Polychrome	White	Wound lines & single wave									1					1
Polychrome	White	Crossed waves					15				9					24
Polychrome	White	Crossed waves & dots					13				1				1	15
Polychrome	White	Single wave									1					1
Polychrome	White	Single wave & dot					1									1
Polychrome	White	Spots									1					1
Polychrome	Yellow	Crossed waves					1				2					3
Polychrome	Blue	Crossed waves & dots					2									2
Polychrome	Blue	Eyed					1									1
Polychrome	Terracotta	Wound lines/bands					3									3
Polychrome	Terracotta	Wound lines & single wave									1					1
Polychrome	Terracotta	Crossed waves					5				8					13
Polychrome	Terracotta	Crossed waves & dots					4									4
Polychrome	Terracotta	Single wave									2					2
Amber							12			2	6			1		21
Shell					6					1						7
Metal	Silver		1								2					3
Metal	Copper alloy										1					1
TOTAL beads			1	10	9		69		2	3	45	3		1	1	144
Wire rings	Copper alloy				1	1										2
Wire rings	Silver		1		2						4	1	1			9
Wire rings	Iron										1					1
Spangles											2					2
Pendant	Scutiform							1			1					2
Pendant	Jewelled									1						1

Table 20. *Composition of necklaces*

Polychrome Glass Beads

Of the 76 polychrome glass beads (see Table 20), the most popular motifs were that of crossed waves (43 examples) and its related motif, crossed trails or waves with dots (20 examples). These motifs occurred on a variety of grounds and colour combinations. Guido comments that although the crossed wave motif in many colours and forms lasted at least from the 5th century into the Viking period, the majority of those on a 'black' ground can be assigned to the 6th century, with a few continuing to be buried in the 7th century (Guido 1999, 26). Only one grave SG75 had beads of 'black' ground and crossed opaque white waves; associated grave goods indicate a date in the latter half of the 6th century.

A white ground with blue waves was the most common combination, a form particularly favoured in the Rhineland, the Netherlands and northern France. In England they are concentrated in the southern counties, the Midlands, and East Anglia (Guido 1999, 32). Blue waves were also favoured on yellow grounds. Opaque white waves occurred on blue and terracotta grounds. Terracotta grounds also had opaque yellow waves, but these were less popular than the white.

Four beads (two from SG75 and two from SG89) of opaque white ground had either green or terracotta waves, with or without dots. Guido has suggested, due to the greater concentration in East Anglia, that these beads are local variants made in Norfolk and Suffolk (Guido 1999, 330). A single bead (SG75) possessed the same colour combination of red and green but differed in having only a single wave. Again this may have been of East Anglian manufacture. Seven beads with white ground and crossed wave and dot motif (all from SG75) retain only their red dots, the glass forming the waves having eroded out. These, therefore, could have had either green or blue waves.

There were only three examples of beads with single waves, occurring on opaque white and terracotta grounds. The opaque white bead possessed a blue wave, a type thought to be contemporaneous with white beads with crossed waves. Equally scarce in number are terracotta beads with a single white wave. Guido noted few beads of this type in her corpus, the most closely dated example from a grave of AD575–625 at Dover (1999, 64). A similar date is suggested for the Melbourn examples from the associated finds of slip-knot rings, spangle and scutiform pendants (SG89).

Spotted beads, such as the single opaque white with terracotta spots found in SG89, are relatively rare. The most closely dated examples come from Puddlehill and Chamberlain's Barn (Beds.) with suggested dates of early 7th century (Guido 1999, 34).

A single example of a bead of opaque white ground with opaque terracotta wound lines overlying a translucent blue wave was noted from SG89. This bead is closest to Guido's type 1vii, which normally have a light-coloured translucent ground. There is, however, a single atypical example of opaque ground from Lyminge in southeast Kent (Guido 1999, 16). On the continent this bead type occurs in 5th century graves (Guido 1999, 16). The Melbourn example, however, is associated with finds of late 6th–7th century date. The same grave yielded a related type, having a terracotta ground with opaque white bands and translucent (blue?) wave.

Three beads, all from SG75, possess a terracotta ground with white or yellow wound bands or lines. These beads are common in northern Europe in the 6th–7th centuries and have a southerly distribution in England, with only two others noted in East Anglia (Mucking, Essex and Mitchell's Hill, Suffolk) (Guido 1999, 62 and 300).

The final two polychrome beads are both single examples of types. The annular bead with black ground and opaque white and terracotta swirls (SG69) is of Guido's type 11b. They appear to be a long-lived type, beginning in the 5th but lasting into the 7th century, if not beyond (Guido 1999, 75). The Melbourn bead of this form is associated with objects of 7th century date. Although swirl beads may have their roots in the Migration Period tradition, they appear to become more popular in Final Phase assemblages (Geake 1997, 111).

The single bead of eyed form is of dark opaque blue, the eyes formed by three white opaque spots with an annular red ring overlying each (SG75). Guido notes that there are few continental analogies but suggests a 6th to 7th century date for their manufacture (1999, 54). Two were found within Phase 1 graves at Edix Hill (Barrington A), Cambs. (Malim and Hines 1998, fig. 3.32, Grave 5 no. 67; fig. 3.37, Grave 14 no. 15). At Melbourn associated finds suggest a date within the second half of the 6th century.

Non-glass beads

Amber

Amongst the 21 amber beads, seven shapes were identified. Although many amber bead collections consist of irregular shapes, thirteen of the beads from Melbourn do exhibit shaping including possible lathe-turning on the largest, bun-shaped bead (Fig. 19 SG89.1). Where beads occur in shape pairs within a necklace they are of similar weight.

At Dover amber beads were found in phases 1–4 (AD475–650), with few in the earliest phase and the majority falling within the 6th century phases. Amber beads do not survive beyond phase 4 (AD625–650) at Dover. Although not exclusively 6th century, this is no doubt their period of greatest popularity (Evison 1987, 57–60 and text fig. 11). After the first few years of the 7th century amber beads generally are only found in ones and twos (Geake 1997, 47). On this basis it can be suggested that SG75 and SG89 belong to the 6th and very early 7th centuries. SG82, with its two beads and shell pendant may be of earlier 7th century date. Occurrences of single amber beads, with no accompanying necklace ornaments (eg SG105), may have had an amuletic, as opposed to decorative, function (Geake 1997, 112; Meaney 1981, 10 and 14).

Shell

Seven cowrie shell beads were identified in SG69 and SG82. Six (all in SG69) were of sub-rectangular shape, retaining a corrugated edge on one side. This form of bead can be paralleled by finds from Shudy Camps, Cambs. (Lethbridge 1936, fig. 4 and 9.6). SG82, however, had a shell pendant with straight sawn edges, tapering in thickness towards one end, which is perforated. This form can be closely paralleled at Dover where they were found in graves dating between AD650–700 (Evison 1987, 60 and text fig. 11/A12 and A16). Meaney has drawn attention to the possible link between cowrie shells and female fertility and noted that most graves containing cowrie shells and cowrie shell beads have been placed in the 7th century (1981, 123 and 128).

Metal Beads

Capsule or biconical metal beads, two silver and one copper alloy, were found in SG89. These can be closely paralleled by examples from Dover, all from Phase 5 (AD650–675) graves (Evison 1987, 61 and text fig. 11 A19 and A20). Only one half of the copper alloy bead (Fig. 19 SG89.13) survives but unlike the Dover examples this bead lacks a central hole. It has two small circular perforations near one edge through which a small silver slip-knot ring is threaded. It is possible that this bead was constructed in a different manner to that proposed at Dover. Geake's survey indicates that double-bell beads start at the very end of the 6th century and continue into the 7th (1997, 43).

A fourth possible capsule bead was identified in SG56. Although fragmentary, this bead (Fig. 4 SG56.3) is of a long conical form, only half surviving. A similar item from Marina Drive, Dunstable is described as a silver clasp in the shape of two cones and was accompanied by a group of amber, amethyst and glass beads (Matthews 1962, fig. 3 no. 7). SG56, however, only had a single silver slip-knot ring accompanying this possible bead.

Slip-knot and wire rings

Eight detached wire slip-knot rings were found. Slip-knot rings were also present on two spangles and threaded through a bead (Fig. 19.20) in SG89. A second bead also from SG89 (Fig. 19.15) had been threaded on to an iron wire ring. All the non-ferrous rings had diameters of 25.2mm or less. Geake (1997, 48–50) has argued persuasively for these rings serving as ends or components of necklaces, and the positioning of the examples discussed here would support this view. Six detached rings were found at the neck or upper chest of a skeleton and two from the back of the skull. However, three further slip-knot rings, all of copper alloy and of similar size to those worn on the necklaces, were found at waist or femur level and served to suspend items from a belt (SG82 and SG64). These and larger copper alloy wire rings are discussed under toiletry items and 'girdle groups'.

Three methods of closure were noted on the non-ferrous rings: ends wrapped into a single knot; ends crossed over and terminals wrapped round the loop forming two knots; and ends formed into a flat spiral with the terminals wrapped round the body of the loop. The latter form can be paralleled at Burwell, Cambs. (Lethbridge 1931, Grave 121), Edix Hill (Barrington A) (Malim and Hines 1998, Grave 60) and Chamberlain's Barn, Beds. (Hyslop 1963, Grave 39). The single iron ring was of small size and was linked, in the manner of a chain, through a slightly larger iron wire ring.

Knotted silver slip-knot rings became popular in the 7th century and continued in use possibly into the early 8th (Geake 1997, 49). There are, however, earlier occurrences of this form of ring. At Edix Hill (Barrington A), Cambs. a number of copper alloy slip-knot rings, used in the same manner as their silver counterparts, occurred at an earlier date (Malim and Hines 1998, 212).

There were two instances of single slip-knot rings unaccompanied by beads or pendants. The copper alloy slip-knot ring accompanying male burial SG72 lay under the chin, whilst the silver slip-knot ring with female burial SG97 was positioned at the back of the skull. It is possible that these rings were used in a slightly different manner, perhaps as clothes fastenings. SG72 appears to be one of the few male burials with a slip-knot ring positioned at the neck (Geake 1997, 50).

Spangles and pendants

The two silver spangles, both found at the neck of Sk1271 (SG89), consist of lozenge-shaped sheets with a central repoussé boss and four lines of dots radiating from the boss to the corners of the spangle. The edge of the spangle is decorated with a single line of dots. One corner of the spangle is perforated and retains a silver slip-knot ring *in situ*. Although spangles were applied to a variety of objects (MacGregor and Bolick 1993, 244; Meaney 1981, 189–90), both these examples appear to have formed part of the necklace in SG89. Parallels for the inclusion of spangles within festoons include examples from Holywell Row and Edix Hill. At the former site two spangles were found on a necklace with beads and copper alloy slip-knot rings from Grave 1 (Lethbridge 1931, 2). At Edix Hill necklaces from Graves 95 and 13 contained two and three spangles respectively, suspended from slip-knot rings (Malim and Hines 1998, 212). The decoration on the Melbourn spangles, in particular the repoussé boss, echoes that found on the two scutiform pendants discussed below and suggests a similar date range.

Both of the scutiform pendants (SG89 and SG78) are of simple form with domed repoussé bosses and, like the spangles, are of base silver with a high copper content. The example in SG89 has a concentric decorative scheme, whilst that in SG78 has a combination of concentric and radiate. Although found in Kent and East Anglia, the latter area has the greater concentration. As a type they are in the main of 6th century date, but at least eight examples from the East Anglia area are known from 'late cemeteries' (Hines 1984, 228). Previously these late examples have been dated

to the mid-7th century but Hines argues for continuity between the Migration Period and Final Phase scutiform pendants and suggests that some at least date to the earlier 7th (1984, 231–33).

A single example of a small cobalt blue glass cabochon or drop pendant, with copper alloy back plate and setting, was found in SG82, accompanied by two amber beads and a shell pendant bead. This form of pendant can be paralleled by versions in gold and silver (MacGregor and Bolick 1993, 160; Evison 1987, 56). An incomplete pendant of light green glass with silver backing was found in Cemetery II at Chamberlain's Barn (Hyslop 1963, 179 and fig. 12, Grave 32 no. c). As a type they appear to have been in use throughout the 7th century (Geake 1997, 40).

Necklace Composition

A major change in dress fashion took place sometime during the late 6th or early 7th century. The practice of wearing paired brooches and long strings of polychrome and amber beads was supplanted by short strings of monochrome glass, metal and shell beads and drop pendants, and the occasional use of single brooches.

As can be seen from Table 20, over 79% of the bead assemblage derived from two graves, SG75 accounting for 47.9% and SG89 for 31.25%. The occurrence of polychrome beads was in the main restricted to these two burials, the only two exceptions being single instances of polychrome beads with SG69 and SG107. The latter skeleton had no other necklace components and in common with single instances of amber beads (eg SG105) may have been worn as an amulet pendant. The quantity of beads accompanying SG75 and SG89 suggests that they formed long strings and, therefore, may pre-date the change in fashion. This would appear to be true for SG75, which was accompanied by three brooches (see below). The composition of the festoon or necklace adorning Sk1271 (SG89), containing slip-knot rings, spangles, a scutiform pendant and metal beads indicates a date in the late 6th to early 7th century. Perhaps given the quantity and mix of beads this burial might be considered transitional between Migration and Final Phase periods.

Although the sample is small, the suggested difference in date between SG75 and SG89 makes a comparison of the polychrome bead assemblages beneficial. This is especially true, as many of these beads appear to have had a lengthy period of use (Welch 1999, 94). In both of these burials a white 'ground' predominated amongst the polychrome beads, the crossed wave motif being favoured. However, the addition of dots to this motif was the preferred choice within the assemblage accompanying SG75, while only one bead in SG89 had both crossed waves and dots. Terracotta grounds with crossed waves also featured strongly in these two festoons but the addition of dots to the motif was absent from the group in SG89. In both cases yellow grounds featured but were not a major component. Dark blue grounds, although not occurring in quantity within the festoon in SG75, were totally absent from that in SG89. The differences noted may be solely due to personal preference and until comparisons of larger assemblages of polychrome bead strings are carried out no conclusions as to chronological significance can be drawn.

The quantity of beads and other necklace components accompanying the remaining burials suggest the presence of short strings. Geake noted that nearly three-quarters of Final Phase graves had three or fewer monochrome beads, the average number across England being five (1997, 45). The greatest number of monochrome beads in this group of shorter necklace strings from Melbourn is ten, but more commonly two or three occur. Amber beads are less frequent and occur in smaller numbers within a string, while cowrie shell beads make their first appearance on these shorter strings.

Birte Brugmann bases her chronological sequence primarily on bead combination groups as opposed to date-ranges for individual bead types. These combination groups have been analysed by means of Correspondence Analysis. She also investigates the alignment of the Anglo-Saxon bead sequence with continental and Scandinavian archaeological evidence, the former of which is particularly strongly underpinned in absolute dating terms by coin finds and some dendrochronological dates.

Brugmann distinguishes three main phases, A, B and C. Phases A and B overlap considerably in the 6th century. The relationship between phases B and C is less clear, and is potentially of immense importance in relation to the transition from the traditionally named Migration Period to the Final Phase of Anglo-Saxon furnished burial. The beads of SG75 belong entirely to Brugmann's Phase B, with a large number of polychrome beads with crossing trails (waves) of types that are frequently associated with the later great square-headed brooches. The bead assemblage in SG89 is similar, although it includes one specimen of the orange, barrel-shaped type that Brugmann identified as bridging the end of Phase B and Phase C: emerging at the earliest in the very late 6th century and continuing in use well into the second half of the 7th century.

The most frequently recurring types otherwise are beads of Brugmann's monochrome wound spiral type, which are a common feature of her Phase C. Brugmann points out that the only reliable absolute dating evidence available for Phase C does not fix any dates for its types earlier than the mid-7th century. The evidence, however, does not cover the transition from Phase B to Phase C in an exhaustive manner in respect of bead types, forms or geographical occurrence. Brugmann's study fully corroborates the relative chronological sequence proposed for this cemetery and the debate over absolute datings will proceed on a far better informed basis with her study available.

Brooches

Of the five brooches recovered, the earliest form, a

small-long trefoil derivative, was found within the backfill of SG56. The very worn and incomplete state of this brooch and its recovery from the grave fill, suggests it was accidentally incorporated. Although this indicates activity in the area during the late 5th/earlier 6th century, it is not in itself evidence for burials of this date.

SG75, in addition to having a festoon of 69 glass and amber beads, had a complement of three brooches. This individual appeared to have been placed in a grave that was too small. As a result the head and right arm lay at a higher level than the rest of the body. Due to this burial position, the three brooches were found almost on top of one another. The great square-headed brooch was uppermost and slightly to the right with its footplate pointing towards the right shoulder. The head of the great square-headed brooch partially overlay the head of the radiate brooch, the footplate of which pointed towards the left shoulder. The saucer brooch was positioned just above the clavicle and beneath the other brooches.

These positionings may suggest that the great square-headed and radiate brooches served as shoulder fastenings on a *'peplos*-type' gown, with the underlying saucer brooch fastening the gown to a sleeved undergarment (Owen-Crocker 1986, 25–64). Alternatively, the great square-headed brooch may have fastened an outer garment with the radiate and saucer brooches serving as the shoulder fastenings. All three brooches retained traces of textile on their fastenings. Although specific fibre species could not be identified (see below), examination indicated that the textile associated with the radiate and saucer brooches was of plain weave. In contrast, the textile associated with the great square-headed brooch was of z-spun 2-2 twill weave, ideal for woollen fabrics due to wool's felting properties. This might suggest that the great square-headed brooch fastened an outer garment such as a cloak.

The great square-headed brooch is of Hines group XVI, sub-group b (1997, 118–33), cast mercury-gilded copper alloy with silver sheet appliqués on the foot plate and side lobes, and raised corner mouldings on the two uppermost corners of the head plate. The central disc has a silver-headed rivet in the raised centre, enclosed by a circle, a band of two-strand interlace, a further circle and a rim. The broad head plate frame is punch decorated (from edge inwards) with ring and dot, 'keyhole' (ring and dot with triangular extension), ring and dot, and 'keyhole' in opposing direction. The remaining compositional elements of this brooch are identical to those found on a brooch from Bury St Edmunds (Hines 1997, pl. 58b). Hines assigns group XVI brooches to Phase 3 of his dating scheme (c. AD530–570) and it is likely that the Melbourn example dates from AD550–570.

The radiate brooch possesses a semi-circular striated head plate, demarcated by a triple linear border, with five knobs. The almost flat bow has a plain centre delineated by a groove either side, and degraded interlace along the length of the bow edges. The slightly expanded square foot is plain. Although the type originates in the Frankish Rhineland, Insular copying is likely and the crudeness of the Melbourn example suggests that this was one such copy. The brooch bears similarities to Kuhn's Type 22 thought to date from about the first quarter of the 6th to perhaps as late as the third quarter of the 6th century (Hines 1997, 236–7).

The final brooch found in SG75 was a cast gilt saucer brooch. John Hines writes 'the decoration consists of a central ringed circle, surrounded by a broad panel of devolved animal ornament in Salin's Style I. The stylised bodies of two animals can be detected here from their still quite clear profile heads, facing in a clockwise direction on either side of the central roundel. The panel of animal ornament is enclosed by ridges and a ring of cable-twist ornament. The closest parallel to this brooch is provided by a pair of severely worn cast saucer brooches found near Ely, Cambs during the Second World War, at a site imaginatively identified as *Cratendune*, the supposed early Anglo-Saxon predecessor of Ely: these two were probably associated in a single grave group with a group XVI great square-headed brooch (Fowler 1948; Hines 1997, 118–33, 325). That brooch is unfortunately highly fragmentary, but it can still be identified as a member of the same subgroup of group XVI as the SG75 brooch and the one from Bury St Edmunds. Further near parallels to the saucer occur in a cast saucer brooch from Woodston, near Peterborough (Peterborough Museum L507) and a flat disc brooch from Market Overton, Rutland (Rutland County Museum OS53). The geographical coherency of this group, and the recurrent association with group XVI great square-headed brooches, strongly suggest that the saucer brooch and the great square-headed brooch of SG75 are broadly contemporary, both datable around the mid 6th century at the earliest.'

As Lucy (2000, 25) notes, from the later 6th century onwards only single brooches tend to be found accompanying burials and these are predominately of circular form. SG82 had a single annular brooch worn at the neck. In common with the majority of annular brooches, this example is cast copper alloy. The plano-convex sectioned ring is continuously ribbed, with a constriction to accommodate the pin (not surviving).

The size of this brooch and the width of the ring indicate that it falls within the narrow-banded group of annulars, which occur predominantly in eastern and northern regions (Cook and Dacre 1985, 77). The inception of annular brooches is thought to date from the last quarter of the 5th century. They are popular well into the 7th century and are one of the few brooch forms to remain in use from the 6th into the 7th century. This is especially true of the smaller examples (Drinkall and Foreman 1998, 263). The amber and shell beads and drop pendant accompanying this burial would also support a date in the earlier 7th century.

Pins

Of the seven pins identified, six were found worn on bodies. The seventh, an incomplete copper alloy pin

(retaining shaft and the start of a flattened head) was recovered from the backfill of SG64 and cannot, with any certainty, be associated with this burial.

SG65 and SG69 produced single examples of pierced disc-headed pins (Ross 1991, 231–6). Both pins possessed collars of incised ring moulding, and had tapering shafts but only the pin from SG69 had incised rings on its lower shaft. Neither pin retained a ring threaded through the hole, and only SG69 had slip-knot rings within the grave goods assemblage. Ross suggests these pins have a late 6th–7th century date range (1991, 234) and a 7th century date accords well with the assemblage of bead strings found with the Melbourn pins.

A single pin with an unpierced disc head accompanied SG93. The gently tapered shaft is long (over 74mm) and lacks ornament. This may be an out-sized example of Ross' Kingston disc-headed type, fitting best within his L.i.a.1 subdivision (1991, 224 and 227). A pin of this type from Little Wilbraham, Cambs is also noted for having a length outside the normal range (89mm). Kingston disc-headed pins are thought to date to the very end of the 6th century or early part of the 7th, continuing into the second to third quarters of the 7th century (Ross 1991, 229). Ross notes that pins with plain tapering shafts are likely to belong to the earlier part of this date range (1991, 229).

The pin in SG82 bears many similarities to Ross' garnet-set disc-headed type, sub-type LXI.i.a (1991, 245–49); possessing a discoid head with glass inset and a slightly swelled shaft decorated with incised grooves at the junction of the head and at the swollen portion of the shaft. The surface of the glass inset is iridescent, but it is clear that the glass is not red in colour. This is perhaps a regional variant, as occurs in some of the polychrome bead colour combinations (see above). This pin was in the same grave good set as a blue glass cabochon or drop pendant. Ross' garnet-set disc-headed pins are dated to the 7th century, and do not appear to be deposited much after the beginning of the third quarter of the 7th century (1991, 245 and 368).

These four copper alloy pins were positioned beneath the chin (SG65 and SG69), at the neck (SG82) and on the right shoulder (SG93) of the bodies. Following Ross' suggestion, pins located under the chin may have fastened a head scarf or head covering, whilst the pin positioned on the shoulder, the largest copper alloy pin recovered, may have been used to close an outer cloak (1991, 402 and 398).

The remaining two pins, one in SG78 and one in SG103, differ from the above examples both in material, bone as opposed to copper alloy, and positioning. They were found, not in the neck or shoulder area, but amongst the left ribs (SG78) and on the right tibia (SG103). Finds of bone pins accompanying skeletons are not common. Grave 94 at Edix Hill (Barrington A) produced one example (Malim and Hines 1998, 206–7), and examples are known from Little Wilbraham (Lethbridge 1931, fig. 38) and Girton College (Malim and Hines 1998, 207). The Edix Hill example, in common with those from Melbourn, was not recovered from the neck/shoulder area but from the rib area of Skeleton 94 (Malim and Hines 1998, figs. 3.61 and 3.82).

The pin accompanying SG78 is closest in form to small disc-headed pins, a group characterised by their short length and flattened heads. MacGregor comments that this form does not appear to have had a Roman ancestry and although having a predominantly Scottish distribution, a few examples are known from farther south (1985, 119–20). It bears similarities to the metal Kingston disc-headed pins and may, therefore, be a 'skeuomorph'. A scutiform pendant was also part of this grave group (SG78), suggesting a date perhaps in the first half of the 7th century.

The bone pin in SG103 survives in a very degraded and incomplete state. The head may originally have been spherical in shape, a type known from the preceding Roman period. The only other grave good associated with SG103 was a ceramic bowl (see below).

Although the number of pins is small, the placement of the metal versus the bone pins would appear to suggest a distinction in usage. The metal pins were used to secure clothing but the function of the bone pins remains unclear.

Belt fittings

Fifteen of the sixteen buckles found were placed at the waist. The buckle in SG67 was the exception, situated at the fingertips of the left hand, in close proximity to a chatelaine. An elegant, relatively small, copper alloy form with an oval loop and rectangular back plate is the commonest type (Table 21). Four were slightly D-shaped, three in iron and the fourth, with its associated shoe-shaped rivet, of copper alloy. All the iron buckles had iron tongues but the non-ferrous buckles could have either iron or copper alloy tongues. Of the ten copper alloy buckles retaining tongues, only three were iron. Three of the copper alloy tongues were decorated with two transverse grooves situated at the base of the loop.

Buckle plates remained *in situ* on 12 frames, all of rectangular shape and folded sheet construction. The number of rivets range from two to five, although three is the commonest number. In most cases they are arranged in a line across the mouth of the plate. All the plates were of the same material as their accompanying buckle. Rivets on the copper alloy plates were also of copper alloy. However, the one surviving iron plate had silver plated, copper alloy rivets. Two of the three copper alloy rivets *in situ* on the buckle plate in SG80, had white metal washers between the rivet head and plate. The high proportion of rectangular plates surviving *in situ* assign the majority of this assemblage to Marzinzik's Type II.24, dated from the late 6th to the early 8th century (forthcoming).

The buckles could accommodate four different widths of strap (see Table 21) ranging from 8mm to 18mm. Ten buckles were associated with males and four with females, all young adult or older. None of the child burials produced buckles. Small buckles are thought to have been used to fasten a knife sheath to a belt (Evison 1987, 90). This appears to be the case

here, 14 skeletons producing buckles and knives in close proximity. Only one burial (SG91) produced a buckle without any other grave goods. As noted above, the buckle in SG67 may have been associated with a girdle group of iron rods, chains, keys and a fire steel.

The cast buckle with constricted bar accompanying SG75 was found with a shoe-shaped rivet and may originally have had a 'shield-on-tongue'. This type of buckle has continental origins. It is not precisely dated but appears somewhat before *c.*AD525, and is particularly associated with the period *c.*AD525 onwards (Hines 1997, 257). In contrast, the small D-shaped and oval buckles with rectangular folded sheet plates appear to be more common in the very late 6th and 7th centuries (Evison 1987, 89, Ager 1989, 221).

Associated with the D-shaped iron buckle from SG104, but worn on the lower back, was a strap ring. This comprised an annular iron ring threaded through two iron U-shaped riveted suspension loops. A third suspension loop, not *in situ*, was associated. The two linked suspension loops are incomplete, but each retains a single copper alloy rivet, while the detached suspension loop has two iron rivets. A spearhead and knife were also found with this burial.

Four types of strap mounts and/or stiffeners were identified. Single examples of a smaller version of the U-shaped riveted suspension loop described above occurred with SG93 and SG65 and as part of a girdle group accompanying SG64. The suspension loop from SG93 retained a small cast copper alloy ring *in situ*. These could have served to suspend items such as knife sheaths from belts or straps. Similar mounts are known from Edix Hill (Malim and Hines 1998, 282 and fig. 3.60), Burwell, Cambs. (Lethbridge 1931, fig. 22), Marina Drive, Beds. (Matthews 1962, fig. 20) and Holywell Row, Suffolk (Lethbridge 1931, fig. 18 A3 and B3), all dating to the 7th century.

A narrow bar-shaped mount decorated with three bands of three transverse lines also accompanied SG93. The bar expands at either end to accommodate a circular perforation. Two copper alloy rivets, one with circular rove and one with clenched tip, remain *in situ* at the ends of the bar. This form of mount is closely paralleled by examples from Burwell (Lethbridge 1931, fig. 22 nos. 3 and 4) and Holywell Row (Lethbridge 1931, 37–9 and fig. 18 no. B4 and 5). The examples from Holywell Row also possess the same combination of rivets, one with a clenched tip and the other with a circular rove.

Also associated with the bar mount was a slotted mount consisting of two triangular sheets with a central, semi-circular perforation, held in place by a copper alloy rivet at each corner (SG93). Parallels for this mount were present at Holywell Row (Lethbridge 1931, fig. 14 no. C2), Burwell (Lethbridge 1931, fig. 30 no. 2) and Dover, where they occurred in graves of Phase 3 (AD575–625) and Phase 6 (AD675–700). Evison suggests that the slot would have held a narrow strap to suspend light objects such as a pouch or knife sheath (1987, 87).

The final form of strap mount, found in SG80, comprised two rectangular copper alloy sheets riveted at each corner. This mount has a combination of copper alloy and iron rivets, suggesting repair. Late 6th and 7th century graves at Dover (graves 56 and 103) had similar mounts or strap stiffeners and Evison draws attention to straps with rectangular, slotted and zoomorphic appliqués from the Trier region dating to the 6th and beginning of the 7th century (1987, 87).

Hooked tags

Two triangular hooked tags were found between the legs of burial SG107. These fastenings have been found in a variety of positions, for example below the head or beside the hip of skeletons, and sometimes occur in multiples, for example the group of five from Shakenoak, Oxon. (Dickinson 1973, 111). These tags were probably sewn on and are likely to have performed a range of functions in fastening clothing, headgear, possibly bags and purses and perhaps shrouds (MacGregor and Bolick 1993, 90). The

Table 21. *Graves containing buckles*

Strap width	SG	Skeleton	Shape and material	Sex
8mm	66	1145	Oval copper alloy	M
8mm	67	1370	Oval copper alloy	?F
12mm	83	305	Oval copper alloy	M
12mm	104	1002	D-shaped iron	M
12mm	85	1124	Oval copper alloy	M
12mm	80	1187	Oval copper alloy	M
12mm	77	1204	Oval copper alloy	M
12mm	82	1229	Oval copper alloy	F
15mm	72	1045	Oval copper alloy	M
15mm	79	1188	Oval copper alloy	M
15mm	91	1301	D-shaped iron	?F
17-18mm	90	1008	Oval iron	M
17-18mm	93	1132	Oval copper alloy	?
17-18mm	75	1307	D-shaped & shoe-shaped rivet copper alloy	?F
17-18mm	68	1386	D-shaped iron	M
N/A	105	1267	?oval iron & looped pin (in pieces)	F

thinness of these examples suggests they could not have withstood much strain.

They appear to be a long-used type, first appearing in 7th century graves and perhaps extending into the 11th century (Dickinson 1973, 116; Hinton (in Biddle) 1990, 549). Parallels include examples from Burwell (Lethbridge 1931, fig. 22 no.1) and Shudy Camps, Cambs. (Lethbridge 1936, fig. 1 no. E2). A 9th century pair from Winchester, found on the knees of a skeleton (Hinton 1990, 548), mirror the positioning of the Melbourn examples. Although Geake noted only eight such tags in her survey of Final Phase grave goods, she suggested that their appearance dates to the second half of the 7th century (1997, 66 and table 6.1).

Textiles

Remains of mineralised textile were recorded on nine objects. A matted and decayed clump of textile was also recovered. Liz Barham (Museum of London Specialist Services) examined the material but due to its extensively mineralised condition, fibre samples could not be taken. Although specific species could not be identified, where vegetable fibre was detected flax (linen) was thought to be the most likely candidate.

The textile remains were recovered from three burials, two female and one male (see Table 22). Tabby (plain) weaves were present in each case. The frequency of tabby (plain) weaves generally increase with 7th century material and are accompanied by a greater use of flax in women's garments (Crowfoot 1998, 239–40). The remains of z-spun 2-2 twill weave in SG75 may suggest the presence of a woollen garment, as this is an ideal weave for woollen fabrics. The positioning of the brooches (see p 113) suggests that this may have been an outer garment, perhaps a cloak. The fibres from the garments worn beneath the possible cloak were both plain weave but with evidence of different spins.

Personal equipment and tools

Combs

Composite antler combs, all of which were heavily abraded and incomplete, accompanied three burials. SG82 and SG65 had double-sided combs with plain, rectangular end plates. The plano-convex connecting plates on the comb in SG82 were unadorned, but those in SG65 had a double linear border along the length of the connecting plate, with a zone of closely spaced cross-hatching at either end. Both combs were held together by iron rivets. Plain double-sided combs with iron rivets were found in three graves at Edix Hill (Malim and Hines 1998, graves 14, 91 and 109A), and one grave at Burwell (Lethbridge 1931, grave 79). Those with decorated connecting plates can be paralleled by examples from Winnall, Hants. (Meaney and Hawkes 1970, fig. 8 and 11).

The single-sided comb in SG64, has a curved 'hog-back' and plano-convex connecting plates. Four iron rivets remain *in situ*, with staining indicating a fifth. A single bone rivet situated near the stained area of the fifth iron rivet suggests this comb had been repaired. The connecting plates bear identical decoration on both sides: four bands of incised 'X' ornament, each 'arm' of the X comprising three incised lines, divided by a border of two to three vertical lines. This motif is bordered by a band of closely spaced cross-hatching at either end of the plate. Parallels for single-sided combs in burials include Polhill, Kent (Philip 1973, fig. 53, no. 487) Burwell (Lethbridge 1931, figs. 25, 34, 36), and Edix Hill, Cambs. (Malim and Hines 1998, 219).

In the Upper Thames valley Dickinson noted that combs were relatively rare in inhumations of the 5th and 6th centuries. Where present, they were generally double-sided. By contrast, in the 7th century combs became slightly more common, with an increase in the incidence of single-sided forms (1976, 216–18). At Edix Hill combs were suggested as being characteristically late and exclusively female (Hines and Malim 1998, 284). Skeletal evidence indicates that SG82 and SG65 contained females with age ranges respectively 19–25 and 25–35. The presence of a pierced disc pin and festoon or necklace of monochrome beads with SG65 and the shell bead, drop pendant and annular brooch accompanying SG82 do suggest a date within the 7th century. Although the age at death of the inhumation within SG64 (13 years) precludes sexing, the presence of the chatelaine chain, fire steel and shears suggests that this individual was also female.

The positioning of the combs within the grave varied. One was placed at waist level in association with a girdle group (SG64). Another was placed on the upper chest, close to a necklace of beads and a pin (SG65). A similar arrangement may have pertained for SG82. The beads and pendant from this burial were

Table 22. *Mineralised textile remains (finds illustration numbers in brackets)*

SG	SK	Sex	Object	Fibre	Description
82	1229	F	Pin disc with glass inset (Fig 16 82.1)	Vegetable	Woven
82	1229	F	Annular brooch (Fig 16 82,7)	Vegetable (?)	Plain weave & s- Z spun
75	1307	F	Buckle & shoe-shaped rivet (Fig 14 75.34)	Vegetable	Wound & s-Z spun
75	1307	F	Saucer brooch (Fig 14 75.32)	?	Plain weave & s-Z spun
75	1307	F	Radiate brooch (Fig 14 75.31)	?	Plain weave & z-S-spun
75	1307	F	Great square-headed (Fig 14 75.30)	Wool?	2-2 twill weave & s-Z spun
75	1307	F	Mineralised textile & brooch pin	?	Plain weave & s-Z spun
75	1307	F	Matted textile	?	Too decayed to identify
104	1002	M	Buckle (Fig 23 104.1)	Wool?	Plain weave & s-Z spun
104	1002	M	Strap junction (Fig 23 104.2)	Wool?	Plain weave & s-Z spun

found overlying the right clavicle/shoulder area, as if when the body was being positioned, the necklace had fallen to the right. The comb was found above the right humerus and may have originally formed part of this group.

Toiletry items

Three toiletry items were identified. In SG82 a copper alloy slip-knot ring was found near the left femur, associated with a girdle group. Threaded on to the ring was a cast circular sectioned copper alloy stem with a flattened perforated terminal. The end of the stem is broken, but the shape and decorative grooves near the perforation are suggestive of an ear pick. A set of toilet implements on a copper alloy slip-knot ring was found in the 19th century at Barrington, while an incomplete example came from the recent excavations at the site (Malim and Hines 1998, fig. 3.36 no. 17). Burwell (Lethbridge 1931, fig. 33 no. 5) and Holywell Row (Lethbridge 1931, fig. 14 no. F2) also produced examples of toiletry items threaded on to slip-knot rings.

Due to disturbance of the grave in antiquity, the original position of the two toiletry items in SG63 is not known. They comprise the bowl and lower stem of an iron spoon, which might well have broken from one of two iron stems on a relatively large (diameter 45mm) copper alloy slip-knot ring. Iron spoons may have had a domestic use, perhaps for mixing or measuring medicines or ointments. The majority of examples have been found in graves of females dating to the second half of the 7th century (Geake 1997, 97–8).

Keys and padlocks

Two burials had three keys, forming parts of two chatelaines. A fourth key may be present in the chatelaine remains in SG64 (see below). By the left femur SG82 had a T-shaped slide key, originally suspended from an iron ring. Amongst the items suspended from a complex chatelaine in SG67 were two slide keys, one T-shaped and the other L-shaped. Both L- and T-shaped slide keys are common in Roman and in 5th–9th century deposits in Britain and northern Europe (Ottaway 1992, 674). Keys occur on at least half of all chatelaine/girdle groups found and Geake comments that this is probably an underestimate due to the effects of corrosion (1997, 57).

Due to disturbance of the grave in antiquity, the original positioning of the barrel or cylindrical padlock in SG62 could not be determined. A small portion of a hooked or bent rod was found near the padlock and may form part of its bolt. Geake recorded only six other graves containing padlocks, while a seventh is noted from Chamberlain's Barn (Hyslop 1963, fig. 17 grave 57). These objects appear to date to the mid- to late 7th century onwards and the few known examples occur predominantly with female burials. This pattern may be the result of more females being buried with small caskets than males (Geake 1997, 83). The skeleton within SG62, although incomplete, has characteristics suggestive of a male. However, SG62 and SG63 were intercut and it is possible that the padlock may have originally formed part of the grave goods assemblage of SG 63, thought from the accompanying finds to be female.

Knives and sharpeners

A total of 29 knives accompanied 27 burials, with a further example found within the fill of an 'empty' grave (SG100). Of the 25 skeletons which could be sexed and aged, knives were found with 14 male and 9 female adults and 2 children.

Although few chronologically sensitive traits have been determined for the various knife types, Hines (Malim and Hines 1998, 217) notes that knives with stepped or angled backs (type C) appear to be particularly characteristic of the 7th century. At Melbourn these form 37% of the classifiable knives, the curved backed knives (type A) forming a majority (52%) and straight-backed knives (type B) a minority (11%).

Although the majority of blades were incomplete (mainly damage to tips), blade length in most cases could be classified according to Härke's (1989) three groups (1: 45–99mm, 2: 100–129mm, 3: 130–175mm). Härke's study of knives from 5th to 7th century English burials indicate frequencies in the size groups 1–3 were about 70%, 25% and 5% respectively. The assemblage of knives from Melbourn had a higher percentage of longer knives (size groups 1–3 respectively 53.8%, 38.5% and 7.7%) perhaps reflecting the generally later date range of the burials.

Härke also noted that size group 3 knives were found exclusively with male burials, frequently in association with weapons (1989, 145 and 147). Of the two burials having size group 3 knives, only one could be sexed on the basis of skeletal traits (SG83), a male with a mean age of 60, and this burial also produced a spear socket. The finds associated with the second burial, SG93, are inconclusive in determining sex.

Two graves contained two knives (SG66 and SG72), in both cases positioned at the waist and placed on top of one another. Although not a common occurrence, Cambridgeshire parallels can be cited from Edix Hill (Malim and Hines 1998, 52, Grave 18, Sk42b), Melbourn (Wilson 1956, 33, Grave 11). Further afield, three burials at Dover (dated to the late 6th – late 7th century) contained two knives worn at the waist (Evison 1987, 116, table XVII). One of the knives accompanying SG66 deserves special mention. Its tang retains two circular iron discs at the junction of tang and blade and two further discs of iron at the end of the tang. Mineralised organic material (wood or horn) was detected between the discs, along the length of the tang and over the 'pommel' of the knife. Parallels for similar handles can be seen at Dover, where one knife had an iron 'guard plate'. A second possessed a segmented handle consisting of a series of iron discs dividing organic material. Both examples were from 7th century burials (Evison 1987, 114).

Most, but not all, knives were positioned at waist level. Two adult males each had a knife above the head (SG55 and SG89), while a male child and an adult female each had one in the area of the shoulder

and upper arm (SG58 and SG98).

Tanged, parallel sided, round-ended tools with a rectangular cross-section have been identified as sharpening steels, examples occurring at Shudy Camps, Cambs. (Lethbridge 1936, fig. 1, no. A4), and Harford Farm, Norfolk (Geake 1997, 92). These sharpening steels appear to date in the main to the 7th century (Geake 1997, 92–3). In common with most other sharpening steels, the example in SG80 was found in close association with a knife, both positioned at the waist.

Shears

Shears placed at the waist were found in SG64 and SG65. The inclusion of full-size shears with burials only became popular in the 7th century. The majority date to the second half of the 7th to the early 8th centuries (Geake 1997, 96). Both examples from Melbourn have a slight expansion at the loop, a transitional element between the earlier U-shaped and later circular loops. The larger pair in SG65 has a straight junction between arms and blade, while the smaller pair has a cusped junction. The latter can be paralleled by shears found at Edix Hill in the 19th century (Hines and Malim 1998, fig. 5.8).

Geake notes that in 7th–8th century graves in England, shears are exclusively associated with female burials (1997, 97). SG65 conforms to this pattern and the finds associated with SG64 also suggest this adolescent was female. Of the 29 graves containing shears in Geake's study group, only 6 were associated with combs. Both skeletons at Melbourn produced composite combs and one (SG65) also had a spindle whorl. Discussions on function have suggested a close link with textile production, but as Geake states it is more likely that shears served as multi-purpose cutting tools (1997, 97).

Spindle whorls

Only two graves, SG75 and SG65, contained spindle whorls. Geake noted that, although examples are known (1997, 59), their inclusion in burials is less common in the Migration Period than in the Final Phase. The finds assemblage with SG75, including a festoon of polychrome glass and amber beads, and combination of radiate, saucer and great square-headed brooches, indicates a later 6th century date for this burial. The associated spindle whorl was fashioned from the base of a Roman grey ware ceramic vessel. The diameter of the spindle hole, 9mm, indicates it is of Saxon date as whorls of the Roman period have smaller spindle diameters (Walton Rogers 1997, 1731). The whorl in SG65 was of antler. It had a plano-convex section (Walton Rogers form A1) and spindle diameter of 9.2mm. The associated grave goods, including shears and a comb suggest a date in the 7th to early 8th centuries.

Both whorls were found in the pelvic area of their respective skeletons. The whorl from SG65 was found in close association with an antler ring and several other items suggesting it formed part of a girdle group (see 'Chatelaines, girdle groups and bags'). The buckle in SG75 may argue against Lethbridge's suggestion that many of the whorls were used as toggles to fasten the girdle (1931, 76).

Fire steels

Two burials, SG67 and SG64, each had a fire steel forming part of complex chatelaines. In both instances the fire steels appear to have hung vertically from the chatelaine and cannot be directly related to purse fittings. These fire steels are entirely of iron, with ends curled over in a loop and a 'hump' on one edge. The fire steel in SG67 had a small (diameter 2mm) circular perforation 5mm from the apex of the hump, which retains part of an iron chain link. This is closely paralleled, in both shape and presence of a circular perforation, by an example from Burwell (Lethbridge 1931, fig. 27). Geake's survey indicated that although some fire steels occur in the first half of the 7th century, they enjoyed greater popularity in the second half of the 7th and early 8th centuries (1997, 79–80).

Chatelaines, girdle groups and bags

Five burials had groups of objects placed below, and apparently suspended from, the waist. Many of the individual elements of these groups have been discussed above. However, because of their distinctive group character, each is considered as a whole below. Four of the five burials were in the early twenties to thirty-five age range. Three were anatomically sexed as females. SG64 contained a 13 year old adolescent; the accompanying finds suggest she too was female.

Chatelaine chains

Chatelaines are defined here as one or more groups of metal chains, frequently linked by rods, which hung from the waist and carried a collection of objects.

At the waist of Sk205 (SG64), immediately below a single-sided composite comb, were two figure-of-eight iron chain links, suspending an incomplete rod (possibly a stem from a slide key?) and a fire steel. The fire steel appears to be suspended by one of its looped over ends. Two copper alloy slip-knot rings and one copper alloy suspension loop are also associated with this group, possibly indicating further items were attached. A pair of shears hung down below the fire steel. The shears may have been suspended from the chatelaine, or perhaps suspended directly from the belt or girdle.

SG67 had an iron rod suspended from the girdle by means of a looped over terminal. The opposing end of the rod is linked to a group of figure-of-eight chains links. The links form two strands of chain, the first strand leading to a rod (incomplete) which then joins a small series of figure-of-eight chain links terminating with a fire steel. The fire steel hangs vertically and appears to have been attached through one of its wrapped over terminals. The second strand of chain leading from the initial rod is attached to the looped over stem of a T-shaped slide key. Two strands of figure-of-eight chains are suspended from the 'bit' of the key, one strand from each arm of the 'T'. The first strand links to both the looped over head of an L-

shaped slide key and a copper alloy Y-shaped suspension link. The ends of the Y-shaped link have broken off, but its presence suggests two further items may have been suspended from its arms. Suspended from the L-shaped bit of the slide key is a short strand of figure-of-eight chain from which two sets of rods and chains extend. All the rods within these two sets have their terminals wrapped in wire. The first set hangs straight down and consists of two rods and linking chains. The presence of a few chain links at the end of the second rod suggests that this set is incomplete. The second set of rods and chains is curved to the left and comprises a group of three rods and chain links, the third rod incomplete.

The second strand leading from the other arm of the T-shaped key comprises a group of five rods, the fifth incomplete, with wire wrapped terminals each linked to the other by figure-of-eight chains. At the junction of the fourth and fifth rods a second copper alloy Y-shaped suspension link was also attached, again suggesting further items were suspended. About 20mm to the southwest of the fifth incomplete rod, and just to the north of the skeleton's hand (which is positioned to draw attention to the chatelaine), is a small copper alloy buckle and plate. Its proximity to the incomplete chatelaine rod suggests it may have been associated with the chatelaine.

A simpler form of chatelaine was worn by SG82. This comprised an iron ring with three separate strands of short iron chain suspended from it. Two of the strands were incomplete but the third retained a short rod, the terminals wrapped in iron wire, with further chain links at the opposing end. These suspended a looped over terminal of a T-shaped slide key, which extended to just above the skeleton's left knee. Immediately to the left of the T-shaped 'bit' was a copper alloy slip-knot ring with a toiletry implement threaded in place. Due to their close proximity, it is suggested that the toiletry ring may have been suspended from the T-shaped key bit. A small copper alloy buckle was placed 80mm above and to the right of the start of the chatelaine, with an incomplete iron nail situated nearby.

SG58 was also accompanied by an iron chain link. A single chain link cannot be considered a chatelaine. It may originally have fastened a knife, lying on the upper forearm, to a belt.

It has been suggested that keys symbolised housewifely authority but, as Geake points out, several keys are known from child burials (1997, 58). The absence of jewellery in graves containing keys at Polhill caused Hawkes to suggest that such burials were not the lady of the house, but the house keeper (1973, 195). The assemblage accompanying SG82, however, included beads, a pendant, brooch and dress pin. Although the popularity of long iron chatelaines peaks in the late 7th – early 8th century, they are known from earlier deposits (Evison 1987, grave 28). The presence or absence of jewellery in the same graves as keys may have more to do with changes in costume fashions. That keys may have symbolised status or class distinction is suggested by the fact that only two (or possibly three) out of the eighteen probable females wore keys.

Geake has examined the significance of the inclusion of chatelaines and, in particular, keys within graves. In contrast to the chatelaine groups of the Migration Period, when the keys tended to be too small to be of practical use, the keys included in the later graves are of functional size. It is evident, however, that the role the keys played within the chatelaines accompanying SG67, SG82 and perhaps SG64, ie suspending lengths of chains and/or objects, made them impractical for everyday use. In life, these objects may have functioned as keys and were perhaps worn in a different manner. However, within the context of the burial rite, they may have served to symbolise the role and/or status of the individual at the time of death. Exactly why functional, full-size keys came to be preferred in the later period is an issue that would repay further consideration.

Girdle group

The girdle group in SG65 had more varied components. The knife, which may have been suspended directly from the left side of the girdle by means of the copper alloy suspension loop, was found underneath a sherd of Roman window glass and an antler ring. The opening of the antler ring is too narrow to have formed the mouth of a bag, and the presence of three circular perforations along one edge suggests it was used to suspend items. The ring itself may have been threaded on to the girdle. An antler spindle whorl lay about 40mm to the northeast of the ring and could have been one of the items suspended. A pair of shears, a copper alloy split pin with applied head and an iron suspension ring lay on the right hand side of the body. Whether the shears were suspended from the antler or iron ring is uncertain. A bead was also recovered in this area. It is of the same monochrome, turquoise variety as the beads in the necklace accompanying the burial, from which it may have been displaced.

Similar rings of antler, many decorated with ring and dot ornament, were found at Burwell (Lethbridge 1931, figs. 32, 33 and 38) and Edix Hill (Malim and Hines 1998, 218), Cambs and at Polhill, Kent (Philps 1973, fig. 53 no. 490). They were thought to have hung from the girdle with various small items dangling from them. Attention is also drawn to the amuletic powers of antler (MacGregor 1985, 108).

Bag/purse

Organic remains did not survive on the site, unless in direct contact with metal objects. However, SG93 had a collection of objects suggestive of a purse or bag. In addition to a buckle and knife, this burial had a triangular, slotted, strap stiffener or mount and fragmentary remains of copper alloy sheeting at waist level. To the left of the skeleton and extending down from the hand was a group of finds comprising a copper alloy suspension loop, a bar-shaped mount, an iron sheet fragment and three small tacks, two copper alloy, one retaining a small rove or washer, and one iron. The positioning of this group and the presence of a suspension loop and mount are suggestive of a purse, suspended from a long belt decorated with copper alloy plates and fastenings. Finds of a similar composition, although with an ivory bag ring, were found in Grave 79 at Edix Hill where it was conjectured that the bag was suspended on a long strap which passed over the shoulder, the bag hanging by the left hip when worn (Meaney 1998, 269).

Vessels

Wooden vessels

Two identical copper alloy rim mounts (retaining mineralised wood) were found in SG56, indicating the presence of a wooden vessel, possibly a cup or bowl. These mounts consist of a small, flat, rectangular sheet folded over and fixed by two transverse rivets at the mouth. The ends of the copper alloy rivets have been bent over or clenched, suggesting that the vessel had a thickness of about 2mm. Due to the heavily mineralised condition of the wood, species identification was not possible.

Geake concluded that the deposition of wooden vessels continued throughout the period of furnished burials (1997, 92). Finds of rim mounts from the earlier Melbourn (1952) excavations were noted in three burials and were variously described as mounts for wooden cups, bowls or gourds (Wilson 1956, 31–2, graves 3, 6 and 9). The presence of a silver slip-knot ring and a possible capsule bead of silver with SG56 is suggestive of a 7th century date for the deposition of this vessel.

The wooden vessel in SG56 was placed above the head. The three examples from the 1952 excavations were also near the head, albeit to the side. Although parallels for this positioning can be found at Holywell Row (Lethbridge 1931, graves 23, 29, 31, 37, 39 and 93), Shudy Camps (Lethbridge 1936, grave 39) and Edix Hill (Malim and Hines 1998, grave 66) it is not universal. Some wooden vessels were placed near the legs. The positioning of some of these vessels at the head may indicate that they were drinking vessels, as opposed to other forms. However, poor survival precludes certainty on this point.

Evidence for a second wooden item is suggested by the presence of two mineralised strips of wood, one retaining a copper alloy tack (10mm in length) *in situ*. This was found near the right humerus of Sk1169 (SG 87) and may represent the remains of a wooden vessel or small box. However, with so little surviving certain identification is not possible.

Ceramic vessels

In contrast to the earlier 1952 excavations, which found only one child buried with a ceramic vessel (Wilson 1956), seven burials were accompanied by either near complete vessels, or sherds (Table 23). Of the six skeletons that could be anatomically sexed and aged one was an adult male and four were adult females, ages spanning from 17 to 30. One burial (SG64) was an adolescent of 13 years of age, but as indicated previously the grave goods accompanying this skeleton are normally associated with females. In the majority of cases the more complete vessels were positioned above the head, although there was one instance of a vessel placed underneath the stomach/pelvis area. Groups of sherds tended to be placed on or near one arm of the body.

The majority of vessels and sherds included as grave goods were plain. Only two sherds, of a sand and organic fabric (type A19), in SG63 had stamped decoration. This stamp is of a circular grid pattern ('A3' group) and has been identified as an A 3aiv stamp. This is a common stamp, East Anglia accounting for the bulk of occurrences (pers comm D Briscoe). Nine sherds of a sandstone and mica fabric (type A30) accompanied SG105. The more complete vessels were all of a micaeous fabric (type A26) with smoothed and frequently burnished surfaces. Bowls were the more popular form, and similarities in shape were noted from Shudy Camps (Lethbridge 1936, pl. I, Grave 27) and Burwell, Cambs. (Lethbridge 1931, pl. IV, Grave 99). The one instance of a tall narrow-necked jar occurred with an adult male (SG74). The form of the latter is paralleled by a vessel from Cemetery II (Grave 8) at Chamberlain's Barn, Beds., thought to be of 7th century date (Hyslop 1963, 195 and fig. 8).

The inclusion of ceramic vessels within a burial

Table 23. *Ceramic vessels from burials*

SG	Sk	Sex	Age	Vessel & fabric	vess/shrd/wt	Position
63	1325	?	?	Body A19	1:7:39	Disturbed burial S end of grave
				Body –stamped A19	1:2:12	Disturbed burial S end of grave
64	205	IMM	13	Bowl A26	1:22:332	Above head
67	1370	F	20-25	Body A26	1:26:565	Left of left arm
74	1012	M	25-46	Jar A26	1:1:1581	Above head
89	1271	F	25-30	Bowl A26	1:31:650	Above head
103	1263	F	17-25	Bowl A26	1:59:485	Under pelvis
105	1267	F	17	Body A30	1:9:93	Overlying right forearm

assemblage is a tradition continuing from the 6th century into the later 7th century (Geake 1997, 90). Geake noted that ceramic vessels as grave goods do not appear to follow the rules which governed the inclusion of other vessel types, ie they were fairly common, found with both sexes and all ages and were not generally associated with graves of high wealth. To an extent this holds true at Melbourn, three of the burials (SG63, SG103 and SG105) having three or less artefact categories present. However, SG64, SG67 and SG89 had five artefact categories present, whilst the single male burial (SG74) was also accompanied by a spear, possibly indicative of a higher status.

In addition to the ceramic vessels which were purposely deposited as grave goods, sherds of Saxon pottery were recovered from the fills of 14 graves (Table 24). Six of these had suffered some form of disturbance, eg superimposed burials or the remains of a second individual identified in the fill. It is, therefore, possible that some of these sherds are derived from grave goods accompanying the original interment. The majority, however, were probably unintentionally incorporated into the grave fills.

Table 24. *Pottery sherds from grave fills (vessel:sherd:weight)*

	Ceramic Fabric Types				
Structure	**A**	**A01**	**A19**	**A26**	**A32**
G48		1:5:26	1:1:8	2:2:8	
Grave					
SG56		2:2:8		2:2:41	
SG62				1:7:82	
SG71				1:1:13	
SG74				3:3:10	1:6:73
SG77			1:1:6		
SG83				1:1:2	
SG87				1:1:3	
SG88	1:1:2			4:4:40	
SG91			1:7:41		
SG92		1:14:27		1:1:6	
SG95			1:1:6	1:1:13	
SG99				1:1:1	
SG101				1:1:6	
SG108				1:1:22	

Spears

Six adult males graves contained either a complete spearhead or part of one. In three instances the spears were positioned to the side of the skeleton, one to the left (SG73) and two to the right (SG90 and SG104). One spearhead was placed above the head, in close association with a ceramic vessel (SG74), while a second was placed above and to the right of the head (SG77). In the four instances where blades survived, one was placed across the width of the grave (SG74), two pointed to the head of the grave (SG104 and SG77), and one was placed next to the lower left leg, the spear pointing to the foot of the grave (SG73).

In two instances (SG83 and SG90) only parts of the spearhead socket survived, and in the case of SG83 it was recovered from the grave fill. The remaining examples can be classified according to Swanton (1973; 1974). Spearheads with mid-ribbed, leaf-shaped blades could be assigned to Swanton's type B2 (SG73), traditionally dated to the 4th and 5th centuries. Welch, however, points out that the type continues into the 7th century, noting examples from Finglesham, Kent, Apple Down, West Sussex and Sutton Hoo, Suffolk (Down and Welch 1990, 94). One difference between Swanton's type B2 (1974, fig. 1d) and the example from Melbourn lies in the shape of the mid-rib. The spearhead from Melbourn possesses a hemispherical-shaped mid-rib while that illustrated by Swanton is more V-shaped. Further study is needed to determine whether this is a diagnostic difference between earlier and later ribbed types.

Small leaf-shaped spearheads, blades longer than the sockets, are classed as Type C1 (SG74). Again Swanton places this form in the 5th and 6th centuries but Dickinson argues that the overwhelming majority date to the 7th century (1976, 297–8; Geake 1997, 68). Angular blades are represented by single examples of types E4 (SG104) and F2 (SG77), dating to the 6th and 7th centuries (Swanton 1973, 81–91; Geake 1997,69).

The graves containing spearheads are not richly furnished. The most common combination of grave goods accompanying a spearhead was a knife and buckle (SG77, SG83 and SG90), with SG104 having an additional strap ring (see p 115). One spearhead occurred on its own and although Härke notes that this accounts for 44% of all weapon burials (1997, 119) it may be noteworthy that this is the only spearhead to be placed pointing towards the foot of the grave. SG74 was accompanied by a ceramic vessel, a knife and an iron staple, the latter off to the left of the head. No other items were associated with the staple and the type of object on which it was used remains uncertain.

Development of the cemetery

Holly Duncan and Corinne Duhig

Introduction

The location of Wilson's 1952 excavation and its relationship to the more recent work remains uncertain. If these two sites did form part of the same cemetery, then our understanding of it, particularly in terms of its size and spatial development, is potentially reduced. In addition, Wilson comments that at the time of his work, further graves had been destroyed without record. The chronological range of the 30 inhumations recorded from the earlier investigations is less problematic. Of the 23 burials accompanied by grave goods, up to 14 are datable to the Final Phase, with no evidence for interments in the Migration Period (Malim and Hines 1998, 323).

The following discussion is in the main restricted to the evidence encountered during the more recent excavations, although where possible reference is made to the earlier findings. Any conclusions drawn

must be considered in the light of the above caveats.

Chronological Development

Grave Goods Chronology

As with many Saxon cemeteries, precise chronological phasing of the burials is impossible. The burials under discussion here do benefit, however, in having a clear starting point. SG75, with its assemblage of three brooches and long festoon of polychrome, amber and, to a lesser extent, monochrome beads, stands out from the rest of the burials and falls towards the end of the Migration Period. The brooch types suggest a date of burial no earlier than the third quarter of the 6th century.

An end point for the cemetery may also be provided by the group of seven inhumations (SG59, SG61, SG84, SG106–108 and SG110) on its southern edge (see p 95 and Figure 28). In addition to their peripheral position, these graves are distinguished by their west-east orientation, rectangular shape, similarities in size and, in all but one instance (SG107), absence of grave goods. As previously noted (see p 118) a date in the second half of the 7th century has been suggested for the introduction of the hooked tags found with SG107.

Current research indicates that the change from furnished to unfurnished graves accelerated after the third quarter of the 7th century (pers comm J Hines). It appears, therefore, that the cemetery was in use for about 100 years, from *c.*AD575 to *c.*AD675. The datable burials discovered by Wilson in 1952 (1956) are compatible with this suggested date range, all being attributable to the Final Phase (Malim and Hines 1998, 322–23).

Precise dating of the assemblages accompanying the remaining inhumations is more difficult. SG89 has elements traditionally attributed to the Final Phase (eg silver slip-knot rings) but also retains aspects more at home in Migration Period assemblages, such as a long festoon of amber, polychrome and monochrome beads. This assemblage also contained a simple, silver scutiform pendant, which in this area are generally of 6th century date. At least eight examples, however, are known from 'late cemeteries' in East Anglia. Previously, these have been dated to the mid-7th century, but Hines argues for continuity with earlier forms of this pendant (1984, 231–33). It is possible that this grave contained a deliberately archaic 7th century assemblage. However, on balance, it is perhaps very late 6th century in date, belonging to a transitional stage between the Migration Period and the Final Phase.

Of the remaining 44 *in situ* inhumations, 37 were accompanied by grave goods. Where datable, these fall within the 7th century but greater precision beyond this is problematic. Brugmann has proposed a mid-7th century starting point for her Phase C monochrome wound spiral beads, but the transitional period between her Phases B and C needs further study (see 'Necklace composition' p 113). Attempts to differentiate between early and later 7th century assemblages have met with a number of difficulties. Firstly, except in Kent, it is difficult to identify specifically early 7th century assemblages (Geake 1997, 123). Secondly, as Hines notes, 'the Final Phase is defined by a multiplicity of archaeological criteria, not all of which are ubiquitously present to make the archaeological record substantially and easily comparable across the whole of Anglo-Saxon England' (Malim and Hines 1998, 280). Finally, several of the object classes used to define Final Phase graves have a long period of use and are not always found with more chronologically sensitive items. This is particularly true in relation to the 'suite' of artefacts typically found with male burials.

It is hoped that current research involving high-precision, radiocarbon dating may make a significant contribution to the ability to differentiate earlier and later 7th century assemblages (Malim and Hines 1998, 281). At present, however, only a general 7th century date can be offered for the bulk of the Melbourn burials. An exception may be SG82. The presence of amber beads may suggest that this inhumation occurs early in the sequence of 7th century graves (cf. Malim and Hines 1998, 282). The accompanying annular brooch, glass-set, disc-headed pin, cabochon pendant and double-sided antler comb would not contradict this suggestion.

Five graves (SG62–65 and SG67) situated along the western limit of the excavation have elements suggestive of a date towards the middle or second half of the 7th century. SG62 contained a padlock and SG63 an iron spoon, objects which are both thought to date towards the second half of the 7th century (Geake 1997, 123–5 and table 6.1). SG64 and SG65 were accompanied by full-size shears. Geake's survey notes that the majority of datable shears-graves belong to the second half of the 7th century (1997, 96). SG64 additionally had a hump-backed comb, one of the components of Geake's Group D finds which she has argued were introduced to grave good assemblages in around AD650, or slightly before (1997, 123–5 and table 6.1). SG67 has a long and complex iron chatelaine of chains and rods suspended from keys. Whilst such items are not unknown in earlier graves, their popularity seems to peak in the later 7th century (Geake 1997, 58).

Chronology and stratigraphic relationships

The stratigraphic evidence provided by the five groups of superimposed burials (see p 94) allows a sequence of burial events to be determined within each reused plot. However, it does not provide evidence for their relationships with surrounding burials. As two of the most intensively reused plots, (SG71–73 and SG77–80), contain predominantly male interments, the accompanying grave goods do not assist in either establishing a chronological link to surrounding graves, or in ascertaining the length of time this burial practice remained in use. The single female inhumation (SG78) within SG77–80 was found with a simple scutiform pendant. This form of pendant was in use during the later 6th into perhaps the first half of the 7th century. It cannot, therefore, assist in refining the date of the male inhumations.

In the three cases of female superimposed burials, SG94–95, SG96–97 and SG102–103, the initial burials were either poorly furnished or unfurnished. The presence of monochrome beads and a silver slip-knot ring accompanying secondary burial SG95 indicates a date within the 7th century, but cannot provide a date for the preceding unfurnished burial (SG94).

Amongst the intercutting graves (see p 94), SG58 contained items which cannot be closely dated and SG59 was unfurnished. SG62–63 both contained items with a suggested date in the mid-7th century. The composition of the grave goods assemblage within SG82 has previously been argued to date to the early 7th century. The presence of two monochrome beads, more typical of Final Phase graves (see p 109), in the later SG81 would seem to confirm the earlier dating for SG82.

Grave goods and gender groups

Introduction

Of the 53 *in situ* inhumations (omitting the foetus Sk1203 in SG78), 40 (75.5%) were accompanied by grave goods. Excluding the two proposed late 6th century graves, the percentage of 7th century inhumations with grave goods is 74.5%. Although such a percentage is not unknown, it is in sharp contrast to the results of Geake's survey of Final Phase graves. Out of her corpus of 7000 graves from 353 burial sites, only 42% of all graves were furnished (1997, 127).

Although it is tempting to draw conclusions from these contrasting figures, such as a difference in standard of living and/or burial practices, it must be remembered that the full extent of the Melbourn cemetery remains unknown. Nonetheless, of the 30 burials noted by Wilson, 23 were accompanied by grave goods (76.7%). Combining the two samples gives a revised percentage of burials accompanied by grave goods of 75.3%.

Child burials

Of the 11 identified child (below 17) burials, one was a foetus (SG78 Sk1203) and one (Sk1401) was poorly preserved within the fill of a secondary burial (SG57). The five graves of children under the age of 12 were sparsely furnished, with the range and quantity of artefact types typically limited. Children between 2 and 4 years (SG76 and SG99) had no grave goods. Children with an age range of 3.7–6.3 years (SG55 and SG57) had a single knife. The only child with an age range of 7.5–12.5 years old was accompanied by two monochrome beads (SG81).

Of the four adolescent burials, SG84 formed part of the group of seven burials identified as amongst the latest in the cemetery. Two of the remaining three adolescents were accompanied by a range of grave goods suggestive of female gender. SG64 possessed a chatelaine, fire steel, shears, and a comb indicative of reaching the age of maturity. SG105 was buried with an amber bead, knife, buckle and pottery sherds. In contrast, SG101, anatomically sexed as a 15 year-old male, had no grave goods. At least in the case of female adolescents it would appear that the range of furnishings available for inclusion is greater, and this corresponds to the cultural child-adult threshold around the age of 12 proposed by Crawford (1991, 239–45).

Adult female burials

Out of the sample of 60 individuals, 17 females were identified anatomically. A further three females could be identified on the basis of associated grave goods. Only three females were unaccompanied by grave goods and of these, one individual (Sk1171) was recovered from the fill of a different burial (SG65) and one (SG102) was truncated by a later grave (SG103). The single undisturbed and unaccompanied burial (SG70) was an elderly female (age range 60–87) located within the concentration of graves surrounding the earliest burial (SG75).

Following on from the work of Hines at Edix Hill (Malim and Hines 1998, 301–03) the range of identifiable artefact categories (RIAC) were compiled to see if any patterns could be discerned between age groups. The results are presented in Table 25. Where the anatomical age range spanned the age bands, the mean age was used to determine attribution.

The number of burials is modest and, therefore, caution must be used in drawing conclusions from this data. There is a very slight hint that women between the ages of 19 and 35 were able to attain a somewhat higher social standing than women of 35 or above. Social differentiation may have been greater amongst the females in the 'adult 1' group, whereas those in 'adult 2' would appear to have had more equal access to indicators of social standing.

Adult male burials

Out of the sample of 60 individuals, 23 males were identified. With the exception of the five unaccompanied burials (SG59, SG61, SG106, SG108 and SG110) argued to be of later 7th century date, the *in situ* graves were furnished. Generally the grave goods were not in conflict with the anatomical sexing. In only two instances were items more commonly found with female burials noted. SG72 had, amongst other items, a copper alloy slip-knot at the neck, perhaps in this instance serving as a clothes fastening. SG62 had a padlock, although disturbance makes it uncertain if this object was genuinely associated with the male occupant of SG62 or derived from intercutting grave SG63, thought from the finds to be female.

The most basically furnished male graves had a single knife (SG98 and SG88) but more commonly a knife and buckle (SG68, SG79, SG85). One burial (SG58) had a knife and chain link, the positioning of the latter at the waist suggesting it may have served as a form of belt fitting. Occasionally an additional knife (SG72 and SG66) or sharpening steel (SG80) was added to this repertoire

Six weaponry burials, containing spears but with no evidence for shields, were present. Only one (SG73) had a spear and no accessory goods, the majority were accompanied by a buckle and knife (SG77,

Table 25. RIAC scores for female graves (Ages 'Adult 1'=17-25; 'Adult 2'=25-35; 'Adult 3'=35-45; 'Adult 4'=45+)

Date	Sg	Sk	Age	RIAC	Age band	Mean age
Late 6th	89	1271	25-30	5	'Adult 2'	27.5
Late 6th	75	1307	45+	6	'Adult 4'	45+
7th (early)	82	1229	19-25	11	'Adult 1'	22
7th	87	1169	17-25	2	'Adult 1'	20.5
7th	103	1263	17-25	2	'Adult 1'	20.5
7th	67	1370	20-25	5	'Adult 1'	22.5
7th	102	1259	21-25	0	'Adult 1'	23
7th	56	1021	21-30	2	'Adult 1/2'	25.5
7th	91	1301	30-35	1	'Adult 2'	32.5
7th	93	1132	25-35	4	'Adult 2'	30
7th	69	1293	25-35	4	'Adult 2'	30
7th	65	1165	25-35	7	'Adult 2'	30
7th	78	1189	33-46	2	'Adult 2/3'	39.5
7th	97	1176	45+	1	'Adult 4'	45+
7th	95	1038	45+	3	'Adult 4'	45+
7th	70	1305	60-87	0	'Adult 4'	73.5
7th	96	1199	Adult	1		
7th	63	1325	Adol/adult	2		
7th	65	1171	Adult	0		
Late 7th	107	1398	45-87	3	'Adult 4'	66

SG83 and SG90). SG104, in addition to the spear, knife and buckle, had evidence for a more robust strap in the form of an iron belt ring and three riveted suspension loops. SG74 differed from the norm in not having a buckle and being accompanied by a staple and a ceramic jar.

There does not seem to be any clear relationship between age and inclusion of spears. Spears were found in all adult male age bands, the greater numbers of spears with men of over 35 (4 instances) reflecting the larger population of male burials of this age (see p 97).

Wilson's 1952 investigations produced only two male weaponry burials. Grave 25 in common with the more recent excavations had a spear (possibly Swanton type C2), knife and buckle (Wilson 1956, 37). However, grave 12 (Wilson 1956, 34–5), in addition to knife, buckle and spear (Swanton type C3) also had a shield grip and boss, the latter probably belonging to Dickinson and Härke's Group 7, dating from the second quarter of the 7th century onwards (1992, 21).

Spatial Organisation

Positioning of the Graves

In the main, the pattern of burial appears to have been determined by the two principal cemetery structures: the lozenge-shaped enclosure G46 and the T-shaped arrangement of post-built structures G38–40 (Figures 25 and 28). In addition, there were a number of outlying graves, including: four sets of paired burials (SG89–90 and SG91–92 to the north of the main burial area, SG104–105 to the southeast and SG106–107 to the south). Two burials SG108 and SG110 were situated to the southwest in close proximity to the barrow. An isolated burial SG55 lay 20m NNW of the cemetery.

Western part of the cemetery

The densest concentration of graves occurred to the north and west of the lozenge-shaped enclosure. Within this area it is possible to distinguish three burial areas. The earliest datable grave SG75 appears to have been the founder burial, in the excavated area at least, attracting a cluster of 14 further burials (SG70–74, SG76–83 and SG88). It is noteworthy that the two most intensively reused burial plots (SG71–73 and SG77–80) fall within this group. Ten burials lay with heads to the south, although there were five instances of different alignment, including the founder burial which lay with the head to the ENE (Figure 28). Two burials (SG70 and SG72) lay with heads to the west and two (SG73 and SG81) with heads to the NNW.

Six burials lay on the northwest perimeter of the cemetery (SG64–69), just to the west of those centred on the founder grave. They all lay with heads to the south and appear to form a cohesive group. Within the grave goods assemblages accompanying three of the female burials (SG64–65 and SG67) are components that suggest a date towards the middle or latter half of the 7th century. This suggests that these six burials may represent a later, westward expansion from the founder cluster.

The 'founder' cluster, and its possible western extension, is notable for a number of reasons. Four of the six spear burials occur within these graves (SG73–74, SG77, SG83). Some of the highest RIAC scores for female burials are also situated within this area (eg

SG82, SG64, SG65, SG67). Two of the most intensively reused burial plots (SG71–73 and SG77–80) are adjacent to the founder. The depths of the initial grave cuts in these two groups (SG71 depth 0.65m and SG77 depth 0.85m), imply they were dug with the intention of adding further burials. This suggests that proximity to the founder grave was highly valued.

In total 27 individuals were buried in this cluster, with six instances of reused grave plots. Males, females and immature inhumations were present in a 12:8:4 ratio (three burials could not be sexed). 'Adult 1' to 'adult 4' groups were represented in both genders, the females evenly spread across the bands while males of 'adult 3' and 'adult 4' (nine examples) predominated.

The second burial area in the western part of the cemetery included the posthole structure G20, immediately southwest of the lozenge-shaped enclosure. Two burials lay with heads to the south (SG57 and SG58), a young child and a mature male, positioned close to the southwest corner of the structure. About 4m west of these burials two further graves (SG62–63) contained grave goods suggestive of a date towards the second half of the 7th century. Hence, these two burials may represent later additions to this group.

The third burial area is represented by the individual female burial SG56. This grave is cut by one of the postholes of structure G19, sited immediately WNW of the lozenge-shaped enclosure. This structure may have served as a marker for the grave, one of the largest and deepest which interestingly shows no signs of reuse.

Eastern part of the cemetery

The eastern half of the main burial area was organised around the T-shaped arrangement of post-built structures G38–39. Eight graves (SG87, SG93–99) lay to the north of the 'T', the closest about 2.5m distant. This group included two superimposed graves (SG94–95, SG96-97), each containing only two burials. Two graves (SG85–86) lay to the southwest of the stem of the 'T' and three (SG101–103) to the NE. One of the latter was a reused burial plot. These burials are generally at least 2.5m distant from the structural features. All the burials in this area lay with heads to the south except for SG99, which lay with the head to the west (Figure 28).

This area of the cemetery is characterised by less intensive use and a predominance of female burials, in particular north of the 'T'. Fewer instances of burial plot reuse (three cases) were also noted. There were two immature burials, a young child and a 15 year old male. The gender ratio of the adult burials was two males to seven females. Two further burials could not be sexed. Amongst the female inhumations, 'adult 1' burials predominated (three instances), with one burial in 'adult 2' and two in 'adult 4'. The two male burials were in 'adult 3' and 'adult 4' groups. Generally the RIAC scores for the female burials were below the median score, only one burial (SG93) achieving the median score of 4. The objects accompanying male inhumations were similarly modest comprising a knife or a knife and buckle.

Other graves

Of the four pairs of outlying graves, only one (SG89–90) was positioned next to a structure G15. Both SG89–90 and SG104–105 lay with heads to the south and comprised one male and one female burial, the males possessing spears and the females noteworthy in having median or above RIAC scores. SG89 was also one of the earlier graves within the cemetery. Paired burials SG91–92 did not lie with heads to the south. These two graves were on the same alignment, but the bodies faced in opposing directions (SG91 ENE and SG92 WSW).

The fourth group of paired outlying burials (SG106–107) form part of a group of seven burials lying on the southern edge of the cemetery area (Figure 28). It has been argued that these form a separate group which is both spatially and chronologically distinct. This group comprised five male burials, 'adult 2' to 'adult 4' groups, one female, 'adult 4' and one immature burial of 14 to 15 years of age. All these burials lay with heads to the west.

Cemetery structures

Although a date range of AD575–675 has been proposed for the cemetery as a whole, a chronological sequence for the cemetery structures and their relationship with the burials cannot be determined. Blair (1995) has reviewed the evidence for Anglo-Saxon 'pagan shrines'. He argues that square-plan 'shrines' and 'ritual' posts echo a long tradition, stemming from Romano-Celtic shrines and re-emerging around AD580–600 as kingdoms and dynasties were forming. This late adoption of a tradition rooted in the aristocratic culture of Celtic Britain represented a 'created continuity', designed to bolster the legitimacy of the new rulers (Blair 1995, 20–22).

Although the Melbourn structural features differ in form to those discussed by Blair, in particular the lozenge shape of G46, they do appear to have functioned as a focus for burial. Blair postulates that the 'foot-post' associated with graves in some late pagan cemeteries such as Finglesham and Broadstairs, developed from the mortuary function of major single posts. He argues that the originally communal type of cult focus was becoming personalised, each family or individual having its own miniature post (1995, 20). These ideas provide a possible interpretative framework within which the evidence from Melbourn can be considered.

The founder grave would appear to have been the initial focus, and from the evidence of the superimposed graves may have remained so for some time. It is possible that the lozenge-shaped enclosure G46 was constructed around the same time, perhaps to mark the establishment of the new burial area. The smaller post-built structures G15, G19, G20 and G38–40 may signal the start of more individual and/or family grave marking. If so, this practice would appear to have commenced in the late 6th century based upon the suggested dating of the finds within SG89 situated

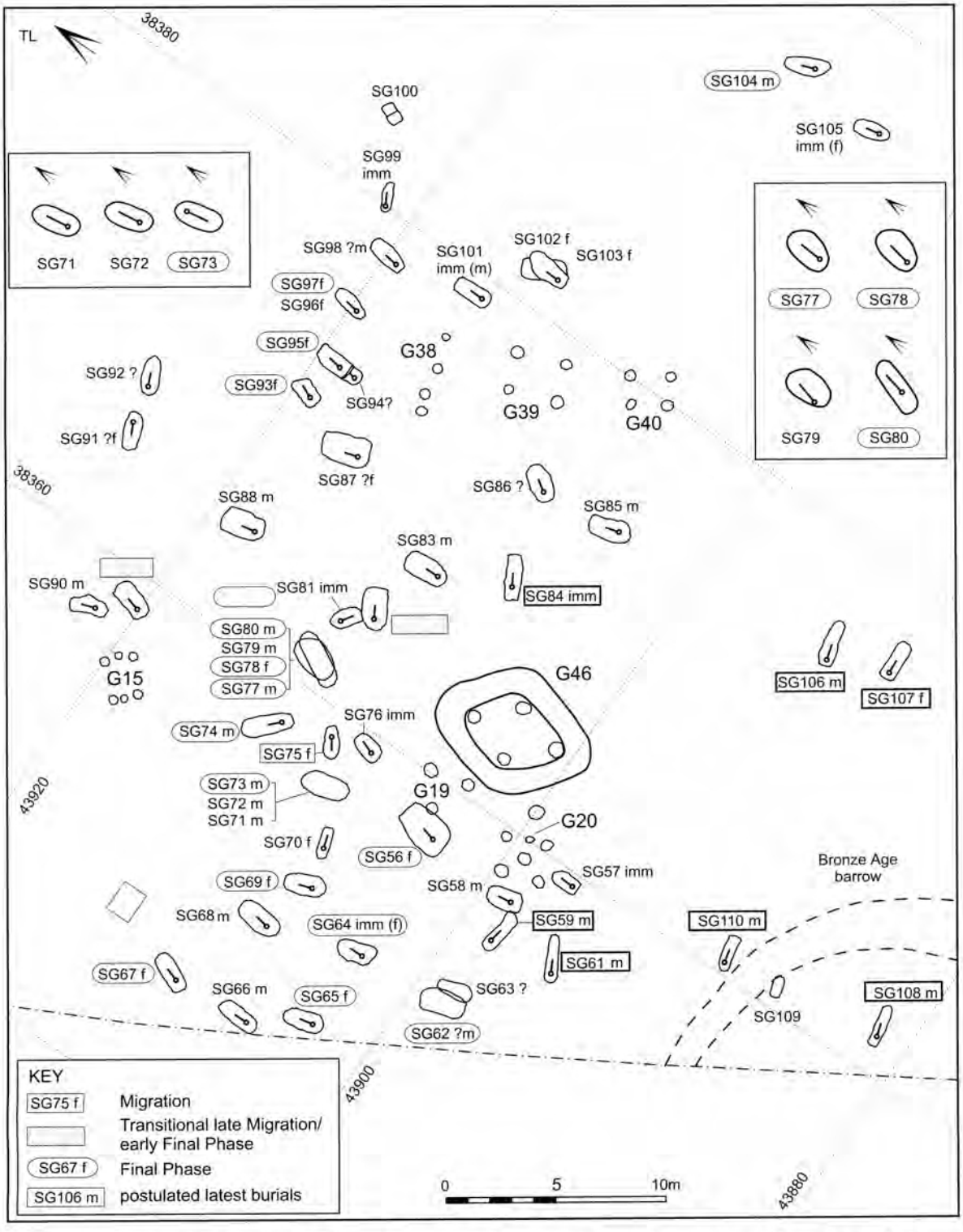

Figure 28. *The Cemetery: Gender, orientation and suggested chronology. Gender indicated as follows: m = male; f = female; imm = immature; ? = uncertain*

adjacent to structure G15. As has been noted above, the burials sited along the T-shaped alignment of structures, G38–40, in particular those adjacent to G38, are predominantly female. This pattern may represent some form of gender segregation, perhaps those of females that married into the community.

Kinship

Divisions of the cemetery have been argued on spatial grounds, in particular juxtaposition to cemetery structures and the founder grave. However, the underlying motivation for these burial foci is unclear. Kinship groups may provide a possible explanation. In attempting to identify family groups it must be remembered that created kinship is as important as consanguinity. However, it is not easy to identify in the archaeological record (Malim and Hines 1998, 303). Epigenetic traits amongst the burial population can be used to postulate family relationships or intergroup relatedness and the evidence for these traits has been presented in 'Epigenetic traits and congenital and developmental disorders'.

There is no clustering of inhumations sharing common dental epigenetic traits. In fact, the instances of parallelogram- and peg-shaped molars, and incisor shovelling, are dispersed. In the case of parallelogram-shaped molars and incisor shovelling, one instance of each was noted amongst the seven west-east oriented burials thought to be of later 7th century date (SG61 male and SG84 adolescent). The remaining inhumations displaying incisor shovelling (SG87 and SG105), and peg-shaped molars (SG64 and SG103) are female burials.

In contrast, the instances of spondylolysis are almost exclusively restricted to the burials clustered around the founder grave, and these are in the main male (SG73, SG80, SG83 and SG88). One female occurs within the western extension of the founder cluster, but one is positioned north of the four-post alignment (G38). Of the three instances of wormian bones two, both male, were within the burial concentration surrounding the founder grave (SG74 and SG77). A third male burial (SG106) formed part of the later west-east oriented burials on the southern fringes of the cemetery. Metopic sutures were found in two burials to the west of the founder grave (SG68 male and SG67 female) and a single inhumation east of the four-post structure G39 (SG86 gender unknown).

At Edix Hill a correlation between the instances of common genetic traits and burial position within the cemetery was found for male burials. In contrast a more dispersed pattern was noted amongst the female inhumations sharing traits. There it was argued that such a pattern would result if female exogamy was the norm (Malim and Hines 1998, 311). The evidence from Melbourn could be interpreted in a similar manner. Caution however should be exercised due to the smaller cemetery population, the density of burials surrounding the founder grave when compared to the rest of the cemetery and the relatively high prevalence of spondylolysis within the burial population. The few instances of epigenetic traits common to both the main burial area and the postulated later 7th century burials to the south hint at continuity of a familial burial area despite the apparent change in burial rite.

Summary

In common with many Final Phase cemeteries Melbourn is sited near an older, prehistoric monument (Lucy 2000, 124–30). In this instance, however, the monument was not the main determining factor in the layout of the cemetery. Instead the burials focused on post-built structures erected during the use of the cemetery. The presence of a slight chalk ridge may have influenced the selection of this site as a burial ground, the cemetery structures enhancing its prominence.

Although the full extent of the cemetery cannot be determined, evidence from the recent excavations suggests it was established in the late 6th century, remaining in use for about 100 years. This is in contrast to some of the sites in the south Cambridgeshire area, for example Barrington A, Barrington B and Hauxton, where burial continuity is evidenced from the early 6th century through to the Final Phase (Malim and Hines 1998, 326–27).

The reasons for establishing a new cemetery, and the location of the settlement it served, remain uncertain. Hines has drawn attention to the appearance of Final Phase burial in effectively new territory beyond the bounds of the south Cambridgeshire region of the Migration Period. Sites are known in north Hertfordshire, south Bedfordshire and Shudy Camps near the Cambridgeshire/Essex border (Malim and Hines 1998, 327). Melbourn may represent one of the earlier links in this chain of expansion.

The recent excavations revealed a cemetery characterised by burials clustered around focal points (as opposed to rows), a high degree of reuse of grave plots, possibly with gender-related restrictions on this reuse, and at the time of writing unique multiple stacking of graves (SG71–73 and SG77–80). Also distinctive are the cemetery structures, which appear to evolve from providing a focus for the community (G46) to family and individual grave markers (G15, G19–20, G38–40). Together these attributes provide an unusually rich insight into the development of the cemetery.

The most intensively reused plots centred on the (female) founder grave, suggestive of an enduring need to retain a link with this individual. There were no skeletal markers that suggested the people buried within these multiple graves were related, and although this cannot be ruled out, it is possible that there were a variety of factors governing the reuse of graves, including created kinship and 'created continuity'. There were also differences evident in the manner of reuse, some graves respecting the previous burials, some truncating them and some apparently disinterring the original 'occupant', and incorporating the disturbed remains in the new grave. Whether these differences represent change over time is unclear. Nor is it clear whether the practice of grave

reuse was contemporaneous with the single burials. Reused graves were likely to have been marked in some manner, especially if the pattern of gender and age related restrictions on reuse was maintained. Subsequent ploughing, evidenced by scarring of the chalk bedrock, has removed any evidence of the form this grave marking took.

The cemetery appears to have extended westwards (graves SG62–69), with a more consistent north-south orientation. It is possible that this extension may have 'joined up' with the previously excavated area where it was noted that all burials varied no more than ten degrees from the north-south line (Wilson 1956, 30). However, current best estimates of the location of Wilson's excavation place it some 110m west of these graves. It is still, therefore, uncertain whether the two sites represent parts of separate cemeteries or one larger cemetery occupying the low chalk ridge to the south of Melbourn.

Within the cemetery's period of use a change in burial practice occurred, characterised by narrower rectangular graves, west-east orientation and poorly furnished or unfurnished graves. These graves although remaining within the area of the cemetery were positioned along the southern edge away from the main burial focus.

Sixty individuals were recorded from the recent excavations and a further thirty were noted from the 1952 investigations. If these two sites form a single cemetery this suggests a burial rate of around one per year. Estimates of the average size of the population potentially served by a single cemetery are hindered by the limited information available from the 1952 excavations. The more recent findings suggest a minimum population size of about two dozen.

Of the recent findings, immature individuals represent 18% of the buried population, a somewhat lower percentage than found in earlier Anglo-Saxon cemeteries locally but closer to that of roughly contemporary populations countrywide. There is a severe under-representation of new-borns and infants compared with modern comparable populations. This is common in ancient cemetery material and differential disposal is the favoured explanation.

There are almost equal numbers of males and females. Some adults reached an advanced age, one-third over 45 years and 14% probably over 60 and possibly considerably older. The preponderance of males in the oldest age group is not standard for archaeologically excavated cemeteries, and cannot be entirely explained by the high numbers of deaths of the younger adult females. The people were tall, some of the tallest Anglo-Saxons yet reported.

In terms of health, it is noteworthy that although there are a few fractures there are no identifiable weapon injuries such as are found at nearby cemeteries of earlier date. It appears that inter-personal conflict had become less common. Degenerative ('wear and tear') arthritis is extremely advanced in some cases, and affects nearly one-third of the population. Dental health is average for the period. There is some non-specific infection and signs that a few individuals had iron deficiency – as regularly observed in ancient cemetery samples. One man died with a massive bladder stone, probably the cause of his death; one woman was pregnant but her cause of death is not known.

There was no clear distribution pattern of epigenetic traits although cases of vertebral developmental anomalies are frequent and, within the male population, are intriguingly clustered in the cemetery. This, combined with the dispersed pattern of dental epigenetic traits within the female population, could suggest that female exogamy was practised.

The range of grave goods at Melbourn is similar to the Phase II burials at Barrington A/Edix Hill, although the absence of bed burials and scarcity of shield bosses may suggest less of a hierarchical differentiation at Melbourn (Malim and Hines 1998, 323). It was also noted at Melbourn that the percentage of graves furnished, although not richly, was higher than generally encountered in Final Phase cemeteries. This would appear to support the suggestion that, at least in death, there were fewer hierarchical differences.

Appendix 1 Methodologies

Contextual

As part of the process of structural analysis, contexts that are closely related both stratigraphically and processually were assigned to a 'sub-group' (SG). Sub-groups represent the archaeological evidence for a distinct event or activity and form the basic unit of interpretation. A 'group' comprises an aggregation of related sub-groups, defining an interpretative entity (for example a group of four post holes forming a structure). Sub-groups and groups were then assigned to phases of activity.

For the purposes of this publication the graves within the Anglo-Saxon cemetery are presented and discussed by sub-group number. All other contextual entities are presented by group number within the relevant phase discussion.

Ceramics

The pottery has been recorded by fabric and, in the absence of a ceramic type series for Cambridgeshire, has been coded according to the Bedfordshire Ceramic Type Series. Previously published fabric types are not fully described here. Units of quantification are vessel and sherd count, and weight in grams.

Flint

The flint from the site was recorded by context and by broad and narrow term. Numbers of complete, edge damaged, patinated, cortical and burnt pieces were noted. Counts and weight were recorded by narrow term and comments were made as necessary. Total numbers of flints, by broad term, were assessed for each phase, with narrow terms being considered where appropriate (eg for specific core or tool types). The flint was also considered by phase in relation to excavated features.

Non-ceramic artefacts

The non-ceramic artefacts were identified by broad and narrow term and assigned to functional categories. For the purposes of this publication the artefacts deriving from the cemetery deposits are grouped into four main categories – personal adornment and costume, tools and personal equipment, vessels and weaponry. Each of these categories is internally subdivided, by broad term.

Human Remains

Recording methods used are primarily those of Cho *et al.* (1996), Iscan & Kennedy (1994), Stewart (1979), Steele & Bramblett (1988) and Ubelaker (1989) with other methods referenced as appropriate.

The 'five sexes' classification (F, ?F, ?, ?M, M) was used in recording. For ease of description and analysis of the material, this is then reduced to 'female', 'male' and 'sex not determined', a procedure justified by the concordance between sexing from the skeletal remains and grave goods and experience with other local cemeteries (Duhig 1998).

Subadult ages are defined as: foetal/neonate, up to one month after birth; infant, one month to one year of age; child, one year to puberty at a notional 13 years; adolescent, puberty to skeletal adulthood at a notional 18 years (when growth ceases due to fusion of long-bone epiphyses). Adults are dealt with in two ways: firstly, age ranges and their mean points. All possible methods (eg pubic symphysis, sternal rib end, auricular area, dental attrition) were applied to each skeleton and the most reasonable estimate made from them. In some cases only one or two methods could be applied, due to damage to the relevant skeletal areas, so the ranges presented are disparate because some methods have wider or higher-extending ranges than others. For example, use of the pubic symphysis provides six ranges which are very wide and overlapping but extend upwards to 87 years of age, while by contrast the Brothwell dental-attrition system has four mutually-exclusive bands with the highest reaching only as 'over 45'. For this reason, researchers wishing to examine the age determination are directed to the original record sheets.

The second way of dealing with adult ages is the four age bands, equating to Brothwell's system of 17–25 years ('adult 1'), 25–35 years ('adult 2'), 35–45 years ('adult 3') and over 45 years ('adult 4') (Brothwell 1981). Individuals were placed according to the mean point of their age range.

Statures are calculated from the regression formulae of Trotter & Gleser (1952), using combined femur and tibia measurements when possible. The plus/minus ranges on the final stature of these are therefore 2.99cm for males and 3.55cm for females. Single leg bones were used if femur and tibia were not both present, and these have larger errors, but no upper limb bones were used due to the wide plus/minus ranges.

Description and diagnosis of pathology is based mainly on Iscan & Kennedy (1984), Ortner & Putschar (1985) and Steinbock (1976). Congenital and developmental defects of the axial skeleton are as ordered by Barnes (1994) and Hauser & De Stefano (1989). Each pathological or similar change is presented in tabular form, and diagnosis and significance are discussed in the main text.

Animal Bone

Due to the small size of the identified assemblage (only 203 fragments could be identified to species), the only method used to quantify species was a basic fragment count. Associated bones were counted as representing one animal. The age at death of the assemblage was calculated, where possible, on the basis of epiphyseal fusion (Silver 1969), and tooth wear (Grant 1982). Measurements were taken using standards set by von den Driesch (1977). Due to the anatomical similarities between sheep and goat bones (Prummel and Frisch 1986), bones of this type were assigned to the category 'sheep / goat', unless a definite identification could be made.

Appendix 2: Pottery Type Description

Anna M Slowikowski

Introduction

The pottery assemblage consists of 715 sherds, weighing 6320g. Most of the sherds came from individual vessels, although 11 vessels did comprise up to 59 sherds, weighing over 5g each. These are mainly associated with burials although not all are grave goods. Assemblage dates range from the Bronze Age to the Saxon period. The pre-Saxon pottery is only summarised here. The exception to this is the early prehistoric pottery, which is illustrated and described.

Early prehistoric (Figure 3)

All the early prehistoric pottery occurs in one fabric, a poorly fired limestone-tempered type, with some differences in the coarseness and colour. It is most often a coarse, rough fabric, buff-grey in colour with a grey core. Sub-rounded or rounded white limestone inclusions are common but poorly sorted. They vary in size from 0.2–3.0mm, although some fragments may be as large as 5.0mm. Less common inclusions are flint and clear, rounded quartz, with mean sizes of approximately 1.5mm and 1.0mm respectively.

Vessels which are identified as possible collared urns, or sherds which are likely to be collared urns, are coded X10. Other sherds are coded X01. Most of the early prehistoric pottery was found in the fill of pit G13. Decoration took the form of incised arcs on the body and incised herringbone motif on the rims of the bowl-shaped vessels (Figure 3.3–4), or twisted cord on the collar and rim of the collared urns (Figure 3.1–2).

Although collared urns are often found with cremations (Gibson and Woods 1990, 64), no cremated remains were recovered from G13. In domestic contexts, collared urns were probably used as storage vessels, the collar enabling a cloth or skin to be securely fastened (Longworth 1984, 6). The convex collar, simple rim and cord decoration suggest that at least Figure 3.1 may come early in the collared urn sequence (Longworth 1984, 21). Far less of the profile of Figure 3.2 survives although the sherds are harder fired. Faint elongated marks on some of the body sherds of this vessel may be decoration similar to crowsfeet impressions often found on late Neolithic Fengate pottery. However, these marks occur on only two of the body sherds and may be naturally occurring seed impressions or just accidental finger-nail impressions made in the course of manufacture.

Only the rims of the two bowl-shaped vessels were found; they may be parts of collars, but not enough survives to determine their forms. The herringbone incisions are in keeping with both the collared urn and the earlier Fengate traditions. The incised arcs, however, fit neither style. If the collared urns have been identified correctly, this suggests an early Bronze Age date for the G13 deposit, despite the close affinities of the decoration to the late Neolithic Fengate style.

Later prehistoric

The majority of sherds occur in a fine flint-tempered fabric, with smaller quantities of coarser flint-tempered ware. This temper is characteristic of the late Bronze Age/early Iron Age in the region. Coarse shelly wares are a significant component of assemblages of this date in Bedfordshire, Northamptonshire and Huntingdonshire, but somewhat less common in Cambridgeshire. At Melbourn they comprise only 11.17% of the assemblage. Sandy and calcareous fabrics are a minor part of the assemblage (Table 26).

Most of the vessels could not be allocated to form. Two small rims, however, each in F01A and B, suggest the presence of jars. The fragment of a carination comes from a carinated jar in fabric F01B, and one substantial vessel in the same fabric can be identified as a round-shouldered jar. Decoration is limited to single examples of finger-tipping on the rim, finger-nail impressions on the shoulder, horizontal incised lines or lines of finger pinching, the last two both on body sherds. Despite the limited forms and decorative motifs, a parallel can be suggested within Knight's group 1 assemblages (Knight 1984, 12). These assemblages have been dated to *c.*8th century BC, although recent research suggests a possible date as early as the 10th century BC (Knight 2002, 126–131).

Late Iron Age/Roman

The late Iron Age and Roman pottery occurs as single residual sherds in the fills of phase 3 features, particularly the graves The types and quantities present are listed in Table 27.

Saxon

Five different fabric types were recognised, although only type A26 was found in quantity. Totals of vessels, sherds and weight in grams are in brackets.

A01 Organic-tempered ware (4:21:61)
Organic temper included chaff and chopped straw or grass. Recent research backed by ethnographic parallels suggests that a source for this tempering may have been dung (Gaimster 1986). In the south and midlands, it reached its peak of popularity in the 7th century and went out of use by the mid-8th century (Hamerow *et al* 1994, 15). The presence of chaff in at least one of the vessels suggests autumn manufacture of pottery.

A26 Micaceous (25:177:3878)
(Figure 6, SG64, no. 1; Figure 12, SG74, no. 4; Figure 19, SG89, no. 29; Figure 22, SG103, no. 1)
Micaceous surfaces, especially where burnished, appear very smooth and glistening. Other inclusions are quartz and occasional black voids, visible where organic matter has burnt out. This is the commonest type on site, and there is some variation in the

Table 26. Later prehistoric fabric types

Fabric type	Description	Sherds	Weight (g)	% of later prehistoric wares (sherds)
F01A	Flint tempered (coarse)	10	81	5.59
F01B	Flint tempered (fine)	137	552	76.54
F16	Coarse shelly	20	65	11.17
F20	Calcareous (limestone?)	9	28	5.02
F29	Coarse sandy	3	7	1.68
TOTAL		179	733	100.00

Table 27. Later Iron Age and Roman pottery types

Fabric type	Description	Sherds	Weight (g)
F06B	Grog tempered (medium)	10	65
F06C	Grog tempered (coarse)	3	30
F07	Shelly	2	6
F09	Grog and sand	1	2
R	Unspecified Roman	12	43
R01	Samian	1	1
R03A	Verulamium region whiteware	2	15
R03C	Whiteware	2	3
R05A	Orange sandy	5	26
R06B	Greyware (coarse)	9	50
R06C	Greyware (fine)	14	84
R06D	Greyware (micaceous)	5	20
R07B	Black sandy	3	15
R10B	Buff gritty	2	8
R12B	Nene valley colour coat	2	22
R13	Shelly	1	11
R14	Red brown	3	26

proportions of the inclusions, the fineness of the fabric and the smoothness of the surfaces. Broadly this fabric divides into a coarse and a fine version, although there are some sherds which could be either. It is a fabric, which is not unusual in this part of Cambridgeshire (P Spoerry pers comm). All vessels are plain, although surfaces are well smoothed and frequently burnished. One bowl has signs of knife-trimming around the lower body (Figure 22, SG103, no. 1). Included among the forms are small globular bowls with upright rims and tall narrow-necked jars. A close parallel in form for the tall necked jar (Figure 12, SG74, no. 4) comes from the cemetery of Chamberlain's Barn, south Beds (Hyslop 1963, fig. 8), where it is dated to the 7th century. Myres (1977, fig. 56, no. 2905) has published a comparable complete example from Shudy Camps, Cambs, of the same date.

A distinctive feature of many of the Saxon vessels is the presence of a heavy internal black residue. The external surfaces are clean. This has been noted on other Saxon vessels, both from cemeteries and domestic settlements, eg Elsham, north Lincolnshire and Cleatham, south Humberside (K Leahy pers comm) and Wharram Percy, north Yorkshire (Slowikowski 1992, 37). A use for these vessels cannot be positively determined although it is likely that they were not purpose made as grave goods. They all appear to be wide mouthed jars or bowls, and may have been used as lamps or for burning herbs or other substances. Despite the absence of external sooting, their use as cooking pots cannot be discounted, as their use within the embers of a hearth would result in very little soot settling on the surface. The complete vessel (Fig. 12, SG74, no. 4) has no internal residue. This may be due to its form, the narrow neck being more suitable for liquid bearing vessels.

A32 Red quartz (1:6:73)
This fabric is characterised by the rounded, red quartz, which is abundant and densely packed. Some rare clear quartz is also present, as are grains of red and black iron ore. A single vessel was found, part of an upright-lugged jar. This is a characteristic fabric, with rare occurrences, usually as single examples, in Saxon contexts in mid-Bedfordshire, such as Salford (Slowikowski forthcoming) and Stewartby (J Wells pers comm).

A19 Sand and organic (6:19:112)
(Figure 5, SG63, no. 1)
A fairly smooth fabric, with quartz and coarse organic matter and/or frequent elongated voids where

organic matter has burnt out, visible on surfaces and in breaks. Possibly associated with type A01. A single example of a stamped sherd in this fabric was found in the fill of grave SG63. It is a circular grid stamp, 10x10mm in size, recorded in the Anglo-Saxon Stamp Archive as MEL-376/1: stamp type A 3aiv.

Diana Briscoe (Anglo-Saxon Stamp Archive) writes:

'The A 3aiv stamps form a large section of the 'A3' group, which describes all circular grid stamps. Over 120 stamps are recorded, thus making it a common stamp. There are 40 examples in the Archive that fall within the size range of 9x9mm to 11x11mm. The bulk of these come from East Anglia, but there are also examples from as far afield as North Yorkshire, Oxfordshire and Sussex. There is nothing that gives the stamp a particular identifying feature and therefore definite parallels to other sites cannot be given. The nearest stamp-producing sites are at Royston, Barrington, Hauxford, Haslingfield and Cambridge, Linton Heath. Interestingly, none of them has produced an A 3aiv stamp.'

A30 Sandstone and mica (1:9:93)

Hard, reduced fabric, with distinct conglomerates of quartz, 0.5–2.0mm, derived from sandstone. Loose grains, approx. 0.5mm, are scattered densely throughout the fabric. Mica is rare in the break but clearly visible on the surface as fine silver flakes.

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A medieval and post-medieval street frontage: Investigations at Forehill, Ely

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with contributions by: Anthony Baggs, Ian Carlisle, Sandra Garside-Neville, David Hall, Lorraine Higbee, Andrew K Jones, Quita Mould, Maisie Taylor and Chris Stevens

Archaeological remains of the medieval and post-medieval street frontage on the north side of Forehill, Ely contribute to the study of urban development in the medieval period. Excavations revealed a deeply stratified building sequence spanning the 12th to the 19th century, overlying earlier roadside ditches. The focus of this paper concerns the building sequence and its relationship to urban development. Aspects of the origins of earliest settlement, the nature of urban fabric and the transition from medieval to post-medieval society are reflected in structural evidence. Documentary evidence has been incorporated into the study of tenement layout, occupation and use, while structural, artefactual and environmental evidence articulates with the general development of the medieval city, in terms of economic exploitation and aspects of status.

In 1995, following evaluations in 1993 and 1994, Cambridge Archaeological Unit excavated a large part of a medieval and post-medieval street frontage along Forehill in Ely, part of a scheme of re-development. The site is located on the southeast side of the city to the east of the cathedral on the northern side of Forehill, which runs from the Market Place to the river Great Ouse. The topography of the site sloped downwards from northwest to southeast. Although a number of small excavations had been undertaken in Ely prior to 1995 the Forehill site represented the first major excavation. Since then several excavations have taken place, the most notable being of 9th century, medieval and post-medieval activity at Jewson's Yard on Broad Street (Alexander 2002) and of Middle and Late Saxon activity at West Fen Road on the western edge of the city (Mortimer 2000; Regan 2001).

The name Ely (*elige*) is first recorded by Bede in the 8th century when it is used as a regional name. St Etheldreda refounded a religious community previously based elsewhere, presumably close to the site of Ely Cathedral, in *c.*673. It was subsequently destroyed by the Danes in 870, and refounded in *c.*970 as a Benedictine institution. The *Domesday* survey of 1086 records that the abbey's manor of Ely was a rural community with 19 ploughs, as well as land for meadow, pasture, a vineyard and fisheries. Henry I created a new bishopric in Ely in 1108 and the abbey church became a cathedral, resulting in an expansion of the town at this time. The post-conquest cathedral appears to have instigated diversion of the Ouse to its present position, and subsequent development of the riverfront. Forehill evolved as the main thoroughfare between hilltop and river, with dense settlement from the 12th century reflecting the importance of both Forehill and its associated wharves. Ely Priory was dissolved in the 1530s, and the economic structure of the town inevitably changed.

An arbitration and survey of 1416–17 describes the properties in this part of Ely and it is also covered by various maps (John Speed 1610, Sir Jonas Moore 1685, tithe map 1843, Charles Bidwell 1851, OS 1885 onwards). Photographs of this frontage survive from the early 20th century although by the end of the century most it had been demolished save one building: no. 47 (Fig. 1). Excavation focused on the area immediately behind this public façade, on the private, inside spaces of structures and parts of their backyards which, in the earliest cases, date back to the 13th century (Fig. 2). This project marked the first major archaeological investigation in Ely, although many smaller excavations had taken place (eg Robinson 1994), and for the first time enables an authoritative discussion of such issues.

The area under investigation (TL 545802) lay at the angle formed by Forehill and Lisle Lane, due east of the cathedral (Fig. 3). The site slopes from northwest to southeast, on a solid geology of Lower Greensand overlying Kimmeridge Clay (in this area a pale very calcareous and impermeable mudstone). The medieval fen edge of the Isle of Ely runs immediately to the south of the area, broadly marked by the river Great Ouse. Preservation of archaeological remains of the street frontage is partly due to the corporate aspirations of Watney Mann who bought up the brewery of Cutlack, Harlock and Hall at Forehill in 1967, and closed it down. Thus the process of rebuilding that threatened the integrity of underlying archaeological remains was halted. Interest in the archaeological potential of the site was initially generated by survival of timber structural elements within the standing building at no. 47, Forehill, provisionally dated to the 14th century.

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Figure 1. *Forehill c. 1912 (no. 47 is on the extreme right of the photo)*

Figure 2. *View of no. 47, with evaluation trench*

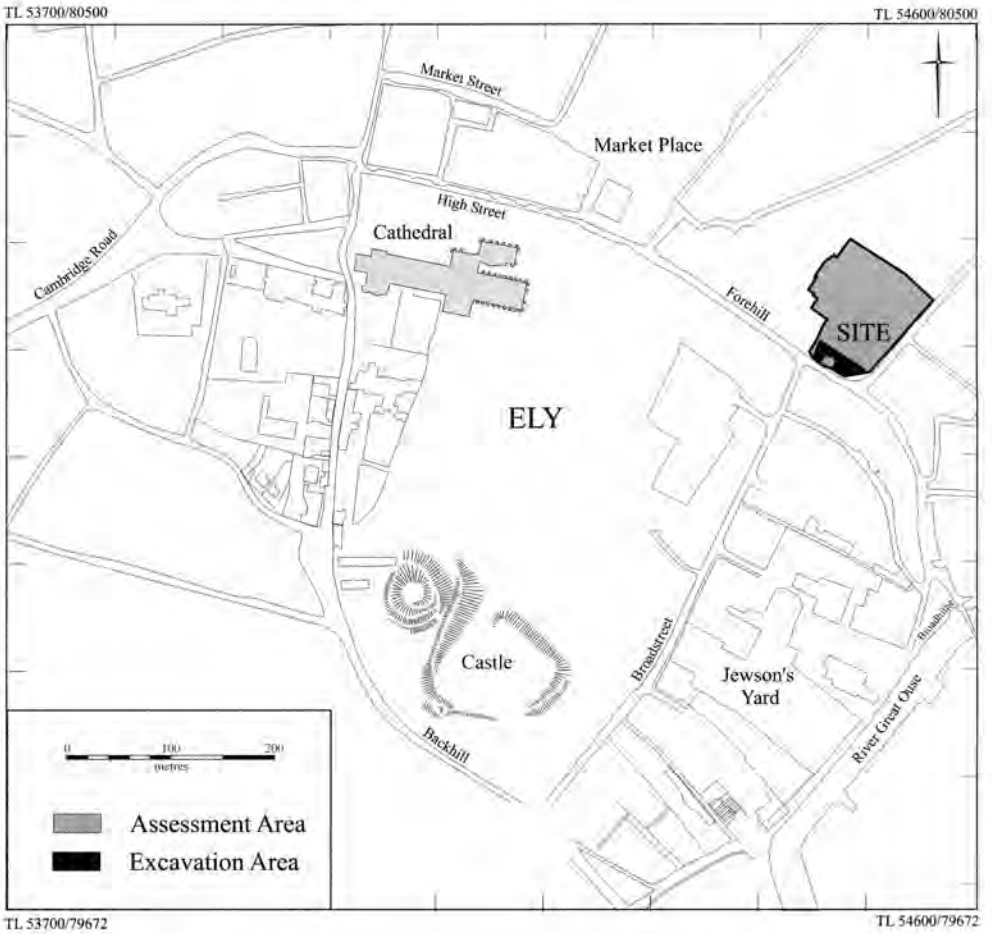


Figure 3. *Site Location*

A two stage archaeological evaluation of the vacant land behind no. 47 was undertaken in 1993 and 1994 (Wait, 1993, Butler, 1994). The first stage indicated that where the major brewery buildings had been constructed, the deep-cut basements had destroyed archaeological levels, but in the brewery entrance and courtyard area surrounding the building at no. 47, there was good survival of stratified deposits to a minimum depth of 1.20m. A sequence of pre-19th century structural evidence was identified, fronting Forehill. The earliest pottery retrieved dated to the 14th century, and local pottery production was indicated by the recovery of a waster and a sagger, dated to the 14th/15th century. The second stage of evaluation investigated a small area of surviving archaeology between the brewery basements. The results indicated that occupation diminished away from the street frontage and that the northern part of the site was in agricultural use in the medieval period, superseded by enclosure of the area as a back plot or garden as depicted on John Speed's map of 1610. Based on the results of both evaluations, the County Archaeology office recommended excavation of the street frontage area, if development was to proceed.

The 1995 excavations at the street frontage revealed over 3m of stratigraphy between the natural clays and the 20th century demolition levels (eg see Fig. 5). The impermeable qualities of the natural clays ensured that damp living conditions prevailed throughout the period of occupation. Various strategies were employed by those who lived there, including adaptation of construction techniques to counteract the ground conditions, but the wet environment was not without its benefits for the excavation, providing ideal conditions for preservation of organic material. Environmental samples from the early roadside drainage ditches, and from the floor levels within the early structures provided a wealth of information on local habitat, diet and the exploitation of resources. Damp conditions also preserved a series of unusual deposits, which were subjected to micromorphological analysis and interpreted as an indication of raised boarded floors. The interpretation is innovative but appears to fit with other structural evidence, and is fully discussed within this report. The excavated sequence was rich in artefactual material, particularly metalwork. Although this provided considerable information on industry and domestic activity, the degree of residuality and a lack of focus in distribution meant specific attribution of activities to properties was only achieved in a few cases. However, the substantial pottery assemblage from Forehill has made a unique contribution to the establishment of a regional pottery sequence, and this will be published

separately (Hall forthcoming a).

Ely is rich in documented material (eg Taylor 1973, Owen 1993, Robinson 1994), but additional research was however undertaken by Christine Went with the aim of establishing a documented sequence of tenement occupation to augment archaeological evidence. This research concentrated in particular on the period of the 1416 survey from which it was possible to obtain a snapshot of tenement ownership and layout. The full report on the documentary evidence can be found in the archive. It will be summarised and referenced here in relevant sections.

The building sequence

In order to provide a more readable narrative within the limits of a paper, it has been necessary to omit a detailed justification of the dating arguments or in-depth discussion of the complex stratigraphic sequence, but this detail is available in the site archive. However a more detailed discussion of the building materials and methods follows the presentation of this basic sequence. Based on stratigraphic evidence, the site sequence has been divided into five main periods (I–V), which will form the framework of this discussion, although within each period are smaller subdivisions (phases 1–24). Uniquely, Period I has two larger subdivisions, Ia and Ib marking the transition to the first buildings on the site. The full sequence is shown in the matrix (Fig. 4) and plans (Fig. 6–11).

In each period the building sequence is described by property, within archaeologically defined property boundaries. Each property is denoted by a letter (A–K, P). Buildings and rebuilds of structures within properties are given consecutive numbers (eg A1 is replaced by A2 etc.) and rooms within buildings, where they can be defined, are identified by small Roman numerals (eg C1 ii). Rooms are defined only when two or more edges to the room can be identified in plan. Some of the properties are divided by alley ways, which are referred to by letters L, M and N. Alley way N was numbered N1 and N2 to denote a substantial re-positioning. No tenement building was excavated in its entirety, thus the configuration of the rooms, and their dimensions were not always available, but an attempt has been made to identify basic building forms in each period and Figure 11 shows the interpreted extent of structures for all periods. Context numbers are included in the text thus [1234], whilst features are denoted by the letter F. Specific artefacts are referred to by their catalogue number thus <123> and by numbers assigned on site using the prefix sf.

The earliest excavated evidence post-dating ditches I and II shows the establishment of boundaries and buildings at right angles to the present street frontage, and these alignments are maintained throughout the excavation sequence. Excavated evidence shows that the boundaries between Properties B and E, between F and G, and between J and K are maintained with only minor shifts in position from the 12th century to the 19th century. Correspondingly, the documentary evidence suggests that many of the property divisions detailed in the 1416–17 survey were maintained from the original apportionment of lands when the bishopric was established in the 12th century. As a general statement then, where the full sequence was excavated, major boundaries apparent in the archaeological record appear to be maintained from their inception. They share an alignment, which overlies and ignores the position of the early ditches, and appear to set the pattern of land boundaries until corporate intervention by the brewery in the 19th century. The rigidity and endurance of this pattern moreover suggests legal endorsement and the word 'property' seemed the most convenient term of identification, and has been applied from Period Ib onwards. Evidence from early phases is insufficient to be certain that all areas of the site were within legally defined boundaries at this stage.

Dating evidence for each period is discussed at the end of the relevant section, and while relying primarily on the ceramics, occasional other finds are also referenced.

Due to the unexpected depth and complexity of the sequence, combined with the fact that the earliest deposits lay beneath the depth of disturbance associated with the development, Periods 1a and 1b were not excavated as fully as might be wished. It was possible to characterise early roadside activity and structural evidence but a comprehensive picture of the process of land reclamation could not be achieved.

Period Ia (Phases 1–3): 12th century (Fig. 6)

The earliest evidence of activity recorded was a ditch running parallel to the present road and cutting a buried soil.[1] A later ditch on the same alignment cut the early ditch after it had silted up. These roadside ditches contain early forms of Saxo-Norman wares, and are dated typologically to the early 12th century from the small vessel sizes. The lowest level [1837] has no Ely fabrics (dating from the 12th century), but they occur higher in the ditch fill (Phase 2, 71 sherds, 62 being Saxo-Norman, 6 Ely fabric). Phase 3 (15 sherds) has Saxo-Norman and Ely fabrics, and sherd of an early Lyveden type, dated to the 12th century at Fletton.

Period Ib (Phases 4–6): 13th–14th century (Fig. 7)

Evidence for the earliest building phases was considerably fragmented due to later truncation and was recorded almost exclusively in section. Nevertheless, these sections indicate the division of the area early in the occupation sequence into separate property strips running north from the street frontage, divisions which were to be maintained almost throughout the sequence. Initially it appears as if there were only two properties in this area: A to the west of no. 47, and B to the west of A. Building activity in properties E, F and G followed at a slightly later date. Features and

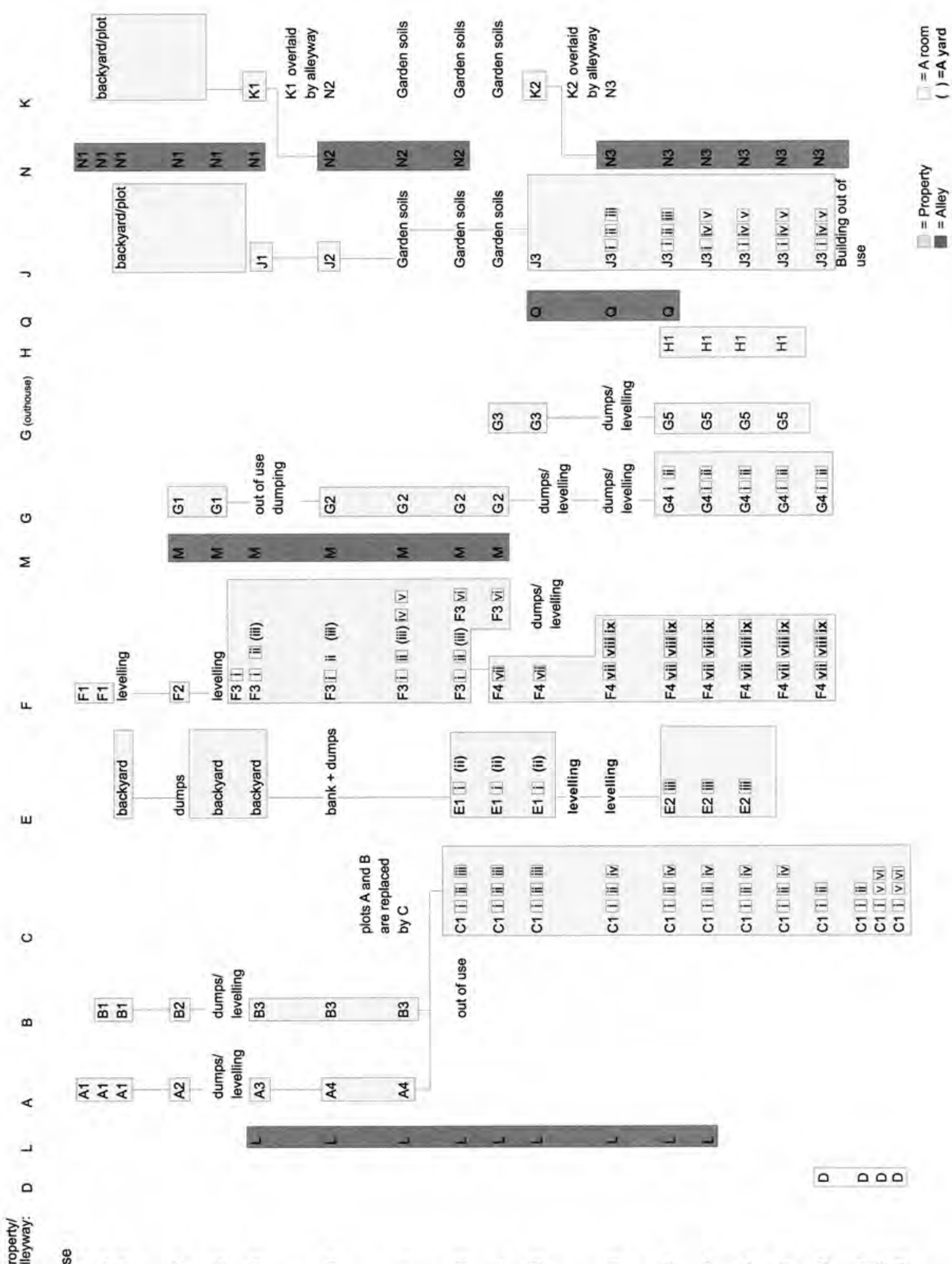


Figure 4. Building Matrix

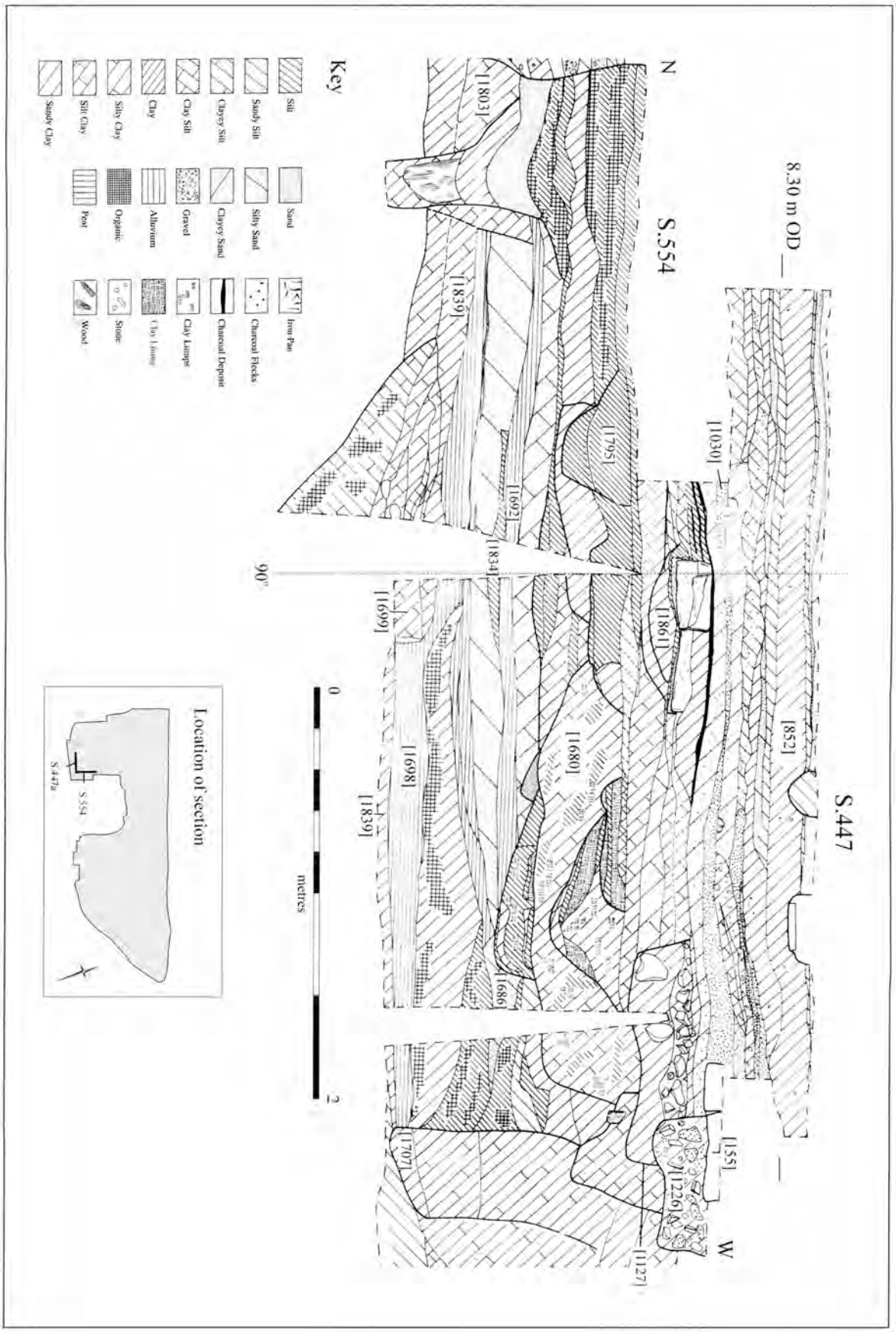


Figure 5. Section

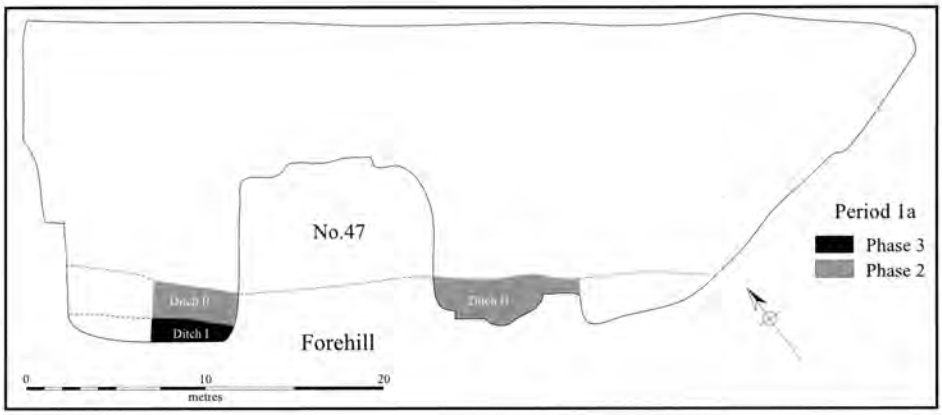


Figure 6. Period 1a Plan

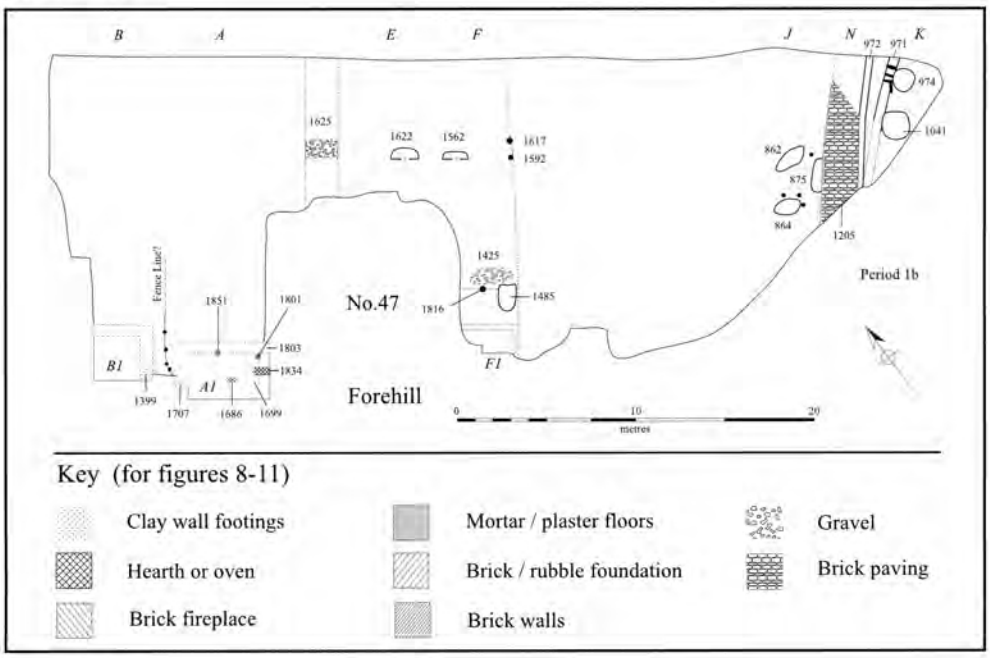


Figure 7. Period Ib Plan

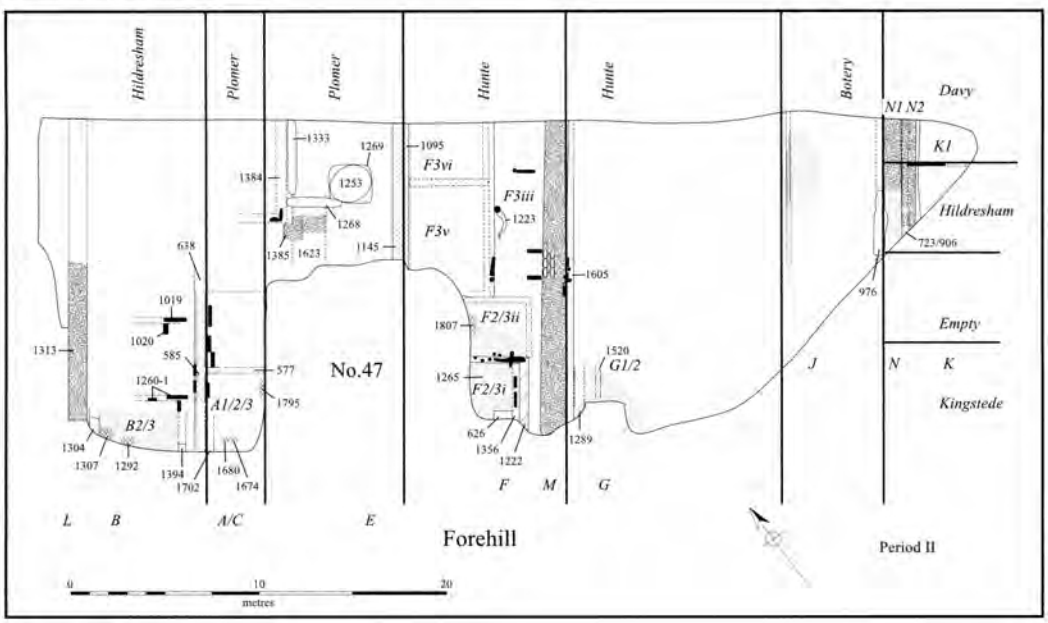


Figure 8. Period II Plan

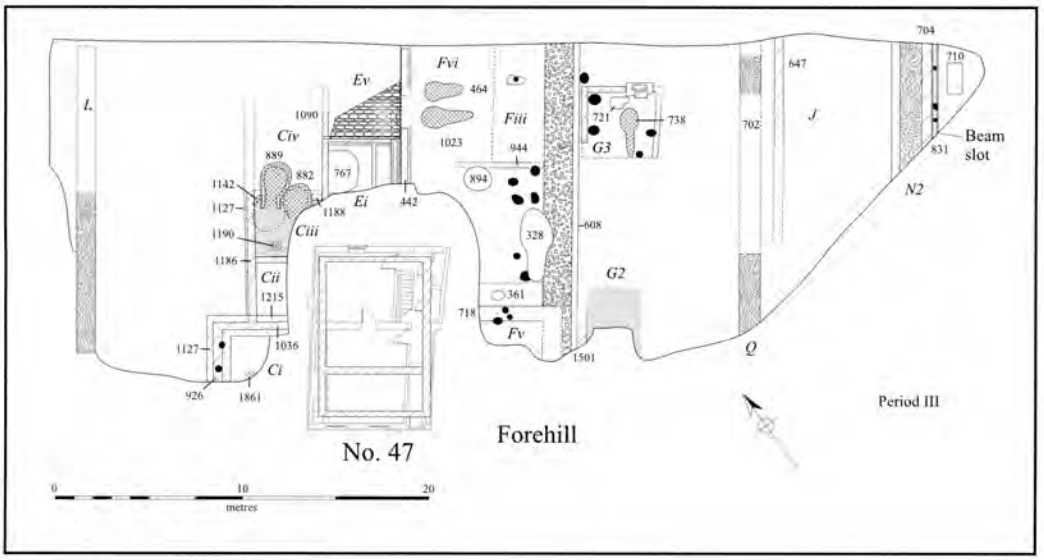


Figure 9. *Period III Plan*

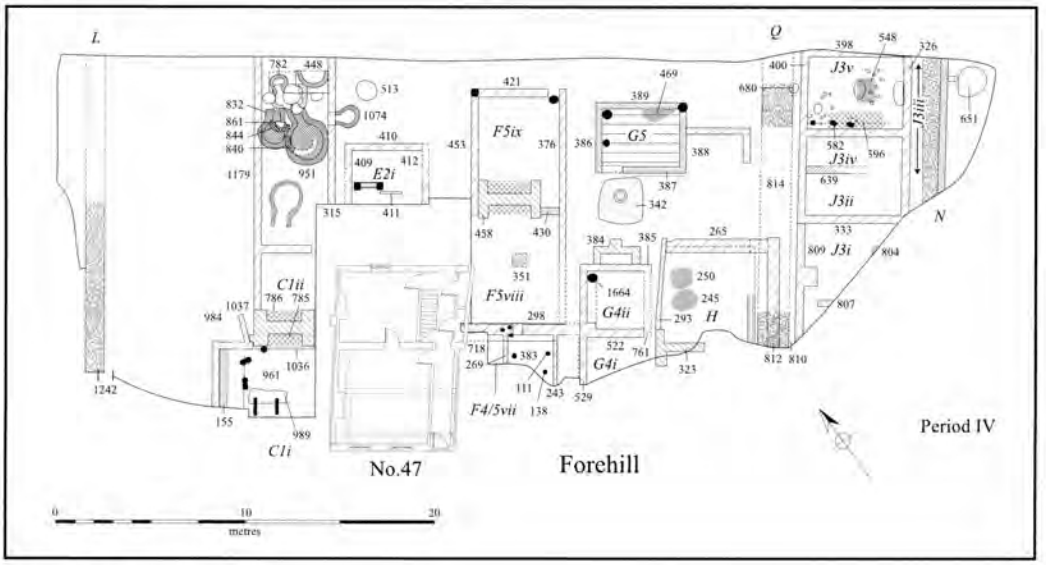


Figure 10. *Period IV Plan*

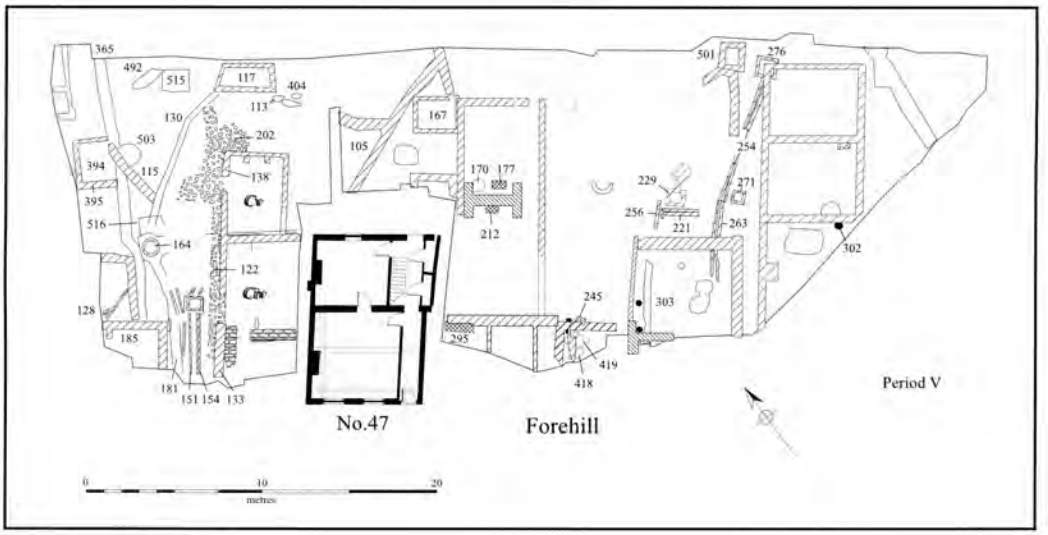


Figure 11. *Period V Plan*

deposits consistent with back-plot activity were found in properties J and K, those in the latter possibly lying within a structure. A cambered walkway (N) divided J from K. The most complete building was A1 (Phase 4), which had evidence for a west, east and north wall, suggesting a single roomed dwelling with a width of 2.70m. This is a narrow width for a medieval building, but falls within the range of comparable examples elsewhere (Clarke and Carter 1977, Schofield 1997). It was probably a timber building constructed on clay wall footings with floorboards over a clay base. It is likely that structures in properties B and F were of a similar character.

These earliest buildings have predominantly Ely fabrics (12th/13th century). Saxo-Norman fabrics are residual. There are small quantities of Lyveden fabric (12th/13th century) and glazed Grimston sherds make their first appearance. Grimston appears at Castle Acre in the late 12th century (Coad and Streeten 1982), and a sherd of imported Picardy fabric found in Phase 4, [904] has a late 12th – early 13th century date. Phase 6 (595 sherds) produced dark sandy fabrics (35 sherds), probably originating in west Norfolk, dated at King's Lynn to the 13th century (Hall forthcoming b). Phase 6 also produced a pewter brooch (<824>) of late 12th – early 13th century date.

Period II (Phases 7–11): 14th – early 15th century (Fig. 8)

By this period the properties have become firmly established, with some showing more than one phase of construction. In properties A and B structural elements of buildings were recorded in plan (A2, B2) superseded by a phase of levelling (or even abandonment), followed by re-establishment of structures (A3, B3). A3 and B3 underwent a series of changes, including a shift to the east of the west wall of A3. A well and pits were recorded in Property E to the west of a gravel alley way or yard between A and E. Occupation also continued at the south end of property F, with possible floorboarded areas, internal room divisions, and the re-establishment of the eastern boundary wall (F3). Alley way M was maintained throughout this period. The northern part of F may have been an unroofed space with access to the alley way, property E and another property beyond the northern limit of excavation. Occupation in property G (G1), was rapidly overlaid by silts and remained unoccupied until the later part of the period, when occupation was resumed (G2). The property division between J and K was re-defined as a wall (N2). Early in the period in J an area of animal stabling was replaced by a mortared surface, indicating a possibly structure (J2), while in K, a structure was defined by a north – south and an east – west wall (K1). In phases 11–13 both properties were covered in garden soils.

Buildings A3–4, F3 and, possibly, K1 could conform to the 'right-angle' type medieval town house plan (Pantin 1962), or the linear plan (Type B in Atkin, Carter and Evans 1985, p.252). This form was suited to narrow tenement holdings in that the building was gable end to the street and additional rooms to the main hall and solar could be added the rear of the structure. A2 and F3 had two rooms apiece, ranged at right angles to the street, but in both buildings the street front was beyond the limit of the site, and the north wall of the back room could not be identified, thus the room lengths were not calculable. Moreover, the east wall to A2 and the west wall to F3 were beyond the excavated area, although the width of the rooms in A2 could be estimated as 4m, assuming the east wall followed the alignment of the boundary between A and E at the north end of the site. Similarly, the west wall to F3 could be aligned with the phase 10 clay sill ([1145], Fig. 8) to the north, giving a room width of approximately 6m. The true form of both buildings remains speculative and the possibility must not be discounted that either F or A could have additional rooms beneath the standing building no. 47. They appear to have been constructed from similar materials to the last phase, ie timber structures on clay foundations.

Sherds from the complex building phases of this period are dominated by Ely wares and also many from Grimston. Dating is provided by the first appearance of Scarborough sherds (in Phase 8) which have a *floruit* of 1200–1350, and Hedingham fabrics, which begin in the 13th century. Phase 9 produced 1540 sherds, dominated by Ely and Grimston fabrics and containing material from Scarborough and Essex. Three stoneware sherds are likely to date from no earlier than the 14th century. A 13th-century lead seal matrix came from [1026]. Phase 10 (216 sherds) had little diagnostic material; Scarborough fabrics are consistent with an early 14th-century date.

Period III (Phases 12–14): Early 15th – early 16th century (Fig. 9)

In this period the western part of the site was subject to a major rebuilding programme. Structures in property B were demolished and levelled and building A was replaced by structure C, a three-roomed, substantial structure which also encroached upon property B to the west. The northern room of C was later altered to accommodate industrial structures (ovens), modified in phase 14. A room with substantial east and west walls was built at the back of property E, with a flagstone yard surface to the north. The yard was connected to a room to the east, in property F, that housed two clay ovens. Towards the end of this phase there were signs that the dwelling area in property F contracted to a single southern room with a newly established north wall. The end of this period was marked by separate, but contemporary measures to raise and level the ground in plots E and F. In the eastern part of the site, there was little major change: a free-standing outhouse was built in property G, a western wall in J was located, and a wall was constructed on the west side of property K, associated with a patch of mortar floor and a pit.

The standing building at Number 47 appears to date from this time and lies at the southern end of E.

Number 47 (Anthony Baggs) (Fig. 2)
The standing building was analysed in 1991 by Anne Holton-Krayenbuhl and the report was incorporated into a reappraisal of the building in 1995 (Baggs 1996). Elements of the surviving building suggest a medieval timber frame with a first floor jetty on the street frontage. The timber roof was supported by a central crown post with four-way bracing of which three braces survive. The crown post roof structure is a feature of the east and southeast (ie lowland) Britain. The rare examples surviving from elsewhere are from medieval buildings of high status. The frontage was formerly divided into three equal bays and may have been used for storage and a shop. There is evidence that the original structure incorporated a further room to the west and may also have extended to the east. A relatively high status for the building is implied. In the earlier analysis of the building, the crown post roof structure was interpreted as 14th century but a 16th century date was suggested in the later report (Baggs 1996). The crown post became rapidly scarce in the early 16th century, but the style of the crown post in the standing building (tall and narrow) suggests a late date as an advanced example of the tendency to narrower and taller posts in the later examples.

The two back rooms to building C1 appear to retain the linear plan of building A, although the wall alignment had shifted, but the front room, with a substantially increased width and solid stone foundations, indicated a new design to the front range, roofed parallel to the street, and possibly already incorporating what was to become no. 47 Forehill. As such, it could be considered to be an L-plan or T-plan (Atkin, Carter and Evans 1985), the L-plan was a characteristic form in 15th century King's Lynn (Parker 1971), but less so in Norwich, where their occurrence was often the result of adaptation of existing structures (Atkin, Carter and Evans 1985). However at Forehill, where the house plans are only partially within the excavated area, the categorisation of building forms is not so simple. The similarity of construction between room E1i, apparently added to the back of property E, and building C1 strongly suggests they were part of the same building. Without the opportunity to excavate within the safety baulk round the standing building at no. 47, it was impossible to establish the relationship between the building sequence in Property E and that in Property F. In phase 10 (period III) E and F appear to share a boundary, but when room E1i was built, a gap of 0.30m was maintained between the east wall of this room and the west wall to room F3vii, although F3vii had a threshold into the yard immediately to the north of E1i. It is possible that during this period, property E extended east into the northern part of F, and that the occupants of E used the ovens. Given the extent of the building behind the street frontage, it seems unlikely that property F was also incorporated into the building complex, unless provision had been made for light to enter the central part of the building complex via a central courtyard or passageway

Shortly after the westerly street front expansion of C1, and the possible amalgamation of E, pressure on living space at the rear of the building appeared to lessen, and room Ciii was converted to industrial use.

At the end of this period (phase 14) F appeared to undergo a radical contraction to a single, wider room at the street frontage, before additional rooms were added to the north in the following period. The pits and post holes to the rear of this room suggest that the period between demolition and rebuilding at the back of the property was more than a short break, although there is also evidence to suggest that some of the walls to the back rooms erected in phase IV are rebuilds from an earlier phase.

Phase 12, which had 207 sherds, is still dominated by Ely and Grimston fabrics. Dating is provided by Essex (Mill Green) and Scarborough sherds, suggesting a 14th-century date. Phase 13 (283 sherds) has Essex fabrics (including a sgraffito sherd) and one stoneware. Early stonewares (Siegburg and Langewehe) date from the 15th century. A token dated 1200–1425 (from [1036]) is consistent with an early 15th century date for the beginning of this phase. Phase 14 has less proportion of Ely (210 out of 334 sherds) and more Essex material than previously. Stonewares and Dutch Glazed Red Earthenware confirm a late 14th/ early 15th century date, concordant with metalwork from a purse of the type used 1480–1520 (from [632]).

Period IV (Phases 15–19): Early 16th–17th century (Fig. 10)

This period sees increased evidence of infilling in backspaces, especially toward the eastern side of the site in properties G and J. The north end of C was enclosed and new industrial structures were erected, two with burning inside. Industrial activity within the site and beyond the northern limit of excavation continued until the end of this period. A significant building development was construction of new fireplaces with wall-fast chimneys in properties C, F and G. A room with stone foundations was built in E, and in F, two new rooms were constructed and a small hearth was replaced by a large fireplace serving both rooms. At the beginning of the period the outhouse in G was rebuilt with a fireplace, but after a fireplace was constructed in the main building in G the outhouse appeared to have served for storage of lime. The latest phase of alley way between H and J was recorded. Property J was divided into three rooms and the cobbled alley way between J and K was re-gravelled.

Some of buildings in period IV (F, G and K) reflect the national trend of subdivision and extension as a manifestation of population increase and pressure on land, but others (C, E, and H) although subject to rebuilding, adhere to the same layout. Building C appears to have been unaffected throughout the period;

a shift of the industrial focus to the north may be a response to new fire precautions, rather than pressure on living space. We cannot speculate about E, apart from observing that there is no apparent expansion or subdivision at the back of the property (which may be an amalgamation of C and E). In property H a single roomed building replaced traces (unexcavated) of an earlier structure.

Amongst the buildings that were extended was building F, which acquired two rear rooms in a linear plan, but with longer dimensions than the period II rooms, both rooms measuring approximately 5.80m N-S by 5m E-W. Building G was extended with a second room to the rear and the outhouse was reconstructed, possibly with a second storey.

Property J underwent a series of subdivisions and rearrangements of internal space, the layout at the beginning of the period was of two largish rooms (room Jiii had an east-west width of 5.40m and a length of at least 6m) flanking a smaller room or east-west corridor. By the end of the period the space was divided into three rooms of roughly equal dimensions (5m x 4m), with the suggestion of a fourth room towards the street.

Phase 15 (240 sherds) still has Ely fabrics, but stonewares and Essex fabrics occur in greater quantity. The presence of Ely Babylon sherds and Bourne D appearing for the first time put the date late in the 15th century. Ely fabrics fall to less than half in Phase 16 (347 out of 705), and many sherds may be residual. Glazed Red Earthenwares, Essex red wares, Bourne D, Babylon and stonewares occur in quantity and a late 15th century date is likely. From the same Phase came a silver-gilt ring, dated to the second half of the 15th century [470]. Phase 17 (283 sherds) has a similar composition and Phase 18 has less than a third of Ely fabrics with Essex types more than a third. The presence of Surrey fabrics (Tudor Green), stonewares and Dutch Glazed Red Earthenwares indicate a date in the late 15th or early 16th century.

Period V (Phases 20–24) 17th/18th–19th century (Fig. 11)

During this period new plumbing and sewage systems were installed in all properties. Most drains were constructed of brick with a flat base and an arched roof. In Areas C/D a pre-existing cess pit was reused as a soakaway. The fireplace in Property C was repaired. The industrial zone to the north went out of use, and a cobbled yard was established. Towards the end of this period, the back rooms to C were rebuilt over part of the yard surface, now no longer in use. Building D was constructed at the west end of the site. The firestack in F was converted to smaller hearths and a second fireplace was established at the south end of the building. Property G was used as a smithy. The little evidence available from later phases suggests that the building forms established in the previous period were maintained without substantial change until demolition in the 19th or 20th century.

Phase 20 has a small group (90 sherds) with very few Ely fabrics and containing Glazed Red Earthenwares, late Essex reds, Babylon and Surrey sherds, dating to the 16th century. Phase 21 is dominated by Glazed Red Earthenwares of likely 16th-century date, and Phase 22 is similar, but dating from the 17th century. Phase 23 has some residual contexts and material from the 17th century and later.

Review of building materials and construction

Interpretation of buildings from the archaeological context is often hampered by the most common constraint of the archaeological record: that buildings rarely survive above foundation level. Moreover in an urban context additional factors are likely to adversely affect the survival of evidence. In constricted conditions, the rebuilding of a house does, of necessity, require the demolition of all, or part, of the previous structure. Recycling of building materials is also a common contributor to destruction of earlier building remains. As building techniques improve, more durable constructions and materials are introduced, inflicting considerably more damage to the earlier surviving evidence than straightforward replacement of the earlier structure. Thus, earlier remains suffer the cumulative effects of later buildings.

All these conditions apply to the Forehill site with the additional problem of interpreting the earliest structural evidence from sections. However despite these caveats some broad trends can be identified both in use of materials and construction techniques.

Wall construction

At Forehill there is little evidence for earth-fast posts as a major construction technique (but see building A1 in phase 4 during the 13th century), although found occasionally as components of internal divisions and additional wall supports. This is consistent with evidence from other medieval sites, where post hole buildings are replaced by other forms of building at the close of the 13th century (Clarke and Carter 1977, Atkin, Carter and Evans 1985). The most prevalent form of wall construction in the earlier phases is a sill or plinth to support a timber frame superstructure. Timbers in beamslots are observed less and are mostly confined in their use to thresholds and some internal walls. Timber for internal walls occasionally appears to have been laid straight onto the floor surface, and this usage undoubtedly contributes to a lack of surviving evidence for the minor, non-load-bearing walls.

The earlier sills or plinths were clay banks, placed straight on the underlying levels, or in a shallow gully,[2] thus where truncation has occurred the sill will resemble a shallow clay-filled beamslot. The sill width averaged 0.30m but could be up to 0.70 wide or as narrow as 0.28m, the width of some sills had been variously affected by truncation, or the flattening effect of overlying deposits. The use of the plinth must be, in part, a response to prevailing wet ground conditions,

for which there is considerable evidence, both archaeological and documentary (Lee 1850).[3] The contiguous floor-and-wall construction is frequently found in the earlier phases (eg F3 in phase 11 of the early 15th century, rooms iv and v) and would have provided an effective seal against rising damp. An exception to the use of clay at Forehill in the early periods is the bank or sill of clunch supporting the east wall of F8. It is not apparent why subsequent clay sills were built against the west side of the bank rather than reutilising the clunch bank itself, but the clunch would have served well as a supporting buttress.

Evidence for timber superstructures is sparse.[4] Traces of wood survive on the plinths in isolated examples (eg F2 in phase 7, F3i in phase 8 and K1 in phase 9, all of the 14th century), but the majority of surviving wood appears to have been in secondary use, as lining for the alley drain for instance, or as ad hoc support for subsiding walls (Fig. 12). Extensive reuse of timbers was probably the norm on the site and a contributory factor to the lack of surviving *in situ* structural elements.[5] An exception to this appears to be the timbers from properties A and B phase 7 (early 14th century), recorded after overlying deposits had been machined off. The plan suggests traces of internal room divisions and two parallel north – south walls flanking a clay-filled cut, originally interpreted as a clay-filled drain. Taking other structural evidence into consideration, it seems evident that the cut is a truncated clay plinth on which the main wall must have rested, while the flanking timbers may have had a subsidiary role, supporting the planks of a raised floor (discussed further below).

Norwich evidence (Alms Lane) identifies a clear cut-off point for clay walls *c.*1500; this sudden demise may have been prompted by the two disastrous fires of 1507, but was also a reflection of changing building styles (Atkin 1991). This broadly concurs with the Forehill sequence, although the transition here is less abrupt: solid rubble filled foundation trenches were introduced in properties C and E in the late 15th century, but there was also a brief *floruit* of beamslot construction *c.*1500 in structures G3 in phase 12 and J3 in phase 14, soon replaced with rubble plinths. The clay walled structures at Norwich were predominantly one or two roomed buildings, with only two examples of evidence for a second storey. Clay walling possibly lacked the load-bearing capacity to support additional storeys, particularly when less flammable roof tiles replaced thatch.

At Ely the majority of the masonry sills or plinths were narrow constructions, between 0.20 and 0.30m wide, built of bricks and brick fragments,[6] in various combinations with brick and tile rubble, flint, flint cobbles and stone,[7] either resting directly on the ground or in a cut no deeper than 5–6 cms. The rebuilding during C and E in phase 12 of the early 15th century, was considerably more substantial, in rooms C1ii and iii the brick and flint rubble plinths stood on foundation trenches 0.50–0.60m wide, 0.20m deep packed with mortar, stones and brick rubble on a base of flint nodules in clay. The foundations to room C1i were a massive 1.20m wide and 0.40m deep, filled with crushed chalk over flint nodules in clay and could have supported a full-height masonry wall, although there is no other evidence to suggest this. In room E1i foundations of compacted mortar were 0.80m wide, 0.35m deep, supporting a limestone and mortar wall 0.4m high. The slot to accommodate a timber baseplate had survived in wall [582], property J in phase 17 of the 17th century. The slot was between 0.13m and 0.16m wide, formed of bricks set on edge.

Analysis of wood samples shows that the majority of identifiable samples were oak; however the superior survival qualities of oak would result in the under representation of other species.[8] All the fragments of

Figure 12. *Detail showing reused timbers for underpinning (Structure F2, Period II). Scale 1m.*

structural timbers were oak. This fits the general rule for timber framed buildings in this period; oak appears to have been the only species used for major structural elements, with other species used for non-structural elements. At King's Lynn alder was recorded for piling, and hazel for wattling (Clark and Carter 1977).

Roofs

It is assumed that most of the medieval buildings on the site were thatched. Great fen sedge would seem to be the most likely material, given its local availability and the lack of evidence for other thatching materials. Great fen sedge was found in charred or unburnt form in environmental samples taken from the 13th/14th deposits (mainly from property F), but in its carbonised form is more likely to represent residues from kindling or fuel (see Stevens, below). Roof tile[9] would have been a more expensive commodity in the early periods, probably reserved for workshops or outhouses where fire precautions were more necessary. Small quantities of roof tile were found in residual 12th to 14th century contexts in Period I, but only in the late 13th and early 14th century backyard deposits of property K in phase 6 was it in great enough quantities to suggest a tiled roof nearby. Considerably more roof tile was found in Period II, occurring in pits and layers in property K in abundance and also in the cultivated soils in J dating to the 14th and early 15th centuries. It is possible that one or both of these properties accommodated a tiled structure, but not necessarily in the excavated area. Tile was also noted in moderate quantities in dumped deposits, possibly transported from elsewhere for ground consolidation in properties A and B and E in phases 9–11 of the late 14th and early 15th centuries, and reused as post packing, and post-pads in property F. It is not until Period III (early 15th to early 16th centuries) that roof tile occurs in sufficient quantities to indicate demolition or collapse of tiled roofs on site. The incidence of tiles in almost all deposits within and without the buildings in the following period (IV) is consistent with widespread adoption of this roofing material from the mid 16th century onwards.

Floors

Indications of floors and hearths were available from most phases of occupation, although traces of internal partitioning, doorways, furniture and evidence for staircases were mostly destroyed by later truncation. The partial excavation of many of the buildings, and the rooms within, impaired analysis of the internal arrangement of features. Clay was commonly used as a floor base throughout the duration of the site, chosen no doubt for its availability and damp proofing qualities. Remnants of mortar surfaces appear from the 14th century, and become the most common form of flooring in the later period, with some cases of mortar applied as a continuous surface to the floors and the inner face of the wall footings.[10] Featuring prominently in the earlier period (I and II) of the 12th to 14th centuries however, were also deposits composed of fine laminae, mostly laid perfectly horizontal and consisting of alternate deposits of silts, or silty clays and organic or ashy material creating a finely striped effect. Although interpreted on site as floor layers, these deposits had caused some puzzlement during excavation. They did not bear the hallmarks of most domestic surfaces, such as compaction, trampling and disturbance or hollows and repairs, although small fragments of ceramic material, bone and even plant fibres were present.

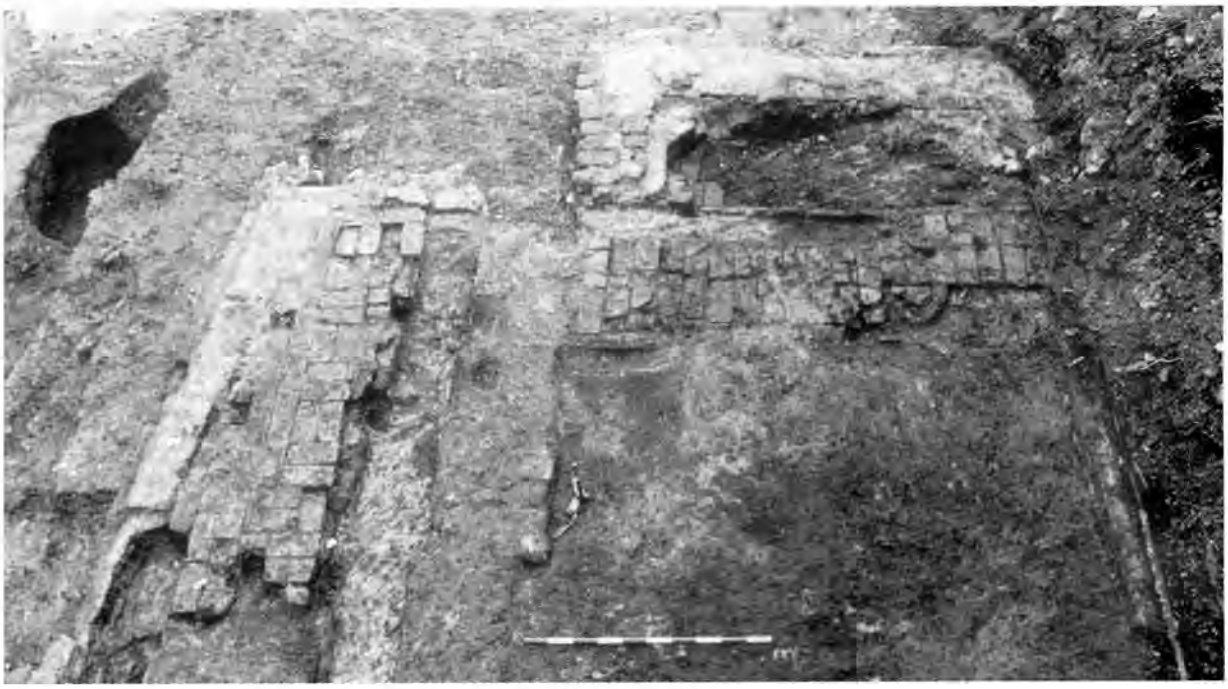


Figure 13. *Back-to-back fireplace (Structure C1, period IV). Scale 2m.*

Micromorphological samples taken from a series of these deposits in property F, confirmed that the fine layers consisted of organic matter, occupation debris and different sediment types that had accumulated in a still, protected environment. Post-depositional compounds such as iron pan, indicative of periodic rise and fall of water levels were also identified. The examination concluded that the sediments were the result of the accumulation of occupation debris in the cavity below raised floorboards in conditions of fluctuating ground water.[11] At Ely the floor board cavity deposits rest on a variety of material. This was often a clay base, laid above preparatory dumps of silty clay and rubble (eg A1 in phase 4 of the 13th century). Thick deposits of silty clay or ash, in between two or more episodes of cavity deposits, suggest the floor boards were temporarily taken up, while measures to mask rotting smells or to raise the level of the floor base were undertaken (F3i in phase 9: [1091], [1008], F3i in phase 10: [979] and [946] of the late 14th and early 15th centuries). The small body of comparative evidence from other sites suggests floorboarding was not a common practise, but a product of unusual environmental conditions – a pragmatic solution to the periodically waterlogged conditions.

Hearths/Ovens

The presence of a hearth in the earliest phase of building (phase 4, 13th century, building A) is inferred by spreads of ash amongst the floor deposits, in the following phase (5, 13th century) the hearth was a clay-lined, flat-bottomed straight edged cut ([1834]). The remainder of early hearths in properties A and B were recorded in section, and appear to be scoops in the ground, lined with clay (A1 in phase 6: [1686], A3 in phase 9: [1680], [1795], B3 in phase 9: [1292] of the late 13th to late 14th centuries). The sections suggest some may have had a sloping side for rake-out but there is no evidence for a superstructure. In contrast, the early 14th century hearth in F in phase 7: [1807] was based

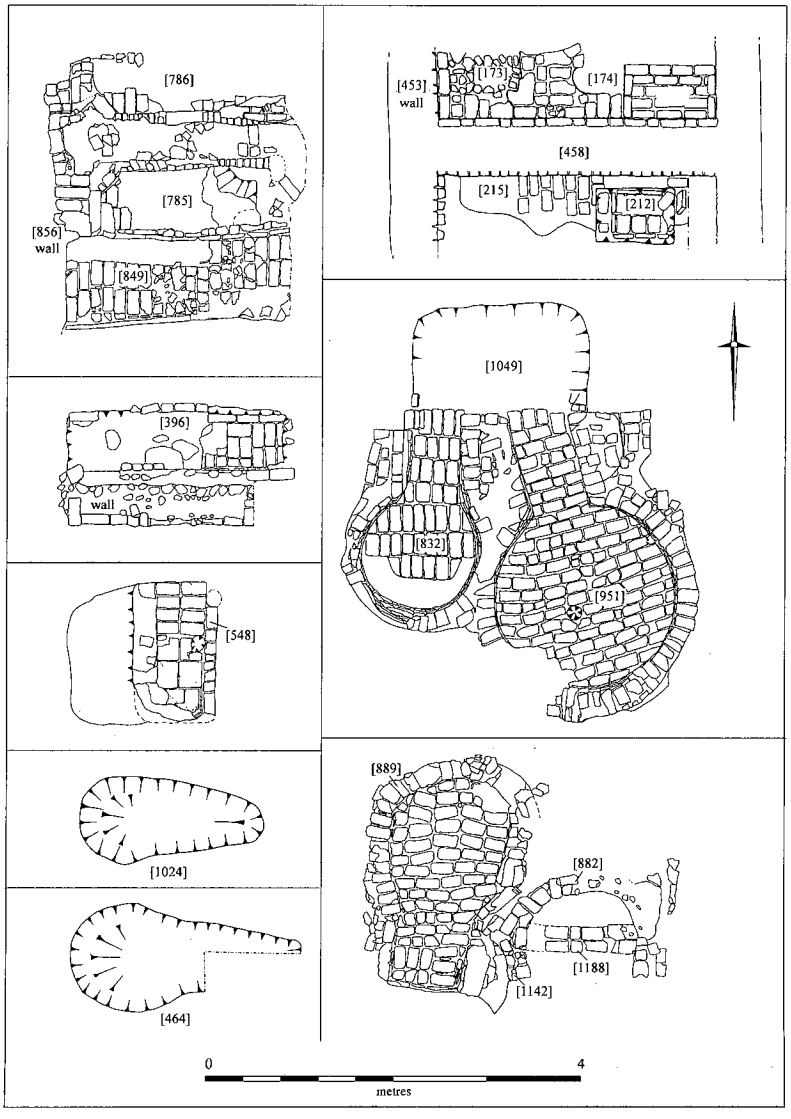


Figure 14. *Hearths/Ovens from various phases*

on a thick layer of crushed chalk, over a 0.20m deep cut filled with clay, and had the surviving remains of a sandstone surround. The presence of hearths within main rooms is unusual in this period (13th –14th century), when hearths were generally found in lean-to's or outhouses, and rooms were presumed to be heated by portable braziers (Atkin, Carter and Evans 1985). It is possible that the scooped hearths at Ely served some industrial function, especially the late 14th or early 15th century hearth from B3 in phase 10, which was 0.90m wide and 0.50m deep and associated with a thick build-up of burnt clay and ash. Two hearths to a room is particularly rare (A3 in phase 9 of the late 14th century: [1680], [1795], and may indicate a room division missing from the section evidence.

The buildings at Forehill show a gradual development from centrally placed hearths to chimney stacks built into a gable or partition wall. A series of changes inspired by pressure of space as well as, no doubt, by fashion, were affecting the internal arrangements of urban housing in this period, but were not necessarily implemented in the same order or with the same outcome. In contemporary urban sites, a trend was developing towards flooring over the hall, traditionally open to the roof, to create a complete first storey room, or suite of rooms. Wall-fast chimney stacks were often part of this development, and if required, allowed the upstairs chambers to be heated. The back-to-back fireplace could serve the hall (or parlour) and an adjacent kitchen, and was often to herald the demise of the separate kitchen outhouse. At Norwich chimney stacks and rubble wall plinths were contemporary developments in the early 16th century, whereas at Forehill rubble walling was replacing other types of construction early in the 15th century, and the wall-fast chimney stack appears to have been a later, and separate development (Fig. 13).

Several stages of the brewing process have been identified at the Marks and Spencer site in King's Lynn (1500) (Clarke and Carter 1977) and Alms Lane, Norwich (*c.* 14th century) (Atkin, Carter and Evans 1985). Clay-lined soaking pits were found at both locations, both containing discarded millstone fragments from the crushing process. There are no equivalent pits at Ely, but some of the unburnt brick structures ([889], [882] and [1142] in property C (see Fig. 9) could have functioned as soaking vats, particularly the keyhole shaped structure [889] with its sealed floor (Fig. 15). This type of structure is known to have been used in the early medieval period for soaking cloth as part of the fulling process (Egan 1991), and is a type of construction which appears to have been put to a variety of uses. At St Martins, Stamford they clearly function as ovens for an unspecified, but possibly industrial purpose (Mahany, Burchard and Simpson 1982).

The identification of grain-roasting ovens at Forehill must remain speculative in the absence of any significant quantities of burnt grain in the environmental record, but a number of external ovens do occur on the site which require some comment. The earliest external ovens E/F in phase 12 of the early 15th century were simple scoops in the ground, similar to the earlier internal hearths, but larger and with flues (Fig. 16). Their function was probably purely domestic but they are similar to the grain-roasting oven at Alms Lane (oven 1479). The later circular brick-built ovens with straight flues [832] and [951] (C1 in phase 16 of the 16th century), were subject to intense heat and can be paralleled to ovens A1 and A2 at King's Lynn; moreover the circular cavity in a rectangular rubble block [448] (C1 in phase 18 of the late 16th or early 17th centuries) at the north end of the site closely resembles Oven (?) (sic) D2 from the same site, which also bore no signs of burning.

Samples taken from the ash at the base of [832] and [951] contained a small amount of grain, but also a variety of other domestic waste. However sedges formed the dominant component, indicative of the fuel source rather than the material processed. In samples taken from the deposits in front of [448], wheat and other cereal grains were present with considerable numbers of free-threshing wheat rachis. The presence of free-threshing wheat rachis in large quantities is indicative of grain processed straight from the sheaf either for brewing or baking, the rachis would supplement the fuel supply (Chris Stevens pers comm). It is evident from the comparative literature that the ovens could be put to a variety of uses as the demand arose (Hilton 1984, p.60), and may have served for cooking, brewing or even boiling or soaking clothes – fragments of a large copper alloy vessel were found in the backfill of structure [889] (<911>).

Figure 15. *Possible soaking vat (Feature [889]). Scale 0.5m.*

Figure 16. *Pair of ovens (Property F, Period III ([464] and [1024]). Scale 2m.*

Figure 17. *Complex of brick ovens (Property C, Periods III–IV). Scale 1m.*

The complex may indicate a small business enterprise, as a laundry, brewery, or bakery possibly providing rented cooking space for those too poor to have the space or resources for their own oven (Fig. 17).

Stairways

Stairways to upper storeys were difficult to identify. The 'L' shaped wall added to G5 had a parallel in building B5ii at Alms Lane, Norwich, where it was interpreted as a staircase (Fig. 18; Atkin, Carter and Evans 1985). The springer arch of the fireplace in G4 could have also supported the staircase, this type of combined construction was observed at Chester, and elsewhere (Schofield 1997). Internally, the staircase could take various forms, and be found almost anywhere within the building, as the early 17th century survey of London properties by Ralph Treswell shows (Schofield 1994). Staircases adjacent to the front entrance would allow access to important rooms such as a first-storey hall, when the ground floor has been given over to industrial activity, commerce or storage. This arrangement is exemplified at The Brooks, Winchester in House I, 1st period (mid 12th century), where a stairway next to the front entrance led to a first-storey hall (Biddle 1964). Both F3i in phase 10 (late 14th or early 15th centuries) and C1i in phase 19 (17th century) had a rectangular cut at the street end of the room, where the foot of a staircase could be situated, and in room C1i the cut contained the possible base of a structure.

External Surfaces

Gravel predominated as the material used for paths and alley ways but cobbles were also utilised. The yard behind E, was a well-made surface of flagstones and tiles in keeping with the high quality rebuilding of properties C and E in Period IV of the early 16th to 17th centuries (Fig. 19).

Discussion of the building sequence

Given that the property boundaries and site layout in general altered very little apart from minor boundary shifts and the amalgamation of A and C in Period III between the early 14th and early 15th centuries, most of the changes relate to construction techniques and floorplans of the structures (Fig. 20). As with other urban sites excavated from this period, building techniques employed recognised general trends, but were also strongly affected by site-specific conditions. Poor drainage and a high water table must have made living conditions damp, but not uninhabitable, influencing the choice of building materials and building techniques employed in the early period. The use of earth-fast posts as a major construction technique was generally in decline in the 13th century, replaced by timber frames, most commonly recognised in the archaeological record by beamslots. The building sequence at Forehill begins in the late 12th century, and earth-fast posts are mainly employed in a subsidiary role, the predominant technique is a timber frame raised above the ground surface on clay plinths, often forming a continuous damp proofing with the clay floor base. The use of a plinth or footings to support the timber frame occurs frequently on medieval urban sites, and often the most readily available materials were used. At Forehill this was the underlying Kimmeridge clay, additionally useful for its impermeable qualities.

Measures to raise the ground level to counteract the problem of rising damp and the generally damp

Figure 18. *Outhouse (Structure G5, Period IV). Scale 2m.*

environment itself, combined to provide rare survival conditions for series of unusual deposits. Interpretation of these finely laminated layers as indicators of a raised boarded floor relies on a conjectural analysis of the micromorphological samples, but appears to fit with the excavated evidence. The use of clay for plinth construction is not unique to Forehill, but the study of its use in an urban medieval context is relatively new and owes a great deal to the analysis of excavated evidence from Norwich (Atkin 1991). It is hoped that the evidence from Forehill will make a significant contribution to this field of study. The interpretation of the laminated deposits is still speculative and would benefit from further analysis of comparable deposits from other sites, but could emerge as an invaluable tool in the interpretation of truncated structural features. More work needs to be done on the correlation of building methods with the environmental contexts of medieval urban sites.

Excavated evidence from the site spans the 'Age of Transition' (*c.* 1400–1600) in which profound economic and social changes transformed the medieval world into a society that provided the foundations of our own modern culture. Attendant on these changes, and prompted by both fashion and necessity, were modifications in the form of buildings and the materials of their construction. There have been attempts to establish a typology of house-plans in this period (Pantin 1962) and to identify house-types within the urban context, but as more urban sites of this period are excavated, the less it seems possible to apply a rigid classification. As John Schofield noted, changes were adopted more often than not as a response to specific circumstances and 'the notion of types arising mainly through alteration is closer to reality' (Schofield 1997).

Figure 19. *Exterior backyard (Property E, Period III). Scale 0.5m.*

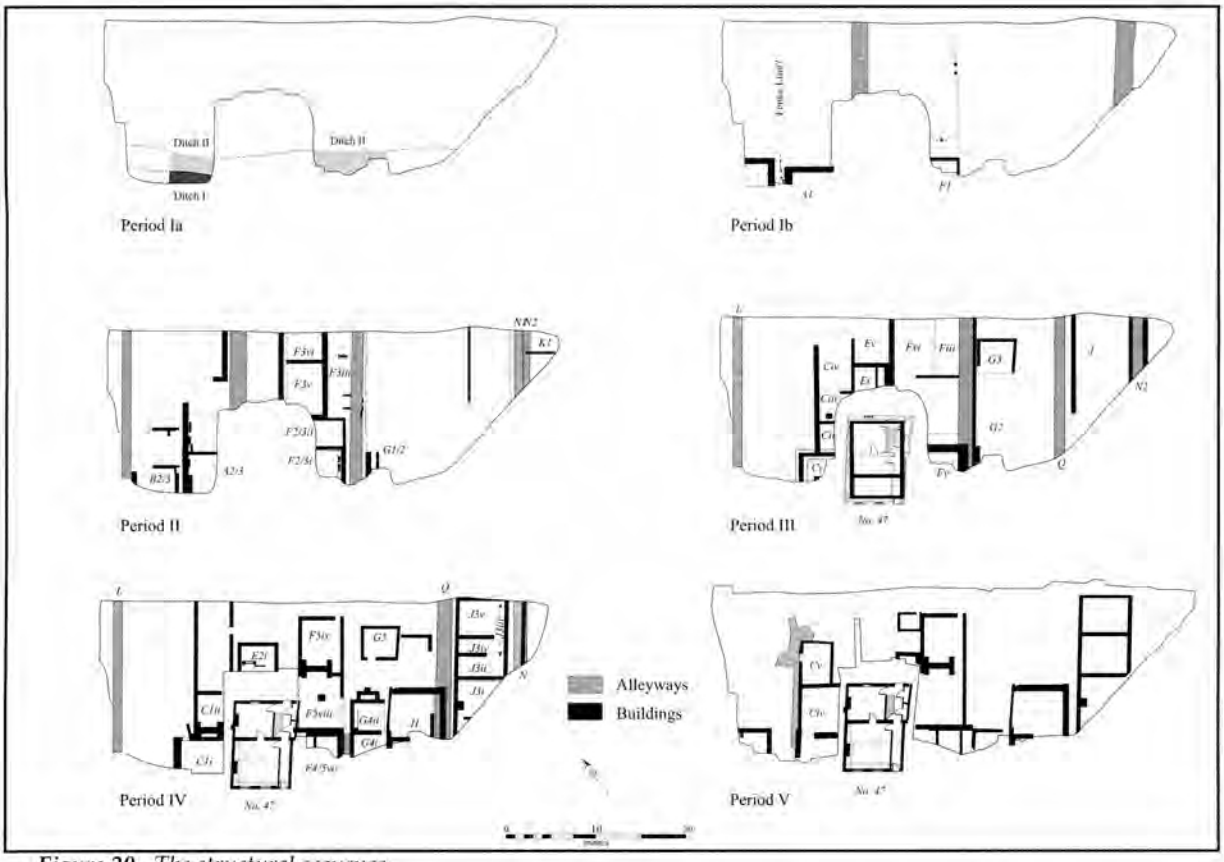


Figure 20. *The structural sequence*

The demise of the open hall, enshrining a rigid sense of status and community, is more apparent in the larger and higher status buildings in town and country than in the smaller houses; this is partly due to the more numerous examples of high status buildings still standing. The smaller house such as those at Forehill is more often studied from the archaeological record. By the 14th century it was common in the small and medium sized town dwellings for the hall to be situated on the first floor, with the ground floor utilised as a commercial space. Later in the 16th century the open hall was superseded by the more private parlour. Business and social/family affairs were beginning a disconnection that would achieve its ultimate expression in the separate work place. With an increase in material culture moveable goods such as furniture and fittings became more important as markers of status, and the function of a room was less rigidly defined by its form alone (Johnson 1997).

Some of the changes that typify this period can be detected in the buildings at Forehill, although the form of the superstructure of the buildings was not always apparent or easy to interpret from the excavated evidence. Where the evidence is available new building materials and forms appear to be adopted in a piecemeal fashion, a gradual process of alteration, dictated by the lifespan of the old structure and the individual householder's resources. Properties A/C and E appear to be the first to adopt new building forms, but whether this is a measure of the household's disposable income, upwardly mobile aspirations, or simply the imminent collapse of the old structure, is difficult to establish (but see Discussion below). The radical rebuild of building A3 as C1 appears to mark the amalgamation of property A/C with E and coincides with the documented tenancy of John Plomer in both properties. The foundations of the new building are substantial enough to support a second storey, but the building appears to have been originally conceived with a ground floor open hall, to judge from the central fireplace; the back-to-back firestack is a later addition. This pattern is followed elsewhere on the site, with brick rubble walls or plinths replacing earlier wall forms, but with wall-fast fireplaces as later additions. Tile fragments are numerous in the new rubble plinths and in other residual deposits from the late 14th century onwards. It may be a measure of the cosmopolitan attitude of the inhabitants that tiled roofs appear to have been readily adopted not only for industrial structures, but probably for domestic structures as well, despite the availability of thatching materials from the fens. In short, the solidity and scope of the new construction work suggests a degree of wealth that is perhaps not matched in the other excavated properties.

The Finds

Pottery

David Hall

Pottery from Ely Forehill consisted of 7980 sherds (excluding 19th century material from context [275]). The total quantities are listed by fabric in Table 1, below (also see Figs. 21–22). Each individual context is detailed in an archive spreadsheet that provides the number of each fabric type, an estimate of the date, and the numbers of rims, bases, decorated sherds and any other significant item of interest. In all 565 collections were studied, most of them being individual contexts. Excluding post-1740 wares, the number of sherds studied is then 7768.

The main group of sherds dates from the 11th to 17th centuries. As expected, the dominant fabric is material from the nearby Ely kilns, which were active from the 12th–15th century. Other identified medieval fabrics come from Grimston, Norfolk, Toynton, Lincs, and from various places in Essex, Lincolnshire and Yorkshire, as well as northern European imports of mainly stonewares and some finewares. The well-stratified series from Forehill provides a useful sample of the range of pottery used in medieval Ely. A few residual Roman sherds (5) were recovered, probably deriving from one of the numerous Roman sites on the Isle of Ely. There were two abraded Middle Saxon sherds.

Saxon-Norman Wares

St Neots, Stamford and Thetford type were present in the ratio 42:18:34. The total was 94 sherds, representing 0.5, 0.2 and 0.4% respectively of the total. St Neots shelly wares occur in lower amounts at Ely than in the south and west of Cambridgeshire as would be expected with the nearness of Ely to Grimston, where a hard, sandy, Thetford-type of pottery was made.

Table 1. *Ely Forehill fabric types. GRE = Glazed red earthenware.*

Fabric	Total	% of 7768
St Neots	42	0.5
Stamford	18	0.2
Thetford	34	0.4
Other 12th/13th	10	0.1
Ely Oxid	2555	33
Ely Reduc	1977	25
Grimston	601	8
Ely Grim.	51	0.7
Reduc sandy	437	6
Other Medieval	324	4
Essex reds	499	6
Lyveden	38	0.5
Yorkshire	55	0.7
Stoneware	63	0.8
Surrey	25	0.3
GRE	887	11
Babylon	113	1
Bourne D	37	0.5
Post 1740	214	-
Total	**7980**	

Ely fabrics

The principal sherds were Ely fabrics that dominate the collection, being 2555 oxidised (33%) and 1977 reduced sherds (25%), or 4,532 in all (58%). Pottery production at Ely was only satisfactorily identified in 1995 (Robinson 1998). The site then examined was a waster dump and not a kiln, but the quantity and nature of the sherds made it certain that the material was waste from industrial production. The location lay just above the appropriately named Potters Lane, recorded as early as 1280 (Reaney 1940, p.215). Many more sherds lie in profusion in the gardens of Cherry Hill, lying next to Potters Lane. Two principal fabrics have been identified, one called 'oxidised' and the other 'reduced', the difference probably only being the final oxygenation conditions in the kiln. Both fabrics are hard with a slight sand component and characteristically contain white flint-grits evenly distributed throughout the fabric and visible on the surface. The grits are usually small, but can be up to 1.5mm in diameter.

Early Ely fabrics (those occurring at the lowest levels mixed with Saxo-Norman sherds) are fairly good quality, do not have that many grits, and can be rather similar in appearance to St Neots Ware, except that they feel rough from the sand content. Soon after the fabric takes on a lighter colour and the coarse white grits are normally very obvious. A few sherds (51 sherds, 0.7%) are well made with few grits and reduced to a grey colour, very similar to Grimston material, probably deliberately imitating it. A major difference between Ely and Grimston Wares is the glazing. Grimston is always clear and green. Ely is almost always opaque, sometimes green and often has a muddy, opaque white colour with a rough pimply surface. Ely glaze is also often very thin and patchy. A sample of 582 sherds had 109 with some glaze (19%). Probably many vessels were glazed on the upper surfaces only, so that a higher percentage of vessels had some glaze than is found with the sherds.

Ely forms are typically of thick-sided bowls, and rather squat jars and jugs. Rims from 165 Ely fabric vessels were studied and classified, of which 79 (48%) were bowls, 52 (31%) were jars ('cooking pots'), and 34 (21%) were jugs. This proportion is consistent with most of the vessels being hand-made and receiving only limited wheel finishing – bowls being the easiest to fashion and jugs the most difficult. Of the bowls 30% were decorated, being predominantly on the rim of type B2 (Fig. 21.3, 4) where it was 39%. The commonest types of rims were B2 and B3 (Fig. 21.5). Jars seldom had decoration, amounting to only 12%. Jugs, apart from handles, were rarely decorated (a single vessel). Handles, mostly from jugs (a few handles were identifiable as belonging to large cooking pots), were frequently decorated (42%). The most

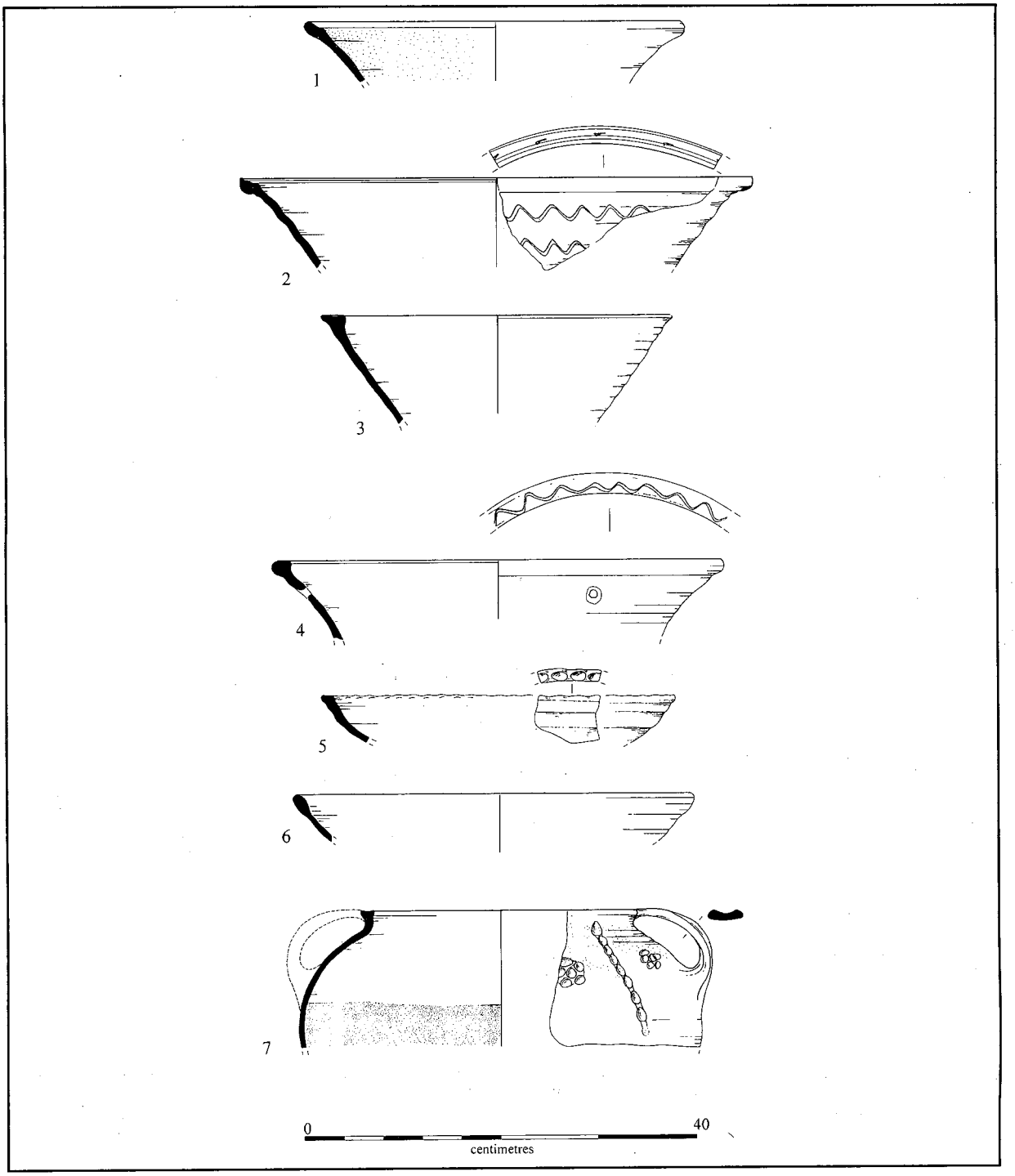


Figure 21. Pottery

1. Buff-pink surfaces & dark core, outside slightly blackened. Fairly large white grits; light green patchy interior glaze.
2. Square-rim type, with only slight hollowing; dark buff inner surface and pink-buff outer surface. Stabbed decoration on inner flange of rim. On outside of the body, two rows of zig-zag.
3. Internal rib with raised outer rim; coarse gritty fabric, pink-buff surfaces with darkened exterior.
4. Flange-rim bowl with wavy line decoration on upper part of the rim, hole made after firing.
5. Thumbed decoration on upper surface; dark core, grey inside, darkened outside, roughly finished.
6. Simple thickened rim, dark core, buff with slight darkening on outside.
7. Large piece of a large jar with a strap handle. Flat topped rim with a hollow except near the handle. One vertical thumbed applied strip (presumably there were others) and three impressed rosettes. Two slight decorative rills were made before the strip was applied. Buff surfaces, outer flaked away on the lower parts. Patchy light-green glaze on top exterior and bottom interior.

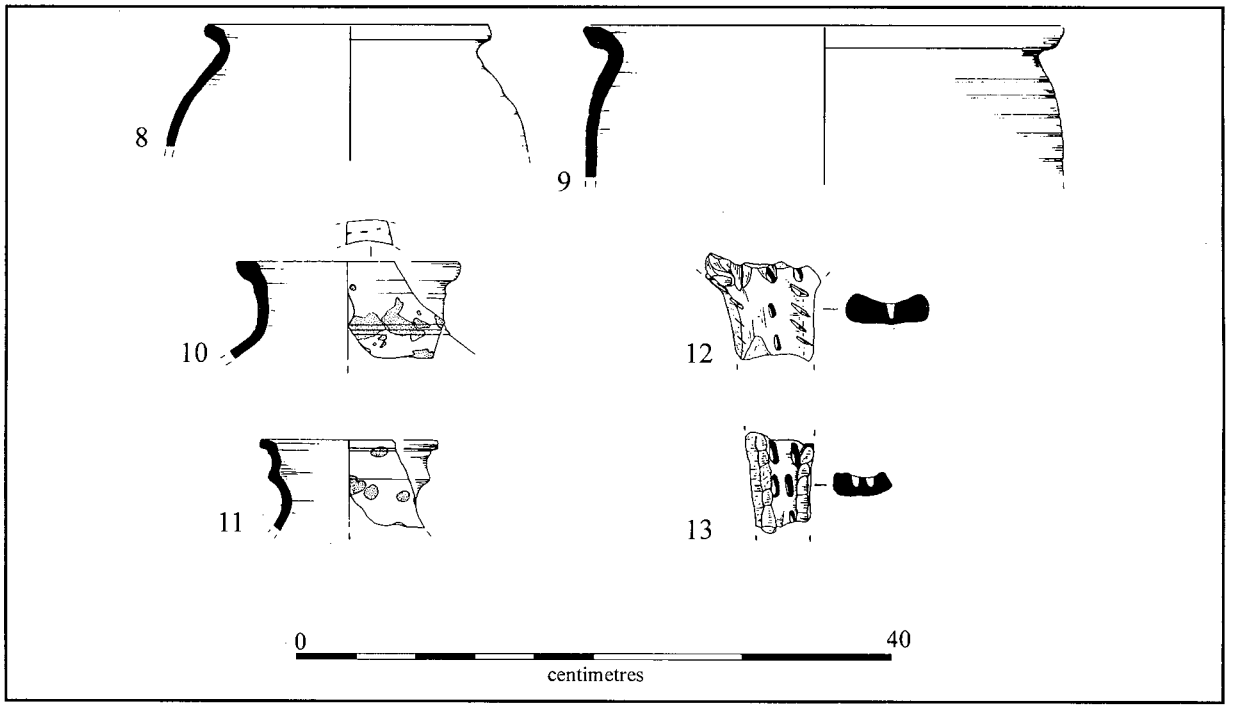


Figure 22. Pottery

8. Slightly squared finish, both surfaces grey-buff.
9. Squared flange, irregular external rilled decoration; buff and darkened.
10. Well developed rim with small holes of stabbed decoration on the upper surface; simple straight neck.
11. Rim and jug lip, pink-buff outside, buff inside, patchy green glaze. Neck has one rib.
12. Pink, partly glazed, two rows of central slashing with both edges thumbed.
13. Grey, central row of stabbed holes and a row of sideways slashes on both edges.

characteristic forms are single and multiple rows of slashing made with a knife (Fig. 22). Sometimes round holes were made. Both these decorative elements were used on the bowls, which additionally often had wavy line motifs on the body. Wavy lines were also used on the bowl rims instead of slashes or holes.

Ely fabrics seem to be identical with material previously known from Lynn and published as 'soft Grimston ware' (Clarke and Carter 1977, pp.186–91). It has subsequently been observed that Grimston is an unlikely source for this fabric, since it has not been found there in spite of numerous excavations (Little in Leah 1994, 86). The published Lynn forms, especially the stabbed handles, and the fabric descriptions exactly match material from Ely. The Ely kilns continued production until the 15th century, but 'soft Grimston ware' at Lynn was found mainly in period I (1100–1250), declining in period II (1250–1350). This is almost certainly explained by the rise of the glazed Grimston industry producing fine wares that would have eclipsed the poorer quality Ely material.

No absolute dating was found with material, so dates have to be deduced from stratified associations and context. The associated pottery types suggest that Ely pottery was in use from the 12th to the early 16th century. It first makes an appearance in some of the earliest levels of the site, along with all three standard forms of Saxo-Norman sherds (mainly St Neots). These are generally reckoned to cease by the end of the 12th century. The date is consistent with the reference to *pottereslane* in 1280, when the industry was presumably well established. The fabric continues with very little change until the 15th century. At the late date the fabric occurs with Surrey Ware (Tudor Green), Raeren stonewares, and late Grimston wares. Ely rim forms were examined for any chronologically useful changes. The industry was very conservative and there were few changes in forms nearly 400 years. The only changes were in decoration. Thumbing, especially on applied strips, is early, mostly 13th century, and on bowls, decoration is mainly a 15th century feature.

Samples of 21 sherds were submitted for petrographic and chemical analysis of the Ely fabric from three contexts, two from the earliest 12th-century contexts [1830, 1831] and one 15th [650]. After thin sectioning three fabrics were identified based on the amount and composition of sand and calcareous components. Fabrics A and C occurred in the 12th-century sample, fabric B was entirely 15th century. The chemical composition was determined by spectroscopy (ICPS) and the data analysed. Provisional interpretation is that Cretaceous clays were used for the pottery with detrital tempering from Jurassic clays. However, further work on the clays and sands from Ely is necessary to establish the sources of materials used for Ely pottery. The potters had a wide range of raw material close at hand to chose from; Kimmeridge Clay,

Lower Greensand, Till (boulder clay), and Glacial Sand.

Other fabrics

Grimston fabrics: Sherds from the well-known kilns at Grimston, Norfolk, occur at Ely (51, 0.7%). Most of them are in the standard fine grey sandy fabric with highly translucent green glaze often containing flecks of brown. The fabric occurs less commonly in an oxidised buff or pink-red colour. Decoration consists of various arrangements of brown slip bands, some rouletted, as well as face jugs with very small handles ('arms') around the top. Most of the Grimston sherds found at Ely seem to date from the *floruit* of production, in the 14th century, but there are some sherds of the 15th century with a denser glaze and yellow flower motifs.

Reduced sandy wares: Reduced sandy wares were fairly common at Ely (437 sherds, 6%). The fabric is different from Grimston, having mainly sand in the grog with very few or no white grits, similar to the reduced sandy material known from Blackborough End, Middleton (Rogerson and Ashley 1985). This site lies near to Grimston and a northwest Norfolk source is likely for the material. The forms at Ely are almost entirely jars, and are closely paralleled from, King's Lynn, Norwich and from sites excavated at Grimston. The fabric is associated with the earliest levels at Forehill.

Essex red wares: Fine quality red wares (jugs) come from a variety of Essex sources, most probably Hedingham, Colchester and Mill Green. There are also a few sherds of sgraffito ware, commonly called 'Cambridge sgraffito' from the place of its first recognition (Bushnell and Hurst 1952). There is no evidence that it was made at Cambridge and it is has the fine Essex-type fabric.

Lyveden, Bourne and Toynton wares: These wares occurred in small quantities only. Lyveden is normally a pink shelly fabric, often soapy, with shells up to 2mm diameter. Often they are leached out giving a corky appearance (Steane 1967, Bryant and Steane 1969). A decorated form, probably made at nearby Stanion (both in Northants) is decorated with a yellow slip of stripes and grill-stamped blobs (Bellamy 1983). Forehill produced 37 sherds. Toynton, Lincolnshire, on the northern fen-edge, produced jugs in a grey fabric with pink surfaces, often decorated with brown applied strips (Healey 1975, MacCarthy and Brooks 1988, p.261). Only 12 sherds were identified at Forehill. Bourne, in the same county, had kilns producing a pink-orange fabric containing small white inclusions and having a very smooth finish, often covered with a light green to yellow and brown glaze (Healey 1969). A total of 38 sherds was found at Forehill.

Yorkshire wares: Fine jug-sherds of Scarborough ware from Yorkshire were found at Ely among the earlier levels. It is known that the men of Scarborough exported pottery into ports along all of Eastern England and Scotland from Aberdeen to Canterbury and farther round the English Channel as well as across the North Sea to Norway (MacCarthy and Brooks 1988, p.95). The Ely material would have come from King's Lynn.

Continental sherds: Continental fine wares occurred in small quantities only (7 sherds). Identified sherds came from France (Picardy and 'North French micaceous' fabrics), Flanders (green glazed over a slip), and from Haffner, Germany. These complement the imported sherds found at King's Lynn, where many more fabrics have been identified. It is interesting that the last two of the Ely types were not found at Lynn, suggesting that many more imported sherd fabrics are yet to be identified at both places.

Late fabrics: Post-medieval sherds (16th and 17th century) consisted mainly of glazed red earthenwares (GRE), almost certainly of local origin (887, 11%). Additionally there were a few (10) of Dutch origin. These last are to be distinguished from local GREs in being slightly better made and having a lustrous glaze. There were 25 sherds of green-glazed Surrey ware (Tudor Green) and 113 (1%) of 'Babylon'. This is the name given to a late Ely fabric (16–17th century), being named after a site near the Maltings where large quantities of wasters and tile kiln-spacers were found. It is a red earthenware often with a dark brown or black lustrous glaze, small cups and multi-handled tygs being a common form. Babylon is a local copy of Cistercian Ware from Yorkshire, which is to be distinguished by having a hard dark-brown almost vitrified fabric. Only a few sherds of Cistercian vitrified fabric were recovered. Imported German stonewares, although not found in large amounts are important dating markers (63 sherds, 0.8 %). Most of them are the early types from Siegburg, Langewehe and Raeren, dating from the 15th and early 16th centuries.

Conclusions

The Forehill site produced a large quantity of stratified sherds that has enabled a type series to be established. It forms the first large undisturbed sequence ever excavated from Ely, dating primarily from the 11th to 16th centuries. Although no pottery kilns were discovered at the site, the material shows a full range of material likely to have been produced at the Ely pottery kilns, and used by the nearby community. In this respect the site is more useful than study on say a single kiln, that would perhaps have produced only a limited type of pottery for a limited period and also yield unrepresentative 'one-off' forms.

The medieval kilns began production in the 12th century and continued until the 15th, when they were superseded by various types of red earthenware, some made elsewhere in Ely (Babylon). Although the quality of some of the material was not high, the pottery had a long life, presumably because of the political and economic dominance of Ely monastery and

bishopric. Ely owned much of the Fenland and southern Cambridgeshire and was able to control what products went to its estates. It also controlled the Ouse, the chief southern Fenland waterway, and so had influence on what went to Cambridge from the north. Hence the distribution of Ely wares is greater than might be expected from the quality of the material. It is found on all Fenland sites and at Cambridge and elsewhere in the south. North of Ely, it occurs at King's Lynn, where it was called 'soft Grimston ware'. Ely wares have been noted in southern Lincolnshire and west Norfolk (pers comm 1996, Hilary Healey and Andrew Rogerson). Further study will probably show that they only occur in these regions at the early dates, being subjected to the same Grimston competition as King's Lynn.

The evidence of the fine wares from Ely can be linked with data from Cambridge and King's Lynn to study regional trade routes. The importance of King's Lynn as a port is well known and illustrated by the occurrence of fine quality decorated jugs from Scarborough and northern Europe (Clarke and Carter 1977, pp.112–18, 225–32). It is possible that fine red wares from Essex arrived at Lynn by sea via Colchester. However, from the regional pattern of recovery it can be shown that the route was landward to Cambridge and then by the fenland waterways to Lynn. This is proved from the large quantities of Essex red wares that occur in Cambridge (36% at Bene't Court, Edwards and Hall 1997, p.156), with a smaller amount at Ely Forehill (6%) and yet smaller quantities at Lynn (1%; Hall forthcoming b). Even allowing for any differences in date range of the sites, and that the three sites compared are only single samples of each town, the differences are striking. Had the trade route been by sea and then via the fenland to Cambridge, then the amounts of sherds recovered would be the other way round, Lynn and Ely keeping more of the fine wares before the residue reached Cambridge. The reverse effect can be seen with the fine quality Scarborough wares. At Lynn they amount to 4%, falling to 0.7% at Ely, with none so far identified at Cambridge.

In conclusion, it can be seen that the Forehill site was occupied from the 12th century to the present. The medieval assemblage is dominated by local wares made at Ely, but has a significant number of imports from Yorkshire and the Continent that demonstrate the wide trading connections of Ely via the port of King's Lynn.

Small Finds

Quita Mould, Sandra Garside-Neville, Lorraine Higbee and Maisie Taylor

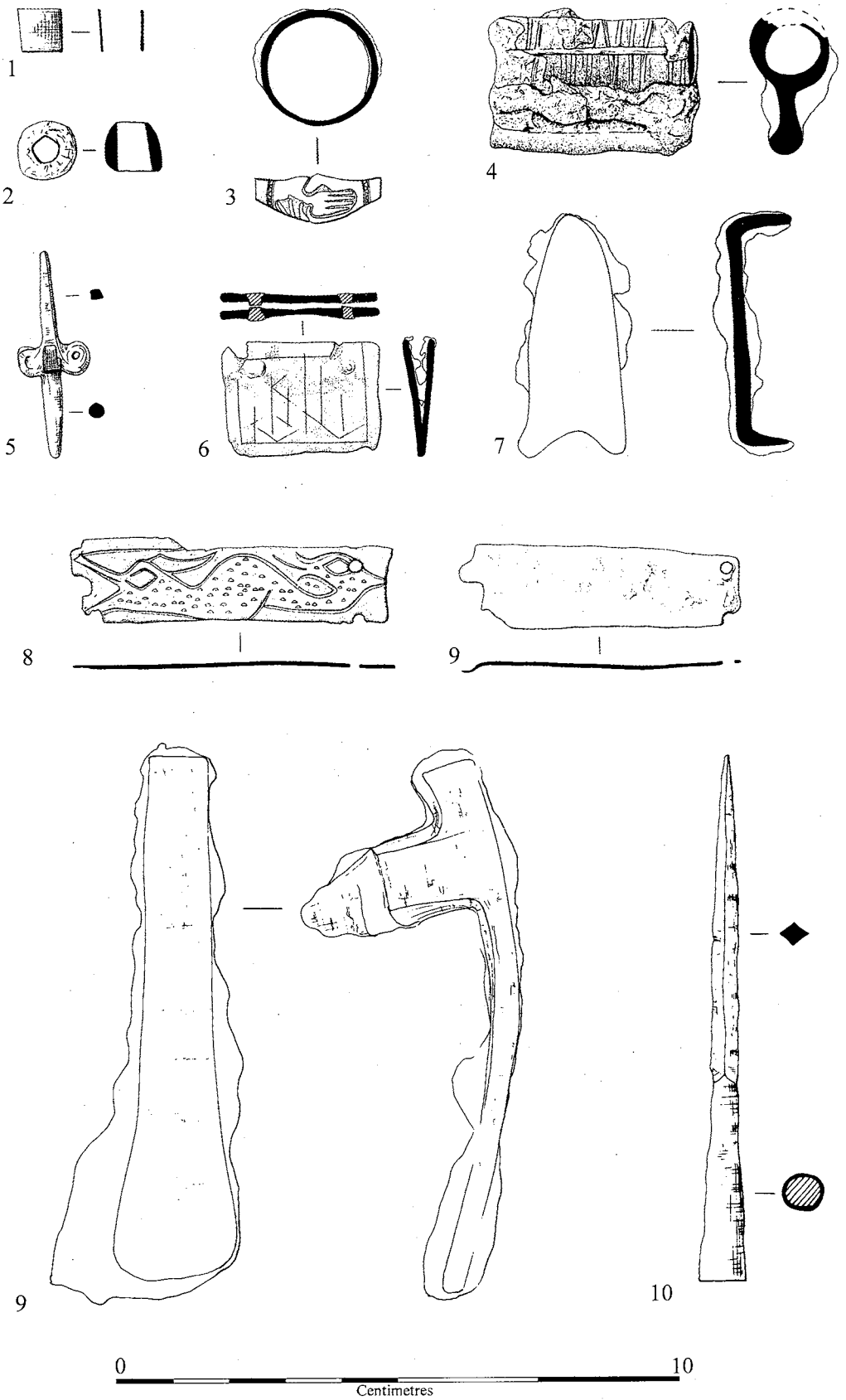
A relatively large and rich assemblage of small finds was recovered, consisting predominantly of metalwork, but also objects in bone, wood and ceramic and these are discussed below by broad functional groups. The metalwork is discussed by Quita Mould,[12] bone objects by Lorraine Higbee, wood by Maisie Taylor and ceramic items by Sandra Garside-Neville, their initials appearing at the head of the relevant sections.

Dress accessories (QM)

A range of dress accessories, principally of 14th and 15th century date was recovered. The most notable personal decorative item was a gilded silver finger ring, <820> [470] phase 16 found in the floor of structure G5 (a freestanding outhouse with internal fireplace probably used for cooking) associated with 15th century pottery (Fig. 23.3). This ring is a love token, probably a betrothal ring, and a relatively expensive piece of jewellery. The ring is decorated with a pair of clasped hands. This motif has a long history going back to Roman times and still in use today. Known as a 'fede' ring (from the Italian *mani in fede* hand in hand) it is comparable with another of gilded copper alloy with a decorated hoop found at Alms Lane, Norwich in a context dating to the second half of the 15th century (Margeson 1993, p.5 and fig 1 no. 4).

Two small annular brooches were found; a decorated brooch of pewter <824> [877] phase 6 found in a late 13th/early 14th century context and a fragment of a plain brooch of copper alloy sf.148 [1248] in area 2 associated with pottery of 13th–14th century date. The pin from another pewter example <819> [946] occurred in a 14th century deposit. These brooches were less expensive trinkets. A large copper alloy pin with a solid globular head<1033> [330] phase 13 comparable with others from a late 14th century deposit in London (Egan and Pritchard 1991, 302 fig 201) was found in a deposit of 15th century date, while four wound wire-headed pins and a single lace tag <841> [855] phase 23 occurred residually.

Various copper alloy belt fittings were recovered dating to the 14th and 15th centuries, which can be paralleled from collections elsewhere (see below). Three buckle plates were found, most notably one decorated with a double-headed animal motif <783> [383] phase 21 (Fig. 23.8), three strap ends <823> [881] phase 14, <834> [352] phase 15, 837 [100] (Fig. 23.6), u/s, a strap loop with internal projections <831> [565] phase 10 and a bar mount <840>[1136] phase 11. The strap loop can be exactly paralleled by an example from the Billingsgate Lorry Park recovered from a context dating *c.* 1350–1400 (Egan and Pritchard 1991, p.233 and fig 149). The bar mount is comparable with others dating slightly earlier to the late 12th through to the late 14th centuries. The distinctive design decorating the buckle plate <783>, comprising a double-headed beast with gaping jaws, lozenge-shaped eyes and scales or fur depicted by a series of pecked lines, occurs on a range of belt fittings dating to the 14th century. A crudely executed example occurs on a strap end from St Botolph Street, Norwich (Margeson 1993, p.28 and fig 14 no. 140), while another on a composite strap end with a forked spacer was found in House 19 Croft B at Goltho (Goodall 1975, p.92 and fig 43 no. 3) which was abandoned shortly after the mid 14th century. A reused buckle plate with the same motif was found in a 15th-century context at Winchester (Hinton 1990, p.510 and fig 132 no. 1191 and comparanda); the


1
2
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6
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8
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9
10
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10
Centimetres

Ely buckle plate is certainly residual to this pit fill.

A wide strap end <837> [100] u/s (Fig. 23.6) deliberately cut from the strap was recovered from area 4. This simple type of strap end, probably used at the end of a belt, is of a type found in late medieval contexts; none from London occur earlier than the late 13th century (Egan and Pritchard 1991, p.129). These wide belt ends are often decorated with a religious inscription or monograph. A gilded example probably dating to the second half of the 15th century from St Benedict's Street, Norwich (Margeson 1993, p.36 and fig 21 no. 241) is inscribed dn in black letter for dominus (lord). IHC and AVE were also popular (*ibid*, 36). It is uncertain what monogram is represented on the Ely example if, indeed, it is any more than a crude parody of lettering.

A 'locking' buckle <825> [843] phase 18 dating to the late 14th or early 15th century used to suspend a purse on a belt and an arm broken from an iron purse frame <879> [632] phase 13 were also found (Whitehead 1996, pp.87–9 nos. 552–4). The fashion for wearing suspended purses was at its height *c.*1480–1520. A small annular shoe buckle of pewter <1038> [457] phase 17 and another of iron <996> [285] phase 22 of 15th century date were found occurring residually. Four copper alloy buttons were present in post-medieval contexts.

Household implements and domestic fittings (QM, LH, SG-N, MT)

The remains of seven knifes were found in contexts dating from the 14th/15th to 16th/17th centuries eg <896>[780] phase 12, <862> [606] phase 14, <842> [650] phase 16. A single broken scale tang knife was found <852> [650] phase 16, the others were whittle tang knives, one <842> with a stamped maker's mark on the blade. The stamped crescent, the principle component of the mark on the Ely knife <842>, is the earliest mark noted on knives from London, occurring on blades of 13th century and late 14th century date (Cowgill, de Neergaard and Griffiths 1987, p.20 nos. 31 and 84). The scale tang knife <852> had part of an inlaid maker's mark present.

A barrel padlock <771> [1828] phase 6 (Fig. 23.4) of Goodall's type B (Goodall 1990, p.1008) was found in a late 13th/early 14th century floor. Two padlock keys of different types were also found <782> [1837] phase 2, <955> [1080] phase 18. One <782> of Goodall's type C (*ibid*, p.1006), a early medieval type, was found in an early 12th century context, the other <955> of Type A (*ibid*) was a common and long-lived medieval form. A small rotary key with a kidney-shaped bow <994> [307] phase 18 was found in the clay floor of structure 472 dating to the 16th/17th century. A small tin-plated iron handle <854> [946] phase 9 found in structure 1852 in a 14th century context may have been used on an item of domestic furniture, as was the hinge

Facing Page: Figure 23. *Metalwork*

1. Iron sewing ring with virtually straight sides with pits running in vertical lines of 10, the pits appear to be hand drilled. Complete, fractured, soil adhering. D. 16mm, Ht 14mm. [1008] <836> sf 119 phase 9
2. Lead alloy plano-convex spindle whorl with a flat lower face and large central hole. Complete. D 21mm, Ht 17mm, hole D 10mm Wt 46.42g. [761] <1008> phase 11
3. Silver gilt 'fede' finger-ring with simple flat-sectioned hoop and gently expanded bezel decorated with a pair of clasped hands motif. Complete, D internal 19mm, external 22mm, hoop W 4mm, bezel W 7mm. [470] <820> sf 62 phase 16
4. Iron barrel padlock, cylindrical case with cylindrical ribs running along its length and a horizontal rod present along the case on each side. The tube to take the free arm of the bolt is joined to the case by a rectangular fin, a fragment of the bolt arm from the padlock bolt appears to be present in the tube. Both end plates are missing. Non-ferrous metal brazing suggested in the radiograph. L 70mm, Ht 50mm, D 23mm. [1828] <771> phase 6
5. Iron pricket with central stem with rounded tip at one end and extending into a pointed tang at the other with four tight scrolls around the middle one on each face. L 70mm, max W 27mm. [1836] <1028> phase 2
6. Copper alloy wide strap end of sheet folded widthways with the straight end secured by two rivets. Minerally preserved remains of the strap present were deliberately cut away. Front face decorated with an engraved linear motif of six parallel vertical lines ending in two simple chevrons within a linear border. W 28mm, L 20mm, strap Th 3mm. [100] <837> sf 49 general cleaning
7. Iron flat-sectioned strap bifurcated at one end, extending into three short arms at right angles to the strap. Possibly this is a wood cramp or simple trivet. L 85mm, max W 42mm, arm Ht 24mm. [736] <964> Area 3 phase 3
8. Copper alloy buckle plate, rectangular front and back plate originally joining, from a folded buckle plate recessed for the buckle frame and with a central slot for the pin, with a pair of rivet holes at the opposite end. One of the rivet holes lies over one edge suggesting it was poorly aligned, mis-stamped or very heavily abraded along that edge. The upper plate decorated with an engraved design of a double-headed beast, bothe heads face toward the buckle, with gaping jaws and lozenge-shaped eyes, scales on the body indicated by small pecks. Almost complete. L 57mm, W 15mm Associated with it is a fragment of buckle frame with a large central bead moulding between two smaller raised collars. Ht 25mm. [383] <783> sf 197 Area 4 phase 21
9. Iron adze with small square flat butt and rectangular-sectioned curving blade with flaring, gently convex curving edge. The small sub-circular eye and protruding socket contain much minerally preserved wood from the original handle of Ash wood (*Fraxinus* sp.) identified by Jaqui Watson (AML, EH). The entire object found to be plated with copper (XRF analysis copper with traces of zinc, tin and possibly lead). L c 210mm, blade W 70mm, socket L 30mm, socket D 31mm, eye D 17mm. [234] <1638>Area 3 phase 6
10. Iron arrowhead with long, narrow pointed head of lozenge-shaped section and round-sectioned socket. Jessop type M7. Total L 195mm, head L 116mm, W 8mm, socket D exterior 17mm, interior 14mm. [1229] <844> Area 2 phase 9

<881.2> [1046] phase 9 and fragments of nailed binding recovered. Handles similar to <854> of copper alloy are found on reliquaries and caskets of 12th and 13th century date. An example thought to have occurred residually in a late 15th century context was found at Oak Street, Norwich (Margeson 1993, p.78 and fig 45, no. 484) where a use as a purse hanger on a belt was also suggested.

Lighting was represented by a small candle pricket <1028> [1836] phase 2 (Fig. 23.5) recovered from an early 12th century context. The size of a small iron swivel <849> [1327] phase 9 suggests it may have been used to suspend a hanging lamp. The highly fragmentary remains of a cauldron <911> made of copper alloy sheet, likely to be of 15th century date, were recovered from a brick built feature [889] phase 14. The surviving fragments of rim suggest a diameter in excess of 318mm and that it may have held a supporting ring of iron. A cauldron of *c.*350mm in diameter with an iron rim support dating to the late 15th century that was found in London (Egan 1998 fig. 139 MOL acc. no. 90.108) would seem to be a similar vessel. An unusual three-legged strap <964> [736] phase 13 (Fig. 23.7) was found in a post hole associated with structure G3 a free-standing outhouse. The function of the object is uncertain; while it may have been used as a heavy cramp or cleat to join structural timbers it could perhaps have served as a low trivet in a hearth.

A number of ceramic objects were identified and include a possible water pipe, confectionery tray, palette and trough. The identification of a water pipe is very tentative. The fragments are obviously part of a tube shaped item. The pieces seem to be coil built, and perhaps finished on a wheel. The fragment walls are quite rough and sag a little in places. Two fragments are knife trimmed at the end and may be part of a socket fitting (Fig. 24.7). Dunning (1967, pp.86–89) reported on water pipe found in Ely during excavations at Market Hill in 1964. That example was glazed and had knife trimming on the outside surfaces. The Forehill fragments are neither glazed, nor knife trimmed along the body. Several fragments of a compartmentalised tray came from context 194, assigned to a 16th–17th century period on the site. It has various shapes cut out of a clay slab which was either square or oblong in shape, and is 42mm deep (Fig. 25.1). It may be a compartmented tray, used for small cakes or confections, similar to the 14th–15th century example illustrated in Cunningham and Drury (1986, p.79, fig. 48.6). However, the Forehill example has a green, bubbled glaze and some of the compartments show traces of a white deposit around the top. It may be that the tray has been reused.

The possible inkstand/palette is represented by an unstratified, fragmentary piece which has one complete circular, shallow hole 55mm across and 27mm deep and there are two other incomplete holes, which would have been of similar size (Fig. 25.2). There are two other holes, one measuring 16mm across and 23mm deep, and the other 17mm across and 17mm deep which tapers inward. There is scoring between the holes. The depth of the piece is 32mm. An example of an inkstand from Byland Abbey in North Yorkshire shows similar features, though in a different configuration. The small holes were used to stand quill pens, while the large holes contained either ink, water or sand for blotting ink (Dunning 1961, p.307). An alternate function may have been as a palette for mixing pigments. Due to traces of what appears to be white mortar, it is likely that the Ely item was reused. Lastly, the trough is in a typical Cambridgeshire yellow fabric, and was found in Phase 16 dating to the 16th–17th century. It probably had two compartments, and has a small nail hole drilled in the side of the remaining one (Fig. 24.8).

Three bone objects were also found, a possible musical instrument fragment, a pricker/stylus and a pen. The former was a cylinder fashioned from the long bone shaft of a large mammal with screw threads inside both ends and lathe-turned decoration ([001] topsoil). It has four small holes in square formation on one side of the cylinder and a sunken central hole on the opposing side. It is possibly part of a musical instrument but no exact parallels could be found in the literature. The possible pricker or stylus is represented by a spherical head with single lathe-turned collar ([932] phase 4 (12th–13th century)). It has been suggested that when recovered from a domestic setting they were used for the transfer of patterns to embroidery. Most examples recorded in the literature (see MacGregor 1985, Margeson 1993) come from medieval contexts. Finally the pen was fashioned from the radius of a goose, with the distal shaft cut at an oblique angle to form a fine point ([1757] phase 6 (13th–14th century)). The limited modification of the bone suggests that it was made by the user as needed. Biek (in Hurst 1963) suggests that they may have been used for measuring out powdered oak galls for making ink. However, MacGregor (1985) suggests that they could have been used for charging quills or as economisers for broken quills. Pens of this type have been recovered from contexts ranging in date from 14th to 16th century such as those from Oak Street, Benedict's Street and Westwick Street in Norwich (Margeson 1993).

Wooden objects included a stave vessel, a turned bowl and a spigot. The stave built vessel [970] phase 6 is an example of a small and finely made artefact, rather than a large barrel. There is no evidence for pegging the staves together or for handles. (Earwood 1993) Although a large part of several staves survive (indicating that the vessel was approximately 460mm high), there are no definite signs of any hoops or banding. Plank D does have a possible hole, but it is very small and inconclusive. The staves are well made, mostly split radially out of high quality oak, the groove to take the base is finely and neatly cut. The other fragment is probably from the base, as it is quite thick (15mm) and does not have the distinctive nail marks that lids seem to invariably carry (Platt and Coleman-Smith 1975, p.233 figs 1661 and 1662). The staves from Forehill are slightly larger than the fragments identified as possible bucket staves from Southampton (*ibid*, p.236 figs 1666 and 1668).

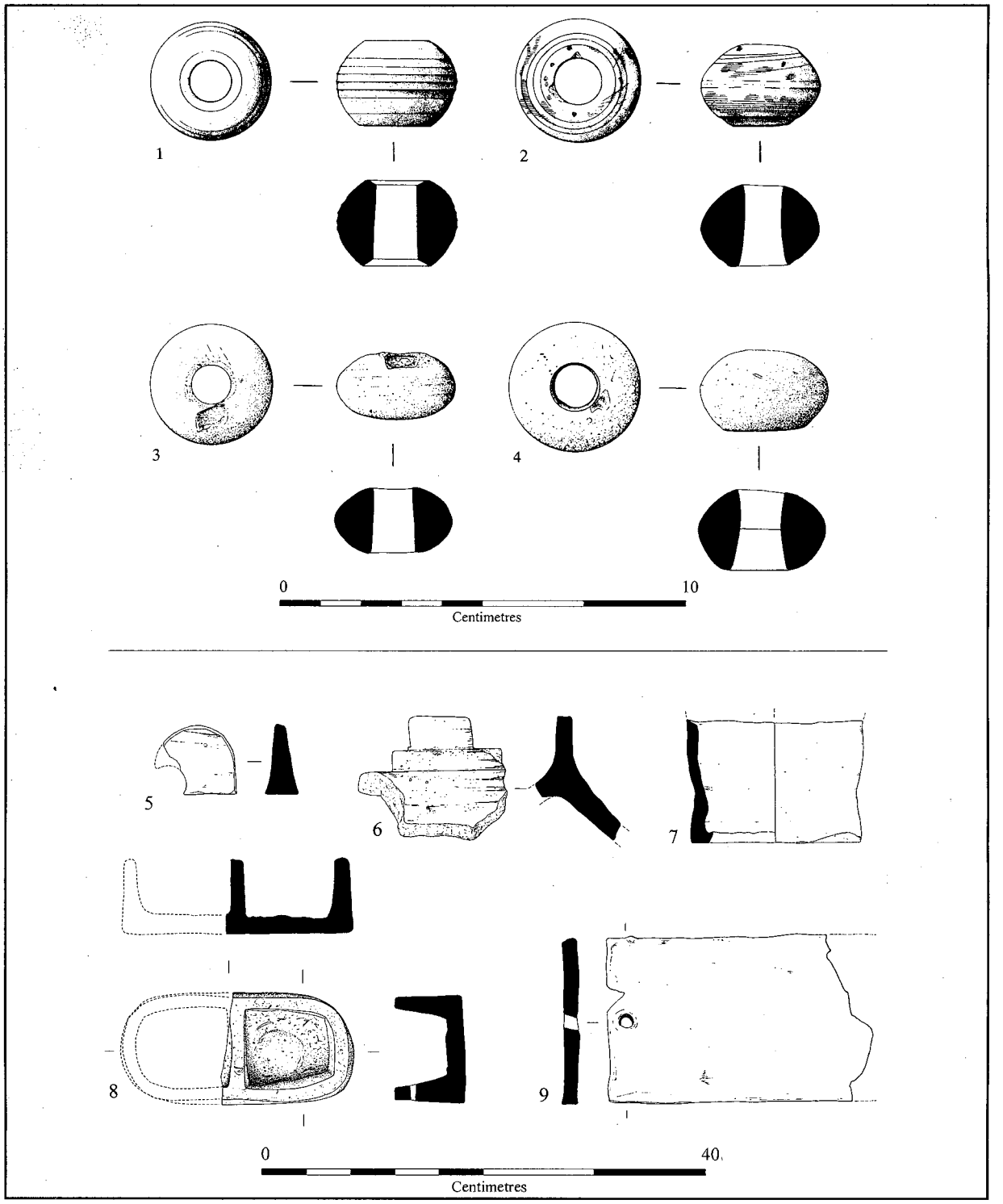

Figure 24. Ceramic objects

1. Spindlewhorl, entire surface covered with a light blue glaze. 15th century Siegburg ware [880] <791> sf 97
2. Spindlewhorl with a spiral design unwinding from the upper pole to the equator. Traces of red paint survive [1352] <792>, sf 157
3. Spindlewhorl with smooth burnished surface. [1185] <793> sf 144
4. Spindlewhorl with minute pitting of surface, one small patch of original burnished surface [995] <790> sf 115
5. Curved crested ridge tile, white slip under a clear glaze [100] <270>
6. Stepped crest; yellow-green glaze [314] <1308>
7. ?Water pipe [780] <533>
8. Trough. [512] <400>
9. Peg tile. [1139] <1317>

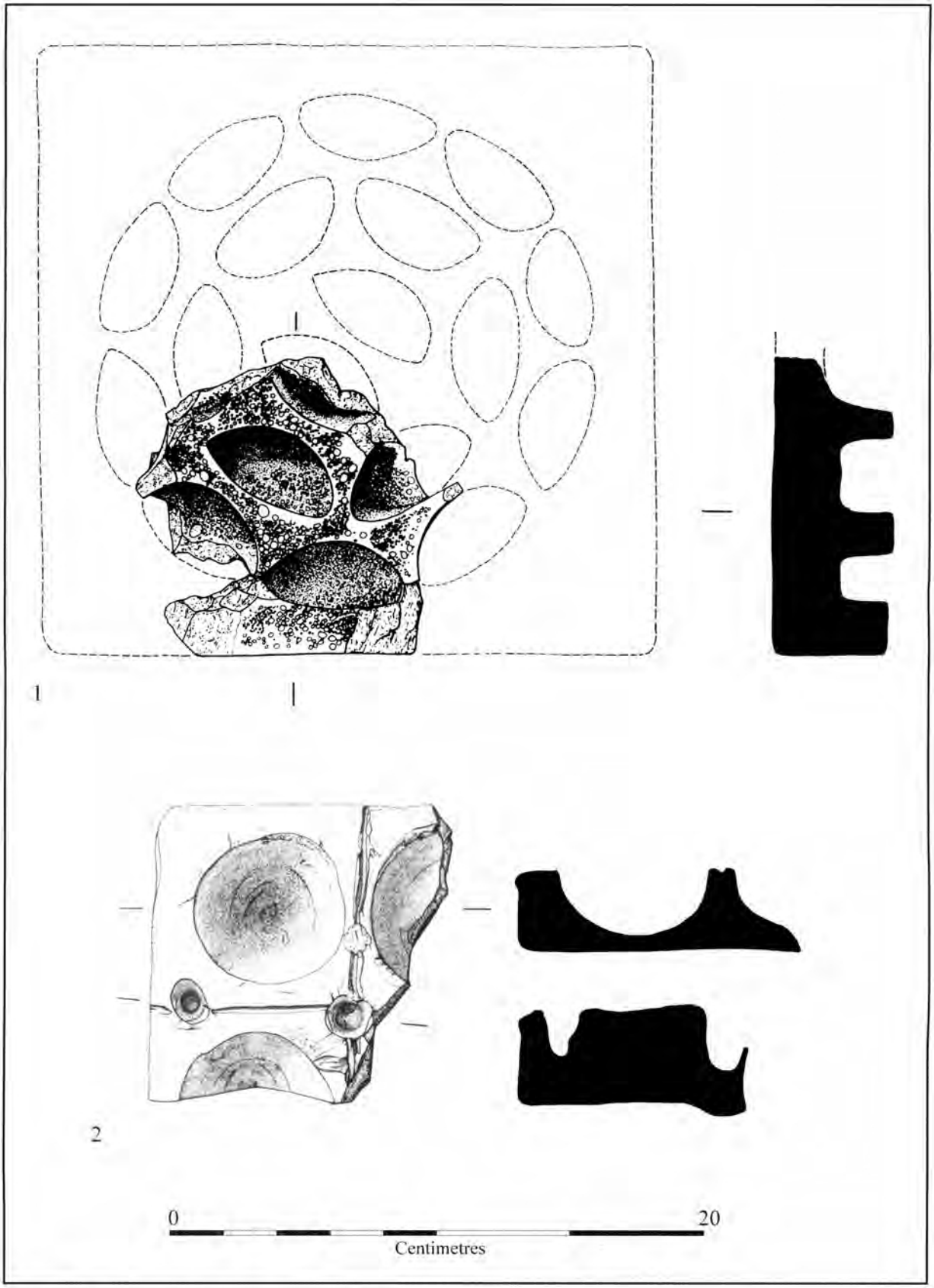

Figure 25. *Ceramic objects*
1. Compartmented tray. [194], <276>
2. Ink stand or palette. [100], <266>

Fragments of a small stave vessel were found at Norwich (Morris 1993, pp.593–96). The development of the stave built vessel began in prehistory and continues until the present day. Finely made tankards, tubs and buckets have been made since the Iron Age (Earwood 1993), and they may have been reasonably common at all periods, but very few survive, and when they do they are often fragmentary. It is not common to have so many staves, so well preserved, with part of the base.

A small turned bowl [992] phase 7 was probably made from a burr of ash wood. As with stave built vessels, wooden bowls must have been produced in vast quantities, but only a small proportion are seen in the archaeological record. For example, of all the material excavated in the Norwich survey excavations, only one bowl survived (Morris 1993, fig.63). More wooden bowls and platters survive from medieval Southampton, but all different from the Forehill example. This little bowl is very small and finely made. Finally a tapered dowel [292] <22> phase 6 proved impossible to identify to species, but is certainly softwood. It was originally cut down from a big log, is tapered and the thicker end is finished with facetting. It is almost certainly a spile or spigot for a stave built cask (Morris 1993, p.597), and, as such was probably made in quantity (and discarded in quantity on this site and many others of this period (Hurley 1982, p.302).

Craftworking tools (QM, LH).

A small number of objects were recovered which are associated with the working of wood and textiles. In addition, a very small amount of possible bar iron associated with the working of iron, small offcuts of copper alloy and lead alloy sheet, and runnels of solidified molten lead alloy were noted. This waste material was found in very small quantities, insufficient to represent any significant metalworking in the vicinity (see Starley and Dennis, in Alexander 1998b).

Woodworking tools found included an adze <1638> [234] phase 6 (Fig. 23.9) from a late 13th/early14th century deposit and two spoon bits <963> [554] phase 11, <974> [330] phase 13, of differing length but each boring a hole of similar size, from contexts dating to the early 15th and the mid 15th centuries. The curve of the blade and the small size of the eye suggest the adze may have been used by a cooper. The remains of a stave built bucket, the staves possibly reused as a drain cover, was also found on the site. The cooper's adze was highly unusual being covered in a plating of copper; the edge of the blade could not be sharpened so that the tool was never intended for ordinary use. It is difficult to suggest any explanation other than it was a ceremonial object. No records can be found of ceremonial tools being owned by the Worshipful Company of Carpenters or the Cooper's Company who controlled the activities of the respective trades in London, though coopering was a widespread trade occurring in every town and it is possible that individual customs developed in the provinces. Substantial remains of the ash wood handle are preserved and it has been suggested that the size of the eye and angle of the socket are such that the handle would be liable to snap if the tool was subjected to heavy use.

Textile-working was relatively well represented; items used in the preparation of fibres, their spinning and the sewing of the finished cloth were found. Three fibre processing spikes were found separately coming from a wool comb or flax heckle. One <775> [1836] phase 2 having a round section can be identified as being a tooth from a wool comb, the other two <777> [1830] phase 6, <973> [313] phase 13 although having an angular section do not differ significantly in shape or size and may also belong to a wool comb, differentiation being difficult (Walton Rogers 1997, 1727). Two lead alloy spindlewhorls were recovered; one <1008> [761] phase 11 (Fig. 23.2) was of plano-convex shape, the other <805> [718] phase 13 was discoid. <805> appears to be a spindlewhorl, though at 106.7g it is rather heavy; the heaviest spindlewhorl recovered from Winchester was 101.3g (Woodland 1990, p.216). The shape can be paralleled by smaller spindlewhorls from Winchester (*ibid*, p.225 and fig 46 no. 196) and at this weight it was probably used to ply yarn. Weighing just slightly light of a 1/4 lb mercantile weight (109.4g; Egan 1998, table 14) the possibility exists that it may have been used as a hanging weight.

Four brass thimbles were found along with an iron sewing ring <836> [1008] phase 9 (Fig. 23.1) for sewing heavier weights of cloth used by the tailor. The sewing ring was found in a late 14th century context in building F3. The brass thimbles derive from post-medieval contexts, but one <815> appears to be a light duty type dating between 1350 and 1450 (Holmes 1988, type C p.1 and fig 1) occurring residually in a phase 18 context (context [1080]). The spinning of yarn and sewing of cloth was carried out in the domestic setting, though the presence of the iron sewing ring <836> may suggest a tailor was working in building F3 at the end of the medieval period.

Two bone tools were also found. One was a socketed tool fashioned from a sheep/goat radius ([1004] phase 6 (13th–14th century)). The socket for the insertion of a handle is represented by a circular hole on the proximal articulation and the mid shaft is cut at an oblique angle on the anterior surface to form a wedge shape. The function of this tool is uncertain but similar tools were recovered from 16th century contexts at Heigham Street, Norwich (Margeson 1993). The other was possibly a sailmakers' needle made from an antler tine from [1486] phase 2 (Fig. 26.2).

Commerce and trade (QM[13])

A lead alloy seal matrix and a range of tokens and jettons recovered reflect local commerce. The seal matrix (<803> [1066] phase 9), probably dating from the early 13th century, has an inscription around a six-petalled flower. The inscription is read as '+ S' MARTINI STARC'. The legend may be interpreted as 'The Seal of Martin Starc'.[14] (Fig. 26.1). An irregular disc of lead

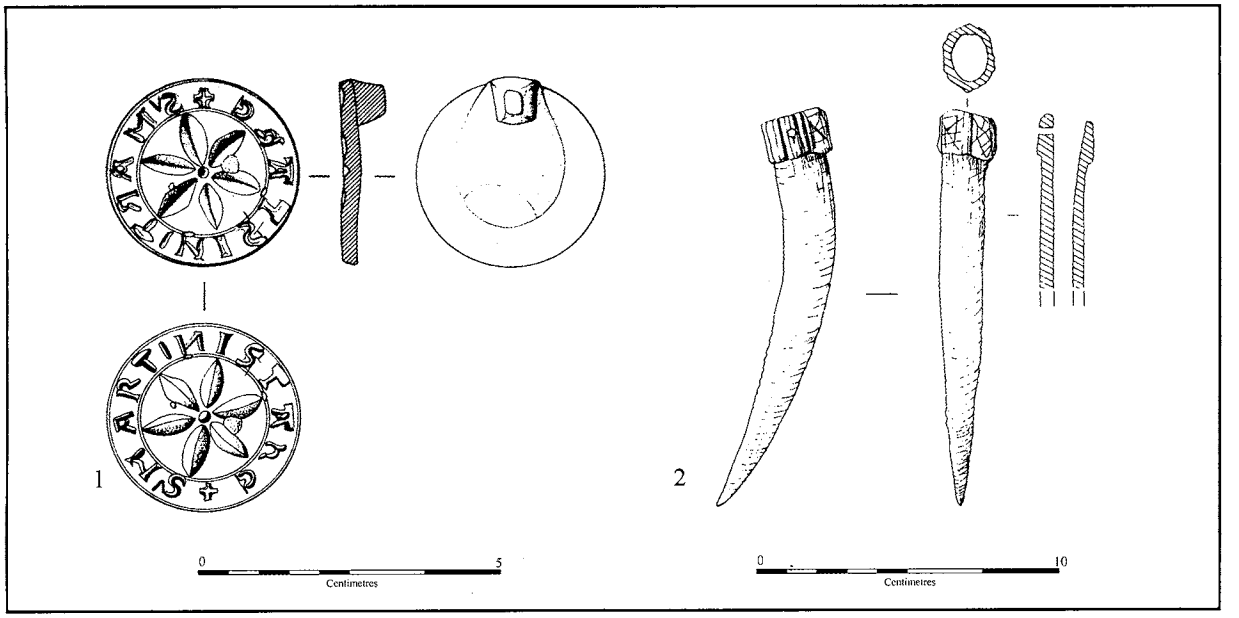

Figure 26. *Lead seal and antler tool*

1. Lead seal matrix with an inscription around a six-petalled flower. The inscription is read as '+ S' MARTINI STARC'. The legend may be interpreted as 'The Seal of Martin Starc'. [1066] <803> phase 9
2. Sailmaker's tool in antler. [1486] <1297> sfno.169 phase 2

sheet <804> [296] phase 20 possibly with a seating for a suspension loop may represent a one ounce weight (actual weight 30.86g, an ounce weighed 29.2g in the mercantile system of weight used in England in the Middle Ages Egan 1998, p.302 table 14). Trade tokens of the type found at Ely were in circulation from 1648 to 1674. These tokens were prohibited in 1672 and in 1674, when they were replaced by small denomination coinage. A farthing token of John Reade of Ely Grocer 1656 ([171] <812>), has the Fishmonger's Arms, three fishes in pale, in chief three of stock fish saltires. The token describes him as a grocer but the symbols used suggest he was a fishmonger. His signature appears in the Holy Trinity Churchwardens Accounts in the years 1663 and 1676, and he was churchwarden in 1673. The family of John Read were Quakers, and in 1664 four of his family were sent to Ely Gaol for refusing to take the oath of allegiance. Another farthing token ([100] <813>) of John Weatherhead has an inscription which reads 'John Weatherhead. The Bakers Arms in. Ely. Baker. 1666'. The initials I.R.W. lie in the centre.

An unidentifiable token ([729] <829>) in base metal is possibly 18th or 19th century, possibly German. On the obverse: A crown with alternating rosettes and anulets around. On the reverse: Unidentifiable. Made deliberately smooth, possibly as an imitation of a halfpenny (Martin Allen, pers comm). An English jetton ([1026] <838>) is a Wine tavern token in pewter, dated to the third quarter of the 13th century. Possibly the same mould as Mitchener's, number 57 plate 5, p.51 (Mitchener and Skinner 1983).

Transport (QM)

Transport was represented by three horseshoes <778> [1836] phase 2, <779> [1837] phase 2, <974.2> [330] phase 13 of Clark's type 2 (1995, pp.95–6) dating between the late 11th and mid 13th century and a small quantity of horseshoe nails found separately. Five fiddlekey nails from horseshoes of Clark's type 2 were found, two with 'eared' heads came from shoes of 13th–14th century date (Clark's type 3 *ibid*, p.96) and two with cuboid heads came from shoes dating no earlier than the 15th century (*ibid*, p.89 fig.70). A tin-coated iron buckle <957> [312] phase 15 from horse harness, a late 13th – mid 14th century type, was found in a early 16th century context.

Weaponry (QM)

Two armour-piercing military arrowheads were found <844> [1229] phase 9 (Fig. 23.10), <843> [1042] phase 12, along with a possible third example <909> [512] phase 16. The implement with a collared tang <843> [1042] is of unusual design but does appear to be a projectile, though the pointed head which has undergone specialist hardening (Margaret Brooks, conservation report – available in archive) could have been used to make a hole in a number of materials.

Structural metalwork (QM)

A small range of structural ironwork was recovered including a cramp-ended strap <880> [865] phase 9, broken window bars, joiner's dogs, cleats and flat-headed timber nails (137 complete nails and 84 broken nail shanks), along with U-shaped staples of iron and lead alloy.

Boy bishop tokens[15]

Two examples of boy bishop tokens[16] were found, one in an unstratified context [100], <1036>, and one in a

residual context derived from the demolition material from outhouse G, [463], <802>. Both appear to be unrecorded types.

[463] <802> Boy bishop token. This example has some affinities with Rigold's series III, which were inspired by the profile groats of Henry I, but is penny-size. The legend on the reverse reads 'Sancte' or 'Beate' followed by 'nICho/ LAE SOS' possibly to be read as 'Sancte Nicholae Sospiti'.

[100] <1036>) Boy bishop token. This token bears characteristics of Rigold's later Ely series (VIII 'Specimens from Ely with Garbled Legends') but is groat sized. The reverse legend possibly reads 'EPIS/ COPV(s?)/ ELIEN/(?)', a variation on 'Episcopus Eliensis' in keeping with other Ely tokens.

Leather

Ian Carlisle

The leather assemblage numbers 47 finds, comprised of 401 individual components, fragments and scraps. The material is entirely of footwear fragments and leatherworking waste, probably deriving from cobbling. Finds date typologically to a range between the 12th and 19th centuries, though most fall between the 12th and the 15th centuries. Finds were recovered from a wide number of contexts of various types, but the majority was from pit and other cut fills. A smaller number came from dumps, layers and sections. Most of the finds are fragmentary and dateable artefacts relatively few. Those that could be dated were for the most part consistent with site phasing, though there are a few instances of residuality. Finds dated typologically to the 12th century were recovered from an early 14th century context [1422], and a 13th century context, [1833].

Footwear

Most of the footwear fragments are of *turnshoe* construction, a manufacturing method prevalent throughout the period represented in this assemblage. Uppers were typically cut from a single piece of leather, (eg [1413] sf.174) with additional inserts used to facilitate a particular shape or style, to correct mistakes in clicking (cutting out), or to make best use of the material. They were also used in some ankle shoes and boots to increase the height of the quarters. Though the assemblage consists entirely of footwear and associated waste, the fragmentary nature of the finds means that only a single example is of a clearly identifiable shoe type. This is an ankle-shoe upper, [1413] sf.174, front fastening, closed with two overlapping flaps at the vamp throat. One flap is integral and the other an insert stitched to the throat and the front of the quarter. The upper is whole-cut, that is cut from a single piece without separate rand and quarters, and originally had a triangular insert at the top of the medial (inside) quarter to bring it up to full height. A second, extant, insert takes the form of a narrow strip filler between the quarter and the vamp. The cordwainer may have used these inserts as a way of using smaller pieces of leather or may simply have made a mistake while clicking (cutting) out the pattern. A drawstring, now absent, originally passed around the leg and was held by two pairs of vertical slits in the quarters. This shoe type was introduced in the late 11th century and persisted until the middle of the 12th. This example is cut from goat or sheepskin, which became popular in the late 11th century with the introduction of fashionable Spanish Cordovan goatskin (cordwain). Calf had been the most common leather used in shoemaking until this date, and superseded goat again from the 13th century.

Although there was only a single clearly identifiable upper, three fragments, [268] sf.12, may be from a front-laced shoe or boot. One of the fragments has possible lace holes, and tunnel stitching typically used to secure a tongue in footwear of this type. The late 14th century date of its context is consistent with this interpretation as front-laced footwear. The top edge of a turnshoe was often finished with a topband. The most common type, of which there are two examples from this site ([1414] and [1593]), was a leather strip, folded lengthways and attached to the quarters with a binding stitch.

There are eight substantially complete soles, including two foreparts from two-piece soles, and fourteen fragments, from this site. Turnshoe soles wore out fairly rapidly, so they were often repaired. The usual method of repair was to attach separate clump soles over the worn holes, usually at the toe, across the tread and at the seat. There are 16 separated clump soles and clump sole fragments from this site and several soles have tunnel stitch holes indicating clumping. One, [268] sf.13, has been clumped at least six times, three each at the tread and the seat, suggesting that Ely's medieval townsfolk did not discard old footwear until they really were worn out. Some shoe fragments have clearly been cut-down eg uppers fragments, [1615] sf.171, and sole fragments, [820], sf.88, which have been salvaged and reused for an unidentified purpose. Cutting down of footwear was generally for one of two purposes. Either to adapt an ill-fitting shoe or to reclaim usable leather from worn out footwear. The latter could either be in the form of whole components for cannibalisation, ie translation, or to cut into clump soles or other pieces used in the refurbishment of old shoes, ie cobbling. The material cut-down here is in the latter category, so probably derives from cobbling.

Leatherworking Waste

There is a small quantity of new leather waste. Carol van Driel Murray (1985, p.49) developed a typology of offcuts which recognised three distinct types, deriving from the three main phases of manufacture. Primary offcuts were produced during initial rough trimming of the hides, when edges, lobes, nipples, orifices and stretcher holes were removed, and often exhibit these characteristics. Secondary offcuts resulted from the clicking – cutting out – of shoe components, and are often of diagnostic shapes eg the 'cigar' shape between two soles at the waist. They may also have hide edges not removed in the primary phase. Tertiary offcuts are the final trimmings produced when the shoes

were finished, and are usually narrow strips, though may be small triangles and other shapes. All three types are represented here, though in small numbers. Two contexts produced finds with more than one or two offcuts. A find from a dump context [975], consisted of 12 primary offcut fragments, 7 secondaries and 7 trimmings. This context also produced shoe fragments, suggesting that it was waste from cobbling. Context [1422] produced 20 secondary offcut fragments and 31 trimmings, again with a few shoe fragments. It too is likely too be cobbling waste. There is also a single flesh scraping, [1422] <936>. This type of waste usually indicates a hide preparation industry such as tanning or currying, as both crafts utilised processes in which the flesh surface of the leather was shaved. Perhaps currying is more likely as the leather would have been tanned by the time it reached the currier and so is more likely to have been preserved in the soil. Unfortunately, a single example is insufficient to point to this craft on the site, this find perhaps having been created when a cobbler tidied up a rough piece of leather.

Conclusions

The finds from this site are consistent in character over the entire period. Footwear components and fragments, many cut-down, together with offcuts of new leather suggest that cobbling took place nearby. The finds were recovered from almost all of the properties, largely from pit and cut fills, and it is possible that there was a cobbler's workshop on site operating over a period of several centuries. The main problem with this interpretation is the small quantity of leather recovered, and the scattering of a few finds over many contexts. A cobbler's workshop would be expected to produce far more waste than represented here. This could, of course be explained by one or more factors such as differential preservation, incomplete excavation of the properties, or dumping of the majority of the waste elsewhere, perhaps the river.

Environmental Remains

Plant and fossil macros

Chris Stevens

A total of fifty-five environmental samples were examined from the excavations dating from the 11th to 12th centuries right up to the 15th/16th centuries. Thirty-three of the samples were processed through wet-sieving for waterlogged plant remains, while the remaining twelve were floated using standard procedures. The result flots and samples were then scanned and in some cases sorted for the extraction of biological material, which could shed light on the local environment, and the changing economy of the site. The material found within the samples has been divided for ease of reference into several categories and is discussed in relationship to these criteria (Table 2).

Food Remains (Table 3)

The split between waterlogged and carbonised plant material was quite distinct, with few species appearing within both categories. The charred evidence suggested the processing and consumption of several cereal crops, free-threshing wheat, rye, barley, and oats, and pulse crops, pea and broadbean. A few seeds of grape appeared both in charred and waterlogged deposits, but most other cultivated fruits appeared only in waterlogged deposits. For example, fig, plum, apple and cherry, although the latter may of been of the wild variety. Some fragments of walnut were also recovered. The waterlogged remains also contained many fragments of the stones and shells of wild fruits and nuts. Hazelnut was particularly abundant, while sloe, plum, bramble, and elder (although this may have arrived from other sources) were all present in varying quantities. Much of the evidence for domestic fruits and nuts, ie apple, grape, fig, plum, cherry and walnut all came from the phase 9, 14th century occupation of the building. The 14th and 15th century samples, however, contained much less in the way of carbonised cereals, with the exception of one deposit from an alley way, possibly suggesting that domestic activities involving crop processing were not carried out to any great extent within the house itself during this period. However, it may be that the sheer quantity of waterlogged remains from these periods have

Table 2. Division of material from bulk samples

Plant material	
Charred Remains	**Waterlogged**
Food Remains	Food remains
Chaff and probably crop weeds	Seeds of species growing in vicinity
Fuel	Seeds of species brought in by flooding
	Seeds brought in by anthropogenic means
Non-plant material	
Food Waste	**Other**
Shellfish	Freshwater and land molluscs
Fish-bones	Vivianite
Egg shell	Fly pupae
	Worm cocoons
	Insects
	White clay (daub) with impressions

Table 3. *Food remains*

Phase	Volume (ml) after wet sieving/floatation	Number of samples	Common Name	Species	fig	*Ficus carica* L.	walnut	*Juglans regia* L.	hazelnut	*Corylus avellana* L. (shell fragments)	sloe	*Prunus spinosa* L. (fragments)	plum/bullace	*Prunus domestica* L.	cherry	*Prunus avium* (L.) L.	apple	*Malus domestica* Borkh.	garden pea	*Pisum sativum* L./Vicia faba L.	grape	*Vitis vinifera* L.	**Cereals**	**Marine Shells**	mussels	*Mytilus* sp.	oyster	oyster shell	**Fish and Animal Remains**	fishbones	fish bone + scales	egg shell
2	300	1			-		-		1		-		-		cf. 1		-		1c		-		14c		+++		2		++		+
3	650	3			-		-		3		-		-		-		-		-		-		28		+++		-		++		o
4	300	1			-		-		++		++		-		-		1		-		-		2		+		-		++		-
5	450	4			-		-		-/o		-		-		-		-		-		-		+		o		-		+		o
6	250	5			-		-		-/o		-		-		-		-		-		-		++		+		o		+		+
7	450	4			-		-		2		-		2		-		-		-		-		few		o		-		+		-
8	50	1			-		-		-		-		-		-		-		-		-		few		+		-		+		-
9	1450	14			+		-		+++		-		9		+++		4		-		2		+		+++		o		++		+++
10	50	1			-		-		-		-		-		-		-		-		-		few		-		-		-		-
11	300	1			-		-		-		-		-		-		-		-		-		2		-		4		2		-
12	800	6			-		-		3		-		-		-		-		-		-		few		+		-		+++		+
13	350	2			-		-		o/-		-		-		-		-		-		o/-		few		-		-		+++		++
16	200	4			-		-		-		-		-		-		-		-		-		+++		-		-		+		+
17	50	1			-		-		-		-		-		-		-		o/-		-		++		-		-		o		+
18	350	2			-		-		10c		-		-		-		-		++/-		-		+++		-		-		o		o
19	200	4			-		-		-		-		-		-		-		+/-		-		+		-		-		o		-
20	50	1			-		-		-		-		-		-		-		-		-				-		-		-		-

masked out the carbonised material to the extent that cereals are scarcely visible.

In addition to the plant foods were several remains of marine and freshwater resources. Marine mussel shells were highly abundant within the samples, as were fish and eel bones. Other shell remains included cockles, oyster, dog whelk and periwinkle, some of which may have come in with the collection of mussel shells, but also may have been collected within their own right. Such remains are reasonably well represented until the 16th/17th centuries when their presence declines to the point that fish bones appear in very small quantities and mussels and other marine resources are absent. This is probably more likely related to a change in the disposal practices as it is a change in dietary practice.

Crop-Processing Waste

This category of material was only in evidence in the carbonised samples which also contained cereal remains. The remains frequently contained high proportions of stinking mayweed, a species associated with the cultivation of heavy clay soils. Some of the samples also contained numerous rachis fragments of free-threshing wheat, suggesting perhaps waste from the processing of bread-wheat stored as sheaves.

Fuel

Some of the most noticeably abundant charred remains were those of sedges, both the stems and seeds. The principle components of such assemblages were the seeds and stems of great-fen sedge. The frequent reoccurrence of such material, especially from ovens, combined with the historical references to the exclusive use of this plant as the only fuel in the bakehouses of St Johns College and that Turner (quoted in Horwood 1919) notes '*The people of the Fenne countreys … do heate ovens with it*', would suggest that

it was collected and used for such purposes on a frequent basis on the site and over a considerable period of time.

Local Environment
Many of the waterlogged seeds within the assemblages can be related to several different key environments. Water/fenland species, arable/wasteland species; species of nitrogen rich wasteland soils; and species of shaded woodland/hedge or scrub.

Seeds of fenland and water species are likely to have had two possible sources. One is through the collection of such plants for domestic use. For example; many of the sedges, especially great-fen sedge, may have been brought in for fuel. The other possible source is through flooding. Certainly many of the freshwater molluscs found within the assemblages are likely to have come from such sources. The indication of flooding from the molluscan line of evidence comes mainly from the 14th century onwards, with at least some indication of major flooding during the 16th to 17th century.

Several uncharred seeds of arable species were also found, possibly brought in as contaminants of the crop, but also possibly growing from plants growing wild within the vicinity of the house, which were escaped crop weeds. Many of the species identified within the assemblages are also indicative of nitrogen rich, wasteland soils, which were probably common within the vicinity of the house.

Utilised Plants
The last category of plant remains are those which may have been brought in for other purposes, such as gypsywort which was commonly utilised for the black dye it produced, and bog-bean which was commonly used as both a pipe tobacco and as a flavouring in brewing (Leyel 1992). Lastly, two samples from the 13th to 14th century produced many seeds of vervain. Vervain was much heralded as a cure for plague during the Middle Ages. Given the presence of many seeds in only two samples, of a 13/14th Century date, and the fact that the plant is commonly associated with lighter chalk soils, its deliberate collection for such purposes cannot be ruled out.

Animal Bones
Lorraine Higbee
The total quantity of hand recovered bone is 52,825 grams or 4001 fragments. It was possible to assign species identification to approximately 30% of the assemblage by weight (or 60% by fragment count); the average weight of identified fragments is 26.7 grams. The assemblage was divided into two samples, a 'background sample' which included phases with small samples (ie phases 2–4 and 17–23) and a 'detailed sample' which included the relatively large samples from the interior of no. 47 and its backyard activities. The detailed sample includes phases 5–6 dated to the 13th–14th century, phases 7–10 dated to the 14th – early 15th century and phases 11–16 dated to the 15th–16th century. Analysis of the background sample was kept to a minimum and while analysis of the detailed sample forms the basis of this report, the skeletal elements selected for full analysis are those which have diagnostic zones (after Dobney and Reilly, 1988). Bird bones were also recorded using the diagnostic zone method (after Cohen and Serjeantson 1996) but were only recorded if they retained at least one articular surface. The ageing data of Silver (1969) was used to assess the epiphyseal fusion of the post-cranial skeleton and tooth eruption. Tooth wear was recorded using the methods of Grant (1982) for cattle and pig, and Payne (1973 and 1987) for sheep/goat. Epiphyseal fusion categories are those of O'Connor (1989), as are tooth eruption and attrition categories for cattle and pig and for sheep/goat Payne's (1973) categories were used. The description of cattle horncores follows those outlined by Armitage and Clutton-Brock (1976). The distinction between sheep and goats follows Payne (1985) and Boessneck (1969) and was restricted to Dp4, metatarsals, metacarpals, astragali, first phalages and cranium. Measurements follow Von den Driesch (1976), body weight ratios were calculated using the mid-points in the Manching data range (Boessneck *et al*, 1971) and withers height calculations for the main domesticates are those of Kiesewalter for horse, Matolcsi for cattle, and Teichert for sheep and pig (see Von den Driesch and Boessneck 1974) and those for dog follow Harcourt (1974).

Species identification (Table 4)
The remains of goat (*Capra*) were extremely rare (1 specimen each from the 14th – early 15th century and 15th–16th century assemblages) hence those fragments simply identified as sheep/goat are taken to represent mainly sheep (*Ovis*). Small numbers of hare bones were also identified and these are assumed to be those of the brown hare (*Lepus europaeus*) based purely on biogeographical grounds. The differentiation between chicken and pheasant can be problematic thus the category chicken could include some pheasant bones although no pheasant bones were positively identified using Macdonald's (1992) differentiation. All goose bones were from a large species and although varied in size could not be further identified but probably represent both domestic and wild grey geese although they have been grouped together in the analysis. Very few duck bones were identified from the detailed sample and these could only be identified as mallard-size. Misidentifications may have been made but it is suggested that this group of large individuals represent mostly domestic mallards. The bones of crane are assumed to be those of the common crane (*Grus grus*) due to the geographical location of the site (ie in the Fens).

Occurrence and frequency of domestic and wild species
The main categories of domestic and wild taxa show some variations through time (table 4). Not surprisingly, the main domestic mammals (ie cattle, sheep and pig) occur in high proportions throughout the detailed sample and range from 77 to 87%. The

Table 4. Number of identified specimens per species (NISP)

	Date																						
	11–12	12	12–13	13–14		14–15				15–16						16–17			17–18	18	18–19		?	
Species	Phase																						Unphase	Total
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
Cattle	10	6	6		38	3	4	85	19	3	10	11	37	8	11	13	3		2	5	3	1	49	327
Sheep/Go	12	10	18	3	67	5	6	65	13	1	7	19	40	8	6	10	4	1		10	4	4	41	354
Sheep	3	3	5		7	3		11	3	4	1	3	7	1	3	1		1					12	68
Goat								1					1											2
Pig	17	13	3	1	25	2	3	51	5	3	8	6	17	5	12	2	1	1		6	1	1	26	209
Horse					5			2					1				1						2	11
Dog		1						2		1														4
?Dog/Fo																							1	1
Cat			2		1	2		3															1	9
Fallow		1			1			3												3			1	9
Roe Deer																1							1	2
Hare								1						1	1					2				5
Rabbit					1			1			1		4	7	5	2				5	2	1	3	32
Chicke	1				5			12		1	1		2	10	10	3	1			28	3	1	2	80
Goose	2	1	1		7	2		8	2			4	3		13	1	2			5	1			52
Duck					1			2								1				22	1		1	28
Teal															1									1
Crane													1		1									2
?Wood																				1				1
Total	**45**	**35**	**35**	**162**		**319**				**300**						**49**			**2**	**87**	**22**		**140**	**1196**

proportions of minor domestic species (ie dog, cat, horse and domestic birds) range from 11 to 16%. The 15th–16th century sample is the most varied in terms of species range since it has the highest proportions of wild mammals (6%) and is the only assemblage in the detailed sample from which the bones of wild birds (crane and teal which represent 1%) were recovered.

The relative abundance of the common domestic species also shows some variation through time. In terms of the number of identified specimens per species (NISP) sheep dominates the 13th–14th century sample but decreases in frequency relative to an increase of both cattle and pig bones in the later phases. This pattern is repeated by the relative frequency of the minimum number of individuals (MNI) in each sample (table 5). However, the relative importance of meat supplied by these three species indicates that not surprisingly cattle dominate throughout all three assemblages. The proportion of beef consumed increasing from 67% in the 13th–14th century to 80% and 81% in the later phases. Mutton and lamb decline in their dietary importance from 30% to 17% whilst pork remains at a low level and never contributes more than 2–3%.

Table 5. Minimum number of individuals (MNI) for main domesticates

Date	Cattle	Sheep/Goat	Pig
13th–14th century	3	10	4
14th– early 15th century	7	12	5
15th–16th century	5	8	4

Main Domestic Mammals

Carcass representation and butchery

The distribution of skeletal elements indicates a recovery bias against small bones.[17] However, all portions of the beef, mutton and pork carcass are represented which suggests that live animals were bought into the town to be slaughtered. The frequency of proximal metapodia over distal metapodia in the assemblages suggests that both beef and mutton were procured as dressed carcasses or joints. There is a greater abundance of the minor meat bearing elements of sheep (eg tibia and radius/ulna) and primary butchery waste of pig relative to the major meat bearing elements of the upper limbs. This observed bias may be due to the differential preservation of skeletal elements, particularly with regard to the porous nature of immature pig bones. The assemblages under analysis are considered to represent mostly domestic household refuse, the presence of skeletal elements considered to represent butchery waste (ie skulls and feet) could indicate either the procurement of specialist cuts of meat or a degree of on site processing being carried out. No spatial concentrations of particular skeletal elements were observed which might suggest industrial or craft activities.

Butchery marks were recorded with great frequency on the bones of the main domestic species, chop marks were more commonly observed than knife cuts, although cut marks were relatively more common on sheep bones. No distinct change in butchery technique could be discerned for the periods under analysis. The butchery observed on cattle bones is consistent with the reduction of the carcass into smaller portions by the simplest means. Metatarsals recovered from phase 6 (13th–14th century) had all been split longitudinally presumably for the extraction of marrow fat. Butchery observed on sheep bones is less systematic but the location of knife cuts around the periphery of joints indicates the jointing out of limbs by cutting through ligaments. Horn cores were removed by sawing through the basal section and skulls were commonly split along the sagittal plane presumably so that the brain could be extracted. Most vertebrae centra were intact. Damage caused by a meat hook was recorded on two scapula blades, one from a 13th–14th century context and the other from a 15th–16th century context. There is little direct evidence for butchery on pig bones, vertebrae centra were recovered intact and dismemberment appears to have been achieved by chopping through the major joints of the limbs. One scapula blade from a 13th–14th century context also has the characteristic damage caused by a meat hook.

Husbandry and Economy[18]

The low number of complete cattle mandibles from all phases means that age estimates could only be deduced from the 14th – early 15th century assemblage, and were based largely on incomplete tooth rows, isolated teeth and epiphyseal fusion. Based on Silver's (1969) data the majority of this group is less than 5–6 months of age, that is it represents calves that were still suckling or newly weaned. Butchery marks recorded on some of the post-cranial bones of immature cattle suggests that they represent animals killed for their meat. Such data is taken to indicate the importance of dairying, with its associated increase in the availability of veal and has been recorded on other sites of a similar date (O'Connor, 1993, Albarella and Davis, 1996, Dobney, Jaques and Irving 1996). Mandibles from immature, subadult and adult cattle are also present in the assemblage and this is reflected in the epiphyseal fusion data.

The age distribution for sheep mandibles from all three assemblages shows a clear trend towards subadult and adult animals aged 2–3 and 3–4 years. Younger animals aged 1–2 year occur only in the 13th–14th century assemblage and mature adults aged 4–6 years are represented in the 15th–16th century assemblage only. Epiphyseal fusion data generally supports this pattern, it also indicates that small numbers of lambs are present in the two earliest periods. Overall the age distribution is characteristic of an emphasis on wool and mutton and is similar to that recorded from other sites of the same date (Dobney, Jaques and Irving 1996, Maltby 1979, Albarella and Davis 1996). This trend no doubt reflects the economic importance of wool production in England at the time.

A limited number of pig mandibles and post-cranial bones were suitable for ageing the available information indicates that the majority slaughtered were immature and subadult. In all periods under consideration pigs were slaughtered between approximately 7–13 months and 17–22 months. This pattern is supported by the epiphyseal fusion data however, older individuals are represented in two of the periods. The age distribution outlined above is similar to that recorded from a number of sites and probably reflects the rapid fecundity of this animal and the fact that it is not exploited for secondary products.

Although measurements were taken where possible on all type of skeletal elements, most did not yield sufficient specimens for detailed metrical analysis to be carried out. Estimates of shoulder height could only be calculated for sheep and pig. The reconstructed shoulder height of sheep in the 14th – early 15th century assemblage is based upon measurements of two astragali and a metacarpal, the mean shoulder height is 0.53m with a range of 0.49–0.61m. A radius from the 15th–16th century assemblage gave a reconstructed shoulder height of 0.47m. The reconstructed shoulder height of pigs in the 13th–14th century assemblage is 0.68m and in the 14th – early 15th century assemblage it is 0.64m. These estimates are comparable to the size range of sheep and pigs from Coppergate, York (O'Connor, 1989), Lincoln (Dobney, Jaques and Irving 1996), Quilter's Vault (Bourdillon 1979) and Melbourne Street, Southampton (Bourdillion and Coy 1980).

The incidence of non-metric traits and pathological conditions recorded on the bones of cattle, sheep and pig was extremely low. Two examples of hypoconulid (the absence or reduction of the posterior cusp of the third molar) were recorded on cattle mandibles from the 13th–14th century and 14th – early 15th century assemblages. The location of the major nutrient foramen on sheep femora was in all instances recorded on the proximal anterior aspect of the shaft, this is the commonest location in modern breeds. One sheep metacarpal from a 14th – early 15th century context was recorded with a bony extension located on the lateral-posterior aspect of the proximal shaft.

Minor Domestic Mammals

Dog is represented by only three bones, a metapodia and tibia from an adult animal recovered from the 14th – early 15th century assemblage and the pelvis of a puppy recovered from the 15th–16th century assemblage. The tibia is complete and gave an estimated shoulder height of 0.47m. A knife cut located on the medio-distal shaft of this specimen suggests that the animal may have been skinned. Despite the rarity of dog bones recovered from the site the frequency of canid gnaw marks recorded on bones in the detailed sample ranged from approximately 10–16%.

Cat bones occur more frequently than dogs and were recovered from the 13th–14th century and 14th – early 15th century assemblages. Of the five specimens

recovered from the 15th–16th century four are from kittens. The mandible of an adult cat also from this assemblage was recorded with a knife cut located on the buccal aspect of the anterior jaw, this has been interpreted as evidence for skinning when recorded on other archaeological cat bones (Albarella and Davis 1996).

Small numbers of horse bones were recovered from all three assemblages, the two specimens from the later assemblages both bear butchery marks in the form of heavy chops. Five complete long bones recovered from a 13th–14th century context appear to belong to the same mature individual and gave a mean estimated shoulder height of 14 hands and 2 inches. Two of the long bones of this individual show signs of osteoarthritis in the form of lipping around the margins of the joint.

Wild mammals

Hare, rabbit and fallow deer are the only wild species of mammal identified in the assemblages. Of the three species rabbit occurs with the greatest frequency and is represented by both adult and juvenile individuals. Rabbits appear to have been skinned on site given the frequency of foot bones in the assemblage. Four specimens of fallow deer were recovered, the skeletal element distribution indicates that dressed cuts were purchased from a butcher although those represented in the assemblage are not the choicest cuts.

Domestic birds

Bones of chicken and goose were recovered from all three assemblages, all portions of the carcass are represented suggesting that whole birds were brought to the tenement probably still in their plumage. Fine knife cuts were observed on a small number of specimens. The bones of duck occur less frequently and were recovered from the 13th–14th century and 14th – early15th century assemblages only. Goose bones are slightly more frequent than chicken in the earlier periods but this trend is reversed in the 15th–16th century assemblage. Only adult birds are present in the earliest period however, juvenile chicken bones make up approximately 5–16% of the domestic bird bones in the later periods whilst juvenile goose bones make up only 2.5–5%. The greater number of adult geese bones may reflect the importance of this species for its secondary products (eg feathers) and the desire to have a fattened goose for the festive season. Female chickens dominate the assemblages and only one male (spurred) chicken tarso-metatarsus was recovered from a 14th – early 15th century context. The prevalence of females may reflect the probability that chickens were kept by the occupants of the tenements primarily for their eggs (egg shell was recovered from some environmental samples). The relatively large number of juvenile chickens in the later assemblages may represent capons slaughtered for meat before development of the spur. Unfortunately insufficient numbers of measurable elements are available from the assemblages to carry out any biometrical analysis.

Wild birds[19]

Both of the wild bird species identified come from the 15th–16th century assemblage, teal is represented by a single carpo-metacarpus and crane by a humerus, Synsacrum and pelvis. During the later medieval period the crane was regarded as a high status bird to be served at banquets which makes its recovery from a tenement in Ely a little surprising, particularly given the mundane nature of the rest of the assemblage.

Conclusions

The bone assemblages in the detailed sample represent the remains of animals exploited for food and are dominated by domestic species with limited dietary variation provided by the exploitation of locally available wild mammals and birds. The skeletal element distribution for some species suggests that dressed carcasses or joints were purchased and that some carcass preparation was carried out on site. An increase in the socio-economic status of the occupants of the tenement in the 15th–16th century is suggested by the presence of crane, a bird considered to be high status.

Fish Remains

Andrew KG Jones

While the site contained deposits ranging in date from the 12th century until the 20th century, fish remains were recovered from phases 3–22 (12/13th century to 18/19th century). A modest assemblage of fish remains were collected by hand from the deposits during excavation. In addition a series of 300 mml samples were washed on 500 micron aperture sieves and fish remains collected from the dried soil residues. Bones and scales were identified by comparison with the reference collections at the Environmental Archaeology Unit, University York. The terminology for fish remains follows that given by Wheeler and Jones (1989) and names of fish taxa follow the nomenclature of Wheeler (1969).

While fish vertebrae dominate both the hand collected and sieved assemblages the species present contrast dramatically. The hand collected assemblage is made up of bones of large gadid (cod family) fishes with cod, *Gadus morhua*, occuring in 9 phases and ling, *Molva cf molva* being present in 5 phases. Other marine fishes include pleuronectid flatfish, including plaice, *Pleuronectes platessa*, (present in 5 phases) and other haddock, *Melanogrammus aeglefinus*, (present in 2 phases) and conger eel, *Conger conger*. Freshwater fishes were represented by a single opercular bone from chub, *Leuciscus cephalus*, phase 20.

By contrast the sieved assemblage is dominated by small and medium sized fishes, notable herring, *Clupea harengus* (present in 8 phases) and eel *Anguilla anguilla* (present in 6 phases). Cyprinid fishes, mainly represented by scale fragments were also present in 6 phases and included two pharyngeal bones identified as chub. Other freshwater species include pike, *Esox lucius* (4 phases) and perch, *Perch fluviatilis* (2 phases). Whiting, *Merlangius merlangus*, a small marine gadid fish and thornback ray, *Raja clavata*, another marine

food fish, were recovered from phase 9 deposits.

The condition of fish remains was generally good. Most had a hard, often shiny, surface. The colour of fish remains varied from light yellowish brown (typical of fish bone from most sites) to dark brown a colour most common on sites with anoxic organic deposits. There was little sign of post-excavation damage. One bone had distinct traces of gnawing and a few of the herring vertebrae were crushed in a manner that suggest that they had survived passage through a mammalian digestive system (see Wheeler and Jones 1989).

Table 6 summarises the finds of fish remains by taxa and demonstrate that the medieval inhabitants of Ely were drawing on both freshwater and marine resources for their supplies of fishes. The presence of head and trunk bones of cod and conger eel are a clear indication that at least some marine fish was imported as fresh fish. However, it is interesting to note that the ling and haddock were only represented by bones that remain with the flesh when these animals are dried and traded as stockfish. Postcleithra, cleithra and vertebrae are usually present in stockfish and the presence of these bones together with the absence of robust upper and lower jaw bones has been used by several authors (eg Wilkinson 1979, Barrett 1997) to indicate the presence of traded fishes. The Ely assemblage is too small to come to a clear conclusion concerning the importation of dried fish, however the possibility that some fish arrived in this form cannot be excluded. It is also possible that herring were imported salted in barrels, but given the location of Ely and the presence of marine fishes in medieval deposits at many other East Anglian sites, it seems clear that freshly caught marine fish were brought to the site.

Taken as a whole the range of fishes from Ely is typical of that found in several medieval East Anglian urban settlements eg Thetford (Jones 1984), Norwich (Jones and Scott 1985) and King's Lynn (Wheeler 1977). Future work in the city should provide more data on the supply and consumption of fishes to the inhabitants of Ely if a more extensive sampling and sieving strategy are implemented.

Discussion

The Urban Fabric

The sequence begins in the 12th century (Period Ia) with a single feature, a recut ditch which in itself, reveals very little; however it was associated with a relatively rich finds assemblage which is more telling. This included ceramics, leather shoes and other scraps, a padlock key, candle pricket, wool combing spike, horseshoes and structural ironwork (see finds reports). In addition the ditch fills contained a diverse range of environmental data which included abundant shellfish, fruits, legumes and cereals as well as freshwater and (to a lesser extent) marine fish alongside occasional wild fauna and the three main domesticates (cow, sheep/goat and pig). All of this almost certainly denotes occupation in the vicinity (perhaps on the other side of the road) despite the dearth of any associated structural or other features from this period. A pollen profile from the ditch was

Table 6. *Fish remains*

Abbreviations: Ph = Phase. s= sieved samples examined from this phase; - = absent; + = present. TR = Thornback ray, *Raja clavata*; Hg = Herring, *Clupea harengus*; El = Eel, *Anguilla anguilla*; Ce = Conger eel, *Conger conger*; Cy = Cyprinidae (includes records for chub, *Leusicus cephalus*); Pk = Pike, *Esox lucius*; Gd = Gadidae, cod family; Hk = Haddock, *Melanogrammus aeglefinus*; Cd = Cod, *Gadus morhua*; Wg = Whiting, *Merlangius merlangus*; Lg = Ling, probably *Molva molva*, Ph =Perch family includes perch, *Perca fluviatilis*; Pd = Pleuronectidae (includes plaice *Pleuronectes platessa*).

Ph	TR	Hg	El	Ce	Cy	Pk	Gd	Hk	Cd	Wg	Lg	Ph	Pd
3s	--	-+	-+	-+	-+	-+	--	--	--	--	--	-+	--
4s	--	-+	-+	--	--	--	--	+-	--	--	--	-+	--
6	--	--	--	--	--	--	+-	--	+-	--	--	--	+-
7s	--	-+	--	--	--	--	++	--	--	--	--	--	--
8s	--	-+	-+	--	-+	--	+-	--	--	--	--	--	--
9s	-+	-+	-+	--	-+	-+	+-	--	+-	-+	+-	--	++
10	--	--	--	+-	--	--	+-	--	--	--	--	--	--
11	--	--	--	--	--	--	--	--	+-	--	--	--	--
12s	--	-+	-+	--	-+	-+	--	+-	--	--	--	--	--
13	--	--	--	--	--	--	--	--	--	--	+-	--	--
14s	--	-+	-+	--	-+	--	--	--	+-	--	+-	--	-+
15	--	--	--	--	--	--	--	--	--	--	+-	--	--
16	--	--	--	--	--	--	+-	--	+-	--	+-	--	+-
17	--	--	--	--	--	--	--	--	+-	--	--	--	+-
18s	--	-+	--	--	-+	-+	+-	--	+-	--	--	--	--
19	--	--	--	--	--	--	--	--	+-	--	--	--	--
20	--	--	--	--	+-	--	--	--	--	--	--	--	--
22	--	--	--	--	--	--	+-	--	+-	--	-	--	+-

not very informative except to confirm its function as drainage with corresponding vegetation.[20]

Unfortunately however, with such circumstantial evidence for occupation, little more can be said except that perhaps this was not necessarily in a marginal settlement area and certainly not agricultural. Determining the wider context of the recut ditch is difficult as little evidence for settlement at this period has been found within Ely. Sporadic finds within the town[21] point to occupation and activity but none of it very informative of settlement patterns. The location of the pre-conquest monastery and an associated secular community have, until recently, been shrouded in mystery, but in the absence of any other archaeological evidence, the area adjacent to the parish church to the west of the abbey was considered to be the most likely focus of Saxon settlement (Taylor 1973, Robinson 1994). Pre-conquest pottery and a substantial stone footing found beneath the cathedral foundations during drainage repairs and other works (Alexander 1994, Regan 2001), suggested a possible location for the pre-conquest church.

All this however, has to be seen in the light of fresh evidence from the western periphery of the city where, in the spring of 1999, a Saxon settlement at West Fen Road, covering 12 hectares and dating from the 8th to the 13th century was discovered (Mortimer 2000, Regan 2001). Until very recently, it had been natural to presume that, as interlinked and possibly contemporary events, the position of the post-conquest monastery and cathedral, and the establishment of a navigable river channel close to the foot of the hill, were the strongest impetus to the development of the medieval town in its present location. However with this fresh evidence to suggest the focus of the pre-conquest settlement was not directly beneath the medieval city, the location of the 11th century monastic institution in relation to the West Fen settlement promotes speculation. It is interesting that the new abbey church was not positioned where it could dominate the well-established settlement on the west side of the island, but was built instead some distance away with a commanding location over looking the eastern hill slope. Equally the explanation may be practical one: the bedrock outcrop beneath the present cathedral would have provided the necessary firm ground and solid foundation for a stone built structure.

In any event, it is an almost inevitable consequence that a road between the new cathedral and the riverside should become a well–used route of some importance. Forehill takes the most direct route from Broadhythe the earliest documented wharf (*c.* 1210) to the monastic precinct and the market, established by licence to the monastery by Henry I. Seen in this context, the ditch at Forehill is possibly marking this route and it is not unlikely that settlement related activity would build up alongside it. As such, it perhaps established the focus for subsequent development in the wake of the demise of the settlement at West Fen. The establishment of property divisions and associated first buildings which appear on the site in the 13th century (Period Ib) century would appear to mark this transition to urbanisation.

Evidence from other investigations in Ely support this picture. Excavation and evaluation in the past decade has established that the street frontage to Broad Street was built up from at least the 13th century onwards, and that the linear plots stretching back from the street to the river also had their origins in this period (Alexander, 1998a and 2002, Regan 1998). The recent renovations of the building at number 41, Broad Street, (lately called The Three Blackbirds) revealed its 13th century origins. At Jubilee Terrace running towards the river from Broad Street, the earliest excavated evidence dated to the 12th century, and in the 14th century a large warehouse was built, in which lime was stored (Connor forthcoming). A dense concentration of intercutting pits found on the southern corner of Lisle Lane and Cresswell Lane during evaluation suggests there was settlement here between the 12th and the 14th centuries (Oakey 1995). 13th century surveys of the town support this interpretation and indicate a system of streets around the monastic precinct with settlement concentrated along the river and the around the market, gradually infilling the space in between, ie along Forehill.[22] Taken together, all this strongly suggests that Forehill forms part of the skeleton of the early riverside settlement and the nature of the site in this period reflects this and the establishment of the urban fabric.

The 14th century (Period II) sees this pattern maintained with accelerated building and rebuilding activity along with more formal, metalled lanes running between the tenements. In effect, at the end of the 14th and beginning of the 15th century, the site clearly shows Ely to be a fully formed small town, with an established urban fabric. This is supported by the first detailed documentary evidence, a survey made in 1416–17 which provides a full list of tenement holdings for the northern side of Forehill covered by the excavated area.[23] The tenement layout for the site was reconstructed from the 1416–17 survey and superimposed on the Period II plan (see Fig 8); it shows a surprising correlation with many of the boundaries defined in excavation.[24] The tenements are labelled according to the recorded owner and include, west to east: the tenement of Richard Hildresham opposite the junction with Broad Street, which seemed to have abutted on the north, a tenement of the infirmarer; the tenements of John Plomer, John Hunte and Robert Botery, all of which probably abut the Bishops vineyard on the north (outside the excavated area);[25] and finally a tenement of the bishop at the junction of Forehill and Lisle Lane.

The pattern which is seen fully established in the 15th century appears to be more or less maintained for the next three centuries (Periods III and IV), although the increase of cess pits, soakaways and wells after the 17th century (Period V) may reflect a subdivision of the properties taking place beyond the limits of the excavation, as well as general modifications of domestic space. Overall though, in terms of the urban fabric, the divisions and buildings within

the site exhibit remarkable continuity over the time span recorded. The major change on the site occurred in the 12th/13th century (Period I) in marking the inception of urbanisation; unfortunately, the evidence from this site is insufficient to fully understand this process and indeed would require data from a much larger area. After the 13th century, with the layout of the site and its property divisions now established, they remain more or less constant for the next seven centuries. What changes is less the urban fabric (except at the detailed level of building/construction methods and the arrangement of internal space – see Building Sequence Discussion above) than perhaps its use, ie patterns of urban living, and it is in this area that the site provides the more useful data.

Urban Space at Ely

Although there is little documentary evidence for how these tenements were used before the 19th century, they almost certainly had a domestic element. Nevertheless, one must be careful when characterising something as domestic for it does not necessarily preclude specialized or industrial activity taking place at the same time and this is where the archaeological data are most useful. Indeed, this is perhaps one of the major themes in medieval urbanism and use of space, the nature and relationship between domestic and commercial activity.

At the very beginning of the sequence at Forehill, there is possible evidence for specialised activity in the form of leatherworking – the quantity of leather waste and shoe soles from the Period I ditch suggest potential specialised industry along this end of Forehill, associated with the general background of domestic waste also retrieved. Indeed, leatherworking possibly continues to form a major component of the finds assemblage into the first half of Period II

Table 7. *Evidence for finds associated with specific activities at Forehill. (n = object/fragment count)*

	Ia	Ib	II	III	IV	V
textile working	1	1	2	-	1	2
farrier	6	1	3	1	-	-
leather working	21	90	74	17	-	6
smithying	-	-	-	-	-	(present)

suggesting this minor industry continued up to the end of the 14th century (see Table 7). However, the likelihood of redeposition must be considered for later phases and indeed the two assemblages considered to be numerous enough to suggest waste from a workshop, were both from contexts with a high residual pottery content. The only other activities represented in this time period are those of a farrier (ie horseshoeing) and textile production, as evidenced in the first case by horseshoes and nails and in the second, wool combing spikes and spindle whorls, a thimble and sewing ring (Table 7).

None of these industries need be anything but small-scale, domestic ventures, indeed it might be questionable to what extent they represent domestic production purely for domestic consumption. This for example, might certainly be the case with textile production and horseshoeing, although the leatherworking might indicate more of a specialised and therefore commercial enterprise. However, it must be noted that given the appropriate conditions for preservation, leather off-cuts are prevalent on almost all urban sites of this period, and were no doubt recycled for a wide variety of uses (Clarke and Carter 1977).

The evidence therefore for commercial as well as domestic activity in the first two to three centuries of occupation at Forehill is rather ambiguous. The presence of a lead seal (Fig. 26) and jetton in this period might be used to argue for more commercial activity being linked with these industries, but this is very slight. Moreover, the data do not suggest clear, specific linkages between properties and industries on the basis of the finds, although the majority of leatherworking waste comes from the properties in the western half of the site (A–F), while most of the textile working artefacts were associated with F.

It is not until the 15th century (Period III) that industrial structures actually appear on the site and provide the first concrete evidence for specialised, commerical activity, which can also be associated with specific properties. Immediately behind the main structure in tenement C were a series of ovens and unburnt brick structures which have been interpreted as part of a brewing complex and continue in use up to the 17th/18th century (Period V). There is documentary evidence to suggest that brewing was a widespread, but subsidiary occupation for the medieval town household, predominantly carried out by women (*'bratriciatices'*), and without the professional status inferred on the full-time trades such as bakers and butchers (Hilton 1984). The brewing process is comparatively simple, but involves a series of processes. The grain is initially soaked and then left to germinate on the malting floor. Once the starch has converted to sugars, the grain is roasted in ovens, crushed and brewed in hot water. The resulting brew was left to ferment in vessels, commonly stave-built barrels, before consumption.

Brewing on a small scale, as was predominantly the case, could be carried out using common domestic equipment (copper cauldrons, the cooking hearth, stave-built vessels and pottery flagons) and would be almost invisible in the archaeological record. Only where production was on a large enough scale to require separate facilities can the process be more securely identified. At 49–63 Botolph St, Norwich the verification of a late 15th century malthouse was considerably aided by the documented occupation of the tenement owner as a maltbrewer, the contemporary archaeological evidence being a room extension to the back of the property, containing a small hearth, an area of heat blackened tiles, and the post hole

alignment of a possible drying rack (Atkin, Carter and Evans 1985). The brewing process became more visible in the later period, when the building was enlarged, and accommodated a drying area and a series of ovens built into the walls in a similar fashion to structure [1074], phase 16 at Ely.

The documentary data for Forehill is not very helpful here – the tenement in which the oven complex sits, according to the overlay, belonged to a John Plomer in the early 15th century, who is recorded as a butcher.[26] He may or may not have lived here however, as he owned several other properties and given the lack of clear archaeological evidence from the faunal assemblage, he almost certainly did not operate his business out of this property (see Higbee, above). A 17th century trade token from the site belonged to a John Weatherhead (see above) who was a baker and although somewhat late, may suggest a bakery rather than brewery. However, it may not be coincidental that the Forehill Brewery, founded sometime in the mid-late 19th century, occupied part of the site in its latter phases, so the interpretation must remain ambiguous. The only other evidence of industrial activity is a smithy which occurs in the 17th/18th century in property G, identified through smithying waste.

In summary, the evidence from the archaeological data on the use of the properties suggests a complex picture; while industrial activity in the form of textile production and leatherworking appears from the earliest period, there is little to suggest it is anything but domestic in scale and consumption. It is not until the 15th century that a more specialized commercial enterprise emerges, probably a brewery. However, this does not mean that the whole site was linked to such activities, nor that the site shifted from a domestic to commercial status – such divisions are peculiarly modern (see below). People were still living and carrying out everyday domestic activities within the tenements, as the archaeological data suggest, and indeed this raises an important question concerning the status of the occupants of these tenements. Is there any link between the development of specialised, commercial enterprises such as the brewery, and the economic and social status of a street such as Forehill?

Wealth and Status along Forehill

Documentary research reveals that from the 15th century, Forehill was occupied by, or at least properties were held by, a mixture of traders and professional people as well as some minor gentry, a pattern which seems to have persisted well into the 19th century on the basis of town directories and census returns.[27] It was not until the 20th century that residential and commercial space in towns started to split, with the rise of suburbia and the transformation of town centres into a zone dominated by business and retail. While some of the smaller scale tradesmen and families may have continued to live above their premises, this has become less and less common, especially since the 1960s with a massive change in the nature of these commercial enterprises (eg the rise of the supermarket).

Given such a mixed composition along a town street such as Forehill for most of its history, how might this have affected the status of its occupants? Again, until the 19th century, archaeological evidence provides the main source of information, chiefly in terms of the environmental data for diet. Taking the main faunal record first (see Table 4 in Higbee, above), there is a clear ascent in both the numbers and diversity of meat sources, peaking in Period II, as observed in the specialist report. This kind of broad and rich meat base to the diet is probably indicative of increasing socio-economic status by the occupants of Forehill, indeed among the wild fowl was crane, a particularly expensive bird. However, it is also interesting to note that diversity, in itself, is not necessarily associated with high status, for the trend after Period II (ie from the 15th century onwards), is toward decreasing overall numbers but increasing variability, especially at the expense of the main domesticates (beef, lamb/mutton and pork). This particularly kicks in with Period IV, that is from the 16th century (Fig. 27).

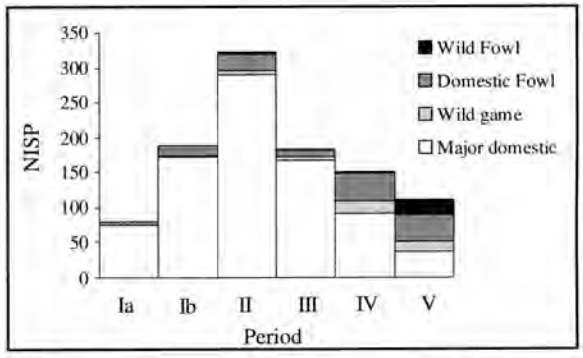

Figure 27. *Summary of mammals and birds*

A similar trend is apparent with the aquatic fauna (see Jones, above), Period II clearly representing the peak of the site in terms of dietary intake – both marine and freshwater fish are present in abundance, declining thereafter (Table 8). The only other feature worthy of note is that freshwater fish seems to predominate over marine fish until the latest periods, except for Period II which again, may suggest something of the higher status of the site, or indeed, the economic wealth in general of Ely in the 15th century. The final source of evidence comes from the plant remains (see Stevens, above). Interpretation is more problematic here, especially as in the case of cereals for example, their presence will be largely in the form of the variously processed crop rather than any

Table 8. *Summary of aquatic fauna*
(+ present, ++ frequent, +++ abundant)

	Ia	Ib	II	III	IV	V
Marine	15	6	92	31	20	3
Freshwater	74	0	77	60	9	1
shellfish	+++	+	+++	+	+	-

final product (ie flour). It is interesting to note however that the occurrence of fruits and nuts is most abundant in Period II, suggesting as diverse a plant diet as with meat (Table 9).

Table 9. *Summary of plant remains (+ present, ++ frequent, +++ abundant)*

	Ia	Ib	II	III	IV	V
Cereals	++	++	+	+	+++	-
Legumes	+	-	+	-	++	-
Fruits	+	++	+++	-	+	-
Nuts	+	++	+++	+	+	
Medicinal herbs	+	+	+	-	-	-

Taken together, all three strands of information resoundingly point to a peak in the 14th century in terms of the diet. Such a rich and varied food supply to the occupants of the site suggest that their social and economic status was comparable to other high status residences, a fact borne out by comparison with assemblages from the Bishop's Kitchen (King's School) in Ely (Higbee 1999; see Table 10). In particular, it is worth mentioning the diversity of wild fowl in a later phase from the Bishops Kitchen including lapwing, swan, wood pigeon, snipe, golden plover, wood cock, grey heron, red grouse, godwit and whooping swan. Moreover in the earlier phase, pig played a greater role in the diet (another indicator of high status).

The relatively high status of the Forehill site at this time is further borne out by the documentary data; out of the four tenement holders on the Forehill frontage at the time of the 1416 survey, three of them are multiple tenement holders: John Hunte and John Plomer with four properties each, and Richard Hildresham with two. Although of course they may not have lived on the site, they were reasonably well to do; Plomer and Hildresham both held a reasonably high status profession (as butcher and Clerk to the Privy seal respectively). The general increase in prosperity is additionally marked by the early adoption of new building styles observed on site (see Building Sequence, above) and moreover, it is at the end of this peak period that the most radical building work takes place as properties A and C are amalgamated.

The artefactual remains unfortunately are not so informative of status as the environmental data – domestic and personal items were few in number and not particularly indicative of wealth apart from the 'fede' ring found in property G. The ring is silver gilt and in comparison to the other dress accessories, is a relatively expensive item (Fig. 23.3). Similarly, ceramics reveal little solid information in this regard; apart from a few continental imports in the earliest and latest phases, the majority of the assemblage is local, indeed during the alleged floruit of the site, most of the pottery comes from Ely itself (see Hall, above). This in itself may of course be more broadly indicative of the prosperity of the town at this time, but it tell us little about this part of Forehill. Vessel types are equally unprepossessing, all essentially functional kitchen wares (jars, bowls and jugs).

The 14th century highpoint occurs just before the first, concrete evidence for commercial industry starting up in the tenements and after this point, the collective environmental information suggests a decline in the diet. Indeed, by the 17th century (Period IV), the main protein source may have changed as meat intake (especially of the main domesticates) decreased while cereals and legumes (beans and peas) increased suggesting a much poorer economic status (see Table 9). It is possible that what we are seeing is a case of people settling along Forehill in the 13th who slowly accumulate a certain wealth and status so that by the start of the 15th century, they move on and rent out their properties to a new wave of artisans and tradespeople. Unlike their predecessors however, these new occupants never seem to attain the same degree of fortune and the status of the street gradually declines.

Looking at documentary evidence for property use along Forehill in the 19th century, it was found that while Forehill as a whole remained fairly prosperous, the eastern end (ie the area of the present site) had declined quite rapidly, 'with the less prestigious businesses and residents occupying the properties closest to the river which had, by this time, become overcrowded and pest-ridden slums' (Went 1999). Indeed, by the mid 19th century, many of the properties had become subdivided, a feature also inferred from the

Table 10. *Comparison of the Forehill faunal assemblage to another contemporary high status site by NISP*

	Ely, Forehill (14th century)	Ely, Bishops Kitchen (14th/15the century)	Ely Forehill (15th/16th century)	Ely, Bishops Kitchen (15th/16th century)
Cattle	114	5	58	28
Sheep/goat	112	15	78	13
Pig	64	85	31	20
Horse	2	1	1	1
Deer	3	0	0	5
Hare/rabbit	2	1	5	24
Chicken	13	3	3	8
Goose	12	1	7	4
Water fowl	2	0	0	11
Wild fowl	0	0	1	3

archaeological remains (see above). This supports the idea that the site had come down in status quite dramatically and on the archaeological evidence, it may be linked to a process that began in the 15th century.

Ely Forehill was, until the recent investigations at Broad Street, the largest open-area excavation to be conducted in Ely. Excavation revealed a deep and complex sequence of deposits, dating from the 11th century and the excavation provided an unprecedented opportunity to investigate a comparatively large area of medieval street frontage and examine aspects of the urbanisation and growth of this part of the town. The relevance of these objectives goes beyond their local setting in defining some aspects of the character of this urban settlement in the context of the small town in medieval England. The genesis of the urban fabric, the relationship of excavated features to documented aspects of ownership and use, and the developments in building construction and use of space at the close of the medieval period are all issues with a regional and national agenda. Although the evidence from Forehill is by no means conclusive, it has provided the best opportunity to date to characterise an area of Ely beyond the precincts of the monastic institution, and has provided a chance to explore the relationship between the documented tenement information and archaeological evidence. The issues of the early development of this part of the city and the evolution of urban buildings in the late medieval period are aspects of the site with a wider relevance to studies of the small town in medieval England and the so-called Age of Transition.

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Endnotes

1. The buried soil was examined by Karen Milek in thin-section and her full analysis can be found in the archive report. In summary, she concluded that subsoils on the site developed under the stable conditions of a forest, and that they experienced a high and periodically fluctuating water table. The first human impact on these soils was the clearance of the forest and the addition of organic matter and occupation debris to the A horizon of the brown forest soil. At some point the soil was disturbed using an implement of some kind, although micromorphological evidence alone is not sufficient to distinguish between disturbance for the purpose agriculture, horticulture or building construction (Milek 1999).

2. This corresponds with Atkin's (1991) type 3 use of clay walling.

3. Several of the possible structural timbers also showed evidence for wet rot. This was always on the under sides of the timbers, not surprisingly. Almost all the timbers from A2/B2 phase 7 showed signs of wet rot (Taylor 1999).

4. Coppiced wood was widely used for wattle panels in buildings and fences at all periods, but there was virtually no evidence for this in the wood from this site. ... Radially split timber is one of the largest groups of wood from the site, ranging from chunky beams to quite thin planks. Only one piece of tangentially split oak was recorded from the site ([1260] phase 7). Various methods of trimming and further shaping wood were also employed including axe or adze trimming: [503](32) phase 24, [1102](6) phase 9, [1115] phase 9, hewing: [1010] phase 9, [1225], and squaring up roundwood: [871] phase 6, [937]a) phase 9, [1071]k) phase 12, [1102](1) phase 9. ... None of the joinery was very sophisticated, and like the timber itself was variable in quality. ... There is a great variety of timber quality and joinery in many of the structures which, with unused joints (such as [1046]), conveys a strong impression that much of the material is reused (Taylor 1999).

5. Throughout the site the quality of the wood, whether the original raw material or subsequent working, is remarkably variable, which suggests that much of it may have been reused. Within structures the variation can be very marked. The timbers identified in the field as structural from F3 phase 9, for example, are of very mixed quality, mostly very poor and they are shaped, some by radial splitting, some by hewing and some by both methods. Even the stakes supporting the timbers are all different: radially split, half split and roundwood. Structures A2/B2 phase 7 similarly had some very poor quality timber and a variety of techniques. The eventual strength, and possibly the aesthetics, of the structure is not necessarily affected by this sort of variation, but it is not ideal. Extensive reuse of timber is likely to be associated with either poverty or problems of supply. Good quality timber would have grown in deep woods or forest and would have been a valuable commodity. The timbers in drain [1071] (alley way M phase 12), for example, were almost certainly reused from a lightweight framework or structure of some kind and some of the timbers are very poor quality: gnarled and knotty. Contrasting this is the reuse of the finely made staves [970] as a drain cover (Taylor 1999).

6. None of the bricks from the site were retained for examination although measurements were taken and occasionally a colour description was noted in the site records. The earliest context where brick is recorded dates from the 14–15th century, but no measurements were taken. Most of the measurements recorded can probably be assigned to between the 14th and early 16th century (Lloyd 1925, 89–100). Dating bricks purely by measurement alone is quite difficult as regional variations need to be taken into account, both in measurements and manufacturing processes. However, generally speaking, brick is longer, broader and thinner during the medieval period. It is likely that these bricks were [originally] being used in walls and hearths (Garside-Neville 1999).

7. Ten fragments of worked stone were recovered and identified by Anthony Baggs. The stone types consisted of Niedermendig Lava, oolitic limestone, clunch and sandstone. The identified worked stone comprised fragments of quern [153], phase 22, coffin [1267] phase 7, door jamb [384] phase 16, flagstone [153] phase 22 and a complete padstone [397] phase 18. Apart from the padstone, all the worked stone appears to have been reused on an ad hoc basis, for constructional support and repairs. Tooling on the sandstone fragment suggests an 18th /19th century date. The remaining fragments could all be medieval (Baggs 1999).

8. A very high proportion of the wood from the site is *Quercus* sp. (oak), which is to be expected, as oak is the best, and most commonly selected building timber. It is also true that oak survives waterlogging well, and most of the wood which did not survive well enough for species identification was probably not oak. This would mean that other species may be under represented because of selective deterioration (Taylor 1999).

9. Only a sample of roof tiles were kept for analysis and of these a variety of different types were identified including: plain peg tiles, ridge tiles, hip tiles and pantiles, in over 20 different fabrics. It is evident that ceramic roof tile, in the form of mostly unglazed peg tile, was deposited in Forehill during the 14th century. It is likely that tile was used on buildings at least as early as the 13th century. The medieval buildings also had glazed, decorated crested ridge tiles. A single hip tile points to the presence of a hipped roof line. (Garside-Neville 1999). A full analysis of the material can be found in her archive report.

10. Some floor tiles were also recovered but not in great numbers or in situ. The fragments of floor tile present are mainly very abraded or burnt, and show signs of reuse. The earliest date that the floor tiles occur is the 14th century. Either they were removed from a nearby high status building for reuse, or perhaps small numbers were used to decorate a small section of floor or hearth. (Garside-Nevile 1999). Nine pieces were submitted to J Stopford of the University of York for further examination, who identified two types, one of which came from the Bawsey kilns (King's Lynn, Norfolk) operating in the mid 14th century (Stopford 1999).

11. Further micromorphological analysis was conducted on these layers in Area A2 by Karen Milek. Again, she suggests that the structures built on Forehill during the medieval period seem to have experienced problems with the high and fluctuating water table, and micromorphological analysis of the floor sediments suggests that floor boards may have been raised over the ground surface in order to improve living conditions. The resulting floor sediments are derived from the range of domestic activities that probably occurred within the structures and the surrounding yards, and appear to have accumulated under the protective cover of the floorboards. Although raised floor boards have not commonly been interpreted on archaeological sites, it is likely that the boards themselves would rarely survive in the archaeological record, and that the distinctive nature of the underlying sediments would be difficult to observe without the high resolution of micromorphological analysis. In addition, it is very likely that such a building technique, if indeed it was practiced at Ely, was a product of exceptional environmental conditions (Milek 1999).

12. A full catalogue of every item of metalwork found is provided in the site archive. A post-medieval lead window came was found during investigations of the site in 1993, while a small collection of metalwork (7 items) including a brass wound wire-headed pin, a lead window came and came tie and iron timber nails were found during work in 1994. 342 items of metalwork were recovered from the excavations at Forehill, Ely undertaken in 1995. It is by far the largest and most interesting assemblage of metalwork to be recovered from Ely in recent years providing useful dating evidence to complement that provided by the ceramic and numismatic finds, evidence of the range of activities being undertaken in the vicinity and an indication of the status of the inhabitants (Mould 1999).

13. Discussion of the jettons, tokens and other similar items is based on verbal and written information from Martin Allen, Museum Asststant, Dept. of Coins and Medals, Fitzwilliam Museum, Cambridge. A note on the seal matrix was provided by John Cherry, Keeper of Medieval and later Antiquities, British Museum. Chris Mycock Museum Assistant, Moyse's Hall Museum, Bury St Edmunds provided written comments on the boy bishop tokens.

14. John Cherry, Keeper of Medieval and later Antiquities, the British Museum.

15. See note 13

16. Boy bishop tokens are peculiar to East Anglia, with a distribution centring on Bury St Edmunds, but widely distributed in Suffolk, with examples from Norfolk and Cambridgeshire, and as far west as St Neots on the Bedfordshire-Cambridgeshire border. Bury was thought the sole source of issue (Caldecott 1936), until examples minted at Ipswich, Sudbury and Ely were identified (Rigold 1975).

    The tokens 'minted' to resemble money: groats or pennies, are presumed to have played a role in the rites and customs of the Boy Bishop or Childe Bishop. The 'reign' of the boy bishop, traditionally lasted from St. Nicholas Day (December 6th) to Childmas or Holy Innocents Day (December 28th), in which time the elected boy performed the functions of a real prelate or abbot. The custom was general to northern Europe, and throughout England, where it is documented from as early as 1299, when Edward I received Vespers from a boy bishop. In Bury the practice existed from at least 1418, although the earliest tokens, dated on numismatic grounds were issued towards the last quarter of the 15th century. In Europe, where the practise seems to have involved a greater element of burlesque, there were attempts at suppression

from 1431 onwards. In England the practise was tolerated until the reforms of the 1540s, revived under Queen Mary and ultimately abolished in the reign of Queen Elizabeth.

17. See the archive report for full data (Higbee 1999).
18. Details on population statistics can be found in the archive report (Higbee 1999).

19. Thanks to John Stewart for his help with the identification of some of the bird species, in particular for confirming identification of the crane bones and providing further mensural data from his own research.

20. Wiltshire 1999.

21. For examples St Mary's Lodge (B Robinson, pers comm), Brays Lane (Alexander and Hunter, forthcoming), The Paddocks (Holton-Krayenbuhl 1988), Walsingham House (Hunter 1991) and Chapel Street (Hinman 1996).

22. Went 1999.

23. Went 1999.

24. The boundaries proposed from the 1416–17 survey, superimposed on the Period II plan, show a surprising correlation with many of the boundaries defined in excavation. There is an almost exact concordance between the width of the Plomer's western tenement of 9ft or 2.74m and the proposed width of buildings A1–4 of 2.70m, based on the boundary between A/C and E at the north end of the site. To the west of Plomers tenement, the massive frontage measurement for Hildresham (18.29m) takes the western boundary far beyond the western edge of excavation, and alleyway L would have subdivided the property. Given this width to the property, it is possible that, following the apparent demise of property B in phase 12, the main dwelling in this property was to the west of L. The eastern boundary of the Hildresham plot equates well with the boundary between properties B and A (later C) which was established as a fence line in phase 3. Moving east the survey gives a combined frontage measurement of 5 perches and 2.5 yards (27.4m) for the second tenement of John Plomer, the two tenements of John Hunte and the tenement of Robert Botery. This measurement added to the widths of alleyways M (1.90), Q (1.50m) and N (1.20m) gives a total length of street frontage of 32m. This figure equals the distance between the western boundary of E, as defined in phase 9 and the eastern side of alleyway N. Under this scheme property E would be the second tenement of John Plomer. The joint ownership by Plomer of the adjacent plots ties in well with the archaeological evidence for the amalgamation of properties C and E, and the structural evidence that standing building no. 47 spanned both tenements in the late 16th century. The boundary between Plomer's eastern plot and the adjacent tenement of John Hunte can be aligned with the western wall of building F5, newly built in the late 15th century. This layout would define alleyway M as a property boundary between the two Hunte tenements, a role it appears to hold in the excavated sequence. The second Hunte tenement could have incorporated properties G and H. Although not much archaeological evidence survived from the period of the survey (Period II), the later evidence suggests there is no boundary between G and H, since the outhouse G3/G5 encroaches into the 'backyard' of H, and G4 and H appear to share a party wall. In this scheme Robert Botery would occupy (J): a tenement fronting Forehill. The boundary between Robert Botery and the tenements of Davy and Hildresham fronting Lisle Lane would be represented by alleyway N: one of the most substantial and enduring boundaries on the site.

25. It is usually assumed that this vineyard pre-dates the plots which were defined by the space left between the vineyard and Forehill but Christine Went has argued against this suggesting the plot may even pre-date the vineyard (Went 1999).

26. We know from the survey that John Plomer was a butcher with a tenement on the east side of Newnham 'towards the old mill of the bishop'. Assuming that there was only one John Plomer in Ely, he also held, in addition to that property, two Forehill tenements and a fourth on the west side of Lisle Lane. There is a fair chance that he also rented one of the lock-up shop in the 'bocherie' (meat market) from the bishop. Of his two Forehill plots, the eastern one was held from the prior and the adjacent western plot from the bishop. The western plot's very narrow frontage – 9 feet – is a viable holding and it appears to have contained a house, but it seems likely that it would have been used in conjunction with the eastern tenement, functioning as one plot. One can only speculate as to whether Plomer actually lived on Forehill – the survey's wording implies that he did – and whether his butchering activities (which may well have included slaughtering) were kept separate from his residence. He cannot have lived or worked in Lisle Lane since his tenement there was vacant but he might have done one or both at the Newnham tenement which, incidentally, was situated next door to the father of another butcher, John Cut. It could be argued that this holding, more conveniently sited for the meat market and the droveway from Turbutsey to Newnham, was his business premises with a sales outlet in the market. His trade as a butcher, appended to the listing of this tenement, may be significant in this respect (Went 1999).

27. Robinson's Directory of Cambridgeshire (1839) notes that No. 45 is occupied by Samuel Dalzell, draper and grocer. By the time of the census of 1881 Mr Dalzell had given way to Moses Macer the shoemaker and another shoemaker, Louis King, continued at the premises until at least 1930 (Blakeman 1985). No. 47 was apparently purely residential in the first half of the 19th century when the 1841 census records its occupant as Rebecca Clark. Forty years later it was the home of John H Clements, printer (Census of 1881) and a photograph of *c.*1912 shows his sign on the building. It was still occupied by the Clements family in 1953 (Blakeman 1985). Ann Cole lived at No. 49 in 1851 when the census return recorded her occupation as 'house owner' meaning, perhaps, that she owned several properties let for rent. From 1881 (Census) until at least 1930 the property was occupied by Nathan Coe, marine store dealer (Blakeman 1985, Went 1999).

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Conservators of the River Cam: 1702–2002

Michael Chisholm

During the 17th century the quickening pace of commercial development placed ever greater strains on inadequate means of transport. From 1663, turnpike trusts were established to improve the roads, and from about the same time numerous private Bills were promoted around the country for river improvements. For Cambridge, the river Cam had long been critically important, the town being an inland commercial centre of national significance. Drainage of the Fens from 1630 was perceived to have had an adverse impact on navigation on the Ouse and its tributaries, including the Cam, though the magnitude of any effect on the Cam is hard to assess. An Act in 1702 established the Conservators as the body to restore and maintain navigation from Cambridge to Clayhithe. Four locks were built which, following local custom, were called 'sluices'.

Finance was difficult for the Conservators until the early 19th century but there then followed about thirty years of ample funds, sufficient to replace the four locks with the two we know today (Jesus Green and Baitsbite). The advent of the railway locally in 1845 caused a sharp and irreversible decline in freight revenues and ultimately the reserves which had been accumulated proved inadequate to sustain the work of the Conservators. An Act in 1922 recognised the significance of recreational boating and also provided for deficit funding by the Corporation (City) of Cambridge, a fact which helped to delay adjustment to the new economic realities by about sixty years. The last two decades have seen a determined effort to restore the long-term financial viability of the Conservators to cope with the ending of deficit funding, which has meant substantial increases in registration charges for vessels.

The Appendix examines the use of the word 'sluice' in the fenland context, meaning pound lock. This examination shows the need to reassess the conflicts between navigation and drainage interests in the 17th and 18th centuries.

Introduction

The Conservators were established by statute in 1702 as the body responsible for improving and maintaining navigation over a short stretch of the river Cam in and downstream of Cambridge. Their story is closely bound up with that of Cambridge itself. It is a story of restoration and improvement of the navigation in the 18th century; of further improvements about 1830, during a period of sufficient revenues for the Conservators; stagnation and decline from the 1850s in face of competition from the railways; transformation from freight to leisure-time uses of the river in the twentieth century and the struggle by the Conservators to regain financial viability.

In the absence of locks and weirs, the Cam (Fig. 1) was tidal all the way to Cambridge. From very early times, the river was vitally important as the main commercial artery for the town, as symbolised by Stourbridge Fair, held near the river every September since 1211. This fair was a trading event of national and international importance until its decline in the 18th century and conversion solely to amusement from the early 1800s.[1] For fear of an adverse impact on navigation, the University opposed proposals for draining the Fens from early in the 17th century. For example, a 1650 petition by the Town and the University argued that works intended for draining the Fens would be calamitous for Cambridge and prejudicial to the national interest.[2]

As the scale and scope of commerce increased with time, the want of adequate inland transport became an increasingly pressing national and local problem. Roads were generally bad and ill-maintained. From 1555 to 1835, with only limited exceptions, roads in England were the responsibility of parishes, and their resources and commitment to the task were both insufficient for the growing needs. One solution was the creation of turnpike trusts. The first such trust in England was established in 1663 – the Great North Road in Hertfordshire, Cambridgeshire and Huntingdonshire, on the line through Royston and Caxton Gibbet to Papworth Everard. Although it was thirty-two years before the next turnpike, by the end of the 18th century some half-dozen additional trusts had been created in Cambridgeshire.[3] In return for maintaining a passable road, a turnpike trust had the right to levy tolls on goods and individual travellers.

As the 17th century drew to a close, the need for improved transport became ever more pressing. By comparison with road transport, rivers offered many advantages on account of the economy with which heavy loads could be carried. However: *'Inland waterways had one serious disadvantage: the ease with which riparian land-owners could obstruct traffic, whether by fish-weirs and other physical obstacles, or by the exaction of tolls. The attempts of 17th-century governments [in Europe] to remove or reduce these hindrances to trade, particularly weirs, had little lasting success'.*[4]

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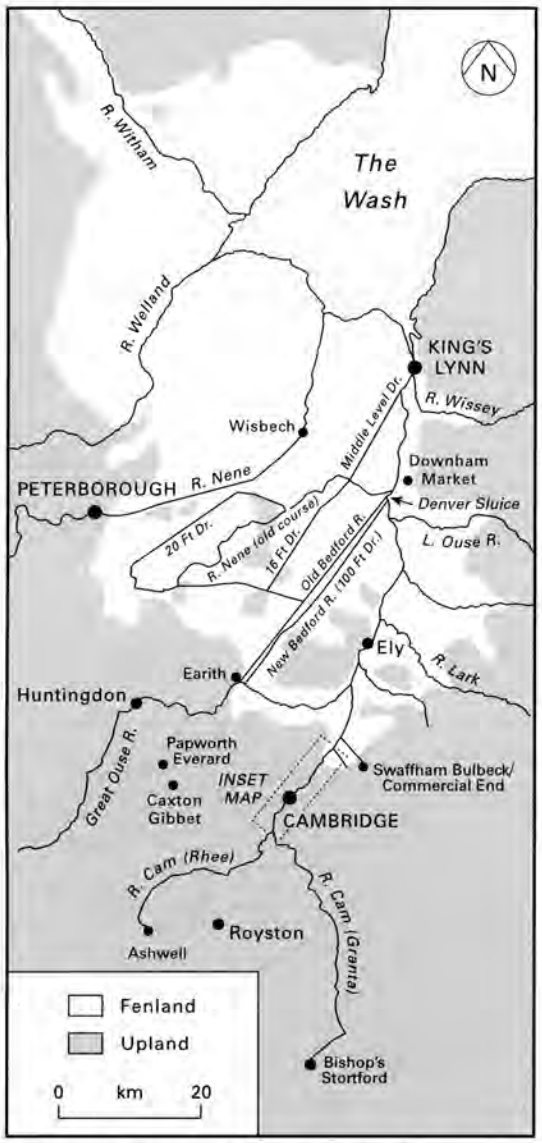

Figure 1. *The river Cam in its regional setting. Drawn by I Agnew, Department of Geography, University of Cambridge*

That navigation was problematic on the Cam is attested by a 1639 edict, issued by the Commissioners for Sewers in Cambridge: all the colleges, and especially Queens' College, were ordered to scour and deepen the river to restore access to the grain mills at the head of navigation in the vicinity of Mill Lane.[5] In England, following the Civil War, the remedy for deficiencies in river navigation lay with Acts of Parliament, and there were three periods during which the legislature was particulary busy in this respect; 1662–65, 1697–1700 and 1719–21.[6]

There was also a specific reason why the perception grew that something had to be done on the Cam. It appears that, during the second half of the 17th century, the condition of the Cam for the passage of craft deteriorated. The opinion was widespread that this was the result of draining the Fens, something which was regarded as inimical to navigation, primarily on account of silting and the reduction of water levels in the rivers following the construction of Denver Sluice.[7] Although the silting problems were most serious in the Ouse outfall between King's Lynn and Denver, the Cam was also affected because of reduced water levels, the loss of tidal high water and of the diminished impact of winter flood waters in removing accumulated silt. The Corporation of Cambridge and the University were sufficiently concerned that on more than one occasion they sought to prevent the draining of the Fens, including an unsuccessful attempt in 1695 to ensure the removal of Denver Sluice.[8]

From the early 1600s onwards, practical steps were taken to improve navigation on a number of fenland rivers, but apparently not on the Cam. As late as 1649, coastal vessels (keels), probably plying from the Humber but no doubt from elsewhere as well, could reach Cambridge. At ordinary neap tides, which are the lowest high tides that occur twice every lunar month, they could carry only 40 tons of cargo, instead of their normal sea-going maximum of some 100 tons. Partially laden, these vessels drew only about three feet of water compared with the seven feet required with a full cargo.[9] With sea-going craft able to navigate as far as Cambridge until 1649, it is apparent that any improvements which had been made to the Cam did not include structures in the river, such as weirs and locks. The following year, 1650, Denver Sluice was built and coastal vessels found that working up the fenland rivers became much more difficult (see Appendix).

It seems to be equally certain that no such structures had been erected by 1679. In that year, the Corporation of Cambridge agreed to join with the University to procure an Act of Parliament *'for setting down of Locks, Sasses or Sluces in the River for the better preserving of navigation between this Town and Lynn'*.[10] *Sasse* is an alternative word for 'lock'. The phrase *'to set down'* must mean the intention to build for the first time, not to repair and renovate any existing structures. However, no action on this agreement was taken for some twenty years.

The first Act for the improvement of the River Cam, 1702

The first legislation for the improvement of the Cam was passed in 1702. Subsequently, four further Acts have had a direct bearing on the duties and powers of the Conservators as the navigation authority. The full title of the 1702 Act deserves to be recorded. It reads: *'An Act for making the River Cham alias Grant in the County of Cambridge more navigable from Clay-Hithe Ferry to the Queens Mill in the University and Town of Cambridge'*.[11]

Reference to *'the University and Town of Cambridge'* draws attention to the fact that, from 1382 to 1856, the University and the civic authority shared responsibility for the regulation of trade in the city.[12] Conflict over these matters was common but at least there was agreement between the University and the Town on the need for improvements to the commercial artery on which the whole of Cambridge depended. Mention of Queens Mill identifies the head of navigation but may seem confusing, since the names of the water mills in Cambridge have varied over time. Two mills formerly stood where Scudamores currently moor their vessels on the upper river, just above the weir and mill pond at the end of Mill Lane. The most usual names for these mills were respectively King's Mill and Bishop's Mill. They, along with Newnham Mill, identified the head of navigation, as recognised in the Act of 1702. Downstream, the limit of the Conservators' jurisdiction was the ferry point known as Clayhithe. (See Fig. 2.)

Eleven Conservators were to be appointed, three by the University, three by the Town and five by the Justices of the Peace in the County. They were given the duty to improve navigation and the requisite power to remove *'all Trees and Roots of Trees Wears or other Impediments'* and authority to carry out necessary engineering works. The cost of promoting the Bill had been borne by the Town and the University, to repay which and to meet on-going costs Conservators were authorised to levy tolls, principally on the goods which passed over their waters. The Act specified the *maximum* toll charges. Twenty-five categories of freight (Table 1) were identified, such as:

For every Chalder [36 bushels; 288 gallons] of Coals	Nine pence
Every thousand of bricks	One shilling

In addition, *'passage boats'* were charged one penny for each passenger. The primary purpose of the navigation was to enable the movement of freight, much of which came up river to meet the needs of Cambridge and Cambridgeshire, though passenger traffic should not be ignored. Finally, the Conservators were empowered to issue Byelaws for the *'orderly usage of the river'*.

The preamble to the 1702 Act states that: *'Whereas there was heretofore a navigable passage ... by Length of Time and for Want of Locks, Sluices and other necessary Works ... [it] is much silted and grown up ... [and] is in Danger of being wholly lost and destroyed'*. Conservators were charged *'to **cleanse** and **open** ... the said River and to cut or dig the Banks thereof and to cut down and remove all Trees and Roots of Trees Wears or other Impediments that may hinder the Passage'* of vessels *'and also to **open** prepare and make all Wears Sasses Locks Pens for Water'*. To assist in financing these works, Conservators were given the power to borrow money *'for **restoring** and continuing the Navigation'*. From the wording of these excerpts, in which certain words have been emphasised, it is clear that the first task of the Conservators was to restore the river channel by removing obstructions.

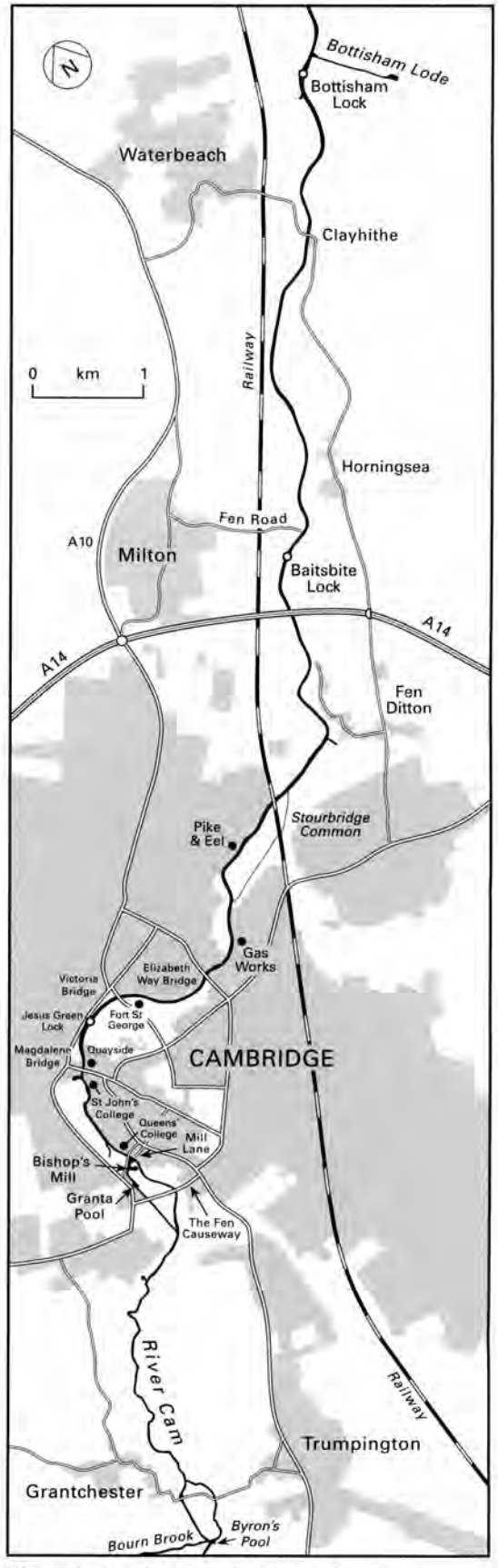

Figure 2. *The river Cam in the vicinity of Cambridge. Drawn by I Agnew, Department of Geography, University of Cambridge*

Table 1. Commodities traded in Cambridge

Stourbridge Fair, medieval times (*VHC*[62])
Victuals; Fish; Harness; Baltic timber; Italian silks; Spanish iron
'Cloth and fish were the most famous articles of commerce.'

(*Pevsner*[63])
Cornish tin; Derbyshire lead; Hanseatic timber; Southern wines, silks and velvets; English wool; Flemish linen and other cloth
English wool formed the bulk of sales (exports) and the Flemish linen and other cloth the majority of the purchases (imports)

Stourbridge Fair 1600 (*VCH*[64])
Tobacco; Bibles; Woven stockings; Tea

Stourbridge Fair 1724–6 (*Daniel Defoe*[65])
The items recorded are too numerous to list. Corn, wool, cloth and hops are given prominence but there were also manufactures from the Midlands and elsewhere. Defoe said that Stourbridge was 'not only the greatest [fair] in the whole nation, but in the world'. According to his account, 'all trades that can be named in London' were present.

Stourbridge Fair 1811 (*Gooch*[66])
All sorts of shop goods; Cheese; Butter; Hops; Horses
The fair lasted two weeks and 'it has been declining for many years'.

Freight on the Cam 1702 (*1702 Act*)
Coal; Deal boards; Timber; Wheat, rye, mesledine; Oats, barley, malt; Bricks; Tiles; Sedge; Stones, pebbles; Turf; Hay; Seeds; Clay, sand; Salt fish; Iron, lead; Salt; Wine; Oil, vinegar, pitch, tar, soap; Butter, cheese; Faggots; Billets (probably lengths of round timber); Hops; Cider; Pales, staves for barrels; Other

Freight on the Cam, 1851 (1851 Act)
Wine, cider, oil, vinegar; Pitch, tar, soap, butter, cheese; Wheat, rye, mesledine, seeds; Oats, barley, malt, hay; Iron, lead, timber, slate, bricks, tiles, lime; Coal, culm (coal dust, slack), coke, charcoal, or other fuel, road materials, stone, pebbles, sand, clay, manure, limestone; Sedge, faggots, billets (probably lengths of round timber); Turf; Pales, staves for barrels; Other

Improving navigation on the Cam, 1702–1813

Once the river channel had been cleared of obstructions, the Conservators had to address the basic problem which arose from the construction of Denver Sluice, the need to create and maintain an adequate depth of water for vessels. To this end, it was necessary to construct weirs and to provide these structures with locks for the passage of craft. Although the precise dates are uncertain, it is clear that four such locks were built during the first decade of the 18th century.

Minutes of the Conservators' meetings are available from 1707.[13] In the early years, these minutes are brief and curiously selective in their coverage. Furthermore, for the entire period up to 1908, Conservators did not use the term 'lock' but habitually used 'sluice'. This poses an interesting problem of interpretation, because in normal English usage a sluice is an obstruction which does not permit the passage of vessels. However, that restricted interpretation is not appropriate in the East Anglian context (see Appendix).

The earliest clear account in the minutes of lock structures was in 1750. Four 'sluices' were specifically identified: Jesus Sluice, Chesterton, Baitsbite and Clayhithe. There is reference to upper and lower doors and to slackers, which can only mean the upper and lower doors of lock pens and the associated guillotine doors incorporated into the vee doors to allow the lock to be filled and emptied. The minutes also record that these doors and slackers were in need of repair or replacement; the upper door at Jesus Sluice was '*much worn*'. Clearly, these structures had been in existence for some time, and there is no doubt that they were locks, notwithstanding use of the term sluice.

Earlier minutes, for 1717, record vessels passing *through* Clayhithe Sluice and also note the damage which had been caused by vessels to the pens at '*the several sluices*' (which implies all four). Since a pen is an enclosure, the inference is that all the sluices incorporated locks, designed to permit the passage of vessels and that as early as 1717 they had all been in existence for some significant period of time. The earliest mention in the minutes of any sluice is to Stourbridge Green (Chesterton) Sluice in 1708, a sluice for which just four years later a pair of new doors was made. In 1709, the minutes record the appointment of sluice keepers/toll collectors at Jesus Green Sluice and at Clayhithe Sluice, respectively the furthest upstream and downstream in the Conservators' jurisdiction. The clear inference is that all four sluices or locks existed in 1709, and possibly in 1708. Completion of these works would have improved navigation considerably and in 1710 the Conservators were able partially to repay the Corporation and the University for the cost of promoting the Bill which became the 1702 Act. In the same year, the Conservators ordered that a toll keeper's dwelling at Clayhithe was to be completed; two year later, they agreed to build stables at Clayhithe for six horses. Horses were important because they were used for haling (ie hauling) vessels along the river.

From the Conservators' records it is not possible to be more precise about the construction of the four locks than to say that they existed in 1709 and probably in 1708. For greater certainty, resort would be necessary to other sources. That quest has not been undertaken, except to establish that the first local newspaper, the *Cambridge Journal*, did not begin publication until 1744, too late to be of assistance.

Once the four locks had been built in the first decade of the 18th century, the basic configuration of the river remained unchanged for more than one hundred years. However, there is some conflict of testimony regarding the benefits derived from the Conservators' jurisdiction. Robert Mylne surveyed the Ouse and Cam from King's Lynn to Cambridge in 1791. Despite noting the existence of the Conservators' four pound locks, he opined that the navigation upstream of Clayhithe was *'perhaps the most defective in the kingdom'*.[14] However, his account shows that the problem was the shallowness of the water below Clayhithe, outside the Conservators' jurisdiction. To release grounded vessels, a 'flash' of water had been generated by opening the sluice gates at the four locks, but this had seriously lowered the water upstream to Cambridge. Mylne recommended the construction of one or two locks downstream from Clayhithe to create a greater depth of water. However, the bleak picture he painted was in part based on soundings at *'dead low water'* at the end of September/early October, coinciding with low high tides. Consequently, he was describing an extreme situation, not the normal condition of the river for navigation.

In contrast to Mylne's pessimistic assessment, Conybeare[15] provides a much more optimistic one. He records that in 1753 a 'passage' or passenger boat plied twice weekly from Cambridge to Ely, returning the following day, implying that the service was reliable. Support for this inference is provided by another document, which records regular passenger services by river to Ely, Wisbech, Downham and King's Lynn, at frequencies ranging from daily to weekly.[16]

Conybeare also reports that freight carried upstream to Cambridge in the mid 18th century was dispatched thence by road in a system embracing sixty-eight destinations, including Bangor, Kendal, St David's and Launceston. The extent of the inland traffic seems surprising but is confirmed by other evidence. As early as 1748, some 1500 to 2000 firkins of butter were reported to come up river every week to be carried onward to London by waggon.[17] Since a firkin of butter is half a kilderkin, or 56 pounds, this weekly butter traffic alone amounted to some 37.5 to 50 tons. It seems reasonable to suppose that the butter trade had been established for some considerable time because the 1702 Act identified butter and cheese as one of the categories for which a maximum toll was specified, the rate being one shilling per ton. A butter market had existed in Cambridge from medieval times[18] and a substantial traffic continued into the 19th century: *'A great quantity of butter is likewise conveyed through here [Cambridge], from the Isle of Ely and Norfolk to London, where it obtained the name of Cambridge butter'*.[19]

Corn was another commodity of considerable importance. The present-day Corn Exchange in Cambridge was completed in 1875, replacing an earlier building on Downing Street,[20] which in turn seems to have succeeded the long-standing open air corn market. So important was the corn trade at one time that: *'Shipped along the county's rivers to Cambridge, corn provided such a flourishing trade that the town was once the ninth wealthiest in England'*.[21]
To create such wealth, much of the corn must have been transported from Cambridge overland to important urban markets, London included, as with the butter trade.

Some indication of the overall scale of the overland traffic from Cambridge destined for London is available for 1813. The London and Cambridge Junction Canal Co. analysed the volume of traffic which they might obtain were a canal from Cambridge to Bishops Stortford and the Lea navigation to be built (it was not constructed). They estimated that 79,924 tons of regular horse-drawn waggon freight annually passed through Trumpington, just south of Cambridge. It is implicit in the company's study that most, if not all, of this estimated traffic was agricultural produce destined for the London markets.[22] Some of this freight would have reached Cambridge along the Cam but we do not know how much.

That the Cam was a satisfactory navigation in the late 18th and early 19th centuries is confirmed in two other ways. A study of Commercial End at Swaffham Bulbeck shows that Barker, Son and Bowyer ran a thriving trading business between 1789 and 1824.[23] Extant letters from 1789 to 1793 show the extent of their trading contacts. Much of their freight traversed Swaffham Bulbeck Lode, which joins the Cam downstream from Clayhithe, and this artery of trade appears to have posed few problems.

Perhaps the most convincing evidence that the Cam navigation was effective and efficient by the standards of the time is provided by the London and Cambridge Junction Canal Co for 1813. They compared the cost of moving freight by land and by water, finding the expected substantial differential in favour of waterborne commerce. Data are recorded for a number of navigations, including from King's Lynn to Cambridge, from which an average cost of fourpence halfpenny per ton mile was obtained. At seven shillings per ton for the 75 miles from King's Lynn to Cambridge, the rate was less than a penny farthing per ton mile, about one quarter of the average for water traffic. The navigation all the way downstream from Cambridge was evidently very economical by contemporary standards, which implies that the section under the jurisdiction of the Conservators must have been operating effectively.

Radiating from Cambridge, there was an extensive system of stage waggons, ie waggons which operated on regular schedules to specified destinations. Such waggons would have carried general merchandise,

personal effects and the like, and are probably to be distinguished from services handling commodities such as butter for the London market. *Cantabrigia Depicta*[24] lists stage waggon services to London, Birmingham, Ipswich and elswhere in 1763. An even more extensive network of these services from Cambridge is recorded in another publication of the same year; Manchester, Wakefield and general destinations north of Derbyshire and Lincolnshire are identified.[25]

There seems to be little doubt that Mylne misjudged circumstances on the Cam and that trade on the river and through Cambridge thrived throughout the 18th century and into the 19th. It does not appear that the role of Cambridge as a significant inland port was under threat from deficiencies of navigation. That being the case, Cambridge was maintaining a pattern of major inland ports, such as York and Nottingham, which had been established in medieval times.[26]

The Act of 1813 (Private Act 53 Geo. 3. c. 214)

This Act was intended to extend and amend the 1702 Act, the title of which is repeated. Specifically, it had become apparent that the powers conferred by the previous legislation to levy tolls were *'insufficient to enforce due payment'*. The intention was to strengthen the powers of enforcement available to the Conservators, to ensure compliance with the tolls which they set. By implication, non-compliance and the loss of revenue must have been serious, with the hint that the Conservators were finding themselves short of funds. One feature of the Act is striking, namely, the absence of revised tolls for the specified commodities and for passengers; this presumably reflects the long-term stability of prices in the 18th century.[27] On the other hand, the power to make Byelaws was restricted to the 'good and orderly using' of the river for freight; there is no mention of passengers.

By the late 1820s, the Conservators were able to contemplate major improvements. William Chadwell Mylne, a notable engineer, was appointed by the Conservators as their engineer in 1830. The previous year, he had recommended that the river between Cambridge and Clayhithe should be deepened and the four locks then existing should be reduced to two.[28] The lock at Clayhithe was to be removed, as also Chesterton Lock, located on the downstream side of the Pike and Eel inn (towards the railway bridge which was constructed later). At Baitsbite, the lock was to be rebuilt *in situ* and what is now Jesus Lock was moved from beside the Fort St George inn (Fig. 3). Jesus Lock was completed in 1832 and at much the same time a single-storey lock keeper's cottage was built, to which a second floor was added in 1885. This lock, along with the weir, sluice gates and iron pedestrian bridge, was listed as a Grade II structure in 1989.

With the completion of these works in the early 1830s, the river as we know it today came into existence. Those with an interest in rowing will realise that it was only then that the section of the river now used for the Bumps and other racing events was created.

River Cam Navigation Act 1851 (Local and Personal Act 14 & 15 Vict. c. xcii)

This Act repealed the two previous Acts, under which *'the navigation of the said River Cham, now called the River Cam, hath been greatly improved'*. To ensure the maintenance of the improvements, the Act consolidated and amended the provisions of the previous legislation. The number of Conservators was not changed, nor was there any change in the numbers appointed by the three appointing bodies – though by this time the Town had become a Borough. Conservators retained their jurisdiction from the head of navigation at King's Mill as it was now called northwards to

Figure 3. *The Cambridge Sluice and Toll House, 1828. Midsummer Common, (original title). Re-drawn by J Youlden from the original watercolour. (Cambridgeshie Collection O.For. J28 760)*

Clayhithe. Arrangements were made for the transfer of assets to the new body of Conservators, these assets including sasses and locks. Although text from the 1702 Act is included which refers to the removal of impediments, the tenor of the 1851 legislation is that the major improvements had been completed and the task was now one of maintenance.

Under the 1851 legislation, the Conservators were given two new powers: the power to suspend navigation so that they could carry out necessary maintenance works; and the power to construct toll houses. One such toll house was in existence in 1871 at Clayhithe, immediately fronting the river on the site now occupied by a workshop adjacent to the slipway.[29]

As with the 1702 Act, provision was made for the maximum tolls which Conservators could charge. Table 2 shows that the 1851 maxima were lower than those set in 1702, even though prices in general had neither risen nor fallen significantly between the two dates. We may infer that the lower tolls specified reflected two things: the general increase in the efficiency of transport nationally – river improvements, canals, turnpikes and the railways – and the accumulation by the Conservators of surpluses. Indeed, there is express provision for the investment of the *'sums of money which have accrued from surplus revenue'*. There is also provision for the Conservators to suspend tolls if they should be possessed of adequate funds to maintain the navigation, a provision which, with the benefit of hindsight, was optimistic given the fact that Conservators had already reduced their tolls in an attempt to counter competition from the railways. Nevertheless, there can be little doubt that, at mid-century, the Conservators felt themselves to be in a financially strong position, a fact of which visible testimony may be seen at Clayhithe. The present Conservators' house was built in 1842, an imposing building which includes a large room in which the Conservators held banquets.[30] Morgan also notes that an impressive 'State Barge' was built in *c.* 1851, used solely for annual inspections of the river by the Conservators.

Provision was made in the Act to prohibit stationary vessels between Queens' College and St John's College, other than for necessary repair work or for taking on board or discharging commodities or passengers. In other words, the University wished to protect the peace of the Backs, thus continuing a policy which had ensured that there would be no haling way (towpath) there. Vessels proceeding along the Backs to the head of navigation at the mill pond had to be poled, or hauled by horses wading in the river. Present-day punters will be familiar with the fact that most of the bottom along the Backs is firm, reflecting the fact that gravel was specifically laid to give a sound footing for the horses and for poling.

An oddity about the 1851 Act is the absence of any figure for the permissible tolls on passengers. Notwithstanding that omission, there is reference to failure to pay tolls or fares for passengers, and also to the embarkation and disembarkation of passengers along the Backs. It would seem that passenger tolls were a minor component of the Conservators' income in the mid 19th century, as was probably also the case in 1702.

Competition from the railways

Although a considerable network of canals was constructed in England from the 1770s,[31] the nearest that any came to Cambridge was at Bishop's Stortford, the northernmost point reached along the Stort valley from the Thames. So it was the advent of the railways which provided the first major competition for the Cam navigation, and the first line to connect Cambridge was the London-Norwich route (via Ely). This arrived in 1845, six years before the 1851 Act, with several other lines soon increasing the accessibility of the town by this new mode of transport. Despite the introduction of steam tugs in place of horses, river traffic declined. Greenhough[32] claims that this decline had started well before 1845 but the evidence of the

Table 2. *Maximum tolls specified in the Acts of 1702 and 1851 (20 shillings/240 pence to the £sterling)*
Note. The commodities identified in this table are those which meet two criteria: that the commodities are comparable; and that the units of measurement are probably similar if not identical.
Sources. The Acts of 1702 and 1851, see text for the details.

Commodity and (unit)	1702	1851
Butter and cheese (per ton)	1 shilling	9 pence
Iron and lead (per ton)	2 shillings	6 pence
Timber (per ton)	1 shilling	6 pence
Clay and sand (per ton)	6 pence	3 pence
Pebbles (per ton)	1 shilling	3 pence
Salt (per ton)	1 shilling	9 pence
Wine (per ton)	4 shillings	9 pence
Pitch, tar and soap (per ton)	1 shilling	9 pence
Sedge (per 100)	2 pence	2 pence
Turf (per 1,000)	2 pence	2 pence
Pales, barrel or hogshead staves (per 100)	1 penny	1 penny
Faggots and billets (per 100)	2 pence	2 pence
Other (per ton)	1 shilling	9 pence

Conservators' toll income refutes his assertion. From 1814 to 1844, income fluctuated around £1500 p.a. but showed no obvious trend.[33]

Conservators responded to the railway competition in 1846 by substantially reducing freight tolls, with effect 1847, but to no avail. Annual revenues from farming the tolls and toll houses averaged £1377 in the two years 1845 and 1846, whereas the equivalent figure for the subsequent two years was only £750 (Table 3). By 1859, the figure was down to £236 and thereafter was never higher than £314.

Despite the dramatic loss of freight revenue, the Conservators' finances remained surprisingly sound for somewhat over half a century on account of the reserves which had been accumulated and for which the 1851 Act provided investment powers. For example, in 1869/70 toll income amounted to £211, interest yielded £423 and the total income was £869 (Minutes 1870). For the remainder of the century and into the early 20th century, ordinary income generally exceeded ordinary expenditure. In 1868, Conservators authorised the expenditure of £2017 to purchase a steam dredger (Fig. 4) in order to improve navigation on the Cam, an investment which generated significant income, being hired as far afield as Wisbech (Minutes 1872) and by the Denver Sluice Commissioners (Minutes 1914).

It was not until 1906 that the financial position began to give cause for concern. A tabulation prepared by the Conservators of total income and expenditure for the twenty years 1886 to 1905 showed an overall surplus of £2192. However, there had been deficits in five years: 1893, 1897, 1900, 1901 and 1904 (Minutes 1906). Thereafter, deficits became more frequent and larger, so that the interest bearing reserves declined from £16,252 in May 1915 to £12,896 at the end of March 1922. Conservators recognised that the position was becoming untenable.

The initial reaction was essentially backwards looking. The Clerk was instructed in 1920 to write to the Ministry of Transport to ask for the reinstatement of the freight tolls which had applied before a reduction had been ordered by the Board of Trade under the Railway and Canal Navigation Act 1888.[34] As Table 3 shows, any increase that might have been possible was unlikely to generate much extra income. In any case, the Ministry declined the request and suggested that the remedy lay in the promotion of a private Bill in Parliament.

River Cam Conservancy Act 1922 (Local and Personal Act 12 & 13 Geo. 5 c. lxxi)

In conjunction with the 1851 Act, the 1922 legislation remains the statutory basis for the continued existence of the Conservators. The 1922 Act introduced several important changes. The first to note is the extension of the Conservators' jurisdiction from Clayhithe a short distance downstream to Bottisham Lock, though not including the lock itself. Visitors to Clayhithe will observe the small slipway on the property of the Conservators. This slipway occupies the site of the berth for the former chain ferry which marked the downstream limit of the Conservators' jurisdiction until the 1922 Act extended it to Bottisham Lock. The curious visitor will also notice that whereas the Halingway south of the road bridge is on the left or western bank, progress northwards must be on the right bank, along the gravel road which separates the Conservators' house from the river and thence along the top of the river bank. This downstream section of the river had originally been under the control of the South Level Commissioners, a body established in

Table 3. *Income from freight tolls, 1841 to 1921/2. Current prices, to the nearest £*

Notes. In the period to 1869, the tolls and toll houses were farmed, the annual auction being held in December for the ensuing year. From 1869/70, the figures are described as tolls, probably including occupation of the toll houses. However, from 1914/5 the tolls are shown gross and also with the deduction of toll-keepers' wages; the figures for the period 1914/5 to 1921/2 are the net toll proceeds.
Sources: 1841–1850, Summers gives figures from 1752 to 1850.[67] 1859–1921/2, Minutes of the Conservators of the River Cam.

Year	Income	Year	Income	Year	Income	Year	Income	Year	Income
1841	1496	1870/1	207	1884/5	284	1898/9	106	1912/3	142
1842	1507	1871/2	212	1885/6	284	1899/00	93	1913/4	134
1843	1507	1872/3	244	1886/7	264	1900/1	115	1914/5	125
1844	1505	1873/4	221	1887/8	233	1901/2	148	1915/6	108
1845	1361	1874/5	233	1888/9	227	1902/3	156	1916/7	101
1846	1393	1875/6	314	1889/90	228	1903/4	155	1917/8	109
1847	805	1876/7	314	1890/1	222	1904/5	161	1918/9	117
1848	695	1877/8	311	1891/2	148	1905/6	163	1919/20	128
1849	971	1878/9	290	1892/3	153	1906/7	163	1920/1	109
1850	367	1879/80	266	1893/4	157	1907/8	161	1921/2	103
		1880/1	268	1894/5	103	1908/9	154		
1859	236	1881/2	200	1895/6	127	1909/10	153		
		1882/3	200	1896/7	99	1910/1	156		
1869/70	211	1883/4	221	1897/8	102	1911/2	137		

Figure 4. *Dredging, 1869. Reproduced from the Illustrated London News, 29 May 1869. (Cambridgeshire Collection W.29 J69 21573)*

1663 to undertake land drainage, and then, from 1741, the Commissioners of the Waterbeach Level. In order that horses used for haling the boats could cross the river, there was a second ferry almost exactly where the road bridge now stands. This bridge, initially a toll bridge, was built following the passage of the Clayhithe Bridge Act in 1871.

The second feature of the 1922 Act to note is the increase in the number of Conservators from eleven to thirteen and the change in the balance of representation. The University continued with three appointments; the County Council had one; the Great Ouse Catchment Board (now the Environment Agency) was given two; and the Borough of Cambridge a controlling interest with seven appointments.

This change in representation reflected the difficult financial circumstances in which the Conservators now found themselves. As the preamble to the Act says: '*the revenues of the existing Conservators derived by them under the provisions contained in the said Act of 1851 are insufficient to enable them to meet their obligations and adequately to perform their duties*'. To remedy this deficiency, the Act introduced important financial innovations. For any year in which the Conservators' income was less than expenditure, they were given the right to claim from the Corporation of Cambridge funds up to the sum equivalent to the product of a penny rate, and the Corporation would be obliged to fund the deficit. In addition, if that funding were inadequate, the Corporation could, at its discretion, give further assistance provided the aggregate assistance did not exceed the deficit for that year. These changes were made with the prior assent of the Corporation.

Another innovation concerned the sources of revenue. Freight tolls would continue to be regulated by the Minister of Transport but provision was made for them to be varied on application by the Conservators. Tolls for passing through locks and for ferries could be set by the Conservators under Byelaws, which could also provide for the registration of pleasure boats and the sums to be paid for such registration. These provisions clearly recognised the importance of the recreational use of the river, which had been on the increase since the first Boat Race between Oxford and Cambridge in 1829. In the clearest possible terms, the 1922 Act signalled that the era of freight traffic on the river Cam had come to an end and that the main use of the river was for pleasure purposes. The Act provided the basis for adjustment to these radically changed circumstances.

Failure to seize the opportunity

The 1922 Act took effect in January 1923 and it then required time before Conservators could fully adjust to the new situation, if only because the formulation and implementation of new Byelaws could not be done instantaneously. Consequently, up to 1930/31, the full amount of the penny rate was paid to the Conservators, but even with this financial support there were significant annual deficits which were funded by bank loans. By March 1930, bank debt amounted to £7426, nearly as much as the value of interest earning investments amounting to £9652. From the early 1930s, the financial position was stabilised. A new dredger, purchased in 1923 at a cost of £4125, was disposed of in 1933. There was some reduction in staffing and from 1931/32 the Conservators received an annual grant from the Great Ouse Catchment Board (GOCB), enabling income and expenditure to be brought into balance, with the Borough contributing less than the full amount of the penny rate

Table 4. *Registration charges, 1924 and 2001/2. £ at current prices: 1924 prices converted to decimal format. Sources: Byelaws 1924 and the Conservators' schedule of charges for 2001–2002.*

Category of vessel	1924	2001/2
Canoe: up to 5 metres	0.125	18.62
Dinghy	0.125	22.58
Scull	0.125	18.62
Four	0.125	24.22
Sailing boat: under 3 metres	0.125	18.62
over 7 metres	0.200	93.13
Punt: private	0.125	45.32
commercial	0.125	203.94
Eight	0.125	28.56
Steam or motor launch: up to 5 metres	0.525	37.53
over 20 metres	1.00	449.45
Houseboat	0.525–1.00	338.97

product. Grant aid from the Board and the Borough combined exceeded 50% of total income in 1935/6 and about 80% in the 1950s.

Net toll income from freight declined from £85 in 1923/4 to £10 in 1937/8, after which date this source of income is not recorded; one of the last regular freights was the removal of toxic residues from the Cambridge gasworks. This left lock tolls and registration charges as the two sources of income from river users under the direct control of the Conservators, plus any sums that might be negotiated with the downstream navigation authority for the transfer of some part of the registration fees they collected attributable to vessels using the Conservators' waters. New Byelaws were issued in 1924, in which lock and registration charges are set out. Lock charges were set at the maximum permissible in the Schedule to the 1922 Act for return passages in one day, these charges ranging from 2.5 to 7.5 decimal pence (6d – 1s 6d), according to the class of vessel. However, the charges set for unlimited numbers of lock transits in a year were substantially lower than the maxima allowed, being in the range of £0.75 to £1.50 compared with permitted fees of £2.50 to £10. Lock charges were additional to any freight toll or vessel registration charge.

All manually propelled and sailing pleasure craft had to be registered at an annual cost of 12.5 decimal pence; the figure for powered pleasure vessels was 52.5 pence if less than 30 feet in length and £1 if exceeding 40 feet (Table 4). Since the great majority of manually propelled pleasure craft did not need to use the locks, the total annual cost for them was just 12.5 decimal pence. For the purpose of comparison, prices rose by a factor of about 25 from 1924 to 2001/2, so that manually propelled craft were registered for a sum which would be approximately equivalent to £3.10 today, and the largest powered craft for £25.

Registration revenue was £88 in 1924/5 and had risen to £150 in 1933, when there were 891 vessels registered and the total annual income was not much above £1000 (Minutes 1925 and 1934). Although the Conservators' finances had stabilised by 1933, their debts had risen during the 1920s and they continued to be reliant upon deficit funding. While the minutes do not record any discussion of the reasons for the level of lock and registration charges set, they do reveal an apparent lack of concern about the annual deficits. There is no doubt that river users were being shielded from the need to meet the full cost of maintaining the facilities which had been paid for by previous generations through freight tolls, and that a substantial part of that shielding arose from the deficit funding provided by the Borough.

An additional reason for the low registration charges was evident in the late 1970s and early 1980s. The Conservators' stretch of the Cam is very short and consequently charges levied by the downstream navigation authority had a powerful impact on the charges which Conservators could set. Indeed, the then current Byelaws explicitly pegged registration charges to those levied by GOCB's successor, the Anglian Water Authority (AWA). Unlike the Conservators, the AWA and its successors received national funds and navigation was a small part of their operations. Because of this peg to the AWA, the registration charges set by the Conservators for 1984/5 were still very low; punts and rowing eights, for example, were charged £1. At that time, there was no distinction between punts and other vessels which were privately owned and those that were hired to the public. Although the AWA applied a multiplier of 3.0 for commercial vessels, the Conservators had chosen not to follow suit in setting their charges.

Persistence in allowing all craft, powered and unpowered, to use the Cam if registered with the AWA, and acceptance of the consequence that only low registration charges were therefore possible, reflected a wider and more general failure of the administration. Management of the affairs of the Conservators was entirely in the hands of the City Council, the Conservators' officers being City employees, and with the cushion of deficit funding little was done to upgrade the quality of the administration and the quality of the advice given to Conservators. One example will suffice to make this point. The minutes for the December 1984 meeting of the Conservators contain the following record: *'The Treasurer said that, although the City Council was not required to make good any deficit to the Conservators, it had become the practice'*. The minutes do not record any Conservator pointing out that this advice was wrong under the terms of the 1922 Act.

As the accounts for 1984/5 show, the dependency culture had become seriously entrenched. Total income and expenditure amounted to £56,474: the contribution from the City was £19,273; and the AWA provided a further £21,163. In aggregate, these two sources of income accounted for 72% of the total.

Minutes of the Conservators' meetings in the 1980s show an increasing awareness of the parlous financial situation. In 1982, it was decided that steps should be taken to discontinue the collection of lock tolls, since the income derived did not justify two employees to man the two locks. Lock tolls in 1984/5 brought in £6548, nearly three times the sum derived from registration charges (£2355). Taking these two sources of income, plus interchange payments from the AWA of £2000, river users were meeting only 19% of income and operating costs. The financial situation was even worse than is immediately apparent from these figures, in that the Conservators were not maintaining their assets properly and funds were not being set aside for future expenditure on repairs and maintenance. Invested funds were inadequate, amounting to only £8746 at 31 March 1985.

The seriousness of the situation may be judged from the following episode. At their June 1984 meeting, Conservators were told by the Clerk that the City Council was preparing to deposit a draft Bill before Parliament. He indicated that this would provide the opportunity to include provision for the Conservators to be wound up and navigation responsibilities

transferred to the AWA. City Councillors had not at that stage considered this possibility but the Clerk wished to know Conservators' reactions to this scenario. Conservators were unanimous in rejecting the idea of being wound up. The matter was not pursued by the City, a fact which was reported to the December 1984 meeting of Conservators.

There were two or three warnings that the City was not happy to continue deficit funding. City officers approached the University, colleges and South Cambridgeshire District Council in the hope that these bodies would contribute funding, but nothing came of these overtures. Thus it was that, in December 1985, Conservators took the first serious steps to improve their financial situation. They decided to seek a renegotiation with the AWA of the interchange agreement whereby some registration income was transferred to the Conservators for vessels registered with the Authority. Second, the decision was taken to amend the Byelaws, so that, of the vessels registered with the AWA, only the powered craft could use the Cam. Although it took some time for the process of changing the Byelaws to be completed, on account of the need for public consultation and obtaining Ministerial assent, the move was of fundamental importance. Once the Byelaws were approved, it would be possible to set registration charges, in particular for manually propelled vessels, which would be appropriate for the circumstances of this particular stretch of river. Another step was to apply a multiplier for commercial vessels, set at 3.0 for 1986/7 even though the general level of registration charges was then still pegged at the AWA rates pending revision of the Byelaws.

Cambridge City Council Act 1985 (Local and Personal Act Elizabeth II c. xl)

The third occasion on which Conservators were told about the legislation sponsored by the City was in December 1985. Minutes for this meeting record the fact that the Cambridge City Council Act 1985 had received the Royal Assent and would become operational on 1 April 1986. Provision was made for the City Council to off-set any deficit of the Conservators to a maximum of the product of half of a decimal penny rate, *if the Council so chose*. The *right* which the Conservators had hitherto had to claim up to the product of a penny rate had been withdrawn, without this intention having been revealed to Conservators as a body. Although deficit funding of the order of £25,000 p.a. did continue for a year or two, it had ceased by 1989/90.

Cessation of deficit funding by the City Council would have spelled financial ruin for the Conservators had it not been for the windfall sale of 0.9 hectares of land in Fen Road with planning permission for house building. This sale had been agreed in principle by Conservators in December 1986 but had been delayed by the City Council's refusal of planning permission. After a successful appeal to the Secretary of State, the transaction was completed in 1988, for the sum of £750,000. It was this windfall which enabled work to commence on automating the lock gates at Baitsbite (completed in 1989) and thereafter provided an all-important cushion allowing for the changes which were needed but which could not be implemented all at once.

Reform and reorganisation, post–1985

If 1988 was an important year on account of the land sale at Fen Road, it was also highly significant because new Byelaws came into effect on 1 April. Powered vessels registered with the downstream navigation authority could still use the Conservators' section of the Cam but henceforth other vessels had to register with the Conservators. Consequently, steps could now be taken to raise registration charges to more realistic levels.

With the automation of Baitsbite Lock in 1989, lock tolls there were abolished and, with the minimal traffic through Jesus Lock, it ceased to be necessary to employ two lock keepers; both were near retirement and continued working on a range of duties until they reached pensionable age. During the 1990s, therefore, the wage bill was substantially reduced and residential property released for commercial letting – one of the cottages at Baitsbite and the lock keeper's cottage at Jesus Lock. When the protected tenant in the second cottage at Baitsbite relinquished his tenancy, it was possible to let all three properties at a full market rent. As a consequence, income from rents and wayleaves increased from £3958 in 1988/9 to £45,571 in 2001/02, that is from 7% to 22% of total income.

By 1991, it was quite clear that the City Council no longer wished to undertake the Clerkship duties for the Conservators. It was equally clear that their best interests would be served by making other arrangements. Thus it was that Archer and Archer, an Ely-based firm of solicitors, was appointed in 1992. Mr Richard Bamford has been the firm's partner who has run the Clerkship ever since. The City Council continued to provide engineering and daily control services, under a Service Level Agreement, with Mr Geoff Facer as the Hon. Engineer, until he retired in 2001.

At the time he took over, Richard Bamford found that the accounts for the past three years had not been audited; it then took three years to get matters sorted out. One reason for these difficulties was the absence of a separate bank account for the Conservators; all transactions had passed through the City's financial system. It also transpired that numerous vessels were not registered and steps had to be taken to ensure compliance, including court proceedings in some cases. Two other matters also occupied the Clerks: negotiation of sensible Service Level Agreements with the City and with the National Rivers Authority (NRA); and renegotiation of the terms whereby the NRA compensated the Conservators for the presence on the Cam of vessels registered with the downstream authority.

These various measures could not all be implemented immediately. However, over a period of about

one decade they have much improved the financial situation, while at the same time Conservators have undertaken some of the necessary long-term work which had been accumulating, such as installing the guillotine gate and new vee doors at Baitsbite, the purchase of a purpose-built weed cutting boat to improve weed management, and pollarding willow trees along the Halingway.

Table 5 shows that since 1988/9 there have been more years in which the Conservators have recorded a deficit than occasions when there was a surplus. After 1992/3, the deficit was steadily reduced and small surpluses were achieved towards the end of the decade. It was therefore disappointing to be back in deficit in the new millennium. However, this reversal has been due in part to the adoption in 1999/2000 of new accounting practices, which make more adequate provision for long-term expenditure needs by increasing the sums counted for depreciation. It now seems reasonable to claim that the accounts give a more accurate picture of the financial task which still lies ahead than was the case a few years ago. Despite all the pressures, the Conservators still have just under £500,000 of interest-earning investments (Table 6).

As Table 7 shows, once the guillotine door at Baitsbite had been installed in 1989, lock tolls became an insignificant source of revenue and the small residual income from tolls at Jesus Lock finally ended in 1998/9 with the decision to install a combination lock to permit authorised persons to operate themselves. Contributions from the AWA were very small in 1988/9 but agreements for specific work with the successor bodies have yielded useful income more recently, though with a tendency to decline since 1995/6. On the other hand, revised interchange arrangements are yielding substantially larger sums for the vessels registered with the Environment Agency (EA) and recorded in the annual boat count as being on the Cam than used to be the case. Another welcome feature of recent years has already been noted, namely the income from commercial lettings, which account for the greater part of the category 'other' income.

Three factors have contributed to the increase in the income derived from the registration of vessels: greater compliance; the introduction in 1986/7 of a multiplier for commercial vessels, initially set at 3.0 and subsequently raised to 4.5 and, from 2002/3, even higher; and by increasing the basic rates for registration substantially more rapidly than inflation has been occurring. As a consequence, registration income has risen from 14.5% of total income in 1988/9 to 39% in 2001/2. If we combine registration income, the sum obtained under the interchange arrangements and the former lock tolls, river users are now contributing 48% of the Conservators' income compared with 20% in 1988/9. Table 4 compares registration charges in 1924 and 2001/2, showing that the greatest increases have been for commercial operators and for large vessels.

Substantial increases in registration charges have drawn the ire of some river users, especially the rowing interests, some of whom believed in the early 1990s that the Conservators should run down reserves to the point of bankruptcy. Were that to have occurred, the Secretary of State would have transferred responsibilities to the Environment Agency. Conservators were steadfast in resisting such a course of action. Although it is always painful to be faced with price rises substantially in excess of inflation, it must be remembered that registration charges in the late 1980s were very low. What has happened since the mid 1980s is the financial adjustment which had been delayed for some sixty years since the 1922 Act, very largely on account of the cushion provided by deficit funding.

Conclusions

Although much can be said about the general need for river improvement prior to 1702, relatively little seems to be known about the specific circumstances on the river Cam. Similarly, although much is known regarding changes since the establishment of the Conservators, there is also much that remains obscure. Four locks were constructed during the first decade of the 18th century, but we do not know the precise years of construction. Although the primary purpose of navigation on the Cam until the arrival of the railway was for freight, and though we have a reasonable idea concerning the range of commodities transported, we do not know much about the volumes involved. No doubt there are many more questions which will have occurred to the reader.

The river as we know it today dates from the early 1830s, when two locks were removed and the other two rebuilt. It was designed for freight traffic but that has disappeared and the river is now a major recreational resource for residents and visitors, an amenity for Cambridge and its environs.

Over their 300 years' existence, the Conservators have faced substantial financial difficulties for much of the time. The original powers conferred to enforce the tolls set proved to be inadequate, a deficiency which was repaired by the 1813 Act. That Act ushered in a short golden era, which was cut short by the arrival of the railway in Cambridge in 1845, though it took more than 50 years before an imminent financial crisis led to the 1922 Act. By virtue of deficit funding and annual grants from GOCB, the financial position was stabilised, but at a relatively low level of activity, and the Conservators lapsed into a sleepy and ill-managed state. Removal of the right to deficit funding by the 1985 Act acted as a spur to press on with policies which had already been initiated, to improve the quality of the service provided to river users and to close the gap between revenue and expenditure – by making those savings which were practicable and by increasing revenue. As we have seen, substantial steps have been taken to reduce the annual deficit. The challenge which lies ahead is to eliminate the remaining annual financial shortfall, in order to secure the fourth century of the Conservators. That target should be achievable.

Table 5. *Expenditure by the Conservators, years ending March 31*
** Accounting procedures were modified to take better account of depreciation.*
Source. Audited accounts held by Archer and Archer, Ely, Cambridgeshire. Transfers to reserves represent the surplus of income over expenditure.

Year	Expenditure including transfers from Reserves	Transfers to Reserves (from Reserves)
1988/9	£92,951	-
1989/90	£107,415	£20,364
1990/1	£117,632	£21,814
1991/2	£127,882	£42,598
1992/3	£164,073	(£44,478)
1993/4	£166,454	(£23,463)
1994/5	£145,609	(£8,402)
1995/6	£167,491	(£11,208)
1996/7	£175,168	(£4,270)
1997/8	£184,154	£556
1998/9	£189,518	£9,582
1999/0*	£193,048	(£15,646)
2000/1	£221,194	(£9,530)
2001/2	£245,867	(£42,523)

Table 6. *Conservators' interest-earning investments at the year's end, 31 March*
Source. Audited accounts held by Archer and Archer, Ely, Cambridgeshire

Year	Aggregate funds
1988/9	£719,683
1989/0	£720,630
1990/1	£699,162
1991/2	£787,667
1992/3	£420,154
1993/4	£488,412
1994/5	£501,944
1995/6	£538,724
1996/7	£549,671
1997/8	£563,991
1998/9	£564,591
1999/0	£496,809
2000/1	£477,525
2001/2	£483,149

Table 7. *Sources of Conservators' income, years ending 31 March*
** From 1990/1, payments for specified services; † Payments for vessels not registered with the Conservators; ‡ Includes £5,387 for registrations in the previous year.*
Source. Audited accounts held by Archer and Archer, Ely, Cambridgeshire

Year	Lock tolls	Registration charges	Interest	Payments by AWA/NRA/EA*	Interchange†	Other	Total
1988/9	£4,249	£13,506	£42,070	£1,000	£1,155	£30,971	£92,951
1989/0	£1,998	£11,364	£49,634	£1,000	£2,184	£61,599	£127,779
1990/1	£238	£23,635‡	£89,528	£14,990	£1,480	£9,575	£139,446
1991/2	£242	£24,107	£97,850	£16,775	£2,095	£29,411	£170,480
1992/3	£35	£26,214	£43,355	£18,061	£2,030	£29,900	£119,595
1993/4	£99	£37,799	£36,824	£21,307	£7,000	£39,962	£142,991
1994/5	£92	£34,226	£27 672	£21,349	£12,682	£41,186	£137,207
1995/6	£137	£45,592	£32,712	£24,893	£13,911	£39,038	£156,283
1996/7	£175	£48,579	£29,539	£24,816	£14,155	£53,634	£170,898
1997/8	£90	£54,577	£35,746	£23,874	£12,417	£58,006	£184,710
1998/9	-	£57,635	£38,568	£22,050	£15,164	£65,683	£199,100
1999/0	-	£62,910	£23,221	£20,665	£16,112	£54,494	£177,402
2000/1	-	£78,647	£26,192	£21,482	£16,385	£68,958	£211,664
2001/2	-	£79,797	£19,108	£21,547	£17,987	£64,905	£203,344

In the course of this account, it has been necessary to emphasise what seems to be an East Anglian use of the word sluice to mean structures which incorporate locks, whereas in normal English usage sluices are barriers to navigation. This matter is explored in the Appendix, where it is shown that our understanding of the conflict between drainage and navigation interests in the 17th and 18th centuries in the Fens needs to be revised. It also appears that the importance of Cambridge as a trading centre in post-medieval times was probably greater than is customarily portrayed.

Appendix: of sluices and navigation

Sluices and locks

The primary definition of a sluice is: *'A structure of wood or masonry, a dam or embankment, for impounding the water of river, canal, etc., provided with an adjustable gate or gates by which the volume of water is regulated or controlled. Also, rarely, the body of water so impounded or controlled'*.[35]

The numerous subsidiary meanings include a flume, a gap and a breach. Derivation of the word is attributed to *excludere*, a Latin word meaning to exclude. There is no hint that in the English language a sluice is anything other than an obstruction to navigation.

However, there is clear evidence that, in the Fens and adjacent areas in the 17th and 18th centuries and later, the word 'sluice' was widely used for structures which included locks designed expressly for the purpose of facilitating the passage of vessels. From the index to Wells[36] it is possible to identify 26 structures under the heading of sluices and tunnels on the Fenland rivers, many of which are specifically called sluices. Two of these structures, both sluices, he records as having existed since 1630. One sluice is specifically described as being for drainage purposes, while another is identified as being for navigation and a third is recorded as a 'navigable sluice'. The others are not characterised, though the sluices on the Cam which he records had all been equipped with locks for many decades at the time he wrote. Four of the other sluices listed by Wells, including Denver, can readily be identified as corresponding to structures which Moore[37] records as being sasses, ie locks. Moore's 1684 map of the Fens, at a scale of one inch for half a mile, shows a total of 14 sasses on the waterways – on main rivers and on lodes. The symbol he used is identical in principle to that currently employed by the Ordnance Survey, being in the form of an arrow head which symbolises the pairs of gates which control the water. Whereas the Ordnance Survey now uses just one symbol (<), Moore variously uses one or two pairs – either << << or just <<. Two of the double symbols have the word sasse alongside, as do five of the single symbols, from which we may infer that all fourteen represent locks intended for the passage of boats. Moore also locates a small number of sluices but these are all on minor waterways tributary to the main channels; in accordance with the terminology which he employs, it seems probable that these sluices did not permit boats to pass. It seems to be clear that most, if not all, of the sluices recorded by Wells did include locks.

We can pursue the matter further back in time. In 1637, Charles I granted a Charter of Incorporation to the Earl of Bedford and others for the Company of Conservators of the Fens (forerunner of the Bedford Level Corporation). This Charter, dated 1637, conferred on the Company the power to levy charges or tolls on boats *'passing through the sluices a-new made and maintained'*.[38] As part of the deal by which the Fens were to be drained, the Earl of Bedford had, in 1630, entered into an agreement with the Commissioners of Sewers for King's Lynn, known as the 'Law of Lynn'.[39] This agreement specified that the intended drainage works should be without prejudice to the existing navigations, including the Cam. Disputes were to be resolved by a small group of individuals, including the Mayor of Cambridge and the Vice-Chancellor of the University, a fact which implies the importance of commerce along the Cam. Vermuyden himself intended to preserve and if possible enhance navigation, as evidenced by the 'Discourse' which he wrote in 1642.[40] In that Discourse, he uses the words 'sluice', 'navigable sluice', 'sasse' and 'lock' in a manner which suggests the interchangeability of the terms, with the clear implication that a sluice could incorporate a lock (note that *sasse* is a word of Dutch origin meaning 'lock'). The need to secure the passage of vessels was explicitly incorporated in the 1649 Act which was the precursor to renewed drainage efforts: land drainage should be *'without prejudice to the navigation in the said rivers'*.

Denver Sluice was constructed in 1650 and is described thus : *'The centre of the sluice appears originally to have been framed with a dam of earth strongly piled, having on one side two small brick sluices, for the purpose of navigation'*.[41]

That Denver did indeed incorporate one or more locks is confirmed by Badeslade. For the location we now know as Denver Sluice, and referring to the time shortly after it was first constructed in 1650, he refers to *'a great Sass at Well-Creek End, at Salters-lode, to keep the Tides out'*. He also described this structure as a sasse or sluice.[42] Since a sasse is a lock, there can be no doubt that Denver was built to permit the passage of vessels. Moore's 1684 map provides confirmation. The original Denver Sluice is conventionally portrayed as being a single structure,[43] whereas Moore shows five separate channels and associated structures. One of these structures is portrayed by the << symbol and another by << <<; consequently, it is clear that two of the five structures were sasses or locks. The whole complex of Denver is labelled by Moore as a dam.

At this point, we need to consider the nature of the locks which were built in the 17th century. As Rolt notes: *'In the 17th century the terms "lock", "sluice" and "turnpike" are loosely used by contemporary writers to describe both pound locks and flash locks or navigation weirs'*.[44] A flash lock consists of a weir across a river which has a section that can be removed temporarily to allow a rush or 'flash' of water. Vessels wishing to

proceed downstream shoot the rapid; those heading upstream must be hauled or winched through the deluge. Once the vessels have passed, the removed section is replaced, allowing the impounded waters to regain their former level over a period of time. Flash locks are clearly hazardous and arduous to use. They are also extravagant in the use of water, such that vessels may not be able to navigate the upper reach for some time after the gates have been closed. In contrast, a pound lock consists of a pen with gates at both the upstream and downstream ends. When both pairs of gates are closed, small guillotine gates or slackers permit the pen to be filled or emptied, so that vessels can be transferred from one level to the other. These locks are much safer to operate than flash locks and they are also much more economical in the use of water. For the purpose of facilitating navigation, pound locks are very much more efficient than flash locks.

There is no doubt that flash locks or staunches were constructed on Fenland rivers. Boughey[45] refers to the staunches on the Great Ouse which continued to be used after six sluices which incorporated pound locks had been built between 1618 and 1625. McKnight[46] mentions staunches on the river Nene and fenland tributaries of the Great Ouse, *'dating in some instances from the early 17th century'*. The visible remnants of flash locks have been reported on Bottisham Lode, the river Lark, at Castle Mill on the Great Ouse and on the Nene.[47]

However, there are reasons for believing that from 1630, and even earlier, the new sluices constructed on the main fenland navigations incorporated pound locks. The first pound locks to be built in England were on the Exeter Canal, 1564–6, but thereafter it was upon rivers that such locks were constructed until the 18th-century era of canal building. Pound locks were constructed during the reign of Elizabeth I on the Trent and Lea and became the normal feature of river improvement schemes, of which the six on the Great Ouse mentioned above are but examples.[48] Summers is explicit that, on the river Ouse from 1617, the sluices which were constructed were normally pound locks and only occasionally staunches or flash locks: *'the sluices, contrary to general belief, were pound locks'*.[49]

The Dutch were the European leaders in the use of pound locks, the first having been constructed in 1373. So far advanced were they in the European context that it used to be thought that the technology was their invention,[50] notwithstanding that the concept and practice was of earlier Chinese origin. It was the Dutch lead in water management which caused the Earl of Bedford and his co-Adventurers to hire Vermuyden and other Dutch engineers to undertake the draining of the Fens. Given his background, given the existence of pound locks on the Ouse and given the obligation to maintain existing navigations, it seems inconceivable that Vermuyden would have contemplated constructing flash locks on the main navigable waterways. And the volume of trade which used the fenland system after 1650 testifies to the improbaility that flash locks were constructed. Indeed, the probability must be that existing flash locks on rivers such as the Ouse were progressively converted to pound locks.

This line of reasoning is consistent with the role of Dutch engineers and practice in East Anglia and the widespread use of the word 'sluice' in the area. In the Dutch language, the primary word for a lock, meaning a pound lock, is *sluis*, though it is also used in the English sense to denote a weir which is a barrier to vessels. Spufford[51] confirms that the modern Dutch usage was well established by 1700.

Further confirmation is found in the use of the word *sasse*, which is derived from the Dutch word *sas* and specifically means a lock. In Dutch, a *sas* is defined in terms of *sluis*, ie as a pound lock. This allows one to use Moore's 1684 map in the following way. He identifies 14 *sasses*, of which seven are specifically labelled while the other seven are marked solely by the symbols which he uses. At Denver, the word *sasse* is absent but on one channel there is the symbol << << and on another <<. Given the large tidal range at Denver and the volume of upland water to be discharged, it would be impractical to construct and operate a flash lock. For this reason, we may be confident that both symbols at Denver signify pound locks, which is consistent with Badeslade's description. As both symbols at Denver must denote pound locks, it seems reasonable to suppose that the same is true for the other thirteen sasses which Moore locates. As of 1684, therefore, the main fenland navigations were equipped with pound locks, though some older flash locks may have remained in use.

Although neither Johnson's 1755 dictionary nor the 1771 edition of the *Encyclopaedia Britannica* give pound locks as a meaning for the word 'sluice', the somewhat later *Cyclopaedia* compiled by Rees (1779) specifically recognises this usage.[52] In the light of all the other evidence mentioned above it is clear that, from the mid 17th century onwards in the Fens, and following Dutch custom, structures described as sluices on the navigable waterways were pound locks, intended to facilitate navigation.

Finally, more recent uses of the word 'sluice' are worth noting. There are two early 19th-century maps for Cambridge and its environs which show sluices on the river Cam at locations which by then had long incorporated locks; these maps are an Ordnance Survey manuscript survey map and a map by R G Baker, dated 1808 and 1821 respectively (they are in the collection of Cambridge University Library). Fig. 4 shows the Fort St George inn as it was in 1828, fronting the 'sluice' which was about to be moved to the present lock site on Jesus Green. And the Conservators themselves habitually used the term sluice instead of lock up to 1908, and even, on occasion, more recently. In so doing, they maintained a usage which appears to have been widespread, had long antecedents and continues today with Denver Sluice.

The conflict between navigation and drainage interests in the Fens

Despite the fact that pound locks were incorporated into sluices constructed when the Fens were drained, there are many reports that navigation was rendered more difficult and that there was conflict between trading and land drainage interests. Important trade and navigation interests were opposed to the drainage scheme initiated in 1630 and there was continuing conflict between them and the promoters of land improvement.[53] But why should this have been so?

The locks constructed at Denver Sluice were, it appears, too small for the traditional coasting vessels. However, the water control part of the sluice was constructed so that large doors would automatically open and close with the tides. When the tidal waters stood above the inland fresh water, the influx forced the gates shut and so prevented the tidal flood from moving upstream. As the tidal waters fell below the fresh water impounded by the sluice, this fresh water forced the gates open and the fenland waters discharged to the sea. For short periods during each cycle, the gates would be open and the flow of water relatively gentle, thereby providing windows of opportunity for coasters to pass into and out of the fenland river system. However, under certain conditions of flood, tide and storm, the large gates could remain closed for days or even weeks, entirely preventing the passage of large boats. In addition, construction of Denver Sluice impacted on the river regimes and it appears that silting of the channels impeded the passage of the seagoing craft which did pass through Denver. As a result of these various circumstances, the number of round trips which a coaster could make into the fenland rivers each year was roughly halved.[54] However, this disadvantage would apply only in respect of those rivers up which the large coasters could penetrate, ie rivers without old flash locks or the newer pound locks. The lower Ouse and the Cam were two principal rivers on which there were no such structures in the 17th century but the Ouse above Earith would have been impassable to coasters on account of the locks which had been constructed. There can be no doubt that some shipping and commercial interests were adversely affected because Denver Sluice made it difficult for coasters to pass but the direct impact was limited to certain parts of the river system.

Adjusting to the new situation created by the construction of Denver Sluice, the fenland lighter, which could pass through the Denver locks, came into its own. This unique design of vessel was based on the Viking tradition of shipbuilding. Some 40–50 feet long and drawing about 3.5 feet, these craft could carry about 25 tons, compared with the 40 tons which the coasters previously could ship to Cambridge.[55] To compensate for the smaller payload, lighters were usually operated in gangs of five. King's Lynn played an important role as the point of transhipment between sea-going and river craft; in 1682, over 40,000 tons of Newcastle coal were so handled. This adjustment in the design and operation of vessels enabled river traffic to thrive.

From the petitions recorded by Badeslade,[56] it seems clear that there were three issues of main concern for navigation: the reduction in the level of water in the rivers; the loss of the benefit of the regularly recurring high waters occasioned by the daily tides; and silting. Of particular concern for Cambridge was the diversion of water from the Ouse at Earith along the new cuts, the effect being lower water levels in the old river, creating difficulties of access to and along the Cam. The fundamental problem was that for land drainage it was desirable to maintain low water levels, which had the further benefit of providing greater storage in the river channels for flood waters, thereby reducing the risk of the land being inundated. There is also little doubt that interference with the river and tidal regimes led to serious problems of silting, particularly below Denver Sluice but not only there. These problems reflected, at least in part, the lack of knowledge about river and marine hydraulics, and in particular about the transport of silt and sand. On the other hand, the navigation interests were faced with the difficulty of proving that the problems which they alleged to have been caused by drainage were in fact derived from that origin and not from seasonal or annual variations in rainfall or other causes. Some degree of caution is needed regarding the scale of the detriment to shipping which occurred and for how long it lasted, since riverborne commerce did continue on a substantial scale.

Viewed with the detachment of hindsight, one could say that an option for resolving the conflict between navigation and land drainage would have been improvements in the science of hydraulics, in the art of constructing sluices and other structures and, consequentially, better water management, so that the problems of water depth and silting could be ameliorated and, with larger locks, the passage of bigger vessels could be permitted. But that was not a realistic option and therefore it is not surprising that the navigation interests which were adversely affected focused on the removal of the sluices and the restoration of the 'natural' river courses as the solution to their problems.

However, conflict between drainage and navigation interests must be viewed in a wider context. Land drainage was intended to create opportunities for commercial grazing and farming, which implies the need for transport within the Fens. Draining the land would have yielded no profit in the absence of passable waters. Consequently, the land drainage interests could not be blind to the needs of navigation. Another issue is that raised by Finch,[57] who points out that land drainage in the Fens was *'made the subject of political capital in the struggle between King and Parliament'*. Consequently, it may be that contemporary reports about navigation difficulties, the issuing of petitions against drainage etc, should be interpreted cautiously, as reflecting the wider political battles and not just the realities of local circumstances. Indeed, over the seven decades from the end of the Civil War to Defoe's tour in 1724–6, the length of navigable waterways in the

fenland area increased by 69%, from 685 miles to 1160 miles.[58] Finch is emphatic that the truly effective use of the fenland waterways for navigation is to be attributed to the drainage schemes, and in particular to Vermuyden. There is clear evidence that riverborne commerce flourished during the 17th and 18th centuries, as noted by Rich and Wilson,[59] which implies that whatever detriments to navigation there may have been were off-set by continuing improvements to the rivers and/or by appropriate adjustments in the type of vessel operating over the waterway system.

It appears that some scholars have failed to appreciate the full meaning of the word 'sluice' as used in the 17th and 18th centuries in East Anglia. For example, Summers,[60] despite her recognition of the role of pound locks on the river Ouse, gives a curiously misleading impression of Denver Sluice. She notes that the doors could remain closed for long periods, whereby vessels had to be unloaded and *'carried over the Dam'*. When the large gates for water control were closed, coasters would be unable to pass. But these vessels were too large to be carried over the embankment of the sluice. An empty lighter would be a practical proposition but the locks would normally allow them to pass. It seems likely that Summers must have been referring to rather exceptional circumstances, not the normal situation. Darby also seems to have missed the significance of the locks at Denver. When the sluice was partially destroyed by natural causes in 1713, he says that *'the obstruction to navigation was demolished'*.[61] A point of some interest is that in neither of Darby's books does the index contain an entry for locks.

The interplay between navigation and drainage in the 17th and 18th centuries was exceedingly complex and it appears that understanding of this complexity has been partially obscured by the failure to realise that the Dutch influence in East Anglia extended beyond drainage works and commerce to include an impact on the very language of England. Once one realises that the word 'sluice' is to be understood in its Dutch meaning, new light is thrown on the impact of the drainers in building fenland sluices in the 17th and 18th centuries. The presumption is that the sluices built on the main navigations after 1630 incorporated pound locks.

Note. The author has been a Conservator since 1979 and Chairman since 1991. Opinions expressed in this paper are the author's and do not necessarily represent those of the Conservators as a body.

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Sir Robert Cotton and the Round Hill, Conington

Christopher Taylor

This paper explores the archaeology and history of the enigmatic Round Hill at Conington in Huntingdonshire. It concludes that it was the site of a detached lodge or belvedere built a little before 1600 by Sir Robert Bruce Cotton.

Introduction

There is an old rhyme, the origin of which is unknown, which goes:

'Glatton Round Hill
Yaxley Stone Mill
And Whittlesey Mere
Are the three wonders of Huntingdonshire'
(Tebbutt 1947a, 131; 1984, 41)

There is little doubt that Whittlesey Mere, which extended to some 1570 acres (650ha) before it was drained in 1852, was a wonder of the county (Camden 1789, 500; Wells 1860, 135–6; VCH 1936, 185–7; Darby 1956, 26, 118, 227–8). Yaxley Stone Windmill stood just south-west of Yaxley village alongside the present A15 between Yaxley and Norman Cross. It was presumably well known because of its unusual building material and its situation on the main road south from Peterborough. A tower mill of at least 17th-century date, although much rebuilt, it was recorded in 1926 before demolition in 1935 (RCHME 1926, Yaxley (17); Tebbutt 1947b, 32–3; 1984, 41).

But what was Glatton Round Hill that made it a wonder? Today it is visible as one of a line of tree-covered knolls and spurs that occupy the high ground just to the west of the A1 between Alconbury Hill and Stilton (CUCAP BEL 99, 100). It lies within Conington parish, hence its name Conington Round Hill on OS maps, which is used in this paper. It is closer to the village of Glatton, only 1km to the north, than to Conington village which is 2km to the east, near the fen-edge (Fig 1). However, it is what lies beneath the tree cover that, presumably, made it one of the wonders of Huntingdonshire. For, hidden by the copse which reflects its shape is an unusual moated site. The purpose of this paper is to attempt to unravel its history.

Background

There have been a number of cartographic depictions of Conington Round Hill but fewer attempts at explaining it. The name Round Hill is given to the spur on Jeffrey's map of Huntingdonshire of 1768, suggesting a then known importance or significance, although neither wood nor moat is shown. The first modern survey was carried out at some time between 1808 and 1824 by the Ordnance Survey (OS 1824) who depicted the wood, a water-filled ditch and an interior circular trackway and named it Round Hill. The tithe map of 1842 (HRO 2196/10A) shows the site as two wooded areas, the eastern one called the Round Hill Plantation and the western one Coffin Close, presumably because of its shape. The 'moat' on the north-east and south sides of The Plantation is coloured blue indicating that it was water-filled. On an estate map of 1847 (HRO TLR 379/A) the whole site is shown as a simple wooded feature. The first detailed survey was in the 1880s for the First Edition 1:2500 OS map (OS 1889; Fig 2) where it was given the attribution 'Moat', which all subsequent Ordnance Survey maps have followed. In 1926 the Royal Commission on the Historical Monuments of England published another survey, together with the first detailed description, but made no attempt to interpret the site (RCHME 1926, Conington (7); Fig 3). Nor did the contemporary description by the Victoria County History add anything, being largely a summary of the Royal Commission's account (VCH 1926, 296). The later Victoria County History volume covering the parochial history of Conington was more informative, if somewhat circumspect, suggesting that perhaps 'the earthwork may have been thrown up in connection with a house which Sir Robert Cotton may have proposed building but afterwards abandoned' (VCH 1936, 145–6). This perceptive statement was later repeated with more certainty by Pevsner (1968a, 231–2) and later still by the Cambridgeshire Gardens Trust (2000, 144). The idea was rejected by Bigmore (1979, 102–3) who, while puzzled by the location and by the lack of medieval documentation, suggested that it was likely to be either a 13th-century manorial site, or an early 12th-century siege castle.

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Setting

Conington Round Hill is situated at the western end of Conington parish, on a east-north-eastward projecting rounded spur of Oxford Clay overlain by glacial deposits (Figs 1, 4, 8). The almost flat summit is between 46m and 48m OD. To the west the ground rises gently for almost 2km, forming a plateau between 50m and 60m OD which is cut into by the deep valley of a small north-flowing brook. Immediately to the north, east and south-east of the site the land falls sharply to about 20m OD, beyond which it slopes very gradually for some 3km to 4km to the fen edge, here only 3m to 4m OD. This position gives limited visibility to the west but spectacular views to the east. The village of Conington and its church lie 2km away to the east, while Glatton and Sawtry are to the north and south-east respectively. Almost the entire parish of Conington is visible and there are more distant views across the fens. The site of Whittlesey Mere is easily recognisable in the middle distance to the north-east, as is the rising ground at Woodwalton and Monk's Wood to the south-east. On a clear day Ramsey, 13km away, and even Ely, 40km distant, can be identified. These remarkable vistas are not without significance in the understanding of the Round Hill (Heathcote 1876, facing frontispiece).

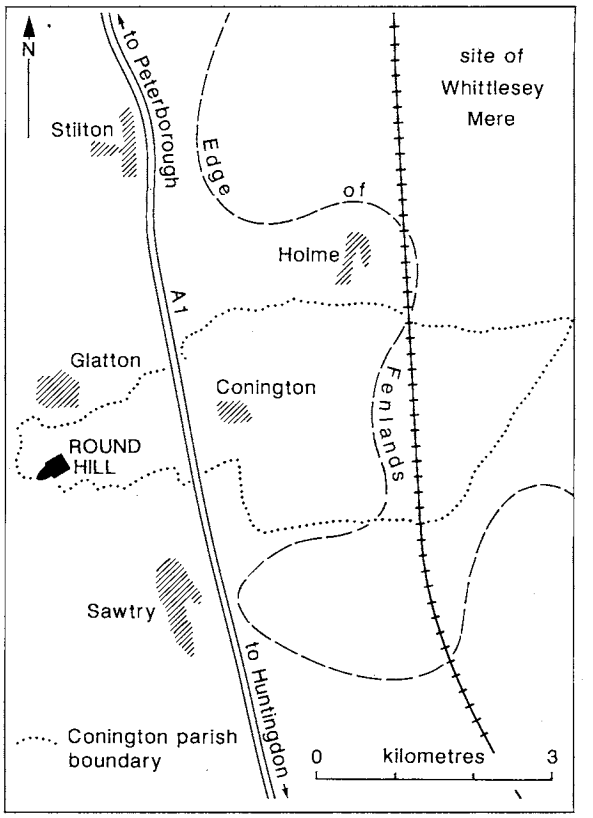

Figure 1. Round Hill, Conington: Location

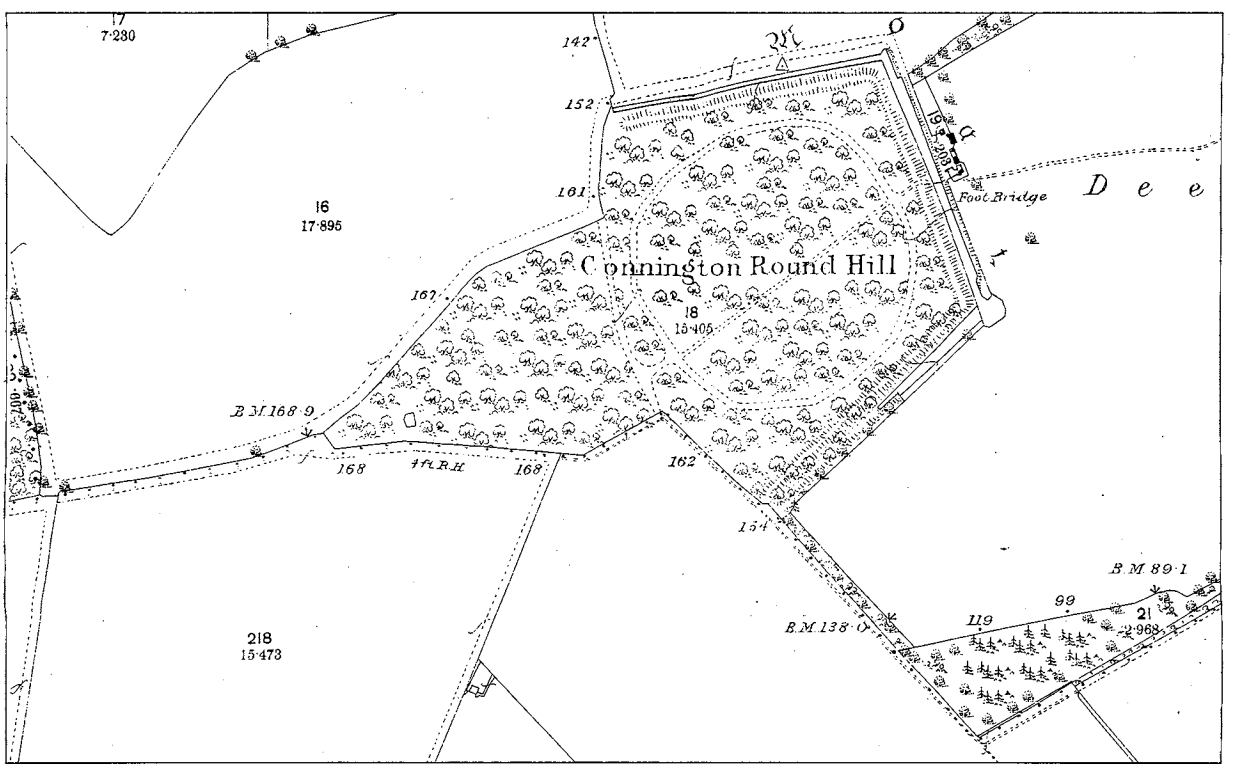

Figure 2. Round Hill, Conington: Reproduced from the 1889 1:2500 Ordnance Survey Plan, Huntingdonshire IX.14

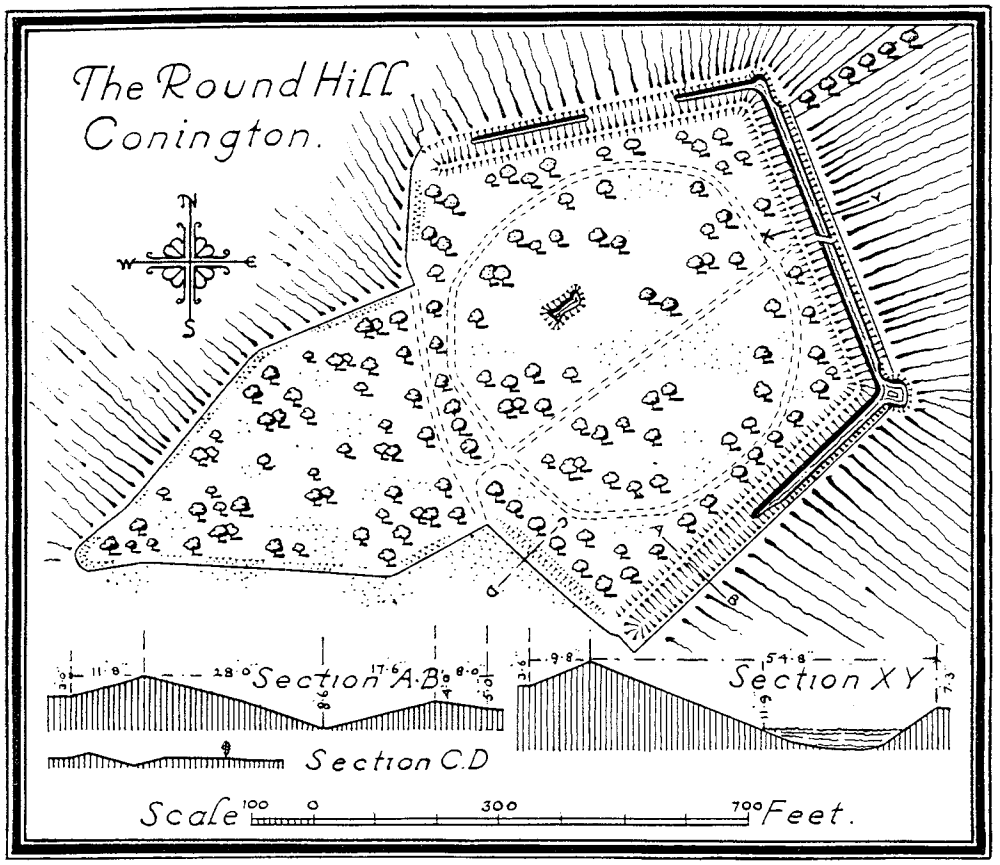

Figure 3. *Round Hill, Conington: Plan by Royal Commission on the Historical Monuments of England, 1926*

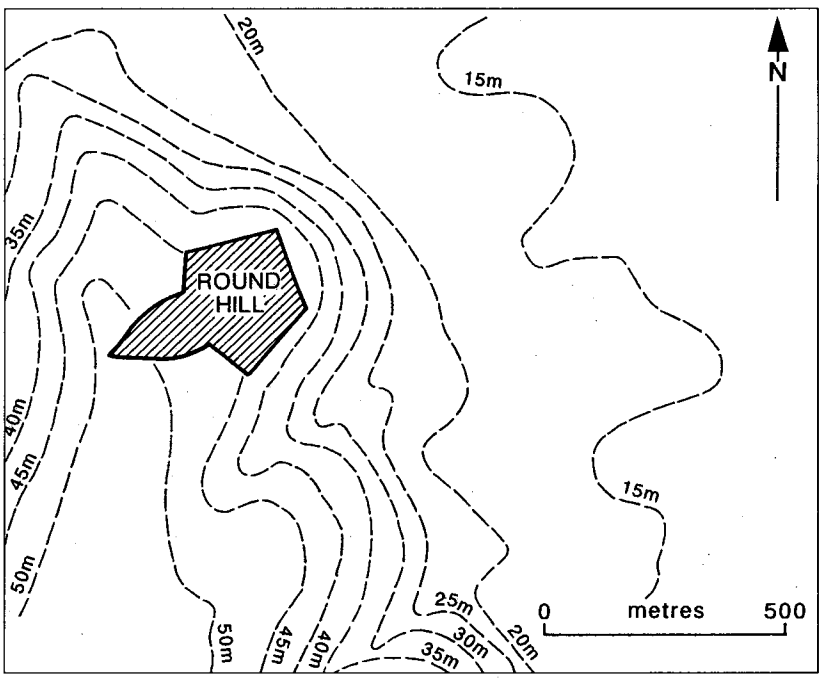

Figure 4. *Round Hill, Conington: Contour plan of site*

Description (Figs 5, 6)

The site at Round Hill covers some 6.25ha (15 acres) and comprises two linked parts: a pentagonal or five-sided area facing north-east and enclosed on three sides by a deep ditch and inner bank, with a smaller, tongue-shaped projection to the south-west. The principal bank and ditch of the north-eastern part, hereafter called the Pentagon, is of massive proportions. On the north-east, overlooking the steep north-eastern slope of the spur, the bank is 11m wide overall, 2m high from the inside and with a flat top or walkway 4.5m across. It is, in fact, a terrace rather than a bank. Its outer face falls precipitously into the outer water-filled ditch, 5m deep below the terrace top, 4m across the bottom and 2.5m deep below a low 3m-wide outer bank (Fig 5 a–b). At the northern and south-eastern corners of the Pentagon the ditch opens out to form small pools. These are animal drinking ponds and may be connected with the 19th-century deer park on the hillside beneath (see below).

The terrace way and ditch along the north-western and south-eastern sides of the Pentagon, while still of considerable size, decline in magnitude towards their western and south-western ends as the slopes of the spur diminish. Thus, near the western end of the south-eastern side (Fig 5 c–d) the main terrace is still 11m wide overall but only 0.5m high from the inside and with a flat top now 5m across. The ditch is only 3m deep below the terrace and 1.75m deep below the small outer bank. Both terrace way and ditch terminate abruptly and the small 0.25m high bank and slight inner ditch that delineate the western and south-western sides of the Pentagon have no connection with them. This small bank and ditch continues around the tongue-shaped projection, hereafter called the Tongue, although recent trackways and a deeper modern drain and its upcast on the edge of the woodland have mutilated them in many places.

All of the above features were noted by the Royal Commission in 1926. However, apart from a small and perhaps fairly recent pond near the centre of the Pentagon, no details of the interior of the site have been recorded hitherto. Yet there are a number of features here that can be assigned to three separate periods of activity. The earliest is ridge and furrow which underlies the entire site and must be the result of ploughing of the area in medieval times. The boundary terraces, banks and ditches all lie over or cut through this ridge and furrow which can be interpreted as fragments of two abutting furlongs. The south-western section is part of a furlong with ridges 7m to 10m across, running north-east to south-west and which occupies all of the interior of the Tongue and the south-western part of the Pentagon. The north-eastern part of the Pentagon is occupied by slightly narrower ridge and furrow extending north-west to south-east. The now ploughed-out continuation of this furlong to the south-east is visible on aerial photographs, as is the pattern of interlocked furlongs to the north, east and south-east of the site (CUCAP RC8 EF, 164; BEL 99, 100). These confirm that the

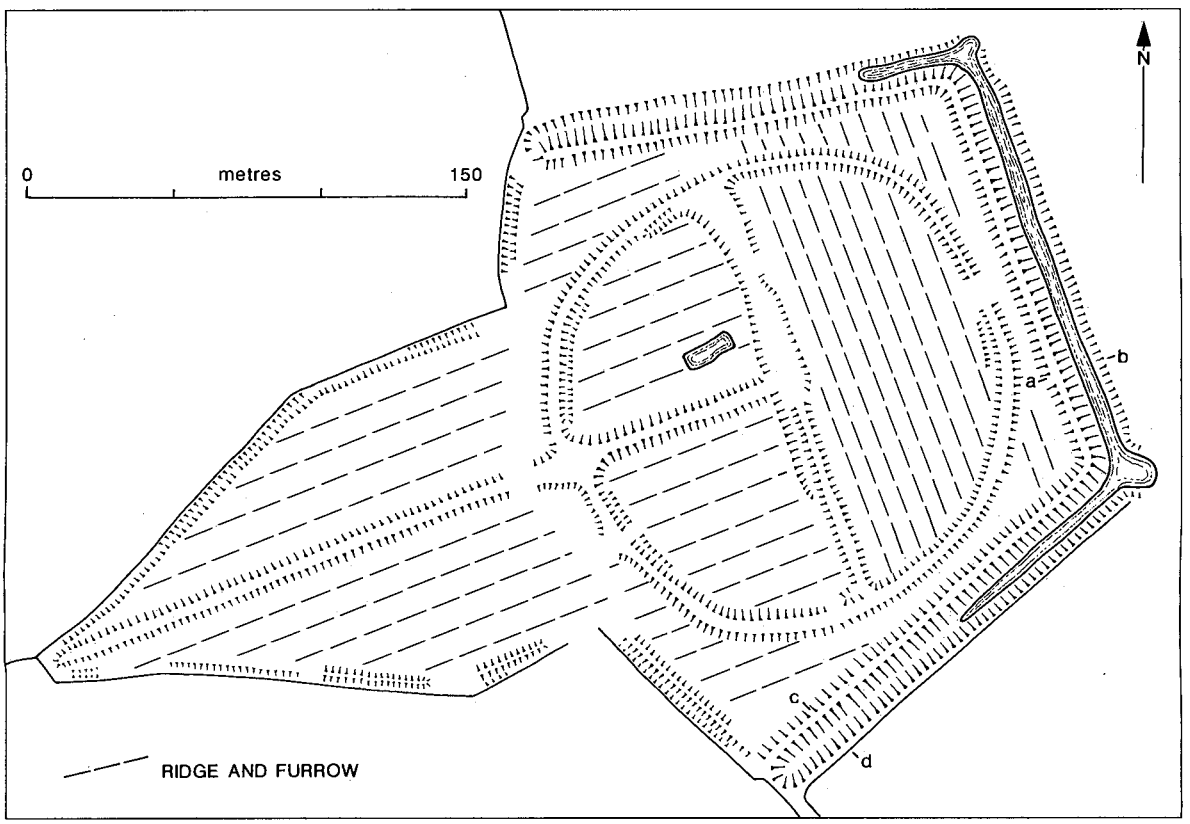

Figure 5. Round Hill, Conington: Plan. The letters a–b and c–d denote the position of profiles illustrated on Figure 6

whole area beneath and adjacent to Round Hill was under cultivation in medieval times, even though by the late 16th century it was open grassland (VCH 1936, plate facing 144).

At the junction of the two surviving furlongs within the Pentagon is part of a broad rounded ridge some 8m across. This is a headland at the end of the north-east to south-west furlong which has also been reused as part of the second period of activity on the site. It belongs to a group of tracks or drives which everywhere else overlie the ridge and furrow. These tracks comprise the following. The central ridge of the block of ridge and furrow which extends across the Tongue has been heightened and widened to create a raised drive 8m across and with a 5m wide flat top. This was an entrance drive from the western apex of the Tongue into the Pentagon. There it meets a circular trackway some 160m in diameter which occupies the centre of the Pentagon and which also overlies the ridge and furrow. The overall form of this trackway is shown on the 1824, 1889, and later maps and on the Royal Commission plan of 1926. But it also survives on the ground as a constructed feature comprising a slightly raised 5m wide track defined on its outer circumference by a low scarp 0.25m high and on its inner edge by a similar scarp or shallow ditch 0.25m deep. The interior of the circle defined by this track is divided into three parts by the raised entrance track from the Tongue, which continues towards the centre of the circle, and by the remains of the headland between the furlongs which bisects the circle. In the middle of the circle are a number of other features, not all of which can be understood but which must relate to a third period of activity. The raised approach drive from the Tongue and most of the adjacent ridge and furrow are all truncated by a later north-west to south-east scarp that extends across the diameter of the circle. To the south-east it forms the south-western side of a shallow elongated depression some 4m wide, the other side of which, also a low scarp, cuts into the side of the headland. This may be a later track. To the north-west of the centre of the circle the first scarp curves back north-westwards and merges with the inner side of the circular track. In the centre of the circle and extending north-west to the circular track is an area of flat ground, the creation of which has destroyed the northern part of the headland.

These complex features may be interpreted as follows. Two adjacent furlongs of ridge and furrow were overlain by the Tongue and the Pentagon. Within them a circular drive, a raised approach drive and another raised track, the last also overlying an earlier headland, were created, forming a pattern of two quarters and one half spaces within the circle. Later, further activity damaged parts of the drives and the ridge and furrow in the centre of the circle. The significance of this sequence of activity will become clear when the function and date of the site is discussed. However, of particular importance is the fact that the relationship between the ridge and furrow and the later Tongue and Pentagon enclosures with their interior features is more than merely stratigraphical. The whole site is arranged so that its long axis is on the same alignment as the cultivation ridges in the south-western furlong. Thus the south-western approach drive across the Tongue and the south-western half of the circle is not only on top of an earlier ridge but is central to and parallel with the surviving ridge and furrow. Likewise the earlier headland between the furlongs, reused as a later drive, exactly bisects the circular trackway. That is the form and alignment of the medieval ridge and furrow controls the alignment and the internal arrangements of the site. In particular, it ensures that the site faces north-east rather than east-north-east which, given the topography of the spur, would seem more logical. This is an extraordinary situation which will also be discussed below.

The present tree-cover on the Round Hill is of little

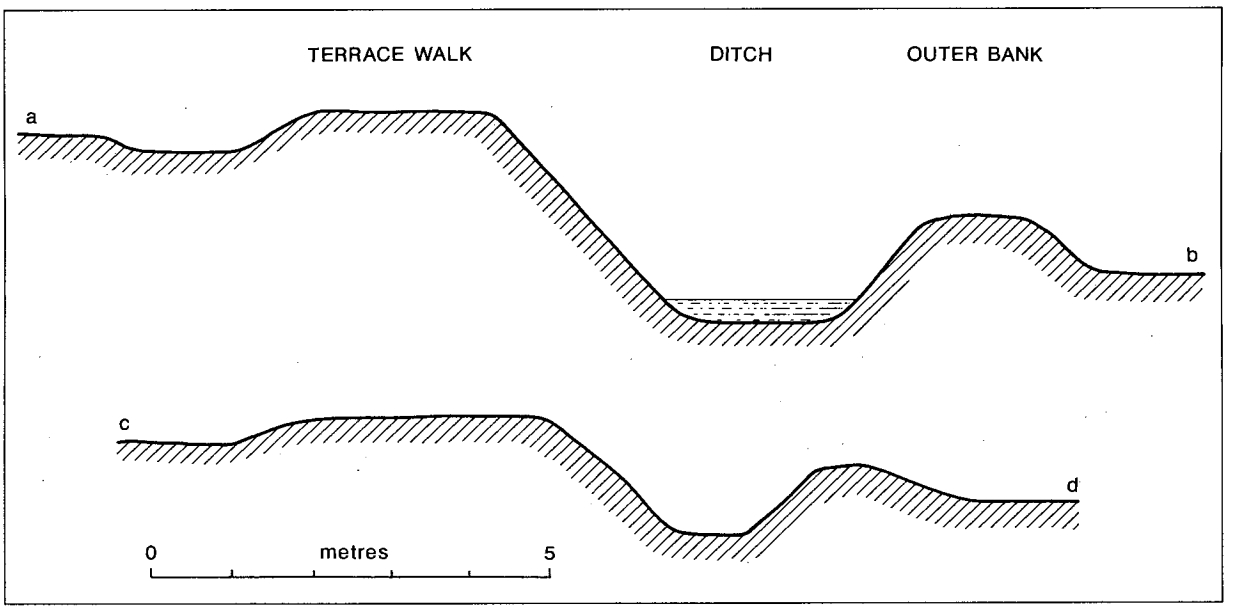

Figure 6. Round Hill, Conington: Profiles across terraceway

significance. Although the site has been covered in trees since at least the early 19th century (OS 1824), only a few mature trees, mainly beech and probably less than 150 years old, survive. Most of the present vegetation is secondary growth resulting from a lack of management and comprises brambles, hazels and beech underwood.

Date

The fact that William Camden on his journey through Huntingdonshire in the early 1580s did not record the Round Hill, although he visited Bruce's Castle, the ancient manor house site at Conington, might suggest that the Round Hill moat did not exist at that time (Camden 1586, 248). However, the principal evidence for the date, and indeed function, of the Round Hill is contained on two maps, one of about 1595 of the parish of Conington and the other of 1613 of the parish of Glatton (VCH 1936, plates facing 144 and 176; HRO TLR404; Figs 7, 8). The 1595 map was probably commissioned by Robert Cotton the then owner of Conington. It shows that, apart from the fenland at the extreme eastern end, the whole parish was already enclosed. But, while most of the enclosed fields are shown as hedged and are given individual names, those at the western end of the parish, around Round Hill, together with four large areas north, north-east and south of the village, have single names written across the internal field boundaries which are not shown as hedged. The Round Hill area has 'Cunnington Downe' across it and a number of isolated trees. In addition there are four carefully drawn groups of sheep, two of which are accompanied by a figure holding a crook and with a dog. Elsewhere is another shepherd and dog and a figure on horseback as well as two small buildings, presumably sheep cots. The implication of this is that the map is depicting a landscape in the process of enclosure. The fields shown on Conington Down and those to the north and to the south of the village, which also have sheep, shepherds, dogs and sheep cots within them, were either new or intended, while all of the rest belong to an earlier period of enclosure. These 'new' fields on the Down are virtually the same as they were depicted in the 19th century and, except for some hedgerow removal, as they are today. This indicates that the enclosure here was indeed implemented in about 1595. However, the Round Hill site is not depicted, except in one important detail. The central circular track is shown as a round field boundary of almost exactly its existing dimensions. The fact that it too includes within it part of one of the groups of sheep presumably means that it, like the adjacent fields, was being created at the time that the map was made.

The second map, of Glatton of 1613, contains the arms of Sir Robert Cotton in its top right-hand corner. As Cotton purchased the manor of Glatton in 1611 and in 1613 was engaged in a dispute with the tenants there, it is likely that this map was also made for Cotton (Manning 1990, 279–80). It shows the whole parish of Glatton, the village and its open fields. Beyond the parish boundary nothing is shown but lettering indicating the land of adjacent parishes, except at one point. Immediately south-west of Glatton village one of the new Conington fields and part of another are shown and named as Conington Downe. More interestingly, at their southern edge and correctly placed, is the northern three-quarters of the completed Round Hill site (Fig 7). To show it the cartographer has had to break across the border of the map, perhaps because it was important that it was included.

This depiction of the Round Hill presumably indicates that it was constructed between 1595 and 1613. It adds much to the understanding of the site and confirms most of the ground evidence but also poses problems. The map shows the Tongue with its central drive continuing into the Pentagon. The drive, coloured brown on the original map, is defined by pecked lines, suggesting that it had no firm boundaries. The Tongue itself is edged by two lines of trees but no planting is shown within it. On the original map this interior is coloured green, presumably to indicate grass. The north-west and south-east sides of

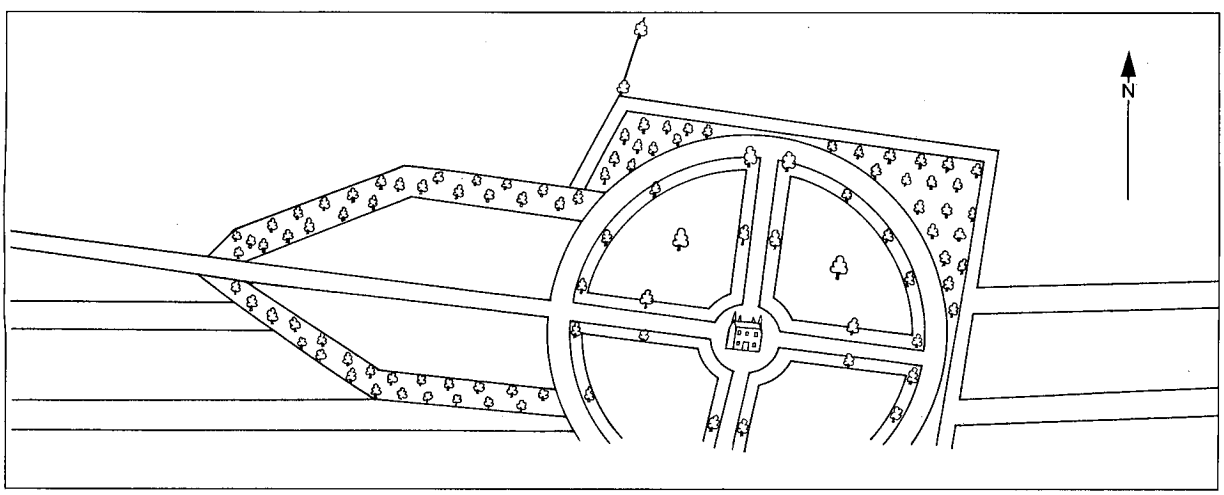

Figure 7. *Round Hill, Conington: Redrawn from 1613 plan (HRO TLR404)*

the Pentagon are shown at right angles to its north-eastern side and not splayed as they actually are. These sides are defined by a double line, presumably the terrace as they are also coloured brown. However these brown lines are shown also on the western side where the terrace does not exist and never could have existed. Within the Pentagon there is the circular track, again coloured brown, with, beyond, clumps of trees in the triangular corners. The inner side of the circle and the outer edges of four intersecting brown tracks across the circle are shown as green strips, presumably hedges, and there are isolated trees along the tracks and within two of the otherwise empty quarters formed by the intersection.

However, the most remarkable feature is in the centre of the circle where a small building is shown. There are problems with the exact interpretation of this building. On the published version of the map (VCH 1936, plate facing 176) the reduction and reproduction process has made it impossible to discern any details. Further, since 1936 the bottom edge of the original map has become stained and buckled. Thus, although this original is more than four times the size of the published one, it remains difficult to make out details of the building. The fact that, even on the original map the building is shown less than 1.5cm across also makes interpretation problematic.

The south-east side of the building is shown in elevation. It appears to be square on plan and, to judge from both the map and the ground, was quite small, being no more than 15m across and probably less. It is coloured grey, possibly indicating that it was built of stone. Of three storeys, each separated by a string course, it has a parapet around a flat roof. It is three bays wide with a central ground-floor door opening. The left-hand, southern, corner appears to have a full-height rounded turret surmounted by a pinnacle. Three more pinnacles, apparently on the other corners, might indicate further turrets.

Despite its detail, the 1613 map does not match the archaeological evidence in two respects. The first is that the existing earthwork is more irregular than the site depicted on the map. For example, the circle is not perfectly round, the central drive is slightly off-centre and the Pentagon is far from a perfect shape. Secondly, on the ground only three tracks meet at the centre of the circle. There is no eastern trackway and the ridge and furrow there indicates that it could never have existed. What survives therefore is less symmetrical than that which is shown on the map.

The curious case of the fossil 'fish'

There is one other piece of evidence that bears on both the date and the function of the Round Hill. This is Sir Robert Cotton's fossil 'fish'. Almost all writings on Cotton's life and his library mention the existence in his eclectic collection of antiquities of a fossil fish which he had found at Conington. It was alleged to have been 'near xx feet long, as was then conjectured' (Dugdale 1772, 172). In fact it may not have been a fish at all. While fossil fish do occur in the Oxford Clay of Huntingdonshire, these are normally less than a metre in length. Further, they are normally found as disarticulated bones or encapsulated within carbonate cement nodules and are only revealed by careful preparation. It is more likely that the 'fish' was a marine reptile commonly found in the brick-pits of the Peterborough district (Martill & Hudson 1991, 30–1, 192–7, 226). But it is where and when this 'fish' was discovered that is important for this paper. The VCH

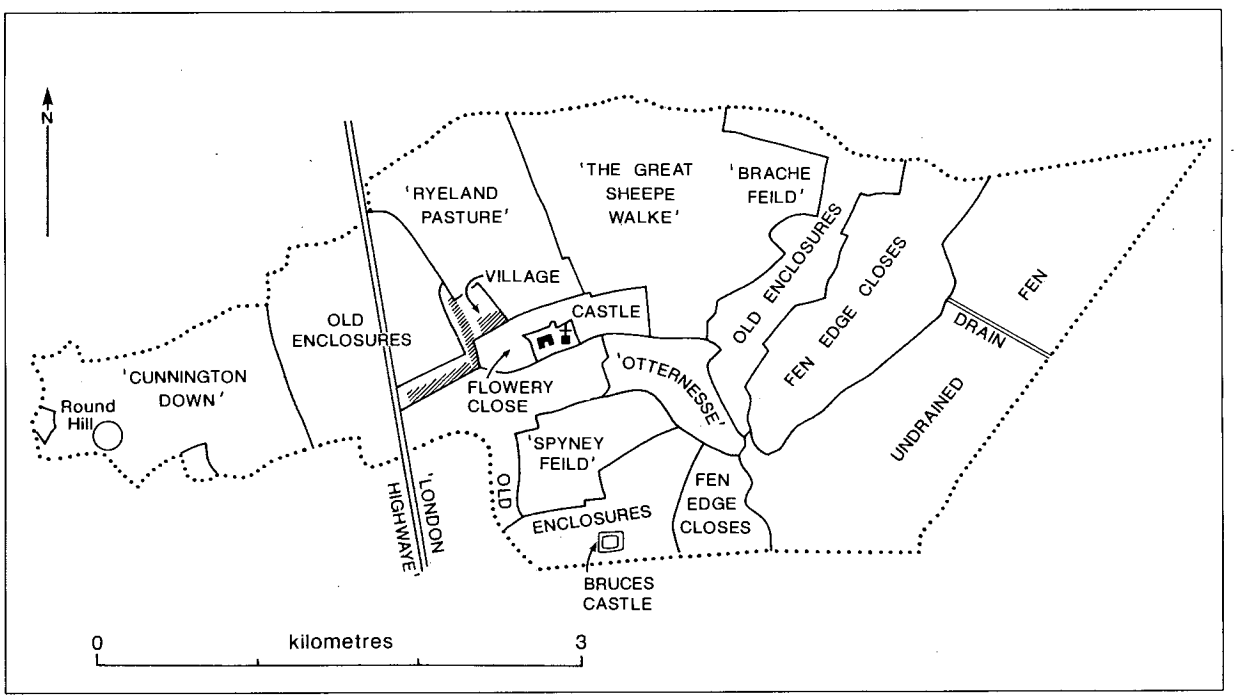

Figure 8. Round Hill, Conington: Parish of Conington, based on plan of 1595

(1936, 144) assumed that it came from the edge of the fens, east of Conington village. However, Dugdale, writing in the 1660s (1772, 172), said that it came from 'the skirt of Conington down ... where, upon making of a pool, ... Sir Robert Cotton ... found a skeleton of a large sea-fish', and that the discovery was 'made of late years'. In the early 18th century Stukeley (1776, Iter v, 81), having actually climbed the Round Hill, wrote 'Upon this hill Sir Robert Cotton, digging the foundations of a house, found the skeleton of a fish'. Regardless of which of these versions is correct, they both seem to be recording a tradition of work on Round Hill, involving digging and organised by Sir Robert Cotton.

The purpose of Round Hill

All of the foregoing indicates that at some time between 1595 and 1613 Sir Robert Cotton, owner of the manor of Conington, created an elaborate arrangement of water-filled ditches, terrace walks, drives and tree-plantings around a small building. This was all set on a high hill overlooking the village and fields of Conington and with wide views across the adjacent fens. Despite its symmetrical layout and its trees and paths, it can hardly be called a garden. Rather it was the setting for the building, a place for viewing the landscape and a way of appreciating the wealth, power and status of the owner of much of that landscape. Also, perhaps, it was a place for pleasure and picnics, recreation and rest and solitude and secrecy. It was approached not apparently directly from Conington to the east, a mere 2.75km distant, but by a circuitous route via Glatton village and the old Bullock Road, a distance of some 8km (HRO TLR404). On entering the Tongue, the visitor would have moved along a raised drive with undulating lawns on both sides. No views would have been possible because of the trees around the perimeter. On reaching the Pentagon the visitor could have continued between low hedges along the raised drive or turned left or right on to the similarly hedged circular track, eventually reaching the central building by the hedged cross-drives. Again, no distant views were possible except perhaps glimpses at the northern and southern ends of these cross-drives or from the roof of the building. The trees in the outer triangles would have formed an enclosed background to the presumed undulating lawns in the interior. Only by walking along the boundary terraces above the water-filled ditches would the really spectacular views have been achieved. Certainly the principal view would have been towards the north-east rather than east-north-east across Conington village, Castle and church, an apparent misalignment of some ten degrees.

The central building would no doubt have been for viewing, shelter, eating or dalliance. It may have been a substantial stone building perhaps similar to the near contemporary Triangular Lodge, Rushton (1594–7), Lyveden New Beild (1590–4), the now lost banqueting house or lodge at Holdenby (1580–5), all in Northamptonshire (Pevsner 1961, 400–2, 300–1; Summerson 1966, plate 84) or the slightly later Wothorpe Lodge, near Stamford (c 1623) (Girouard 1978, 108–9; Taylor 1996). All of these are geographically close to Conington. Other buildings, further afield but perhaps nearer in terms of architecture as well as function, include Carlton Biggin, North Yorkshire (1577), Westwood Park, Worcestershire (1598–1600) and especially Sherborne Castle, Dorset (1594) (inf S Wrathmell; Pevsner 1968b, 286–7; 1972, 388–9; RCHME 1952, Castleton (5)).

Despite the comments by Stukeley (1776, Iter v, 181) concerning the digging of foundations on Round Hill, the lack of any other contemporary or later information on the building, together with the fact that there is no evidence on the ground for any former structure, raises the possibility that the building may have been an insubstantial one. A plastered and painted timber-framed building similar to the mid 16th-century Banqueting House at Nonsuch Palace, Surrey, or the near contemporary hunting lodge at Chingford, Essex, or even a canvas structure like the Banqueting House at Whitehall of 1591 or the Palace at the Field of the Cloth of Gold of 1520 is possible (Biddle 1961, 11–13; RCHME 1921, Chingford (5); Thurley 1993, 46–8; *Cal State Pap* 1869).

The earthworks on Round Hill are more difficult to parallel. The nearest, geographically and functionally but not in shape, is the moated site at Croydon, Cambridgeshire, also set on high ground and with fine views across the valley of the Ashwell Cam. Unlike that at the Round Hill the moat at Croydon is exactly square with walkways or terraces along two sides and with prospect mounds at each corner. The original building within it, known as Croydon Tower, was demolished without record in the 1950s, but it appears to have been a square three-storey brick structure of early 17th-century date, perhaps a banqueting house (RCHME 1968, Croydon (7), (14); VCH 1982, 33, 37).

The Round Hill thus becomes explicable as a late 16th-century setting for a detached lodge, banqueting house or belvedere, situated some distance from the house of its owner. Such a function is by no means unique at this period nor indeed earlier or later. It is a good example of a form of structure the origins of which are before the 12th century and successors of which continued to be erected in the 19th century.

Sir Robert Cotton

There is no doubt that the Round Hill was laid out by Sir Robert Bruce Cotton (1571–1631), country gentleman, politician, historian and antiquary, who is best known for the large collection of manuscripts that he made during his lifetime and which was the first major acquisition of the new British Museum in 1753. Cotton is also notable as one of the members of the first, and short-lived, Society of Antiquaries (Wright 1958; 1997).

There is no full modern biography of Cotton and, until recently, most of what was known of his early years at Conington was largely recycled from the account by the Reverend Smith in his *Catalogue of the Cotton Manuscripts of 1696* (Tite 1984, 25–40). It is from this source that the erroneous idea that Cotton disliked rural life originated. Detailed local studies, more recent research, the 1595 and 1613 maps and the examination of the Conington estate papers in the Huntingdonshire Record Office have all shed new light on Cotton's activities before he began his career in politics early in the reign of James I (Fig 8).

Robert Cotton was born at nearby Denton in 1571. Despite the exalted ancestors that he later claimed, by the 16th century his family were modest landowners. His great-great-grandfather Thomas Cotton I (d 1505) had been left Conington by his great-uncle in 1460. Thomas enlarged this estate by the subsequent purchase of Denton. His son, Thomas II (d 1517) and his grandson Thomas III (1515–1574) acquired small pieces of land and various advowsons, mainly in Huntingdonshire, and the latter bought parts of three manors in Woodwalton in 1568 as well as acquiring former monastic land in Conington itself (VCH 1936, 147–8, 153, 236–8; Wright 1958, 191–2). Even so, on the death of Thomas Cotton IV, in 1592, the Cotton lands were still less than 7000 acres in total (2900ha). Although at the time of Robert Cotton's birth the family were living at Denton, because of 'the incommodiousness' of the ancient Conington seat, Bruce's Castle, his father seems to have already begun building a new house, Conington Castle, within the village of Conington (Probert, 1881; CRO 588 DR/Z1). Small though this estate was, Thomas Cotton IV had certainly worked hard on improving it. The surviving Conington Court Rolls for 1560–81 (HRO CON 1/5/4–9), although mainly concerned with manorial administration, show a marked increase in business after 1579. This perhaps reflects Thomas Cotton IV's interest in his land. More importantly the 1595 map shows that the parish of Conington had been largely enclosed by that date, almost certainly by Thomas IV (VCH 1936, 144 n1). Robert Cotton continued this work by ruthless estate management, further enclosure and increased rents. It may have been the profits from all of this that enabled him to purchase his prestigiously located London home with its well known garden, to finance his political activities and to further his manuscript collection. These profits presumably also paid for the improvements to Conington Castle and its landscape and perhaps the construction of Round Hill.

Cotton inherited Conington on the death of his father in 1592 and seems to have begun work on the estate almost immediately. What he achieved in some eight to ten years is well documented, most of it remarkably on the 1595 map, which seems to have been made either during or just before most of the 'improvements' (Fig 8). His work can be divided into two, the alterations to his house at Conington and its immediate surroundings and the changes to the wider estate. One of his first achievements was the completion of the building or rebuilding of Conington Castle which his father or perhaps his grandfather had begun. What remained of this house was pulled down without record in the 1950s. The Royal Commission's account of 1926, while adequate for its time, leaves much to be desired in terms of a plan, date and sequence of development (RCHME 1926, Conington (4)). However, with the aid of the 1595 map, and a series of 18th and 19th-century engravings (VCH 1936, plates opp 145–7), it is possible to reconstruct the overall arrangement of the house and its surroundings.

Conington Castle was a typical late 16th-century country house of brick with a U-shaped plan. The two south-east-facing wings enclosed a courtyard with an outer courtyard beyond. To the sides of the house were walled garden compartments, that to the north-east surrounding the medieval parish church. This church contained, and still contains, monuments to Cotton's immediate ancestors and, more significantly, two cenotaph monuments of about 1600 displaying shields of arms of Anglo-Saxon, French and Scottish kings as well as those of an Emperor of Germany, medieval Scottish princes and English nobles. These were all intended to demonstrate the descent of David, Prince of Scotland and Earl of Huntingdon (?1142–1219) whom Cotton believed was his direct ancestor (RCHME 1926, Conington (1); VCH 1936, 150; Pevsner 1968a, 233; Mirrlees 1962, 166). The church was thus intended to be both a monument and a mausoleum to Cotton's family and alleged forebears and its position next to his new house and within his garden has an added significance (Heathcote 1876, plates opp 27, 28).

On the north-west side of the house the formal garden there was bounded by a raised terrace or walkway probably similar to those that survive at Leighton Bromswold of about 1616 and those at Childerley of about 1550 (Brown & Taylor 1977, 85–9; RCHME 1968, Childerley (4)). At the corners of the Conington terrace were circular stone summerhouses in which Cotton kept his collection of Roman antiquities that he and his former teacher William Camden had made on a visit to Hadrian's Wall in 1590 (Hepple 1999; 2001; Mirrlees 1962, 83–5; Tite 1984, 40; Wright 1958, 177). To the west of the house and gardens was a large field called Flowery Close which contained five avenues of trees intersecting each other at right angles.

A last feature relating to the house and gardens which Cotton also created was a new approach drive from the main London Road, now the A1. This was the presently disused drive with its 19th-century lodge at the western end. On the 1595 map it is shown as the only road into the village from the west and lined by five houses or cottages with a farmstead at its north-east end. However the map also shows the boundaries of the new drive superimposed on the earlier road, leaving the houses within the boundaries of the drive. This presumably means that the houses were about to be removed. This is the cartographic evidence for another of Cotton's activities in the 1590s, depopulation.

After the 1607 Midlands Revolt against enclosure, a number of landlords were prosecuted and Cotton was among them. At the hearing the jury reported that 'about twelve years last past and since [Cotton] . . . destroyed seven houses of husbandry with the barns stables and outhouses' displacing some forty to fifty people. The farmstead and the five houses along Cotton's new drive may have been six of these. Cotton's defence was that one house had blown down in a gale and that another abutted on to his terrace and garden (Bigmore 1979, 125, 143; Manning 1990, 278). The latter building could have been another farmstead shown on the 1595 map, standing just outside the western edge of the Flowery Close. This lay at the end of one of the avenues, at the other end of which was one of Cotton's summerhouses on his garden terrace. Certainly this farmstead is not shown on any later maps.

This depopulation was not concerned merely with the visual improvement of the landscape of Conington. Much more importantly it was part of the enclosure of what remained of the open field arable and wastes of the parish. As noted above, Cotton's father probably enclosed the bulk of the open fields in Conington and Cotton himself completed the process in the mid 1590s. This was a period during which enclosure was by no means uncommon in Huntingdonshire and so Cotton was doing no more than many of his contemporaries (Gay 1904, 235). For the removal of the seven houses at Conington also involved the conversion to pasture of 208 acres (85ha) of arable (Bigmore 1979, 125). In 1619 Cotton and his son Thomas received a pardon for the earlier enclosure of 800 acres (330ha) of 'land, formerly arable' in Conington (HRO CON 3/1/1/13). It was presumably this land that Thomas Cotton was prosecuted over in 1636 when he claimed that his father had actually converted the 800 acres (330ha) of arable to pasture in 1596–7 (Manning 1990, 278). It was the establishment of these new enclosures that led to a boundary dispute with the farmers of the still open fields of Glatton to the north, over which judgement was given in October 1596 (HRO CON 3/1/1/10). The land involved in this enclosure can be seen on the 1595 map. Round Hill and its surrounding area Conington Down is one piece, while Spyney Feild, Otternesse, The Great Sheepe Walke, Ryelande Pasture and Brache Feild to the south and north of the village are the others. The disputed boundary may well have been just to the north of the Round Hill where the 1595 map shows the boundaries of Cotton's new enclosures at variance with the existing parish boundary and extending into Glatton. Certainly by 1636 the whole of Conington parish was one large sheep walk (Manning 1990, 278).

Like many of his neighbours, Cotton was also interested in maximising the profits on the fenland he owned by draining and reclaiming. He created closes along the fen edge east of the village, perhaps some of those shown there on the 1595 map. Certainly one of his tenants sued him in 1598 for failing to drain several enclosed pastures by carrying the water away in 'a great Loade and ditch' as the terms of the lease required (Darby 1956, 20; 1983, 50; Manning 1990, 278). This lode is probably the ditch shown on the 1595 map as extending from the fen-edge closes, across the open fenland to the Monks' Lode in Sawtry. Cotton was also involved in the unsuccessful attempts at larger scale drainage. He was a member of the Commission of Sewers, although not apparently a regular attender at meetings. And after the ill-fated 1600 General Drainage Act, he was one of the 'undertakers' who hoped to organise and run a corporation to drain the fens (Darby 1956, 29–30; Mirrlees 1962, 316–17, 319–20). It was presumably this interest that led to his acquisition of a number of maps of the fenland (VCH 1936, 292 no 2, 303 no 78).

With all of this work achieved Cotton, still in his twenties, could mix with his landed neighbours on an equal footing. He was soon engaged in all of the activities that would have been expected of him as a country gentleman. He became a JP in 1601 and although he was an MP for the Isle of Wight in the same year, he finally represented his own county in Parliament in 1604. In 1603 he acquired a knighthood and thereafter called himself Sir Robert Bruce Cotton, an allusion to his ancestry. He became a baronet in 1611 (Sharpe 1979, 151–2; Hasler 1981, 663; DNB 1887, 308–15; Cockayne 1900, 45–6).

By this time Cotton had become involved in the Court and London politics. Conington began to play a less important role in his life which is, from here on, well documented (DNB 1887, 308–15; Sharpe 1979; Mirrlees 1962; Tite 1984, 25–45). Even so he still returned to Conington and participated in local affairs and the management of his estate. The surviving Conington accounts and rentals of 1603–12 are actually in Cotton's own hand (HRO CON 4/2/1/1). He also continued to bring friends and colleagues to stay. In 1603 both Ben Jonson and William Camden visited Conington and Jonson described it as one of his favourite 'country havens' (Sharpe 1979, 200). At about the same time Cotton brought the lawyer and poet John Davies to see the moated Bruce's Castle, the supposed seat of Cotton's ancestors (Mirrlees 1962, 50). Cotton's continuing interest in his garden at Conington is revealed by a letter written to Cotton, then in London, by John Watts, rector of Conington in about 1613. Watts was working on the Cotton orchard at Conington and he suggests planting fresh varieties of apples there. He outlines the possibilities in a way that indicates Cotton's detailed knowledge (Mirrlees 1962, 311). As late as 1611 Cotton purchased the adjoining manors of Glatton and Holme and in the same year he bought the Lordship of Norman Cross Hundred which brought him additional fishing rights on Whittlesea Mere as well as the profits from the hundred court. And in 1613 he was involved in a bitter dispute with his new tenants at Glatton and he was also appointed Commissioner for the sale of the crown manor of Weybridge in Alconbury (Mirrlees 1962, 236–7; Manning 1990, 278–83).

It is perhaps worthwhile at this point to look at Cotton's achievements in Huntingdonshire and to

establish what might have lain behind them. For the work at Conington exhibited a combination of astute and even ruthless estate management for profit, detailed antiquarian research at both a local and a national level, a desire for status and position, again at both local and national levels and a sustained attempt to enhance the visual appearance of his home and its surroundings. None of these interests were unusual in members of his class in the late 16th and early 17th centuries and many of Cotton's contemporaries had similar aims and achievements. Even his enthusiasm for history and antiquities was not uncommon. Most of his fellow-members of the Society of Antiquaries were similarly preoccupied. Manning (1990, 279–87) suggests that Cotton's interest in studying ancient manorial records may have been at least partly because he realised how antiquarianism 'could be put to use for extracting profit ... as well as serving scholarship'. Certainly his later successes in London were at least partly the result of his realisation of 'the political usefulness of antiquarian studies' (Sharpe 1979, 42–5).

However, while all of this is undoubtedly true, what emerges from this examination of Cotton's early life is his obsession with his family origins and its links with Conington through the de Brus family and especially through Robert the Bruce, king of Scotland (1306–29). There are at least three known family pedigrees in his hand, as well as his own copies of many deeds relating to his ancestors as far back as the 13th century. There are also notes on the history of Conington and its land including a plan of Bruce's Castle, all by him (CRO 588 DR/Z4; 588 DR/F38). That is, his interest in his origins and in his lands were more than merely scholarly or economic. His collection of records, together with Conington Castle, its garden, the church and its monuments, perhaps even the Round Hill site itself, all demonstrate his interest in where he had come from, what he and his forebears had achieved, particularly at Conington, and his desire to display them to his contemporaries.

The Round Hill would have provided a place for pleasure and have impressed visitors. It also would have enabled all to view the modern, profitable farmland below and to appreciate it as the latest success in the long association of the Cottons with Conington. In this context it is necessary to return to the archaeology of the Round Hill and to look again at the ridge and furrow within it. As already noted, this ridge and furrow governs the alignment of the site and so forces it to face north-east rather than east-north-east across the steepest part of the spur. This latter alignment would have been much more logical in that the principal view from the main part of the terrace would have then been directly across the parish towards Conington village, the Castle and the church. Further, the ridge and furrow was left intact within the site and was thus apparently meant to be seen by visitors to it. Is it too far-fetched to suggest that, in an age where symbolic meanings were displayed and disguised in literature, heraldry, painting, architecture and gardens, that the incorporation of the medieval ridge and furrow was intended to represent the final triumph of Cotton as a successful sheep farmer over the earlier poor ploughmen? That is, the victory of profitable pastoralism over uneconomic arable. Or was it all merely a convenience of construction?

The years around 1615 saw the end of Cotton's active engagement with Conington. His son, Sir Thomas Cotton, took over most of the estate management and proved to be at least as efficient as Sir Robert. Both father and son had begun the draining and enclosure of Holme Fen soon after the purchase of the manor there, although whether it was completed is uncertain (Lindley 1982, 83–6; VCH 1936, plate opp 290). But it was probably Thomas who finally drained and enclosed all of the 820 acres (340ha) of open fenland in Conington that had been completed by 1636 (VCH 1936, 144; Manning 1990, 287).

Although there is no direct evidence, Sir Robert probably continued to visit Conington until his death in 1631, but whether he still rode up to Round Hill to view what he had achieved is unknown. He was certainly buried in the church at Conington near his monument, surrounded by his forebears and the arms of his ancestors, within his garden and in the centre of his estate.

The later history of the Round Hill

How long Sir Robert Cotton's lodge survived on Round Hill is not clear. If it was the timber-framed or even the flimsy canvas structure suggested earlier, it probably soon collapsed or rotted away. Certainly when Stukeley visited Round Hill in about 1722 there was nothing there. He records the tradition of the fossil 'fish' being found during the digging of foundations, but only describes the remarkable view, including that of Whittlesey Mere, from it (Stukeley 1776, Iter v, 81). This might suggest that the Round Hill building was perhaps abandoned in the later 17th century.

Sir Thomas Cotton lived at Conington until his death in 1662. But his son, Sir John (d 1702), did not and indeed allowed Conington Castle to become ruinous. It was so when Stukeley saw it in 1722: 'I was concerned to see a stately old house . . . lie in dismal ruins, the *lares* deserted and the genius of the place fled a poor cottage or two seems to be the whole town.' (Stukeley 1776, Iter v, 81). Sir John Cotton's grandson, another Sir John (d 1731), pulled down much of the house and converted the rest into a farmhouse (Camden 1798, 154). The Roman antiquities in the garden were given to Trinity College, Cambridge and are now in the University Museum of Archaeology and Anthropology (Anon 1883). When, in 1754, the last of the Cottons died, Conington was sold to Sir John Heathcote, son of a wealthy London merchant. Sir John's grandson, another John (d 1838), lived there from 1795 and was the first of the family to do so. He restored the Castle, created new gardens and revived the estate. His son, John Moyer Heathcote (d 1892), was a great agricultural improver. It was he who was responsible for the drainage of Whittlesey

Mere in 1852 as well as for updating the Castle and the church (VCH 1936, 145, 148; Colvin 1995, 133–4).

It was probably soon after 1795 that the Round Hill area was altered, presumably by John Heathcote. The principal addition to the landscape was the establishment of a small deer park of 48 acres (20ha) in the field which slopes down from the north-eastern edge of Round Hill as far as the Sawtry to Glatton road (Shirley 1867, 113; OS 1889; Fig 9). On the Tithe Map of 1842 (HRO 2196/10A) this area was divided into two parcels, both pasture and both called Deer Park. By 1847 (HRO TLR 379/A) improvements, presumably by John Moyer Heathcote, who succeeded to the Conington lands in 1838, had taken place. The deer park, so named on the 1847 map, was then a single parcel of land, bounded by a continuous belt of trees. In the centre was a circular copse with a wedge-shaped clearing on its western side, presumably a wind shelter. A single building stood in the north-west corner of the park against the Round Hill terrace and there were a group of buildings in the north-east corner close to the Sawtry to Glatton road. By 1889 (OS) further changes had been made, again presumably by John Moyer Heathcote. The circular wind shelter had been removed and a new route to the Round Hill established, a track which ran across the deer park from the road to the edge of the site. A footbridge giving access from this track across the ditch on to the old terrace walkway had been constructed. The track also led to a group of buildings and yards arranged lengthways along the outer edge of the ditch, on the site of the building depicted in 1847 (Figs 2, 9). A building is shown here on the 1824 OS map and probably existed in 1808 (Harley 1970). The 1889 buildings were almost certainly the stables, pens and paddocks for deer, together with a deer-keeper's cottage. They had been abandoned by 1912 when they were ruinous and had gone by 1926 (sketch in HRO; RCHME 1926, 62). A few fragments of 18th or 19th-century brick and some slate remain on the ground today.

Within the Round Hill the features attributed earlier to the third period of activity there are also probably the work of the Heathcotes in the late 18th or 19th century. By 1808 and still in 1889 carriage access on to the hill was from the north, from Glatton, and then on to the circular drive from an entrance in the north-west corner of the Pentagon. The flattened area in the centre, the curving scarp to the north-west and other scarps in the area suggest that carriages were turned here and perhaps indicate that the Heathcotes were again using Round Hill as a place of recreation and as a viewing platform, now with grazing deer in the foreground (Heathcote 1876, facing frontipiece).

Conclusion

This paper has attempted to show that the enigmatic earthworks on Round Hill, Conington, were the elaborate formal surrounds for a lodge or belvedere constructed in the late 16th century by Sir Robert Cotton.

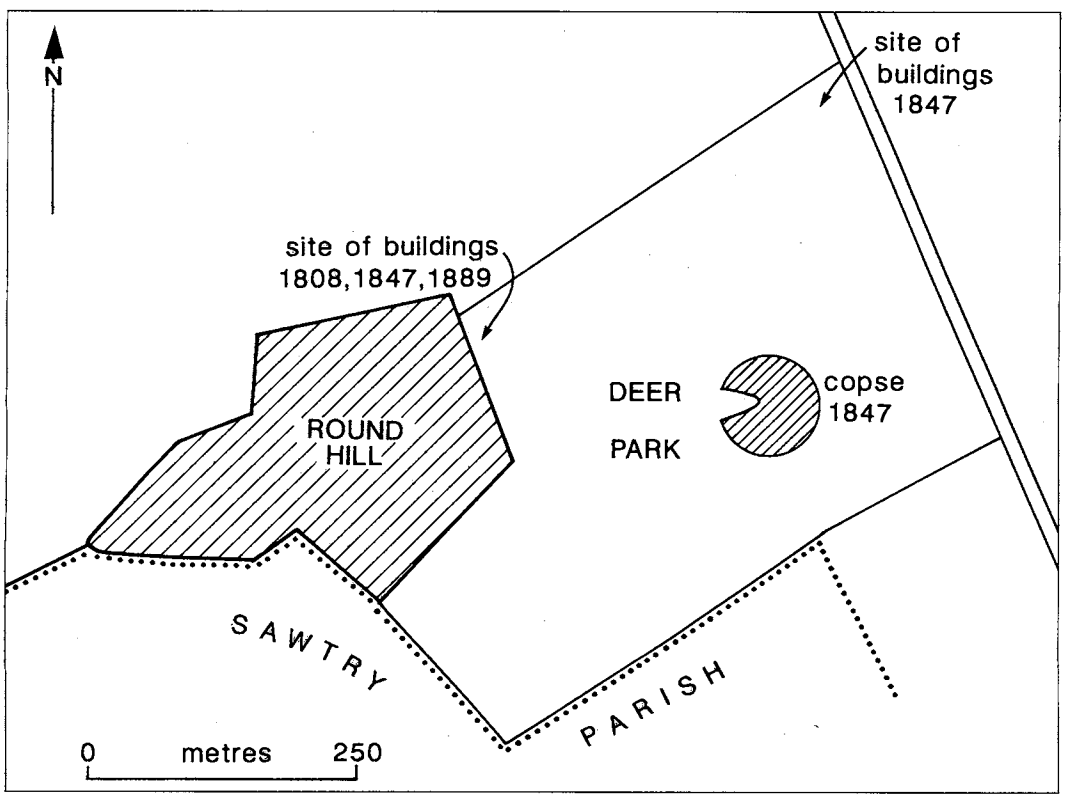

Figure 9. Round Hill, Conington: 19th-century deer park

However, one problem remains over the building that appears to have stood within the earthworks. Apart from the tradition recorded by Stukeley over a century later that Cotton had dug the foundations for a house here, contradicted by Dugdale writing only fifty years or so after the alleged event, there is no record of the existence of this remarkable building other than on the 1613 map. No contemporary or later reference to it has been noted and no architect has either claimed it or been credited with it. No plan or detailed drawing has been found. It may be that it was indeed a flimsy structure of wood or canvas and that it soon disappeared. But an alternative explanation is that the Round Hill lodge was projected, perhaps started but never finished, and that the building on the 1613 map depicts a hope rather than a reality, as the VCH suggested (1936, 145–6). The lack of any evidence on the ground for the fourth drive within the Pentagon supports this idea. That is not even the surrounding earthworks were completed as intended.

Explaining difficulties in interpretation by postulating that sites are 'unfinished' is a not entirely unknown methodological device, at least among archaeologists, even though such explanations are philosophically unsatisfactory. On the other hand, unfinished or abandoned contemporary projects are recorded (eg Brown & Taylor 1972; RCHME 1982, Newbottle (5)). Perhaps the only way to solve this problem would be to carry out an excavation in the centre of the Round Hill whereby the former existence of the building might be ascertained. But, unfinished or not, the Round Hill is an important site both for garden history and for the life of Robert Cotton. At the end of this paper, as at the beginning, the Round Hill remains one of the 'wonders of Huntingdonshire'.

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Fieldwork in Cambridgeshire 2002

The work outlined below has been conducted for a variety of reasons, including development control derived projects, emergency recording and research. All reports cited are available in the County Sites and Monuments Record, Cambridge for public consultation.

Abbreviations:

AFU	Cambridgeshire County Council Archaeological Field Unit
BUFAU	Birmingham University Field Archaeology Unit
CAU	Cambridge Archaeological Unit
HAT	Hertfordshire Archaeological Trust
NAU	Northampton Archaeological Unit

Bottisham, Bell Road
TL 54426092 (Report A201 and forthcoming)
S Kenney for AFU
Evaluation revealed ditches, a gully, a pit and a post-hole. 2nd to 4th century Roman pottery was found across the site together with tile, building material, bone and glass. This material may be connected with a possible villa estate, found just to the southeast across Tunbridge Lane in 2000. Area excavation revealed the full extent of the features found in the evaluation as well as ovens and flues.

Brampton, West End & Belle Isle, land off
TL 20057115 (HAT Reports 1052 and 1117)
N Crank and S Ralph / B Wilkins and M Wotherspoon
Excavation produced Roman, medieval, post-medieval and modern pits and a medieval ditch.

Buckden, Margetts Farm
TL 204 666 (report in prep)
J Oetgen and J Watters for Albion Archaeology
Well-preserved evidence for a number of elements of the Iron Age landscape were recorded. An early–middle Iron Age system of linear field boundaries and possible droveways was succeeded by a farmstead of middle Iron Age date, characterised by large rectangular stock enclosures, a roundhouse and associated water pits, four-post structures, pits, and a single cremation. A short distance to the west two further roundhouses and a well were discovered. A small number of linear features probably represent the part of a system of Romano-British bedding trenches, thought to be evidence for cultivation of vines.

Burwell, Reach Road
TL 58666567 (Report forthcoming)
A Connor for AFU
Finds dating to the late Saxon and early medieval periods have been recovered from numerous ditches, pits, postholes and a probable palaeochannel, showing that the remains discovered in previous archaeological work extend into this area and towards the ancient fen edge.

Caldecote, Highfields, land east of Highfields Road
TL 35265858 (CAU Report 482)
M Redding
Excavation revealed two main phases of activity, spanning the Romano-British and medieval periods. The Romano-British phase was characterised by the establishment of a horticultural system of formalised rectilinear bedding plots, overlain by a medieval ridge-and-furrow field system.

Cambridge, Addenbrooke's Electricity Substation
TL 46395544 (CAU Report 469)
D Mackay
A single evaluation trench was excavated, revealing a ditch running on the same alignment as those earlier identified by geophysical survey in Downing College playing field. Although there were no finds, it is highly likely that the excavated ditch forms part of the late Iron Age/early Roman settlement at Addenbrooke's.

Cambridge, Barnwell Priory, Cellarers Chequer
TL 46245898 (CAU Report, no number)
T Fletcher
A watching brief recorded a 12th century pit.

Cambridge, Brooklands Avenue, former government offices
TL 45605677 (CAU Report 524)
R Patten

Evaluation trenches revealed a series of undated, though probably 'early', pits and ditches. Whether these are associated with the Roman period remains found in the 2001 phase of evaluation at this site is unclear. Also found were 19th century garden features belonging to Brooklands House, including a fountain base and ha-ha.

Cambridge, Castle Street, Cambridge and County Folk Museum
TL 44575904 (CAU Report 484)
A Dickens and N Armour
Test Pit 1 showed a sequence of deposits dated by pottery sherds and other material to the 12th–13th century, 16th century, 18th century and 19th–20th centuries respectively. Test pits 2 and 3 revealed only 19th and 20th century foundations.

Cambridge, Castle Street, Cambridge and County Folk Museum
TL 44575904 (CAU Report forthcoming)
C Cessford
Excavation revealed a sequence of Roman to post-medieval activity. The most intense periods of activity at the site were represented by a Roman timber building and neonate burial, a late Saxon sunken or semi-sunken featured building and pitting, and a 16th century path and associated features.

Cambridge, Chesterton, Scotland Road/Union Lane
TL 4621 5996 (HAT Report 1149)
J Grant and B Wilkins
Field evaluation identified small undated features and two large features containing sherds of 10th–12th century pottery.

Cambridge, Kings Hedges Road, Arbury Camp
TL 444616 (CAU Report 509)
C Evans and M Knight
A series of evaluation trenches and test pits were excavated in the interior and eastern exterior of Arbury Camp. Trenching confirmed this to be devoid of settlement features, as indicated by earlier excavation. Trenching to the east uncovered only ridge-and-furrow and a post-medieval field system. Test-pitting showed a low density of Roman pottery around the northeastern perimeter of the ringwork, probably relating to a cropmark site of this period located immediately to the north. A watching brief for a cable trench allowed examination of the ditch deposits in the southern part of the ringwork. Roman pottery was recovered, below which were organic waterlogged deposits potentially dating to the Iron Age, although no artefacts of that period were found.

Cambridge, King's Parade
TL 448 584 (CAU Report forthcoming)
A Hall
A series of watching briefs recorded 10th–11th century rubbish pits at No. 14 King's Parade, and 19th century rainwater cisterns located beneath the cellars of several properties in the street.

Cambridge, Lion Yard Car Park
TL 451582 (CAU Report 516)
C Cessford
Three test pits were excavated in the basement of the Lion Yard car park, following evaluation in 1999. These revealed a varied post-depositional history for the site, with no archaeology surviving at the lowest level to the north, a sequence of intercutting 12th century pits in the centre, and complete truncation to clay in the south. It is probable that no horizontal stratigraphy remains intact, but there is likely to be intermittent survival of deeper features.

Cambridge, Long Road 28–30, Addenbrooke's Daycare Centre
TL 46175549 (CAU Report 483)
P Whittaker
Evaluation trenches revealed Iron Age enclosure ditches and roundhouse gullies. Later enclosure ditches of the Late Iron Age/Conquest period cut the earlier ditch system. These remains must be related to the settlement complex to the south at Addenbrooke's Hospital/Downing College playing fields (below).

Cambridge, Long Road, Downing College Playing Fields
TL 462553 (CAU Report forthcoming)
D Mackay and C Evans
Excavation uncovered an extensive late Iron Age and early Roman settlement and enclosure system along with an associated cemetery, part of the complex excavated by M Cra'ster at Addenbrooke's Hospital. Several Early Roman pottery kilns were found, including some that were unfired, while late Iron Age 'wasters' indicate earlier pottery production. The cemetery contained sixteen inhumations, two cremations and a dog burial. There were also further human remains in the enclosure ditches and settlement contexts. Other notable finds from the site included a stone block with incised non-figurative decoration. In addition to the main settlement phase, there were traces of occupation from the early Iron Age and the Anglo-Saxon period.

Cambridge, Northwest Cambridge, Gravel Hill Farm
TL 434598 (CAU Report 513)
R Mortimer and D Mackay
Trenching showed that the vast majority of the evaluation area had seen post-medieval gravel and coprolite quarrying, with only small areas of undisturbed ground remaining. Within the latter was a ditch producing Iron Age and Roman pottery. A possible Roman stone sarcophagus was recorded in a garden backing onto the area.

Cambridge, Park Street, ADC Theatre
TL 44945881 (CAU Report 511)
P Whittaker
Evaluation trenches revealed deep stratigraphy dating from Roman through to post-medieval times. Both trenches showed what appeared to be a major landscaping phase; it can be seen from old maps that for-

mal gardens were located in this area during the 16th century. Trench 1 evidenced a deep medieval deposit, 3m from the ground surface, possibly part of the western side of the King's Ditch. Medieval pit and gully features were found in Trench 2, the gullies probably being drainage features feeding into the King's Ditch. Part of a large Roman ditch survived beneath the medieval features, dating to the 2nd/3rd centuries AD.

Cambridge, Park Street 11
TL 44955888 (CAU Report 485)
N Dodwell
Two Roman period adult inhumations, one buried with a neonate, were excavated in the basement of 11 Park Street. In addition, disarticulated skeletal material from a minimum of five neonates and a subadult were recovered. Two Roman ditches were also identified. The burials are very likely to be part of the late Roman cemetery recently identified nearby in the basements of Nos. 35–37 Jesus Lane.

Cambridge, Trumpington Street, land beside Fitzwilliam Museum
TL 4491 5788 (CAU Report 502)
P Whittaker
A watching brief revealed evidence of occupation activity dating from the 11th/12th to 19th centuries. The earliest horizon was an 11/12th century sub/plough soil into which Saxo-Norman postholes and pits had been cut. Residual Roman pottery sherds had also become incorporated into some of these features and the plough soil. Larger pits, also Saxo-Norman in date, were partially exposed, possibly being gravel extraction pits later used for rubbish disposal. Sealing these pits were mortar floors and walls relating to a substantial clunch structure, of *c.* 13th century date, one internal wall had the plaster facing still surviving. Evidence of demolition rubble and truncating pits dating to the 15th century suggested that some of the walls had been demolished by this period. Later activity on the site could be seen, with 16th century layers and pits cutting through these earlier deposits, as well as an 18th century drain relating to the post-medieval structures that were demolished in the mid 19th century when the Museum was built.

Cambridge, University of Cambridge, Sidgwick Site, Institute of Criminology
TL 4428 5812 (CAU Report 526)
N Armour, C Evans and J Tipper
Excavation revealed an Early Anglo-Saxon settlement of the 6th and/or 7th century AD. This included a substantial post-built building or hall (*c.* 10m x 5m), two other probable posthole structures, two sunken featured buildings and three large pits. It seems likely that the settlement continued further to the east and west in a linear arrangement. A small amount of residual Roman pottery and prehistoric flint was also recovered.

Cambridge, West Road 5
TL 44285812 (CAU Report 468)
D Mackay
Archaeological features were uncovered in both the front and rear gardens of the property, possibly of Saxon date and agricultural in nature. However, the archaeology was severely truncated, probably by later agricultural activity, and few artefacts were recovered.

Cambridge, Worts Causeway, Strangeways Laboratory
TL 471550 (CAU Report 487)
P Whittaker
A pair of parallel ditches contained a scrap of Roman pottery. There was a probable Neolithic sherd from the subsoil.

Chatteris, Doddington Road, land south west of
TL 38538736 (HAT Report 1234)
J Grant and D Hounsell
Trial trenches revealed a few sherds of medieval and post medieval pottery, a small quantity of animal bone and some building materials. The site was apparently used for gravel quarrying during the post-medieval period and beyond. Undated features may relate to construction of a post-medieval/modern drain.

Cherry Hinton, Church End
TL 487576 (CAU Report forthcoming)
R Mortimer
Excavation revealed settlement evidence dating from the 8th–13th centuries.

Chesterton, St Michael's Church
TL 12689545 (HAT Report 1098)
J Grant and B Wilkins
Field evaluation revealed sparse ditches and gullies of probable medieval/post-medieval date along the same alignment as existing land boundaries.

Cottenham, The Undertakers, Gravel Diggers Farm
TL 489696 (CAU Report 503)
M Redding
A watching brief encountered no archaeological features other than remnant ridge-and-furrow. Sparse amounts of medieval and post-medieval pottery indicative of manuring were recovered from the topsoil.

Doddington, 6 Ingles Lane, land south-east of
TL 40199064 (HAT Report 1178)
M Sutherland
Excavation revealed post-medieval features, some associated with buildings formerly on this site.

Duxford, Hinxton Road
TL 48104585 (Report forthcoming)
J Roberts AFU
Excavation revealed extensive Iron Age ritual features including an early Iron Age ring ditch, a group of Iron Age pits and a curvilinear gully. Industrial features on the lower land included a possible lime kiln (provisionally dated to the Romano-British period, but

awaiting a C14 date) and a mortar mixer. Anglo-Saxon settlement remains included three sunken floor buildings. Evidence of medieval and post-medieval quarrying was also found in the area.

Site stripping and excavation of the northern part of the site revealed further Iron Age features including at least one possible shrine or temple, inhumations, cremations and a horse burial on the chalk knoll. The upper part of the site was surrounded by Iron Age and post-conquest ditches. A sequence of boundary features, some of substantial size, demarcate elements in this ritual landscape and in later phases cut across the recognisable monuments.

Duxford, Moorfield Road, proposed extension of the Volvo Construction Equipment Works Depot
TL 47854687 (CAU Report 532)
M Redding
Trenches southwest of the Volvo Works Depot revealed evidence for Romano-British, medieval and post-medieval activity. On the eastern edge of the area are a series of coaxial ditches containing Roman pottery. Quantities of Roman roof and floor tile and pottery were found strewn over the southern part of the area. Other linear ditches are attributable to medieval and post-medieval periods with pottery ranging from the 12th to 20th centuries. Two discrete features were excavated, an undated post hole and an undated possible clunch pit. These could be related to a square earthwork known as Coldham's, immediately to the south of the evaluation area. It is highly probable that this earthwork is a post-medieval garden feature that has earlier origins, possibly utilising the earthworks of a Romano-British enclosure.

Earith, Brackhill Fen
TL 392771 (CAU Report forthcoming)
R Regan
A watching brief encountered ditches from two previously known cropmark sites. To the north, two ditches were seen that produced no dating evidence but could form part of field systems associated with the Roman settlements. To the south, ditches from cropmark-identified enclosures or paddocks yielded a few sherds of Iron Age pottery.

Earith, The Holme
TL 38507662 (CAU Report 527)
C Evans and R Patten
Excavation of a 4.4ha area of a Bronze Age field system and settlement, associated with Collared Urn, Rusticated Beaker and post-Deverel-Rimbury pottery (mid 2nd millennium – early 1st millennium BC). The field system comprises a series of compounds laid out on an approximately E-W/N-S alignment, bounded on the south by an E-W droveway. The settlement, spreading across three of the compounds, comprises up to seven roundhouses marked by postholes and two 'four-posters'. The layout may indicate an occupation 'module' of paired roundhouses. Also found were two Neolithic pits, an early Iron Age pit-well, and two rectilinear enclosures of the Roman period.

Elm, Friday Bridge Road, land off
TF 469067 (HAT Report 1099)
N Crank and J Grant
Field evaluation revealed a number of features, principally drainage ditches, the majority of them post-medieval field drains. A pond containing a single abraded sherd of medieval pottery was recorded close to the Friday Bridge Road frontage. Sparse medieval features were recorded including a ditch parallel to Friday Bridge Road.

Elm, Maltmas Drove, Friday Bridge
TF 46400450 (Report A198)
J Abrams AFU
Evaluation trenches contained darlands (or dielands) used to drain agricultural land from the medieval period onwards.

Elsworth, Fardells Lane
TL 31646381 (HAT Reports 1040 and 1274)
L O'Brien and G Seddon
Excavation revealed several phases of Saxo-Norman and later medieval agricultural activity, including two post-built structures in fenced tofts, followed by a stock enclosure, a droveway and an open field. Residual prehistoric struck flints and sparse residual middle Saxon and Roman finds were also found.

Ely, Broad Street 55
TL 543798 (CAU Report 480)
N Armour
Two evaluation trenches recovered material dating from the 14th to 19th centuries. The only feature identified was a 14th century ditch, mostly obscured by the trench sides.

Ely, 5 High Street
TL 54066 80372 (HAT Report 1223)
J Grant and W Keir
Field evaluation revealed medieval and post-medieval deposits. The latter included the foundations of a structure and its later demolition and rubble layers, the remains of buildings depicted on 19th and 20th century maps.

Ely, Kings School
TL 5378879834 (Report A210)
A Hatton AFU
A narrow ditch contained medieval pottery and tile and may have been a drainage channel associated with Barton Farm.

Eye, Tanholt Farm
TF 2430 0240 (CAU Report 545)
R Patten
Excavation uncovered early Bronze Age pits, a middle Bronze Age field system, and later Bronze Age structures, representing seasonal activity within a predominantly agricultural landscape. Various ditch lengths evidenced a consolidated Bronze Age field system that was bracketed by Collared Urn pits and four-post structures. No evidence for Iron Age activity was re-

covered with a possible period of abandonment occurring before the Romano-British field systems were imposed upon the landscape. Two separate Romano-British systems were recorded, possibly representing landscape usage by two distinct settlements also separated in time.

Fen Ditton, Greenhouse Farm
TL 490598 (CAU Report 508)
C Hatherley
Evaluation trenches uncovered several ditches, pits and postholes, with finds from the earlier and later Iron Age. One early Iron Age four-poster could be identified. The alignment of some ditches shows that the late Iron Age/Conquest period field system discovered in earlier excavations immediately to the south continued into the southern part of the evaluation area. While these earlier excavations found substantial settlement evidence, the evaluation area shows a marked fall off in the intensity of Iron Age activity.

Fenstanton, Church Lane, Old Baptist Chapel, land adjacent to
TL 3193268713 (HAT Report 1207)
J Grant and M Sutherland
Pits and ditches contained a large quantity of early Roman pottery and animal bones. The site appears to have ceased to be active around the late 2nd century. It may be related to a potential villa to the north of Church Lane.

Fordham, 17 Hillside Meadow
TL 6323570637 (HAT Report 1118)
M Sutherland and M Wotherspoon
Five ditches and one gully on a similar alignment to Saxon ditches identified by previous work at 12 Hillside Meadow (Casa Hatton 2001 AFU Report A192) and 20 Hillside Meadow (HAT Report 1062) are likely to be of Saxon date and may represent domestic activity relating to the Saxon occupation previously recorded in the area.

Fordham, 20 Hillside Meadow
TL 63257057 (HAT Report 1062 and1076)
R Gardener and L O'Brien
Evaluation trenching revealed two Anglo-Saxon ditches on the same alignment as excavations at 17 Hillside Meadow (HAT Report 1118). One ditch, probably a boundary feature, is indicative of sparse domestic and/or agricultural activity on the periphery of the main settlement focus to the northeast. A substantial area of modern disturbance caused by modern gravel extraction was revealed northeast of the site.

Fordham bypass
TL 612717 and 630690 (AFU Report A202)
R Casa Hatton
Six significant sites were identified. These include Bronze or early Iron Age timber buildings, fences and a field system. Quarrying appears to have been the dominant activity in the Iron Age. Site 2 was a medieval or post-medieval stock enclosure close to the medieval fen edge. Site 3 revealed small ditches and a curvilinear gully amongst remnants of post-medieval and modern drainage channels. Site 4 contained pits and field boundary ditches. Near the northern end were Romano-British quarry pits and the remains of a field system.

Foxton, High Street
TL 411482 (Report forthcoming)
A Hatton AFU
A scatter of struck flint was found in the upper fills of medieval ditches. There were three small Iron Age pits one of which contained cremated human remains in a Gallo-Belgic Pot. In the medieval period large ditches divided up the landscape. Extensive pitting occurred close to the back of High Street properties, this included cess pits. Further pitting took place in the post-medieval period, probably for the recovery of gravel.

Glatton, Glatton House
TL 1533686060 (HAT Report 1200)
J Grant and D Hounsell
A post-medieval ditch, pit and gully terminal were revealed in one evaluation trench. These features may be associated with the use of the site as a formal garden in the 19th–20th centuries.

Great Shelford, Granham's Farm
TL 470535 (CAU Report 514)
C Evans, D Gibson and P Whittaker
Transect fieldwalking led to the definition of five lithic scatters. Trenching demonstrated evidence of prehistoric activity and settlement in three main areas across the site. Early Bronze Age usage of natural hollows was found in two separate areas. A middle/late Bronze Age roundhouse was revealed with associated pits and additional postholes, indicating the area was settled during that period. From the late Bronze Age/early Iron Age were found a four-poster and possible eaves gullies. A large prehistoric ditch, possibly relating to some manner of interrupted enclosure or even a barrow/ring-ditch, was exposed on the ridge of Clark's Hill. This, however, produced no diagnostic artefacts. Only one feature of late Iron Age/Romano-British date was found, which appears isolated. Post-medieval pits (17th century) and enclosure ditches were also revealed. An anti-tank trench was located within Arnold Land, this being part of the GHQ line around the southern and eastern sides of Cambridge.

Godmanchester, Oakleigh Crescent
TL 2459 7033 (BUFAU 943)
Two test pits revealed a possible Roman surface and the other a pit and another feature. The pottery mainly dated from the 2nd century and later.

Hinxton Genome Campus
TL 49804420
S Kemp AFU
A sequence of riverside sedimentation included palaeo-channels and areas of degraded peat. The best preserved sequence lies adjacent to the River Cam. The most important remains consist of broken and incomplete wooden artefacts and related wood-working debris. One fragment of wood has been radiocarbon dated to between AD770 and 1000. The presence of oak and ash points to the importation of wood and specialist working in the vicinity. A boundary ditch bordered the dry land.

Hinxton, Riverside
TL 500433 (Report A 206)
S Kenney AFU
Among the features excavated were several large ditches, pits, postholes and gullies. There was a general background scatter of Neolithic, Bronze Age and Iron Age flint work and a single Bronze Age feature. A cropmark can now be attributed in part to the early post-Conquest period, and may represent the reinstatement of an earlier boundary. Further medieval features revealed house platforms and closes.

Isleham, Hall Barn Road
TL 64007360 (HAT Report 1064)
R Gardener and J Grant
A single pit or post hole was probably of prehistoric date and there were two undated features.

Kennett, Kennett Hall Farm
TL 69286875 (CAU Report 492)
M Redding
A fieldwalking survey revealed evidence of widespread prehistoric activity from the Mesolithic to early Bronze Age. No Iron Age material was recovered, with sparse Romano-British activity. Medieval pottery and a concentration of post-medieval pottery, brick and tile were also found.

Kennett, Kennett Hall Farm
TL 697692 (CAU Report 530)
M Redding
A programme of archaeological trenched evaluation was carried out following fieldwalking (see above). A series of undated but probably 'early' features were uncovered, including differentially aligned linear ditches and narrower curvilinear gullies, and a large pit/well. A single Bronze Age posthole represents the only certain prehistoric feature from the site. Later medieval and post-medieval occupation was found in the form of beam slots for wall footings, postholes, post pads, pits, a clunch-lined well, and a hollow way. This corresponds with a concentration of medieval and post-medieval pottery, brick and tile found during fieldwalking, and represents the farmstead of Houndell, known from cartographic sources.

Kirtling, Kirtling Towers
TL 687574 (CAU Report forthcoming)
A Dickens
A watching brief encountered Tudor drains and a path belonging to a 17th century garden layout. A deep machine sondage found 'natural' at almost 3m below the present ground surface, and the occurrence of Tudor bricks to almost this depth attests to a great build-up of deposits.

Kirtling, Place Farm
TL 687574 (CAU Report, no number)
P Whittaker
A watching brief encountered 18th–19th century farmyard structures.

Landbeach, New Cross Farm
TL 4751965185 (Report A209)
S Macaulay
Three ditches and a single posthole contained pottery dating to the Saxo-Norman (AD900–1150) period. These features were beneath an eroded gravel layer, interpreted as a possible trackway or courtyard surface of later medieval date (1150–1350).

Litlington, Church Street, former School House/Oblic Engineering
TL 31024270 (HAT Report 1229)
J Grant and W Keir
One trench uncovered two parallel ditches and two inhumation burials. The burials aligned E/W (possibly late-Saxon/medieval) and post-dated the ditches. The ditches may relate to Roman or Iron Age occupation.

Littleport, Padnal
TL 57458626 (Report A199)
J Abrams
Several drainage ditches produced artefactual material dating to the 19th/20th centuries. Other features on the site (including pits, ditches and postholes) contained no dating material

March, Church Street 9
TL 415953 (HAT Report 1084)
L O'Brien
Evaluation revealed a number of ditches and gullies all orientated N/S. Finds were consistently Iron Age and Roman.

March, March Northern County Offices, HQ site
TL 416977 (HAT Report 1066, 1079 and 1269)
W Keir and L O'Brien
Excavation revealed agricultural enclosures and a possible droveway dated to the late Bronze Age to middle Iron Age period. A contemporary intact crouched burial and possibly associated hearth were found. Further ditches and pits of Roman date (2nd – 4th century AD) were found, as well as late medieval, post-medieval and recent agricultural features.

Melbourn, High Street
TL 3833644907 (Report 210)
A Hatton AFU
Postholes, ditches and pits dated to the medieval period. One group of postholes formed a structure that may have been a house, with the remaining postholes forming a fenced enclosure. A large ditch (early modern period) took water away from properties along the street front.

Offord Cluny, High Street
TL22006720 (Report forthcoming)
S Whitehead AFU
At least three phases of activity included possible Bronze Age ditches, Saxo-Norman postholes and pits and an 18th century well.

Papworth Everard Bypass
TL 290620 and 278627 and TL 278627 and 284639 (Report A211)
A Hatton AFU
Archaeological remains were recorded along much of the route of the proposed bypass. Three areas of concentrated human activity were identified. Features dated from the late prehistoric through to the 3rd century AD. These areas provided evidence of small-scale industrial activity and enclosure ditches. One isolated enclosure may have had a ceremonial use.

Peterborough, Broadlands, land off the
TF 2146 0012 (HAT Report 1078 and 1272)
D Hounsell and M Wotherspoon
Excavations revealed an extensive system of coaxial field boundaries, several pits and postholes of predominantly late Bronze Age and late Iron Age/ Roman date.

Peterborough, Oundle Road, Peterborough Business Park
TL 140 962 (CAU Report 504)
D Mackay
Excavation revealed successive ditched field systems from the Iron Age, earlier Roman period and later Roman period respectively. The final field system appears to have been abandoned before the beginning of the 4th century AD.

Peterborough, Oundle Road, Riverside Retail Park
TL 17929751 (CAU Report 519)
A Cooper
Evaluation trenches revealed at least four ditches of probable late Bronze Age date as well as postholes, gullies and pits of uncertain date. This evidence complements the findings of other recent investigations in the area to suggest fairly ephemeral but extensive later prehistoric activity.

Ramsey Abbey School
TL29328515 (Report forthcoming)
S Macaulay AFU
Information about the layout of the Abbey included the area devoted to refuse disposal. The identification of a channel/canal suggests that there may have been a wharf for loading and unloading goods in the vicinity.

Ramsey, Great Whyte, Garden Centre
TL 28728526 (HAT Report 1024)
N Crank and L O'Brien
Field evaluation revealed a sequence of medieval and post-medieval deposits probably representing attempts at land reclamation. An early post-medieval ditch was the only feature present.

Soham, Brook Dam Lane
TL 59517296 (HAT Report 1065)
W Keir and L O'Brien
Field evaluation identified drainage ditches containing abraded medieval and late medieval sherds and deposits of shell, in addition to post-medieval and modern material. The cut of the drain was artificial, and probably represents part of fen drainage works dating back to the Saxon or early medieval period.

Somersham, Church Street
TL3607477687 (Report A213)
A Cooper AFU
Deposits related to the backfilling of the medieval fishpond

Spaldwick Bridge
TL 12667305 (Report A212)
A Hatton AFU
An archaeological watching brief was undertaken at Spaldwick Bridge to ascertain the structural condition of both the medieval bridge as well as the post-medieval bridge, which butts up against it.

St Neots (Eynesbury) Ernulf School
TL 18225885 (Report A204)
S Kenney AFU
A pit was interpreted as a tree bole, possibly associated with Neolithic woodland clearance. A narrow ditch may also belong to this period, but no finds were recovered.

St Neots, Love Farm
TL 202607 (Report A208)
S Whitehead AFU
There were traces of a human presence in this area from the Neolithic to modern times, with one concentration dateable to the Romano-British period.

St Neots, South Street
TL 1832 6017 (BUFAU 838)
Excavation and trial trenching in 2001–2 revealed traces of buildings dating from the 13th–15th century adjoining the street frontage . Drystone walls and post holes represented buildings and less substantial structures respectively. Cobbled and tiled surfaces, pits and ditches were also discovered.

Steeple Morden, Hay Street
TL 286426 (Report A215)
A Rudge AFU
A large ditch contained a significant quantity of Romano-British pottery. Post-medieval finds were identified in overlying layers.

Steeple Morden, 15–17 Hay Street
TL 28604260 (HAT Report 1121)
J Grant and B Wilkins
Trial trenching revealed a large number of Romano-British archaeological features, comprising ditches and curvilinear features representing enclosures. A number of larger pits and smaller post holes were also present, indicating occupation.

Steeple Morden, Station Quarry
TL 3032 3919 (Oxford Archaeology)
A field walking survey was carried out as part of an evaluation, which also included trial trenches. One flint blade and a flake were retrieved during the field-walking, however in general the finds assemblage was characteristic of manuring deposition and not suggestive of plough truncation of underlying archaeological features.

Stibbington, A1
TL 08609845 (HAT Report 1116)
M Wotherspoon and D Hounsell
One ditch contained pre-medieval material and two ditches were associated with late medieval pottery. A gully and pit of a similar period appear to relate to agricultural activity.

Swaffham Prior, land adjacent to Green Head Road
TL 57056413 (CAU Report 520)
A Hall
Trenching revealed that the area had been extensively quarried for clunch. No in situ archaeological deposits were identified, though residual pottery sherds were encountered within the quarry backfill.

Teversham, Cambridge Airport Replacement Terminal
TL 48975913 (CAU Report 523)
A Cooper and C Evans
Trenching revealed evidence of Iron Age and Roman Conquest period occupation in all but one of the excavated trenches. This included a system of ditched boundaries on a NW-SE and NE-SW alignment as well as the remains of circular structures, possible post-built structures, pits and a single inhumation. The artefacts retrieved were indicative of settlement and included an unusual Iron Age base sherd with a 'makers' stamp and a possible continental import. The evidence complements the findings from investigations to the north of the site and suggests that the extensive Iron Age settlement found there extends southwards into and probably beyond the current area of investigation.

Tydd St Giles
TF 5427131647 (AFU Report 209)
A Hatton, T Baker and A Rudge
A watching brief revealed evidence for medieval activity, including the possibility that Grimston-type pottery (1250–1500) was in production nearby. Also identified was a stone wall and a series of drainage ditches, of unknown date, all of which appear to have been filled by a large-scale episode of flooding.

Waterbeach, Denny Abbey
TL 494650 (CAU Report 493)
C Hatherley
A watching brief revealed a layer containing mortar, charcoal, clunch, oyster shell and animal bone, but with no datable finds.

Waterbeach, Ely Road, Integrated Waste Management Park
TL 488 690 (CAU Report forthcoming)
P Whittaker
Evaluation trenching revealed an isolated cremation, a late Bronze Age/early Iron Age ditch, and Roman field systems relating to the settlement features found in the southwest corner of the field. These midden and structural features dated to the late 3rd–4th century and appear to be the northern fringes of a settlement focus further to the south and west which is evidenced by cropmarks.

Water Newton, Mill Lane, land east of
TL 10959725 (HAT Report 1270 and 1270)
N Crank and L O'Brien
Excavations revealed ditches of Roman and Saxo-Norman date and drystone walls. The Roman ditches represent remains of field boundaries associated with a nearby villa. There is continuity of use between the Roman and Saxo-Norman periods. Saxo-Norman ditches and walls may represent the remains of the pastoral fields of an early medieval settlement located south of the present village.

Wicken, Dimmocks Cote
TL 54707240 (Report A205)
S Kemp AFU
The archaeology continued the dispersed pattern of activity seen at Dimmock's Cote since 1994. These activities included post-built structures, a large pit (possibly a well) backfilled with deposits containing significant quantities of Bronze Age pottery, animal bone and local fossiliferous limestone. A crouched Bronze Age inhumation was found on the margins of a barrow excavated in 1997. Results indicate an open landscape with an unenclosed settlement and pockets of activity occurring beyond the main focus of habitation. These areas have been used for pastoral, industrial (smelting and quarrying) and ritual (particularly burial) activities. In addition to the prehistoric activity there is slight evidence for Iron Age or Roman field boundaries and much of the site is covered in traces of the medieval field system.

Wicken Spinney Abbey
TL55507184 (Report A207)
G Bailey
Ditches and pits were found but the only dating evidence was pottery from a small pit provisionally dated as Anglo-Saxon.

Willingham, High Street, land to west of
TL 40107010 (HAT Report 1087)
W Keir and J Murray
Boundary/drainage ditches of late medieval and post-medieval/modern date followed the same broad coaxial layout of property boundaries that can be seen at the rear of the High Street. A single ditch yielded late Iron Age pottery

Wimblington, Coneywood Fen, land east of Coneywood Road
TL 895919 (CAU Report 488)
M Redding
A post-medieval field drain was found in the westernmost trench, while further east on the fen edge there were remnants of 19th century drainage channels.

The following investigations produced little or no archaeological evidence:

Barrington Primary School
TL 39695003 (AFU Report B96)
A Hatton

Brampton, 32 High Street
TL 21107095 (HAT Report 1199)
J Grant and M Sutherland

Burwell, 6 High Street
TL 59106595 (AFU Report B105)
A Hatton

Cambourne
TL 3280 5960 (Wessex Archaeology Report 45976.10)

Cambridge, Chesterton, St. Andrews Road, former Simoco works
TL 46455960 (CAU Report 490)
N Armour

Cambridge, Clare College, Master's Garden
TL 44455847 (CAU Report 496)
A Clarke

Cambridge, Girton College
TL 42486089 (CAU Report 501)
P Whittaker

Cambridge, Homerton College
TL 4607 5629 (CAU Report 495)
C Hatherley

Cambridge, Huntingdon Road, The Old Field Laboratory
TL 4309 6007 (CAU Report 494)
C Hatherley

Cambridge, Kings College School
TL 44005826 (AFU Report B99)
S Macaulay

Cambridge Riverside
TL 463591 (AFU Report B110)
J Roberts

Cambridge, Rustat Road, Cambridge Water Company
TL 4644 5697 (CAU Report 525)
A Cooper

Cambridge, West Road 9
TL 44195812 (CAU Report 476)
R Patten

Chatteris, Black Horse Lane
TL 39218674 (AFU Report B97)
S Cooper

Chettisham Pumping Station
TL 5443 8329 (NAU Report 787)

Chettisham sewer
TL 5486 8316 (NAU Report 788)

Comberton, Church Farm Barn
TL 38365557 (AFU Report B112)
J Roberts

Earith, Meadow Drove
TL 39227552 (AFU Report B109)
A Hatton

Ely, Cambridge Road
TL 53508009 (AFU Report B100)
R Atkins

Ely, beside the Bishop's House, Ely
TL 5405 8019 (Heritage Projects Report)

Ely, West Fen Road
TL 5302 8089 (NAU)

Manea, 64 Williams Way, land adjacent to
TL 47608943 (HAT Report 1018)
NA Crank, L O'Brien and M Sutherland

Mepal, Block Fen
TL 44308400 (HAT Report 1059)
D Hounsell and M Sutherland

Old Weston Model Farm
TL 09837732 (AFU Report B101)
A Hatton

Papworth Everard, Papworth Hospital

TL 29046282 (HAT report 1088)
J Grant and B Wilkins

St Neots, Berkeley Street, 12/14, rear of
TL 18485970 (HAT Report 1075)
W Keir and L O'Brien

St Neots, Hardwick Road, Coneygeare PH
TL 18155960 (HAT Report 1215)
W Keir, J Grant, M Wotherspoon and D Britchfield

Soham, Cloverfield Drive
TL 58677460 (AFU Report B106)
S Cooper

Soham, Fordham Road, 49 & 49A
TL 60067246 (HAT Report 1055)
M Sutherland

Swaffham Bulbeck, New England Stud
TL 58806065 (AFU Report B102)
A Hatton

Whittlesey, Stonald Road
TL 26329756 (AFU Report B104)
S Cooper

Whittlesey, Victory Avenue
TL 79307490 (AFU Report B98)
S Kenney

Whittlesey, 6 Inhams Road
TL 2772 9699 (Sutton Archaeological Services)

Wood Walton Farm
TL 23009200 and TL 22008200 (AFU Report 208)
R Casa Hatton

Summaries of papers presented at the Spring Conference
8 March 2003, Lady Mitchell Hall, Cambridge

Cambridgeshire, a land of plenty

Derek Booth

Cambridgeshire in context: changing patterns of arable farming from the middle ages to the 19th century

Cambridgeshire, in terms of its landscape and agrarian history, is something of a transitional zone – in part East Anglian, in part Midland. The south and west of the county are often considered part of the champion Midlands but, although open fields were extensive here in the middle ages and often fairly 'regular' in nature, they often achieved this form at a relatively late date and the settlement pattern included many dispersed elements. The environmental factors which encouraged emergence of 'champion' landscapes were present, but in muted form. In the southeast of the county, on the clay plateau extending into East Anglia, rather different agrarian and environmental factors encouraged development of a more dispersed pattern of settlement, associated with 'irregular' open fields and enclosures. The Fens remained a world apart, exploited amongst other things for thatching materials, litter, fodder and grazing, with arable farming restricted to the various 'islands'.

In the 15th, 16th and 17th centuries arable land use declined on some of the clay soils in the county and pasture expanded. But during the 'agricultural revolution' the county followed an East Anglian rather than a Midland path. As the arable open fields of Northamptonshire, Leicestershire, and north Buckinghamshire were steadily laid to grass, Cambridgeshire remained a largely arable county: evidence of ridge and furrow – open field plough ridges preserved under pasture – is thus comparatively rare, and concentrated towards the west. Enclosure, and new crops and rotations, transformed farming on the light chalk soils in the south of the county, while the claylands in the south east – like those of Suffolk and Norfolk – became intensively arable as underdrainage came into widespread use: much of the old-enclosed field pattern was 'rationalised' and many hedges were realigned or removed. Above all, from the early 19th century the drainage of the fens was steadily improved, and arable acreage expanded.

All this was part of a wider transformation in the geography of English agriculture. In the course of the 'agricultural revolution' period the complex mosaic of farming regions which had characterised early modern England was broken down, and was replaced by a new and simpler pattern, similar in many ways to that which exists today. Arable farming was increasingly concentrated in the east of England, pasture in the Midlands and west, a development with important consequences for agricultural productivity.

Tom Williamson
Centre for East Anglian Studies,
University of East Anglia

Transport and the rural economy since 1750

Commercial agriculture depends on distribution and marketing arrangements, regionally, nationally and internationally. In 1750, at least half of Cambridgeshire's produce was consumed outside the county, with London and the towns of Yorkshire and the North-East exerting the major demand. The 18th century saw major improvements in the county's transport infrastructure, especially its road network: most main roads had been turnpiked by 1770, and Parliamentary Enclosure led to a dramatic redrawing of the local road network by 1830. River improvement was slower and less certain, and transport tended to take second place to the interests of fen drainage, and the improvement of the Ouse and Nene outfalls, although helping coastal shipping (and contributing greatly to the prosperity of Wisbech and Lynn), had unforeseen consequences on the upper reaches of the rivers.

Unfortunately, analysis of traffic patterns is fraught with problems. Coastal shipping is relatively easy, as Port Books (and, from the 1820s, published Shipping Returns in the local press) list vessels, destinations or points of origin, and cargoes carried. The voluminous records of Turnpike Trustees and Navigation Commissioners, however, were accounting rather

than commercial records: total receipts were all that mattered and except on rare occasions the nature of road and river traffic – and their relative shares of the market – remain elusive.

Between 1845 and 1880, the railways took over virtually all long-distance agricultural traffic (although waterways and roads remained important for local collection), and also meant a widening of markets for the region's farmers, especially the new ability to supply the Midlands and the North-West, which had been inaccessible by water. Mills, maltings and cattle markets moved to railside locations, and the marshalling yards at March (supplemented by the Whitemoor complex) became the nerve centres of East Anglian freight, a role they retained until the 1980s. Fruit and market gardening gained especially, with fast transit times and the provision of specialised rolling stock. Additionally, the railways made possible the expansion of the extractive industries (cement in South Cambridgeshire, and brick-making at Whittlesey and Fletton) from 1880 onwards.

Effectively monopoly providers in 1914, the railways were slow to adjust to changed circumstances between the wars. The lorry (whether steam or motor) offered cheaper rates and the ability to deliver directly from farm to consumer. Consequently, the most profitable traffic had been creamed-off by 1939 (witnessed by the very large number of Fenland-based road hauliers), although both railways and waterways benefited from the post-1925 expansion of sugar beet production, supplying the new factories at Ely and Wissington.

Since the 1950s, agriculture has become almost exclusively road-orientated, helped by the newly-metalled Fenland roads that resulted from the second world war, construction of the motorway and dual-carriageway trunk road networks and the demands of supermarket chains (and their suppliers) for 'just-in-time' deliveries that the roads can offer but the railways (so far) have found difficult to achieve.

Tony Kirby
President, Cambridge Antiquarian Society,
Strategic Information & Planning Unit,
Anglia Polytechnic University, Cambridge

Nuts, bones, pots and stones – the ingredients of prehistoric Cambridgeshire

Every now and then, when the light is just right, the prehistoric landscape can be seen breaking through Cambridgeshire's thick historical blanket, and as its flat fields sprout ancient earthworks we are reminded of a different topography that was once inhabited by a different people. Strange things made and used at the time when these earthworks were being constructed are regularly brought to the surface by ploughing and it is their very difference that makes them stand out against the debris of more recent times.

Over the past couple of decades, large parts of Cambridgeshire have been developed (housing, quarries etc) and planning laws have often required the developers to fund archaeological investigations before they start work. As a result, the scale of development has to an extent been equalled by the scale of excavation leading to vast tracts of Cambridgeshire's buried landscape being opened for investigation. The sheer size of the projects has brought about a particular way of thinking, which places an emphasis upon understanding how particular spaces came to be transformed or forgotten over time. At quarry sites in particular, the historical blanket has been lifted and archaeologists have been able to visit the spaces once frequented by prehistoric peoples. Pits, houses, burials, boundaries and monuments have been found in relationship to each other illustrating complex histories spanning broad periods of time. These complex histories can be related to different kinds of inhabitation of these spaces. For instance, a place to stop and camp in the late Neolithic may be just a small part of a large fieldsystem by the Middle Bronze Age.

Nuts, bones, pots and stones – the ingredients of prehistoric Cambridgeshire described some of these spaces using quarry sites located along the Welland, Nene and Ouse valleys. This process involved interpretation of how things were made, how they were used, how they came to be incorporated into the landscape, and ultimately, what this might tell us about being prehistoric.

Christopher Evans
Cambridge Archaeological Unit,
Downing Street, Cambridge CB2 3DZ

Designs on the Black Fens, 1000–2000

During the second millennium, the Black Fens were seized on repeatedly by developers. Successive schemes revealed contemporary demands in the surrounding country. At one time and another, the principal proponents were either outsiders or local. Most projects entailed investment in engineering; but physical geographic impediments proved ever more frustrating.

From the beginning of the millennium summer pastures were major assets, attracting herds from both marshland and uplands. Manors and monasteries progressively asserted themselves over the pastures. The abbeys exploited the fisheries too and sponsored local schemes of drainage for arable. Both for draining and for transporting produce from or across the Fens, canals large and small were cut during the middle ages; but development seems to have flagged with national economic contraction in the 14th century.

Rising Tudor population prompted new efforts to control flooding, both locally and, sponsored by metropolitan investors responding to urban markets, at regional scale. The first major schemes, at the southern limits of the silt fens, were superseded by the Bedford project for draining the entire Great Level.

The latter underwent two phases: intended originally to secure pasture, by 1649 it was for the even more ambitious purpose of creating arable. Huge drains and fields were scored across the mire. Local resistance was quelled but dreams of vast model estates faded as national growth slackened again and even avid local farmers lost control of first their soil and then the rivers. Yet they managed to maintain agriculture and finally took up the call for 'improvement' during the inflations of 1794–1821. Regional development was resumed and the Victorians intensified and diversified production for their burgeoning cities.

By the 1900s, floods were increasing; but the second world war prompted fresh appreciation of the Fens' agricultural value. The regional system of flood defences, developed from 1937 to 1968, included diversion of water to Essex. Yet, as the millennium closed, with a market regulated for the European 'community' of suppliers, and worries about rising tides, fields were hollowed into gravel pits and covered by housing estates and industrial parks for new colonists. Catering for 'green' demand among the latter, there are even plans to restore wetlands.

Nicholas James
59 Mawson Road, Cambridge CB1 2DZ

Smallholdings for the unemployed in inter-war Cambridgeshire: the Land Settlement Association in Cambridgeshire 1935 to 1982

During the 1930s two estates of smallholdings were created in Cambridgeshire by the Land Settlement Association (LSA) for unemployed men, some of whom were coal miners from the North of England. These were at Fen Drayton where 54 holdings were created on 302 acres of land and at Great Abington where 62 holdings were created on 686 acres. Development started at Fen Drayton in December 1935 and at Great Abington in August 1936. In September 1939 the scheme for unemployed men was halted and, instead, men with agricultural experience were let holdings in order to maximise food production as part of the war effort. In 1948 the LSA became part of statutory smallholdings policy, with the same aim as the County Council statutory smallholding scheme, to provide the 'first rung on the farming ladder' for those with agricultural experience. After a turbulent post war history, including two Government Committees of Enquiry, the scheme was wound up in 1982.

The LSA's original plan was to settle a few hundred men on estates of agricultural smallholdings based on horticulture, pigs and chickens. In May 1935 the LSA became the main agent for rapidly extending the scheme as part of the Government's Special Areas policy. It was under this policy that the estates at Fen Drayton and Great Abington were established. By the outbreak of war 1100 small holdings created on 21 estates, in total covered 11,063 acres nationwide. 1728 men had been moved to the estates as trainees, together with perhaps 6500 others, including wives and children. For about half it was not a success, but at the outbreak of war 850 men remained (400 as tenants). Though only two estates were established in Cambridgeshire eight more were established in neighbouring counties.

The creation of these estates, this extraordinary transfer of men both geographically hundreds of miles and between industrial sectors, raises themes more familiar elsewhere in the world than in rural England: 'Back to the land', land reform and the creation of small farms. The LSA was not, however, a response to spontaneous demands for land. It was promoted by those who believe that post-industrial society in the UK meant a permanent surplus of men from heavy engineering occupations, coal miners, shipyard workers and engineers. The only alternative to permanent unemployment and perhaps social unrest was a return to the land.

The County Council statutory smallholdings scheme created isolated holdings, as demand arose. The LSA believed that smallholdings could succeed if they were established in estates (also referred to as colonies or groups) focused on a central farm, to which the settlers were linked by a system of compulsory cooperation.

The experience of the Land Settlement Association estates provides insights for those today that see the creation of smallholdings as a means of intensifying agriculture, re-populating the countryside or as the basis for a utopian ideal.

Peter Clarke
Department of Computing, City University, London

Chivers and Son: fruit farmers and manufacturers of preserves

Fen-edge Cambridgeshire survived the agricultural cereal depressions of the 19th century by falling back on its traditional fruit-growing and market gardening skills. The Chivers family exploited this niche.

By 1870 Stephen Chivers, dissatisfied with the vagaries of northern market prices, opened a wholesale depot in Bradford. This was run by his sons, William, 18 and John, 13, who were quick to realise their principal customers were jam-makers. A trial batch was made in a disused stable abutting an Impington barn in 1873. In 1875 this successful enterprise was transferred to a purpose built factory adjacent to Histon station. Except for stone jars, parchment and string they were self sufficient, Stephen's 700 acres (employing 45 men and boys) supplying the fruit.

In 1885 seasonal production was abandoned, when new products such as marmalade, jellies, lemon curd, custard powder and Christmas puddings were introduced. Additional soft fruit purchased locally and citrus from Spain enabled the company to employ 440 people by 1893. Industrial jam making was new. Back-up departments rapidly evolved. Under the chief en-

gineer Charles Lack many tasks were mechanised, and Chivers was probably the first firm in Britain to generate their own electricity. Their greatest technological leap came with the new field of canning. Reports from America had been impressive, so Charles Lack went there to investigate. He saw the potential, and encouraged Chivers to invest in the first large-scale bottling and canning facility in Europe. Bottling began in 1980, canning in 1983.

In the next forty years employment at Chivers increased tenfold, with product diversification and innovative advertising. By 1939 they farmed 8000 acres and employed 4000, with back-up departments employing engineers, builders, blacksmiths, coopers, electricians, mechanics, coach-builders, chemists, artists and salesmen.

Eleanor Whitehead
Histon and Impington Village Society
21 Cottenham Road, Histon

Index
Christopher Chaplin

Illustrations are indicated by numbers in *italics* or by *illus* where figures are scattered throughout the text.

Abbreviations

AFU	Archaeological Field Unit, Cambridgeshire County Council
Ant.	*Antiquity*
Antiq. J.	*Antiquarians Journal*
Arch. J.	*Archaeological Journal*
BAR	British Archaeological Reports
BUFAU	Birmingham University Archaeological Field Unit
CAU	Cambridge Archaeological Unit
CBA	Council for British Archaeology
CCC Rpt	Cambridgeshire County Council Report by the Archaeological Field Unit
CRO	County Record Office, Cambridge
CUCAP	Cambridge University Committee for Aerial Photography
CUL	Cambridge University Library
CUP	Cambridge University Press
EAA	East Anglian Archaeology
HMSO	Her Majesty's Stationery Office
HRO	County Record Office, Huntingdon
NMR	National Monuments Record, Swindon
OUP	Oxford University Press
PCAS	*Proceedings of the Cambridge Antiquarian Society*
PRO	Public Record Office
RCHME	Royal Commission on Historic Monuments (England)
SMR	Cambridgeshire Sites and Monuments Record
VCH	Victoria County History

The Conduit

Local History and Archaeology Organisations, Societies and Events

For many years, Conduit has been an indispensable part of the local archaeological and historical scene. Far more than a simple listing of events, it has acted as, effectively, the 'journal of record' of what is happening in Cambridgeshire and beyond, as well as being invaluable to secretaries of local societies looking for speakers for their next year's programme!

For most of this period, Conduit was published jointly by this Society and Cambridgeshire County Council. Regrettably, the Council are no longer able to continue their involvement, and thus the Society has taken over sole responsibility. Members owe a tremendous debt of gratitude to Vicky Faupel and Sue Oosthuizen for collecting and co-ordinating all the information it contains.

It is very pleasing to see that interest in all aspects and periods of our region's past flourishes today as never before. At a time when economic and social pressures are changing the landscape more rapidly and more dramatically than ever, the need to record even very recent events, buildings and controversies grows more urgent and it is good to know that so many local societies now recognise this as part of their role.

More traditional local historical and archaeological activities are equally flourishing and of course last year marked the completion of the *Victoria County History of Cambridgeshire*. To mark this, the Society is organising a Day Conference on 6 March 2004 on *Recording Cambridgeshire's Past*, which will look at the work of 'amateur' and 'professional' archaeologists and historians, as well as the work of artists, photographers and film-makers. It promises to be a fascinating day on 'the history of local history': put the date in your diary now!

Tony Kirby
President

The South West Cambridgeshire Project

The South West Cambridgeshire Project aims to reconstruct the medieval landscapes of Bassingbourn, Litlington, Abington Pigotts, the Mordens, Shingay and Wendy, and tries to work out how they originated and developed. The Project progresses in a number of ways. Some people undertake their own research, either individually or in a group (or both). Others contribute by coming to informal meetings (usually in the pub). There is an Open Day, usually at Bassingbourn Village College, often in the spring. Anyone who is interested is welcome to join the Project, whether they contribute to research or just wish to come for the informal meetings, as we have found that listening and talking informally have contributed as much as more formal work. More detail can be found on *http://www.cont-ed.cam.ac.uk/Subjects/landscape/swcambs.html*.

In 2003–2004 the Institute of Continuing Education will be running two courses relating to the Project:

- A Practical Course on Field Walking (Tutor: Paul Palmer on four Saturdays in the autumn: 4 Oct, 18 Oct, 1 Nov, and 15 Nov, listed under Therfield in the Institute's programme) on how to walk over fields in order to recognise archaeological evidence. The course will investigate sites in South West Cambridgeshire.
- A course on doing projects in landscape history both for beginners and more experienced students (Tutor: Sue Oosthuizen, at St Mark's Church Hall, Barton Road, Cambridge, 9.30am - 1.30pm on 4 Oct, 25 Oct, 29 Nov, 17 Jan, and 14 Feb for anyone who would like to get involved in a small project on any aspect of landscape history that interests them.

Further details of these and other courses in landscape and garden history can be found on the Institute's website *www.cont-ed.cam.ac.uk*, or in our printed programme which can be obtained from Madingley Hall, Madingley CB3 8AQ (01954 280399). If you would like to find out more about the Project or the courses, or if you would like to get in touch with the informal group, please contact: Sue Oosthuizen, Institute of Continuing Education, Cambridge University, Madingley Hall, Madingley CB3 8AQ *smo23@cam.ac.uk*. The most recent report of the South West Cambridgeshire Project, The Third Interim Report for 2000-2002, has just been published. It includes work on greens and commons in all these parishes, as well as a vividly described armchair guide of the Guilden Morden parish boundary and an account of the obstinate persistence of one of Guilden Morden's medieval priests. Copies are available at £4.50 each (incl postage and packing) from the same address, (please make cheques payable to 'University of Cambridge').

WEA Courses in Cambridgeshire 2003

The Workers' Educational Association for 100 years has organised courses for adults, young, old, in work, at home, unemployed or retired. Fees are kept as low as possible, and courses are free to students who receive an income-based benefit. Courses are also arranged for groups of people who have missed out on educational opportunities.

Course Organiser: Sue Young, 15 Causeway, Godmanchester, Huntingdon, Cambs PE19 2HA *syoung@wea.org.uk*

Bottisham Contact: Shirley Ellis 01223 811891
Fenland History Around Ely Tutor: Mike Petty
Thursday 10 weeks starting 25 September 2003, 10am – 11.30am, Youth Centre, High Street
Full Fee: £28 Concessionary Fee: £21

Burwell Contact: Irene Friend 01638 744022
History of Medicine Tutor: Sue Edgington
Tuesday 10 weeks starting 23 September 2003, 3.15pm - 4.45pm, Day Centre, Parsonage Close
Full Fee: £28 Concessionary Fee: £17

Cambridge Contact: WEA Cambridge 01223 361656
Elizabeth I – Her friends, her ministers and her enemies Tutor: Mary Dicken
Tuesday 10 weeks starting 16 September 2003, 2pm – 3.30pm, WI Hall, High Street, Girton
Full Fee: £30 Concessionary Fee: £20
1066 And All That Tutor: Honor Ridout
Wednesday 10 weeks starting 24 September 2003, 7.30pm – 9.00pm, Parkside Community College, Parkers Piece. Full Fee: £30 Concessionary Fee: £20

Cheveley Contact: Scilla Harvey 01638 731154
Fenland History Around Ely Tutor: Michael Petty
Friday 10 weeks starting 26 September 2003, 10.15am – 11.45am, Community Centre, Cheveley Primary School, Park Road. Full Fee: £28 Concessionary Fee: £17

Cottenham Contact: Liz Milway 01954 250039
Elizabeth I – Her friends, her ministers and her enemies Tutor: Mary Dicken
Tuesday 10 weeks starting 16 September 2003, 9.30am – 11.00am, The Lecture Room, Cottenham Village College, High Street. Full Fee: £28

Ely Contact: John Hobson 01353 860007
Fenland History Around Ely Tutor: Michael Petty
Wednesday 10 weeks starting 8 October 2003, 10.30am – 12.00pm, The Meeting Room, Ely Library, 6 The Cloisters. Full Fee: £28 Concessionary Fee: £18

Great Gransden Contact: Barbara Lovejoy 01767 650160
Investigating brick – through history and architecture Tutor: Mary Lockwood
Thursday 10 weeks starting 25 September 2003, 10.00am – 11.30am, Reading Room, Fox Street
Full Fee: £28

Haddenham Contact: Derek Genders 01353 741100
Changing Map of Europe Tutor: Peter Hewitt
Monday 10 weeks starting 22 September 2003, 10.00am – 11.30am, Arkenstall Village Centre, Station Road. Full Fee: £28 Concessionary Fee: £19

Hemingfords Contact: Mrs Ursula Smith 01480 461405
Changing Map of Europe Tutor: Peter Hewitt
Monday 10 weeks starting 22 September 2003, 7.45pm – 9.15pm, The Reading Room, High Street, Hemingford Grey. Full Fee: £28

Huntingdon Contact: Vera Williams 01480 810353
Cambridgeshire During the English Civil War Tutor: Sue Sadler
Tuesday 10 weeks starting 23 September 2003, 7.30pm – 9.00pm, The Staff Room, Godmanchester Primary School. Full Fee: £28

Ickleton/Chesterfords Contact: Janice Stanley Tel: 01799 531402
The Challenge of the Fens Tutor: Nicholas James
Thursday 10 weeks starting 25 September 2003, 7.45pm – 9.15pm, Great Chesterford Congregational Chapel, Carmel Street. Full Fee: £28 Concessionary Fee: £26

March Contact: Celia Taylor 01354 657410
19th Century European Statesmen Tutor: Peter Hewitt
Thursday 10 weeks starting 18 September 2003, 10.15am – 11.45am, The Conservative & Unionist Club, 14 Creek Road. Full Fee: £29 Concessionary Fee: £26

St Ives Contact: Mrs B Horner 01487 822715
History of Clothes Tutor: Honor Ridout
Thursday 10 weeks starting 2 October 2003, 10.00am – 11.30am, The Community Lounge, St Ivo School, High Leys. Full Fee: £28 Concessionary Fee: £19.50

Upton Contact: Nora Wood 01480 890646
Huntingdonshire in the 17th Century Tutor: Ken Sneath
Wednesday 10 weeks starting 17 September 2003, 10.00am – 11.30am, Upton Village Hall, Green Lane
Full Fee: £28

Wisbech Contact: Ivan Esgate 01945 583326
Ancient Egypt Tutor: Angela Rhys-Williams
Wednesday 10 weeks starting 17 September 2003, 10.30am – 12.00pm, Upper Room, St Peter's Church Hall. Full Fee: £28 Concessionary Fee: £25

Yaxley Contact: R A Dudley 01733 269341
The Victorian Household Tutor: Liz Carter
Tuesday 10 weeks starting 16 September 2003, 7.30pm – 9.00pm, The Clubroom, Royal British Legion Club, 210 Broadway. Full Fee: £28 Concessionary Fee: £17

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CAMBRIDGE ANTIQUARIAN SOCIETY

21, High Street, West Wickham, Cambridge CB1 6RY
info@cambridge-antiquarian-society.org.uk • *www.cambridge-antiquarian-society.org.uk*

President Tony Kirby
Secretary Janet Morris
Registrar (Membership) Don Fage, 178 Fishpool Street, St Albans AL3 4SB; 01727 847562

The Society was founded in 1840 to promote both the study of history, architectural history and archaeology, and the conservation of relevant features/objects, within the County of Cambridge particularly. Members are entitled to free access to our lectures (to which university undergraduates and members' guests are welcome); reduced fees for our conferences; a free copy of *Proceedings of the Cambridge Antiquarian Society*; and access to a specialist archaeological library. Excursions arranged.

PROGRAMME FOR 2003/4

Our programme of monthly lectures is held in the friendly atmosphere of the Runcie Lecture Theatre in the Divinity Faculty building, Sidgwick site (near Lady Mitchell Hall), except for the conferences and joint meeting with the Cambridge Local History Society. There is plentiful free car parking. Lectures begin at 6.00 pm and last for about an hour, with the opportunity for questions and discussion afterwards.

6 Oct	David Matless *Debating the origin of the Norfolk Broads: popular science and local tradition in the 1950s and 1960s*
3 Nov	David Marcombe *From Prehistory to the Present: 2000 years of continuity and change in a Lincolnshire sacred site*
22 Nov	CONFERENCE *Recent archaeological work in Cambridgeshire*
1 Dec	Tim Hitchcock *Tricksters, Lords and Pious Chanters: Masculinity and begging in the long 18th century* (with Cambridgeshire Local History Society)
12 Jan	Mark Hinman *West of Wandlebury: pits and pots in their landscape setting*
2 Feb	Tim Strickland *Armenia: its history and significance to the Roman world*
8 Mar	AGM (5.35pm) followed by David Roffe *Domesday boroughs: a red herring?*
13 Mar	DAY CONFERENCE *Recovering Cambridgeshire's past*
3 Apr	John Sutton *Royal Newmarket, 1606–1714* (Joint meeting with Cambridgeshire Local History Society, 2.15pm St John's Church Hall, Blinco Grove, Cambridge)
19 Apr	Evelyn Lord *The Knights Templar in Britain*
10 May	Sue Oosthuizen *Recent work in the Bourn Valley*
7 Jun	Leigh Alston *Medieval shops and workshops in East Anglia*

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BUCKDEN LOCAL HISTORY SOCIETY

Chairman Robin Gibson 01480 811558
Secretary Les Button 13 Vineyard Way, Buckden, Huntingdon, Cambs PE19 5SR 01480 811323

The Society aims to promote the study and knowledge of local history in the very widest sense, primarily by means of talks on all manner of topics in any way connected with the subject, and will be pleased to promote individual or group research into local history projects. Meetings are usually on the first Wednesday of each month (no meeting in August) in the Conference Room at Buckden Towers. Annual subscription: £10

3 Sep Alec Foster *Musical Boxes*
1 Oct David Thomas *What's in a Name?*
5 Nov Geoff Hales *Samuel Pepys Diaries*
3 Dec Peter Ibbett CHRISTMAS LOCAL HISTORY QUIZ
7 Jan Sarah Poppy *Archaeological Update*
4 Feb Bernard O'Connor *East Anglian Dinosaurs and the Fossil Diggings*
3 Mar TBA
7 Apr Michael Gates *Vintage Transport*
5 May Bill Wittering *Bottles*
2 Jun AGM, followed by David Thomas *Any Old Iron?*
July Visit to be arranged

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BURWELL HISTORY SOCIETY

Chairman Pauline Rogers, 37 Toyse Lane, Burwell, Cambs 01638 742953
Secretary Carolyn Marshall, 8 Buntings Crescent, Burwell, Cambridge CB5 0EU 01638 741654

The Society hosts talks on aspects of local and occasionally wider history. It undertakes some research into village history, has recently been involved in the publication of Village Walks Book, and is looking to publish Burwell Chronicles: extracts from the Cambridge Chronicles relating to Burwell.

Meetings are held monthly at the Small Hall, Burwell Village College at 7.30pm, on usually the third Wednesday in the month. Annual membership is £12, visitors £2.

17 Sep Stuart Bowell *East Anglian Dialects*
15 Oct David Skeates *Life of an Undertaker*
19 Nov Alan Brigham *20 Years on the Streets of Cambridge*
17 Dec Society's 10th Anniversary: Christmas Entertainment/Memories of Burwell
21 Jan Joan Shaw *Burwell Connections*
25 Feb Rodney Tibbs *A Fresh Look at the Fens*
17 Mar Peter Ibbett *Mr Punch goes to the Great Exhibition*
21 Apr AGM and local speaker
19 May Rosemary Wheeler *Lavenham*
6 Sep 2003 Guided Tour of Burwell Church
Oct 2003 Visit to the 'Abbotts' House – to be arranged
2004 Visit to a Cambridge College

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CAMBRIDGE INDUSTRIAL ARCHAEOLOGY SOCIETY

Chairman Don Fage 01727 847562
Secretary Jeanette Fage, 178 Fishpool St, St Albans, Herts AL3 4SB
Treasurer Nigel Balchin 01223 832439

The Society's aim is to study and record the industrial history and artefacts of Cambridgeshire. It is affiliated to the Association of Industrial Archaeology (AIA) and is one of the founder members of the East of England Industrial Archaeology Conference (EERIAC). The Society also commissions

and publishes occasional monographs on Cambridge industrial subjects, written by its members. Meetings, visits and conferences are open to everyone with an interest in industrial history.

Meetings are held on the second Monday of the winter months at the Friends Meeting House, Jesus Lane, Cambridge at 7.45pm. Subscriptions: £4 per year, or visitors £1 per meeting.

13 Oct John Baker *The Growth of Road Travel: Wagons, Chaises & Coaches; Milestones Turnpikes & Tarmac*

10 Nov HJK Jenkins (Chairman of the Fenland Lighter Project) *Barges and Cathedrals: Freighting Stone in the Mediaeval Fenlands*

8 Dec Robert Woodward (Of 'Painters & Stainers' Livery Company) *Work at the Palace of Westminster*

12 Jan AGM and Members Evening • Slide & Print Competitions • Short talks by members

9 Feb Glen McBirnie, author of the recent long-awaited publication *Rugby Portland Cement Transport Systems*

8 Mar Alan Denney (for the 150th anniversary of the water company) *The New Cambridge Water & Sewage Works*

5 Apr Brian Carter *Small Boats on the River Ouse – past, present and future*

Cambridgeshire Local History Society

President Mike Petty
Chairman Michael Farrar
Secretary Gillian Rushworth, 1a Archers Close, Swaffham Bulbeck, Cambridge CB5 ONG
01223 811703

The Society was founded in 1951 as the Cambridgeshire Local History Council to encourage and support the study of local history within the old counties of Cambridgeshire and the Isle of Ely. Monthly meetings are held from October to May, with visits to places of interest during the summer months. Meetings are held at St John's Hall, Blinco Grove, off Hills Road, Cambridge, at 2.15pm on Saturdays. An annual Review and a bi-annual Newsletter are issued to members. The annual subscription is £8 or £10 for joint members.

4 Oct Susan Oosthuizen *Hidden History of Women in Cambridge*

1 Nov Peter Filby *Cambridgeshire Trades & Industry, 1750-1950*

1 Dec Tim Hitchcock *Tricksters, Lords and Pious Chanters: masculinity and begging in the long 18th century* (Cambridge Antiquarian Society invitation lecture at Lecture Theatre 8, Lecture Theatre block, Sidgwick Site, 5.50pm)

6 Dec Bill Wittering *King's Cross to Cambridge: Things not noticed or now vanished*

3 Jan Anthony Cooper *Cambridge Preservation Society*

7 Feb Eileen Gander *Collecting tea spoons*

6 Mar Alan Eade *History of timber-framed buildings*

3 Apr John Sutton *Royal Newmarket, 1606-1714* (A joint meeting with the Cambridge Antiquarian Society)

8 May AGM TBA

Cambridge Industrial Archaeology Society

Chairman Don Fage 01727 847 562
Secretary Mrs Joyce Birkby, 149 Hereward Close, Impington CB4 9YF; 01223 233935
Treasurer Nigel Balchin 01223 832439

The Society's aim is to study and record the industrial history and artefacts of Cambridgeshire. It is affiliated to the Association of Industrial Archaeology (AIA) and is one of the founder members of the East of England Industrial Archaeology Conference (EERIAC). The Society will host the 13th conference on 7th June 2003, the venue and programme to be notified later. Meetings, visits and conferences are open to everyone with an interest in industrial history

Meetings are held on the second Monday of the winter months at the Friends' Meeting House, Jesus Lane, Cambridge at 7.45 p.m. Subscriptions £4 per year or visitors £1 per meeting.

14 Oct	John Parsons and Ron Hartley *Restoration of a vintage car*
11 Nov	Lorna Delanoy *Denny Abbey Farmland Museum: from shoebox to County collection*
9 Dec	Michael Bowyer *Cambridgeshire under attack 1940–1945*
13 Jan	Members' Evening Slide and Print competitions, and short talks including Nick Smith on printing
10 Feb	Don Unwin *Canals: from the viewpoint of a 'Gongoozler'!*
10 Mar	to be arranged
14 April	Peter Filby *Wind and water mills in Cambridgeshire*

Cottenham Village Society

www.cottenhamvillagesociety.ukfamily.com

President Mac Dowdy
Chairman Margaret Brierley
Secretary Maire Collins, 52 Lambs Lane, Cottenham, Cambs CB4 8TA 01954 200873
mmc24@cam.ac.uk
Treasurer Anne Wright

The objects of the Society:

- To stimulate: public interest in and care for the beauty, history and character of the village and surroundings.
- To encourage: the preservation, development and improvement of features of general public amenity or historic interest
- To encourage high standards of architecture and village planning in the Parish of Cottenham and also by supporting other village groups.
- To pursue those ends by means of meetings, exhibitions, lectures, and promotion of schemes of a charitable nature.

Meetings take place at Cottenham Primary School, Lambs Lane, Cottenham, at 7.45 pm. Annual subscription: £3

12 Sep	AGM, followed by Pete Meadows speaking about his work as First Responder for Magpas
10 Oct	Mac Dowdy *Coaching Days and Motor Ways*
14 Nov	Francis Garrett & Mervyn Haird *Slides of Cottenham*
Dec	Christmas Party (date TBA)
9 Jan	Olwyn Peacock *The Cottenham Charities*

13 Feb	Philip Saunders *Robert Fox – A Huntingdon Scientist*
12 Mar	Tom Doig *The Domesday Survey of Cottenham*
2 Apr	Sue Oosthuizen *Living in a late 14th century Manor House*
May	Village walk (date TBA)
June	Summer outing (date TBA)
July	Barbecue (date TBA)

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Eltisley History Society

Chairman Michael Sawyer, 19 The Green, Eltisley PE19 6TG; 01480 880019
Secretary Mary Flinders, Heylock, Caxton End, Eltisley PE19 6TJ; 01480 880268
maryflinders@waitrose.com

Meetings take place at Cade Memorial Hall, The Green, Eltisley on the fourth Wednesday of the month, 7.45pm for 8.00pm. Cost of annual subscription/membership: £10 per year for individuals, £15 for joint or family, concessionary rates available, visitors welcome at £1 per meeting.

Eltisley History Society aims to research and record family and local history. Monthly meetings are held with a variety of speakers. Current research is ongoing into Eltisley's first world war soldiers, and the Society has a project to sound-record and film elderly residents and children about their memories and hopes.

25 Jun	Bernard O'Connor *Tempsford Airfield*
23 Jul	Paul Spoerry *Mediaeval Towns*
27 Aug	Twigs Way *Wimpole Hall Gardens*
24 Sep	Tim Reynolds *Archaeology in Cambridgeshire*
22 Oct	Mark Hinman *Prehistory of South Cambridgeshire*
26 Nov	Nick Bruce *History of Gamlingay*
28 Jan	David Rudd *Local Saxons*
25 Feb	Rosemary Horrox *The Black Death*
24 Mar	Maureen James *The History of Witchcraft*

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Ely and District Archaeological Society

Chairman/Secretary Steven Cole, 2a Church Lane, Ely CB7 4JG; 01353 669326
Treasurer Clive Hughes, Berrycroft, 65 The Row, Sutton CB6 2PB; 01353 778388

The object of the Society is 'To advance the education of the public in their study of archaeology, history and kindred subjects'. EDAS promotes this via:

- A programme of lectures between October and May
- Visits to sites of archaeological or historical interest
- Collecting and disseminating information about archaeology and history of the local area.

Meetings are held at New Room Ely Methodist Church, Chapel Street, Ely on the third Monday in the month at 8pm. Cost of membership: single £6, double at same address £10, visitor £1.50, student: £1.00

20 Oct Melvyn Jefferson *Conservation of Manuscripts in Cambridge College Libraries*

17 Nov Sue Oosthuizen *The making of an Anglo-Saxon rural landscape: the Bourn Valley, Cambs*

19 Jan TBA

16 Feb TBA

15 Mar TBA

17 May Honor Ridout *Medieval Fairs*

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Essex Historic Buildings Group

President DF Stenning
Secretary Alan Bayford, 12 Westfield Avenue, Chelmsford CB1 1SF; 01245 256102

The Group was formed in 1983 and has about 110 members. Its aims are to encourage the study of the historic buildings of Essex, to discuss and exchange information on these and other relevant buildings, both within and outside the Group, and, whenever possible, to produce its own publications.

Meetings are held at Moulsham Mill, Parkway, Chelmsford (except when stated otherwise) on Fridays, 7.30pm for 8.00pm. Cost of annual membership: £10 single, £15 joint.

11 Jul *Comparison of Essex and Norfolk house types* (jointly with Norfolk Historic Buildings Group, to be held 7.00pm at Cressing Temple)

29 Aug David Martin *The VAG Spring Conference in Essex: a visitor's viewpoint*

20 Sep Day School *From Jacobean to Georgian: the Evolution of the Georgian House* (to be held 9.00am at Cressing Temple, tel 01376 321435 for details)

17 Oct David Clark *Medieval Shops*

28 Nov Dave Stenning *Recent Studies in Maldon*

16 Jan TBA

20 Feb TBA

26 Mar TBA

30 Apr TBA

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Friends of the Cambridge & County Folk Museum

The Cambridge & County Folk Museum, 2/3 Castle Street, Cambridge CB3 0AQ 01223 355159

Chairman Allan Brigham
Secretary Pamela Fry

The Friends aim to support the Museum with their time, talents and money, by fund-raising and by practical help in the Museum. Various activities take place during the year, some at the Museum, others at larger venues (details from the Museum, 01223 355159).

Cost of subscription/membership: Adults £10, Family £12.50, Seniors £7, two Senior at the same address £10.

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Fulbourn Village History Society

Chairman Peter Halton, 6 Cambridge Road, Fulbourn CB1 5HQ t 01223 880465
Secretary Glynis Arber, 28 The Haven, Fulbourn, Cambridge CB1 5BG 01223 570887
g.arber@ntlworld.com

Fulbourn Village History Society held their second public Exhibition over the four afternoons of the Jubilee weekend, which won the gold medal from South Cambridgshire District Council for the most innovative Jubilee exhibition. On May 8 2002, the society was awarded £25,000 by the Local Heritage Initiative and also received £2031 from a Nationwide Building Society award. The LHI is a partnership between the Heritage Lottery Fund, Nationwide Building Society and the Countryside Agency. Volunteers are currently undertaking ongoing projects within Fulbourn, such as surveying earthworks, historic buildings and field walking. It is intended that the research will help determine the medieval origins and settlement patterns of medieval Fulbourn.

Fulbourn Village History Society meet at the Six Bells Public House, 7.45 – 8.00pm the third Thursday monthly, October through to May annually. The Society has an attendance of between 50 to 60 and visitors to the forthcoming programme will be given a warm welcome (£2 entry for non-members, members free). Individual Membership £6, Joint Membership £10, Junior Membership (under 16 years) £3.

16 Oct John Gibbs *History of Wandlebury*
20 Nov Becky Proctor *Toys and Games from Cambridge Folk Museum Collection*
18 Dec Geoff Hales *'Victorian' Christmas Readings* (held at Townley Hall, Fulbourn)
15 Jan Alan Brigham *Thomas Hobson – The local connection*
19 Feb Peter Filby *Watermills and Windmills of South Cambridgeshire*
18 Mar Mike Petty *Fens in the 40s*
15 Apr Bill Wittering *History of Postcards*

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Haverhill and District Archaeological Group

President Dr SE West
Hon Secretary Dot Challis, 18 Broad Street , Haverhill , Suffolk CB9 9HD 01440 761092

The group was formed in 1975 to investigate the archaeology of an area within a 10km radius of Haverhill, including parts of Cambs, Essex and Suffolk. Our fieldwork research area in South East Cambridgeshire covers the parishes of Bartlow, Castle Camps, Horseheath, Shudy Camps and West Wickham. West Wratting is currently being investigated and will be added to our parishes list. Fieldwork is undertaken on Sunday mornings, crops and weather permitting, and is directed primarily to the non-destructive detection, identification and investigation of archaeological sites using various methods of field surveying and full liaison with the relevant County Council Archaeological services. Anyone interested in committing their Sunday mornings on a regular basis to assist/learn 'in the field' would be very welcome.

In addition to fieldwork, monthly lectures are held from September to April. These informal meetings are held in Haverhill Town Hall Arts Centre, usually on the third Tuesday of each month except January when the AGM is held. Non-members may be asked for £1 donation.

Annual Subscriptions: Single £9, Couple £13, Concessionary £6, Joint concessionary £11. New members are always very welcome, both active & armchair-interested alike!

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Huntingdonshire Local History Society

3 The Lanes, Houghton, Huntingdon PE28 2BW *www.huntslocalhistory.org.uk*

President Simon Thurley
Chairman David Cozens
Secretary Mary Hopper

The Society aims to encourage research into Huntingdonshire history. During the summer coach excursions to places of interest in the County and further afield are arranged. The Society's Goodliff Awards Scheme was launched in 1996. Since then 70 awards have been made supporting history projects in 30 towns and villages in Huntingdonshire. Details on how to apply for grants can be obtained from Ken Sneath (01480 450686) or from our website. Annual subscription: Single £7, Double £12 (includes a copy of The Records of Huntingdon and two Newsletters).

Meetings are held monthly October to April at 7.30pm in Pathfinder House, St Mary's Street, Huntingdon. The AGM is in May.

10 Oct	Simon Thurley *President's Lecture*
13 Nov	Peter Clarke *The Land Settlement Scheme*
5 Dec	Christmas Social Evening – The Bridge Singers
Jan	John Drake *Wood & Ingram, Huntingdon Nurserymen to Royal Gardens* (Date TBA)
Feb	Mark Hinman *Hinchingbrooke Archaeology* (Date TBA)
18 Mar	David Cozens *Isabella Bird: Huntingdonshire's intrepid Victorian traveller and writer*
22 Apr	Eleanor Whitehead *The History of the Local Firm, Chivers*

Details of all excursions from Mary Hopper 01480 463007

Thurs 19 Jun	Pastoral Huntingdon: an evening walk round Huntingdon Commons
Weds 9 Jul	Whole day visit to Waltham Gunpowder Mills and the Abbey
Sat 23 Aug	Whole day visit to Calke Abbey and Ashby de la Zouche
Thur 11 Sept	Evening visit to Whittlesey Church, Museum and Town

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The Isleham Society

Chairman Roynon Howes, 51 Waterside, Isleham CB7 5SS 01638 780530 *roynonhowes@tesco.net*
Secretary Beryl Powys, 5 Church Lane, Isleham CB7 5SQ 01638 780519 *powys169@enterprise.net*
Treasurer Janice Pope, 32 Kennedy Road, Isleham CB7 5SU 01638 780380

The Society is interested in the history and traditions of the village, in its preservation and development. It arranges lectures each year on a wide range of subjects but all with special emphasis on local and East Anglian interest. There are three or four outings each year, as well as organised rambles around the village pathways in the summer. A Nature Reserve is maintained, and members assist in planting trees in the village.

Meetings are held in the Village Hall at 8 pm on Thursday evenings and subscription is £10 per year (visitors £2 per meeting).

17 Jul	Outing to Gifford's Hall Vineyard & Sweet Pea Centre, Hartest, Suffolk. Coach leaves Village Hall at 5pm. Cost: £3.50 plus coach fare
21 Aug	Outing to Stretham Beam Engine , a perfectly preserved single cylinder steam engine built in 1831. Own transport. Tour starts 6pm, led by E Langford. Cost £2, Senior Citizens £1.50
18 Sep	Honor Ridout *Tudor Times at Kentwell Hall*
16 Oct	Mike Nicholas *Duxford Museum: its history and evolvement to the present day*

20 Nov Mrs Lawrie *Enigma at Bletchley Park*
Dec No meeting
15 Jan Vernon Place *More of 'Arthur Houghton's Collection'*
19 Feb Richard Rigby Magic Lantern Show: Victorian and Edwardian Pictures
18 Mar Roy Tricker *In Praise of Old Churches*
29 Apr AGM
Rambles Meet at the Priory Green on Saturdays at 10am in June, August and September by arrangement with Alwyn Clements 01638 780252 *Aclem64849@aol.com*

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KIMBOLTON LOCAL HISTORY SOCIETY

Chairman Nora Butler
Secretary V Shorer-Nixon, 3 The Lane, Stow Longa, Huntingdon PE28 0TP 01480 860325

The aim of the Society is to promote and sustain interest in local history and to undertake limited research when possible. Meetings are held monthly on a Wednesday at 8pm in Kimbolton Castle. Annual subscription: £10 double, £6 single.

10 Sep Michael Knight *Local Milestones and Turnpikes*
15 Oct Beth Davis *Photographic Records of Francis Frith*
12 Nov Philip Burkett *Catherine of Aragon*
10 Dec Geoff Hales *Travelling Theatre: Plague, Fire and Mrs Willett*

Programme for 2004 not yet available.

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MARCH AND DISTRICT MUSEUM SOCIETY

High Street, March

Chairman Peter Hewitt
Vice-Chairman Richard Munns, 101 Elwyn Road, March, Cambs PE15 9DB
richard-joan@munns22.fsnet.co.uk

The Society exists to run the March Museum, housed in a former Victorian school in the centre of March, and its associated historical society. The Museum has extensive social history collections and archives of March. Regular opening times are Wednesdays and Saturdays from 10.30am – 3.30pm, and for parties at other times by appointment. Admission is free.

The Society meets at St Peter's Church Hall (opposite the Museum), High Street, March on the second Friday of each month at 7.30pm. Membership is £3 annually to the Society, with entry to meetings £1.50, non-members £2.50.

21 Sep Christina Swain *The Peckover Family of Wisbech*
10 Oct An evening of films from the East Anglian Film Archive
14 Nov AGM, followed by Neil Faulkner *The Decline of Roman Britain*
12 Dec Members only – punch and pies in the Museum

Friday evening meetings continue in 2004, but the programme is still to be finalised.

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Orwell Local History Society

Secretary Sue Miller, 55 High St, Orwell, Royston, Herts SG8 5QN 01223 207328
sue.miller@talk21.com

Meetings are held at 8pm on the last Tuesday of each month in the Schoolroom of the Methodist Church, Town Green Road, Orwell. Annual subscription, payable in November, is £6. Non-members are welcome at meetings on payment of £1. June and July meetings are outings to places of historic interest and there is no meeting in August.

29 Jul Visit to the walled garden, Wimpole Hall, with talk by Philip Whaites. Meet at 6.45pm at Wimpole Hall car park

30 Sep TBA

28 Oct Margaret Shepherd *Counting the People – the use of the census of population*

25 Nov Charlie Marr *Local Changes in Farming over the past 40 years*

Meetings continue in 2004, but the programme is still to be finalised.

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Peterborough Museum Society

Chairman D A Sharp, 30 Apsley Way, Longthorpe, Peterborough
Secretary R Rodwell, 9 Royston Avenue, Orton Longueville, Peterborough PE2 7AA 01733 231434

The Society meets on alternate Tuesday evenings at 7.30pm in the Museum Lecture Hall, Peterborough Museum & Art Gallery, Priestgate, Peterborough. The main aims of the Society are to promote the study of local and natural history, archaeology, art, science and kindred subjects, and to promote the interests of the Peterborough Museum & Art Gallery.

Subscriptions for 2003/2004 (due 1 October 2003) are Members £12.50, Senior Citizens £10, Juniors & Students £10, Visitors £2.50.

7 Oct Stuart Orme *The Peterborough Ghost Walk*

21 Oct Robert Bracegirdle *Bells in the New Millennium*

4 Nov Peter Clayton *Thomas Clarkson of Wisbech*

18 Nov Ben Robinson *Archaeology*

2 Dec Michael Honeybone *'Improvement in Friendship & Knowledge', Gentlemen's Society 1710-1760*

16 Dec President's Evening: An Evening of Musical Entertainment at All Saint's Church, Park Road

6 Jan Mike Sockett *Disraeli: His Life and Achievements*

20 Jan Neil Mitchell *World War II and the Build-Up to it*

3 Feb David Bond *England's Historic Coast*

17 Feb Chairman's Evening: David Sharp

2 Mar Norman Allen *Work of the Woodland Trust* (local to area)

16 Mar Sheila Berrill *Life in the Norman Cross Prisoner of War Camp*

30 Mar HJK Jenkins *'Special Duties': A Small Warship at Peterborough 1946-1951*

Summer Outings programme available from the Secretary in Feb 2004

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STAINE HUNDRED LOCAL HISTORY SOCIETY

95 High Street, Bottisham CB5 9BA. Tel: 01223 812 146

Chairman Robert Hill
Secretary Maureen Rogers
Programme Secretary Gillian Rushworth

Visitors are welcome (£2 per lecture). Members from the six villages in the 'Hundred' meet to promote interest in local history, particularly in East Anglia. Social events and outings are an important part of the programme.

Meets at Bottisham Village College at 7.30 p.m. on the second Wednesday of each month. Annual subscription 8. Visitors pay 2 per lecture.

10 Sep	Honor Ridout *Stourbridge Fair*
8 Oct	Steve Cassidy (Rattee & Kett) *Stone and Restoration*
12 Nov	Chloe Cockerill *1000 Years of English Churches*
10 Dec	Local Talent: Quiz, Readings, Displays
4 Jan	John Durrant *Cambridge Part II*
11 Feb	John Sutton *Charles II in Newmarket*
10 Mar	Twigs Way *John Loudon and the Histon Road Cemetery*
21 Apr	Donna Martin *Soham and its Abbey*
May	Local outing (date TBA)
June	Day outing (date TBA)

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ST NEOTS LOCAL HISTORY SOCIETY

Chairman Rosemary Pullinger, 40 Drake Rd, Eaton Socon, St Neots PE19 8HS 01480 217933
Meetings Secretary Nell Marshall, 3 Berkeley St, St Neots PE19 2NB 01480 472495
Programme Secretary Eileen Meeks, 26 High St, Wilden, Beds MK44 2PB 01234 771792

The aim of the Society is to stimulate and foster an interest in local history through monthly meetings and the opportunity for research and outings. Historical information is collected, and a magazine published three/four times a year.

Meetings are usually held on the first Friday of each month at 7.30pm (except where notified) in the hall of Eynesbury C of E Junior School, Montagu Street, Eynesbury, St. Neots. Annual subscriptions are £7 per individual, £12 a couple. Visitors are always welcome at all events at a charge of £1.50 per session.

5 Sep	John Shaw *The History of St Neots Golf Club*
3 Oc	John Goldsmith *Life and Times of Oliver Cromwell*
7 Nov	Bob Burn-Murdoch *Fen Skating*
5 Dec	Member's Meeting
9 Jan	John Gibbs *Charles Wells: A family brewery*
6 Feb	Linda Reed *George Bower: Gas Manufacturer 1850–1910*
5 Mar	Michael Knight Milestones & Turnpike Ways
2 Apr	John Walker *Hinchingbrooke Football Cup Competition*
7 May	Nita Luxford *Gettin' a Livin' on the Great Ouse*
4 Jun	TBC

The Thorney Society

Thorney Heritage Museum, The Tankyard, Station Road, Thorney PE6 0SE
dot.thorney@tesco.net • *www.thorney-museum.org.uk*

Chairman John Wilson
Secretary Dorothy Halfhide

The Thorney Society is dedicated to the heritage and environment of the village of Thorney and its parish. It runs a Museum and holds events (details will be placed on the website). The Society holds family trees for Thorney families put together by a previous Curator, and can organise guided tours of the village. Occasional meetings are held at Bedford Hall. Cost of membership: £5, or £2.50 concession.

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Whittlesea Society

Chairman Ken Mayor, 19 Bowker Way, Whittlesey PE7 1PY 01733 204944
Secretary David Hancock, 3 Vintners Close, West Parade, Peterborough PE3 6BT 01733 753894

Meetings are held on the second Monday of each month (except August) at 7.30pm in the Town Hall, Market Street, Whittlesey. Annual subscriptions are £5 (individual) and £7.50 (family).

8 Sep	Maureen James *Thomas Clarkson*
13 Oct	Charles Kitchen *The Nene Washes*
10 Nov	Tony King *Just Popping Out for a Stroll*
8 Dec	Mike Osborne *Wartime Peterborough*
12 Jan	Nita Luxford *Life on the River Ouse*
9 Feb	Stuart Orme *Ghosts in and around Peterborough*
8 Mar	Gerry Burrows *Open All Hours*
12 Apr	John Wilson *Airfield Memorials*
11 Oct	David Cozens *The Cromwell Family*
8 Nov	John Drake *Historic Gardens of Cambridgeshire*

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WISBECH & FENLAND MUSEUM FRIENDS

Wisbech & Fenland Museum, Museum Square, Wisbech
wisbechmuseum@beeb.net • *http://wisbechmuseum.members.beeb.net*

Chairman Richard Barnwell
Secretary WR Knowles

The aims of the Wisbech & Fenland Museum Friends are to improve the display of exhibits in the Museum; to arrange special exhibitions, lectures and concerts; and generally to further the charitable purposes of the Museum and to encourage the development of facilities afforded by it. Meetings are held on the first Wednesday of each month in the Museum. Cost of annual membership: £6 individual, £8 couple.

1 Oct	AGM, followed by Bill Knowles *The Hunt for King John's Treasure*
5 Nov	TBA
3 Dec	Ruth Banger & Friends A Musical Entertainment
7 Jan	Know Your Own Museum
4 Feb	Brian Payne *The History of the Welle Stream and Wisbech Canal*
3 Mar	DJ Piggott *Antarctic Exploration*

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Cambridge and County Folk Museum

2–3 Castle Street, Cambridge CB3 0AQ; 01223 355159
info@folkmuseum.org.uk

Curator Cameron Hawke-Smith

The museum has received the promise of a grant of £786,000 for HLF for the complete redevelopment of the site. At the time of writing the last elements of the partnership funding are still to find, but the auguries are favourable for a start in October 2003 and closure for around eight months. During this period an extension will be constructed on the triangle of land to the rear of the museum, to contain an education room, new stores and workspace. The historic listed building will be put into good shape, a lift inserted and the displays rearranged. The museum service over this period will be much reduced, but it is intended to continue with the loans service to schools and other bodies, talks to local organisations and some mobile displays. The curator, who has spent the greater part of his life as a disturber of museums, promises to let the dust settle once again when this episode is finished.

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Cambridge Museum of Technology

The Old Pumping Station, Cheddars Lane, Cambridge CB5 8LD
www.museumoftechnology.com

Victorian steam and gas engines and sewage pumps, printing machines, radios, etc, etc. Further information about the Museum can be found on the website or by phoning 01223 368650.

The next Steaming event is during the Summer Holiday, Sun/Mon 24-25 August, 11am – 5pm. Also in steam: October half-term, Sat/Sun 1-2 Nov; New Year, Sat/Sun 3-4 Jan 2004. As well as the Steaming Days, the Museum is open from 2pm to 5pm every Sunday in the summer and the first Sunday in the month from November to Easter. The Museum also hosts other events. Always a great draw, the Model Railway's Day this year is Sun 5 October, 12 – 5pm.

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The Farmland Museum and Denny Abbey

Denny Abbey, Ely Road, Waterbeach, Cambridge CB5 9PQ
tel/fax 01223 860988 (Office) 01223 863036 (Education)
f.m.denny@tesco.net • *www.dennyfarmlandmuseum.org.uk*

Curator Kate Brown

The Farmland Museum and Denny Abbey is a Museum of Cambridgeshire farming and village life and an English Heritage Grade 1 Abbey in a beautiful rural setting. On site there are various craft workshop displays including a blacksmiths, basket makers and wheelwright. There is a 1940's farmworkers cottage and village shop. We are open 1 April – 31 October daily from 12 - 5pm.

6 Jul **Children's Art Day, 12–5pm**
Join in the creation of a magnificent "stained grass window" outside the abbey. There will also be an Exhibition by the Stained Glass Museum and other children's activities.
Normal admission prices apply. For more information contact Jeremy Rossiter 01223 863036

12 Jul **Glass Painting Workshop**, 11am–4pm (prior booking essential)
Try your hand at the craft of glass painting at this one-day informal workshop. Open to novices

and experienced painters, the day will give you a chance to explore different techniques and methods in glass painting.
For more information contact Jeremy Rossiter 01223 863036

27 Jul **Wood Crafts Day**, 12–5pm
Never mind flat-packed furniture, come and see how it's really done with cooperage, carving, and pole lathing. There will also be basket making demonstrations and a display by the Cambridge Bee Group. Normal admission prices apply. For more information contact Corrina Bower 01223 860988/489

3 Aug **Walking Tour of the Farm with Friends of the Museum**
Normal admission prices apply. For more information contact Corrina Bower 01223 860988/489

9 Aug **Mosaic Making Workshop**, 11am–4pm (prior booking essential)
This informal workshop is open to novices and the experienced. The day will give you a chance to explore different techniques and methods in mosaics, looking at all designs, from the ancient to the contemporary. For more information contact Jeremy Rossiter 01223 863036

24-25 Aug **"Past Times and Pleasures": Medieval Life**, 12pm–5pm
Explore life in medieval times with the Plantagenet Medieval Society.
Normal admission prices apply. For more information contact Corrina Bower 01223 860988/489

7 Sep **The Wheelwrights** with Friends of the Museum
Normal admission prices apply. For more information contact Corrina Bower 01223 860988/489

13-14 Sep **Art Workshop**, 10am–4pm (prior booking essential)
These workshops will be led by Ann Biggs, an experienced tutor and local wildlife artist, and are suitable for both beginners and more advanced artists. Full use will be made of the Farmland Museum & Denny Abbey sites and collections for sessions of sketching and painting.
For more information contact Corrina Bower 01223 860988/489

27-28 Sep **Basketmaking Workshop**, 10am–5pm (prior booking essential)
Discover the wonderful world of willow and the traditional craft of basketmaking at this workshop for beginners and those who already have some experience. Sandra Barker, a working basketmaker who demonstrates and teaches throughout the country, leads the workshops. She is one of only eight Yeomen of the Worshipful Company of Basketmakers.
For more information contact Corrina Bower 01223 860988/489

28 Sep **Fruit and Food Festival**, 12–5pm
Tickle those taste buds as you find out about country foods at this popular festival. Normal admission prices apply.
For more information contact Corrina Bower 01223 860988/489

5 Oct**1940's Wash-day Demonstration** with the Friends of the Museum
Normal admission prices apply. For more information contact Corrina Bower 01223 860988/489

26 Oct **Halloween at Denny**, 12–5pm.
Prepare to be afraid, very afraid as the Museum prepares to play trick or treat! Normal admission prices apply. For more information contact Corrina Bower 01223 860988/489

30 Oct **Halloween Children's Party**
Come dressed to impress for the Museum's final party of the season. There will be lots of games and prizes for the scariest costume! Normal admission prices apply.
For more information contact Jeremy Rossiter 01223 863036

Children's holiday activities on selected Thursdays 12–4pm throughout the season as follows:
24 July, 31 July, 7 August, 14 August, 31 August, 30 October.
Normal admission prices apply. For more information contact Jeremy Rossiter 01223 863036.

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Norris Museum

The Broadway, St Ives PE27 5BX; 01480 497314

Curator Bob Burn-Murdoch
bob@norrismuseum.fsnet.co.uk

Opening Hours Monday–Friday: 10 am–1 pm, 2–4 pm

Saturday: 10 am–12 noon

Also open Saturday and Sunday afternoons May–September

Friends of the Museum £3 (individual) and £5 (couple)

Truth can be stranger than fiction. Sometimes it's even stranger than what you read in *The Conduit*. Soon after my last year's report, when I complained that the disappearance of the Norris's Muscovy ducks had resulted in our auditors getting above themselves, a new family of Muscovies appeared in the garden and the auditors immediately withdrew their objections to our latest expensive project. The results are now here for all to see. Visitors who are bold enough to force their way through the crowd of particularly ugly ducks in the Museum garden can go down to the river bank and see our new river wall. St Ives Town Council has generously given £22,000 for the river bank to be reinforced with piles so that bits of it won't be washed away each winter, handing out free gifts of our topsoil to the denizens of Earith and Ely and threatening to drop the Museum itself into the river if left unchecked. The garden is not only secure, it's bigger than it was. The contractors who built the new river wall are based in the Fens and they know what's what. The Norris has unobtrusively sprouted a peninsula which juts out some distance into the river.

Meanwhile the Friends of the Norris are continuing to support the Museum with gifts that include a new cabinet for the video monitor that forms part of our display on skating in the Fens, while members of the Friends are devoting many hours to computerising the Museum catalogues. Our bid to stage the 2012 Olympics in the extra bit of garden has been generally under-reported in the media, but the ducks should ensure its ultimate success.

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St Neots Museum

The Old Court, 8 New Street, St. Neots, Cambs PE19 1AE
01480 388921 (Curators and 24hr answerphone), 01480 214163 (Reception, open hours only)
stneotsmuseum@tiscali.co.uk

Curators Anna Mercer and Elizabeth Davies

Open Tuesday to Saturday 10.30am to 4.30pm (Easter–December). Closed for most of January, then open Wednesday to Saturday 10.30am to 4.30pm until Easter. (Please phone to check opening times over holiday periods). Admission: £2 adults, £1 concessions (senior citizens, children 5–16). FREE to local residents of contributing parishes, children under 5.

Award-winning local history Museum in town's former police station and Magistrate's Court building. Attractive displays appeal to all ages and include NEW 'hands-on' activities and sound effects. Extensive 'reserve' collections including Huntingdonshire maps and postcards. Pre-booked school and other group visits welcome, in regular museum hours or 'out-of hours'. Schools Resource Pack available.

The Museum has an active programme of changing exhibitions, including work by local artists and on various local history themes. Activities such as talks, walks and workshops are also regularly arranged; please contact Museum for full programme. The following may be of particular interest to Conduit readers:

5 Feb–13 Mar	'Clarabut Collection' of local photographs
28 Apr–5 Jun	Exhibition by Local History Societies from St Neots area
10 Jul–4 Sep	Gardening and Wildlife - an RHS exhibition. With associated talks/activities

Normal Museum admission charges and opening hours apply; an additional charge may be made for some talks/activities.

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Proceedings of the Cambridge Antiquarian Society

Notes for contributors

The Editor welcomes the submission of papers which are principally on the history and archaeology of the County. Papers will be sent out to referees.

Format of articles

All articles should begin with a Summary. The main text of the Article should be followed by (as appropriate): Appendices; Glossary; Acknowledgements; Endnotes; Bibliography; Acknowledgement of Grant.

Notes should be numbered consecutively throughout the article. Full stops after initials should be omitted.

References in the Bibliography should be cited as follows:

Manuscripts: Buckinghamshire Record Office (hereafter Bucks RO) Dormer estate, D/93/Box 2, Court Roll of Ravensmere Manor, Hughenden 1752.

Books: Schmorl, G & H Junghanns 1971 *The human spine in health and disease.* 2nd American edn, ed. E F Besemann, New York: Grune and Stratton.

Articles in books: Hines, J 1998 'The sixth-century transition in Anglian England: an analysis of female graves from Cambridgeshire'. In J Hines (ed), *Studies in Early Medieval Chronology.* Oxbow Monographs.

Articles in Journals: Moorrees, C F A, E A Fanning & E E Hunt 1963 Formation and resorption of three deciduous teeth in children. *American Journal of Physical Anthropology* 21: 205–13.

Theses: Mortimer, C 1990 *Some Aspects of Early Medieval Copper-Alloy Technology, as illustrated by a Study of the Anglian Cruciform Brooch.* Oxford University D Phil thesis, unpublished.

Format of submissions

The *Proceedings* are produced digitally: authors must supply copies of their final text both on paper and on disk. Contact the Editor for information on appropriate software packages. The following information must also be supplied on paper: the file-names on the disk; the software package from which each file originated; and the platform (Mac/PC) on which the disk and files were produced. Files may also be emailed; contact the Editor for more information. Artwork will be scanned, placed and printed.

Tables

These should be set out with no vertical rules and as few horizontal rules as possible. A paper copy must be supplied. Files supplied from a specialist database must be compatible with Microsoft Excel.

Figures and illustrations

A complete list of figures and their captions must accompany each article; note that photographs are to be referred to as figures and included in the list of figures rather than separately as plates. Each piece of artwork and/or digital file must be clearly identified with the correct figure number. The desired location of each figure must be marked in colour on the paper copy of the final text.

If created digitally these should be supplied in digital format, both to save time and cost, and to ensure that the final versions are of the best quality. Requirements for both digital files and camera-ready artwork are noted below; please contact the Editor for more specific information.

Note that the PCAS page is set in two columns: maximum column width is 73mm ; maximum full page width is 155mm; maximum full page height is 240mm.

Photographs

Prints: glossy black and white prints should be submitted at the size at which authors would ideally wish them to appear. Crops should be marked on an overlay.

Scans: greyscale image resolution should be 300dpi when printed at the desired size. TIF and EPS are appropriate file formats.

Artwork

***Camera-ready artwork* must be supplied no larger than A4**, in finished form, and with adequate keys and scales included (note that a textual statement of scale is inaccurate if the image is subsequently resized). The scanning process is less able to compensate for some problems than was the camera: extremely fine lines and small text should be avoided. Letratone must not be used.

Line art scans should have a resolution between 900 and 1200dpi when printed at the desired size, and should be supplied as TIF or EPS.

Graphic files should be produced using graphics packages such as Illustrator or Freehand, and be in a standard graphic format such as TIF or EPS which can be imported into another application.

Copyright

Papers are accepted for publication on the understanding that they have not already been accepted for publication elsewhere. The copyright will normally remain with the Society.

Other information

Twenty-five offprints of each paper will be supplied. Further offprints may be ordered at extra cost at proof stage.

Contributors who know of possible sources of subventions towards the cost of printing their paper should inform the Editor of this when submitting the typescript; long articles will not normally be accepted without some financial support.

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