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A fen island in the Neolithic and Bronze Age: excavations at North Fen, Sutton, Cambridgeshire

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Excavations at North Fen, Sutton, revealed prehistoric activity on a small gravel island within the fen. A buried soil horizon survived across most of the site, which produced pottery and large quantities of worked flint of later Neolithic/early Bronze Age date. Associated features included shallow pits and hollows and two large waterholes, one of which contained a timber-revetted platform securely dated to the early Bronze Age. Environmental evidence from this feature shows that it was situated within an area of pasture. It is argued that the site was probably occupied discontinuously through the course of the later Neolithic and early Bronze Age. Patterning in the spatial distributions of different flint tool types across the site suggests discrete episodes of activity focused on differing tasks. The occupation horizon was subsequently buried by an alluvial soil layer, representing abandonment of the site under conditions of increased wetness and flooding, before the island was engulfed by the fen during the later Bronze Age or Iron Age.

Introduction

The apparent poverty of the settlement record of the later Neolithic and early Bronze Age across much of southern Britain has long been a cause of frustration. Due to plough damage, most occupation sites survive only as small clusters of truncated pits, or as scatters of flint and pottery in the topsoil. The Fenland is one of the few areas where *in situ* occupation horizons can be preserved, thanks to the protection afforded by later fen deposits. Excavations by Oxford Archaeology (OA) at North Fen, Sutton, provided a valuable opportunity to investigate a site of this kind.

The site lies in the western part of Sutton parish, immediately to the north of Long North Fen Drove (centred TL 4046 8137; Fig. 1a). It is situated at *c.* 0.5m OD on a small 'island' of 1st/2nd terrace river gravels and sand, 1.4 km across, overlying Upper Jurassic clays. The gravel island is capped by a thin layer of peaty soil and is surrounded by deeper Nordelph Peat deposits interleaved with 'fen clay'. The fieldwork was carried out between October 2004 and February 2005 on behalf of Woolpit Business Parks Ltd, in advance of construction of an irrigation reservoir.

Current understanding of the environmental history of the area suggests that the North Fen terrace had become an island surrounded by the fen by the later Neolithic/early Bronze Age, separated from the much larger Chatteris island a short distance to the north (Fig. 1b and c; Hall 1992; 1996; Waller 1994). A major palaeochannel of the River Ouse probably active during the Neolithic/Bronze Age lies 300–400m to the south of the island; its course is approximately followed by the post-medieval drainage work known as Hammond's Eau. Deposits of 'fen clay' to the south and west of the island represent brackish marsh conditions resulting from a marine incursion along the Ouse corridor. Brackish conditions had reached Haddenham (4 km upstream of the site) by 2870–2410 cal BC and attained their maximum extent in the early or middle Bronze Age (Evans and Hodder 2006). Freshwater fen lay to the east of the island.

Fieldwalking carried out as part of the Fenland Survey found several prehistoric sites on the North Fen gravel island (Fig. 1c; Hall 1996). Two Neolithic flint and pottery scatters were found, one lying 100m to the south of the site (SUT1) and the other 500m to the west. The pottery from the SUT1 site is of plain bowl type, suggesting an early Neolithic date (Last 1996). Soilmarks representing five round barrows, presumed to date to the early Bronze Age, were also found scattered across the island to the north, east and west of the site (Hall 1996; van Velzen 2003). Further Neolithic flint scatter sites and clusters of round barrows and ring ditches were identified during the Survey on the larger Chatteris gravel island to the north (Hall 1992). Subsequent test pit evaluation of one of the scatters at Stocking Drove Farm (CHA37), 700m north-west of the site, revealed a buried soil deposit that produced flintwork of late Neolithic/'Beaker period' date and a few sherds of Impressed Ware and Grooved Ware pottery (Crowson *et al.* 2000).

Further evidence for prehistoric activity on the North Fen island was revealed in 1996 by an 18.8 ha

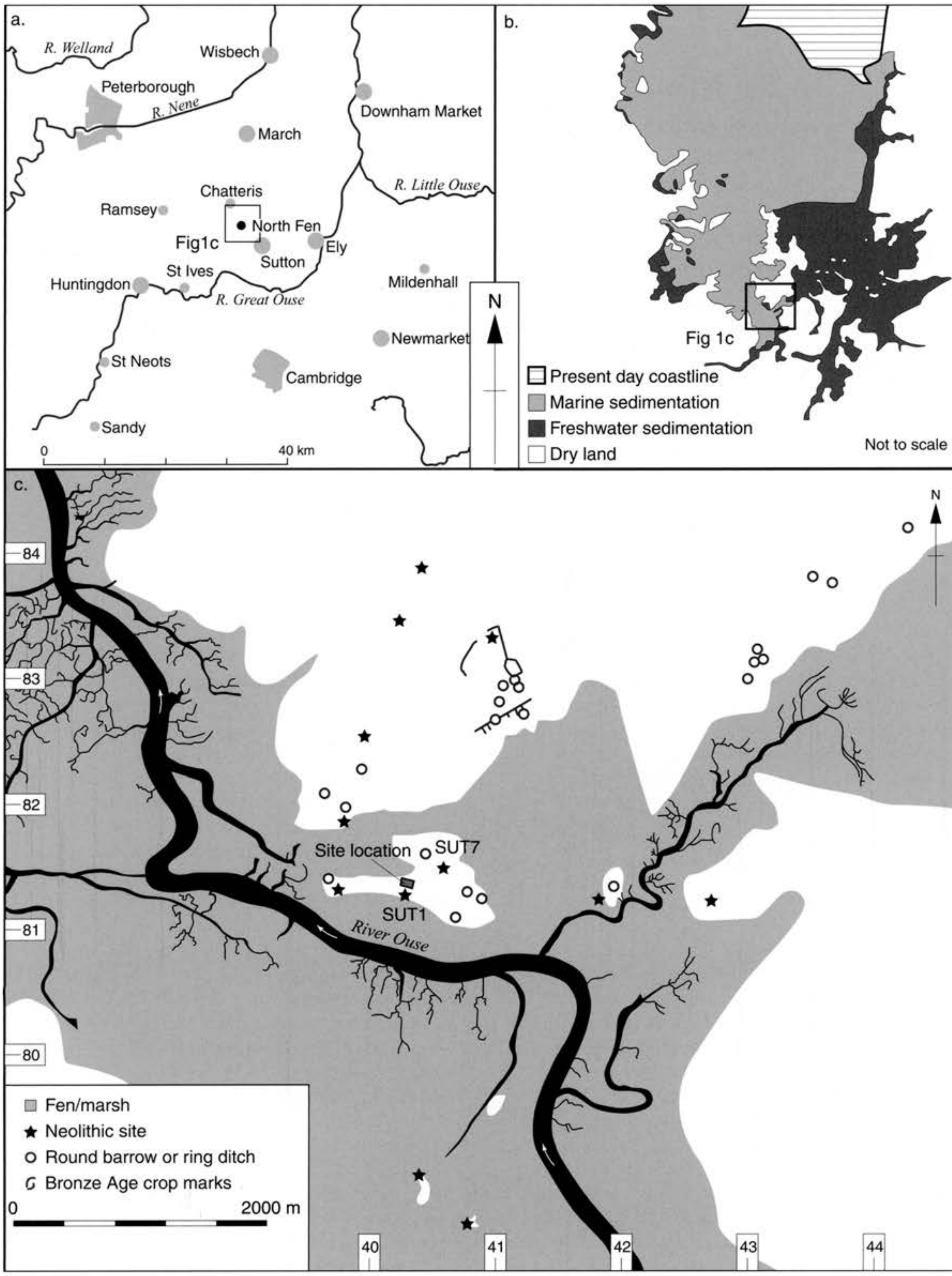


Figure 1. *Site location.*

evaluation carried out by the Cambridgeshire County Council Archaeological Field Unit (now OA East). Excavation of a trial trench immediately to the south of the present site revealed a series of shallow hollows containing vestiges of a buried soil, although it was uncertain whether the hollows were of natural or anthropogenic origin. Finds included flintwork ascribed to the Neolithic. In a second trench, 300m to the north-east of the present site, further shallow, irregular features produced pieces of pottery and worked flint, again suggested to be of Neolithic date (Last 1996).

More recently, excavations have been carried out by the Sutton Conservation Society at the SUT7 round barrow, 300m to the north-east of the site (Fig. 1c). The barrow was plough damaged but contained a primary cremation burial within an inverted Collared Urn, radiocarbon dated to 1870–1690 cal BC (3440±30 BP). Further fragments of Collared Urns and Food Vessels may derive from ploughed-out secondary burials.

During the later Bronze Age or Iron Age, North Fen island became uninhabitable due to the rising water table, and was engulfed by fen peat (Waller 1994; Hall 1996, 54–8; Last 1996). No later prehistoric, Romano-British, Saxon or medieval sites are known on the island or nearby. Large-scale reclamation of this part of the Fens began in the mid 17th century with the construction of Hammond's Eau and the Old and New Bedford Rivers (Darby 1983). From the late 19th century onwards, the site was in agricultural use.

The first phase of the fieldwork reported on here comprised a test pit survey. Twenty-four $1m^2$ test pits were excavated by hand on a 20m grid (Fig. 2). The test pits showed that a consistent sequence of deposits existed across most of the site. The modern ploughsoil sealed a layer of peat, which in turn sealed a silty sand soil deposit, overlying the natural sand and gravel. A 15-litre sample of each deposit within each test pit was sieved for artefacts through a 5mm mesh. Worked flint was recovered from the buried soil in 9 of the 24 pits, at densities of up to four flints per pit.

An area measuring 100 x 60m was then stripped using a mechanical excavator under archaeological supervision (Fig. 3), revealing that buried soil deposits survived across much of the site, particularly its southern, eastern and western parts. Four of the best-preserved areas of buried soil (Areas 1–4) were sample-excavated using a 1m grid. Within Area 1, alternate grid squares were hand-excavated to give a 50% sample; in Area 2 a 20% sample was excavated, and in Areas 3 and 4 a 10% sample. In total 200 squares were excavated. A 15-litre sample from each square was dry-sieved for artefacts through a 5mm mesh. A further 12 grid squares from Areas 1–3 were bulk sampled for wet sieving. Artefacts were also systematically collected from the exposed surface of the buried soil and natural gravels across the site, and their locations plotted. The few archaeological features uncovered were excavated by hand. Later stages in the excavation four large slots were mechanically excavated to ensure that no further archaeological deposits were sealed beneath the buried soil.

Archaeological sequence

Palaeochannel

A former stream channel (1233) running across the site on a NW-SE alignment was cut into the natural sand and gravel and sealed by the buried soil. Two machine-excavated sections showed that the channel was 1.4m deep and contained a series of sterile clay, silt and sand fills. The channel clearly predates the archaeological activity at the site, and probably dates to the late Pleistocene or early Holocene.

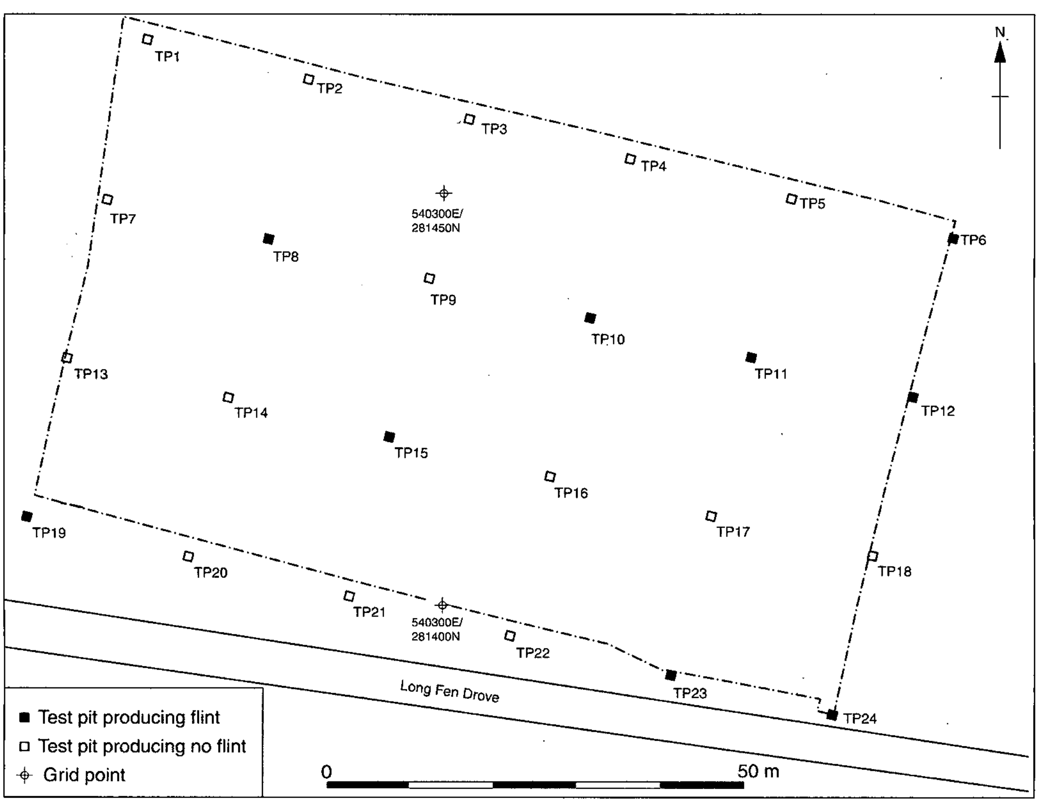


Figure 2. Test pit survey.

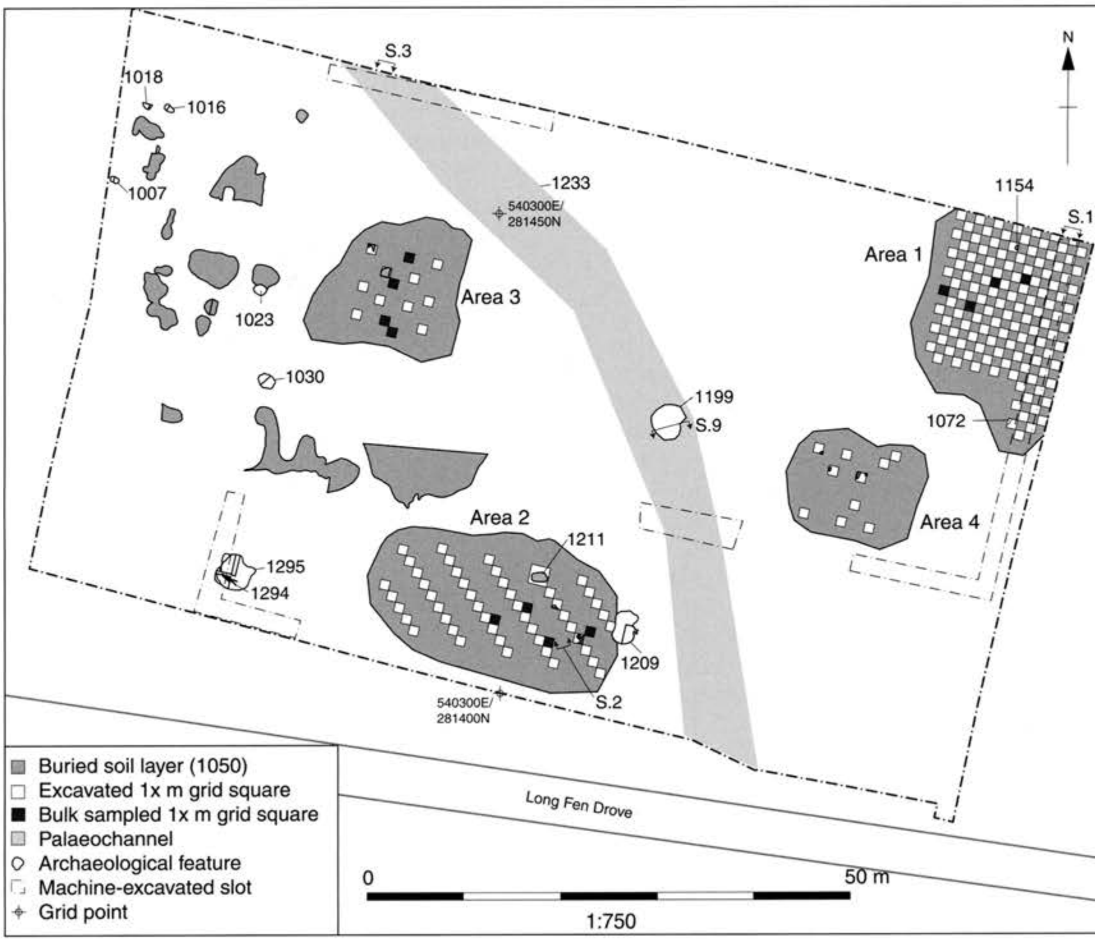


Figure 3. *Site plan.*

The buried soil sequence

A sequence of two buried soil layers was identified overlying the natural sand and gravel (Fig. 4). The lower layer (1060) was a grey-brown to yellow-brown silty sand up to 0.25m thick that extended across almost the whole site. This deposit was overlain in parts of the southern, eastern and western areas of the site (Areas 1–4) by a distinctive layer of more humic grey-brown silty sand that typically survived to a thickness of 0.05–0.10m (1050). The upper surface of this deposit lay at *c.* 0m OD. While a few modern plough scars could be seen cutting down into the buried soil layers, the degree of disturbance was limited. Both layers produced worked flint, small sherds of later Neolithic/early Bronze Age pottery, and occasional fragments of animal bone. The ceramics largely belong to the Grooved Ware (*c.* 3000–2000 BC) and Beaker (*c.* 2500–1700 BC) traditions. Fragments from a single Impressed Ware vessel (*c.* 3400–2500 BC) and possible Food Vessel sherds (*c.* 2100–1500 BC) were also present. Two radiocarbon dates of 2397–2139 cal BC (95.4% probability; OxA-19133: 3806±31 BP) and 2132–1921 cal BC (95.4% probability; OxA-19050: 3640±29 BP) were obtained on charred material from layer 1050 (Table 1).

Thin section analysis was carried out on three monolith samples taken through the buried soil sequence (see Macphail below). Layer 1060 can be characterised as the Neolithic/early Bronze Age 'subsoil', containing occasional fine charcoal and burnt flint. It is likely that many artefacts from this 'subsoil' layer have been transported down from the original ground surface by biological action. The lower part of layer 1050 can be characterised as the Neolithic/early Bronze Age 'topsoil', a humic layer containing very abundant fine charred matter. The upper part of layer 1050 (0.05m thick) contains little charred material and represents a humic soil that formed out of alluvium, burying the occupation horizon. This represents a period of abandonment probably due to increased wetness and flooding before fen peat formation commenced.

The buried soil was sealed by a layer of clayey peat (1070), around 0.10m thick, which extended across the whole of the site. This represents freshwater inundation of the site and clayey sedimentation under 'backswamp' conditions (Macphail, below), probably commencing in the later Bronze Age (Hall 1996; Waller 1994). The peat was directly overlain by the modern topsoil (1000).

Hollows, pits and postholes

A small number of shallow hollows, pits and post-

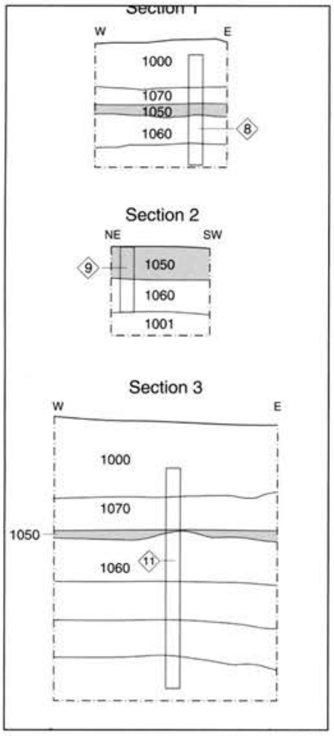


Figure 4. Sections through the buried soil sequence.

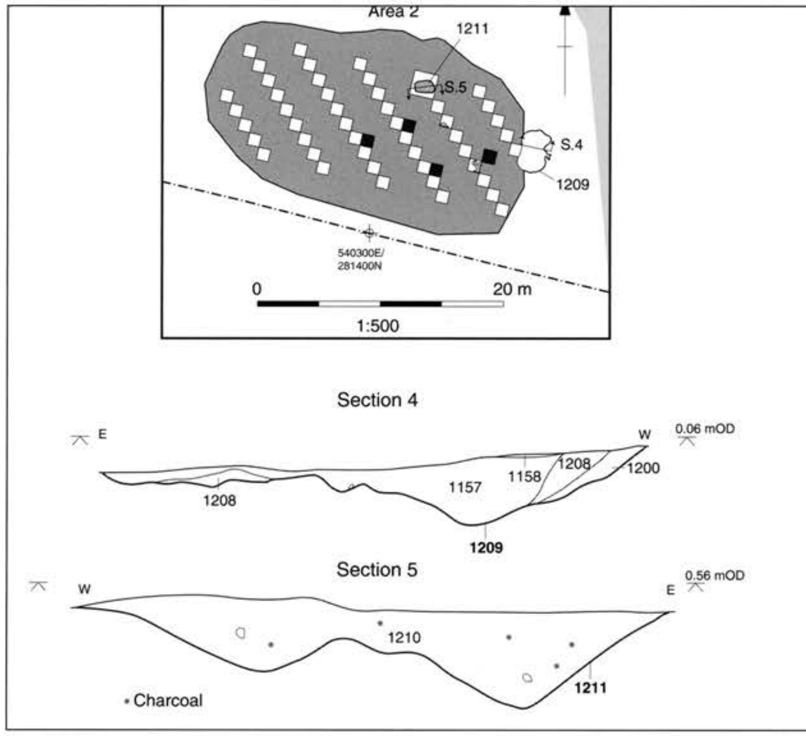


Figure 5. Hollow 1209 and pit 1211.

holes were found in association with the buried soil. All of these were recorded as being cut into 'subsoil' layer 1060, and either sealed by or showing no relationship to 'topsoil' layer 1050. They had silty sand fills similar in character to the upper buried soil layer. With one possible exception, they can all probably be regarded as broadly contemporary with the later Neolithic/early Bronze Age occupation horizon.

Irregular hollow 1209 was found at the eastern edge of buried soil Area 2 (Fig. 5). It measured 5m by 3m in size and up to 0.25m deep. A lower deposit of sterile silty sand was overlain by a darker layer (1157) which contained 72 pieces of worked flint and six small fragments of late Neolithic/early Bronze Age pottery, including two Beaker sherds. The high density of flint from this feature, and from the buried soil deposits immediately to its west, suggests that the hollow was a significant focus for activity.

Three possible irregular pits, up to 0.29m deep, were revealed during excavation of the 1m sample squares in Areas 1 and 2 (1072, 1155 and 1211; Fig. 3). Pit 1211 contained three flint flakes, two scrapers, a few sherds of late Neolithic/early Bronze Age pottery and fragments of animal bone. Pit 1155 produced a single flint flake.

Three small features in the western part of the site may have been shallow pits, up to 0.25m deep, although they could equally well represent natural hollows (1007, 1023 and 1030, Fig. 3). Feature 1023 contained three flint flakes, a flint knife and sherds of Impressed Ware pottery. Feature 1007 produced a few sherds of late Neolithic/early Bronze Age pottery. Feature 1030 contained two flint flakes, a few Beaker sherds and a single fragment of probable late Bronze Age/early Iron Age pottery. It may therefore postdate the main period of activity on the site, although plough disturbance to this feature raises the possibility that the late Bronze Age/early Iron Age sherd is intrusive.

A pair of possible postholes (1016 and 1018) in the north-west corner of the site produced no finds. These were up to 0.25m deep, and in one case (1018) contained abundant charcoal.

Waterholes

Two waterholes—one certain and one possible—were located at the margins of the areas of well-preserved buried soils. Waterhole 1295 lay in the south-western corner of the site, cutting through buried soil layer 1060 into the natural gravel, and was 3.5m in diameter and 0.7m deep (Figs 6 and 7). A wooden revetment structure (1294) at the southern edge of the feature had been preserved due to the waterlogged conditions. This consisted of a group of horizontal alder poles, stacked one on top of the other (1305–9 and 1311–13), retained by two vertical hazel stakes driven into the base of the waterhole (1304 and 1310). Tool marks on the wood are characteristic of the metal axes of the early Bronze Age (see Goodburn below), and a radiocarbon date of 2014–1776 cal BC (95.4% probability; OxA-19051: 3559±29 BP) was obtained from alder pole 1308 (Table 1). The void behind the revetment had been back-filled with sand and gravel (1302), to create a platform to stand on while drawing

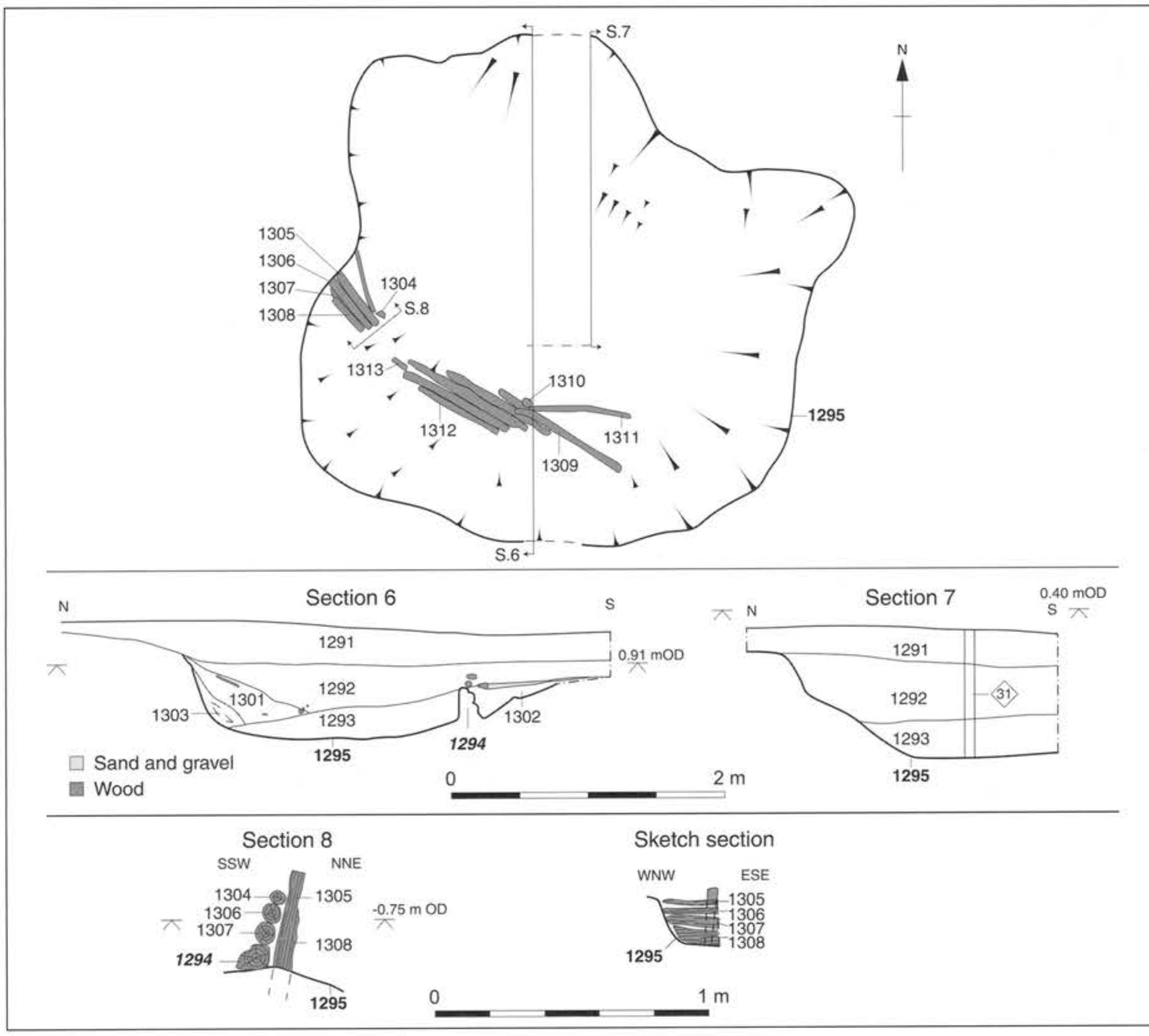


Figure 6. *Waterhole 1295.*

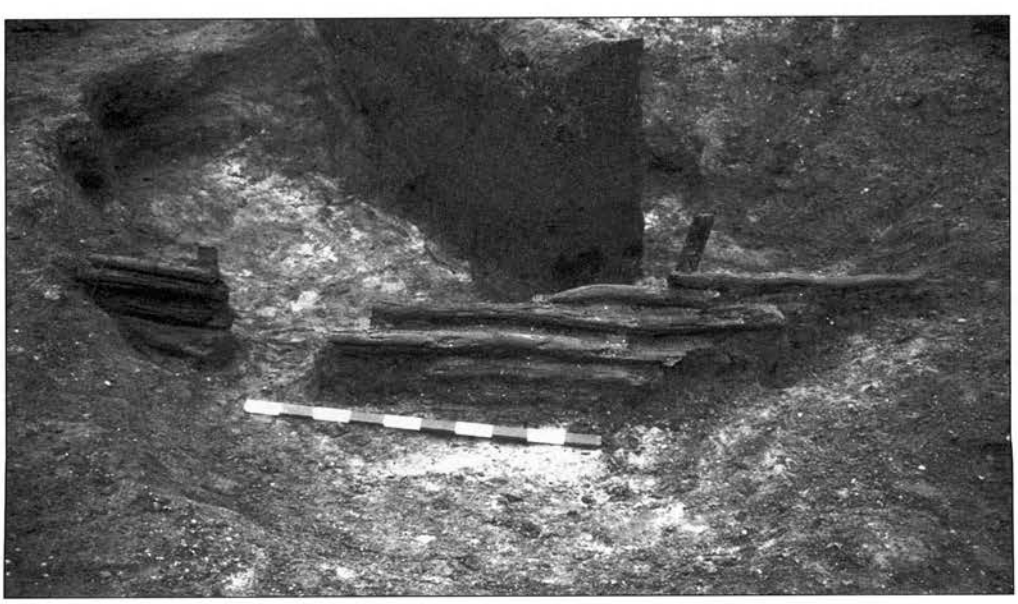


Figure 7. *Revetment structure 1294 within waterhole 1295, looking north-east. Scale: 1m*

water. The waterhole itself contained a sequence of naturally-deposited fills. The lower fill (1293) consisted of clay containing large amounts of waterlogged organic material. This was followed by two erosion deposits of sand and gravel (1303 and 1301), and a final layer of clay containing organic material (1292). Seven pieces of worked flint were recovered from the waterhole, along with a few sherds of late Neolithic/early Bronze Age pottery from upper fills 1292 and 1301. The waterhole was subsequently sealed by peat (1291), which filled a shallow hollow left at the top of the feature.

Possible waterhole 1199 overlay the palaeochannel, cutting through both 'subsoil' layer 1060 and the upper channel deposits. The waterhole was 2.8m in diameter and 0.8m deep, with an irregular profile. It contained a series of naturally-deposited, waterlogged clay, silt and sand layers. The only finds came from the uppermost fill (1009), consisting of an incomplete human cranium, a fragment of a human longbone, and a few pieces of animal bone. The cranium has been radiocarbon dated to 2194–1979 cal BC (95.4% probability; OxA-19107: 3690±27 BP; Table 1).

Artefacts and economic evidence

Flint

Hugo Lamdin-Whymark

A total of 513 worked flints and 42 pieces (275g) of burnt unworked flint was recovered (Table 2). The majority of the flint was recovered as a scatter preserved within buried soil layers 1050 and 1060. The scatter may have undergone some vertical displacement after deposition on the original land surface, but the presence of localised concentrations suggests the scatter had undergone little horizontal movement. The flint was generally in fresh condition, exhibiting only occasional nicks and edge-damage consistent with light disturbance such as trampling. Several flints exhibited an orange-brown mineralised surface deposit.

The raw material exploited was predominately a mid to dark brown flint, but some pieces of a distinctive light to mid grey mottled flint were also observed. The cortical surface, where present, was abraded to differing degrees, with some pieces retaining several millimetres of white chalky cortex, whilst the cortex on other pieces was worn away to a smooth or pitted surface. Thermal fractures were frequently observed in all the raw materials utilised. The condition of the cortex and presence of thermal fractures indicate the flint derives from secondary sources, such as glacial or river gravels. The local gravels contain a limited number of flint nodules, but some flint is likely to have been imported from further afield. A few flints exhibited a relatively fresh white cortex and may originate from a chalk region. A single flint flake exhibited a dark green cortex with an underlying orange band. This flint is characteristic of the Bullhead Bed at the base of the Reading Beds; this flint is likely to originate from a source to the south around the Thames Valley (Dewey and Bromehead 1915; Ellison and Williamson 1999).

Thirteen white corticated flints from earlier industries were also exploited as a raw material. A single- and a multi-platform flake core each exhibited two episodes of knapping and two flakes had clearly been struck from corticated cores. Nine tools were also manufactured from corticated flakes including four scrapers (Fig. 8.3 and 8.7–8), a serrated flake, a knife, a retouched flake, a fabricator (Fig. 8.14) and a tanged arrowhead (Fig. 8.9). The fabricator was manufactured on a fine parallel-sided blade that after retouching still measures 95mm long by 21mm wide and 10mm thick. This blade probably dates from the early Mesolithic. It is not possible to date the other corticated flakes, but it is notable that a small number of Mesolithic or early Neolithic flints were identified in this excavation and that other Neolithic activity has been identified elsewhere on the gravel island (Hall 1996; Last 1996). These flints may, therefore, represent local discoveries, although it is also possible that they were collected further afield.

The reworking of earlier flints may simply reflect the opportunistic exploitation of chance discoveries. However, the transformed colours and unfamiliar artefact forms, for example Mesolithic blade technology, may have been considered to be of significance in the early Bronze Age. These occasional discoveries were both familiar, as struck flints, but alien due to their unusual colour and form. As such, these artefacts may have been associated with the past, ancestors or other more mysterious origins. The working of corticated flints may, therefore, have been of more

Table 1. *Radiocarbon dates. Calibrated dates have been generated with Oxcal v4.0 (Bronk Ramsey), using the INTCAL04 dataset (Radiocarbon 46, 2004).*

Lab. no.	Context	Radiocarbon age	δ^{13} C (‰)	Material	Calibrated date (68.2% probability)	Calibrated date (95.4% probability)
OxA-19050	1122 (buried soil 1050, Area 1)	3640 ± 29	-24.63	Charcoal (Maloideae)	2108–1951 cal BC	2132–1921 cal BC
OxA-19051	1308 (waterhole 1295)	3559 ± 29	-25.19	Wooden stake (*Alnus glutinosa*)	1951–1880 cal BC	2014–1776 cal BC
OxA-19107	1009 (waterhole 1199)	3690 ± 27	-21.03	Human cranium fragment	2134–2033 cal BC	2194–1979 cal BC
OxA-19133	1289 (buried soil 1050, Area 3)	3806 ± 31	-25.22	Charred hazel nutshell	2291–2200 cal BC	2397–2139 cal BC

	Zone					
Category type	A	B	C	D	Unlocated	**Total**
Flake	78	57	6	102	22	**265**
Blade	2	2	1	8	1	**14**
Bladelet	1	7		3	1	**12**
Blade-like flake	3	1		13	2	**19**
Irregular waste	5	8	1	7	3	**24**
Chip	1	6				**7**
Rejuvenation flake core face/edge					1	**1**
Rejuvenation flake tablet				1		**1**
Janus flake (thinning)				1		**1**
Flake from ground implement	2	1		1		**4**
Tested nodule/bashed lump				2		**2**
Single platform flake core	2	1		2		**5**
Multiplatform flake core	3	2	2	2		**9**
Core on a flake		1				**1**
Unclassifiable/fragmentary core		2		1		**3**
Barbed and tanged arrowhead		1				**1**
Triangular arrowhead		2				**2**
End scraper	7	1				**8**
Side scraper	10	1		1		**12**
End and side scraper	6	1		3	1	**11**
Disc scraper	2			1		**3**
Thumbnail scraper	5	1				**6**
Scraper on a non-flake blank	1			1		**2**
Other scraper	9	2	1	2		**14**
Piercer	4		1	1		**6**
Serrated flake	1	3	5	7		**16**
Notch	5		1	2	1	**9**
Backed knife	1			1		**2**
Other knife	4	1		1		**6**
Retouched flake	18	5	2	9	2	**36**
Fabricator	2			1		**3**
Dagger				1		**1**
Pick					1	**1**
Misc. retouch	1			3	1	**5**
Hammerstone					2	**2**
Total	**173**	**106**	**20**	**177**	**38**	**514**
Burnt unworked flint (g)					42/ 275	**42/ 275**
No. of burnt worked flints (%)*	5 (2.9)	5 (5)		11 (6.2)	1 (2.6)	**22 (4.3)**
No. of broken worked flints (%)*	36 (20.9)	26 (26)	8 (40)	55 (31.1)	14 (36.8)	**139 (27.4)**
No. of retouched flints (%)*	76 (44.2)	18 (18)	10 (50)	34 (19.2)	6 (15.8)	**144 (28.4)**
No. of flakes per core	16.8	11.2	3.5	18	26+	**15.5**
% of blades and bladelets in the flake assemblage *	3.6	13.4	14.3	8.7	7.7	**8.4**

Table 2. *The flint assemblage by category type and zone. * Percentage excludes chips.*

significance than simply exploiting raw materials and perhaps involved the creation of implements imbued with attributes of these earlier artefacts.

A small number of flakes and tools derive from a Mesolithic and/or early Neolithic blade-orientated industry. These flints, including the majority of the blades and bladelets, reflect a careful reduction strategy and frequently exhibit platform preparation and the scars of earlier blade removals on their dorsal surface. The latter indicates that the blade was struck from a core specifically orientated to blade production. The majority of serrated flakes were manufactured on blades, but the dating of these tools is problematic as several of these early flints have been reworked and used in the early Bronze Age, including at least one of the serrated blades. When cortication is not present it

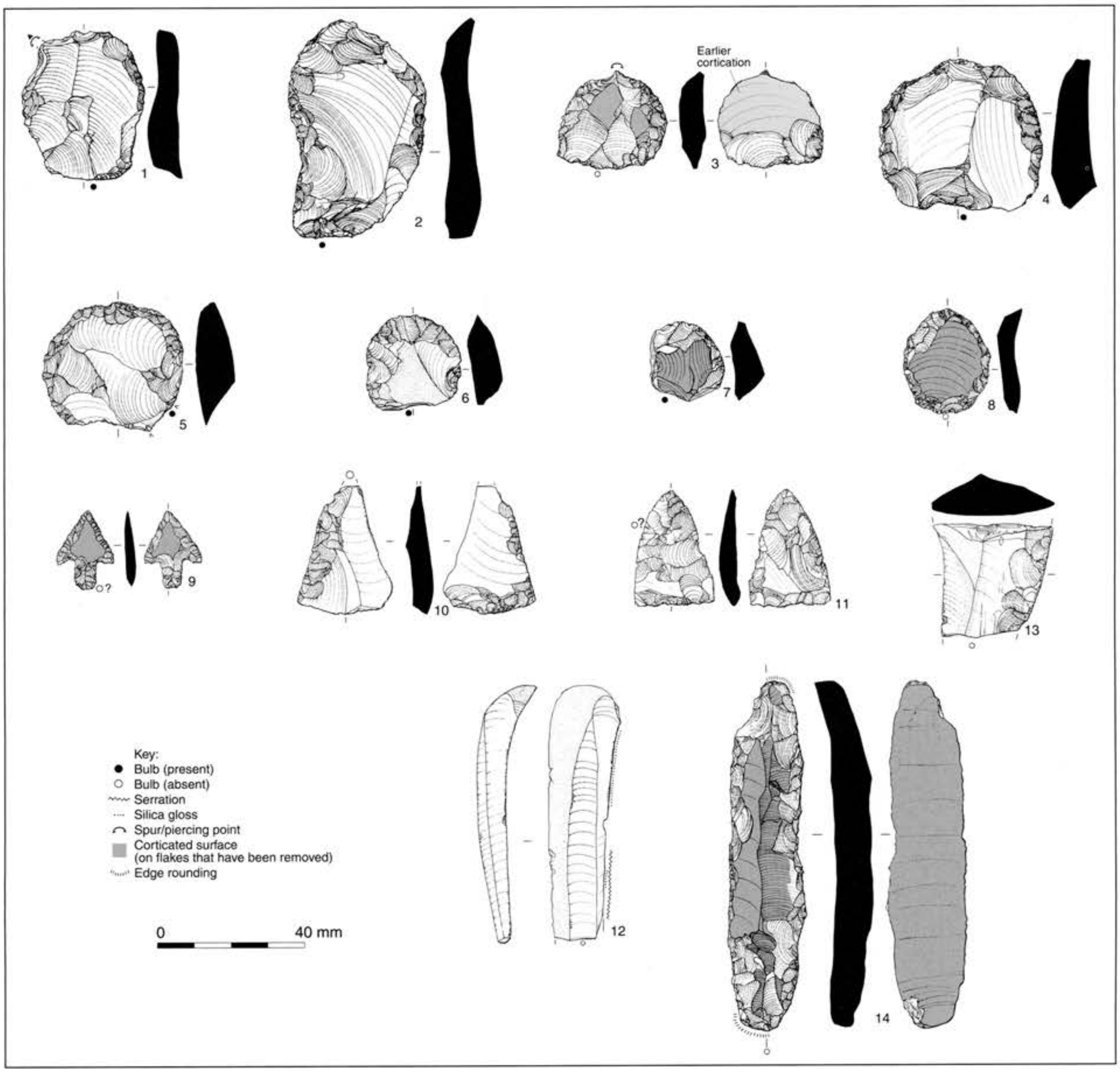


Figure 8. *Worked flint, nos 1–14.*

may not be possible to determine whether the tool is genuinely early, or the product of later reuse.

The majority of the flint forms a coherent assemblage that dates from the late Neolithic/early Bronze Age. The flint assemblage is dominated by small non-specialised flakes that appear to have been detached using both hard and soft hammer percussors, such as antler and stone, possibly including the two flint hammerstones recovered. Few flakes exhibit platform-edge abrasion and only two rejuvenation flakes are present, suggesting little care was taken to maintain core forms or regulate the morphology of flakes. In total, twenty cores were present with single- and multi- platform flake cores most frequently encountered. The cores showed little evidence for the preparation of the platform or the platform-edge prior to flake removal. The negative flake scars on the cores reflect the removal of unspecialised flakes and it is notable that no blade scars were observed. Cores were relatively frequently encountered with one core per 15.5 flakes recovered. The cores varied in weight from 14g to 130g with one exceptionally large flake core weighing 1499g. Excluding the latter core, the cores averaged 38g weight and appeared to have been abandoned when exhausted. The high frequency of cores is indicative of knapping, but no refits were identified and other debitage commonly associated with knapping, such as irregular waste and chips, is relatively scarce. The scatters therefore do not appear to represent *in situ* knapping, but contain some knapping debitage redeposited from another location.

Retouched artefacts are exceptionally common and represent 28.4% of the total assemblage. Scrapers are the most common tool type. The scrapers include a wide variety of forms and sub-forms, but no form clearly dominates the assemblage (Table 3).

Table 3. Scrapers by form and sub-form.

Scraper type	*Sub-Form*	Total
End scraper	*Double end*	1
	Horseshoe <180° retouch	2
	Kite-shaped	3
	Parallel sided	6
	Irregular	1
Sub total		13
End and side scraper	*'D'- shaped 180°-270° retouch*	6
	Parallel sided	2
	Unclassifiable	1
Sub total		9
Side scraper	*Double side*	2
	On a flake	8
	Unclassifiable	1
Sub total		11
Thumbnail scraper	*'D'- shaped 180°-270° retouch*	4
	Oval 270°-359° retouch	1
	Oval 360° retouch	1
Sub total		6
Disc scraper	*Circular - 360° retouch*	2
	Oval 270°-359° retouch	1
Sub total		3
Other scraper	*Irregular*	9
	Denticulate	1
	Unclassifiable	2
	Scraper on a non-flake blank	2
Sub total		14
Total		56

The assemblage includes both irregular and regularly worked forms with variable standards of retouch including relatively irregular edges and finely retouched forms; a thumbnail scraper and an end scraper exhibited scale flaking (Fig. 8.1–8). The scrapers are quite small with average dimensions of 32mm long by 31mm wide and 9mm thick (Fig. 9). The size of the scrapers and the presence of thumbnail forms suggest a Beaker date. In this respect the absence of scrapers on blades is also notable as these typically found in Mesolithic and early Neolithic assemblages (Riley 1990). Hide preparation and woodworking represent the most probable tasks for which scrapers were used, but considering the limited size of the scrapers, especially the thumbnail forms, they may have been used for a very specific activity.

The working of plant materials is attested by the presence of 16 serrated flakes, many of which bore a thin band of silica gloss behind the teeth. This band of gloss develops from a transverse motion that separates plant fibres, presumably for cordage or weaving. Use-wear studies have yet to determine the species of plant that generates this gloss (Juel Jensen 1994). The majority of the serrated flakes are manufactured on blades and in two cases these blades appear to be Mesolithic (Fig. 8.12). However, one of these blades is corticated white, whilst the serration is not corticated, indicating that the blade has been re-used.

The three arrowheads include a tanged form (Sutton type A, Green 1980; Fig. 8.9) and two triangular forms (Fig. 8.10–11). It is possible the triangular forms are unfinished barbed and tanged arrowheads, as neither have been extensively worked and both exhibit hinged removals that would hinder further pressure flaking, but they may simply represent a relatively crude arrowhead form. The four small flakes from polished implements originate from a minimum of two artefacts; two flakes were of a light brown flint with a high polish and the other two were mid grey. The fabricators include a fine example reworking a Mesolithic blade (Fig. 8.14), a broader rod-shaped form (SF 133), and a minimally worked flake with characteristic wear on the bulb (SF 419). The presence of three fabricators is perhaps surprisingly considering the limited evidence for fire as attested by the small quantity of burnt stone and low proportion of burnt artefacts in the assemblage as a whole (4.3%). The eight knives include two backed forms and six more irregular forms on flakes. The latter forms exhibit invasive low angle to semi-abrupt retouch along straight to slightly curving blade edges, with little modification to the original form of the flake blank. Two of the knives have been inten-

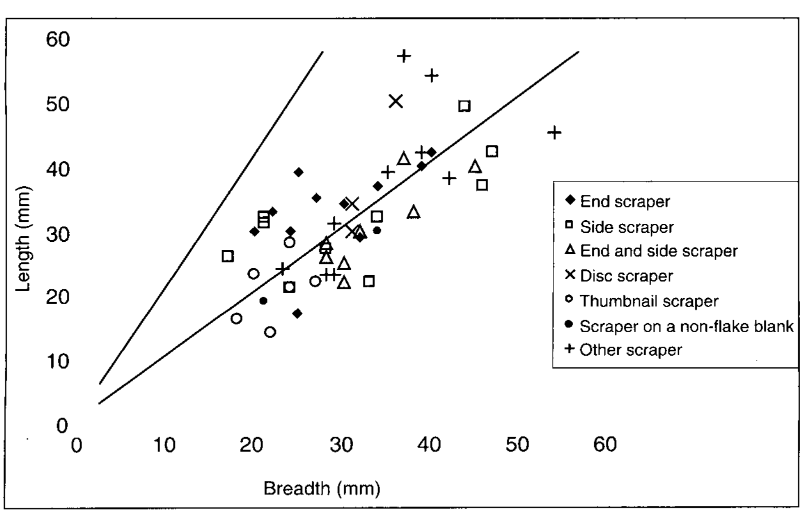


Figure 9. Length to breadth scatter diagram of all complete scrapers by form.

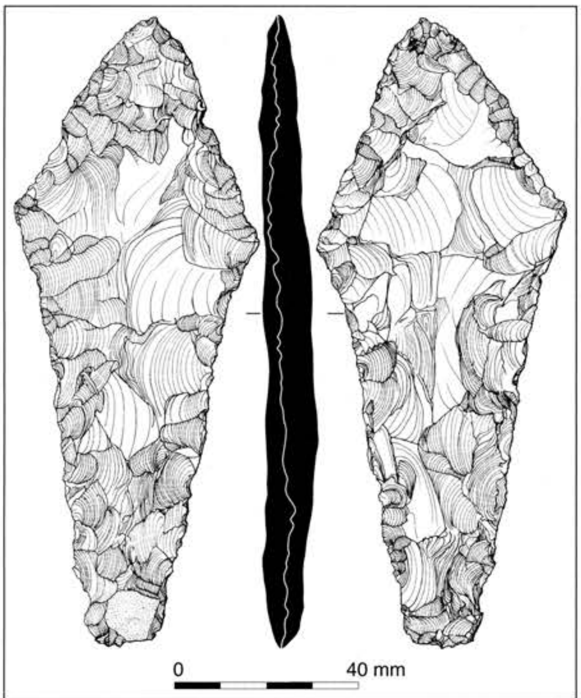


Figure 10. *Flint dagger (no. 15).*

tionally broken, with one exhibiting two snaps forming a wedge-shaped element (Fig. 8.13).

An artefact of particular note is the flint dagger (Fig. 10). The dagger is a simple tanged form measuring 137 x 54mm and a maximum of 13mm thick. The implement was manufactured from a mid grey mottled flint, with a small dark grey translucent area and patch of abraded cortex at the base of the tang. The colour of the flint and characteristics of the cortex suggest the raw material originates from a gravel source. The blade-edge of the dagger measures *c.* 47mm in length and has been finished with fine invasive flaking, which was probably produced by delicate soft hammer percussion and pressure flaking. The blade edge exhibits several nicks which may result from use or edge-damage. The tang has straight sides measuring 85–90mm in length by 50mm wide that taper to 18mm wide at the distal end. The tang exhibits relatively coarse flaking, with occasional step fractures, and lacks the refined finish of the blade. The dagger is unlikely to have been hafted in a wooden or horn handle as it lacks notches to facilitate attachment. The tang forms a good handle, although given the crude flaking it may be presumed that the handle was finished by binding, perhaps with raw hide or plant cord. Flint daggers are relatively uncommon finds with a limited distribution pattern across the British Isles (Grimes 1931). This discovery falls within one of the most distinctive concentrations in the East Anglian Fens (*ibid.*, fig. 2).

For the purpose of spatial analysis, the site can be sub-divided into four 'flint zones' on the basis of distinctions in the density and composition of the flint assemblages (Figs. 11–15). Flint zone A comprises a dense spread of flint centred on hollow 1209 and the eastern part of buried soil 1050 (Area 2). The assemblage contains a limited number of flake cores, but does not represent an *in situ* knapping scatter as chips and pieces of irregular waste were scarce and no refits were identified. Moreover, the zone is dominated by retouched artefacts that account for 44.2% of the total assemblage. Scrapers are the most common retouched tool, although piercers, notches, knives, retouched flakes and fabricators are also well represented in comparison to the other zones. In contrast, serrated flakes are underrepresented with a single example present. Blades only form a small component of the assemblage.

Flint zone B equates to buried soil Area 1. The scatter in zone B is more diffuse than zone A, and

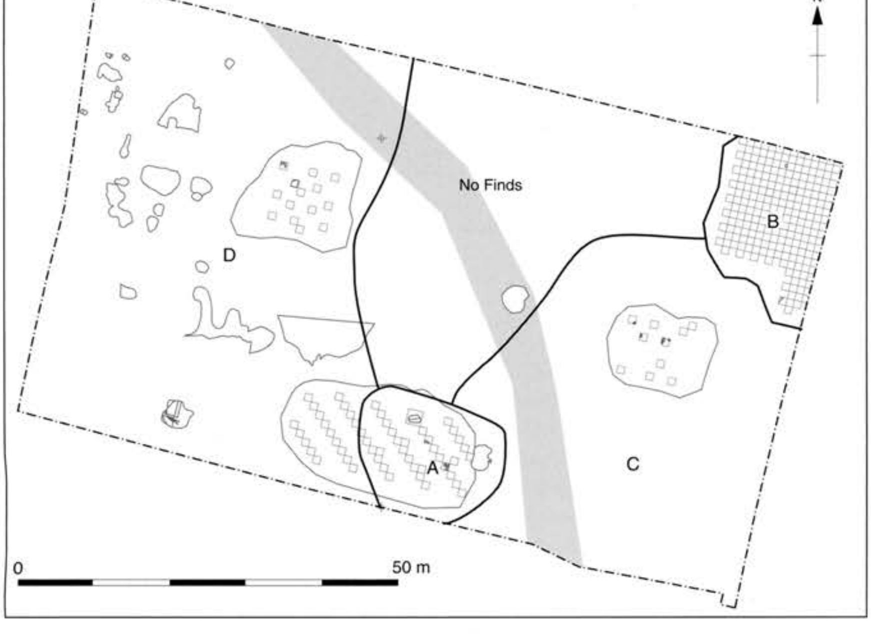
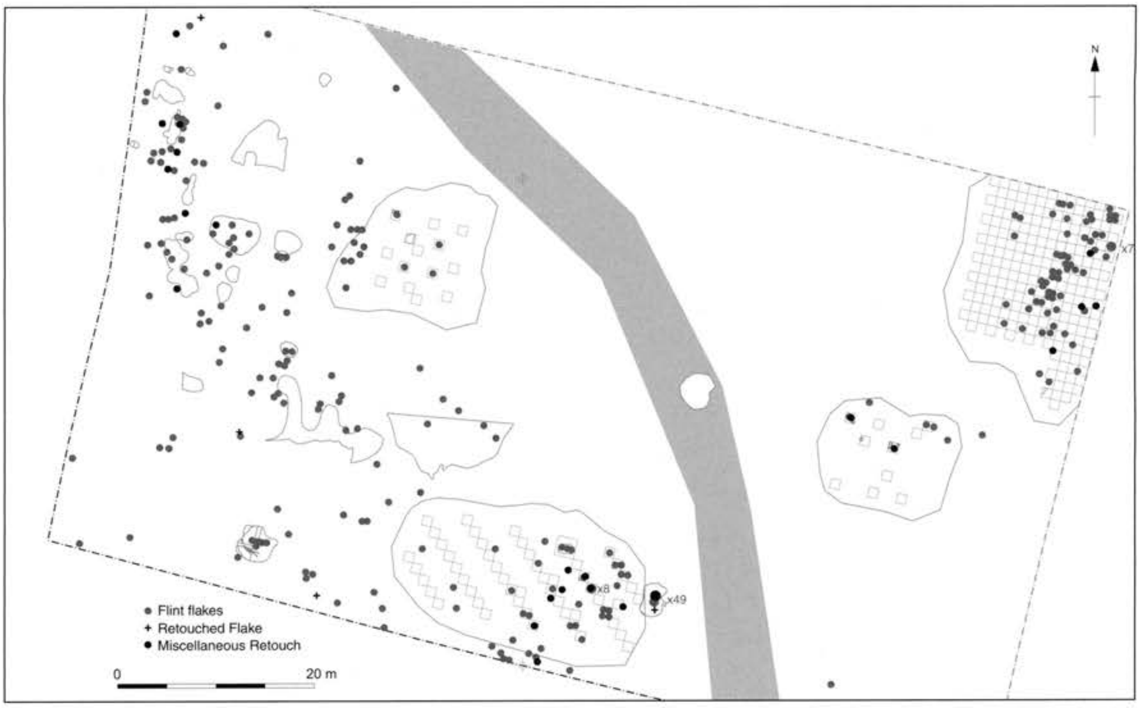
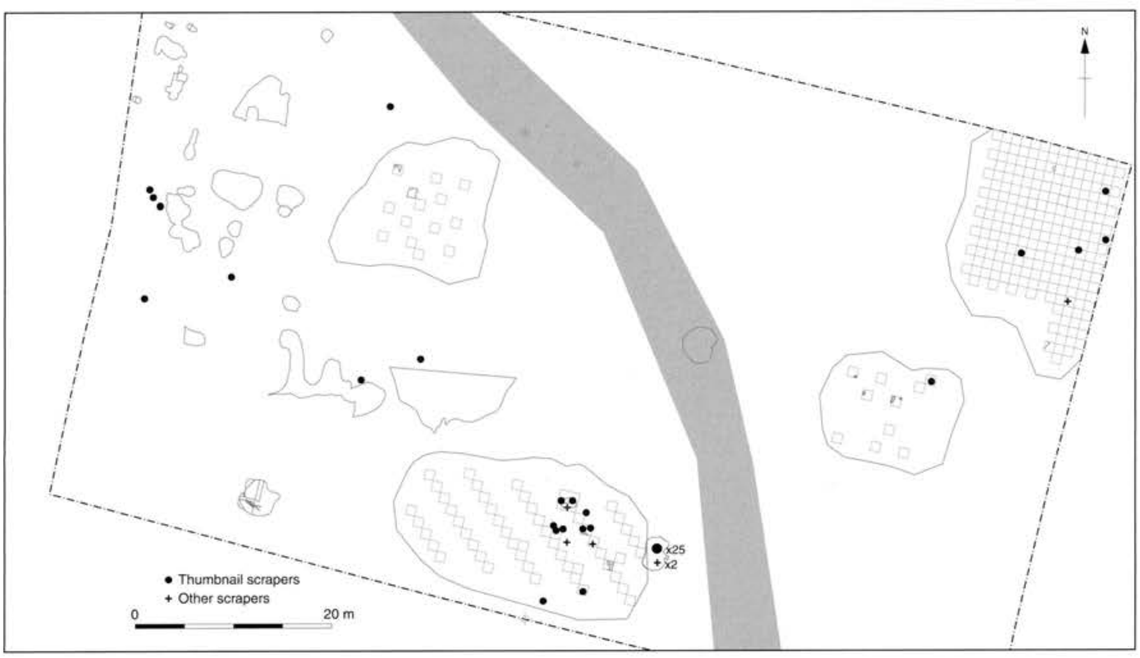


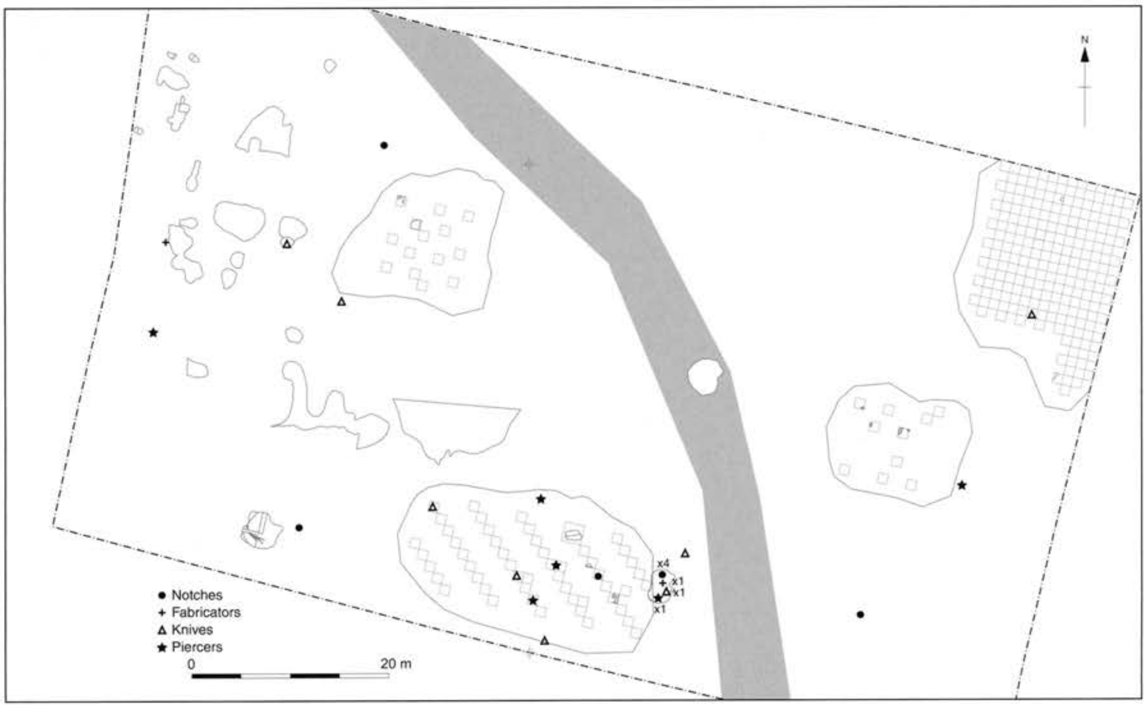
Figure 11. *Zones used for analysis of flint distributions.*

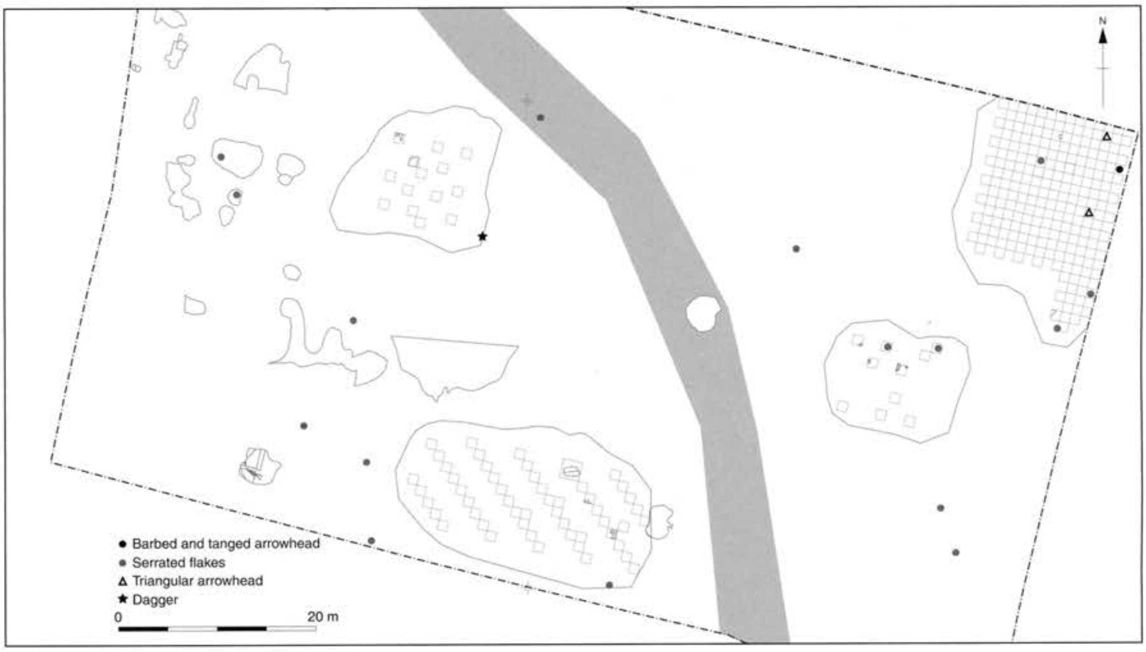




Top ***Figure 12.*** *Flint distributions: flakes, retouched flakes and miscellaneous retouch; below* ***Figure 13.*** *Flint distributions: scrapers.*

whilst no distinct clusters were present some variation exists in the density of flints across the area. The scatter contains fewer flints than zone A, but cores, chips and pieces of irregular waste are more numerous. Retouched pieces form 18% of the assemblage and whilst scrapers remain the most common tool type they are less dominant than in zone A. The presence of three serrated flakes and all three of the arrowheads from the excavation further suggests an emphasis on different activities. The arrowheads and the thumbnail scraper date from the early Bronze Age and most of the flake debitage is probably contemporary, but eight blades and bladelets, representing 13.4% of the flake debitage, may indicate the presence of some Mesolithic and/or early Neolithic flintwork.
Flint zone C covers an extensive area in the south-eastern part of the site, including buried soil Area 4, but yielded only 20 flints. The scatter is very diffuse and despite the presence of two cores, the emphasis is on retouched artefacts with ten implements,





*Top **Figure 14.** Flint distributions: notches, fabricators, knives and piercers; below **Figure 15.** Flint distributions: arrowheads, serrated flakes and dagger.*

including five serrated flakes and blades.

Flint zone D covers the western half of the excavation area, including buried soil Area 3. The flint recovered represented a low density spread with no distinct concentrations. The assemblage includes a number of exhausted flake cores and a larger partly worked core weighting 1499g, but these cores were distributed across the area and provide no indication of a distinct knapping area. Retouched tools represent 19.2% of the assemblage and notably scrapers are outnumbered by edge retouched flakes; serrated flakes are also relatively common. The flint dagger was found at the edge of this zone and represents the only diagnostic early Bronze Age artefact from the area. The flake debitage is broadly comparable to the other areas and is probably broadly contemporary with the dagger, but it is notable that blades and bladelets represent 8.7% of the flake debitage and that 13 flakes exhibited blade-like attributes. This may indicate the presence of some flint from an earlier blade-orientated industry.

The fresh condition and distribution of the flintwork across the excavation area indicates the flint scatter is *in situ*. Moreover, the zones that have been defined appear to reflect different activities. Flint zone A represents a relatively dense scatter and includes a high proportion of retouched artefacts with a particular emphasis on scrapers. In contrast, the scatter in flint zone B is more diffuse and includes a higher proportion of knapping debris. The range of retouch tools present is, however, broadly similar to zone A, but forms a lower proportion of the assemblage. Flint zones C and D represent comparatively low density scatters, but notably have an emphasis on serrated flakes rather than scrapers. Zone D also produced a number of cores. These patterns may be interpreted as different activity areas, with intensive hide or woodworking in zones A and B, some plant working in zones C and D and flint knapping around zones B and D. However, this activity may not all be contemporary. The distribution of serrated flakes and elevated proportions of blades coincide in zones B, C and D. These artefacts may date from the Mesolithic and/or early Neolithic and reflect a diffuse scatter of early flintwork with an emphasis on plant working. Early Neolithic flintwork has been recovered south of the excavation area (the SUT1 flint scatter site: Hall 1996; Last 1996) and it is possible that some of this early flintwork relates to this activity. Alternatively, it is possible that some of these flints have been imported to this area and reused as earlier flints were being reworked in the early Bronze Age. The thumbnail scrapers, tanged arrowhead and general flake morphology in zones A and B and the dagger in zone D can confidently be assigned to the Beaker period, indicating that at least some of the activity in zones A, B and D is broadly contemporary.

The densest area of the scatter in zone A is particularly notable as it forms a discrete group associated with hollow 1209. Recent research has emphasised that deposits in pits are frequently drawn from surface contexts, although these deposits are very rarely preserved (Garrow 2006; Lamdin-Whymark 2007). In general, the flint assemblages from Beaker pits elsewhere in East Anglia are broadly comparable in composition to the surface scatters at North Fen, although some differences exist in the retouched assemblages (Table 4). Garrow (2006, 128–9) suggests that scrapers are overrepresented in pit deposits and that they may have been specially selected for deposition. The assemblage from North Fen, however, contains a comparable proportion of scrapers to the average from pit deposits. It is notable that with the exception of serrated flakes and scrapers, other retouched artefacts are poorly represented in pits, but represent common occurrences in the surface deposits at North Fen. It therefore appears that the dominance of scrapers in pit deposits reflects the frequent exclusion of other tools, such as piercers, knives, daggers, and arrowheads, rather than the intentional selection of scrapers.

Pottery and fired clay (Figure 16)

Lisa Brown

The prehistoric pottery (241 sherds / 576g) spans the later middle Neolithic (*c.* 3300 BC) to late Bronze Age/early Iron Age (*c.* 1000–800 BC), but most is late Neolithic/early Bronze Age (*c.* 2000–1800 BC) in date. Seventy-eight percent of the assemblage came from buried soils, the remainder from features (Table 5). Preservation was very poor and sherds from cut features and buried soils were equally abraded, indicating that both soil conditions and exposure affected preservation.

Recording followed Prehistoric Ceramics Research Group guidelines (PCRG 1997). Details of the small assemblage of amorphous fired clay (Table 5) are available in archive.

***Table 5.** Pottery*

Fabric	No. sherds	Weight (g)	% no. / weight
unidentified	7	1	3 / 2
C1	1	20	0.4 / 3.5
F1	27	171	11 / 30
F2	34	103	14 / 18
G1	108	173	45 / 30
G2	19	59	8 / 10
Q1	22	5	9 / 1
Q2	23	44	6 / 7
Total	**241**	**576**	
Fired clay	141	189	

The predominant fabrics were grog-tempered and flint-tempered wares. Grooved Wares and Beakers

***Table 4.** The proportions of broad artefact/debitage types in relation to Beaker pit deposits from elsewhere in East Anglia.*

Area	Cores	Blades/ flakes	Hammer-stones	Serrated flakes	Scrapers	Arrowheads	Other tools
East Anglian Beaker pits (Garrow 2006, 129)	5.8%	78.1%	0	3.8%	11.2%	0.1%	1.1%
North Fen combined	3.9%	67.7%	0.4%	3.1%	10.9%	0.6%	13.4%
Zone A	2.9%	53.2%	0	0.6%	23.1%	0	20.2%
Zone B	5.7%	77.4%	0	2.8%	5.7%	2.8%	5.7%
Zone C	10%	40%	0	50%	5%	0	20%
Zone D	4%	76.8%	0	4%	4.5%	0	10.7%

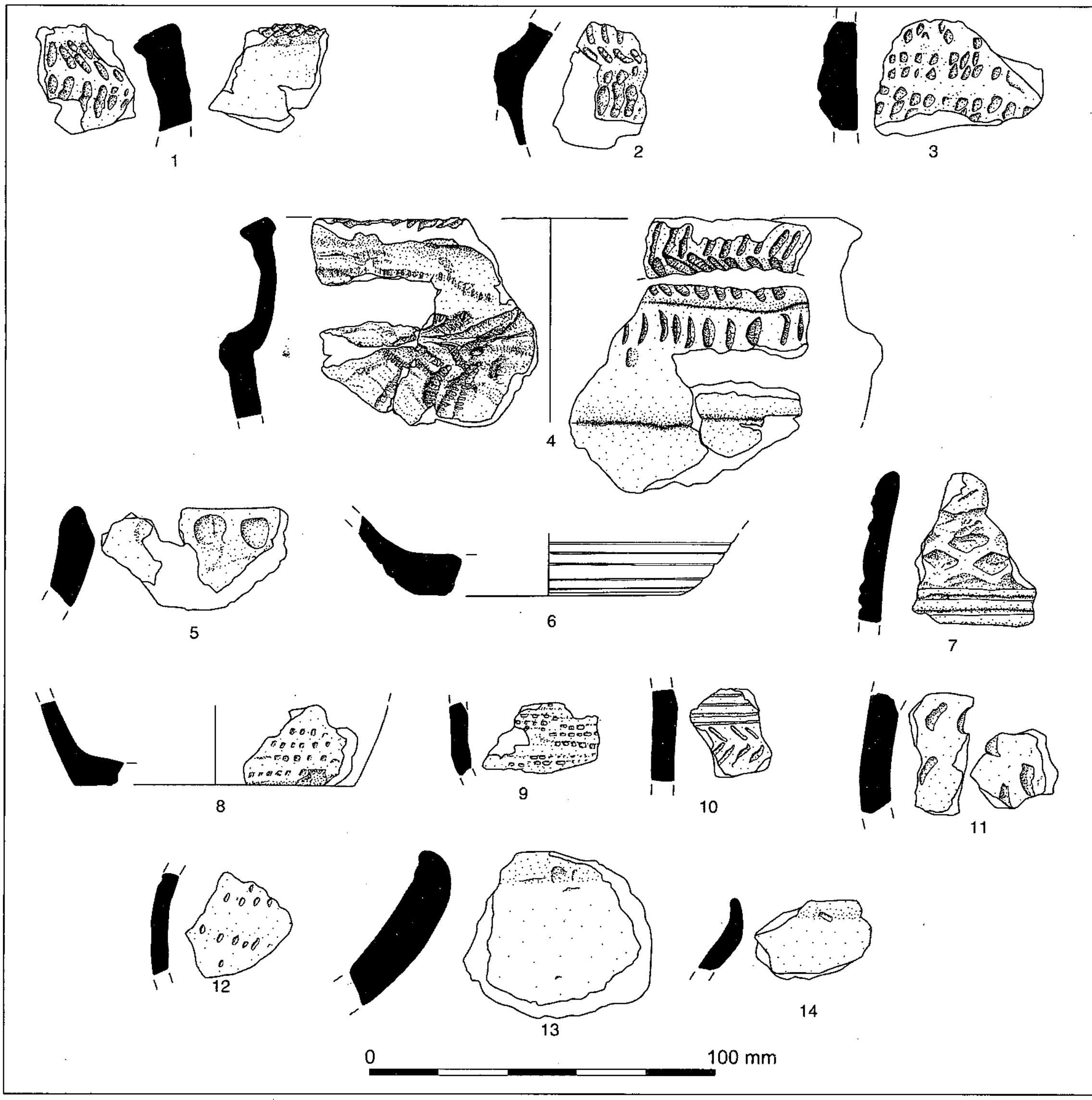


Figure 16. Prehistoric pottery.

were generally manufactured in fabric G1 and large jar forms in the more friable G2. A late Bronze Age/ early Iron Age bowl was made in sandy ware (Q2).

C1: Fine glauconitic sand with sparse shell and rare calcined flint
F1: Fine glauconitic clay with coarse rounded quartz sand and ill-assorted calcined flint
F2: Fine slightly micaceous clay with sparse to moderate ill-assorted calcined flint
G1: Smooth 'soapy' fabric with red or grey grog
G2: Friable lightly sanded ware with red grog.
Q1: Fine to medium quartz with glauconite .
Q2: As Q1 but with sparse angular, calcined flint

The earliest of the 23 individual vessels identified were Peterborough Wares. Fengate bowls in flint-tempered ware c ame from pit 1023 (Fig. 16.1–3) and a whipped-cord and linear incised grog-tempered carinated bowl from buried soil 1050 may also be Peterborough Ware (Fig. 16.4).

Three of five Grooved Ware sherds came from buried soils, including a decorated sherd in G1 from (1125), a whipped-cord decorated sherd in F2 from (1186), and a finger-tipped rim from (1019) (Fig. 16.5). Waterhole 1295 produced two cord-impressed Grooved Ware fragment in F2 and another with parallel horizontal grooves in G1. Two sherds with incised decoration from buried soil 1050 could be either Grooved Ware or Beaker (Fig. 16.6–7).

Two twisted-cord impressed Beaker sherds came from hollow 1209 (Fig. 16.8–9), and five grog-tempered Beaker sherds from the buried soils. Decoration included incised horizontal lines and herringbone pattern (Fig. 16.10). A fingernail impressed Beaker sherd (Fig. 16.11) is paralleled at Bury St Edmunds, Suffolk (Clark 1970; Gibson and Woods 1997, 154) and Haddenham, Cambridgeshire (Pollard and Johnston 2006, fig. 2.22.6). A thick-walled vessel with fingertip impressions from buried soil 1060 was probably a Food Vessel. A possible beaker sherd was recovered from pit 1211 (Fig. 16.12). Figure 16.13 is a flint-tempered jar from deposit 1003. A similar range of pottery in flint-tempered and grog-tempered fabrics has been noted at fen edge sites elsewhere in the local area, including Colne Fen (Knight 2004). The latest vessel in the assemblage was a late Bronze Age/early Iron Age bowl in Q2 from pit 1030 (Fig. 16.14).

The worked wood

Damian Goodburn

Structure 1294 comprised 10 pieces of worked wood, as found: alder poles (*Alnus glutinosa*, species identified by Dana Challinor) stacked one on top of another retained by two hazel (*Corylus avellana*) stakes on one side and backfill on the other (Figs 6-7 and 17). The stacked poles stood *c.* 0.6m high, pushed over slightly by the weight of the backfill. The revetment was truncated in antiquity, breaking horizontal poles that originally ran full length between the two stakes. At any one point between four to six poles lay one upon another. All the material was worked roundwood *c.* 40–95mm diameter;).

In the last few years a considerable number of later prehistoric 'waterholes' have been excavated in southern Britain. Some of these features contained structures of roundwood or timber of many forms, though most appear to have been revetted platforms (Masefield *et al.* 2003). In some deeper examples notched log ladders have also been found (eg Framework Archaeology 2006). The main purpose for these structures appears to have been to provide a secure place to stand or crouch whilst filling up water containers, which would appear to have been the function of structure 1294.

There are clear datable trends in the size and form

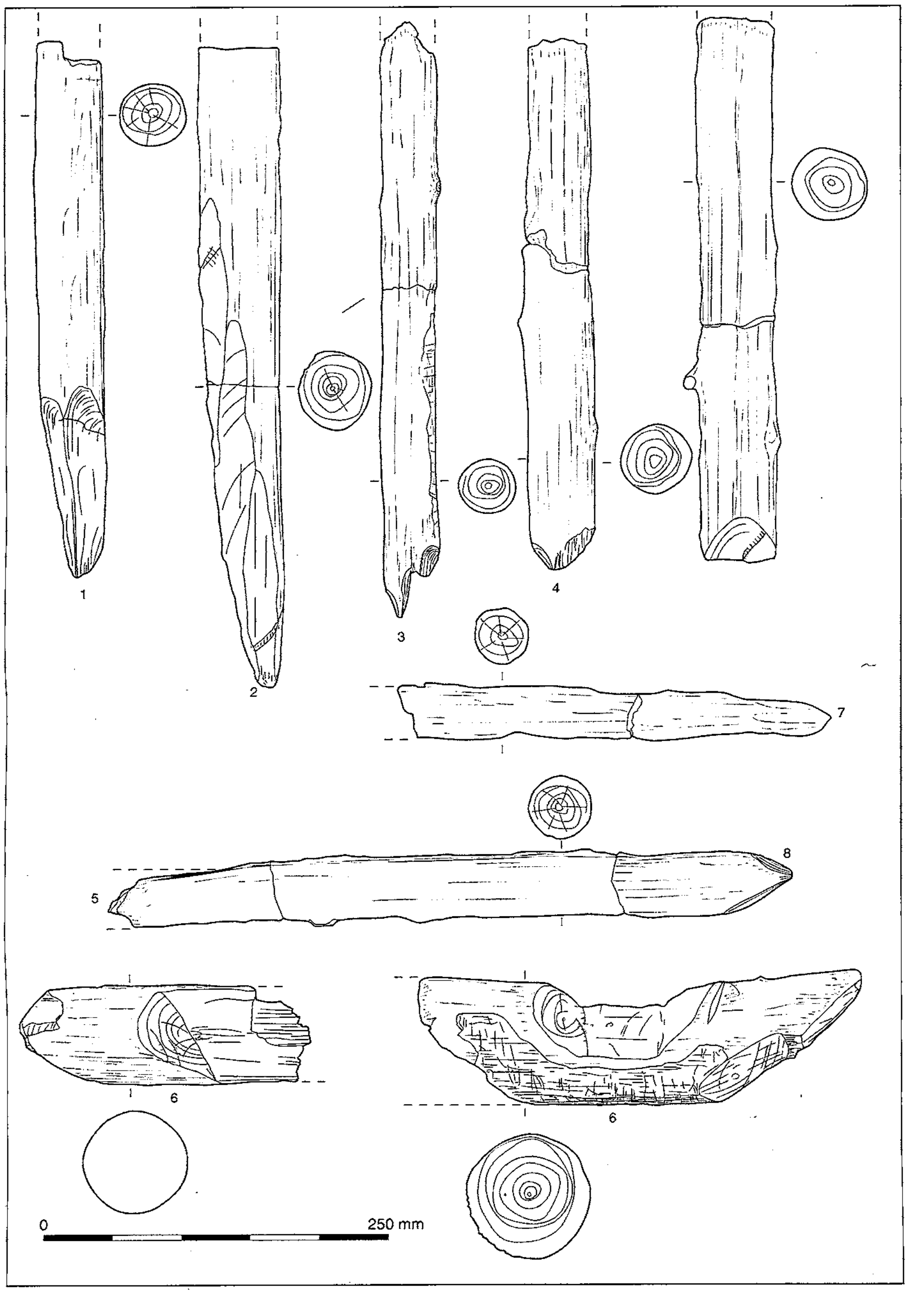


Figure 17. Worked wood from structure 1294 within waterhole 1295. 1: 1304; 2: 1310; 3: 1305; 4: 1306; 5: 1307; 6: 1308; 7: 1312; 8: 1316

of axe marks from the Neolithic to Roman periods (O'Sullivan 1997; Sands 1997; Brunning *et al.* 2000; Goodburn 2003a; 2004). Of key interest here is whether the worked roundwood was cut with stone or early metal tools or a combination of the two. The marks on the ends and sides of the poles are clearly from axes as is evident from their orientation, even though prehistoric 'axe heads' were sometimes hafted as adze heads for specialised woodwork such as boatbuilding (Goodburn 2004, 129).

The most complete axe marks were found on the ends of the basal pole (1308). Here the marks were up to 75mm wide with a curve of *c.* 13mm. They were the result of the use of a keen, thin metal blade (bronze or possibly hard copper), as typical British ground stone axe blades rarely produce axe stop marks over 35mm in width due to the thickness of the blade edge (O'Sullivan 1997, 300). Experimental work and archaeological evidence also shows that ground stone axe marks from typical British axe forms are also much rougher than those created with early metal tool edges (Orme *et al.* 1983).

During the Bronze Age, the sizes of the axes used for heavy and rough work varied in blade width from period to period. Typical maximum widths for early Bronze Age axe marks are *c.* 70–100mm (Goodburn 2003b). The width declined a little in the middle Bronze Age to *c.* 65–70mm wide (Goodburn 2004, 131) and was smaller still in the late Bronze Age at *c.* 45–50mm wide (Goodburn 2003a, 104).

The very curved axe marks found may have been produced by the use of a large, cresentic-bladed, flanged axe (Megaw and Simpson 1979, 220). These tools are apparently typical of the secondary phases of the early Bronze Age in southern Britain. Thus, on technological grounds an early Bronze Age date can be proposed for structure 1294, perhaps *c.* 2300–1800 BC. This agrees with the radiocarbon date from timber 1308 of 2014–1776 cal BC (Table 1).

The material was all similar: pole sections taken from small whole stems. Indeed, it is likely that the alder poles derive from perhaps two stems. Alder is a wetland deciduous species with a fairly straight growth habit and softwood easily cut with bronze tools. The felling and cutting of the top and side branches was clearly done with metal axes. The stems were axe cross cut into pole lengths of *c.* 1.75m and ranged from *c.* 43–95mm diameter.

The poles had two fairly pointed ends, and so were initially thought to have been reused stakes, but this is an artefact of cross cutting a pole with an axe when a pole is cross-cut quickly with an axe a blunt 'wedge point' is normally left on both ends so they may be easily mistaken for a stake by modern observers. The poles survived stacked four or five high, lightest to the top, with those higher being less well preserved. Some survived as amorphous fragments such as 1312, but most were much better preserved.

The best preserved horizontal pole was basal pole 1308, which was recorded as 1.73m long *in situ*, and was 95mm in diameter at the largest end (Fig. 17.6). Both ends were roughly axe-cut and had also been carefully axe notched. These notches retained clear, very curved, axe stop marks up to 75mm wide and were cut to fit snugly round the bases of vertical stakes 1304 and 1310, almost in the manner of a notched 'laft' or housing joint. The other smaller poles had one blunt axe cut end with the other being broken.

Two poles 60–65mm in diameter were cut out of straight hazel stems. Each stake was lifted in at least four sections, but it could be seen that stake 1310 survived 0.94m long. Stake 1304 had an elongated axe-cut point formed of two adjacent concave facets while stake 1310 was hewn to a 'pencil'-form point with many small facets (Fig. 17.1–2).

Animal bone

Lena Strid

The animal bone assemblage comprised 136 fragments (1.3 kg), mostly in a very poor condition. Cattle was the only identified species, represented by two fragments from waterhole 1199.

Human bone

Ceridwen Boston

Two fragments of human bone were recovered from the upper fill of waterhole 1199. The anterior part of an adult cranial vault included most of the frontal bone, the orbits, part of the nasal and parietal bones. The large supra-orbital ridges suggest that the individual was male, as do the marked temporal lines. Complete fusion of the coronal suture on both the ectocranial and endocranial aspects indicated that the individual was greater than the age of 40 years when he died. The anterior sagittal suture was incomplete but also was fully fused, suggesting an age greater than 43 years. The cranium has been radiocarbon dated to 2194–1979 cal BC (Table 1). One fragment of long bone shaft was also recovered. It appeared to be either humerus or femur, the latter being more probable. Pathology was not noted on any of the bone fragments.

Charred plant remains and charcoal

Dana Challinor

Ten taxa were positively identified: yew (*Taxus baccata*), elm (*Ulmus* sp.), oak (*Quercus* sp.), alder (*Alnus glutinosa*), hazel (*Corylus avellana*), lime (*Tilia* sp.), poplar/willow (*Populus/Salix*), blackthorn (*Prunus spinosa*), hawthorn/apple/pear/service (Maloideae) and ash (*Fraxinus excelsior*). Much of the hazel and all of the yew came from small diameter roundwood stems. The samples produced, on the whole, quite mixed assemblages with an average of four taxa per sample. Nonetheless oak was present in all of the samples, and clearly dominated several including context 1029 from pit/hollow 1030. The use of shrubs/trees for fuel wood such as blackthorn, hawthorn group and hazel (which are typical of hedgerow/scrub) is consistent with the picture of open landscape of pasture/grassland gained from the environmental analyses from waterhole 1295 (see below). Trees such as alder, lime and willow or poplar prefer wet or damp soils, and would have flourished in the fenland environment. However, the yew, elm, oak and lime suggest that woodland resources were also exploited.

Non-charcoal charred plant remains were rare. A few small fragments of hazel nutshell were noted in the buried soil and pits/hollows 1030 and 1211. Pit/hollow 1211 was also the only context to produce any cereal remains, although these were limited to a single whole grain (*cf. Hordeum*, barley) and a few unidentifiable grain fragments.

The waterlogged fills of waterhole 1295 contained well-preserved organic material, and were targeted for environmental sampling. Bulk samples of 40L in volume (samples 32–3) were collected from the two main fills of the waterhole (contexts 1292 and 1293), and 2L incremental samples were collected at 10cm intervals through these two fills and overlying peat layer 1291 (samples 34–40; Fig. 6). The two bulk samples were richest in plant and insect remains, and these were therefore selected for further analysis. A monolith sample was also taken for pollen analysis alongside the incremental samples.

Waterlogged plant macrofossils
Wendy Smith

The plant remains recovered are typical of a range of habitat types, all of which are likely to occur in and around a waterhole set within grassland/pasture (Table 6). The taphonomy of these deposits probably represents the gradual infilling of the waterhole with detritus from surrounding vegetation.

A range of grassland/meadow plants such as buttercups (*Ranculus acris* L/*repens* L./*bulbosus* L.), mouse-ear (*Cerastium* spp.), self-heal (*Prunella vulgaris* L.) and greater plantain (*Plantago major* L.) were recovered. Parsley-piert (*Aphanes arvensis* L.), a plant typical of cultivated and/or open ground conditions, was also recovered. Several plants typical of waste places were identified, but common nettle (*Urtica dioica* L.) was most frequently recovered. A number of taxa typical of damp to wet conditions were recovered, including celery-leaved buttercup (*Ranunculus sceleratus* L.), crowfoot (*Ranunculus* subgenus BATRACHIUM (DC) A. Gray), water-starwort (*Callitriche* spp.), rushes (*Juncus* spp.) and sedges (*Carex* spp.). Those taxa most indicative of standing water (e.g. crowfoot and water-starwort) were recovered from the upper deposit (context 1292). Several taxa indicative of scrub, hedges and/or woodland also were recovered, but typically in small quantities. These taxa included bramble (*Rubus* spp.), campion (*Silene* spp.), dogwood (*Cornus sanguinea* L.), hazel (*Corylus avellana* L.) and sloe/blackthorn (*Prunus spinosa* L.). Bramble/blackberry seeds are frequently super-abundant in waterlogged deposits, but their low density here (<20 items) and only small quantities (<5 items) of other scrub/woodland taxa suggests that although some shrubs/trees were in the vicinity, they are unlikely to have been a dominant part of the overall vegetation.

Common nettle (*Urtica dioica* L.) and elder (*Sambucus nigra* L.) are often associated with high nitrogen input, such as cattle manure. There is limited indication for trampled ground in this flora. Both knotgrass (*Polygonum aviculare* L.) and greater plantain (*Plantago major* L.) can occur in heavily trampled areas (e.g. Robinson 1989, 89). Certainly many of the damp to wetland plants can also occur in muddy places, which may be the situation on heavily trampled ground around a water source.

The fills of waterhole 1295 contain a flora that probably represents plants growing in the immediate vicinity of the waterhole (*cf.* Peglar and Wilson 1978, 147). It is, of course, plausible that manure from livestock visiting the waterhole may also have entered the feature adding to the seed assemblage, possibly with the inclusion of browsed vegetation, given that dung beetles were recovered from the waterhole (D Smith, this report). However, it is more likely that this water feature acted as a pitfall trap accumulating insects and plant remains which accidentally fell or were blown into this feature, which was clearly placed within grassland with limited amounts of trees/scrub.

The waterlogged plant assemblages are dominated by native plants typical of grassland/meadow, wood/scrub and damp to wet ground. A small quantity of plants typical of high nitrogen input (eg elder and common nettle) were identified in the plant macrofossil assemblage, and the insect remains recovered from the deposit include a small proportion of dung beetles. Together, these limited results suggest domesticated livestock were grazing grassland in the vicinity of the waterhole, though clearly not intensively.

Waterlogged roundwood
Dana Challinor

Contexts 1292 and 1293 both contained well-preserved waterlogged roundwood. A selection of 15 pieces from each context were identified in full. There was a marked difference between the two deposits, with the lower deposit (1293) containing only hazel (*Corylus avellana*) and blackthorn (*Prunus spinosa*), while the upper fill (1292) produced oak (*Quercus* sp.), alder (*Alnus glutinosa*), blackthorn, hawthorn/apple/pear/service (Maloideae) and wild privet (*Ligustrum vulgare*). The stems ranged in size from 6–38mm, although the maturity was more consistent with most being 6–8 years old. It is possible that some of the wood was related to the revetment structure 1294, which was composed of alder and hazel, although the diameter of the poles and stakes of 1294 were larger than the stems which were loose in the fill. None of the pieces appeared to be worked. The wood assemblage is characteristic of hedgerow or scrub, which is consistent with the other environmental evidence from the waterhole.

Pollen
Lucy Verrill

A monolith sample was taken through the fills of waterhole 1295 (contexts 1291–3; Fig. 6), and six subsamples prepared for pollen analysis. Pollen was preserved in all the samples assessed and the frequencies were high in all levels (Table 7). In general,

Sample Number	32	33	34	35	36	37	38	39	40	Habitat(s)	Common Name
Context Number	1292	1293	1293	1293	1292	1292	1292	1291	1291		
Depth from top of feature (cm)			80–90	70–80	50–60	40–50	30–40	20–10	10–0		
Ranunculus acris L./ *repens* L./ *bulbosus* L.	++	++			+	+		+		G to Gw and/or M	meadow/creeping bulbous buttercup
Ranunculus subgenus RANUNCULUS							+			G to Gw and/or M	buttercup
Ranunculus subgenus BATRACHIUM (DC) A. Gray	+++	++	++	+	+++	+++	++++	+	+	Gw to Ws and/or W	crowfoot
cf. Aquilegia vulgaris L.				+						Gw, F & Wo	columbine
Urtica dioica L.	++	+	+	+	++	+	+++	+		*V* esp. Wo, F and Cu	common nettle
Chenopodium spp.	+	++	+	+	+	+	+	+			goosefoot
Chenopodium spp./ *Atriplex* spp.	+										goosefoot/orache
Atriplex spp.	+						+				orache
Stellaria media s.l.	++	+	+	+	+	+	+			Cu and O	common chickweed
Cerastium spp.		+		+	+					*typ* G	mouse-ear
Lychnis flos-cuculi L.	+									Gw and/or M	ragged-robin
Silene spp.	+										campion
CARYOPHYLLACEAE											Pink Family
Persicaria lapathifolia (L.) Gray		+	+	+			++			Wa, Cu and O esp Dg	pale persicaria
Persicaria spp.	+	+	+	+	+	+	++	+			knotweed
Polygonum aviculare L.	+			+		+	+			O	knotgrass
Polygonum spp.	+			+				+			knotgrass
Rumex spp.	++	++	++	++	+++	+++	+++	+		*typ* G	dock
cf. Rorippa nasturtium-aquaticum (L.) Hayek	+			+						Ws and/or W	water-cress
Rubus spp.	++	+	+	+	+	++	+++	+		*typ* of Wa	bramble
Prunus avium (L.) L./ *cerasus* L.			+							He, Wb and/or Co	wild/dwarf cherry
Chaerophyllum temulum L.	+									G, He and/or Wb	rough chervil
Torilis japonica (Houtt.) DC		+								G, He and/or Wb	upright hedge-parsley
cf. Stachys spp.										*V* esp. G, He and Wo	woundwort
Galeopsis spp.		+	+	+					+	*typ* Dg	hemp-nettle
cf. Prunella vulgaris L.					+						possible selfheal
Lycopus europaeus L.		+									gypsywort
LAMIACEAE – *Mentha* spp. type	+		+								Mint Family seed type
LAMIACEAE – unidentified			+								Mint Family
Callitriche spp.	+	+					+++			*typ* W, but also Ws	water-starwort
Plantago major L.	+			+	+					O, G or Cu	greater plantain
Sambucus nigra L.	+	+			+	+				He, Wo & Wa	elder
Carduus spp./ *Cirsium* spp./ Centaurea spp. – seed head			+							*typ* G	thistle/knapweed
Cirsium spp.		++				+	++			*typ* G	thistle
Lapsana communis L.	+				+					Wo, He and Wa	nipplewort
Sonchus spp.		+								*typ* of Wa and Cu	sow-thistle
Juncus spp.	+++	+++	+	++	+++	++++	+++++	++	+++	*typ* of Gw, Gw	rush
Schoenoplectus lacustris (L.) Palla/ *tabernaemontani* (C.C. Gmel.) Palla						+	+		+	W and/or M	common/grey club-rush
Carex spp. – 2-sided		+			+	+	+			*typ* Dg, Gw or M	sedge
Carex spp. – 3-sided	+		+		+	++	+	++	+	*typ* Dg, Gw or M	sedge
Glyceria spp.		+				+				Ws	sweet-grass
POACEAE – indeterminate large grass caryopsis			+								Grass Family Indet..
POACEAE – indeterminate medium grass caryopsis			+				+				Grass Family Indet..
POACEAE – indeterminate small grass caryopsis					+						Grass Family Indet..
Unidentified bud	+	+	+	+		+		+			Unidentified large buds
Unidentified bud scars	++	++	+								Unidentified bud scars
Unidentified vegetative material (grass/ plant stalks)	++++	+++++									

Table 6. *Waterlogged plant remains (excluding wood) from waterhole 1295. Key for semi-quantitative scores: + 1–3; ++ 4–9; +++ 10–20; ++++ 21–40; +++++ > 40. Habitat Codes: Co Copse; Cu cultivated ground; Dg Damp ground; F Fen; G grassland; Gw wet grassland; He Hedges; M marsh; O open ground; W water plant; Wa waste ground; Wb Woodland border; Wo Woodland; Ws waterside.* typ *typically and* V *variable habitats.*

Depth m		**0.14**	**0.30**	**0.55**	**0.80**	**0.86**	**0.96**
Tree pollen %		16.4	14.9	21.6	13.6	9.7	20.6
Shrub pollen %		13.6	12.3	8.4	27.7	2.1	4.2
Herb pollen % (incl. Cereal type)		69.9	73.4	70.1	58.6	88.5	74.8
Spores %		2.1	2.5	2.4	1.4	0.7	8.3
Total Land Pollen (minus spores and aquatics)		**140**	**285**	**167**	**213**	**145**	**96**
Trees							
Alnus glutinosa	Alder	5.7	3.2	6.6	5.6	2.8	3.1
Betula	Birch	5	5.6	6	3.8	1.4	8.3
Fagus	Beech		0.4				1
Fraxinus excelsior	Ash	0.7	0.4	1.2		0.7	
Pinus sylvestris	Pine		0.4	1.2		0.7	1
Quercus	Oak	3.6	4.2	6	2.8	3.4	5.2
Tilia	Lime	1.4	0.7	0.6	0.5		1
Ulmus	Elm				0.9	0.7	1
Shrubs							
Corylus avellana type	Hazel	13.6	11.2	7.8	27.2	2.1	4.2
Hedera	Ivy				0.5		
Ilex	Holly		0.7	0.6			
Salix	Willow		0.4				
Crops							
Cereal type			0.7	0.6		0.7	1
Herbs							
Apiaceae	Cow parsley family	2.1	1.8	1.2			
Artemisia	Mugwort	0.7					
Carypohyllaceae	Pink family		3.9	0.6	0.9	0.7	3.1
Chenopodiaceae	Goosefoot family	1.4	2.5			2.1	
Cardueae (Asteroideae)	Daisy family	0.7	0.4			2.1	1
Cyperaceae	Sedge family	1.4	1.4	3.6	0.9	2.1	1
Filipendula	Meadowsweet					1.4	
Hypericum	St John's Wort				0.5	0.7	
Lactuceae	Dandelion type	2.9	1.8	3	2.8		2.1
Melampyrum	Cow-wheat	1.4	0.4	0.6	0.5		
Persicaria maculosa	Redshank		0.4				
Plantago lanceolata	Ribwort plantain	23.6	11.6	16.2	9.4	11	12.5
Plantago und.	Plantain	5	4.9	3	6.1	3.4	5.2
Poaceae	Grass family	22.9	34.7	32.3	27.2	54.5	36.5
Potentilla type	Cinquefoil type			1.2	0.5		
Ranunculus sp	Buttercup	2.1	3.5	1.2	4.2	2.1	3.1
Rosaceae und.	Rose family	2.9	2.8	1.8	2.3	2.1	1
Rubiaceae	Bedstraw family		0.4			2.1	
Rumex type	Dock	1.4	0.4	1.2		1.4	1
Saxifraga und.	Saxifrage		0.7	1.8	1.4		
Succisa pratensis	Devil's-bit Scabious			1.2	1.4	0.7	3.1
Teucrium	Germanders					0.7	
Trifolium	Clover		1.1		0.5	0.7	2.1
Urtica	Nettle	1.4		0.6			2.1
Pteridophytes							
Sphagnum							1
Polypodium	Polypody fern						1
Pteridium aquilinum	Bracken		1.1	0.6		0.7	2.1
Pteropsida (monolete) indet.	Ferns	2.1	1.4	1.8	1.4		4.2
Aquatics							
Lemna	Duckweed				0.5		
Indeterminates		**3.6**	**14.4**	**10.8**	**10.3**	**11**	**7.3**
Microscopic charcoal		110	110.9	98.8	98.1	113.1	285.4

***Table** 7. Pollen data from waterhole 1295. All numbers are percentages of total land pollen.*

preservation was good or fair and the percentages of indeterminate pollen were less than 20% of total land pollen (TLP).

0.96–0.66m (context 1293)

In the basal context, values of arboreal pollen decline from 20% to *c.* 10% of the total land pollen sum, before recovering at 0.8m to *c.* 14% TLP. The main tree pollen types represented are alder (*Alnus glutinosa*), birch (*Betula*) and oak (*Quercus*). Percentages of shrub pollen are negligible until 0.8m, where hazel-type (*Corylus avellana*-type) pollen reaches 27% TLP. Herbaceous pollen, dominated by Poaceae throughout, forms 75% of the pollen sum initially, peaking at *c.* 88% TLP at 0.86m and declining to 58% TLP at 0.8m. A relatively wide suite of open-ground herbs was recorded, dominated by ribwort plantain (*Plantago lanceolata*) (stable at *c.* 11% TLP), with lesser percentages of pink family (Caryophyllaceae), dandelion family (Lactuceae), buttercups (*Ranunculus*) and devil's-bit scabious (*Succisa pratensis*). Two cereal-type grains were recorded. Values of microscopic charcoal are initially extremely high at nearly 300% TLP, but declined to *c.* 100% TLP at 0.86m, remaining stable throughout the profile.

0.66–0.14m (contexts 1291 and 1292)
Very few changes in the pollen assemblage are recorded within this section of the monolith. The arboreal pollen suite is almost identical to that in the underlying context, with the exception of the disappearance of elm (*Ulmus*) pollen above 0.66m. Shrub pollen percentages increase gently from *c.* 8 to *c.* 14% TLP. Whilst the total percentage representation of herbaceous pollen remains more or less stable at *c.* 70% TLP, fluctuations are evident in the constituents of this group. Grass family (Poaceae) pollen percentages initially recover from the slight depression at 0.8 m, reaching *c.* 33% TLP at 0.55m and 0.3m, before declining to 22% TLP at 0.14m. This pattern is mirrored by the increase in ribwort plantain pollen percentages from *c.* 16% to *c.* 23% TLP. The suite of minor herbaceous plants is much the same as that in the lowermost context. Two cereal type pollen grains were recorded, in the lowermost two spectra of the context.

Discussion
The low quantity of arboreal pollen indicates an open landscape prior to the formation of the feature, and the relative stability of the assemblages in the lowermost spectra suggests that the local and regional vegetation patterns were well-established. The sporadic presence of elm pollen indicates that the sediments post-date the primary (Neolithic) elm decline of *c.* 5800 cal BP. Interestingly, the very low values of lime pollen could indicate the sequence post-dates the 'lime decline' which, though asynchronous, is generally of late Neolithic to middle Bronze Age date and associated with human activity (Turner 1962). Lime declines predating the early Bronze Age are also seen in pollen sequences from the Ouse palaeochannel 3.5km to the south and Foulmire Fen Terrace 5km to the south (Cloutman 2006a, 41; Peglar 2006, 28) although at both sites, rising water tables may have made some areas previously occupied by lime unsuitable for its growth (Evans and Hodder 2006, 26).

There are few significant changes in the pollen profile. Herbaceous pollen taxa dominate throughout the sequence, demonstrating maintenance of an open landscape. The predominance of grass pollen accompanied by a range of grassland herbaceous plant taxa indicates pastoral agriculture was occurring in the vicinity. The occasional presence of cereal-type pollen grains and weeds associated with agriculture, such as mugwort (*Artemisia*) and goosefoots (Chenopodiaceae) suggest that arable agriculture was occurring on dry-land areas in the vicinity of the site. The peak in hazel pollen at 0.8m can perhaps be interpreted as the expansion of a copse or an area of hazel scrub, although this does not appear to represent the cessation of agricultural activity. This scrubland persisted in the landscape for the duration of the time represented by the profile, although it was evidently reduced in area. Agriculture continued throughout the profile, albeit perhaps at reduced levels during the time represented by the peat (0.14m spectrum).

Whilst the nearby Ouse channel pollen profile from the fen proper shows much higher arboreal pollen percentages in Neolithic and post-Neolithic levels than that from this site (Evans and Hodder 2006, 26), the Bronze Age profile from the Delphs Terrace, a gravel fen island more directly comparable to the North Fen island, evidences a very similar pollen sequence, with grass and grassland herbs dominating, and tree and shrub pollen persisting at very low levels throughout the profile (Cloutman 2006b, 206). The profile from Foulmire Fen Terrace, another gravel fen island, is also dominated by non-arboreal pollen, but trees, principally alder, are better represented in Bronze Age levels than in either the Delphs Terrace or the North Fen profiles.

Insects
David Smith
Sub-samples for insect analysis were taken from the two bulk samples from waterhole 1295 (contexts 1292 and 1293). The two insect faunas are very similar in nature, and will thus be discussed together (Table 8).

The dominant feature of these faunas, perhaps not surprisingly, is the clear evidence for slow-flowing, still or even stagnant waters. The very abundant Hydraenidae *Ochthebius minimus* is commonly associated with slow-flowing shallow water and clogged with vegetation (Hansen 1986). *Hydreana britteni* is also particularly associated with shallow, shaded 'peaty' pools also clogged with vegetation (Hansen 1986). A similar environment is also favoured by the *Limnebius* and *Hydrochus* species along with the hydrophiliids *Enochrus* spp. *Cercyon convexiusculus*, *C. tristis* and *Coelostoma orbiculare* (Hansen 1986). Other areas of the waterhole may have had a more open surface, as suggested by the presence of a range of 'diving beetles' which are normally associated with such water bodies. Species typical of this environment are *Agabus bipustulatus*, *Agabus* spp., *Hydroporus* spp. and *Acilus* spp. (Nilsson and Holmen 1995). Two species of 'reed beetle', *Donacia marginata* and *Plateumaris braccata* indicate the presence of waterside vegetation. The former is associated with branched burr-reed (*Sparganium erectum* L.) and the later with water reed (*Phragmites australis* (Cav.) Trin. ex Steud.) (Koch 1992). *Noterus acridulus* is similarly associated with reed sweet grass (*Glyceria maxima* (Hartm.) Holmb) (Koch 1992). There is also evidence to suggest duckweed on the surface of the water, indicated by the presence of the small weevil *Tanysphyrus lemnae* which feeds on this plant (Koch 1992).

There are hints in the insect faunas that the waterhole may have been surrounded by rough grassland or pasture. This is primarily suggested by the small proportion of the terrestrial fauna (*c.* 8–9%) which are associated with the dung pats of herbivores such as cattle and sheep. This includes the *Geotrupes* or 'dor' beetle and *Aphodius sphacelatus* and *A. fimentarius* 'dung beetles' (Jessop 1986) and the 'rove beetle' *Platystethus arenarius* (Tottenham 1972). Grassland is also suggested by the presence of the two 'chaffers' *Phyllopertha horticola* and *Hoplia philanthus* which

	Ecological codes	Context 1292 Sample 32 8L, 9kg	Context 1293 Sample 33 16L, 18.5kg
DERMAPTERA **Forficulidae**			
Forficula auricularia (L.)		-	2
HEMIPTERA Indet.		-	12
COLEOPTERA **Carabidae**			
Nebria brevicollis (F.)		1	-
Loricera pilicornis (F.)		1	1
Clivina fossor (L.)		1	1
Dyschirus globosus (Hbst.)		1	1
B. guttula (F.)		-	1
Bembidion spp.		1	1
Stenolophus mixtus (Hbst.)	ws	1	-
Pterostichus minor (Gyll.)	ws	-	1
Dromius longiceps Dej.		-	1
COLEOPTERA **Halididae**			
Haliplus spp.	a	-	1
COLEOPTERA **Dytiscidae**			
Hydroporus spp.	a	-	1
Agabus bipustulatus (L.)	a	1	-
Agabus spp	a	-	3
Acilius spp.	a	-	1
COLEOPTERA **Gyrinidae**			
Gyrinus spp.	a	-	1
COLEOPTERA **Hydraenidae**			
Hydreana britteni Joy	a	1	-
Hydreana spp.	a	-	2
Ochthebius bicolon Germ.	a	-	1
Ochthebius minimus (F.)	a	24	83
Octhebius spp.	a	30	120
Limnebius spp.	a	1	6
Hydrochus spp.	a	-	1
Helophorus spp.	a	5	16
COLEOPTERA **Hydrophilidae**			
Coelostoma orbiculare (F.)	a	1	1
C. impressus (Sturm)	df	1	-
Cercyon tristis (Ill.)	ws	-	1
Cercyon convexiusculus Steph.	ws	1	-
Megasternum boletophagum (Marsh.)	df	2	2
Hydrobius fusipes (L.)	a	-	2
Enochrus spp.	a	3	5
COLEOPTERA **Silphidae**			
Phosphuga atrata (L.)	df	-	1
Silpha tristis Ill.		-	1
COLEOPTERA **Orthoperidae**			
Corylophus cassidoides (Marsh.)		-	1
COLEOPTERA **Staphylinidae**			
Micropeplus staphylinoides (Marsh.)		1	2
Lesteva spp.	ws	1	2
Trogophloeus bilineatus (Steph.)		-	3
Trogophloeus corticinus (Grav.)	ws	7	-
Trogophloeus spp.		-	2
Oxytelus sculptus Grav.		-	1
Oxytelus rugosus (F.)		-	1
Oxytelus nitidulus Grav.		2	1
Oxytelus tetracarinatus (Block)		-	1
Platystethus arenarius (Fourc.)	df	-	2
Platystethus corntus (Grav.)	ws	4	-
Bledius spp.	ws	-	1
Stenus spp.		5	4
Paederus spp.		-	1
Lathrobium spp.		-	1
Xantholinus spp.		2	2

	Ecological codes	Context 1292 Sample 32 8L, 9kg	Context 1293 Sample 33 16L, 18.5kg
Philonthus spp.		-	2
Philonthus spp.		2	-
Tachyporus spp.		-	1
Tachinus rufipes (Geer.)		-	1
Aleocharinidae Indet.		5	6
COLEOPTERA **Pselpahidae**			
Rybraxis sp.		1	-
Brachygluta spp.		1	3
COLEOPTERA **Cantharidae**			
Cantharis sp.		-	1
Rhagonycha fulva (Scop.)		-	1
COLEOPTERA **Elateridae**			
Agroties spp.	p	1	1
COLEOPTERA **Helodidae**			
Helodidae Indet.	a	-	1
COLEOPTERA **Dryopidae**			
Dryops spp.	a	-	2
COLEOPTERA **Byrrhidae**			
Byrrhus pilula (L.)		-	1
COLEOPTERA **Nitidulidae**			
Brachypterus urticae (F.)[1]	p	1	1
COLEOPTERA **Cryptophagidae**			
Atomaria spp.		-	1
COLEOPTERA **Lathridiidae**			
Corticaria/Corticarina spp.		-	2
COLEOPTERA **Coccinellidae**			
Adalia bipunctata (L.)		-	1
Platynaspis luteorubra (Goeze)		-	1
COLEOPTERA **Mordellidae**			
Anaspis spp.		1	-
COLEOPTERA **Scarabaeidae**			
Geotrupes spp.	df	-	1
Aphodius sphacelatus (Panz.)	df	2	4
Aphodius fimentarius (L.)	df	2	-
Phyllopertha horticola (L.)	p	-	1
Hoplia philanthus (Fuessl.)	p	-	1
COLEOPTERA **Chrysomelidae**			
Donacia marginata Hopp [2]	ws	1	-
Plateumaris braccata (Scop.)[3]	ws	1	-
Hydrophassa marginella (L.)[4]	ws	-	1
Phyllotreta spp.		1	2
Chaetocnema concinna (Marsh.)		1	-
Psylliodes sp.		-	1
COLEOPTERA **Scolytidae**			
Scolytus rugulosus (Müll.)	l	1	4
COLEOPTERA **Cuculionidae**			
Apion spp.	p	-	2
Barypeithes spp.		1	1
Strophosoma melanogrammum (Forst.)	p	-	1
Sitona humeralis Steph.[5]	p	-	1
Sitona spp.		1	-
Bagous spp.	ws	1	-
Tanysphyrus lemnae (Payk.)[6]	a	2	1
Notaris acridulus (L.)[7]	ws	-	1
Trachodes hispidus (L.)[8]	l	-	1
Hypera spp.[9]	p	-	1
Ceutorhynchus spp.	p	-	1
SUBORDER CYCLORRHAPHA			
family, genus & spp. Indet.		9	30
HYMENOPTERA			
Formicoidea Indet.		5	15

Table 8. *Insect remains from waterhole 1295. a aquatic species; aff aquatic species normally associated with fast flowing water; ws waterside species either from muddy banksides or from waterside vegetation; m species normally associated with moorland; df species associated with dung and foul matter; g species associated with grassland and pasture; l species either associated with trees or with woodland in general. Phytophage host plants (Koch 1989; 1992):*

are associated with old rough pasture (Jessop 1986). *Sitona humeralis* and the *Hypera* species of weevil are normally associated with medicks (Medicago spp.) and clover (*Trifolium* spp.) (Koch 1992). Both of these plants are particularly common in grassland. Rough disturbed areas are also suggested by the recovery of *Brachypertus urticae* which feeds on stinging nettle (*Urtica dioica* L.).

There are very few indicators of trees or woodlands in the area. The two taxa recovered consist of a small number of individuals of the scolydiid 'bark beetle' *Scolytus rugulosus* which is associated with a range of rosaceous shrubs and trees and a single individual of the weevil *Trachodes hispidus* which is associated with a range of dead wood (Koch 1992). It would therefore seem that the area around the waterhole was essentially clear of dense woodland, except perhaps for scrub.

It is clear from the ecology of the species recovered that this early Bronze Age waterhole was set in a cleared landscape, possibly used for grazing. While few other insect analyses have been carried out on comparable early Bronze Age features, analyses of faunas from waterholes within later Bronze Age field systems have been conducted at sites such as Hillfarrance, Somerset (Smith and Tetlow in press) and Perry Oaks, Heathrow (Framework Archaeology 2006). At both of these locations the later Bronze Age landscape is dominated by indicators for grassland and grazing animals. As at North Fen there is also a lack of species associated with deadwood or trees, suggesting a cleared landscape. The landscape associated with these sites is the forerunner of what appears to be pasture, most commonly identified in lowland landscapes during the Iron Age.

Soil micromorphology summary

Richard I Macphail

Five thin sections through palaeosol deposits were analysed from monolith samples 8, 9 and 11 (Fig. 4). The palaeosol can be considered as a humic sandy alluvial gley soil. This soil was bioactive, with artefacts being worked down-profile, although high water tables and the coarse parent material probably led to an acidophyle small invertebrate mesofauna being normally dominant (*cf.* "grey alluvial soil": Duchaufour, 1982, 187). The soil also continued to accrete; the Neolithic/Bronze Age occupation topsoil which is rich in coarse and fine artefacts, and has a microfabric rich in fine charcoal, was buried by some 55mm of coarse alluvium in monolith 8. This upper palaeosol developed a humic Ah horizon that is poor in charcoal indicating that the site had been 'abandoned', probably because of increased flooding and site wetness, but before full blown fen peat formation commenced. Increased soil wetness resulted in the preservation of much amorphous organic matter and tissue fragments in the upper part of layer 1050 in monolith 8. The Bronze Age occupation soil (1050 lower) shows no microfeatures indicative of trampling, although there is ubiquitous evidence of burning (very fine charred organic matter, fine and coarse charcoal, and burned flints); no hearth material or strongly burned soil are present, however. Lastly, the site was eventually affected by 'permanent' high water tables, leading to fen peat and backswamp sediment formation. There is only trace evidence of later possible marine inundation, affecting the sediments, although minerals like gypsum found in the sediments overlying the palaeosol testify to the probable influence of marine inundation of the area at times.

Discussion

Leo Webley

The discovery of significant later Neolithic/early Bronze Age activity was unexpected. The failure to identify the later Neolithic/early Bronze Age occupation in earlier fieldwork prior to stripping of the site is sobering, and might hint that the paucity of settlement of this period identified in the wider Sutton/Chatteris area during the Fenland Survey (Hall 1992; 1996) does not reflect the true situation.

A buried soil 'occupation horizon' survived across most of the site. Though a minor element of late Mesolithic/early Neolithic flintwork was present, finds from the buried soil were dominated by flint and pottery of later Neolithic/early Bronze Age date. The fragmented and abraded condition of the pottery suggests that it had been discarded on the ground surface and exposed to trampling and weathering, rather than being deposited within midden heaps. The buried soil was rich in fine charcoal, suggesting that hearths had existed on the ground surface, but the scant quantities of charred cereals and hazelnut shell recovered from the bulk samples provide little indication that large-scale food processing took place on the site. A few shallow pits and hollows were associated with the buried soil, typical of the amorphous features generally found on settlements of this date (Bamford 1982; Healy 1988; 1996; French and Pryor 2005). More unusual for a site of this period were two large waterholes, one with an *in situ* wooden revetment structure. Pollen, macroscopic plant remains and insects from this latter feature provide a picture of an open, grassland-dominated landscape, with dung beetles and nitrogen-loving plants suggesting the presence of livestock.

The later Neolithic/early Bronze Age activity clearly spans a significant time period. The ceramics from the buried soil include Impressed Ware (*c.* 3400–2500 BC), Grooved Ware (*c.* 3000–2000 BC), Beaker (*c.* 2500–1700 BC) and possible Food Vessel (*c.* 2100–1500 BC), suggesting that occupation took place over a minimum period of *c.* 400 years (Garwood

1 Urtica dioica *L. (stinging nettle)*
2: On Sparganium erectum *L. (branched burr-reed)*
3: Phragmites australis *(Cav.) Trin. ex Steud. (water reed)*
4: Often Caltha palustris *L. (Marsh marigold)*
5: Often on medicks (Medicago) *and clover* (Trifolium)
6: Lemna *spp. (Duckweed)*
7: Often on Glyceria *(sweet-grasses) including* Glyceria maxima *(Hartm.) Holmb. (reed sweet-grass)*
8: Deadwood of range of hardwood trees
9: Mainly Trifolium *spp. (Clover)*

1999; Gibson and Kinnes 1997; Healy 1995). Prolonged or repeated occupation of the site is supported by the radiocarbon evidence. Two samples of charred material from the buried soil produced non-overlapping date ranges of 2397–2139 cal BC and 2132–1921 cal BC at 95% probability (Table 1). The infilling of waterhole 1199 is dated to 2194–1979 cal BC by a radiocarbon sample from its upper fill, and the timber revetment structure of waterhole 1295 is dated to 2014–1776 cal BC. Both waterholes could therefore have been contemporary with the period of occupation of the site implied by the radiocarbon dates from the buried soil. There is a strong possibility, however, that waterhole 1295 was late in the sequence, or perhaps even constructed after the main period of occupation had ended. At the 68% probability level, the radiocarbon date range from this feature is later than the other three radiocarbon determinations from the site, with no overlap (Table 1).

The most reasonable interpretation of the site is that it saw a number of separate episodes of occupation through the later Neolithic and early Bronze Age. There is a general acceptance that this period was characterised by shifting patterns of settlement, though the rhythm of this movement through the landscape is a matter of debate. Brück (1999) argues for fairly mobile settlement, with people moving through the landscape on a seasonal basis, coming together and dispersing at different times of the year. Discussing the evidence from the Lower Welland Valley, French and Pryor (2005, 166) similarly suggest a 'mobile and transitory' occupation pattern, with seasonal movements between the higher ground and the floodplain. A slightly different view is taken by Healy (1996, 180), who argues that the evidence from around the Wissey Embayment on the south-eastern fen edge implies shifts of settlement location "at intervals of years or decades".

There may have been a complex pattern of movement through the landscape, with periodic shifts in place of residence (whether over intervals of a few weeks or several years) accompanied by daily cycles of routine offsite 'tasking', for purposes such as taking livestock to pasture, hunting, food gathering and collecting raw materials. This perspective allows us to see North Fen less as a discrete 'settlement site', and more as a window into part of a palimpsest landscape created by numerous episodes of settlement and brief task-specific visits (Edmonds *et al.* 1999). The fact that the site seems to have been returned to on several occasions suggests that it was to some extent a favoured location. However, intrusive investigation elsewhere on the North Fen island would be required to gauge the degree to which the site really was a local focus for activity. Comparison can be made with the late Neolithic/'Beaker period' site on the southern edge of the Chatteris island at Stocking Drove Farm (CHA37), 700m to the north-west. Test pit evaluation here produced worked flint at a density of 1.8 per m^2, compared with only 0.7 flints per m^2 for the test pitting at North Fen, or 0.4 per m^2 for the gridded excavation of the buried soil. This could suggest that the Stocking Drove Farm site saw more repetitive or intense occupation than North Fen. The densities of finds from North Fen also seem unspectacular in comparison with many broadly contemporary sites elsewhere in the wider Fenland region, particularly the very rich later Neolithic/early Bronze Age sites known along the south-eastern fen edge (Healy 1996; Edmonds *et al.* 1999).

The character of the flint assemblage provides some insight into the activities carried out at the site. Overall, the assemblage contains a low proportion of debitage and shows a lack of refits, suggesting relatively little *in situ* flint knapping. The proportion of formal tools—particularly scrapers—is high, as is often the case at later Neolithic/early Bronze Age sites (Cleal 1984; Garrow 2006). The distributions of the various flint types show some spatial patterning (Figs 11–15). Particularly notable is the compact spread of flint in and around hollow 1209 ('flint zone A'), which included high concentrations of scrapers and other finished tools, and low quantities of cores and knapping waste. Despite comprising only 36% of the flint from the site, this small area produced 73% of the scrapers and the clear majority of the knives, notches, piercers, fabricators and retouched flakes. This cluster of material may relate to a specific episode of activity centred on the hollow, perhaps with an emphasis on hide, bone and/or wood working. The 'Beaker-type' character of the flint assemblage from this area and presence of Beaker sherds from hollow 1209 provide chronological indicators for this episode. Meanwhile, serrated flakes show a quite different distribution, being widely dispersed across the site, with only a single example from flint zone A. This suggests episodes of plant harvesting or processing unrelated to the activity around hollow 1209. Also of note is the fact that all three of the arrowheads from the site were found close together in the north-east corner of the site (Fig. 15). These could derive from a single event, perhaps a visit by a hunting party.

Clearly, though, there are dangers in interpreting the artefact distributions from the site in such a straightforward manner. Simply because most of the finds were recovered from a buried soil does not necessarily mean that they form an unaltered record of *in situ* activity; routine site maintenance and practices of selective deposition are likely to influenced artefact distributions. The possibility that some of the artefacts from the site represent deliberate, 'placed' or ritualised deposits should be acknowledged, even though such deposits are more normally associated with pit contexts (eg Garrow 2006). The complete flint dagger (Fig. 10) could fall into this category, given that these objects are very rare from occupation sites and more usually found in mortuary contexts, implying that they were highly valued (Myers 2005). The human cranium and long bone fragments from the upper fill of waterhole 1199 could also have been deliberately deposited, perhaps to mark the decommissioning of this feature. Human bone fragments have been found at a number of other late Neolithic/early Bronze Age occupation sites around the fen edge

(Healy and Housley 1992, 953), suggesting that the curation of such relics was a fairly common practice.

The role of the two waterholes is important to understanding the inhabitation of this site. Clearly, these features show a desire to control and manage the supply of water, though whether this was for the use of people, livestock or both is a moot point. It is difficult to demonstrate a direct association between the waterholes and the 'occupation' activity at the site; both waterholes were peripheral to the artefact scatters in the buried soil, and themselves produced very few finds. Given the environmental evidence for pasture from waterhole 1295, it would be tempting to assume that the waterholes were associated with livestock, and could therefore have been in use during periods when the site was not settled *per se* but used as grazing land. Arguing against this is that fact that the timber-revetted platform within waterhole 1295 seems unsuited for use by livestock, suggesting that the feature is in fact more likely to have provided water for human use. However one views the function of these waterholes, the key point is that they imply an investment by a community or family group in a particular place which they had (or claimed) long-term rights to, and either used continuously or returned to regularly over a period of several years.

The secure early Bronze Age date of waterhole 1295 appears to make it the earliest certain feature of this kind yet identified in the region. The one possible early Bronze Age parallel is a timber-revetted waterhole from the Glinton-Northborough Bypass excavations in the Lower Welland Valley; this produced a radiocarbon date of 1920–1650 cal BC, but its dating is confused by the large fragments of later Bronze Age pottery also recovered from the feature (French and Pryor 2005). It has previously been argued that waterholes were a later Bronze Age innovation, closely related to the adoption of more permanent modes of settled farming at that time (Evans 1999). The waterholes at North Fen raise questions of the extent to which this later Bronze Age 'settling down' had its roots in developments during the early Bronze Age.

A puzzle thrown up by the Fenland Survey was the contrast between the numerous clusters of early Bronze Age round barrows in the Chatteris/Sutton area—including five barrows on the North Fen island itself—and the apparent paucity of contemporary settlement evidence (Hall 1992; 1996). The excavations reported here may help to redress this balance, though a connection between the people who occupied this site and those buried in the barrows is difficult to prove at present. The one barrow in the area excavated to date—SUT7, 300m to the north—produced a primary burial associated with Collared Urn pottery and radiocarbon dated to 1880–1670 cal BC. The burial therefore probably post-dates most of the activity at North Fen, though it could possibly have been contemporary with the use of waterhole 1295. Frustratingly, a 'domestic' context for the barrow builders remains elusive.

Occupation of this low-lying gravel island is likely to have become increasingly difficult by the mid 2nd millennium BC. The occupation horizon was overlain by an alluvial layer containing little evidence of human activity, indicating abandonment of the site under conditions of increased wetness and flooding. This was followed by peat formation as the island was lost to the fen, probably during the later Bronze Age and Iron Age (Hall 1996; Waller 1994).

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