Chapter 5: Earlier Neolithic middens and other evidence from Sites 6 and 10 and Lake End Road West

Introduction

Perhaps the most striking of the discoveries of both projects were concentrations of earlier Neolithic artefacts, including deposits interpreted as middens, in Areas 6 and 10 and at Lake End Road West (Fig. 5.1). At all three of these sites these artefacts had been preserved in hollows formed by the silting up of palaeochannels. The artefacts included large quantities of Carinated, Plain and Decorated Bowl pottery and, in the case of Area 6, of Ebbsfleet Ware, as well as worked flint, stone and bone, a fragment of a shale bead, fired clay, animal bone, including animal burials, charred plant remains and charcoal. The deposits filling the hollows and other areas of the sites were cut by tree-throw holes and pits which contained similar assemblages of finds.

In all cases small quantities of later finds were also recovered from the hollows. Whilst these finds indicate continued activity in, and some disturbance of, the hollows, there were also indications, such as early Neolithic vessels apparently broken *in situ*, which suggest that this disturbance was limited. The later finds (post-dating the early/middle Neolithic) are discussed in the appropriate chapters below.

Detailed analysis of the earlier Neolithic artefacts does, however, suggest that many of the finds consist of secondary material which was discarded elsewhere and only subsequently deposited in the middens. It also suggests that the middens built up over a considerable period of time as the result of repeated episodes of deposition. Modelling of a series of radiocarbon dates from Area 6 suggest that deposition began at 3830-3690 cal BC and ended at 3529-3320 cal BC (68% probability). A smaller series of radiocarbon dates from Area 10 indicate activity in a later period than that suggested by most of the pottery.

Similar deposits preserved within a hollow in the top of a palaeochannel were also found at Amerden Lane West. However, whilst the deposits at Amerden Lane West contained some early Neolithic finds, the deposits had clearly suffered from considerable disturbance. Since most of the finds from this site date from the late Neolithic/early Bronze Age, it is described in Chapter 9.

This chapter describes all of the earlier Neolithic evidence from Areas 6 and 10 and Lake End Road West. Earlier Neolithic evidence from other sites is described in the following chapter.

Area 6: earlier Neolithic Midden deposits and other remains *by Anne Marie Cromarty, Hugo Anderson-Whymark and Tim Allen*

Extensive earlier Neolithic artefactual evidence was found in Area 6 (Fig. 5.2). The vast majority of this evidence came from midden deposits in a hollow in the top of a silted late glacial channel (Plate 5.1), but a few other discrete features have also been dated tentatively to this period.

The hollow (Figs 5.3-4; Plates 5.2-6)

A large number of early Neolithic artefacts were recovered from the land surface preserved in the deeper parts of the hollow. The fills of the hollow were sampled in a number of box sections (Plate 5.3). Because of the way in which the excavation of this area was undertaken, and because it was assumed that the top layer in each of these sections was contemporary, the finds were initially thought to be spread through several layers. As excavation progressed and the hollow became more fully understood, it became clear that most of the early Neolithic artefacts were from a single horizon, and from features cut into or built up upon that surface. This horizon was concave due to the pattern of earlier silting, and preservation was best in the deepest part of the hollow in the eastern half of the area (Plate 5.4).

The early fills of the hollow

The sections excavated in this hollow (eg squares 11218 and 11224; Fig. 5.5) revealed deposits of friable mid brown orange sandy silt with some gravel (11305 and 11360) immediately overlying the Pleistocene gravel and sand deposits in the bed of the channel. These deposits (given the general number 11202) represent the early silting of the channel. They contained a limited number of early Neolithic artefacts.

The early Neolithic horizon

Above the early fills was a layer of mid orange brown or grey brown sandy silt which again contained a little gravel (general number 11201, equivalent to 11191 and 11166 in squares 11224 and 11218; Fig. 5.5) and which derives from soil formation on top of the early silting. Early Neolithic middens and artefact scatters were deposited on the surface of this layer, and it was cut by a number of contemporaneous features (Plate 5.5).

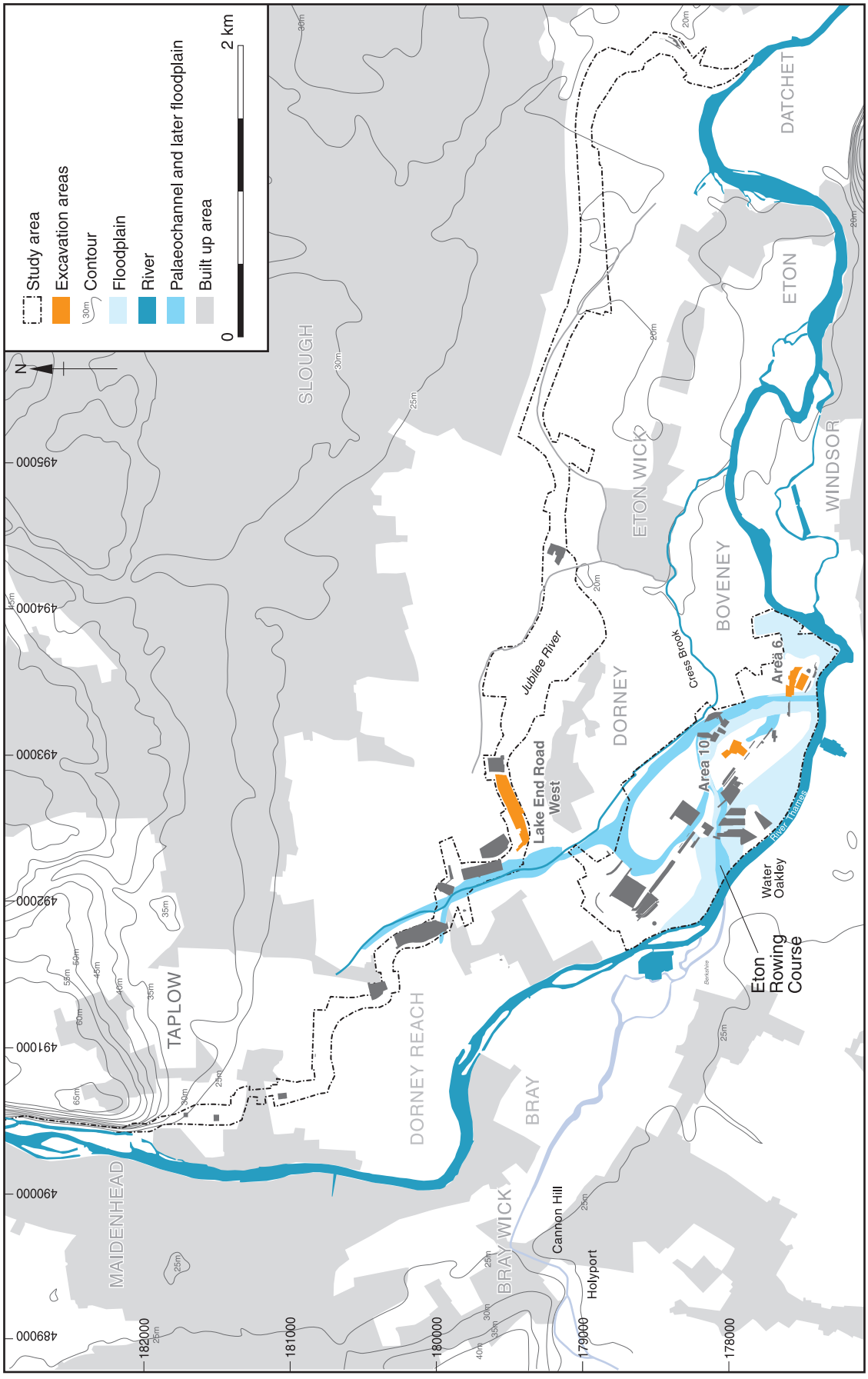


Fig. 5.1 Location of sites discussed in Chapter 5 (Crown copyright 2013 Ordnance Survey 100005569)

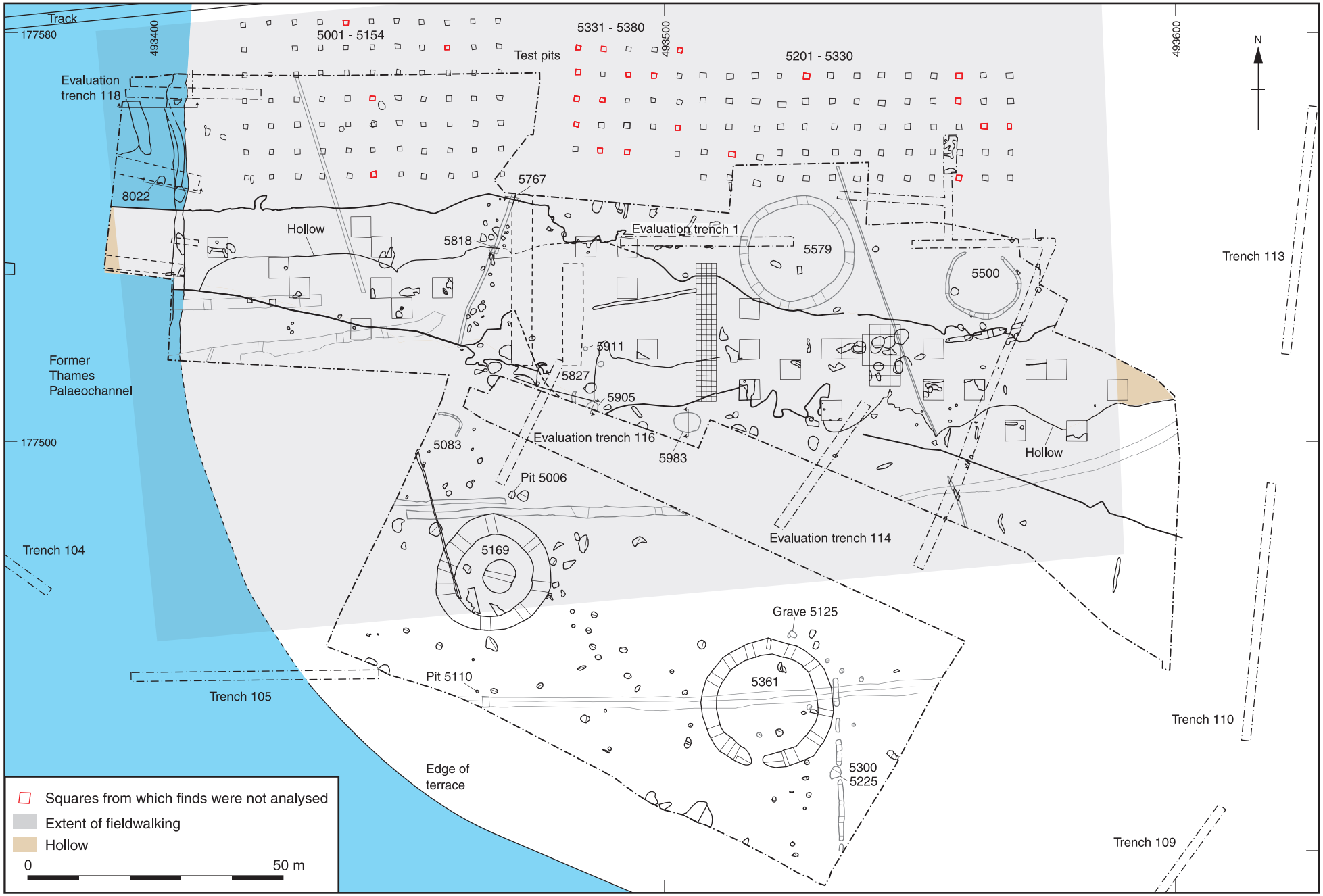


Fig. 5.2 Overall plan of Area 6 showing areas of evaluation, test-pitting, fieldwalking and excavation

Plate 5.1 Air photograph of Area 6 showing cropmarks of hollow and barrows, viewed from the north (© Crown copyright. EH)

The surface middens (Figs 5.3-4 and 6)

The surface middens 5980=11172 (hereafter group no. 11421), 5981=11173 (hereafter group no. 11422), 11174=5985 (hereafter group no. 11179) and 5984=11175 (hereafter group no. 11423) in Trench 11231, and 5986=11160=11364 (hereafter group no. 11426) stretching across square 11224 (Fig. 5.4), all lay on the surface of deposit 11201, and were of a similar overall character, though varying in size, shape and exact composition.

The largest (11426) covered an oval area measuring approximately 12.5m by 4.5m, oriented along the line of the hollow, and survived to a depth of 0.22m (Figs 5.4-5, square 11224). The deposit consisted of friable dark red brown sandy silt with a small proportion of gravel inclusions and considerable quantities of finds. Though only the area of this deposit falling within square 11224 (approximately 13.6m^2, representing less than a quarter of the midden) was excavated, a huge number of artefacts was recovered (Plate 5.6). This included 676 sherds of pottery (3094 g; Plate 5.7), 211 fragments of animal bone and 2486 flints, an approximate density of 248 finds per m^2. Two radiocarbon dates upon cattle bones and one upon a charred emmer grain were obtained from this deposit. One cattle bone (SF 77496) dated to 4330-

Plate 5.2 Hollow during excavation with enclosure 5500 and barrow 5579 in the foreground, viewed from the north-east

3960 cal BC (OxA-9670: 5295±70 BP), the other (SF 23932) to 3940-3650 cal BC (OxA-9858: 4970±45 BP) and the charred emmer grain (SS 2306) to 3800-3640 cal BC (OxA-9889: 4935±40 BP).

Further west, middens 11421, 11422 and 11179, lay in a row. All of these middens were oval, between 2.5 and 3m long and 2.0-2.5m wide. Both 11421 and 11422 consisted of similar deposits of compact, dark grey brown sandy silt. Both were entirely excavated and contained numerous pottery, animal bone, flint and worked stone finds, though midden 11422 yielded markedly fewer finds than 11421. Midden 11422 yielded 95 sherds of pottery (426g), 24 fragments of animal bone, 377 flints and three fragments of worked stone, a density of approximately 120 finds per m^2. In contrast, midden 11421 yielded 324 sherds of pottery (2087g), 118 fragments of animal bone, 1168 flints and two fragments of worked stone, a density of approximately 240 finds per m^2, more comparable with the other surface middens.

Plate 5.3 Occupation layer and shallow middens sampled by 2m squares

Midden 11179 was 0.08m deep, and consisted of compact dark grey brown clay silt similar to middens 11421 and 11422 to the west and to the upper fill of tree-throw hole 11420, 3m to the south. The soil matrix was, however, more clayey and more compact. The excavated half of this deposit yielded 57 sherds of pottery (203g), 3 fragments of animal bone and 143 flints, a density of approximately 104 finds per m^2, comparable to the neighbouring surface midden 11422. The single sherd of medieval date included in this total and some fragments of coal probably came from a field drain which cut across this feature, but which was not recognised when the first half of this feature was excavated.

Plate 5.4 Shot showing depth of the general land surface within the hollow, and darker midden patches

Plate 5.5 Finds spread in the hollow during initial cleaning

Plate 5.6 Cleaning of midden deposit 11421 showing joining sherds of a Carinated Bowl

Plate 5.7 View of partly reconstructed Carinated Bowl

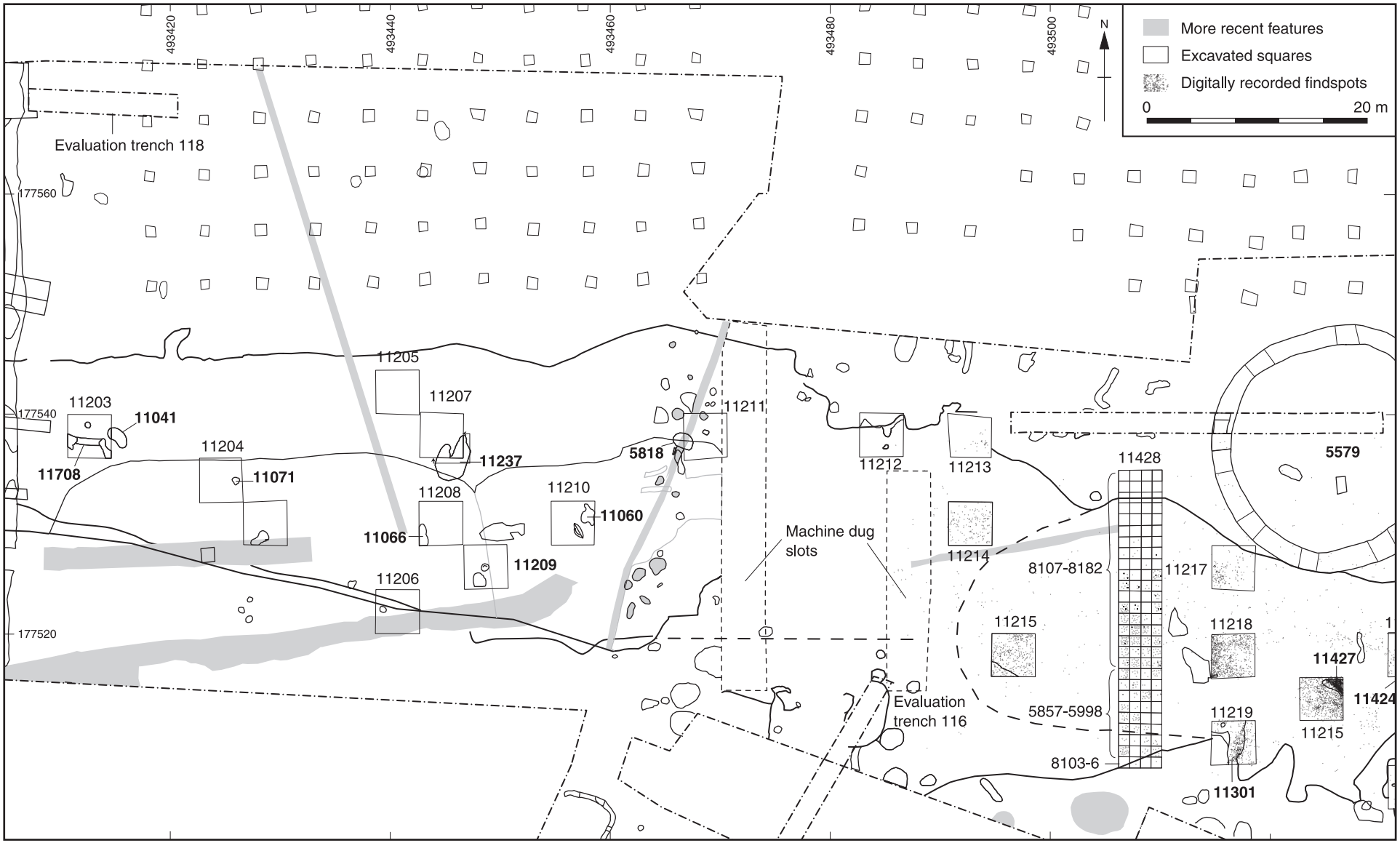


Fig. 5.3 Plan of Area 6 hollow, western part, showing numbering of sample squares, features and locations of illustrated sections

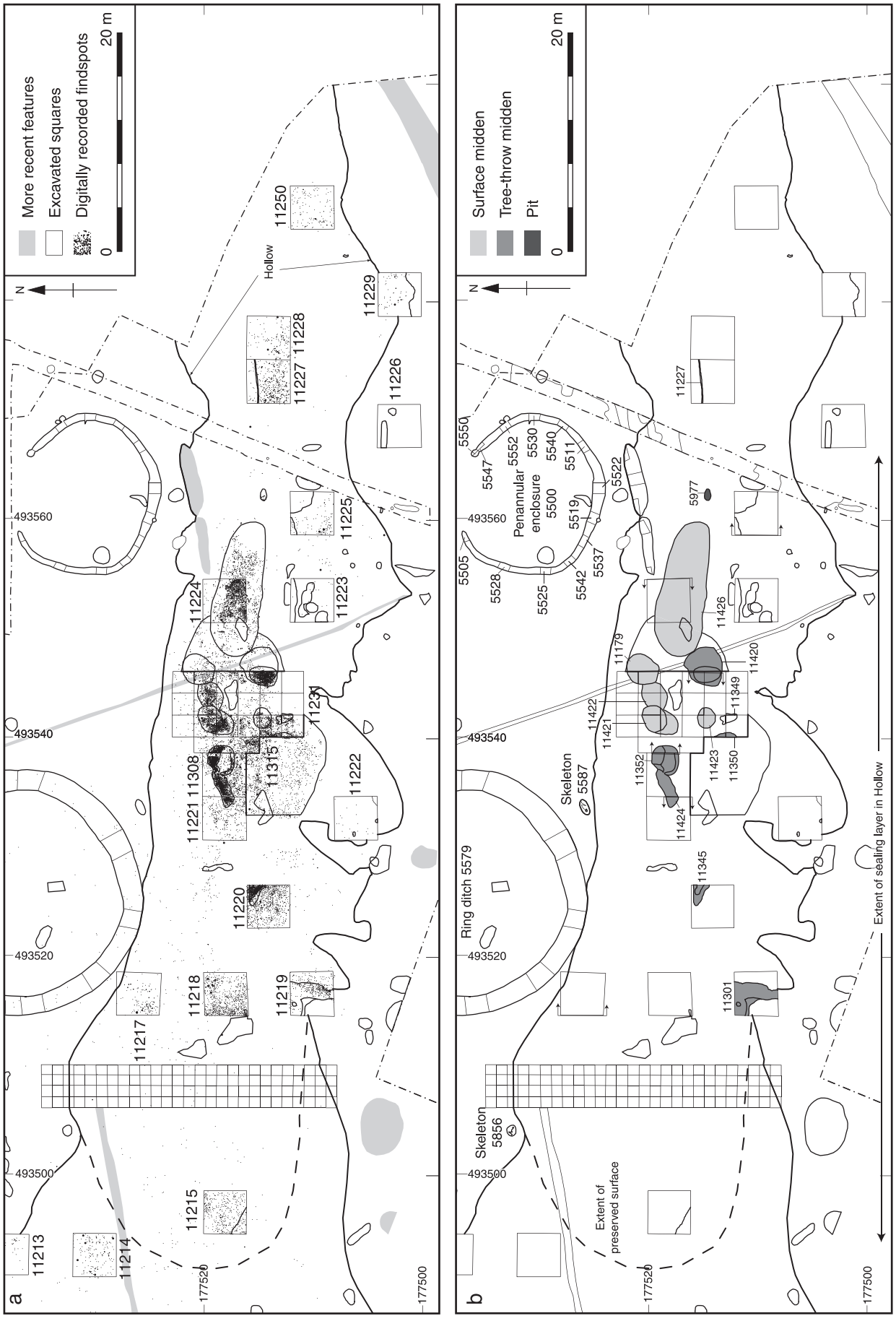


Fig. 5.4 Plan of Area 6 hollow, eastern part, showing numbering of sample squares, features and tree-throw holes, and locations of illustrated sections

The fifth of the surface middens, 11423, lay about 3m to the south of 11421, and was the smallest, measuring only approximately 1.8m in diameter. It was made up of very similar dark grey brown sandy silt and yielded 168 pottery sherds (492g), 29 fragments of animal bone and 546 flints, a density of approximately 263 finds per m^2.

Similar midden deposits were found in many of the features cut into the surface of 11201. These cut features were generally tree-throw holes, like 11352 (=11319=11346=11348=11351, in squares 11308 and 11315), 11424, 11312=11190; in squares 11308 and 11221), 11181 (in trench 11231) and 11345/11327 (filled by 11344 and 11194 in square 11220; Figs 5.3-4 and 7). These tree-throw holes varied in size and shape.

The first, 11352, was subcircular in plan, measuring 2.7m by 2.5m and was up to 0.54m deep. This feature contained the classic tree-throw hole pattern of fill, with dark brown loam around the edges and a wedge of cleaner deposits derived from the material in which the tree had been growing in the centre. In this case, the cleaner deposits (11354 and 11310) consisted of orange silty sand, reflecting the early fills of the channel, while the lowest of the loam fills (11321) consisted of dark grey sandy loam reflecting the soil in which the tree had grown. The remaining hollow was filled with friable red brown sandy loam early Neolithic midden material (11320) containing numerous finds. Altogether 264 pottery sherds (1722g), 107 fragments of animal bone, 957 flints, 4 fragments of burnt clay and 5 fragments of worked stone were recovered from this feature.

Just to the west of this tree-throw hole lay another, smaller tree-throw hole (11424) which also contained midden material. This feature was an irregular, elongated shape in plan, measuring 3.5m long and 1m wide and 0.55m deep. It contained two fills. The lower of these fills consisted of friable dark orange brown silty sand (11307=11314) which contained only a small number of pottery and flint finds, while the upper fill (11187=11313) consisted of friable dark reddish brown sandy silt and contained the bulk of the midden deposit. Together these fills yielded 595 pottery sherds (3033g), 66 fragments of animal bone, 1655 flints and 17 fragments of worked stone.

Both of these features were totally excavated, but others like 11420 were only half sectioned. Tree-throw hole 11420 was oval in plan, 2.77m long and 0.42m deep, and had a similar pattern of infill to 11424 (Plate 5.8). The lower fill (11340) consisting of orange sand with only a relatively small number of finds while the upper fill (11176=5988=8200) consisted of compact dark grey brown clay silt and contained the bulk of the finds. Altogether the excavated half of this feature yielded 365 sherds of pottery (1521g), 98 fragments of animal bone and 1508 flints.

Tree-hole 11345 also had a similar fill character and density of finds. Other tree-throw holes existed in this area of the site which also yielded significant numbers of finds analogous to these midden tree-throw holes (eg tree-throw holes 11349 and 11350).

A number of joining sherds, bone fragments and even worked stone fragments were found within these midden deposits, suggesting that they were *in situ*, or at least little disturbed deposits, while the examination of the low power usewear of the flints indicated that the flints were not entirely fresh. This pattern is consistent with the midden deposits having undergone a significant amount of animal trampling in addition to mixing by worm action.

Other early Neolithic features in the hollow

A few other features also associated with early Neolithic artefacts were found cut into the early Neolithic land surface in the hollow, but contained deposits of a distinctly different character from the midden deposits. This group included various tree-throw holes and a pit (5977=11195).

This pit (Fig. 5.4) was a small oval feature measuring 0.9m by 0.7m wide and 0.12m deep. It contained two fills. The lower fill (11197) filled most

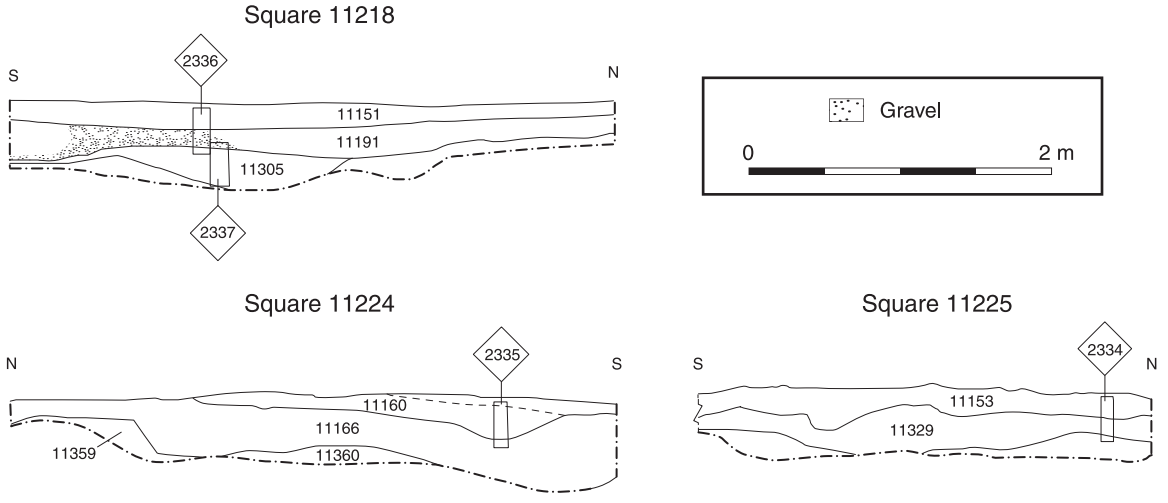


Fig. 5.5 Area 6: sections of excavated squares showing monolith sample locations

Plate 5.8 Excavation of tree-throw hole midden 11420 viewed from the west

of the depth of the feature and consisted of mid grey brown clay silt, while the upper fill (11196) filled only the upper 0.02m and was dark grey to black in colour and contained a substantial amount of burnt flint and charcoal in a sandy silt matrix. This fill was similar to the soil of surface middens 11421 and 11422, but contained more evidence of burning, and might have been dumped material from a hearth. Numerous flint chips were recovered from the lower fill during sieving, but the majority of the finds from this feature – including 96 flints (only 3 of which had been burnt), 2 animal bone fragments and 6 sherds of early Neolithic pot (51g) – were found within the upper fill. A high proportion of the flints (16%) were retouched pieces.

A number of tree and root holes were found towards the western end of the hollow, in the area where the early Neolithic horizon was truncated by later ploughing (Fig. 5.3). Several of these features contained artefacts. In some cases, including 11237=11091, 11071 and 11060, the finds assemblage included only animal bone and flint.

The first of these (11237; Fig. 5.3) was the largest and yielded the greatest number of finds. This feature was irregular in plan, measuring approximately 3.5m across north to south and east-west, and 0.84m deep in the deepest part of the excavated portion. The north-western corner of the feature lay within square 11207, and this was the only part to be excavated. Here the feature had at least four fills. The primary fill consisted of a fairly clean deposit of loose light orange brown sandy silt with a larger proportion of gravel but no other inclusions (11285). This was restricted to the western edge of the feature. In the bottom of the feature was a deposit (11251) of friable, mid orange brown sandy silt up to 0.45m deep. This deposit contained some gravel and a small amount of burnt flint and of charcoal, seven fragments of animal bone and 34 flints. This was overlain by a second deposit of friable, mid orange brown sandy silt (11247). This deposit included a higher proportion of gravel and a little burnt flint and charcoal, in addition to another fragment of animal bone and 9 flints. The top fill of the feature consisted of a very similar deposit (11238) with slightly less gravel and more flints, as well as burnt flint and charcoal and one fragment of animal bone. The flint from this fill stood out from the other assemblages recovered from this end of the hollow. In general, few chips were found in the western part of the hollow, but this fill contained a high density of 10-4mm chips. Such a density is, however, analogous to some of the midden tree-throw hole fills in the eastern part of the hollow, perhaps indicating that this feature dates from the same phase.

Tree-throw hole 11071 in square 11209 (Fig. 5.3), 15m to the south-west, also yielded some burnt flint and 18 flints from fill 11072. This fill consisted of loose, dark grey brown sandy loam. Tree-throw hole 11060, further east, contained two fills of friable, mid orange brown sandy silt and loam which did

Fig. 5.6 Plan of Area 6 hollow showing overall distribution of pottery, struck flint and animal bones

not contain any burnt flint or charcoal but did yield 18 flints.

Sealing layer 11200

The early Neolithic horizon, the middens and other features, were sealed by a layer of friable dark brown sandy silt or loam with a small percentage of gravel (11200). On the basis of the pottery recovered from within it, this soil appears to have gradually accumulated through the remainder of the Neolithic period and the early Bronze Age.

The original extent of this sealing layer is not known due to it having been truncated in the western part of the excavation hollow and removed during machining of the site to the east of Trench 11231. From the condition of the early Neolithic land surface immediately to the east of that trench to a line somewhere beyond the eastern end of pit 5977 (Fig. 5.4), it can, however, be inferred that the layer existed at the time of machining. Pit 5977 and midden 11426 would not have survived intact as they did had they not have been protected from plough disturbance by a sealing layer. Further east beyond this line the sealing layer had been completely removed but the underlying early Neolithic land surface remained, though it was starting to suffer damage from ploughing. A few deeper plough marks (for example 11177 in square

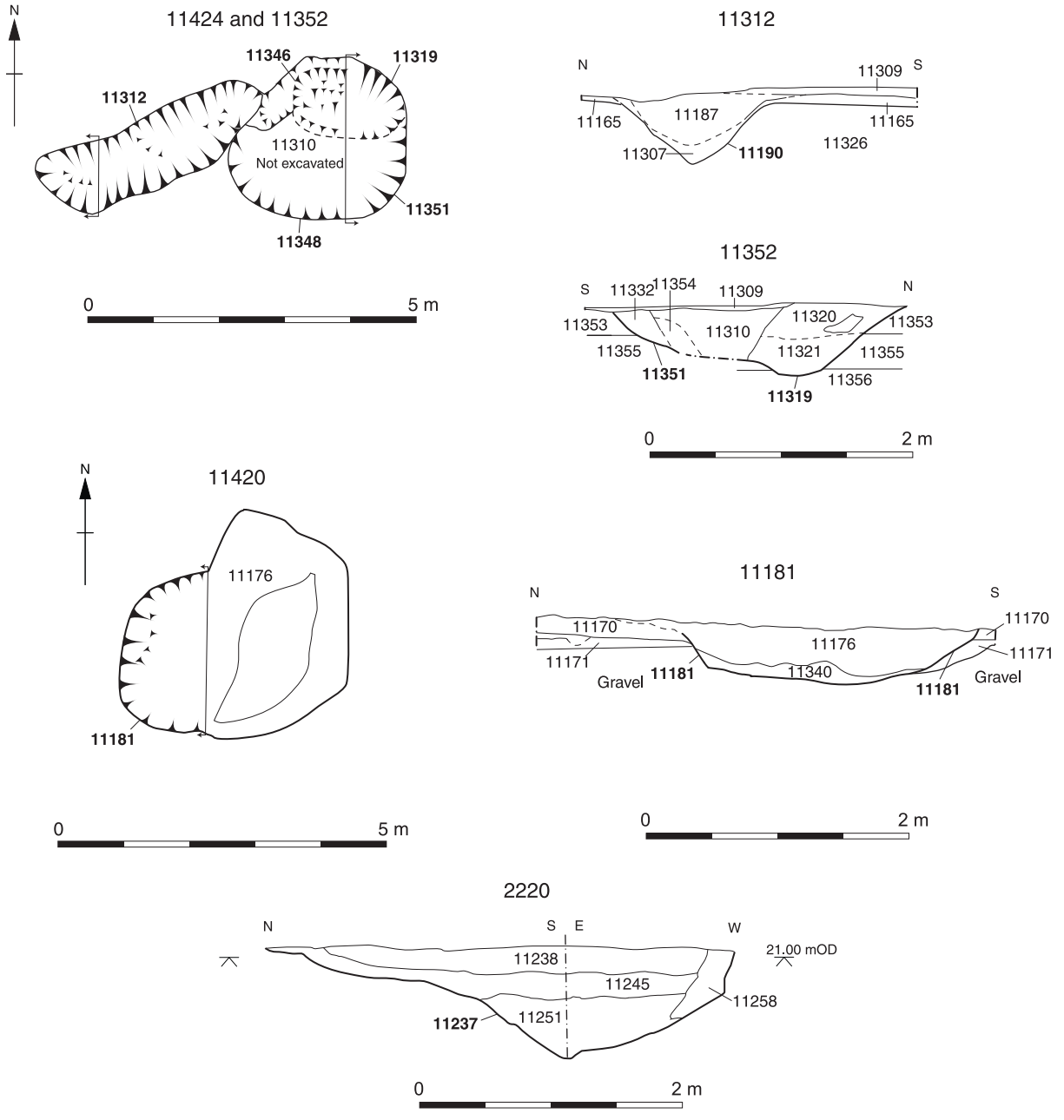


Fig. 5.7 Area 6: plans and sections of tree-throw holes

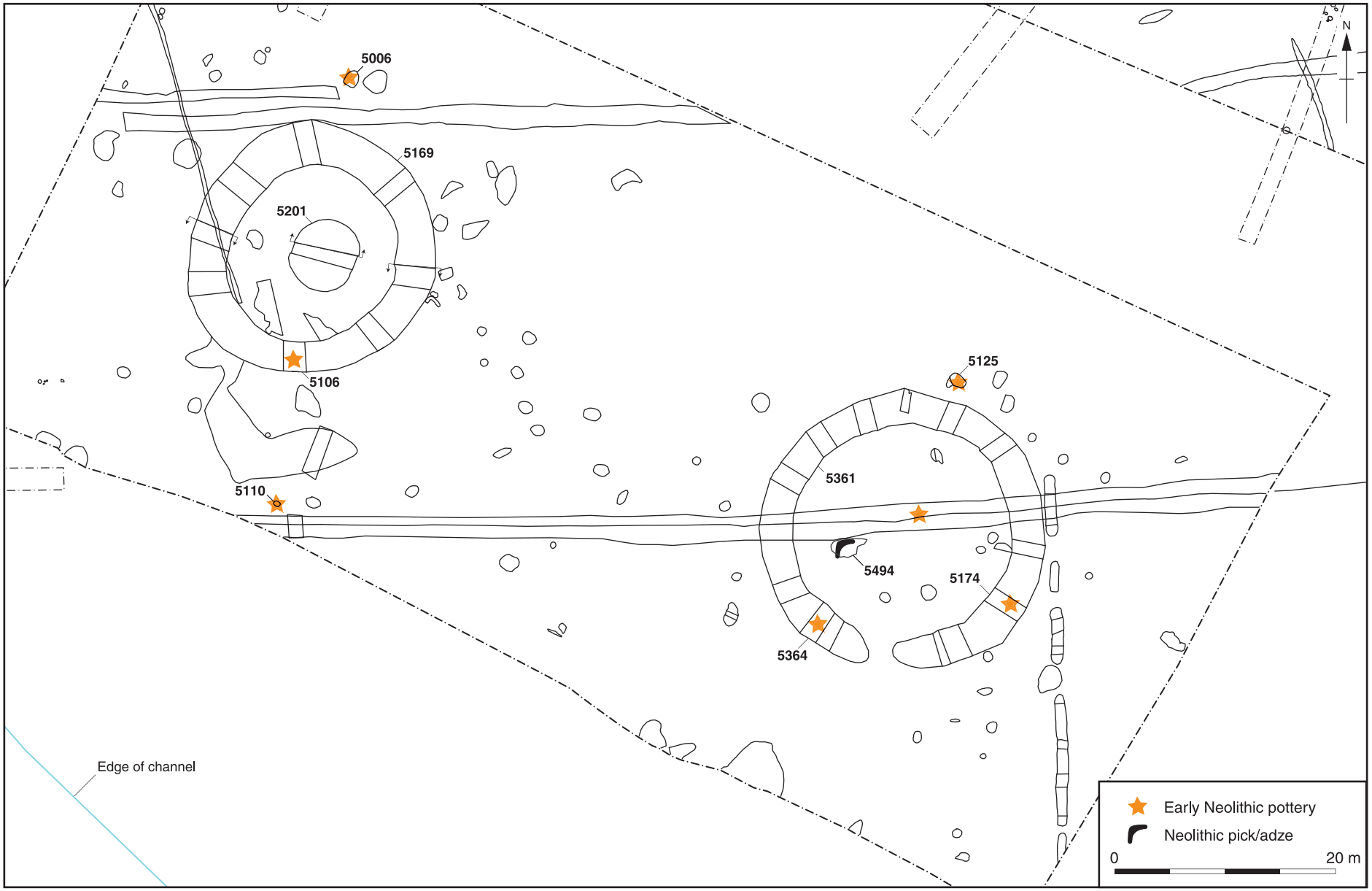


Fig. 5.8 Plan of features in Area 6 south showing location of early Neolithic pottery and Neolithic pick/adze

Table 5.1 Catalogue of Neolithic and undated pits and burials in Area 6

Cut	Shape in plan	Length	Breadth	Depth	Profile	Fills	Fill character	Pot (NoSh)	Bone (no.)	Flint (no.)
Early Neolithic pits										
5110	Subcircular	0.30	0.62	0.26	Bowl shaped	5111, 5118	Occupation deposit	7		
11179	Subcircular	2.50	2.50	0.08	Saucer shaped	5985, 11174	Midden pit in hollow	57	3	143
5977= 11195	Oval	0.90	0.70	0.12	Saucer shaped	11196-7	Occupation deposit high in burnt flint	6	2	154
Possible early Neolithic pits truncated by later ploughing										
5784	Circular	0.17	0.38	0.18	Sloping U shaped	5785	Similar to midden deposits in hollow			2
5797	Circular	0.33	0.14	0.13	Bowl shaped	5798	Reworked early silts in hollow			
5807	Irregular	0.78	0.71	0.08	Saucer shaped	5808	Reworked early silts in hollow			1
5845	Subcircular	1.50	1.50	0.54	Bowl shaped	5846	Reworked early silts in hollow			1
5847	Subcircular	1.40	1.40	0.43	Bowl shaped	5848	Reworked early silts in hollow			1
8025	Not recorded	0.28	1.10	0.47	Bowl shaped	8026	Occupation deposit			5
8101	Oval	0.50	0.25	0.13	Bowl shaped	8102	Occupation deposit high in charcoal			
8156	Ovoid	1.20	1.60	0.34	Bowl shaped	8157	Reworked early Neolithic horizon in hollow			
Middle Neolithic pit										
8022	Subcircular	1.00	1.00	0.03	Saucer shaped	8022	Occupation deposit with burnt flint and abundant charcoal	37	37	61
Middle Neolithic burials										
5588	Oval	1.47	0.66	Not recorded	Saucer shaped	5586-7	Inhumation grave fill		2	5
5991	Subcircular	0.34	0.35	0.10	Saucer shaped	5856, 5992	Inhumation grave fill			1
Undated pits										
5014	Circular	0.9	0.9	0.4-	U-shaped	5012-3	Occupation deposit high in charcoal			1
5029	Oval	0.9	0.82	2.00	Bowl shaped	5028	Occupation deposit high in charcoal			
5044	Oval	1.29	0.8	0.24	Bowl shaped	5045	Occupation deposit			3
5104	Circular	1.25	1.25	0.26	Bowl shaped	5105	?			
5215	Irregular	1.65	0.88	0.37	Bowl shaped	5216-7	Occupation deposit			5
5220	Circular	1.00	1.00	0.28	Bowl shaped	5221-2	Occupation deposit			2
5223	Oval	1.2	0.50	2.00	Irregular	5224	Occupation deposit			2
5229	Linear	0.70	0.70	0.31	Bath shaped	5228	?			
5250	Subcircular	0.69	0.69	0.28	U shaped	5251, 5277	Reworked sand & gravel			
5297	Subcircular	1.50	1.50	0.35	Irregular	5298-9	Reworked sand & gravel			
5311	Circular	1.80	1.80	0.20	Irregular	5312	Reworked sand & gravel			
5313	Oval	0.77	0.32	0.21	Bath shaped	5314	Occupation deposit		1	1
5319	Circular	0.40	0.40	0.20	Bowl shaped	5347	Reworked sand & gravel			
5354	Subcircular	0.98	0.98	0.17	Bowl-shaped	5355	?			
5356	Subcircular	0.44	0.44	0.15	Bath shaped	5357	Reworked sand & gravel			
5372	Circular	0.5	0.50	0.07	Bowl shaped	5373	Occupation deposit high in charcoal			
5512	Oval	1.20	1.06	0.45	V shaped	5513-5	Reworked sand & gravel with some charcoal			
5535	Irregular	0.40	0.40	0.10	Irregular	5536	Reworked sand & gravel			
5577	Subcircular	0.95	0.76	0.13	Irregular	5578	Reworked sand & gravel			
5610	Subcircular	1.36	1.36	0.13	Saucer-shaped	5611	Reworked sand & gravel			
5622	Subcircular	2.35	2.35	0.25	Irregular	5621	Reworked sand & gravel			
5623	Circular	1.10	1.10	0.16	Bowl-shaped	5624	Reworked sand & gravel			
Undated and modern postholes										
5254	Circular	0.90	0.36	0.18	Bowl shaped	5255	Reworked sand & gravel			
5256	Circular	0.50	0.44	0.21	Bowl shaped	5257, 5276	Occupation deposit		1	
5534	Subcircular	0.18	0.15	0.08	V-shaped	5533	Reworked sand & gravel			
5550	Circular	0.94	0.94	0.26	Irregular	5548-9	Reworked sand & gravel			
5555	Circular	0.54	0.54	0.12	Saucer shaped	5554	Reworked sand & gravel			
5567	Circular	0.43	0.43	0.16	Bowl shaped	5568	Reworked sand & gravel			
5569	Circular	0.24	0.24	0.08	Sloping U shaped	5568	Reworked sand & gravel			1
5763	Subcircular	1.50	1.00	0.41	Sloping U shaped	5813-4, 5764	Modern topsoil			9

Plate 5.9 Enclosure 5500 from the south-west

11227; Fig. 5.4) were found to have just clipped the surface but the deposit had remained relatively intact and with the artefact assemblages had suffered very little contamination.

Numerous pits (Table 5.1), tree-throw holes and root holes were found cut into the truncated early Neolithic horizon in the western end of the hollow. Many of these features were difficult to date on the basis of the artefact assemblages recovered from them due to the contamination by later material introduced by this ploughing. They have generally been interpreted as having been contemporary with the pits and tree-throw holes sealed by layer 11200 further east. Tree-throw holes 11041 and 11244, however, appear to date to the early/middle Neolithic period (see below).

Early Neolithic activity outside the hollow

A scatter of early Neolithic artefacts was found outside the hollow. There was considerable material in ring ditch 5579 and enclosure 5500 (Fig. 5.2) immediately north of the hollow and scattered across the surface of the subsoil in between. The widespread occurrence of this material is likely to indicate the original extent of early Neolithic activity beyond the hollow itself rather than dating the features themselves. This is certainly the case for ring ditch 5579, which cut the sealing layer, 11200. Enclosure 5500 on the other hand had no stratigraphic relationship with the hollow (Plate 5.9). It had a shallow ditch and a very wide entrance on the north, atypical of barrows, and is more likely to have been an enclosure of sorts.

In the southern part of Area 6, where ploughing was more severe, there was little early Neolithic material, and the pottery was concentrated in two features. Twenty five sherds of early Neolithic pottery (131g) were recovered from grave 5125 near south-eastern ring ditch 5361 (Fig. 5.8). The grave was roughly rectangular in plan, measuring 1.56m long by 0.9m wide and 0.3m deep, and was orientated roughly north-west – south-east, on the same alignment as a row of three middle Bronze Age cremations (5445; see Volume 2). The skeleton (5127) within it was tightly crouched lying on its right side with its head at the north-western end of the grave (Fig. 5.9 and Plate 5.10). It was almost complete when found but was in a very poor state of preservation. It was identified as an adult male perhaps in his twenties, but the preservation was too poor to make a more accurate determination of age. The 25 early Neolithic sherds are small and abraded, and although no other dating evidence was recovered from this grave, they may be

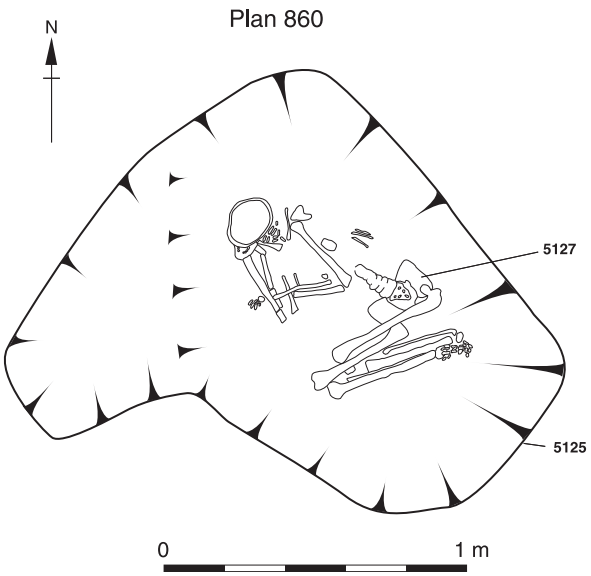


Fig. 5.9 Area 6: plan of possibly Neolithic burial 5125

Plate 5.10 Burial 5127 in Area 6 south

residual; the grave's position immediately outside a Bronze Age ring ditch might then be taken to suggest it was of later date. Equally well, however, the absence of residual early Neolithic pottery from the adjacent barrow and other Bronze Age features makes this doubtful. The date of the burial thus remains uncertain. Attempts to date bone from the skeleton using radiocarbon were unsuccessful due to the lack of collagen.

Pit 5110 (Figs 5.8 and 10; Table 5.1) which lay near the south-western edge of the area, contained two fills. The upper fill contained 7 sherds of early Neolithic pottery (112g) and a little burnt flint (50g). No other artefacts were recovered from the feature. This group of large fresh sherds suggests that this was a genuinely early Neolithic feature.

A small worn sherd of early Neolithic pottery (1g) was recovered from tree-throw hole 5006 in the north-west of the southern part of the area (Fig. 5.8). This was presumed to be residual, and the tree-throw hole is unphased.

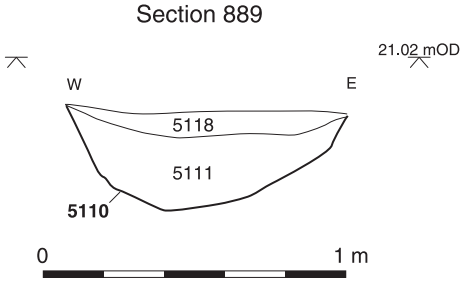


Fig. 5.10 Area 6: section of Neolithic pit 5110

Early/middle Neolithic evidence

A small number of features containing Ebbsfleet ware have also been dated to the early/middle Neolithic. These include a scoop or spread located to the north of the line of the hollow, within the fills on the edge of the later palaeochannel (8022; Fig. 5.2), at the western end of Area 6, and tree-throw holes 11041 and 11244 which lay within the western part of the hollow (Fig. 5.3).

The scoop or spread (8022) was an irregular oval in shape, some 1.3m long by 1m wide but only 0.03m deep (Fig. 5.2). It consisted of a deposit of firm black-brown clay silt (8022) with burnt flint and abundant charcoal. This deposit also contained 37 sherds of early/middle Neolithic pottery (121g), 61 flints and 37 fragments of animal bone representing several different species. Twenty-six of the pottery sherds were derived from the same vessel.

The first tree-throw hole (11041; Fig. 5.3) was located in the westernmost of the squares (11203) sampled in the hollow, but extended further east outside this area. The excavated section measured 1.8m long and 0.3m deep and had a roughly bowl-shaped section. The excavated area was only a part of the whole feature but nonetheless yielded a large number of finds from the single fill (11042). The fill consisted of loose mid orange brown silty sand and gravel with some charcoal. The finds comprised 33 sherds of early Neolithic pottery, 5 sherds of early/middle Neolithic date and a single very worn sherd of possible medieval date, together with 294 flints and 40 fragments of animal bone. The flint assemblage included several Mesolithic pieces. The assemblage was very mixed and clearly includes

material from several different periods. However, the relative abundance of artefacts from this feature in an area with a generally low density of finds suggests that accidental incorporation of these finds into deposit 11042 is unlikely. The material is more likely to have been deliberately placed within the tree-throw hole, probably during the early/middle Neolithic period. The intrusion of the possible medieval sherd is attributed to the later plough truncation of this area.

The second tree-throw hole in this group (11244; Fig. 5.3) was also located within square 11203. This feature was more elongated and irregular in plan but also extended beyond the eastern limit of square 11203. It had three fills. The primary fill (11250), located towards the northern side of the cut, consisted of loose mid yellow brown silty sand, and contained one fragment of animal bone and five flints. The second fill (11242) was seen as a lens within 11250. This deposit consisted of friable, dark grey brown sandy silt with a little gravel similar to the midden deposits seen in other tree-throw holes further east in the hollow. This deposit also contained a fragment of animal bone and three flints. The final fill (11243) consisted of friable, mid grey brown sandy silt and contained a further two fragments of animal bone, nine flints and a single 17g sherd of middle Neolithic pottery. The proximity of this feature to tree-throw hole 11041, just 0.3m to the north-east, may be coincidental, but it is possible that they are parts of the same feature, together with the adjacent tree-throw hole 11078. This last feature was interpreted as root disturbance but contained a deposit of friable, mid grey brown sandy silt with a little gravel (11079) from which came 11 fragments of animal bone and 30 flints.

Early Neolithic pottery from Area 6 *by Alistair Barclay with Chris Doherty, Mark Copley and Richard Evershed*

Introduction

A total of 7227 sherds (39kg) of pottery, which ranges in date from early Neolithic through to early Bronze Age, was recovered from Area 6 (Table 5.2). The majority (86% by weight) of the early prehistoric assemblage belongs to the early Neolithic and can be described as a Bowl assemblage. Typologically it can be split into an earlier Carinated Bowl and a later Plain Bowl group, which together span the period 3800-3350 cal BC (Barclay 2000; Whittle *et al.* 2011). This typological argument receives support from a series of radiocarbon determinations some of which were obtained on burnt residues adhering to sherd surfaces. However, these two groups of pottery are difficult to separate out because of limited stratigraphy, an absence of closed features, and the probability of an uncertain degree of redeposition. The majority of the pottery was recovered from middens and features within the Area 6 hollow, while smaller quantities were recovered from features in the adjacent south and north areas. Analyses of absorbed residues are presented below.

In addition to the early Neolithic pottery, Area 6 produced small quantities of later Neolithic and early Bronze Age pottery, including Peterborough Ware, probable Grooved Ware, Beaker and early Bronze Age pottery, which are discussed in the relevant chapters below (Table 5.2).

Condition and preservation of assemblage

Overall the early Neolithic assemblage is characterised by a high degree of fragmentation, which largely reflects the fact that most of the assemblage was recovered from midden and occupation layers within a relatively wide and shallow hollow. Despite this, the excavation and assessment has identified areas of good preservation with apparently *in situ* broken vessels and discrete clusters of conjoining sherds. Stratified sequences were short and uncomplicated with much of the pottery deriving from spreads within a single surface layer that in places had been disturbed by a relatively small number of tree-throw holes, pits, and ditches. It is estimated that the land surface remained open for a considerable period, and although the deposits within the hollow were generally well-preserved, they were unprotected from post-depositional disturbance, such as human and animal trampling, weathering and other forms of bioturbation, until a point perhaps in the Bronze Age when a sealing layer is thought to have accumulated. That this was

Table 5.2 A breakdown of the assemblage from Area 6

Date	*NoSh*	*%*	*Wt*	*%*
Early Neolithic (Carinated Bowl, Plain Bowl & Decorated Bowl)	6262	87	33361g	86
Early/middle Neolithic (Ebbsfleet Ware)	54	1	232g	1
Middle Neolithic (Mortlake and Fengate Wares)	37	0.5	202g	0.5
Late Neolithic (Grooved Ware)	5	0	15g	0
LNEBA (Beaker)	73	1	236g	0.5
EBA (Urn)	35	0.5	396g	1
Total	7227	100	38791g	100

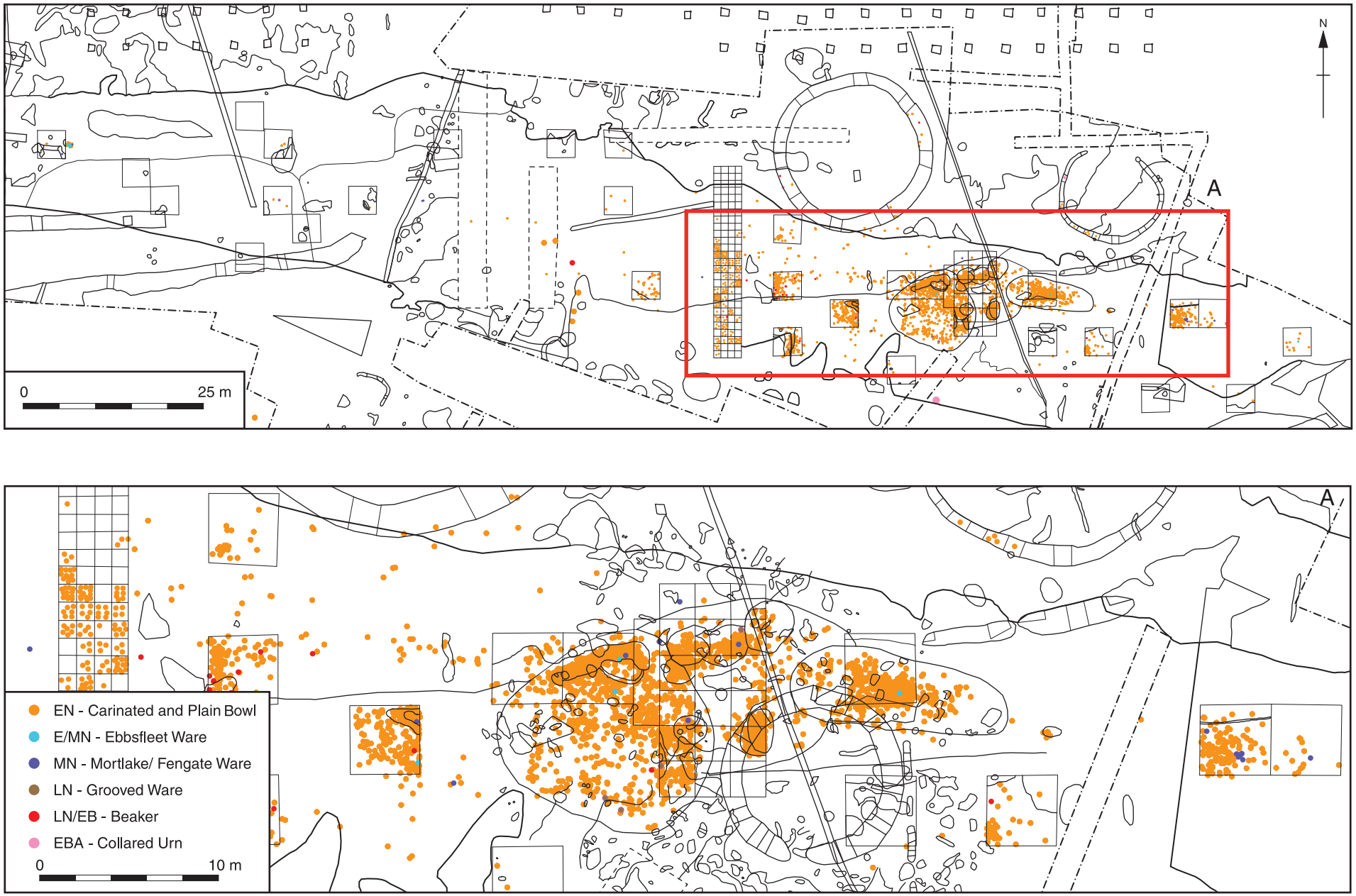


Fig. 5.11 Distribution of Neolithic and early Bronze Age pottery from the Area 6 hollow by phase

so is reflected in the discovery of later pottery within the same deposits (see Volume 2), albeit in relatively small quantities. On the whole, however, post-early Neolithic disturbance is thought to have been minimal.

Finds were recorded and collected from the surface of the hollow, and some 20% of the site within the hollow was excavated from gridded sample squares and from hand excavated features. Further pottery was recovered as bulk finds during a watching brief on the removal of the remainder. The pottery was mostly recorded and collected as individual sherds which were given unique small find numbers or as bulk finds within a gridded trench.

Comparable assemblages

Within the Middle Thames Valley there are relatively few assemblages of Carinated Bowl that are comparable to that from Area 6. A smaller assemblage of Carinated Bowl occurs in Area 10 of the Rowing Course, and there are other isolated finds within the Rowing Course. A somewhat similar but much smaller assemblage occurs at Staines Road, Shepperton (Jones 2008); otherwise this material is represented by small groups or isolated finds (Herne 1988; Holgate 1988). An assemblage of twelve vessels was recovered from pits at Cannon Hill, Maidenhead (Bradley *et al.* 1975-76). Further comparable material is found in the Upper Thames and Kennet Valley and to the east around the Thames estuary (Smith and Darvill 1990; Smith 1983; Brown 1995). Assemblages of Plain and Decorated Bowl are slightly more numerous and include a large assemblage (5658 sherds) from the excavation of the Staines causewayed enclosure some 12km to the south-east (Robertson-Mackay 1987), while smaller assemblages occur at the adjacent sites of Eton Wick and Bray (Cleal in Ford 1991-3; Cleal 1995, fig. 18: P1-4), Manor Farm, Horton (Raymond 2003a) and Cippenham (Raymond 2003b) and at a number of sites along the Flood Alleviation Scheme. Assemblages also occur at Runnymede (Kinnes 1991, 157-8 and figs 67-9; Longworth and Varndell 1996, 100-2 and figs 57-9), and at Whiteleaf (Smith 1954). However, at present the Staines report represents the only detailed study and characterisation of a large early Neolithic assemblage from the Middle Thames and because of this a similar approach to the recording of vessel and rim forms is presented here.

Early Neolithic

In total some 6262 sherds (33kg) of early Neolithic pottery were recorded, most of which came from features or layers within the Area 6 hollow (Table 5.2; Fig. 5.11). This assemblage includes a range of cup and bowl forms in a wide variety of fabrics. The early Neolithic assemblage comprises two typological groups of pottery that can be described as Carinated Bowl and Plain Bowl.

Fabric groups

Twenty four fabrics were identified as early Neolithic in date (Table 5.3; Fig. 5.12). Descriptions of the fabrics are given in Appendix 1. The individual fabrics have been grouped by principal inclusion into four fabric groups (sand, flint, quartzite and shell). Minor inclusions, some of which were probably natural within the clay body were noted (eg clay pellets, ferruginous pellets and bone). A note was also made if the clay fabric appeared to be micaceous. Fabrics were graded by inclusion size and range, although it should be noted that great variation exists within some sherds, and whilst some sherds had well-sorted temper, in the majority the temper was ill-sorted. In a few cases, where relatively large portions of vessels survived, elements of the same vessel appeared to contain temper of different size ranges. Often the inclusions are poorly distributed within the clay so that their density varies and appears patchy. The clearest example of this is vessel 189 (Fig. 5.34, 189), where part of the neck contains medium flint-temper but the rim contains much coarser flint.
Nineteen sherds were selected for petrological examination from which 17 were chosen for thin section analysis.

Of the four fabric groups, sand and flint accounted for 98% of the total assemblage (Table 5.3). These two groups were made up of fabrics tempered either with sand, flint or a mixture of the two. Such a range of fabrics is typical for pottery of this date from the Middle Thames Valley. More unusual are the minor fabric groups that are

Table 5.3 A breakdown of all fabrics by group (Number of sherds, weight (g)).

Fabric group	*Fabrics*	*NoSh*	*%*	*Weight*	*%*	*Group % (NoSh, Wt)*
Sand	A1	329	5%	1403g	4%	
	AF1-3, AFQ2	2304	37%	13652g	41%	
	AQ2-3, AQR2	10	<1%	61g	<1%	
	AS1	1	<1%	1g	<1%	
Subtotal		2644		15117g		43%, 45%
Flint	F1-3	1417	23%	5764g	17%	
	FA1-3	2040	33%	12185g	37%	
	FQ2-3, FQA2	4	<1%	11g	<1%	
Subtotal		3461		17960g		56%, 54%
Quartzite	Q2-3	3	<1%	6g	<1%	
	QA2, QAF2	44	1%	234g	1%	
Subtotal		47		240g		1%, 1%
Shell	S3	2	<1%	13g	<1%	
	SA2	1	<1%	2g	<1%	
Subtotal		3		15g		<1%, <1%
Total		6155		33332g		

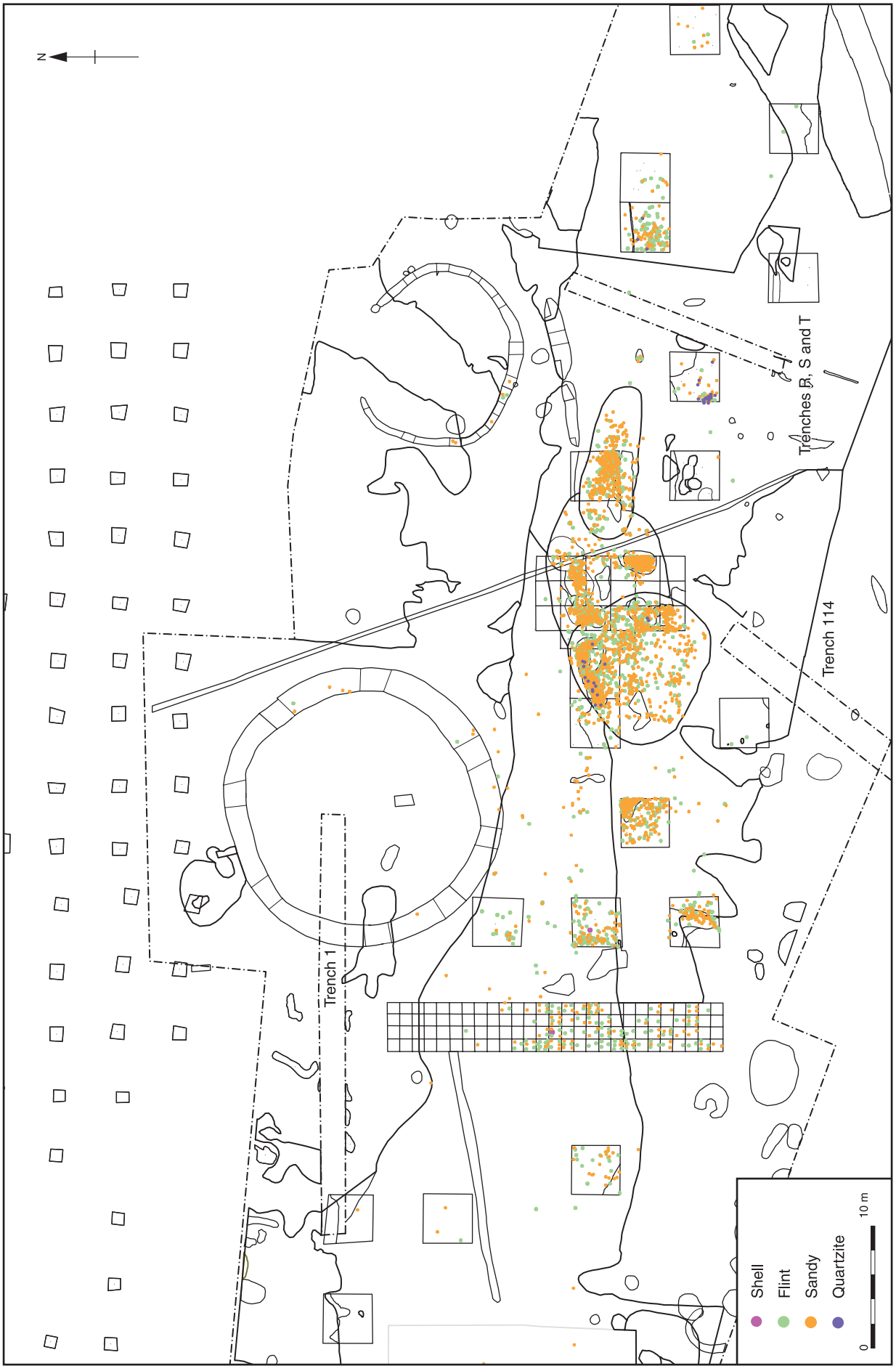


Fig. 5.12 Area 6: distribution of early Neolithic fabric groups

tempered with shell or quartzite. Shell-tempered fabrics are common in early Neolithic ceramics of the Upper Thames region especially in the Oxford and more northern parts of the valley, typified by the assemblage from the Abingdon causewayed enclosure (Avery 1982) and from areas of the Midlands such as the Nene Valley (eg Briar Hill enclosure: Bamford 1985). Unfortunately at Eton the shell had been leached and it was not therefore possible to identify this material and its likely source. These fabrics tend to be dominant where a ready supply of fossil shell occurs, as is the case at Abingdon. The occurrence of quartzite temper is unusual for the Middle Thames Valley, and is a rare fabric in the Upper Thames where it is sometimes used instead of either flint or shell. It is more common in parts of the Midlands where naturally occurring flint is scarce.

Given the possible local rarity of quartzite and fossil shell, it is possible that these fabrics are non-local and represent contact or interaction with adjacent regions.

The only featured sherd in a shell-tempered fabric was an early Neolithic rim. Sherds made from fabrics that included quartzite inclusions were more common. The earliest forms were a number of Plain Bowls with upright or straight-sided necks and simple everted or rolled rims. However, there is no definite evidence from Eton that quartzite was used to temper Carinated Bowls. In the Upper Thames region there is evidence that quartzite-tempered fabrics were used to manufacture such vessels. At Area 6 it is therefore possible that this fabric group was used during a secondary phase of the early Neolithic (*c* 3650-3350 cal BC), while fabrics with quartzite temper were also used to manufacture Ebbsfleet Ware at Area 6 and in Area Ex1.

It is possible that at least two types of clay source were used in the production of the pottery. One clay identified was naturally sandy and micaceous, while another was a geological clay rather than a river clay. Doherty concludes that most of the fabrics examined could be considered to be of local manufacture with material obtained within a few kilometres of the site. The occurrence of black sand (possibly glauconite) in some fabrics could indicate a clay source near to the Greensand and perhaps south of the present river Thames.

There is evidence, then, that either materials were being procured from several different places within the immediate area or that vessels were being made at more than one locale within this area. The presence of shell and perhaps quartzite as temper could indicate that some vessels were being brought to the Dorney area from further afield, perhaps along the river. An alternative explanation is that the technique of using quartzite instead of flint, which would have been less readily available, was adopted by part of the community or that part of this community derived from a region were the selection and use of this type of temper was the norm (eg the Upper Thames or Midlands).

Manufacture and firing

The assemblage is typically handmade from strips or rings of clay. Horizontal breakage tends to follow joins between rings of clay sometimes giving rise to 'false' rims. Sometimes the line of breakage is oblique with the suggestion of slight coiling. Vertical breaks sometimes exhibit a slight tongue and groove construction, perhaps as an attempt to strengthen the bond between adjacent horizontal strips of clay. With shouldered vessels, breakage often occurs on or just above the line of carination, this plane of weakness perhaps indicating two stage construction with the neck section built on to a base. Bonds between rings of clay usually take the form of tongue in groove. Rims tend to be moulded from rings of clay added to the body, and there is a tendency for breakage to happen right at the top of the neck.

Rims are made either by simply rounding and smoothing the upper edge or are moulded into pointed, everted or rolled forms. Heavier rim forms are moulded either by rolling the clay over or through the addition of clay strips to the upper edges. Sometimes the rim is thickened by the addition of clay to the neck immediately below the rim. In a number of cases, rolled rims are constructed first and then thickened with clay. The clay used to thicken the rim zone can be the same as that used for the vessel, although there are examples of non-tempered and differently tempered clay being used. There is also evidence that finer or coarser tempered clay was used to mould the rim. In some cases, this would result in the texture of the finished vessel having a banded appearance with a zone of untempered clay contrasting with adjacent zones gritted with conspicuous white flint.

Shoulder forms vary from simple rounded or carinated to more elaborate forms. In the case of the latter, the shoulder zone beneath the carination is made from a thicker strip of clay, while the carination is marked by a slight step or groove, although sometimes this feature is exaggerated as a distinct ridge.

Firing varies from non-oxidised dark grey to black through to highly oxidised reddish-browns. In some cases the firing is even throughout (eg black across the section) or can have an oxidised outer surface with a non-oxidised inner surface. There is some evidence that firing was controlled to a limited extent with the deliberate production of non-oxidised 'black wares' and oxidised 'red wares'. A number of fine Carinated Bowl forms are evenly fired to a consistent dark grey or black, while there is evidence that coarse or thick-walled bowls were fired reddish-brown.

There is evidence for over-firing and/or for re-firing of sherds. Some sherds are very hard-fired, grey or white in colour, and have spalled and pitted surfaces (eg Figs 5.28, 52 and 5.34, 189). One vessel (Fig. 5.34, 189) in particular had been overfired with the result that it had a very hard fabric, was

Plate 5.11 Vessel 94 showing thickening of rim with finer clay

grey to black in colour (although the intended colour was possibly oxidised reddish-brown) and had an outer spalled surface. The result of the overfiring and hard fabric could explain why this is one of the most complete and better preserved vessels from Area 6.

Surface treatment

Clay slips were added to some vessels, sometimes to aid smoothing or burnishing of the surfaces (eg P14). Clay was also used to thicken the upper necks and rims of some vessels (eg Figs 5.27, 25 and 5.30, 94; Plate 5.11).

A characteristic of the assemblage was the use of smoothing and burnishing on the exterior, interior and in particular around the rim zone of a vessel (Figs 5.26, 2-3 and 14; 5.27, 25 and 34; 5.30, 94; and 5.32, 144-6). Other forms of surface treatment such as wiping were noted but were generally rare. More elaborate burnishing was noted on some bowls, resulting in vessels having clear vertical facets (Fig. 5.28, 49-51) and slightly fluted rims (Fig. 5.32, 145). Vessels with vertical facets were nearly always shouldered and grey or black in colour. Some interior surfaces were left uneven through wiping or were scored by deep burnished marks.

Decoration and 'potter's marks'

Decorated pottery from Area 6 is limited to just six examples: five rims (Figs 5.27, 26; 5.29, 85; 5.31, 107; and 5.32, 136 and 146, and one body sherd, Fig. 5.33, 160). P146 is decorated with faint twisted cord impressions and P26 has oblique incised lines below the rim. P136 has two vertical incised lines on the edge of the rim, P85 has two incised lines and P107, an upright rim, has crude internal decoration consisting of deep grooves, while the body sherd P159 is decorated with oblique, parallel incised lines. All of the sherds are from bowls.

These sherds are unlikely to be contemporary with the Carinated Bowl as the use of decoration is generally considered to be a later development within the early Neolithic Bowl tradition (Herne 1988; Smith 1974a). Some of the decorated rims could well be late within the Bowl tradition with parallels found at sites such as Runnymede that contain Ebbsfleet Ware or vessels with Ebbsfleet Ware traits (Kinnes 1991, 158; Longworth and Varndell 1996, 100). Other sherds considered to have Peterborough traits are discussed below.

One rim (P134) had a double impressed mark, perhaps made with a piece of bone. It is uncertain whether such a mark was deliberate, although a similar mark has been observed by the author on a pot from the Abingdon causewayed enclosure. If it was intentional then it is possible that it represents an example of a 'potter's mark'. Such marks are rare but have been noted on earlier prehistoric vessels, although they are more common in the early Bronze Age (Tomalin 1995).

Handles and perforations

A single example of a broken handle was recorded. It was made from a strip of clay applied vertically to the neck of a bowl (Fig. 5.29, 89). At Staines, only nine lugged vessels were recorded, and in general lugged vessels are rare in assemblages of this date from south-eastern England. Handles similar to P89 have been recorded at Windmill Hill (Smith 1965, fig. 20-2), while lugged vessels are a feature of Bowl assemblages from the Upper Thames and the Chilterns (eg Abingdon causewayed enclosure: Avery 1982; Case 1956; Maiden Bower, Buckinghamshire: Piggott 1931; and the Whiteleaf barrow: Smith 1954, fig. 7).

There were two examples of vessels with perforations set below the rim. This includes a number of rim and body sherds from a single vessel (Fig. 5.27, 37: SF 73079, 77130, 76215) and an everted rim (Fig. 5.28, 54). In P37 the holes were made during manufacture, suggesting that this vessel was perhaps intended to be for storage with the multiple holes used to attach a lid. Similar vessels are quite common within Bowl assemblages, and like P37 and P54 often have simple or everted rims. At least 17 vessels are illustrated from Staines as having either single or multiple perforations (Robertson-Mackay 1987, eg P117-20, P123, P246) and at least 3 occur at Eton Wick (Cleal in Ford 1991-3, fig. Mf11:8-10). One vessel in particular, Staines P123, is very similar in size and shape to P37, while other vessels are known from Whiteleaf (Smith 1954, fig. 6:22).

Forms

The assemblage is characterised by a relatively high degree of brokenness, which means that any system of recording has to take into account vessel elements (eg rim, neck, body, shoulder and base sherds). Featured sherds consisting of these elements were recorded separately and in the case of rims and shoulders further subdivided by form (see below). Given the high degree of brokenness it was decided not to record the angle of the rim and neck as in many cases this could not be determined with any certainty. Relatively few vessel profiles can be reconstructed and, therefore, the analysis has to focus on rim form.

Rim morphology (Figs 5.13-15)

The rim morphology adopted is based on that used for Staines (Robertson-Mackay 1987, 72, fig. 37), which is a modified version of the widely accepted typology used for material of this date (Tables 5.4-5; eg Clark *et al.* 1960; Smith 1965). As with the Staines report this system can be simplified to simple (1-3), rolled (4-5) and heavy (6-11) forms (Robertson-Mackay 1987, 72).

Simple

1 Plain (eg P3, 6, 8, 11, 35-6, 38, 64, 67, 73, 76, 111-2, 116-9, 122, 131, 138, 153, 168-9, 181-2, 184-5, 196)

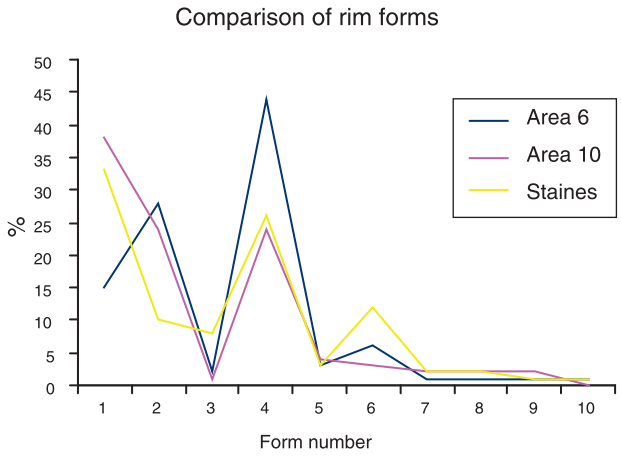


Fig. 5.13 Area 6: percentage of different rim forms compared with those from Staines causewayed enclosure

2 Plain everted (eg P1, 15, 27-9, 53-4, 68, 70-1, 77, 83, 87, 97, 99, 100, 109, 114, 125-6, 129, 132, 137, 145, 147, 154, 157)

3 Pointed (eg P2, 4, 26, 42, 82, 123, 135, 186)

Rolled

4 Rolled (eg P9, 10, 12-3, 20, 23-4, 32, 39, 41, 43-5, 47-8, 52, 55-6, 58-60, 63, 65, 72, 74, 78-81, 88, 91-2, 94, 98, 103, 105, 108, 110, 115, 120, 124, 127, 134, 139, 150, 155, 158, 164, 171-2, 175, 188, 195)

5 Beaded (eg P17, 22, 37, 40, 66, 133, 149)

Table 5.4 A breakdown and quantification of the rim forms with a comparison with Staines

Rim form	*Area 6*	*%*	*Staines CE*	*%*
1	81	15	192	33
2	154	28	60	10
3	11	2	46	8
Simple subtotal	246	45	298	51
4	246	44	152	26
5	17	3	19	3
Rolled subtotal	263	47	171	29
6	34	6	71	12
7	4	1	14	2
8	3	1	11	2
9	1	<1	8	1
10	2	<1	6	1
Heavy subtotal	44	8	110	19
Total	553		579	

Table 5.5 A breakdown of rim types by selected feature groups

Context	*Rims*												*Total*
	Plain			*Rolled*		*Heavy*							
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*Misc*	
Middens													
11421	3	10	1	9		1							24
11422				3		1							4
11423				1	1	1						2	5
11426	15	15	2	16	2	4	1	1		1		5	62
Tree-throw holes													
11420	3	3	1	19		1					1	2	30
11352	7	14		17	2	10						4	54
11424	2	2	3			1							8
11301	3	4	1							1			9
11427		1		2	2	1	1						7
Pits													
5110				1									1
11179	2	1		1									4
Total	35	50	8	68	7	20	2	1	0	2	1	13	207

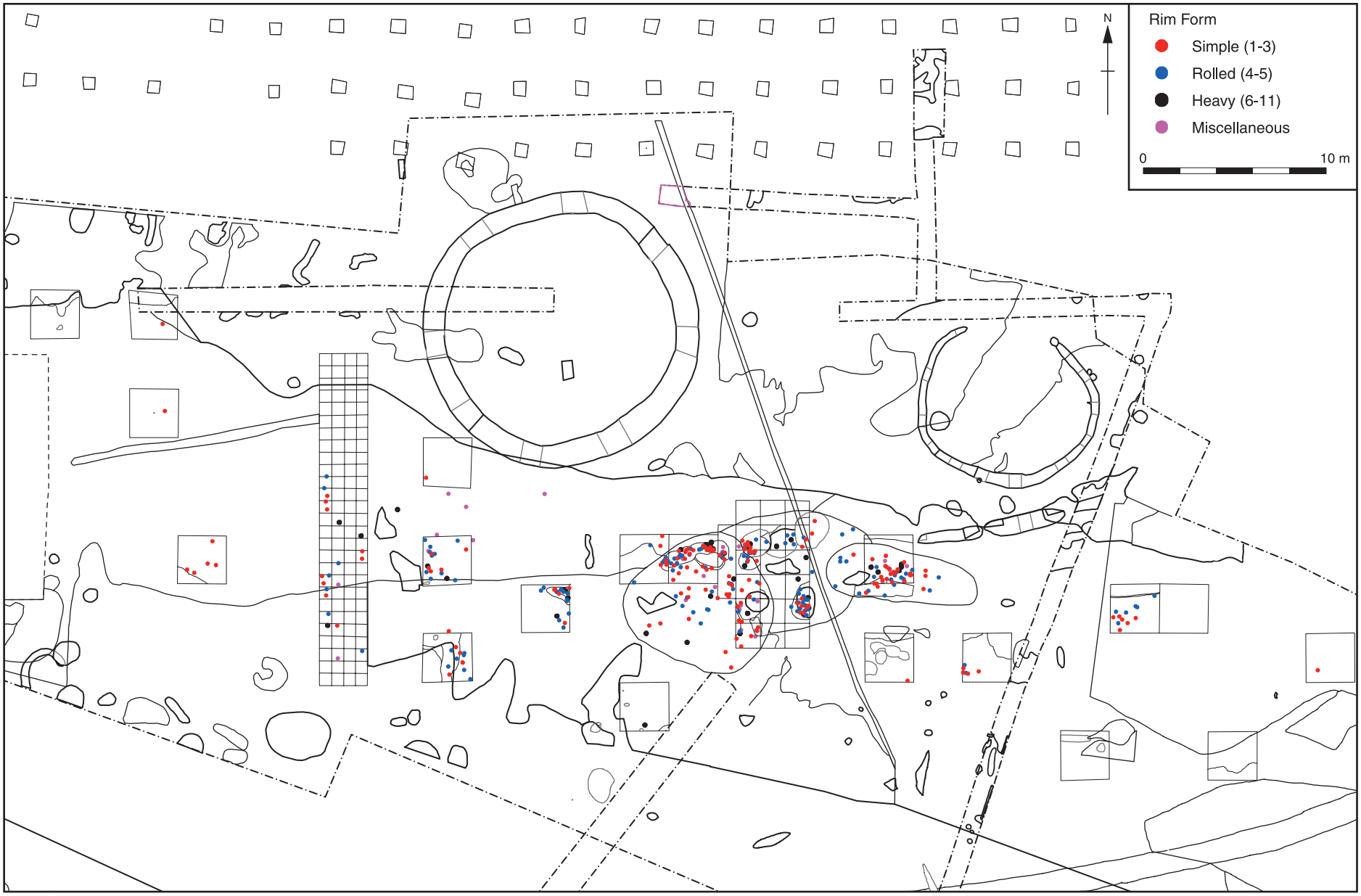


Fig. 5.14 Area 6: distribution of early Neolithic rim types

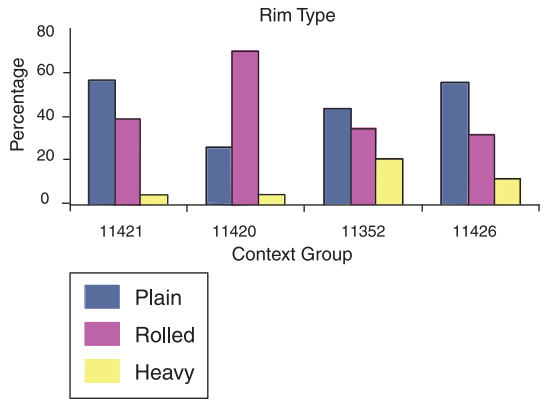


Fig. 5.15 Area 6: percentages of different rim forms in selected context groups

Table 5.6 A breakdown and quantification (number of sherds) of the shoulder forms with a comparison with Staines (SCE; published vessels only)

Shoulder form	*Area 6*	*%*	*SCE*	*%*
1	46	42%	5	21%
2	35	32%	5	21%
3	21	19%	3	13%
4	5	5%	0	0%
5	2	2%	2	8%
6	1	1%	1	4%
Other	1	1%	8	33%
Total	110		24	

Heavy

6 Externally thickened (eg P5, 7, 16, 21, 46, 75, 86, 90, 104,121, 128, 136, 140-1, 146, 152, 156, 159, 177-9, 194)
7 Expanded (eg P69, 180, 187, 189)
8 T- shaped (eg P62)
9 Inturned (eg P33)
10 Angular, inturned inverted (eg 11316 SF 80872; 11160 SF 73493
11 Internally expanded/thickened (eg P172)

Shoulder morphology (Fig. 5.16)

This follows a scheme devised by Case for characterising a large body of early Neolithic material from Ireland that included Carinated and Plain assemblages (Case 1961). As this material is related and bears striking resemblance to British early Neolithic pottery, its use is adopted here. First a simple distinction can be made between rounded and angular shoulders. One of the characteristics of 'early' Carinated Bowl assemblages is the variety and elaboration of the shoulder. Following Case, six shoulder forms were identified. These were divided into slack rounded shoulders (1) and a range of angular forms (2-5), and rounded and grooved (6).

1 Rounded (eg P21, 37, 143, 148)
2 Simple angular (eg P13-4, 31, 49-50, 57, 61, 94, 107, 113, 151, 166)
3 Angular with stepped profile (eg P18, 82, 92, 101, 135, 165, 167, 174)
4 Angular stepped and grooved (eg P56, 170)
5 Strip/cordoned (eg P19, 34, 95, 144)
6 Grooved (eg P130)

Rounded shoulders tend to be weak or slack (type 1). Angular forms range from simple to elaborate. Simple angular forms (type 2i) are inflected with a clear edge marking the shoulder and little change in wall thickness. More elaborate forms have a thicker shoulder and thinner neck (type 2ii). There are some examples where the shoulder zone

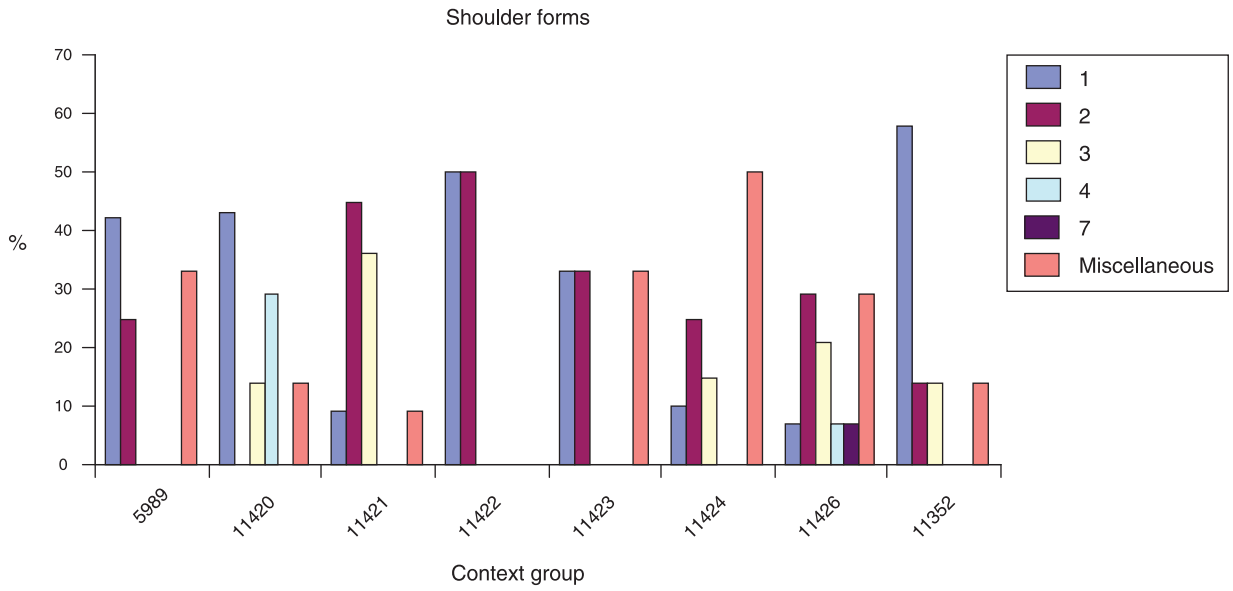


Fig. 5.16 Area 6: percentages of different shoulder forms in selected context groups

Table 5.7 Concordance of vessel shapes used in the analysis (after Cleal 1992; Robertson-Mackay 1987; Wainwright 1972)

Categories/types	*Staines*	*Broome Heath*	*Area 6*
Simple	Open/closed uncarinated bowls	IIB-C	1i-ii
Inflected	Closed S-profile bowls		
Necked bowls	IID, IIA	2i-ii	
Composite	Open/closed carinated bowls	IVA-B	3i-iii

is marked but where there is no change in angle (type 2iii). There are also more developed angular forms with a deliberate step (type 3) in the profile and some of these are exaggerated with a slight lip and groove (type 4). There are examples where a cordon-like strip has been added to emphasise the shoulder (type 5). Types 1-5 are likely to occur on vessels that have a clear bipartite profile where the neck-zone is relatively large in contrast to the belly of the pot. Types 2-5 are frequently associated with Carinated Bowl forms (Case 1956; Manby 1988). Generally absent from this assemblage are the ledge-like shoulders that tend to belong to vessels with short necks. These are perhaps more typical of so-called shouldered bowls that belong to Plain and Decorated Bowl assemblages (see Robertson-Mackay 1987, figs 44 and 48). Finally, there is a single example of a rounded shoulder marked with a wide shallow groove. This sherd may belong to a vessel that is related in form to so-called thumb-groove bowls (Smith 1965, fig. 18: P76-8). Thumb grooves are perhaps more commonly found just below the rim (Smith 1965), although an example with a groove around the girth was recorded at Staines (Robertson-Mackay 1987, fig. 38: P23).

In total, the shoulder sherds were thought to come from possibly as many as 110 separate vessels from which at least 57 % could have derived from Carinated Bowls (Table 5.6).

Vessel morphology

Following the work of Cleal and Smith the assemblage can be divided into the typical categories of cups and bowls (Table 5.7; Cleal 1992; Smith 1965). Cups are generally defined as having a mouth diameter that does not exceed 120mm (Smith 1965). True cups are generally of simple form with a hemispherical profile and with simple rims. In terms of size they overlap with small bowls. However, the major vessel category is the bowl, which can be divided into three basic shapes (Piggott 1931; Cleal 1992):

1 simple forms with rounded profiles (round mouthed bowls), which are basically larger versions of cups but sometimes with more elaborate rim forms
2 more elaborate forms in which the profile is sinuous or inflected (S-profile bowls and necked bowls)
3 and carinated/shouldered or composite forms, which can be divided into classic Carinated Bowls as defined by Herne (1988), round shouldered and high or ledge shouldered bowls.

Cups (Fig. 5.17)

Cups and small bowls (Type 1)
Small (diameter range 80-120mm, except miniature vessels with diameters less than 40mm), hemispherical with simple, sometimes slightly thickened rims. These occur either as neutral (1a – eg P6, P76) or closed (1b – eg P36, P115) forms. There is a single example of a carinated cup (P102). They were manufactured from a variety of sand and flint-tempered fabrics, although a significant number are made from the sandy fabric A1/EN. Some are quite poorly made from ill-sorted sandy or sand-tempered clays that include natural inclusions (eg gravel flint). At least two cups were made from what appeared to be untempered clay, while one cup was made from the quartzite tempered fabric (QA/EN). Surface treatment was generally rare with only seven vessels having signs of burnish or smoothing.

Although no complete profiles were represented, at least 57 cups are represented by rim sherds (Table 5.8). Nine cups were analysed for lipids (samples 1-4, 6, 86-8) of which eight were found to have residue traces: five have traces of dairy produce, three of which also have possible traces of ruminant fat, three only have traces of ruminant fat. One cup had carbonaceous residue on its interior surface. One cup had a drilled hole possibly for repair and another had a spalled surface.

In addition to these vessels there are a small number of sherds that appear to come from miniature cups (P30 and P102), which are of uncertain but

Table 5.8 Vessels based on rims and selected featured sherds

Vessel form	*Number*	*Percentage*
Cups (Type 1a-b)	57	13%
Hemispherical bowls (Type 1i-ii)	9	2%
S-profiled (Type 2)	6	1%
Shouldered (uncertain) (Type 3)	3	1%
Carinated Bowl (Type 3i-ii)	9	2%
Ledge shouldered (Type 3iii)	4	1%
Uncertain bowl shape	360	80%
Total	448	

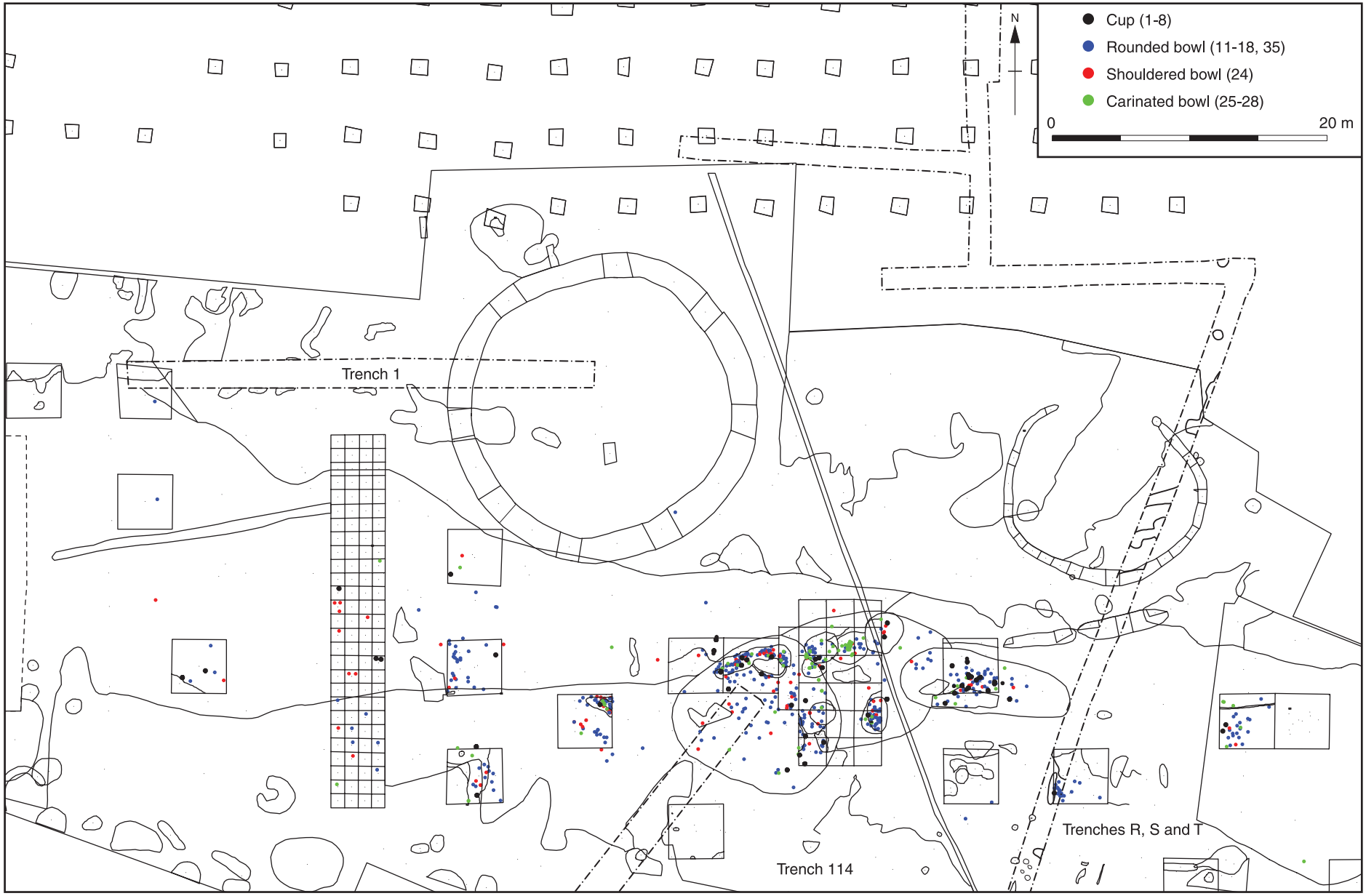


Fig. 5.17 Area 6: distribution of early Neolithic vessels: cups and bowls

probable early Neolithic date. No complete profiles survive, although a similar and more complete cup comes from Area 10.

1a closed form: P35-6, 122, 196
1b neutral form: P6, 30, 64, 67, 73, 76, 111-2, 117-9, 153, 163, 168-9, 181-2, 184-5

Bowls (Fig. 5.17)

The majority (391 vessels) of the recorded vessels (448 vessels) can be described as bowl forms (Table 5.8). These vessels have a diameter range based on measurable rims of 140-460mm. Both carinated and uncarinated forms are present. Some elaborate shoulder forms occur, while the majority of rims are everted or rolled. Surface treatment such as smoothing or burnishing is common, while decoration is very rare. Some 87% of recognised vessels can be classified as bowls and these can be described under the following headings.

Bowls-indeterminate
The majority of bowls (80% of the total assemblage) are of uncertain shape as little of the vessel profile survives apart from the rim and/or shoulder. As the assemblage is known to contain uncarinated and carinated bowls no attempt has been made to assign rims to vessel forms.

Simple bowls (type 1)
rounded/unshouldered bowls
These can be divided into the following shape categories:

1i – Neutral bowls with simple, rolled, pointed or everted, or heavy rims.
Vessel profiles either have hemisperical or straight conical bodies with the rim diameter equal to that of the body. Examples include P9, P28, P42, P60, P80, P141 and P158. Vessel P42 was analysed (sample 27) for lipids and was found to contain possible ruminant fat.

1ii – Rounded/globular bowls
These have a rounded profile and are either of neutral or closed form with a rim diameter less than the girth. They tend to have either simple or rolled rims. Only two examples are represented (P40 and P96).

Inflected bowls (type 2)
2i – S-profiled bowls
These have the typical S-shaped profile and can be either open, neutral or closed in form. They tend to have either rolled or everted rims and occur in a range of sizes. Bowl P189 is the most complete example but other examples include P130-1. Although only three certain examples are represented a number of rims and shoulders are likely to derive from such vessels (eg P27 and P29). Three of these vessels were analysed for residues but no lipid traces were detected.

2ii – Necked bowls
A number of simple rims are probably from so-called necked bowls. These tend to have simple rims and are generally of closed form. Examples include P133. This vessel was analysed for residues (RS18) and was found to contain possible dairy products.

Shouldered bowls (type 3)
3i – Carinated bowls
These have a distinct bipartite profile with upright or concave necks, and sharp and sometimes elaborate angular shoulders. Rims tend to be simple or rolled but never heavy. Shoulders can be simple but angular (type i) or more elaborate with stepped or stepped and grooved profiles (types ii-iii). Often vessels are very well-made and are finished with burnished surfaces. Some vessels can be very fine with thin (4-5mm) walls. However, coarser vessels were also manufactured with wall-thickness exceeding 10mm. Fabrics vary but tend to include a mixture of sand and flint inclusions. Firing can show a preference for either an even unoxidised dark grey to black or for an even oxidised reddish-brown. This includes a number of fine examples, such as P92 and P94 of open and neutral form, respectively. Both vessels are well-made from unoxidised dark fabrics. P92 is extremely fine and was originally burnished all-over. P94 was also a very fine product and made from flint-tempered and untempered sandy clay. Fragments from coarser Carinated Bowls (P93) are also recorded, some of which are made from sandy clay tempered with flint, and have been fired a distinctive reddish-brown. While very few profiles of this type of vessel survive, a relatively high number of recorded shoulder sherds (eg P14, 56, 61, 82, 84 and 101) are thought to derive from Carinated Bowls, and it is therefore probable than a high number of the simple and rolled rims belong to such vessels. Three vessels were analysed for lipids (P92-3 and SF 38800). P92 was found to have possibly contained dairy produce.

3ii – Other carinated bowls
These have weak shoulders in which there is little change in the vessel profile, although the shoulder zone is clearly marked by a carination and a thickening of the clay wall (shoulder form 2). Examples include two shoulders possibly from the same ripple-burnished bowl (P49-51), as well as P107 and the rim and shoulder sherds that make up vessel P113.

3iii – Ledge/high shouldered bowls
Other carinated bowls include vessels with rounded shoulders and examples with high ledge shoulders. Again the number of profiles is limited to a small number of vessels which includes P21, P37, P86 and P194. P21 was analysed for residues but produced no trace.

Miscellaneous bowl forms
There is a single example of a bowl with a thumb groove around its girth (P128). There is also a lugged bowl represented by a single sherd with part of a broken vertical perforated strap handle (P89). Four rims are from decorated bowls (P26, P85, P136 and P147). P26, P85 and P136 are all typical of the Decorated Bowl tradition, while the use of twisted cord impressions on the rim of P147 is perhaps more unusual but can be paralleled by a single example recovered from the ditch of the Staines causewayed enclosure (Robertson-Mackay 1987, fig. 49, 146). The ripple-burnished sherds can also be paralleled by a group of bowls recovered from the Staines causewayed enclosure (Robertson-Mackay 1987, fig 47).

Simple bowls
1i Neutral bowls: P9, 28, 40, 42, 60, 80, 141, 158
1ii Rounded/globular bowls: P96

Inflected bowls
2i S-profiled bowls: P131-2, 189
2ii Necked bowls: P133

Shouldered bowls
3i Carinated bowls: P13-4, 92-5, ?108
3ii Simple angular carinated bowls: P49
3iii Ledge/high shouldered: P21, 37, 86, 194

Discussion of forms

The brokenness of the assemblage and the lack of vessel profiles limits the potential to characterise the assemblage by vessel type. Based on the number of different rims a minimum of some 448 vessels has been recognised, which can be simply divided into cups (13% – 57 examples) and bowls (87% – 391 examples; Table 5.8). The range of bowl forms includes both shouldered and rounded types. Shouldered bowls include classic Carinated Bowls (P92-5), uncertain shouldered forms, and ones with high/ledge or rounded shoulders (P21, 37, 86 and 194). Rounded bowls include examples with S-profiles (P132-3, 189), and hemispherical types (P9, 28, 40, 42, 60, 80, 141 and 158). Unfortunately the number of recognisable forms is perhaps too low, and insignificant, to estimate accurately the ratio of carinated to uncarinated forms. However, it can be noted that some 108 vessels are represented by shoulder sherds (although the majority could not be joined to rims) of which a very high percentage are angular and could derive from Carinated Bowls. This gives a possible minimum of 24% and, with the caveat that it is usual to recover more rims than shoulder sherds, this figure can be taken to indicate that originally a high proportion of the assemblage was carinated.

Rim diameters were measured and these gave the following ranges. Vessels classified as cups seemed to fall with the range of 80-120mm (with the exception of a miniature cup which has an estimated diameter of 40mm), a figure that compares well with other sites. Bowls fall within the range of 140-460mm, which again mirrors the expected size range of assemblages found on sites such as causewayed enclosures and for bowl assemblages in general (Howard 1981). Cups tended to be made from sandy fabrics and were seldom finished with any surface treatment. In contrast almost 30% of bowls had traces of burnish or smoothing on the vessel surfaces, a figure that is likely to have originally been much higher.

Evidence for use

The assemblage is characterised by a range of vessels that vary in both form and size. On typological grounds only it can be suggested that vessels suitable for storage, preparation, serving and consumption of foodstuffs are present. The overall assemblage includes a complete range of vessels (cups, small bowls, larger bowls, fine and coarse bowls). There is little evidence to suggest that categories of vessels were excluded from the Area 6 midden deposits or that the assemblage reflects a restricted set of activities.

Charred residues on a number of bowl sherds as well as one cup indicate some were used for cooking, while absorbed residues (lipids) indicate the consumption of animal fats and dairy products as well as the use of beeswax. Evidence for dairy products was found in 15 vessels (cups and a variety of bowls), while a further three vessels have possible traces. Three of the five cups with dairy fats also contained traces of possible ruminant fat, two bowls also contained mixed fats, and one beeswax. Seven vessels (cups and a variety of bowls) contain traces of ruminant fat, while a further four have possible traces. One bowl has traces of beeswax only. There were no obvious patterns of correlation between type of pottery, fabric, surface treatment and lipid residue. Porcine fats were notably absent from the vessels sampled, while there was evidence for the mixing of animal fats and beeswax in two vessels (samples 46 and 49).

Discussion

The analysis of the early Neolithic pottery supports the view that many of the features and deposits within the hollow were broadly contemporaneous; this includes all of the identified surface midden deposits, middens within tree-throw holes and pits (Table 5.9). The openness of these deposits can be demonstrated by the recovery of relatively small quantities of mid-late Neolithic and early Bronze Age pottery (see below) from some of them. This later material occurred in the surface deposits but was generally absent from those features (pits and tree-throw holes) considered to be contemporaneous. Early Neolithic pottery was also found as redeposited material in later features (eg ring ditch 5579, Fig. 5.35, 191-3, and enclosure 5500).

The early Neolithic pottery assemblage is heterogeneous in character in that it contains an earlier Carinated Bowl component as well as later Plain and Decorated Bowl components. A small number

Table 5.9 A breakdown (number, weight) of fabrics by selected feature group

	Sandy A1	*AF1*	*AF2*	*AF3*	*AFQ2, AQ2-3, AQR*	*AS1*	*Flint F1*	*F2*	*F3*	*FA1*	*FA2*	*FA3*	*FQ2-3, FQA2*	*Quartzite Q2-3, QA2*	*Misc S3, SA2*	*Indeter-minate*	*Total*
Middens																	
11421	3, 8g	21, 127g	52, 514g	20, 168g			10, 14g	20, 48g	6, 66g	11, 52g	54, 741g	21, 300g				6, 5g	224, 2043g
11422		4, 20g	9, 70g	2, 20g			7, 8g	7, 20g	4, 15g	4, 11g	22, 158g	14, 128g				6, 5g	224, 2043g
11423	2, 4g	15, 73g	26, 72g	3, 13g				15, 10g	18, 52g	8, 15g	12, 60g	7, 40g		2, 82g	1, 8g	12, 8g	121, 437g
11426	43, 189g	46, 162g	28, 205g	22, 215g	2, 12g		19, 52g	46,215g	54,258g	18, 48g	49, 367g	23, 236g	1, 3g			19, 12g	370, 1974g
Tree-throw holes																	
11420	17, 51g	54, 165g	65, 320g	12, 119g	1, 6g	1, 1g	17, 48g	51,136g	22,107g	26, 80g	66, 286g	26, 229g				5, 5g	363, 1553g
11352	32, 75g	118, 556g	148, 987g	94, 873g	2, 17g		19, 155g	36,235g	23,109g	35,122g	108, 665g	39, 361g		12, 85g		16, 12g	682, 4252g
11424	3, 12g	18, 59g	25, 141g	3, 34g			1, 1g	7,34g	2, 7g	17, 34g	77, 142g	5, 36g		1, 3g		5, 3g	164, 506g
11301	7, 50g	14, 50g	30, 209g	12, 204g			1, 11g	16,135g	10, 88g	6, 40g	23, 130g	17, 231g	1, 4g				137, 1152g
11427	15, 64g	14, 42g	32, 168g	23, 219g	1, 8g		2, 2g	20,. 50g	9, 83g	5, 11g	28, 105g	13, 108g					162, 860g
Pits																	
5110	1, 4g		1, 3g						1, 27g		3, 27g	1, 48g					7, 109g
11179		3, 6g	7, 45g	1, 22g				15, 50g	7, 24g	1, 1g	13, 22g	4, 27g				5, 4g	56, 201g
Total	123, 457g	307, 1260g	423, 2734g	192, 1887g	6, 43g	1, 1g	76, 291g	233, 933g	156,836g	131,414g	455, 2703g	170,1744g	2, 7g	15, 170g	1, 8g	70, 54g	2361, 13542g

of decorated vessels are present, which is an indicator of a later date (3650-3350 cal BC). The near absence of both stratigraphy as well as closed features containing good groups of vessels makes it difficult to characterise and quantify these elements of the total assemblages. The open nature of the deposits means that redeposition and intrusiveness are likely to be factors when considering the integrity of these deposits. Despite this, it was possible to suggest a subdivision of the early Neolithic context groups into early and late phases, while the recovery of vessels with Peterborough ware traits (eg P147, 160 and 199) perhaps indicates a late date within the early Neolithic sequence for some of this activity.

In total some 48 sherds (371g) came from group 11202 (early fills 11180 and 11305), which includes the simple rims P1-4 and the heavy rim P5 (Fig. 5.14). The early Neolithic horizon, 11201, contained a total of 1304 (7055g) sherds and included a wide variety of rim and vessel forms (P6-31). Vessels represented include examples of Carinated Bowl (P13) and shouldered bowl (P21). It also contained the rim from a decorated bowl as well as a miniature cup (P30). The sealing layer, group 11200, also contained a wide variety of rim and vessel forms (P37, 39-91). This includes a number of shoulder sherds from Carinated Bowls (P56-7, 61, 82, 84) as well as uncarinated vessels (P36, 40, 42, 60, 80), sherds from one or more ripple burnished bowls (P49-51), weak and high shouldered bowls (P37, 86), a sherd from a decorated bowl (P85) and a handled bowl (P89).

Surface middens 11421 and 11422 contained totals of 244 and 75 sherds respectively. Fragmentary Carinated Bowls as well as sherds came from both context groups (P92-5, 101, 107). However, the context groups also contained part of a simple closed bowl (P96), a miniature cup (P102) and a refitting rim fragment from a decorated bowl (P136). Midden 11426 also contained a wide variety of rim and bowl fragments (P107-31), including fragments from Carinated Bowls (P108), uncarinated vessels, part of a thumb groove bowl (P130) and a significant number of cups (P111-2, 116-20, 122). Midden 11179 contained relatively little pottery (56 sherds), which includes the rims from two cups (P181-2). Tree-throw hole midden group 11352 (11320, 11332 and 11347) contained a wide range of rim and vessel forms (P132-47), which included rims from two decorated bowls and a number of vessels with heavy out-turned rims (P134, 136, 140 and 146). Tree-throw hole midden group 11424 contained a similar range of vessels. Carinated Bowl (165-7) was present alongside vessels with heavy rims (P152, 156) as well as sherd (P160) with internal decoration. Tree-throw hole middens 11420 and 11427 also contained a variety of rim and vessel forms (P168-80). In addition early Neolithic pottery came from pits 5110, 11134 and 11195 and from tree-throw holes 11301, 11349 and 11350.

A total of 295 sherds came from the excavated trench across the hollow (11428), which included refitting fragments from a large S-profiled bowl (P189). Redeposited pottery including rims P191-3, came from the ditch of barrow 5579, and from layers and contexts 5788 (P194-6), 5566 (P197) and 5750 (P198).

Date, affinities and comparisons with other assemblages

It can be demonstrated that the Area 6 pottery is not an homogeneous group belonging to a single phase but contains a series of groups deposited over a period time, probably centuries.

The development of early Neolithic ceramics is still a matter for debate, although the sequence outlined by Smith and Herne still broadly holds true (Herne 1988; Smith 1974a). The earliest pottery in Britain is characterised by assemblages of Carinated Bowl, which are thought to have appeared around the start of the 4th millennium cal BC (3900-3800 cal BC; cf Coles *et al.* 2008 and Whittle *et al.* 2011). Herne (1988, 9) used the term Carinated Bowl to describe a broad category of vessels loosely defined as 'a class of high quality undecorated open carinated vessels ... characterised by an angular bipartite profile that are found across Britain and Ireland'. However, within the broad category of Carinated Bowl it might be possible to subdivide assemblages into two groups. The first group consists of very fine bipartite bowls with distinctive hollow necks and sharp shoulder carinations, where the shoulder occurs relatively low down on the vessel profile and with relatively light, simple plain, pointed or everted rims (eg Ascott-under-Wychwood: Barclay and Case 2007; Cannon Hill, Maidenhead: Bradley *et. al.* 1975-76; Kilham, Yorkshire: Piggott 1931; Spong Hill, pit group 2618, Norfolk: Healy 1988; Gwernvale pre-cairn group: Lynch in Britnell and Savory 1984). A second group consists of assemblages of fine and coarse vessels in which rims are relatively heavier occasionally rolled and/or thickened, shoulders are less acute and necks are relatively shorter (eg Staines Road, Shepperton: Jones 2008; Blackwater Site 18, Hullbridge Survey, Suffolk: Brown 1995; Cherhill, Wiltshire: Evans and Smith 1983; Hazleton North, Gloucestershire: Smith and Darvill 1990). At the moment it is not clear whether the distinction between these two groups is contextual or chronological.

The Carinated Bowl from Area 6 is closer in style to the second group as outlined above, and is very similar in character to an assemblage from Staines Road, Shepperton some 30km to the east (Jones 2008; pers. comm.). The exact forms of the vessels from Cannon Hill, Maidenhead, a site that is only 5km to the west, are difficult to parallel at Area 6. Shoulder sherd P14 could belong to such a vessel but the profile is too incomplete to be certain. Vessel P94 is similar in profile to the Cannon Hill bowls but is generally heavier with a thickened rim.

Large assemblages of Carinated Bowl are rare but include a number sealed by long cairns and barrows

(eg Hazleton North: Saville 1990; Ascott-under-Wychwood: Benson and Whittle 2007, and Gwernvale: Britnell and Savory 1984). Many deposits of Carinated Bowl involve the possible selection of fine vessels, while cups and coarser vessels may be present in assemblages recovered from probable domestic contexts. At Gwernvale the pre-cairn deposit contained fine Carinated Bowls as well as heavy rimmed vessels (Lynch in Britnell and Savory 1984, 106, fig. 43). At Ascott-under-Wychwood fine and coarse Carinated Bowls are present (Barclay and Case 2007). At Hazleton North, 32 vessels were recovered from the pre-cairn midden and associated contexts (Smith and Darvill 1990, 149, fig. 156). Vessels represented included cups, fine carinated bowls and possible coarser examples with heavier rims. A similar assemblage of vessels (23 in total), again comprising cups and both fine and coarse vessels, was recovered from ditch deposits at Cherhill, Wiltshire (Evans and Smith 1983, 86, fig. 23). Many of these assemblages have been recovered from open sites rather than monuments.

The precise date range of Carinated Bowl assemblages is at present uncertain, although the lack of association between carinated assemblages and causewayed enclosures in Wessex and the Thames valley could indicate that they belong to a period before 3650 cal BC, perhaps falling within the range 3800-3650 cal BC. It is possible that some assemblages are earlier still. The construction of enclosures within the Thames Valley is generally thought to occur within the period 3650-3350 cal BC with radiocarbon dates obtained for six enclosures within the Thames valley (Abingdon, Peak Camp, Eton Wick, Windmill Hill, Knap Hill and Orsett: Holgate 1988; Whittle 1993; Whittle *et al.* 2011). It is these sites that provide large assemblages of Bowl pottery. Taking the earlier open sites and the enclosure sites together, a series of developments in ceramics can be proposed. The early assemblages are dominated by generally fine, plain, open and shouldered vessels. However, over time, shouldered forms become less dominant, heavier rimmed vessels appear, as do vessels with decoration, handles and lugs. Assemblages may be dominated by hemispherical bowls, while shouldered forms tend to be less angular with shorter necks. In the Thames Valley decorated assemblages tend to be found at enclosures, while plain assemblages and assemblages containing vessels with rim decoration tend to occur at open sites and monuments (Barclay 2002, 87-8).

There are two further developments in the ceramic sequence that at present await clarification. One is the chronological position of assemblages such as that from Whiteleaf (Smith 1954) and the other is the emergence of Ebbsfleet Ware, although it is possible that both could date from before 3350 cal BC, and perhaps during a period from 3500-3350 cal BC (representing a final stage in the early Neolithic; Barclay and Bayliss 1999).

It is suggested that the assemblage from Area 6 was originally made up of groups of Carinated Bowl and Plain Bowl that had over time become mixed as the result of post-depositional processes. The Carinated Bowl element is best represented by a group of vessels recovered from midden deposits 11420-1. This group includes both fine and coarse bowls of open or neutral form. Elsewhere within the midden there are sharp angular and stepped shoulders that almost certainly derive from carinated vessels. In contrast, the midden deposits within tree-throw holes 11424 and 11352 contained a series of heavy rims possibly from uncarinated vessels. A cord-impressed decorated rim sherd (P146) came from the same deposit. There are a number of straight-sided, S-profiled, and globular bowls, as well as cups, from deposits within the hollow. Vessels with rounded or high ledge shoulders are rarer. There are sherds from ripple burnished bowls (P49-51), a lugged bowl (P89) as well as one example of a possible thumb grooved bowl (P128). In general, many of the deposits appear to contain a mixture of typologically early and late vessels. Rim forms are dominated by simple or rolled forms, while the number of heavy forms accounts for only about 12% of vessels.

The total assemblage is very similar to that recovered from Staines Road, Shepperton which is characterised by bowls with either simple, everted or rolled rims. At the Staines Road site forms include carinated vessels, possible S-profiled bowls and cups or small bowls with simple rims (Jones 2008; pers. comm.). In contrast to this is the assemblage from the Staines causewayed enclosure that contains relatively few shouldered forms and no Carinated Bowls (Robertson-Mackay 1987). However, despite this typological difference, it did contain a high number of cups, S-profile bowls, ripple-burnished bowls, globular bowls and vessels with thumb grooves. Another smaller assemblage comes from the ditches of a U-shaped barrow at Manor Farm, Horton (Preston 2003). This assemblage can be described as Plain Bowl and was made up of a series of vessels with heavy thickened or T-shaped rims (Raymond 2003a). In general this assemblage has many similarities with the assemblage from the Staines enclosure (Raymond 2003b). Similarities with this group, which Raymond places between '3600-3300 bc' can be recognised amongst the assemblage at Area 6. There are also similarities with some of the plain and heavy rim forms at Whiteleaf (Smith 1954). The early Neolithic site at Runnymede provides a complex picture. No Carinated Bowl is present but there are groups of Plain and Decorated Bowl as well as vessels with Ebbsfleet Ware traits (Kinnes 1991; Longworth and Varndell 1996).

Within the Middle Thames it is possible to postulate a sequence of ceramic development based on the following sites. One of the earliest groups of pottery is represented by an assemblage of Carinated Bowls from Cannon Hill, Maidenhead

(Bradley *et al.* 1975-76). This pottery was recovered from a layer that contained charcoal and flintwork. A single radiocarbon date of 4350-3800 cal BC (HAR-1198: 5270 BP) was obtained on charcoal from this layer, although the sample has an unknown age offset. Although these vessels cannot be precisely paralleled at Area 6 and at Staines Road, it is probable that all three assemblages belong to the period 3800-3650 cal BC. Elements of the Area 6 assemblage are, however, also typologically comparable with the assemblages from Eton Wick, Bray, Manor Farm, the Staines enclosure, Runnymede and Whiteleaf. These sites are likely to have developed within the period from 3650 to 3350 cal BC.

That the assemblage from Area 6 belongs to the two broad phases outlined above receives some support from the radiocarbon dates obtained on charred residues and other material. Five radiocarbon dates were obtained on carbonised residues, which provide direct dates with minimum age offsets for the assemblage (Table 5.10). Further dates were obtained on associated material within the same deposits. The five dates span a period from the late 5th millennium to the end of the 4th millennium cal BC (see below). Only one sherd, a Carinated Bowl shoulder (SF 50842), is diagnostic.

Analysis of the pottery deposits within the Area 6 hollow

The pottery within the Area 6 hollow was examined in order to gain a better understanding of the character and formation of those deposits. Nine deposits were selected for analysis, of which four (11421-3, 11426) were identified in the field as surface middens, and five as middens within treethrow holes (11420, 11352, 11424, 11301 and 11427), while a further context, 5989 (surface material), was used as a control.

A comparative study of these 10 deposits was made, which considered the following: typological analysis, refitting, sherd weight, sherd thickness, relative fabric proportions and condition and degree of abrasion.

Typological analysis

Early Neolithic pottery was concentrated in all of the 10 context groups. Simple (type 1-3), rolled (type 4-5) and heavy (type 6-10) rims were distributed across these features (Figs 5.14-15), although their proportions varied. Plain rims dominated in many of the feature groups with the notable exception of 11420, while in 11352 and to a lesser extent 11426 there was a higher proportion of heavy rims. 11352 contained two decorated rims, while 11426 contained part of a thumb grooved bowl. 11421-2 contained a number of fragmentary Carinated Bowls and as a deposit stood out from the rest. Shoulder sherds were present in all of the selected deposits (Fig. 5.16), although it can be noted that context group 11352 contained a higher proportion of rounded shoulders. Shoulder forms more typical of Carinated Bowls (types 3-4) were present in context groups 11421, 11426, 11352, 11424 and 11420. Cups were distributed across the hollow (Fig. 5.17) but were noted as rare or absent in pottery deposits 11420-3, while the highest concentration occurred in deposit 11426. Deposits 11352 and 11424 also contained a relatively high number of cups. Carinated Bowls were present in most of the pottery deposits but were more concentrated in deposits 11421-2.

Refitting analysis and refit patterns (Figs 5.18-21; Plates 5.6-7)

A programme of refitting was undertaken on pottery groups recovered from the hollow. In particular, pottery from those deposits identified as middens within the hollow was examined in detail. During the general recording of the assemblage, a record was made of refitting sherds and sherds that were similar in appearance. These sherds along with all featured sherds were then laid out in context and feature groups and a search was made to identify further conjoins.

Where multiple refitting featured sherds were identified, a search was made of all sherds from a particular context or feature to identify all related fragments. A limited search between feature groups was made. Where significant clusters of refitting or related sherds were found the entire context group was examined.

In total 72 vessels were represented by refitting and/or related sherds (Fig. 5.18), although the study was not exhaustive. However, the majority of related sherd groups consisted of only two or three sherds. Only six sherd groups involved complex refits (more than five related sherds). Significantly, four of these sherd groups came from midden deposits.

Middens 11421 and 11422 contained nearly all the examples of complex refits, all of which can be described as Carinated Bowls. This included P92 (Fig. 5.19), P94 (Fig. 5.20) and P93. The most

Table 5.10 Radiocarbon dates on carbonised residues

Context	*Sf no.*	*Lab. ref. no.*	*Determination*	*2δ cal BC*	*Comment*
8194	50842	OxA-9852	5110±90	4230-3700	?Carinated Bowl, Shoulder sherd, fabric FA3
11194	82319	OxA-9924	4920±65	3930-3530	Neck sherd, fabric AF3
11313	84429	OxA-9851	4760±50	3650-3370	Body sherd, fabric AF3
11320	84566	OxA-9850	4645±55	3630-3340	Body sherd, fabric AF3
11344	82594	OxA-10660	4915±55	3800-3630	Body sherd, fabric FA3

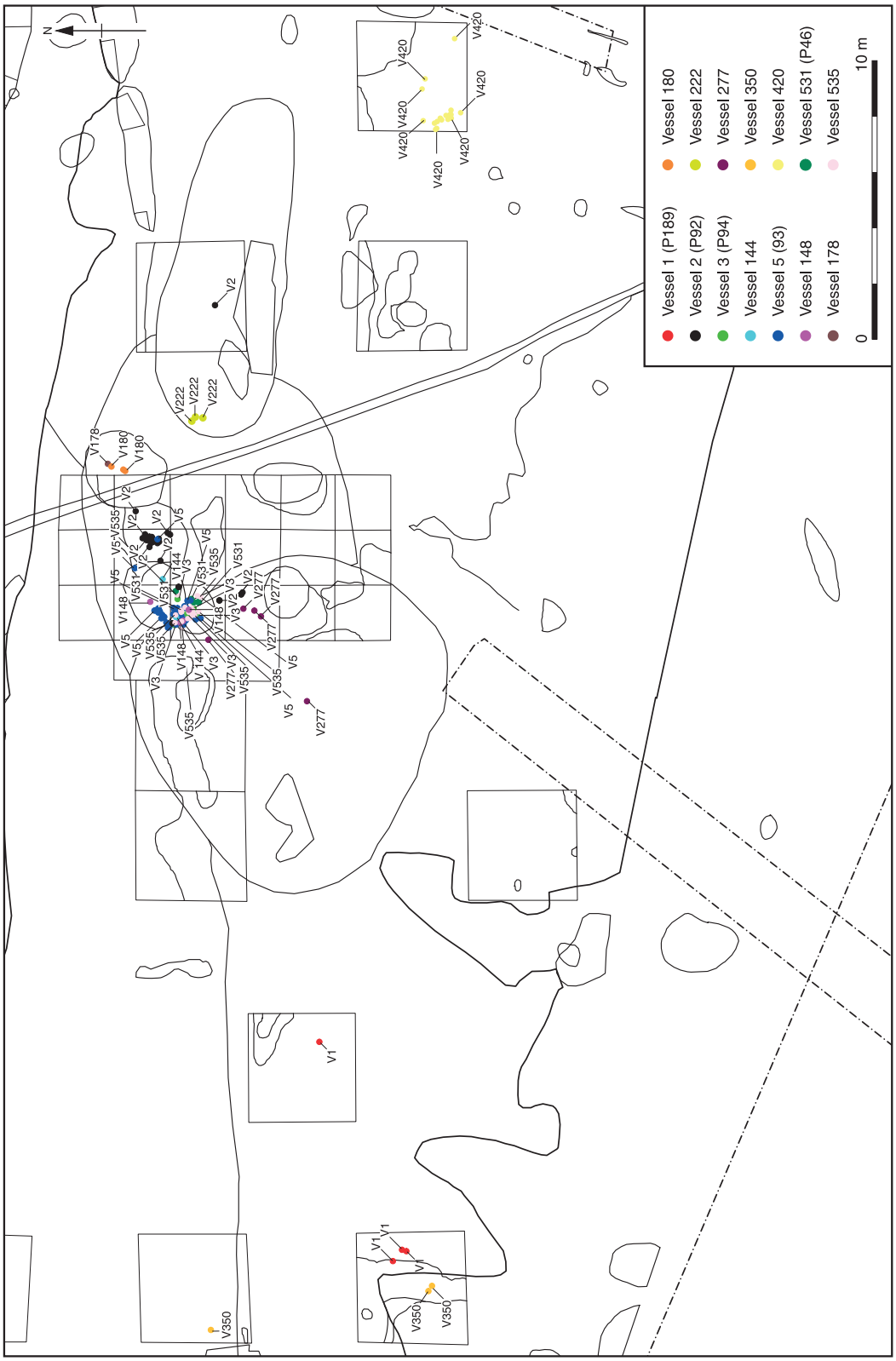


Fig. 5.18 General distribution of vessel groups in the Area 6 hollow

complete vessel, P92, was represented by at least 62 sherds many of which refitted to form two large rim and shoulder fragments.

The refitting provides several lines of evidence. First the general absence of refitting fragments could suggest that much of the material arrived in the hollow in an already broken state. The relatively high number of single refits, however, could indicate that limited fragmentation occurred either within the hollow or prior to deposition within the hollow. The high number of refits within midden deposits 11421-2 indicates that this material is of

Fig. 5.19 Area 6: spread and refitting sherds of vessel P92

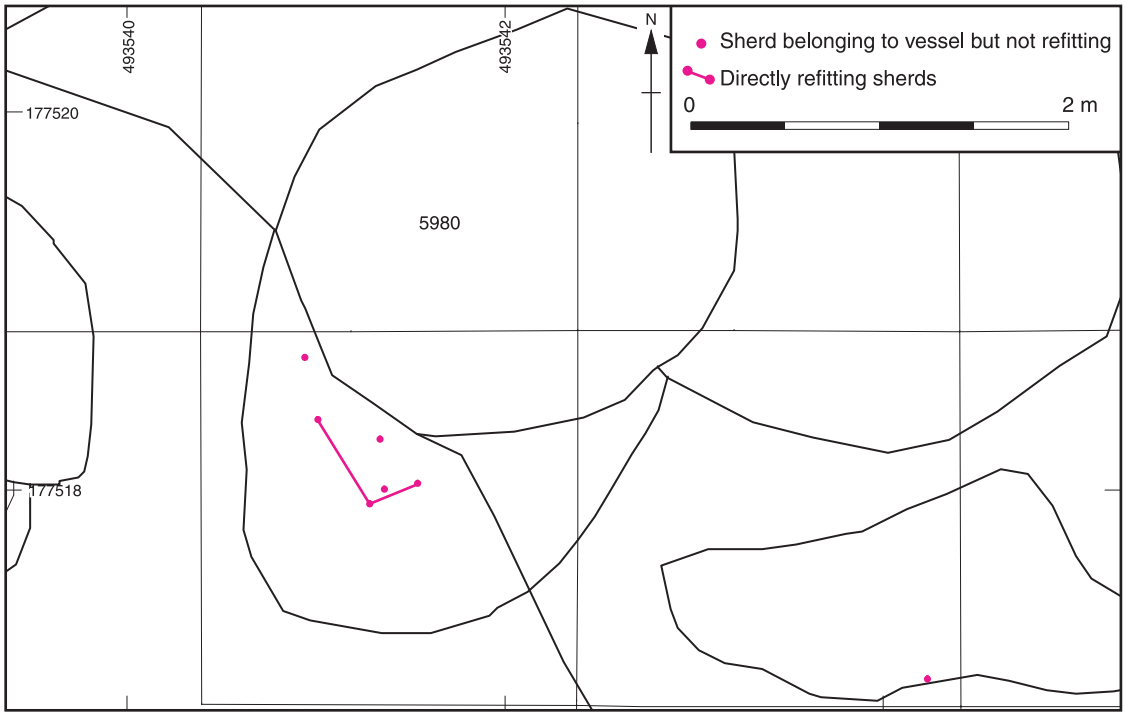


Fig. 5.20 Area 6: spread and refitting sherds of vessel P94

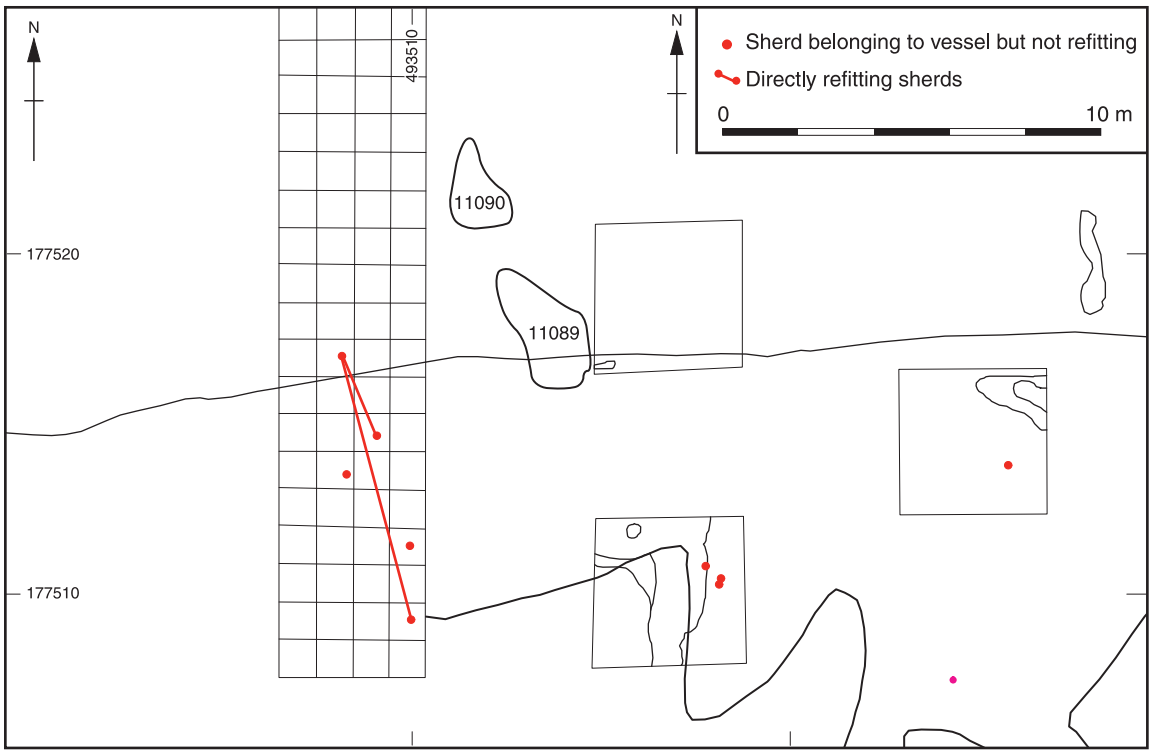


Fig. 5.21 Area 6: spread and refitting sherds of vessel P189

different character to the other selected deposits and could represent primary rather than secondary refuse.

Vessel P92 is a fine Carinated Bowl that had an average upper vessel wall thickness of 6mm, while its lower vessel wall thickness was only 3mm. In general it was well-made, relatively well-fired and originally burnished all-over. Considering its wall thickness, it would have been relatively fragile. The breakage pattern for this vessel seems to indicate that it was originally deposited within a relatively small area at the centre of midden 11422 (Fig. 5.19). At some point the vessel seems to have been broken in half and further fragmented with sherds transported up to 3m west. Half of the vessel and another smaller fragment were found within the immediately adjacent midden 11421. The smaller fragment was subsequently broken with a piece transported almost 2m south-east and beyond the limits of midden 11421. This fragment was again broken.

A significant deposit or possible dump of sherds from coarser Carinated Bowls in sand and flint tempered fabrics that were fired to a deliberate and distinct reddish-brown colour included eight refitting rim and neck sherds (P93). Possibly related to this vessel were a further 12 sherds from context 5980/11172 and many sherds from the base or bottom of a second vessel (32 sherds). A further 48 sherds (397g) are likely to come from the same or similar vessels, some of which refit and come from near the base. Although the vast majority of sherds from this dump can be described as 'red wares', this deposit also included the sherds that make up the burnished black Carinated Bowl P94. Sherds from this vessel were found in an area 1m by 1m on the south-west edge of midden deposit 11421. Refitting rim sherds (P135) came from tree-throw hole 11352 (fill 11320) and midden 11421 (5980). This rim is from a plain bowl and is, therefore, unlikely to be contemporary with the Carinated Bowl and may well be intrusive within 11421.

In contrast to midden 11421/2 were the deposits from grid squares 11218 and 11219. These deposits contained related and/or refitting sherds from a small number of recognisable vessels. Sherds from vessel P189 were recovered from grid square 11219 and from the gridded trench 11428 (Fig. 5.21). Sherds that probably came from the same ripple burnished bowl (P49-51) were recovered from context 5753 and 11151. Sherds from the closed bowl P37 were recovered from contexts 11150 and 11151. Unlike the deposits in middens 11421-2 which appear to represent disturbed *in situ* primary refuse, those in squares 11219 and 11218 and Trench 11428 appear to have suffered a greater degree of bioturbation.

Sherd weight and thickness (Figs 5.22-23)

A comparative study of sherd weight is presented in Fig 5.22 for sherds recorded within the surface middens (11421-3, 11424) as well as surface deposit 5989. The profiles are quite similar and in every case demonstrate that a significant proportion of the ceramic groups are composed of sherds weighing no more than 10g, while only a small proportion weighed between 10 and 50g. As would be expected, the surface layer, 5989, contained the

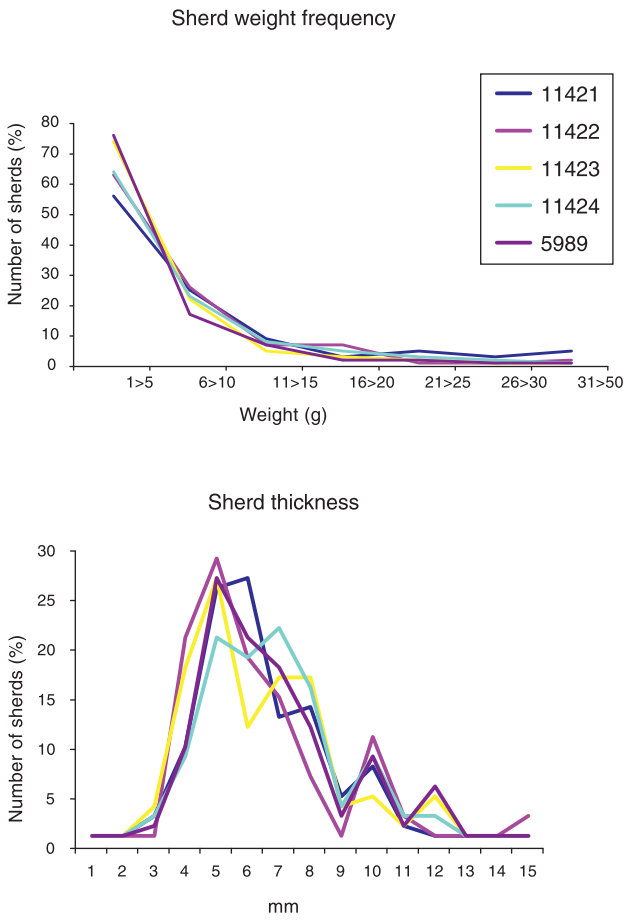


Fig. 5.22 Area 6: selected midden deposits: a - sherd weight profiles; b - sherd thickness profiles

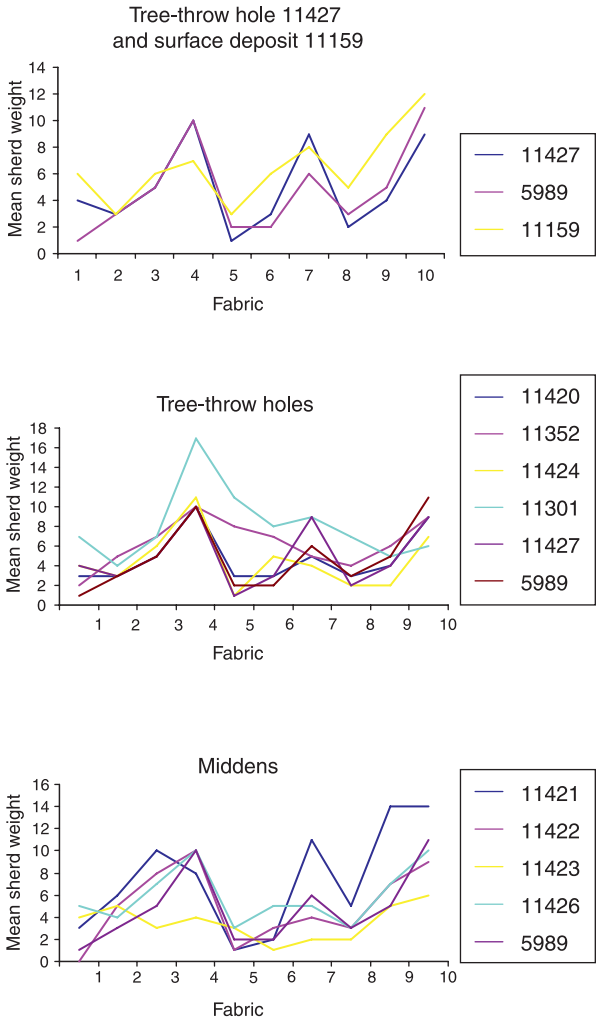


Fig. 5.23 Area 6: mean sherd weight (g) profiles in tree-throw hole 11427 and immediate surface deposit 11159, tree-throw hole deposits, and surface midden deposits

highest proportion of small sherds, although there is little difference between the profile for this context and midden 11423. Deposit 11421 had the lowest relative proportion of sherds below 10g and the highest above 25-50g, which reflects the fact that it contained a number of fragmentary vessels. For the same five deposits a comparison was made of sherd thickness (Fig. 5.22), which suggests that each group was composed of a similar range of sherds with similar proportions of fine (3-9mm) and coarse (9-15mm) sherds present. If the latter supports the notion that each group was composed of similar proportions of sherds of equal thickness, then the comparison of sherd weights can be considered to have validity.

Sherd size, weight and mean weight analyses

Sherd weight was presented as a profile for each context group (Fig. 5.23). These profiles are presented as graphs that express the frequency of sherds (relative proportion) against weight size ranges for the 10 most numerous fabrics (A1, AF1-3, F1-3, FA1-3). A comparison of the mean weight of the 10 most numerous fabrics was made between selected contexts. This included both the surface middens (context group 11421-3, and 11426) and the midden deposits within tree-throw holes (11420, 11352, 11424, 11301 and 11427). As a control, material from surface deposit 5989 was also calculated.

A profile was generated for the 10 fabrics in each context group, and are presented as graphs (Fig. 5.23). With the midden deposits there appears to be a close correlation between three of the groups (11421-2, 11426) and the surface material 5989, while 11421 stands out from the rest as containing larger sherds in flint-tempered fabrics. Context 11423 had a relatively flat profile and appeared different from all of the other midden deposits and surface deposit 5989. For the tree-throw hole deposits, profiles were again generated for the ten fabrics with surface deposit 5989 used again as a control. Three of these deposits (11420, 11424 and 11427) appeared to have similar profile signatures to surface deposit 5989, while those of 11301 and 11352 were markedly different. A comparison was also made between sherds from the fill of tree-throw hole 11427 and the surrounding ground surface, again using surface deposit 5989 as a control. Here it was noted that much larger sherds came from the surrounding

surface than from the tree-throw hole deposit. However, the similarity between the surface layer 5989 and the fill of the tree-throw hole is striking.

How are these patterns to be interpreted? First the similarity between the profiles of the surface middens, the tree-throw hole deposits and the surface layer 5989 could be taken to indicate that the ceramic material in all three types of deposit had been deposited in a similar broken state. It might have been expected that material deposited within tree-throw holes would be larger than that recovered from the surface as it would have been better protected from post-depositional processes such as trampling. One possibility is that some of the tree-throw holes are later than the midden and simply contain redeposited surface midden material. This suggestion receives support from the finding of later material in tree-throw hole deposits 11352 (Fengate Ware), 11424 (indeterminate Peterborough Ware) and 11301 (Beaker).

Tree-throw hole deposit 11301, which was located away from the other features, is significantly different from the rest. Its profile was skewed by the remains of vessel P189, a large thick-walled bowl that had been over-fired. Tree-throw hole deposit 11352 varied slightly from the other deposits but was not as different as 11301. This feature had a larger proportion of heavy rims and included a decorated rim (P146). Its composition was that of a mixed deposit with typologically early material as well as a relatively high number of later forms.

Condition and degree of abrasion (Fig. 5.24)

A comparative study of the condition and degree of abrasion was undertaken on selected deposits. The degree of abrasion was recorded as one of four states that ranged from non-abraded (A) to very abraded (D; Fig. 5.24). All of the selected deposits contain a mixture of non-abraded and abraded sherds. The surface deposit, context 5989, contained the highest proportion of abraded and very abraded sherds, while context groups 11423, 11426 and 11420 also contained relatively high proportions. In contrast the surface middens 11421-2 and the midden deposits within tree-throw holes 11427 and 11352 contained relatively high proportions of non-abraded sherds.

It is suggested that many of these deposits consisted of fresh material reworked with abraded material. Most of the pottery groups were open deposits into which further material could have been added either by deliberate action such as further dumping or by bioturbation (eg human or animal trampling). Another possibility is that material arrived at the hollow in an already mixed state. Vessel P92 comprised fragments that were very abraded and very fresh, and although this could have occurred within the hollow, it is just as likely to have happened on an adjacent occupation site. Another indicator of this is provided by the refitting bowl fragments (P93), with differential preservation of burnish. Again, it would be

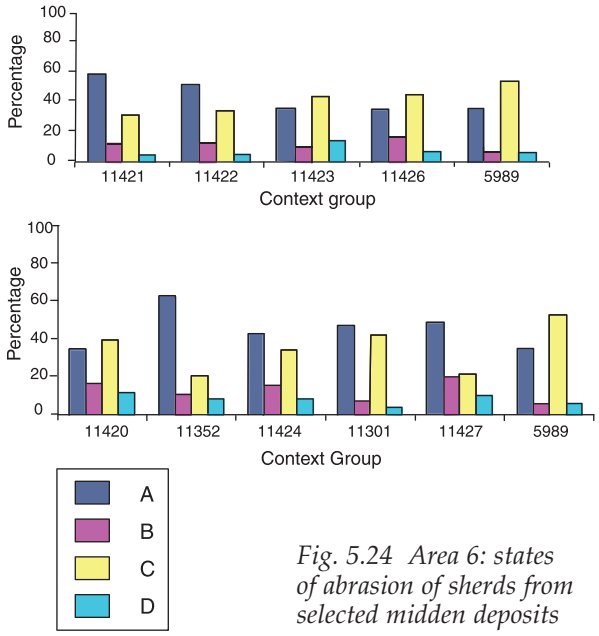


Fig. 5.24 Area 6: states of abrasion of sherds from selected midden deposits

plausible to see this as a vessel that had been broken elsewhere and had undergone differential damage prior to being collected and dumped within the hollow.

Discussion of analysis

The analysis has highlighted some patterns within the pottery deposits recovered from the hollow. Typological analysis of the pottery confirms that all of the selected deposits can be considered to be of broad early Neolithic date, while the overall assemblage contains a significant number of vessels that belong to the earliest Neolithic. Middens 11421-2, which could have formed a single deposit, contained a group of Carinated Bowls and are considered to have been one of the primary pottery deposits within the hollow. The tree-throw hole midden deposit 11352 contained the highest proportion of heavy rims as well as decorated rims, which are indicative of a later date. The dating of the other deposits was less certain. Cups were also common in tree-throw hole midden deposit 11352 and the adjacent midden deposits 11424 and 11426, but rare in those deposits that contained significant deposits of Carinated Bowl. Sherds in quartzite tempered-fabrics were also noted in the tree-throw hole deposits 11424 and 11352, while being almost or completely absent from 11421-2, 11179, 11423, 11301 and 11426, perhaps indicating that the use of quartzite temper in pottery occurs at a slightly later date, post-Carinated Bowl, in the 4th millennium cal BC.

The high proportion of sherds weighing less than 10g and the near absence of refits could indicate that much of the material arrived in the hollow in a broken and mixed state. Material from tree-throw holes appeared to be in a similar condition and to have a similar size range to material deposited on the land surface, with the notable exception of

surface midden 11421-2 which contained the only clear evidence for large vessel fragments, multiple refits and *in situ* deposits. There was little difference in character between surface material and some of the midden deposits. Context 5989 (surface spread) was very similar in character to the tree-throw hole deposits 11427, 11420 and 11424 and the middens 11422 and 11426 in terms of fabric proportions, while 11420 and 11426 had a similar, relatively high proportion of abraded sherds. Surface midden 11423 was similar to the surface deposit 5989 in that it also contained a very high proportion of small sherds (by weight), a high proportion of abraded sherds and had a very different fabric profile and a relatively low number of featured sherds in comparison to the other nine deposits. The substantial deposit 11426 is also similar in character to 5989 in terms of the fabric mean weight profiles and the high number of abraded sherds. It is possible that it represents a similar surface spread, although the concentration of rim and vessel fragments near the centre of this deposit could indicate that a more substantial pottery deposit existed within the overall spread. Another deposit that appeared to be different is tree-throw hole midden deposit 11301. Its fabric mean sherd weight profile was different to the other selected deposits, although it can be noted that it contained a group of large sherds from vessel P189. The presence of these sherds is likely to have skewed the profile slightly but not significantly. Relatively large sherds were also noted in the adjacent surface deposit 11159 surrounding tree-throw hole deposit 11427. Deposit 11301 was the most distant from the other deposits, which could partly explain its different character.

From this analysis three categories of archaeological deposit can be recognised:

- Those that contain a relatively high number of refitting sherds from a small number of vessels. The presence of large as well as small sherds and a higher proportion of unabraded sherds.
- Refitting sherds present but not abundant. Relatively equal proportions of abraded and unabraded sherds and a low frequency of large sherds.
- Near absence of refitting sherds, a high proportion of abraded sherds and a relatively high proportion of small sherds.

Figure 5.25 distinguishes those deposits thought to be of similar character from those that appear to have their own character. Middens 11421-2 were the only deposits to contain significant portions of refitting and/or related sherds and may well have been amongst the earliest pottery rich deposits within the hollow. While they appeared to comprise *in situ* deposits that had undergone some disturbance, this did not appear to be true of the other deposits. They could have represented primary rubbish deposits within the hollow, while most of the other deposits possibly comprised secondary or reworked material brought into the hollow in an already mixed and fragmentary state. Surface middens 11426 and 11420 were similar in character to the surface deposit 5989 and the tree-throw hole deposits 11427 and 11424. Surface midden 11423 stood out as containing few featured sherds, a high proportion of abraded sherds and sherds of a relatively small size and weight. Tree-throw hole midden deposit 11352 was different in character to many of the other deposits and was almost certainly later in date.

Deposition and formation of pot groups

Pottery was distributed throughout the hollow (Fig. 5.11), although its density varied. The vast majority of the pottery is of early Neolithic date and is thought to have accumulated over a period of several centuries. A typological argument has been presented to suggest that this material can be divided into two distinct groups belonging to the early Neolithic. This suggestion receives some support from the radiocarbon dating of carbonaceous pottery residues. The pottery spread within the hollow comprises several midden deposits. These deposits occurred either as surface middens or as midden deposits within cut features (mostly tree-throw holes but also pits). No complete vessels were recorded, although a few fragmentary vessels did occur within surface midden deposits. Joining fragments were recorded within the same midden or between adjacent midden deposits. In three cases the possible post-depositional breakage history of a vessel can be traced across part of the site.

In general, the pottery groups from the midden deposits seem to be composed of the following types of material: single sherds from vessels, non-joining, related sherds from the same vessel, joining sherds and vessel fragments.

It is suggested that all of the pottery arrived at the midden in an already broken state. However, there is evidence that some deposits involved the deposition of large vessel fragments, while others included a small numbers of sherds from a relatively large number of vessels.

Given that middens were created on the land surface as well as within tree-throw holes, analysis should reveal the possible extent of post-depositional disturbance. In general, deposits within tree-throw holes should be more protected from post-depositional disturbance or bioturbation such as trample from animals or human activity. Post-depositional breakage from processes such as trample should produce a pattern of a relatively large number of sherds of small size. The scale of fragmentation of sherds within the middens could reflect the extent to which the deposit has been disturbed with each treading event leading to further breakage. If relatively large sherds were deposited then it should be possible to trace a breakage history as the vessel is reduced to smaller fragments.

This could be reflected in a larger sherd size or a higher incidence of low-abrasion. If the pottery was

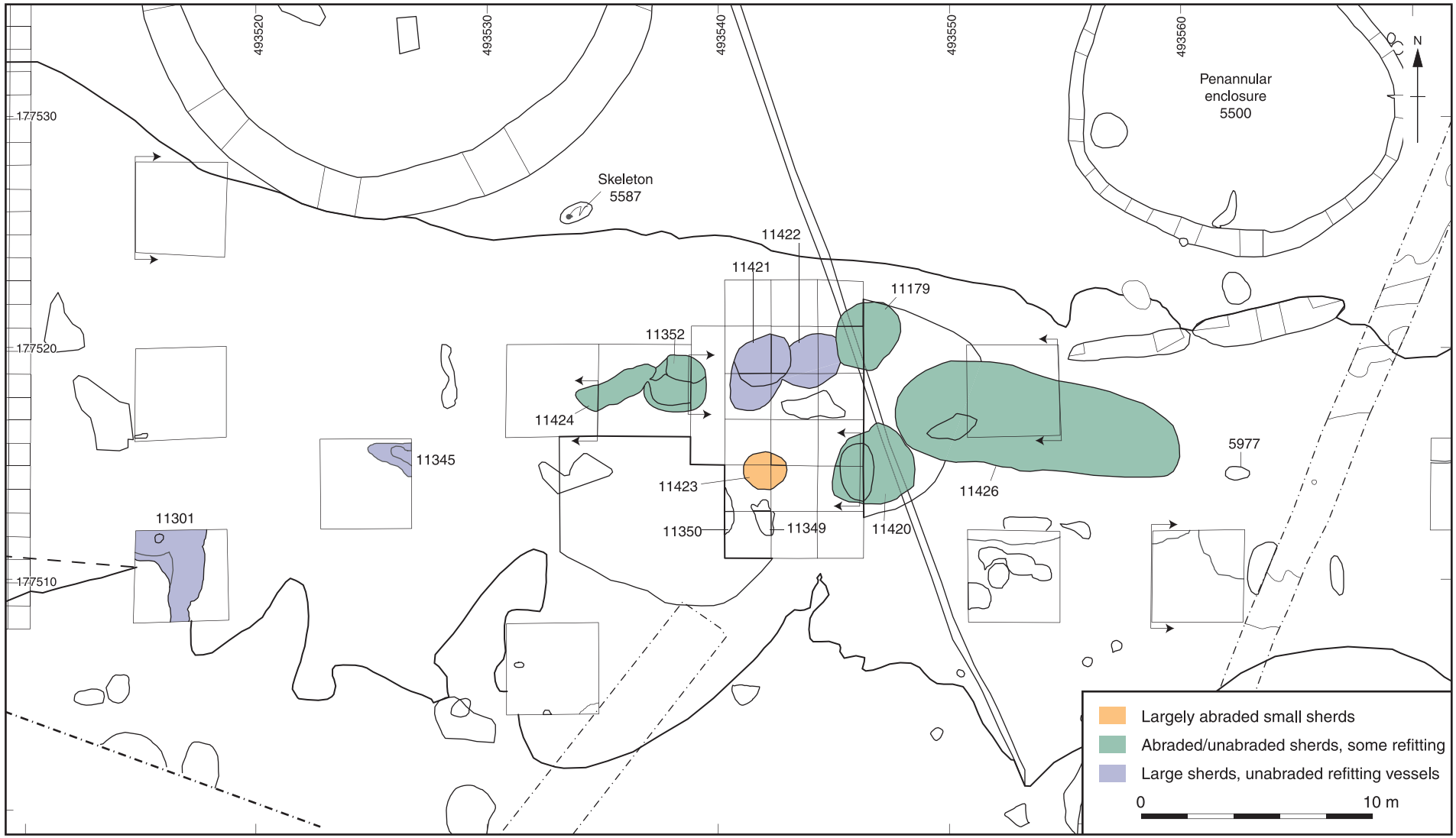


Fig. 5.25 Area 6: a comparison of early Neolithic ceramic deposits by character

used and broken within the hollow (primary refuse) then it might be expected that the typologically early material should be more fragmentary than subsequent pottery. This would also act as an indicator of the degree of post-depositional disturbance. Thus if all the pottery occurred as primary or *in situ* refuse it might be expected that the earliest material would be represented by a greater number of smaller sherds, while the latest material would be represented by the more complete, and therefore less broken, vessels. A distinction could also be made between pottery discarded either as primary or secondary refuse as this would also be a factor in the recorded sherd size. Material added as secondary refuse (broken and/or stored off-site, selected and brought to the midden) could already have been in a relatively broken state. Again the character of the pot groups is likely to illuminate the types of activity that have occurred both on and off-site. If use and discard occurred within the hollow then we might expect to find either large vessel fragments, or depending on the degree of disturbance, large groups of related sherds from individual vessels.

Other factors influencing the character of the deposit could include the fineness of the individual vessels, type of fabric, firing temperature along with functional use and reuse. Thick-walled vessels or the thicker parts of vessels could be expected to survive better than smaller thin-walled vessels.

Analysis of selected deposits within the hollow indicate that with the exception of middens 11421-2, which it is suggested could have formed a single deposit, most of the material could have been brought to the hollow in a very fragmentary and mixed state. This is perhaps supported by the relatively low number of related and/or refitting sherds within the feature groups. This suggestion is supported by the fact that material of similar character was recovered from many of the surface middens, tree-throw hole deposits and surface deposits. Typologically earlier and later material was recovered in a similar state. In fact, the most complete vessels were a group of Carinated Bowls from a surface midden. The condition of these vessels indicates that at least this midden had undergone relatively little post-depositional disturbance.

It has been argued that the assemblage from Area 6 was the result of a series of episodes of deposition. Apart from a single primary deposit of fragmentary vessels, most of the pottery appears to have been deposited as secondary refuse. It seems likely that pottery was broken, mixed and stored elsewhere, perhaps in a temporary midden within the place(s) of habitation. This material could then have been collected and deposited within the hollow perhaps at a point of temporary (seasonal) abandonment of the settlement. Certainly there is considerable evidence to support the idea that many of the individual pottery deposits were not the result of single events of deposition.

One possibility is that the group of large vessel fragments and refitting sherds from midden deposits 11421-2 represented primary refuse and that the hollow was initially used as a place of occupation. Some of this pottery had been crushed on the ground surface but otherwise appeared to be *in situ* with only minimal displacement of fragments and with relatively short distances of 1-3m between refitting sherds (Fig. 5.18). Had further occupation taken place within the hollow then greater disturbance to these deposits might have been expected. Permanent occupation would probably have led to the gradual breakage and reduction of these deposits from trample. Had all the pottery been deposited in a similar way then it would be expected that the earlier vessels would be more fragmentary and dispersed. Similarly, pottery deposited within tree-throw holes should have been more protected from surface trample and could be expected to be more intact and less abraded. However, there is little or no difference between the pottery from the surface and tree-throw hole midden deposits. Again this supports the view that most of the pottery was discarded into the hollow as secondary refuse with a great many vessels represented by single sherd fragments.

The evidence that sherds from the same vessels were being deposited in different areas within the hollow is slight. Possible sherds belonging to vessel P189 were found over a distance of 20m. These sherds were non-refitting and could have arrived in the hollow as separate dumps. Other non-refitting sherds from the hollow include P37 from contexts 11150 and 11151 and P49-51 from 11200 and 11159. It is also possible that these sherds represent a deposit similar to 11421-2 that had been disturbed. What is clear, with the notable exception of deposits 11421-2, is that only a token amount of any one individual vessel found its way into the hollow. One possibility is that pottery broken on a settlement site had then undergone a number of processes that involved collection, accumulation and storage before being dumped in the hollow. This would certainly account for the mixed character of many of the midden deposits. There is nothing to suggest that types of pottery were deliberately selected, although pottery was evidently included as a component of the rubbish selected for dumping. It is therefore possible that the bulk of this pottery arrived with other types of material.

Comparisons with other sites

The character of the Area 6 material can be compared with other midden and non-midden sites. An assemblage of 264 sherds (833g) was recovered from the sub-cairn soil at Hazleton North (Smith and Darvill 1990, 141, table 19). Much of the pottery recovered came from a single midden deposit, with the remainder coming from the land surface. Like the Area 6 deposits, only a few of the 32 vessels were represented by refitting fragments, while the majority of vessels were denoted by relatively small fragments (Smith and Darvill 1990, fig. 156). The same can be said of the similar deposits found

beneath the Gwernvale long cairn (Lynch in Britnell and Savory 1984). It is argued that at all three sites the pottery underwent a number of cycles of breakage and accumulation that resulted in a low ratio of sherds per vessel and a relatively low average sherd size. In contrast to this type of deposit are those recovered from causewayed enclosures. At both Staines and Abingdon it is evident from the sherd size that much of the pottery was deposited as primary refuse (Robertson-Mackay 1987; Avery 1982) and much of the illustrated pottery from the two sites appears to be in a similar state of completeness and condition to the pottery recovered from the primary Area 6 deposits 11421-2.

Catalogue of illustrated early Neolithic pottery by feature group (Figs 5.26-35)

Early fills 11202 (contexts 11180 and 11305)

P1 11180. SF 82237. Bowl. Everted rim (type 2) (17g). Fabric F2/EN. Firing: ext. brown; core black; int. brown. Condition average. Residue sample 8 (D8).
P2 11180. SF 85008. Bowl. Simple rim (type 3) (9g). Fabric FA3/EN. Firing: ext. brown; core grey; int. brown. Interior smoothed. Condition fair.
P3 11180. SF 82280. Bowl. (type 1) (17g). Fabric AF2/EN. Firing: ext. black; core grey; int. black. Burnished surfaces. Condition fair.
P4 11180. SF 82250. Bowl. (type 3) (8g). Fabric F1/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition fair.
P5 11305. SF 81391. Bowl. Heavy rim (type 6) (25g). Fabric F2. Firing: black throughout. Interior burnish. Condition average. Residue sample 15 (dairy product, mixed fats).

Early Neolithic horizon 11201 (contexts 5831, 5987, 5989, 8185, 8192, 8194 and 11150)

P6 5831. SF 38796. Bowl. Simple rim (type 1) (21g). Dia. 180mm. Fabric F3/EN. Firing: ext. brown; core and int. black. Condition average.
P7 5831. SF 38867. (refits with 11150 SF 73116). Bowl. two refitting out-turned rims (type 6) (31g). Dia. 320mm. Fabric AF2/EN. Firing: ext. greyish-brown; core grey; int. black. Interior smoothed. Condition average to worn.
P8 5831. SF 38830. Bowl. Simple rim (type 1) (5g). Fabric FA3/EN. Firing: dark grey throughout. Condition average.
P9 5831. SF 73421. Bowl. Rolled rim (type 4) (32g). Fabric A1/EN. Firing: greyish-brown throughout. Condition average-worn.
P10 5831. SF 38452. Bowl. Rolled rim (type 4) (5g). Fabric F1/EN. Firing: dark grey throughout. Smoothed. Condition average.
P11 5831. SF 38747. Bowl. Everted rim (type 2) (8g). Fabric FA2/EN. Firing: ext. brown; core and int. dark grey. Condition average.
P12 5831. SF 38865. Bowl. Rolled rim (type 4) (17g). Dia 210. Fabric AF2/EN. Firing: ext. brown; core and int. black. Burnished. Condition average.
P13 5831. SF 38720. Bowl. Rolled rim and shoulder sherds (type 4) (33g). Fabric FA2/EN. Firing: ext. black; core brown; int. reddish-brown. Exterior smoothed. Condition average.
P14 5987. SF 49568. Bowl. Burnished shoulder (type 2) (30g). Fabric FA2/EN. Firing: ext. dark grey; core grey; int. dark grey. Burnished external slip. Condition average to worn.
P15 11059. SF 79505. Bowl. Rim (type 2) (5g). Fabric FA1/EN. Firing: ext. black; core grey; int. brown. Condition average.
P16 5831. SF 38904. Bowl. Out-turned rim (type 6) (3g). Fabric FA3/EN. Firing: ext. brown; core grey; int. brown. Condition average.
P17 5987. SF 49358. Bowl. Rim (type 5) (7g). Fabric F2/EN. Firing: black throughout. Exterior burnish. Condition average.
P18 5831. SF 38869. Bowl. Shoulder (12g). Fabric FA2/EN. Firing: black throughout. Smoothed. Condition average.
P19 11059. SF 73406. Bowl. Shoulder (6g). Fabric FA1/EN. Firing: ext. reddish-brown; core black; int. reddish-brown. Interior burnish. Condition average.
P20 5989. SF 25960. Bowl. Rolled rim (type 4) (10g). Fabric FA2/EN. Dia. 170mm. Firing: ext. black; core grey; int. black. Exterior and interior burnished. Condition average.
P21 5989. SF 25787. Bowl. Heavy rim (type 6) (15g). Fabric FA2/EN. Firing: ext. yellowish-brown; core and int. grey. Condition average. Residue sample D29
P22 5989. SF 24044. Beaded rim (type 5) (15g). Dia. 200mm. Fabric F2/EN. Firing: black throughout. Exterior and interior smoothed. Condition average.
P23 5989. SF 24039. Bowl. Rolled rim (type 4) (15g). Fabric F3/EN. Firing: grey throughout. Condition average.
P24-5989. SF 26045. Bowl. Rolled rim (type 4) (13g). Fabric FA2/EN. Firing: ext. reddish-brown; core grey; int. black. Condition average.
P25-5989. SF 26467. Bowl. Everted rim (type 4) (25g). Fabric F2/EN. Firing: ext. black; core grey; int. reddish-brown. Exterior thickened with a clay slip that has been burnished. Condition average.
P26 5989. SF 49117. ?Bowl. Decorated rim (type 3) (5g). Fabric FA2/EN. Firing: ext. black; core grey; int. brown. Condition average.
P27 5989. SF 24971. Bowl. Everted rim (type 2) (31g). Fabric AF2/EN. Firing: black throughout. Exterior smoothed. Condition average.
P28 5989. SF 25854. Bowl. Everted rim (type 2) (30g). Fabric FA3/EN. Firing: ext. black; core brown; int. reddish-brown. Condition average.
P29 5989. SF 24067. Bowl. ?Everted rim. Fabric FA2/EN. Firing: ext. brown; core black; int. brown. Condition worn. Residue sample 33(A3).
P30 5989. SF 26976. Rim from a miniature cup (type 1) (1g). Fabric AF1/EN. Firing: reddish-brown throughout. Condition average to worn.
P31 5989. SF 25128. Bowl. Shoulder (8g). Fabric AF1/EN. Firing: ext. black; core grey; int. greyish-brown. Condition average.
P32 8185. SF 50250. Bowl. Rolled rim (type 4) (10g). Fabric FA2/EN. Firing: ext. greyish-brown; core grey; int. brown. Smoothed surfaces. Condition average to worn.
P33 8194 SF 50823. Bowl. In-turned rim (type 9) (4g). Fabric FA2/EN. Firing: ext. reddish-brown; core grey; int. black. Condition worn.
P34 8192. SF 50699-700. Carinated Bowl. Shoulder (20g). Fabric AF2/EN. Firing: dark grey throughout. Exterior and interior smoothed. Condition average.
P35 8194. SF 50850. Bowl. Rim from cup (8g). Fabric

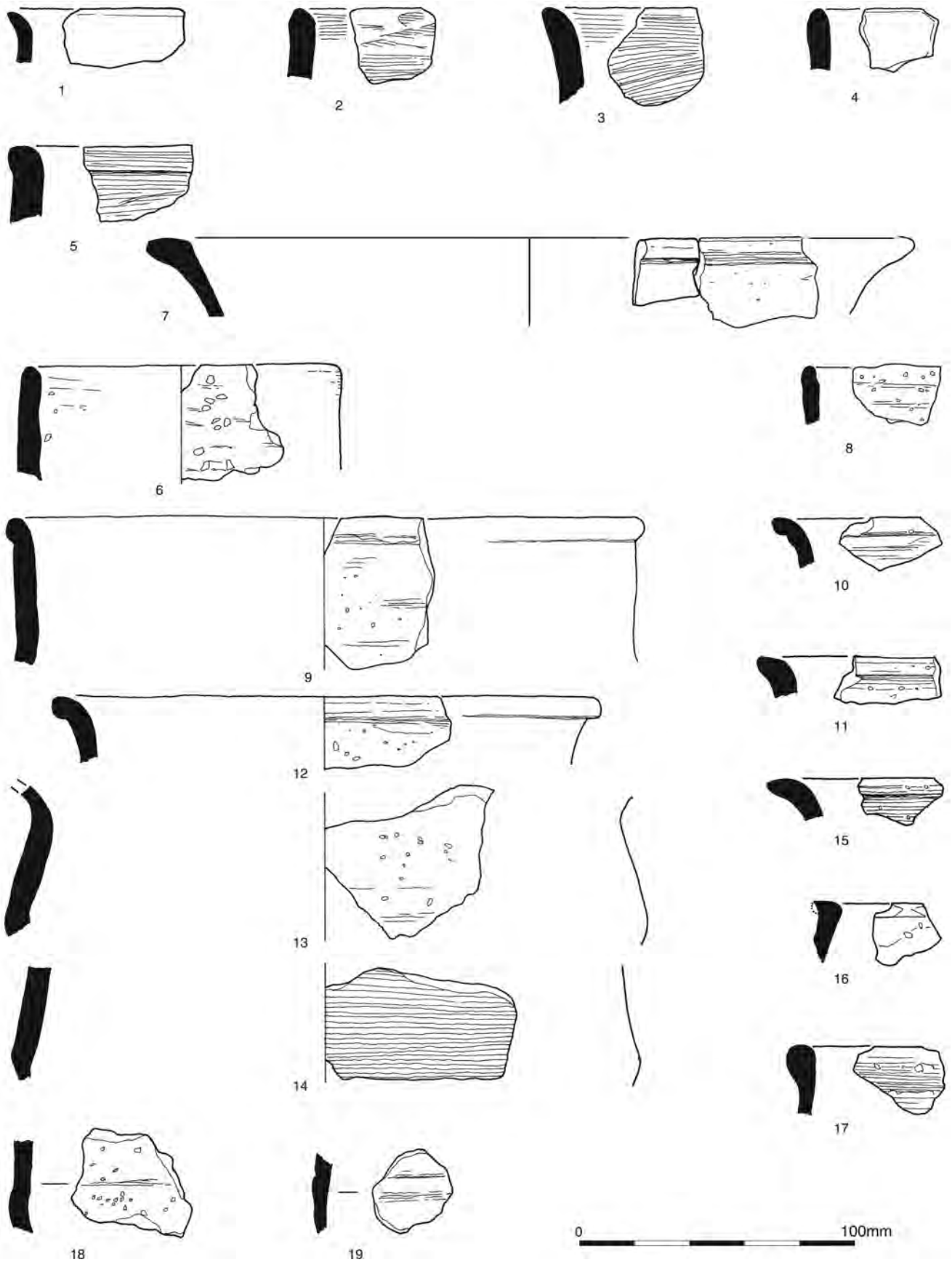


Fig. 5.26 Neolithic pottery from Area 6: early fills 11202, P1-5; early Neolithic horizon 11201, P6-P19.

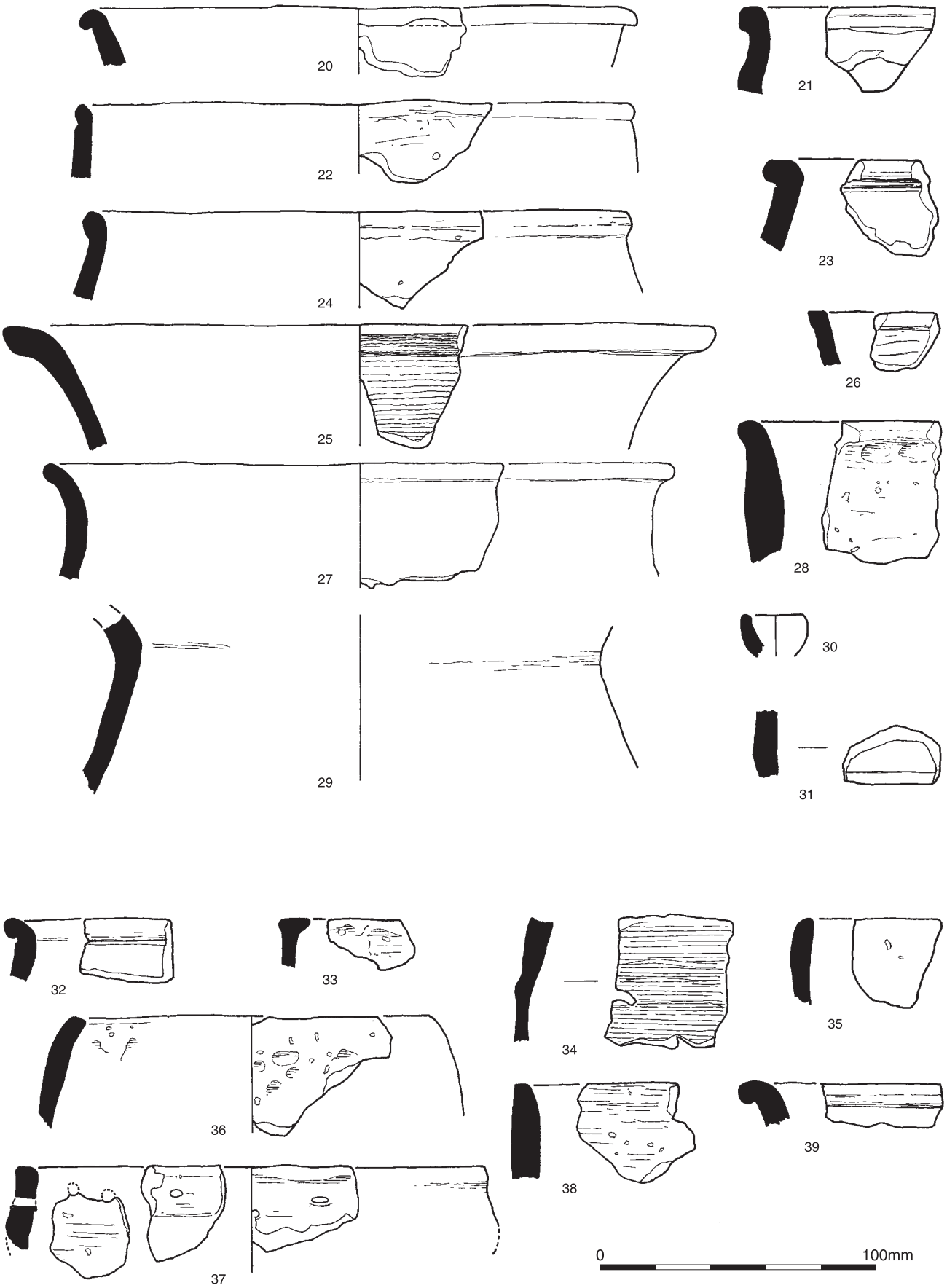


Fig. 5.27 Early Neolithic pottery: early Neolithic horizon 11201, P20-39

AF1/EN. Firing: ext. brown; core grey; int. brown. Condition average-worn.

P36 8187. SF 50425 Bowl. Cup rim (type 1) (18g). Fabric FA3/EN. Firing: greyish-brown throughout. Condition average.

P37 11150-1. SF 73079, 77130, 76214-5. Bowl. Four sherds (55g) from a small shouldered bowl of closed form. Neck is perforated by a series of oval holes. Rim (type 5). Fabric FA2/EN. Firing: ext. reddish-brown/brown; core grey; int. black. Two sherds have an external slip and have internal smoothed surfaces. Condition average to worn.

P38 8194. SF 50843. Bowl. Simple rim (type 1) (17g). Fabric FA3/EN. Firing: ext. black; core and int. grey. Condition average.

P39 11151. SF 73711. Bowl. Rolled rim (type 4) (12g). Fabric AF1/EN. Firing: ext. grey; core brown; int. grey. External burnish. Condition average.

P40 11151. SF 75357, 75504, 76163. Bowl. Rim (type 5) (57g). Dia. 460. Fabric FA3/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition average.

P41 11151. SF 75522. Bowl. Rolled rim (type 4). Fabric F1/EN. Firing: black throughout. Interior smoothed. Condition average. Thin section 16. Residue sample 26 (dairy product and ?mixed fats).

P42 11153. SF 76054 (76046). Bowl. Pointed rim (type 3) (18g). Fabric QA2/EN. Firing: ext. brown; core and int. black. Exterior and interior burnished. Condition average. Thin section 15. Residue sample 27 (?ruminant fat).

P43 11151. SF 77100. Bowl. Rolled rim (type 4) (14g). Fabric AF2/EN. Firing: ext. grey; core brown; int. greyish-brown. Interior smoothed. Condition average.

P44 11151. SF 79815. Bowl. Rolled rim (type 4) (16g). Fabric AF3/EN. Firing: black throughout. Exterior and interior smoothed. Condition average.

P45 11151. SF 78326. Bowl. Rolled rim (type 4) (7g). Fabric AF2/EN. Firing: ext. black; core greyish-brown; int. black. Condition average.

P46 11151. SF 75822. Bowl. Out-turned rim (type 6) (13g). Dia. 340mm. Fabric FA1/EN. Firing: grey throughout. Exterior smoothed. Condition average.

P47 11151. SF 75823. Bowl. Rolled rim (type 4) (8g). Dia. 180mm. Fabric FA2/EN. Firing: ext. yellowish-brown; core grey; int. black. Condition average.

P48 11151. SF 75830. Bowl. Rolled rim (type 4) (12g). Fabric FA2/EN. Firing: ext. black; core and int. brown. Exterior and interior smoothed. Condition average.

P49-51 11200/11159. SF 37702, 78663 and 3514.5. Ripple burnished sherds from one or more shouldered bowls.

P52 11153. SF 76059. Bowl. Rolled rim (type 4) with spalled surface (8g). Fabric QA2/EN. Firing: ext. brown; core black; int. brown. Interior burnish. Condition average.

P53 11153. SF 76046. Bowl. Everted rim (type 2) (5g). Fabric QA2/EN. Firing: ext. brown; core grey; int. black. Condition average.

P54 11153. SF 71256. Bowl. Refired/over-fired everted rim with drilled perforation (type 2) (9g). Fabric FA2/EN. Firing: ext. brown; core grey; int. brown. Condition very worn.

P55 11157. SF 82039. Bowl. Rolled rim (type 4) (9g). Fabric FA3/EN. Firing: black throughout. Condition average. Residue sample 49 (beeswax).

P56 11157. SF 82200. Carinated Bowl. Shoulder (type 4) (8g). Fabric FA3/EN. Firing: ext. brown; core black; int. brown. Exterior burnish. Condition average-worn.

P57 11157. SF 80031. Bowl. Two shoulder sherds from the same vessel (type 2) (8g). Fabric A1/EN. Firing: ext. brown; core grey; int. brown. External burnish. Condition average.

P58 11159. SF 75824. Bowl. Burnished everted rim (type 4) (11g). Fabric FA3/EN. Firing: ext. greyish-brown; core grey; int. brown. Exterior smoothed. Condition average.

P59 11159. SF 75300. Bowl. Rolled rim (type 4) (9g). Fabric AF1/EN. Firing: ext. black; core grey; int. black. Exterior smoothed, interior burnished. Condition average.

P60 11159. SF 74432. Bowl. Rolled rim (type 4) from an open bowl (53g). Fabric FA2/EN. Firing: grey throughout. Burnished surfaces. Condition worn.

P61 11157. SF 82045. Bowl. Shoulder (type 3) (10g). Fabric FA3/EN. Firing: ext. reddish-brown; core and int. black. Condition average.

P62 11159. SF 71768. Bowl. Expanded rim (type 8) (7g). Fabric FA2/EN. Firing: ext. and core brown; int. reddish-brown. Condition worn.

P63 11159. SF 75301. Bowl. Everted rim (type 4) (9g). Fabric AF2/EN. Firing: black throughout. Condition average.

P64 11159. SF 73735. Bowl. Simple rim (type 1) (6g). Fabric AF2/EN. Firing: ext. and core grey; int. reddish-brown. Internal smoothing. Condition average.

P65 11159. SF 75395. Bowl. Rolled rim (type 4) (10g). Fabric FA3/EN. Firing: black throughout. Exterior smoothed. Condition average to worn.

P66 11170. SF 78000. Bowl. Beaded rim (type 5) (6g) from a cup or small bowl. Fabric F2/EN. Firing: greyish brown throughout. Condition average. Charred residue below rim. Residue sample 12 (ruminant fat).

P67 11159. SF 72951. Bowl. Simple rim (type 1) (30g). Fabric FA2/EN. Firing: greyish black throughout. Condition average.

P68 11159. SF 77639. Bowl. Pointed rim (type 2) (7g). Fabric A1/EN. Firing: ext. greyish-brown; core grey; int. grey. Condition average-worn.

P69 11159. SF 75273. Bowl. Everted rim (type 7) (21g). Fabric F3/EN. Firing: ext. brown; core and int. black. Interior burnish. Condition average. Thin section 18. Residue sample 24.

P70 11309. SF 81421. Bowl. Everted rim (type 2) (15g). Fabric FA2. Firing: ext. brown; core black; int. black. Interior burnish. Condition average to worn.

P71 11309. SF 81270. Bowl. Everted rim (type 2) (10g). Fabric AF1/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Exterior burnish. Condition average.

P72 11309. SF 89887. Bowl. Rolled rim (type 4)

P73 11316. SF 81798. Bowl. Simple rim (type 1) (11g). Fabric no added temper. Firing: ext. black; core and int. grey. Exterior burnish, interior smoothed. Condition average. Residue sample 1 (?ruminant and dairy product).

P74 11316. SF 81780, 81784 and 82174. Bowl. Burnished rolled rim (type 4) (22g). Fabric AF2/EN. Firing: ext. black; core grey; int. black. Smoothed surfaces. Condition average.

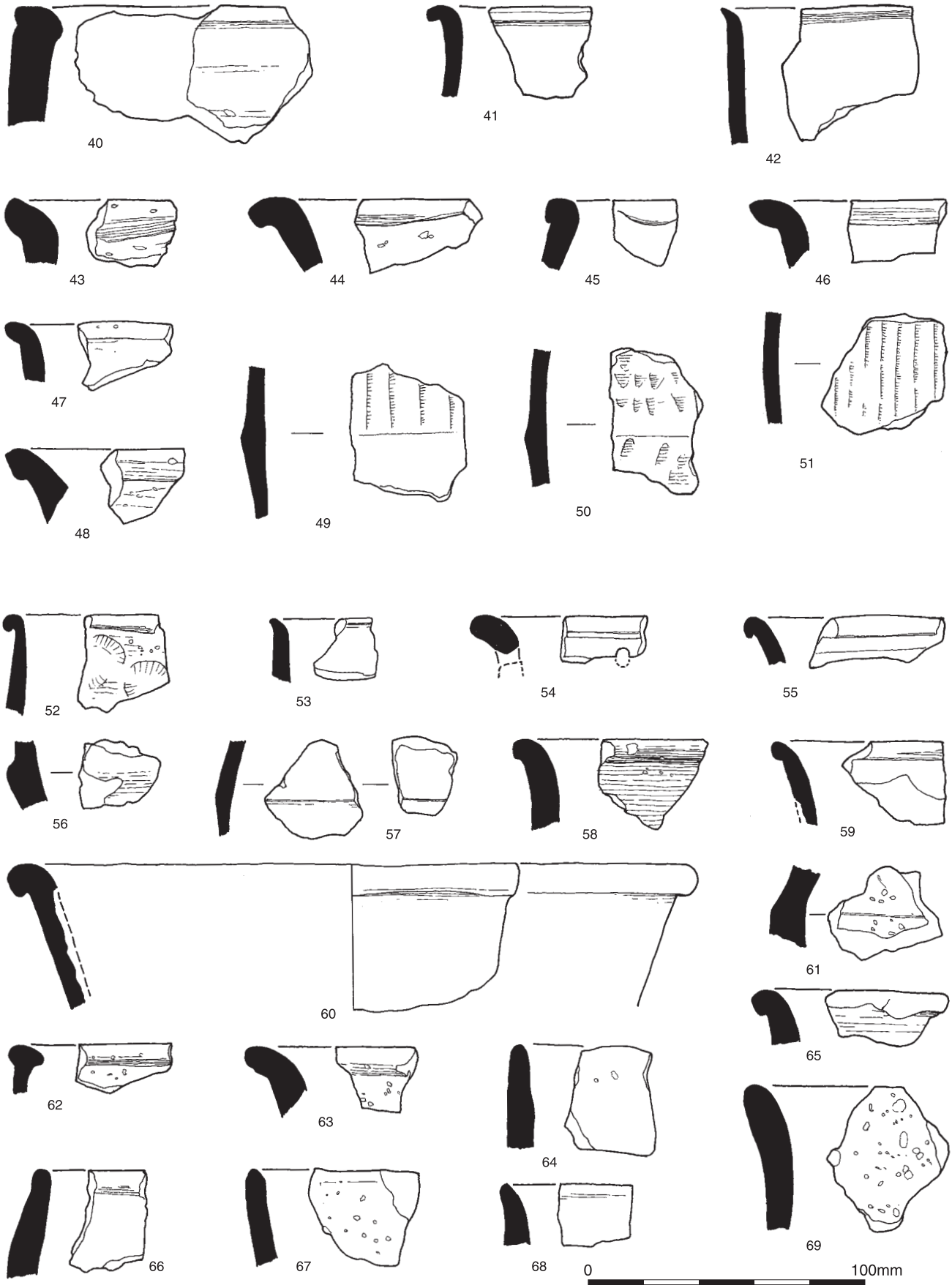
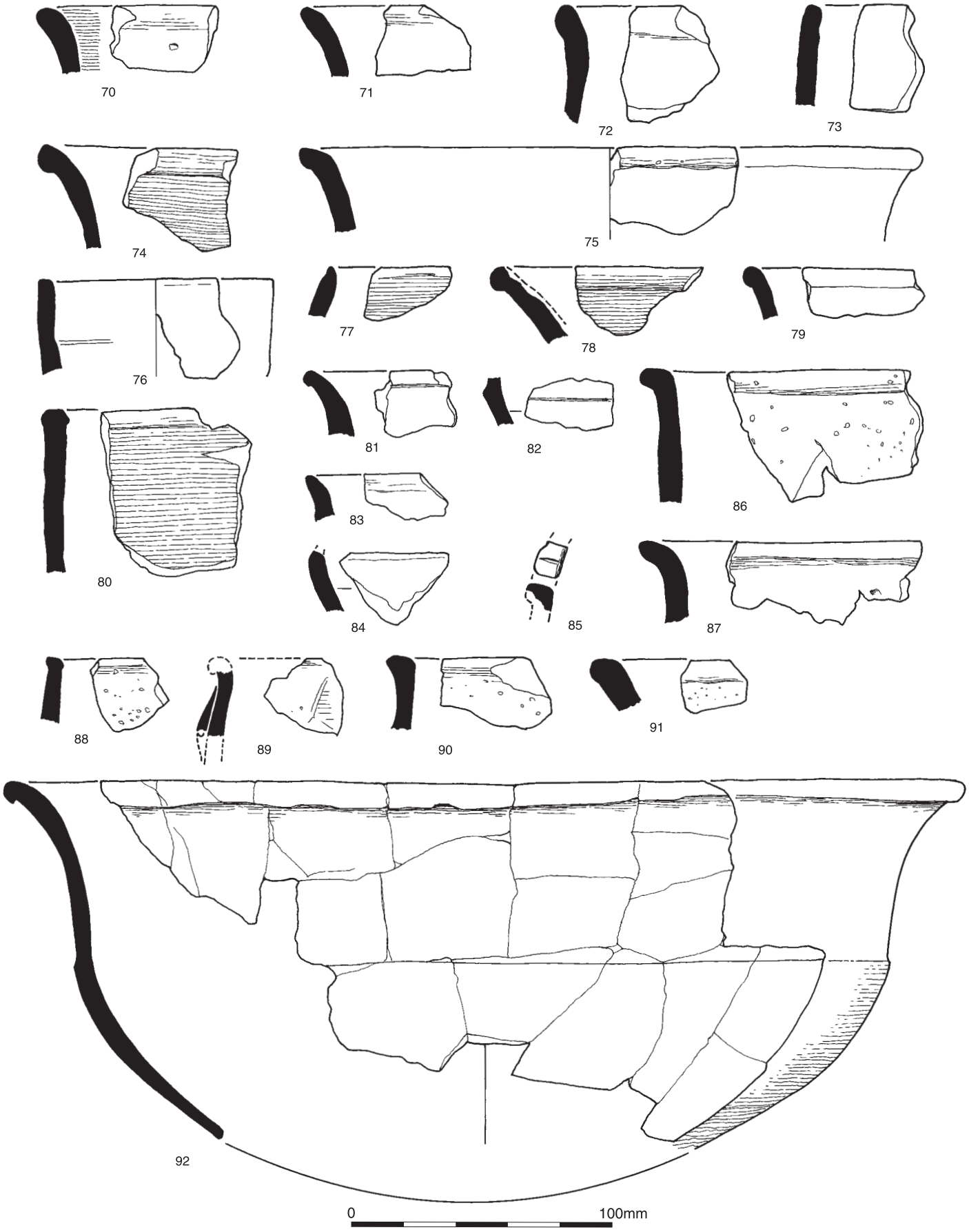


Fig. 5.28 Early Neolithic pottery: early Neolithic horizon 11201, P40-69


70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
0
100mm

P75 11200. Grid sq 3522.5. Bowl. Out-turned rim (type 6) (13g). Fabric F2/EN. Firing: grey throughout. Condition worn.
P76 11365. Grid sq 3526.5. Bowl. Simple rim (type 1) (9g) from a cup. Fabric A1/EN. Firing: ext. black; core and int. grey. Condition average.
P77 11365. Grid sq 3522.5. Bowl. Pointed rim (type 2) (4g). Fabric AF1/EN. Firing: grey throughout. Burnished surfaces. Condition worn.
P78 11365. Grid sq 3562.5. Bowl. Rolled rim (type 4) (10g). Fabric A1/EN. Firing: ext. brown; core black; int. surface missing. Burnished exterior. Condition average.
P79 11365. Grid sq 3534.5. Bowl. Rolled rim (type 4) (10g). Fabric FA2/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Traces of burnish on the rim. Condition worn.
P80 11365. Grid sq 3502.5. Bowl. Rim (type 5) (50g). Fabric FA2/EN. Firing: ext. grey to reddish-brown; core grey; int. greyish-brown. Exterior smoothed. Condition average.
P81 11365. Grid sq 3554.5. Bowl. Rolled rim (type 4) (14g). Fabric A1/EN. Firing: black throughout. Condition average.
P82 11200. SF 79493. Carinated Bowl. Shoulder (type 3) (7g). Fabric AF1/EN. Firing: black throughout. Burnished surfaces. Condition worn.
P83 11365. Grid sq 3566.2 Bowl. Everted rim (type 2) (14g). Fabric QA2/EN. Firing: black throughout. Smoothed surfaces. Condition average.
P84 11365. Grid sq 3534.5 Carinated Bowl. Shoulder (type 3) (10g). Fabric AF2/EN. Firing: black throughout. Burnished surfaces. Condition average to worn.
P85 11200 (11365). Grid sq 3510.5. Decorated Bowl. Rim with incised decoration (1g). Fabric FA2/EN. Firing: ext. reddish brown; core grey; int. reddish-brown. Condition average.
P86 11200. SF 70053. Bowl. rim (type 6) (42g). Fabric FA2/EN. Firing: ext. brown; core grey; int. brown. Condition average. Residue sample 30 (ruminant fat).
P87 11200. SF 76628. Bowl. Everted rim (type 2) (38g). Fabric F2/EN. Firing: ext. brown; core grey; int. brown. Condition average. Residue sample 52 (dairy product).
P88 5753. SF 38536. Bowl. Rim (type 4) (5g). Fabric FA3/EN. Firing: black throughout. Condition average.
P89 5753. SF 38504 (sherd marked 38304). Bowl. Broken vertical perforated handle (5g).Fabric AF2. Firing: ext. brown; core and int. grey. Condition average.
P90 5753. SF 37706. Bowl. Rim (type 6) (13g). Fabric AF2/EN. Firing: ext. reddish-brown; core brown; int. greyish-brown. Condition average.
P91 5753. SF 37703. Bowl. Rim (type 4) (15g). Fabric FA2/EN. Firing: grey throughout. Condition average.

Midden deposit 11421(5980, 11172)

P92 5980-1 and 11172. SF 22084, 22242, 22515, 22620, 22626, 22633-9, 22667, 22755, 22775, 22980, 24636, 24911-2, 39964, 49583, 49585, 49587, 49703, 49856, 72238, 78556. Carinated Bowl. Refitting rim, neck and shoulder sherds (62, 867g) from a fine open bowl with rolled rim. Fabric FA2/EN. Firing: ext. brown; core grey; int. brown. Burnished all-over. Condition variable, good-abraded. Thin section 9. Residue sample 32.
P93 5980. SF 22404 and 22406 and 39884, 22213 and 22159. Carinated Bowl. Five refitting neck sherds (118g). Fabric AF2/EN. Firing: reddish-brown throughout. Exterior burnished. Condition average.
Fabric AF2/EN. Firing: reddish-brown throughout. Interior burnished. Condition average.
P94 5980, 11172. SF 39897, 39881, 39901, 22491, 74399. Carinated Bowl. Rim, neck and shoulder sherds (94g). Fabric FA3/EN. Firing: black throughout. Condition average.
P95 5980. SF 39986, 22159. Carinated Bowl. Refitting shoulder sherds (60g). Fabric FA3/EN. Firing: ext. greyish-brown; core and int. brown. Smoothed interior. Condition average.
P96 5980. SF 22162. Bowl. Rim from simple closed bowl (32g). Fabric FA2/EN. Firing: ext. black; core grey; int. reddish-brown. Smoothed. Condition average.
P97 5980. SF 22308. Bowl. Rim (type 2) (11g). Fabric AF1/EN. Firing: black throughout. Exterior slip. Condition average.
P98 5980. SF 22437. Bowl. Rim (type 4) (22g). Fabric FA3/EN. Firing: ext. brown; core grey; int. brown. Condition average.
P99 5980. SF 22387. Bowl. Everted rim (type 2) (22g). Dia. 300mm. Fabric FA3/EN. Firing: greyish-brown throughout. Condition average.
P100 5980. SF 22158. Bowl. Everted rim (27g). Fabric FA2/EN. Firing: ext. black; core and int. brown. Exterior slipped, interior burnished. Condition average. Same or similar to P25 (5989 SF 26467).
P101 5980. SF 39966. Shoulder (4g). Fabric FA1/EN. Firing: ext. black; core brown; int. black. Burnished. Condition average.
P102 11172. SF 74743. Sherds from a miniature cup (5g). Fabric FA1/EN. Firing: ext. reddish-brown; core and int. grey. Condition average.

Midden deposit 11422 (5981, 11173)

P103 5981. SF 22225. Bowl. Rolled rim (47g). Fabric FA3/EN. Firing: ext. reddish-brown; core grey; int. brown. Exterior and interior burnished. Condition average.
P104 11173. SF 72232. Heavy rim (type 6) (2g). Fabric FA1/EN. Firing: ext. and core black; int. brown. Condition average.
P105 5981. SF 22777. Bowl. Rolled rim (19g). Fabric AF2/EN. Firing: black throughout. Condition average.
P106 5981. SF 22237. Shoulder (12g). Fabric AF1/EN. Firing: reddish-brown throughout. Exterior and interior smoothed. Condition average.

Midden deposit 11426 (5986, 11160, 11364)

P107 11160 SF 76999. Bowl. Rim (type 2) with internal decoration (18g). Fabric F2/EN. Firing: reddish-brown throughout. Condition average.
P108 5986 and 11160. SF 23632 and 71433. Bowl. Neck and rim (type 4) sherds possibly but not certainly the same vessel (23g). Fabric FA3/EN. Firing: ext. reddish-brown; core black; int. brown. Condition worn.

Fig. 5.29 (facing page) Early Neolithic pottery: early Neolithic horizon 11201, P70-91, midden deposit 11421, P92

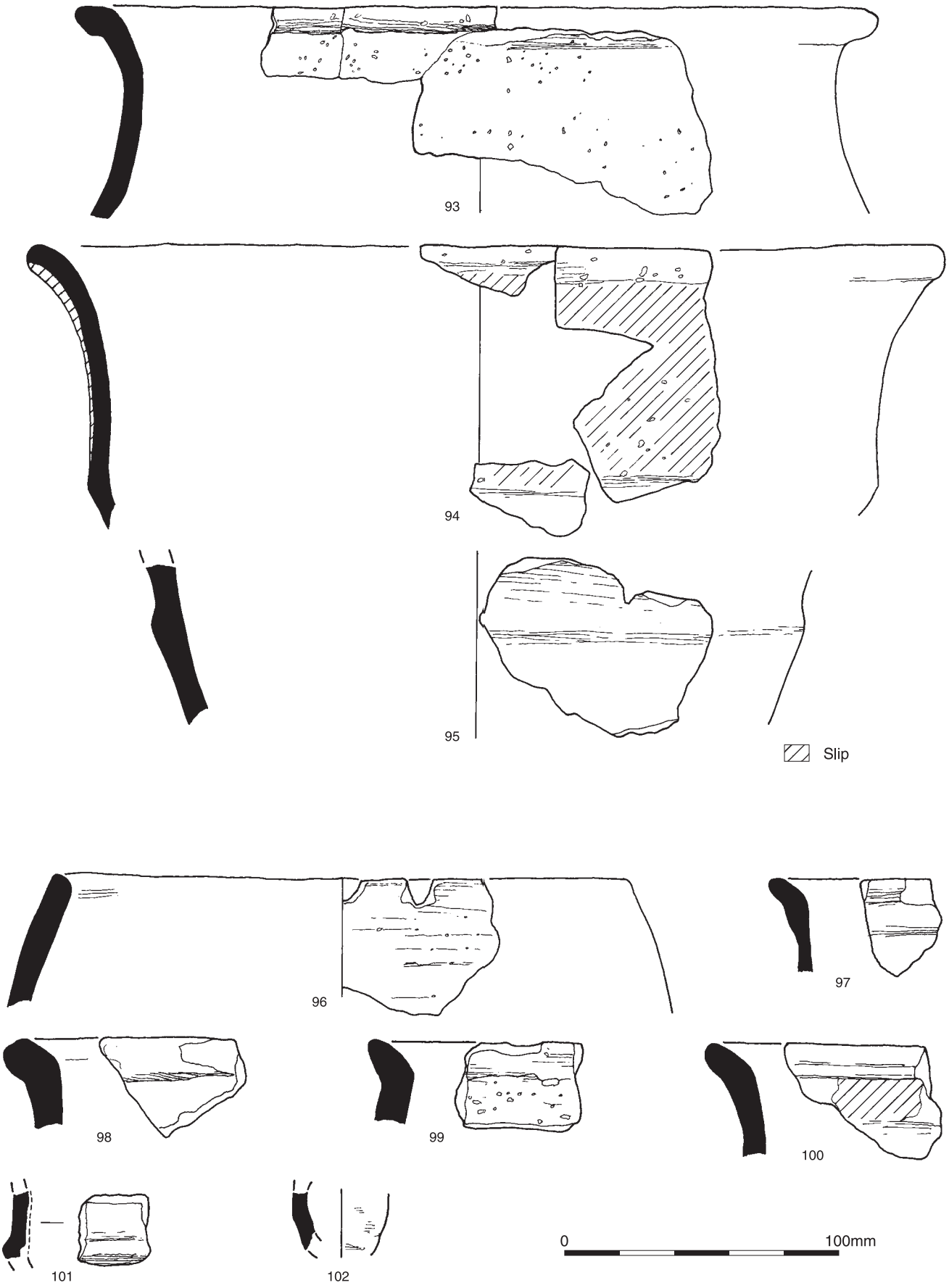


Fig. 5.30 Early Neolithic pottery: midden deposit 11421, P93-102

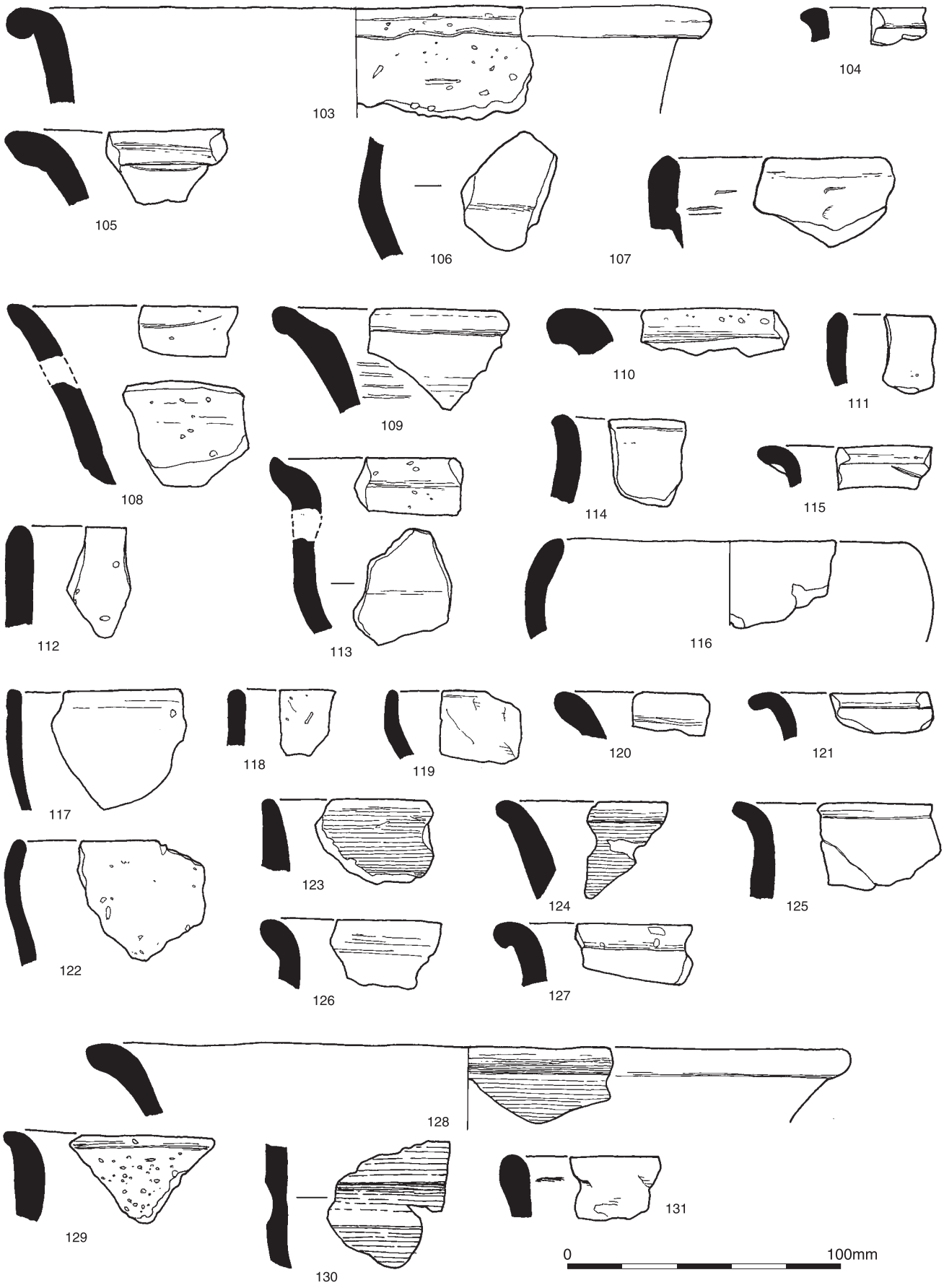


Fig. 5.31 Early Neolithic pottery: midden deposit 11422, P103-106; midden deposit 11426, P107-131

P109 5986. SF 22933. Bowl. Rim (type 2) (28g). Fabric FA2/EN. Firing: ext. black; core reddish-brown; int. black. Condition average-worn.
P110 5986. SF 49629/49964. Bowl. Single rim sherd with a fresh break. (type 4). Fabric FA3/EN. Firing: ext. reddish-brown; core and int. grey. Condition average.
P111 5986. SF 26844. Bowl. Simple rim (type 1) from a cup (4g). Fabric F2/EN. Firing: grey throughout. Condition average-worn.
P112 5986. SF 23695. Bowl. Cup rim (type 1) (9g). Fabric AF3/EN. Firing: ext. black; core and int. greyish-brown. Condition worn.
P113 5986. SF 49889 and 49674. Bowl. Rim and shoulder possibly from the same vessel (12g). Both refired. Fabric F2/EN. Firing: ext. and core grey; int. reddish-brown. Condition average.
P114 5986. SF 23157. Bowl. Rim (type 2) (5g). Fabric A1/EN. Firing:ext.and core grey; int. reddish-brown. Condition average. Residue sample 85 (?ruminant and dairy product).
P115 5986. SF 49622. Rolled rim. Bowl. (type 4) (7g). Fabric F2/EN. Firing: grey throughout. Interior smoothed Condition average.
P116 11160. SF 77256. Bowl. Cup rim (type 1) (16g). Fabric F2/EN. Firing: black throughout. Condition average.
P117 11160. SF 77251. Bowl. Simple rim from cup (15g). Fabric A1/EN. Firing: ext. black; core and int. grey. Exterior and interior burnish. Condition average. Residue sample 2 (dairy product).
P118 5986. SF 26844. Bowl. Cup rim (type 1) (4g). Fabric F2/EN. Firing: grey throughout. Condition average-worn.
P119 11364. Bowl. Simple rim (type 1) (5g). Fabric A1/EN. Firing: grey throughout. Condition average.
P120 11364. Bowl. Rolled rim (type 4) (19g). Fabric A1/EN. Firing: grey throughout. Condition average-worn.
P121 11160. SF 74239. Bowl. (type 6) (7g). Fabric F2/EN. Firing: ext. black; core and int. grey. Condition average.
P122 11160. SF 78986. Bowl. Simple rim from a cup (18g). Fabric FA3. Firing: black throughout. Condition average. Residue sample 4 (dairy product).
P123 11160. SF 77242. Bowl. Rim (type 3) (2g). Fabric AF2/EN. Firing: grey throughout. Condition worn.
P124 11160. SF 75766. Bowl. Rim (type 4) (14g). Fabric A1/EN. Firing: ext. and core black; int. brown. Interior smoothed. Condition average.
P125 11160. SF 79574. Bowl. Rim (type 2) (16g). Fabric F2/EN. Firing: ext. brown; core grey; int. brown. Condition average. Residue sample 13 (D13).
P126 11160. SF 77250. Bowl. Rim (type 2) (11g). Fabric F3/EN. Firing: ext. brown; core grey; int. brown. Condition average. Residue sample 14 (dairy product).
P127 11160. SF 73234. Bowl. Rim (type 4) (14g). Fabric AF3/EN. Firing: ext. black; core grey; int. black. Condition average.
P128 11160. SF 76458. Bowl. Rim (type 6) (33g). Fabric A1/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition average. Residue sample 9 (ruminant fats and mixed fats).
P129 11160. SF 75696. Bowl. Rim (type 2) (14g). Fabric F3/EN. Firing: ext. reddish-brown; core and int. black. Burnished exterior. Condition average. Residue sample 28 (D28).
P130 11160 and 5986. Bowl. SF 23325 and 73367. Bowl. Refitting sherds with thumb groove (15g). Fabric A1/EN. Firing: ext. black; core and int. grey. Condition average.
P131 11160. SF 79958. Bowl. Rim (type 1) (7g). Fabric FA3/EN. Firing: yellowish-brown throughout. Condition average.
P132 11320. SF 83936. Bowl. Rim (type 2) (90g). Fabric F2/EN. Firing: ext. reddish-brown; core and int. black. Condition average. Residue sample 11 (D11).
P133 11320. SF 83935. Bowl. Rim (type 5) (47g). Fabric F1/EN. Firing: ext. greyish-brown; core grey; int. greyish-brown. Condition average. Residue sample 18.
P134 11320. SF 84279. Bowl. Rim (type 4) (25g). Fabric AF1/EN. Firing: ext. grey; core and int. black. Burnished surfaces. Condition average.
P135 11320. SF 83516. Bowl. Shoulder (type 3) (5g). Fabric AF1/EN. Firing: ext. brown; core and int. grey. Exterior burnish. Condition average.
P136 11320 and 5980. SF 84554 and 39899. Decorated Bowl. Refitting rim sherds, one of which is decorated on the lip with two vertical lines (type 6) (14g). Fabric FA3/EN. Firing: reddish-brown throughout. Condition average.
P137 11332. SF 83575. Bowl. Rim (type 2) (8g). Fabric FA1/EN. Firing: ext. yellowish-brown; core grey; int. reddish-brown. Condition average. Residue sample 7 (D7).
P138 11332. SF 82792. Bowl. Rim (type 1) (10g). Fabric AF3/EN. Firing: ext. brown; core and int. grey. Condition average-worn.

Midden deposit 11352 (contexts 11347,)

139 11347. SF 85683. Bowl. Rolled rim (type 4) (24g). Fabric AF2/EN. Firing: ext. and core reddish-brown; int. black. Interior burnished. Condition average.
140 11347. SF 85699. Bowl. Heavy rim (type 6) (52g). Fabric AF3/EN. Firing: ext. black; core brown; int. black.. Burnished surfaces. Condition average to worn.
P141 11347. SF 84711. Bowl. Rim (type 6) (5g). Fabric AF1/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition average.
P142 11347. SF 85096. Bowl. (4g). Fabric AF2/EN. Firing: ext. black; core reddish-brown; int. black. Exterior burnish. Condition average.
P143 11347. SF 85717. Bowl. Shoulder sherd (type 2) (12g). Fabric AF3/EN. Firing: ext. reddish-brown; core and int. grey. Burnished surfaces. Condition average.
P144 11347. SF 85535. Bowl. Shoulder (11g). Fabric FA1/EN. Firing: black throughout. Burnished surfaces. Condition average.
P145 11347. SF 85568. Bowl. Rim (type 2) (6g). Fabric FA2/EN. Firing: black throughout. Interior burnish. Condition average.
P146 11347. SF 85604 and 82793. Probably the same vessel. Bowl. Rim (type 6) (25g). Fabric AF2/EN. Firing: ext. black; core brown; int. black. Burnished surfaces. Condition average.
P147 11347. SF 85814. Decorated Bowl. Everted rim (type 2) with impressed twisted cord decoration (4g). Fabric A1/EN. Firing: ext. black; core grey; int. black. Burnished surfaces. Condition average.

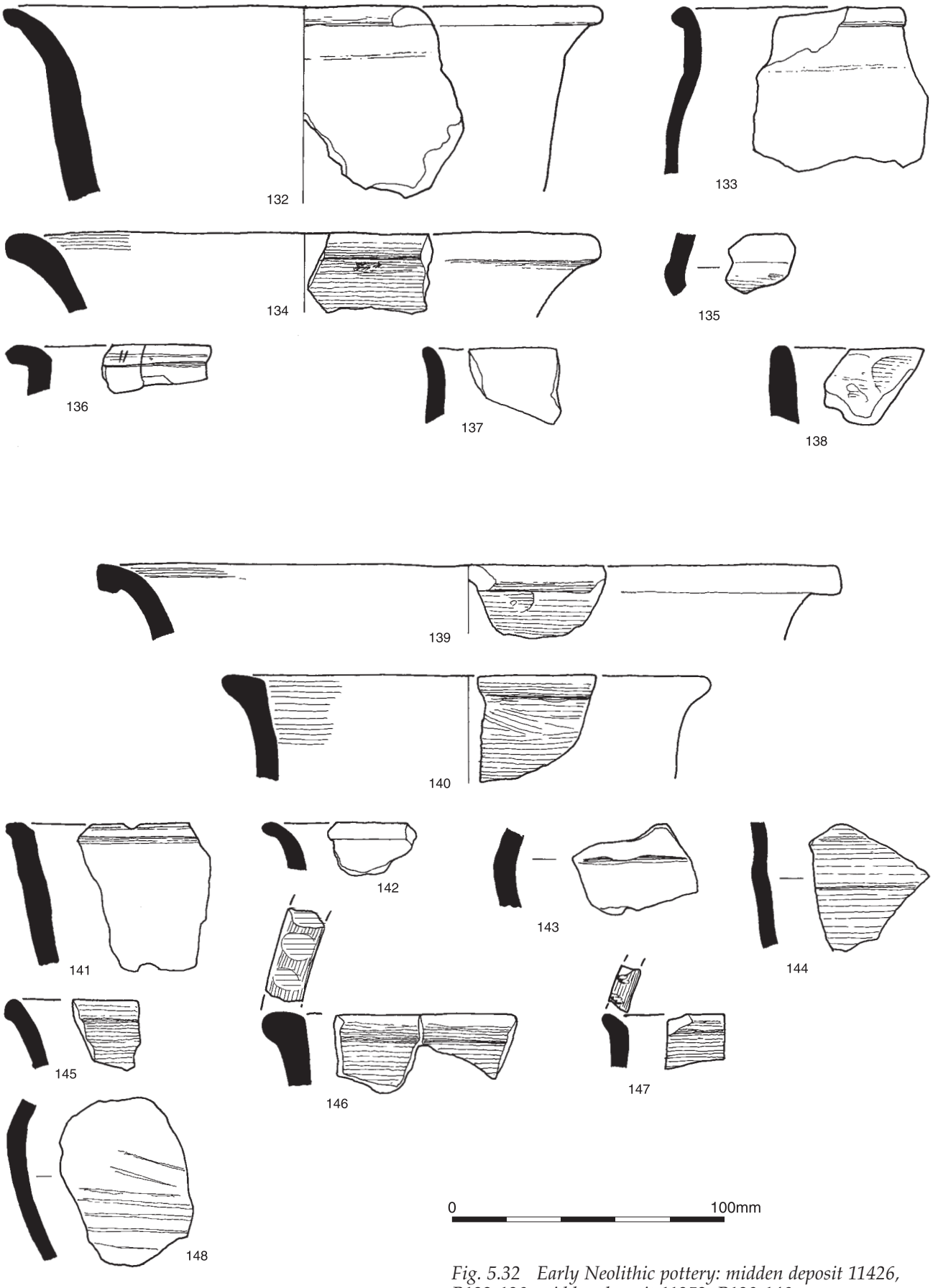


Fig. 5.32 Early Neolithic pottery: midden deposit 11426, P132-138; midden deposit 11352, P139-148

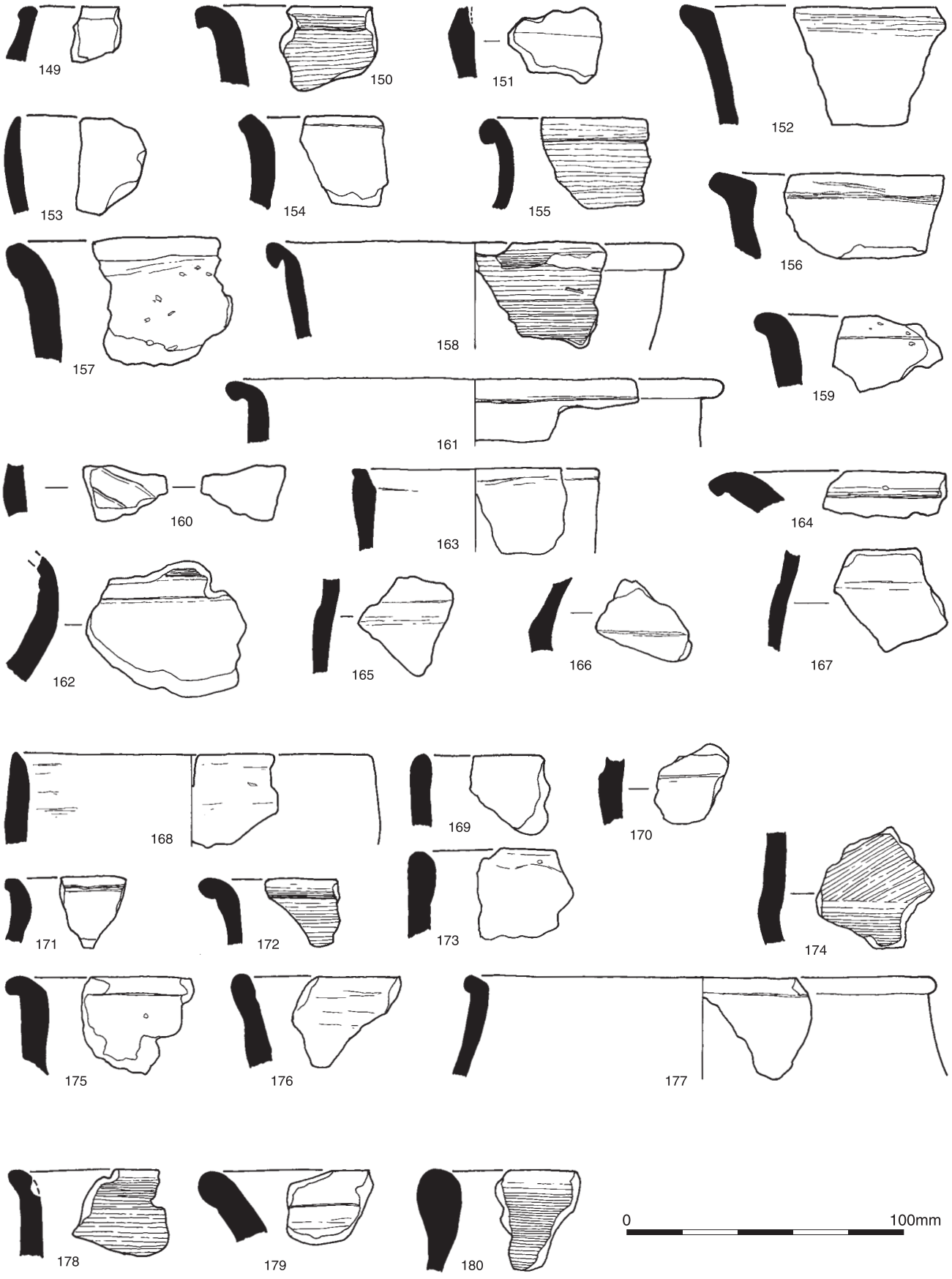


Fig. 5.33 Early Neolithic pottery: context group 11424, P149-167; context group 11420, P168-177; context group 11427, P178-180

P148 11347. SF 85570. Bowl. Shoulder (25g). Fabric AF2/EN. Firing: yellowish-brown throughout. Condition very worn.

Context Group 11424 (11312-4, 11190, 11307, 11187)

P149 11187. SF 76542. Bowl. Rim (type 5) (2g). Fabric FA2/EN. Firing: black throughout. Condition average.

P150 11187. SF 72783. Bowl. Rolled rim (type 4) (20g). Fabric AF2/EN. Firing: ext. black; core reddish-brown; int. black. Burnished surfaces. Condition average.

P151 11187 and 11307. SF 78866 and 79903. Shoulder sherds (21g).Fabric AF2/EN. Firing: ext. black; core and int. brown. Exterior burnished and interior smoothed. Condition average.

P152 11313. SF 83810. Heavy rim (type 6) from a bowl (31g). Fabric F1/EN. Firing: ext. black :core grey; int. black. Interior and exterior burnish. Condition average. Residue sample 19 (?dairy fats).

P153 11316. SF 81798. Cup. Simple rim (type 1) (11g). Fabric no added temper. Firing: ext. black; core and int. grey. Condition average. Residue sample 1 (D1). P153 11313. SF 81216. P154 Rim (2) from bowl (14g). Fabric F1/EN. Firing: ext. reddish-brown; core and int. brown. Condition average. Residue sample 10 (D10).

P155 11313. SF 84372 and 84205. Bowl. Rolled rim sherds (type 4) (18g). Fabric AF1/EN. Firing: ext. greyish-brown; core grey; int. black. Burnished surfaces. Condition average-worn.

P156 11313. SF 82402. Heavy rim (type 6) from a bowl (26g). Fabric F1/EN. Firing: ext. reddish-brown :core and int. black. Interior and exterior burnish. Condition average. Thin section 13. Residue sample 20 (dairy product).

P157 11313. SF 83314. Rim (type 2) from a bowl (25g). Fabric FA3/EN. Firing: grey throughout. Condition average. Residue sample 25 (D25).

P158 11313. SF 85166. Bowl. Rolled rim (type 4) (14g). Fabric FA3/EN. Firing: ext. black; core and int. grey. Condition average.

P159 11313. SF 81215. Heavy rim (type 6) from a bowl (12g). Fabric F3/EN. Firing: ext. brown; core grey; int. brown. Exterior burnish. Condition average. Residue sample 21 (D21).

P160 11313. SF 82936. Bowl/Ebbsfleet Ware. Body sherd with internal linear decoration (5g). Fabric FA2/EN. Firing: ext. reddish-brown; core and int. grey. Condition average.

P161 11313. SF 82526. Bowl. Two refitting rim sherds (type 6) (15g). Fabric FA1/EN. Firing: ext. grey; core reddish-brown; int. grey. Condition average to worn.

P162-11313. SF 84418 Bowl. Neck fragment (36g). Fabric AF2/EN. Firing: ext. black; core grey; int. black. Condition average.

P163 11313. SF 83552. Bowl. Rim (type 1) (10g). Fabric FA2/EN. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition worn.

P164 11313. SF 84428. Bowl. Rolled rim (type 4) (13g). Fabric AF2/EN. Firing: ext. reddish-brown; core and int. black. Internal burnish. Condition average.

P165 11313. SF 83008. Bowl. Shoulder (type 3) (8g). Fabric AF2/EN. Firing: ext. black; core and int. grey. Condition average.

P166 11313. SF 84189. Bowl. Shoulder (type 2) (7g). Fabric AF1/EN. Firing: ext. black; core and int. grey. Condition average.

P167 11314. SF 85402. Bowl. Shoulder (type 3) (8g). Fabric AF1/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition average to worn.

Context Groups 11420 (11340, 11176, 5988, 8200)

P168 11176. SF 76702 Bowl. Cup rim (type 1) (10g). Fabric FA1/EN. Firing: ext. brown; core and int. grey. Condition average to worn.

P169-11176. SF 79565. Bowl. Cup rim (type 1) (8g). Fabric F1/EN. Firing: reddish-brown throughout. Condition worn.

P170 11176. SF 78772. Carinated bowl. Shoulder (type 4) (7g). Fabric FA3/EN. Firing: ext. reddish-brown; core and int. black. Smoothed surfaces. Condition average.

P171 11176. SF 81027. Bowl. Rim (type 4) (5g). Fabric FA1/EN. Firing: ext. and core black; int. brown. Condition average.

P172 11176. SF 78460. Bowl. Three sherds from a rolled rim (type 4) (11g). Fabric AF1/EN. Firing: black throughout. Condition average.

P173 11176. SF 75189. Bowl. Rim (type 11) (11g). Fabric FA2/EN. Firing: ext. black; core grey ; int. brown. Condition average.

P174 11176. SF 82125. Bowl. Shoulder (type 3) (15g). Fabric FA3/EN. Firing: grey throughout. Condition average to worn.

P175 11176. SF 75100 (includes SF 75101). Bowl. Rim (type 4) (15g). Fabric FA3/EN. Firing: ext. brown; core grey; int. brown. Condition worn.

P176 11176. SF 82109. Bowl. Rim (type 11) (10g). Fabric FA2/EN. Firing: grey throughout. Condition average.

P177 5988. SF 49328. Bowl. Rim (type 6) (10g). Fabric FA2/EN. Firing: ext. brown; core grey; int. greyish brown. Condition average.

Context Group 11427 (11194)

P178 11194. SF 79003. Bowl. Rim (type 6) (9g). Fabric FA2/EN. Firing: grey throughout. Condition average to worn.

P179 11194. SF 49328. Bowl. Out-turned rim (type 6) (10g). Dia. 170mm. Fabric FA2/EN. Firing: ext. brown; core grey; int. greyish-brown. Condition average.

P180 11194. SF 80756. Bowl. Heavy rim (type 7). Fabric F3/EN. Firing: ext. brown; core and int. grey. Interior burnish. Condition average. Residue sample 23 (D23).

Midden 11179 (5985, 11174)

P181 5985. SF 22891. Bowl. Simple rim (type 1) (14g). Fabric FA3/EN. Firing: ext. and core grey; int. reddish-brown. Interior burnish. Condition average to worn.

P182 5985. SF 23012. Bowl. Simple rim from a cup (20g). Fabric AF1. Firing: ext. brown; core grey; int. brown. Condition average. Thin section 10. Residue sample 3 (ruminant fat).

Other Neolithic features

Pit 11195

P183 11196. SF 79376. Bowl. Everted rim (type 2) (31g). Fabric F2/EN. Firing: reddish-brown throughout. Condition average. Residue sample 12 (D12).

Pit 11301 (11150)

P184 11150. SF 72913. Bowl. Cup rim (type 1) (4g). Fabric FA1. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition worn. Residue sample 88 (58).

P185 11150. SF 76205. Bowl. Cup rim (type 1) (9g). Fabric A1/EN. Firing: ext. reddish-brown; core and int. grey. Condition very worn. Residue sample 87 (?ruminant and dairy product).

P186 11150. SF 76227 Bowl. Pointed rim (type 3) (9g). Fabric AF2/EN. Firing: ext. reddish-brown; core grey; int. black. Condition average.

P187 11150 SF 78387. Bowl. Heavy rim (type 7) (35g). Fabric F3/EN. Firing: reddish-brown throughout. Condition average. Residue sample 22 (D22).

P188 11150. SF 74625. Bowl. Rolled rim (type 4) (30g). Fabric AF3/EN. Firing: ext. reddish-brown; core and int. black. Condition average.

11428/Section through hollow

P189 5867, 5871, 5874, 5876, 5884, 8109, 11150 (SF 73103, 74391, 74625, 75561, 78372, 78386 and 78627). Bowl. Fifteen refitting and related sherds from a S-profile bowl with a rolled rim (type 4) (796g). Sherds are spread over a distance of *c* 20m, although it is not completely certain that they all derive from the same vessel, in particular SF 75561. Fabric AF3/EN. Firing: ext. greyish brown/black to reddish-brown; core grey; int. reddish-brown. Hard fabric possibly overfired

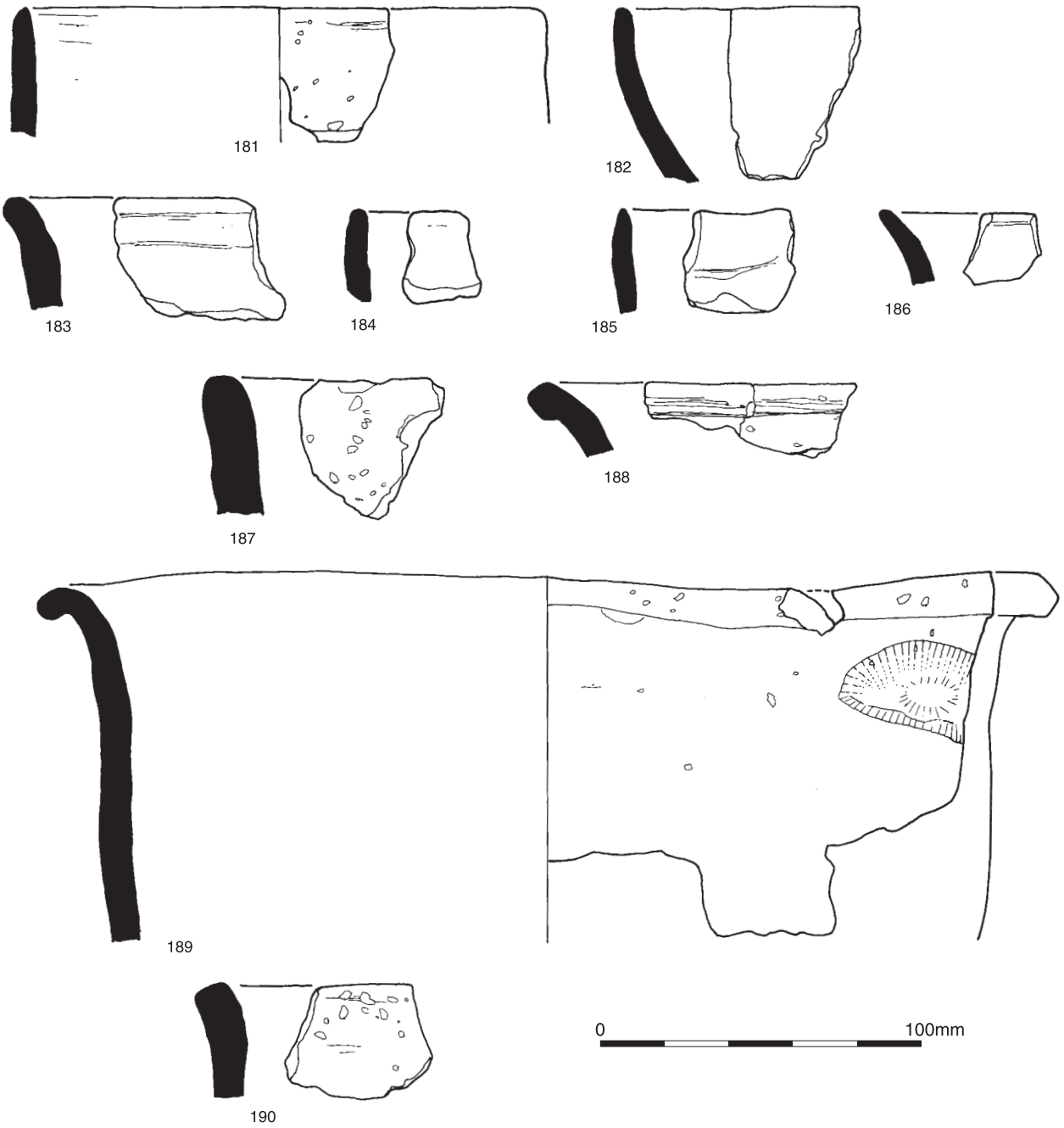


Fig. 5.34 Early Neolithic pottery: pit 11179, P181-2; other neolithic features, P183-190

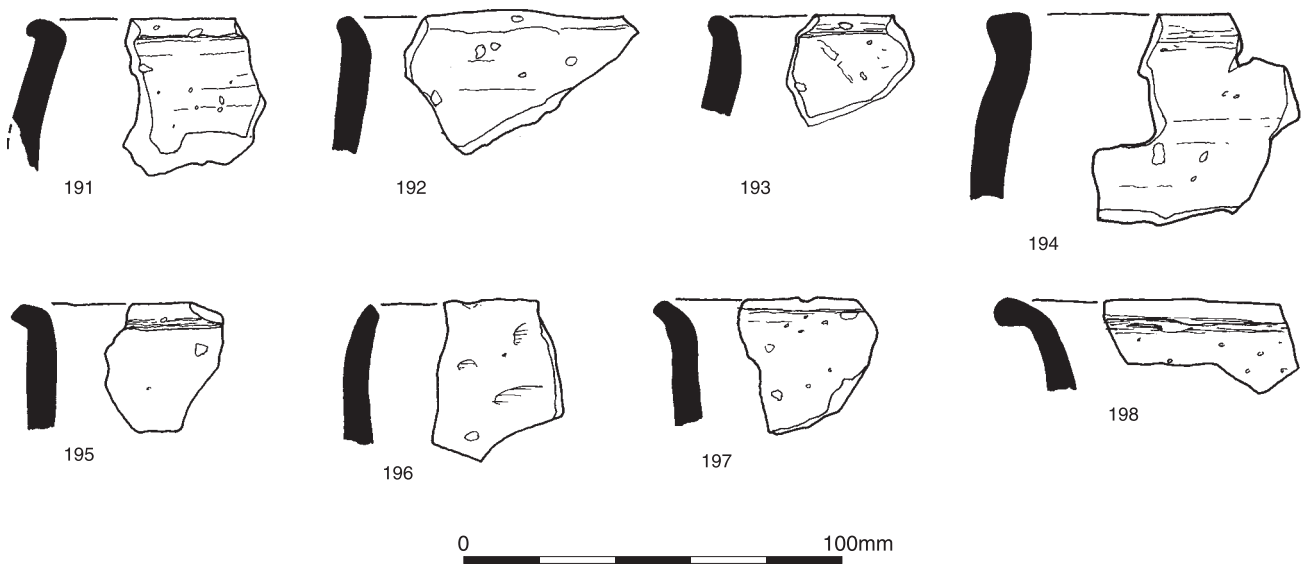


Fig. 5.35 Early Neolithic pottery from Bronze Age ditch: P191-198

with evidence of spalling. Condition average. Residue sample 34 (A4).

P190 8134. Bowl. Eight sherds including three rims (type 2) (50g) from a plain bowl. Fabric F3/EN. Firing: ext. black; core grey; int. reddish-brown. Condition worn.

Bronze Age ditch (5599, 5616-7, 5598, 5788)

P191 5599. Bowl. Rim (type 4) (16g). Fabric F2/EN. Firing: black throughout. Condition average.

P192 5616-7. Bowl. Everted rim (type 2) (20g). Fabric AF3/EN. Firing: ext. reddish-brown; core and int. grey. Condition average.

P193 5598. Bowl. Everted rim (type 2) (10g). Fabric FA2/EN. Firing: dark greyish-brown throughout. Condition average-worn

P194 5788. SF 24117. Bowl. Everted rim (type 6) (28g). Fabric F3/EN. Firing: ext. brown; core and int. reddish-brown. Condition average.

P195 5788. SF 37650. Bowl. Rolled rim (type 4) (9g). Fabric AF3/EN. Firing: ext. brown; core black; int. brown. Condition average.

P196 5788. SF 38405. Bowl. Cup rim (type 1) (13g). Fabric AF3/EN. Firing: ext. yellowish-brown; core grey; int. yellowish-brown. Condition average.

P197 5366. SF 35141 Bowl. Everted rim (type 2) (12g). Fabric AF2/EN. Firing: greyish-brown throughout. Condition average.

P198 5750. SF 39597. Bowl. Rolled rim (type 4) (16g). Fabric FA2/EN. Firing: grey throughout. Exterior smoothed. Condition average.

Early/middle and Middle Neolithic pot from Area 6

In addition to the early Neolithic pottery discussed above, ninety two sherds (439g) of early/middle and middle Neolithic Peterborough Ware were recovered from Area 6 most of which came from the hollow (Fig. 5.36: P199-215; Table 5.11). The majority of this pottery (55 sherds) can be assigned to the Ebbsfleet style, while smaller quantities of Mortlake and Fengate ware were also recovered. Twelve fabrics were identified (Table 5.12).

Forms and decoration

A minimum of 10 vessels are represented by rim sherds, while additional vessels could be represented by decorated body sherds.

At least five of these vessels can be placed within the Ebbsfleet substyle. This includes a neck sherd with neck pit (P199), a plain incurving rim (P202), the rim from a decorated cup (P201), an out-turned rim (P205) and a fragmentary bowl (P203). A sixth vessel (context 8022) is represented by rim and shoulder sherds and numerous small fragments. This vessel is of typical closed form with a simple slightly incurving rim similar to P202, and is decorated with oblique impressions made by short lengths of twisted cord. In addition, two decorated body sherds (P200 and P204) are classified as belonging to this substyle on the basis of style and context association. At least four of the featured sherds had linear decoration, while finger-nail or tip impressions was used to decorated the body of at least two vessels (P203-4). The cup fragment P201 can be paralleled at a number of sites in the Avebury area (Piggott 1962; Smith 1965).

At least three Mortlake Ware vessels are represented by rim sherds. This includes a group of 10 rim and body sherds from layer 11157 that make up part of a bowl (P206). This vessel has a heavy squared rim, a slight shoulder and finger-tip impressed decoration. Two further bowls are represented by rim sherds. One rim is decorated with impressed bone (P209) and the other by twisted cord maggots (P213). Five decorated body sherds (P207-8, 210-2) probably derive from vessels belonging to this substyle. In addition, two sherds – a collared rim (P214) and a decorated body sherd (P215) – can be placed in the Fengate substyle.

The Ebbsfleet ware is likely to be the earliest group of pottery. Its date range is still somewhat uncertain but is likely to fall within the period from

Table 5.11 Peterborough Ware from Area 6 summarised by context group

Context group	*Description*	*Context*	*Illustrated vessels*		*NoSh*	*WT*
5767	MBA ditch	5768		Indeter. Pet. W	1	1 g
5779	Tree-throw hole	5779		Indeter. Pet. W	1	1 g
5788	layer	5788		Indeter. Pet. W	1	15 g
5811	Cut	5812		Indeter. Pet. W	1	2 g
8022	Layer	8022		Ebbsfleet Ware	37	121 g
11041	Tree-throw hole	11042	P202-4	Ebbsfleet Ware	9	46 g
11200	Sealing layer	5753, 5853,11200,11365	P210-1, 213	Mortlake Ware	10	56 g
11201	Land surface	5831, 5989, 11151, 11157-9, 11163	P199-200, P205-9	Ebbsfleet ware and Mortlake Ware	22	117 g
11244	Tree-throw hole	11243	P214	Fengate Ware	1	17 g
11301	Midden	11150		Indeter. Pet. W	2	19 g
11352	Midden	11347	P215	Fengate Ware	1	4 g
11422	Midden	5981-2	P212	Mortlake Ware, Indeter. Pet. W	2	10 g
11423	Midden	5984		Indeter. Pet. W	1	2 g
11424	Midden	11313		Indeter. Pet. W	1	5 g
11426	Midden	5986, 11160	P201	Ebbsfleet Ware	2	23 g
Total					92	439 g

3600 to 3300 cal BC, while heavier vessels with more profuse decoration and Ebbsfleet ware traits (eg P213) could be contemporary with Mortlake and Fengate ware, which probably had a currency spanning the period from 3300 to 2800 cal BC. It is possible that some overlap in use occurred between Neolithic bowl and Ebbsfleet Ware, although at Area 6, because of the strong possibility of intrusiveness and redeposition it would be difficult to demonstrate this. P199-205 all occurred in contexts that produced early Neolithic Bowl. However, while P199-201 may represent intrusive material in early Neolithic deposits, the sherds P202-5 may have been contemporary with tree-throw hole 11041. Table 5.11 lists all the Peterborough Ware from Area 6. It can be seen that some 22 sherds came from soil 11201, while six of the midden deposits contained Peterborough ware, perhaps as intrusive material.

Context

Peterborough Ware pottery was scattered in layers (11200-1) and features within the hollow (Fig. 5.11; Table 5.11). A small number of sherds occurred within early Neolithic midden deposits 11422, 11423, 11424 and 11426. These were single sherds and it is, therefore, possible that they represented intrusive material. Both the Ebbsfleet and Fengate sherds were associated with tree-throw holes. A deposit of Ebbsfleet ware occurred within tree-throw hole 11041 and is described in detail below, while another group of Ebbsfleet ware came from layer 8022.

Tree-throw hole 11041

The single fill (11042) of tree-throw hole 11041 contained 38 sherds (139g) of pottery. The sherds were mostly small (1-11g with an average weight of 3.5g) indicating a high degree of brokenness and some (but not all) of the material had abraded edges. At least three Ebbsfleet Ware vessels are represented, two by rim and other fragments and a third by a decorated body sherd. The most complete vessel is represented by several non-refitting fragments that include rims, neck, shoulder and body sherds. Two sherds in the same fabric (FQA2/EMN) as this vessel and possibly deriving from it had burnt residues on their interior surface. The decorated body sherd is in a different fabric to the other two and therefore derives from a further vessel. The remaining sherds from context 11042 are all plain body sherds and occur in a range of fabrics that would not be inconsistent with either an early

Table 5.12 Summary of middle Neolithic fabrics from Area 6

Fabric	*No. sherds*	*Weight (g)*
Sand-tempered		
A1/MN	1	4
AF/MN	2	16
AG/MN	10	36
Flint and sand-tempered		
F2/MN	8	50
FA2/MN	9	46
FA3/MN	42	155
FG3/MN	1	6
FQA3/MN	5	28
Grog-tempered		
GAF3/MN	1	15
Quartzite tempered		
QA2/MN	1	1

(Plain Bowl) or early-middle (Ebbsfleet Ware) Neolithic date. Both the Ebbsfleet Ware sherds and many of the plain body sherds are thin-walled (between 4-7mm), perhaps indicating that they belong to the same ceramic style. However, some thick-walled sherds occur in fabrics that are almost certainly of early Neolithic date, indicating the presence of at least some residual material.

Catalogue (Fig. 5.36)

P199 11159. SF 73084. Ebbsfleet Ware. Neck pit and incised lines on neck (8g). Fabric AF1/MN. Firing: black throughout. Condition average.

P200 11159. SF 85932. Ebbsfleet Ware. Body sherd decorated on the interior with an incised lattice motif (2g). Fabric FA3/EMN. Firing; core grey; int. black. Condition worn.

P201-5986. SF 49633. Ebbsfleet Ware. Decorated rim from a cup (5g). Fabric AF1/EMN. Firing: ext. yellowish-brown; core and int. grey. Condition average.

P202 11042. SF 74304. Ebbsfleet Ware. Plain pointed inturned rim. Fabric. FA2/EMN. Colour black throughout.

P203 11042. SF 73029, 73144, 73618, 73800-1. Ebbsfleet Ware. Decorated rim, neck and shoulder sherds possibly all from the same vessel. Impressed decorated out-turned rim with internal lattice motif. Stepped shoulder with pinched paired finger-tip decoration below. Fabric FQA2/EMN. Colour: ext. reddish-brown/black; core black, int. reddish-brown. Condition fair.

P204 11042. SF 74115. Ebbsfleet Ware. Body sherd with impressed finger-nail decoration (10g). Fabric F2/EMN. Colour: ext. reddish-brown; core grey; int. reddish-brown. Condition average.

P205 5989. SF 25474. Ebbsfleet Ware. Rim (2g). Fabric FA3/EMN. Firing: ext. yellowish-grey; core grey; int. yellowish-grey. Condition average.

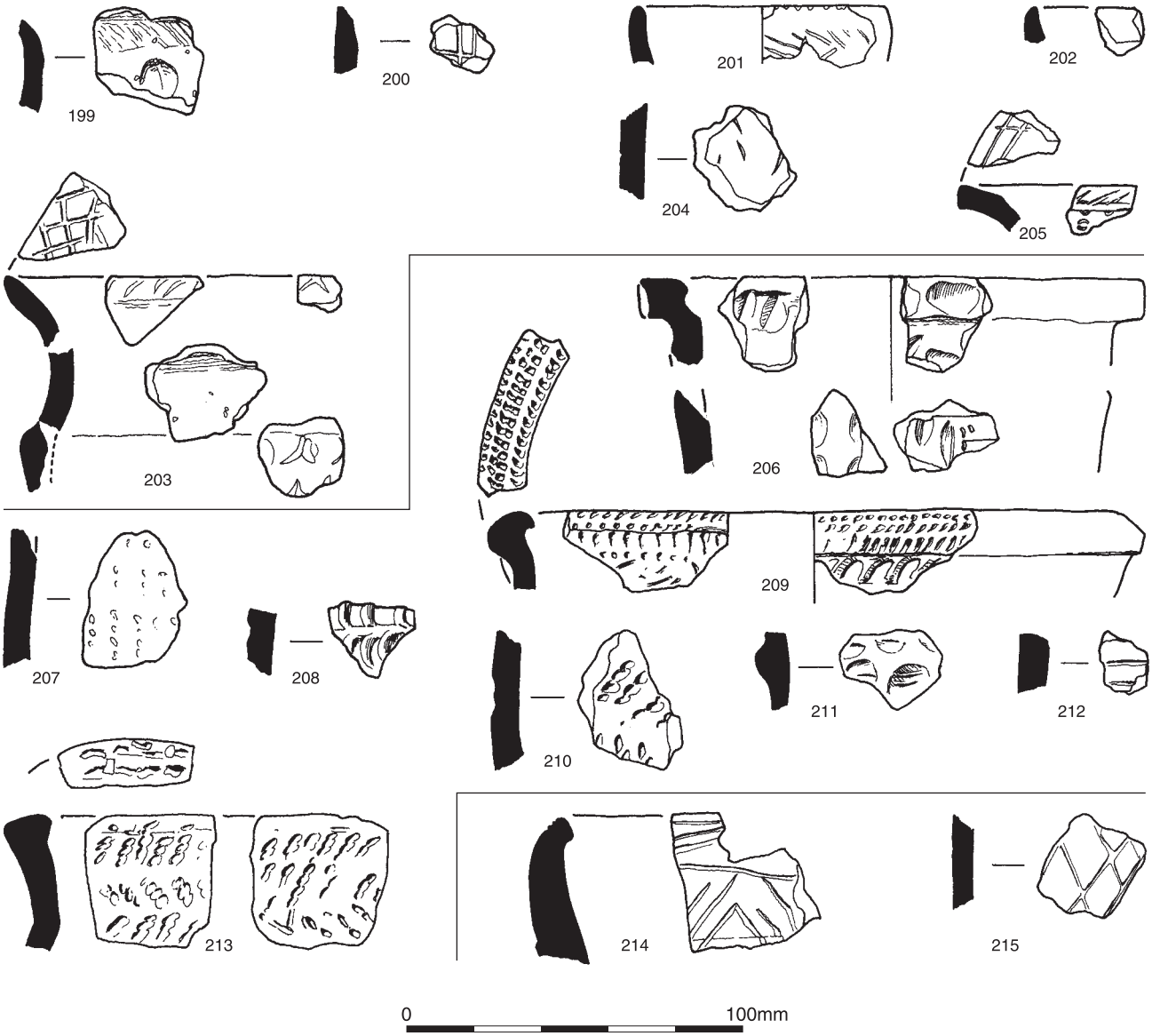


Fig. 5.36 Early/middle and middle Neolithic pottery from Area 6: P199-215

P206 11157. SF 80089-90, 80347-8, 80647, 80649, 80076. Mortlake Ware. Rim and body sherds from a bowl decorated with finger-tip and nail impressions (10 sherds, 36g). Fabric AG1/MN. Firing: ext. reddish-brown; core grey or black; int. brown. Condition average-worn.
P207 11159. SF 77659. Mortlake Ware. Body sherd with twisted cord decoration (14g). Fabric AF3/MN. Firing: ext. reddish-brown; core and int. black. Condition average.
P208 11163. SF 80813. Mortlake Ware. Body sherd with plastic finger-tip pinched decoration (3g). Fabric FA2/MN. Firing: ext. black; core and int. grey. Condition average.
P209 11158. SF 80802. Mortlake Ware. Rim decorated with bone impressions, finger-pinching and incised lattice motif (12g). Dia. 190mm. Fabric FA3/MN. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition average.
P210 11200 3458.5 south. Peterborough Ware, Mortlake. Body sherd with twisted cord decoration (9g). Fabric FA3/MN. Firing: ext. reddish-brown; core black; int. brown. Condition average.
P211 11200 3566.5. ?Mortlake Ware. Finger-tip impressed body sherd (5g). Fabric A1/MN. Firing: reddish-brown throughout. Condition worn.
P212 5981. SF 22647. Peterborough Ware, Mortlake? Body sherd with two grooved lines (2g). Fabric F2/MN. Firing: dark grey throughout. Condition average.
P213 11200 3502.5 south. Mortlake/Ebbsfleet Ware. Decorated rim (23g). Fabric F3/MN. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition very worn.
P214 11243 (644). SF 79210. Fengate Ware. Decorated rim (17g). Fabric FA2/MN. Firing: ext. greyish-brown; core and int. grey. Condition average. Residue sample 23.
P215 11347. SF 85504. Fengate ware. Body sherd with incised lattice motif (4g). Fabric FA3/MN. Firing: yellowish-brown throughout. Condition average.

Fired clay from Area 6 by Alistair Barclay

Fired clay was recovered from 20 contexts in Area 6 including the early Neolithic horizon (11201), the sealing layer (11200), surface middens (11421, 11426, 11422 and 11423), grave 5125, ring ditch 5579, as surface finds (5989) and in tree-throw holes (11301, 11181 and 11312=11190). In total 47 amorphous fragments (94g) of fired clay were recovered, mostly weighing 1 or 2g. It can be dated only generally to the early-middle Neolithic on the basis of the associated pottery. The fragments lacked any distinctive features and may derive from hearths or ovens, or from other activities like the burning of *in situ* tree stumps.

The struck flint from Area 6
by Hugo Anderson-Whymark

Introduction

A total of 25,818 flints were recovered from excavations in Area 6 (Table 5.13). A small quantity of Mesolithic flint was redeposited in later features. The majority of the lithic assemblage, however, was recovered from the hollow running across the site which contained the preserved early Neolithic land

Table 5.13 The Area 6 flint assemblage by phase

CATEGORY TYPE	Early Neolithic	Early Neolithic with contamination	Early Neolithic?	Early/mid Neolithic	Middle Neolithic	Middle Neolithic?	Neolithic	Neolithic?	Late Neolithic	Late Neolithic/EBA	Bronze Age	Post Bronze Age	Unphased	Total
Flake	9856	487	28	220	13	4	1879	70	10	2	562	169	274	13574
Blade	1483	66	6	21	4	1	318	7	3		42	32	55	2038
Bladelet	286	23	2	11	1	1	57	2	1		15	4	10	413
Blade-like	1173	55	7	25	1		186	9	1	1	44	13	33	1548
Irregular waste	306	13	1	6	1		39	1		1	20	1	6	395
Chip	874	61		35	1	2	276	2			14	19	19	1303
Sieved chips 10-4mm	838		4				50				49	2	4	947
Sieved chips 4-2mm	724	28	17									16		785
Sieved chips <1mm	80													80
Burin spall	1													1
Rejuvenation flake core face/edge	92	9	2	1			17	3			1	2	3	130
Rejuvenation flake tablet	64	8		1			14				2	3	1	93
Rejuvenation flake other	8			1										9
Levallois flake		1												1
Janus flake (= thinning)	4	1												5
Thinning flake	7	1		2			3				1	1		15
Flake from ground implement	16	1					1				1		1	20
Core single platform blade core	12	3		4			5				3	1	2	30

Table 5.13 (continued)

	Early Neolithic	*Early Neolithic with contamination*	*Early Neolithic?*	*Early/mid Neolithic*	*Middle Neolithic*	*Middle Neolithic?*	*Neolithic*	*Neolithic?*	*Late Neolithic*	*Late Neolithic/EBA*	*Bronze Age*	*Post Bronze Age*	*Unphased*	*Total*
Bipolar blade core	3			1	1						2	1		8
Other blade core	6	5					9						2	22
Tested nodule/bashed lump	222	30	1	6			40	1			48	6	7	361
Single platform flake core	92	15		1			16				8	3	1	136
Multiplatform flake core	186	46		3			61	4			16	3	8	327
Keeled non-discoidal flake core	4													4
Levallois/other discoidal flake core	3	2					1		1					7
Core on a flake	28	8					16				1	3		56
Unclassifiable/fragmentary core	111	8					24				9	3	5	160
Microlith	4	4		3			1				1	3	3	19
Leaf arrowhead	9						2	1						12
Oblique arrowhead												1		1
Chisel arrowhead		2									1			3
Barbed and tanged arrowhead		1											1	2
Laurel leaf	1													1
Unfinished arrowhead/blank	17	2					2						1	22
Fragmentary/unclass arrowhead	4	1					1							6
End scraper	45	6	1	1			11				1			65
Side scraper	18	3	1				8				2		2	34
End and side scraper	21	1					7				4	1		34
Scraper on a non-flake blank	4	1												5
Other scraper	20						1				1		2	24
Awl	4	2					1						1	8
Piercer	18	4									2			24
Spurred piece	5													5
Other borer	1													1
Serrated flake	33	2					7	2	1		6	1		52
Saw	1													1
Denticulate	2						1							3
Notch	20	9	1	1			5				3			39
Backed knife	2						1						1	4
Discoidal knife							1							1
Other knife		1		1			1							3
Retouched flake	401	42	3	13	1		83	16			42	10	9	619
Single-piece sickle	2	1												3
Fabricator	3													3
Axe	1												2	3
Other heavy implement	2						1					1		4
Misc. retouch	23	2					9							34
Other	2			1									1	4
Hammerstone	19	2					4	1			4	1	1	32
Not assessed		2278												2278
Grand total	17161	3235	74	358	23	8	3159	119	17	4	906	300	455	25817
Burnt unworked flint (g)	15892	5318	817	4104	23	0	1541	1260	0	40	7106	3256	8618	47975
Burnt no. (%) (exc. chips)	695	30	0	49	1	0	125	4	0	0	17	19	27	967
	(4.8)	(N/a)		(15.2)			(4.4)	(3.4)			(2)	(7.2)	(6.2)	(4.7)
Broken no. (%) (exc. chips)	5379	260	15	160	8	3	1053	44	4	2	184	81	105	7298
	(36.7)	(N/a)	(28.3)	(49.5)	(36)		(37.2)	(37.6)			(22)	(30.8)	(24.3)	(35.8)
Retouched no. (%) (exc. chips)	663	84	6	20	1	0	143	19	1	0	63	17	23	1040
	(4.5)	(N/a)	(11.3)	(6.2)	(4.6)		(5.1)	(16.2)			(7.5)	(6.5)	(5.3)	(5.1)

surface upon which the midden deposits were located. A number of deposits of midden material were also located within tree-throw holes and a pit. Several features of middle and late Neolithic date were identified that contained small but coherent assemblages. Small assemblages of flint were also recovered from four ring ditches and associated features, and from a scatter of other later Bronze Age features on site. The assemblages from the northern ring ditches were dominated by residual Neolithic material; those from the southern ring ditches all came from secondary fills of middle Bronze Age or later date, except for pit 5201 in the centre of the south-western ring ditch 5169, which contained Beaker pottery.

This report provides a general overview of the flint from all periods from Area 6, before analysing the early Neolithic flint in more detail. More specific comments on the flint from later periods is given in the relevant chapters below and in Volume 2.

Methodology

The general methodology applied to the analysis of lithics on all sites is described in Appendix 2. The notes here relate only to the specific details of the analysis on this site. A total of 23,539 flints from the site were recorded to stage one level. The final machine stripping of the site resulted in the recovery of 2340 flints. These were only quickly scanned due to restrictions on time, and only 62 artefacts and cores were catalogued (context 11365).

Technological analysis was undertaken on 838 flints in five samples, which vary in size from 141 to 199 flints. The five samples were chosen to represent a cross section of the early Neolithic deposits in Area 6. Two samples were taken from midden deposits, one from fill 11313 in tree-throw hole 11312 and the other from the surface midden deposit 11426. The three remaining samples were taken at regular points on the preserved early Neolithic land surface (11201), west to east: 11059, 11159 and 11157. Metrical analysis was undertaken on the samples from 11159 (151 flints) and 11313 (195 flints) in conjunction with the technological analysis

Raw materials

The raw materials identified in the flint assemblage originate from several sources. The entire assemblage, with the exception of a single flake of fine quality black chert, is flint. The sources of the flint from Area 6 can be divided into four main categories:

1 Gravel flint (river gravels) *c* 99.4% of the assemblage
2 Bullhead flint *c* 0.3%
3 Chalk flint *c* 0.3%
4 Reworking of polished flint implements (chalk flint) *c* 0.01%

Gravel flint

Most of the worked flint derives from local river gravels, although the exact percentage is difficult to quantify scientifically. Non-gravel flint whether judged on the cortex, quality of the material or colour (black flint being least weathered – ie chalk flint) accounted for only one percent of the total assemblage.

The gravel-derived flints generally exhibit a pitted or abraded cortex that varied in thickness from *c* 1mm to *c* 3mm. Their colour was very variable with the majority of pieces being shades of beige and orange, although grey flints were represented in small numbers. The quality of the gravel flint is quite variable; thermal fractures are present in most nodules, although to varying degrees. While most of this flint has good flaking qualities, the presence of some inferior material perhaps accounts for the large number of tested nodules.

The river gravels, on which the site is situated, represent the closest and most obvious source for this flint. They are post-Pleistocene in date and vary from coarse to medium poorly sorted gravel (Holroyd 1995). Thus, a variety of sizes of nodule are available, which include nodules weighing several kilograms, some exhibiting a relatively fresh chalky cortex. However, the quality of this material is often poor and the potential for making core tools limited. No derived nodules of Bullhead Bed flints were identified in the river gravel flint on site.

Bullhead flint

A total of 76 pieces of Bullhead Bed flint were identified; these pieces represent 0.3% of the assemblage. This good quality flint originates from the base of the Reading Beds, and is identifiable by a distinctive orange line under the dark green cortex. The nearest sources of this flint are thought to be 5.5km to the west and 3.5km to the east at Windsor. The assemblage of Bullhead flint is largely comprised of flakes and blades, two cores (one of which was a single platform blade core) and two tested nodules. Only two tools were made of Bullhead flint: one retouched flake and a pick. The pick, which is 189mm in length, would have been manufactured from a large good quality nodule of a sort not readily available from the local gravel flint. The manufacture of a pick from Bullhead flint is of interest as it appears to represent the selection of an appropriate material for the manufacture of a large implement from a material which was not in everyday use. Despite this, the small proportion of Bullhead flint in the assemblage suggests that it was not regularly used, or specifically sought, despite its good quality flaking properties.

Chalk flint

A small number of chalk flints were identified. A total of 71 flints exhibited a thick, 4mm to 6mm, chalky cortex and a good quality black interior. Seventeen of these pieces appeared to have derived

from the same core in context 5980 (part of midden 11421), although no refits were found. It is apparent from the small number of pieces of chalk flint identified that this material did not represent a commonly exploited source.

Reworking of polished implements

A total of two polished axe fragments and 20 flakes from polished implements were recovered. The axe fragments both bore the scars of flake removals, and the presence of the other fragments as flakes indicate the reworking of polished implements as cores. The use of broken polished implements as a source for raw materials was obviously minimal and probably only occurred as broken pieces became available.

The original source of flint for the polished implements appears in all cases to be direct from the chalk. Twelve flakes from polished implements and the cutting edge of an axe were made from a good quality mid grey chalk flint, with occasional large cherty inclusions. A further three flakes and the butt of a polished axe were manufactured from a dark grey, slightly translucent flint with occasional cherty inclusions. A very distinctive flint type was represented by a single flake from a polished implement. The flint was mid grey in colour with small mottled white, dark grey and red inclusions. This piece of flint may have been selected for its aesthetic qualities. The three remaining flakes from polished implements, although all of a grey flint, did not comfortably fit with the above descriptions and were too small to describe accurately.

All pieces of grey flint similar to the raw materials of the axes were noted, amounting to 298 unpolished grey flint flakes. It is unlikely that all these pieces originated from polished implements, due to the presence of some grey flint in the river gravels. However, the spatial distribution of these pieces is similar to that of the flakes from polished implements and appears to concentrate in the vicinity of middens 11313, 5980 and 11160.

The nearest outcrop of chalk flint is at High Wycombe, 14km to the north, where the river Wye cuts through the Chilterns. A possibly Neolithic flint mine is located in the same grid square (SU 8693; Barber 1999, 75). The axes probably represent traded or exchanged objects and may have originated from distant mines, such as those on the Sussex Downs. Scientific sourcing of the flint axes was not attempted.

Chert

A single retouched flake of good quality black chert was recovered from Area 6. This raw material is similar to Portland-type chert (M Tingle pers. comm.). This chert is comparable to that used for a large leaf arrowhead found in Area Ex1. The recovery of a single flake indicates the raw material was probably not worked on site and may represent a flake from the working down of a larger finished object.

Quartzite

The river gravels also contain a large number of quartzite pebbles, which vary in both size and composition – affecting the hardness of the material. These were commonly used as hammerstones.

Condition

The flintwork was generally fresh, although there were some variations in the assemblage. The Neolithic assemblage was in an exceptionally good state of preservation, exhibiting only occasionally evidence of slight post-depositional damage. This may have occurred from contact with other flints in the ground or with a stony soil matrix. The Mesolithic flint was generally slightly rolled and was clearly redeposited. Significant numbers of flints were recovered from plough-disturbed horizons towards the west of the hollow, and former plough soils. These flints exhibited considerable edge damage and 'plough nicks'. A few flints had a slight calcium carbonate encrustation.

The cortication of the flints was variable and presented an interesting spatial pattern. The majority of the flint was uncorticated (*c* 95%). The remainder mainly had a light cortication, with a very small number of pieces exhibiting a heavy white cortication. The corticated pieces concentrate in tree-throw hole fills: 11313 (feature 11352), 11176 (feature 11420) and 11194 (feature 11427). In the former, corticated pieces concentrated towards the base of the feature. A number of flints in the surface midden deposit 11160 where corticated on one side. The majority of the flint on the land surface was uncorticated, although in squares 11157 and 11158 and 11180 the majority of flints were corticated. This may indicate differences in depositional environment or weathering. However, the erratic formation of cortication causes difficulties in interpreting this pattern with any degree of confidence.

The assemblage

Unretouched flakes and blades

Unretouched flakes and blades have been divided into four categories: flakes, blade-like flakes, blades and bladelets. These categories account for 17,573 flints. Flakes which have been utilised (as identified by use-wear), although not adapted, are included here as typologically they do not differ from their unutilised counterparts.

Irregular waste

A total of 395 pieces of irregular waste were recorded. The majority of these pieces were formed through breaks along frost shatters within the core during knapping.

Chips and sieved micro-debitage

A total of 1303 chips were recovered through hand excavation on site. An additional sample of chips was collected from the 28 sieved soil sample

residues. A total of 947 chips were recovered from the 10-4mm residues (100% of 40 litre residues), 785 chips at 4-2mm (50% of residue only), and a further 80 chips in the one sample sieved below 2mm (50% of residue only). The average density of chips recovered from the 10-2mm range of the sieved soil samples is approximately 2250 chips per m^3; a much greater density than that achieved by hand excavation, which clearly illustrates the collection bias. The deposits are predominantly early Neolithic and the chips and their spatial distribution are discussed further below. Due to the bias in the recovery of chips, they are excluded from all percentages and tables.

Rejuvenation flakes

A total of 232 rejuvenation flakes were recovered. This total includes 93 rejuvenation tablets and 123 face or edge rejuvenations. Only nine crested flakes were recovered, suggesting that this reduction strategy was not commonly employed on site. This may relate to the nature of the raw material and the use of an appropriate reduction strategy, rather than a generally low level of technology.

Thinning flakes and Janus flakes

A total of fifteen thinning flakes and five Janus flakes was recorded. There were no concentrations in the spatial distribution. The presence of these few thinning flakes suggests that some core tools were produced on site, although this was not a regular activity. The raw material of four of the thinning flakes is a grey flint similar to the raw material of the polished implements, and it is therefore possible that axe rough-outs were brought to the site and finished.

Cores

A total of 1112 cores were recovered, including 361 tested nodules (Table 5.14). Blade cores appear slightly under-represented in comparison to the number of flake cores. However, blade removals were apparent on numerous flake cores – indeed, flake cores often appear to have been blade cores earlier in their reduction. Platform edge abrasion was a common trait, identifiable on 40% of cores (303), although it was rarely encountered on the tested nodules

The majority of the cores appeared to have been worked until fully exhausted, often being finally abandoned after knapping errors, such as a hinge or step fractures, or on encountering a thermal fracture. Cores are generally abandoned at an average weight of between 50 and 60g regardless of type, with the possible exception of the few levallois style/discoidal cores which generally appear to be smaller. A few cores were recovered from the hollow that were clearly not exhausted or abandoned for any clear reason. These include a single platform blade core weighing 427g and a multi-platform flake core of 348g. No unworked nodules were recovered from the site to indicate the original size of the raw materials worked. However, the latter cores hint at the weight of the nodules worked.

Microliths

Fifteen microliths and four backed bladelets were recovered. Both early and late Mesolithic microlith forms were represented in the assemblage. Five early Mesolithic obliquely blunted points, including two of Jacobi's form 3d (1978, 16) were identified, whilst six rod microliths (Jacobi No. 6) and two scalene micro-triangles date from the late Mesolithic. The remaining microliths and backed bladelets were broken and unclassifiable.

Leaf arrowheads

A total of 12 leaf arrowheads were recovered (Plate 5.12). Nine were found in early Neolithic contexts and three in contexts broadly dated to the Neolithic; eight of the arrowheads were broken and one burnt. Six of the fragmentary pieces were unclassifiable, comprising four base fragments, a medial fragment and a tip and body fragment. The six identified pieces were classified using Green (1980). The closest parallels were a 1b (SF 81697 – 11157), a 4a, a type 4, a 3a, and possibly a 3c. This arrowhead is almost kite shaped, although the sides are slightly rounded. Given the size of the type 1b arrowhead (SF 81697), although typologically belonging to the leaf arrowhead category, it is unlikely to have functioned in a similar manner to the other arrowheads. There is also a fragment of a probable type 2, although the piece is slightly squatter (finds reference 5750). Two arrowheads exhibit rough protrusions on their edges and may not have been finished, although these pieces may just have been crudely retouched.

Table 5.14 The range and average weight of cores from Area 6

Core type	*No. weighed*	*Min. Wt (g)*	*Max. Wt (g)*	*Avg. Wt. (g)*
Core single platform blade core	29	9	427	72
Bipolar blade core	7	27	156	63
Other blade core	19	24	191	58
Single platform flake core	129	6	186	53
Multiplatform flake core	310	11	348	59
Keeled non-discoidal flake core	2	41	234	138
Levallois/other discoidal flake core	5	17	75	44

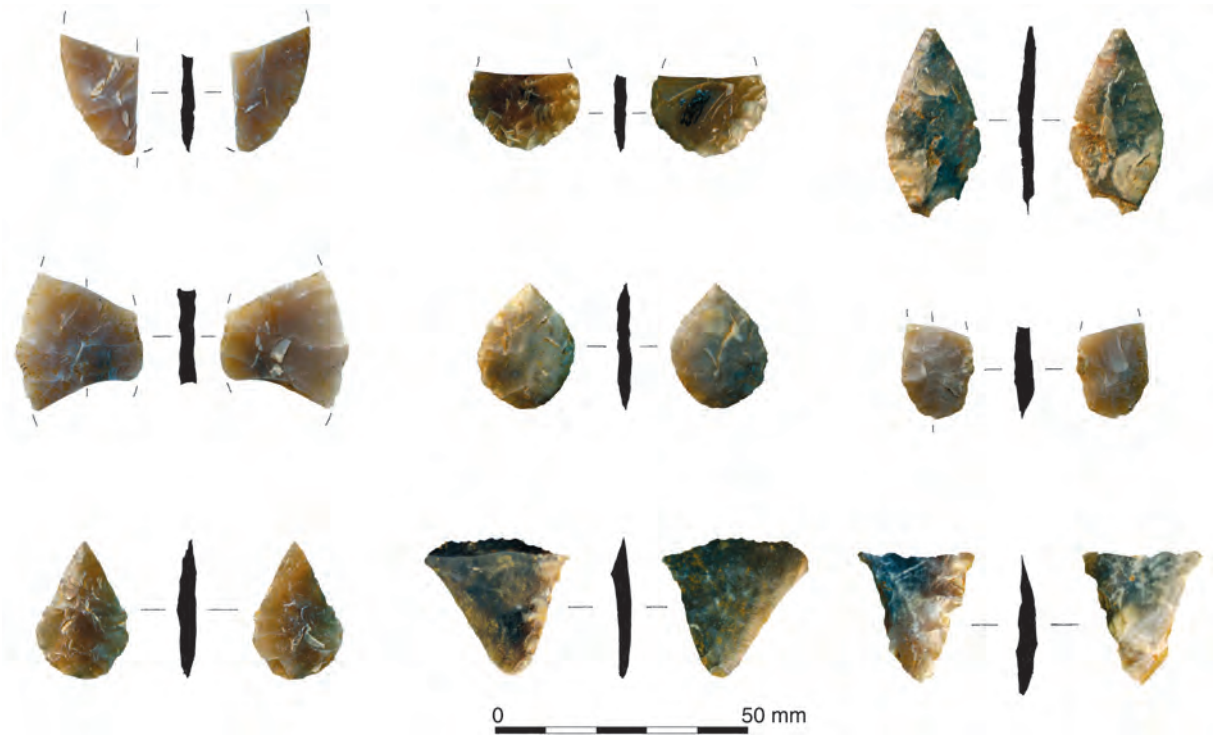


Plate 5.12 Area 6, leaf-shaped and transverse arrowheads

Chisel arrowheads

Three chisel arrowheads were recovered from the excavation. All were manufactured on distal flake fragments, the terminations of which are slightly hinged. Two arrowheads from 11365 exhibit some asymmetry with a slight protrusion on one side, similar to Green's type D, but not as prominent (Green 1980, 101). Considerable impact damage is apparent on all three arrowheads.

Oblique arrowhead

A single fragmentary oblique arrowhead was recovered from the topsoil (11000). A small piece of the base of the arrowhead survives. The arrowhead is finely retouched although few removals are invasive. The arrowhead is made of a distinctive orange-brown flint.

Barbed and tanged arrowheads

Three barbed and tanged arrowheads were recovered: two Sutton type C's and a type B (Green 1980, 122). However, it was difficult to ascribe more precise parallels as the tangs were missing from two of the arrowheads and the tip from the third. The arrowheads all exhibit fully invasive retouch, but the standard of workmanship clearly differs. The arrowhead recovered from pit 5313 exhibits very fine flaking and is finished to a high standard; the arrowhead from 11365 is well flaked, but not finished to such a high standard, leaving a few imperfections in the edge (Green, type B). An unstratified arrowhead is flaked and finished to a lower standard than the other arrowheads.

Unfinished arrowheads

A total of 25 flints have been classified as unfinished arrowheads. This category has been subdivided into three groups:

Probable rough-outs

These exhibit some invasive and bifacial retouch, but due to the early stage of abandonment or fragmentation cannot be definitively identified. A total of six probable rough-outs were identified, five of which were broken. The bulb of percussion is missing from all these pieces and invasive removals have been made across the surface in four of the examples.

Rough-outs

The form and dimensions of the rough-outs are consistent with leaf arrowheads and exhibit considerable invasive, bifacial retouch. However, the artefacts are still crude and irregular. Six definite rough-outs were identified. These were in various stages of production from heavily bifacially flaked pieces (tree-throw hole 11420, SF 82849 and 22119) to relatively advance pieces fully bifacially retouched with a rough leaf-shaped form; pieces that required further thinning and refining of the shape (SF 79765, 26882 and 78007). These flints may have been abandoned due to flaking errors and the thickness of the artefacts.

Misshapes and unfinished arrowheads

These probably represent leaf arrowheads nearing completion. Some irregularities are present and the

edges are rough and unfinished. A total of eight unfinished arrowheads, broken during the course of manufacture, and two misshapen arrowheads were identified. The two misshapes (midden 11421, SF 39969 – 5980 and tree-throw hole 11424, SF 76514 – 11187) were both whole and nearing completion. However, along one side the retouch become abrupt bifacial retouch rather than invasive, a fault which could not be corrected. The eight unfinished arrowheads, comprising four tips and three bases were nearing completion when broken, bar one of the base fragments. Slight protrusions and irregularities along the edges required pressure flaking to complete the task. These pieces would have functioned as projectiles without any further adaptation, and it is therefore with caution that these pieces are classified as unfinished. However, comparison with other arrowheads from the midden indicates that the edges were in general finished, indicating these piece may well be unfinished. (SF 75651 – 11160, 36315 – 5750, 49363 – 5987, 38698 – 5831, 36290 – 5750, 85182 – 11313 and 77843 – 11176). Arrowhead SF 49684 (from midden 11426) was clearly abandoned at an earlier stage of production than the other pieces, possibly as a result of the piece breaking. The reduction strategy visible is the same as that identified in Area Ex1 in scatters 678 and 720. On selection of an appropriate flake blank, a small platform was established on the ventral surface and the dorsal surface invasively retouched. However, a series of step fractures occurred on the dorsal surface; attempts to remove the fault resulted in further step fractures and an irregularity in the arrowhead's form. It is unclear if the break occurred at this time or if the irregular nature of the piece resulted in its abandonment. The form of this piece is comparable to the refitting arrowheads in Area Ex1.

A single rough-out for a barbed and tanged arrowhead was found in the topsoil. The blank for the arrowhead appears to be a thick (>7mm) partially cortical trimming flake. A small platform was established on the ventral surface and the dorsal surface exhibits fully invasive retouch; the shape has also clearly been refined at this stage. The point is established with curving sides and probably a flat base (modern damage has made the surface slightly concave). The proximal end of the flake correlates with the point of the arrowhead. Several invasive removals have been made across the proximal end of the flake to remove the bulb.

Fragmentary/unclassifiable arrowheads

Five fragmentary arrowheads were recovered, comprising three arrowhead tips, a medial fragment and a base or rounded tip fragment. The arrowhead fragments all appear to represent broken pieces of finished artefacts. Indeed, the broken tips and the medial fragment exhibited very fine retouch.

Laurel-leaf points

A single laurel-leaf point was found. This example, from midden 11160 (SF 23664), represented the broken butt end of a laurel leaf, exhibiting partially invasive retouch on both sides. It is not clear whether this artefact has been finished, as an area near the original bulb has not been retouched. This example appears to have been made transversely on a flake. A number of unfinished retouched pieces were noted as possibly being laurel leafs; these were invariably too broken or misshapen to be reliably categorised as anything other than miscellaneous retouch.

Scrapers

A total of 262 scrapers were identified; end scrapers were most common, but considerable numbers of side, and end and side scrapers were also found. Five scrapers were manufactured on thermally fractured flakes. A number of other scrapers were identified many of which were of horseshoe form.

Awls

Eight pieces with heavily retouched thick points were classifiable as awls. Many of these pieces exhibited heavy use-wear.

Piercers

A total of 24 pieces were classed as piercers. This category differs from the awls, on functional grounds, and because the point is finer, generally exhibiting only a slight retouch. Many of these pieces were made on plunging flakes with a distal point.

Spurred pieces and other borers

Five natural spurs were identified as having been used as piercers. These were generally on larger flakes than the piercers. One broken fragment was classified as an other borer.

Serrated flakes

Fifty-two serrated flakes were recorded from Area 6. The numbers of teeth per 10mm varied from six to twelve. Twenty-four of the serrated flakes were on blade or blade-like flakes. Sixteen of the serrated flakes exhibited edge gloss. This gloss is thought to derive from the cutting of silica rich plants (Juel-Jenson 1994). On the majority of these pieces the gloss was present on the ventral surface whist the serrations were on the dorsal surface.

Flakes with silica gloss

Twelve flakes and blades, including two retouched flakes, exhibited small areas of silica gloss on their edges (see serrated flakes above).

Saw

A single fragment was tentatively identified as a saw. The straight left-hand side of this piece exhibits abrupt retouch forming teeth; there are 7 teeth in

20mm. Approximately 20mm of the proximal right hand side is serrated.

Denticulates

Three denticulates were noted. These were made on flakes by the removal of two or three flakes along a side, leaving between two and four points. Although generally seen as Bronze Age, these pieces were found on the Neolithic land surface. It is possible that they were intrusive, along with the transverse and barbed and tanged arrowheads.

Notches

Thirty-nine notched pieces were recorded. The form of the notches was very variable. The size was generally between 5mm and 15mm. The notches were usually fairly shallow although a few were semicircular. It appeared that half of the notches had been utilised.

Knifes

Four backed knifes were identified and a further three pieces were classified as other knife forms. The backed knifes were generally made on large flakes, sometimes cortical or side trimming flakes, which were modified by abrupt retouch along one side to form the backing. The cutting edges of these knifes had variable degrees of retouch. Some were not retouched; others had only slight/abrupt or invasive retouch. Two of the other knifes were broken and would probably have been classified as backed knives if whole. The remaining 'other' knife is 'D' shaped in plan with invasive retouch over the entire dorsal surface. The bulb has been almost entirely removed by invasive retouch on the ventral surface. The retouch of the artefact has left the edges of the knife relatively blunt.

A single discoidal knife was identified. The piece was found in context 5753 (SF 37863), part of layer 11200 sealing the early Neolithic deposits. The retouch, although invasive, is quite crude. The knife was either intended for use in this condition or represents an unfinished form.

Retouched flakes

A total of 619 retouched flakes were recorded. The majority of these pieces had abrupt edge retouch along one or more sides. The retouch on these pieces falls into two main categories: firstly there are retouched pieces where the retouched edge is the utilised edge, and secondly there is retouch that backs an edge allowing the other sides to be utilised. It is, however, not necessarily easy to distinguish the two except through a detailed analysis of the use-wear patterns. This will be discussed in more detail later in the report.

Single-piece sickle fragments

Two possible fragments of single piece sickle and a third dubious fragment were identified in the assemblage. All three fragments are relatively small (maximum length 70mm).

All three artefacts have been manufactured on large flakes. The artefacts are triangular in section. Two of the fragments are triangular in plan, and the third appears to be a lunate form. The degree of retouch is variable on all three of the specimens. SF 36792 exhibits fully invasive retouch on the dorsal surface, whilst on the ventral surface, there is only a small area of invasive retouch. Another exhibits large invasive removals on the dorsal right hand side, and only a few removals on the ventral surface. The left-hand side exhibits no retouch, only quite heavy use-wear, and no sickle gloss was present. The third and smallest example (45mm long), 79097, has been fully invasively retouched on the ventral surface (flat) and had quite large invasive removals on both dorsal left and right hand sides.

None of the examples can be classified as a sickle with any degree of certainty, although the forms appear to be comparable with other early Neolithic specimens (Macgregor 1987, 81-83).

Fabricators

Only three fabricators were recovered from the entire assemblage, of which two were complete. All of the fabricators were manufactured on thick flakes. The fabricator from 11159 had crude invasive removals all round the dorsal edges, whereas the fragment from 11201 only had abrupt retouch at the distal end and along the right hand side. All had been heavily utilised, producing the distinctive rounded abrasion. One of the complete fabricators and the fragment exhibited wear at the very end of the artefact, whereas the other complete example was worn on the sides of each end.

Polished implement fragments

A total of 22 fragment of polished implements were recovered. Two of these fragments are axes, whilst the remaining 20 pieces are flakes removed from polished implements with a small area of the original polished surface remaining. The raw materials for the axes and possible sources have been discussed above. The two axe fragments are from different implements. The butt end of a polished axe was recovered from the topsoil in Area 6. This implement has had almost all of the flake scars removed through polishing. The axe may have broken at the position it was hafted. The cutting edge of a second axe was found in midden 11179. This finely polished axe had only a few slight unpolished scars. Both axes had several flakes removed and further attempted removals after breakage. The reuse of polished implements as cores after breakage is common in Neolithic assemblages.

Axes and other heavy implements/flakes from flaked implements (Plates 5.13-14)

Five implements and two flakes from implements are included under this broad heading. All differ considerably from one another. A Mesolithic tranchet axe was recovered from a post-medieval

Plate 5.13 Area 6, Neolithic core tools nos. 77 and 78

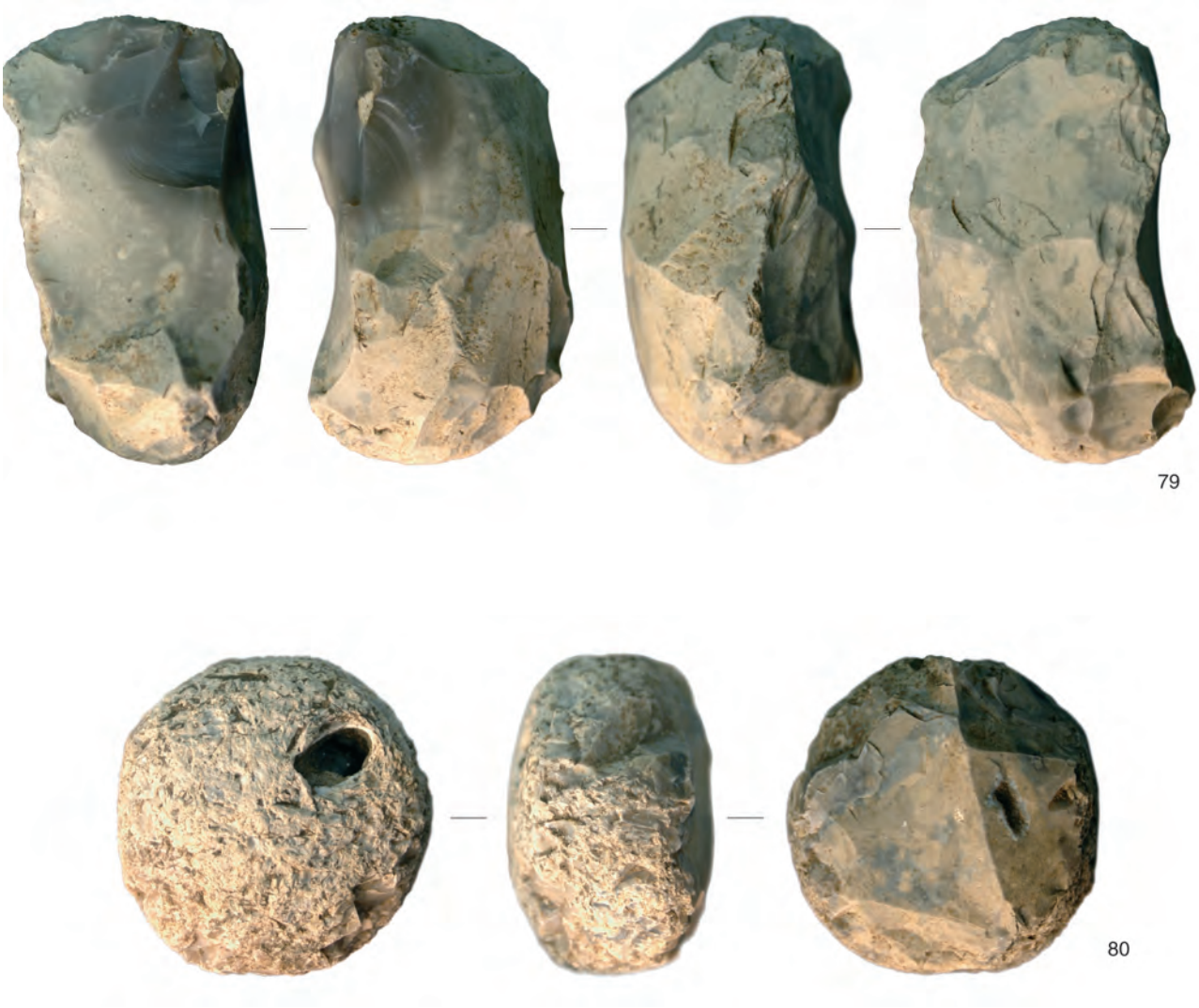


Plate 5.14 Area 6, Neolithic core tools and hammerstones nos. 79 and 80

context. This axe is relatively crudely manufactured from a nodule of gravel flint, leaving a considerable area of cortex on the sides and butt end. The axe is in good condition showing no evidence of rolling.
A very crude pick/adze was manufactured on a long nodule of gravel flint, with flakes removed from the cutting edge only.

A large, well made pick, manufactured from Bullhead flint, was found in the Neolithic land surface deposits in Trench 11428. There were large flake removals on each side of this piece, forming indentations for hafting, and a large flake was removed from the tip after utilisation, presumably to re-sharpen it, although this process was not completed.

A small and very heavily rolled axe like implement was recovered, the date of which is unclear, although its condition more closely resembles that of Mesolithic rather Neolithic flint from the site. One further axe was recovered the Neolithic land surface 11201. This had been extensively reworked as a flake core before being used as a hammerstone.

Two small flakes (SF 80609 and 26595) appeared initially to be axe sharpening flakes. However, the angle of the platform from which the flake was removed suggests that in both cases the axe must have been broken before the flake was struck. The flakes are therefore from the reduction of broken flaked axes.

Miscellaneous retouched pieces

A total of 35 flints are classified under this category. The majority of pieces are misshaped bifacial implements, which were either abandoned at an early stage of manufacture or were too broken or distorted to suggest a product with any degree of certainty. The majority of these pieces may be very distorted arrowheads, backed knifes or laurel leafs.

Truncated blades

Two truncated blades were identified, both had been snapped and the proximal end retouched.

Table 5.15 The flint assemblage from the midden deposits

	Midden in pit	*Middens in tree-throw holes*					*Middens in TTH's/ pit total*	*Surface middens*				*Surface middens total*	*Grand total*
CATEGORY TYPE	*11179*	*11301*	*11352*	*11420*	*11424*	*11427*		*11421*	*11422*	*11423*	*11426*		
Flake	78	249	604	819	903	245	2898	678	207	273	1491	2649	5547
Blade	17	21	110	129	158	30	465	97	63	41	179	380	845
Bladelet	2	5	15	46	16	9	93	22	12	4	32	70	163
Blade-like	13	28	43	130	103	28	345	122	34	24	125	305	650
Irregular waste	3	8	13	40	26	4	94	32	3	10	47	92	186
Chip	15	8	40	99	64	30	256	64	19	44	129	256	512
Sieved chips 10-4mm		23	37	137	125		322	29		27	171	227	549
Sieved chips 4-2mm		23	45	82	147	22	319	14		57	108	179	498
Sieved chips <1mm										51		51	51
Rejuvenation flake core face/edge			7	13	9	3	32	8		3	16	27	59
Rejuvenation flake tablet		1	1	7	3	1	13	13	3	1	7	24	37
Rejuvenation flake other				2			2		1		1	2	4
Janus flake (= thinning)										1	1	2	2
Thinning flake								2			1	3	3
Flake from ground implement				1	2	1	4				3	3	7
Core single platform blade core					1		1	1			1	2	3
Bipolar blade core								1				1	1
Other blade core								1				1	1
Tested nodule/bashed lump		8	7	16	17	7	55	18	2	11	32	63	118
Single platform flake core	1	2	2	4	7	2	18	6	1	2	13	22	40
Multiplatform flake core	1	3	2	9	13	4	32	4	4	4	26	38	70
Keeled non-discoidal flake core			1				1		1		1	2	3
Levallois/other discoidal flake core				2			2						2
Core on a flake		3		1		3	7				4	4	11
Unclassifiable/fragmentary core	1	6	7	6	3	1	24	8	6	3	16	33	57
Microlith									1			1	1
Leaf arrowhead			1	1			2		1	1	1	3	5
Laurel leaf											1	1	1
Unfinished arrowhead/blank			1	4	3		8	2			2	4	12
Fragmentary/unclass arrowhead											2	2	2
End scraper	2	4	1	1	7	2	17	2	1		8	11	28
Side scraper					2	1	3	3		1	1	5	8
End and side scraper	1					1	2				1	1	3
Scraper on a non-flake blank				1			1						1
Other scraper					2		2				5	5	7
Awl					1		1	1				1	2
Piercer			2	1	1		4	2			3	5	8
Spurred piece										1	1	2	2
Other borer								1				1	1
Serrated flake				2	2	4	8	1			11	12	20
Saw					1		1						1
Notch			2	1			3			1	1	2	5
Backed knife								1				1	1
Retouched flake	6	4	16	40	37	14	117	35	17	5	39	96	213
Reworked Polished axe frag.	1						1						1
Single-piece sickle					1		1						1
Misc. retouch	1	1		2			4		1	1	4	6	10
Hammerstone	1	1	1		2	1	6				1	1	7
Grand total	143	398	958	1596	1656	413	5164	1168	377	566	2485	4596	9760
Burnt unworked flint (g)	63	172	222	139	537	165	1298	197	653	267	308	1425	2723
Burnt no. (%) (exc. chips)	2	13	55	53	89	19	231	52	16	21	110	199	430
	(1.4)	(3.8)	(6.6)	(4.2)	(6.7)	(5.3)	(5.4)	(4.9)	(4.5)	(5.4)	(5.3)	(5.1)	(5.3)
Broken no. (%) (exc. chips)	47	111	321	554	494	125	1652	363	166	148	792	1469	3121
	(32.9)	(32.3)	(38.4)	(43.4)	(37.4)	(34.6)	(38.7)	(34.2)	(46.4)	(38.2)	(38.1)	(37.8)	(38.3)
Retouched no. (%) (exc. chips)	11	9	23	53	57	22	175	48	21	10	81	160	335
	(7.7)	(2.6)	(2.8)	(4.2)	(4.3)	(6.1)	(4.1)	(4.5)	(5.9)	(2.6)	(3.9)	(4.1)	(4.1)
No. flakes per core	37.7	14.2	41.7	31.2	29.8	18.9	28.2	25	23.1	17.9	20.5	21.4	24.5

Hammerstones

Thirty-two hammerstones were recovered from the excavation (Plate 5.14). Twenty of these were flint, ten quartzite, one of cherty greensand and one of tertiary ironstone (stone identifications by F Roe, see below). Nine of the hammerstones were broken and two burnt. In addition, 15 flakes struck from hammerstones were noted, the majority of which were accidentally struck during percussion rather than reworking. All of the complete hammerstones were weighed. The flint hammerstones weighed between 47g and 284g, with an average weight of 166g. The two hammerstones which had been most extensively used and exhibit pitting over the majority of their surface, weighed 207g and 276g. The quartzite and other hammerstones weighed between 110g and 827g. The two largest hammerstones, weighing 660g and 827g, have been excluded from the average weight as it is unclear if their surface damage resulted from flint knapping. The 660g stone showed a small area of battering yet had mainly been used as a rubber. The larger 827g hammer is probably inappropriate for flint knapping given the limited size of the raw materials available (the largest core only weighs 427g) and therefore the visible damage is likely to have originated from another use. The average weight of quartzite hammerstones is 245g, slightly higher on average than the flint hammerstones. This may reflect the use of different hammerstones during the reduction sequence. Heavy quartzite, or other hard stone hammers, may be used for the initial preparation, whilst slightly softer flint hammerstones may be used for finer, precise removals.

Burnt unworked

A total of 48kg of burnt unworked flint was retrieved from Area 6. Substantial quantities of the flint were recovered from the Neolithic deposits, both in association with the land surface and the middens. The burnt flint was not recovered in distinct concentrations, and as such represented a general spread across the middens and land surface. The role burnt flint served, be it industrial or domestic (as, for example, pot boilers) is unclear. Small quantities of burnt flint were also recovered from the majority of Bronze Age features, especially waterhole 5983 from which 3.3kg was recovered. The recovery of considerable quantities of burnt unworked flint, often in association with large numbers of struck flints, has been observed in many of the Bronze Age waterholes across the Rowing Course sites.

The early Neolithic assemblage

The early Neolithic flint assemblage from Area 6 was predominantly recovered from the hollow running east to west across the site, and originated from several distinct types of context (Tables 5.15-17). Considerable numbers of flints were recovered from the preserved land surface (11201), and small quantities from layers beneath and sealing this surface (11202 and 11200 respectively). Upon the land surface, middens were observed as distinct dark, charcoal and finds rich deposits; similar deposits were also observed in the fills of tree-throw holes cut from this level. Early Neolithic and early/mid Neolithic flint was recovered from 12 other features including seven additional tree-throw holes.

Technology

The early Neolithic flint assemblage possesses distinctive technological traits, some of which exhibit variability across the site. Technological traits were recorded as notes for the majority of the assemblage; detailed analysis was undertaken on samples from selected contexts to quantify the traits accurately. The features selected for detailed technological analysis were surface midden 11426 (context 11160), the midden deposit within tree-throw hole 11424 (context 11313) and three samples from the land surface (11201), spaced evenly across the deposit from west to east: 11059, 11159 and 11157. In addition, metrical traits were recorded for the samples from 11159 and 11313. The technological traits of the midden are tabulated in Tables 5.18-21 and represented as graphs in Figure 5.37.

Metrical analysis provided average length and breadth measurements of 32.3mm by 22.7mm in midden 11313 (tree-throw hole 11424) and 28.5mm by 19.7mm on land surface 11159 (part of 11201); therefore the length to breadth ratio is below 2:1 in both samples at 1.4:1 and 1.5:1 respectively. This tendency towards narrowness is indicative of earlier assemblages and supports the date suggested on typological grounds (Jacobi 1978; Ford 1987a). Blades (flakes with a length to breadth ratio of 2:1 or higher) represent 25.2% and 20.5% respectively for contexts 11159 and 11313. This proportion of blades is consistent with Ford's division for the early Neolithic (1987a, 79). Plots of the length to breadth measurements are shown in Figures 5.38-9.

The average size of the flakes recovered is relatively small. A number of factors could have influenced the size of the flakes in this assemblage. The primary cause, however, may be the raw materials, in particular the size of the nodules worked and their flaking qualities. The average thickness of 6mm in 11313 and 5.5mm in 11159 is high although not entirely surprising given the range of flake types in the assemblage.

The proportions of flake types present in the samples vary considerably, although they do not exhibit a clear distinction between the samples on the land surface and those in the middens. Preparation flakes form between 6.5 and 12.3% of the samples. Midden deposit 11160 contains the lowest proportion of preparation flakes, whereas midden deposit 11313 contains the highest, the proportions on the land surface being closer to the higher figure. Side trimming flakes represent an average 25.4% of the assemblage, the variations

Table 5.16 The flint assemblage recovered from the hollow deposits (excluding middens)

	Below land surface	*Land surface*	*Layer sealing land surface*	*Tr. through land surface*	*Cleaning reference over middens*	*Disturbed hollow deposits (western half of site)*	*Machining hollow deposits*	*Finds reference for disturbed material*	
Phase	*EN*	*EN*	*N*	*EN*	*EN + contam*	*EN + contam*	*EN + contam*	*N*	*Grand total*
CATEGORY TYPE	*11202*	*11201*	*11200*	*11428*	*5788*	*11425*	*11365*	*5750*	
Flake	153	3768	996	267	154	331	2	881	6552
Blade	38	532	171	49	36	30		146	1002
Bladelet	6	113	30	2	10	13		27	201
Blade-like	17	458	100	38	23	32		85	753
Irregular waste	5	102	23	10	2	11		16	169
Chip	10	334	135	12	43	18		141	693
Sieved chips 10-4mm		241	50						291
Sieved chips 4-2mm		75				28			103
Sieved chips <1mm		29							29
Burin spall		1							1
Rejuvenation flake core face/edge	1	26	14	5	4	5		3	58
Rejuvenation flake tablet		21	10	1	2	5	1	4	44
Rejuvenation flake other		3		1					4
Levallois flake							1		1
Janus flake (= thinning)		2					1		3
Thinning flake		4	2				1	1	8
Flake from ground implement		9					1	1	11
Core single platform blade core	1	7	1		2	1		4	16
Bipolar blade core		2							2
Other blade core		5	4		3	1	1	5	19
Tested nodule/bashed lump	9	76	33	15	7	22	1	7	170
Single platform flake core		50	11	1		4	11	5	82
Multiplatform flake core	4	91	40	17	9	10	27	21	219
Keeled non-discoidal flake core		1							1
Levallois/other discoidal flake core		1	1		1		1		4
Unclassifiable/fragmentary core	2	48	14	4	2	5	1	10	86
Core on a flake		12	12	5	2	2	4	4	41
Microlith	1	2	1		1	3			8
Chisel arrowhead							2		2
Barbed and tanged arrowhead							1		1
Leaf arrowhead	1	3	1					1	6
Unfinished arrowhead/blank		5					2	2	9
Fragmentary/unclass arrowhead		1			1			1	3
End scraper	1	12	7	4	1	3	2	3	33
Side scraper	2	8	5			3		3	21
End and side scraper	1	14	2	3	1			5	26
Scraper on a non-flake blank		3			1				4
Other scraper		10	1	2					13
Awl		2	1		1	1			5
Piercer		8		1		4			13
Spurred piece		3							3
Serrated flake		9	4	4		2		3	22
Denticulate	1	1	1						3
Notch		14	3	1		9		2	29
Backed knife		1	1						2
Discoidal knife			1						1
Other knife			1				1		2
Retouched flake	9	143	48	30	8	33	1	35	307
Single-piece sickle		1			1				2

Table 5.16 (continued)

	Below land surface	*Land surface*	*Layer sealing land surface*	*Tr. through land surface*	*Cleaning reference over middens*	*Disturbed hollow deposits (western half of site)*	*Machining hollow deposits*	*Finds reference for disturbed material*	
Phase	*EN*	*EN*	*N*	*EN*	*EN + contam*	*EN + contam*	*EN + contam*	*N*	*Grand*
CATEGORY TYPE	*11202*	*11201*	*11200*	*11428*	*5788*	*11425*	*11365*	*5750*	*total*
Fabricator		3							3
Other heavy implement		1		1				1	3
Misc retouch		12	3	1		2		6	24
Other		2							2
Hammerstone		11	3	1	1	1		1	18
Not Assessed (mainly flake material)	-	-	-	-	-	-	2278	-	2278
Grand total	262	6280	1730	475	316	579	2340	1424	13406
Burnt unworked flint (g)	1840	7951	0	2661	40	0	-	16	12508
Burnt no. (%) (exc. chips)	13	228	71	14	7	20	N/a	53	406
	(5.2)	(4.1)	(4.6)	(3)	(2.6)	(3.8)		(4.1)	(4.1)*
Broken no. (%) (exc. chips)	58	2034	553	107	93	157	N/a	499	3501
	(23)	(36.3)	(35.8)	(23.1)	(34.1)	(29.5)		(38.9)	(35.2)*
Retouched no. (%) (exc. chips)	16	258	80	47	15	60	N/a	62	538
	(6.3)	(4.6)	(5.2)	(10.2)	(5.5)	(11.3)		(4.8)	(5.4)*
No. flakes per core	13.8	17.2	11.6	8.9	8.9	9.5	N/a	51.9	38.6*

* = 11365 excluded due to collection method

again are most apparent in the midden deposits. In this case, 11313 contains 20% side trimming flakes whereas in 11160 they form almost 30% of the assemblage. Distal and miscellaneous trimming flakes form roughly similar proportions of each assemblage, with the exception of 11157 where more distal than miscellaneous flakes were present. The lowest proportions of these flakes were present in 11160 and 11159 followed by 11313. The highest proportion of non-cortical flakes was present in 11160 at 40.7%, although the figures for 11159, 11313 and 11157 are not significantly lower. On the other hand, only 28.8% of the flints examined from land surface 11059 (part of 11201) were non-cortical flakes. A clear distinction is not apparent between the midden deposits and the land surface deposits. However, if the proximity of land surface sample 11159 is considered, a slight fall in the proportion of non-cortical flakes can be observed to the east and west of the midden deposits. The variations in the flake types recovered from the middens may well represent the selection of certain flake types for use in specific tasks rather than representing different knapping activities.

The butts were classified into seven categories. Plain butts were most common, representing between 42.3% and 56.7% of the assemblage. The three samples from the land surface (11201) contained the highest proportions of cortical butt types (although 11313 had the highest number of cortical trimming flakes). Linear and punctiform butts form a significant proportion of the assemblages in both middens 11313 and 11160 and land surface 11159, whereas 11059 and 11157 contain significantly lower proportions of both categories. This pattern is similar to the flake types and probably represents the fall in the number of non-cortical flakes from the centre of the middens. Linear and punctiform butts are generally associated with blade industries (Tixier *et al.* 1980, 105).

Feather terminations were the most common termination type ranging between 51.9% and 65.2%. The lowest percentage of this type of termination was found on the land surface 11059, which also has the highest proportion of hinge terminations (19%) and step terminations (9%). This perhaps indicates a proportion of the well struck flakes have been removed from the assemblage. Plunging flake removals formed a significant part of the assemblages ranging between 7.8% and 16.6%.

The hammer mode was determined using the traits defined by Ohnuma and Bergman (1982). The proportions of each hammer mode identified varied considerably, and in a large number of cases proved impossible to determine (between 26.6% and 44.7% of the individual samples). In all the contexts analysed, except 11059, a higher proportion of soft hammer percussion was identified than hard hammer. Context 11059 contained only 1.3% more hard hammer struck flakes than

Table 5.17 The flint assemblages from other early Neolithic and early/middle Neolithic contexts

	Layer		*Natural hollow*	*Pit*		*Tree-throw hole*						*Other*	*Grand total*
Phase	*EN?*	*E/MN*	*EN?*	*EN*	*E/MN*	*EN*	*EN*	*EN?*	*EN*	*EN*	*EN*	*EN*	
CATEGORY TYPE Feature	*8013*	*8022*	*11078*	*11195*	*11041*	*11066*	*11071*	*11192*	*11237*	*11349*	*11350*	*11134*	
Flake	9	36	15	21	184	15	10	4	26	43	5	1	369
Blade	3	13	1	2	8	3	2	2	5	5	1	1	46
Bladelet		2	2		9				2				15
Blade-like		5	7	2	20	3	2		2	1			42
Irregular waste	1	1		1	5				1	1			10
Chip		3		2	32				1	3			41
Sieved material 10-4mm				48				4					52
Sieved material 4-2mm				68				17	83				168
Rejuvenation flake core face/edge			1		1			1	1				4
Rejuvenation flake tablet					1		2		1	2			6
Rejuvenation flake other					1								1
Thinning flake					2								2
Core single platform blade core					4	1							5
Bipolar blade core					1								1
Tested nodule/bashed lump	1			2	6		1			1			11
Single platform flake core					1	1							2
Multiplatform flake core		1		2	2		1		1				7
Microlith					3								3
Fragmentary/unclass arrowhead				1									1
End scraper		1	1										2
Side scraper								1					1
Other scraper				1									1
Notch			1		1								2
Other knife					1								1
Retouched flake	1	2	2	4	11				2				22
Other					1								1
Grand total	15	64	30	154	294	23	18	29	125	56	6	2	816
Burnt unworked flint (g)	0	1307	815	274	2797	14	3	2	361	15	0	0	5638
Burnt no. (%) (exc. chips)	0	5	0	3	44	2	1	0	4	0	0	0	59
		(8.2)		(8.3)	(16.8)	(8.7)	(5.6)		(9.8)				(10.6)
Broken no. (%) (exc. chips)	5	17	6	9	143	6	5	4	14	24	0	1	234
	(33.3)	(27.9)	(20)	(25)	(54.6)	(26.1)	(27.8)	(50)	(34.1)	(45.3)			(42.2)
Retouched no. (%) (exc. chips)	1	3	4	6	17	0	0	1	2	0	0	0	34
	(6.7)	(4.9)	(13.3)	(16.7)	(6.5)			(12.5)	(4.9)				(6.1)
No. flakes per core	13	57	-	6.5	16.5	10.5	8	-	38	52	0	0	19

soft. Similarly 11159 contained roughly equal proportions, but with 6% more soft than hard hammer. Both 11313 and 11157 contained a high proportion of unidentifiable pieces but also contained over twice as many soft hammer flakes as hard. Midden 11160 is very distinctly soft hammer, at 64.3%, whilst only 9% is hard hammer. All hammers recovered from the site were hard hammers mainly of quartzite and flint, although a cherty greensand and tertiary ironstone were also recovered. Numerous antler fragments were recovered from the site, but none bore evidence of use as a percussor.

The proportion of flakes with platform edge abrasion varies considerably across the site. Only 17.1% of the assemblage in 11059 and 22.7% of 11157 exhibited platform abrasion, whereas 33.9%, 30.5% and 26.6% respectively of 11313, 11159 and 11160 bore platform edge abrasion. The pattern of platform edge abrasion is similar to both the proportions of flake types present and hammer mode, and again relates to the distribution of non-cortical flakes. A total of 67.6% of flints exhibiting platform abrasion were struck with a soft hammer.

Spatial distribution of chips

Although the deposits were excavated by hand, relatively few chips were recovered from the excavation. However, 28 soil samples were sieved to 2mm, and a single sample was sieved to 1mm. Discussion of the spatial distribution of chips will refer only to the chips recovered from sieving.

Table 5.18 Proportions of flake type present in selected samples from the land surface and two midden deposits

			FLAKE TYPE							
Context group	*Context*	*Data*	*Preparation trimming*	*Side trimming*	*Distal trimming*	*Misc.*	*Non cortical*	*Rejuv-enation*	*Thinning flake*	*Grand total*
Land surface 11201	11059	No.	16	41	24	23	44	4		152
		%	10.5%	27.0%	15.8%	15.1%	28.9%	2.6%		100%
	11157	No.	12	36	24	14	53	1	1	141
		%	8.5%	25.5%	17.0%	9.9%	37.6%	0.7%	0.7%	100%
	11159	No.	17	38	16	16	59	4	1	151
		%	11.3%	25.2%	10.6%	10.6%	39.1%	2.6%	0.7%	100%
Surface midden 11426	11160	No.	13	59	20	18	81	8		199
		%	6.5%	29.6%	10.1%	9.0%	40.7%	4.0%		100%
Midden in TTH 11424	11313	No.	24	39	26	26	75	5		195
		%	12.3%	20.0%	13.3%	13.3%	38.5%	2.6%		100%
Grand total		82	213	110	97	312	22	2	838	
Total %		9.8%	25.4%	13.1%	11.6%	37.2%	2.6%	0.2%	100%	

Table 5.19 Proportions of butt types present in selected samples from the land surface and two midden deposits

			BUTT-CATEGORY							
Context group	*Context*	*Data*	*Cortical*	*Plain*	*>1 removal*	*Faceted*	*Linear*	*Punctiform*	*Other*	*Grand total*
Land surface 11201	11059	No.	22	85	14		9	12	10	152
		%	14.5%	55.9%	9.2%		5.9%	7.9%	6.6%	100%
	11157	No.	13	80	13	1	14	11	9	141
		%	9.2%	56.7%	9.2%	0.7%	9.9%	7.8%	6.4%	100%
	11159	No.	21	64	14		21	17	14	151
		%	13.9%	42.4%	9.3%		13.9%	11.3%	9.3%	100%
Surface midden 11426	11160	No.	17	103	27	1	28	9	14	199
		%	8.5%	51.8%	13.6%	0.5%	14.1%	4.5%	7.0%	100%
Midden in TTH 11424	11313	No.	12	91	31	1	24	20	16	195
		%	6.2%	46.7%	15.9%	0.5%	12.3%	10.3%	8.2%	100%
Grand total			423	99	3	96	69	63	838	
Total %			50.5%	11.8%	0.4%	11.5%	8.2%	7.5%	100%	

Table 5.20 Proportions of termination types present in selected samples from the land surface and two midden deposits

			TERMINATION					
Context group	*Context*	*Data*	*Hinge*	*Step*	*Plunging*	*Feather*	*Thick*	*Grand total*
Land surface 11201	11059	No.	29	14	12	79	18	152
		%	19.1%	9.2%	7.9%	52.0%	11.8%	100%
	11157	No.	19	5	15	92	10	141
		%	13.5%	3.5%	10.6%	65.2%	7.1%	100%
	11159	No.	20	2	25	88	16	151
		%	13.2%	1.3%	16.6%	58.3%	10.6%	100%
Surface midden 11426	11160	No.	27	11	18	129	14	199
		%	13.6%	5.5%	9.0%	64.8%	7.0%	100%
Midden in TTH 11424	11313	No.	31	8	23	123	10	195
		%	15.9%	4.1%	11.8%	63.1%	5.1%	100%
Grand total		126	40	93	511	68	838	
Total %		15.0%	4.8%	11.1%	61.0%	8.1%	100%	

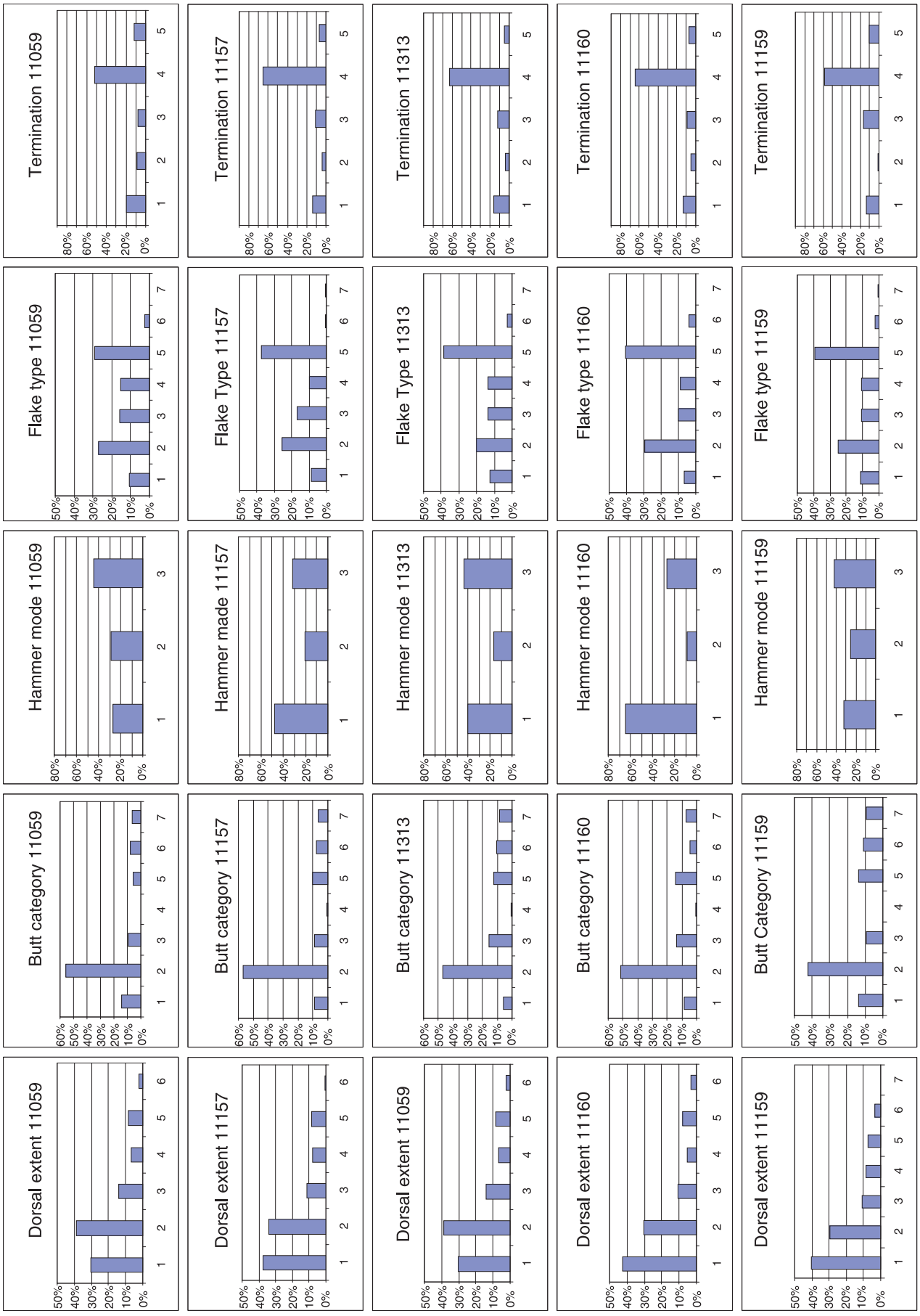


Fig. 5.37 Graphs of technological traits of struck flint from Area 6 (For explanation of categories see Appendix 2)

Table 5.21 Proportions of cortex present in selected samples from the land surface and two midden deposits

			DORSAL EXTENT (%)						
Context group	*Context*	*Data*	*0*	*1-25*	*26-50*	*51-75*	*76-99*	*100*	*Grand total*
Land surface 11201	11059	No.	46	59	21	10	13	3	152
		%	30.3%	38.8%	13.8%	6.6%	8.6%	2.0%	100%
	11157	No.	53	48	16	11	12	1	141
		%	37.6%	34.0%	11.3%	7.8%	8.5%	0.7%	100%
	11159	No.	61	45	16	13	11	5	151
		%	40.4%	29.8%	10.6%	8.6%	7.3%	3.3%	100%
Surface midden 11426	11160	No.	85	60	21	11	16	6	199
		%	42.7%	30.2%	10.6%	5.5%	8.0%	3.0%	100%
Midden in TTH 11424	11313	No.	81	62	22	9	19	2	195
		%	41.5%	31.8%	11.3%	4.6%	9.7%	1.0%	100%
Grand total		326	274	96	54	71	17	838	
Total %		38.9%	32.7%	11.5%	6.4%	8.5%	2.0%	100%	

The micro-debitage was sorted into 10-4mm and 4-2mm groups. Considerable variation is present in the distribution of micro-debitage across the site. To the west of the site no 10-4mm chips were present in the samples from the disturbed land surface. Within the central area of the middens the density increases, with by far the highest densities found in midden tree-throw hole fills 11313 and 11176 (11424 and 11420), whilst surface midden 11426 has a similar density (up to 123 10-4mm chips in a 30 litre sample). Interestingly, tree-throw hole midden fill 11194 (11427) contained no 10-4mm chips. High densities were also found in pit 11195 and fill 11238 (tree-throw hole 11237 to the west of the site). Where the layer beneath the land surface, layer 11202, was sampled, only low densities of chips were present, even within areas where high densities of chips were recorded in 11201. The 4-2mm chips show a similar pattern to the 10-4mm chips although many of the densities are lower than the 10-4mm chips.

The presence of the highest densities of chips in the middens, both those on the land surface and in tree-throw holes, is intriguing as in general there is more evidence of knapping on the land surface than within the middens. Therefore, the presumed origin of the chips from knapping has to be reconsidered, and it is possible that some of the chips are the product of use damage rather than knapping.

Core to flake ratios

The calculation of the core to flake ratio was undertaken using the combined sum of all cores, calculated by combining the total numbers of tested nodules, blade cores, flake cores and fragmentary cores to gain the total number of cores. The combined total of flakes, blades, blade-like flakes

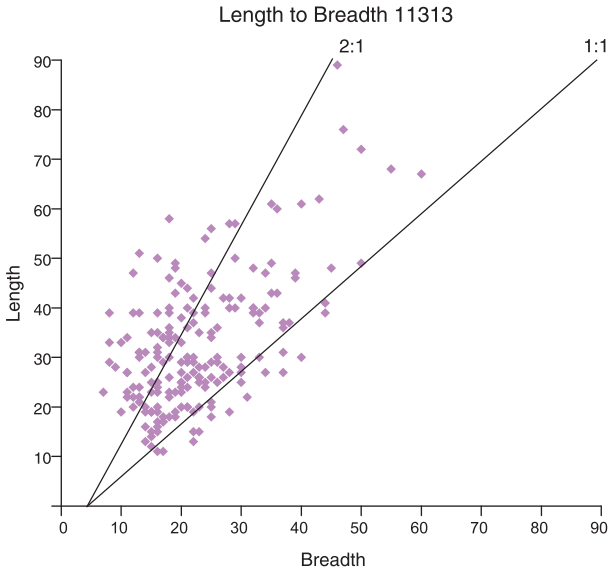


Fig. 5.38 Area 6: length to breadth plots (mm) for fill 11313, midden 11424

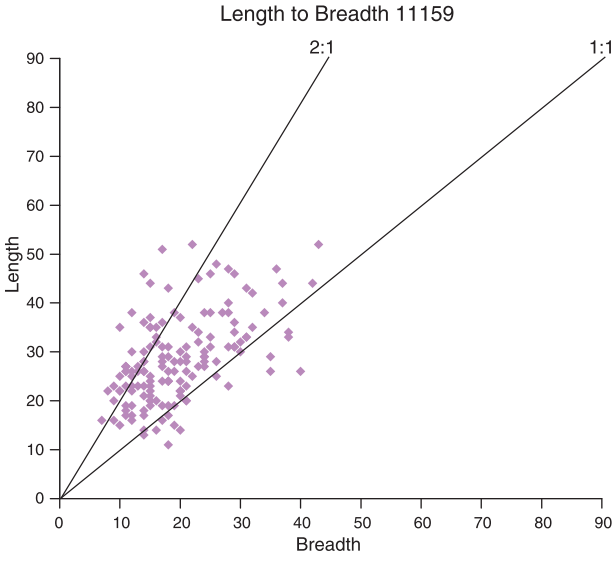


Fig. 5.39 Area 6: length to breadth plots (mm) for layer 11159, part of land surface 11201

and bladelets provides the flake total. The figures presented represent the number of flakes and blades per core.

The number of flakes per core in middens 11301 and 11352 was 14.2 and 41.7 respectively, averaging 24.5 flakes per core. On the land surface ratios of 10.1 to 21.5 flakes per core was recorded, averaging 17.2 flakes per core. This indicates a distinct separation between the midden deposits and those on the land surface. The low core to flake ratio on the land surface indicates a higher proportion of knapping debris than in the middens, or more likely the removals of flakes from knapping events on the land surface and their deposition in the middens.

Variations in proportions of burnt and broken worked pieces

The proportion of burnt pieces across site is relatively consistent. The middens in tree-throw holes and on the land surface vary between 3.8% and 6.7% burnt (average 5.3%); the midden deposit in pit 11179 contained only two burnt pieces (1.4%). The proportion of burnt flints on the land surface varies between 0.8% (11170) and 11.2% (11163), averaging 4.1%, slightly lower on average than the middens.

The proportions of broken material exhibit a similar pattern to the burnt material. The flint assemblages from middens vary between 32.9% and 46.7% broken, averaging 38.3%. The land surface is more variable, between 23.7% in 11170 and 48.3% in 11163, but the average is slightly lower than the middens at 36.3%. It is clear that the proportion of breakage often closely relates to the proportion of burnt pieces. The presence of higher proportions of burnt and broken material in the middens is significant and is probably associated with the domestic character of the deposits.

Refitting

A total of 2,029 flints was examined for refits, including midden deposit 11421 and samples from 11159 (part of land surface 11201) and fill 11313 (part of midden 11424). In addition, a few refits were identified during the initial assessment of the assemblage. The refitting exercise was largely unsuccessful. Only two flakes refitted to a core, and a number of related groups of flint were identified in 11421; no refits were found in 11159 or 11313. A small number of conjoins were also found.

In surface midden 11421 two flakes refitted to core 50048. These represent the final two removals from the core. Prior to the removal of these two flakes, the core had been producing relatively fine bladelets with platform edge abrasion, despite it being of only average quality gravel flint with a frost shattered platform. The face of the core had developed a few step fractures and the two refitting flakes were struck to remove this protrusion. However, the removal of the flakes revealed an internal fault in the flint that resulted in the rejection of the core. Intriguingly both flakes were used for soft cutting before their disposal, yet were still found within 28 cm of the core, although none of the bladelets struck from the core were found.

Two exceptionally large trimming flakes of a frost shattered gravel flint, with a combined weight of 433g, were found 1.28m apart on land surface 11170 (part of 11201). The larger flake 75617 exhibits the use damage of medium scraping on the right distal edge of the flake.

An end scraper and an end and side scraper (SF 73739 and SF 73914), were found 1.24m apart on land surface 11151 (part of 11201), refitted on a knapping break. These pieces had not only both been retouched, but had also been utilised for hard scraping.

Conjoins were made between six fragments, forming three compete flakes, two frost shattered fragments of a flake core and three pieces of irregular waste. In 11150 (part of land surface 11201) the fragments were only 0.11m apart, whereas in 11151 (part of land surface 11201) the pieces were 0.52m apart and in 5989 (part of land surface 11201) the fragments were 5.80m apart. Additionally the pieces of core from 11159 (part of land surface 11201) conjoining on a frost shatter were 0.41m apart. Three conjoining pieces from layer 8000 (part of 11425) were found within 0.18m of each other.

Few refits were identified indicating that no significant knapping scatters remain *in situ*. The presence of small numbers of knapping refits, many which have been utilised, on both land surface 11201 and in the midden deposits, allows several inferences to be draw. The lack of significant knapping sequences suggests that either the knapping was not performed in the locations examined or that the scatters have been dispersed. The fact that the refits were often utilised implies the pieces were kept together in both use and disposal, and that these refits may represent *in situ* activity or discard following use elsewhere. The presence of an exhausted core and the last two flake removals, both of which were utilised, could suggest that the period between production, use and disposal was relatively short. This may also be true of conjoining pieces. The distribution of broken conjoining pieces suggests some degree of disturbance to the land surface.

Use-wear analysis

This analysis aims to provide information on the depositional and post-depositional history of the assemblage, the extent and nature of the use of the lithics on site, and the spatial distribution of activities on site.

Sampling strategy

A total of seven samples were chosen to represent a cross section of early Neolithic context types and their spatial distribution on site. Three samples were taken at regular intervals along the land surface 11201 (west to east: 11059, 11159 and 11157). A further four samples were taken from the midden

deposits, two from surface midden dumps 11421 (context 5980) and 11426 (context 11160), and two from midden deposits contained within tree-throw holes 11424 (fill 11313) and 11420 (fill 11176).

Samples of 150 to 200 flints were chosen to provide statistically valid sample sizes (G Lock pers. comm.; with the exception of 5980). The samples were selected by choosing a random small find number and analysing the next consecutive 150 to 200 small finds from that context. All category types, in any condition, were analysed in order to determine the correlation of typology to use-wear. A small number of pieces could not be assessed due their degree of burning and breakage.

The original assessment of the use-wear was undertaken by Dr Andrew Brown on 317 straight-edged flakes from various contexts across the Area 6 and Area 10 middens. The sampling strategy does not allow direct comparison between these pieces and the final sampling blocks. However, where pieces from the assessment fell within the sample area, the results from the assessment were included. The use-wear of the remaining pieces outside the sample areas will be discussed only with respect to the relationship of use-wear to typology and technology. For this assessment, the entire assemblage of 348 flints from context 5980 (midden 11421) was examined. This context is included within the final samples as it represents a complete assemblage.

The use-wear samples considered the same pieces examined for technological and metrical analysis. The sample size does not precisely match since the technological and metrical analysis was only performed on complete flakes.

Condition

The condition of the lithic assemblage from the hollow is very good. Post-depositional edge damage was present on 6% to 20% of the pieces examined (excluding 5980). Most pieces (203) exhibited minor post-depositional edge damage consisting of large crescents on thin edges or dropnicks (Moss 1983), both of which may result from contact with other artefacts or a stony matrix in the ground. Nine flints were rolled and are considered to be residual; six of these flints were from 11157. The pattern of breakage was recorded in detail. A total of 508 breaks were recorded. However, only 12 of the broken edges had been utilised. It is apparent that the majority of broken edges were not utilised, and is possible that many of breaks occurred during use and, in many cases, may represent the reason for the disposal of the artefact.

Extent of use

In Area 6, an average of 56.6% of the assemblage was identified as having been utilised. This figure may be seen as a minimum number since the low magnifications used by low-power use-wear techniques may not identify brief periods of use on softer materials. This figure thus suggests that a large proportion of the flint assemblage has been utilised. If the flake material is considered alone, 61.2% of these pieces were utilised, and the total of 755 utilised flakes exhibit a total of 985 utilised edges, an average of 1.3 utilised edges per flint.
The percentage of utilised pieces per context falls between 48% and 64% of the assemblage (Table 5.22). Land surface 11059 contains the highest proportion of utilised flints by a clear 6%, whilst land surface 11157 contains the lowest proportion of utilised pieces. The middens contain between 51% and 58% of utilised flints.

Nature of use

The deposits in Area 6 contained a full range of activities, illustrated by a breakdown of use-wear by context sample (Fig. 5.40). The majority of use-wear falls within the medium category (48.6%), closely followed by soft activities which constitute 42.1%. A total of 9.3% of the utilised flints were used against hard materials. The dominant activity was cutting and whittling, forming over 75.2% of the actions. Scraping represented another 22.3% of the activities, whilst boring formed only 2.5% actions.

All actions were present in every context, except 11159 from which boring was absent. There was considerable variation between contexts in the proportions of actions and the hardness of the material worked. No boring actions were recorded in the sample from 11159, (although two borers and an awl found in the context were not included in the

Table 5.22 The use-wear samples by use damage identification

		UTILISED?			
Feature	*Context*	*Yes*	*No*	*Unass.*	*Grand total*
Land surface 11201	11059	104 (64.2%)	52 (32.1%)	6 (3.7%)	162
	11157	89 (48.1%)	83 (44.9%)	13 (7.0%)	185
	11159	97 (53.0%)	82 (44.8%)	4 (2.2%)	183
Surface midden 11421	5980	193 (55.5%)	150 (43.1%)	5 (1.4%)	348
Surface midden 11426	11160	90 (52.6%)	68 (39.8%)	13 (7.6%)	171
TTH midden 11420	11176	84 (50.9%)	76 (46.1%)	5 (3.0%)	165
TTH midden 11424	11313	98 (58.0%)	61 (36.1%)	10 (5.9%)	169
Grand total		755 (54.6%)	572 (41.4%)	56 (4.0%)	1383

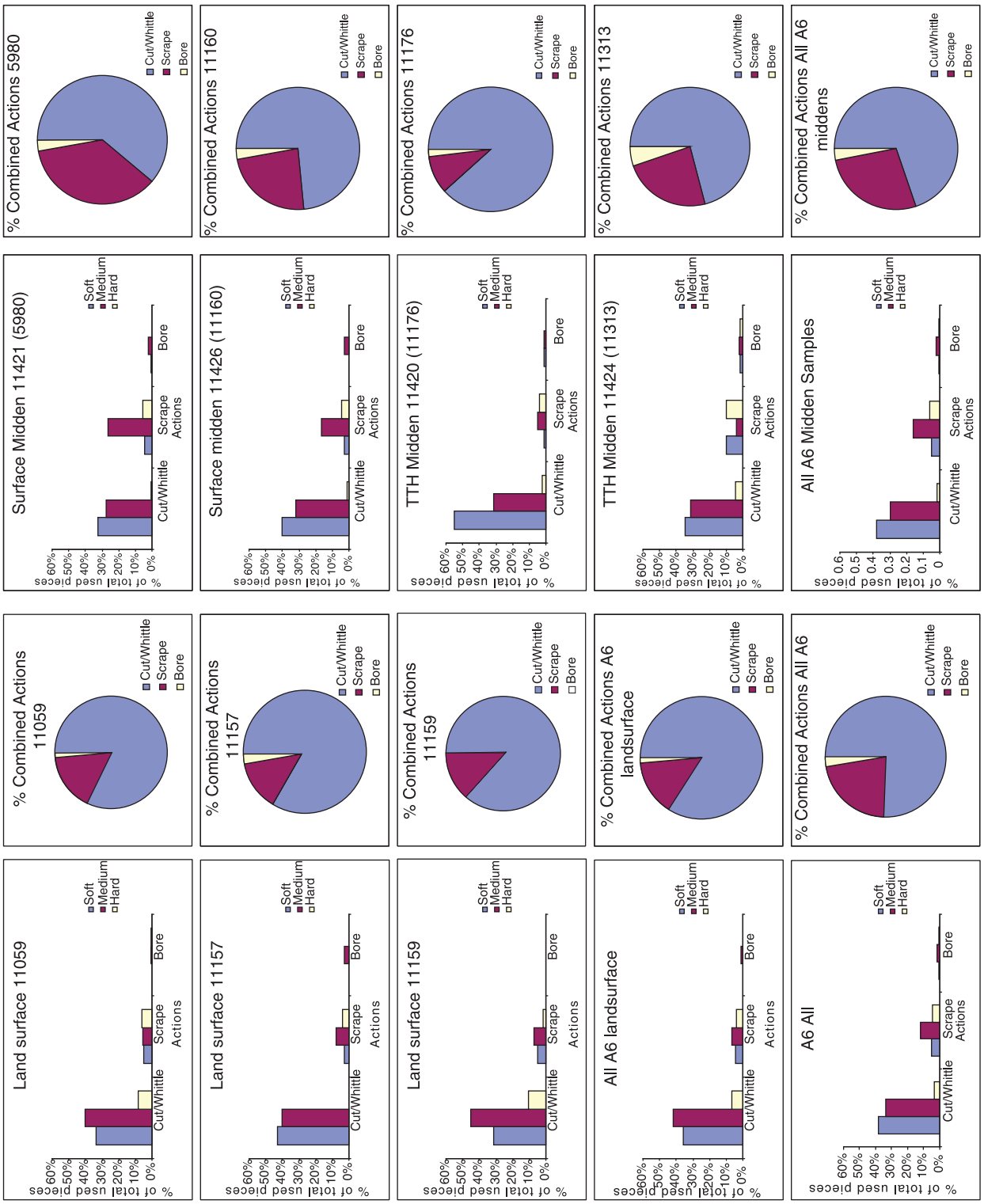


Fig. 5.40 Area 6: use-wear graphs

use-wear sample). Scraping actions are lower than average in context 11159, representing 13% of the actions; the dominant activity is cutting and whittling. This context contains the highest percentages of both hard and medium cutting and whittling (10% and 45% respectively), whilst also having a high proportion of soft cutting and whittling. 11059 is similar in composition to 11159. A high proportion of all cutting and whittling activities is again present, although a slightly higher proportion of scraping, particularly hard, is present along with two unretouched flakes used as borers. Midden deposit 11313, which was contained within a tree-throw hole, was notable for having over double the number of soft scraping, hard scraping and boring actions than the other samples analysed. However, a similar deposit in a tree-throw hole 11176 has a very different character, and is quite similar to land surface deposits. There are very few hard activities represented (5.5%). There were also few scraping actions (10%). However, cutting and whittling, particularly soft (55%) and medium (31%), predominate. This pattern of cutting and whittling is similar in 11160 and 11157, but mixed with a slightly higher proportion of scraping. Surface deposit 5980 has the higher proportion of medium scraping yet the lowest proportion of medium cutting and whittling.

It is clear that each context has its own distinctive traits. However, the samples on the land surface are more comparable with each other (and 11176) than the middens. Scraping is more prevalent in the midden deposits, particularly medium and hard scraping. Cutting and whittling forms 84% of the activities on the land surface, compared with 70% in the middens. Soft cutting and whittling are similar in each deposit, while the medium and hard activities predominate on the land surface deposits. A larger proportion of boring activities are present in the middens, although this may result from the restricted size of the sample. There is little variation in the hardness of the activities, with very slightly more softer activities present in the middens and slightly more harder activities present on the land surfaces.

A total of fourteen pieces of the use-wear sample (1.4%) exhibited silica gloss. Twelve were used for cutting and whittling and two for scraping. Seven of these pieces were used against medium hard materials, five against soft and three against hard materials. The pieces were mainly unretouched flakes and blades. However, two of the flints were serrated flakes. In the majority of cases the gloss was on the ventral surface with use-wear removals on the dorsal surface indicating a whittling action. Nine of the glossed flakes were from land surface sample 11159, representing 7% of utilised flints examined from the context. 11159 has the highest proportion of medium cutting and whittling which therefore may derive from the cutting and whittling of silica rich plants (Juel Jensen 1994, 62-63).

The presence or absence of use-wear from the combined samples analysed is shown against category type in Table 5.23. The pattern of utilised pieces suggests there is a genuine distinction in the flake material between flakes, blades and blade-like flakes. Approximately 80% of the blades and blade-like flakes were utilised, whilst 68% of bladelets were used, yet only 53% of the flakes were used. This clearly shows deliberate selection for use of narrow and straight blades rather than flakes. Few cores bore evidence of use, although appropriate edges were used on occasion, sometimes for relatively heavy duty activities. A large proportion (82.5%) of the retouched artefacts were clearly used. However, use damage was not visible on several of the tools, although this may be a reflection of the high edge angles being less susceptible to use damage.

Conclusions and spatial patterning

The interpretation of the use-wear data is fraught with difficulties. To analyse the data it is necessary to understand the formation of the deposit. It is far from clear if deposition occurred as a single event, or due to prolonged or seasonal habitation. Therefore, contemporaneity of deposits cannot be assumed, limiting the value of any spatial distribution. Furthermore, the condition of the pottery indicates that the midden deposits may not represent primary refuse, introducing problems of mixing and reuse. Therefore, the discussion will be kept broad, highlighting data that will assist in defining the general character of the deposit.

Both the midden deposits and the deposits on the land surface share several distinctive characteristics. The proportion of utilised pieces is exceptionally high (between 48% and 64%) and the samples all exhibit a broad range of actions and hardness of contact materials. However, the assemblage is dominated by cutting and whittling actions against soft and medium hard materials. A couple of context specific variations were observed, such as the significant proportion of scraping actions identified in midden 11352 (11313), suggesting tools used for hide preparation form part of the assemblage. Equally, in the land surface sample 11159 the dominance of cutting and whittling actions, including a number with silica gloss, perhaps indicates increased working of plants, particularly silica rich plants, in this area.

Conclusions

The early Neolithic deposits were concentrated within the hollow; only a few groups of earlier Neolithic flint were found in tree-throw holes outside the main scatter. Indeed, only a very low-density background scatter was present south of the hollow. The flint assemblage was principally recovered from surface midden deposits, similar midden deposits contained within tree-throw holes (and a pit) and deposits on the surrounding land surface. The flint assemblages showed some variation from

Table 5.23 All flint analysed for use-wear by presence of use damage and category

	UTILISED?			
Feature	*Yes*	*No*	*Unass.*	*Grand total*
Flake	476 (53.3%)	376 (42.1%)	41 (4.6%)	893
Blade	89 (80.9%)	20 (18.2%)	1 (0.9%)	110
Bladelet	17 (68.0%)	8 (32.0%)		25
Blade-like	94 (78.3%)	24 (20.0%)	2 (1.7%)	120
Irregular waste	7 (24.1%)	20 (69.0%)	2 (6.9%)	29
Chip	5 (7.7%)	57 (87.7%)	3 (4.6%)	65
Rejuvenation flake core face/edge	6 (46.2%)	6 (46.2%)	1 (7.7%)	13
Rejuvenation flake tablet	7			7
Janus flake (= thinning)	1			1
Thinning flake	2	1		3
Flakes: subtotal	704 (55.6%)	512 (40.4%)	50 (4%)	1266
Core single platform blade core		1		1
Other blade core		1		1
Tested nodule/bashed lump	1	18	2	21
Single platform flake core	1	12		13
Multiplatform flake core		8		8
Keeled non-discoidal flake core		1		1
Levallois/other discoidal flake core		1		1
Core on a flake		2		2
Unclassifiable/fragmentary core	2	10		12
Cores: subtotal	4 (6.7%)	54 (90%)	2 (3.3%)	60
Unfinished arrowhead/blank	1			1
Fragmentary/unclass/other arrowhead			1	1
End scraper	6			6
Side scraper	3			3
Scraper on a non-flake blank		1		1
Other scraper	3			3
Spurred piece	1		1	2
Serrated flake	4			4
Denticulate	1			1
Notch	1	1	1	3
Retouched flake	26	3	1	30
Misc. retouch	1	1		2
Retouched: subtotal	47 (82.5%)	6 (10.5%)	4 (7%)	57
Grand total	755 (54.6%)	572 (41.4%)	56 (4.0%)	1383

deposit to deposit, but in general the deposits were relatively uniform in character and will be grouped accordingly. Consideration will be paid to individual deposits where appropriate.

The discussion of these deposits will concentrate on typological and technological variations between the deposits. It is, however, worth considering the condition of the flintwork. The proportion of burnt flints in the assemblage is comparatively high at 4.8%. However, the levels are higher in the tree-throw hole and surface midden deposits at 5.4% and 5.1% respectively than on the land surface (4.1%). The proportion of broken flints in the early Neolithic deposits is relatively high overall at 36.7%, but differs only very slightly between the middens and the land surface.

Typology

The composition of the flint assemblage is shown in Tables 5.13-17. The flint assemblages show no significant variation to indicate distinguishable chronological periods. However, variations are present which may reflect patterns of deposition or the location of specific activities. The variations observed are often relatively slight and it is possible that there is little difference between the

flint assemblage in the midden deposits and the surrounding scatter. Indeed, it is possible that the material in the middens was originally deposited on the land surface. It is therefore likely that typological and technological variation will be most apparent between early Neolithic deposits on a wider spatial scale.

The retouched component identified in the assemblage was very varied. However, the retouched assemblage (excluding simple edge retouched flakes) was not dominated by any particular tool category, such as scrapers, serrated flakes, or laurel leaves, as has been observed on other sites.

It is clear that not only did many finished tools come to be deposited in Area 6, but that the debitage from manufacture was also present. Evidence was identified for leaf arrowhead and scraper manufacture. Most of the unfinished leaf arrowheads were recovered from five of the middens (proportionally twice as many as on the land surface). Evidence of scraper manufacture (and use and disposal) was found on the land surface (square 11159). There is very slight evidence for the production or possibly finishing of axes, namely a small group of thinning flakes and an axe polisher (see Roe, below).

Variation in the distribution of scraper types was observed. Twice as many end scrapers were recovered from the middens as from the land surface, whereas 14 of 17 end and side scrapers that were recovered were found on the land surface. The significance of this observation is unclear, although it possibly reflects selected deposition or a division of activities that utilised different scraper types.

Technology

Technological analysis revealed that the early Neolithic flintwork from Area 6 is typical of assemblage of this period. The average flake dimensions fall short of a 2:1 length to breadth ratio although the proportion of blades falls into Ford's early Neolithic division (1987a, 79). The intended product of a narrow blade-like flake is clear from the platform preparation and rejuvenation of cores. Unfortunately, no long refitting sequences could be reconstructed to provide examples of the reduction sequence.

The variations present between samples subject to detailed technological analysis failed to formed a coherent pattern, but it is possible that a general pattern across the site may be observed. The flake to core ratio on the land surface was distinctly lower than that of the middens. In addition, the land surface samples 11059 and 11157 to the west and east of the main area of the middens appear to be deficient in soft hammer, platform abraded flakes and blades, whilst these pieces are generally in surplus in the middens. This perhaps illustrates the movement of usable flakes and blades from the land surface (possibly where they are produced), to the middens where they were deposited after use. Perhaps contrary to the previous statement, the middens contain higher proportions of cortical trimming flakes than the land surface.

Low power use-wear

The proportions of use identified on Area 6 are exceptionally high, varying between 48% and 64% of the assemblages. The range of use actions is relatively broad, and all of the contexts analysed bear some similarity. Indeed, given the concept of middening, it would be exceptionally improbable that any single specific task would be solely represented in any deposit. However, some of the deposits analysed contain evidence of slightly more distinctive tasks, such as the presence of numerous flints used for soft and hard scraping in context 11313 (midden 11352), which probably reflects hide scraping, or the dominance of cutting and whittling, and the presence of several flints with silica gloss in square 11159 (land surface 11201) probably derived from processing silica rich plants. It is possible that the task identified on the land surface in square 11159 is represented *in situ*. However, given the limited windows the 4m squares provide into the site it is not possible to suggest any spatial patterning of activities. Although some patterns were probable present, the material in the midden deposits is likely to have been deposited from another location.

Conclusions

In conclusion, the flint assemblage indicates that a large number and wide variety of activities were performed on or near to this location. The identification of specific activity areas was hampered by the depositional history of the material. The flintwork, although not in poor condition, was clearly subject to some movement, redeposition or reworking prior to reaching its final location. The origin of the flintwork can be described as 'domestic', as judged though the proportion and variety of retouched artefacts, although it is perhaps more significant to consider the overall artefactual composition of an assemblage than a single element. The classification as domestic does not, however, assist greatly in interpreting the deposits. The 'settlement' activity may have varied greatly, in both scale and permanence. As such, the assemblage may have been formed by a small group returning to a location intermittently or seasonally over hundreds of years or alternatively derive from a single event carried out by a larger group.

Catalogue of illustrated struck flint (Figs 5.41-46)

Neolithic

Flakes and cores

1 Land surface 11201, context 11151. SF 78237 and 75617. Refit group 57. Two large trimming flakes, these were found 1.28m apart. Combined weight 433g.

2 Finds reference 5750. SF 36083. Flake, broken, scratches in cortex.

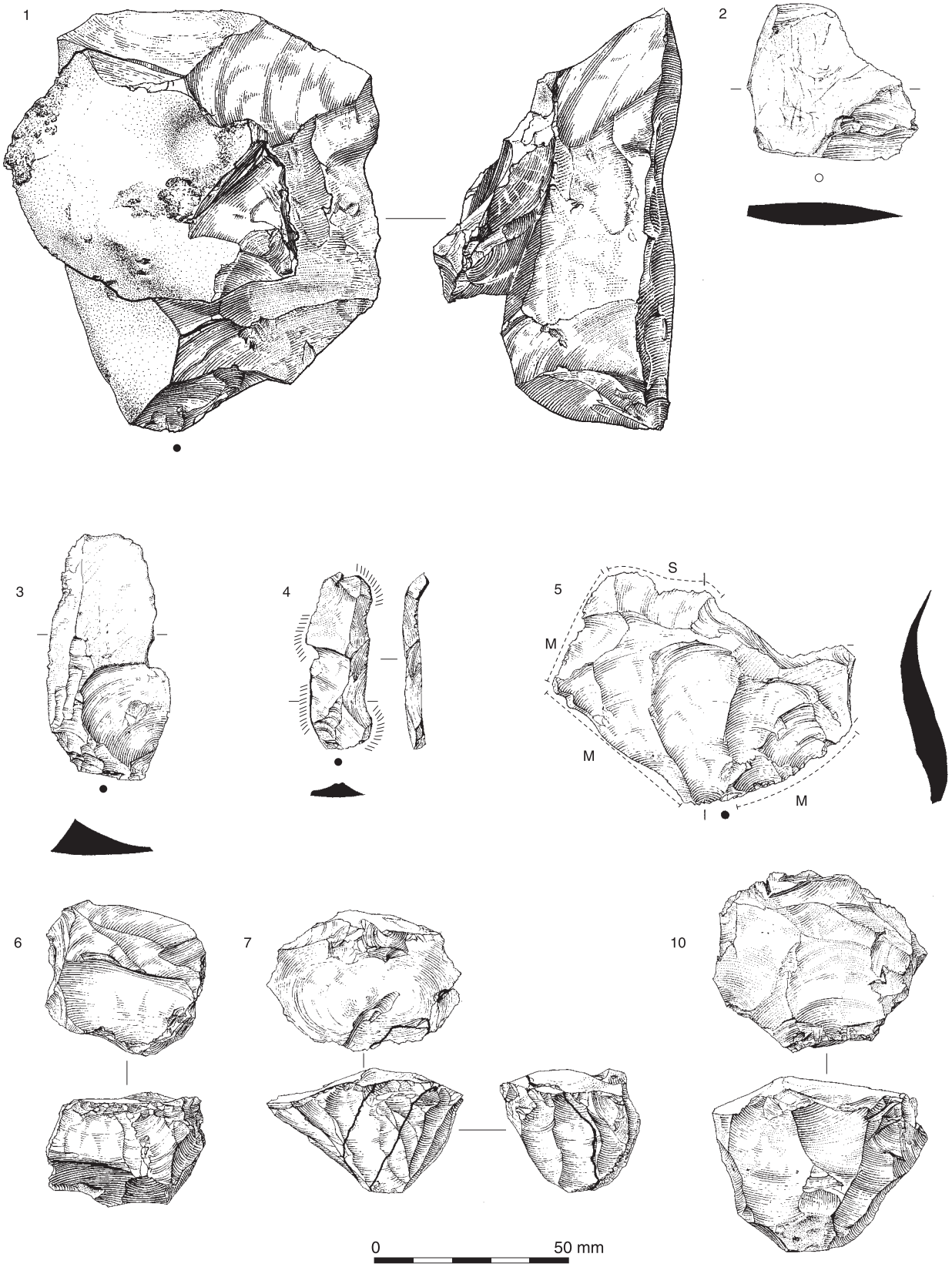


Fig. 5.41 Area 6: flakes and cores etc, nos 1-7 and 10

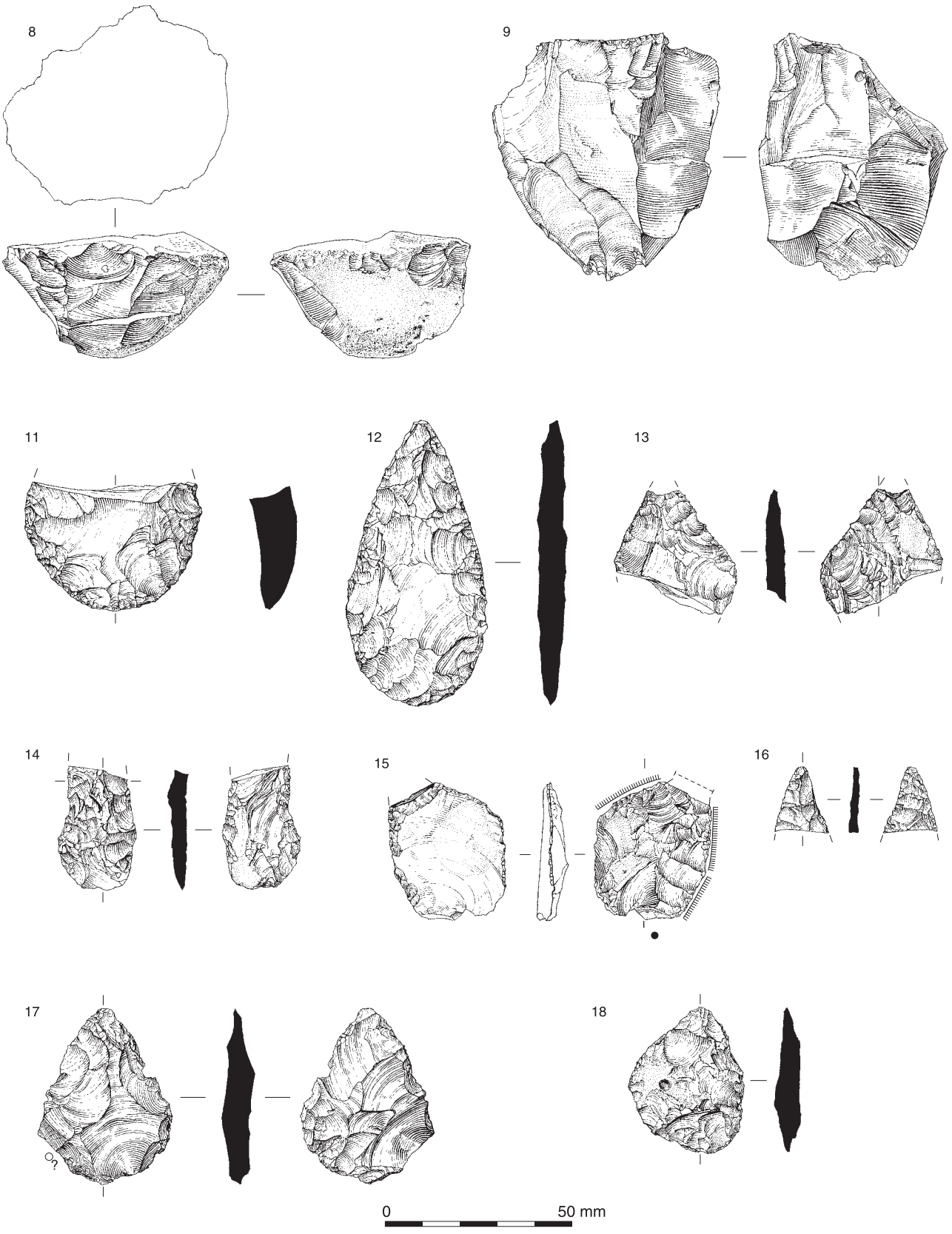


Fig. 5.42 Area 6: Neolithic cores, laurel leaf and leaf-shaped arrowheads, nos 8-9 and 11-18

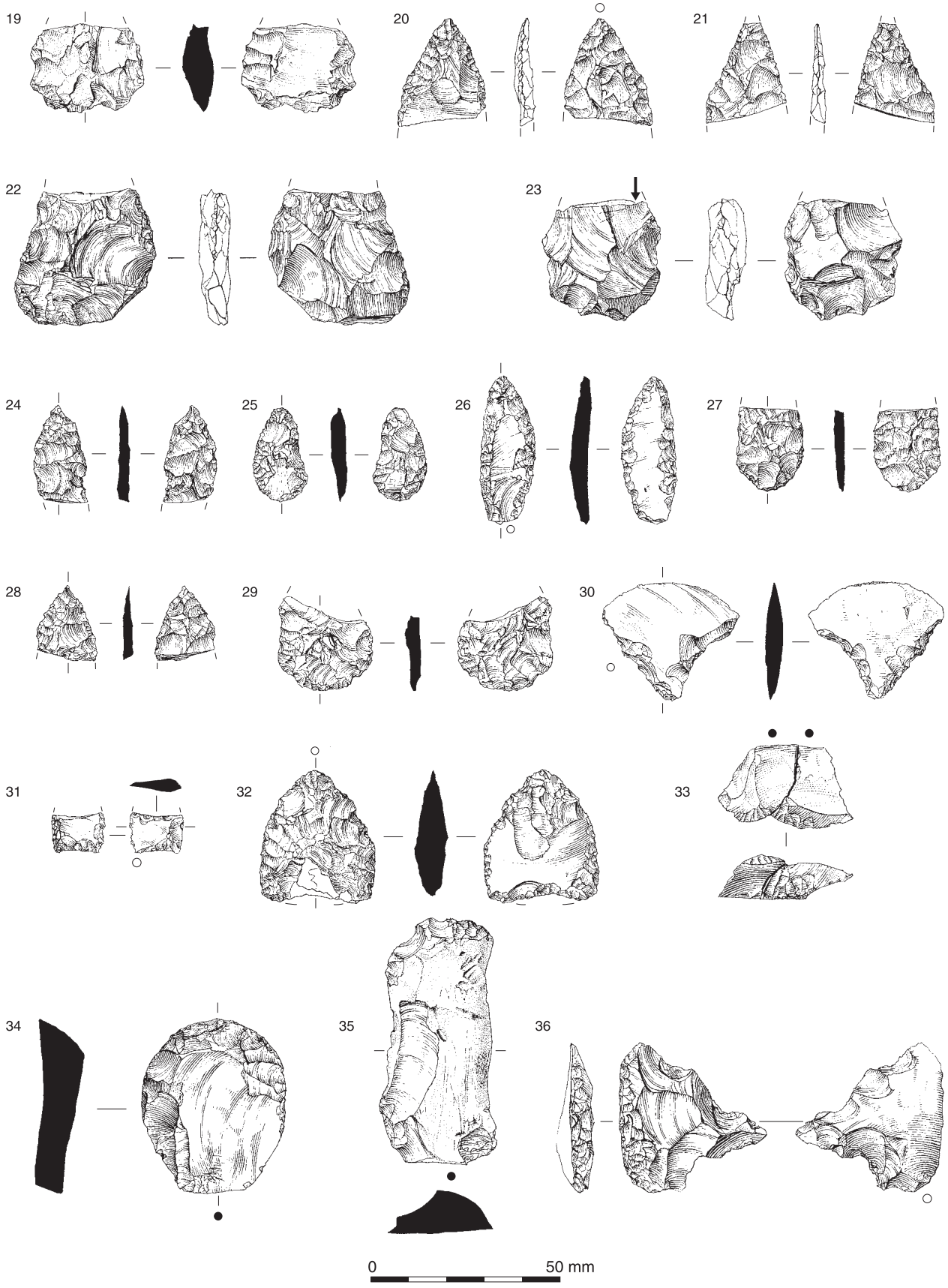


Fig. 5.43 Area 6: Neolithic arrowheads and scrapers, nos 19-36

3 Finds reference 11365 (hollow). Co-ordinate 3502.5 S. Distal trimming flake, scratches in cortex from several directions.
4 Midden 11424, fill 11313. SF 82632. Blade, left hand side, right hand side and distal rounded and striated through use.
5 Midden 11421, context 5980. SF 22019. Axe thinning flake.
6 Land surface 11201, context 11165. SF 70724. Single platform flake core.
7 Midden 11421, context 5980. Refit group 40. Flakes SF 50045 and 22362 refit to core 50048. Combined weight 57g. All three flints were found within 0.28m.
8 Midden 11424, fill 11313. SF 82854. Single platform flake core, cortical platform, no platform abrasion. Weight 99g.
9 Layer sealing land surface 11200, SF 76615. Multi-platform flake core. Weight 165g.
10 Layer sealing land surface 11200. SF 73678. Multi-platform flake core. Weight 119g.

Laurel leaf

11 Midden 11426, context 5986. SF 23664. Laurel leaf, fragment of butt.

Leaf arrowhead and unfinished leaf arrowheads

12 Land surface 11201, context 11157. SF 81697. Leaf arrowhead.
13 Finds reference 5750. Leaf arrowhead, medial fragment.
14 Midden 11426, context 5986. SF 49684. Unfinished leaf arrowhead, fragmentary – broken during knapping.
15 Midden 11421, context 5980. SF 22119. Unfinished arrowhead.
16 Midden 11424, fill 11313. SF 85182. Unfinished arrowhead, fragmentary tip.
17 Land surface 11201, context 11170. SF 78007. Unfinished leaf arrowhead or laurel leaf?
18 Midden 11420, context 11176. SF 79765. Unfinished leaf arrowhead
19 Midden 11424, fill 11313. SF 82849. Unfinished leaf arrowhead.
20 Finds reference 5750. SF 36315. Unfinished arrowhead, fragmentary tip.
21 Midden 11426, context 11160. SF 75651. Unfinished leaf? arrowhead, fragmentary tip.
22 Midden 11426, context 5986. SF 26882. Unfinished leaf arrowhead, fragmentary.
23 Midden 11420, context 8200. Soil sample 1046 >10mm. Unfinished arrowhead? Or discoidal core.
24 Finds reference 5750. SF 36290. Unfinished leaf arrowhead, fragment of tip.
25 Midden 11424, fill 11187. SF 76514. Unfinished lead arrowhead.
26 Midden 11421, context 5980. SF 39969. Unfinished leaf arrowhead.
27 Land surface 11201, context 5987. SF 49363. Unfinished leaf arrowhead, fragment of butt end.
28 Midden 11420, context 11176. SF 77843. Unfinished leaf arrowhead, fragmentary.
29 Land surface 11201, context 5831. SF 38698. Unfinished leaf arrowhead, tip broken

Transverse arrowheads

30 Finds reference 11365 (hollow), co-ordinate 3458.5 S. SF 36793. Chisel arrowhead, similar to Clark's type D.
31 Topsoil 11000. Oblique arrowhead, fragmentary. Orange flint.

Unfinished ?barbed and tanged arrowhead (Bronze Age)

32 Unstratified. SF 33065. Unfinished arrowhead – ?barbed and tanged. The dorsal surface exhibits fully invasive retouch from a small platform on the ventral surface. The shape of the arrowhead has been defined, and retouch on the proximal end has removed the bulb and formed the point of the arrowhead. A small area of modern damage to the distal end is present giving the false appearance of a hollow base (these scars are left unshaded).

Scrapers

33 Land surface 11201, context 11151, Refit group 56. Knapping refit between two flakes manufactured into scrapers, SF 73739 and end scraper and SF 73914 an end and side scraper. These flints were found 1.24m apart.
34 Land surface 11201, context 11159. SF 78617. End scraper.
35 Land surface 11201, context 8187. SF 50393. End scraper with parallel lines scratched in the cortex.
36 Finds reference 5750. SF 39563. Side scraper on left hand side, the right hand side has been heavily retouched to form a thick point.

Awls and piercers

37 Layer sealing land surface 11200, context 11152. SF 71232. Awl.
38 Midden 11424, fill 11313. SF 84651. Awl.
39 Land surface 11201, context 11151. SF 70571. Piercer.
40 Midden 11424, fill 11313. SF 85207. Piercer.
41 Land surface 11201, context 5831. SF 38597. Piercer.

Serrated flake, saw and denticulates

42 Midden 11426, context 11160. SF 71205. Serrated flake, silica gloss on the ventral surface on the left and right hand side of the flake, also retouched as an end scraper.
43 Midden 11424, fill 11313. SF 84997. Saw, left hand side exhibits rough retouch, leaving regular points every 2-3mm, a slight serration is present on the right hand side proximal edge.
44 Layer sealing land surface 11200. SF 70055. Denticulate also with abrupt distal retouch.
45 Land surface 11201, context 11059. SF 70857. Denticulate.

Knives

46 Midden 11421, context 5980. SF 22167. Backed knife, bifacial retouch blunting the right hand side, slight retouch and utilisation on left hand side.
47 Layer sealing hollow 11200, context 11309. SF 82072. Backed knife, heavy use on left hand side, right hand side abruptly retouched.
48 Layer sealing hollow 11200, context 11249. SF 78688. Other knife.
49 Layer sealing hollow 11200, context 5753. SF 37863 Unfinished discoidal knife or discoidal core.

Single piece sickles?

50 Midden 11424, fill 11187. SF 79097. Single-piece sickle? Broken.

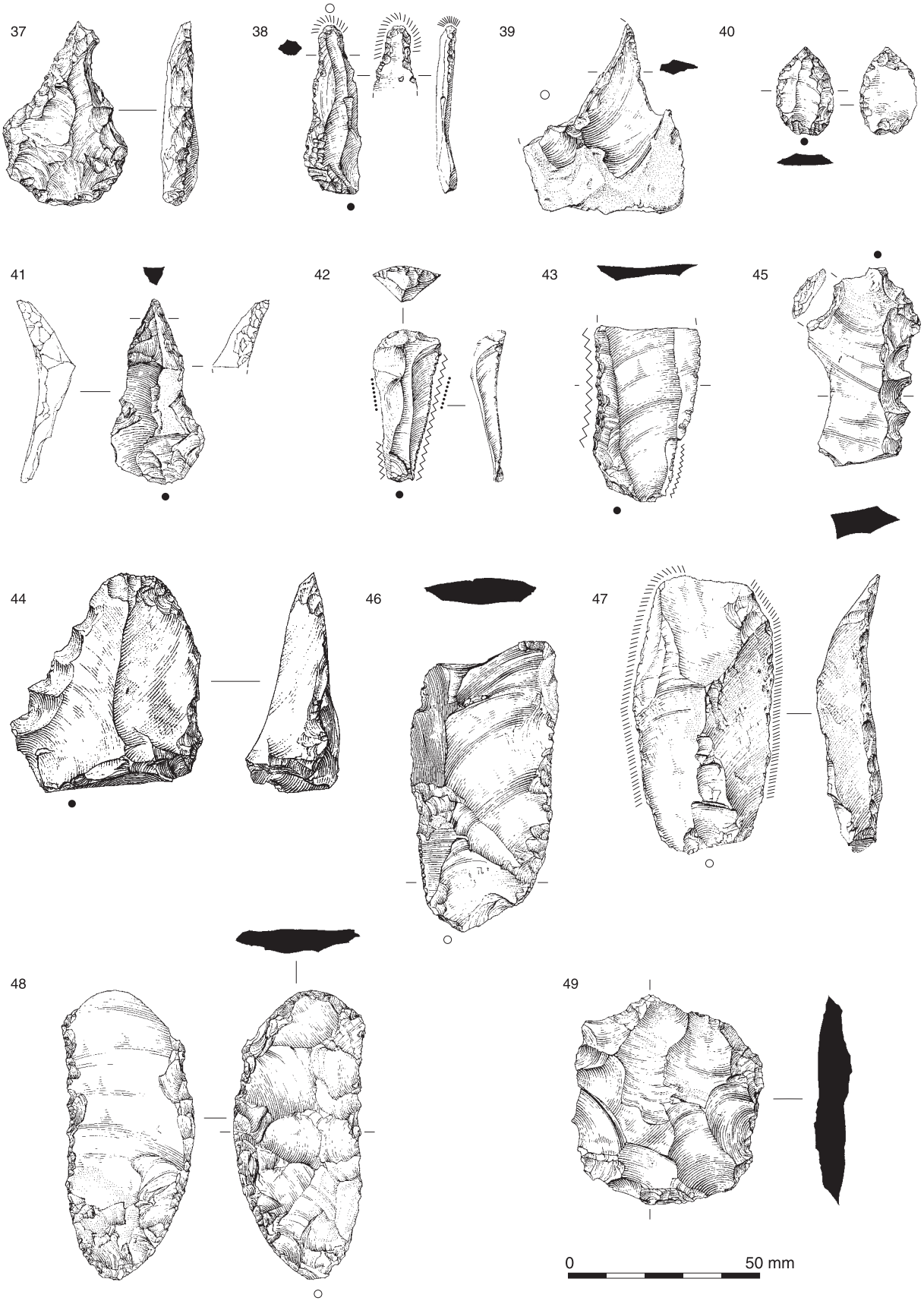


Fig. 5.44 Area 6: awls, piercers, serrated flakes, saws, denticulates and knives, nos 37-49

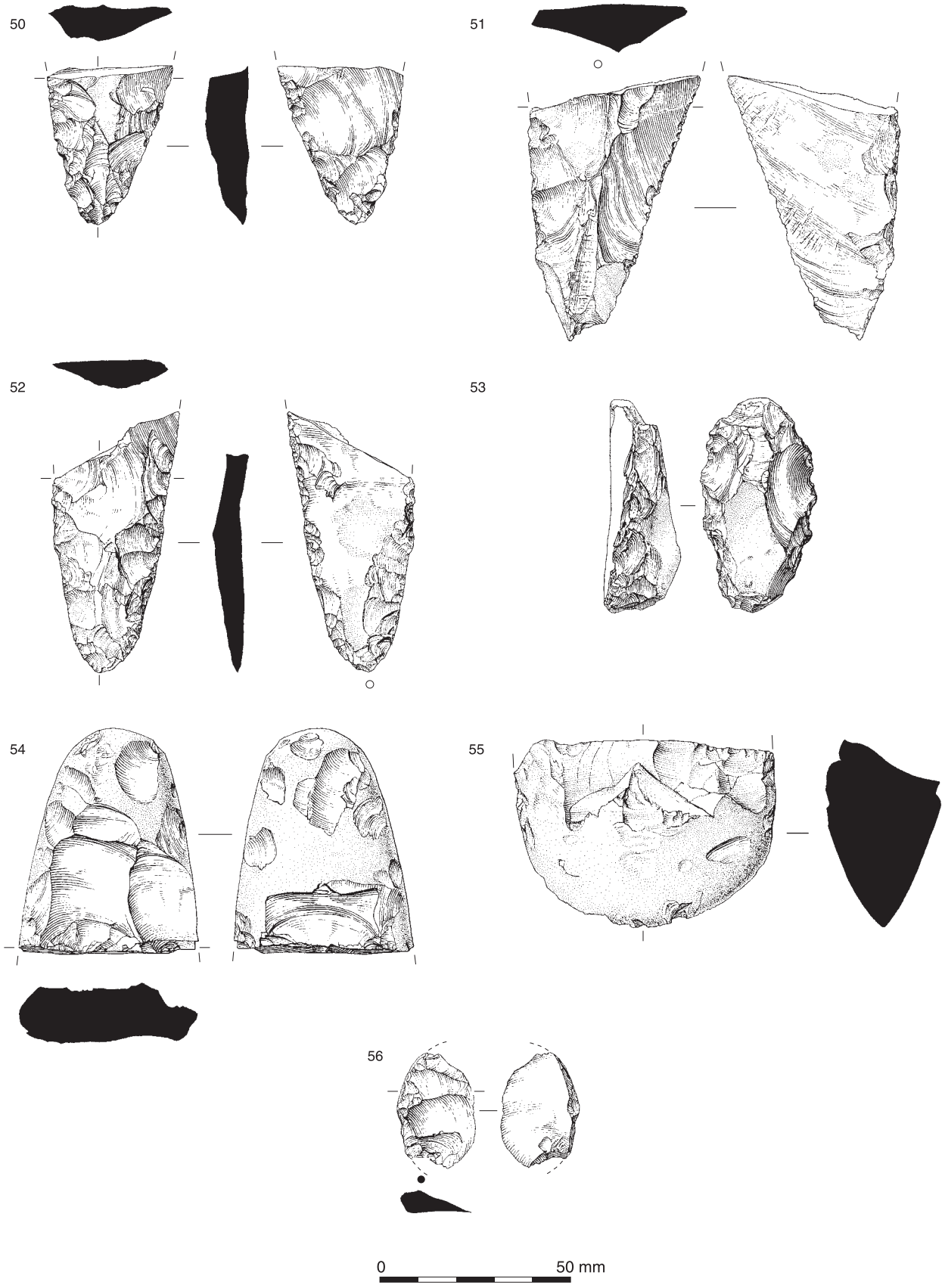


Fig. 5.45 Area 6: single piece sickles, fabricator and axes, nos 50-56

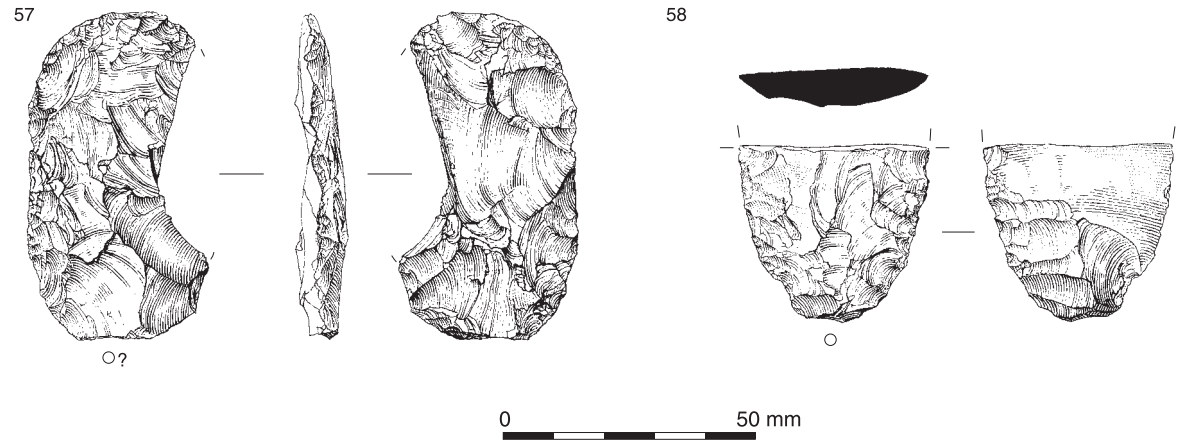


Fig. 5.46 Area 6: miscellaneous retouch, nos 57-8

51 Land surface 11201, context 5989. SF 26053. Single-piece sickle? Broken.
52 Find reference 5788. SF 36792. Single-piece sickle?, broken.

Fabricator
53 Land surface 11201. Context 11159. SF 72711. Fabricator, crude abrupt retouch around sides, rounded wear at both ends.

Axes
54 Unstratified. SF 33064. Reworked polished axe fragment.
55 Midden 11179, fill 5985. SF 22815. Reworked polished axe fragment.
56 Land surface 11201, context 5989. SF 26595. Flake removed from the blade edge of a large flaked core tool. The blade edge well used and glossed.

Miscellaneous retouch
57 Land surface 11201, context 5989. SF 24061. Miscellaneous retouch, ?unfinished laurel leaf or backed knife, broken.
58 Midden 11426. Context 5986. SF 23999. Miscellaneous retouch, ?unfinished laurel leaf or backed knife, broken.

Worked stone from Area 6 *by Fiona Roe*

Introduction

Pieces of worked stone were retrieved from 34 contexts in Area 6, and have been summarised in Table 5.24. Many of these finds were concentrated in the midden area. The stone objects are all fragmentary, and often burnt as well, while the categories of implement are fairly limited. Despite these limitations it is possible to perceive a gradually emerging story of the use of stone in the earlier prehistoric period in the area. There are many similarities with the Neolithic stone assemblage from Yeoveney Lodge Farm, Staines, sited only 9.25km (5.75 miles) to the south east of Eton (Robertson-Mackay 1987). The majority of the stone artefacts were used either for grinding or for percussion, a pattern that can also be seen in the finds from Area 10 and from Lake End Road West and Lot's Hole. For grinding, the finds from Area 6 comprise 3 saddle quern fragments, 7 rubbers, and a further 5 small fragments that could come either from saddle querns or rubbers. For percussion, 7 pebbles have finely pecked facets, and were probably used for flint knapping. Another 13 worked pebbles have been identified as hammerstones, and these, together with further flint examples, are described in the report on worked flint above. As is often the case, there are some dual purpose implements: two hammerstones which additionally have worn facets were found, and a rubber which also has a worn facet.

Two finds are more unusual, and were put to different uses: one was part of a probable axe polishing/sharpening stone; the other a shafthole adze of less certain purpose. In addition four early Neolithic contexts produced small fragments of Niedermendig lava, but these are likely to be altogether later in date. Burnt stone was retrieved from 19 contexts, amounting to nearly 3kg. As with the worked stone, these finds came mainly from the midden area.

Sources of stone

The shafthole adze is made from Group XVIII quartz dolerite, with a source in Whin Sill in the north of England (Evens *et al.* 1962, 224). However, this dolerite also occurs in Pleistocene deposits extending southwards down eastern England as far as East Anglia (Phillips *et al.* 1988, 53), implying that the immediate source was possibly less distant. All the other materials found in Area 6 could have been obtained locally. Sarsen is known to have been abundant on Chobham Common, only some 12km (7.5 miles) south of the site (Dewey and Bromehead 1915, 58). It must once have been plentiful in the area generally, since it was used for building much of Windsor Castle (*op. cit.* 93). The Chilterns would have been another possible source of sarsen (Sumbler 1996, 106). Other Tertiary deposits in the area consist mainly

Table 5.24 Summary of stone artefacts and materials in Area 6

Objects	*Sarsen*	*Quartzitic Sandstone*	*Quartzite*	*Cherty Greensand*	*Sandstone*	*Igneous*	*Totals*	*Flint*
Saddle quern	2	1					3	
Quern/rubber	3	1			1		5	
Rubber for quern	2	3	1				6	
Rubber/flint knapper			1				1	
Flint knapper		3					3	1
Hammerstone/flint knapper		1	1				2	
Hammerstone		2	8	1			11	
Axe polisher/sharpener		1					1	
Shafthole adze						1	1	

of sands and clays, but some ironstone is also to be found (Dewey and Bromehead 1915, 33 and 52), including its occurrence around Chobham (Sumbler 1996, 106). The remaining utilised materials could all have been collected from the local river terrace deposits. These were a source for abundant flint pebbles (Ellison and Williamson 1999, 16), but also contained pebbles of quartzite and other materials such as chert from the Lower Greensand (Dewey and Bromehead 1915, 69). The pebbles utilised at the Rowing Course were found to be very variable in character, particularly in the degree of compaction of the quartz grains. The hardest, well-compacted pebbles have been described here as quartzite, and these include the liver-coloured Bunter type pebbles with an ultimate source in the Triassic deposits of the Midlands. The hardness of these pebbles limited their usefulness for prehistoric purposes, although burnt ones often occur. Many of the utilised pebbles consist of less well compacted quartzite or sandstone, being intermediate in hardness between the Bunter quartzite and the more loosely compacted sarsen with its 'saccharoidal' texture, and these materials have here been termed quartzitic sandstone. These can be quite light coloured, and are not always easy to distinguish in hand specimens from pieces of sarsen, some of which may also occur as pebbles.

Types of implement

Saddle querns

Three fragments have been identified as coming from saddle querns, two being made of sarsen and one of quartzitic sandstone. The pieces are small, but could be identified because each has a concave, worked surface, which has been previously pecked to prepare the quern for grinding. In one case (11313, SF 75549) the pecking is coarsely executed. On the two other fragments, both from early Neolithic contexts (11232, in tree-throw hole 11424, SF 76494 and 11313, SF 85148), the pecking has been subsequently smoothed over by wear. At least two of these fragments have also been burnt.

Rubbers

The rubbers used with saddle querns were often made from more robust materials than the lower stones, and so have survived better, and there are seven examples from Area 6. Five were made from quartzite or quartzitic sandstone, though sarsen was used for two small, burnt examples from early Neolithic contexts (11313, SF 83736 and 84069). However, while sarsen was probably essential to provide sizeable slabs with the right dimensions for saddle querns, some of the larger cobbles in the gravels would have been of suitable dimensions to make good rubbers. These can be identified by their slightly convex working surfaces, now usually worn smooth and flatter than the original rounded cobble, but sometimes with some evidence for earlier pecking. Most of the rubbers are burnt. In one case five fragments from a shattered cobble (11151, part of 11200, SF 73769, 73780 (Fig. 5.47), 73784 and 73973 x 2) were found within *c* 1.26m of each other.

Quern or rubber fragments

Five further pieces were too small to be identified with certainty as either querns or rubbers. Most are burnt. The largest weighs only 60g, but all have worked surfaces. There are three more fragments of sarsen, two refitted fragments of quartzitic sandstone and one fragment of iron-stained sandstone, probably from a Tertiary source.

Pebbles with worn facets

Experimental work by Hugo Anderson-Whymark (pers. comm.) has demonstrated that the worn facets found on 7 pebbles from Area 6 can be replicated by using similar pebbles for flint knapping. About one day's work was needed to produce a finely pecked facet. Once a pebble is fully worn in this way it becomes less effective, and a new facet or a new tool must be started. The less hard varieties of pebble, such as those of quartzitic sandstone, were found to be the most suitable, and these tools may have been used as a less robust alternative to hammerstones. Quartzitic sandstone was selected for four of the faceted tools from Area 6, but

quartzite was also used for two of them, and a roughly shaped flint pebble for one more. Only one or two of these tools appear to have been burnt, but one was additionally used as a rubber, and two more as hammerstones. These tools are increasingly being recognised on river gravel sites, where suitable pebbles were easy to come by. There are late Neolithic examples from Drayton, Oxon (Barclay *et al.* 2003, 135), but at Yarnton, also Oxon, a broken greenstone axe from a Neolithic/early Bronze Age ground surface had been reused (Hey in prep.).

Miscellaneous

A fragment with a slightly concave, polished surface could be part of an axe polishing or sharpening stone. It was made from quartzitic sandstone from the local gravels, and came from sealing layer 11200. This layer is interpreted as a soil which formed during the later Neolithic and early Bronze Age, but many of the finds from it appear to be Neolithic. Portable axe-polishers with their distinctive shiny worn surfaces are, like flint knappers, being increasingly recognised in Neolithic contexts. Local examples include two fragments from Runnymede, Surrey (Needham and Trott 1987, 482) and one made of fine-grained sarsen from Furze Platt, Maidenhead, Berkshire (Harding *et al.* 1991, 50 and fig. 15). On sites lying at some distance from river gravels, sarsen was often utilised, as at Hambledon Hill in Dorset (Roe 2008, illus. S 26) and at Wayland's Smithy, Oxon (Whittle 1991, 87 and fig. 11, 9). At Carn Brea in Cornwall three portable axe polishers were made from local rocks (Smith 1981, 154).

Plate 5.15 Late Neolithic/early Bronze Age shafthole adze from the Area 6 midden

Another find from sealing layer 11200, which overlies the Neolithic horizon, is the broken half of a shafthole adze (Plate 5.15; Fig. 5.47; 11200 SF 83500), and this was made from Group XVIII quartz dolerite with an ultimate source in the north of England. It has been shaped all round to a somewhat blunt edge, and would have been hafted at right angles to the usual direction for shafthole implements, leading to the suggested term of shafthole adze (Roe 1979, 36), although these implements are of unknown purpose. The hour-glass shafthole was probably positioned centrally. Some shafthole adzes are shaped much like axes with the addition of a central hole, while others are more symmetrical in outline, and a few are approximately circular and resemble discs (Roe 1979, 36 and fig. 13).

These are not especially common implements, but there are now petrological results for some 214 examples from England, of which 46 were made from grouped rocks with suggested source areas. The Group XVIII quartz dolerite was the most frequently selected rock type, accounting for some 20 known examples (43 %), while another 13 (28 %) were made from Group XV greywacke. Both these materials were also used for making early Bronze Age battle-axes and axe-hammers (Roe 1966; Coope *et al.* 1988, 65), which suggests that a similar date for the shafthole adzes is a possibility. In general, a somewhat restricted range of grouped rocks was being used; five further examples were made of Group I greenstone, and there are others made from Groups XIII, XVII, XIX and XX, materials which have mainly later Neolithic or early Bronze Age connotations. Only Group XVII (with one or two examples) can be shown to have its main links with early Neolithic sites (Smith 1979, 18).

The distribution of the Group XV and XVIII shafthole adzes is very similar to that of axe-hammers made from the same two materials; the Group XV implements occur mainly in western England, while the Group XVIII ones have a mainly eastern distribution (Roe 1979, figs 6 and 12). However, the general distribution of these implements is very different from the axe-hammers, being weighted towards south eastern England, where a number of finds were made from quartzite or local sandstones (Woodcock *et al.* 1988, 28 and fig. 5). Axe-hammers by contrast have been found in greatest numbers in north west England and south west Scotland (Roe, 1979, 28, fig. 5).

The associations for shafthole adzes tend to be less than satisfactory. One suggested find, from High Down Camp, Sussex (petrological number Sussex 134) came from the same area as a bronze dagger and chisel and a gold ring (Read 1901, 388). A very weathered example originally published as a loomweight was found with pottery and flints at English Island Carn, St. Martin's, Scilly (CO 418;

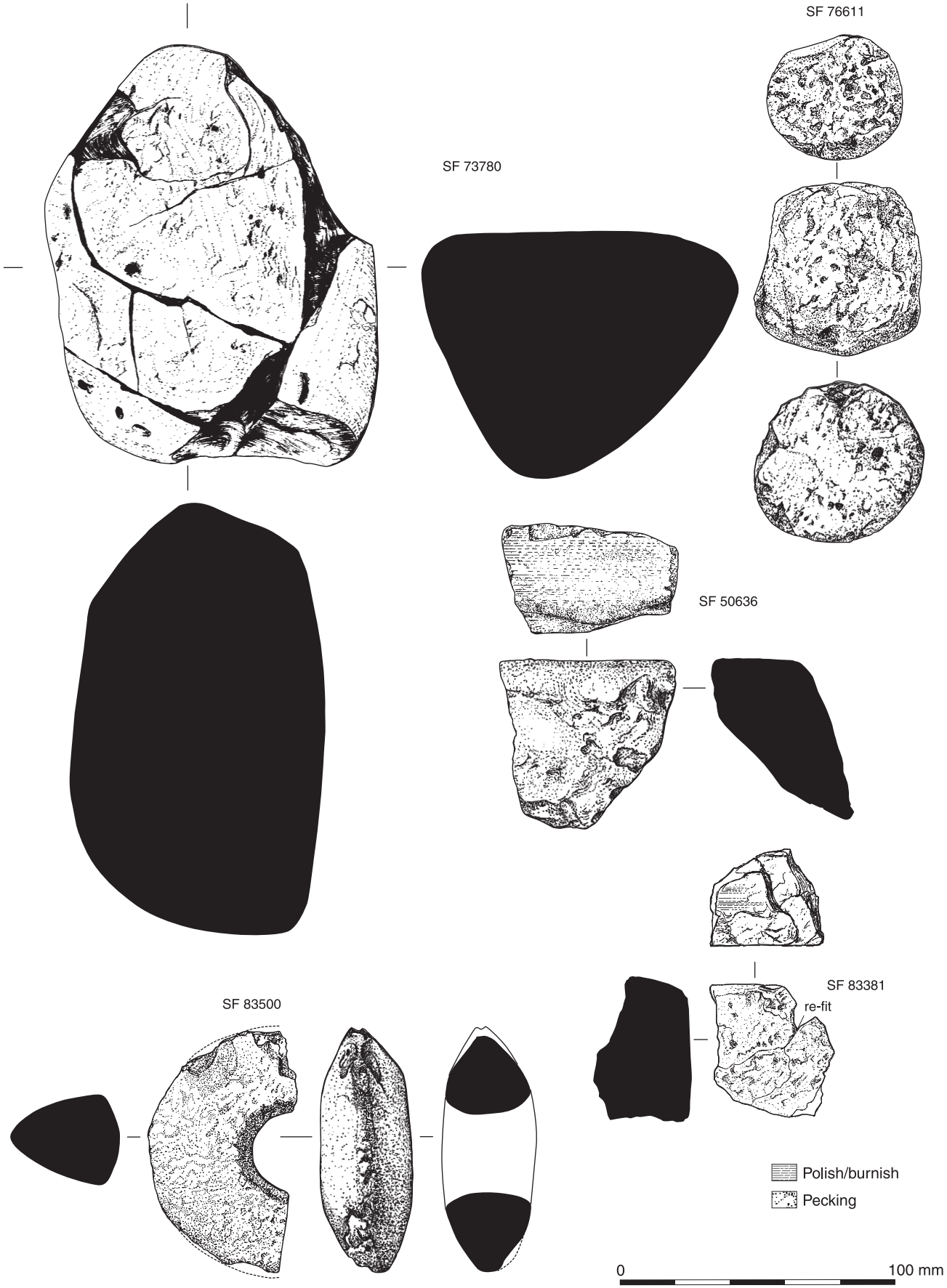


Fig. 5.47 Worked stone from Area 6

Ashbee 1974, 164), and is probably Bronze Age. A third example was apparently a surface find at the Arbor Low stone circle (Db 40). Dating here is also problematic (Burl 1976, 279), though a barbed and tanged arrow-head on the bottom of the ditch provides a clue, and there is also a closely adjacent barrow which contained two Food Vessels. The circumstantial evidence provided by the petrological information adds a little credence to these loose associations. On balance it would seem more probable that the shafthole adze from Eton should belong with the Beaker/early Bronze Age pottery from the midden area, rather than with any of the Neolithic activity.

Four small, weathered fragments of Niedermendig lava from the Rhineland all come from Neolithic contexts (5769, 5858, 8114 and 8126), which, however, are shallow deposits, so these anomalous finds could be explained by plough disturbance or animal borrowing. The likelihood is that they are pieces of rotary quern, and that they are of Roman or later date.

Burnt stone

The unworked burnt stone is divided between quartzite pebbles (47%) and sarsen fragments (42%), with just a few pieces of Tertiary sandstone and quartzitic sandstone. Much of the worked stone has also been burnt.

Catalogue of illustrated worked stone (Fig. 5.47)

SF 50636, context 11200. Fragment from pebble or cobble with slightly concave polished area, possibly an axe polishing/sharpening stone; now 74 x 63 x 36mm, 150g. Quartzitic sandstone

SF 76611, context 11187. Pebble with a small, smoothly worn facet at one end from possible use as a flint knapper; 77 x 52 x 38mm, 208g. Quartzitic sandstone

SF 83381, context 11332. Burnt fragment from quern or rubber; 56g. Quartzitic sandstone

SF 73780, context 11151. Five fitting fragments, burnt, from a cobble utilised as a rubber; convex grinding surface, now nearly worn smooth; now 159 x 123 x 84mm, 2.040kg. Quartzite

SF 83500, context 11200. Broken half from shafthole adze, probably originally nearly circular, shaped all round to a blunt edge, hour-glass hole; now 86 x 55 x 32mm, 200g. Thin section R 303. Group XVIII quartz dolerite, Whin Sill.

A shale bead fragment from Area 6

by Alison Sheridan, Mary Davis and John M Jones

A squarish fragment of a perforated object (SF 85895; Fig. 5.48; dimensions 17.1 x 16.7 x 4.25mm), probably a bead, with only a small area of its original surface present was found in context 11151, part of the sealing layer 11200 in square 11218 (Figs 5.3 and 5.5). Made of a laminar black stone, it had broken along a natural cleavage plane to reveal part of the perforation. Another break along a cleavage plane had removed much of the outer surface. The item had also snapped apart close to the perforation, and also across the perforation, so that the surviving portion represents only a small fragment of the original. Reconstruction of the latter is consequently hard but if, as seems likely, the perforation was cylindrical and the bead was roughly symmetrical on either side of it, then its original height must have been at least 26mm, its thickness at least 14mm, and its perforation diameter around 4mm. Judging from the curvature of the surviving surface, the bead's overall shape may well have been a flattened ellipse.

Its outer surface had been smoothed but not polished; its numerous shallow multidirectional striations had probably been caused by the abrasive agent (eg a sandstone) used to grind it into shape. One of the fracture surfaces also has multi-directional striations, some deep, but these are more likely to represent pre- or post-depositional wear after the bead had broken. The perforation is smooth for some of its length, but there are also stretches of roughly parallel rilling, caused by the drill.

The microstructure and elemental composition of the bead were analysed by Mary Davis, using the Cardiff University/NMGW CamScan MaXim 2040 scanning electron microscope, with Oxford LINK analyser; a low vacuum chamber was used so that the bead could be examined without having to be coated. This confirmed that the material lay within the cannel coal – shale spectrum of raw materials, as opposed to jet or lignite. Further analysis of a tiny sample drilled from the bead, undertaken by John M Jones using reflected light microscopy (see Allason-Jones and Jones 2001 for details of the method), revealed the material to be an amorphinite-rich shale. The presence of *Botryococcus* indicates a non-marine origin; this, and its reflectance, means that it is not Kimmeridge shale. It may come from the Fairlight Clay (Lower Cretaceous, Wealden Series) deposits of south-east England; the material would thus not have been local to the findspot area.

If this item really had been a flattish elliptical bead, then it is a kind of object familiar from other early Neolithic contexts in Britain (with similar, but uncontexted, examples from Ireland: Frazer 1892). These, and the contemporary and slightly more elaborate collared beads, were discussed by Isobel Smith in her discussion of an example from a house

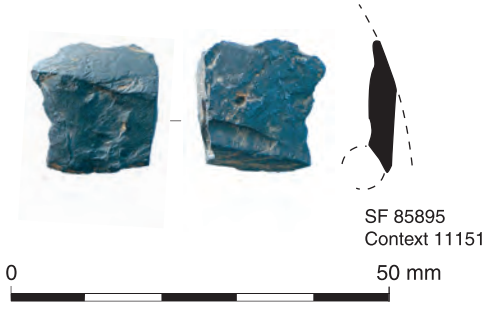


Fig. 5.48 Shale bead from Area 6

at Fengate, Cambridgeshire (Smith 1974b; cf Beck in Liddell 1932). The Fengate specimen – a collared bead – had broken in a similar manner to the present bead (Smith 1974b, fig. 23). The elliptical beads vary in their profile, from fairly slender (eg an example from the Windmill Hill causewayed enclosure: Smith 1965, fig. 58) to broad and, in the case of Eyford, Gloucestershire, nearly circular (Clarke *et al.* 1985, fig. 7.2. cf *ibid.*, fig. 7.3, showing the bead from Notgrove, Gloucestershire, and *ibid.*, fig. 3.38, showing a set of mostly collared beads found with an edge-polished flint axehead from Greenbrae, Aberdeenshire; these last three finds were all from definite or probable funerary contexts). Although the terms 'shale', 'jet' and 'lignite' are often used to describe the raw material of these beads, very few have been analysed. Most of the Greenbrae specimens, analysed by MD, are of Whitby jet; but it is clear macroscopically that other beads from Britain and Ireland are of a cannel coal, shale or lignitic material. It remains to be seen whether there is any patterning in the source of these beads, and whether Kimmeridge shale had been used for any of them, as Stone had claimed for the examples found in south-west England (in Houlder 1963).

The dating of these beads is unfortunately dependent on old or ambiguous radiocarbon dates, but they are likely to belong to the first half of the fourth millennium BC. The example from the Hembury, Devon causewayed enclosure is from an occupation level dated to 4340-3700 cal BC (BM-136: 5190±150 BP; Liddell 1932, pl. xvi: 1, 2; Smith 1974b, 40); that from the settlement at Hazard Hill, Devon, is loosely dated to 4040-3360 cal BC and 3800-3010 cal BC (BM-149: 4920±150 BP and BM-150: 4700±150 BP: *ibid.*; Houlder 1963, fig. 8.12); and the Fengate example is dated by two charcoal samples from the foundation trenches of the house, producing widely divergent results of 3950-3640 cal BC and 3330-2900 cal BC (GaK-4196: 4960±64 BP and GaK-4197: 4395±50 BP; Pryor 1974). Of these, the earlier of the Fengate dates is more likely in view of its Carinated Bowl association (Herne 1988, 16). Elsewhere, at Maiden Castle, an unfinished bead was found associated with Hembury pottery, which is likely to date to the first half of the fourth millennium (Wheeler 1943, fig. 52; Sharples 1991); and the flint axehead found with the Greenbrae beads (Kenworthy 1977) could well date to *c* 3600 BC or slightly earlier (cf Manby 1979).

Worked bone and antler from Area 6 by Tim Allen

A bone gouge (SF 82395) was recovered from a tree-throw hole (11317) within the hollow (Fig. 5.49). The object consists of a long bone shaft split and cut obliquely at one end to form a gouge. Polish on the oblique end extends onto the split surface, showing that this object was deliberately split to form the gouge; the angle at the pointed end is sharp.

It is paralleled by examples from Windmill Hill and from Cotswold-Severn chambered tombs

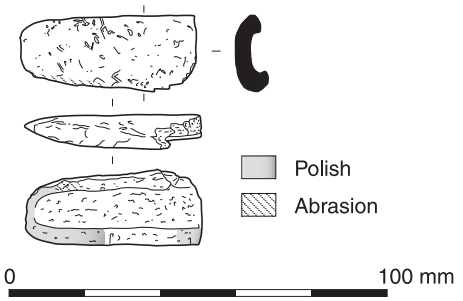


Fig. 5.49 Bone gouge from Area 6

(Piggott 1954, 84, fig. 13, 3; 146 and fig. 22, 12 and 13). These were interpreted by Childe as skinning tools (Piggott 1954, 84). Very similar objects are also found in late Neolithic contexts (Piggott 1954, fig. 54 no. 3).

Early Neolithic animal bone from Area 6
by Gillian Jones

Introduction

The early Neolithic bone from the Area 6 hollow was the largest group of Neolithic bone from the site: 1236 bones, of which 386 were identified. Most were cattle (67%) and sheep or goat (18%), with some pig (9%), deer (5%, red deer and roe), and a single badger bone. The cattle were mostly of domestic cattle size. There is an indication of hunting from the few bones identified as aurochs, the deer, and possibly pig. Results are summarised on Table 5.25. The bone sample is an important group, because of the early date and the association of the bone with abundant evidence of occupation.

Dating

A total of fourteen radiocarbon dates were obtained from the Area 6 hollow. Three were from animal bones:

3940-3650 cal BC (GrA-22561: 4970±45 BP) from tree-throw hole midden 11420, context 11176, taken from a cattle mandible;
3790-3630 cal BC (GrA-22560: 4910±45 BP) from midden 11426, context 5986), taken from a cattle first phalanx of domestic cattle size, and
3640-3370 cal BC (OxA-12238: 4701±34 BP) also from midden 11426, context 11160, from a cattle pelvis.

Two of these bones date to the early 4th millennium, the third to the mid-4th millennium. Dates obtained from other materials were early to mid 4th millennium cal BC, with the exception of one intrusive 3rd millennium date from a beech charcoal fragment. The pottery from both the middens with radiocarbon dates and those without is all of early Neolithic character, so there is little reason to doubt the integrity of the assemblage as a whole.

Table 5.25 Early Neolithic animal bone from Area 6, by feature

Feature	*Associated RC date*	*Cattle*	*Wild*[1] *wild/dom., large cattle*	*Sheep/ goat*	*Pig*	*Deer*	*Other species*	*Ident-ified*	*Unidentified large*	*med*	*mammal*	*Total*
Below land surface 11202		12	1 w	2	6	1a deer		21	19	12	5	57
Land surface 11201	e. 4th mill	104	2 w, 3 w/d 1 lg	25	10 1 wild	2 +1a red		143	109	48	45	345
Midden 11426	e.-mid 4th[2]	43	3 lg	13	4			60	92	25	37	214
Midden 11421	e. 4th mill & 3rd mill	20	1 lg	5				25	40	40	14	119
Midden 11422		2		2				4	6	11	3	24
Midden 11423		3		2				5	12	4	8	29
Pit 11179				1				1	1	1		3
Tth midden 11352	mid 4th mill	16	1 w/d, 2 lg	9	1			26	32	31	17	106
Tth midden 11420	e. 4th mill[2]	18	1 lg	4	2	1 red, 2a deer		27	30	22	19	98
Tth midden 11424	mid 4th mill	17		1	3			21	30	29	5	85
Tth midden 11327	e. 4th mill	5	2 lg	4	4			13	19	3	19	54
Tth midden 11301		3			1			4	2	1		7
Fill 1m square 11428		13	1 w, 1 w/d	1	2	3 red, 1 cf. red	1 badger	21	18	2	9	50
Layer in pal ch 8042, 8045						1 red, 1 roe		2			1	3
Layer in pal channel 8022[3]		1			1	4 red		6[3]	7	2	14	29[3]
Other EN Area 6		2		2		3 red		7	1	4	1	13
Total		259	(19)	71	34	16	1	380	411	233	183	1207
Percentages		66.8		18.4	8.8	deer 4.1	0.3	100				

[1] Column 4 – wild and ?wild cattle bones are included in the Column 3 count; lg – large bone, possibly wild, but not measurable; a – antler; Tth – tree throw hole.
[2] Contexts with directly dated animal bones, see text. All groups are early Neolithic except the layer in the palaeochannel 8022, which is early to middle Neolithic.
[3] Layer 8022, which is early to middle Neolithic, is included here because it is discussed in the text, but is excluded from the totals.

The bones from the two features with radiocarbon dates, middens 11420 and 11426, were from cattle, nearly all of which were of domestic cattle size, from sheep/goat and from pig, with just two antler pieces (probably red deer; Table 5.25). They were similar to the early Neolithic bone as a whole, and indicate a mainly domestic animal assemblage.

Preservation

The Area 6 early Neolithic bone was very poorly preserved. Many bones broke into pieces on excavation. Such was the frequency of this type of preservation, that most bones were bagged individually, and it was common for one bone to be broken into a dozen or more fragments. They were recorded as single bones. Of the bones of the main species, 38% were loose teeth. Of these, many were much broken, with the enamel surviving but the dentine eroded. Two-thirds of the identified bones had at least one zone more than half complete. Of these more-complete bones, the main long bones were on average 24% complete, compared to an average of 47% for the bones from the site as a whole. 31% of bones were identified, compared to 47% for the site as a whole. These indicators of preservation are shown on Table 5.26, for each feature. Also shown are the number of burnt bones. Few butchery marks were observed – only eight bones – which is not surprising given the eroded condition of the surface of the bones. In addition, sometimes scratches on bones were suggestive of butchery, but it was uncertain whether this was butchery or post-depositional damage from flints and stones.

The poor preservation is likely to mean that there is a survival bias in favour of cattle. The proportion of species is compared separately for bones of the head, body or foot in Table 5.27, and it can be seen that, although the order of importance of cattle, sheep/goat and then pig remains, there are large differences in the percentages, influenced in particular by the number of cattle teeth, metatarsals and phalanges (Table 5.28). Sheep/goat and pig foot bones may be under-represented due to the small size of, for example, phalanges and carpals/tarsals. But the absence of any sheep/goat metatarsals is surprising, in that there were 15 tibiae (at least seven

Table 5.26 Bone preservation, Area 6 early Neolithic

	1 Main Species NISP	2 % loose teeth		3 % with at least one zone >50% complete (Zgt50)		4 Average completeness of main long bones N %			5 % identified		6 Burnt
Below lands 11202	21	14	○	71	○	7	28	●●	37	●	0
Landsurface 11201	143	45	●●	59	●	28	26	●●	42	○	13
Midden 11426	60	28	●	57	●	14	21	●●	28	●	6
Midden 11421	25	52	●●	76	○	5	17		21	●●	12
Midden 11422	4					1			17		1
Midden 11423	5					0			17		1
Pit 11179	1					1			33		0
Tth midden 11352	26	15	●	81	○	8	20	●●	25	●●	2
Tth midden 11420	27	22	●	63	●	5	20		28	●	1
Tth midden 11424	20	60	●●●	65	○	4	33		30	●	5
Tth midden 11327	13	38	●●	54	●	5	17		24	●●	3
Tth midden 11301	4					0			57		0
Fill 1m square 11428	20	24	●	86	○○	11	28	●●	42	○	0
Other EN Area 6	8				○	3			40	○	0
Total	377	37	●●	64	●	92	24	●●	32	●	44
Site as a whole (GJ)		5		75			42		47		

Preservation indicators, compared to the bone as a whole (recorded by GJ):- good ○○, average ○, poor ●, very poor ●●, extremely poor ●●●.
1. Number of identified bones (NISP) from the main species (cattle, sheep(goat), pig and deer).
2. The proportion of loose teeth, as a percentage of NISP
3. The proportion of bones with at least one zone more than half present (Zgt50).
4. Average completeness of the main long bones (scapula, humerus, etc., but not tarsals and phalanges) where at least one zone was more-than-half complete i.e., the average value of: (number of zones present/ the total number of zones) for each bone.
5. % identified of bone (though note discussion of counting bone, in text).
6. Burnt bones present.

Table 5.27 Percentages of bones from the head, body and foot, between species and within species

	Compare species proportions					*Compare head/body/foot for each species*				
	Cattle	*Sheep/ goat*	*Pig*	*Deer*		*Cattle*	*Sheep/ goat*	*Pig*	*Deer*	*Total*
Head	71	19	6	3	100	48	46	31	30	45
Body	49	31	19	2	100	19	44	54	10	26
Foot	78	6	5	11	100	33	10	14	60	29
Total	67	18	9	5	100	100	100	100	100	100
No.						259	71	35	20	385

individuals), and the metatarsals were probably removed for bone working. Further comments on the pig and deer bones are made below. Of the 850 unidentified bones, twice as many were large (cattle or red deer) as medium-sized: 49% large, 28% medium and 23% too fragmented to assign to large/medium. Of the large unidentified bones, most are presumed to be from cattle, given the proportion of cattle to red deer in the identified bones.

Bone from the features (Fig. 5.50)

The earliest fills (11202) overlying the Pleistocene gravels from the earliest silting of the channel included a few bones (Table 5.25). There were cattle of both domestic and wild size (see discussion of wild cattle, below), sheep/goat (2 bones, from two individuals) and pig bones. Four of the pig bones were probably from one individual, suggesting that this was a primary deposit.

The early Neolithic soil layers above this (11201), sampled in grid squares across Area 6, account for nearly half of the early Neolithic bones from Area 6. Thirteen bones were burnt. Preservation was poor, with 45% of identified bones being teeth. Cattle predominated (104 bones) and two bones were identified as from aurochs and three as wild or domestic (see discussion below). Wild pig was present. Sheep/goat were more than twice as numerous as pig, and the medium-sized unidentified bone had more the look of sheep/goat than of pig. The red deer bones were two upper teeth and a piece of shed antler.

Surface middens were found deposited on or cut into this layer. The largest of these, 11426 (5986 and

Table 5.28 Anatomical analysis, early Neolithic bone from Area 6

	Cattle	*Sheep*	*Sheep/ goat*	*Pig*	*Red deer*	*Cf. red deer*	*Roe deer*	*Deer*	*Badger*	*Large mam*	*Med mam*	*Mammal*	*Total*
Skull	7	1		1						3	2	2	16
Antler					1			3					4
Maxilla	2 (1)												2
Mandible	15 (2)			2						3	1		21
Upper tooth	50		10		2								62
Lower tooth	22		8	5									35
Tooth	28		14	3						7	2	4	58
Atlas				1									1
Cervical vert	2												2
Thoracic vert				1						1			2
Lumbar vert	3												3
Sacrum	2												2
Vertebra										31	5		36
Rib										54	5		59
Scapula	2 (1)		1	1								1	5
Humerus	10 (4)		4	5									19
Radius	6 (4)		3	2							2		13
Radius/ulna	1												1
Ulna	2 (1)			4									6
Carpal	7 (1)												7
Metacarpal	8 (2)		4		3								15
Metacarpal III				2									2
Pelvis	2 (1)		2	1									5
Femur	11 (3)		6	2							1		20
Patella	1 (1)												1
Tibia	7 (1)		15	2	1		1			1			27
Astragalus	5 (3)		3	1									9
Calcaneum	7 (5)			1									8
Cub-navicular	3 (1)				1								4
Metatarsal	23 (3)				3	1			1				28
Metapodial	6				2								8
1st phalanx	17 (2)				1								18
2nd phalanx	8 (1)				1								9
3rd phalanx	2 (1)												3
Fragment										318	217	190	725
Subtotal Head	124	1	32	11	3			3					
Body	49		31	19	1		1						
Foot	86		7	5	11	1			1				
Total	259	1	70	35	15	1	1	3	1	418	235	197	1236

Figures show number of specimens, with MNE (minimum number of individuals for this element) in brackets. For jaws and teeth, the overall MNI for cattle was 8).

11160), was the only midden with more than 50 identified bones. The midden produced 43 cattle bones, three of them described as 'large', the rest appearing to be normal domestic size. Three cattle bones were measurable, one of them the first phalanx which has been radiocarbon dated (3790-3630 cal BC, GrA-22560: 4910±45), and were of domestic cattle size, all of them within the size range of Iron Age cattle (Table 5.29). Other bones consisted of a skull fragment identified as sheep not goat, 12 other sheep or goat bones, just four pig bones (one measurable) and no deer. Three bones bore cut marks. A cattle lower third molar was of unusual shape with a reduced posterior cusp, a very early example of this anomaly.

There were three small, more circular, middens 11421, 11422 and 11423, to the west of 11426. Of these only 11421 contained much bone (119 fragments, 25 of them identified). One humerus was broken into 133 pieces, and a phalanx was in 82 pieces. 12 bones were burnt. Unusually, this group had as many medium-sized unidentified fragments as large. No pig or deer bones were found in these three middens. The association of both burnt bones

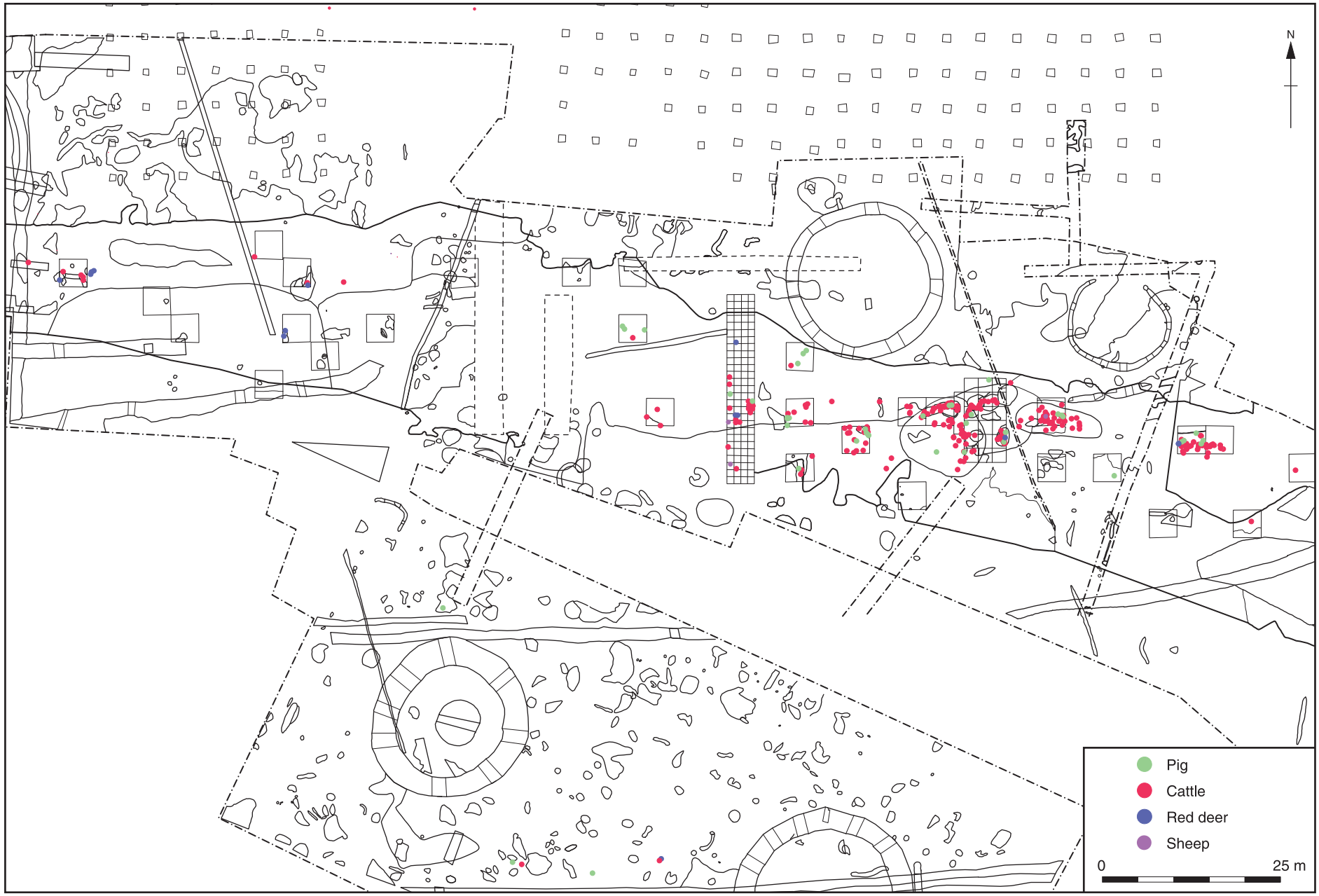


Fig. 5.50 Distribution of animal bones of different species in the Area 6 hollow

Table 5.29 Cattle Measurements, using relative size to suggest identifications of the cattle as wild, domestic or wild/domestic. For each specimen, one measurement is highlighted and used to show whether this measurement is (a) within the range of British Iron Age cattle, based on the Animal Bone Metrical Archive Project (ABMAP 2001) or, for first phalanges, Bierton (Jones 1986), (c) equal to or larger than the Ullerslev aurochs cow (Steppan 2001) or (b) intermediate. The italicized figure shows the percentage difference from the Ullerslev 'standard' (Eton/Ull x 100). The final columns show the comparable Ullerslev measurement (average of left and right side) and the log ratio (log(Eton/Ull)) (Simpson, Roe and Lewontin 1960, Payne and Bull 1988, Steppan 2001) (see Fig. 5.51) and the suggested identification. (Some measurements, eg 2nd phalanges, do not have an Iron Age comparative, so cannot be categorised between (a) and (b)).

	Within the range of:- and percentage difference from the Ullerslev aurochs	*(a) Iron Age ABMAP*	*(b) inter-mediate: >IA , <Ull*	*(c) =/> Ullerslev*	*Ullerslev aurochs 'standard'*	*Eton as log ratio of Ull.*	*Identification*
Area 6, early Neolithic							
scapula	**SLC: 79**;			***115***	SLC 68.6	+0.061	wild
humerus	SD: 28.8; **BT: 59**; HTC: 43.6; v. small	***65***			BT 90.3	-0.185	dom.
radius	**Bp: 94**; BFp: 86;		***94***		Bp 99.5	-0.025	wild/dom.
radius	**SD: 41.3**;		***77***		SD 53.7	-0.114	dom.
radius	**Bd: 97.4** estimated			**est 110**	Bd 88.5	+0.042	wild
radius/ulna	Prox depth 47.8 (large)						
metacarpal	**Bp: 52.5**; SD: 24.1;	***72***			Bp 73.0	-0.143	dom.
metacarpal	**Bp: 56.2**; SD: 28.1;	***77***			Bp 73.0	-0.114	dom.
metacarpal	**Bp: 62**;	***85***			Bp 73.0	-0.071	dom.
metacarpal	**BFd: 57.5**;	***80***			BFd 71.9	-0.097	dom.
metacarpal	**Bp 53.5** est to 2mm; SD 27 est. (1)	***c. 73***			Bp 73.0	-0.135	dom.
tibia	**Bd: 69.7**; Dd: 51;		***90***		Bd 77.6	-0.047	wild/dom.
tibia	**SD: 34.9**; SDmin: 26.9;	***72***			SD 48.8	-0.146	dom.
astragalus	**GLl: 67**; Bd: 43; DL: 37.3;		***81***		GLl 82.4	-0.0899	dom.
astragalus	**Bd: 52.6**;			***100***	Bd 52.5	+0.001	wild/dom.
calcaneum	**GL: 179**;			***108***	GL 165.8	+0.033	wild
calcaneum	**GL: 127.5**; DS 44	***77***			GL 165.8	-0.114	dom.
calcaneum	DS 36						dom.
metatarsal	**Bp: 41**;	***67***			Bp 61.6	-0.177	dom.
metatarsal	**Bp: 46.6**;	***76***			Bp 61.6	-0.121	dom.
metatarsal	**SD: 21.3**;	***62***			SD 34.2	-0.206	dom.
metatarsal	**SD: 22.6**;	***66***			SD 34.2	-0.1799	dom.
metatarsal	**SD: 25**;	***73***			SD 34.2	-0.136	dom.
1st phalanx	**GLpe: 77**;			***109***	GLpe 70.6	+0.038	wild
1st phalanx	**GLpe: 59.8**; Bp: 29		***85***		GLpe 70.6	-0.072	dom.
1st phalanx	**GLpe: 57** (to 2mm);	***c. 81***			GLpe 70.6	-0.093	dom.
1st phalanx	**GLpe: 61**;		***86***		GLpe 70.6	-0.063	dom.
1st phalanx	**GLpe: 62.8**; Bp 31.5 (to 1mm)		***89***		GLpe 70.6	-0.051	wild/ dom.
1st phalanx	**GLpe: 57.8**; RC date(1)	***82***			GLpe 70.6	-0.087	dom.
1st phalanx	**GLpe: 58.5;** Bp: 26 (to 1mm); **RC date**(1)	***83***			GLpe 70.6	-0.082	dom.
2nd phalanx	**GL: 42.8**; SD: 24.4;		***90***		GLpe 47.3	-0.043	wild/ dom.
2nd phalanx	**GL: 41**; SD: 23.8;		***87***		GLpe 47.3	-0.062	dom.
2nd phalanx	**GL: 40**; Bp: 32.3; Bd: 26.3;		***85***		GLpe 47.3	-0.073	dom.
2nd phalanx	**GL: 39.2**;		***83***		GLpe 47.3	-0.082	dom.
2nd phalanx	**GL: 37.7**; Bp: 33;		***80***		GLpe 47.3	-0.099	dom.
2nd phalanx	**SD: 22.4**; Bd: 23;		***80***		SD 28.0	-0.097	dom.
3rd phalanx	**DLS: 75**;	***86***			DLS 87.2	-0.066	dom.

1 RC date – Context 5986, Feature 11426, 3940-3650 cal BC (95% confidence, OxA-9858); (1) other bones from this context.

Area 6, Context 11200, Neolithic, sealing the above midden hollow, and below the alluvial layer							
cervical vt	BFcr 46						wild/dom?
radius	**Bp: 107**; BFp: 96.3;			***108***	Bp 99.5	+0.032	wild
ulna	**DPA: 78**; BPC: 48.6; SDO: 58.8			***101***	DPA 76.9	+0.006	wild/dom.
metacarpal	**Bp: 61**, est.		***c. 84***		Bp 73.0	-0.078	dom.
metatarsal	**Bp: 40** est.; SD: 24.2;	***c. 65***			Bp 61.6	-0.188	dom.

Table 5.29 (continued)

	Within the range of:- and percentage difference from the Ullerslev aurochs	*(a) Iron Age ABMAP*	*(b) inter-mediate: >IA and <Ull*	*(c) =/> Ullerslev*	*Ullerslev aurochs 'standard'*	*Eton as log ratio of Ull.*	*Identification*
A10 6882 skeleton ENeo	two thoracic vertebra: height/ width of anterior, unfused centrum; w. neural channel: 43, *c.* 46, 29; *c.* 41, 53, -						?wild
EX3 10190 RC skeleton ENeo	Average difference, using six long bone lengths (see skeleton description)		***80***			-0.099	dom.
A10 6331 ENeo	upper M3 L: 27.2; M3 WA: 18.6						
A5 3839 ENeo	horncore max Basal Diam: 45.9; (not shown in fig.)	***49***			GD 94		dom.
"	scapula, left GLP: **67.7**; SLC: 50.2;	***78***			GLP 86.7	-0.107	dom.
"	scapula, left GLP: **72**; SLC: 57.6;		***83***		"	-0.081	dom.
"	scapula, left GLP: **63.9**; SLC: 47.2;	***74***			"	-0.133	dom.
"	scapula, left SLC: **52.7**;	***77***			SLC 68.6	-0.115	dom.
"	tibia Bp: **93.6**;		***75***		Bp 124.2	-0.123	dom.
EX1 692 ENeo	scapula **GLP: 70**; SLC: 51.	***81***			GLP 86.7	-0.093	dom.
A16 9931 ENeo, pr. one individual	phalanx 1 **Bp: 29.8**; first 2 of the 4 log ratios used on Figure 66		81		Bp 36.95	-0.092	dom.
"	phal 2 **GL: 39.9**; Bp: 27.8; SD: 22.1; Bd: 24.1;		***84***		GLpe 47.3	-0.074	dom.
"	phal 2 **GL: 38.2**; Bp: 28.2; SD: 21.6; Bd: 22;		***81***		GLpe 47.3	-0.093	dom.
"	phal 3 **DLS: 70.5**; Ld: 51.2; MBS: 24.8;		***81***		DLS 87.2	-0.092	dom.

RC – radiocarbon dated; 10190 to 3650-3370 cal BC (95% conf., BM-3177).

Other Cattle measurements of Neolithic date

A10 6915 skeleton MNeo RC	metatarsal unfused, width at epiphyseal plate 61.6mm (very flared)				Bd 67.4		
"	phalanx 1 **Glpe 66.4**; Bp 31.2; SD 26.8; Bd 31.8 (see A10 text)		***94***		GLpe 70.6	-0.027	wild/dom.
WB96 7005 SF45001, MNeo RC	skull: (30) 123; (31) 141; horncore, right: Bas circ: 188; **max BDiam: 69**; min BDiam: 51; LOC: 352;	***73***			GD 94	-0.134	dom.
EX2 935 E-MNeo	tibia **Bd 63.2**; Dd 44.5; SD 39; SDmin 30		***81***		Bd 77.6	-0.089	dom.
EX2 935 E-MNeo	phalanx 2 **Gl 46.5**; Bp 31.1			***98***	GLpe 47.3	-0.007	wild/dom.
A6 8020 E-MNeo	astragalus **GLl: 79.6**; Bd: 53.1; DL: 45;			***97***	GLl 82.4	-0.015	wild/dom.
A6 8040 E-MNeo	astragalus **GLl: 66.1**; Bd: 45; DL: 37.2;		***80***		GLl 82.4	-0.096	dom.
A6 8021 pr.Neo	metacarpal: **Bp: 69.9**; BFp: 68.8;			***96***	Bp 73.0	-0.019	wild/dom.
A6 11238 Neo	metacarpal **Bp 62**		***85***		Bp 73.0	-0.071	dom.
A6 11079 pr. ENeo	phalanx 1 Depth proximal 39.5						
A5 3602 Neo	humerus: **BT 94.6**; Bd: 109.5			***105***	BT 90.3	+0.020	wild
A11 10910 Neo	scapula **GLP: 61.5**; SLC: 40.2	***71***			GLP 86.7	-0.149	dom.

RC – radiocarbon dated: 6915 to 3490-3020 cal BC (95% conf. BM-3188); 7005 SF45001 to 3370-3020 cal BC (95% conf., OxA-8815).

Other relevant cattle measurements (not shown on Fig. 5.51)

Table 5.29 (continued)

	Within the range of:- and percentage difference from the Ullerslev aurochs	*(a) Iron Age ABMAP*	*(b) inter-mediate: >IA and <Ull*	*(c) =/> Ullerslev*	*Ullerslev aurochs 'standard'*	*Eton as log ratio of Ull.*	*Identification*
A20 15728 Meso/Neo	calcaneum estimated **GL 169**; min and max diameter of shaft of tuber calcis 20.2, 44.5.			***102***	GL 165.8	+0.008	wild
EX3 10105 Meso(Neo)	astragalus **GLl 68**; Bd 38; DL 38		***83***		GLl 82.4	-0.083	pr. dom.
A11 10530 EBA	radius **GL 248**; BFp: 64.4; SD: 37.5;	***74***			GL 337.2	-0.133	dom.
A16 9132 EBA	metatarsal **SD 37.8**			***111***	SD 34.2	+0.043	wild
A16 9167 EBA	metacarpal **Bp 58.8**	***73***			Bp 73	-0.094	dom.
A1 1946 LBA, see Area 1 text	7th cervical vertebra BFcr 42.6; BFcd c.93 (to 2mm); BPacr 127; BPacd 97.			***(est.124)***		(est.0.095)	wild
WB 7008 M-LIA	metatarsal: **GL: 273**; Bp: 57.7; ; SD: 32.4; Bd: 64			***98***	GL 279.1	-0.010	wild/dom.
WB 12009 LBA-EIA	scapula: **GLP: 102**; SLC: 81.3; ASG: 71;			***118***	GLP 86.7	+0.071	wild
WB 12054 IA	scapula: **GLP: 95**; SLC: 68;			***110***	GLP 86.7	+0.0397	wild
WB 12144 EIA	humerus: **GLC >277** (277 survives); SD: 46.6;		***>90***		GLC 306.8	-0.002	wild/dom.
	Bd: 99.5; BT: 84.6; HTC: 55.5; HT: 42.1;			***100***	Bd 100.0		
WB 12053 M-LIA	radius: L **334** without distal unfused epiphysis; **Bp: 100.5**; SD: 55;			***v large 101***	GL 337.2 Bp 99.5	+0.004	wild/dom.

WB - These large bones from the Watching Briefs, although found in broadly Iron Age contexts, are probably from disturbed earlier deposits in the palaeochannel.

and the higher proportion of medium-sized fragments may indicate occupation in this area (cf Wilson's 1996 work on spatial patterning).

Of the other midden deposits, in tree-throw holes and pits, tree-throw hole midden 11420 has a dated cattle mandible (context 11176: 3940-3650 cal BC, GrA-22561: 4970±45) and is typical in having predominantly cattle bones, only one of them large, and both sheep and pig, but was the only tree-throw hole midden to include deer remains (two antler pieces and a second phalanx).

Tree-throw hole 11352 has associated dates from the mid 4th millennium (3630-3340 cal BC, OxA-9850: 4645±55 and 3650-3370 cal BC, OxA-9851: 4760±50), and one cattle bone identified as wild/domestic. From tree-throw hole 11424, almost all the identified bones were from cattle, yet a quarter of the unidentified fragments were medium-sized (pig/sheep/goat) – a useful demonstration of the value of counting the unidentified bones. For tree-throw hole 11327, preservation was poor on all indicators, yet a pig unfused proximal radius and a femur with four zones present survived. Two features, 11179 and 11301, included very little bone.

Layer 8022 was a single deposit containing part of a single Ebbsfleet Ware vessel in the edge of the palaeochannel. Only six of 29 bones were identified, four of them from red deer. The cattle bone was of normal size and the pig large (neither measurable). All six were the less useful parts of the animal (one a distal tibia, the rest all foot bones), and so are more likely to be peripheral waste rather than the remains of a feast. There was burnt flint and charcoal, and two mammal fragments were burnt. The other layers in the palaeochannel included a red deer and a roe deer bone (8045 and 8042 respectively) and no other identified species.

The cattle, sheep/goat, pig and deer are discussed below. The only bone from other species found was a badger metatarsal from 11428, which could have been hunted or a natural, perhaps intrusive, occurrence.

Cattle: aurochs or domestic?

Most of the cattle bones from the primary Neolithic midden in Area 6 were identified as domestic cattle, but a number of bones were very large, almost certainly aurochs, and others were of uncertain identification. A metrical study of the bones was used to present the evidence for identifications as aurochs, or possibly aurochs.

Aurochs was present in Britain during the Neolithic, and died out during the Bronze Age, with latest dates for aurochs of 1900 to 1390 BC (Legge 2010, 34; Yalden 1999). The latest example in the Thames Valley is a skeleton deposited in a pit at a gravel quarry at Holloway Lane, West London, 1km north of Heathrow Airport. Although too poorly preserved for radiocarbon dating, it is dated by artefacts to the final Neolithic/earlier Bronze Age (Cotton *et al.* 2006). Wild cattle were larger than

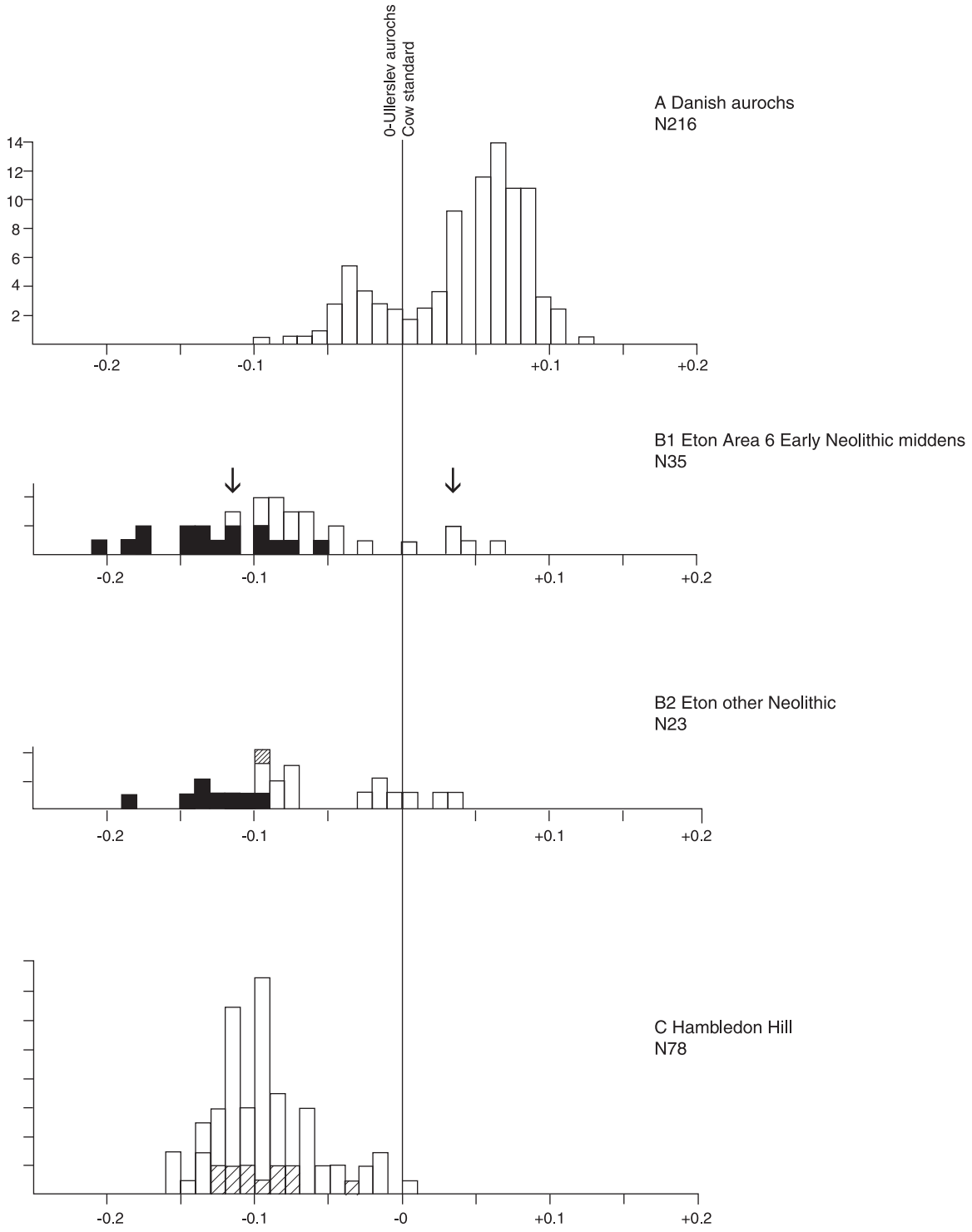


Fig. 5.51 Cattle measurements, compared with aurochs, and Neolithic and Iron Age domestic cattle. Measurements are compared with the Ullerslev 'standard' aurochs cow, using the log ratio technique (see Table 5.29)

A Danish aurochs (Steppan 2001 and pers. comm.); based on the re-measured Ullerslev skeleton, and 216 postcranial measurements, Degerbøl 1970

B1 Eton Rowing Lake, Area 6 early Neolithic middens; measurements within the range of Iron Age cattle (ABMAP 2001) shown in black; arrows mark the two calcanea

B2 Eton, other Neolithic cattle measurements from various areas of the site; the hatched value is the mean of six length measurements from skeleton 10190

C Hambledon Hill earlier Neolithic domestic cattle; width of distal articulation:- metacarpal hatched; humerus unfilled (re-calculated from Legge 1981a)

domestic cattle, but separation on the basis of size is complicated by the fact that in all cattle, bulls are larger than cows, and Neolithic domesticated cattle were larger than Bronze Age and Iron Age cattle (see Grigson 1969; Degerbøl 1970; Grigson 1984; Legge 1981; Steppan 1998; 2001; Yalden 1999). Recent work on aurochs and domesticated cattle, based on 72 radiocarbon dated samples, suggests that domestic cattle arrived in eastern Denmark, northern Germany and southern Sweden almost simultaneously around 4000-3900 cal BC (Noe-Nygaard *et al.* 2005). Isotope results, in the same study, suggest that the domestic cattle were kept on open areas of grassland, and that the aurochs (and red deer) were increasingly dependant on forest cover. Work on mitochondrial DNA suggests that 'as for modern cattle, there appears to be no definable contribution from western European *Bos primigenius* in the ancient cattle studied' (Edwards *et al.* 2007). The problem of identification remains, but it appears likely that the two types of cattle were distinct.

In Degerbøl's classic study of aurochs and Neolithic domestic cattle from Denmark, for some measuring points wild cows were beyond the range of domestic bulls, but for most measurements there was an overlap. The best preserved of the Danish aurochsen is a cow from Ullerslev, and this specimen has been remeasured and used as a 'standard' with which to make comparisons (Steppan pers. comm. and 2001), following the method used in the study of wild and domestic pigs by Payne and Bull (1988).

This allows the rather few measurable bones to be grouped and studied together (Table 5.29 and Fig. 5.51). For the Area 6 early Neolithic cattle from Eton (Fig. 5.51, B1), it can be seen that five bones are equal to or larger than the Ullerslev reference and several are smaller but still within the size range of the Danish aurochs cows (the smaller, left peak; there were more bulls than cows in Degerbøl's study). The earliest period for which there is a large dataset for British cattle is the Iron Age (eg the Animal Bone Metrical Archive Project (ABMAP, version of 2001), Centre for Human Ecology, University of Southampton). Half the measurable Area 6 early Neolithic bones fall within the size range of Iron Age cattle in the ABMAP. These are shown black in Figure 5.51, and there is little overlap with the Danish aurochs cows (Fig. 5.51, A). All except the four smallest (see below) are larger than the average values in the ABMAP Iron Age dataset, and are between 62% and 85% of size of the Ullerslev 'standard' cow. These are identified as domestic cattle.

Legge's (1981) study of Mesolithic, Neolithic, Bronze Age and modern cattle showed how similar the spread, though not the size, of measurements from Star Carr (Mesolithic), Grimes Graves (Bronze Age), Windmill Hill and Hambledon Hill (both early Neolithic) are to each other and to modern measurements of females and males (steers and some bulls), thus indicating that the larger specimens at the early Neolithic sites are much more likely to be from domestic bulls than aurochsen, even though they clearly overlap with the lower measurements of aurochsen at Mesolithic Star Carr. For most early sites, adult cows were far more numerous than adult males (Legge 1981; Grigson 1984; Steppan 2001).

The Hambledon Hill measurements, of metacarpal distal breadth and humerus breadth of trochlea, are redrawn on Figure 5.51, C. They show a similar distribution to the centre part of the Eton results. At Eton, the left (ie small) cases are taken on bones where there may be continued growth even when the bone looks mature (Davis 2000), so not too much weight should be given to this part of the figure. (The bones were metatarsals without the distal end: proximal breadth, two bones, and shaft diameter, one bone; and humerus without the proximal end, breadth of trochlea, BT, one bone.) Note, however, that the humerus BT was only 65% of the size of the Ullerslev cow (identification as cattle not red deer checked by D Jaques and B Charles), which is smaller than any from Hambledon. The 1st phalanx from context 5986, with a radiocarbon date of 3940-3650 cal BC (OxA-9858: 4970±45 BP), is of domestic size and was quite small and gracile. The metacarpal and the other 1st phalanx from this context were also within the range of Iron Age cattle. Comparison of the right side of Figure 5.51 shows four bones larger than any from Hambledon. It seems most likely that these were aurochs. Given that they are of comparable size to the larger group of Danish aurochsen, they may have been bulls. Presumably if aurochs bulls were hunted, so too were cows. The intermediate group are therefore likely to be from wild cows or domestic bulls. Given the much greater overall numbers of domestic than wild cattle, the intermediate cases are in fact more likely to be domestic than wild.

The added complication present for sites where most measurable bones are from cows (see ageing section below) seems not to apply to the results here. Most measurements are from mid-fusing bones, most of which are fused (Table 5.30). That is, the measurement sample includes both sexes. The males, however, were probably nearly all slaughtered soon after fusion (see tooth data, Table 5.31), with likely slight post-fusion growth of bone as referred to above. Only three measurements are from late-fusing elements – the distal radius and two calcanea. The calcanea are marked with arrows on Figure 5.51. One is of domestic size, the other 29% larger, and similar to small bulls or large cows in the Danish aurochs sample. There is a very high log ratio difference of 0.147 and, in addition, the two data points, –0.114 and 0.033, are not at the extremes of the Eton range. This gives support to the identification of two populations.

Of the 'intermediate' specimens, beyond the Iron Age ABMAP ranges and smaller than the Ullerslev

Table 5.30 Area 6 early Neolithic cattle bone fusion

Early fusing 7-10 months	*U, Y, F*	*Mid fusing 12-18 months*	*U, Y, F*	*Mid fusing 2-3 years*	*U, Y, F*	*Late fusing 3 ½ - 4 years*	*U, Y, F*
Scapula, acetabulum	0, 0, 0	Distal humerus, proximal radius, first	1, 1, 26	Distal metapodials, distal tibia	3*, 0, 4 * - one calf	Calcaneum, p. humerus, d. radius, olecranon, d. ulna, p. and d. femur and second phalanx	3, 0, 4

U unfused, Y fusing, F fused; p. - proximal (upper end of bone), d. – distal (lower)

Table 5.31 Area 6 early Neolithic cattle teeth, with estimated age classes

Tooth and wear group	*lower tooth values*	*upper tooth values*	*Total*	*MNEf*	*Juvenile (0-12mo)*	*Immature (2nd/3rd year)*	*Sub-adult*	*Adult*
dp4 in wear, <'g'	e	d,f	3	2	2			
dp4 'g' or beyond		>g, k, wr, wr	4	4	(4 juv/imm)			
P4 unworn	U, V	U	3	3		3 <31-36mo		
P4 in wear	e,g	<g,g,g	5	4			(4 sub/ad)	
M1 unworn		U	1	1	1 <4-6 mo			
M1 in wear, <'g'		f,f	2	1		2		
M1 'g' or beyond	g	k	2	2			(2 imm/ad)	
M2 unworn	E	U	2	2		2 <13-18mo		
M2 in wear, <'g'		f	1	1		1		
M2 'g' or beyond		k	1	1			(1 sub/ad)	
M3 unworn	U,U	U,U	4	3		3 <23-30mo		
M3 in wear, <'g'	d,e	f,f	4	4			4	
M3 'g' or beyond		k,k,l	3	3				3
M1/2 unworn	U,U	U	3	2	(2 juv/imm.)			
M1/2 in wear, <'g'	f	e,e, 5 x f	8	7		-7		
M1/2 'g' or beyond	g, 3 x k, l	>g, 4 x k	10	7			(7 imm/ad)	
	19 teeth	37 teeth			MNIf 3 MNI 2	MNIf 7 MNI 2	MNIf 4 MNI 2	MNIf 3 MNI 2

Included in the above are three mandibles (P4 visible, M1 at g and, probably belonging, M2 at f (this from Context 11176, RC date); M2 erupting; and P4 at e), two maxillae (dp4 at k; M2 and 3 both at k) and two probable maxillae (M1 at f, M2 unworn; M2 at f, M3 unworn).
Tooth wear stages follow Grant 1982; 'wr' 'in wear'. MNEf – Minimum Number of Elements taking each feature as distinct (see text). The age classes use the MNEf value. MNIf – Min. No. of Individuals, again taking each feature as distinct, using only those, unbracketed, tooth values which could be given a single estimated age class. The overall minimum number of individuals is also given. Age estimates for lower teeth based on Jones and Sadler (2012).

reference (Table 5.29, Column 'b'), two are nearly as large (tibia Bd 90%, radius Bp 94%) and are within the range of aurochs cows. These, plus the astragalus which is the same size as the standard, have been categorised as 'wild or domestic'. Two are relatively smaller (77 and 81%), fall to the left of the aurochs cow figures, and are included as domestic.

First phalanges were not summarised in the ABMAP, and are compared with a sample from Iron Age Bierton (Jones 1986, 12 bones). One was very large and clearly aurochs. The small sample size and the unknown mix of fore/hind and medial/lateral phalanges limit the reliability of comparisons, but it is of note that three of the other six fall in the intermediate class, Column (b) on Table 5.29 (ie larger than Bierton but smaller than the standard). Given the proportion identified as domestic from measurements of the rest of the skeleton, it is suggested that the two at 85% and 86% of the standard are probably domestic, and the one at 89% wild or domestic. Interestingly, the comparative length of these six, 81 to 89%, is greater than for the other measurements, many of which are width rather than length measurements. Second phalanx measurements in published reports are even rarer, but on the basis of visual comparison with the first phalanges and the similarity in the comparative length, those 80 to 87% have been classed as domestic and the largest, at 90%, was classed as 'wild or domestic'. (Note that GL = GLpe for 2nd phalanx, von den Driesch 1976, 99).

Three of the first phalanges also have proximal width measurements, which when compared with the Ullerslev standard, are interesting. In all three, the widths show more difference from the standard than do the lengths, with the three lengths being

83%, 85% and 89% of the standard, and the widths only 70%, 78% and 85%, respectively. This suggests that the difference in the conformation of the domestic cattle compared with the aurochs was particularly in lightness of build.

It is worth considering whether the cattle could be from one population of large, domestic cattle, most of which were females, and the bulls very large, as this is at first sight a possible interpretation of the distributions in Figure 5.51. The argument against this in the spread of the measurements observed. Normally, where sample sizes are larger, the spread of measurements is also larger, so that it would be expected that the range of the Danish measurements (sample size 216) would be greater than those for Hambledon (sample size 78) and this is indeed the case. However, for Eton, with a much smaller sample size, the spread is greater than for either, and this does suggest that two populations were present. (Note that the use of the log ratio for this is helpful, as for any two points a and b which are the same distance apart on the figure, the ratio will be the same, eg the distance between 60% and 80% – a quarter larger – will be the same as between 75% and 100%.) It should also be borne in mind that the Danish measurements are more varied (long bone widths and depths plus lengths of short bones eg astragalus, calcaneum and phalanges) than the Hambledon ones (two measurements; see also the discussion of the log ratio method, Legge 1996).

Metrical work using the log ratio method on domestic and wild cattle in south-west Germany and the Alpine foreland has shown that at several sites from the early Neolithic, remains are mainly from domestic cattle, with the proportion of aurochs among the cattle bones 0.6% at Heilbronn-Neckargartach, 6.7% at Ehrenstein, and 9.8% (plus 1.7% wild/domestic) from the very large sample at Bruchsal/Aue (number of cattle bones 1628, 1804 and 17113 respectively). The Bruchsal/Aue site is dated to 4100 – 3800 cal BC. At all three sites, metapodial measurements suggest that 76% to 77% of the domestic cattle were cows. At the slightly later site in the Alpine foreland, Bruchsal/Scheelkopf, about 3700 cal BC, hunting was of great importance, with nearly 60% of the cattle identified as aurochs (20% wild/domestic, 20% domestic, number of cattle bones 543; Steppan 1998, fig. 2).

Overall, the metrical study at Eton of the early Neolithic cattle bones from the Area 6 middens suggests the identification of twenty-six bones as domestic cattle, four bones as aurochs and five as wild or domestic. Taking the non-measurable bones as well, 8% of the 259 cattle bones were described as 'large' when recorded, with the majority considered to be of normal domestic size. It is confirmed that in the early to mid 4th millennium at Eton, the keeping of domestic cattle was of primary importance.

Wild cattle were hunted, and bones from various parts of the skeleton were found, indicating no specific collection of particular bones. In addition to cultural aspects of hunting, there may have been reliance on wild animals at certain times of the year, or associated with times of hardship, and it may have been necessary to protect pasture needed for the domestic herd as well as the prevention of inter-breeding (Boyle 2006; Legge 2010).

The age at death of the cattle

Evidence for age at death of the early Neolithic cattle is shown in Tables 5.30-31. Because there were so few mandibles, and loose teeth formed a third of bones found, ageing information had to be sought by study of the loose teeth. There were twice as many upper as lower teeth, so it was useful to record and use data from both. In Table 5.31, column 4, the upper and lower teeth are summed. This figure could include four teeth from one individual (upper, lower, left and right) so for each tooth, at each wear stage group (column 1), the minimum number of animals for this element (MNEc) was assessed, assuming that the teeth of one individual were not spread across more than one feature (potsherds from single vessels were found spread across the small adjacent middens 11421 and 11422, but very few sherds from single vessels were found spread between the more separated middens). It can be seen that this does not reduce the sample sizes by very much: the teeth generally appear to be from distinct individuals. A total minimum number of individuals, again assuming that each context contains distinct individuals (MNIc), is given for each estimated age class, using only those values which could be assigned a single age class.

The tooth data, taken with the fusion evidence from the long bones, suggests that few cattle died in their first year. Rather more appear to have been slaughtered in the later part of the second year (most bones that fuse at about 12-18 months were fused) and in the third year.

Few cattle reached adulthood, with less than a quarter of teeth in the adult class, though rather more long bones were fused than would be expected from this. The sample size is small, and the teeth very poorly preserved – 28 fragments were too incomplete to be identified as upper or lower – so a preservation bias in favour of the larger molars might be expected. However, numbers of the smaller deciduous and permanent premolars are similar to other teeth. The post-cranial bones included just one calf bone.

Legge's study of cattle age data (1981) identified two slaughter patterns from Neolithic and Bronze Age European sites, one, including Bronze Age Grimes Graves, where there is a high proportion of juvenile slaughtering and a high proportion of females amongst the adults (based on fused metacarpals), thought to indicate an emphasis on dairying, and the second where slaughter of young cattle was later, and there was a more equal spread of sexes amongst the fused metacarpals (which fuse at about 2½ years), interpreted as indicating a greater emphasis on producing meat. In both, most

adults were cows. It is expected that before castration was practised, only the minimum number of bulls would be kept, for practical reasons of management.

The question of whether cows were milked has been much debated, and recent work on lipid residues from pottery has contributed direct evidence from many sites of Neolithic, Bronze Age and Iron Age date, including samples from Eton (see below; Copley *et al*. 2003, Copley *et al.* 2005). Patterns of lower molecular weights in the triacylglycerols were recovered from many of the samples, which are characteristic of dairy fat, as opposed to adipose (body) fat. The results from six British Neolithic sites 'confirm that dairying was an established component of the agricultural practices that reached Britain in the 5th Millennium BC'. Of 438 pottery sherds studied, approximately 25% gave evidence of ruminant dairy fat (ie from cattle, sheep or goats). Of the Eton early Neolithic pottery studied, 50 of 88 samples contained lipids, and of these 50, 78% contained dairy fats and 22% adipose fats.

Residues from beeswax were identified in five of the Eton sherds (Copley *et al.* 2005). One of them also contained dairy fats, one adipose fats and the others beeswax only.

The early Neolithic sample from Eton fits a rather generalised pattern, with some juvenile deaths, but in which a good number of the surplus bull calves would have been kept over their first winter at least, to provide more meat, marrow, fat and other products. The calves will have been present with their dam during the first year, which some evidence suggests may be necessary for milk let-down (McCormick 1992). The availability of milk and milk products is many times more efficient in terms of food production than relying on meat only (Serjeantson 2007).

Pathology

A cattle lower third molar with a reduced posterior cusp was found in feature 11426 (context 5986). The tooth has the normal posterior fold near the cement-enamel-junction, albeit rather small, and this reduces to nothing in the upper part of the tooth. Three M_3s were normal.

Sheep/goat and pig

One skull fragment was identified as sheep, not goat, from context 5986 (SF 23296). Two specimens were probably sheep (not goat): a first or second lower molar with a pronounced flare on the medial occlusal fold, characteristic of first molars in sheep (Payne 1985), and an astragalus (also studied by D Jacques, at York Environmental Archaeology Unit). Goat may have been present – there were few bones present where identification is possible. All sheep and goat, if found in Britain, are domestic, as the wild progenitors were absent. As commented on above, sheep/goat bones may be under-represented in the total percentages. Looking at the proportion of bones from the main body, they are 31%, compared to 18% overall (Table 5.27). Their bones were present in all the features except midden 11301 (Table 5.25). They were, then, an important species, less common than cattle, but more common than pig. Sheepskins, which would have had a hairy outer coat with woolly under fibres, would have been more useful for warmth than pigskin or cowhide.

Evidence for age at death and size is limited due to the small sample size. Lower teeth show that some young were present (probable M_2 at 3A, $M_{1/2}$ at 2A, 8A) with the rest adult ($M_{1/2}$ at 11A, 12A, M_3 at 11G, 11G). Four measurable bones are of typical small size, and similar to Davis' 'standard' Shetland sheep (1996; astragalus, probably sheep, GLl 30.4, Bd 18.5, Dl 17.4; astragali: GLl 26, Bd 15, DL 14.1; and Bd 17.6; metacarpal SD 11.7mm).

Bones from pig were less frequent than sheep/goat, and were absent in six of the 16 features. They were present in the earliest layer, 11202: one neonatal bone plus four bones probably from one very young individual. Unusually for pig, few teeth were found – the proportion indicated from bones of the main body, 19%, is much higher than those from either head or foot (Table 5.27). This is surprising, as it is often remarked that pig bones survive less well than other species, and therefore teeth are expected to be more frequent than long bones in sites with poor preservation. There were, for example, twice as many cattle humeri as pig humeri (10 and 5) but many times more cattle teeth than pig (100 and 7: Table 5.28), which may mean that the heads of pigs were disposed of elsewhere. The few teeth were from one immature and two subadult animals (probable mandible: P_4 Un, M_1 d, M_2 Un; loose lower M_3s at b and c; Grant 1982). Long bones suggest a majority of immature animals: a neonatal tibia, one juvenile (unfused distal humerus and proximal radius, ulna and metacarpal), one very juvenile femur shaft, another unfused proximal radius, and two fused early-fusing elements (scapula and pelvis).

The few measurements include two ulnae of contrasting size: DPA 51.8 and 38.9mm (neither definitely fused, though of adult appearance). The first one is larger than Payne's wild 'standard', of 47.3mm, based on modern Turkish wild pigs (Payne and Bull 1988). The smaller one is from context 11160, and is within the range of unfused ulnae in Payne's study. Other measurements are a little smaller than this standard but still within the size range of the wild pigs studied (M_3 WA 16.6, L 37.2; scapula SLC 28). The M_3 length and width is within the range of the Durrington Walls pigs, interpreted as domestic, although both are above the means (15.7 and 34.5; Albarella and Payne 2005). The scapula is equal to the maximum found at Durrington Walls.

Little can be said for certain about the status of the pig bones as wild or domestic. Given the undoubted husbandry skills in managing cattle and

sheep/goat, it is unlikely that these skills were not applied also to the pigs. The greater number of pig than deer, the immaturity of most of the bones, and the presence of young bones in the very early context, suggest domestic status. But note also the presence of woodland, suitable for wild pig, and the hunting of deer and aurochs. The lipid residue study found no evidence of porcine fat from the Eton pottery samples (Copley *et al.* 2005). This was in contrast to results from Windmill Hill and Hambledon, and it was suggested, by Copley *et al.*, that pork may have been cooked without the use of pottery vessels (eg roasted).

Deer

Twenty bones of deer were identified from the Area 6 early Neolithic features, forming 5% of the identified bones. Fifteen were red deer, one of them antler, and one was roe deer. Deer was present in seven of the 16 features/feature groups (Table 5.25). Specific identification was uncertain in four cases: two antler fragments and a metatarsal 'probably red' and one antler tip '?roe'. Few bones from the main body were identified as deer, which suggests some under-representation of deer (Tables 5.27-28). Comparing bones from the foot only, deer form a much higher

Table 5.32 Other Neolithic to early Bronze Age animal bone from Area 6, by feature

		Cattle	*Aurochs*[1]	*Sheep/ goat*	*Pig*	*Deer*	*Other species*	*Ident-ified*	*Unidentified large*	*med*	*mam*	*Total*	*Burnt*
11200, Layer sealing the landsurface 11201	Neo [2]	29	1 w 1 w/d 3 lg	5	5	red 3a cf.red 1a roe 1	badger 3 (pike 1)	47	33	15	15	110	
5750 and 5566	prob Neo [2]	2					beaver 1 fox 1	4	4	4	1	13	1
Sealing layer 11323	ENeo + contam	2		4	4		horse 1	11	11	6	8	36	1
Above layers		33		9	9	deer 5	other 7	62	48	25	24	159	2
Percentage		53.2		14.5	14.5	8.1	9.7	100					
Layer in pal chan 8020, 8040	E-MNeo	7	1 w/d 1 lg	3	2	red 9		21	34	8	1	64	
Treehole 11041	E-MNeo	1			1	red 3, roe 1		6	8	13	13	40	8
Treehole 11078	prob ENeo	3	2 lg			red 1		4	7			11	
Treehole 11237	Neo	1				red 2		3	6			9	
Treehole 11244	MNeo	1						1	2	1		4	
Grave 5588	MNeo [3]			1			(pike 1)	1				1	
Ditch/ pits in chan 8024, 8025	prob Neo	1	1 w/d		2	red 1		4	8			12	
Above mainly Middle Neo		14		4	5	deer 17		40	65	22	14	141	
Percentage		35.0		10.0	12.5	42.5		100					
5849 in treehole 5303	LNeo	2						2	1			3	
Pit in Ring Ditch 5169	EBA	1						1	3			4	
Feature 8000	ENeo + MBA contam	2		2				4				4	
Total, these groups		52	(10)1	15	14	deer 22	other 6	109	117	47	38	311	10
Percentage		47.7		13.8	12.8	20.2	5.5	100					

[1] - included in the cattle count; [2] – Neolithic with possible later-prehistoric intrusions; [3] – associated radiocarbon date late 4th millennium.
w – wild, w/d – wild or domestic, based on measurements, lg - 'large'; a – antler; contam – contamination. Numbers of bones from the head, body and foot for cattle were:- 11200 etc., layers: 16, 8, 9 and the mainly E-MNeo layers: 1, 3 and 10. Two pike bones not included with the totals. Note that one E-MNeo context is shown with the E. Neolithic hollow bones (cattle 1, pig 1, deer 4, total 29).

percentage (11%), than overall. Comparison with sheep and pig reveals differences which may be treated as effects of preservation (more larger red deer foot bones surviving than sheep/pig) and identification (foot bones of deer are more characteristic and therefore more easily identified when fragmentary than the bones of the main body), rather than differences in bone elements deposited. With hunted red deer, the bones often left at the kill site are the skull, vertebral column and ribs (Gairloch estate manager, pers. comm.). Both immature and adult deer were present (molar at 4A, 9A, immature metatarsal, two fused metapodials, a fused phalanx). Measurements were few (metatarsal Dem 19, Dvm 26, Dim 24.7; phalanx I Bd 18.1; phalanx II GL 37.7, Bp 18.6, SD 13.3).

Deer seems to have provided only a small contribution to the diet, in contrast to Palaeolithic and Mesolithic sites in temperate Europe, where red deer predominated, being the commonest species in 95% of 165 sites surveyed by Jarman (1972). Jarman suggested, from age at death profiles, that it was not unlikely that red deer herds were managed in some way (*ibid.* and Barker 1985). In view of the very limited numbers of red deer bones at the Eton Rowing Course in this period, however, it seems unlikely that this was part of the animal husbandry of the early Neolithic, the bones more likely representing occasional hunting of wild species. The proportion of bones found is lower than the average for European Neolithic sites of the 4th millennium BC, which is 11.9% of identified bones (Boyle 2006).

Other Neolithic animal bone from Area 6

The east part of the early Neolithic hollow and its middens was sealed by the layer 11200. On the west, where the sealing layer did not survive, the Neolithic horizon (11323) was in direct contact with the later plough soil above. This, and features 5750 and 5566, relate to the hollow, but also contain occasional intrusive later finds. Bone finds (Table 5.32) were similar in the dominance of cattle, some of them large (with some useful additional measurements), and presence of sheep/goat and pig. Three of the nine pig bones were noted as 'large' and one of these is certainly of wild boar size, an adult calcaneum with greatest length 95mm, within the range of Turkish wild boar (Payne and Bull 1988) and 7mm larger than any from Anglo-Saxon Hamwih (Bourdillon and Coy 1980). The red deer remains were all antler pieces, two of them worked. One of the worked pieces and one other were shed antlers; that is, they were collected, and did not involve hunting. Although a much smaller bone group than the hollow and middens, there were more additional species: roe deer, beaver, fox, badger and pike, of which only badger was found in the hollow. The find of one horse bone (a fragmented premolar or molar) is presumed to be intrusive. The three badger bones were probably

Table 5.33 Other Neolithic to early Bronze Age measurements and age data from Area 6

Feature	*Date*	*Species and element*	*Measurement/ tooth wear stage*
11200	Neo[1]	Cattle teeth	M_i k, M_2 g*; P_4 U; M_3 very worn
8040	E-MNeo	Cattle tooth	$M_{1/2}$ f
8040	E-MNeo	Sheep/goat tooth	M_3 11G
5588	Middle Neo	Sheep/gt mandible	M_1 8A, M_2 2A, M_3 C (-crypt)
11200	Neo[1]	Sheep/goat humerus	BT 26.3; HTC 17.0; HT 20.9mm
8040	E-MNeo	Sheep/goat humerus	Bd 26.1, BT 24.9, HTC 20.3, HT 15.3
8021/8024	prob Neo	pig lower canine	max diam 28, occlusal surface 42.0 x 19.8 (cf. an Iron Age example of 19, 23 x 7)
11200	Neo[1]	pig M_2	f; WA 14.7; L 21.9
11041	E-MNeo	pig deciduous tooth	upper deciduous incisor, in wear
11200	Neo[1]	pig humerus	HTC 22.7
11200	Neo[1]	pig calcaneum	GL 95; C 15; C+D 32.3; DS 29.6
11200	Neo[1]	pig calcaneum	DS 28.1
11200	Neo[1]	red deer antler	burr max diameter 79 (worked bone)
8040	E-MNeo	red deer tooth	P_4 d
8020	E-MNeo	red deer humerus	HTC 47.9; HT 34.3
8021/8024	prob Neo	red deer humerus	BT 48.1, HTC 37.6, HT 26.7
8040	E-MNeo	red deer radius	Bd 45.7, BFd 38.2
8040	E-MNeo	red deer metacarpal	SD 23.1
8040	E-MNeo	red deer phalanx 1	GLpe 62.4
11237	Neo	red deer metacarpal	SD 24
11041	E-MNeo	red deer decid. tooth	di_3 Unworn
11041	E-MNeo	roe deer tooth	M_1 or $_2$ 1A
11200	Neo[1]	Badger femur[2]	GL 107.6; Bp 32.6; SD 9.7; Bd 26.2
11200	Neo[1]	Badger tibia[2]	GL 97.3; SD 7.5; Bd 20

For cattle measurements, see Table 5.29; [1] with possible later-prehistoric intrusions; [2] probably the same individual.

from one individual. Both badger and beaver, as burrowing animals, could be rather later in date, though their quality of preservation was similar to the other bones. A sheep upper third molar was abnormal; the distal fold was more curved and deep than normal (context 11152). Two bones bore cut marks and two were burnt. Preservation was similar to the midden material.

The pike bone, kindly identified by A K G Jones, was a large maxilla, with an estimated total length of *c* 1m.

A few bones were found in the early/middle Neolithic tree-throw holes 11244 and 11041 (and probably-associated feature 11078). The presence of Plain Bowl pottery as well as middle Neolithic pottery in 11041 may indicate a residual element in the finds, although it is also possible that the two pottery traditions overlapped. The bones included cattle, pig, red deer and roe, with no sheep/goat. Teeth from pig, red deer and roe were all from immature animals. Two cattle bones were large. Eight bones were burnt (all from 11041, seven of them to a white colour).

The early to middle Neolithic bone, though a very small sample, has a different character from the early Neolithic from the hollow and middens and the sealing layers 11200, etc., in having more deer than cattle, and few sheep and pig. All the deer remains are bones, not antler, so half of the bones, or more if some of the cattle and pig were wild, are from hunted not farmed animals. The red deer bones were from all parts of the body (3 antler pieces, 2 teeth, 7 main body, 7 foot bones), unlike the red deer sample from the early Neolithic hollow itself, where most were foot bones. The presence of a total of 142 bones does suggests occupation debris, although only two bones were observed with cut marks (from 11200). The small amount of age and size information is shown on Table 5.33, except for the cattle measurements, which are summarised with those from the early Neolithic (Table 5.29).

The low proportion of remains from domestic animals is in contrast to finds from the middle Neolithic at nearby Runnymede, where only five red deer, all antler pieces, were found, in a sample of 407 identified bones (Done 1991). The middle Neolithic bones from Eton therefore appear to be an unusual group, perhaps suggesting less dense occupation than at Runnymede, or some unusual character to the deposits.

Charred plant remains from the early Neolithic midden deposits in Area 6 *by Mark Robinson*

Introduction

Extensive sampling of the early Neolithic middens was undertaken for charred plant remains (Fig. 5.52). Thirty two samples were analysed in full for charred plant remains other than charcoal and the samples were scanned for charcoal.

Methods and results

Each sample was floated onto a 0.5mm mesh, the flot dried and the flot sorted under a binocular microscope. Charred plant remains other than charcoal were identified in full and are listed in Table 5.34, apart from a partly charred grain of hulled barley in Sample 1036 (context 8192, part of 112901) and a very fresh-looking grain of free-threshing wheat in Sample 2303 (context 11178, fill of plough mark 11177). Over three quarters of the cereal grain could not be identified with certainty but this was more a factor of 'clinkering' during charring than post-depositional deterioration. Most of the unidentifiable grains could have been *Triticum dicoccum* (emmer wheat).

Most of the samples contained charcoal but it was very comminuted with few fragments of identifiable size. A range of fragments was examined from each sample under a binocular microscope at magnifications of up to x50. Summary results are listed in Table 5.34 (see Appendix 4 for more detailed identification).

In addition to the charred plant remains, many of the samples contained fragments of coal and coke. There were also shells of molluscs from the subfamily Helicellinae which are regarded as medieval introductions to Britain.

Interpretation

The assemblages come from three types of deposit: midden fills of tree-throw holes, surface middens and less clearly defined spreads of Neolithic finds on the contemporaneous land surface in the hollow. Only material from the lower fills of tree-throw holes can be regarded as securely stratified. All of the deposits that were sampled contained early Neolithic artefacts and, with the exception of the two modern cereal grains, the non-charcoal charred plant remains were characteristic of the period. Indeed, the most numerous identified cereal grains were of *Triticum dicoccum* (emmer wheat) which had largely disappeared from cultivation in the region by the end of the Bronze Age (but see Volume 3 for a most unusual discovery of Saxon emmer wheat at Lake End Road). Some of the assemblages, however, also contained fragments of coal and coke which had presumably been deposited on the fields at Dorney in the post-medieval period. It is believed that biological turbation, particularly earthworm activity and material falling down cracks when the soil dried out, resulted in the incorporation of more recent items into the midden deposits. As soil accumulated in the hollow left by the channel, and the midden became buried more deeply, the deposits presumably experienced a reduction in these processes. Even so, modern material was incorporated into it.

As a check on the date of the material four charred emmer seeds were submitted for radiocarbon dating at the Oxford Accelerator Laboratory. One of these came from layer 11187

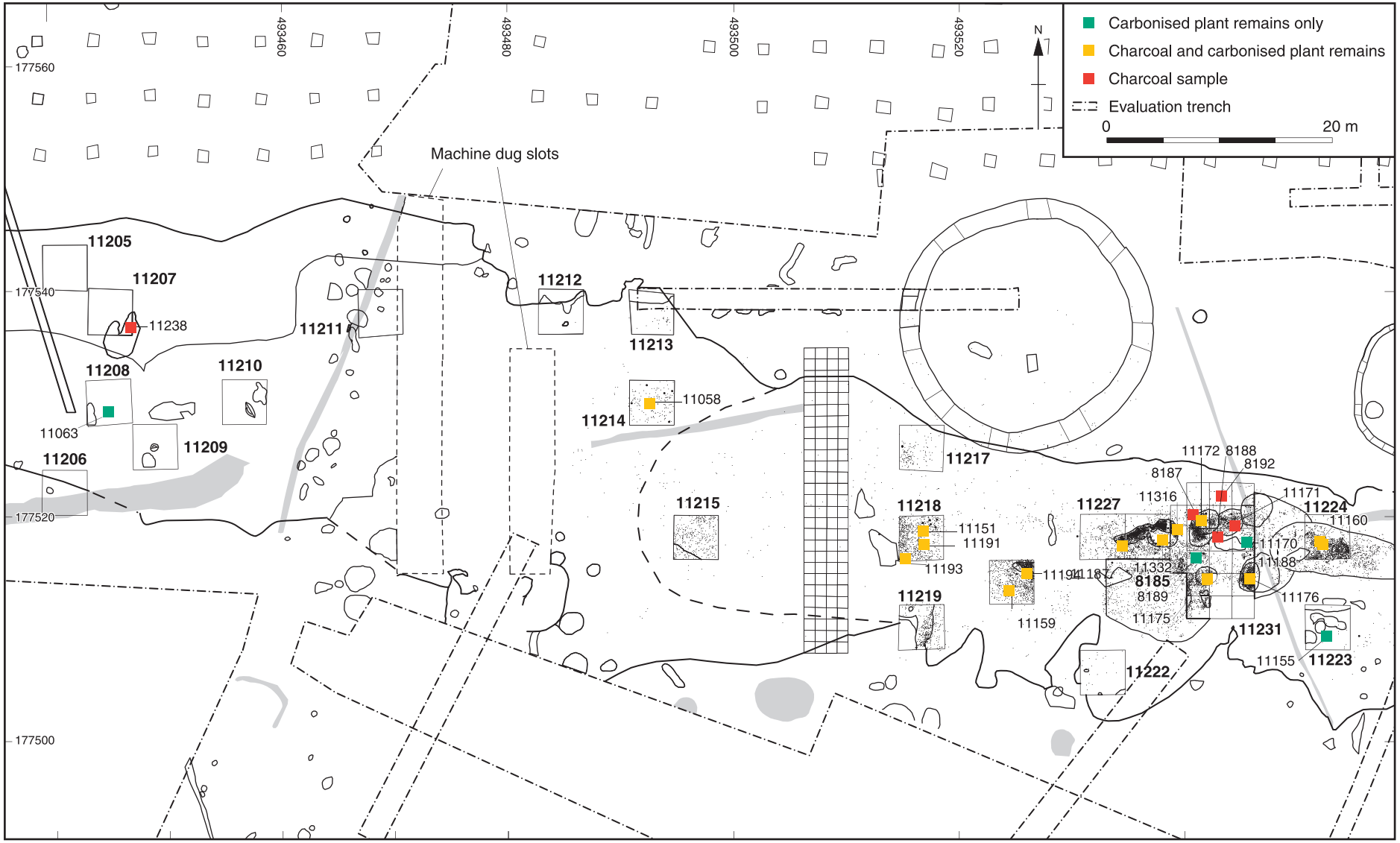


Fig. 5.52 Area 6: location of samples for charred plant remains and charcoal

Table 5.34 Charred plant remains (excluding charcoal)

			Number of items					
(Total samples 32)	*Sample*		*1037*	*1038*	*2301*	*2302*	*2304*	*2306*
	Context		*8187*	*8189*	*11176*	*11172*	*11187*	*11160*
(Total sample volume 967)	*Sample volume (litres)*		*30*	*30*	*37*	*30*	*32*	*30*
Triticum dicoccum Shübl.	emmer wheat	grain	2	-	-	2	1	-
T. cf. *dicoccum* Shübl.	emmer wheat	grain	-	-	-	1	1	1
Triticum sp. - short free-threshing grain	rivet or bread-type wheat	grain	-	-	-	-	-	1
Triticum sp.	wheat	grain	-	-		-	--	1
Hordeum sp. - hulled	hulled barley	grain	-	-	-	-	-	-
Hordeum sp.	barley	grain	-	-	-	-	-	-
Cereal indet.		grain	7	1	1	7	8	6
Total cereal grain			9	1	1	10	10	9
Prunus spinosa L.	sloe	stone	-	-	-	-	-	1
Crataegus sp.	hawthorn	stone	-	-	-	-	-	-
Corylus avellana L.	hazel	nut shell frag	2	-	-	3	4	5
Silene sp.	campion	seed	-	-	-	-	-	-
Weed indet		seed	-	-	-	-	-	-
No. items / litre			0.37	0.03	0.03	0.43	0.44	0.50

within tree-throw hole 11424, two from layers 11172 and 11160 within surface midden deposits 11421 and 11426 respectively, and the last from the land surface further west, layer 11159. All of these proved to be early Neolithic in date: 3780-3540 cal BC (OxA-9859: 4895±50 BP), 3780-3630 cal BC (OxA-9891: 4910±40 BP), 3790-3640 cal BC (OxA-9819: 4925±40 BP), 3800-3640 cal BC (OxA-9889: 4935±40 BP), all falling between 3800 and 3630 cal BC. A hazel nutshell from layer 11194 within tree-throw hole 11427 (adjacent to the charred seed from layer 11159) was also dated to 3950-3660 cal BC (OxA-9890: 4995±40 BP). While, therefore, the charred plant remains from the midden cannot strictly be regarded as securely stratified, almost all of them apart from the charcoal were probably Neolithic in date because no subsequent crop processing activity occurred in Area 6 to generate such remains.

More doubt must remain about the charcoal. Unlike the other charred plant remains, the assemblages were not characteristic of any particular period and it is possible that there was some charcoal amongst the post-medieval fuel waste spread on the site. Even so, the majority of the charcoal is thought likely to have been Neolithic (see Appendix 4).

The problem of contamination of charred plant assemblages with more recent material has tended to be avoided by archaeobotanists. It is not unusual for flots from shallower prehistoric features to contain uncharred seeds up to 2mm across and shells of medieval Helicellinae but reference to this is rarely made in published reports. The Dorney midden material was probably comparable, in terms of its stratigraphic security, with many other smaller prehistoric assemblages which had not been deeply buried.

The charred remains listed in Table 5.34 were almost all from food plants. Cereal grain predominated. *Triticum dicoccum* (emmer wheat) was the most abundant but there was also a slight trace of free-threshing *Triticum* sp. (rivet or bread- type wheat) and hulled *Hordeum* sp. (hulled barley). Chaff was absent. There was also a significant presence of remains of gathered wild food plants, particularly nutshell fragments of *Corylus avellana* (hazel) but also a few stones of *Prunus spinosa* (sloe) and *Crataegus* sp. (hawthorn). The only identifiable weed seed was from *Silene* sp. (campion), which could have grown amongst the cereals.

About two thirds of the samples contained charred food plant remains but their concentration was low and only exceeded 0.5 items per litre in one sample. The remains seemed to be quite evenly distributed throughout the midden other than that Sample 2317 perhaps included a cluster of hazel nutshell fragments. The remains presumably represented the accidental burning of cereal grains, probably during crop processing or food preparation, and the disposal into fires of the waste from the consumption of wild plant foods. The remains were entirely consistent with the domestic activities suggested by the artefacts from the midden.

The results for the charred food plant remains fell into the usual pattern for Neolithic sites in England (Moffett *et al.* 1989). Cereal grain was present but in company with the remains of gathered woodland or woodland edge fruits and nuts, particularly hazel nutshell fragments. There are similarities with the Neolithic remains from beneath the Hazleton North long barrow (Straker

						Number of items								
2307	*2308*	*2309*	*2311*	*2312*	*2313*	*2314*	*2315*	*2317*	*2320*	*2321*	*2323*	*2329*	*2332*	
11159	*11151*	*11175*	*11063*	*11155*	*11170*	*11058*	*11160*	*11194*	*11193*	*11191*	*11188*	*11316*	*11332*	
32	*30*	*32*	*30*	*30*	*30*	*30*	*32*	*30*	*15*	*30*	*8*	*33*	*30*	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
2	1	-	-	-	-	-	1	-	-	1	-	-	1	9
-	-	-	-	-	-	1	-	-	-	-	-	1	-	3
-	-	-	-	-	-	2	-	-	1	-	-	1	-	5
-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
4	3	2	1	3	4	11	2	5	1	1	2	1	3	73
6	4	2	1	4	4	15	3	5	2	2	2	3	4	97
-	-	1	-	-	1	-	1	-	-	-	-	-	-	3
1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
4	1	-	-	3	-	-	5	26	-	-	-	-	-	53
-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
0.28	0.20	0.09	0.03	0.23	0.17	0.50	0.30	1.03	0.20	0.07	0.25	0.09	0.13	0.16

1990). A large assemblage of charred food plant remains was recovered from an early Neolithic midden deposit in the soil sealed beneath the barrow. There the deposit was dated to 3930-3540 cal BC (OxA 646/738/739: 4920±56 BP), very similar to the dates from Dorney. The most abundant cereal remains from Hazleton were grains of emmer and a free-threshing wheat was also present, although to a greater extent than at Dorney. There was likewise a slight trace of barley. Some cereal chaff was found at Hazleton, perhaps because the protection of the barrow resulted in better preservation. Many hazel nutshell fragments were present on both sites but whereas cereal grain outnumbered nutshell fragments by 2:1 at Dorney, nutshell fragments outnumbered grain by 4:1 at Hazleton. The concentration of remains at Hazleton, 2.5 items per litre, was very much greater than at Dorney, where it was only 0.16 items per litre. The Hazleton midden was a discrete area beneath the barrow whereas the Dorney midden covered a much larger area and was more diffuse. It is possible that similar activities were occurring on both sites but that the charred plant remains had become more dispersed at Dorney.

The charcoal from the midden was difficult to identify because it was so fragmented. Although *Alnus/Corylus* sp. (alder/hazel) and *Quercus* sp. (oak) were both noted in 16 of the 32 samples, the quantity of alder/hazel charcoal was much greater than the quantity of oak charcoal. The charcoal assemblages were mixed and it is probable that most contained several species even though it was sometimes only possible to name a single taxon. The charcoal could plausibly have been derived from domestic activity and all but one species, *Fagus sylvatica* (beech), are commonly found on Neolithic sites in the region. Beech appears to have been a late addition to the British flora, only becoming a common tree over the past 1000-2000 years. There are, however, a few Neolithic records including a little charcoal from the Hazleton midden (Straker 1990). The Dorney finds need to be treated with some caution in view of the evidence of post-Neolithic contamination of the midden deposits, two fragments of beech charcoal were also submitted for radiocarbon dating, one from layer 11172 in surface midden 11421 and another from layer 11316 sealing the main midden deposits. The dates were respectively later Neolithic (2880-2460 cal BC; OxA-9926: 4075±65 BP) and late medieval (cal AD 1440-1650; OxA-9860: 346±35 BP), bearing out the contamination of the surface deposits. There is limited artefactual evidence of later Neolithic activity in the hollow, with which the first date is consistent.

The overall environmental implications of the charred remains from the midden, including the charcoal (see Appendix 4) agree well with the evidence of the waterlogged biological remains from the Neolithic palaeochannels at Dorney for the landscape of the site. They gave a picture of a wooded landscape with small clearances. Much alder/oak woodland was present on the floodplain which would have provided a ready source for the gathering of the fruits and nuts. Indeed, waterlogged remains of hazel, sloe and hawthorn were recovered from the channels. The cleared areas would have been suitable for cereal cultivation, and although evidence for grassland was also present there was a slight trace of cereal pollen from these palaeochannels.

Plate 5.16 Area 10 hollow after initial stripping, viewed from the south-east

Area 10: earlier Neolithic middens and other features *by Tim Allen, Anne Marie Cromarty and Ken Welsh*

The geology of Area 10 consisted of two slightly different areas of Pleistocene sands and gravels divided by a palaeochannel. This palaeochannel was encountered running east-south-east in Evaluation Trenches 83, 84 and 86, and continued south-south-east into Area 15, where a succession of early Holocene deposits were laid down under water (Fig. 1.3). Throughout Area 10 and in Trenches 84 and 83 to the west, however, the palaeochannel had been blocked by calcareous deposits at the very end of the late Pleistocene, and the infilled channel survived only as a shallow hollow in the Neolithic and Bronze Age (Plate 5.16). North of this hollow the gravel was coarse and hard-packed; south of it was a mixed deposit of sand and gravel, within which patches of early Holocene soil survived. Ploughing had removed all of the early Holocene soil over the hard-packed gravel to the north of the hollow.

A few worked flints of Mesolithic date were found in this area, but all of these were residual in later features. There was, however, very significant evidence of Neolithic activity (Fig. 5.53). A very dense concentration of early and middle Neolithic artefact spreads was found in the fill of the hollow left by the late Pleistocene channel in the northern part of the site, and a smaller concentration of 75 early Neolithic pottery sherds and *c* 150 struck flints was found in Evaluation Trench 88 at the south edge of the excavation area. Another 260 early Neolithic potsherds and rather more struck flints were recovered from many of the features in this area, indicating a general spread of activity of this date across the site.

The finds from the Neolithic soil preserved in the hollow were concentrated in the widest part of the hollow, towards the south-east side of the site, and a length of 30m of the hollow in this area was divided up into numbered 2m squares, of which alternate squares were excavated by hand (Fig. 5.54). The hollow was excavated in spits 20-50mm deep, and all of the finds were individually numbered and plotted in 3 dimensions using a data-logger. A number of dark soilmarks were found during the excavation of the squares, which proved to be fills in tree-throw holes. Some of these tree-throw holes continued into unexcavated squares, and in some cases additional squares were excavated to expose, plan and complete the excavation of these features.

The numbers of finds appeared to diminish rapidly towards the north-west as the hollow narrowed, but in order to test this two smaller areas further north-west were divided into 2m squares and each alternate square was excavated in the same manner as in the large area (Fig. 5.53). Much lower densities of finds were present, confirming the impression gained from surface inspection of the hollow.

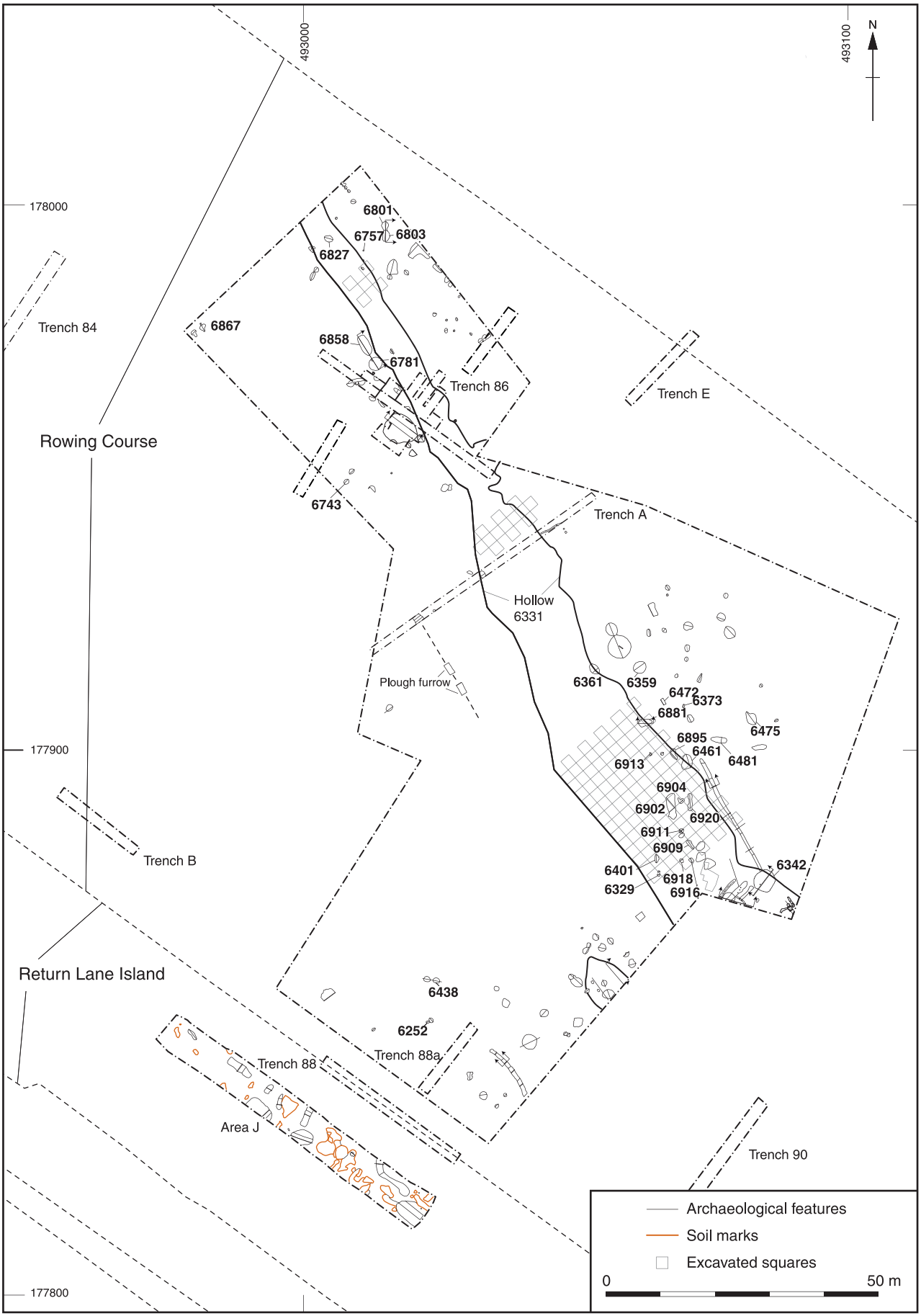


Fig. 5.53 Plan of Area 10 showing extent of evaluation and excavation, and indicating all features including the hollow, grids of squares and tree-throw holes within it

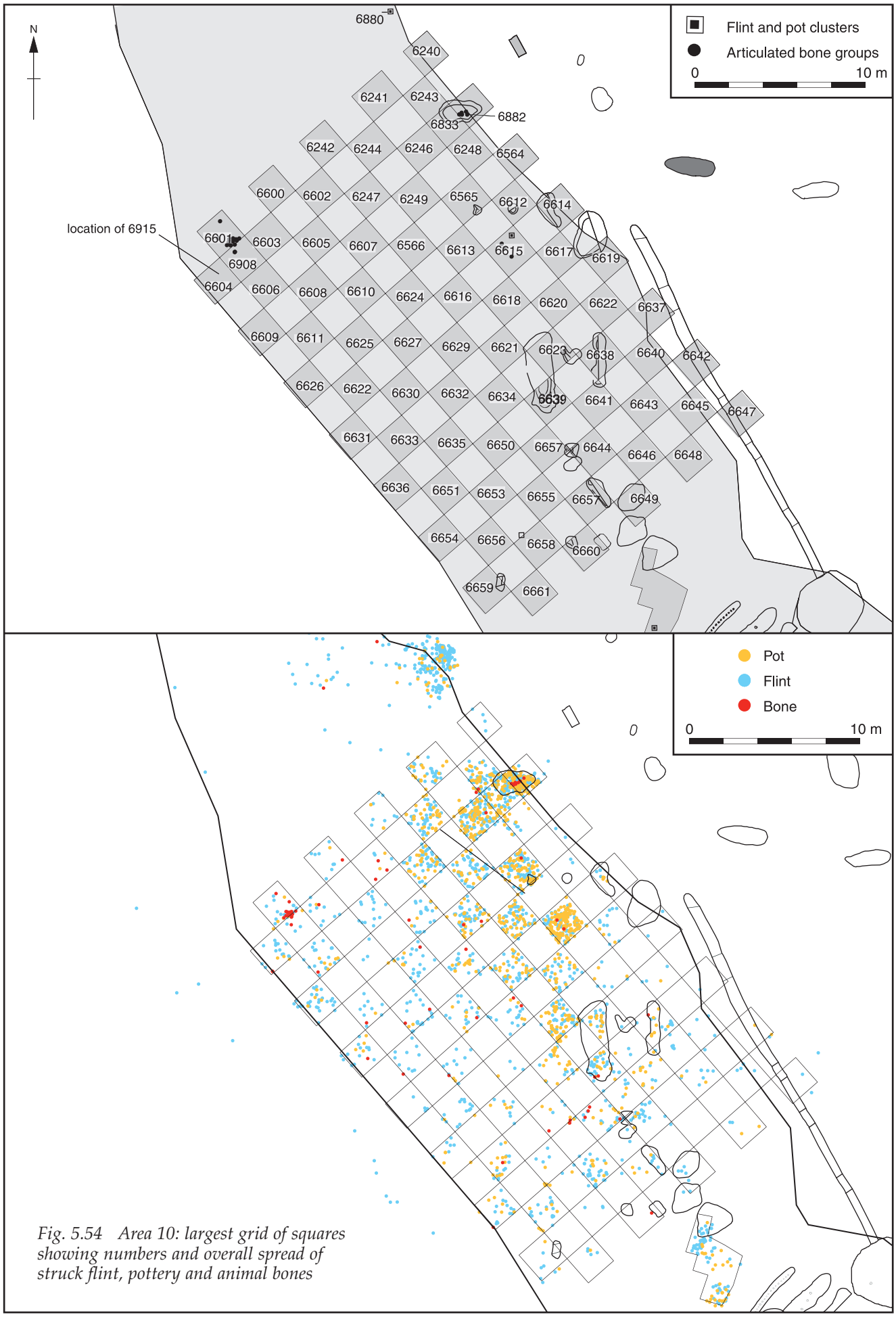


Fig. 5.54 Area 10: largest grid of squares showing numbers and overall spread of struck flint, pottery and animal bones

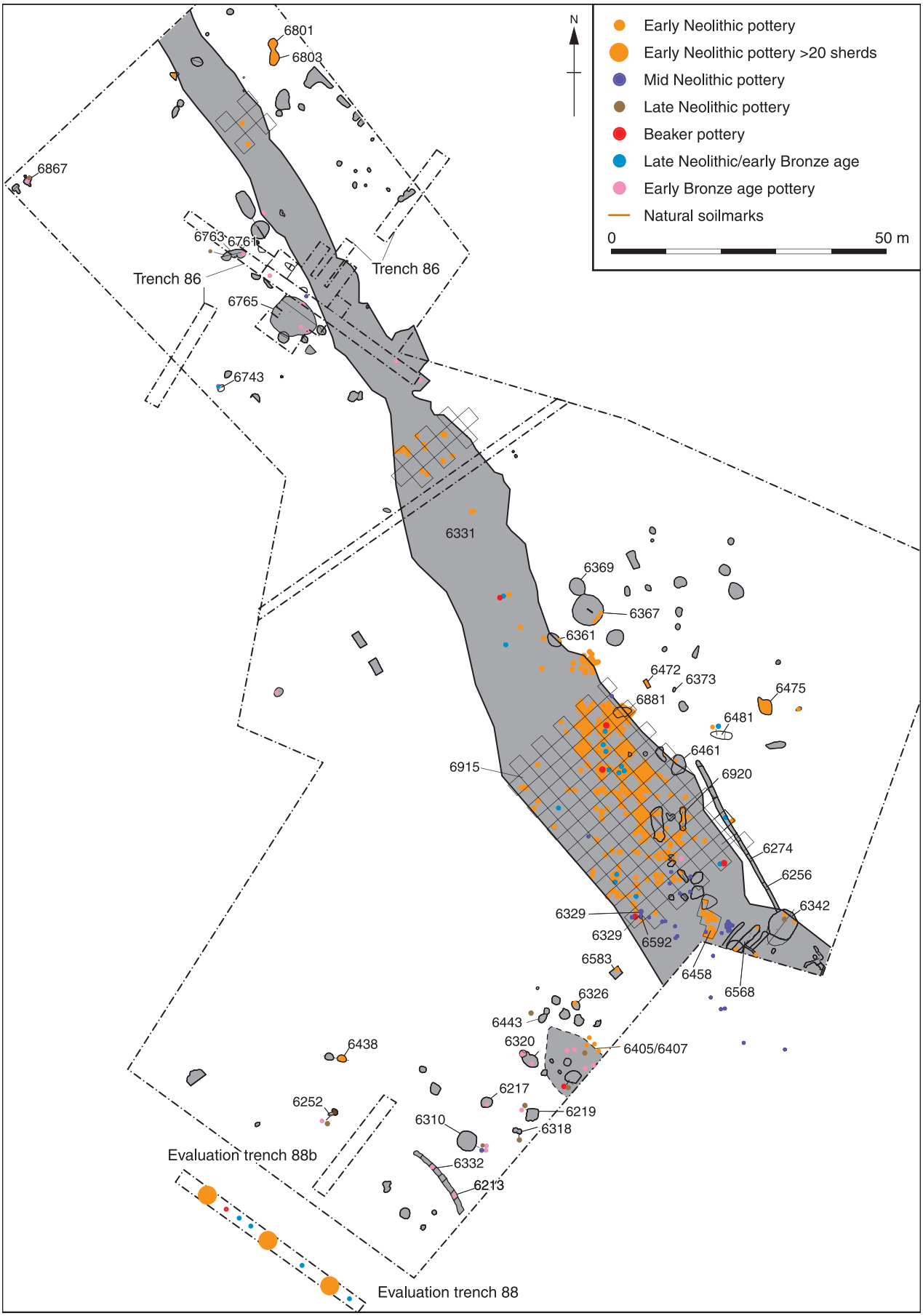


Fig. 5.55 Area 10 showing Neolithic features outside the hollow, and distribution of Neolithic and early Bronze Age pottery by period

The hollow

The shallow hollow left in the top of the infilled late Pleistocene channel ran for 157m from north-west to south-east across the excavation area. It varied in width from 6m to 20m, being generally narrower towards the north-west and wider towards the south-east.

The main area of squares towards the south-east was located not only in the widest part of the surviving hollow, but also the deepest. A longitudinal section formed by an amalgamation of the excavation results from squares 6240-9, 6564-6, 6601-61, 6833 and 6908 in the main area and section 6458 nearby showed that the hollow not only became shallower to the north-west but also to the south-east. At the extreme south-western edge of the excavated area the edges of the feature became very difficult to discern. In transverse section the hollow had a slightly irregular saucer-shaped profile. The observed irregularities were principally the result of later features cut into fill 6331, and are described below.

Fill 6331

The fill of the hollow consisted of friable mid-grey-, red- or yellow- brown sandy silt (6331=6328=6829), with occasional gravel, burnt flint and charcoal. This deposit was up to 0.26m deep (deepest in squares 6618, 6616 and 6615), shallowing not only towards the sides of the hollow but also towards the NW and SE. It showed some variation over its full extent though not in any systematic way that could be divided into different layers. This variation showed rather as some darker patches or patches of gravel visible on the surface in places. Excavation revealed that many of these patches were related to tree-throw holes, some such as 6881 and 6920 partly sealed by 6331, some cutting the deposit, but these were ill-defined due to the similarity of their fills to fill 6331.

Significant quantities of finds including pot, flint, animal bone, burnt flint and fired clay were observed both on the surface of this deposit and within it in the main area of sample squares (Fig. 5.54). No horizons were observed within this fill during excavation, but analysis of the distribution of the artefacts showed that the lowest part of the deposit contained a high density of relatively well-preserved finds, almost all Neolithic material, the only very occasional artefacts of later date found this deep in the deposit being very small and likely to have been intrusive (Fig. 5.55). Square 6615, where the hollow was deepest, had a particular concentration of pottery and other finds (Fig. 5.56; Plate 5.17), and a partial cattle skeleton (6915) was also found at the base of the hollow in squares 6601 and 6908 (Figs 5.55 and 5.58; Plate 5.18).

This lowest part of the deposit was cut by a small tree-throw hole (6913; Fig. 5.53), irregular in plan, approximately 0.67m across and 0.17m deep with an irregular profile. This feature contained a single deposit of friable dark brown sandy loam streaked with red and containing occasional gravel (6914). Two sherds of early Neolithic pottery (9g and 14g) were recovered from this deposit.

Plate 5.17 Area 10 pottery cluster in square 6615

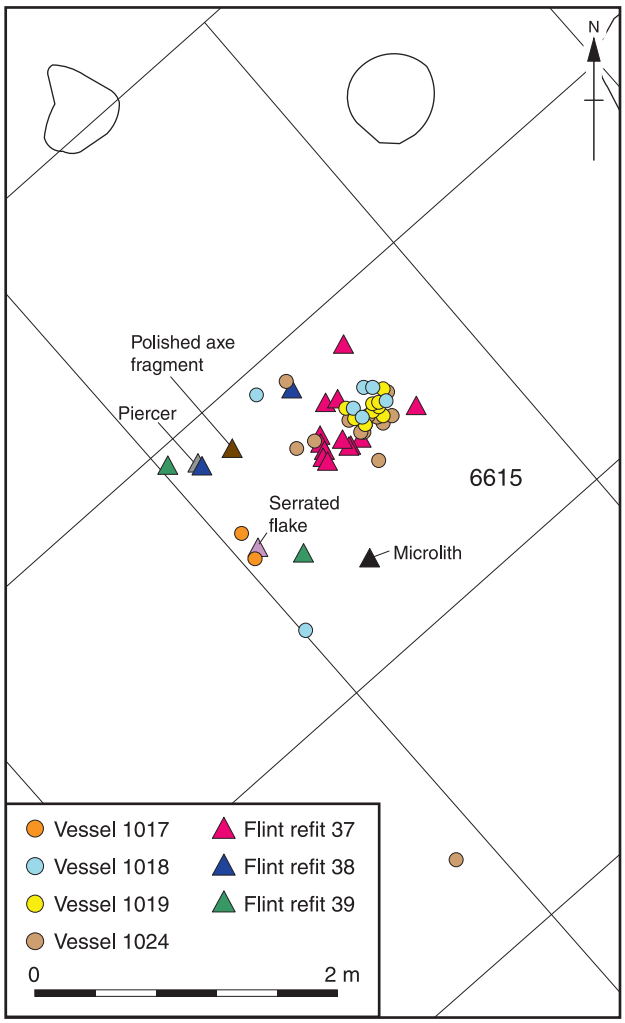


Fig. 5.56 Concentration of finds in Area 10 hollow, square 6615

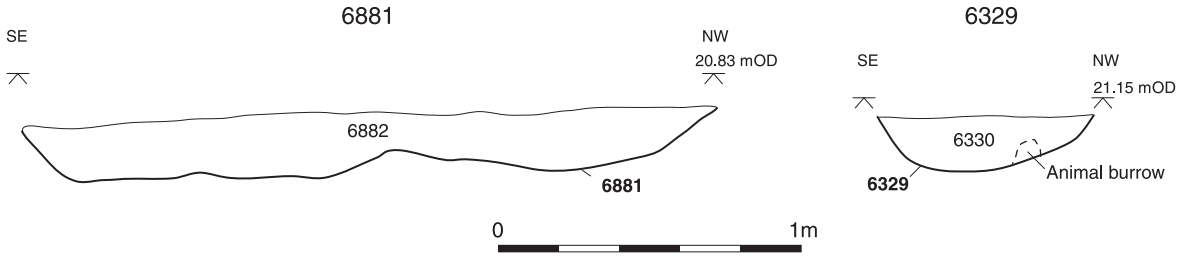


Fig. 5.57 Sections of Neolithic features 6881 and 6329 within the hollow

The tree-throw hole was sealed by a second finds-rich stratum, which contained more than half of the artefacts recovered from the hollow. The vast majority of these finds were of early Neolithic date, and burnt residues on two sherds were submitted for radiocarbon dating. These were SF 32522 from square 6566, which gave a date of 3660-2900 cal BC (OxA-9671: 4590±150 BP), and SF 41577 from square 6621, which gave a date of 3630-2890 cal BC (OxA-9672: 4520±120 BP). The pottery recovered, however, also included 46 sherds of middle Neolithic date, 14 of late Neolithic/early Bronze Age date, 11 others of Bronze Age date, 28 of Iron Age or Roman date and even three of medieval date. The sherds of middle Neolithic pottery were loosely concentrated towards the north-eastern side of the middle of the hollow at elevations between 20.83m OD and 20.96m OD. This suggests this was the level to which this part of the hollow had been filled by this time, though this zone also contained some other intrusive pottery of later date. This layer may have accumulated principally between the later Neolithic and the middle Bronze Age, but had clearly been disturbed by later ploughing. It is probably best to regard the tree-throw hole as representing the level to which plough disturbance penetrated within the hollow, rather than a genuine horizon sealing the early Neolithic activity.

Scatter 6880

An artefact scatter covering an area of roughly 4m^2 was found on the north-eastern edge of the hollow and just north-west of the main area of excavated squares (Fig. 5.54). The scatter consisted principally of flint flakes, but also included a number of pottery sherds, mostly of early Neolithic date but including one sherd of Peterborough Ware and is discussed in Chapter 7.

Features cutting 6331

Within the main area of sample squares the uppermost part of deposit 6331 appeared to seal a small pit (6592, which was itself cut by a very similar small pit, 6329; Figs 5.55 and 5.57; Table 5.35) and a number of tree-throw holes (6401, 6881, 6895, 6902, 6904, 6906, 6909, 6911, 6916, 6918 and 6920; Figs 5.53, 5.55 and 5.57), though others were cut from the surviving top of the layer. Of those that yielded any pottery from their fills (6401, 6881, 6902, 6920 and 6329), 6401 and 6902 contained sherds of middle Bronze Age date. A total of 12 other sherds of pottery, all of residual early Neolithic date, were recovered from 6902, and two middle Neolithic sherds from 6329 (Fig. 5.57). A few of the tree-throw holes, for instance 6920, may genuinely have been of early Neolithic date, but the remainder were probably originally cut through 6331, later disturbance (probably ploughing) mixing the soils and obscuring the edges and tops of later tree-throw holes.

No features cut 6331 in the other two areas of sample squares, but elsewhere several other features were cut through it. This included pits 6827, 6858 and 6361, possible waterhole 6781 and waterhole 6342, all dated to the middle Bronze Age. The last of these is located towards the extreme south-east edge of the area where deposit 6331 becomes less well-defined, making this relationship less certain.

Animal burials within the hollow

A partial articulated cattle skeleton (6915) was found within layer 6331 in squares 6601 and 6908 (Fig. 5.58; Plate 5.18). No cut was observed associated with this burial despite careful examination

Plate 5.18 Partial cattle burial 6915

Table 5.35 Catalogue of pits in Area 9/10, excluding 6405=6407

Pit	*Shape in plan*	*Length (m)*	*Breadth (m)*	*Depth (m)*	*Profile of pit*	*Fill No(s)*	*Fill character*	*Pot (no.)*	*Flint (no.)*	*Bone (no.)*	*Date*
Neolithic											
6252	Subrectangular	0.75	0.50	0.09	Saucer-shaped	6253	Occupation deposit	1	2		LN?
6329	Circular	0.71	0.71	0.15	Bowl-shaped	6330	Occupation deposit	2	2	1	LN/EBA?
6373	Subcircular	0.72	0.72	0.13	Saucer-shaped	6374	Occupation deposit		2		LN/EBA?
6743	Circular	0.31	0.31	0.16	Sloping U-shaped	6741-2	Occupation deposit	4	4		LN/EBA?
Unphased											
6250	Subcircular	0.65	0.35	0.13	Bowl-shaped	6251	Occupation deposit		3		
6254	Subcircular	0.55	0.55	0.14	Saucer-shaped	6255	Reworked 6204				
6276	Oval	1.24	1.24	0.32	Saucer-shaped	6277	Reworked 6204				
6299	Circular	0.56	0.56	0.16	Saucer-shaped	6542	Reworked fills of earlier features				
6316	Irreg. subcircular	0.50	0.50	0.07	Saucer-shaped	6317	Reworked fills of earlier features		14		
6379	Subcircular	0.55	0.55	0.28	Saucer-shaped	6378	Occupation deposit		4		
6382	Subcircular	0.80	0.80	0.18	Bowl-shaped	6380, 6381	Reworked 6204			1	
6432	Oval	0.50	0.46	0.22	Saucer-shaped	6451	Reworked 6203		12		
6470	Oval	-	0.70	0.10	Saucer-shaped	6471	Reworked 6204				
6489	Oval	-	0.30	0.31	Bowl-shaped	6490	Reworked fill of earlier features				
6494	Not seen in plan	-	0.91	0.19	Bowl-shaped	6495	Reworked 6204		1		
6511	Not seen in plan	-	0.18	0.21	Bowl-shaped	6510	Reworked 6205				
6522	Irregular	-	0.77	0.22	Bowl-shaped	6523, 6298	Reworked 6203				
6533	Circular	0.82	0.82	0.18	Saucer-shaped	6582	Reworked fill of earlier features				
6543	Subcircular	0.30	0.30	0.20	Saucer-shaped	6544	Reworked fill of earlier features				
6545	Circular	0.55	0.55	0.24	Bowl-shaped	6546	Reworked 6203				
6547	Not seen in plan	-	0.67	0.10	Saucer-shaped	6548	Reworked 6203				
6549	Oval	-	0.60	0.06	Saucer-shaped	6579	Reworked 6203				
6592	Circular	0.43	0.43	0.18	Bowl-shaped	6593	Reworked 6203 and 6205				
6662	Circular	0.35	0.35	0.23	Bowl-shaped	6534	Reworked 6203 and 6205				
6663	Not seen in plan	-	-	0.27	Bowl-shaped	6664	Reworked 6205				
6750	Subcircular	1.00	1.00	0.42	V-shaped	6751	Occupation deposit		2		
6779	Irreg. oval	1.78	0.90	0.20	Saucer shaped	6780	Reworked 6203 and 6205				
6785	Subcircular	1.05	1.05	0.26	Bowl-shaped	6786-7	Reworked 6203		2		
6805	Oval	2.80	1.75	0.56	Saucer shaped	6806, 6814	Reworked 6205		3		
6811	Oval	0.95	0.80	0.49	Bowl-shaped	6812, 6816	Reworked 6203 and 6204				
6819	Circular	0.50	0.50	0.17	Saucer-shaped	6820	Reworked 6203				
6821	Irreg. oval	0.85	0.63	0.14	Saucer-shaped	6822	Reworked 6203				
6842	Subcircular	0.90	0.80	0.24	Sloping U-shaped	6843-4	Reworked 6203				
6860	Circular	1.76	1.76	0.57	Bowl-shaped	6861-2	Occupation deposit			2	
6863	*Circular*	-	*0.47*	*0.45*	*U-shaped*	*6864*	*Reworked 6203*				

during excavation of these two squares. Sherds of early Neolithic and middle Bronze Age pottery were found close by, although they were not securely associated with the burial. Bone from the skeleton was radiocarbon dated to 3490-3020 cal BC (BM-3188: 4530±50 BP). A single crumb of early Roman pottery was also attributed to this context number, but was intrusive, part of a later disturbance that included a copper alloy strip in context 6908.

A second partial cattle skeleton was found within fill 6882 of feature 6881 (Figs 5.55 and 5.57), a probable tree-throw hole. This feature was located within squares 6245 and 6833 on the north-eastern edge of the hollow. Four teeth and another fragment of large mammal bone from square 6245 may also have formed parts of this skeleton. Bone from the skeleton was submitted for radiocarbon dating, but contained too little collagen for dating to be possible.

Other Neolithic features

There were very few features elsewhere that can be associated with the hollow (Fig. 5.55). Many of the

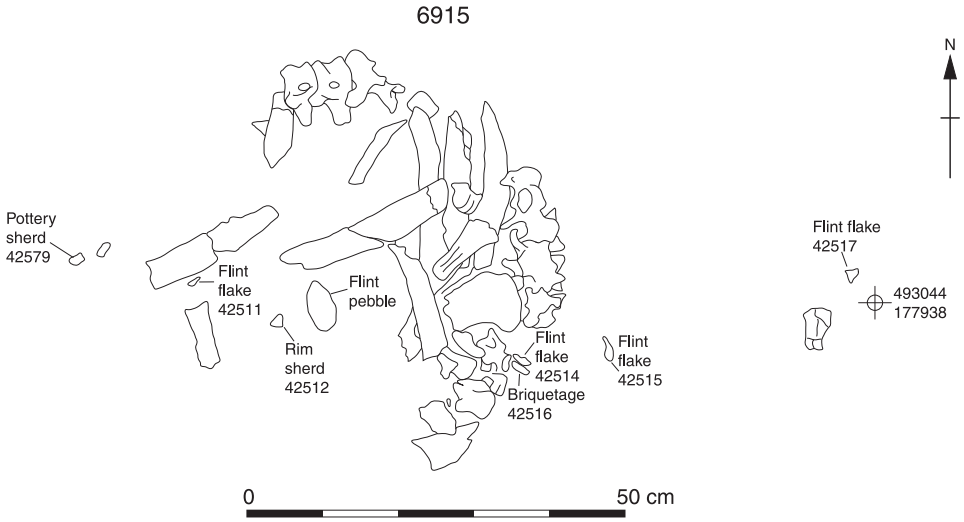


Fig. 5.58 Partial cattle skeleton 6915 in Area 10 hollow, square 6601

Neolithic sherds recovered from other contexts were found together with later finds, and even where the only finds were early Neolithic they generally consisted of very small sherds in small numbers, and so may very well have been residual. A number of tree-throw holes contained only Neolithic struck flint, but in some of these, such as 6359, evidence of post-depositional damage suggested that the finds were residual. Tree-throw hole 6801=6803 (Fig. 5.53), however, contained large fresh sherds of early Neolithic pottery (9 sherds, 173g) and 15 Neolithic flints, and tree-throw holes 6438 and 6472 also contained flint of early Neolithic character in relatively fresh condition, so may also have been of that date. Tree-throw hole 6475 also contained flints and small sherds of early Neolithic pottery, and although this was close to the hollow and the finds may have been residual, it is tentatively dated to this period (Table 5.36).

Tree-throw holes

A variety of features ranging from 0.4-2.95m across and 0.06-0.52m deep with a range of shapes and profiles were classified as tree-throw holes on the basis of their irregularity and poorly defined edges. These features were scattered over most of the excavation area, but were found particularly in the vicinity of the hollow. In most cases these features were filled with material that could be categorised as reworked Pleistocene deposits and other material into which these holes were cut. Most of these features contained only one fill and are thus likely to have become infilled within a relatively short time after the collapse or removal of the tree. In around a third of cases, the fills of these features also contained sufficient numbers of artefacts to tentatively date their infilling. The features so dated are catalogued in Table 5.36. The proposed dates are

Table 5.36 Dated tree-throw holes in Area 9/10

Tree-throw hole	*Fill(s)*	*Pot (no.)*	*Flint (no.)*	*Bone (no.)*	*Date*
6461	6462	1	4		Early Neolithic?
6475	6476	4	15		Early Neolithic?
6482	6483	1			Early Neolithic?
6801=6803	6802, 6804, 6834-6	9	15		Early Neolithic?
6881	6882		163	1	Neolithic
6359	6358		11		Late Neolithic?
6481	6572, 6479, 6463	3	8		Late Neolithic/early Bronze Age?
6920	6921, 6924		4		Late Neolithic/early Bronze Age?
6401	6402	4	32		Middle Bronze Age?
6790	6791	4		2	Middle Bronze Age
6851	6852	7	4		Middle Bronze Age
6865	6866, 6868	2	8		Middle Bronze Age
6355	6354	1	3		Late Iron Age
6777	6778	2	9		Late Iron Age/early Roman
6867	6839	17	9		Post-Roman

Table 5.37 Summary of the pottery assemblage from Area 10

Date	*NoSh*	*%*	*Wt*	*%*
Early Neolithic (Carinated Bowl, Plain Bowl & Decorated Bowl)	1604	93	8269g	94
Early/middle Neolithic (Ebbsfleet Ware)	1	<1	5g	<1
Middle Neolithic (Mortlake and Fengate Wares)	64	4	352g	4
Late Neolithic (Grooved Ware)	9	<1	29g	<1
LNEBA (Beaker)	21	1	104g	1
Indeterminate earlier prehistoric	28	2	17g	<1
Total	1727	100	8776g	100

based on the dates of the artefacts and only represent the earliest date at which a feature could have become infilled. In the case of 6867, for example, the pottery recovered from the fill suggests a middle Bronze Age date, but this feature was cut into much later plough soil 6202. This feature may have dated to the medieval or modern period, with artefacts in the plough soil incorporated into its fill.

Early Neolithic pottery from Area 10
by Alistair Barclay

Introduction

The earlier prehistoric pottery (1732 sherds, 8.8kg) from Area 10 ranges in date from early Neolithic through to late Neolithic/early Bronze Age (Table 5.37). The later prehistoric pottery (mid Bronze Age to Iron Age) is discussed in a separate report (see Volume 2). The majority (94% by weight) of the early prehistoric assemblage belongs to the early Neolithic and can be described as a Bowl assemblage. Most of this pottery can be characterised as Plain or Decorated Bowl, while sherds of Carinated Bowl are also present. Analysis of absorbed residues is presented in a separate report. In addition to the early Neolithic pottery, Area 10 produced small quantities of middle and late Neolithic and early Bronze Age pottery, which includes Peterborough Ware, Grooved Ware and Beaker (Table 5.37), and is discussed in the appropriate chapters below.

Early Neolithic pottery

In total some 1604 sherds (8.2kg) representing a minimum of 94 vessels of early Neolithic date were recorded most of which came from features in or around the hollow (layers 6331, 6458 and the probably middle Neolithic deposit 6880; a natural hollow 6473; cattle skeleton 6915; tree-throw holes 6801 (6802, 6804) and 6881 (6882) or layers within the hollow itself (6565-6, 6603-11, 6613-8, 6620-1, 6623-4, 6626-30, 6632-36, 6638-9, 6641-4, 6650-7, 6659 and 6661, 6833, 6885-7, 6889-90, 6892-3, 6899-900, 6908). Early Neolithic pottery was also redeposited into features of later date (date and fill numbers:- middle Neolithic: 6914; late Neolithic: 6252-3, 6463, 6741; Bronze Age: 6275; middle Bronze Age: 6224,

Table 5.39 Summary (number, weight) of fabrics by selected feature group

	Sandy				*Flint*				
	A1	*AF1*	*AF2*	*AF3*	*F1*	*F2*	*F3*	*FA1*	*FA2*
Middens									
SE squares	25,60g	71,215g	93,401g	69,650g	51,116g	200, 781g	50, 354g	82, 258g	278,1376g
Central squares	1, 1g	1, 7g		2, 10g	1, 2g	5, 27g	5, 38g	2, 10g	7, 18g
NW squares					1, 1g	1, 5g			
Layers									
6458			2, 10g	2, 8g	3, 9g	48, 49g	8, 63g	5, 30g	7, 49g
6880			1, 3g	1, 6g		4, 14g	2, 16g	3, 14g	4, 28g
6331		1, 3g			3, 7g	4, 8g	1, 20g	1, 5g	4, 25g
Tree-throw holes									
6801				2, 7g		6, 201g			
6881			5, 39g	6, 30g		6, 17g	2, 4g	6, 16g	12, 42g
6913			2, 9g	1, 9g			1, 14g	1, 7g	
Total	26,60g	73,225g	103,462g	83, 720g	59,135g	274, 1102g	69, 509g	100, 340g	312, 1538g

Table 5.38 Summary of all fabrics by group (Number of sherds, weight (g))

Fabric group	*Fabrics*	*NoSh*		*Weight*	*%*	*Group % (NoSh, Wt)*
Sand	A1	29	2%	90 g	1%	
Sand & flint	AF1-3,	270	17%	1455 g	18%	
Subtotal		299	19%	1345 g	19%	19 %, 19%
Flint	F1-3	587	37%	2516 g	30%	
Flint & sand	FA1-3	695	43%	4197 g	51%	
Subtotal		1282	80%	6713 g	81%	80 %, 81%
Quartzite	QA2	2	<1%	3 g	<1%	
Total		1603		8269 g		

6270, 6310-1, 6321, 6323, 6327, 6333, 6343-4, 6349, 6360, 6366, 6368, 6402, 6404, 6406, 6450, 6501, 6509, 6569, 6576, 6724, 6754, 6760, 6776, 6779, 6828, 6872, 6903; Iron Age: 6215, 6225, 6319; late Iron Age and Roman: 6218, 6236, 6321; post-Roman: 6200, 6202, 6584, 6839) and from features of uncertain date (6330, 6462, 6483, 6533, 6542, 6921-4). The assemblage includes a range of bowl forms in a wide variety of fabrics, while cups were relatively rare. The early Neolithic assemblage comprises two typological groups of pottery that can be described as Carinated Bowl and Plain Bowl.

Fabric groups

Eleven fabrics were identified as early Neolithic in date (Appendix 1). Sand- and flint-tempered fabrics accounted for 98% of the total assemblage (Tables 5.38-39). These two groups were made up of fabrics tempered either with sand, flint or a mixture of the two. Such a range of fabrics is typical for pottery of this date from the Middle Thames Valley (see Area 6 report above). The only minor fabric group represented on Area 10 is the principally quartzite-tempered QA2.

FA3	*QA*	*Indet*	*Total*
165,1372g	1, 1g	12, 6g	1097, 5590 g
3, 24g			27, 137 g
			3, 7g
8, 75g			83, 293g
10, 170g			25, 251g
2, 22g			16, 90 g
			8, 207 g
10, 85g	1, 2g		48, 235 g
			5, 39 g
198, 1748g	2, 2g	13,7g	1312, 6849 g

Manufacture and firing

The assemblage is typically handmade from strips or rings of clay according to the methods described for vessels from the larger Area 6 assemblage. Evidence for construction was visible in P42, P53, P59 and P66 (diagonal bonding). Breakage along planes of weakness (rim and shoulder zone) was evident in P35 and P58. Rim and shoulder forms, finish and firing also follow what is described for Area 6. Several examples of refired or overfired vessels were identified (eg P62) as well as a single example of a spalled sherd. All of this evidence could indicate that some pottery manufacture took place near to the Area 10 site.

Surface treatment

As with Area 6, clay slips were added to some vessels, sometimes to aid smoothing or burnishing of the surfaces and to thicken the upper necks and rims of some vessels (eg P6). Smoothing and burnishing was also used to emphasise particular zones of a vessel, especially rims. Burnish was often used on fine vessels (carinated and S-profile bowls) as represented by P1, P3, P14-5, P25, P30, P32, P53, P55-6, P71, P73 and P83 as well as a probable coarser vessel, P16. Examples of fluted rims include P61, while ripple burnish was present on P20-1, P44, P46 and body sherds recovered from contexts 6616 , 6642 (P44), 6654 and 6833.

Decoration

Decorated pottery in Area 10 was limited to just six examples: five rims (Fig. 5.62, 78, P81 and 84, and Fig. 5.60, 36 and 40) and a shoulder sherd (P65). Four rims have linear decoration: P81 and P84 are decorated with simple parallel lines or grooves, P40 has oblique incised lines, while on P36 they are cross-hatched. P78 has a row of finger-nail impressions on its neck just below the rim; P65 has rows of stabbed dots bounded by linear incised marks.

The decorated shoulder sherd can be placed within the Mildenhall style of the Decorated Bowl tradition. Sherds with Mildenhall affinities have been found at the Staines causewayed enclosure (eg Robertson-Mackay 1987, fig 48: P136) and at the Maiden Bower enclosure, some 30km to the north

(Piggott 1931). P81 can also be paralleled at Staines, while P40 can be paralleled at Whiteleaf (Smith 1954, fig 5: 8-12). The cross-hatching on P36 can also be loosely paralleled with a bowl from Whiteleaf (Fig. 5.60, 36). A rim somewhat similar to P40 was found in Area 16.

Handles and perforations

A single example of a perforated handle was recorded. It was made from a tube of clay applied to a shoulder carination of a bowl (Fig. 5.60, 32). This type of perforated handle can not be precisely paralleled within the Middle Thames. Examples of perforated lugs can be found among the assemblage published from the causewayed enclosure site of Windmill Hill, Avebury (Smith 1965, fig 23: P130 and P134). A single example of a vessel with perforations set below the rim was recorded (P74). Similar vessels are quite common within bowl assemblages and are discussed in greater detail in the Area 6 report.

Forms

The assemblage is characterised by a relatively high degree of brokenness, which means that any system of recording has to take into account vessel elements (eg rim, neck, body, shoulder and base sherds). Featured sherds consisting of these elements were recorded separately and in the case of rims and shoulders further subdivided by form (see below). Given the high degree of brokenness of this assemblage it was decided not to record the angle of the rim and neck as in many cases this could not be determined with any certainty and would simply be subjective. Relatively few vessel profiles can be reconstructed and, therefore, the analysis has to focus on rim form.

Rim morphology

The rim morphology adopted has been outlined in the Area 6 report and is presented in Table 5.40. A breakdown and quantification of rim forms is given in Table 5.41 along with comparative data from Area 6 and the Staines causewayed enclosure. Table 5.42 presents a breakdown of rim forms from selected Neolithic contexts.

Shoulder morphology

This follows the scheme outlined in the Area 6 report. These were divided into slack rounded shoulders (1) and a range of angular forms (2-5), and rounded and grooved (6). However, only types 1-4 are present in the Area 10 assemblage (Table 5.43).

In total the shoulder sherds were thought to come from possibly as many as 33 separate vessels from which at least 15 could have derived from Carinated Bowls (Table 5.44).

Vessel morphology

This follows what is outlined in the Area 6 report with vessels divided into two basic categories: cups/small bowls (up to 120mm diameter) and medium to large bowls (120-500mm diameter) and then subdivided by form. In total a minimum of 94 vessels were identified by rims, of which five were cups or small bowls.

Table 5.40 Illustrated rim forms

Simple		
1	Plain	P3-5, 8, 10, 21, 23, 26, 30, 35-6, 39, 55, 58-9, 63, 79, 83, 85-6, 90-1
2	Plain everted	P6, 9, 22, 24
3	Pointed	P50, 80
Rolled		
4	Rolled	P11-3, 16, 27, 29, 33-4, 37-8, 40-1, 44, 46-9, 54, 56-7, 62, 64, 66, 73-4, 77, 82, 88
5	Beaded	P72
Heavy		
6	Externally thickened	P2, 14, 60
7	Expanded	P28
8	T- shaped	P17, 86
9	Inturned	

Table 5.41 A breakdown and quantification of the rim forms with a comparison with Staines

Rim form	*Area 6*	*%*	*Area 10*		*Staines CE*	*%*
1	81	15	45	38	192	33
2	154	28	26	24	60	10
3	11	2	2	1	46	8
Simple subtotal	246	45	90	63	298	51
4	246	44	32	24	152	26
5	17	3	6	4	19	3
Rolled subtotal	263	47	41	28	171	29
6	34	6	4	3	71	12
7	4	1	3	2	14	2
8	3	1	3	2	11	2
9	1	<1	1	0	8	1
10	2	<1	1	0	6	1
Heavy subtotal	44	8	13	9	110	19
Total	553		126		579	

Cups and small bowls

Cups occur either as neutral (1a – eg P3, P21, 37, or closed (1b – eg P79) forms. P21 is a miniature cup or thumb pot similar to vessel fragments found in the Area 6 assemblage. P79 was the most complete cup. A single cup (P59) was analysed for lipids (samples 44(13a) and was found to contain ruminant fats (see Evershed *et al.* below).

Bowls

As with the Area 6 assemblage the majority of rims from the Area 10 assemblage cannot be assigned to

Table 5.42 A breakdown of rim types by selected feature groups.

Context	*Rims*												*Total*
	Plain			*Rolled*				*Heavy*					
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*Misc*	
Middens													
SE squares	24	15	1	22	3	2	3	2		1		3	76
Central squares			1	1									2
Tree -throw holes													
6801	2												2
6881	3			4	1								8
6913					1								1
Layers													
6458		3		1	1								5
6880	2	1		1									4
6331	2	1											3
Other contexts	12	6		3		2		1	1				25
Total	45	26	2	32	6	4	3	3	1	1	0	3	126

Table 5.43 Illustrated shoulder forms

1	Rounded	P30, 52, 71
2	Simple angular	P1, 11, 35, 38, 51, 65
3	Angular with stepped profile	P15, 12-3, 25, 47, 71
4	Angular stepped and grooved	P76

Table 5.44 A breakdown and quantification of the shoulder forms with a comparison with Staines (SCE) (published vessels only)

Shoulder form	*Area 6*	*%*	*Area 10*	*%*	*SCE*	*%*
1	46	42%	18	55%	5	21%
2	35	32%	7	21%	5	21%
3	21	19%	5	15%	3	13%
4	5	5%	3	9%	0	0%
5	2	2%	0	0	2	8%
6	1	1%	0	0	1	4%
7	1	1%	0	0	8	33%
Total	110		33		24	

a particular bowl type. A small number of hemisperical or globular bowl forms are represented by the vessel P66, the rims P26 and P72 and the shoulders P23 and P71. Vessel P30 has a sinuous profile and can be loosely described as an S-profile bowl. A number of heavy rims are more likely to derive from uncarinated vessels (eg P39 and P40). Carinated bowls are represented by P35 and P38 and by shoulders P9, P11-3, P25, P47, P51 and P76 and possibly by rims P3-4, 14 and P53. At least one lugged bowl (P32) is represented, along with at least 6 decorated bowls (P36, 40, 65, 78, 81 and 84) of uncertain form. The assemblage of bowls can be broadly split into thin-walled finewares often with simple rims (eg P3-4, 14, 52-3, 61) and coarsewares with thicker walls and sometimes heavier rims (eg P28-9, 39, 41, 50, 62, 72). Most bowls can either be described as open or neutral in form, although one rim (P27) was almost certainly from a closed form. In total some 89 vessels could be identified by rims of which 36 were examined for lipid residues (see Evershed *et al.* below).

Discussion of forms

The brokenness of the assemblage and the limited number of vessel profiles restricts the potential to characterise the assemblage by vessel type. However, the following general comments can be made. Although the assemblage appears to be made up of Plain Bowl pottery, it also contains a proportion (at least 15 vessels) of Carinated Bowl, and a small number (six vessels) of Decorated Bowls, along with bowls with lugs, perforations and ripple burnish. Some of the decorated pottery has affinities with the Mildenhall style and with pottery recovered from Runnymede and Whiteleaf. The overall assemblage is therefore unlikely to represent a homogenous group. It is thought that the variety of types is likely to reflect a long chronology and episodic use of the site over centuries during the early Neolithic period (4100-3350 cal BC).

Evidence for use

The overall assemblage includes a complete range of vessels (cups, small bowls, larger bowls, fine and coarse bowls) that might be expected on a domestic site. Charred and absorbed (lipid) residues on a number of bowl and cup sherds indicate preparation and consumption of food. The analysis of 37 vessels identified animal fats and dairy products as well as the use of beeswax (see Evershed *et al.*

below). There were no obvious patterns of correlation between type of pottery, fabric and lipid residue. The analysis demonstrated that vessels had contained either ruminant or dairy fats. Porcine fats were notably absent from the vessels sampled, while there was evidence for the mixing of animal fats and beeswax in two vessels (samples 46 and 49). Charred residues were found on at least eight body sherds some of which were used for radiocarbon dating.

Discussion

The Area 10 assemblage is characterised by mostly small, plain sherds of which *c* 20% can be classified as featured (rims, shoulders or decorated). Many of the 94 identified vessels recorded were represented by single rim sherds only. Refitting and related sherds were limited, representing only a small number of vessels. In the absence of whole vessel profiles, characterisation has to depend on vessel elements (rims and shoulders).

The Area 10 assemblage is not a homogenous group of pottery and, like Area 6 appears to be of mixed character. While the majority of the assemblage can be characterised as Plain Bowl, it also contains vessels and sherds more characteristic of Carinated Bowl assemblages (P19-20 and possibly P9-10, P66 and 68), while other carinated vessels are represented by P16, P18, P42, P45 and P54. Other bowls from Area 10, mostly of uncertain form, had heavy rolled (P60) or expanded rims (P58). Decorated Bowls are also present and these include P36, P40, P65, P78, P81 and P84. There are sherds from ripple burnished bowls (eg P44 and P46) as well as a sherd from a lugged vessel (P32) and the handle from a 'spoon' (P82). Cups are also a component of the overall assemblage (eg P59). In terms of chronology the overall assemblage could be representative of much of the early Neolithic period. Unlike Area 6, no discrete groups of Carinated Bowl occur, perhaps indicating that this material was well dispersed within the hollow or that material within the hollow had undergone considerable disturbance, movement and redeposition.

In terms of the range and style of pottery, the Area 10 assemblage is similar to the one from Area 6 in many ways, and the two are considered to have been broadly contemporaneous. However, the comparison made between the assemblages from these two areas and the Staines enclosure in Tables 5.41 and 5.44 suggest that Area 10 could be closer in character, and by implication date, to Staines. Many of the vessel and rim forms are common to all three sites, with the exception of Carinated Bowl which is not present at Staines. Ripple burnished bowls are found at all three sites, as are decorated bowls.

Analysis of the Area 10 assemblage identified little evidence for the *in situ* deposition of ceramics, with only slight evidence for refitting. In general, the assemblage was characterised by a high number of relatively small sherds (eg 50% of the sherds recovered from the main hollow deposit weighed 3g or less, while only 13% weighed 10g or over (range 1-51g).

In total 19 groups of refitting and/or related sherds were found, of which all but one sherd group (6802) came from the south-eastern sample squares. In most cases (squares 6243-5, 6248, 6565, 6613, 6615) refits were between only two or three sherds. However, in squares 6615 and 6621 more complex refits were found. Square 6615 contained at least 19 sherds from vessel P30 as well as 11 sherds from the base of a bowl, the nine sherds that represent the carinated vessel P35 and the two sherds that make up vessel P38 (Plate 5.17).

The refitting evidence from 6615 may be taken as an indicator that this deposit had undergone little post-depositional disturbance and that the pottery had been dumped in a semi-fragmentary state. However, in the majority of cases vessels are represented by single featured sherds, suggesting that much of the material was deposited in an already broken, mixed and fragmentary state into the hollow. This implies that much of the pottery entered the hollow as secondary rubbish that had been broken, collected and stored elsewhere.

The south-eastern sample squares (6240-9, 6565-6, 6603-11, 6613-8, 6620-1, 6623-4, 6626-30, 6632-36, 6638-9, 6641-4, 6650-7, 6659 and 6661, 6833) produced a total of 1097 sherds of early Neolithic pottery weighing 5590g, which accounts for over 80% of the stratified pottery of this date from Area 10. However, a high proportion of this assemblage was made up of sherds that weighed less than 5g. Figure 5.55 illustrates the overall distribution of early Neolithic sherds within this area of the hollow, as well as the higher concentration of sherds in the squares toward the north, in particular 6615, 6565 and those contexts around tree-throw hole 6881. Some 76 rims were identified representing somewhere in the region of 70 vessels. This group of vessels includes Carinated, Plain and Decorated bowls (Figs 5.59-62: P1-51) that are unlikely to have been contemporaneous.

The high frequency of small sherds from the Area 10 hollow suggests that the pottery had been ground down by some physical process such as repeated trampling. However, there is evidence for more complete vessels such as P30 and P35, 53, 58 and 66, although it is not clear whether they represent *in situ* breakage or the dumping of material broken elsewhere. None of the recorded sherds that make up vessel P30 weigh more than 10g, while it can be noted from the illustrations that the larger or coarser vessels represented by P53, 58 and 66 (Fig. 5.61) appear to have broken into relatively bigger fragments (10-25g). One way to explain the pattern of fragmentation found in P30, 58 and 66 is that they were deposited as more complete fragments that subsequently became crushed on the surface of the hollow. The high frequency of low weight sherds could have been produced by repeated episodes of trampling, fragmentation and dispersal of material. If this is what took place within the midden then it

would be expected that other contexts protected from such a cycle should show a different pattern of fragmentation.

Tree-throw hole 6881 (fill 6882) has an almost identical plot to the hollow, perhaps suggesting that material was redeposited from the hollow, while the probably middle Neolithic scatter 6880 has a different plot signature. This could just be a factor of the small sample size (25 sherds) but it could also reflect a deposit of different character. In the field, 6880 was described as being different from the main hollow deposit, and was interpreted as an artefact scatter rather than a midden deposit. Although the pottery from this deposit included a single sherd of Peterborough Ware, and the deposit may be middle Neolithic in date, it also contained rims from at least five early Neolithic vessels (P57-61), and was fairly typical of the assemblages from the hollow.

The remaining features associated with the hollow contained relatively small quantities of early Neolithic pottery of generally similar character. This includes layers 6458 and 6331 (Table 5.39). Layer 6331 (Fig. 5.61, 62-3) was also cut by the south-eastern sample squares that produced a further 1097 sherds of early Neolithic pottery. Context 6458 was a section through the hollow that produced 83 early Neolithic sherds which include P52-6. Twenty seven sherds of early Neolithic pottery came from the central sample squares (6885-7, 6889-90 and 6892-3), which included the pointed rim (P64). Tree-throw holes 6801, 6881 and 6913 again contained only small groups of early Neolithic pottery (Table 5.39). These groups include a refitting bowl fragment (P66) from tree-throw hole 6801, a group of vessels (represented by P67-72) from tree-throw hole 6881, and a simple rim (P73) from tree-throw hole 6913.

Evaluation Trenches 86 and 88 produced small quantities of early Neolithic pottery. Some 11 fragments of early Neolithic pottery were recorded from Evaluation Trench 86, which includes the decorated shoulder sherd (P65) possibly from a Mildenhall style bowl. Evaluation Trench 88 produced 25 fragments of early Neolithic pottery, most of which derived from three vessels, a cup and two bowls (Figs 5.61, 74 and 5.62, 75).

Although most of the early Neolithic pottery came from the Area 10 hollow, redeposited sherds were found in features of middle Neolithic, late Neolithic, Bronze Age, Iron Age, Roman and post-Roman date. This includes the thumb pot (P77), the decorated rims (P78, 81 and 84), the 'spoon' shaft (P82) and illustrated rims P79-80, 83, 85-6.

Catalogue (Figs 5.59-62)

Layers within the Area 10 hollow

SE squares (6240-9, 6565-6, 6603-11, 6613-8, 6620-1, 6623-4, 6626-30, 6632-36, 6638-9, 6641-4, 6650-7, 6659 and 6661, 6833)

1 6244, spit 2. SF 92107. Bowl. Shoulder sherd (type 2) (11g). Fabric FA2/EN. Firing: ext. and core black; int. reddish-brown. Condition average to worn.

2 6244. SF 32549 and 32552. Plain Bowl. Refitting rim sherds (type 1) (38g). Fabric FA2/EN. Firing: ext. and core reddish-brown and int. black. Condition average to worn. Res sample 72.

3 6245. SF 40151. Plain Bowl. Everted rim (type 2) (6g). Fabric FA2/EN. Interior smoothed. Firing: ext. reddish-brown; core and int. black. Condition average.

4 6245. SF 40380. Plain Bowl. Simple rim (type 1) (4g). Fabric FA1/EN. Firing: ext. reddish-brown; core and int. black. Condition average.

5 6245. SF 40142. Plain Bowl. Rolled rim (type 4) (16g). Fabric FA3/EN. Firing: reddish-brown throughout. Condition average.

6 6245. SF 40371. Plain Bowl. Rolled rim (type 4) (10g). Fabric AF2/EN. Firing: ext. black; core brown; int. black. Condition average.

7 6246. SF 40816. Plain Bowl. Rolled rim (type 4) (6g). Fabric FA1/EN. Firing: ext. brown; core grey; int. black. Interior burnish. Condition average.

8 6246. SF 31292. Plain Bowl. Expanded rim (type 6) (4g). Fabric AF2/EN. Firing: ext. black; core grey; int. black. Condition average to worn.

9 6247, spit 2. SF 32182. Carinated Bowl. Shoulder (type 3) (7g). Fabric AF3/EN. Firing: reddish-brown throughout. Condition worn.

10 6247, spit 2. SF 32964. Plain Bowl. Rolled rim (8g). Fabric AF3/EN. Firing: ext. and core black; int. brown. Condition average to worn.

11 6248. SF 31197. Plain Bowl. Shoulder (type 1) (41g). Fabric FA3/EN. Firing: ext. reddish-brown; core grey; int. brown. Condition average. Res sample 71.

12 6248, spit 3. SF 41826. Carinated Bowl. Shoulder (type 4) (15g). Fabric AF1/EN. Firing: ext. brown; core grey; int. brown. Surfaces smoothed. Condition average. Residue sample 73.

13 6248, SF 31853/2. Bowl. Refitting shoulder sherds (type 2) (4g). Fabric FA3/EN. Firing: ext. brown; core grey; int. brown. Interior burnish. Condition average. Residue sample 38.

14 Context 6565. SF 41492 and 41494. Bowl. Refitting cup rim sherds (type 1) (18g). Fabric FA1/EN. Firing: black throughout. Burnished surfaces Condition average.

15 6565. SF 41600. Bowl. Everted rim (type 2) (6g). Fabric FA1/EN. Firing: brown throughout. Smoothed exterior. Condition average to worn.

16 6565. SF 41607. Bowl. Outturned rim (type 6) (12g). Fabric FA3/EN. Firing: ext. black; core reddish-brown; int. black. Condition average.

17 6565. SF 31544. Bowl. Rim (type 8) (3g). Fabric F1/EN. Firing: reddish-brown throughout. Condition average to worn.

18 6565. SF 31231. Bowl. Cup rim (5g). Fabric FA3/EN. Firing: ext. grey throughout. Condition worn.

19 6565 SF 32457. Bowl. Everted rim (type 2) (9g). Fabric F1/EN. Firing: ext. brown; core grey; int. black. Condition worn.

20 6603. SF 42399. Bowl. Everted rim (type 2) (24g). Fabric FA2/EN. Firing: ext. greyish-brown; core grey; int. black. Burnished surfaces. Condition average. Residue sample 87.

21 6613, spit 2. SF 41970. Bowl. Everted rim (type 2) (10g). Fabric AF1/EN. Firing: black throughout. Ripple burnished surfaces. Condition average. Residue sample 82.

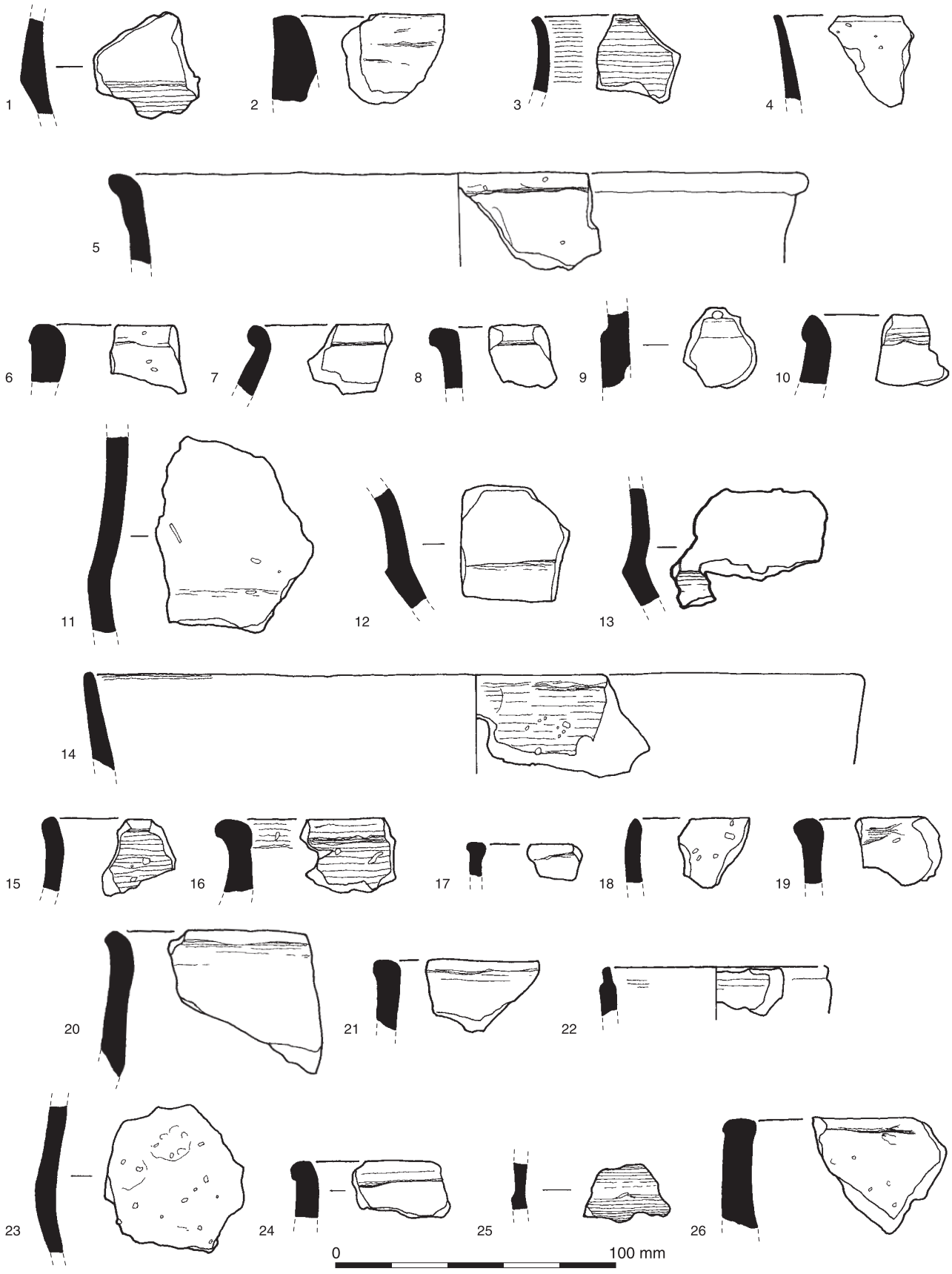


Fig. 5.59 Area 10: early Neolithic pottery from the area of the SE squares, 1-26

Fig. 5.60 Area 10: early Neolithic pottery from the area of the SE squares, 27-47

22 6613, spit 3. SF 41509. Bowl. Small bowl or cup with neck groove (3g). Fabric FA2/EN. Firing: ext. black; core grey; int. black. Condition average to worn.
23 6613. SF 41516. Bowl. Shoulder (type 1) (22g). Fabric FA3/EN. Firing: ext. brown; core grey; int. brown. Condition average. Residue sample 76.
24 6613. SF 32829. Bowl. Rolled rim (type 4) (6g). Fabric FA2/EN. Firing: greyish-brown throughout. Condition average. Residue sample 62.
25 6615/3??, spit 2. SF 32972. Bowl. Shoulder (type 4) (4g). Fabric FA2/EN. Firing: reddish-brown throughout. Condition average.
26 6614, spit 2. SF 32666. Bowl. Large beaded rim (type 5) (24g). Fabric AF3/EN. Firing: reddish-brown throughout. Condition average. Residue sample 84 (no identified residue).
27 6615. SF 32875. Bowl. Beaded rim (type 5) (6g) from a bowl of closed form. Fabric FA2/EN. Firing: ext. reddish-brown; core and int. black. Condition average. Residue sample 85.
28 6615, spit 2. SF 32336. Bowl. Expanded rim (type 7) (9g). Fabric FA3/EN. Firing: brown throughout. Condition average. Residue sample 74.
29 6615, spit 2. SF 32905. Bowl. Heavy rim (type 7) (10g). Fabric FA2/EN. Firing: ext. reddish-brown; core and int. black. Interior smoothed. Condition average. Residue sample 80.
30 6615. SF 32867, 32873, 41054, 41107, 41377, 41379, 41387, 41389, 41393, 41399-400, 41402-4, 41412, 41415, 41444, 41454, 41566. Plain bowl. At least ten of the 17 sherds refit to form the rim and shoulder of a small, S-profiled bowl (93g). Dia. 200mm. Fabric F2/EN. Firing: ext. black; core grey; int. black, grey or brown. Smoothed surfaces. Condition average to worn.
31 6615, spit 4. SF 41380. Bowl. Everted rim (type 2) (21g). Fabric FA2/EN. Firing: ext. brown; core and int. grey. Condition worn. Residue sample 71 (41)
32 6616, spit 2. SF 32691. Bowl. Shoulder sherd (type 2) with perforated horizontal lug (10g). Fabric F2/EN. Firing: ext. brown; core black; int. brown. Condition worn.
33 6618, spit 3. SF 41540. Bowl. Rolled rim (type 4) (9g). Fabric FA3/EN. Firing: reddish-brown throughout. Condition average.
34 6621. SF 31714. Bowl. Simple rim (type 1) (6g). Fabric AF2/EN. Firing: grey throughout. Smoothed surfaces. Condition worn. Residue sample 65.
35 6621. SF 31701, 31703-5, 31708-11, 31713 and 31716. Carinated Bowl. Rim, neck and shoulder sherds (type 4 rim) (40g). Fabric F2/EN. Firing: ext. grey or black; core and int. black. Condition average to worn.
36 6621, spit 2. SF 32729. Dec bowl. Everted rim (type 2) (9g). Fabric FA2/EN. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition average to worn.
37 6621. SF 41329 Bowl. Simple rim (type 1) (4g). Fabric FA2/EN. Firing: black throughout. Condition average. Residue sample 60.
38 6621. SF 41700 and 41331, spit 2. Bowl. Rim and shoulder sherds from a small ?Carinated Bowl (6g). Fabric F1/EN. Firing: black throughout. Condition average to worn.
39 6629. SF 32316 Bowl. Rolled rim (type 4) (28g). Fabric FA3/EN. Firing: ext. and core reddish-brown; int. black. Condition average to worn.
40 6629. SF 31616. Decorated Bowl. Rim with oblique incised lines (type 11) (26g). Fabric F3/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition worn.
41 6634. SF 41318. Bowl. Rolled rim (type 4) (19g). Fabric FA3/EN. Firing: ext. and core reddish-brown; int. black. Condition average to worn.
42 6636. SF 31286 CB rim Bowl. (42g). Fabric F2/EN. Firing: black throughout. Condition average.
43 6639. SF 40227. Bowl. (type 4) (6g). Fabric F2/EN. Firing: ext. and core black; int. brown. Condition average. Residue sample 78.
44 6642, spit 1. SF 32091. Bowl. Body sherd from a ripple-burnished bowl (21g). Fabric AF2/EN. Firing: ext. brown; core and int. black. Burnished surfaces. Condition average.
45 6651, spit 1. SF 41939. Bowl. Rolled rim (type 4) (8g). Fabric FA3/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition average to worn. Residue sample 63.
46 6652. SF 32127. Bowl. Neck sherd from a ripple burnished bowl (25g). Fabric FA2/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Condition average. Residue sample 86.
47 6653, spit 3. SF 41892. Carinated Bowl. Shoulder (type 3) (19g). Fabric AF2/EN. Firing: ext. black; core grey; int. black. Burnished surfaces. Condition worn. Residue sample 67.
48 6654, spit 1. SF 32327. Bowl. Simple rim (type 1) (13g). Fabric AF3/EN. Firing: black throughout. Condition average.
49 6833. SF 40599. Bowl. Rolled rim (type 4) (4g). Fabric AF2/EN. Firing: reddish-brown throughout. Smoothed surfaces. Condition worn.
50 6833, spit 3. SF 41232. Bowl. Rolled rim (type 4) (17g). Perforated below rim. Fabric F3/EN. Firing: ext. reddish-brown; core grey; int. reddish-brown. Smoothed surfaces. Condition average.
51 6833, spit 4. SF 41648. Bowl. Shoulder (type 2) (5g). Fabric FA2/EN. Firing: ext. and core black; int. brown. Internal burnish. Condition average.

Layers 6458, 6880 and 6331

52 6458, SF 30683. Bowl. Everted rim (type 2) (22g). Fabric F2/EN. Firing: grey throughout. Burnished surfaces. Condition average. Residue sample 39.
53 6458. Bowl. A total of five rim and neck sherds from a fine ?Carinated Bowl (type 2 rim) (38g). Fabric F3/EN. Firing: black throughout. Condition average.
54 6458. SF 30921. Bowl. Everted rim (type 2) (13g). Fabric FA2/EN. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition average.
55 6458. SF 30684. Bowl. Beaded rim (type 5) (3g). Fabric F1/EN. Firing: black throughout. Condition average.
56 6458. SF 30664. Bowl. Rolled rim (type 4) (5g). Fabric FA2/EN. Firing: ext. brown; core and int. black. Burnished surfaces. Condition average.
57 6880, SF 41033. Bowl. Simple rim (type 2) (15g). Fabric F3/EN. Firing: reddish-brown throughout. Condition average.
58 6880. SF 40881, 40872, 40960, 40995 and 41011. Plain Bowl. Refitting neck and rim sherds (96g). Fabric FA3/EN. Firing: ext. reddish-brown; core and int. brown. Condition average-worn.
59 6880. SF 41168. Bowl. Refitting sherds from the rim

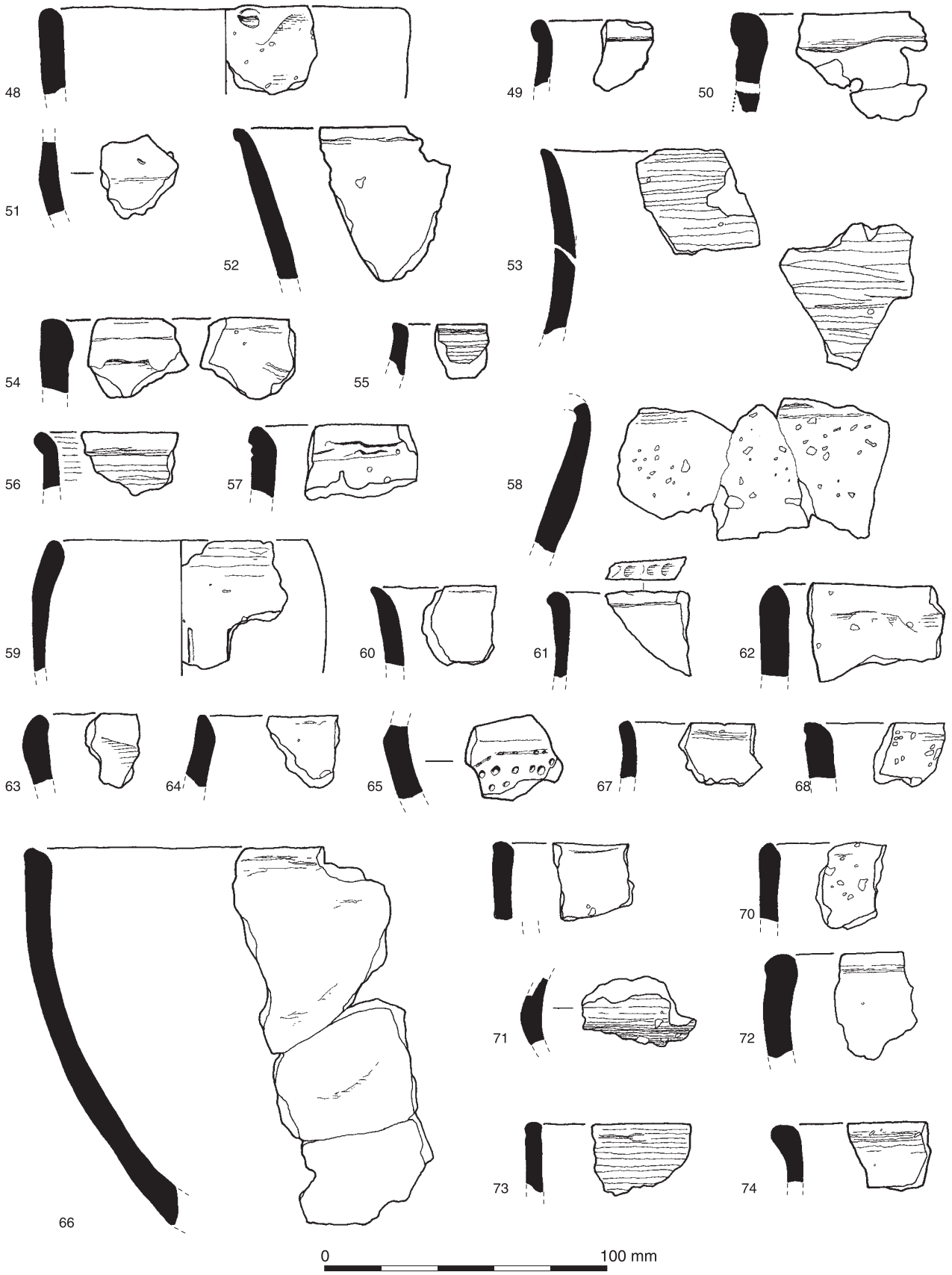


Fig. 5.61 Area 10: early Neolithic pottery from the area of the SE squares, 48-51; layers 6458, 6880 and 6331, 52-63; central squares, 64; evaluation trench 86/2, 65; tree-throw holes 6801, 6881 and 6913, 66-73; and evaluation trench 88, 74

(type 1) of a cup (14g). Fabric FA3/EN. Firing: ext. and core grey; int. brown. Condition average. Residue sample 44.

60 6880, SF 40933. Bowl. Everted rim (type 2) (6g). Fabric FA1/EN. Firing: ext. and core brown; int. black. Condition average. Residue sample 81.

61 6880, SF 40892. Bowl. Rolled rim (type 4) (6g). Fabric FA1/EN. Firing: black throughout. Interior burnish and fluted rim. Condition average. Residue sample 61.

62 6331, SF 40732. Bowl. Simple rim (type 1) (20g). Fabric F3/EN. Firing: yellowish-brown throughout. Condition average to worn.

63 6331. SF 40067. Bowl. Simple rim (type 1) (5g). Fabric FA1/EN. Firing: ext. black; core grey; int. black. Condition average.

Central squares (6885-7, 6889-90 and 6892-3)

64 6892, SF 41729. Bowl. Pointed rim (type 3) (6g). Fabric AF3/EN. Firing: black throughout. Condition average.

Evaluation trench 86/2

65 86/2. Decorated Bowl, ?Mildenhall style. Shoulder (type 2) decorated with incised lines and multiple stab marks (12g). Fabric FA2/EN. Firing: ext. and core black; int. brown. Condition worn.

Tree-throw hole 6801 (6802, 6804), 6881 (6882) and 6913(6914)

66 6802. Bowl. Refitting rim and body sherds from the side of a simple bowl (92g). Fabric F2/EN. Firing: ext. reddish-brown; core and int. grey. Condition average. Residue sample 59.

67 6882, SF 41671. Bowl. Rolled rim (type 4) (5g). Fabric F2/EN. Firing: black throughout. Interior burnished, exterior smoothed. Condition worn.

68 6882, SF 41300. Bowl. Semi rolled rim (type 4) (6g). Fabric AF3/EN. Firing: reddish-brown throughout. Condition worn.

69 6882, SF 41484. Bowl. Simple rim (type 1) (6g). Fabric AF3/EN. Firing: reddish-brown throughout. Condition average. Residue sample 79.

70 6882, SF 42116. Bowl. Simple rim (type 1) (7g). Fabric FA3/EN. Firing: reddish-brown throughout. Condition average.

71 6882, SF 41298. Bowl. Shoulder sherd (type 2) (7g). Fabric FA3/EN. Firing: ext. and core black; int. brown. Condition average to worn.

72 6882, SF 42392. Bowl. Beaded rim (type 5) (15g). Fabric AF2/EN. Firing: black throughout. Condition average. Residue sample 70.

73 6914, SF 42456 Bowl. Beaded rim (type 5) (7g). Fabric FA2/EN. Firing: black throughout. Burnished surfaces. Condition average.

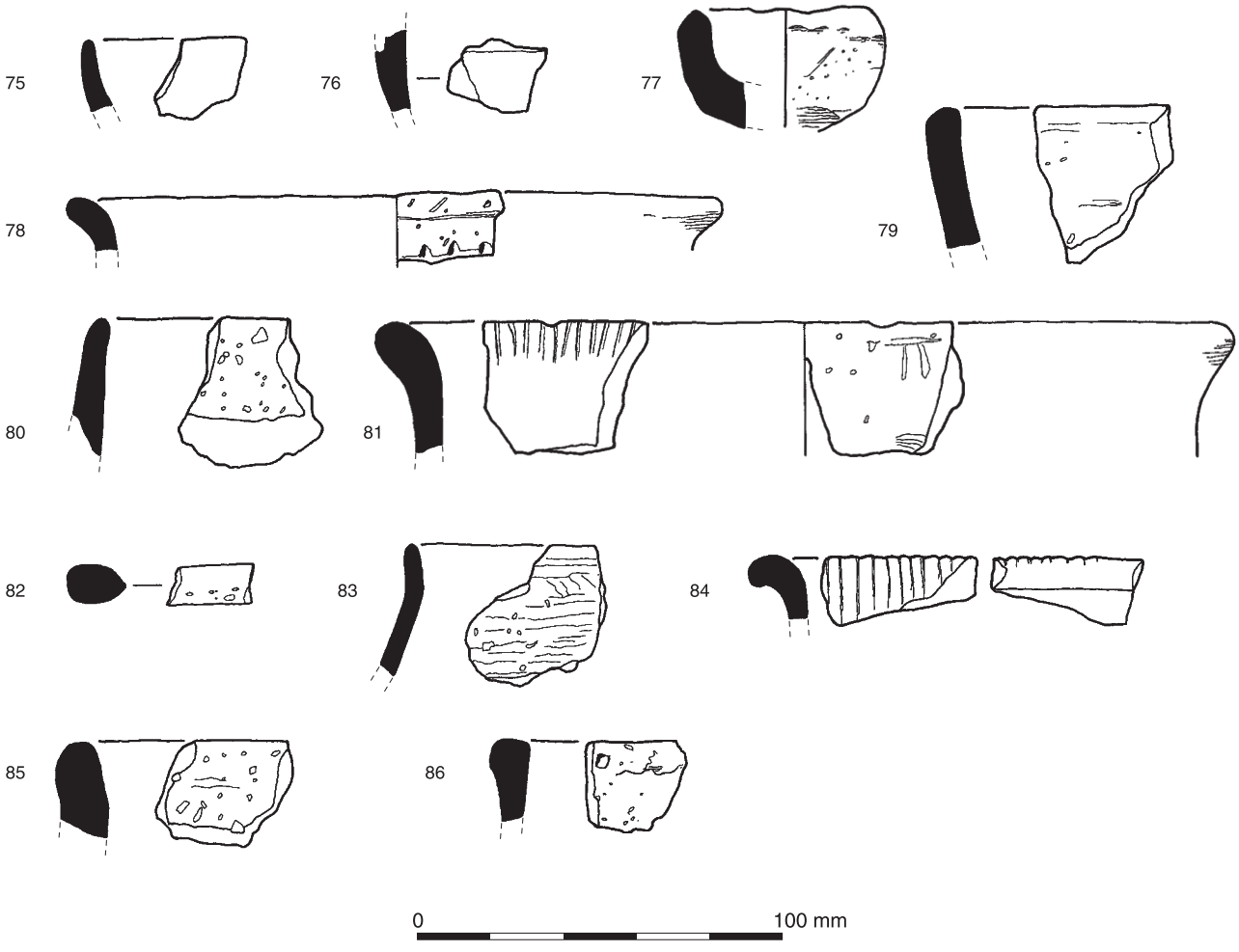


Fig. 5.62 Area 10 early Neolithic pottery. Evaluation Trench 88, 75; later features, 76-86

Evaluation Trench 88

74 88/2, SF 77039. Plain Bowl. expanded rim Bowl. (type 6) (6g). Fabric FA2/EN. Firing: ext. reddish-brown; core and int. black. Condition worn.

75 88/2, SF 77039. Plain Bowl. Cup rim (type 1) (3g). Fabric A1/EN. Firing: ext. reddish-brown; core and int. black. Condition average.

Earlier Neolithic pottery from later features

Late Neolithic/early Bronze Age context

76 6741. Carinated Bowl. Shoulder sherd (type 4) (4g). Fabric FA2/EN. Firing: black throughout. Condition average.

Middle Bronze Age contexts

77 6310. Bowl. Miniature cup with a simple rim (type 1) (21g). Fabric A1/EN. Firing: ext. reddish-brown; core black; int. reddish-brown. Condition average.

78 6311. Decorated Bowl. Everted rim sherd (type 2) with impressed decoration on neck (7g). Fabric FA2/EN. Firing: ext. black; core grey; int. reddish-brown. Condition average.

79 6311. Bowl. Simple rim (type 1) (16g). Fabric FA2/EN. Firing: ext. reddish-brown; core and int. grey. Condition worn.

80 6236. Bowl. Simple rim (type 1) (14g). Fabric F3/EN. Firing: grey throughout. Condition worn.

81 6236. Decorated Bowl. Thickened everted rim (type 2) decorated with parallel incised lines (26g). Fabric FA2/EN. Firing: ext. black; core and int. grey. Condition average.

82 6236. Spoon shaft (g). Fabric FA3/EN. Firing: ext. reddish-brown; core grey. Condition average-worn.

83 6922, SF 42523. Bowl. Everted rim (type 2) (8g). Fabric FA3/EN. Firing: ext. reddish-brown; core grey; int. brown. Condition average. Residue sample 45.

Iron Age and Roman contexts

84 6321. Decorated Bowl. Rolled rim (type 4) decorated with parallel rows of deep rounded grooves (11g). Fabric FA2/EN. Firing: ext. reddish-brown; core and int. grey. Condition average.

Post-Roman contexts

85 6200, SF 32275. Bowl. Simple rim (type 1) (15g). Fabric FA3/EN. Firing: reddish-brown throughout. Condition average.

86 6327. Bowl. Expanded rim (type 8) (7g). Fabric FA3/EN. Firing: ext. black; core grey; int. brown. Condition worn.

Fired clay from Area 10 *by Alistair Barclay*

Ten contexts from Area 10 (6241, 6243, 6246, 6343, 6371, 6615, 6618, 6629, 6882 and 6885) produced 12 (23g) amorphous fragments of fired clay. Most of the fragments weigh either 1 or 2g. The fragments are generally featureless, untempered and oxidised reddish-brown. Such fragments are likely to derive from hearths or from other activities like the burning of *in situ* tree stumps. The precise date of the fired clay is uncertain and can only be indirectly dated to the early-middle Neolithic through its association with pottery; it is possible that some or all of the material is intrusive as fired clay was also found in Iron Age contexts in Area 10.

The only fired clay object of early Neolithic date is the 'spoon' shaft fragment (described in the pottery report; Fig. 5.62, 82).

Early Neolithic flint from Area 10 *by Hugo Anderson-Whymark*

Introduction

A total of 5416 struck flints were recovered from the excavations in Area 10, 10J and Evaluation Trenches 86 and 88 (Table 5.45 for Area 10 and Table 5.48 for Evaluation Trench 88). The majority of the flint was recovered from a hollow running across the site. Most of the flint dates from the earlier Neolithic, but a small number of later Neolithic and early Bronze Age flints were also found and are discussed in the appropriate chapters below. A sizeable number of struck flints (739 in all) came from middle or late Bronze Age features, and although these included some residual earlier flints, most of the flintwork appeared to be contemporaneous with the features, and so is discussed in Volume 2. Reference will, however, be made to clearly residual earlier flints in Bronze Age features in this report. A further 686 flints were residual in Iron Age and later features, or in unphased features. These flints appeared mainly to be of Neolithic character.

Raw material and condition

The vast majority of flint used appears to be of local origin, derived from the river gravels. Colour varies from translucent beige through to orange and dark brown, with varying degrees of opacity. Cortex is generally thin and worn, and grey, brown or whitish in colour. In this area, translucent light brown and brown flint was the most commonly encountered and this type was of good quality. A small amount of dark brown and dark grey flint bore a chalky cortex, suggesting that the flint was acquired from a chalk source. A total of fifteen flakes of Bullhead Bed flint were also present, including one scraper; eleven of the pieces of Bullhead Bed flint were recovered from early Neolithic deposits. This is a distinctive flint recognisable by a thin orange band present under a dark grey or greenish cortex. This flint is often found in the London area, North Surrey and Kent, and originates from the Bullhead Bed at the base of the Reading Beds (Dewey and Bromehead 1915, 2), which outcrops approximately 1.5km away from the site towards Windsor. It may also occur in a derived state in the river gravels of the Thames; however, examination of the river gravels on site by the author failed to identify any pieces of derived Bullhead Bed flint.

The majority of the struck flint was in a very fresh condition, although a few rolled pieces were also present. Cortication was present on a notable

Table 5.45 The Area 10 flint assemblage by category

CATEGORY TYPE	Total
Flake	2747
Blade	152
Bladelet	22
Blade-like	365
Irregular waste	104
Chip	94
Sieved chips 10-4 mm	108
Sieved chips 4-2 mm	692
Rejuvenation flake core face/edge	4
Rejuvenation flake tablet	15
Rejuvenation flake other	5
Levallois flake	2
Thinning flake	5
Flake from ground implement	2
Single platform blade core	11
Bipolar (opposed platform) blade core	2
Other blade core	2
Tested nodule/bashed lump	36
Single platform flake core	37
Multiplatform flake core	34
Keeled non-discoidal flake core	9
Levallois/ other discoidal flake core	7
Core on a flake	6
Unclassifiable/fragmentary core	24
Microlith	4
Leaf arrowhead	4
Chisel arrowhead	2
Barbed and tanged arrowhead	1
Unfinished arrowhead/blank	1
Fragmentary/unclass/other arrowhead	2
End scraper	40
Side scraper	4
End and side scraper	7
Disc scraper	1
Scraper on a non-flake blank	1
Other scraper	3
Awl	6
Piercer	8
Serrated flake	19
Saw	1
Denticulate	4
Notch	6
Retouched flake	68
Axe	2
Other heavy implement	1
Misc. retouch	1
Hammerstone	6
Grand total	4677

proportion of the flintwork; this varied from a light bluish-white speckling to a uniform grey or white cortication. The varying degrees of cortication did not form any particular pattern relating to different features or the date of flintwork. A very light calcium carbonate encrustation was present on some pieces.

Mesolithic

A total of five diagnostic Mesolithic artefacts were identified. These pieces, comprising four microliths and the blade edge of a tranchet axe, were found within the early-mid Neolithic deposits in the hollow and a pit, and are therefore residual. An early Mesolithic obliquely blunted point was found in context 6615 (SF 32911; Jacobi 1978, 16, fig. 6, 1b). The three other microliths were of late Mesolithic narrow blade forms; two were broken and could not be classified, whilst the third was simply notched and snapped using the micro-burin technique. In addition, a rolled end scraper, manufactured on a plunging blade which exhibits dorsal blade scars, is attributed to the Mesolithic. The Mesolithic element within the assemblage is difficult to quantify given the many characteristics it shares with Neolithic flintwork.

Early to middle Neolithic

The early to middle Neolithic flint assemblage from Area 10 was primarily contained within the upper fills of the hollow running across the site. The assemblage recovered from the hollow was of a relatively uniform character and so will be discussed as a whole; the spatial distribution of the material will be discussed separately.

The hollow (Table 5.46)

Technology

The flake material consisted of flakes, blade-like flakes and blades. Metrical analysis of 130 flints confirmed 18% of the flakes were of blade proportions (higher than 2:1 length to breadth ratio), a total comparable with other assemblages of earlier Neolithic date (Ford 1987a, 79; Figs 5.63-64). In addition, blade scars were present on 19% of the flints. Metrical analysis also revealed that all flakes were below 80mm in length, indeed the vast majority were under 40mm. The average length and breadth of the flakes is 28.8mm by 20.7mm with an average thickness of 5.7mm.

All stages of the knapping process appeared to be present. Nine percent of the flakes were cortical trimming flakes and 50% bore some cortical surface. The large number of chips recovered from the sieved samples provides additional evidence for the presence of knapping debris in the hollow. In general, the flakes indicate care was taken over the reduction of cores; the majority of flakes bore platform edge abrasion (73%) and numerous rejuvenation flakes were present. A mixture of soft and hard hammer flaking is apparent. Soft hammer percussion dominates (50% of flakes were struck using a soft hammer; 18% using a hard hammer, and the remaining 37% of bulbs were indeterminate). Three flint hammerstones and one quartzite hammerstone were recovered from the hollow; no soft hammer percussors were found. Only two flint hammerstones were complete. They weighed 80g and 129g.

Table 5.46 The Area 10 flint assemblage from the hollow (brackets indicate Mesolithic flints)

CATEGORY TYPE	*Southern grid*	*Middle grid*	*Northern grid*	*Scatter 6880*	*General hollow*	*Grand total*
Flake	1464	54	12	145	279	1954
Blade	91	3	2	5	17	118
Bladelet	17				2	19
Blade-like	203	7	1	14	42	267
Irregular waste	45	6		14	12	77
Chip	55			1	10	66
Sieved chips 10-4 mm	108					108
Sieved chips 4-2 mm	692					692
Rejuvenation flake core face/edge	3					3
Rejuvenation flake tablet	6			1		7
Rejuvenation flake other	4	1				5
Levallois flake	1					1
Thinning flake	2				1	3
Flake from ground implement	1					1
Core single platform blade core	8				2	10
Opposed platform blade core	2					2
Other blade core	1					1
Tested nodule/bashed lump	9	2		1	5	17
Single platform flake core	22	3		4	4	33
Multiplatform flake core	16			3	5	24
Keeled non-discoidal flake core	5	1		1		7
Levallois/ other discoidal flake core	3	1				4
Core on a flake	3				2	5
Unclassifiable/fragmentary core	11	2		1	4	18
Microlith	(2)				(1)	(3)
Leaf arrowhead	1				1	2
Chisel arrowhead	1					1
Barbed and tanged arrowhead	1					1
Unfinished arrowhead/blank	1					1
Fragmentary arrowhead					1	1
End scraper	20 (1)	1		2	1	24 (1)
Side scraper	1		1	1		3
End and side scraper	5					5
Disc scraper	1					1
Scraper on a non-flake blank					1	1
Other scraper	1					1
Awl	2				2	4
Piercer	2				1	3
Serrated flake	10	1				11
Denticulate	3					3
Notch	3			1	1	5
Retouched flake	38	3			6	47
Axe	1	(1)				1 (1)
Other heavy implement	1					1
Misc. retouch	1					1
Hammerstones	3	1				4
Grand total	2871	87	16	194	400	3568
Burnt unworked flint (g)	57,670	835	930	28	2065	61,528
Burnt no. (%) (exc. chips)	61 (3.2)	1 (1.2)	0	2 (1)	5 (1.3)	69 (2.6)
Broken no. (%) (exc. chips)	701 (36.5)	20 (23)	2 (12.5)	77 (39.9)	157 (40.3)	957 (35.4)
Retouched no. (%) (exc. chips)	96 (4.8)	6 (7.2)	1 (6.3)	4 (2.1)	15 (3.9)	122 (4.6)
No. flakes per core	26.6	7.9	-	17.9	17.7	22.7

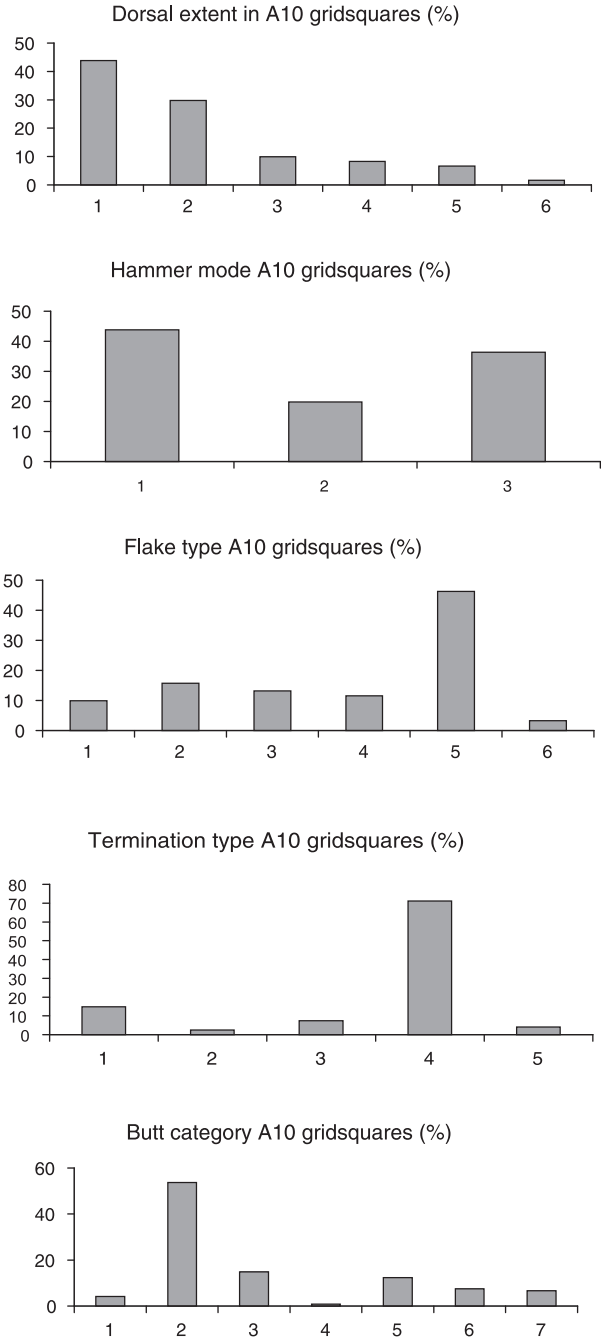


Fig. 5.63 The technological traits of the flint from the midden deposit in Area 10

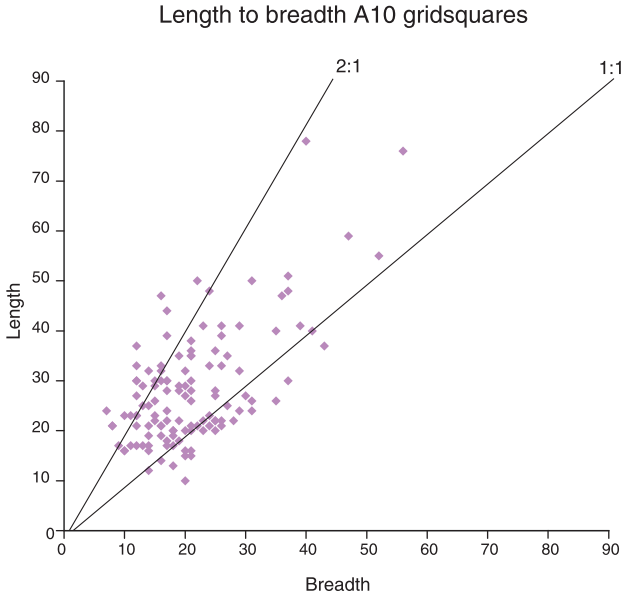


Fig. 5.64 The length to breadth plot (mm) of the metrical sample from the hollow

Table 5.47 The range and average weight of complete early Neolithic cores

CATEGORY TYPE	*Total no. of cores*	*Weight range (g)*	*Av. weight (g)*
Core single platform blade core	10	12-93	49.3
Bipolar blade core	2	17-23	20
Other blade core	1	65	65
Single platform flake core	35	5-334	66.2
Multiplatform flake core	26	19-100	51.8
Keeled non-discoidal flake core	8	22- 287	87.4
Levallois/other discoidal flake core	4	29-48	36.3
Total	86	5-334	59.4

The range of cores found in the hollow reflects the proportions of flakes and blades observed (Fig. 5.65). Both flake and blade cores were present. Blade cores were generally single platform. Only two bipolar cores and one blade core with more than two platforms were recovered. Blade cores made up 11% of the total of 121 cores. Single platform flake cores were the most common type, although similar numbers of multi-platform flakes cores were also recovered; these two core types represent 47% of the cores. Small numbers of keeled and discoidal flake cores were also identified, including one possible Levallois style core. The latter core type is probably a late Neolithic form, but the other core types are probably contemporary with the early Neolithic assemblage. Cores were well represented in the assemblage with one core per 23 flakes. This again indicates the presence of considerable quantities of knapping debris, but it is also possible that flakes have been removed from the scatter for use elsewhere. The weight range of the cores (Table 5.47) is relatively broad, although on average the cores weigh 59 g; only four cores weigh over 100g and 56% of the cores weigh under 50g (Fig. 5.65). The majority of cores were exhausted, and were most probably abandoned due to their limited size.

Retouch

There are 121 retouched tools, which made up 4.6% of the flint assemblage. They include scrapers, awls and piercers, serrated flakes, notched flakes, edge retouched flakes, arrowheads, a reworked fragment

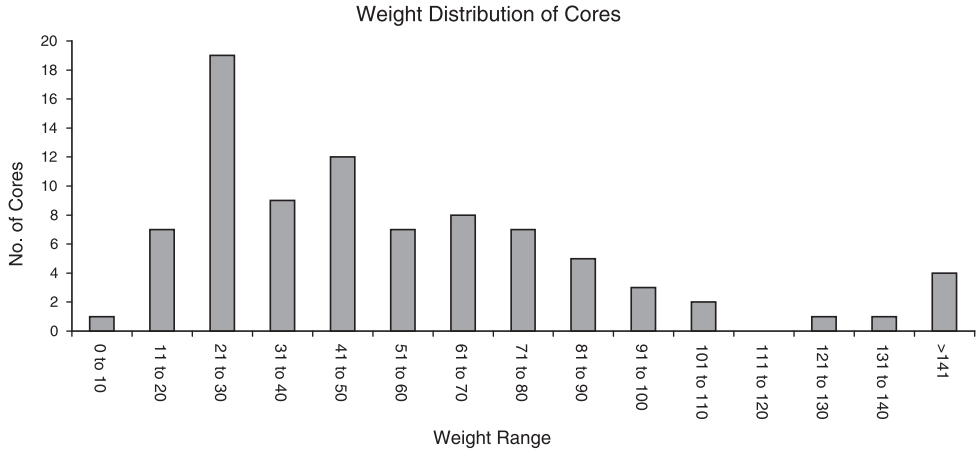


Fig. 5.65 The weight range of early Neolithic cores in Area 10 (g)

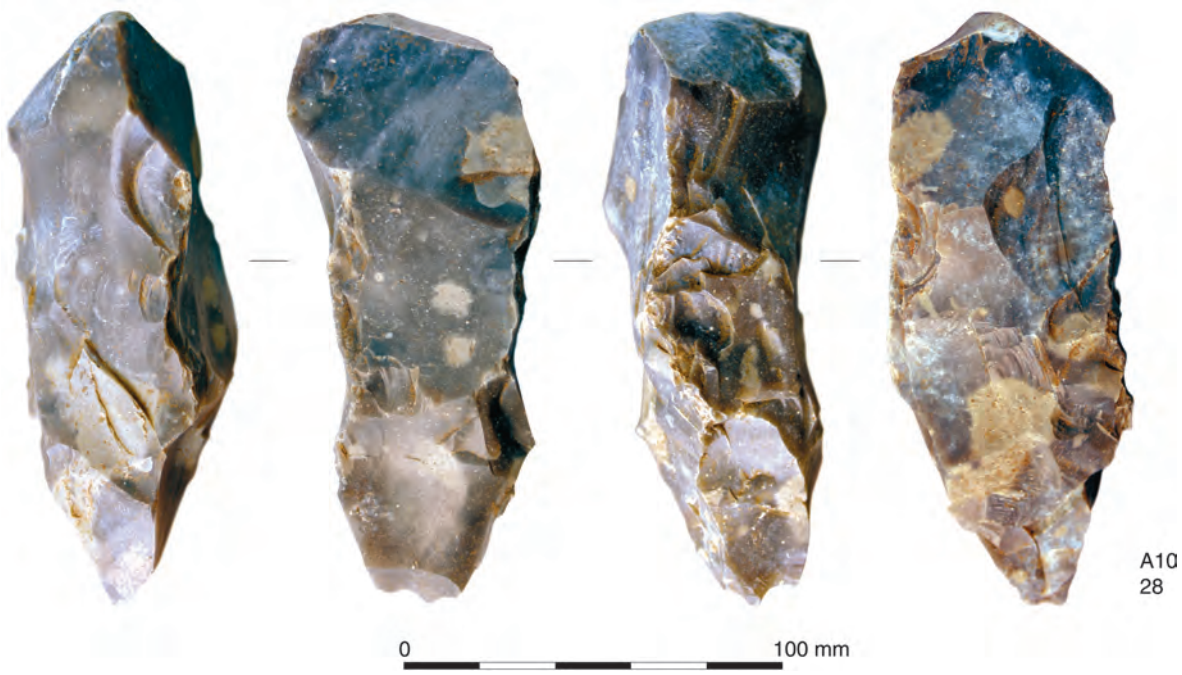


Plate 5.19 Area 10 crudely flaked pick no. 28

of a polished axe (and one additional flake) and a crude pick (other heavy implement; Plate 5.19).

Scrapers and denticulates

A total of 36 scrapers and three denticulates were recovered from the hollow, including one residual Mesolithic scraper (discussed above). Several forms of scraper were present in the hollow, but the most common type were end scrapers manufactured on flakes; indeed, only two scrapers were manufactured on blades. The majority of the scrapers were manufactured on partially cortical trimming flakes; only five were manufactured on non-cortical flakes. The working edges of all of the scrapers were curved, except for a single end scraper and the side scraper. The side scraper has a straight scraping edge on the right hand side and was denticulated on the distal edge, whilst the left hand side has been heavily backed and the surface also appeared bruised.

Three denticulates were found. All were manufactured on relatively thick flakes. On two of the examples, the teeth were confined to one straight edge and spaced at 5mm intervals; in both cases each tooth was formed by two or three removals. The third example was manufactured on the side and distal edges of a broken flake; the teeth are formed by one or more removals and are spaced at 10mm; only three teeth are present in any one line. This tool has been heavily used, the backing retouch and ridges being heavily worn; the teeth are in fresher condition suggesting that they have been

re-sharpened. Denticulates are thought to date primarily from the Bronze Age, and although their presence as intrusive finds cannot be entirely excluded, these examples are probably Neolithic.

Awls and piercers

A total of four awls and three piercers were identified in the hollow. All examples exploited natural spurs or the converging distal ends of flakes, which, through minimal edge retouch, form a point.

Serrated flakes

A total of eleven serrated flakes were found. The serrated flakes were mainly manufactured on blade and blade-like flakes, but a few were manufactured on flakes. In general, the flakes had relatively straight and sinuous edges. The removals forming the teeth in all instances were made from the ventral surface; between eight and 15 teeth per 10mm were recorded. Silica gloss was present on the ventral teeth of one flake. The flakes bore no evidence of having been hafted and were mainly unbroken.

Edge retouched flakes

A total of 47 edge retouched flakes were recovered from the hollow. The retouch on these flakes and blades varies considerably, from small areas of abrupt retouch to entire edges of slight abrupt retouch. The retouch often represents small areas of backing so that an unretouched edge is usable. In other cases the retouched edges bear evidence of use-wear, often scraping.

Arrowheads

A total of seven arrowheads were recovered from the Neolithic deposits. Four leaf arrowheads were found, of which two were misshapes (SF 41757 and SF 30396), abandoned after some initial working; in addition a broken arrowhead tip, possibly of a leaf arrowhead, was found. The two complete arrowheads were manufactured to very different standards. Arrowhead 32274 is crudely manufactured and poorly finished. The outline is irregular and the retouch is invasive yet not well finished, leaving a rough edge. The second arrowhead, 41783, is only 2mm thick, and exhibits fine invasively retouch with almost no errors. The finishing is very fine leaving a perfect outline (Green 1980, fig.28: type 3c).

A crude chisel arrowhead and a misshaped barbed and tanged arrowhead were recovered from the second spit of squares 6247 and 6605 respectively; these flints were probably intrusive.

Axes/picks

A singe fragment of a polished flint axe head, a flake from a polished implement, and a crude pick-like implement were recovered from the hollow. In addition, a second flake from a polished implement was recovered from the fill (6319) of an Iron Age pit, and a fragment of Langdale axe was recovered from the topsoil. The polished axe fragment, SF 32970, from square 6615, represents a small area of the blade edge; the axe has been reworked and is also heavily frost shattered. The surviving surface is almost entirely polished to a fine reflective surface, except for a couple of small scars. The one surviving side of the axe appears flattened through polishing.

The pick, from square 6618, was manufactured on a nodule of gravel flint. The artefact is trapezoidal in cross section and tapers to a point: the flaking is relatively rough although the majority of faults result from the poor quality of the flint. An attempt has been made to rework the point, but this was never completed.

Other retouched artefacts

Several other retouched artefacts were recovered from the hollow; these include 5 notches and a one piece of miscellaneous retouched flint. The notches are all made on flakes and are generally small and shallow, averaging approximately 5mm wide. The miscellaneous retouched flake exhibits semi-abrupt retouch with a few invasive removals, alternating along the right hand side. Several removals have been made across the bulb, but it has been left intact. The retouch exhibits a glossy surface and has been utilised as a scraping edge. The original intended product is unclear.

Refitting

Refitting was attempted on the flint from grid squares 6245, 6833 and 6615. However, the results were variable. Within the fourth and lowest spit of square 6615, at the base of the deposit, a refitting sequence of 12 flints with three associated flints was found (Group 37). The flints were all present in a roughly circular area 0.8m in diameter that appeared to represent an *in situ* knapping scatter. Examination of the flints for use-wear proved negative. The original core had already been extensively worked before flaking began at this location. Indeed, the shape of the core appears to have been flaked as if intended to be an axe. The knapping sequence began with the establishment of a simple platform through a single flake removal. The core was then rotated though 90° and a few blades were removed. The core was then rotated back 90° and a platform rejuvenation tablet removed, returning to the original platform orientation. Blade removal then continued. Although considerably reduced, the core was absent from the scatter. The presence of this scatter at the base of the deposit suggests it may have either been present prior to the deposition of the midden or was an undisturbed part of the midden (the scatter was also closely associated with a dense pottery scatter, much of which refitted to form one vessel). The blade-based character of the reduction sequence would imply a late Mesolithic or early Neolithic date for the sequence.

The identification of refits within the main deposit was, however, less fruitful. A single refit

between two flints was located between a blade-like flake and a single platform blade core in square 6245, and a few flakes of a similar flint were also found in square 6833 (flint group 53).

Spread to south of site (Trenches 88 and 10J)

A total of 182 flints were recovered from Evaluation Trench 88 (170 flints) and Area 10 J (12 flints), situated to the southern corner of Area 10 (Table 5.48). The flint was recovered from various contexts, but mostly came from a layer of reworked subsoil (context 88/2). This subsoil had been reworked by ploughing, and the slightly damaged condition of the flints reflects the disturbed nature of the contexts from which the flint was recovered. However, the flint assemblage would be consistent with a Neolithic date and is comparable in composition with the assemblage recovered from the hollow. It is notable that a number of Bronze Age and Iron Age features in the southern part of the site contained much worked flint, including an element of residual Neolithic material. It therefore seems likely that there was a spread of Neolithic activity across much of Area 10.

Table 5.48 The assemblage from Evaluation Trench 88

CATEGORY TYPE	*Total*
Flake	146
Blade	8
Blade-like	11
Chip	1
Tested nodule/bashed lump	3
Levallois/ other discoidal flake core	1
Unclassifiable/fragmentary core	1
End scraper	3
Other scraper	1
Serrated flake	2
Retouched flake	5
Grand total	182
Burnt unworked flint (g)	443g
Burnt no. (%) (exc. chips)	1 (0.6)
Broken no. (%) (exc. chips)	55 (32.4)
Retouched no. (%) (exc. chips)	11 (6.5)

Tree-throw holes (Table 5.49)

Tree-throw hole 6881

A total of 167 flints were recovered from tree-throw hole 6881 (Fig. 5.66). The flint was of a similar character to the assemblage recovered from the hollow. Metrical and technological analyses revealed the assemblage to contain a slightly higher proportion of blades (24%) than the surrounding deposit in the hollow. This was not the result of a higher proportion of non-cortical flakes, as the tree-throw hole contained 55% cortical and partly cortical flakes. The presence of

Table 5.49 Flint assemblages from early Neolithic tree-throw holes in Area 10

	Early Neolithic			*Early Neolithic?*			
CATEGORY TYPE	*TTH 6881*	*TTH 6438*	*Natural hollow 6272*	*TTH 6475*	*TTH 6801*	*TTH 6913*	*Grand total*
Flake	102	13	11	10	11	1	148
Blade	6			2			8
Bladelet	2						2
Blade-like	24	2	1	2	2		31
Irregular waste	11						11
Chip	2	2			1		5
Tested nodule/bashed lump	3		1				4
Single platform flake core	2						2
Multiplatform flake core	2						2
Keeled non-discoidal flake core	1						1
Unclassifiable/fragmentary core				1			1
End scraper	1						1
End and side scraper	1						1
Retouched flake	4				1		5
Hammerstone	2						2
Grand total	163	17	13	15	15	1	224
Burnt unworked flint (g)	390	25	110	0	105	0	630
Burnt no. (%) (exc. chips)	10 (6.1)	4 (26.6)	0	1 (6.7)	0	0	15 (6.7)
Broken no. (%) (exc. chips)	61 (37)	9 (60)	1 (7.7)	6 (40)	6 (40)	0	83 (36.4)
Retouched no. (%) (exc. chips)	6 (3.6)	0	0	0	1	0	7 (3.1)
No. flakes per core	18.1	-	12	14	-	-	20

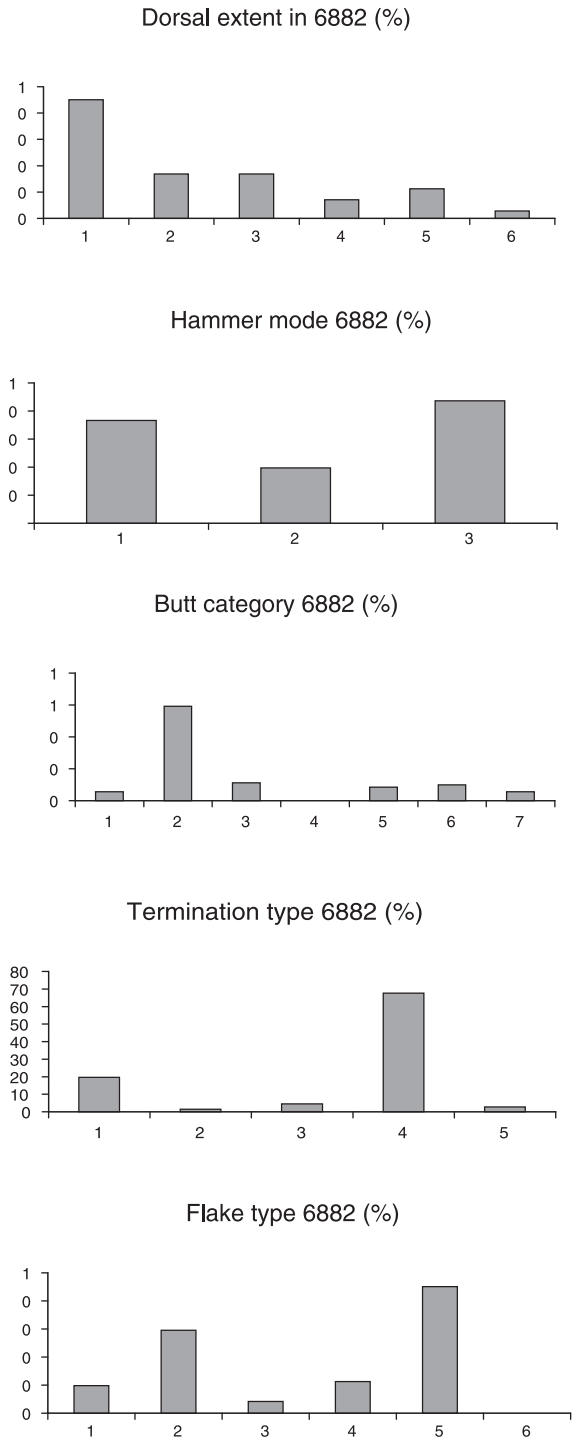


Fig. 5.66 The technological traits of flint from tree-throw hole 6881

cores, hammerstones and irregular waste indicated the presence of all stages of the reduction sequence, although no refits were identified and only a few possibly related flints were seen. Examination for use-wear revealed that 39.6% of the assemblage was utilised (see low-power use-wear analysis below). In addition, a range of activities similar to those identified from use-wear in the middens were present.

Tree-throw holes 6438, 6472, 6475, 6801 and 6913

Small numbers of blade-like flints in good condition were recovered from five tree-throw holes. Several of the features were also associated with early Neolithic pottery, and are therefore considered to be of that date.

Other Neolithic flintwork

Several diagnostically Neolithic artefacts were recovered as residual finds from later features.

Leaf arrowheads

SF 30000 Green 1980, fig. 28, 3a. The arrowhead has three distinct areas of plough damage, despite which the artefact still exhibits some interesting traits. Originally the arrowhead was invasively retouch over the entire area of both surfaces with large, precise removals. However, at some point the arrowhead broke at both the proximal and distal ends. The arrowhead exhibits slight abrupt retouch, reshaping the piece into a functional arrowhead; only a small area of the break at the distal ends survives.

SF 30242 Green 1980, fig. 28, 3c. very slightly rolled. Relatively fine retouch and good finishing, although it is apparent that a few step fractures hindered removals on the dorsal surface leaving the arrowhead slightly thicker towards the tip. Unusually the ventral surface was worked first and the dorsal second.

SF 30308 This flint possibly represents an unfinished, misshapen leaf arrowhead; alternatively the artefact may represent a middle Bronze Age projectile tip, contemporary with the feature (6310) in which it was found. A platform was established and some invasive removals have been made. Problems were encountered at an early stage when attempting to remove a bulb and the piece was then abandoned.

SF 30107 A bifacially worked projectile tip, probably of a leaf arrowhead.

SF 40425 Chisel arrowhead, relatively thick, partial retouch on blade edge.

Low power use-wear analysis

Low-power use-wear techniques were applied to the entire assemblages from two 2 m² squares, 6613 and 6615 (164 flints), which are positioned beside each other in the centre of the midden, and to the assemblage from tree-throw hole 6881 (158 flints). For comparative purposes the samples will be considered to have been contemporaneous.

Condition

The condition of the flint from Area 10 was generally very good. A few pieces exhibited post-depositional damage. This was generally limited to drop-nicks (Moss 1983) and crescents, and did not significantly affect the examination of any piece for use-wear. A single flake appeared to be rolled and residual and was therefore excluded from the analysis. A small number of pieces could not be assessed due to their burnt or broken condition.

A high proportion of the material was broken. In 6613 and 6615 a total of 32% of the flints were broken, compared to 28% in 6882. The breaks do not appear to be the result of post-depositional damage, and are probably the result of breakage during use, although only two of the broken edges exhibited any sign of use-wear.

Extent of use

The examination for use-wear suggests that 51.2% and 62.1% of 6613 and 6615 respectively have been utilised, which provides an average of 55.6% utilised. A total of only 39.6% of the assemblage from tree-throw hole fill 6882 was utilised.

A number of the utilised pieces displayed use on more than one side. This was recorded separately. Contexts 6613, 6615 and 6882 had on average 1.3 utilised edges per flint.

Nature of use

Overall in Area 10 a distinctive range of activities are represented. The use-wear of the deposit may be characterised by the predominance of medium and soft cutting and whittling, with an absence of hard cutting and whittling. The assemblage also contains a variety of scraping actions, but actions against hard materials dominate. However, variations are present in the deposit. Context 6882 contained no boring actions, whilst

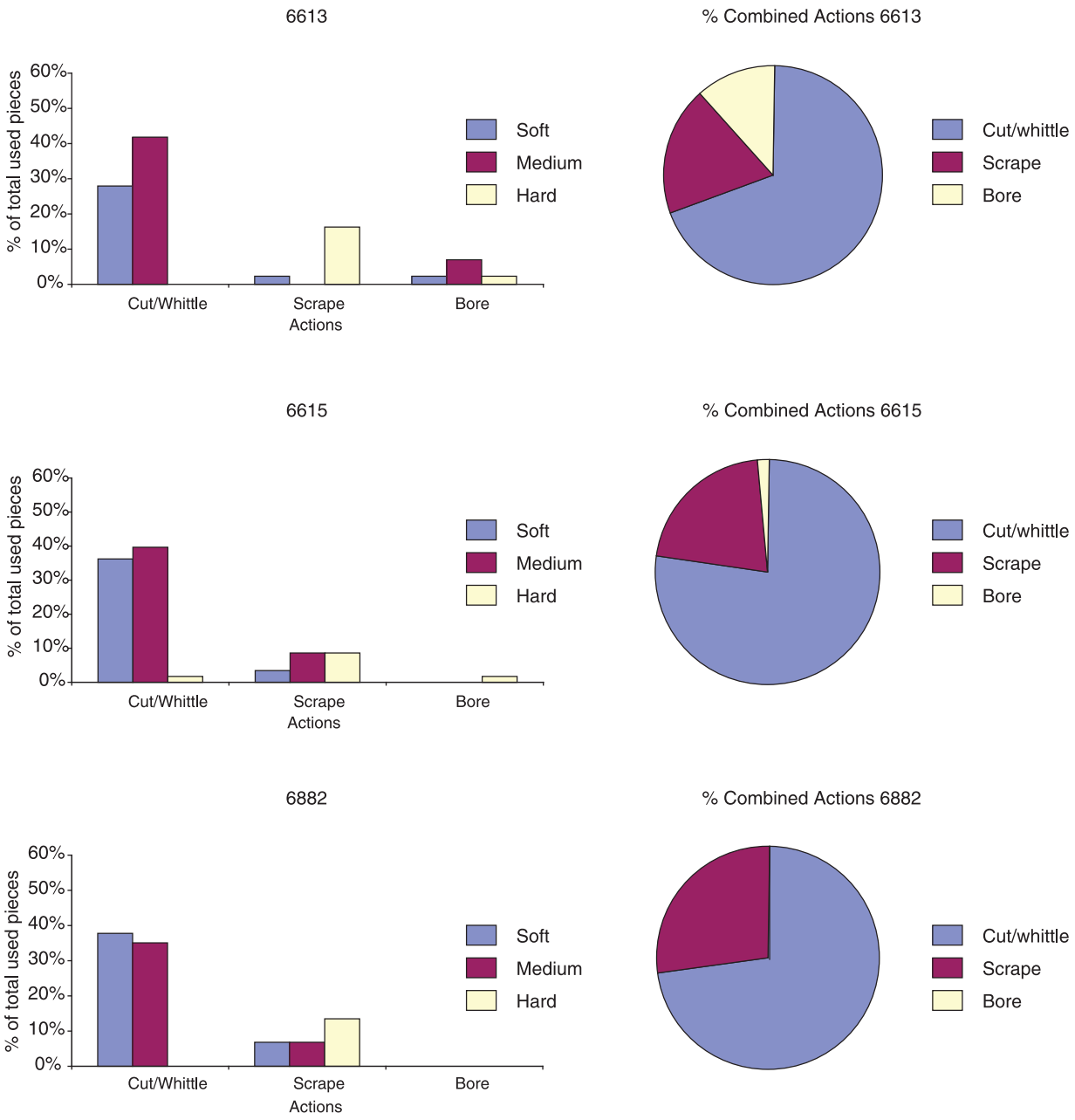


Fig. 5.67 Use-wear graphs for 6613, 6615 and 6882

Table 5.50 The remaining flint assemblage by phase in Area 10

CATEGORY TYPE	Middle Iron Age	LIA/ER	Medieval	Unphased	Grand total
Flake	257	78	74	82	491
Blade	7	1	5	4	17
Bladelet	1				1
Blade-like	28	7	7	18	58
Irregular waste	7	1	4	3	15
Chip	17			4	21
Rejuvenation flake core face/edge		1	2	1	4
Rejuvenation flake tablet	1	1		3	5
Levallois flake				1	1
Thinning flake	1			1	2
Flake from ground implement	1				1
Core single platform blade core	1				1
Other blade core		1			1
Tested nodule/bashed lump	3	1	6	4	10
Single platform flake core	1	1			2
Multiplatform flake core	3	2	2	1	8
Keeled non-discoidal flake core				1	1
Levallois/ other discoidal flake core	1				1
Unclassifiable/fragmentary core	3		1		4
Core on a flake			2		2
Microlith		1			1
Leaf arrowhead	1		2		3
Chisel arrowhead		1			1
Fragmentary arrowhead	1				1
End scraper	2		6	3	11
Side scraper	1				1
End and side scraper			1		1
Other scraper	1				1
Awl			2		2
Piercer		1	1	1	3
Serrated flake	5			1	6
Denticulate	1				1
Notch			1		1
Retouched flake	2	5	3	3	13
Grand total	346	102	119	128	686
Burnt unworked flint (g)	33,348	9880	9125	14,646	66,556
Burnt no. (%) (exc. chips)	24 (7.3)	4 (3.9)	2 (1.7)	6 (5)	35 (5.2)
Broken no. (%) (exc. chips)	131 (39.7)	36 (35.3)	32 (26.9)	38 (31.7)	228 (34)
Retouched no. (%) (exc. chips)	14 (4.2)	8 (7.8)	16 (13.5)	7 (5.8)	46 (6.6)

in contrast 6613 and 6615 contained 5 boring actions (6%).

Spatial patterning

The identification of spatial patterns is limited by the small proportion of the assemblage which was analysed and the confined spatial area examined. However, the four flints in 6613 used for boring were located within 0.5m of each other (3 within 0.2m). The scraping actions in 6613 and 6615 also show a distinctive, although not conclusive pattern. In 6613 and the western part of 6615 six flints used for hard scraping are present whereas to the east in 6615 a number of medium hardness scrapers may be found (Fig. 5.67).

Spatial distribution

Examination of the spatial distribution of flintwork in the hollow reveals a distinct concentration towards the north of the southern grid; this area measures approximately 8m wide by 16m long. Densities of flint between 60 flints and 270 flints per m^3 (excluding chips) were recorded; this was set against a background of 5-55 flints per m^3 over the majority of the hollow. No distinct patterning was observed in the distribution of the artefact types although it is notable that several of the typologically late artefacts, such as the chisel arrowhead and barbed and tanged arrowhead, were found away from the main area of the midden.

The majority of burnt worked flints and 57kg of burnt unworked flint (out of a total of 61kg from the hollow and 252kg from the site) was recovered from the southern grid. The densest concentrations of burnt unworked flint were recovered from the northern corner of the hollow and directly relates to the dense areas of other finds. However, the northern corner of the southern grid is closely associated with a waterhole and three associated features containing varying quantities of burnt unworked flint (up to 25kg). Therefore, given the disturbance of the upper fills of the hollow, it is possible that this spread may have been a surface deposit associated with these features, perhaps even sealing the Neolithic features in this area from later truncation.

Flint from later features

A total of 686 flints were recovered from later features and from unphased features (Table 5.50). The struck flint, and that from the late Neolithic is discussed in Chapter 8, and Bronze Age features is dealt with in Volume 2. A large proportion of the flintwork from later features appears to be residual from the Neolithic, including three leaf arrowheads and one chisel arrowhead, and so is included here. Features containing the largest numbers of flints were generally situated in close proximity to, or south of, the hollow. This include the Iron Age working hollow 6405, situated some 13m from the hollow, which contained 159 flints.

Discussion

The site contains a significant early Neolithic assemblage recovered from the hollow running across the site. To interpret the deposit it is necessary to examine its depositional signature. The assemblage contained considerable evidence for knapping debris, as is suggested by the flake to core ratio, the number of chips recovered, and the presence of numerous cortical trimming flakes. It is also perhaps significant that the dense midden in the southern grid contained a slightly higher proportion of retouch and a higher number of flakes per core than the rest of the hollow and the other early Neolithic features. However, refitting failed to identify many refits beyond a small *in situ* scatter possibly deposited prior to the midden. Therefore, it is likely that knapping was performed elsewhere, but the debris was eventually deposited in the hollow. The hollow also contained a broad range of retouched artefacts, constituting nearly 5% of the assemblage, the proportion considered by Wainwright (1972) to represent a domestic assemblage. In addition, low-power use-wear analysis identified use-wear on 56% of the flints examined from the hollow, and 40% from tree-throw hole 6881, towards the edge of the hollow (excluding chips). It is therefore likely that the flint in the deposit was knapped and utilised elsewhere, and was deliberately deposited as a midden afterwards. No obviously 'special' deposits of flint were identified. The deposit does, however, include a reworked polished axe fragment and two functional arrowheads, which may represent 'special' artefacts. Indeed, it is possible the entire deposit resulted from behaviour which produced similar deposits at causewayed enclosures.

The majority of the early Neolithic flintwork was recovered from the fills of the shallow hollow running across the site; a significant number of flints were also recovered from the fills of a tree-throw hole within the hollow (6881). The only additional Neolithic flintwork found in contemporaneous features was recovered in small quantities within five tree-throw holes. While no large assemblages were found in other features, the presence of a sizeable scatter at the very south end of the site, and the almost ubiquitous presence of Neolithic flint in later features across the site, suggests that Neolithic activity involving flint was widespread across the area.

The flintwork located towards the base of the hollow deposits in square 6615 was clearly *in situ*. The re-assembly of a significant number of blades (all unused), present within 0.4m of each other (Refit Group 37), suggests that the flints either represent an *in situ* knapping scatter or a dump of knapping debris from elsewhere. The association of this deposit with a large number of sherds from a single early Neolithic pottery vessel may indicate a dump of material. It is perhaps no coincidence that within the spits above this deposit a reworked fragment of polished axe and a half saddle quern rubber were found. A cluster of flints (6880), probably of middle Neolithic date (see Chapter 7) was also present just to the north of the excavated grid, but no other such deposits were found within the upper levels of the hollow, in contrast to Area 6. The survival of these two deposits perhaps indicates that other well-defined Neolithic deposits may originally have existed in the hollow, but the uppers spits of the deposits in the hollow appear to have been disturbed by ploughing to some degree, although the condition of the flint does not significantly reflect this.

Catalogue of illustrated flint from Area 10 (Figs 5.68-69)

Mesolithic

1 Square 6615, spit 2. SF 32911. Microlith – obliquely blunted point.
2 Square 6889, spit 2. SF 42161. Tranchet axe, cutting edge.

Neolithic

Cores and Flakes

3 Square 6615, spit 4. Refit group 37. Possible flaked axe rough-out reworked as a blade core, the sequence displays the removal made to create the original platform, a series of blade removals, a platform tablet removal and further blade removals. None of the flints were utilised. All the flints were recovered from an area 0.40m in diameter.
4 Square 6613, spit 1. SF 41904. Flake, utilised.
5 Square 6245, spit 3. Refit group 53. A knapping refit between single platform blade core SF 40375 and blade-like flake SF 40435.

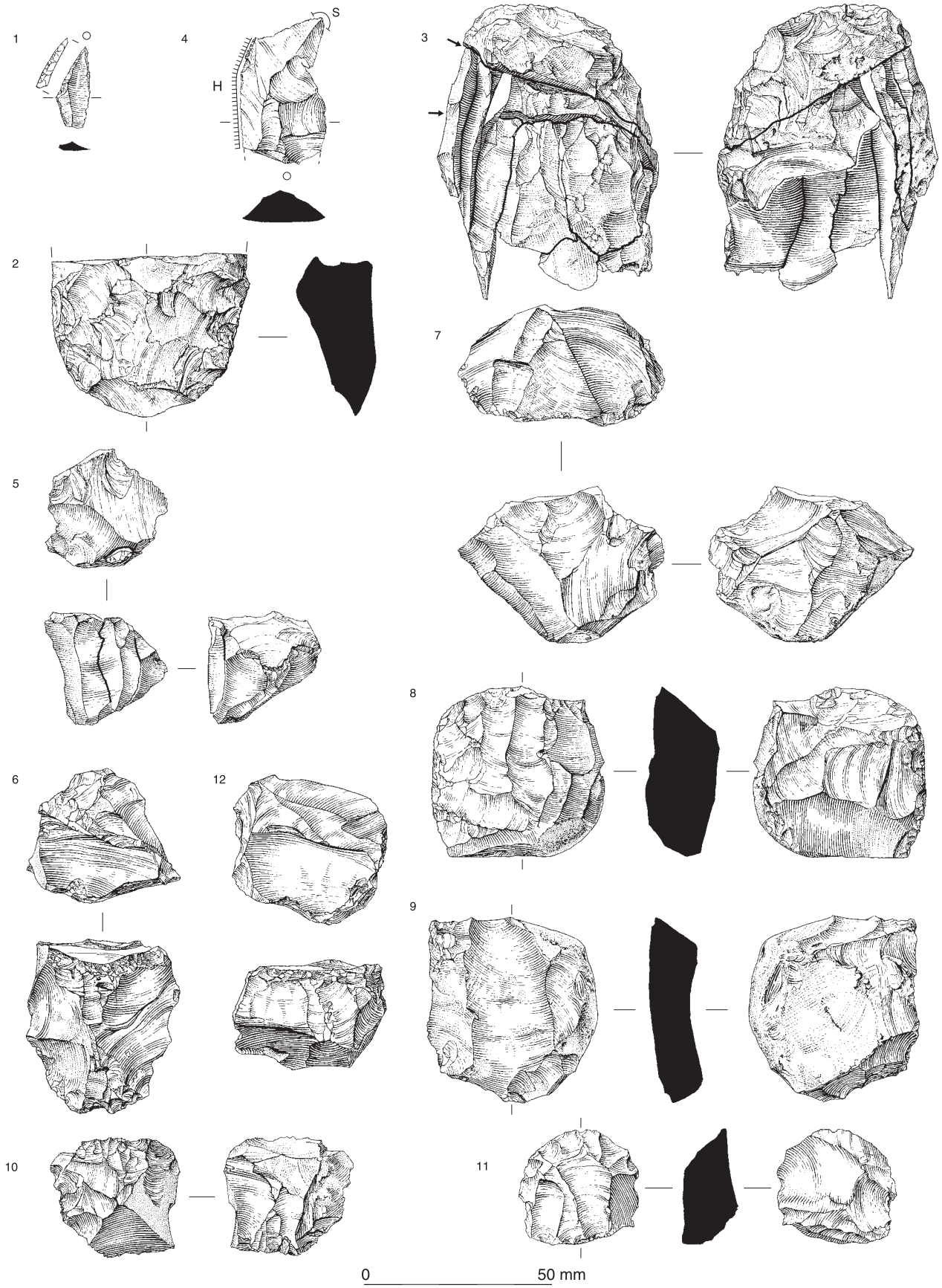


Fig. 5.68 Area 10: Mesolithic points and Neolithic flakes and cores, nos 1-11

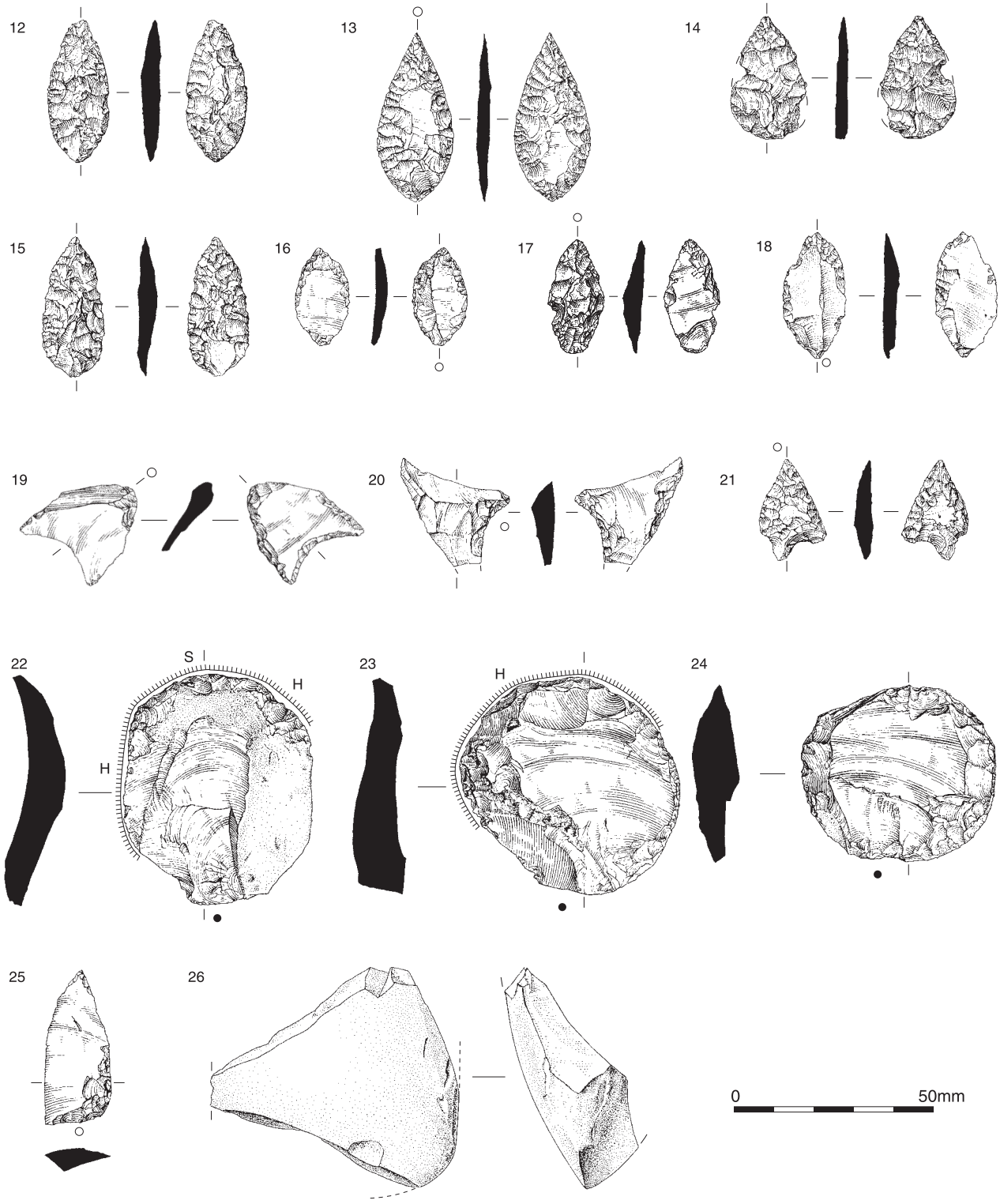


Fig. 5.69 Area 10: Neolithic arrowheads, scrapers, awl and polished implement, nos 12-26

6 Context 6331. SF 40568. Multi-platform flake core. Weight 60g.
7 Square 6245, spit 2. SF 31871. Keeled non-discoidal flake core, few removals made. Weight 69g.
8 Scatter 6880. SF 40922. Keeled non-discoidal flake core. Weight 57g.
9 Square 6249, spit 3. SF 41619. Crude discoidal flake core. Weight 48g.
10 Square 6618, spit 3. SF 41575. Discoidal flake core. Weight 29g.
11 Context 6360. SF 40421. Crude discoidal flake core. Weight 14g.

Arrowheads

12 Context 6406. SF 30242. Leaf arrowhead
13 Square 6638, spit 2. SF 41783. Kite-shaped leaf

Table 5.51 Summary of stone artefacts and materials in Area 10

Area	*Objects*	*Sarsen*	*Quartzitic sandstone*	*Quartzite*	*Cherty greensand*	*Sandstone*	*Igneous*	*Totals*	*Flint*
A 10	Quern/rubber					1		1	
A 10	Rubber	1	2					3	
A 10	Hammerstone/flint knapper			1				1	
A 10	Hammerstone			2				2	
A 10	Polished stone axe						1	1	2 + c 20 flakes 1 + 2/3 flakes

arrowhead, very fine pressure flaking.
14 Context 6200. SF 30000. Leaf arrowhead, the notch is probably damage.
15 Context 6331. SF 32274. Leaf arrowhead
16 Context 6313. SF 30396. Unfinished leaf arrowhead
17 Square 6613, spit 3. SF 41757. Unfinished leaf arrowhead., only retouched on dorsal surface.
18 Context 6311. SF 30308. Unfinished leaf arrowhead
19 Context 6427. SF 40425. Transverse arrowhead, Chisel form?.
20 Square 6247, spit 2. SF 32947. Chisel arrowhead.
21 Square 6605, spit 2. SF 42364. Tanged arrowhead, slightly misshapen, no clear barbs, tang off centre.

Scrapers
22 Fill 6882. SF 41265. End scraper.
23 Fill 6882. SF 42391. End and side scraper.
24 Square 6644, spit 2. SF 41692. Disc scraper.

Other
25 Context 6331. SF 40553. Awl.
26 Square 6615, spit 2. SF 32970. Polished axe fragment, reworked.

Worked and burnt stone from Area 10 *by Fiona Roe*

The six worked stone objects from Area 10 are mostly very similar in character to the finds from Area 6 (Table 5.51). No definite quern fragments had survived here, but the three rubber fragments and a quern or rubber fragment were made from the same range of materials, all from local sources. Quartzitic sandstone and sarsen were again selected for the rubbers, and Tertiary iron-stained sandstone was utilised for the quern or rubber fragment. One piece of rubber was nearly half complete, and was made from quartzitic sandstone, with a slightly convex grinding surface prepared by pecking (Fig. 5.70, 6245 SF 32773). The hammerstones are discussed by Anderson-Whymark above, but one (6331 SF 40052) also had worn facets at either end.

A small polished stone axe fragment was found unstratified in Area 10. It was made from a fine-grained greenish-grey rock, with the appearance, in hand specimen, of Group VI Langdale tuff. Thin sectioning has demonstrated that it is not an exact match for Group VI, but it could fall within the wider range for this rock, and so may have been obtained from the Lake District.

A total of 0.5kg of burnt stone was recovered from Area 10. It consisted of fragments of quartzite and quartzitic sandstone pebbles from the gravels, and fragments of sarsen and other Tertiary sandstone, these possibly being the elusive remnants of Neolithic saddle querns.

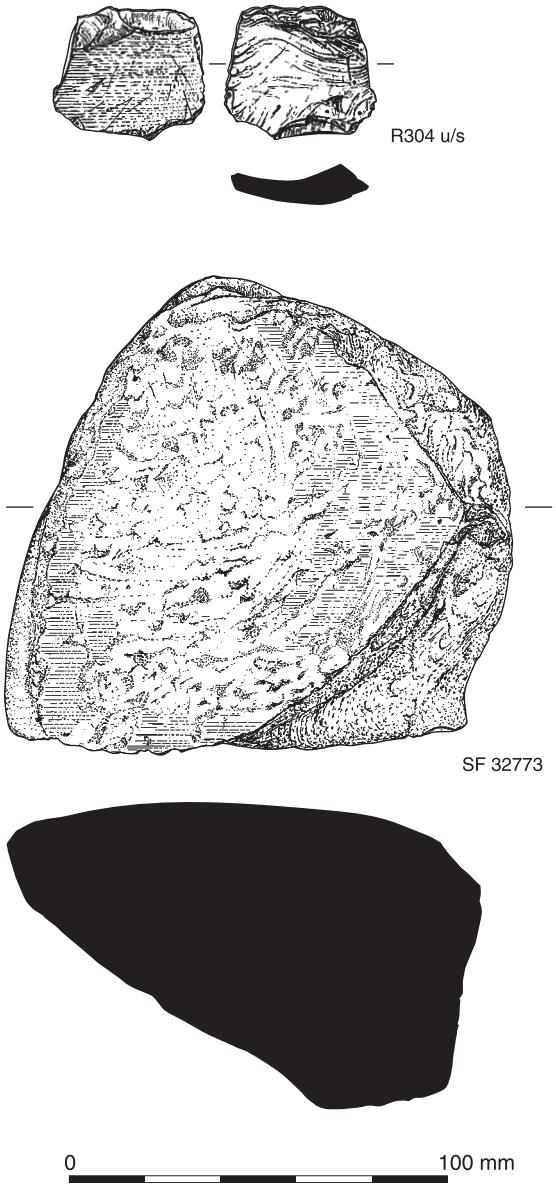


Fig. 5.70 Worked stone from Area 10

Catalogue of illustrated worked stone (Fig. 5.70)

SF 32773, context 6245. Part of cobble, slightly burnt, with convex grinding surface which has been pecked and then worn from use as a rubber; now 117 x 128 x 77mm, 1.650kg. Quartzitic sandstone

R304, u/s. Small fragment from polished stone axe; now 40 x 35.5 x 8.5mm, 7g. Thin section R 304. Volcanic tuff, not typical Group VI, but probably within its range

Animal bones from the Area 10 early Neolithic hollow by Gillian Jones

Introduction

The animal bones from the early Neolithic hollow in Area 10 were numerous enough to confirm cultural activity in the area. The bones were very fragmented and eroded. As with the Area 6 hollow, bones often disintegrated on excavation, were bagged separately, and the number of fragments recorded. The 68 bones summarised in Table 5.52 were broken into over 300 pieces. 73% of identified bones were teeth, and of the 18 cattle teeth found, only six were more-than-half complete. Often, the hard enamel survived, with little of the softer dentine (Table 5.53).

Composition of the assemblage

The order of importance of the main species was the same as for the larger Area 6 early Neolithic hollow: cattle, sheep(goat), pig and deer. Of the unidentified medium mammal bones, more were probably sheep/goat rather than pig. Two caprine teeth are probably sheep not goat (an incisor, probably I1, and a molar, probably M1; Payne 1985). Of particular note was the presence of two horse bones. The bones were an upper tooth, and a metacarpal which gives a height estimate of 12 hands (method of Kiesewalter, in von den Driesch and Boessneck 1974). If Neolithic, these would be the earliest horses on the site. Given the presence of later pottery in the hollow, it is, however, possible that these bones are also later, possibly mixed into the hollow by ploughing. The occurrence of watervole and mole may be natural or cultural; no cut marks were observed.

Articulated bone groups

Despite the poor survival of the bone in the hollow, two groups of articulated bones of Neolithic date were found, both of cattle, from context 6915, within the hollow, and from tree-throw hole 6882 (Figs 5.57-58; Plate 5.18). Both consisted predominantly of articulated vertebrae and ribs from the torso, and in neither were the limbs or head present. They were not accompanied by exotic items or large quantities of other materials, so interpretation as special deposits or offerings is uncertain. Alternatively they could be butchery waste, disposed of by burial. The dates from these articulated remains are useful for dating the hollow, as they are certainly not residual.

Table 5.52 Animal bone from the Area 10 hollow

	Cattle	*Sheep/ goat*	*Pig*	*Horse*	*Red deer*	*Other species*	*Identified total*	*Large mammal*	*Medium mammal*	*large/ med.*	*Total*
Upper layer of hollow 6331	2			1		mole 1	4				4
2m Squares in hollow	21	5	1	1	1	watervole 1 w.vole/rat 1	31	14	14	4	63
6915, within hollow, RC dated	1 sk (12)		1				1 + 1 sk	sk (22 ribs)			1 + 1 sk
Treehole 6882	1 sk (6)						1 sk	sk (14 frags)			1 sk
Total	23 + 2sk	5	2	2	1	3	36 + 2sk				68 + 2sk

Sk – partial skeleton/articulated group. Note also one beaver bone from middle Neolithic pit 6329.

Table 5.53 Preservation of animal bone in Area 10

	1 Main Species NISP	*2 % loose teeth*	*3 % with at least one zone >50% complete (Zgt50)*	*4 Average completeness of main long bones, where Zgt50*	*5 % identified*	*6 No. burnt (ident + unident.)*
Area 10 Hollow	33	73 ●●●	61 ●	N6 39%	53 ○	3

Preservation indicators, compared to the bone as a whole (recorded by GJ):- good ○○, average ○ poor ●, very poor ●●, extremely poor ●●●.
The partial skeletons are excluded.

Cattle partial skeleton 6915

A partial cattle skeleton was found in one of the 2m squares in the Area 10 hollow, from which a middle Neolithic radiocarbon date, of 3490-3020 cal BC (BM-3188: 4530±50 BP), was obtained (Fig. 5.58; Plate 5.18).

As with most of the later animal burials, the animal was laid on its right side. The surviving part of the spine lay curved, oriented roughly north to south. The lower spine survived (the final thoracic vertebra, 7 lumbar vertebrae and the sacrum, with 9 loose epiphyses) as well as 50 rib pieces (none with the articulation, but mostly substantial parts of the central sections, 140-230mm long). The animal was immature (vertebral epiphyses unfused except the sacrum which was partially fused). Three other bones from the pit may have belonged to the same animal: an unfused proximal humerus with a light chop mark 13mm long on the anterior shaft, an unfused distal metatarsal, and a fused first phalanx which looks a good match for the metatarsal. Fusion of the last two of these suggests an age at death of about 2 years.

The metatarsal and phalanx were large (Table 5.29). The first phalanx, GLpe 66.4mm, compares to 48.6-53.8mm for 1st phalanges from the middle Bronze Age skeletons 6265, 6273 and 6744 (see Volume 2). It is nearly as large as the Ullerslev aurochs cow, and may therefore be from a wild cow or a domestic bull (see discussion of Area 6 early Neolithic cattle). The bones were moderately well-preserved compared to other bones of this date. The 34 bones were broken into about 117 pieces. No butchery marks, apart from that on the humerus, were observed.

Cattle articulated remains 6882/6881

The articulated group 6882 from tree-throw hole 6881 (Fig. 5.57) was more poorly preserved, with the 20 counted bones broken into over 380 fragments. It consisted of two thoracic vertebrae, one lumbar and one other vertebral body, part of a left pelvis and femur and other fragments probably from cattle vertebrae and long bones. The thoracic vertebrae, though immature, were very large (Table 5.29).

Table 5.54 Area 10, age and size information from bones in Neolithic hollow excluding cattle measurements

Upper layer of hollow, 6331	
Cattle upper molar	M^3 stage g
Horse metacarpal	GL 201, GLl 194, Bp 41.4, SD 28.7, Bd 40.5
2m squares in hollow	
Cattle upper tooth	P^4 Unworn
Cattle lower teeth	$M_{1 \text{ or } 2}$ Unworn; stage 9A
Sheep/gt upr teeth	$M_{1/2}$ 9A; <9A
Sheep* lower tooth, *probably sheep not goat	$M_{1/2}$ 2A
Red deer 2nd phalanx	GL 43, Bp 20.2, SD 14.2, Bd 15.3

Radiocarbon dates from the Area 6 and 10 middens
by P D Marshall, T Allen, C Bronk Ramsey, and J Ambers

Introduction

Twenty-two radiocarbon age determinations have been obtained on samples from Areas 6 and 10. Nineteen samples were processed by the Oxford Radiocarbon Accelerator Unit between 2000 and 2003 (one bone, seven charcoal and nine pot residues), one by the British Museum in 2000-2001 (one bone) and two by the Centre for Isotope Research of the University of Groningen in 2003. Overall seven charcoal, four bone and nine pot residue samples were submitted for radiocarbon analysis.

Objectives

The principal aims of the dating program were to:

- date the Neolithic midden deposits in Areas 6 and 10;
- date the inception, longevity and likely date of abandonment of the middens;
- compare the dates of the two midden deposits, and their chronological relationship to other Neolithic activity on the site;
- date the use of the Carinated Bowl assemblage from Area 6;
- confirm the presence of beech (*Fagus sylvatica*) in the Neolithic.

Sampling

The first stage in sample selection was to identify short-lived material which was demonstrably not residual in the context from which it was recovered. The taphonomic relationship between a sample and its context is the most hazardous link in this process, since the mechanisms by which a sample came to be in its context are a matter of interpretative decision rather than certain knowledge. All samples consisted of single entities (Ashmore 1999). Material was selected only where there was evidence that a sample had been put fresh into its context. The main categories of material which met these taphonomic criteria were:

- Articulated animal bone deposits – these must have been buried with tendons attached or they would not have remained in articulation, and so were almost certainly less than six months old when buried (Mant 1987, 71).
- Charred organic residues on the interior of ceramic sherds. Where the survival of the residue seemed to indicate that the sherd had not been exposed to weathering and the proximity of a number of sherds from the same vessel suggested that the vessel was not redeposited.

Due to the small number of samples that met these strict criteria, additional samples had to be submitted for analysis that had a rather less certain taphonomic relationship with their contexts. These included individual cereal grains and a hazel nutshell, not from discrete caches, that could have been residual or been incorporated into their contexts after the contexts had formed (ie be intrusive), together with animal bones that because of their size and apparent 'freshness' were thought to have not been exposed to weathering for any considerable time.

In addition samples of intrinsic interest were also selected – in this case beech charcoal – to confirm its presence in the Neolithic.

Once a group of potentially suitable samples had been identified, a number of models were built simulating the results of the dating programme. Radiocarbon results were simulated using the R_Simulate function in OxCal, with error terms estimated on the basis of the material available and the type of measurement to be commissioned (in this case all Accelerator Mass Spectrometry (AMS)). These simulated results suggested that it should be possible to estimate the start and end dates for the middens to within 150 years.

Unfortunately a number of the samples selected from the site for radiocarbon analysis that were almost certainly not residual failed to produce measurements because of poor yields during pretreatment. These samples included SF 83427, a cattle phalanx (II) that probably articulates to SF 84362; SF 74876, a cattle phalanx (III) that refits to SF 22085; a cattle vertebra from a semi-articulated skeleton (context 6882), and SF 32883/32885, part of a pig tooth that refits an old break to form a complete tooth.

Radiocarbon analysis and quality assurance

Of the nineteen samples submitted to the Oxford Accelerator, the carbonised material and residues on pot sherds were processed according to methods outlined in Hedges *et al.* (1989), and the bone sample was processed according to methods described in Bronk Ramsey *et al.* (2000). All samples were dated by AMS using methods outlined by Bronk Ramsey and Hedges (1997).

The laboratory maintains a continual programme of quality assurance procedures, in addition to participating in international intercomparisons exercises during the period when the measurements were made (Scott 2003). Following the discovery of a contamination problem in the ultrafilitration protocol (Bronk Ramsey *et al.* 2000) used for the processing of bone at Oxford in 2002 which resulted in some bone samples giving ages which were about 100-300 radiocarbon years (BP) too old (Bronk Ramsey *et al.* 2004a), three samples were redated. One sample (77496) was redated following pretreatment using the revised ultrafiltration protocol (Bronk Ramsey *et al.* 2004a) and measured by AMS as described by Bronk Ramsey *et al.* (2004b). Two samples (SF 82706 and SF 23932) were redated at the Centre for Isotope Research, Rijksuniversiteit Groningen. These samples were pretreated following Longin (1971) and measured by AMS, according to the procedures set out in Aerts-Bijma *et al.* (1997; 2001) and van der Plicht *et al.* (2000).

The one bone sample processed by the British Museum was treated with cold dilute acid, to extract the 'collagen', a term used here to mean the acid insoluble organic fraction produced by this treatment rather than the strict biochemical meaning. The sample was measured using liquid scintillation counting (Ambers *et al.* 1986).

Results

The results, given in Table 5.55, are conventional radiocarbon ages (Stuiver and Polach 1977), and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986).

Calibration

The radiocarbon determinations have been calibrated using the datasets published by Reimer *et al.* (2009) and the computer program OxCal v4.1 (Bronk Ramsey 1995; 1998; 2001; 2009). The calibrated date ranges cited are quoted in the form recommended by Mook (1986), with the end points rounded outward to 10 years. The ranges in Table 5.55 have been calculated according to the maximum intercept method (Stuiver and Reimer 1986), while the probability distributions in Figure 5.71 are derived from the probability method (Stuiver and Reimer 1993).

Analysis and interpretation

The calibrated dates given in Table 5.55 are accurate estimates of the dates of the samples. However, in archaeological terms they are not exactly what we want to know. Of much greater interest and potential importance are the dates of the archaeological events represented by those samples. Absolute dating information in the form of radiocarbon measurements on the animal bone, pot residues and carbonised plant material can be combined with the relative information provided by stratigraphic relationships between samples to provide estimates of the dates of this activity.

These posterior density estimates are not absolute, they are interpretative estimates, that can and will change as further data becomes available and as other people choose to model the existing results from different perspectives.

The technique used is a form of Markov Chain Monte Carlo sampling, and has been applied using the program OxCal v4.1.5 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by this program are available from the on-line manual or in Bronk Ramsey (1995; 1998; 2001; 2009). The algorithm used in the models described below can be derived from the structures shown in Figures 5.72 and 74.

Table 5.55 Radiocarbon dates from Area 6 and 10

Laboratory number	*Sample number*	*Material & context*	*$\delta^{13}C$ (‰)*	*Radio-carbon age (BP)*	*Weighted mean*	*Calibrated date range (95% confidence)*	*Posterior density esti-mate (95% probability)*
Area 10							
OxA-9671	DBC 32522	Charred organic residue on interior of potsherd (A Barclay). From a layer of greyish brown sandy silt 6331 which filled the top of an early Holocene channel crossing the flint gravel terrace	-32.0	4590±150		3660-2890 cal BC	3500-3020 cal BC
OxA-9672	DBC 41577	Charred organic residue on interior of potsherd (A Barclay). From a layer of greyish brown sandy silt 6331 which filled the top of an early Holocene channel crossing the flint gravel terrace	-27.8	4520±120		3630-2890 cal BC	3490-3020 cal BC
OxA-10206	DBC 40929	Charred organic residue on interior of potsherd (A Barclay). From a discrete flint scatter 6880 lying in a shallow hollow to the north of an early Holocene channel crossing the flint gravel terrace	-26.9	4565±60		3500-3090 cal BC	3490-3460 (1%) or 3380-3090 (94%) cal BC
BM-3188	6915	From a semi-articulated skeleton found in 6331, a layer containing midden material	-19.9	4530±50		3490-3020 cal BC	3370-3100 cal BC
Area 6							
OxA-12238	77496	Bone; cattle pelvis (G Jones). From 11160 a distinctive midden deposit, situated on land surface 11201.	-21.3	4701±34		3640-3370 cal BC	3640-3560 (81%) or 3540-3400 (14%) cal BC
OxA-9819	SS 2302 (11172A)	Carbonised grain; emmer (M Robinson). From midden deposit 11172 on land surface 11201	-25.9	4925±40		3790-3640 cal BC	3770-3640 cal BC
OxA-9850	SF 84566	Charred organic residue on interior of body sherd – fabric AF3 (A Barclay). From 11320 the upper fill of tree-throw hole 11352	-28.1	4645±55		3630-3340 cal BC	3640-3400 cal BC
OxA-9851	SF 84429	Charred organic residue on interior of body sherd – fabric AF3 (A Barclay). From 11313 the upper fill in tree-throw hole 11352. 11313 appears to be a dense, finds rich midden deposit.	-27.3	4760±50		3650-3370 cal BC	3660-3490 (93%) or 3430-3400 (2%) cal BC
OxA-9852	SF 50842	Charred organic residue on interior of carinated bowl – shoulder sherd, fabric FA3 (A Barclay). From 8194 a 2m2 area of land surface 11201	-26.4	5110±90		4230-3700 cal BC	3860-3640 cal BC
GrA-22561	SF 82706	Bone; cattle mandible (G Jones). From 11176, the upper fill of a tree-throw hole, which resembles a midden deposit.	-22.4	4970±45		3940-3650 cal BC	3800-3650 cal BC
GrA-22560	SF 23932	Bone; cattle phalanx I (G Jones). From 11160 a distinctive midden deposit located on land surface 11201.	-22.6	4910±45		3790-3630 cal BC	3770-3630 cal BC
OxA-9859	SS 2304 (11187)	Carbonised grain; emmer (M Robinson). From the upper fill in tree-throw hole 11190.	-26.1	4895±50		3780-3540 cal BC	3780-3630 (94%) or 3560-3540 (1%) cal BC
OxA-9860	SS 2329 (11316)	Charcoal; twig, *Fagus sylvatica* (M Robinson). From 11316 part of 11200. Seals tree-throw hole 11352 and the midden deposits found within it	-24.7	346±35		cal AD 1440-1650	-
OxA-9889	SS 2306 (11160)	Carbonised grain; emmer (M Robinson). From a distinctive 'midden' deposit 11160 on a preserved land surface 11201	-24.5	4935±40		3800-3640 cal BC	3780-3640 cal BC

Table 5.55 (continued)

Laboratory number	*Sample number*	*Material & context*	*$\delta^{13}C$ (‰)*	*Radio-carbon age (BP)*	*Weighted mean*	*Calibrated date range (95% confidence)*	*Posterior density estimate (95% probability)*
OxA-9890	SS 2317 (11194)	Charcoal; hazelnut shell (M Robinson). From 11194 the upper fill of tree-throw hole 11345. The fill resembled a midden deposit.	-25.6	4995±40		3950-3660 cal BC	3810-3650 cal BC
OxA-9891	SS 2307 (11159)	Carbonised grain; emmer (M Robinson). From 11159 part of general land surface deposit 11201	-24.6	4910±40		3780-3630 cal BC	3770-3640 cal BC
OxA-9924	SF 82319	Charred organic residue on interior of neck sherd – fabric AF3 (A Barclay). From 11194 the upper fill of tree-throw hole 11345. The deposit resembled a midden deposit.	-25.5	4920±65		3930-3530 cal BC	3800-3630 (94%) or 3560-3540 (1%) cal BC
OxA-9925	SF 82594	Charred organic residue on interior of body sherd – fabric AF3 (A Barclay). From 11344 the lower fill of tree-throw hole 11345	-28.6	5240±85		4330-3810 cal BC	-
OxA-10660	SF 82594	Replicate of OxA-9925	-30.5	4915±55		3800-3630 cal BC	3790-3630 cal BC
OxA-9926	SS 2302 (11172B)	Charcoal; twig, *Fagus sylvatica* (M Robinson). From midden deposit 11172 located on land surface 11201	-25.4	4075±65		2880-2460 cal BC	-
OxA-X-1028-12	SF 83461 (11344)	Charred organic residue on interior of potsherd (A Barclay). From 11344 the primary fill of tree-throw hole 11345	-29.5	4580±65	4598±42 BP (T′= 0.1; ν=1; T′(5%) =3.8)	3500-3120 cal BC	3630-3590 (32%) or 3520-3430 (61%) or 3380-3350 (2%) cal BC
OxA-X-1045-9	SF 83461 (11344)	Replicate of OxA-X-1028-12	-31.2	4610±55			

In the analyses undertaken we have chosen to impose a uniform prior distribution on the spread of dates while assuming that the dated samples represent independent events and a random sample of a relatively constant level of human activity (see Bronk Ramsey (2000) for further details of its implementation). Such an approach has been used because when radiocarbon dates are constrained by relative dating information it has been shown that there is a danger that the posterior density distributions may be spread evenly across a plateau in the calibration curve, irrespective of the actual age of the material dated (Steier and Rom 2000). This is due to the fact that the statistical weight of a group of measurements naturally favours longer overall spans.

Stage 1: the samples and the sequence

Eighteen measurements were made on samples from the Area 6 midden. Although essentially a deposit from a single stratigraphic unit, it does seem to be a settlement midden. Thus the assumption of continuous use for a period of time (Buck *et al.* 1992) seems to be more realistic than in situations comprising, for example, scattered pits.

Samples from the midden included a cattle mandible (SF 82706; GrA-22561). This is unlikely to have been either intrusive or residual as several pieces of bone, broken in antiquity, refit to form a relatively complete cattle mandible. A cattle phalanx I (SF 23932; GrA-22560) probably refits to SF 23370 found in the same deposit 1m away, suggesting that the bones are not residual. OxA-12238, a cattle pelvis (sample 77496) is potentially residual as it does not articulate with any other bones from the deposit. However, the fact that it was one of the largest bones from the Area 6 midden suggests that it was deposited fairly fresh or it would have broken due to its fragility.

Although the eight measurements (OxA-9850-2, OxA-9924-5, OxA-10660, OxA-X-1028-12 and OxA-X-1045-9) from the organic residues on the interior of pot sherds (SF 84566, 84429, 50842, 82319, 82594 – replicate measurements, 83461 – replicate measurements) are not from sherds that re-fit, the survival of residues on them does seem to suggest that they had not been exposed to excessive weathering and probably indicates that they were not residual. The replicate measurements on the residue from SF 83461 (11344) are statistically consistent (T′=0.1; □=3; T′(5%)=7.8; Ward and Wilson 1978) and therefore a weighted mean has been calculated (SF 83461 (11344); 4598±42 BP).

A replicate measurement was made on the organic residue from pottery sherd (SF 82594) as a

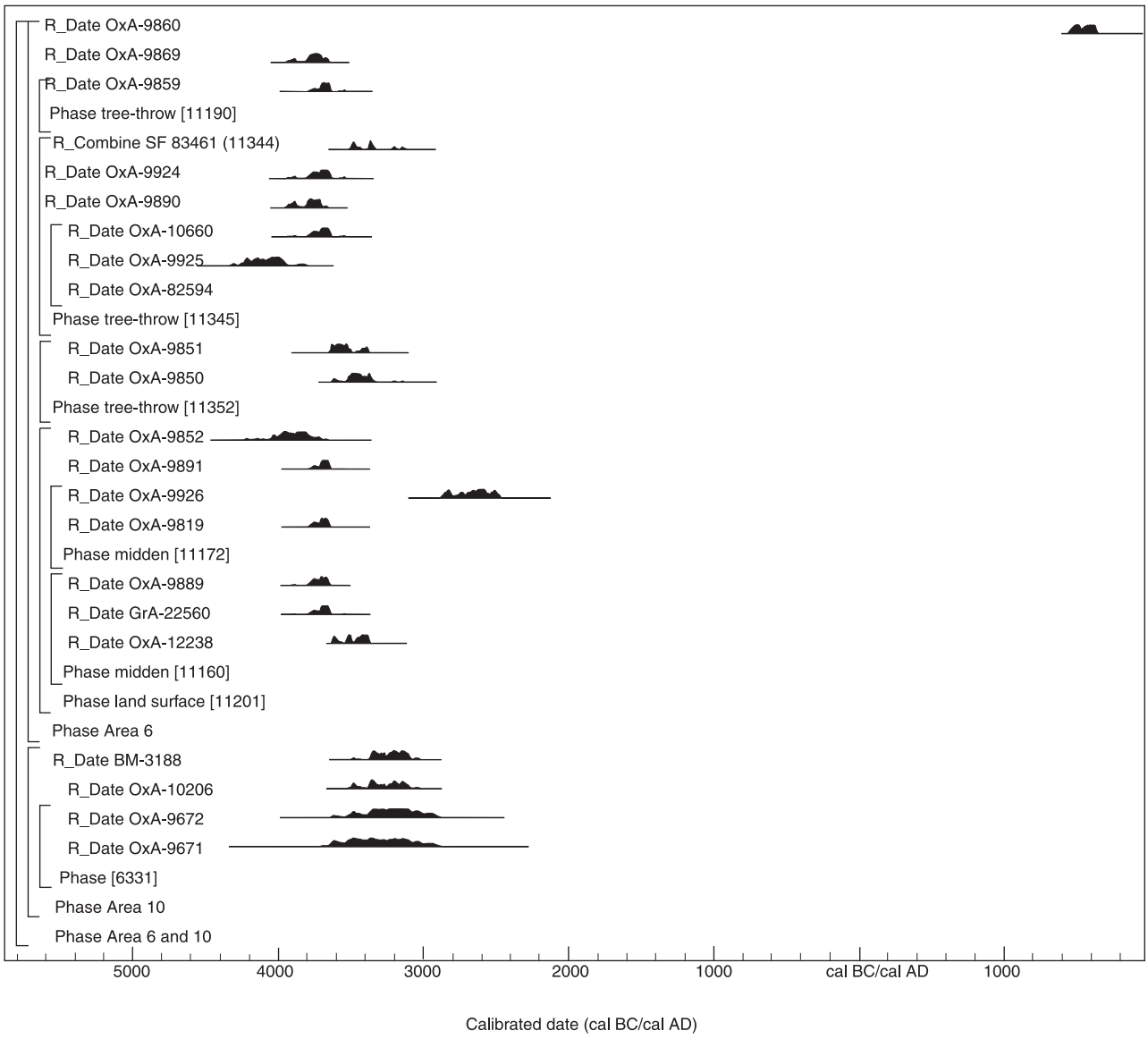


Fig 5.71 Probability distributions of dates from Eton Rowing Lake. Each distribution represents the relative probability that an event occurred at a particular time. These distributions are the result of simple radiocarbon calibration (Stuiver and Reimer 1993)

check on the very early measurement of OxA-9925. The two measurements (OxA-9925; 5240±85 BP and OxA-10660; 4915±55 BP) are statistically different (T'=10.5; ν=1; T'(5%)=3.8; Ward and Wilson 1978). In addition to the difference in the radiocarbon measurements the $\delta^{13}C$ values are quite different as well (-28.6‰ for OxA-9925, and –30.5‰ for OxA-10660). This would seem to suggest that either a different fraction of the residue recovered from the pot is being measured, or that there is a contaminant whose removal is reflected in a shift in the $\delta^{13}C$ values. Since the pretreatment of both samples was identical, the former is the more likely interpretation.

There is also variation in the percentage pretreatment yields of both samples, and the CO_2 generated from the combustion of this pretreated material also varies between them. This would seem to imply that the differences in the radiocarbon and carbon isotope results may be due to the 'residues' recovered from the pot being chemically different, with variable proportions of carbonaceous materials and possibly contaminating material present, or a varying presence or proportion of lipids. As a group, the pottery residues dated from Eton Rowing Course have very high (50-80%) yields after pretreatment, and very low CO_2 yields after combustion. Of the two measurements made on SF 82594, OxA-10660 maintains the closest similarity to the general trend (pretreatment yield 50%; combustion yield 3%).

The four charred grains of emmer wheat (OxA-9819, 9859, 9889, and 9891) and the single charred hazelnut (OxA-9890) do not come from caches of burnt material and could potentially be either intrusive or residual.

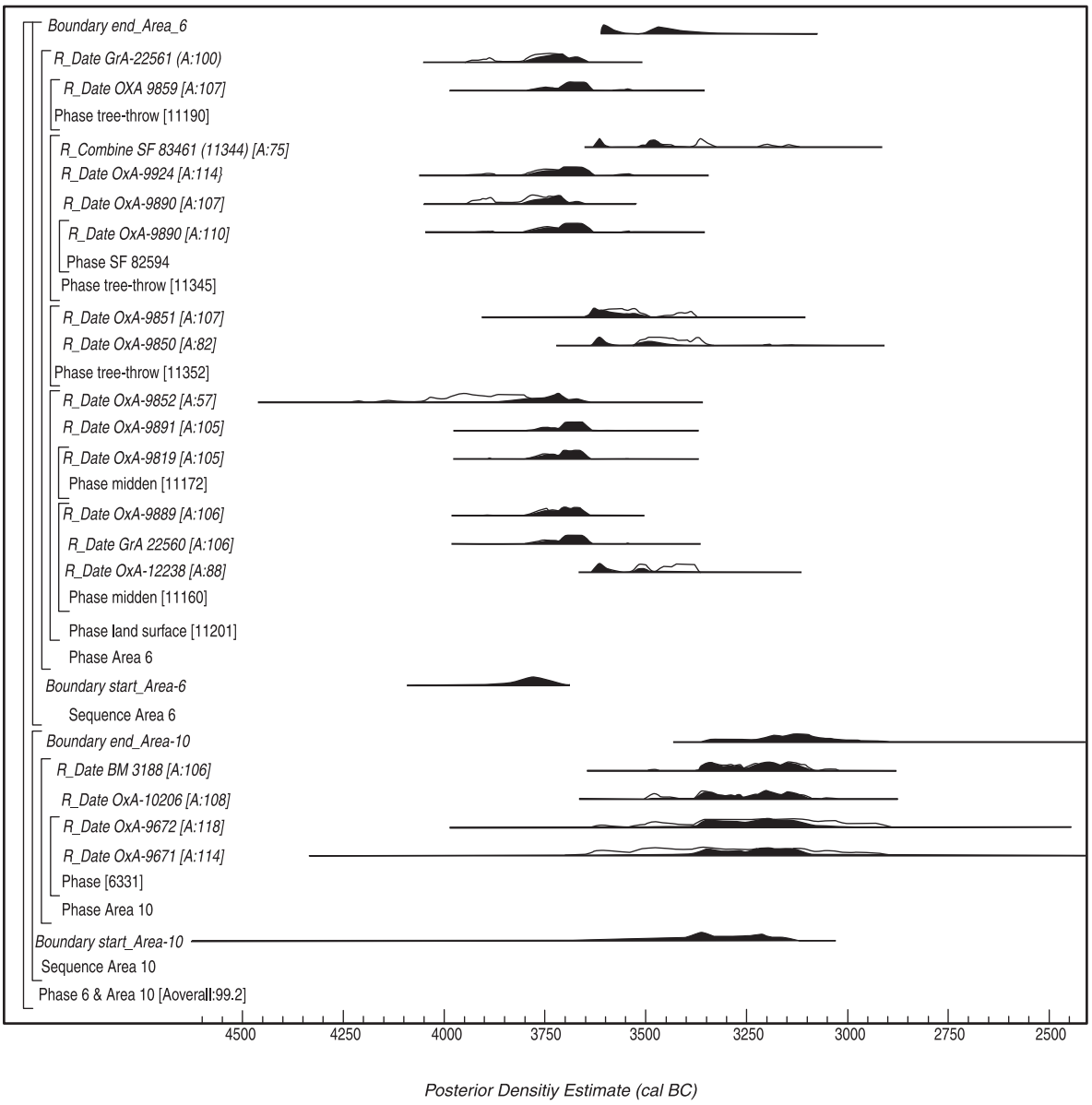


Fig 5.72 Probability distributions of dates from Eton Rowing Lake (model I): each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. The large square brackets down the left hand side along with the OxCal keywords define the model exactly

Two samples from Area 6 have been excluded from the analysis (see below): OxA-9926 and OxA-9860. Both these samples were twigs of *Fagus sylvatica* (beech) and it would seem that they were not contemporary with the deposit but represent later intrusive material. Given that the site is located on a gravel terrace and the midden deposits were covered by only a very thin layer of top soil, the presence of intrusive material is not entirely unexpected.

The four samples from Area 10 include three from organic residues on the interior of potsherds (OxA-9671-2 and OxA-10206) and a cattle vertebra from a semi-articulated skeleton. As the pot sherds containing organic residues do not re-fit with other parts of the assemblage the possibility that they are residual cannot be discounted. However, the same interpretation applied to the Area 6 fragments must be true here as well (ie the survival of an organic residue implies they are not residual).

The four determinations are not statistically different ($T'=0.3$; $\nu=3$; $T'(5\%)=7.8$; Ward and Wilson 1978) which might mean that all the material was incorporated into the midden at the same time. However, it is possible that if the midden accumulated over a relatively short period of time it could produce such a group of results.

Model 1

In Figure 5.72 we have chosen to exclude the first measurement (OxA-9925) made on pot sherd (SF

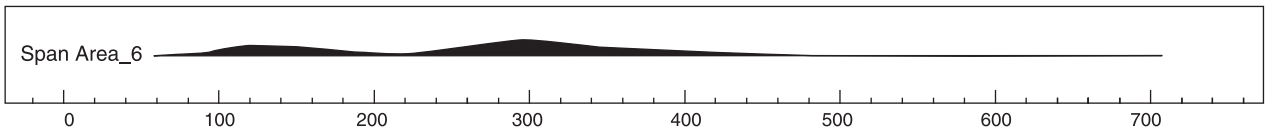


Fig 5.73 Probability distribution showing the number of calendar years during which activity occurred at Area 6. The distribution is derived from the model shown in Figure 5.72

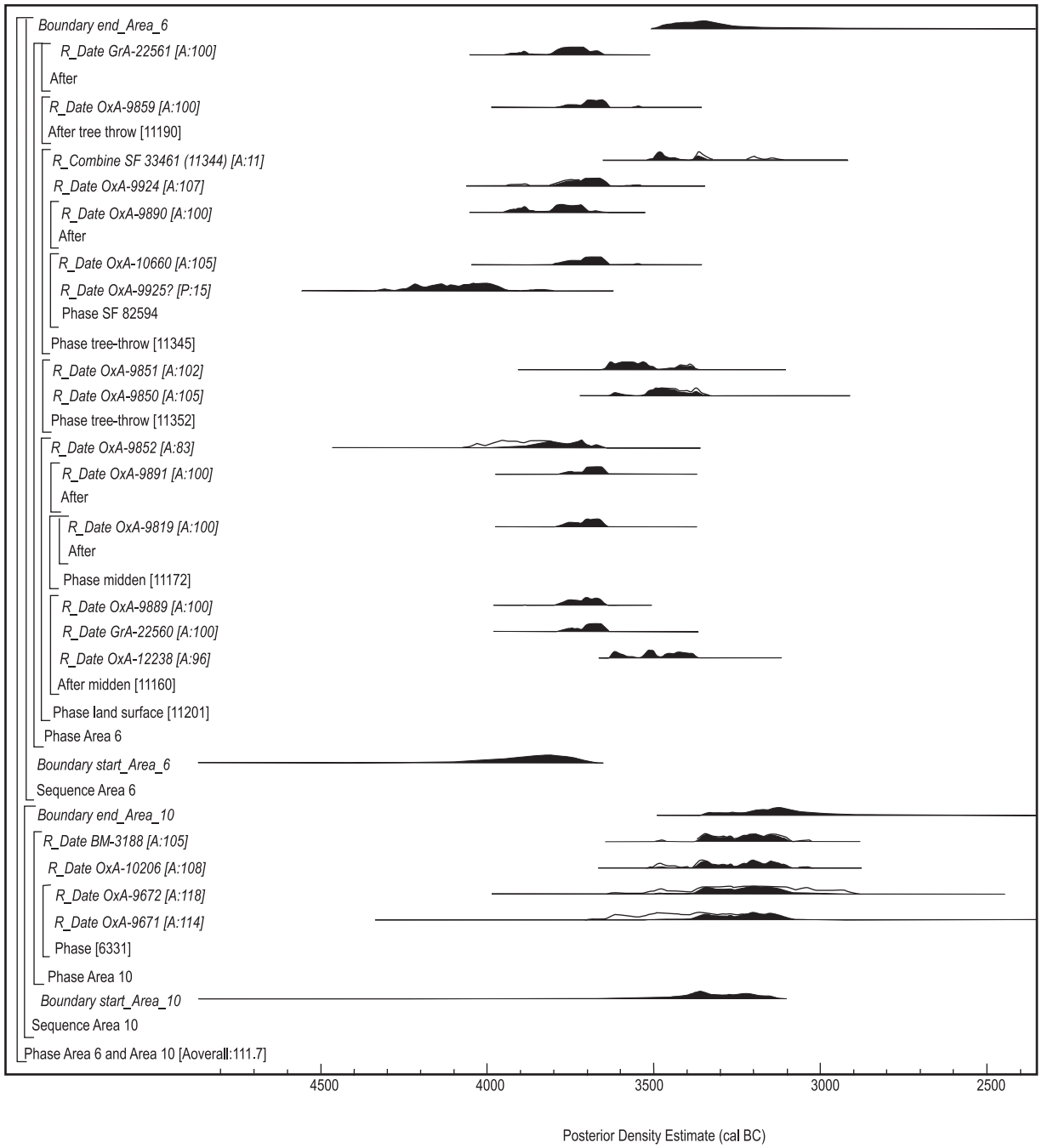


Fig 5.74 Probability distributions of dates from Eton Rowing Lake (model II): each distribution represents the relative probability that an event occurs at a particular time. For each of the radiocarbon dates two distributions have been plotted, one in outline, which is the result of simple radiocarbon calibration, and a solid one, which is based on the chronological model used. The large square brackets down the left hand side along with the OxCal keywords define the model exactly

82594) because of the fact that – given the similarities in pretreatment and combustion yields – it would seem that OxA-10660 is dating a similar 'residue' to that on other pottery sherds from the site. The model shows good agreement with the assumption that the two middens represent single phases of activity (Aoverall=99.2%) and provides an estimate for the start of activity in Area 6 of 3920-3690 cal BC (95% probability; start;_Area 6_; Fig. 5.72), and probably 3830-3730 cal BC (68% probability). The end of midden accumulation in Area 6 is estimated to have taken place in 3520-3320 cal BC (66% probability; end_Area 6; Fig. 5.72).

The start of accumulation of the Area 10 midden took place in 3750-3100 cal BC (95% probability; start_Area_10; Fig. 5.72) and probably 3430-3150 cal BC (68% probability). The end of activity at Area 10 is estimated to have occurred in 3370-2770 cal BC (95% probability; end_Area_10; Fig. 5.72) and probably 3230-3020 cal BC (61% probability).

The length of time over which the midden in Area 6 accumulated was 70-460 years (95% probability; Fig. 5.73) and probably 100-170 years (21% probability) or 250-370 years (47% probability). The small number of dates available from the Area 10 midden means that any estimate will tend to suggest that activity continues for longer than it really did and so a span of use has not been calculated.

Model 2

The model shown in Figure 5.74 treats all those measurements from model 1 (Fig 5.72) that have the potential to be residual, ie the four individual grains of carbonised emmer wheat (OxA-9819, 9859, 9889, and 9891), the single charred hazel nutshell (OxA-9890), and the animal bones (OxA-12238, and GrA-22560-61) as only providing *termini post quem (tpqs)* for their contexts. Thus from Area 6 the only samples that are demonstrably not residual are the pottery residues.

The model shows good agreement with the assumption that the middens represents a single phase of activity (Aoverall=111.7%) and provides an estimate for the start of activity in Area 6 of 4220-3670 cal BC (95% probability; start_Area 6; Fig. 5.74) and end of 3500-3020 cal BC (95% probability; end_Area 6; Fig. 5.74). The large spans for the start and end of activity is a function of the small number of measurements that are not tpqs. It is therefore rather unfortunate that amongst the samples that failed to produce radiocarbon measurements from this part of site, two were from articulated animal bones (SF 83427 and SF 74876).

Choosing a model?

Of the two alternative models presented above we think that model 1 provides the best estimates for the dates of archaeological activity on Area 6 at Eton Rowing Course. Although it contains a number of samples that are not demonstrably either residual or intrusive there seems good archaeological evidence to suggest that all the samples represent activity associated with the accumulation of a settlement midden. This includes the discarded large relatively fresh, although not necessarily articulating animal bones, and the small quantities of charred grain, resulting from accidental burning.

Conclusions

The dating programme has been successful in meeting most of the objectives outlined above. The most important of these relates to the inception of the Area 6 midden and the date of use of the Carinated Bowl assemblage contained within it. Modelling suggests that the start date for the Area 6 midden falls early in the 4th millennium cal BC (3830-3730 cal BC; 68% probability). This agrees well with the expected date for pottery assemblages containing Carinated Bowls in Britain which are thought to have appeared at the start of the 4th millennium cal BC.

Given the much smaller number of determinations obtained from Area 10 it is not surprising that the chronology they suggest is considerably less precise than that for Area 6. Whilst the ceramics from the two areas suggest that they were broadly contemporary, the radiocarbon dates from Area 10 suggest that deposition began at a date (3430-3150 cal BC; 68% probability) which is significantly later than that suggested by the Bowl pottery it contained. Both middens, however, contained clear evidence for later disturbance, and Area 10 in particular, contained clear indications of activity continuing into the middle Neolithic and beyond. It is possible that the later chronology suggested by the dates from Area 10 reflects this later activity. The four sherds from which the dated residues were obtained were not diagnostic. The ceramic evidence suggests that deposition must have begun at a significantly earlier date than is suggested by the radiocarbon dates.

Confirmation of the presence of beech in the Neolithic is shown by the date of sample 11172B – 2880-2460 cal BC (OxA-9926: 4075 ± 65 BP) – although the sample is clearly not related to the primary formation of the middens.

Organic residue analysis of sherds from Areas 6 and 10 *by Richard Evershed, Sebastian Payne, Vanessa Straker, Mark Copley, Robert Berstan, Sophie Aillaud and Gordon Docherty*

Introduction

Fats and waxes entrapped as absorbed residues associated with ceramic vessels during the processing of organic materials in antiquity are well protected from chemical decay and microbial attack (Heron and Evershed 1993), and can be retrieved and identified even after several thousands of years of burial. The application of modern analytical techniques enable even highly degraded remnants of natural commodities to be characterised and identified (Evershed *et al.* 1990; 1994; 1997; 1999).

Often, data obtained from organic residue analysis provides the only evidence for the exploitation and processing of animal commodities or leafy vegetables, particularly at sites exhibiting a paucity of environmental evidence. To date the use of chemical analyses in the reconstruction of vessel use at various sites in the UK has enabled the identification of animal fats (Evershed *et al*. 1992; Needham and Evans 1987), beeswax (Charters *et al.* 1995; Needham and Evans 1987), birch bark tar (Charters *et al.* 1993a) and the epicuticular waxes of leafy vegetables (Charters *et al.* 1997; Evershed *et al.* 1991, 1992, 1994).

The identification of ancient commodities based on lipid residues in pottery is inevitably complicated by the degradative processes occurring during vessel use and burial. However, reliable identifications can be made based on the structures of individual components and comparison of lipid profiles with modern reference samples and degraded materials produced in laboratory simulation experiments (Evershed *et al.* 1995a; Dudd *et al.* 1998). Degraded animal fats are by far the most commonly identified residues found in association with pottery vessels, and are characterised by a readily recognisable distribution of free fatty acids, monoacylglycerols, diacylglycerols and intact triacylglycerols. However, identification of the particular type of animal from which the fat is derived is much less straightforward and complicated to some extent by chemical and microbiological alteration (Evershed *et al.* 1992; Dudd *et al.* 1998). To date, distinctions have been made based primarily upon the distributions of free fatty acids present (Needham and Evans 1987; Rottländer 1990). However, new approaches are required in order to make unambiguous distinctions between remnant fats derived from different animal species.

For example, the use of stable isotopes in archaeology was first explored by Morton and Schwarcz (1988) who investigated the bulk $\delta^{13}C$ and $\delta^{15}N$ values of organic residues thought to originate from the C4 cereal Maize. Hasdorf and DeNiro (1985) and Sherriff *et al.* (1995) also used stable isotope measurements to characterise prehistoric carbonised plant and animal remains, respectively. However, the first application of compound-specific stable carbon isotope measurements to archaeological samples was reported by Evershed *et al.* (1994). The $\delta^{13}C$ values obtained for individual components in solvent extracts of pottery vessels from the Raunds Area Project, Northamptonshire, confirmed that the lipids being investigated were of C3 origin. The distributions of components were consistent with the lipids in the potsherds having derived from *Brassica* species, such as cabbage. We have recently developed this approach further, and by utilising fundamental differences in the stable carbon isotope composition of the fatty acid component of the adipose fat in the major domesticates, have been able to make clear distinctions between remnant fats of different origins in archaeological ceramics (Evershed *et al.* 1997; Dudd and Evershed 1998). These differences in stable isotope values were paralleled by differences in fatty acid composition, although the former are deemed to be diagenetically more robust.

Aims and objectives

The aims of the study were to determine the extent of the evidence for dairying in the Neolithic pottery as witnessed through residue analysis obtained from carefully selected pottery vessels.

The initial objective of this investigation was to screen a group of selected sherds in order to determine the presence (or absence) of organic residues. Herein we present the results of chemical analyses of these lipid extracts. Where degraded animal fat residues have been detected, further analyses comprising a combination of criteria have been considered in the determination of origin, including the characterisation of solvent extractable lipid components by high temperature gas chromatography (HTGC) and gas chromatography-mass spectrometry (GC-MS) and the application of compound-specific stable carbon isotope analysis to measure $\delta^{13}C$ values of the major n-alkanoic acids.

Materials and methods

Lipid analyses were performed using our established protocols which are described in detail in earlier publications (Evershed *et al.* 1990; Charters *et al.* 1993b). Briefly, analyses proceeded as follows:

Solvent extraction of lipid residues

Approximately 2g samples were taken and their surfaces cleaned using a modelling drill to remove any exogenous lipids (eg soil or finger lipids due to handling). The samples were then ground to a fine powder, accurately weighed and a known amount (20 μg) of internal standard (n-tetratriacontane) added. The lipids were extracted with a mixture of chloroform and methanol (2:1 v/v). Following separation from the ground potsherd, the solvent was evaporated under a gentle stream of nitrogen to obtain the total lipid extract (TLE). Portions (generally one fifth aliquots) of the extracts were then trimethylsilylated and submitted directly to analysis by gas chromatography (GC). Where necessary combined gas chromatography/mass spectrometry (GC/MS) analyses were also performed on trimethylsilylated aliquots of the lipid extracts to enable the elucidation of structures of components not identifiable on the basis of GC retention time alone.

Preparation of trimethylsilyl derivatives

Portions of the total lipid extracts were derivatised using N,O-bis(trimethylsilyl) trifluoroacetamide (20 μml; 70°C; 20 mins; T-6381; Sigma-Aldrich Company Ltd, Gillingham, UK) and analysed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS).

Saponification of total lipid extracts

Methanolic sodium hydroxide (5% v/v) was added to the TLE and heated at 70°C for 1 hour. Following neutralisation, lipids were extracted into hexane and the solvent reduced by rotary evaporation.

Preparation of fatty acid methyl ester (FAME) derivatives

FAMEs were prepared by reaction with BF3-methanol (14% w/v; 2 ml; B-1252; Sigma-Aldrich, Gillingham, UK) at 70°C for 1 h. The methyl ester derivatives were extracted with diethyl ether and the solvent removed under nitrogen. FAME were redissolved into hexane for analysis by GC and gas chromatography-combustion-isotope ratio mass spectrometry (GC-C-IRMS).

Samples

A total of 88 samples from the Neolithic hollow deposits in Areas 6 and 10 were submitted for residue analysis (Table 5.56). An initial study investigated a total of twenty-eight of these (sample numbers in brackets prefixed A in Table 5.56), which was supplemented shortly after by another group of thirty (sample numbers in brackets prefixed D in Table 5.56). These sherds include cups and bowls (Carinated and Plain), but as pottery analysis had not yet taken place, these were not selected to answer specific questions. A further thirty sherds (sample numbers in brackets 29-58 in Table 5.56) were selected for organic residue analysis to address specific questions. Such questions were:

- Does the fabric of a pottery vessel affect the survival of lipid residue?
- Was the fabric related to the lipids which were stored/used in these vessels?
- Can we distinguish differences in the presence or type of lipid residue according to vessel form?
- Does surface treatment or finish have a correlation with certain types of lipid residue?
- Are different parts of vessels more or less likely to contain lipid residues?

Not all of these questions could be answered within the timeframe and resources of the project.

Results

Gas Chromatography (GC) analyses were performed on the solvent extracts of a subsample of each potsherd, totalling 88 analyses of this type. The results of screening by GC are summarised in Table 5.57 on a sample-by-sample basis, giving the total lipid content per gram of powdered sherd and a brief description of the lipid distributions. Where there were sufficient quantities of lipid present in the lipid extracts, samples were selected for further analysis by GC-C-IRMS (as indicated by an asterisk in column 1 of Table 5.57).

Fifty of the 88 sherds (57%) from Eton Rowing Course yielded appreciable concentrations of lipid residues; up to 1.1 mg g-1 dry weight of sherd (mean 0.1 mg g-1). The majority of extracts comprised degraded animal fat residues characterised by a distribution of free fatty acids, mono-, di- and triacylglycerols (eg Fig. 5.75). It is known that the triacylglycerols (TAGs) can be hydrolysed to diacylglycerols (DAGs), monoacylglycerols (MAGs) and free fatty acids during vessel use and burial (Evershed *et al.* 1992). Seven of the 50 lipid extracts contained only free fatty acids (principally $C_{16:0}$ and $C_{18:0}$); no MAGs, DAGs or TAGs were present, indicating that extensive degradation of the acyl lipid moieties has occurred. In the burial environment or during vessel use, the TAGs are

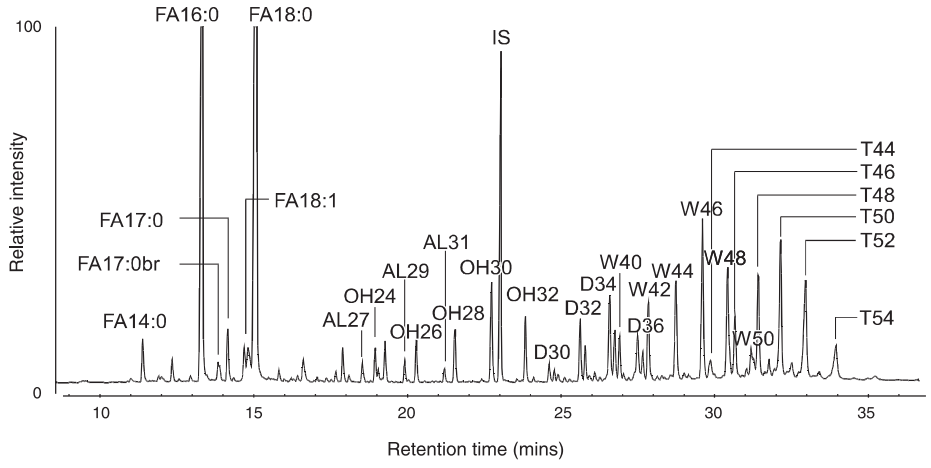


Fig. 5.75 Partial HTGC profile of the trimethylsilylated total lipid extract from sample DBC16, illustrating the distribution of components characteristic of a degraded animal fat. Key: FAx are free fatty acids of carbon length x. OHx are primary alcohols, Dx are diacylglycerols, Tx are triacylglycerols, Wx are wax esters and ALx are alkanes, all of carbon length x. IS is the internal standard (C 34 alkane)

Table 5.56 List of sample sherds from Areas 6 and 10

Sample no	*Area*	*Context*	*SF*	*Fabric*	*Date*	*Form*	*Rim form*	*Shoulder form*	*Identified residue*	*Catalogue reference*
1 (D1)	6	11316	81798	X	EN	Cup	1		X	P73
2 (D2)	6	11160	77251	A1	EN	Cup	1		X	P116
3 (D3)	6	5985	23012	AF3	EN	Cup	1		X	P181
4 (D4)	6	11160	78986	FA3	EN	Cup	1		X	P121
5 (D5)	6	11313	84046	A1	EN	Cup	1		X	Not illustrated
6 (D6)	6	11159	72591	F2	EN	Cup	1		X	Not illustrated
7 (D7)	6	11332	83575	FA1	EN	Ind. Bowl	2			P136
8 (D8)	6	11180	82237	F2	EN	Ind. Bowl	2		X	P1
9 (D9)	6	11160	76458	F1	EN	Ind. Bowl	6		X	P127
10 (D10)	6	11313	81216	F1	EN	Ind. Bowl	2		0	P152
11 (D11)	6	11320	83936	F2	EN	13	2		0	P131
12 (D12)	6	11170	78000	F2	EN	Ind. Bowl	2		X	P66
13 (D13)	6	11160	79574	F2	EN	Ind. Bowl	2		X	P124
14 (D14)	6	11160	77250	F3	EN	Ind. Bowl	2		X	P125
15 (D15)	6	11305	81391	F2	EN	Ind. Bowl	6		X	P5
16 (D16)	6	11313	85123	F2	EN	Ind. Bowl	4		0	Not illustrated
17 (D17)	6	11316	80887	FA	EN	Ind. Bowl	4		0	Not illustrated
18 (D18)	6	11320	83935	F1	EN	Hemispherical bowl	5		X	P132
19 (D19)	6	11313	83810	F1	EN	Ind. Bowl	6		X	P151
20 (D20)	6	11313	82402	F1	EN	Ind. Bowl	6		X	P155
21 (D21)	6	11313	81215	F3	EN	Ind. Bowl	6		0	P158
22 (D22)	6	11150	78387	F3	EN	Ind. Bowl	7		0	P187
23 (D23)	6	11194	80756	F3	EN	Ind. Bowl	7		0	P179
24 (D24)	6	11159	75273	F	EN	Ind. Bowl	7		0	P69
25 (D25)	6	11313	83314	FA	EN	Ind. Bowl	2		0	P156
26 (D26)	6	11151	75522	F1	EN	Ind. Bowl	4		X	P41
27 (D27)	6	11153	76054	QA2	EN	Hemispherical bowl	3		X	P42
28 (D28)	6	11160	75696	F3	EN	Ind. Bowl	2		0	P128
29 (D29)	6	5989	25787	FA2	EN	Ind. Bowl	6		X	P21
30 (D30)	6	11200	70053	FA2	EN	Ind. Bowl	6		X	Not illustrated
31 (A1)	6	5989	26206	FA3	EN	Ind. Bowl	4		X	Not illustrated
32 (A2)	6	5989	24912	FA2	EN	Carinated bowl	4		X	P92
33 (A3)	6	5989	24067	FA2	EN	Ind. Bowl	2		X	P29
34 (A4)	6	8109		AF3	EN	S-profile bowl	4	1	0	Not illustrated
35 (A5)	10	6243	32571	F2	EN	Ind. Bowl	4		0	Not illustrated
36 (A6)	10	6245	32597	FA2	EN	Ind. Bowl		10	0	Not illustrated
37 (A7)	10	6246	31289	F2	EN	Ind. Bowl		10	X	Not illustrated
38 (A8)	10	6248	31852	FA3	EN	Carinated bowl			0	P13
39 (A9)	10	6458	30683	F2	EN	Ind. Bowl	2		0	P52
40 (A10)	10	6565	41957	FA3	EN	Ind. Bowl	4		0	Not illustrated
41 (A11)	10	6615	41378	F1	EN	Ind. Bowl	3		X	Not illustrated
42 (A12)	10	6618	41573	FA3	EN	Ind. Bowl	8		X	Not illustrated
43 (A13a)	10	6621	31698	FA3	EN	Ind. Bowl	2		X	Not illustrated
44 (A13b)	10	6880	41168	FA3	EN	Cup	1		X	P59
45 (A14)	10	6922	42523	FA3	EN	Closed ind	2		0	P83
46 (A16)	6	11150	76244	F3	EN	Ind. Bowl	4		X	Not illustrated
47 (A17)	6	11150	79355	F2	EN				0	Not illustrated
48 (A18)	6	11151	78890	F3	EN				0	Not illustrated
49 (A19)	6	11157	82039	FA3	EN	Ind. Bowl	4		X	P55
50 (A20)	6	11160	76999	F2	EMN		8		X	Not illustrated
51 (A21)	6	11176	79390	FA2	EN	Ind. Bowl	4		X	Not illustrated
52 (A22)	6	11200	76628	F2	EN	Ind. Bowl	2		0	P87
53 (A23)	6	11243	79210	FA2	MN	Ind. Bowl	30		X	Not illustrated
54 (A24)	6	11313	81037	FA2	EN	Ind. Bowl	2		0	Not illustrated
55 (A25)	6	11313	83569	FA2	EN	Ind. Bowl	2		0	Not illustrated
56 (A26)	6	11320	84278	FA3	EN	Ind. Bowl	2		0	Not illustrated

Table 5.56 (continued)

Sample no	*Area*	*Context*	*SF*	*Fabric*	*Date*	*Form*	*Rim form*	*Shoulder form*	*Identified residue*	*Catalogue reference*
57 (A27)	6	11342	83604	F2	EN	Ind. Bowl	2		0	Not illustrated
58 (A28)	6	11320	85488	FA2	EN	Ind. Bowl	2		X	Not illustrated
59 (29)	10	6802		F2	EN	Hemisperical bowl	1			P66
60 (46)	10	6621	41329	FA2	EN	Ind. Bowl	1		X	P37
61 (33)	10	6880	40892	FA1	EN	Ind. Bowl	4			P61
62 (36)	10	6613	32829	FA2	EN	Ind. Bowl	4		X	P24
63 (45)	10	6651	41939	FA3	EN	Ind. Bowl	4		X	P45
64 (55)	6	5986	23157	A1	EN	Ind. Bowl	2		X	Not illustrated
65 (47)	10	6621	31714	AF2	EN	Ind. Bowl	1			P34
66 (32)	10	6652	32129	FA3	EN	Ripple burnished bowl			X	Not illustrated
67 (44)	10	6653	41892	AF2	EN	Carinated Bowl		3		P47
68 (34)	10	6615	32906	FA2	EN	Ind. Bowl		1		Not illustrated
69 (56)	6	5986	23042	X	EN	Cup	1			Not illustrated
70 (51)	10	6882	42392	AF2	EN	Hemisperical bowl	5		X	P72
71 (54)	10	6248	31197	FA3	EN	Shouldered bowl		1		P12
72 (53)	10	6244	32549	FA2	EN	Ind. Bowl	1			P2
73 (52)	10	6248	41826	AF1	EN	Carinated bowl		4		P11
74 (43)	10	6615	32336	FA3	EN	Ind. Bowl	7	0		P28
75 (40)	10	6615	41381	FA2	EN	Ind. Bowl	2		X	Not illustrated
76 (37)	10	6613	41516	FA3	EN	Shouldered bowl		1	X	P23
77 (57)	6	11150	76205	A1	EN	Cup	1		X	P184
78 (48)	10	6639	40227	F2	EN	Ind. Bowl	4			P43
79 (50)	10	6882	41484	AF3	EN	Hemisperical bowl	1	0	X	P69
80 (42)	10	6615	32905	FA3	EN	Ind. Bowl	7	0	X	P29
81 (49)	10	6880	40933	FA1	EN	Ind. Bowl	2			P60
82 (35)	10	6613	41970	AF1	EN	Ind. Bowl	2		X	P21
83 (41)	10	6615	41380	FA2	EN	Ind. Bowl	2	0		P31
8 4 (38)	10	6614	32666	AF3	EN	Closed hemisperical bowl	5			P26
85 (39)	10	6615	32875	FA2	EN	Closed ind. Bowl	5	0	X	P27
86 (31)	10	6652	32127	FA2	EN	Ripple burnished bowl			X	P46
87 (30)	10	6603	42399	FA2	EN	Ind. Bowl	2			P20
88 (58)	6	11150	72913	FA1	EN	Cup	1			P183

more stable to degradation (compared to the DAGs) and are less susceptible to leaching than free fatty acids. Furthermore, it has been shown in previous studies that the TAGs are good indicators of the origin of fatty residues.

Through laboratory simulation experiments, midchain ketones are known to be formed through the heating of fatty acids at high temperature in the presence of clay minerals (Evershed *et al.* 1995b; Raven *et al.* 1997), and would have been produced during the 'cooking' of animal fats/oils. The pyrolytic condensation of free fatty acids to mid-chain ketones is shown in Figure 5.76. These ketones were present in 20 (23%) of the extracts. They are normally detected with other lipids. However, in one case (sample A23, small find 79210) the only lipids extracted from the pottery vessel were mid-chain ketones (Fig. 5.77), illustrating the stability of these compounds.

Wax esters, alkanes and alcohols were present in five of the sherds, with distributions indicating the presence of beeswax (eg sherd 76244 (sample A16),

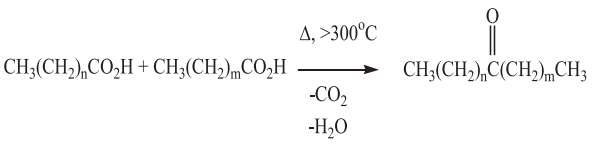


Fig. 5.76 The ketonic decarboxylation of free fatty acids which leads to the formation of ketones by condensation of the fatty acids. The reaction is catalysed by metal oxides and proceeds at temperatures in excess of 300°C. The subscripts n and m correspond to alkyl chain lengths in the range 13-16 (Evershed et al. *1995; Raven* et al. *1997).*

shown in Fig. 5.75). The dominant constituents of this sample were free fatty acids, MAGs (not labelled), DAGs and TAGs which are indicative of a degraded animal fat. Tables 5.58-59 detail the lipids detected in the extracts from the sherds from Area 6 and Area 10.

Stable carbon isotope data for extracts (n=36) from Eton Rowing Course are plotted in Figure 5.78. Data obtained for modern reference animal fats from species believed to have been the major

Table 5.57 Summary of lipid analyses

Sample	*Lipid concentration (mg g^{-1})*	*Description*
DBC1*	0.131	FFa; MAG; DAG; TAG
DBC2	0.004	MAG; TAG (trace)
DBC3*	0.036	FFa; MAG; TAG
DBC4	nd	
DBC5	nd	
DBC6	nd	
DBC7*	0.040	FFa; MAG; K
DBC8*	0.108	FFa; MAG; TAG; K
DBC9*	0.301	FFa; MAG; TAG; K
DBC10	0.004	TAG(trace)
DBC11*	0.565	FFa; TAG; WE
DBC12*	0.060	FFa; TAG; WE; OH
DBC13a*	1.067	FFa; DAG; TAG; K
DBC13b	0.044	FFa; WE; AL
DBC14	nd	
DBC16	0.156	FFa; MAG; DAG; TAG; K; WE
DBC17	nd	
DBC18	nd	
DBC19	0.048	FFa; MAG; WE; AL;
DBC20*	0.044	FFa; MAG; TAG
DBC21*	0.251	FFa; MAG; TAG; K
DBC22*	0.735	FFa; MAG; TAG; K
DBC23	0.010	K
DBC24	nd	
DBC25*	1.033	FFa; MAG; TAG
DBC26	nd	
DBC27	nd	
DBC28*	0.334	FFA; MAG; TAG
DBC29	nd	
DBC30	nd	
DBC31*	0.109	FFa; MAG; DAG; TAG; K
DBC32*	0.025	FFa
DBC33	0.021	FFa (tr)
DBC34	nd	
DBC35*	0.018	FFa
DBC36*	0.437	FFa; MAG; K
DBC37*	0.518	FFa
DBC38	nd	
DBC39*	0.075	FFa; MAG; DAG; TAG; K
DBC40	0.014	FFa; MAG; DAG; TAG
DBC41	nd	
DBC42*	0.021	FFa (tr); MAG; DAG; TAG
DBC43	nd	
DBC44	0.011	FFa; TAG; K
DBC45*	0.043	FFa; MAG; DAG; TAG
DBC46*	0.027	FFa; MAG; DAG (tr)
DBC47	nd	
DBC48	0.004	FFa (tr); K
DBC49	nd	FFa; MAG; TAG; K
DBC50*	0.116	FFa; MAG; TAG; K
DBC51*	0.091	FFa; MAG; DAG; TAG; K
DBC52	nd	
DBC53	nd	
DBC54	0.005	FFa (tr)
DBC55*	0.077	FFa; MAG; DAG; TAG; K
DBC56	nd	FFA; MAG; TAG
DBC57*	0.022	FFa; MAG; DAG; TAG
DBC58	nd	
D1*	0.055	FFa; MAG; DAG; TAG; K
D2*	0.089	FFa; MAG; DAG; TAG; K
D3	0.026	FFa; MAG; DAG; TAG; K
D4*	0.135	FFa; MAG; DAG; TAG
D5	0.024	FFa; MAG; DAG; TAG; K
D6*	0.017	FFa; MAG; DAG; TAG
D7	nd	
D8	0.027	
D9*	0.090	FFa; MAG; DAG; TAG
D10	nd	
D11	nd	
D12*	0.026	FFa; MAG
D13	0.009	FFa; MAG; DAG
D14*	0.199	FFa; MAG; DAG
D15*	0.026	FFa
D16	nd	
D17	nd	
D18	0.260	FFa; TAG; K
D19	0.156	FFa; MAG; DAG; TAG
D20*	0.139	FFa; MAG; DAG; TAG
D21	nd	
D22	nd	
D23	nd	
D24	nd	
D25	nd	
D26*	0.269	FFa; K
D27	0.011	DAG; TAG (trace)
D28	nd	
D29	0.007	FFa; DAG (trace)
D30	0.018	FFa; DAG; TAG (trace)

Key: FFa refers to free fatty acids; MAG to monoacylglycerols; DAG to diacylglycerols; TAG to triacylglycerols; and K to C_{31}, C_{33} C_{35} mid-chain ketones comprising 31, 33 and 35 carbon atoms, respectively. WE are wax esters, AL are alkanes, and OH are alcohols. nd = not detected. *samples which have been analysed by GC-C-IRMS.

domesticated animals exploited in UK prehistory are grouped within ellipses, onto which the archaeological pottery have been overlayed. The $\delta^{13}C$ values for the $C_{18:0}$ fatty acid are more depleted in milk fats than in ruminant adipose fats, thus enabling distinctions to be drawn between milk and adipose fats from ruminant animals (Dudd and Evershed 1998). This is witnessed in the *c* 2‰ shift between the centroids of the reference ruminant adipose fat and ruminant dairy fat ellipses. The less depleted $\delta^{13}C$ values seen for the fatty acids in non-ruminant fats compared to equivalent components in ruminant fats, are believed to be due to differences in diet and in the metabolic and biochemical processes involved in the formation of body fats in ruminant and non-ruminant animals.

Twenty-eight of the samples plot within the dairy fat ellipse, and four sherds (sherds 81391 (sample

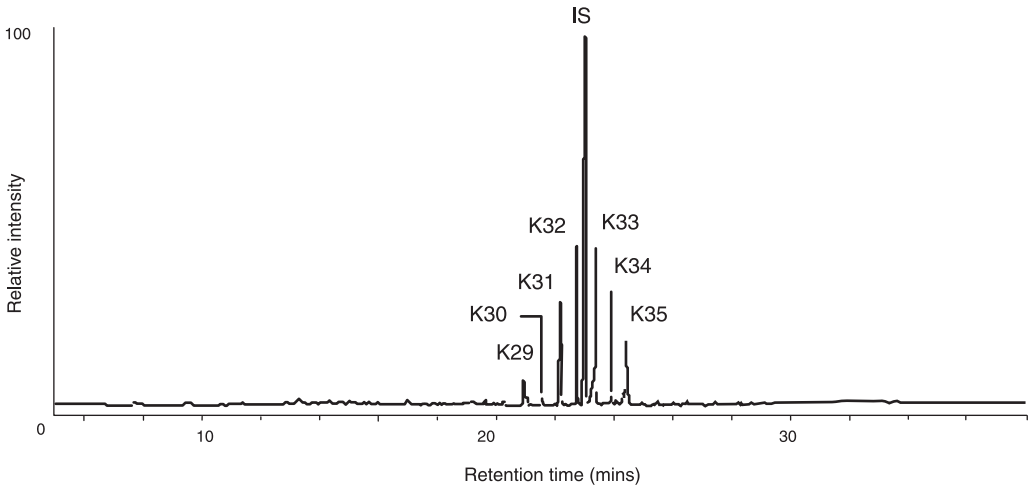


Fig. 5.77 Partial HTGC profile of the trimethylsilylated total lipid extract from sample DBC23, illustrating the distribution of components characteristic of animal fat that has undergone heating and extensive degradation. Key: Kx are mid-chain ketones of chain length x. and IS is the internal standard (C 34 alkane).

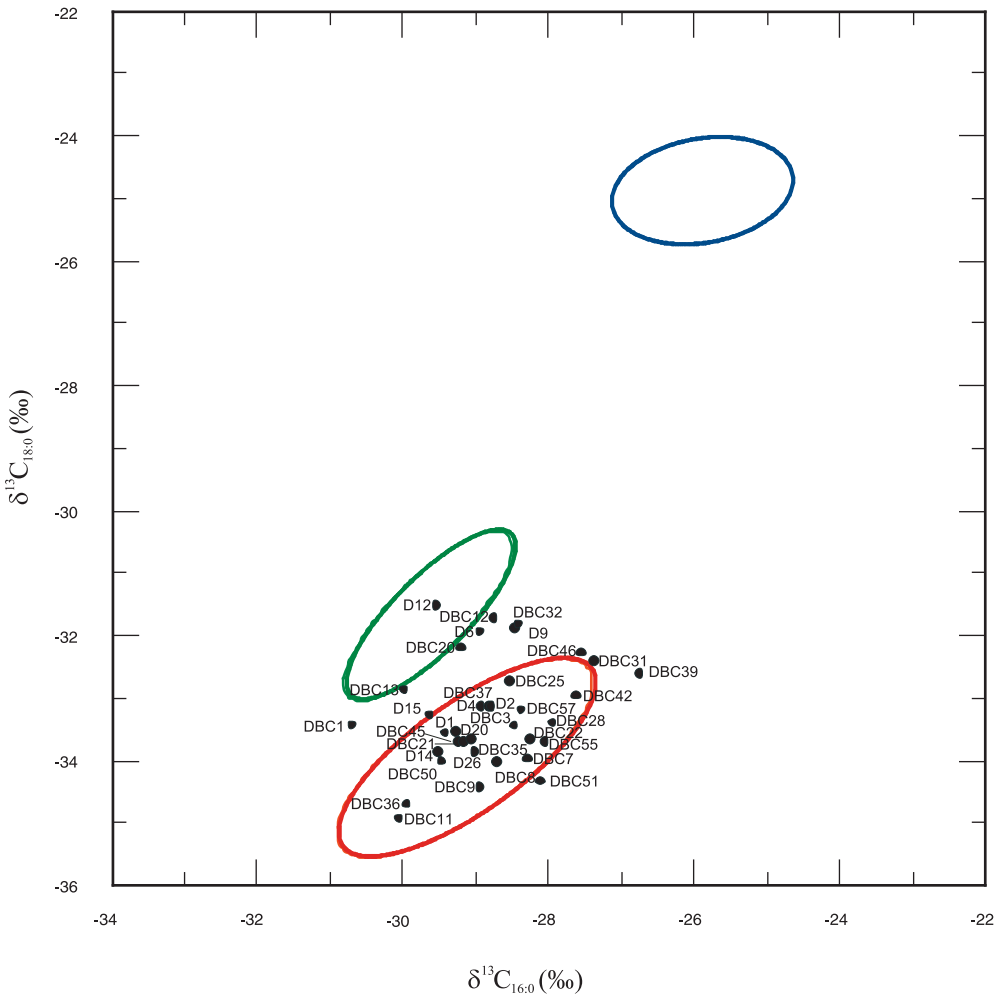


Fig. 5.78 Plot of the ^{13}C values of the fatty acid methyl esters prepared from lipid extracts from the Eton Rowing Lake Neolithic assemblage. The majority of the extracts plot close to the reference ruminant adipose and milk fats. The reference fats are represented by confidence ellipses (1 standard deviation), with blue being porcine, green being ruminant (bovine and ovicaprine) and red being of dairy origin.

Table 5.58 Area 10 sherds with identified lipid residues

Context	SF	Fabric	Style	Form	Rim	Shoulder	Ext. colour	Surface treatment	Catalogue ref.	Ref. no.	Ruminant	Dairy products	Beeswax
6243	32571	FA2			1		Black			76		*	
6245	32597	AF3			1		Reddish brown			80	*?	*	
6615	41378	F2			2		Grey	bu/bu		39		*	
6618	41573	AF1			2		Black	bu/bu		65		*	
6621	31698	FA2			2		Grey	Bu/bu		70		*	
6652	32129	F1			3		Black	Bu		41		*	*
6880	40892	FA2			4		Greyishbrown			66		*	
6615	32906	FA3			4		Reddish brown			75	*?	*	
6615	32875	FA2	Closed bowl		5	0	Reddish brown		P27	69		*	
6615	41381	AF2			5		Black			81	*?	*	
6615	32905	FA3	Bowl		7		Reddish brown	Sm	P29	72		*	
6651	41939	F2	Bowl			10	Reddish brown	sm/bu	P45	37		*	
6621	41329	FA3			1		Brown	Bu	P37	38		*	
6621	31714	FA2					Reddish brown	bu/bu		61		*	
6639	40227	FA3				1	Brown			67		*	
6246	31289	FA3			1		Grey			44			*
6880	41168	FA3			2		Greyish brown			43	*		*
6613	32829	FA3			4		Brown		P24	40	*		
6653	41892	FA3	CB?		8		Reddish brown		P47	42	*		*
6882	41484	FA3					Black	bu/bu		62	*		

Table 5.59 Area 6 sherds with identified lipid residues

Context	SF	Fabric	Form	Rim	Ext. colour	Surface treatment	Ref. no.	Ruminant	Dairy product	Mixed	Beeswax
11316	81798	X2	cup	1	BL	bu/sm	1	*?	*		
5986	23157	A1	cup	2	DKG		85	*?	*		
11150	76205	A1	cup	1	RBR		87	*?	*		
11160	77251	A1	cup	1	BL		2		*		
11160	78986	FA3	cup	1	BL	bu/bu	4		*		
11160	77250	F3	bowl	2	BR		14		*		
11305	81391	F2	bowl	6	BL	Bu	15		*	*	
11313	82402	F1	bowl	6	RBR	bu/bu	20		*		
11151	75522	F1	bowl	4	BL	Sm	26		*	*?	
5989	24067	FA2	bowl	2	BR		33		*		
11150	76244	F3	bowl	4	RBR		46		*		*
11176	79390	FA2	bowl	4	BL		51		*		
11200	76628	F2	bowl	2	BR		52		*		
11313	83569	FA2	bowl	2	BL		55		*		
11320	85488	FA2	bowl	2	BL		58		*		
11320	83935	F1	18	5	GBR		18		*?		
11313	83810	F1	bowl	6	BL	bu/bu	19		*?		
5989	24912	FA2	carinated bowl	4	GBR	Bu	32		*?		
5985	23012	AF3	cup	1	LBR	Sm	3	*			
11313	84046	A1	cup	1	BR		5	*			
11159	72591	F2	cup	1	BL		6	*		*	
11160	76458	F1	bowl	6	RBR		9	*		*	
11170	78000	F2	bowl	2	RBR		12	*			
11200	70053	FA2	bowl	6	BR		30	*			
5989	26206	FA3	bowl	4	RBR		31	*			
11153	76054	QA2	11	3	BR	bu/bu	27	*?			
11157	82039	FA3	bowl	4	BL		49				*

D15), 32127 (sample 31), 32875 (sample 39), and 41329 (sample 46)) plot just outside. The eight remaining samples all plot along the axis of the ruminant adipose reference fat ellipse, and although only sherd 78000 (sample D12) actually plots within the ellipse, it is very likely that these are all indicative of bovine/ovi-caprine adipose fats. Interestingly, none of the samples plotted within the porcine adipose fats. If mixing of ruminant and non-ruminant fats has occurred (either contemporaneously, or through reuse of the vessels), then the extracts would plot in between the respective ellipses. None of the vessels from Eton plotted in this area of the graph.

Figure 5.79 shows the stable isotope values for the samples, indicating the different vessel types represented. It is not clear if there is a complete distinction, but it appears that the majority of the Carinated Bowls (and cups) plot in the dairy fats ellipse, whereas the Plain Bowls (only 2 vessels) plot nearer to the ruminant adipose fat ellipse.

For the majority of the vessels, the C52 TAG predominates, although they range from C40 to C56. The lower molecular weight (ie lower carbon number) triacylglycerols comprise the shorter-chain fatty acids that are diagnostic of milk fats. Thus, while the stable isotope data indicates that the lipids originated from either remnant fats or dairy fats, analysis of the triacylglycerol distributions has confirmed these assignments. For 14 of the samples the archaeological ruminant fats are clearly not adipose-derived due to the abundance of the shorter-chain fatty acid components present, which are indicative of dairy fats. Twelve of the sherds that contained TAGs displayed a distribution indicative of a ruminant adipose fat origin. None of the remaining 3 sherds exhibited TAG distributions that were of a non-ruminant origin.

Generally, the TAG distributions concur with the stable isotope values indicating that most of the fats are either of a ruminant adipose or dairy fat origin. The assignments based on the TAG distributions are given in Table 5.60.

Discussion

The lipid extracts from pottery from Eton are quite well preserved. Although the TAGs have been degraded to DAGs, MAGs and free fatty acids, they were present in significant abundances in 40/88 (45%) of the samples, which is an unusually high proportion for Neolithic pottery.

Although they were only present in low abundance, the presence of wax esters in six of the vessels, together with n-alkanes and primary alcohols, are indicative of beeswax. Evidence for the mixing of beeswax and animal fats has previously been reported in late Saxon/early Medieval pottery (eg Charters *et al.* 1995).

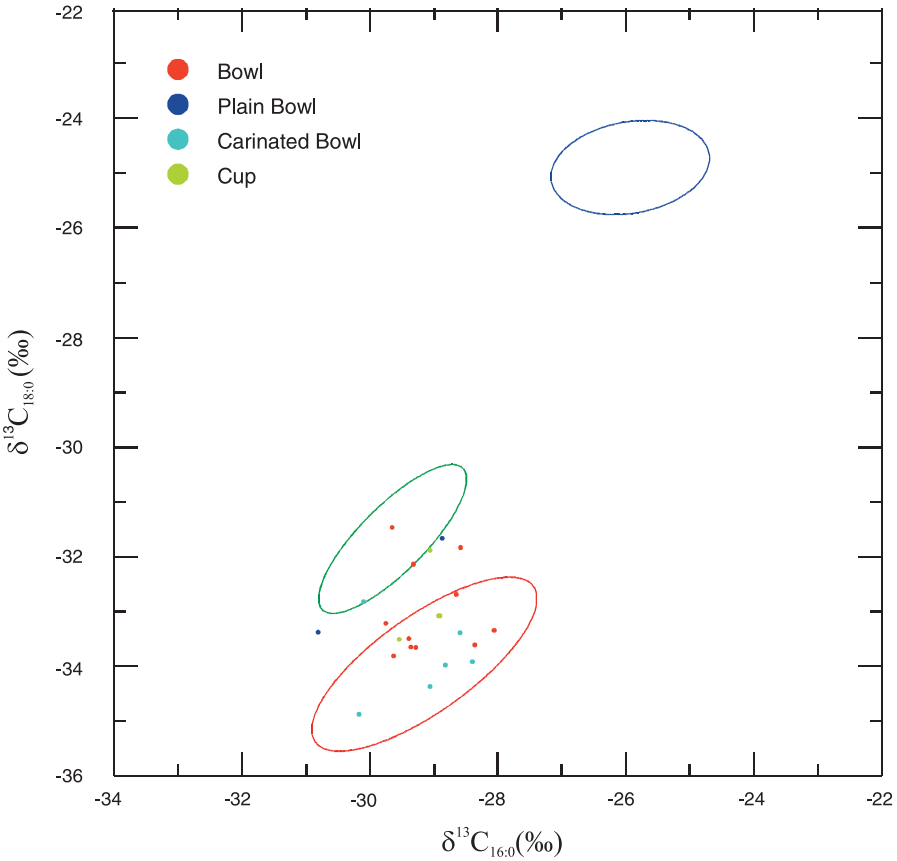


Fig. 5.79 Stable isotope values for the pottery vessels with lipid residues, with vessel forms indicated

Table 5.60 Assignment of absorbed lipid residues

Sample	*Assignment from stable isotopes*	*Assignment from δ13C18:0 - δ13C16:0 values*	*Assignment from TAGs*
DBC1	Ruminant	Ruminant?	Ruminant?
DBC2			Dairy products?
DBC3	Dairy products	Dairy products	Dairy products
DBC4			n/d
DBC5			n/d
DBC6			n/d
DBC7	Dairy products	Dairy products	n/d
DBC8	Dairy products	Dairy products	n/d
DBC9	Dairy products	Dairy products	Dairy products?
DBC10			Ruminant
DBC11**	Dairy products	Dairy products	Dairy products?
DBC12**	Ruminant	Ruminant?	Ruminant
DBC13a**	Ruminant	Ruminant?	Ruminant
DBC13b**			n/d
DBC14			n/d
DBC16**	Dairy products	Dairy products	Dairy products?
DBC17			n/d
DBC18			n/d
DBC19**			n/d
DBC20	Ruminant	Ruminant?	Mixed adipose/ dairy fats?
DBC21	Dairy products	Dairy products	Dairy products?
DBC22	Dairy products	Dairy products	Dairy products?
DBC23			n/d
DBC24			n/d
DBC25	Dairy products	Dairy products	Dairy products?
DBC26			n/d
DBC27			n/d
DBC28	Dairy products	Dairy products	Dairy products
DBC29			n/d

Table 5.60 (continued)

Sample	*Assignment from stable isotopes*	*Assignment from $\delta^{13}C_{18:0} - \delta^{13}C_{16:0}$ values*	*Assignment from TAGs*
DBC30			n/d
DBC31	Dairy products	Dairy products	n/d
DBC32	Ruminant	Ruminant	n/d
DBC33			n/d
DBC34			n/d
DBC35	Dairy products	Dairy products	n/d
DBC36	Dairy products	Dairy products	n/d
DBC37	Dairy products	Dairy products	n/d
DBC38			n/d
DBC39	Dairy products	Dairy products	Dairy products
DBC40			Dairy products
DBC41			n/d
DBC42	Dairy products	Dairy products	Dairy products?
DBC43			n/d
DBC44			n/d
DBC45	Dairy products	Dairy products	Ruminant?
DBC46	Dairy products	Dairy products	n/d
DBC47			n/d
DBC48			n/d
DBC49			n/d
DBC50	Dairy products	Dairy products	Ruminant?
DBC51	Dairy products	Dairy products	Ruminant?
DBC52			n/d
DBC53			n/d
DBC54			n/d
DBC55	Dairy products	Dairy products	Ruminant?
DBC56			n/d
DBC57	Dairy products	Dairy products	Ruminant?
DBC58			n/d

The stable carbon isotope values from Eton Rowing Course are extremely closely grouped, plotting within, or very near to the ellipses for the reference ruminant fats. Thirty-one of the sherds have stable isotope values/TAG distributions that are indicative of dairy fats, suggesting that milk was stored or processed in the vessels. This is corroborated by the numerical difference of the $\delta^{13}C_{18:0}$ and the $\delta^{13}C_{16:0}$ (given in Table 5.60). Although a large proportion of the lower molecular weight triacylglycerols originally present in the dairy fats have been degraded, resulting in a profile similar to degraded adipose fats, the stable isotope values provide a robust chemical signal apparently unaffected by decay. No non-ruminant adipose fats were present in any of the sherds, which is surprising as approximately 10% of the animal bones from a midden in Area 6 were porcine. The majority of the faunal assemblage from the Area 6 midden were bovine (*c* 62%) or ovi-caprine (*c* 17%), and although the TAG distributions cannot definitely distinguish between ovi-caprids or bovids, the TAG evidence does concur that few pigs were utilised at Eton. Tables 5.58-59 give the final assignments based on the criteria utilised above, drawing upon Table 5.60.

In summary, the lipid extracts from the Eton assemblage consist of ruminant adipose and dairy fats. No non-ruminant (eg porcine) fats were present, but evidence for the mixing of animal fats and beeswax were detected in six vessels. The use of a combination of criteria including stable isotope measurements and distributions of triacylglycerol components determined by HTGC has enabled distinctions to be drawn between ruminant and non-ruminant fats. Furthermore, ruminant dairy fats have been clearly distinguished on the basis of more depleted $\delta^{13}C$ values for their $C_{18:0}$ fatty acid compared with ruminant adipose fats. The distinctive trends seen in the $\delta^{13}C$ values of the dairy product $C_{16:0}$ and $C_{18:0}$ fatty acids reflect their different biosynthetic origins (Christie 1981; McDonald *et al.* 1988).

Lake End Road West: midden deposits and other early neolithic activity *by Alistair Barclay*

Early Neolithic activity at Lake End Road West was represented by midden deposits similar to those excavated in Areas 6 and 10 of the Eton Rowing Course (Fig. 5.80-81). These deposits had again been

Fig. 5.80 Plan of Lake End Road West

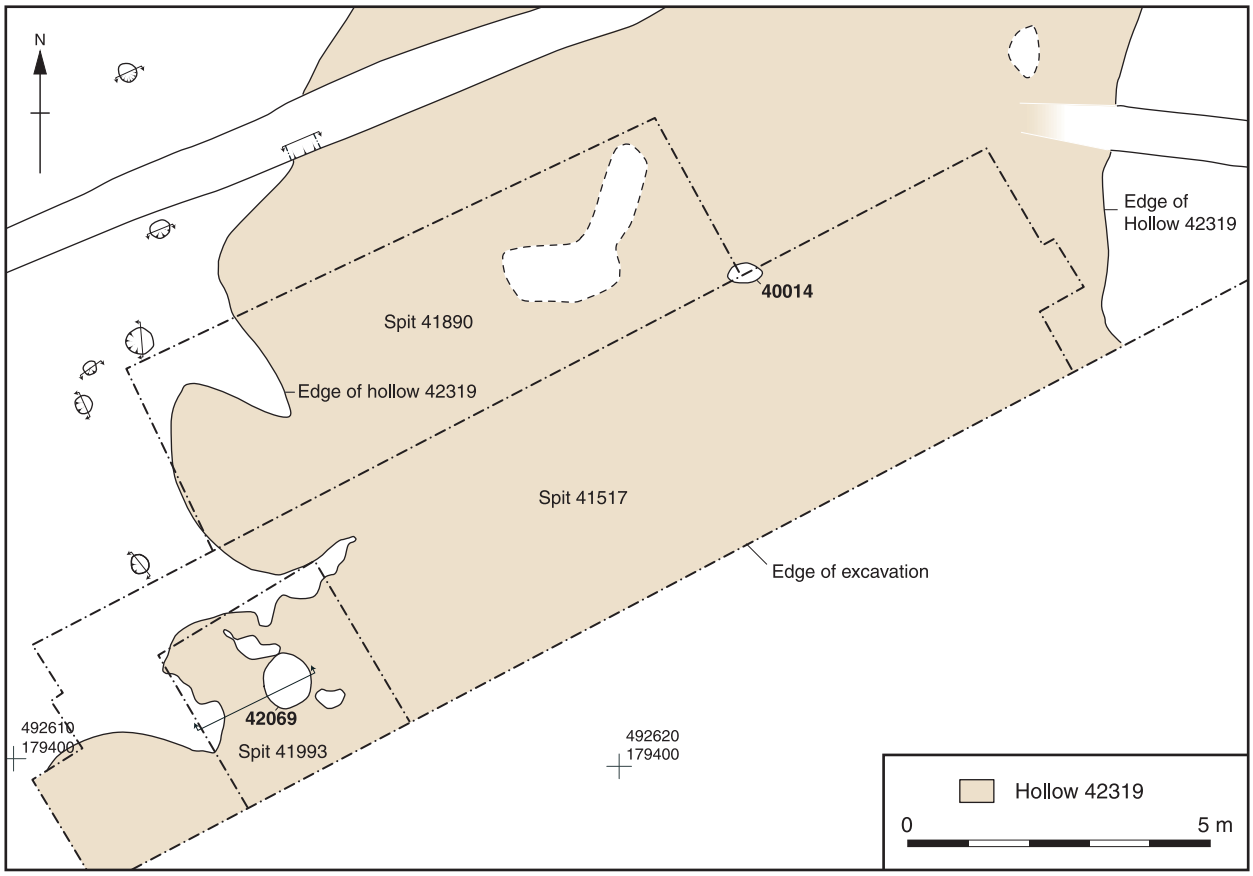


Fig. 5.81 Plan of Hollow 42319, Lake End Road West

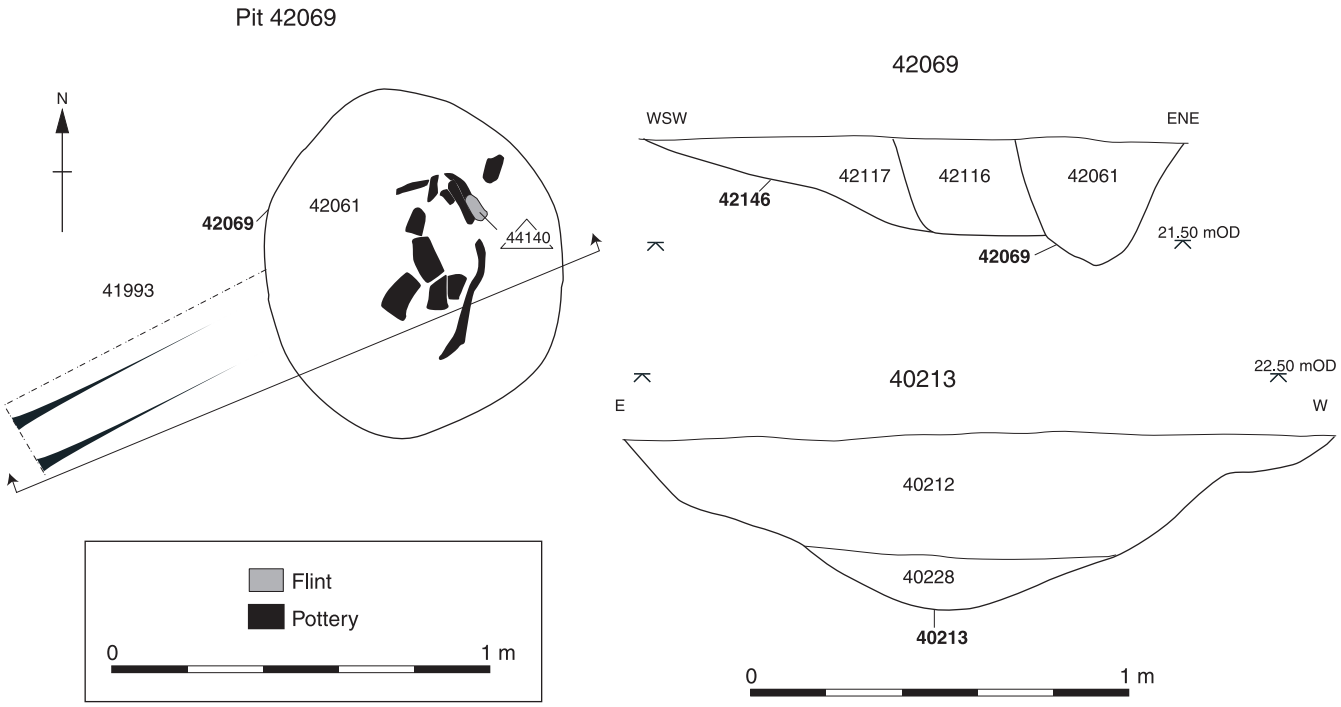


Fig. 5.82 Pit 42069, plan and section, and pit 40213, section, Lake End Road West

preserved within a hollow left by a palaeochannel, and contained a concentration of Plain Bowl pottery and worked flint. Further early Neolithic artefacts were recovered from tree-throw holes which were scattered widely across the site.

Hollow 42319 and associated midden deposits

Hollow 42319 was a slight depression in the top of a silted Pleistocene palaeochannel. The silty fill could be traced across the site and was visible as a cropmark on aerial photographs. A concentration of finds was identified in the top of this silted up hollow during the machine stripping and hand cleaning of the site, and a significant quantity of early Neolithic Plain Bowl pottery (171 sherds, 500g) was collected along with some worked flint (recorded as context 40014). The significance of this material was realised and it was decided to hand-excavate a trench in a series of spits to characterise and recover in detail the artefact-rich deposit (Fig. 5.81).

The first spit (41517) was excavated over an area of *c* 18m by 3m to a depth of 0.05m. It contained 155 sherds of mostly Plain Bowl pottery, worked flint and burnt unworked flint. A second area, *c* 10m by 3m, was excavated (recorded as spit 41890) and found to contain smaller quantities of pottery, worked flint and burnt unworked flint. A third spit (41993: 3m by 3m) was excavated down to a depth of 0.05m and contained a similar range of finds. Finds from the machining and cleaning in the area of the hollow were recorded as context 40014.

Cutting spit 41993 was a small circular feature (42069) which contained refitting sherds from two or more Plain Bowls as well as some flintwork (Fig. 5.82). In section, what had initially been recorded as a pit was found to cut a tree-throw hole (42146) and the supposed pit may well, in fact, have been part of this feature. The tree-throw hole was almost certainly related to other features (42176-8) interpreted as root disturbance some of which contained worked flint probably as redeposited material.

The finds were not evenly distributed through throughout the fills of the hollow (Fig. 5.83). Spit 41517 contained the largest proportion of pottery and flint, whereas as Spit 41890 contained a much higher proportion of burnt unworked flint. The remaining spit, 41993, was much smaller and contained only a small proportion of the finds.

Tree-throw holes

A series of further tree-throw holes were recorded across the site. Many are undated, although at least one appears to have been open during the late Mesolithic and/or early Neolithic. The upper fill (40212) of this feature (40213; Fig. 5.82) contained a small assemblage of flint, consisting mainly of blades and blade like flakes, but including also a core and a single piece of burnt flint. The small size of the assemblage makes it difficult to date, but it is likely to belong to either the Mesolithic or early Neolithic. The feature was irregular in plan and had

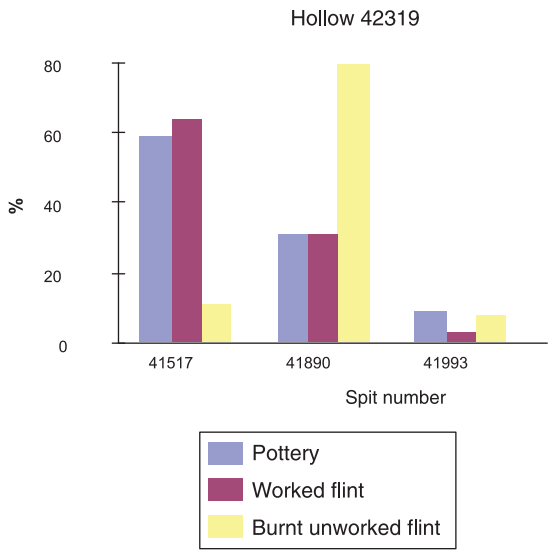


Fig. 5.83 Distribution of finds in spits from the early Neolithic deposits in hollow 42319 at Lake End Road West

an uneven, rounded base. It measured 1.36m across and was filled with a lower layer of dark brown stoney silt, and an upper layer of reddish brown silty clay flecked with charcoal.

Early Neolithic pottery from Lake End Road West
by Alistair Barclay

Introduction

A total of 467 sherds (2326g) of early Neolithic pottery was recovered from the Lake End Road West excavations (Table 5.61). Most of this pottery was recovered from the hollow (42319: spits 41517, 41890 and 41955), and can be classified as Plain Bowl, although three decorated sherds were also found. The pottery was quite highly fragmented. Although the mean sherd weight was 5g, this figure has been elevated by the presence of a few large sherds. Much of the assemblage consisted of small fragments of just 1 or 2g. There were very few featured sherds: just 10 rim sherds and 1 base were recovered.

Fabrics

A total of five fabrics were identified (Table 5.62; see Appendix 1 for descriptions of fabrics). In all cases the predominant inclusions were flint which, almost always, was quite coarse (over 3mm: FA3), although in a few cases it was finer. The flint was usually accompanied by a small proportion of quartz sand, although there were a few sherds where this was not apparent.

This range of fabrics is typical of early Neolithic pottery in the Middle Thames Valley, and corresponds, for example, with the fabrics found in the assemblage from Area 6 (see above). Unlike the Area 6 assemblage, however, there is no indication

Table 5.61 Summary of Neolithic pottery from Lake End Road West

Feature	Context	Fabric F2	F3	FA1	FA2	FA3	IND	Total (NoSh/weight)
Hollow 42319	40014					171/500 g		171/500 g
	41517	9/9 g	5/32 g	3/2 g	29/60 g	89/411 g	6/3 g	141/517 g
	41890		1/4 g	1/1 g	13/65 g	2/29 g		17/99 g
	41993		5/49 g			4/64 g		9/113 g
Tree-throw hole/pit 42069	42061					115/1050 g		115/1050
Residual pottery in later features	40295					1/12 g		1/12 g
	40448					1/4 g		1/4 g
	40449				1/4 g			1/4 g
	41072	2/20 g						2/20 g
	41831	6/1 g	1/1 g		2/5 g			9/7 g
Total (NoSh/weight)		17/30 g	12/86 g	4/3 g	45/134 g	383/2070 g	6/3 g	467/2326

Table 5.62 Summary of early Neolithic fabrics from Lake End Road West

Fabric	No. sherds	Weight (g)
FA3/EN	383	2070
FA2/EN	45	134
FA1/EN	4	3
F2/EN	17	30
F3/EN	12	86

that the clay was obtained from more than one source, and it is likely that all of the clay was obtained locally within a few kilometres of the site.

Decoration

Just three sherds had traces of decoration (Fig. 5.84, 3, 10 and 11). One sherd had vertical incised lines on the edge of the rim. Another was decorated with one or two rows of impressed dots just below the rim. A further sherd had what appear to be three possibly vertical rows of twisted cord decoration. The closest affinities of these decorated sherds are with the Mildenhall style, other examples of which had been found in Area 10 of the Rowing Course and at the Staines causewayed enclosure.

Rims

Although only a small number of rim sherds were recovered, they were varied. Most were of plain everted form (Type 2: see Area 6 report above), although there were also examples of simple, rolled and beaded rims (Types 1, 4 and 6). One of the decorated sherds was an inturned rim (Type 9).

Context and condition

Most of the early Neolithic pottery was recovered from fills of hollow 42319 (spit 41517: 141 sherds/517 g; spit 41890: 17 sherds/99 g; spit 41993: 9 sherds/113 g; cleaning and machining 40014: 171 sherds/500g). A large assemblage was also recovered from tree-throw hole or pit 42069/42146 which cut the fills of the hollow (115 sherds/1050g). The remaining pottery was residual in later contexts.

Most of the pottery in the hollow and the tree-throw hole or pit was highly fragmented and in a more or less worn and abraded condition. This is consistent with the pottery having been deposited in an open midden where, as was the case in Area 6 (see above), it would have been subject to weathering, trampling and other disturbance before it became buried. It is noticeable that the pottery from the tree-throw hole or pit (42069/42146) was in a better condition than that from the fills of the hollow. It is, however, unclear whether this is because the pottery was deliberately placed within the tree-throw hole or pit, or simply because the pottery, perhaps incorporated into the tree-throw hole from the midden deposits when the tree fell, was better protected within the feature than was the pottery in the more exposed midden deposits.

Catalogue of illustrated early Neolithic pottery (Fig. 5.84)

1 Plain Bowl, rim, Type 6
2 Plain Bowl, rim, Type 2
3 Decorated Bowl, rim, Type 2, vertical incised lines on outer rim
4 Plain Bowl, rim, Type 1
5 Plain Bowl, rim, Type 1
6 Plain Bowl, rim, Type 2
7 Plain Bowl, rim, Type 4
8 Plain Bowl, rim, Type 4
9 Plain Bowl, rim, Type 6
10 Decorated Bowl, rim, Type 9, irregular row or rows of impressed dots below rim
11 Decorated Bowl, body sherd, three rows of vertical (?) impressed cord decoration
12 Plain Bowl, rim, Type 5
13 Plain Bowl, rim, Type 4
14 Plain Bowl, rim, Type 2
15 Plain Bowl, rim, Type 2

Fig. 5.84 Early Neolithic pottery, Lake End Road West

Table 5.63 The categories present in hollow 42319

CATEGORY TYPE	Context 41517	41890	41993	Grand total
Flake	336	162	26	524
Blade	26	12		38
Bladelet	5	3		8
Blade-like	53	27	4	84
Chip	33	37	3	73
Irregular waste	17	4	1	22
Flake from ground implement	1			1
Rejuvenation flake core face/edge			1	1
Rejuvenation flake tablet	2			2
Tested nodule/bashed lump	6	1	1	8
Single platform flake core	7			7
Multiplatform flake core	5			5
Levallois/other discoidal flake core	1			1
Unclassifiable/fragmentary core	3	1		4
Side scraper	1			1
End scraper	3			3
End and side scraper	1			1
Retouched flake	9	1		10
Serrated flake	4	3	1	8
Axe	1			1
Hammerstone	2			2
Grand total	516	251	37	804
Burnt unworked flint (g)	138	986	102	1226
No. burnt (%) (exc. chips)	9 (1.9)	14 (6.5)	-	23 (3.2)
No. broken (%) (exc. chips)	155 (32.1)	92 (43)	12 (35)	259 (35.4)
No. retouched (% exc. chips)	19 (3.9)	4 (1.9)	1 (2.9)	24 (3.3)

Early Neolithic struck flint from Lake End Road West *by Hugo Anderson-Whymark*

Flint from the hollow (42319)

A total of 804 worked flints were recovered from the hollow (42319) along with 30 burnt unworked flints. The lithic material in the spread proved difficult to characterise, although the majority appears to be of Neolithic date based on technological aspects of the flint and other associated artefacts. Table 5.63 shows the contents of each spit, and Table 5.64 the fill (42061) of pit or tree-throw hole 42069.

The hollow contained a large assemblage of unretouched flakes and blades. The blades and blade-like flakes form 19.9% of the unretouched flake material. Following Ford's (1987a, 79) analysis, this suggests an early Neolithic date. However, this date has to be treated with caution as it is not supported by all the artefactual evidence. All of the cores in the spread are flake cores, the majority of which are multiplatform. There are also a few single platform flake cores and a single discoidal core. The latter type of core is more common in later Neolithic assemblages.

Although a large proportion of the assemblage appears to have been utilised (see use-wear below) there is quite strong evidence for knapping. Two fragments of flint hammerstones were recovered, along with the 17 cores discussed above, and eight tested nodules. A further 73 chips were recovered and 22 pieces of irregular waste. The scatter did not, however, appear to represent *in situ* knapping.

Table 5.64 Flint from pit or tree-throw hole 42069, fill 42061

Pit 42069, fill 42061 CATEGORY TYPE	Total
Flake	19
Blade-like	3
Rejuvenation flake tablet	1
Multiplatform flake core	3
Unclassifiable/fragmentary core	2
End scraper	1
Serrated flake	1
Grand Total	30
Burnt unworked flint (g)	15
No. burnt (%) (exc. chips)	8 (26.7)
No. broken (%) (exc. chips)	7 (24.3)
No. retouched (% exc. chips)	2 (7)

Table 5.65 The utilisation by category of flint from the hollow at Lake End Road West

Finds Spread 2	*Utilised?*		
CATEGORY TYPE	*Yes*	*No*	*Grand total*
Blade	1.3%		1.3%
Blade-like	13.6%	3.9%	17.5%
Flake	50.0%	15.6%	65.6%
Irregular waste	1.9%		1.9%
Retouched flake	1.3%		1.3%
Serrated flake	*11.0%		11.0%
Rejuvenation flake core face/edge		0.6%	0.6%
Tested nodule/bashed lump		0.6%	0.6%
Grand total	79.2%	20.8%	100.0%

*percentage distorted through sample strategy

Table 5.66 Use-wear of flint from the hollow at Lake End Road West

Use	*Wear*	*Total no.*	*%*
Bore	Medium	3	3.5%
Bore total no.		3	3.5%
Cut/Whittle	Hard	2	2.3%
	Medium	36	41.9%
	Soft	27	31.4%
Cut/Whittle total no.		65	75.6%
Scrape	Hard	5	5.8%
	Medium	13	15.1%
Scrape total no.		18	20.9%
Grand total		86	100.0%

The retouched artefacts represented only 3% (24 flints) of the overall assemblage. Ten of these artefacts were retouched flakes and a further eight were serrated flakes. Many of the serrated flakes were on blades and blade-like flakes. All were utilised, but none had edge gloss. Five scrapers were found. Three were end scrapers. There was also one side scraper and a side and end scraper. The latter was made on a thermal flake. Two of the side scrapers exhibited relatively fine retouch. A polished flint axe or pick was also recovered. This had been heavily reworked as a flake core. A single flake from a polished implement was recovered. The latter two artefacts are diagnostic of the Neolithic, although it is not possible to suggest a more precise date.

A total of 36.4% (298) of the flints from the hollow are broken. This figure is relatively high. However, considering the degree of utilisation and post-depositional edge damage that should be expected on a surface spread, the figure is not abnormal. A further 3.2% (26) of the flints are burnt, with an additional 14 pieces of burnt unworked flints being recorded. The burning is not likely to have taken place *in situ* considering the distribution of the material.

The fill of pit or tree-throw hole 42069 (42061) contained 30 worked flints and one burnt unworked flint (Table 5.64). The assemblage in this pit appears similar to that from the hollow, and it is likely that some, if not all, of the material contained in this feature is residual from the hollow.

Use-wear

A total of 85 flints from the hollow were examined for use-wear. The finds were randomly selected, although cores and irregular waste were excluded, as their potential for use-wear was considered low. The majority of serrated flakes were analysed for comparison with the middle Neolithic pits discussed below (see Chapter 7). Some post-depositional edge damage was present but did not substantially hinder the examination for use-wear. All of the spits in which the spread was excavated will be considered as a whole due to their arbitrary nature and the comparable assemblages they contained.

A total of 65% (55) of the flints analysed from the hollow were utilised. The average utilised flake had 1.6 utilised edges, which equates to a total of 86 recorded uses. Table 5.65 shows the utilisation by category.

Cutting and whittling represents 75.6% (65 edges) of the use-wear, scraping represents 20.9% (18 edges) and boring a mere 3.5% (3 edges). The most common utilisation (60.5%) was on medium hard material, while a further 31.4% was used on soft materials and 8.1% on hard (Table 5.66). The cutting/whittling of medium and soft materials is the most common action, followed by the scraping of medium and hard materials. Two flakes showed evidence of edge gloss and damage from medium hardness material, such as silica-rich plants. The numerous serrated flakes in the spread – all with medium wear – are also associated with the cutting of plant materials.

The use-wear of the finds from the hollow follows a generally similar pattern to that of the middle Neolithic pits, although there are significant differences. The overall use in the finds spread is considerably lower than that of the pits, while still being a high 65% utilised. The contact materials in the hollow are generally softer and scraping actions are less common than in the pits, indicating a focus on different activities – perhaps food preparation tasks as opposed to hide preparation.

Tree-throw hole fill 40212

A total of 11 worked flints and a single piece of burnt unworked flint were recovered from the fill (40212) of tree-throw hole (40213). The flint derived from the gravels and all pieces exhibited a heavy white cortication. As Table 5.67 shows, the assemblage consisted mainly of blades and

Table 5.67 Flint by category in context 40212

CATEGORY TYPE	*Total*
Flake	1
Blade	4
Blade-like	4
Irregular waste	1
Single platform flake core	1
Grand total	11
Burnt unworked flint (g)	374
No. burnt (%) (exc. chips)	2 (18.1)
No. broken (%) (exc. chips)	4 (36.4)
No. retouched (% exc. chips)	-

blade-like flakes. The core exhibited flake and blade removals. The single flake appeared to be of the same flint although it did not refit. Given the limited size of the assemblage and the lack of any diagnostic artefacts it is difficult to propose a date, although it seem likely that this assemblage dates from the Mesolithic or early Neolithic.

Discussion

The earlier Neolithic flint from the hollow is similar in composition to that from the Areas 6 and 10 early Neolithic middens on the Eton Rowing Course, and like these middens, was preserved because the finds were deposited in a shallow hollow left by an early channel. The assemblage from the hollow was similar to those from the Rowing Course middens in that it contained a broad range of tool types and high level of utilised flints. Furthermore, whilst cores and irregular waste demonstrate the presence of knapping material, refitting evidence was absent, suggesting that the finds were not part of an *in situ* knapping scatter, but had probably been middened.

Catalogue of illustrated flint (Fig. 5.85)

1 Layer 41517, SF 43512. Finds Scatter 2. Discoidal core. 32g.
2 Layer 41517, SF 43031. Finds Scatter 2. Serrated blade-like flake, serrated on left and right hand side.
3 Layer 41517, SF 43507. Finds Scatter 2. Polished implement reworked as a flake core.
4 Ditch 41651, fill 41648, SF 42648. Tip of a fragmentary arrowhead, probably of leaf or oblique form.
5 Ditch 41646, fill 41645, SF 42665. Leaf-shaped arrowhead.

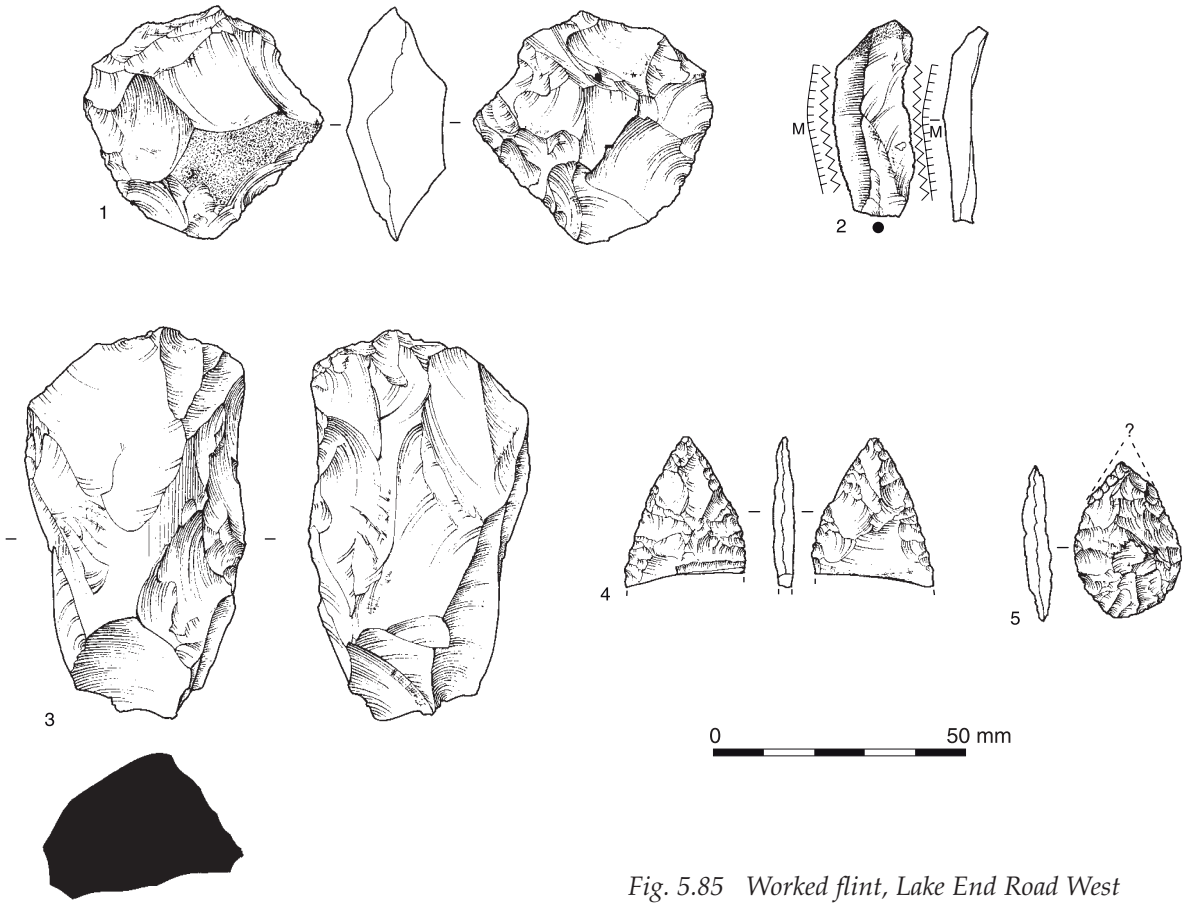


Fig. 5.85 Worked flint, Lake End Road West