Chapter 3: Whitecross Farm: Artefactual Evidence

COPPER-ALLOY METALWORK

by J Peter Northover

Introduction

The Wallingford section of the River Thames has been very productive of Bronze Age metalwork, especially late Bronze Age material, since the mid 19th century. The material that has been dredged from the river itself has been carefully considered by Thomas (1984), while investigation of an occupation layer at Whitecross Farm on a number of occasions since 1949 has yielded an assemblage of Bronze Age and later metalwork. The metalwork recovered from these previous interventions has also been discussed by Thomas *et al.* (1986). The most recent excavations at Whitecross Farm have added further items, as has metal-detector exploration in the vicinity (see Table 3.1 for a summary of this material). This report discusses the metallurgical analysis of artefacts recovered from the most recent excavations and metal-detector finds, as well as some of the earlier finds. The results of the analysis will be used to extend our understanding of Bronze Age metal use in the area in relation to the river and the settlement. As the results affect some of the published descriptions in Thomas *et al.* (1986), the objects analysed are described again below, together with their analyses and metallographic descriptions.

Methods

With the exceptions of two pieces of waste material and fragments of sheet and wire which were simply sectioned, all objects were sampled using a hand-held modelmaker's electric drill with a 0.7 mm diameter bit. All samples were hot-mounted in a conducting resin, ground and polished to a 1μm diamond finish. Analysis was by electron probe microanalysis with wavelength dispersive spectrometry; 12 elements (13 for the most recent finds) were analysed with detection limits generally in the range 100–200 ppm. Three analyses were made per sample, and these analyses and their means, normalised to 100%, are set out in Table 3.2. All concentrations are given in weight %.

In one case, the stop-ridge flanged axe, a lead isotope analysis was made because of the object's important place in understanding the development of middle Bronze Age metalworking styles (see Appendix 2). Where drilled samples were used, metallographic examination was not possible; all the other samples were examined under an optical microscope.

Catalogue of metalwork of confirmed Bronze Age date

Five objects of Bronze Age date, either whole or fragmentary, were analysed from the material published by Thomas *et al.* (1986) (Figs 3.1.3, 3.2.1–3); three further metal-detector finds are also definitely Bronze Age (Figs 3.2.4–6). A further three artefacts from Whitecross Farm are from late Bronze Age contexts (Figs 3.1.1–2, 3.1.4). Two were recovered from layers stratigraphically later than wood dated in the range 1000–800 cal BC (see Appendix 1), and therefore potentially of Ewart Park date; although rather lacking exact parallels, they certainly have Bronze Age typological affinities. See Table 3.2 for composition.

Pin *(Fig. 3.1.1)*

Whitecross Farm excavations (WBP86, TrXXIV, SF 2411, layer 2414, the LBA midden); sample no. Ox 40: complete; roughly circular nail-head with flat base and slightly domed top; shaft is subrectangular in section, becoming more circular near the point; the shaft is corroded in places and slightly bent; the point is long and gently tapered. L: 84 mm; head Dia.: 5.2 mm.

In a Bronze Age context this would be classed as a nail-headed pin (O'Connor 1980, 200; list 180) with a date extending from the Wilburton to the Llyn Fawr periods. These pins occur in both hoard and settlement contexts. However, most, if not all, of the published examples have a round shaft and, usually, a slightly conical lower profile to the head. In the absence of contextual evidence the flat base to the head and the square shaft would raise doubts about the dating of this piece. An alternative might be that it is a nail, but the slender point would not be suitable for such a use. The object, therefore, must be a pin, but on the basis of typology alone cannot be assigned a specific Bronze Age date.

The moderately leaded bronze composition with low impurities except for arsenic is typical of much Ewart Park bronze in southern Britain, particularly where metal is influenced by the import of Carp's Tongue material where, characteristically, As » Sb. It could, perhaps, be of late Iron Age or Roman date, but the pin is not an Iron Age type, and Roman pins frequently contain alloy levels of zinc. Thus the compositional evidence (see Table 3.2) is consistent with the dating of the context in which the pin was found. Future excavations in the Thames Valley may uncover further examples.

Table 3.1 Copper-alloy metalwork from Wallingford

Date	*Group/class*	*Location*	*Publication*
Early/middle Bronze Age transition			
Ribbed dagger or dirk?	?Group I dirk	Lost	Thomas 1984, no. 11
Stop-ridge flanged axe	Rowlands class 2 flanged axe	OAU	This report: Fig. 3.2.4
Acton Park period			
Unlooped palstave	Acton Park	Reading 1271.64	Thomas 1984, no. 16
Taunton period			
Basal-looped spearhead	Leaf-shaped	OAU	This report: Fig. 3.2.5
Dirk	Group III	Reading 1088.64	Thomas 1984, no. 12
Basal-looped spearhead	Hybrid	Reading 1270.64	Thomas 1984, no. 15
Penard period (1350–1150 BC)			
Leaf-shaped sword	Ballintober	Reading 177.61	Thomas 1984, no. 10
Rapier	Group IV	Reading 1268.64	Thomas 1984, no. 14
Dirk	Group IV	Reading 173.65	Thomas 1984, no. 18
Wilburton period and Ewart Park transition			
Socketed sickle with mid-rib blade	Ring socketed	Reading 1949.80/65	Thomas *et al.* 1986, no. 3: Fig. 3.2.2
Ewart Park period (1050–750 BC)			
Barbed spearhead	Group II	Reading 1091.164	Thomas 1984, no. 13
Leaf-shaped pegged spearhead, ribbed socket		Reading 1949.80/64	Thomas *et al.* 1986, nos 4–5: Fig. 3.2.1
Leaf-shaped pegged spearhead		Ashmolean, Pr 374	Thomas 1984, no. 3
Five-ribbed socketed axe	cf. Croxton type	Ashmolean, Pr 372	Thomas 1984, no. 1
Three-ribbed socketed axe, edge ribs	cf. Croxton type	Lost	Thomas 1984, no. 4
Faceted socketed axe		Ashmolean 1927.2707	Thomas 1984, no. 5
Socketed knife	Thorndon type	Ashmolean, Pr 373	Thomas 1984, no. 2
Socketed knife	Thorndon type	Ashmolean, 1927.2708	Thomas 1984, no. 6
Socketed knife	Thorndon type	Reading 173.65	Thomas 1984, no. 19
Socketed knife	Dungiven type	OAU	This report: Fig. 3.2.6
Socketed gouge		Ashmolean, 1927.2709	Thomas 1984, no. 7
Sickle socket	Fox Thames series	Reading 1949.80/65	Thomas *et al.* 1986, no. 2: Fig. 3.2.3
Bifid razor, ribbed shaft	Class II	Ashmolean, 1927.2711	Thomas 1984, no. 9
Tanged leatherworking knife	Roth type II	Ashmolean, 1927.2710	Thomas 1984, no. 8
Tanged leatherworking knife	Roth type II	Reading 1949.80/63	Thomas *et al.* 1986, no. 1: Fig. 3.1.3
Pin	Nail-headed	OAU, WBP86 SF2411	This report: Fig. 3.1.1
Knife/razor		OAU, WBP86 SF2415	This report: Fig. 3.1.2
Flat-section awl		OAU, WBP91 SF1	This report: Fig. 3.1.4
Llyn Fawr period			
Faceted socketed axe	Blandford type	Reading 1272.64	Thomas 1984, no. 17
Uncertain, probably later Bronze Age			
Awl	Round section, flat tang	Reading	Thomas *et al.* 1986, no. 6
?Awl point or tang	Square section	Reading	Thomas *et al.* 1986, no. 7
Sheet fragment		Reading	Thomas *et al.* 1986, no. 8
Crumpled sheet fragment		Reading	Thomas *et al.* 1986, no. 11
Thin plate		Reading	Thomas *et al.* 1986, no. 9
Wire fragment		Reading	Thomas *et al.* 1986, no. 12
Wire fragment		OAU, WBP91 SF2	This report
Two droplets casting waste		Reading	Thomas *et al.* 1986, no. 10
Oxidised bronze		OAU, WBP86 SF2406	This report
Uncertain date			
Ring		OAU, WBP86 SF1	This report
Recent			
Crumpled sheet	Brass	OAU, WBP91 SF3	This report

Razor *(Fig. 3.1.2)*

Whitecross Farm excavations (WBP86, SF 2415, layer 1703, a LBA context); sample no. Ox 38: complete; possible scraper in the form of a bronze disc truncated along a chord; it comprises a plate thickened around a hole located at the centre of the circular arc, and thinning to a sharp edge at the circumference; back edge rounded off where it meets the circumference. Dia.: 76 mm; Ht: 48 mm; hole Dia.: 5.5 mm; Th.: 2.5 mm (max.).

Good parallels for this object are not found in southern Britain and we must look further afield among continental razors and razor knives. More particularly, reasonably close comparisons can be made with objects in Jockenhövel's type description *Einscheidige Halbmodrasiermesser ohne Griff* (Jockenhövel 1971; 1980). A typical example is from Mörigen, Kanton Bern in Switzerland (Jockenhövel

Table 3.2 Analysis of copper-alloy metalwork from Wallingford

Sample number	*Object*	*Location of sample*	*Fe*	*Co*	*Ni*	*Cu*	*Zn*	*As*	*Sb*	*Sn*	*Ag*	*Bi*	*Pb*	*Au*	*S*
Ox151a	Basal-looped spearhead	socket	0.07	0.03	0.47	84.18	0.00	1.69	0.06	13.20	0.01	0.01	0.06	0.00	0.21
Ox151b			0.04	0.02	0.47	86.36	0.01	0.39	0.07	12.53	0.00	0.01	0.07	0.00	0.03
Ox151c			0.07	0.04	0.43	85.81	0.00	0.82	0.04	12.44	0.03	0.00	0.11	0.00	0.22
Ox151d			0.06	0.04	0.50	85.76	0.00	0.00	0.04	13.41	0.00	0.00	0.09	0.00	0.11
Ox152a	Stop-ridge axe	blade	0.14	0.01	0.14	89.83	0.01	0.00	0.02	9.66	0.00	0.00	0.13	0.00	0.05
Ox152b			0.17	0.01	0.12	88.12	0.00	1.20	0.01	10.25	0.02	0.00	0.03	0.03	0.03
Ox152c			0.14	0.00	0.14	89.04	0.00	0.07	0.01	10.38	0.05	0.01	0.13	0.00	0.03
Ox152d			0.15	0.01	0.15	90.04	0.02	0.00	0.02	9.41	0.00	0.00	0.11	0.00	0.09
Ox153a	Socketed knife	fracture	0.02	0.01	0.21	87.16	0.00	0.53	0.77	8.36	0.27	0.00	2.46	0.04	0.19
Ox153b			0.03	0.01	0.16	83.16	0.00	0.00	0.45	6.36	0.24	0.00	9.58	0.00	0.01
Ox153c			0.01	0.00	0.17	88.72	0.00	0.00	0.48	7.61	0.19	0.00	2.62	0.00	0.19
Ox153d			0.02	0.00	0.21	82.43	0.00	0.00	1.11	10.51	0.44	0.00	5.17	0.04	0.07
Ox154a	Flat awl (WBP91 SF1)		0.04	0.02	0.08	90.35	0.03	0.00	0.10	8.58	0.02	0.06	0.56	0.15	0.01
Ox154b			0.14	0.00	0.09	88.95	0.00	0.17	0.15	9.71	0.09	0.00	0.56	0.11	0.04
Ox154c			0.00	0.01	0.11	87.56	0.05	0.75	0.17	10.15	0.12	0.00	0.83	0.14	0.12
Ox155a	Wire (WBP91 SF2)		0.03	0.00	0.02	91.34	0.00	1.51	1.56	4.34	1.03	0.00	0.04	0.11	0.02
Ox155b			0.17	0.00	0.06	92.47	0.01	0.00	1.57	4.01	1.00	0.00	0.00	0.00	0.72
Ox155c			0.36	0.00	0.04	91.88	0.00	0.10	1.54	4.08	1.05	0.01	0.19	0.00	0.76
Ox156a	Crumpled sheet (WBP91)		0.11	0.00	0.09	73.76	22.80	1.80	0.02	0.01	0.10	0.18	1.12	0.00	0.01
Ox156b			0.15	0.01	0.06	74.77	24.73	0.00	0.07	0.02	0.01	0.00	0.17	0.00	0.00
Ox156c			0.15	0.00	0.07	75.36	23.86	0.00	0.01	0.04	0.00	0.05	0.27	0.00	0.20
Ox151/Mean	Basal-looped spearhead	socket	0.06	0.03	0.47	85.53	0.00	0.73	0.05	12.89	0.01	0.01	0.08	0.00	0.14
Ox152/Mean	Stop-ridge axe	blade	0.15	0.01	0.14	89.26	0.01	0.32	0.02	9.92	0.02	0.00	0.10	0.01	0.05
Ox153/Mean	Socketed knife	fracture	0.02	0.00	0.19	85.37	0.00	0.13	0.70	8.21	0.28	0.00	4.96	0.02	0.11
Ox154/Mean	Flat awl		0.06	0.01	0.09	88.95	0.02	0.31	0.14	9.48	0.08	0.02	0.65	0.13	0.06
Ox155/Mean	Wire		0.19	0.00	0.04	91.90	0.00	0.54	1.56	4.14	1.03	0.00	0.08	0.04	0.50
Ox156/Mean	Crumpled sheet		0.14	0.00	0.07	74.63	23.80	0.60	0.03	0.02	0.04	0.08	0.52	0.00	0.07
Ox33	Sickle socket		0.03	0.01	0.05	87.58	0.01	0.12	0.12	11.25	0.06	0.02	0.75	0.00	0.00
Ox34	Sickle blade		0.01	0.03	0.20	85.61	0.01	0.40	0.55	8.63	0.26	0.02	4.25	0.03	0.00
Ox35	Spear point		0.04	0.09	0.22	86.22	0.03	0.46	0.32	10.04	0.11	0.02	2.45	0.00	0.00
Ox36	Spear socket		0.03	0.08	0.22	85.71	0.00	0.40	0.36	11.04	0.11	0.03	2.02	0.00	0.00
Ox37	Tanged leatherworking knife		0.03	0.05	0.22	90.83	0.00	0.31	0.59	6.07	0.24	0.01	1.65	0.00	0.00
Ox38	Disc		0.07	0.05	0.35	86.97	0.00	0.09	0.10	12.22	0.06	0.01	0.08	0.00	0.00
Ox39	Ring		0.02	0.01	0.06	86.37	0.09	1.11	1.02	6.93	0.50	0.13	0.43	0.02	0.00
Ox40	Pin, nail-headed		0.07	0.01	0.09	85.98	0.00	0.20	0.04	9.77	0.08	0.02	3.74	0.00	0.00

Fe = iron, Co = cobalt, Ni = nickel, Cu = copper, Zn = zinc, As = arsenic, Sb = antimony, Sn = tin, Ag = silver, Bi = bismuth, Pb = lead, Au = gold, S = sulphur

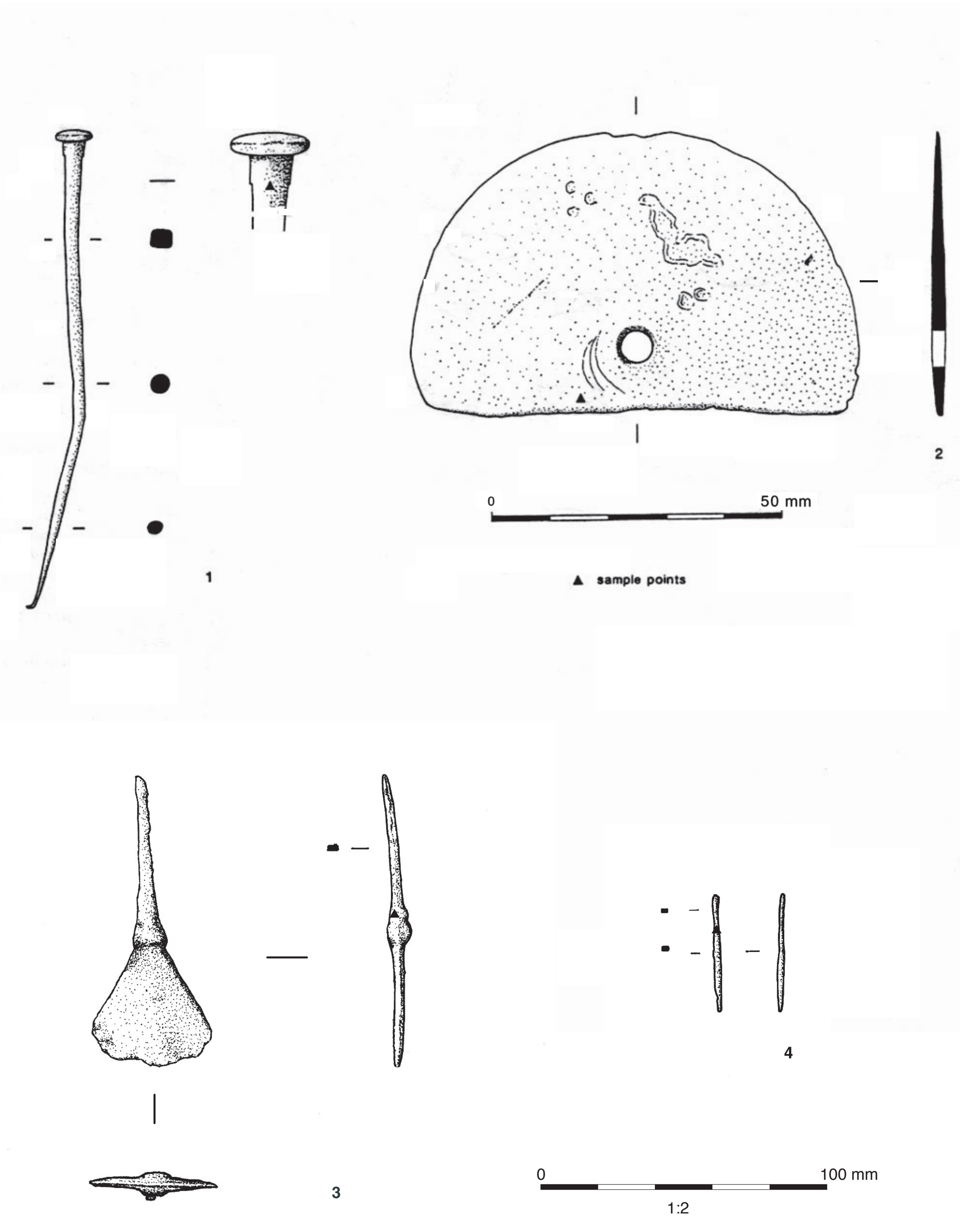


Figure 3.1 Metalwork from Whitecross Farm and riverbank: pin (1), razor (2), tanged chisel (3), awl (4)

1971, no. 546); other good parallels can be found elsewhere in Switzerland and in eastern France. Further west they are much rarer, but they can be found in the large hoard from Vénat, Charente, on the Atlantic coast of France, and associated with an unfinished Ewart Park sword (Coffyn *et al.* 1981, pls 25–6). The composition is of interest in this context. The alloy is a medium tin unleaded bronze with no zinc, which suggests an origin further east than Atlantic Europe where a leaded bronze would be expected. The impurity pattern is consistent with this.

The association of impurity pattern and alloy content may be more informative. There are similarities between the composition of the disc and that of the basal-looped spearhead (see below) and, indeed, the best match for the disc composition is in the Taunton/Cemmaes period (15th into the 14th century BC). However, the piece cannot be paralleled in that period.

Tanged chisel (leatherworking knife) *(Fig. 3.1.3, Pl. 3.1)*

Recovered from the occupation layer in the riverbank in 1949 (Thomas *et al.* 1986, no. 1); sample no. Ox 37: complete but worn; rectangular section but slightly tapered tang, possibly with extreme tip missing; the stop is in the form of a slightly rounded swelling of the tang; the blade has widely splayed straight sides and a thin lenticular cross-section; the cutting edge is curved and asymmetrically worn; chipped; sandy brown colour on surface. L: 101 mm; W: (blade) 41 mm. Now in Reading Museum (no. 1949.80/63).

Tanged chisels or blades of this type have been identified as leatherworking knives by Roth (1974); the asymmetrical wear on both this and the second example found in the Wallingford area (Thomas 1984) are compatible with this use. However, this definition is probably too restrictive as the tools would have been adequate for other cutting purposes, including uses akin to a modern paring chisel or marquetry knife, and might even have had uses with materials other than wood or leather.

This type is first established in the Penard period (13th century BC; Needham 1996) in the Burgess Meadow hoard near Oxford. They probably evolved from plain chisels through an expansion of the cutting edge. This example belongs to Roth's type II, with a triangular or nearly straight-sided blade. This has a wide distribution in the Ewart Park period, perhaps extending into the Llyn Fawr period. The distribution is concentrated in south-east England and the Thames Valley, with other clusters in south-west England and Yorkshire, and a

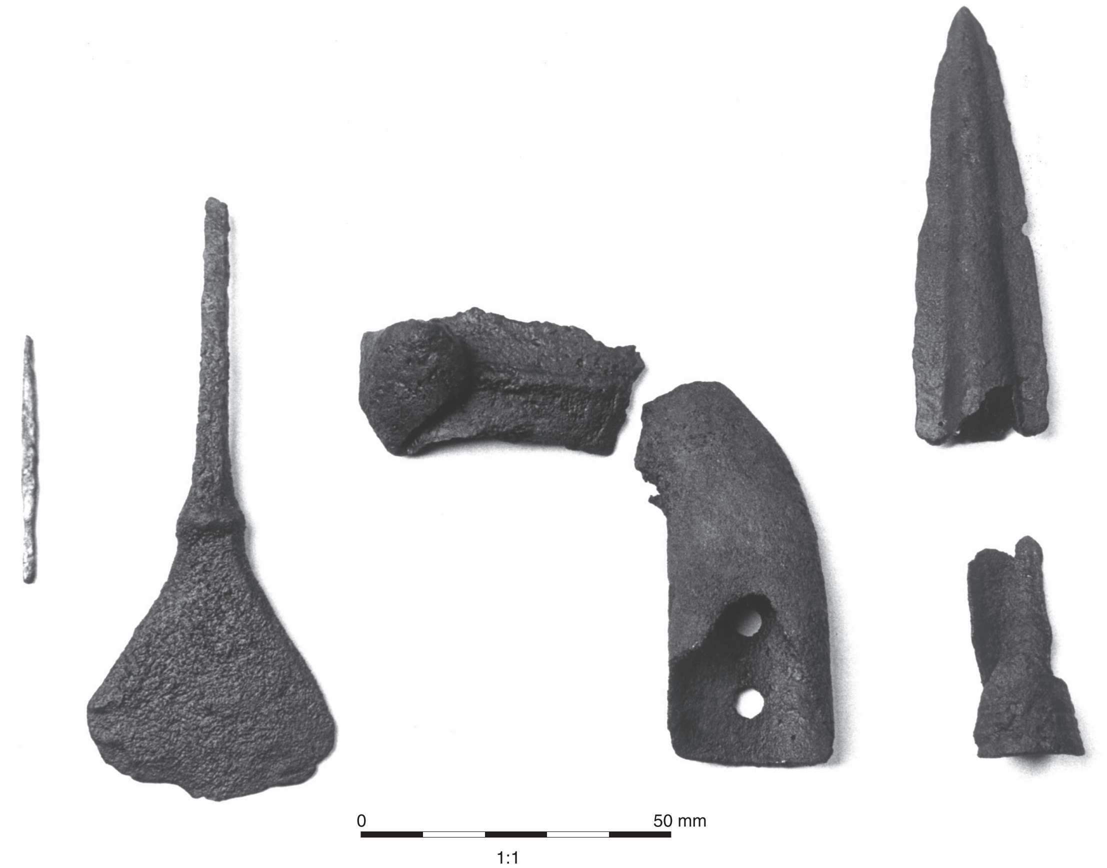


Plate 3.1 Metalwork recovered from the riverbank in 1949. From left to right: awl, tanged chisel, sickle blade and socket, and socketed spearhead. Copyright Reading Museum Service.

scatter elsewhere. Roth's list is far from complete and there have been more recent discoveries, especially from metal-detector finds in southern and eastern England. The composition is of 'S' type and closely parallels that of the sickle blade, including the relatively low tin content. The composition is also not unlike that of the spearhead and it is quite possible that the three are roughly contemporary. While the metal type is entirely consistent with a date in the earlier part of the Ewart Park period, it is also possible that this knife could be dated to the Wilburton period.

Awl *(Fig. 3.1.4, Pl. 3.1)*

Whitecross Farm excavations (WBP91, SF 1, context 2505/B/2, a context dated by pottery to the end of the LBA, perhaps after 800 BC); sample no. Ox 154: small rectangular section awl or cutting tool with circular section point. L: 35 mm; W: 4 mm (max.); Th.: 3 mm (max.).

This awl fragment, despite having a rather low lead content, could well be of Ewart Park date or even later. It is typical of many small tools from later Bronze Age sites in Britain, for example at Flag Fen (Northover and Rohl 1996).

Socketed spearhead *(Fig. 3.2.1, Pl. 3.1)*

Recovered from the occupation layer in the riverbank in 1949 (Thomas *et al.* 1986, nos 4–5); sample nos Ox 35–6: fragmentary. Thomas *et al.* (1986) illustrate this as two fragments but indicate that the socket has now been reduced to a number of small fragments. It is quite clear that the illustrated point and socket are part of the same spearhead, and this has been confirmed by the analyses. Long, narrow, elliptical blade with chipped, corroded edges; long, tapering, rather broad, circular section mid-rib; medium-length socket with two rivet holes and horizontal ribbing around mouth. L: (point) 76 mm; W: 22 mm (max.); L: (socket) 50 mm; W: 19 mm. Now in Reading Museum (no. 1949.80/64).

The plain pegged spearhead became established in Britain at the end of the middle Bronze Age, the Penard period (Burgess 1968; Needham 1996). The range of elaboration on this basic theme reached a maximum in the Wilburton period with elaborate blade sections, hollow blades, and so forth. At the same time decorated sockets became part of the repertoire; usually grooved decoration round the socket is engraved but cast decoration is also known and casting skills also reached a peak in the Wilburton period. The variety of spearhead types became more restricted in the Ewart Park period and the plain pegged type in a range of sizes came to be predominant. Decorated sockets persisted into the Ewart Park period, but for how long is problematic. Ehrenberg (1977, 60, fig. 22.102) suggests that the ribbing on a spearhead of possible Hallstatt date from Sonning, Berkshire is a parallel for the apparently cast decoration on the Wallingford spearhead. However, this spearhead is of a very different solid bladed type and the decoration is in the form of separate, cast, raised ribs (it is not even certain, given its present condition, that the decoration on the Wallingford spearhead is cast). A better parallel is a spearhead with a narrow, stepped blade from Taplow, Buckinghamshire (ibid., 47, fig. 21.110), or one from Maidenhead, Buckinghamshire (ibid., 41, fig. 21.76). All these finds cited are from the River Thames itself.

The type of spearhead cannot necessarily be dated too closely, although Wilburton to earlier Ewart Park is perhaps most plausible. The impurity pattern and alloy content would tend to favour the latter part of that range.

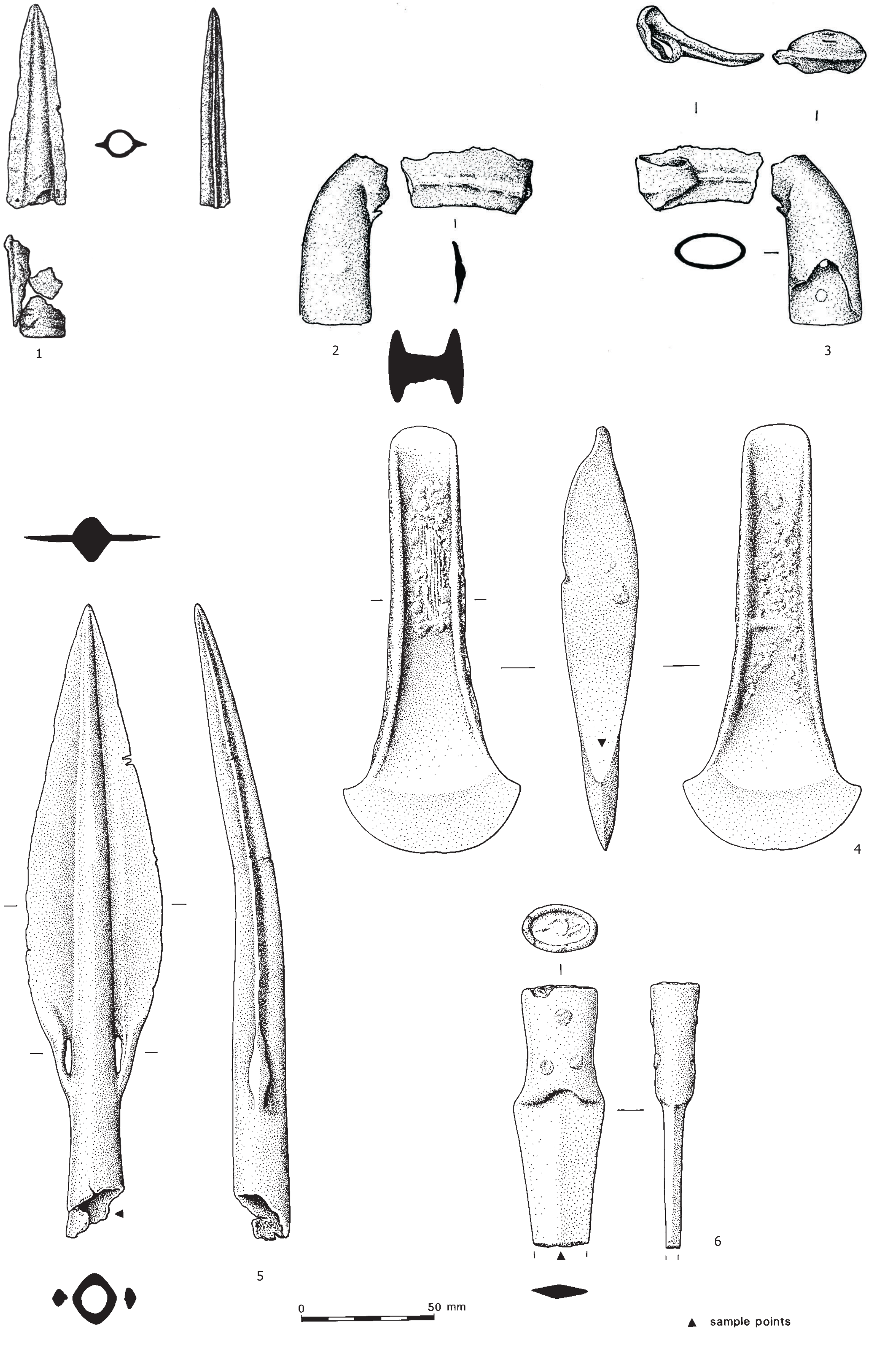
Sickle blade *(Fig. 3.2.2, Pl. 3.1)*

Recovered from the occupation layer in the riverbank in 1949 (Thomas *et al.* 1986, no. 3); sample no. Ox 34: fragmentary; a length of sickle blade, narrowing towards the tip, with a rounded, slightly curved mid-rib; the blade edges are damaged and bent over; the tip has been rolled upon itself; corroded pitted surface; brown. L: (present) 46 mm; L: (unrolled) 90 mm; W: 22 mm (max.). Now in Reading Museum (no. 1949.80/65).

Both form and composition demonstrate that this blade does not belong with the socket described below (Fig. 3.2.3). Many of the sickles in Fox's evolutionary scheme for socketed sickles have some form of ribbing on the blade. However, only the earliest ring-socketed sickles, with open or closed sockets, where the blade either curves upwards slightly from the socket or meets it at right angles, have blades with a simple mid-rib. The sickles in the Isleham, Cambridgeshire hoard tend to have a sublozengic cross-section with a central arris rather than rib, but other classes of object in the hoard show both rib and ridge existing together. Thus, typologically, we might suggest that this sickle is relatively early in the late Bronze Age, either coming towards the end of the Wilburton period or soon after the beginning of the Ewart Park period.

This proposal is supported by the analysis: a leaded medium tin bronze with significant arsenic, antimony, nickel and silver impurities, just within the definition of 'S' metal in a scheme for labelling Bronze Age impurity patterns (Northover 1980; 1982). 'S' metal, generally with higher levels of impurities than this, was the characteristic metal of the Wilburton period and was imported ultimately from Alpine or central Europe, via northern and north-western France. The use of 'S' metal did not

Figure 3.2 (opposite) Metalwork from riverbank and river dredging: socketed spearhead (1), sickle blade (2), sickle socket (3), stop-ridge flanged axe (4), basal-looped spearhead (5), socketed knife (6)



1
2
3
4
5
6
0
50 mm
▲ sample points

cease abruptly with the end of the Wilburton period but generally declined, most rapidly in the west and more slowly in East Anglia and other parts of the east coast. On compositional grounds a Wilburton or early Ewart Park date is sensible, and a good parallel is the hoard from Marston St Lawrence near Banbury, north Oxfordshire (Brown and Blin-Stoyle 1959).

Sickle socket *(Fig. 3.2.3, Pl. 3.1)*

Recovered from the occupation layer in the river-bank in 1949 (Thomas *et al.* 1986, no. 2); sample no. Ox 33: fragmentary; the blade is broken off close to its base and one side of the socket is also missing; socket has flattened oval cross-section and two rivet holes on surviving side; the socket is closed and curved at the top, the curve being continued by the line of the missing blade; where the thickness of the socket narrows to that of the blade there is a marked step at a small angle to the vertical. L: 64 mm (max.); W: 30 mm (max.). Now in Reading Museum (no. 1949.80/65).

Comparison of the analyses of the sickle socket and sickle blade (described above: Fig. 3.2.2) shows very clearly that they are not from the same object; this difference can also be supported typologically. The form of the sickle socket, with the blade and socket joined in a smooth curve, places it in Fox's Thames series (Fox 1939). In the Thames series the blade is smooth, as appears to be the case here, while the blade fragment (see above) has a mid-rib. The Thames series cannot be closely dated because there are no helpful associations. Fox assumed that it broke away early from the main series of socketed sickles (his group I) and that it followed an independent evolution in the Thames Valley. Discoveries made since Fox wrote have some bearing on this question. The Isleham hoard can be firmly dated to the end of the Wilburton period of the late Bronze Age in the 11th century BC (Needham 1996). All the socketed sickles in that hoard are of the open ring-socket type found at the head of group I (O'Connor 1980; Northover 1982). There is therefore a strong probability that the Wallingford sickle dates to the subsequent Ewart Park period, the 10th–8th centuries BC, or even a little later. Another influence on the type might be Fox's group II, essentially derived from the double-edged socketed knife by curving the blade into a sickle-like form. The double-edged socketed knife is also prototyped in the Isleham hoard, while several group II sickles have also been found in East Anglia. There are two examples in Ireland where there is also one example of a Thames series sickle. Since Fox wrote, another has been found outside the Thames Valley, at Halkyn, Clwyd, in north-east Wales (Green 1985; *pace* Green, this is not a ring-socketed type).

Thus the typological evidence, such as it is, places the socket in the Ewart Park period, or possibly in the succeeding Llyn Fawr period, into the 7th century BC. The low-lead medium–high tin alloy could support any of these dates. The impurity pattern is equally undiagnostic other than being typical of the Ewart Park and Llyn Fawr periods as a whole.

Stop-ridge flanged axe *(Fig. 3.2.4)*

Metal-detector find from river dredgings. Sample no. Ox 152: complete; slightly rounded butt protruding above long, leaf-shaped flanges; splayed blade; well-curved, expanded cutting edge with large bevel; well-defined stop-ridge with slight ledge on one face, less well defined on the other; no flash line on either flange; blue-green corrosion products with earth and lime encrustations. L: 161 mm; W: (blade) 67 mm; W: (butt) 25 mm; Th.: 28 mm (max.); Wt: 455 g. Private ownership.

This axe represents part of the transition to the long-flanged axe with expanded cutting edge of the end of the early Bronze Age, of which the Arreton type is one of the principal forms (Schmidt and Burgess 1981). This axe fits into Rowlands' class 2 of flanged axes although this class is rather loosely defined (Rowlands 1976). The small hoard from Dorchester-on-Thames (Ashmolean Museum 1927.2679–80) offers a close parallel and others can be found along the Thames down to London.

The developments that have occurred in the Wallingford axe are a shift towards a more palstave-like outline and the formation of stop-ridges on both faces; however, the 'septum' is still almost the same thickness as the blade and the flanges are still full length, extending well below the stop-ridge. The form probably represents a mixture of influences, the stop-ridge perhaps deriving from the north-west of the European mainland, as evidenced in hoards such as Ilsmoor in northern Germany, while the palstave outline could have developed in Britain. The development of early unlooped palstaves of Llandderfel and Acton Park type seems to have proceeded most rapidly in Wales. The composition fits well in this transitional phase and can be compared with that of some early palstaves in the Burley, Hampshire hoard (Rohl 1995). This is further supported by the lead isotope analysis (see Appendix 2) where this axe groups with palstaves in the Burley hoard.

Basal-looped spearhead *(Fig. 3.2.5)*

Metal-detector find from river dredgings. Sample no. Ox 151: complete; long leaf-shaped blade with flat section and wide, shallow, hammered bevels along edges; some small cuts on edge; lozengic section mid-rib; long loops with tear-shaped covering with marked flash line; broken, circular section socket. Blue-green patina with some earthy encrustation. L: (present) 241 mm; blade 190 mm x 51 mm; socket Dia. (present) 20 mm; Wt: 226 g. Private ownership.

This is a well-developed leaf-shaped basal-looped spearhead, perhaps with a flatter blade than most specimens. The composition, with its relatively high nickel and arsenic content, defines the metal as dating to the Taunton/Cemmaes period of the middle Bronze Age, from the 15th into the 14th century BC (Northover 1980; Needham 1996), rather than the later Penard period. In the region of the Upper Thames Valley, Ehrenberg (1977) shows basal-looped spearheads as largely confined to the Thames and Kennet rivers, with some separation between leaf-shaped and triangular blades. The latter tend to be later although there is some overlap.

Socketed knife (Fig. 3.2.6)

Metal-detector find from river dredgings; sample no. Ox 153: fragmentary; rivet holes on both faces of flattened, oval socket; step at base of socket is concave in outline; tapered blade with lozengic cross-section and no edge bevels; edges slightly concave; rough pale blue-green to brown surface; blade broken off at half to two-thirds length; socket full of ?soil concreted with corrosion products. L: (present) 96 mm; W: 36 mm (max.); socket 30 mm x 18 mm. Private ownership.

The concave lower edge to the socket defines this knife as being of Dungiven type rather than the more common Thorndon type where the socket has a straight lower edge. Socketed knives are essentially a Ewart Park type although their prototype is to be found in the Wilburton-period hoard from Isleham, Cambridgeshire. As discussed with the other Ewart Park period objects above, the 'S' type composition indicates that this knife is likely to date either to the earlier part of the Ewart Park period or to the Wilburton period. It should be noted that in the composition quoted in Table 3.2 the arsenic content is an underestimate due to the instrumental complications in analysing arsenic in the presence of lead (Northover 1986); a more accurate estimate would be of the order of 0.4%. The composition, as noted already, can be closely paralleled in the Oxfordshire region in the Marston St Lawrence hoard, typologically very early in Ewart Park.

Catalogue of metalwork of uncertain date

There is one item which can be described as a recognisable artefact rather than a fragment or waste but for which a clear typological identification is not possible because of a lack of parallels. It is from a disturbed context.

Ring

Whitecross Farm excavations (WBP86, SF 1, layer 3); sample no. Ox 39. The ring is elliptical rather than circular, one half having a simple D-shaped cross-section, the other being expanded into a flattened, undecorated oval. Overall Dia.: 14 mm x 10 mm; internal: 11 mm x 7 mm; Th.: (hoop) 3 mm; plate: 14 mm x 9 mm.

Because of its small size this piece could only be regarded as being a finger ring if it were for a child or young person. Alternatively it might have been designed as decoration for some other object. The earliest date the object could be is Roman, earlier rings being of completely different forms. The alloy is a low tin unleaded bronze; the principal impurities are high levels of arsenic, antimony and silver; zinc was also observed. As/Sb/Ag levels of this order are very rare in the Roman period and a medieval or later date would be more plausible (eg Lewis *et al.* 1987, especially no. 19). More usually, though, bronze of this type in medieval England was heavily leaded. Of course, a late date would be consistent with a surface find.

Catalogue of waste

Corrosion

Whitecross Farm excavations (WBP86, SF 2407, layer 2403, a plough-disturbed LBA occupation layer); sample no. Ox 41: proved to be soil concreted with copper corrosion products and so was not studied further.

Metalworking waste

Whitecross Farm excavations (WBP86, SF 2406, layer 2402, medieval alluvium); sample no. Ox 42: of uncertain date, although externally this appeared to be a fragment of a late Bronze Age planoconvex copper ingot. These are typical of the Ewart Park period in southern and eastern England, but are rare as far up the Thames as Oxfordshire. The lump was sectioned and metallographic examination at once showed it to be extensively oxidised bronze, largely comprised of copper with abundant cuprite (Cu_2O) inclusions and needles and rhombs of cassiterite (SnO_2). Low to medium tin bronze melts are unstable in excess oxygen and will freeze to give just these products. As tin contents increase the ∂ phase will be found to remain as it can exist in equilibrium with SnO_2 (Hoffmann and Klein 1966). Patches of low tin bronze can remain segregated within lumps like this, although this was not the case here. Some small particles of a glassy slag were attached. The state of oxidation means that the only elements likely to remain unoxidised in the copper are silver and small amounts of residual arsenic, and this was seen here. The other impurities, as oxides, react with the slag or are lost to the vapour phase; here there was insufficient slag remaining for a quantitative analysis to identify impurities.

The occurrence of this material indicates the melting, but not necessarily the making, of bronze on site. So far this type of waste has not been identified in a hoard of late Bronze Age or other date, indicating that it was regarded as something not worth recovering. Given the presence of fragments of metalwork in scrap condition, such as the pieces of two sickles, the melting of bronze could well have been occurring in the Bronze Age on the site. If this lump is indeed of Bronze Age date it is probably the first example to be identified on a British Bronze Age site, although similar material has been described and analysed from Bronze Age sites in Switzerland (Fischer 1997). In Britain it has been more commonly recorded on Iron Age sites (eg Northover 1987). The formation of this type of waste is consistent with the residues recorded in Bronze Age crucibles (Whewell 1998). In later periods crucibles were generally used in a less wasteful way.

Wire

Whitecross Farm excavations (WBP91, SF 2, context 2505/B/2, a context associated with LBA pottery); sample no. Ox 155: fragment of corroded bronze wire; the surface of the wire is too damaged by corrosion to determine its method of manufacture.

Given its context as a near-surface find there is no direct evidence for the dating of this piece. Interestingly the composition is remarkably similar to that of the ring (sample no. Ox 39, see above) and the wire could very well be contemporary with it. The microstructure could have belonged to either a drawn or a hammered wire.

Crumpled sheet (Roman or later in date)

Whitecross Farm excavations (WBP91, SF 3, context 2505/D/3, a context associated with LBA pottery); sample no. Ox 156: crumpled fragment of thin copper-alloy sheet.

The alloy used in this sheet is brass which determines that it is of Roman or later date. Roman brass ingots are of clean, tin-free brass, but the great majority of Roman brass objects carry a greater tin impurity than is seen here. The same applies to English medieval brass, so it is probably more likely that this metal is post-medieval in date.

Discussion

Table 3.1 lists 40 items of copper-alloy metalwork as coming from the river and riverside at Wallingford, of which 15 are described in detail above (including 12 that are directly associated with the eyot and 3 that are new finds); of the total, 29 have been assigned to recognisable artefact types belonging to one or other period of the Bronze Age. A further 8 items are either of uncertain type or are simply fragments or waste, but whose contexts are most probably of later Bronze Age date. The remaining 3 pieces are near-surface finds and are most probably no earlier than medieval in date; 1 further find submitted proved to be soil impregnated with corrosion products and is not included in this discussion. The distribution through time of the Bronze Age material is of great interest, with patterns of deposition showing a clear differentiation between the middle and late Bronze Ages.

With a rather small number of finds from the middle Bronze Age, 9 in all, it is not possible to say whether the metalwork points to a continuity of activity through that period. The first 3 finds – 2 axes and 1 ribbed dagger or dirk – cluster round the transition from the early to middle Bronze Age as defined in terms of the metalwork, although none is strictly of the early Bronze Age. It is interesting to note that the axes have also been dredged from the river, although the other findspots of palstaves in Oxfordshire suggest that they are not normally river finds. It is of course possible that, like some of the late Bronze Age material, they have eroded from the bank as the channel has moved with time. There could well be a time gap before the next episode of deposition which consists entirely of weapons, and dates to the Taunton and Penard periods. The types involved are basal-looped spearheads, group III and group IV dirks or rapiers, and a Ballintober sword; the spearheads, dirks and rapiers are intact but the sword is bent and broken, although this may be a result of being recovered by a dredger in 1868. The group IV dirk and rapier are both of a type with rather numerous Thames findspots (Burgess and Gerloff 1981), while basal-looped spearheads are shown by Ehrenberg (1977) to have a small concentration in the Wallingford/Dorchester stretch of the Thames with relatively little overlap with other spearhead types.

There is then a gap in the record until the late Bronze Age, more specifically the end of the Wilburton period and the beginning of Ewart Park. Of the 17 larger objects from the late Bronze Age only one bronze, a linear faceted axe of Blandford type, can definitely be attributed to the latest phase of the late Bronze Age, the Llyn Fawr period. With the other 16 any typological dating evidence, such as the barbed spearhead, the sickle fragments and, perhaps, the ribbing on the plain spearhead, tends to cluster in the first half of the Ewart Park period. As discussed earlier, there is good support for this view from the analyses with the possibility that at least one piece can be dated even earlier, to the end of the Wilburton period. On this basis, although it cannot be proved, it is reasonable to believe that the majority of the metalwork represents activity in and around the reach below Wallingford Bridge in the first half of the Ewart Park period, from the end of the 11th into the 10th century BC.

The nature of that activity appears to be strongly domestic, with an emphasis on tools and personal effects, and with a hint of industrial activity. This last is immediately indicated by the metalworking waste, as well as by some of the fragmentary items. Some of these, of course, may simply be losses of broken parts of artefacts but some, for example the sickle fragments, could equally be scrap metal for local reprocessing. The large number of intact objects, mainly the axes and socketed knives recovered from the river, is not what would be expected from normal occupation layers which usually yield either personal items or small fragments (Needham and Burgess 1980). Neither are axes and knives usual candidates for river deposition: it seems most plausible to accept that a dispersed hoard, possibly eroded from the riverbank, is involved, a hoard that could include knives and spearheads as well as axes.

The objects that are demonstrably from the occupation layers and of late Bronze Age date are the two joining pieces of the spearhead with a ribbed socket, the sickle fragments and a tanged leatherworking knife, plus the awls and awl fragments, the pin, sheet and wire fragments, and casting waste. This assemblage is indeed typical of domestic occupation. The obvious site from which to seek comparisons is Runnymede (Needham 1991; Needham and Spence 1996). The sites at Runnymede have produced a variety of small fragments similar to the wire, sheet and small pieces of awl, as well as somewhat larger items such as a section of a socketed knife. While some of the fragments, and maybe the pin, are the result of casual loss or breakage, the presence of a small amount of industrial waste implies that some might be scrap or the debris of metalworking activities such as patching sheet-metal vessels. Although the dating of the metalworking at Wallingford cannot be more precise than an assignment to part of the Ewart Park period, there is no evidence to suggest that it continued beyond that period. The one Llyn Fawr-period item, the linear faceted axe, is a non-utilitarian type and is from the river.

While the great majority of the bronze artefacts can be considered local types, or at least manufactured in southern England, one is almost certainly exotic and that is the knife/razor which could have come from as far as Switzerland or eastern France. Two other sites in southern Britain show connections in that direction: Flag Fen, Peterborough, with its tin objects (Northover and Rohl 1996), and Caldicot Castle, Gwent, with not only another tin object, but also a miniature late Urnfield scabbard chape for which there are parallels in the same area of Switzerland as those for the knife/razor (Northover 1997).

Conclusions

Forty items of copper-alloy metalwork have been studied from Wallingford; analysis indicates that three items are relatively recent while the remainder can be attributed with some confidence to the Bronze Age. The Bronze Age metalwork comprises three main categories: deposition in or close to the river through the middle Bronze Age, and both hoard and occupation contexts in the late Bronze Age. This last includes some small industrial activity, evidenced at the very least by casting waste and oxidised bronze. This type of economic activity had almost certainly ceased by the end of the Ewart Park period.

FERROUS METALWORK

by Leigh Allen

Three iron objects (two horseshoes and a miscellaneous fragment) were recovered from alluvium and later contexts; further details of these objects may be found in the archive. These objects are not particularly datable, but indicate sporadic use of the site from the medieval period onwards.

GLASS BEAD

by Angela Boyle and Julian Henderson

A single glass bead was recovered from the occupation layer 103. The bead was analysed and identified as high magnesium glass (Henderson 1988).

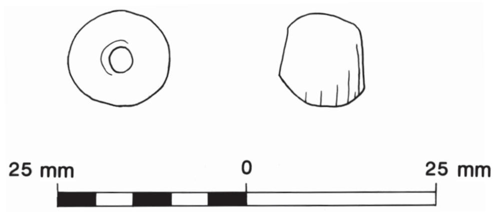


Figure 3.3 Green glass bead recovered from layer 103

Plate 3.2 The glass bead

Catalogue

Glass bead *(Fig. 3.3, Pl. 3.2)*

Dark translucent green glass bead, spherical with cylindrical central perforation. Complete. Ht: 8.9 mm; W: 10.7 mm; width of perforation 1.2 mm.

British high magnesium glass (HMG) has been found in 13th- and 12th-century BC contexts at St Martin's, Isles of Scilly (Stone 1952) and Glentrool, Tayside; and Potterne, Wiltshire of *c* 9th- to 7th-century BC date (Gingell and Lawson 1984; 1985), and Aderbrock, Isle of Lewis (Anderson 1911). It is likely that either raw high magnesium glass or the finished beads derived from the Near East or the Mediterranean, although the possibility that it was made and worked in Bronze Age Europe using imported raw material cannot be ruled out (Henderson 1988, 447).

The majority of glass beads of this date have been found in funerary contexts, frequently in association with cremation urns, though six are known from occupation sites including Potterne, Wiltshire and Runnymede Bridge, Surrey (Henderson 1989, 23).

Glass beads of slightly different composition are also known from an earlier Bronze Age context at Wilsford, Wiltshire (Guido *et al.* 1984) and from the LBA/EIA site at All Cannings Cross (Cunnington 1923; Guido 1978, 177, fig. 23.1).

WORKED FLINT

by Andrew Brown and Philippa Bradley

Introduction

The lithic material provides a rare opportunity to investigate and characterise a sealed late Bronze Age assemblage. The flint was recovered from contexts sealed by alluvium and channel deposits in association with other late Bronze Age settlement debris and is therefore comparable in condition with material that has been recovered from waterlogged sites elsewhere. As a result, the questions addressed in this report are to some extent different from those tackled at other later prehistoric sites such as Black Patch (Drewett 1982) or Winnall Down (Winham 1985). Unlike those reports, the potential exists at Whitecross Farm to characterise late Bronze Age technology through a study of reduction strategies and refitting rather than purely in statistical terms. The flintwork can therefore be characterised on its own merits rather than as an abstract continuation of the degeneration of knapping competence from the late Neolithic onwards (eg Ford *et al*. 1984).

The worked flint from the 1985–6 excavations was initially recorded by George Lambrick but subsequently analysed in detail by Andrew Brown, and that work forms the basis of this report. Further excavations in 1991 produced more flintwork, which was analysed by Philippa Bradley using Andrew Brown's methodology. Further details of the assemblages may be found in the site archive. The assemblage is summarised in Table 3.3, and selected pieces are described in the catalogue below and illustrated in Figures 3.4–6. The distribution of the flint is presented in Figures 2.10f–i.

Approach

The approach employed combines both use-wear analysis and an understanding of the reduction strategies used. Use-wear data can aid the understanding of the uses to which flint artefacts were put, and are particularly helpful where raw material was used unmodified without retouch. The Whitecross Farm material lends itself to this sort of approach by virtue of its excellent preservation. Despite the fact that some of the occupation layers were plough disturbed (see Chapter 3), there was no evidence for plough damage on any of the flints. At the same time, this perspective deals with the assemblage on its own merits rather than with constant pejorative reference to earlier reduction techniques. It is recognised that reduction in the late Bronze Age was no longer orientated towards blade production (Pitts 1978) and that retouching was reserved for particular tool types (eg Ford *et al*. 1984, 167). This report tries to understand late Bronze Age reduction strategies and what types of artefact they were orientated towards producing.

With this approach in mind, the starting place for the analysis is the use-wear data, thereby defining, in utilitarian terms, the demands made by the users on flint as a raw material. The technological aspects of the assemblage can then be considered within the constraints placed by that available raw material. Within this framework, it will be noted that retouched items are seen alongside unretouched ones as products designed to meet a need. In this way, retouch is seen as an option rather than the natural end-point of the reduction sequence. Retouched items are therefore removed from their usual prominence to a position more suited by their numerical representation. Why, in these exceptional cases, the option of retouch *was* taken up then becomes a valid question.

Summary quantification

A total of 1130 pieces of flint were recovered from the excavations, 537 of which were struck and the remainder were burnt and fire-cracked beyond recognition as struck or otherwise. The unstruck totals also include a small quantity of unflaked raw materials/tested pieces. The material was recovered by hand throughout, and no particular sample bias is evident in the collections from different trenches, although no small chips were recovered. The majority of the flint was recovered from phases 7 (ploughing) and 5 (midden and occupation; Table 3.4). The plough disturbance to the midden might explain the lack of chips, and although approximately one-third of the material came from these layers it is likely that it still derives from the same activity and may not have moved far from its original place of deposition.

In addition, 12 pieces from earlier excavations (as reported in Thomas *et al*. 1986) were examined, although they are not included in the summary tables. At least three of those illustrated (ibid., 192,

Table 3.3 Summary of flint composition by trench

Trench	*Unflaked raw materials/tested pieces*	*Hammerstones*	*Split pebbles*	*Cores, core fragments*	*Preparation flakes*	*Trimming flakes*	*Whole unretouched flakes*	*Snapped flakes*	*Retouched flakes*	*Burnt*	*Total*
I	-	-	1	1 core	-	-	21	7	-	Unstruck 6 Cores 1 Flakes 2	39
II	-	-	-	-	-	1	13	5	-	Unstruck 5 Cores 1 Flakes 1	26
III	-	-	-	-	-	-	5	-	-	Unstruck 1	6
XVII	-	-	1	1 core	6	1	12	4	-	Unstruck 78 Cores 3 Flakes 7	113
XVIII	1	1	1	4 cores 3 core fragments	6	3	36	22	6	Unstruck 15 Cores 1 Flakes 2	101
XXIV	29	-	11	15 cores 9 fragments	31	28	81	20	10	Unstruck 144 Cores 7 Flakes 15	400
XXV	-	-	27	1 core 1 core fragment	14	9	32	17	3	Unstruck 245 Flakes 2	351
XXVI	-	-	2	1 core fragment	3	3	7	4	-	Unstruck 29 Flakes 1	50
XXVII	-	-	5	1 fragment	3	1	5	1	-	Unstruck 25	41
U/S	-	-	-	1 core fragment	-	-	-	-	-	Unstruck 2	3
Total	30	1	48	38	63	46	212	80	19	593	1130

Table 3.4 Flint assemblage composition by phase

Phase	*Unflaked raw material tested pieces, hammer-stone, split pebbles*	*Cores, core fragments*	*Flakes*	*Retouched flakes*	*Burnt (worked/unworked)*	*Total*
8 Alluvium	2	5	37	4	16	64
7 Ploughing	12	20	174	11	124	341
6 Alluvium/silting of channel	-	1	-	-	2	3
5 Midden/occupation with pits/ postholes	30	10	184	3	360	587
4 Organic silt/timber deposit/ removal of palisade	13	2	4	1	91	111
3 Structures/palisade	-	-	1	-	-	1
2 Earlier occupation	22	-	1	-	-	23
Total	79	38	401	19	593	1130

nos 2, 6 and 7) are pre-late Bronze Age in date on the grounds that their technological attributes and raw materials are wholly different from the recently excavated sample. Six more from the recent work can be ascribed similarly to the Neolithic and earlier Bronze Age. The material represents an insignificant presence of residual material on the site, whose very different characteristics from the great majority of the assemblage support the assertion that all the remaining 526 struck pieces from the recent excavations belong to the late Bronze Age phase. The burnt material cannot be distinguished in the same way, but where the condition of the cortex and the nature of the flint can be discerned it is of the same type as the LBA material and different from the earlier. It has therefore been treated in its entirety as contemporary with the majority of the struck flint.

Use-wear data

Use-wear data were recorded using what is known as the 'low-power' approach. Magnifications of 10–30 times, occasionally 50 times, were used to pinpoint the damaged areas of flake edges. The combined distribution and nature of the scars (particularly the proportions of damaged flakes with abrupt terminations) was used first to distinguish the pre- or post-depositional incidence of the damage and then the mode of use (cutting/ whittling, scraping and boring) and the likely resistance of the worked material. The methodology is based on the pioneering work of Tringham *et al*. (1974), which was explored further by George Odell and others (Odell 1975; 1981; Odell and Odell-Veryeecken 1980; Lawrence 1979; Akoshima 1987). Experimental work by one of the authors (A Brown) has suggested that the main drawback of the methodology is that the working of some soft, yielding materials may go unnoticed, especially in the cutting/whittling mode of action, unless fragile edges were used. Although no attempts can be made to identify specific uses at this level of analysis, for interpretative assistance materials of the resistance of unseasoned wood are likely to be represented in the medium hardness category. Hard wood, bone and antler should be represented towards the hard end of the range while soft woody or vegetable matter, hideworking and meat-cutting with sinew, cartilage or slight bone contact should figure at the soft end. Thus the overall distribution of the damage types may be used to give an indication of the balance of resources exploited at a site.

Of the edges of the 410 unburnt and potentially usable flakes (ie excluding split pebbles, cores and core fragments), only 59 instances of use-damage were identified (Table 3.5). This forms just over 14% of the usable flakes and such a small sample precludes attempts at spatial analysis of specific activities, for which purposes it would be necessary anyway to demonstrate the primary nature of the refuse deposition. Figure 2.10g illustrates the distribution of used edges (individual pieces may have more than one used edge) irrespective of use. The used pieces are concentrated in trenches XVIII, XXIV, XXV and XXVI, and although the sample is too small to attempt any detailed analysis, a few general observations may be made. Pieces used for boring are concentrated in the eastern part of trench

Table 3.5 Summary of use-damage (pieces may have more than one used edge)

Type of use-damage	*Soft/medium*	*Medium*	*Medium/hard*	*Total*
Cut/whittle	7	10	7	24
Scrape	8	10	9	27
Bore/piercer	3	2	3	8
Total	18	22	19	59

Table 3.6 Summary of use-damage by phase

Phase	Cut/whittle	Scrape	Bore/pierce	Total
8 Alluvium	2	3	2	7
7 Ploughing	16	10	3	29
5 Midden/occupation with pits/postholes	5	13	2	20
4 Organic silt/timber deposit/removal of palisade	-	1	1	2
3 Structures/palisade	1	-	-	1
Total	24	27	8	59

XXIV; only a single flake with boring damage was recovered from trench XXVI. Of the formally retouched pieces, two artefacts classed as piercers/borers were recovered from trench XVIII (Fig. 2.10h), neither of which had been used for boring, but one had scraping damage on it. Scraping damage and cutting/whittling damage seem to have been equally important in trenches XVIII and XXIV (Fig. 2.10g). Scraping damage was much more frequently recorded in trenches XXV and XXVII, but less so in trench XXVI. To the south, trench XVII produced an even number of scraping damage and cutting/whittling damage (Fig. 2.10g). Apart from the concentration of boring damage in trench XXIV, it seems likely that the use of flint was not tied to a specific task as it was at later sites such as the shale-working flint industries on the Isle of Purbeck, Dorset (Calkin 1953; Woodward 1987a, 110; Cox and Woodward 1987, 172).

Numerically trench XXIV produced the greatest number of used edges (19); however, as a percentage of the worked total it is only 8.4% as compared with 16.9% for trench XVIII, 33% for trench XXVI, 12.9% for trench XXV, 12.5% for trench XXVII and 15.5% for trench XVII. These figures are perhaps slightly misleading for the last two trenches as they are based on relatively low numbers of used pieces out of quite small overall totals. As with the majority of the flint assemblage as a whole, the used pieces are concentrated in phases 7 and 5 (Table 3.6), suggesting that the occupation was quite intensive and that the later ploughing has simply disturbed these midden and occupation deposits. It is interesting that the apparent concentration around trenches XXV and XXVI is located on the eroded bank of the modern River Thames (see Fig. 2.10), perhaps suggesting that any focus of activity lay immediately to the east of this area which is now thought to be a destroyed part of the eyot.

The small number of retouched pieces (19; Table 3.7) had all been used on at least one edge but so too had many other, unretouched edges. The selection of flakes for use and retouch appears to have been made, unsurprisingly, on the basis of overall flake size, perhaps for comfort of handling, and edge form: a short length of an edge straight in profile was generally adequate, the mode of use depending on the appropriateness of the edge angle. Examples of the used pieces are illustrated in Figures 3.4–6. The used pieces tended to be larger than the unused. Beyond the properties of a particular edge and size of flake, little notice seems to have been taken of the form of the flake. Core fragments and cortical flakes were used alongside non-cortical ones: indeed a cortical backing to a flake seems often to have been preferred, presumably to facilitate holding, protecting the hand from sharp edges. There is no evidence of hafting of flint tools at Whitecross Farm; the irregularity of many of the flakes would have made this very difficult.

Table 3.7 Retouched forms by phase

Phase	Palaeochannel	Eyot	Riverside
8 Alluvium		1 scraper 1 piercer/borer 1 scraper 1 miscellaneous retouch	
7 Ploughing		3 scrapers 3 piercers/borers 4 miscellaneous retouch	1 retouched flake
5 Midden/occupation with pits/postholes	1 piercer/borer		2 scrapers
4 Organic silt/timber deposit/removal of palisade	1 piercer/borer		
Total	2	14	3

Use of retouch

The retouched pieces are of limited form (7 scrapers, 4 denticulates, 2 piercer/borers, 1 retouched flake and 5 unclassifiable pieces; see Table 3.7) and were difficult to assess, especially in the case of the denticulates. A denticulated effect – by which is meant a coarsely toothed edge comprising perhaps just two or three 'teeth' separated by concavities produced by single, relatively large retouch removals – can be intended to create either points or concavities or may sometimes be accidental, perhaps the effect of using a flake as a core or even as an anvil for écaille flaking. Many of the Whitecross Farm pieces had such an edge, but low-power use-wear analysis located only six cases where either points or concavities had been used, the points predominating slightly. It seems probable that the term 'denticulate' covers a variety of conceptualised 'tools', the manufacture of which coincided in the removal of these large retouch flakes, although the intended uses for the resulting edge were different. Of the other used pieces, scraping edges were frequently unretouched, but there are two examples where scrapers with retouch have been resharpened, one of which may have broken during this process or subsequently during use. Here retouch may have been used to rejuvenate dulled edges (Fig. 3.5.13, 18). The distribution of the retouched pieces is presented in Figure 2.10h, which can be compared with that of the used pieces (Fig. 2.10g). Unsurprisingly there is an overlap between these two groups.

The lack of control over the final forms of retouched pieces, which makes categorisation so difficult, and the *ad hoc* usage of retouch to create short sections of usable edge, contrast markedly with the use of retouch during the Neolithic and earlier Bronze Age. Early Neolithic assemblages in the region, for example, may be characterised by their small range of retouched items (Holgate 1988a) but contain a high proportion of easily categorised artefacts such as regular scrapers, symmetrical piercers and leaf-shaped arrowheads. In a review of later prehistoric flintworking by Ford *et al*. (1984), the range of classifiable retouched forms has been shown to diminish through the Bronze Age, yet the unclassifiable 'deliberately modified pieces' rose as a proportion of total assemblages. Such changes are difficult to explain at a purely utilitarian level. Late Bronze Age points presumably perforated as effectively as most Neolithic ones and the knives presumably cut as cleanly. It may be that it is necessary to see the reduction of control over final form of retouched pieces in the context of changes in the social and symbolic uses of flint though prehistory (Brown 1991a).

Technological aspects

Having defined the limits of usability of flint flakes, it is now appropriate to turn to the techniques used to produce such flakes, given the constraints of the raw materials. These raw materials were exclusively flint pebbles or cobbles, commonly fist-sized but sometimes larger. Such cobbles do not occur in the clay loam of the site, which is almost stoneless, but may be found in the gravel terraces of the Thames floodplain in the immediate locality. The surfaces of these cobbles are both smoothed and cortical or patinated brown. Internally, the flint varies in colour from very dark grey through mottled grey/brown, and frequent cherty and crystalline inclusions were noted. Larger nodules of chalk flint, although available within a 2 km radius of the site, seem not to have been exploited. The very few reworked earlier flakes present show that the collection of usable raw materials formed an insignificant part of the raw material acquisition strategy.

The battering which the flint cobbles have experienced has left them with a severely weakened internal structure, resulting in ventral fractures with sharp changes in angle where faults were encountered. As a result, debitage is often angular and irregular, and it is difficult in such circumstances to determine the part played in the reduction sequence by these pieces. Experimental flaking of similar raw material, however, has facilitated the description of the reduction sequence through the recognition of technological indicators in the material usually pushed aside as 'waste'.

In order to avoid using the general category of 'waste' or 'irregular workshop waste', the products of flaking were divided into those resulting from initial core preparation, from production of flakes and from trimming the core again ready for more removals. **Preparation flakes** are often the largest and are frequently wholly or mostly cortical. They show scant or no signs of previous flaking in the form of dorsal scars, and correspond broadly to primary flakes (Bradley 1970), although they need not be cortical if the material is already split and/or patinated as is often the case at Whitecross Farm. A **trimming flake,** by contrast, can never be wholly cortical, as it is defined as being a flake which demonstrates a change in the orientation of flaking by bearing dorsal scars struck from a different direction from itself. Core tablet rejuvenation flakes and crested blades are distinctive subsets of trimming flakes – most simply remove overhangs or hinge fractures which have arrested temporarily the reduction of the core; as such, they are thicker than the majority of ordinary flakes.

Flakes, unretouched or retouched, are the only other product of flaking under this classification; no distinction is drawn between flakes and blades as they represent the same stage in reduction. A flake may be classed as such, even if it is very irregular, as long as it shows sign of previous flaking (ie is not wholly cortical) and is struck from the same platform as those flakes whose scars it bears on its dorsal face. All retouched pieces are classed as flakes and subdivided as appropriate in terms of functional categories, such as scrapers, denticulates and borers/piercers. The remaining artefacts, cores

Table 3.8 1985–6 and 1991 assemblages: proportions of artefacts as a percentage of the total struck assemblage

Technological category	1985–6 number	%	1991 number	%
Unflaked raw material/tested pieces	30	-	-	-
Hammerstone	1	0.1	-	-
Split pebbles	12	2.1	29	7.2
Cores/core fragments	34	5.1	3	0.7
Preparation flakes	43	6.5	17	4.2
Trimming flakes	33	5.0	12	2.9
Whole unretouched flakes	168	25.5	39	9.7
Snapped flakes	58	8.8	21	5.2
Retouched flakes	16	2.4	3	0.7
Burnt				
Unstruck	250	-	274	-
Cores/core fragments	13	3.2	-	-
Flakes	27	6.7	3	2.4
Total struck (worked and burnt)	405	-	127	-
Total unstruck (burnt and unflaked raw materials etc.)	280	-	274	-
Overall total	685	-	401	1086

and core fragments, are the by-products of reduction. Cores are self-explanatory, but must bear more than a single scar from any one platform in order to exclude split pebbles/cobbles or accidentally flaked pieces, perhaps the result of dropping. **Core fragments** are the result of accidental breakage of cores, usually as flaws in the structure of the raw materials, and so bear truncated flakes' scars on one or more of the faces adjacent to the split.

Such a system allows the characterisation of the reduction sequence(s) at a site in terms of, for example, the approach to platform creation through the proportion of preparation flakes, or the length of the flaking episodes through the ratio of flakes to trimming and preparation flakes. Its other uses might include the identification and possible contrast of areas of production and consumption debris. The application of this classificatory system at a general level (Table 3.8) reveals that trimming flakes are outnumbered by preparation flakes, an indicator that cores were not exhaustively reduced and that fresh platforms tended to be created rather than existing platforms being maintained by further trimming and rejuvenation. This is supported by the statistic that each core recovered had yielded on average only seven flakes of all types. This figure is in accordance with the appearance of the cores themselves and suggests that a representative sample of debitage has been recovered; a discrepancy between the figures would be expected if the cores and flakes had been deposited separately.

Four individual approaches to reduction can be seen in the assemblage; an example of each is illustrated (Fig. 3.4.1–4). The first and most simple was the removal of a small number of flakes directly from a cobble, a technique which could only be applied to a cobble with a relatively sharp corner to provide a platform. The resulting flakes may be blade-like if the cobble is narrow (Fig. 3.4.1). A second takes the first a little further: a cobble with an existing platform, an old split surface for example, was flaked from a number of directions, sometimes resulting in long flakes and other times in very squat flakes (Fig. 3.4.2). In either of these first two cases no trimming is required, a fresh platform area being selected instead. The third and fourth techniques involved the splitting of a cobble. If the resulting cobble fragment was sizeable it was flaked as a conventional core, with multi-polarity being exhibited largely on the more exhausted cores of better-quality flint (Fig. 3.4.3). It is from such cores that few trimming flakes are likely to have resulted. If the original split piece was thinner (in fact a thick preparation flake), it could be flaked on its ventral face to give usefully sized products (Fig. 3.4.4). For 33 trimming flakes to have been produced from just one of the four possible techniques suggests that the third, fairly conventional, core reduction was actually the most frequent.

Spatial aspects

The overall distribution of the worked flint is presented in Figure 2.10f. It is apparent that this distribution coincides with that of burnt flint (not illustrated), and shows that the greatest activity was occurring on the island. There are three possible foci for activity: trench XVIII to the north, trench XXIV immediately south and the area around trenches XXV, XXVI and XXVII on the eastern edge of the island (Figs 2.10f–i). Two aspects of the organisation of activities at Whitecross Farm can be examined using the technological classification outlined above. Differences in the types of materials deposited on and off the island itself may be explored to some extent, although the area of channel deposits investigated was small. The main contrasts, however, can be drawn between the activities represented at the different locations on the island.

Only trench XXIV included a significant area of excavated channel deposits (48 m² up to grid line 507). The finds from layer 2405, the channel deposits, can be compared with those from 2403, the dry-land occupation layer, and with 2409 and 2414, the midden deposits within the channel (Table 3.9). The midden deposit was divided into two layers (2409 and 2414), the lower of which was waterlogged. Immediately noticeable is the meagre proportion of struck pieces from the channel deposits. Indeed, 2405 contained only one used piece in comparison with six from the 18 m² of layer 2403. When the 23 burnt unstruck pieces from 2405 are added to the unflaked/tested pieces, which are in fact exceptionally large flint nodules, some of which are burnt on one side (Table 3.10), it becomes evident that the channel was an area largely reserved for deposition of burnt stone. Furthermore, the average density of 'potboilers', recorded in the field, from the channel contexts was three times higher than for the island when trenches XVIII and XXIV were grouped, and a sondage into the channel deposits of trench XVII confirmed that the pattern was widespread. This is not to say, however, that the converse also applied; burnt material, as the table shows, was deposited on the drier areas too, but in smaller quantity. The 14 nodules, some of which are burnt and others tested (see Table 3.10), from the channel deposits (layer 2405) are best interpreted as hearthstones. They were recovered from an area of approximately 4 m² and they may have been dumped together. Their considerable size makes it likely that they were dropped rather than tossed into the deeper water some 6–7 m offshore, presumably from the end of the jetty or other timber structure that existed in the locality.

It is interesting to note, before moving on to broader analysis, that the midden (layers 2409 and 2414) has a character of its own, in terms of its lithics, rather than being identical to the occupation layer (2403) as might be expected. There was very little difference between the composition of 2409, the upper part of the midden, and 2414, the lower, waterlogged layer, and as such they have been treated as the same deposit. The main difference between the midden and the occupation layer is the higher proportion of preparation and trimming flakes – 23.2% against 11.5% – and lower proportion of whole unretouched flakes – 12.0% against 29.7% (see Table 3.9). Interestingly the percentage for snapped flakes is much lower from the midden than the occupation layer, 2.5% as opposed to 6.1% (see Table 3.9), perhaps indicating that discarded flint is more likely to become broken in an occupation area than in a midden deposit. More cores, core fragments and retouched flakes were recovered from the occupation layer (see Table 3.9). The midden was also rich in 'potboilers'. This may simply reflect deposition of knapping waste and burnt stone within the midden away from the occupation areas. Although the overall totals from each of these contexts is small, there does seem to be

Table 3.9 Comparison of flint from layers within trench XXIV

Technological category	*Channel deposits (2405)*	*%*	*Midden (2409, 2414)*	*%*	*Dry land occupation (2403)*	*%*
Unstruck raw materials/tested pieces	14	31.1	1	0.8	5	3.4
Split pebbles	-	-	6	5.1	3	2.0
Cores	2	4.4	3	2.5	7	4.7
Core fragments	-	-	1	0.8	4	2.7
Preparation flakes	1	2.2	12	10.3	9	6.1
Trimming flakes	1	2.2	15	12.9	8	5.4
Whole unretouched flakes	2	4.4	14	12.0	44	29.7
Snapped flake fragments	-	-	3	2.5	9	6.1
Retouched flake	1	2.2	1	0.8	5	3.4
Burnt pieces						
Unstruck ('thermal')	23	51.1	55	47.4	48	32.4
Struck (cores/core fragments)	-	-	1	0.8	3	2.0
Struck (flakes)	1	2.2	4	3.4	3	2.0
Total struck (worked and burnt)	8	17.7	60	51.7	95	64.2
Total unstruck (burnt and unflaked raw materials etc.)	37	82.2	56	48.2	53	35.8
Overall total	45		116		148	

Table 3.10 Details of flint nodules from trench XXIV, layer 2405

Number	Type of nodule	Burnt	Tested	Weight (g)	Comments
1	rounded	*	-	310	
1	rounded	-	-	975	Two flakes one of which refits another nodule
1	rounded	-	-	2275	
1	rounded	-	-	1825	
1	tabular	-	*	800	Refitting flake – see above. One other flake recovered which does not seem to refit any other nodule but is of a similar character
1	rounded	*	*	800	
1	rounded	*	-	1500	
1	rounded	*	-	1325	
1	rounded	-	-	2080	
1	tabular	*	-	1275	
1	tabular	-	*	750	
1	rounded	-	*	1000	
1	rounded	*	-	2250	
1	rounded	-	-	1025	

some patterning which supports the suggestion of different activity areas on the island.

In order to look for differences in the organisation of activities across the island, the occurrence of the technological categories was compared between the occupation layers of the trenches (Table 3.11). This analysis assumes that activity and discard were more or less *in situ*. Initially the numbers of core fragments, preparation and trimming flakes were combined as evidence of production activities (these being less likely to be moved than usable cores or flakes). In the second test, the proportions of the unretouched flakes that had been snapped were compared to seek evidence of more intensive activity that might have led to trampling breakage. Lastly, the presence or absence of refitting pieces was considered.

Two trenches in the north of the island, XVIII and XXIV, and trench XXV to the east show markedly higher quantities of production debris than those further south and west, although the seven pieces in trench XVII represent a high proportion of the struck material (32%). As noted above, layer 2414 contains the most production debris. Layer 1803 contains a high proportion of snapped flakes (as well as the highest proportion of used flakes – 13% of unburnt material), suggesting that this trench was close to an area of more intensive activity. Layers 2505 and 2605 also contained quite high proportions of snapped flakes (see Table 3.11) which together with the overall distribution of material, the numbers of used pieces and the incidence of retouched pieces might suggest another area of activity was situated in the vicinity of these trenches.

The general absence of refitting pieces, which might have indicated *in situ* flaking or at least redeposition of quantities of debitage, from the 'occupation layers' is of interest and it suggests that most of the debitage was moved from its primary location, perhaps to the island edge if the refits from 2414 and the channel end of 1803 are representative. Material from 2405, the channel deposits proper, refitted most frequently although the numbers of

Table 3.11 Indicators of activities from occupation layers compared across trenches

Trench/layer	Production debris (number of pieces)	% of whole unretouched flakes snapped (numbers snapped)	Refits
I/103	0	28.5 (6)	None
II/203	1	38.5 (5)	None
III/303	0	0.0	None
XVII/1703	7	25.0 (3)	None
XVIII/1803	11	66.6 (22)	Some – including a core on a flake with a refitting segment, Fig. 3.6.28
XXIV/2403	21	20.4 (9)	None
XXV/2505	19	28.0 (16)	None
XXVI/2605	1	33.3 (4)	None
XXVII/2705	4	11.1 (4)	None

refitting pieces was generally low. The best conjoining group was a series of exfoliation flakes from a burnt nodule which seems likely to have been dropped into water while still hot and thus is the result of a specific action of deposition rather than knapping *per se.*

Discussion

The implications of the lithic analysis can be divided into those that relate to the use of the site itself and those of relevance to the wider context of the study of later prehistoric flintwork. Whether flint can be said to have been an important resource for tools at Whitecross Farm is more equivocal than the fact of its frequent and varied usage. Local cobbles from the gravel terraces were brought to the site and flaked effectively if not efficiently, the resulting debitage being sifted for usable edges and the remainder moved, presumably to a less obtrusive location. Edges were sometimes retouched, but were equally often used in an unmodified form. The use-damage evidence suggests a broad range of applications for edges of flint, but it is likely also that soft use-damage has been underestimated (see above). In comparison with similar analyses (eg Brown 1996), the use of points for boring is strongly represented at Whitecross Farm.

Differences in the organisation of activities on the site may be indicated by the high rate of breakage at the north end and the eastern side of the island, the concentration of discarded used pieces in the same areas and the high proportion of genuine waste at the south end of the island. The combined evidence from the lithics would suggest that activity gravitated towards the north end and eastern side of the island. The deposition of waste seems to have been organised, to the extent that burnt flint (sometimes barely perceptibly so) was thrown to the island margins and especially into the river itself. Very little flint was deposited into the features in trench XXIV, but the material that was recovered shared the attributes of the late Bronze Age material.

In the broader context of late Bronze Age flintworking, the Whitecross Farm material assumes a particular importance because of the sealed nature of the flint assemblage; it can be stated with some certainty that it was contemporary with the other LBA activity on the island. Every piece of flint was brought to the site and worked (or reused) in the late Bronze Age, with the possible exception of the single (probably Neolithic) blade from the earlier ditch in trench XXIV. Although approximately one-third of the assemblage was recovered from a plough-disturbed layer of the midden, it would seem likely that the material has not moved far. The smallest element of the reduction sequence is missing. This seems to have resulted from a combination of collection biases and post-depositional factors. It is also likely given the nature of the deposits that knapping may have taken place elsewhere and that the tiny chips and spalls were not collected and placed on the midden.

Later prehistoric flintworking, other than the specific industries such as those associated with shaleworking in Dorset, has long been recognised (eg Fasham and Ross 1978), and since the important paper by Ford *et al*. (1984) there has been renewed interest in the subject. Later Bronze Age assemblages have begun to be characterised (eg Pryor 1980; Drewett 1982; Ford *et al*. 1984; Holgate 1988b; Brown 1991b; 1992; Montague 1995) and research is ongoing into this area of lithic analysis. A recognised typology has been established for the products and by-products of the flint associated with Kimmeridge shaleworking in Dorset (Calkin 1953; Woodward 1987; Cox and Woodward 1987). The technology of this material has also been studied in depth. It is perhaps easier to establish typologies and understand the technology of this material given the relatively regular nature of the by-products and tools produced (Calkin 1953).

There are few published examples of securely stratified later prehistoric lithic assemblages within the region so it is difficult to compare the results from Whitecross Farm with other sites. The preservation of the Whitecross Farm material and its almost complete lack of contamination from earlier material are unique within the region and this also makes comparison difficult. A small element of later Bronze Age flint was recovered from excavations at Grim's Ditch (see Bradley, Chapter 5) and Bradford's Brook (see Bradley, Chapter 6). Late Bronze Age activity has been found at Yarnton, but associated lithics are relatively sparse (Bradley and Cramp in prep.). Later Bronze Age lithics have been found at Weathercock Hill and Rams Hill. However, little of the flintwork from these sites was stratified and there were earlier elements present in each assemblage (Bowden *et al*. 1991–3, 77; Bradley 1975, 86). Further downstream in the Middle and Lower Thames Valleys and into Kent and Essex there is much more evidence for later Bronze Age flintworking. At sites like Reading Business Park (Brown 1992, 92; Bradley 2004), Bray (Montague 1995, 22), Woodley (Bradley 1999b), Runnymede Bridge (Bevan in prep.), Lofts Farm (Holgate 1988b, 276–7), Gravesend (Bradley 1994, 397) and Hollingbourne (Bradley 1997) the retouched component of later Bronze Age flint assemblages is dominated by scrapers, retouched flakes, points, denticulates and notched pieces. Retouch is often perfunctory and, as has been noted at Whitecross Farm, it should be seen as one option within the production and use of flint artefacts.

A major problem with the advancement of our appreciation of when and how lithic raw materials declined in, and finally disappeared from, general use is the resistance of excavators to collect struck flint and stone from late prehistoric sites with the same care as they might from earlier periods, thus limiting the usefulness of those pieces that are recovered. The Whitecross Farm material perhaps demonstrates that much useful archaeological information can be derived from the analysis of this material provided that the standard of recovery is high. Now that later prehistoric flintworking has been widely recognised and characterised, the challenge will be to further illuminate the role of lithics alongside other materials such as metal. Perhaps until recently somewhat inappropriate analytical frameworks have been applied to later prehistoric lithics, which has compounded the problems of characterisation, and has led to a series of uninformative and unimaginative descriptions of flake shapes and scant retouched forms as if these were the only approaches available to analysts. The very nature of these assemblages means that they require a different approach to analysis than that used for earlier prehistoric lithics. If 'waste' is to be the overwhelming component of these late assemblages, then surely a new framework that exploits the potential of this material is needed and such an approach has been attempted here.

Catalogue of worked flint *(Figs 3.4–6)*

Entries are ordered as follows: trench number, context, grid square, small find number (SF), brief description of object with use-wear data.

1. Trench XXIV, 2414, 153/505. Used flake. Right side used, cutting/whittling, medium.
2. Trench XXIV, 2402, 153/497. Used flake. Right side used, cutting/whittling, soft/medium.
3. Trench XXIV, 2403, 153/501. Used flake. Left side used, cutting/whittling, soft.
4. Trench XXIV, 2422, 153/505, SF 2420. Used flake. Left side used, cutting/whittling, soft.
5. Trench XXIV, 2413/2, 153/497, SF 2410. Used blade. Both edges used, cutting/whittling, medium. ?Neolithic.
6. Trench XXIV, 2416, 153/503, SF 2409. Used flake. Tip used for boring/piercing, soft.
7. Trench XXIV, 2402, 153/495. Used flake. Tip used for boring/piercing, soft/medium.
8. Trench XXIV, 2403, 153/501, SF 2422. Used flake. Tip used for boring/piercing, hard.
9. Trench XXIV, 2403, 153/499. Used flake. Tip used for boring/piercing, hard.
10. Trench XXIV, 2403, 153/499. Used piece. Left tip used for boring/piercing, medium. On probable core fragment.
11. Trench XXV, 2505/E/4. Scraper with denticulated edge. Distal end and right-hand side hard scraping.
12. Trench XXIV, 2403, 153/501. Broken scraper, soft scraping damage on retouched edge.
13. Trench XXIV, 2403, 153/501. Retouched flake with scraping damage across distal end and right-hand side, medium. Attempted resharpening.
14. Trench XXIV, 2403, 153/503. Miscellaneous retouched flake, distal end used for scraping, medium.
15. Trench XXIV, 2403, 153/503. Thick miscellaneous retouched flake. Point at distal end used for scraping, soft/medium.
16. Trench XXV, 2505/C/2. Retouched flake. Scraping medium along whole of ventral right-hand side.
17. Trench XXIV, 2402, 153/497, SF 2416. Scraper, reworked Neolithic example. Soft scraping damage at distal end. Very heavy rounding on scraping edge.
18. Trench XXV, 2505/B/2. Broken scraper. Scraping medium left-hand side. Resharpening damage at distal end, possibly broken during resharpening or subsequent use.
19. Trench XXV, 2505/C/1. Used flake. Scraping hard left-hand side, cutting/whittling soft right-hand side.
20. Trench XXIV, 2402, 153/497. Possible denticulate formed at proximal end of flake. Small concave edge used for scraping, medium.
21. Trench XXIV, 2402, 153/501. Combined scraper and borer/piercer. Scraping edge broken and subsequently a point was formed on the opposite edge. Scraping damage right-hand side, soft/medium; boring/piercing left-hand side, soft/medium.
22. Trench XXIV, 2402, 153/497. Large trimming flake with scraping and cutting/whittling damage. Scraping right upper, hard; cutting/whittling lower right, hard.
23. Trench XXIV, 2403, 153/501. Scraper/spurred piece, used edge obscured by cortex. Possible scraping damage upper left-hand side, soft/medium.
24. Trench XXIV, 2402, 153/499. Core. Single platform with edge abrasion, lightly corticated, ?Mesolithic.
25. Trench XXIV, 2403, 153/503. Core. Simple core with one platform.
26. Trench XXIV, 2403/1, 153/501. Core. Core on tabular flint showing extensive flaking.
27. Trench XVIII, 1803/1804 (interface 10.5–12.5 m). Multiplatform core, exhausted.
28. Trench XVIII, 1803/1804 (interface 10.5–12.5 m). Core on a flake with a refitting segment. Removals made before and after breakage.

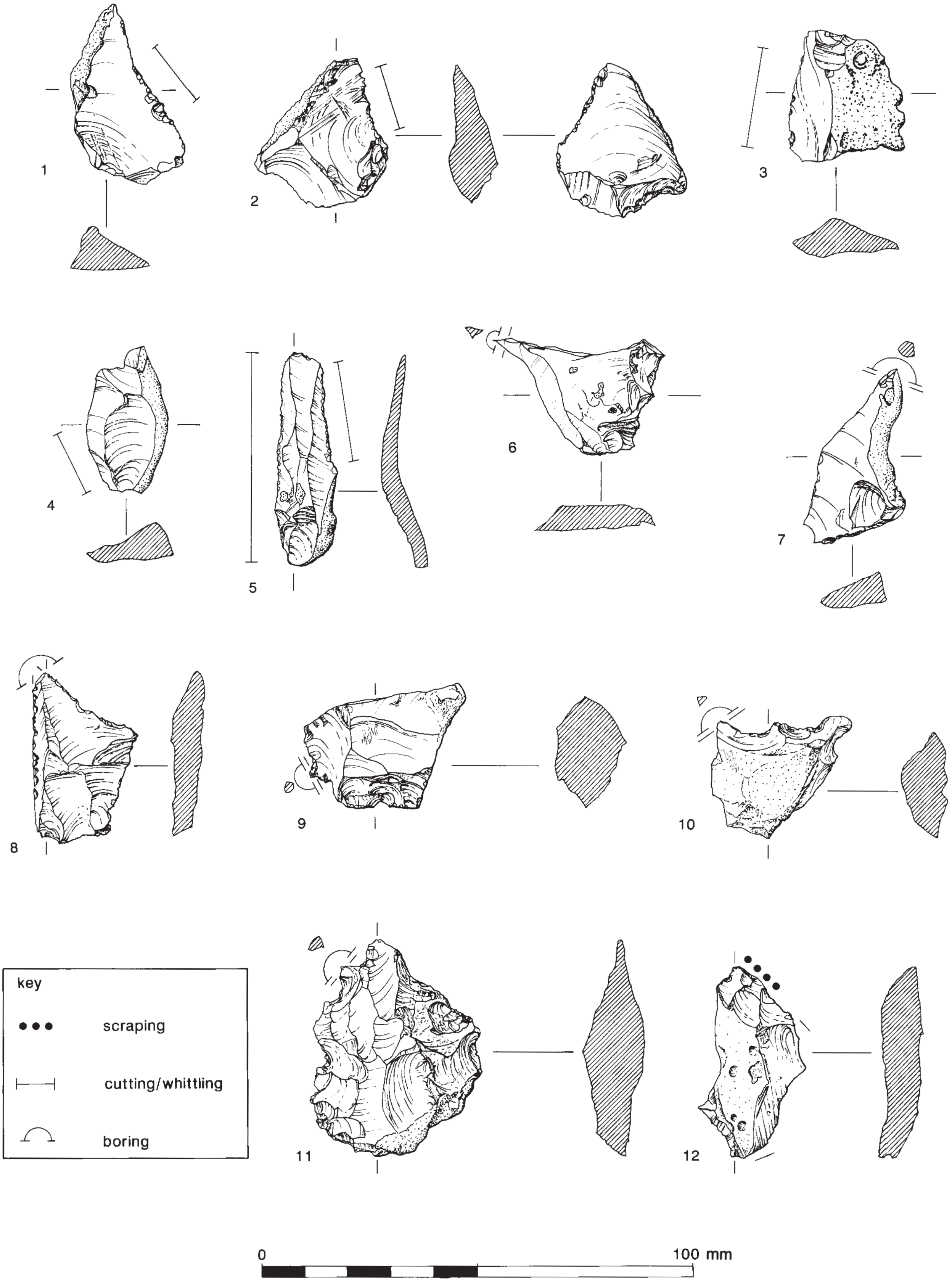


Figure 3.4 Worked flint (details in catalogue)

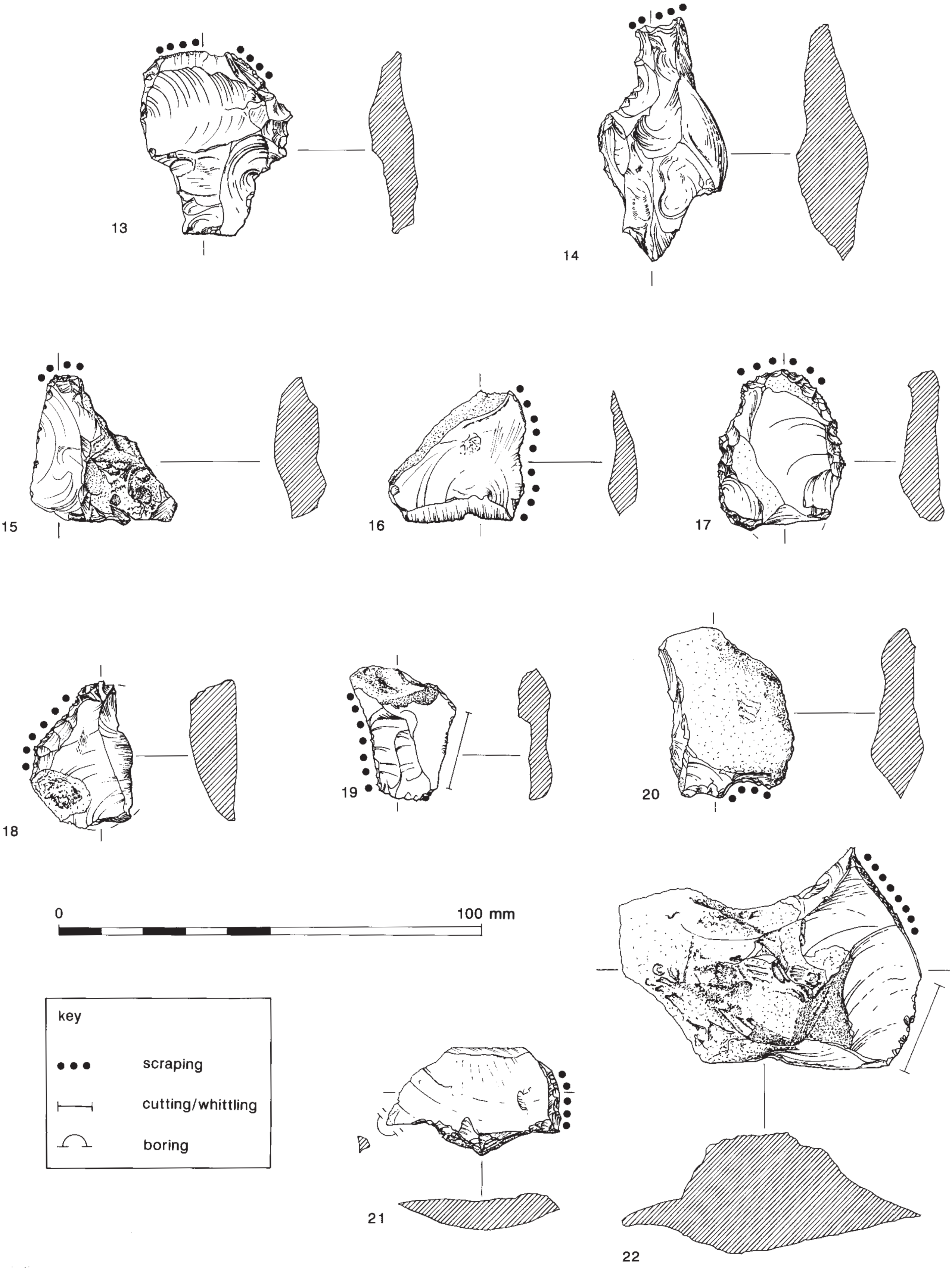


Figure 3.5 Worked flint (details in catalogue)

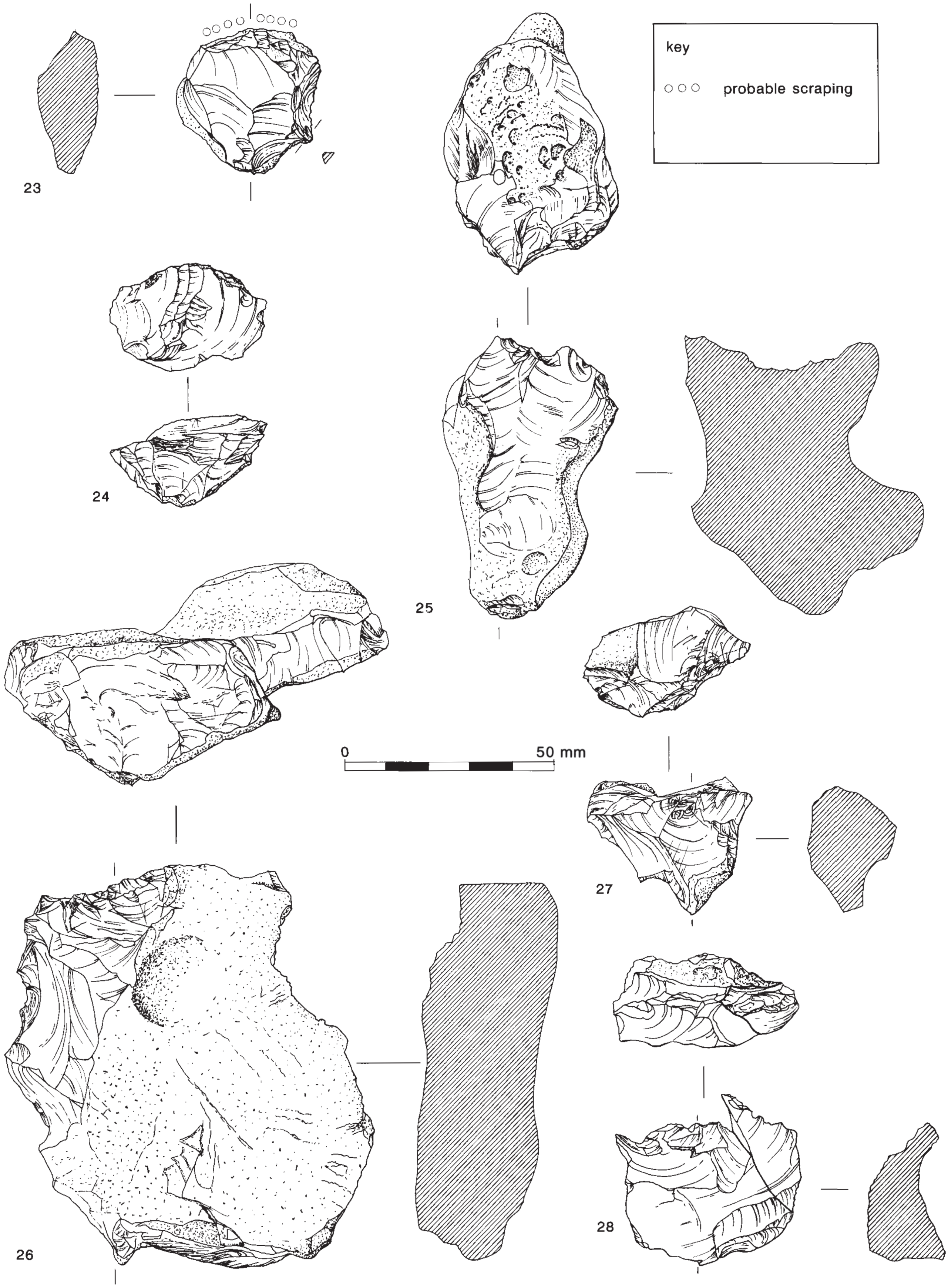


Figure 3.6 Worked flint (details in catalogue)

WORKED AND BURNT STONE

by Fiona Roe and Alistair Barclay

Three quern fragments, two hammerstones and a quantity of burnt stone were recovered. The worked stone, utilising Lower Calcareous Grit and quartzite, is described in the catalogue, and selected pieces are illustrated in Figure 3.7.

Discussion

Neither of the two varieties of stone used for the five objects described below came from any great distance. The Lower Calcareous Grit occurs in a band to the north-west of Abingdon (Arkell 1939), and a journey of only 9.7 km or so would have been needed to acquire suitable quern material. Quartzite pebbles could have been collected without difficulty from local Quaternary deposits, since they occur in the Clay-with-Flints, in undated gravel deposits and in the river terraces (Jukes-Browne and Osborne White 1908, 78; see also map Sheet 254, 1980), one of which, the First Gravel Terrace, occurs just to the west of the site.

Similar pebbles were often available elsewhere in Pleistocene or later deposits, and so were frequently used on prehistoric sites as hammerstones or other artefacts for which a hard, compact stone was suitable. Other Bronze Age finds of quartzite hammerstones are known from Reading Business Park (Moore and Jennings 1992, 94), and also from Yarnton, Oxfordshire, where they were used from the Neolithic onwards (Roe in prep.).

Lower Calcareous Grit was quite commonly used for saddle querns on early and middle Iron Age sites in southern Oxfordshire, as for instance at Gravelly Guy, Stanton Harcourt (Bradley *et al*. in prep.), while evidence is gradually accumulating for its use on earlier prehistoric sites. A saddle quern was retrieved from a Bronze Age waterhole (context 162) at Mount Farm, Dorchester-on-Thames (Barclay and Lambrick 1995), while a second one came from another Bronze Age waterhole at the Abingdon Multiplex site (Pugh 1998). A worked fragment was found in a section of the palisaded enclosure (K 71 CA) at Corporation Farm, Wilsham Road, Abingdon (Shand *et al*. 2003). The same material was being used for querns both from a Neolithic/Bronze Age ground surface and from Bronze Age contexts at Yarnton (Roe in prep.). The use of Lower Calcareous Grit for saddle querns at Whitecross Farm can thus be seen as part of a lengthy tradition in the area.

Burnt stone

The burnt stone consists mainly of fragments of quartzite pebbles, amounting to 8.449 kg in weight. The burnt unworked flint is discussed together with the worked flint (see Brown and Bradley, above). A few further burnt fragments of greensand suggest that this variety of stone may also have been used for saddle querns on the site. Similar collections of burnt pebbles, again consisting mainly of quartzite, are known from Corporation Farm, Abingdon (Shand *et al*. 2003), and sites on Yarnton floodplain (Roe in prep.). The use to which this burnt stone was put remains somewhat enigmatic. Some pieces may represent the opportune use of freely available local pebbles as fire surrounds, both to support cooking pots and to keep hot ashes and embers in place, perhaps even as an aid to slow cooking, with both the pebbles and ashes retaining the heat. Many pebbles might have become damaged in this way, but could always easily have been replaced.

The distribution of the burnt stone (not illustrated) is almost identical to that of burnt flint (not illustrated) with notable concentrations or densities in trenches XXIV–XXVII and smaller quantities in trenches XVII–XVIII (full details of the contexts are available in the archive). This distribution corresponds to the midden and occupation deposits. Both burnt stone and burnt flint are likely to have been used for similar purposes (see above). However, burnt flint could also have been purposefully burnt for use as potting temper.

Angular white quartz/quartzite

In addition to the burnt stone a small number of angular fragments of quartzite or vein quartz were identified from trenches XXV–XXVI. Unfortunately the stone from the earlier trenches had been discarded and therefore was not available for re-examination by the present authors. It is likely that the distribution extended further across the eyot. Angular quartzite is found as temper in some of the pottery and it is possible that this represents unused temper. If this assumption is correct then it provides evidence for pottery production on the site.

Catalogue of worked stone *(Fig. 3.7)*

1. WBP86 trench XVII, occupation layer 1703, LBA. Fig. 3.7.1. Fragment from saddle quern, with worn, slightly concave grinding surface. L: (now) 149 mm; W: 92 mm (max.); D: 64 mm (max.); Wt: 932 g. Lower Calcareous Grit.
2. WBP86 trench XXIV, 153/495, context 2402, an alluvial layer which covered the whole of the trench beneath the topsoil, LBA. Fig. 3.7.2. Fragment from probable saddle quern, with small area of grinding surface, and part of the curved side and underside of the quern. Grinding surface: (now) 29 mm x 22 mm; D: 100 mm; Wt: 250 g. Lower Calcareous Grit.
3. WBP86 trench XXIV,153/501, SF 2405, context 2402, alluvial layer, as for no. 2, LBA. Not illustrated. Small fragment with weathered and worn surface, probably from saddle quern or rubber. L: (now) 84 mm; W: 50 mm; D: 23 mm; Wt: 106 g. Lower Calcareous Grit.
4. WBP91 trench XXV, context 2505, occupation layer (west), LBA. Not illustrated. Quartzite pebble

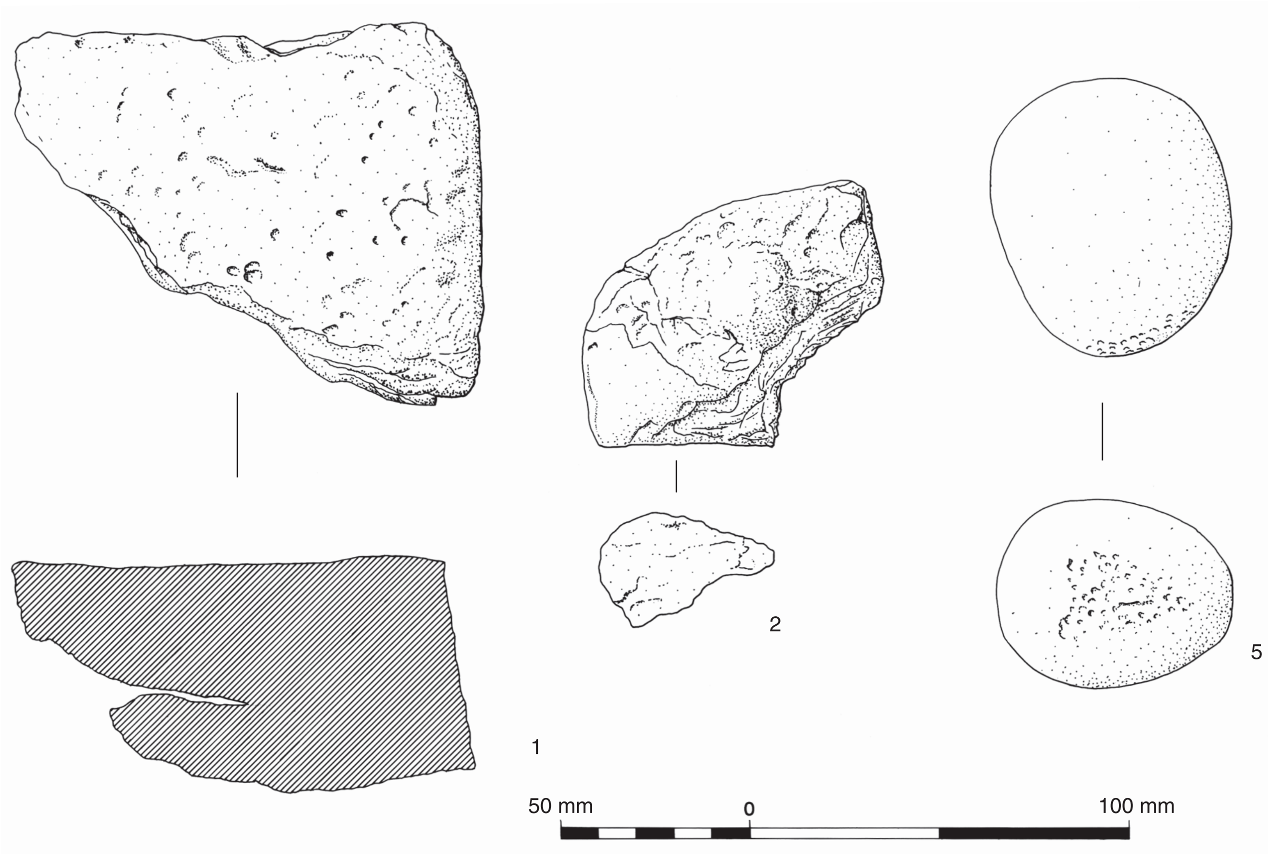


Figure 3.7 Worked stone (details in catalogue)

utilised in two ways. There are flattened areas of wear across an old break, suggesting use as a rubber, while areas of fine pecking at each end suggest lightweight use as a hammerstone. L: 90 mm; W: 77 mm; D: 61 mm; Wt: 560 g.

5. WBP91 trench XXVII, context 2703, the same alluvial layer as for nos 2 and 3, but from another trench, ?IA and later. Fig. 3.7.3. Quartzite pebble used as hammerstone, with clear evidence of battering at one end. The pebble appears to have been burnt before utilisation. The quartzite is reddened and cracked, leading to the loss of a fragment of burnt stone. L: 73 mm; W: 62 mm, D: 51 mm; Wt: 322 g.

WORKED BONE

by Adrienne Powell and Kate M Clark

Two pieces of worked bone were identified among the assemblage from contexts 2505 and 2428. One is a distal shaft of a sheep/goat radius which has been chopped longitudinally from the proximal end down both the dorsal and ventral surfaces (2505), the other is a *c* 96 mm segment of beam from a red deer antler, chopped at both ends and bearing a small tine (2428).

LATE BRONZE AGE POTTERY

by Alistair Barclay with a report on the ceramic petrology by Chris Doherty

Introduction

The excavations produced a total of 2444 sherds (12.6 kg) of late Bronze Age pottery representing at least 132 vessels. The entire assemblage was recovered from a series of related stratified deposits on the eyot within the former course of the River Thames and was sealed by alluvium. Most of the assemblage was recovered from occupation layers that are believed to extend over part of this island, although in places these deposits had been disturbed by more recent ploughing. Other important groups of material came from the channel deposits and a midden located in trench XXIV. The assemblage includes no material earlier than the late Bronze Age; very small quantities of Iron Age, Roman and medieval sherds are present, mostly from layers that are stratigraphically later within the sequence of deposits or as intrusive material (see Booth and Whittingham, below).

Condition and preservation of the assemblage

The overall condition of the assemblage is largely characterised by a high degree of fragmentation. This no doubt reflects the character of the site with much of the assemblage being recovered from a midden deposit in trench XXIV and from an occupation layer that appears to have covered a large part of the island. It would appear that much of the assemblage was deposited in a fragmentary state with very little evidence for refitting sherds or for groups of sherds from the same vessel. In most of the excavated trenches the stratified sequence was short and uncomplicated with much of the pottery deriving from a single occupation layer, that in many of the trenches had been disturbed and truncated by ploughing (see Chapter 2). The only complex stratified sequence is that found in trench XXIV where groups of material occurred in basal channel deposits, in an overlying midden, in a later occupation horizon and as derived material in post-Bronze Age ploughsoil.

Methods

Table 3.12 provides a quantification of the assemblage by weight and sherd number (excluding refitting fresh breaks). The pottery was characterised by fabric, form, surface treatment, decoration and colour. The sherds were analysed using a binocular microscope (x20) and were divided into fabric groups by principal inclusion type. OAU standard codes are used to denote inclusion types: A = sand (quartz and other mineral matter), B = black sand (glauconite), C = calcareous limestone, F = flint, G = grog, O = organic, Q = quartzite, S = shell. Size range for inclusions: 1 = <1 mm fine; 2 = 1–3 mm fine–medium; 3 = medium–coarse up to and over 3 mm. Frequency range for inclusions: rare = <3%; sparse = <7%; moderate = 10%; common = 15%; abundant = >20%.

Fabrics

In total 23 fabrics were defined on the basis of principal inclusions. These are divided into the following fabric groups: flint-tempered (F1–3, FA1–3); grog-tempered (G2, GF2/GFA2, GQ2); limestone-tempered (L2); quartzite-tempered (Q1–3, QA1–3); mixed flint–quartzite (FQ2/3); organic-tempered (O1/2); sand-tempered (A1, BO1); shell-tempered (S2, SA2, SF 2).

In addition a series of sherds were selected for thin-section (see Doherty, below); samples were given the prefix TS.

Flint-tempered

F1 Hard fabric with moderate fine flint. Some fabrics also contain rare grog and burnt-out organics (TS1).

F2 Hard fabric with moderate medium flint. Some fabric may also contain rare ferruginous pellets, clay pellets, grog, shell or voids from burnt-out organics (TS2–3).

F3 Hard fabric with sparse–moderate coarse flint, although in some sherds the temper is quite dense. Some fabrics may also contain voids from burnt-out organics. One sherd contains gravel flint inclusions as well as calcined flint. One sherd contains possible bone fragments as well.

FA1 Hard fabric with moderate fine flint and sparse–rare quartz sand.

Table 3.12 A breakdown and quantification of fabrics by temper group (number of sherds, weight)

Trench	*Flint*	*Quartzite*	*Mixed flint & quartzite*	*Sand*	*Shell*	*Grog*	*Organic*	*Limestone*	*Other*	*Total*	*%*
Riverbank	16, 63 g	5, 25 g		2, 5 g	1, 2 g				4, 2 g	28, 97 g	
I	132, 347 g	40, 159 g	1, 8 g	12, 45 g	1, 1 g				44, 32 g	230, 592 g	9%, 5%
II	81, 207 g	16, 34 g		17, 30 g	2, 2 g	3, 10 g			17, 8 g	136, 291 g	6%, 2%
III	137, 484 g	26, 87 g	11, 59 g	29, 101 g	2, 2 g	4, 18 g			6, 5 g	215, 756 g	9%, 6%
XVII	117, 384 g	44, 146 g	23, 92 g	8, 36 g	6, 26 g			1, 7 g	4, 2 g	203, 693 g	8%, 6%
XVIII	34, 129 g	8, 48 g	1, 2 g	9, 33 g	1, 4 g				22, 16 g	75, 232 g	3%, 2%
XXIV	361, 2278 g	130, 1087 g	15, 150 g	34, 143 g	12, 65 g	11, 33 g	16, 37 g		11, 9 g	590, 3802 g	24%, 30%
XXV	509, 2841 g	228, 1809 g	31, 427 g	26, 90 g	6, 42 g	8, 50 g	7, 25 g		5, 3 g	820, 5287 g	34%, 42%
XXVI	73, 339 g	15, 64 g		8, 55 g						96, 458 g	4%, 4%
XXVII	67, 395 g	6, 52 g	2, 15 g	1, 1 g			2, 22 g		1, 3 g	79, 488 g	3%, 4%
Total	1527, 7467 g	518, 3511 g	84, 753 g	146, 539 g	31, 144 g	26, 111 g	25, 84 g	1, 7 g	114, 80 g	2472, 12696 g	
%	62%, 59%	21%, 28%	3%, 6%	6%, 4%	2%, 1%	1%, 1%	1%, 1%	<1%, <1%	4%, 1%		

FA2 Hard fabric with moderate medium flint and sparse–rare quartz sand (sometimes glauconitic). Some sherds also contain either rare ferruginous or clay pellets. (TS13).
FA3 Hard fabric with sparse–moderate coarse flint and sparse to rare quartz sand.

Grog-tempered

G2 Soft fabric with moderate angular grog. Some fabrics also contain rare shell and quartz sand.
GF2/GFA2 Soft fabric with moderate grog (either subangular or subrounded), rare flint and sometimes quartz sand.
GQ2 Soft fabric with moderate grog (either subangular or subrounded) and rare angular quartzite.

Limestone-tempered

L2 Soft fabric with moderate angular limestone fragments.

Quartzite-tempered

Q1 Hard fabric with moderate fine angular quartzite. Some fabrics also contain rare rounded grog or clay pellets.
Q2 Hard fabric with moderate medium angular quartzite. Some fabrics also contain rare clay pellets, rounded grog, chalk, sandstone or organics (TS4, 6).
Q3 Hard fabric with moderate medium-coarse quartzite.
QA1 Hard fabric with moderate fine quartzite and rare quartz sand.
QA2 Hard fabric with moderate medium angular quartzite and rare quartz sand. Some fabrics also contain rare clay or ferruginous pellets, rounded grog, sandstone or organics (TS8, 9). One sherd has the addition of black (?glauconitic) sand (TS7).
QA3 Hard fabric with moderate medium-coarse quartzite and rare quartz sand. Some fabrics also contain rare rounded grog.

Mixed flint- and quartzite-tempered

FQ2/3 Hard fabric with both medium and medium-coarse flint and quartzite. Some fabrics also contain either sand, and/or ferruginous pellets. One sherd also contains black (?glauconitic) sand (TS5).

Organic-tempered

O1/2 Soft fabric with burnt-out organics. Either with no other temper or with the addition of rare amounts of either sand, flint, quartzite and/or ferruginous pellets (TS11–12).

Sand-tempered

A1 Hard fabric with medium-coarse white or colourless quartz sand (sometimes black sand may also be present). Some fabrics also contain rare flint, quartzite, sandstone, clay or ferruginous pellets, rounded grog or organics. One sherd also contains rare bone fragments (TS10).
BO1 Hard fabric with fine black sand and rare voids from burnt-out organic inclusions.

Shell-tempered

S2 Soft fabric with moderate medium shell platelets. One sherd also contains bone fragments (TS15).
SA2 Soft fabric with moderate medium shell platelets and rare quartz sand. One sherd also contains bone fragments.
SF 2 Soft fabric with moderate medium shell platelets and rare angular flint (TS14).

Discussion of fabrics

The pottery assemblage from Whitecross Farm is manufactured from a wide range of fabric types (see Table 3.12), although between 80–90% of the overall total is tempered principally with flint, quartzite or a mixture of the two inclusions. Flint-tempered fabrics predominate within the assemblage and account for approximately 60% of the total, while quartzite accounts for between 20–30%. Sand usually mixed with other inclusion types is a minor fabric group, while rare fabrics containing either shell, grog or limestone also occur.

The use of a wide range of inclusion types is not unusual as a similar situation is found at both Yarnton and Eynsham (Barclay and Edwards in prep a; Barclay 2001). Certainly in the eastern part of the Upper Thames Valley both flint and quartzite appear to have been predominantly used to temper late Bronze Age pottery. Whitecross Farm is situated close to the Chalk, and flint nodules would have been readily available. Both flint and quartzite (most probably vein quartz) are siliceous in character and would have had similar properties. They could have been worked in a similar way by the potters and would have had a very similar appearance. However, although their occurrence in the same fabrics (FQ2/3) would suggest that they could have been interchangeable, there is some evidence from Whitecross Farm to indicate that some distinction was made. Of the two inclusion types only flint was used to grit bases even when the fabric of the pot was quartzite-tempered (see eg Forms, below). At Eynsham, and probably at Yarnton too, the use of flint temper is rare, which can be explained by the distance from good sources of flint nodules. However, at both these sites the use of quartzite temper is very common. Pebbles of vein quartz would have been locally available in deposits derived from the gravel terraces near all three sites.

A small number of sherds were manufactured from a very dense flint-tempered fabric. No featured sherds were recovered, although it is possible that all the sherds came from the same vessel.

The use of sand and shell at Wallingford can be paralleled at both Yarnton and Eynsham (Barclay and Edwards in prep. a; Barclay 2001). At the latter site the use of shell, and shell mixed with quartzite, was quite common (over 40%), although this could be a reflection of the early date for this assemblage. Fossil shell was widely used in this area for the manufacture of middle Bronze Age (Deverel-Rimbury) fabrics and would have been readily available as derived fossil material within the Thames gravels. At Wallingford there is only limited evidence for the use of shell to temper vessels. Most if not all the purely shell-tempered sherds are from vessel bodies, but at least one sherd in a mixed shell and flint fabric is from the rim of a small, probably bipartite vessel (Fig. 3.8.13). However, many of these sherds in shell-tempered fabrics are from stratified contexts and while it is possible that some of these represent intrusive early Iron Age sherds it nonetheless seems probably that shell-tempered fabrics were still manufactured during the late Bronze Age.

A small number of sherds in a range of fabrics (F3, A1, S2 and SA2) contained fragments of bone. In nearly every case the bone occurred as a secondary rather than as the main inclusion type. There is no ready explanation as to why bone should be added and its occurrence in generally relatively small quantities could suggest accidental rather than deliberate inclusion. The relatively small size of these inclusions (up to 3 mm) negates any further identification. The occurrence of bone temper has been noted in the Upper Thames at Yarnton where it is used in both Iron Age and late Neolithic pottery (Barclay and Edwards in prep. a) and an early Neolithic bowl from the Hazleton North long cairn (Smith and Darvill 1990, 152).

From the range of inclusions present it can be suggested that all the pottery could be of local manufacture (see below).

Petrographic analysis

by Chris Doherty

Petrographic analysis was undertaken in order to verify the principal temper/inclusions present, as these form the basis for the working fabric groups constructed from visual examination. In addition, similarities and differences between these fabrics and knowledge of the local clays allow comment to be made on whether any of these ceramics are inconsistent with a local production. Fifteen sherds were submitted for examination. Following consolidation (by impregnation with epoxy resin), the sherds were prepared as standard thin-sections and analysed with a polarising microscope (magnification range x40–x400).

Results

Table 3.13 summarises the main inclusion/temper types identified by thin-section analysis and compares these to the fabric groups assigned previously. Photomicrographs and brief descriptions of these fabrics are given in Appendix 4.

Discussion

The main point to emphasise is the good agreement between the fabric groups originally assigned and those based on the identification of the main types of inclusion/temper by thin-section analysis. Only in a few cases were original fabric groups significantly revised; instead only minor refinements were made to the descriptions, which largely reflect the greater resolving power of the polarising microscope. This verification provides strong support for the ability of field observations to correctly identify the main fabric characteristics of this pottery. The main fabrics and recognised subfabrics will now be discussed.

Table 3.13 Thin-section samples

TS sample no.	*Reference*	*Fabric group (key)*	*Thin-section*
1	2414	Flint (F1)	Flint
2	2505/B/3	Flint (F2)	Flint (fine clay) (Plate A4.1)
3	2403 151/501	Flint (F3)	Flint (temper rich) (Plate A4.2)
4	2414 141/507	Quartzite (Q2)	Quartzite (Plate A4.3)
5	2505/D/3	Quartzite, flint & sand (QFA3)	Quartzite & flint (Plate A4.4)
6	2505/C/3	Quartzite with flint-gritted base (Q2)	Quartzite with basal flint
7	2505/D/3	Quartzite with flint-gritted base	Quartzite with basal flint
8	2414	Grog (GAQ2)	Quartzite, grog, flint & shell (Plate A4.5)
9	2402	Grog (GAQ2)	Grog & quartzite
10	2505/C/1	Sand (AFP1)	Organic & sand
11	2414	Organic (AO1)	Greensand
12	1703	Organic (O1)	Greensand & organic
13	2403	Flint & black sand (FB2)	Greensand & flint (Plate A4.6)
14	203/3	Shell & flint (SF2)	Shell & flint
15	1703	Shell & bone (S2)	Bone & shell (Plate A4.7)

Flint

Flint-dominated fabrics have few if any other coarse inclusions. The flint is mostly calcined, giving it a mosaic appearance in thin-section. Distribution is uniform throughout the section, a feature that distinguishes these fabrics from those with flint-gritted bases (see below). Subfabrics are defined on the basis of the abundance of flint temper and the nature of the clay matrix. Considering TS1 as our standard reference, TS2 is defined as a subfabric characterised by having a similar proportion of flint temper as TS1 and also a sand-free clay. TS3 differs by having a much greater abundance of flint, again in a sand-free clay.

Quartzite

Two quartzite-dominated fabrics have been defined: one with quartzite as the only coarse inclusion in a fine sandy clay, and the other with quartzite and flint in a fine sandy clay. In both cases the morphology of the quartzite grains shows that these do not represent naturally transported grains but have been added as temper. The flint-gritted bases of TS4 and TS5 are modifications of the quartzite plus sand body fabrics and therefore are not considered as separate subfabrics.

Grog

Two grog-based fabrics have been defined. One (TS8) has grog accompanied by a range of other coarse inclusions – flint, quartzite and shell. The other (TS9) has only quartzite as the other main temper type (plus minor flint). Both have fine sandy clay bodies.

Sand

A single sand-tempered fabric has been defined (TS10) but was shown by thin-section analysis to also contain organic temper. This sand is distinguished from the fine sand which characterises most of the clay bodies in being coarser and very well rounded.

Greensand

The term 'blacksand-tempered' has been used to describe those fabrics in which the sand component also contains numerous black or dark red grains (TS7). In thin-section these are recognised as sand-sized grains of the mineral glauconite which occurs in the Greensand geological formation that outcrops directly beneath the Chalk. The restricted distribution of Greensand means that its occurrence in pottery clay restricts the possible provenance of the latter.

Shell

Shell is present as a minor inclusion in several of these fabrics, but is only dominant in two of these – TS14 (with flint) and TS15 (with bone). In all cases this represents fossil shell derived from the erosion of fossil limestone.

Bone

As noted above, bone temper is observed in TS15 where it is associated with shell temper in a fine sandy matrix. This is the only observation of bone in thin-section.

Provenance

The principal inclusion/temper types represented are flint, grog, quartzite, sand, organics, shell and bone. All of these materials can be sourced locally and therefore the inclusion/temper types do not suggest an imported origin for any of these sherds. This conclusion is also supported by the nature of the clay matrix of these fabrics. Although the fine sand/silt content of the clays differs, there is nothing to suggest the use of significantly different clay sources.

Consideration of the geology of the region shows that all the main inclusion types which have been observed in these fabrics – quartzite, flint, sand, shell and Greensand – would have been available locally. It can be shown that, whereas quartzite and sand can be found in sediments along the entire length of the Thames floodplain in this region, flint and Greensand have a distribution restricted approximately to the south of the Ridgeway. This distribution is geologically controlled as Greensand outcrops at the base of the chalk escarpment and flint is a residual product from the erosion of the chalk.

This fortunate division into geological distinct zones may therefore allow us to predict that local fabrics can be further subdivided into those made from clays north or south of the Ridgeway. Previous studies have shown that the Thames alluvial clays to the north contain natural inclusions of sand, quartzite, ironstone, shell and limestone; whereas south of the chalk, sand and quartzite persist, but ironstone, shell and limestone become rare and are replaced by flint and (occasionally) Greensand. However, it is necessary to apply some caution here as tempering materials may have been derived from non-local sources. This is particularly the case where recycled materials such as grog and flint-knapping waste have possibly been used.

With these limitations in mind it is possible to state that all of these fabrics have types of inclusions/temper which indicate that they were made from floodplain clay on or south of the intersection of the Thames with the Ridgeway. All of these fabrics are therefore consistent with production in the vicinity of the Whitecross Farm site.

In addition to the use of several temper types, minor variations are also seen in the clay matrices. The main variation is in the amount of fine sand

Table 3.14 Rim forms by fabric

Rim form	*Flint*	*Quartzite*	*Mixed flint & quartzite*	*Sand*	*Shell*	*Grog*	*Other*	*Total*
1	15	1		1	1		3	21
2	2	1	4	2	1	1	1	12
3		4					1	5
4	5	1	1	1				8
5	3	2				1		6
6	4	1	1	1				7
7	10		1				1	12
8	15	5	1	2			1	24
9	8	7		3		1	1	20
10	4			1			1	6
11	2							2
12	3	1						4
13	4	2					3	9
Total	75	25	8	11	2	3	12	136

present, which may range from abundant (eg TS1) to absent (eg TS3). Although a conspicuous difference in thin-section, such variations are to be expected over short distances (lateral and vertical) within floodplain clay deposits and therefore cannot reliably indicate the use of different clay sources.

One exception is TS11, which has very abundant Greensand. This abundance plus morphological characteristics of the grains suggest that this fabric does not represent alluvial clay tempered with Greensand but that it may be clay derived from the *in situ* weathering of a Greensand outcrop. This would still imply a local source and could be easily checked by field observation of Greensand outcrops.

Conclusion

The thin-section analysis verifies field fabric groups without major revision. All fabrics have been shown to be consistent with a local provenance (the vicinity of Wallingford or immediately south), and all but one of the fabrics are made from Thames alluvial clay. This exception may be made from clay derived from a weathered Greensand outcrop.

Forms

The following approach was adopted in analysing the assemblage. Because of the very fragmentary nature of the assemblage it was not possible to identify many complete vessel profiles. In order to characterise the assemblage, various rim, neck, shoulder and base forms were defined and these are outlined below. Rarely was it possible to link base forms to upper portions of vessels, while this task was somewhat easier with featured sherds (eg rims, necks and shoulders) from the upper halves of vessels. In the absence of profiles the type of analysis is restricted with the categorisation of vessel forms largely dependent on rim and shoulder forms. Given the limitations, no attempt is made to categorise the assemblage into functional groups such as bowl, jar and cup, although a subjective comment is made below in the discussion.

Rims *(Tables 3.14–15)*

R1 Simple, upright squared or flattened
R2 Simple, upright rounded
R3 Simple, upright pointed
R4 Simple, out-turned squared
R5 Simple, in-turned
R6 Beaded
R7 Everted squared
R8 Everted rounded or pointed
R9 Flared (sometimes only slightly) with either decorated or plain rim bevels
R10 In-turned or hooked usually rounded or pointed
R11 In-turned or hooked squared
R12 Expanded
R13 Indeterminate

Twelve different rim forms were recognised. A correlation of rim forms by fabric group is given in Table 3.14. Nearly every identified rim form was manufactured from a variety of fabrics. However, very high proportions (55%) of the rim forms were manufactured from flint-tempered fabrics, and many of these rims were also made in fabrics tempered with quartzite, sand and more rarely shell or grog. Rim form R3 was more often manufactured from quartzite-tempered fabrics. Of the three most numerous rim forms, R1 and R8 were predominantly made from flint-tempered fabrics, while R9 was equally likely to be manufactured from flint- or quartzite-tempered fabrics. Of the two most numerous fabric groups, rim form R3 is the only one not to be flint-tempered, while forms R7, 10 and 11 were never manufactured from quartzite-tempered fabrics. Principally sand-tempered fabrics were used to manufacture a wide range of rim forms. The

Table 3.15 A breakdown of rim forms by trench

Rim form	*I*	*II*	*III*	*XVII*	*XVIII*	*XXIV*	*XXV*	*XXVI*	*XXVII*	*Total*
1	3	1	6			3	8			21
2	1	2	3	2		2	2			12
3	1					3	1			5
4		1	4	1			1	1		8
5		1			1		3		1	6
6		1				1	5			7
7		1	3	2	1	2	3			12
8				1	1	6	12	2	2	24
9	1		1			5	12	1		20
10	1			1		2		1	1	6
11				2						2
12						1	2		1	4
13		1	1	2		2	2	1		9
Total	7	8	18	11	3	27	51	6	5	136

use of shell- and grog-tempered fabrics was restricted to rim forms R1–2 and R2, 5 and 9, respectively. Table 3.15 gives a breakdown of the occurrence of the rims by trench, the significance of which is discussed below.

Neck cordons

A small number of applied neck cordons were recorded. These varied from plain (Fig. 3.15.49), to fingertip impressed (Fig. 3.15.48) to cabled (Fig. 3.14.26). Vessels with neck cordons had a limited distribution and were only found in trench XXV. In two cases the neck cordons belonged to very large vessels, probably jars. Their purpose could have been to facilitate lifting or handling. Neck cordons are a feature found on vessels of late Bronze Age date and their use continues into the start of the early Iron Age.

Shoulders

A variety of shoulder forms occur although most are rounded (eg Figs 3.8.3, 3.9.12, 3.10.4, 3.10.6, 3.11.4, 3.13.14, 3.14.27, 3.15.48, 3.15.54 and 3.17.10) and very few are angular (eg Figs 3.8.7, 3.13.11, 3.15.55, 3.15.57 and 3.17.13). The rounded forms vary from slack (Figs 3.11.8, 3.13.10) or humped (Fig. 3.9.5) to distinctly globular (Figs 3.10.5, 3.11.4). Impressed decoration mostly in the form of fingertipping or fingernail occurs on a number of these (eg Figs 3.9.12, 3.13.10, 3.13.14, 3.13.16, 3.16.67), while at least two vessels have distinct finger moulding on the inside (Fig. 3.13.10 and 14).

Bases

Sherds from approximately 55 separate bases were recorded and these can be grouped into either flat with a rounded base angle (B1 (5%) eg Fig. 3.8.5–6), flat with an angular or squared section (B2 (29%) eg Figs 3.10.8, 3.11.10) or flat with an expanded/protruding foot (B3 (33%) eg Figs 3.8.23, 3.11.11–12, 3.12.18, 3.13.18–19). A number of the latter carry crude finger-pinched or dimple impressions around the base (Figs 3.11.11, 3.12.18). One base fragment has finger dimples impressed on the interior surface (Fig. 3.8.16). Ten bases of B2–3 type have been deliberately flint-gritted and there is one example where the gritting involves clay pellets or grog (Fig. 3.15.56). In two cases the vessel is manufactured in a non-flint fabric, while the base is gritted with flint, and although quartzite is used instead of flint to temper pottery, it is not used to grit bases.

Vessel forms

Ten basic vessel forms (V1–10) were identified and these are defined and discussed below.

- V1 Straight-sided or slack-shouldered vessels, probably jars, with simple rims. More rarely rims may be in-turned and/or decorated. Fabrics F1, FA1, F2. Plain. Surface treatment includes wiping (eg Figs 3.8.2, 3.8.17, 3.8.26, 3.12.17).
- V2 Hooked-rimmed jars with either in-turned, incurved or hooked rims. Closed form. Fabrics A1, F2, FA2, QA2. Plain. Surface treatment includes wiping (eg Figs 3.8.11, 3.9.6, 3.10.1, 3.12.14, 3.17.1).
- V3 Slack-shouldered vessels with simple rims. Fabrics F2, FA2, FQ2/3, Q2, QA2 (eg Figs 3.8.3, 3.9.3, 3.9.5, 3.17.11; Barrett 1986, fig. 4.1).
- V4 Biconical vessels with angular profiles and simple rims. Fabrics A1, G2, SF 2 (eg Figs ?3.8.13, 3.13.9, 3.14.34).
- V5 Bipartite vessels, mostly jars, with high rounded or angular shoulders. Closed forms. Fabrics A1, F1, FA1–2, FQ2, QA2 (eg Figs 3.8.19, 3.9.12, 3.10.2, 3.11.2–3, 3.11.8, 3.12.16, 3.13.10, 3.13.14, 3.13.23, 3.14.27, 3.14.29, 3.14.31, 3.14.35, 3.15.55, 3.15.57, 3.17.6, 3.17.10).
- V6 Round-bodied vessels, jars/bowls, with simple rims. Fabrics FA2, Q2 (eg Figs 3.10.5–6, 3.16.64; Barrett 1986, fig. 4.12).

Table 3.16 A breakdown of vessel forms by fabric

Vessel form	*Flint*	*Quartzite*	*Mixed flint & quartzite*	*Sand*	*Shell*	*Grog*	*Total*
1	5	1					6
2	3	1		1			5
3	3	2	2				7
4				1	1	1	3
5	11	1	3	1		1	17
6	1	1					2
7	1						1
8	5						5
9	9	7	3	1		1	21
Total	38	13	8	4	1	3	67

V7 High-shouldered round-bodied vessels. Fabric F2 (eg Figs 3.11.4, 3.14.38; Barrett 1986, fig. 4.14).

V8 Vessels with short flaring rims. Fabrics FA1, F2 (eg Figs 3.8.24, 3.9.1, 3.12.23, 3.13.12, 3.13.24, 3.16.62, 3.17.13; Anon. 1960, fig. 1.6).

V9 Vessels with either angular or S-profiles with long flaring rims. Rims often squared or bevelled and either plain or decorated with fingertipping or cabling. Necks may carry applied cordons. Shoulders sometimes decorated. Fabrics FA1–2, F2–3, G2, O1/2, Q2, QA2, FQ2/3 (eg Figs 3.8.18, 3.8.29, 3.11.1, 3.11.9, 3.11.14, 3.12.12, 3.12.25, 3.13.1, 3.13.4–5, 3.13.7, 3.13.22, 3.14.28, ?3.14.30, ?3.14.43, 3.15.48–51, 3.15.58, 3.16.63; Barrett 1986, fig. 4.20; Anon. 1960, figs 1.1 and 1.3).

V10 Vessels with upright or flaring rims that are probably tripartite. Fabric Q2 (eg Fig. 3.17.8).

Discussion of vessel forms

The assemblage can be characterised by a high degree of fragmentation. Vessel profiles are rare with only one occurrence of a complete vessel profile (Fig. 3.10.1). Approximately 75% of this vessel survived and this represents the most complete vessel from the site. It is estimated that from the remaining vessels identified many are represented by no more than 7% of the actual pot. In only one case was it possible to match a base to a pot profile. The assemblage is dominated by shouldered forms (84%) of which a high number of the recognised vessels have either flaring or everted rims (56%). Hooked-rimmed and simple straight-sided jars are rare and account for only 16% of the assemblage. The assemblage also contains a small number of globular forms, some of which could be bowls rather than jars.

It is assumed that many of the rims are of jar rather than bowl form; however, this cannot be proved with any certainty because of the relatively high brokenness of the assemblage. Possible bowls include Figures 3.11.4, 3.11.8 and 3.16.64. Some vessels are quite small and could have functioned as cups or small bowls (eg Fig. 3.17.10).

From a total of 67 identifiable vessel forms (see Table 3.16) and with the exception of forms 4 (biconical vessels) and 10 (probable tripartite vessels), 38 vessels are made out of flint-tempered fabrics and 13 are made out of quartzite-tempered fabrics. It can be noted that there is a direct relationship between the most numerous vessel forms (V3, 5 and 9) and the most abundant fabrics (flint-, quartzite- and sand-tempered groups) (see Tables 3.12 and 3.16). Typologically early forms are predominantly but not exclusive made from flint-tempered fabrics, although this is of course based on a statistically low number of vessels (11). Similarly the angular bipartite form (V4) that could typologically be late within

Table 3.17 A breakdown of vessel forms by trench

Vessel form	*I*	*II*	*III*	*XVII*	*XXIV*	*XXV*	*XXVI*	*XXVII*	*Total*
1	1		1		3	1			6
2		1		1	2		1		5
3	1			1	1	3		1	7
4		1				2			3
5			1	2	4	6	2	1	16
6					1	1			2
7					1				1
8				1	3	1		1	6
9			1	1	5	14			21
Total	2	2	3	6	20	28	3	3	67

the late Bronze Age sequence (as outlined below) does not occur in either the flint- or quartzite-tempered fabrics. Again the number of vessels is small (3).

Table 3.16 illustrates that all the identified vessel forms were made in a wide range of fabrics most of which can be described as fine-medium wares with inclusion size ranges varying from 1 mm to 3 mm (52 of the 67 vessels). Table 3.17 provides the distribution of vessel forms across the site and the significant of this is discussed below.

Form analysis

Use of the vessel classification as outlined by Barrett (1980, 302–3) is limited because of the general lack of vessel profiles and brokenness of the assemblage, and precise quantification would be impossible. However, the following subjective comment is made. The assemblage appears to be dominated by jar forms (class I – eg Figs 3.9.12, 3.13.14, 3.15.48–9, 3.15.51, 3.15.57), although bowls (classes III–IV – eg Fig. 3.11.4, 3.11.8 and possibly the shoulder Fig. 3.10.5) and cups (class V – eg Fig. 3.17.10) are also present. Some class II jars could be present although these are defined on the criteria of finer fabric and burnished surfaces alone, while class II jars with complex incised decoration are notably absent.

In terms of ware the assemblage can be divided into two categories: fineware and coarseware vessels, with the latter divided into medium coarse and very coarse. The relative fineness of the fabric, wall thickness range and surface finish can be used as criteria in order to define these categories. In terms of fabric approximately 20% of the total assemblage is manufactured from very fine fabrics, 75% is made from fabrics that are of medium size (1–3 mm) and only 5% is made from fabrics with coarse inclusions (exceeding 3 mm). Wall thickness has a maximum range of between 3–14 mm, although the vast majority of the assemblage falls between a minimum range of 5–10 mm. Very rarely were sherds found that had a wall thickness greater than 10 mm. The more common fine fabrics (F1, FA1, Q1 and QA1) have a wall thickness range towards the lower end of this range (3–7 mm), while the medium-coarse and coarse fabrics tend to fall in the higher range of 5–10 mm. In general terms many of the fine vessels tend to be better finished with more effort put into the smoothing and/or burnishing of surfaces. These vessels are very rarely decorated. This includes two of the three examples of linear decoration from the whole site. There are only three examples where the use of impressed decoration occurs on vessels made from fine fabrics. This includes a cabled rim, an impressed rim and a shoulder sherd with fingernail decoration. In contrast many of the impressed decorated rim and shoulder sherds tended to be manufactured from the medium to coarse fabrics. They also fall within the wall thickness range of 5–10 mm and, while burnishing and smoothing still occur, there is a greater incidence for the use of wiping as a surface treatment.

In general terms the assemblage can be characterised as one that contains a significant number of coarseware vessels, although even these tend to be relatively thin walled and well made (a characteristic of the period), while its general fineness overall in terms of fabric and manufacture might be a reflection of the site's overall status. The wider significance of this point is further discussed below.

Manufacture and surface treatment

There was little direct evidence for pottery manufacture from the eyot. All the pottery can be assumed to have been hand-made, with construction employing either the ring or the slab method. Tempering materials could all have been procured locally (see Doherty, above). Both calcined flint and quartzite were found on the eyot (see Roe and Barclay, above). The presence of glauconitic sand, sometimes quite fine, in some fabrics indicates more than one clay source.

It is possible that the few refired or overfired sherds could indicate production, with the latter perhaps representing the remains of wasters, although none was found in an obvious deposit and other explanations as to how they became refired could just as easily apply (Barclay 2002). At least one example of spalling was observed. Surface treatment included wiping, smoothing and burnishing. Both smoothing and burnishing were used to finish either outer or inner surfaces, and sometimes both. In one case burnishing has left clear deep facets on the vessel's surface (Fig. 3.10.4). These techniques were mostly used on sherds belonging to fineware vessels, although some use on coarseware vessels was also noted. In contrast, wiping and finger smearing tended to be used on coarseware vessels. Some bases were given a coating or backing of grits, usually flint, although one example unusually has clay pellets (see section on Bases, above). In a number of cases flint grit was preferred even when the pot was tempered with a different material.

Decoration

The total assemblage includes 59 instances (sherd number) of decoration. A variety of decorative techniques were used although most involve some form of finger impression (eg fingertipping). The use of decoration is limited to rims, shoulders and necks, and is summarised in Table 3.18. The most common form of rim decoration is cabling (Figs 3.12.23, 3.15.48, 3.15.50–1), although fingertipping and fingernail impressions also occur (Figs 3.8.11–12, 3.9.17). Necks are rarely decorated, although neck cordons are decorated in a variety of ways (Figs 3.14.26, 3.15.48, 3.15.51). The most common form of shoulder decoration is by

Table 3.18 Summary of all decorated sherds by context

Context	*Rims*						*Necks*		*Shoulder*		*Total*
	Cabled	*Fingertip*	*Fingernail*	*Misc. impressed/incised*	*Fingernail*	*Applied cordon*	*Fingertip*	*Fingernail*	*Incised*	*Combed*	
103				1						1	2
203		1	1						1		3
303	3		1	1							5
1703					1			2			3
1803			1								1
2402	1										1
2403		1					1				2
2409	2										2
2411									1		1
2414	1			1							2
2505	12	3	1	2		4	13				35
2605							1				1
2703		1									1

impressed fingertipping (Figs 3.9.9, 3.13.10, 3.13.14, 3.14.27), although fingernail is also used (Fig. 3.9.12). Two possible examples of linear incised decoration occur (the sherds are too small to be illustrated), while there is one rare example of combing (Fig. 3.8.7).

The range of decoration found in the Whitecross Farm assemblage is perhaps typical for the late Bronze Age period, while the near absence of linear incised motifs may reflect the overall date range of the assemblage, with this type of decoration being more common during the transitional late Bronze Age/early Iron Age (or earliest Iron Age). In terms of decoration the assemblage has certain similarities with Runnymede and Ivinghoe Beacon (Cotton and Frere 1968).

Decoration is not common at Whitecross Farm with no more than 24% of rims and 13% of shoulders being decorated. Across the site there is the suggestion that trenches XXIV and XXV contained a higher incidence of decorated vessels (see Fig. 2.10b–c). Both trenches, however, produced significantly large quantities of pottery. In trench XXIV decoration became more common higher up the stratigraphic sequence. But in the case of trench XXV this difference could be real, perhaps chronological, and the implication of this aspect is further discussed below. The shoulder sherd with combed lines (Fig. 3.8.7) is unusual, although examples of this technique are found at Runnymede (Longley 1980, 70, fig. 36, 376–82). One further decorated sherd not listed in Table 3.18 is a fragment of base with internal all-over finger dimples (Fig. 3.8.16). Similar decorated bases have been found on other LBA sites (eg Reading Business Park and Runnymede; Hall 1992, fig. 48, 155).

Function and use

Some surface traces such as burnt residues and sooting on the surfaces of pots survived, but no examples of limescale were found. There were no obvious signs of physical wear, although such traces would be difficult to recognise given the degree of sherd fragmentation. In general, such residues indicate that part of the assemblage was used for cooking and the preparation of food, while it can be assumed that many of the finer vessels would have been used for serving.

Repair and reuse

There is slight evidence for both the repair of vessels and the reuse of broken sherds. One vessel (Fig. 3.10.1), which was fragmentary, had a single drilled hole near the rim and next to an old break. The hole is most likely for repair in an effort to prolong the use of the vessel. This was the most complete vessel from the site and although it was only three-quarters complete, it was possibly curated before being deposited in the channel. Two examples of sherd reuse were recorded (Figs 3.8.21, 3.9.14); in both cases body sherds appeared to have been deliberately notched. This could have been caused by rubbing the fracture against a sharp edge. Their exact function is unknown, but the occurrence of paired notches suggests that they could have been used as weights.

A small number of refired or overfired sherds were found (two body sherds and possibly a shoulder sherd from 2405, a body sherd from 2505/B/1 and a rim fragment from 2705/2). These sherds tend to be a whitish-grey in colour, sometimes crazed and relatively light in weight. Such alteration may have happened at different stages of a vessel's use-life. Possible explanations include the overfiring of pots during initial firing or the reuse and subsequent refiring as a result of pyrotechnical-related activities such as metal-working, cooking or pottery production. Some sherds may have been refired either accidentally or deliberately by the use of burning to remove abandoned structures, rubbish or vegetation. One suggestion is that refired sherds could represent a residue of ritual activity, perhaps tied to the deliberate destruction of other possessions and maybe linked to the death of an individual and the funerary rite of cremation (Barclay 2002).

Discussion of the context groups

Pottery was recovered from nine of the excavation trenches. These are treated as context groups and are described and illustrated below.

Trench I *(Fig. 3.8.1–10)*

This trench produced a total of 230 sherds (592 g). With the exception of a sherd from context 105, all the pottery came from layer 103. The group of pottery from this layer contains a number of simple, out-turned or everted rims (Fig. 3.8.1–4, 8–10) including some from straight or slack-shouldered vessels (Fig. 3.8.2–3). Most of this pottery is plain with the exception of a decorated rim fragment (not illustrated) and a shoulder sherd with combed lines (Fig. 3.8.7). The majority of pottery from 103 was flint-tempered (some 59% by weight), while most of the remainder was quartzite-tempered (27%). Twelve sherds from 103 were principally sand-tempered and one was shell-tempered.

Trench II *(Fig. 3.8.11–13)*

All the pottery from this trench came from layer 203 (136 sherds, 291 g). This group of pottery includes the rims from at least eight vessels. Most of the rims are simple or everted, although one is beaded (not illus. 203/1 2–3 m). Decoration occurs on two rims and one body sherd. One in-turned rim from a possible hooked-rimmed jar has fingernail decoration (Fig. 3.8.11). An everted rim has fingertip decoration (Fig. 3.8.12) and a body sherd (not illus. 203/4 2–3 m) may have originally had linear decoration. The rim illustrated as Figure 3.8.13 is possibly from a thin-walled bipartite vessel and is made from a fabric tempered principally with shell but also with flint. Approximately 71% of the sherds by weight are made from flint-tempered fabrics, while of the remainder sand- and quartzite-tempered fabrics occur in almost equal amounts. Two sherds were shell-tempered while three were grog-tempered.

Trench III *(Fig. 3.8.14–31)*

All the pottery from this trench came from layer 303 (215 sherds, 756 g). This includes the rims from a minimum of 18 vessels, a neck sherd and three base sherds.

Most of the rims are simple (eg Fig. 3.8.14, 17, 20, 25–8), some are everted (Fig. 3.8.19) and two are flared (Fig. 3.8.18, 29). Decoration occurs on 5 of the 18 rims. One rim has fingernail impressions (Fig. 3.8.14), three are cabled (eg Fig. 3.8.18, 31) and one has an incised line (Fig. 3.8.20). A base fragment from 303/1 (0–1 m) illustrated as Figure 3.8.16 has deep finger dimples on the interior surface and flint-gritting on the exterior surface. Approximately 64% of the sherds by weight were flint-tempered, while from the remainder sand- and quartzite-tempered fabrics occur in almost equal amounts. Four sherds were grog-tempered and two were shell-tempered. One sherd from 303 had been notched and reused as a possible weight (Fig. 3.8.21).

Trench XVII *(Fig. 3.9.1–16)*

All the pottery from this trench came from layer 1703 (203 sherds, 693 g). This includes the rims from a minimum of 14 vessels. There is a wide range of rim forms which includes simple (Fig. 3.9.3, 7, 12), everted (Fig. 3.9.2, 16), flared (Fig. 3.9.1, 11) and hooked types (Fig. 3.9.6, 13). Vessel forms include shouldered jars (Fig. 3.9.1–3), a possible hooked-rimmed jar (Fig. 3.9.6) and jars with everted or flared rims (Fig. 3.9.1, 11, 16). In at least two cases the representative sherds suggest that the vessels could have been quite angular in profile. Decoration is quite rare and occurs on a minimum of three vessels. Fingernail decoration occurs on one shoulder (Fig. 3.9.9), and on the neck and shoulder of the same vessel (Fig. 3.9.12). In addition, one rim has cabled decoration (Fig. 3.9.11).

Approximately 55% of the sherds by weight were flint-tempered, while sand- (5%) and quartzite-tempered fabrics (21%) accounted for much of the rest. Four sherds were grog-tempered and two were shell-tempered. One sherd from 1703 had been notched and reused as a possible weight (Fig. 3.9.14).

Trench XVIII *(Fig. 3.9.17–8)*

This trench produced a total of 75 sherds (232 g) most of which was recovered from 1803, although seven body sherds are recorded as coming from 1803–4 as well as one from 1806. The group from 1803 includes three rim sherds and three base fragments. Two flaring rims are probably from vessels of shouldered form (Fig. 3.9.17–18). One of the rims (no. 17) has fingernail decoration and represents the only occurrence of a decorated vessel in this trench. The majority of sherds from layers 1803 and 1803–4 in this trench were flint-tempered, and of the remainder most were either quartzite- or sand-tempered. Layer 1803 contained one shell-tempered sherd, while the sherd from 1806 was principally sand-tempered.

Figure 3.8 Late Bronze Age pottery (details in catalogue)

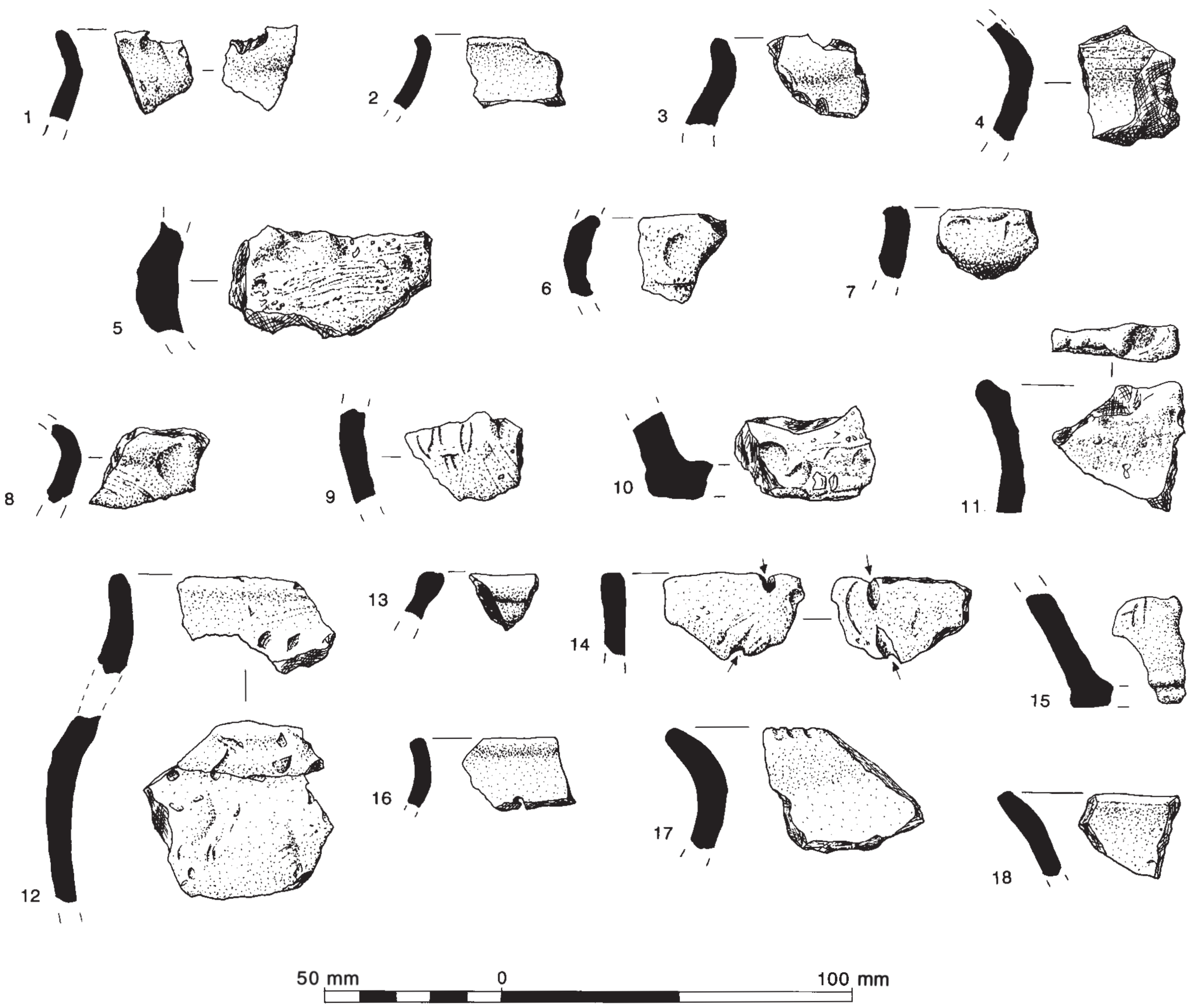


Figure 3.9 Late Bronze Age pottery (details in catalogue)

***Trench XXIV** (Figs 3.10.1–8, 3.11.1–14 and 3.12.1–25)*

This trench has the most complex stratigraphic sequence. A total of 590 sherds (3802 g) were recovered.

The earliest deposit is 2405 from the base of the channel. This deposit contained 29 sherds from a relatively small number of vessels including 3 rims, 6 shoulders and 4 bases. This includes the hooked-rimmed jar (Fig. 3.10.1), which is the most complete vessel from the whole site. Approximately one-quarter of the vessel is missing and a repair hole had been drilled near the rim against an old break (see above). The pot may represent a deliberate deposit as it was recovered at the shore end of timber Structure A. The fact that the vessel was repaired may indicate that it had some value as an object; however, it seems to have been deposited in an incomplete state. Other sherds from this layer include the rim and shoulder from a small bead-rimmed bowl or jar (Fig. 3.10.2) and the rim from a small cup or bowl (not illus.). Most of the shoulders are from rounded or globular vessels (Fig. 3.10.2, 4–6). None of the pottery from this deposit is decorated.

A number of sherds from this layer are burnished and this includes an unillustrated rim fragment, the rim and shoulder fragment (Fig. 3.10.2), a base wall sherd (Fig. 3.10.3) and shoulder sherds (Fig. 3.10.4–5). Three body sherds from this layer had been refired.

Stratified above this deposit are the midden deposits, which are subdivided into a lower wet level (2409) and an upper dry level (2414). However, it is thought that this distinction reflects only a state of post-depositional preservation. The two deposits, 2409 and 2414, produced totals of 51 sherds (259 g) and 144 sherds (1332 g), respectively. That the two contexts could be part of the same overall deposit is possibly indicated by the recovery of six sherds, some refitting, from the same vessel (Fig. 3.11.4). In total these contexts produced the rims from at least ten vessels that included both everted types (Fig. 3.11.2–3, 7, 8) and flared types (Fig. 3.11.1, 4, 9, 14).

Figure 3.10 Late Bronze Age pottery (details in catalogue)

Decoration is restricted to flared rims that are mostly cabled, although one is impressed. Shoulders are on the whole rounded and none is decorated. Bases are varied, although none is flint-gritted. A small number of vessels have smoothed or burnished surfaces.

The majority of sherds from this deposit were flint-tempered, and of the remainder most were quartzite-tempered, although a significant number were sand-tempered. Of interest is the use of sand-tempered fabrics to manufacture vessels with everted and flaring rims (Fig. 3.11.7, 9). Four shell-tempered sherds came from this deposit.

Stratified above the midden deposits is the occupation layer 2403. The top half of this layer has been interpreted as a ploughsoil (2403/1) and this layer extends over the upper alluvial channel fills (2404/1) and the silted-up ditch 2413. It is almost certain that layer 2403/1 derives from other later deposits and therefore not all the pottery need derive from the occupation deposit. The distinction between 2403/1 and 2403/2 was not always made when retrieving finds from this layer.

Context 2403 produced a total of 216 sherds (954 g) from which only 31 were securely stratified within the actual undisturbed occupation layer. Within this group of material the only featured sherd was a minute rim fragment. It is argued above that layer 2403/1 is a post-Bronze Age ploughsoil (phase 7). However, Figure 2.10a illustrates that the part of the trench that corresponds with layer 2403 contained most of this pottery (630 g), while only 17 g of pottery was found from above the alluvial deposit 2404/1 and a further 132 g came from above the silted ditch (2413).

The total assemblage from 2403 includes rims from at least seven vessels. Decoration is rare and includes one shoulder sherd with fingertip impressions (Fig. 3.12.6) and a cabled rim (Fig. 3.12.12). Vessel forms include probable hooked-rimmed and

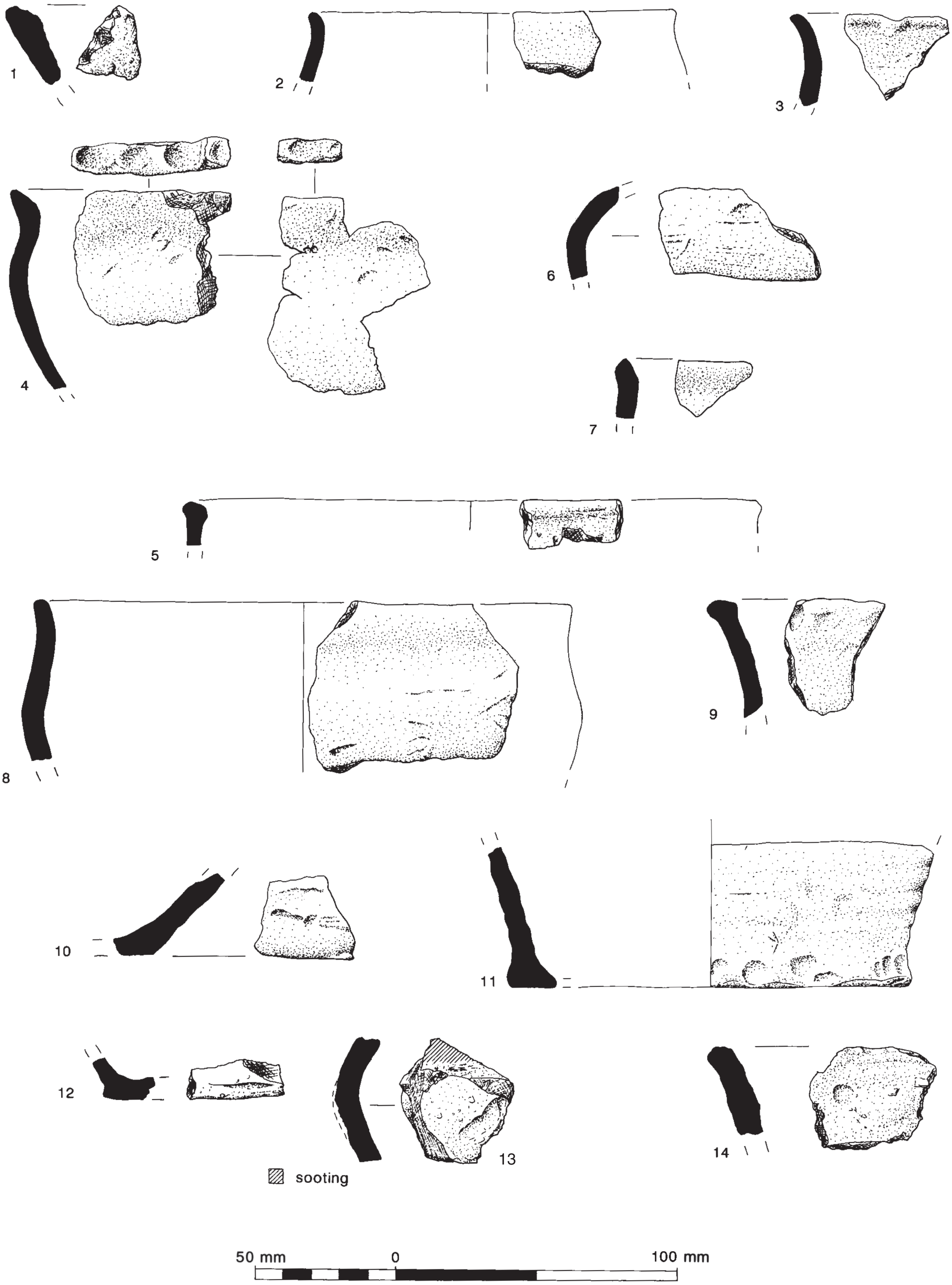


Figure 3.11 Late Bronze Age pottery (details in catalogue)

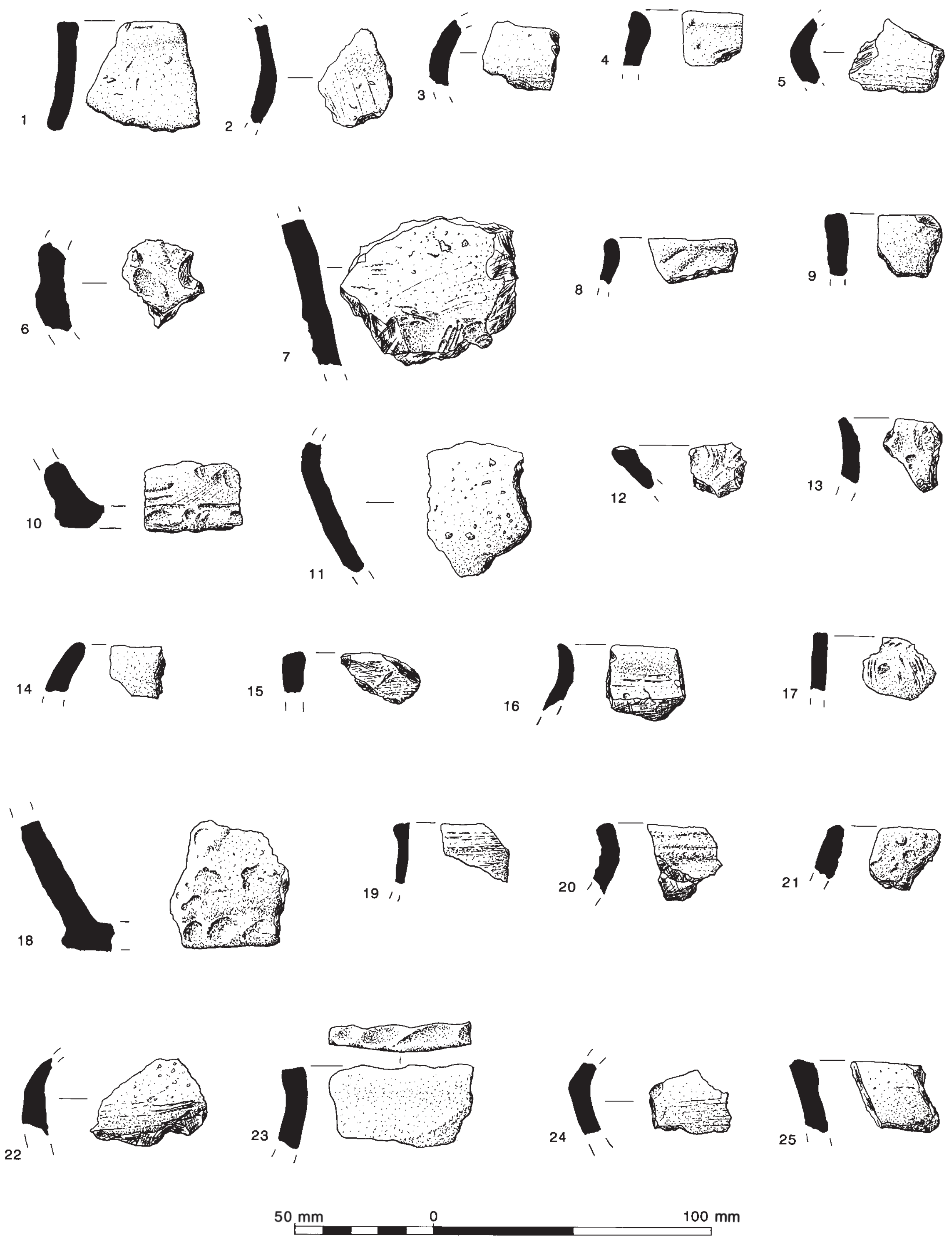


Figure 3.12 Late Bronze Age pottery (details in catalogue)

slack-shouldered jars as well as other round-shouldered jars. Of the two base fragments recovered from this context, one has been deliberately flint-gritted. At least two shoulders appeared to be from quite angular vessels, while a neck sherd (Fig. 3.12.2) may come from a tripartite vessel.

The pottery was predominantly made from flint-tempered fabrics (some 61% by weight) and of the remainder most was quartzite-tempered. However, other minor fabrics such as grog, sand, organic and shell also occur. This includes five shell-tempered sherds from which one came from the *in situ* deposit 2403/2.

Layer 2402 produced a total of 114 sherds (562 g) of pottery which includes the rims from six vessels. Most of the rims are of simple form (Fig. 3.12.16–17, 18–21), but one is long flared (Fig. 3.12.25) and another is short flared with cabled decoration (Fig. 3.12.23). Four base fragments include two flint-gritted types. The only occurrence of decoration is a cabled rim. The pottery was predominantly flint-tempered (72% by weight), and of the remainder most was quartzite-tempered.

Pottery from small features

A small number of sherds came from the ditch 2413 and postholes 2418 and 2422 (see Fig. 2.4). A single sherd in a fine flint-tempered fabric (F1) came from the fill of ditch 2413. This sherd was worn and weighed only 1 g and could easily be residual. The fill of posthole 2418 produced three sherds, of which two were flint-tempered (FA2 and F2) and one was shell-tempered (S2). Two of the sherds are of average size (weighing 5 g and 7 g) but all are in a worn state. The fill of posthole 2411/A produced two flint-tempered sherds (FA2 and F1). Both are small sherds from fine vessels, although only one is in a worn state. The smaller of the two sherds is of interest as it is a tiny shoulder fragment from an angular vessel with incised decoration, which was unfortunately too small to illustrate. This sherd represents the only evidence for an incised decorated vessel from the whole site.

These sherds are not necessarily residual, although they could have been redeposited when either the posthole was dug or the post was removed. If the postholes belong to structures then it is quite likely that small sherds accumulated near the upstanding posts and became trapped in any voids around the post base. As such they could well be broadly contemporary with the postholes.

Trench XXIV: stratigraphic sequence

The sequence in this trench reflects the known later Bronze Age occupation on the eyot. Pottery was recovered from basal deposits in the channel (2405) and from around the timber structures and deposits of wood, from the overlying midden (2409, 2414) and from the occupation layer (2403). Several trends can be observed in this sequence. Decoration is notably absent towards the bottom of the sequence, although the number of sherds and vessels represented is small. In the midden deposits decoration is restricted to rims and again is generally rare, and only present towards the top of the sequence. There is also a slight change in the use of fabrics. Flint-tempered fabrics are the most common throughout the sequence, although their relative frequency decreases with time. Quartzite- and sand-tempered fabrics are found throughout the sequence and become more common, while shell-tempered fabrics appear in the middle and upper part of the sequence only.

Trench XXV *(Figs 3.13.1–25, 3.14.26–47, 3.15.48–59 and 3.16.60–7)*

This trench produced the largest group of pottery (820 sherds, 5.3 kg) (see Fig. 2.10a). Nearly all the pottery was recovered from layer 2505 (spits A–E), although one sherd came from 2506. This includes the rims from a minimum of 50 vessels. A wide range of rim forms is present, although a high proportion are either everted or flared. It is possible to recognise at least 28 separate vessel forms mostly from the rims present. Of these just over half are shouldered vessels with mostly long flaring rims (Figs 3.13.1, 4–7, 22, 3.14.28, 30, 43, 3.15.48–51, 58, 3.16.63), although one vessel with a short rim is also present (Fig. 3.16.62). Of the remaining vessels six are bipartite round-shouldered jars (Figs 3.13.13, 23, 25, 3.14.31, 3.15.57), one is rounded (Fig. 3.16.64), two are biconical (Figs 3.13.9, 3.14.34) and four are slack shouldered or straight sided (Figs 3.13.10, 16, 24, 3.15.59). The bases from some 22 vessels were recorded, although none could be assigned a vessel type. Seven of these have deliberately added basal grits, usually crushed flint, although one rare example has clay pellets (2505/E/2). Most of these bases belong to vessels that were manufactured from principally flint-tempered fabrics, but two instances of quartzite-tempered fabrics were noted. This trench produced the highest number of decorated sherds from the whole site. Of the 50 identified rims, 19 are decorated. Most of these are cabled but a smaller number have either fingertip or fingernail impressions. In addition the shoulders from 14 different vessels have been decorated with fingertip impressions, while 3 vessels have applied neck cordons. There are two cases where vessels with neck cordons have decorated rims and two where vessels with decorated rims also have decorated shoulders.

Approximately 53% of the sherds by weight were manufactured from principally flint-tempered fabrics, while 34% were quartzite-tempered and 8% were mixed flint and quartzite. Of the remainder a small number of sherds were manufactured from either grog-, organic-, sand- or shell-tempered fabrics.

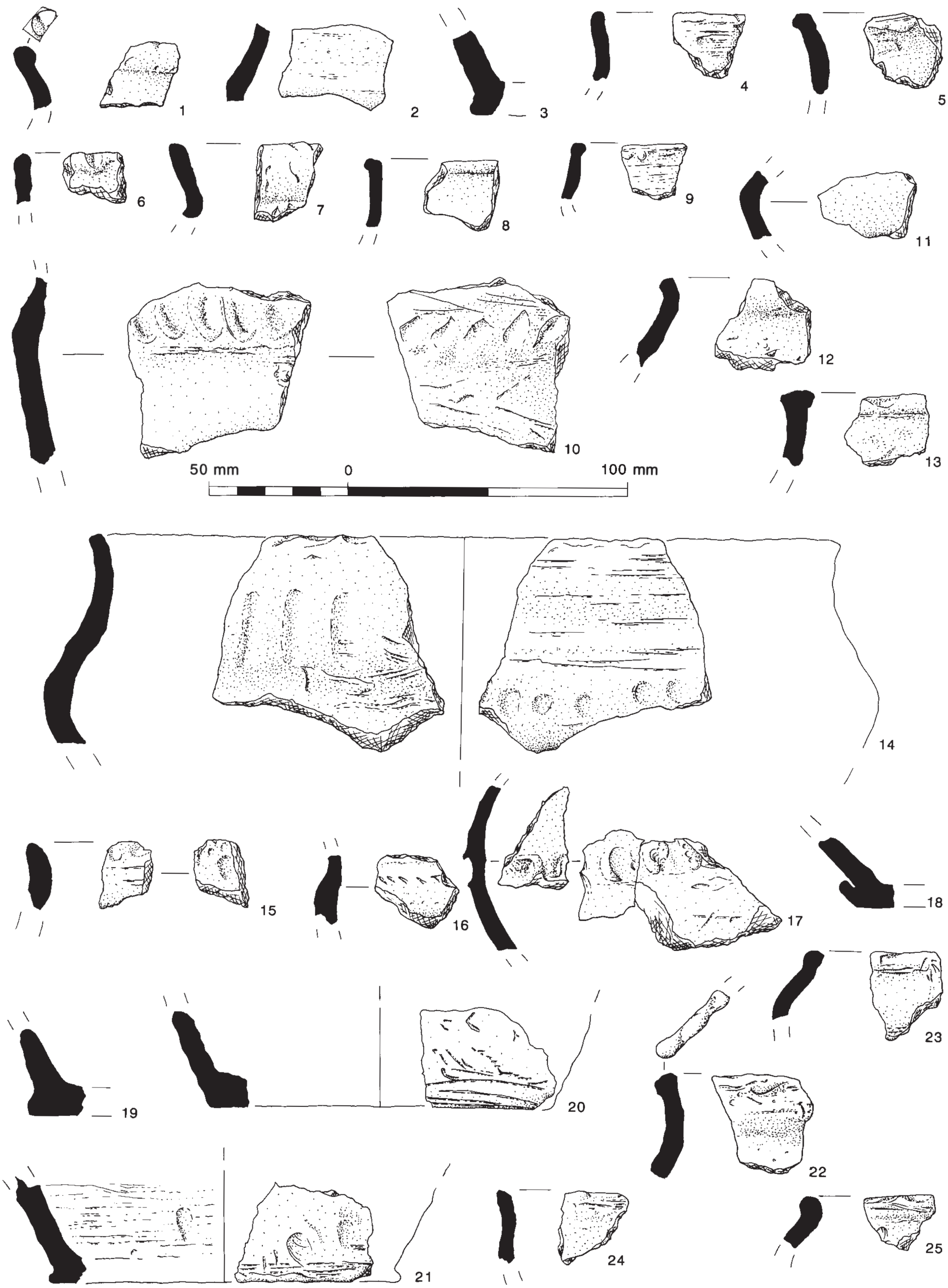


Figure 3.13 Late Bronze Age pottery (details in catalogue)

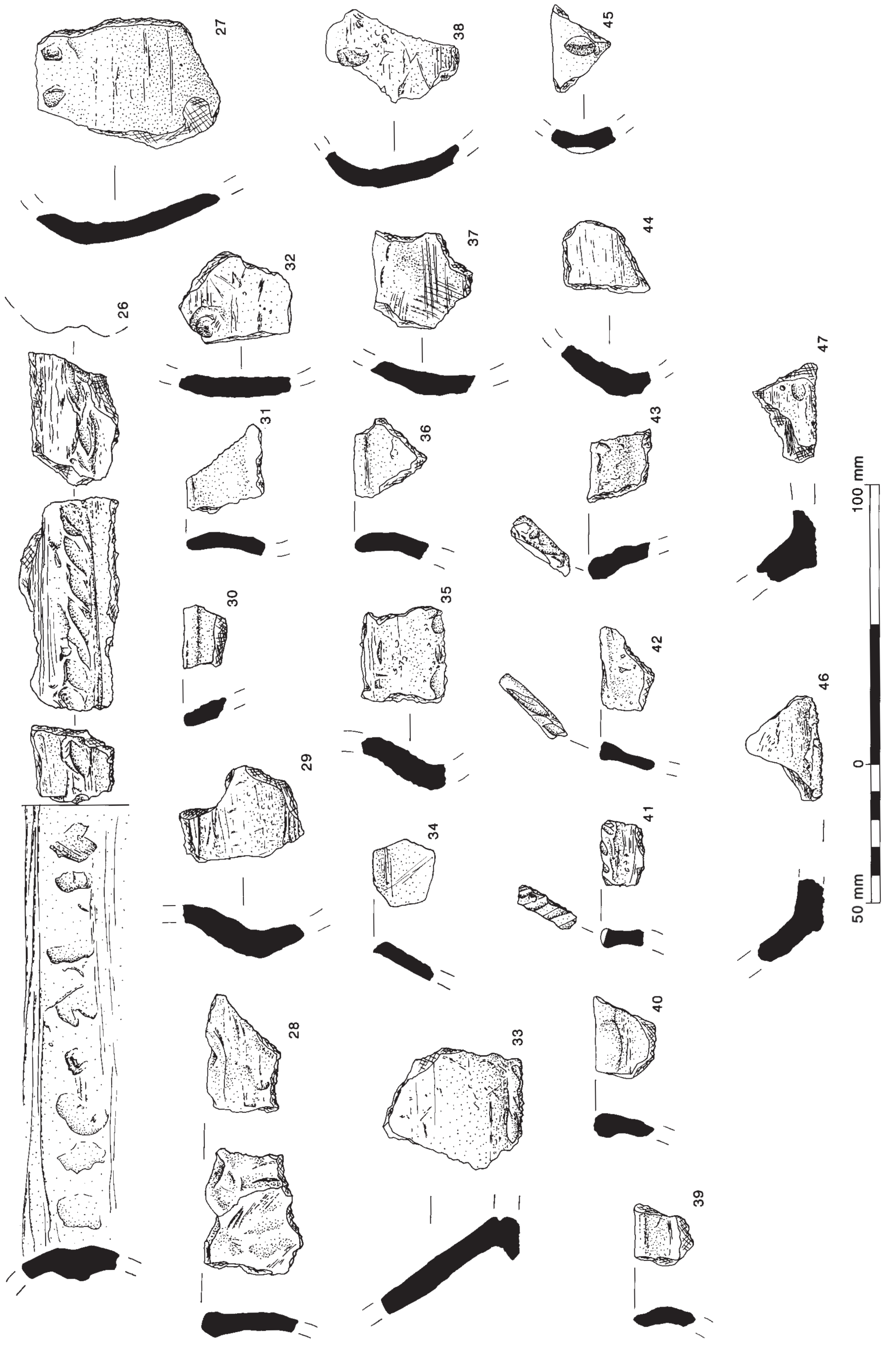


Figure 3.14 Late Bronze Age pottery (details in catalogue)

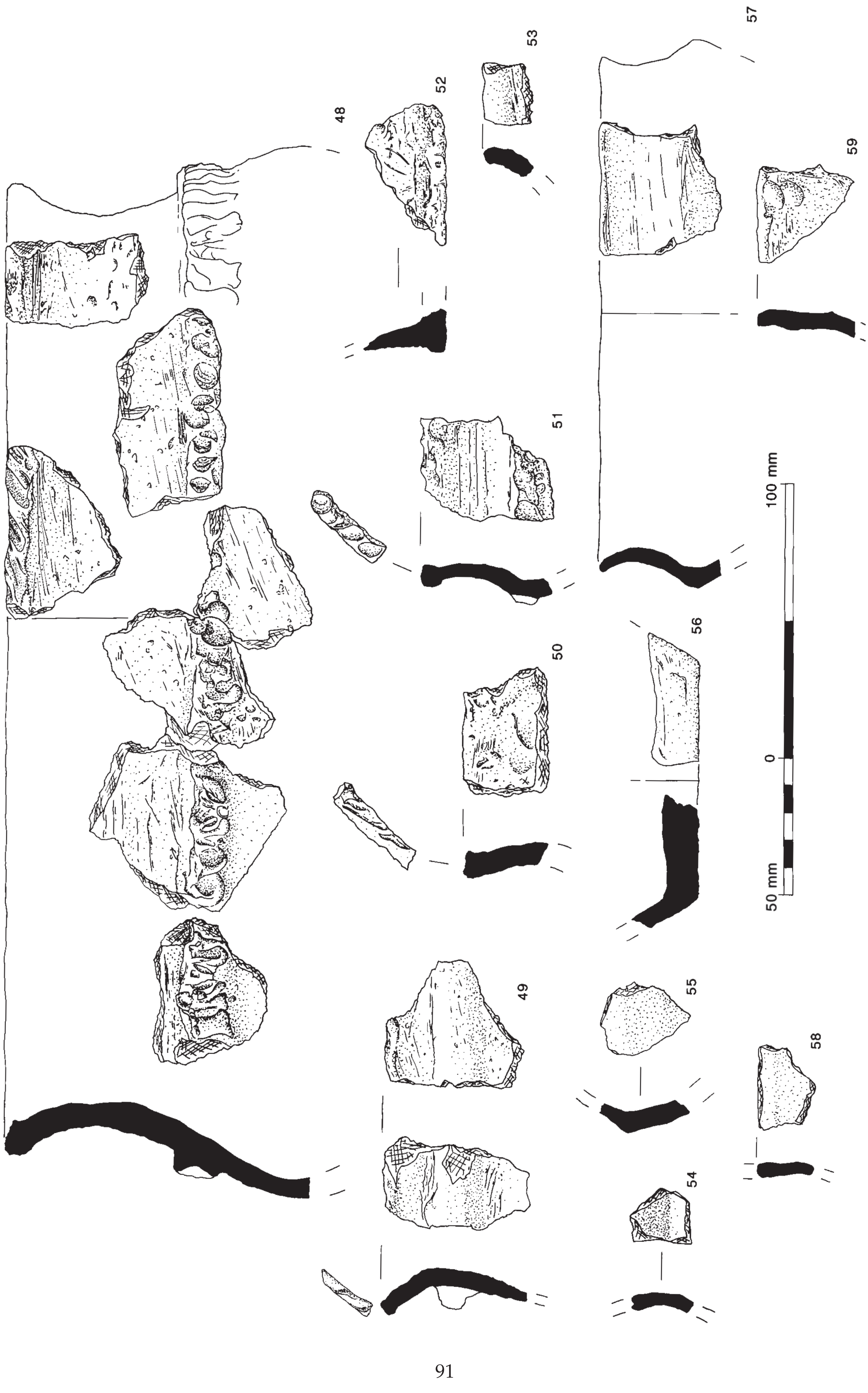


Figure 3.15 Late Bronze Age pottery (details in catalogue)

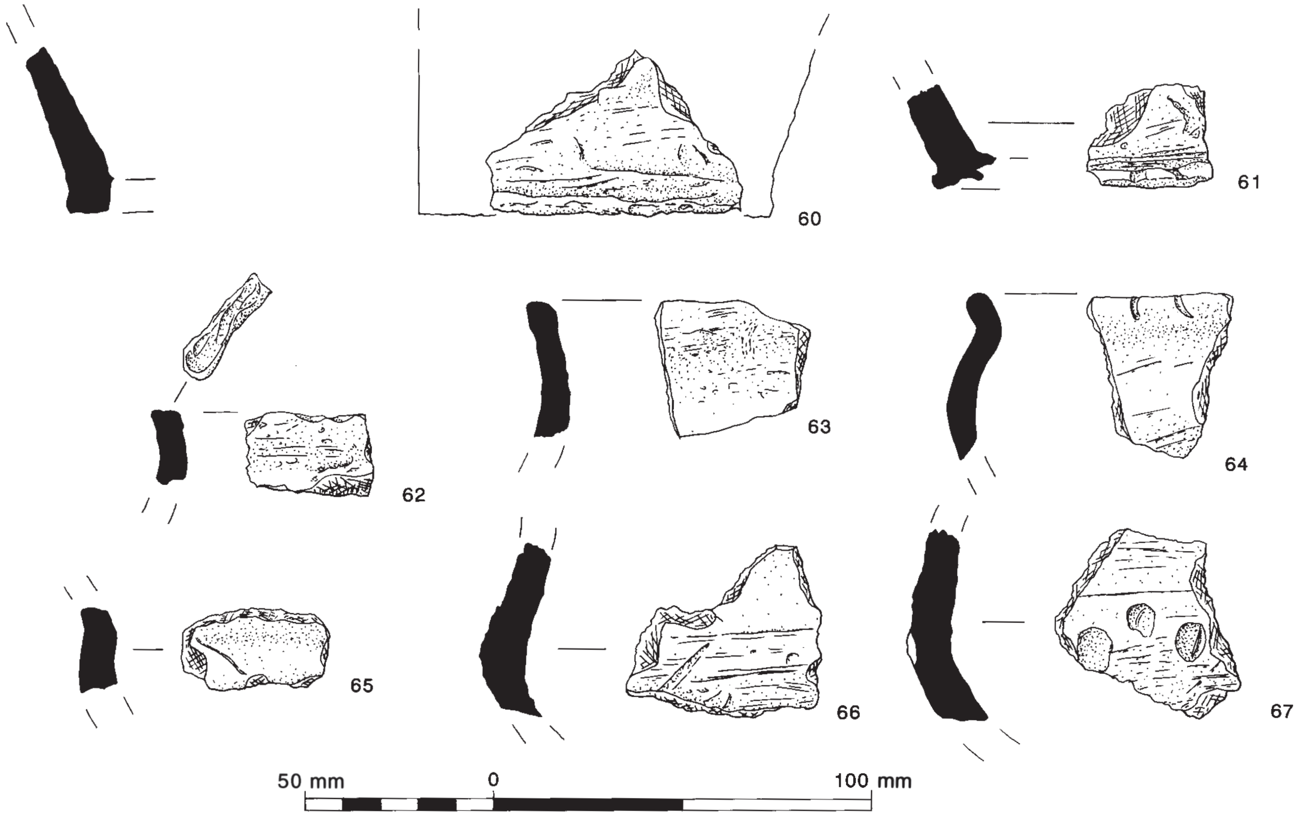


Figure 3.16 Late Bronze Age pottery (details in catalogue)

Trench XXVI *(Fig. 3.17.1–8)*

This trench produced a total of 96 sherds (458 g) of pottery from layers 2604–6 from which only three vessel forms could be recognised. The lowest of these layers, 2606, contained only a single body sherd. Layer 2605 was stratified above 2606 and produced the largest quantity of pottery (72 sherds) including the rims from four different vessels. Two of these rims are everted (Fig. 3.17.6–7) and a third is simple and in-turned (Fig. 3.17.4). A probable fourth rim (Fig. 3.17.8) is flared with a very sharp neck carination. Such rim forms tend to be of early Iron Age date, although rare examples do occur in late Bronze Age assemblages (form 18: Longley 1980). It is possible that this rim comes from an angular tripartite vessel of early Iron Age form, although it can be noted that the fabric (Q2) is quartzite-tempered. Only one sherd had been decorated. This was a neck and shoulder sherd with fingertip impressions (Fig. 3.17.3). The upper layer, 2604, produced a further 23 sherds which include the rims from two vessels; one is simple (Fig. 3.17.1) and the other is upright and squared.

Trench XXVII *(Fig. 3.17.9–15)*

This trench produced 79 sherds (488 g) of pottery. Most of the pottery came from spits within layer 2705, although small quantities also came from spits within layers 2703 (6 sherds, 27 g) and 2704 (2 sherds, 7 g).

Layer 2705 is interpreted as forming part of the occupation layer and is stratified beneath 2704 (ploughsoil) and 2703 (alluvium), respectively. Layer 2705 produced a small group of 71 sherds. This includes the rims from at least four vessels as well as a small number of shoulder sherds. Two of these rims are everted (Fig. 3.17.10–11), one is hooked and the other is expanded (Fig. 3.17.13). Vessel forms are mostly shouldered, either slack, rounded or angular. It is assumed that most of these vessels are jars, although one would appear to be a small cup or bowl (Fig. 3.17.10). None of the pottery from 2705 appears to have been decorated. The small quantity of pottery from the two overlying layers (2703–4) probably derived from this deposit. These groups of pottery consist of plain body sherds with the exception of a finger-impressed rim from 2703/3 (Fig. 3.17.9). A high proportion (81% by weight) of the pottery from trench XXVII was manufactured from flint-tempered fabrics, while only 11% was quartzite-tempered. Of the remainder, sherds were either manufactured from mixed flint and quartzite fabrics, the organic-tempered fabrics or sand-tempered.

The ceramic sequence

The earliest deposits containing ceramics are those from the base of the channel (phase 4). Some of this pottery, for example the hooked-rimmed jar (Fig. 3.10.1), could have been deposited at a time when the timber structures were in use, while other sherds could have been discarded along with the timber deposit that overlies these structures. All the pottery from the phase 6 deposits is plain. Radiocarbon dating indicates that these events probably took place in the 10th–9th centuries and before the end of the 9th century. The midden in trench XXIV (contexts 2409 and 2414) may represent a number of dumps of material rather than a single event. Decorated pottery appears for the first time in the sequence, although this is restricted to a small number of rims. The interval between the dumping of the timber deposit and the first dumping of the midden need not be great, and the whole deposit could fall within the 9th century. The occupation layer from the same trench (2403) and from other trenches on the eyot could post-date the midden. Certainly the pottery from trenches XXV–XXVII is of a somewhat different character with a much higher proportion of decorated vessels. This could simply represent differential dumping of material on the eyot, although alternatively it could have a temporal dimension. The pottery from trenches XXV–XXVII fits within Barrett's Decorated phase of the 8th and 7th centuries BC and some of the

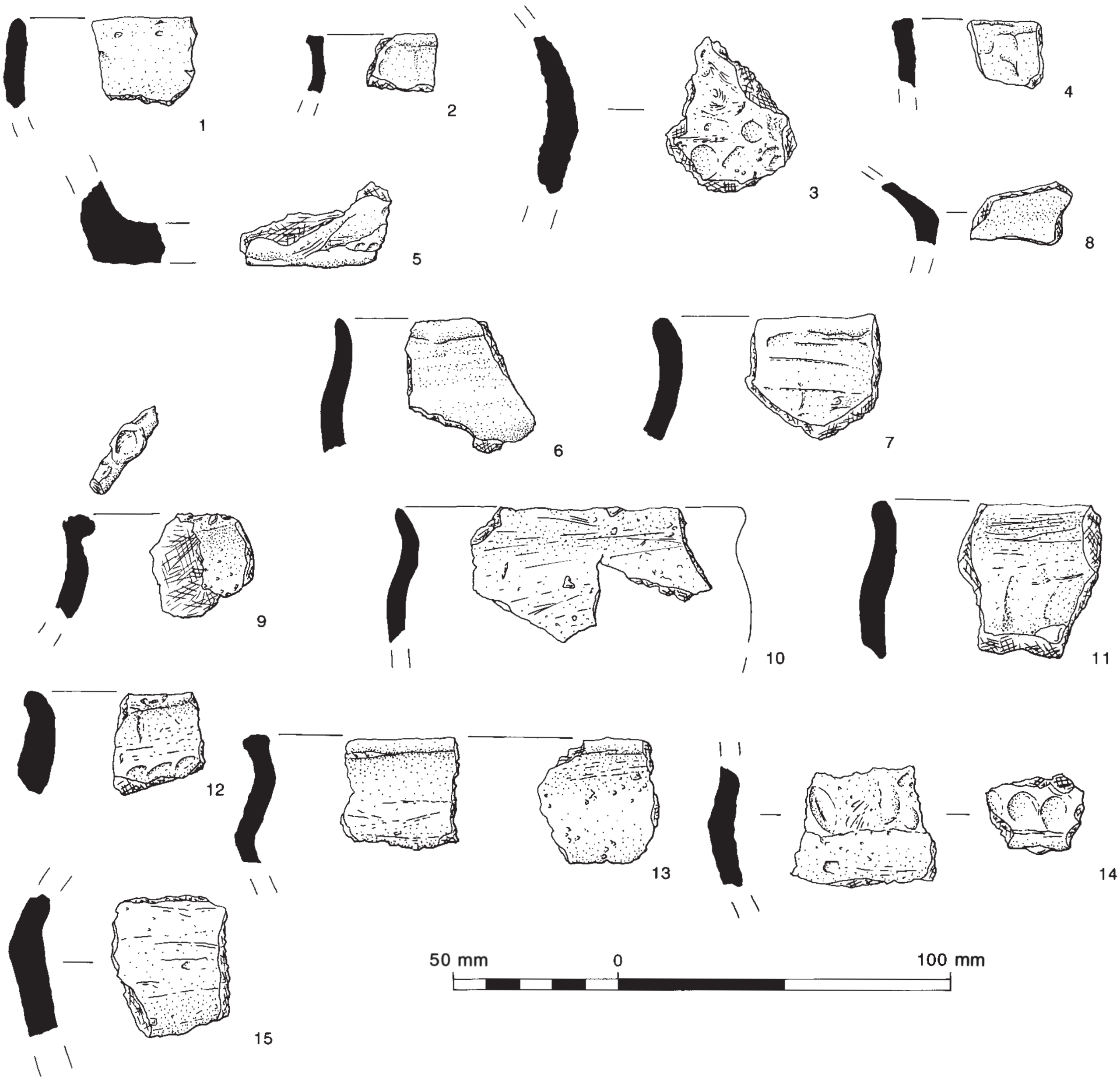


Figure 3.17 Late Bronze Age pottery (details in catalogue)

pottery published from the earlier excavations is also likely to be of this date (Barrett 1986, 187). The general absence of pottery of transitional date and the lack of early Iron Age forms suggest that the ceramic sequence does not continue any later than the 7th century.

In conclusion, the pottery from Whitecross Farm appears to span the period from the 10th to 7th century cal BC in which there was a development from plain to decorated wares. The assemblage is dominated by shouldered jars, although other forms include bowls and possibly cups. Overall decoration is restricted to no more than about 25% of the assemblage and mostly consists of fingertip or fingernail impressions on coarser jars. Decoration on fineware vessels is very rare. Burnishing and smoothing are found on a number of otherwise plain and generally finer jars, but is difficult to quantify because of the factors of wear and fragmentation. Vessels were made in a variety of fabrics. The evidence from Whitecross Farm indicates that a wide range of fabrics were used of which the most common was the flint-tempered group. Vessels made from flint-tempered fabrics were also made from ones containing quartzite. Other fabrics that appear to be contemporary can be made from shell temper or sand.

Spatial patterns

Analysis was undertaken to try and identify any spatial patterning of ceramics across the island. On other types of late Bronze Age site (eg ring works and enclosures) there is considerable evidence for such patterning. At Lofts Farm, Essex there was a notable concentration of fineware around the enclosure's entrance (Brown 1988, 270), while at the North Ring, Mucking there was some evidence for the selection and separate deposition of finewares from coarsewares. Similar patterns are also evident at Iron Age enclosures (Parker Pearson 1996). However, these sites have a recognisable ground plan unlike such midden sites as Whitecross Farm. At the enclosure sites, deposits of ceramics often mark out boundary or entrance locations. At Whitecross Farm the river edges of the island or eyot could have been treated in a similar way to an enclosing ditch.

The following themes were considered: overall sherd density across the island (Fig. 2.10a), the occurrence of finewares and coarsewares; the distribution of decorated sherds and vessels (Fig. 2.10b–c); and various miscellaneous categories (eg refired sherds, notched sherds and deliberately gritted bases) (Fig. 2.10d). For the purpose of this analysis, some material from disturbed layers was also included (eg the plough-disturbed occupation layer 2403). This is on the grounds that any post-depositional bias was likely to be minimal given the general character of the site and that much of this material can be considered as locally derived from otherwise *in situ* deposits.

In terms of density there are notable concentrations that centre on trench XXV and on the midden and occupation layers in trenches III and XXIV. However, pottery appears to have been deposited across much of the surface of the eyot and was found in most of the trenches (Fig. 2.10a). Although the total excavated area of the island is in the region of only 7% there is evidence that pottery spread across much of the island's surface in what is described as the occupation layer. In some of the trenches there is slight evidence that the density of pottery increased towards the island's edge (eg trenches I, III, XXIV). However, in relative terms the pottery concentrations were far denser in trenches XXV–XXVII, which would have originally been away from the river's edge.

In terms of the proportion of fabric types there is very little difference between the trenches. Both finewares and coarsewares appear to have occurred alongside each other in all the trenches. There is some evidence that trenches XXV–XXVII contained higher concentrations of coarsewares. One trait of coarseware jars is the use of impressed decoration on rims and/or shoulders. Decorated sherds occurred in nearly all the trenches (Fig. 2.10b–c). Many of the trenches contained decorated rims (mostly impressed) from coarseware vessels, although there was a significant concentration in trench XXV. This pattern is even more marked when decorated shoulders are considered, with the majority of fingertip-impressed types from coarseware vessels coming from trench XXV. The distribution of deliberately gritted base sherds from coarseware vessels also had a notable concentration within trench XXV. In addition, the occurrence of neck-cordoned vessels was restricted to this trench. The occurrence of decorated fineware vessels with incised linear or combed motifs was generally rare; such vessels were notably absent from the large assemblage from trench XXV with the only examples occurring in trenches I and XXIV. Many of the coarseware vessels are considered to have been used for cooking or storage. Burnt and soot residues on surfaces are predominantly associated with sherds from coarseware vessels, with notable concentrations occurring in trenches XXIV and XXV. There is no evidence to suggest that finewares and coarsewares were treated any differently upon breakage despite their probable different functional uses in life, and both types appear to have been deposited or discarded in the same areas of the site. The relative difference between the high number of coarsewares against a low number of finewares could simply reflect differential rates of breakage. The near-absence of incised-decorated finewares is difficult to interpret as such vessels can and often are rare on late Bronze Age sites. At Whitecross Farm the only incised-decorated sherd came from the fill of a posthole in trench XXIV, which indicates that such vessels were at least present and in use on the island. The context for this sherd perhaps favours incidental inclusion rather than deliberate discard. The absence of similar material from the rest of the site and from trench XXV in particular is difficult to interpret, although this might just be a factor of the small scale of the excavations. Taken at face value it might suggest that such decorated vessels received special treatment upon breakage and were separated out from what was considered to be more ordinary domestic rubbish.

In general there is little evidence from the pottery assemblage for structured deposition, although to some extent this might reflect the excavation strategy which concentrated on defining the limits of the eyot. The only clear evidence for a placed deposit is in trench XXIV, where the semi-complete hooked-rimmed jar was recovered from one end of a timber structure at the base of the channel (see Fig. 2.4). The occurrence of this vessel alongside other deposits of wood, flint and antler make this suggestion likely and it is of interest that such deposits occur close to what is clearly a way on to the island or what can be considered as an entrance location. With the exception of this vessel, the highly fragmentary nature of the assemblage fits with the idea that much of this material suffered further breakage within the occupation layers from activity such as trampling and no doubt became further mixed at this stage. The general absence of sherd refits and groups of related sherds suggest that much of this material did not accumulate *in situ* near zones of activity. The midden deposit in trench XXIV (contexts 2409 and 2414) indicates that at least some material was taken to the island edge and dumped.

In addition there are a small number of categories that are worthy of further consideration (Fig. 2.10d). Refired or overfired sherds were found in trenches XXIV, XXV and XXVII. It has been argued that these sherds could indicate activities such as pottery production or perhaps metalworking. However, another possibility is that they provide evidence for deliberate destruction of household structures. With this in mind it might be significant that the three sherds from trench XXIV come from a layer (2405) that also contained a deposit of burnt timber.

Regional comparisons

The late Bronze Age pottery from this region was reconsidered by Barrett in his article on 'The pottery of the later Bronze Age in lowland England' (1980). Before this, Harding had drawn attention to a number of possible sites with late Bronze Age pottery (1972, 82–4), although little mention was made of Wallingford. There are still relatively few late Bronze Age assemblages from the Upper Thames Valley in comparison to other areas of the Thames Valley catchment (eg the Lower Kennet Valley around Reading), although important assemblages have been found to the north-west of Oxford at Yarnton and Eynsham Abbey (Barclay and Edwards in prep. a; Barclay 2001).

Apart from Whitecross Farm the only other relatively large published assemblage from this region comes from the Rams Hill enclosure, located some 20 km to the west (Bradley and Ellison 1975). However, there are a number of unpublished assemblages from the Eynsham–Yarnton area of the Upper Thames gravels. The assemblage from Eynsham Abbey is dominated by simple and hooked-rimmed jars (Barclay 2001) and, therefore, could largely predate Wallingford. The site at Eynsham is associated with a series of six directly associated radiocarbon dates, five of which were obtained on burnt residues that adhered to pottery surfaces (Bayliss *et al*. 2001). Calibrated at two sigma these dates have ranges that fall within the last quarter of the 2nd millennium BC. A similar late Bronze Age Plain Ware assemblage came from a site (as yet unpublished) just to the north of Eynsham Abbey at Mead Lane near Cassington. The excavations at Yarnton have produced a complete sequence of late Bronze Age pottery, which includes an important group of transitional late Bronze Age/early Iron Age, or earliest Iron Age, pottery, although this pottery comes from a number of small-scale settlement features that are dispersed over a wide area.

Among the older-published assemblages are from those sites listed by Barrett: Allen's Pit, Dorchester and Long Wittenham (1980, 308). Harding also illustrates material from Standlake, Kirtlington and New Wintles Farm, Hanborough that would not be out of place in a transitional late Bronze Age/early Iron Age context (1972, pls 47–9). Added to this is material from Gravelly Guy and a number of other sites around Stanton Harcourt (Duncan *et al*. in prep.) which is of similar transitional date. Some of the pottery from Woodeaton would also appear to be of this date, especially that published by Bradford (1942, fig. 13), whereas the assemblage published by Harding (1987) is mostly early Iron Age. Similarly material published by Bradford as coming from Wytham would also appear to be of late Bronze Age and transitional date (1942, fig. 12). A multi-period site at Appleford has also produced some late Bronze Age pottery (De Roche and Lambrick 1980), which includes a significant group of pottery from a single large pit. This group includes both decorated coarseware jars and fineware bowls in a range of shell-, flint- or sand-tempered fabrics. The pottery published by Hingley (1979–80) from the settlement outside the hillfort at Wittenham Clumps includes both late Bronze Age and early Iron Age forms. A limited stratigraphic sequence of occupation deposits occurs and coincides with a change in ceramics from plain late Bronze Age to earliest Iron Age. The latter includes a large number of highly decorated sherds that would not be out of place in an 'All Cannings Cross' type assemblage of transitional date. This type of material has yet to be found at Whitecross Farm. Further along the Upper Thames Valley at Lechlade a number of late Bronze Age and transitional late Bronze Age/early Iron Age assemblages have now been recovered. These include two small late Bronze Age assemblages from Butler's Field and Gassons Lane (Barclay 1998; Timby 1998).

An intra-regional ceramic sequence

From the available evidence it is possible to outline the following sequence for the development of ceramics during the late Bronze Age over a period of some 500 years (see Fig. 7.2). Similar to this period, there is now considerably more middle Bronze Age pottery known from the Upper Thames Valley since Barrett produced his review in 1980. New and important groups of material have been found from sites in the Yarnton/Eynsham area (Barclay and Edwards in prep. a; Barclay 2001; OAU unpubl. info.), while comparable material has been found at ongoing excavations at Appleford (Paul Booth pers. comm.).

It is suggested that the late Bronze Age ceramic sequence in the Upper Thames Valley can be divided into three stages. The first stage spans the period of 1250/1150–950 cal BC and is marked by assemblages dominated by simple straight-sided and hooked-rimmed jars. In the Upper Thames Valley such assemblages are rare, but include here part of the assemblages from the enclosure ditch beneath Eynsham Abbey and Rams Hill (Barclay 2001; Bradley 1975). Another unpublished assemblage comes from Mead Lane, Cassington, and similar material – some of which is associated with a roundhouse – comes from Yarnton (Gill Hey pers. comm.). Such assemblages are thought to replace the Deverel-Rimbury style Bucket Urn dominated assemblages of the middle Bronze Age. The date for this transformation would on present evidence lie somewhere in the 12th century, but could perhaps be as early as the 13th. At Eynsham most of the pottery is shell-tempered which would suggest some continuity in fabric as most of the locally manufactured Deverel-Rimbury pottery is made from similar calcareous-tempered fabrics.

Only at Rams Hill is it possible to recognise a near-complete ceramic sequence from a single site, while at Eynsham Abbey the assemblage comprised a sequence of post-Deverel-Rimbury plain jars followed by a range of shouldered forms of phases 2–3. Another important unpublished assemblage from Mead Lane near Eynsham (Miles 1997, 10) may span the transition from middle Bronze Age (Deverel-Rimbury) to Plain Ware. Shouldered vessels are rare but become more common during the 10th–9th centuries; assemblages now include a greater range of vessels although decoration is rare (stage 2). Decoration becomes more common during and after the 8th century (stage 3). It is possible that all three phases are represented among the assemblages from Yarnton/Cassington, although this awaits further investigation (Barclay and Edwards in prep. a). Although groups of pottery belonging to all three stages can be recognised at Yarnton, the relevant sites are spread across a wide tract of excavated landscape. The Wallingford assemblage would appear to span stages 2–3 with a progression from Plain to Decorated Ware, although there is little indication that this assemblage continues into the late Bronze Age/early Iron Age transition (750–650 BC). The group of pottery from Appleford belongs to this final stage, while the pottery from Wittenham Clumps may belong to a sequence that starts in the late Bronze Age and continues into at least the early Iron Age.

Towards the end of the late Bronze Age more angular forms were adopted and the use of complex decoration becomes more common. Assemblages spanning the late Bronze Age/Iron Age transition and dating to approximately the 8th–7th centuries have been found at Yarnton on the Second Gravel Terrace where extensive early Iron Age settlements have been excavated. At Yarnton it is argued that pottery of transitional date coincides with a greater use of fabrics that contain a mixture of inclusions (eg shell and quartzite), and towards the start of the early Iron Age there is a greater use of shell- and sand-tempered fabrics (Booth and Biddulph in prep.). A similar ceramic sequence is described for Gravelly Guy and the Stanton Harcourt area (Duncan *et al*. in prep.). The well-known assemblage from Allen's Pit, Dorchester along with some of the comparable material listed by Bradford from Wytham, Stanton Harcourt and Woodeaton is also likely to belong to this phase. On the Chalk Downs a number of sites, mostly enclosures, have produced pottery of this date. At Uffington decorated pottery of north Wiltshire type (All Cannings Cross) has been found during recent excavations at the hillfort and similar material has come from an open settlement at Tower Hill, Ashbury and from ditches that abut the Wayland's Smithy long barrow (Miles *et al.* 2004). The settlement site at Tower Hill also produced a large hoard of contemporary metalwork.

Inter-regional comparisons

Overall the Wallingford assemblage is of typical late Bronze Age character and fits within the general sequence for lowland England as outlined by Barrett (1980). It is also from a limited stratified sequence with metalwork associations and a series of radiocarbon dates.

It can be compared with a number of assemblages in the Middle Thames and the Lower Kennet Valley. It has been argued that the Wallingford site was established during the 10th or 9th century BC, and the site could have been abandoned sometime before the foundation of many of the Iron Age settlements on the gravel terraces – perhaps during the 7th century BC. The ceramic evidence for the Lower Thames Valley is well known with a series of key assemblages already published (Bradley *et al*. 1980; Hall 1992; Morris 2004), and follows a similar sequence to the Upper Thames with transitional mid–late Bronze Age pottery coming from Pingewood and early Plain Ware recorded from Reading Business Park (Bradley 1983–5; Morris 2004). The latter site has now produced pottery belonging to all three stages as outlined above, while the pottery from

Aldermaston and Knight's Farm, Burghfield may represent a similar sequence. In the Kennet Valley the large assemblages from Aldermaston Wharf and Knight's Farm, Burghfield are characteristically similar to the range of vessels from Wallingford (Bradley *et al*. 1980). Aldermaston Wharf produced an earlier Plain Ware assemblage that contained a high number of shoulderless jars and pots (some 44% of the recognised vessels). It is possible that the assemblage spans the period 1150–800 cal BC with both phases 1–2 of the Plain Ware sequence represented. At Knight's Farm the assemblage is characterised by a range of fine and coarse shouldered vessels. Decoration occurs on a relatively high number of these vessels and includes a number of vessels with complex motifs. The presence of these vessels could indicate that the site continued into the transitional late Bronze Age/early Iron Age period. Such decoration is absent at Whitecross Farm which may, along with other factors, be taken to suggest that the site had been abandoned before this stage.

A number of assemblages have now been found in the Middle Thames Valley, although few can be placed earlier than the 10th century BC; many of these sites have been discussed by Barrett (1980), Longley (1980) and Adkins and Needham (1985). The Plain and Decorated Ware assemblages from Runnymede and Petters Sports Field, respectively, have much in common with the range of ceramics from Wallingford (Longley 1980; O'Connell 1986). Like Whitecross Farm, the earlier of the two sites, Runnymede Bridge, produced an assemblage dominated by shouldered vessels. It is argued that this site was established *c* 900 cal BC, while the adjacent site at Petters Sports Field may have continued into the transitional late Bronze Age/early Iron Age period (Needham 1991). The assemblage from the ring work at Queen Mary's Hospital, Carshalton (Adkins and Needham 1985) would appear to be of a broadly similar date to that of Runnymede. In the Chilterns the hillfort site at Ivinghoe Beacon, Buckinghamshire produced a Decorated Ware assemblage that is characteristically similar to the later material from Whitecross Farm (Cotton and Frere 1968). Around the Thames estuary the assemblages from the ring works at Mucking again recall that from Whitecross Farm.

The Whitecross Farm assemblage is characteristic of those assemblages from sites of early 1st-millennium BC date that are found in lowland England. The closest similarities are perhaps with sites of special character, such as middens and ring works, while the open settlements, in particular around the Lower Kennet, appear to contain a coarseware element that is generally not found at these sites. This slight difference could partly be chronological, but it could also be functional both in terms of economy and as a reflection of the types of social practices performed (eg feasting) at sites like Whitecross Farm.

Catalogue of late Bronze Age pottery

Figure 3.8.1–31: context groups 103, 105, 203 and 303

3.8.1 Context 103/1. Rim R1 (2 g). Fabric F1. Colour: grey throughout. Condition: worn.

3.8.2 Context 103/1. Rim R1, V1 (3 g). Fabric F1. Colour: black throughout. Condition: average.

3.8.3 Context 103/1. Rim R2, V3 (8 g). Fabric FA2. Colour: reddish-brown throughout. Condition: average.

3.8.4 Context 103/1. Rim R3 (2 g). Fabric QA2. Colour: grey throughout. Condition: average-worn.

3.8.5 Context 103/1 (0–1 m). Base B2 (7 g). Fabric QA3. Colour: ext. reddish-brown: core and int. dark grey. Condition: worn.

3.8.6 Context 103/1 (0–1 m). Base B1 (18 g). Fabric QA2. Colour: yellowish-brown throughout. Condition: average.

3.8.7 Context 103/1 (2–3 m). Shoulder decorated with combed lines (5 g). Fabric FA2. Colour: dark grey. Condition: worn.

3.8.8 Context 103/2 (2–3 m). Rim R1 (4 g). Fabric QA2. Colour: ext. yellowish-brown: core and int. grey. Condition: average-worn.

3.8.9 Context 103/3 (0–1 m). Rim R4 (2 g). Fabric F2. Colour: brown throughout. Condition: worn.

3.8.10 Context 105. Rim R6. Smoothed surfaces. Fabric FA2. Colour: dark grey throughout. Condition: average.

3.8.11 Context 203/2 (2–3 m). In-turned rim R5 (1 g) with fingertip decoration. ?V2. Fabric QA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: worn.

3.8.12 Context 203/2 (2–3 m). Pointed everted rim R8 with fingertip decoration. Fabric FA2. Colour: ext. brown: core grey: int. brown. Condition: average.

3.8.13 Context 203/3 (2–3 m). Rim R7, ?V4 (3 g). Fabric SF 2. Colour: ext. dark brown: core and int. black. Condition: average-worn. TS14.

3.8.14 Context 303/1 (0–1 m). Simple upright out-turned rim R4 decorated with fingernail impressions (8 g). Fabric FA2. Colour: ext. brown: core grey: int. brown. Condition: average.

3.8.15 Context 303/1 (0–1 m). Neck (2 g). Fabric FA2. Colour: reddish-brown throughout. Condition: average.

3.8.16 Context 303/1 (0–1 m). Base (3 g) with finger dimples on the interior surface and flint gritting on the bottom surface. Fabric FA2. Colour: ext. brown: core grey: int. brown. Condition: average.

3.8.17 Context 303/1 (2–3 m). Simple upright rim R1, V1 (1 g). Smoothed surfaces. Fabric FA1. Colour: ext. brown: core and int. black. Condition: average.

3.8.18 Context 303/1 (2–3 m). Flared rim R9, V9 (2 g) with cabled decoration. Fabric FA1. Colour: ext. brown: core grey: int. brown. Condition: average.

3.8.19 Context 303/1 (2–3 m). Pointed everted rim R8, V5 (2 g). Fabric FA1. Colour: ext. brown: core grey: int. brown. Condition: average.

3.8.20 Context 303/1 (2–3 m). Simple squared rim R1 (3 g) decorated with an incised line. Fabric A1. Colour: yellowish-brown throughout. Condition: average-worn.

3.8.21 Context 303/1 (2–3 m). Body reused with notched edges (15 g). Fabric FA2. Colour: ext. reddish-brown: core and int. dark greyish-brown. Condition: worn.
3.8.22 Context 303/1 (2–3 m). Base B1 (14 g). Burnished exterior surface. Fabric FA2. Colour: dark grey throughout. Condition: average.
3.8.23 Context 303/1 (2–3 m). Base B3 (17 g). Fabric FA2. Colour: ext. reddish-brown: core grey: int. reddish-brown. Condition: average-worn.
3.8.24 Context 303/1 (4–5 m). Squared everted rim R7, V8 (4 g) with cabled decoration. Fabric FQ2. Colour: ext. greyish-brown: core and int. grey. Condition: average-worn.
3.8.25 Context 303/1 (4–5 m). Simple out-turned rim R4 (1 g). Fabric F2. Colour: ext. greyish-brown: core dark grey: int. brown. Condition: average.
3.8.26 Context 303/1 (4–5 m). Simple squared rim R1, V1 (2 g). Fabric A1. Colour: ext. and core grey: int. brown. Condition: average.
3.8.27 Context 303/1 (4–5 m). Simple rounded rim R2 (2 g). Fabric G2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.
3.8.28 Context 303/1 (4–5 m). Simple out-turned rim R4 (4 g) with cabled decoration. Fabric QA2. Colour: ext. brown: core grey: int. brown. Condition: average.
3.8.29 Context 303/1 (4–5 m). Simple out-turned rim R4, V9 (3 g). Fabric A1. Colour: dark grey throughout. Condition: average.
3.8.30 Context 303/1 (5–6 m). Neck (8 g). Fabric QA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: worn.
3.8.31 Context 303/1 (5–6 m). Rim of indeterminate form R13 (5 g). Fabric FQ2. Colour: grey throughout. Condition: worn.

Figure 3.9.1–18: context groups 1703 and 1803

3.9.1 Context 1703 (0 m). Pointed everted rim R8, V8 (3 g). Fabric FA1. Colour: ext. greyish-yellow: core grey: int. greyish-yellow. Condition: average.
3.9.2 Context 1703 (0–1 m). Squared everted rim R7 (3 g). Burnished on both surfaces. Fabric F1. Colour: ext. greyish-brown: core and int. grey. Condition: average.
3.9.3 Context 1703 (0–1 m). Simple rounded rim R2, V3 (5 g). Fabric FQ2. Colour: ext. yellowish-brown: core grey: int. brown. Condition: worn.
3.9.4 Context 1703 (0–1 m). Neck (6 g) with smoothed surfaces. Fabric S2 (includes some bone temper). Colour: grey throughout. Condition: average.
3.9.5 Context 1703 (0–1 m). Shoulder V3 (21 g). Fabric F2. Colour: ext. greyish-brown: core grey: int. brown. Condition: average.
3.9.6 Context 1703 (2–3 m). Hooked rim R10, V2 (7 g). Fabric F2. Colour: ext. dark brown: core grey: int. dark brown. Condition: average.
3.9.7 Context 1703 (2–3 m). Rim R4 (4 g). Fabric A1. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.
3.9.8 Context 1703 (2–3 m). Neck (5 g). Fabric FA2. Colour: ext. yellowish-brown: core and int. grey. Condition: average.
3.9.9 Context 1703 (2–3 m). Shoulder (4 g) with fingertip decoration. Fabric A1. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.
3.9.10 Context 1703 (2–3 m). Base B2 (12 g). Fabric FQ3. Colour: ext. yellowish-brown: core grey: int. black. Condition: worn.
3.9.11 Context 1703 (4–5 m). Flared rim R9 with cabled decoration (8 g). Fabric F2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.
3.9.12 Context 1703 (4–5 m). Simple rim R2, V5 and shoulder sherds with fingernail decoration (33 g). Fabric FQ2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average.
3.9.13 Context 1703 (6–7 m). Simple in-turned rim R11 (1 g). Fabric F2. Colour: dark grey throughout. Condition: average.
3.9.14 Context 1703 (6–7 m). Notched body reused (5 g). Fabric FQ2. Colour: grey throughout. Condition: worn.
3.9.15 Context 1703 (6–7 m). Base B2 (5 g). Fabric A1. Colour: reddish-brown throughout. Condition: average-worn.
3.9.16 Context 1703 (9–10 m). Squared everted rim R7 with burnished surfaces (3 g). Fabric F2. Colour: grey throughout. Condition: average.
3.9.17 Context 1803/1 (1–2 m). Pointed everted rim R8 (12 g) with fingernail decoration. Fabric FA2. Colour ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average.
3.9.18 Context 1803 (2–3 m). Flared rim R9 (5 g) with burnished surfaces. Fabric FA1. Colour: yellowish-brown throughout. Condition: average.

Figure 3.10.1–8: context group 2405

3.10.1 Context 2405/5. Hooked-rimmed jar V2 (415 g). Approx. 75% complete. Drilled hole possibly for repair. Smoothed interior surface, finger-wiped and grass-wiped exterior surface. Fabric FA2. Colour: ext. greyish-brown: core grey: int. greyish-brown. Condition: average.
3.10.2 Context 2405 (149/507). Beaded rim R6, V5 (3 g) and shoulder. Fabric FA1. Colour: greyish-brown throughout. Condition: average.
3.10.3 Context 2405 (149/511). Sherd broken at base angle (14 g). Fabric FA2. Colour: grey throughout. Condition: average.
3.10.4 Context 2405 (149/511). Rounded shoulder (5 g) with horizontally burnished surface. Fabric FQ2. Colour: dark grey throughout. Condition: average.
3.10.5 Context 2405 (151/509). Neck and shoulder from a globular vessel with highly burnished surfaces V6 (19 g). Fabric Q2. Very hard fired. Colour: ext. black: core grey: int. black. Condition: average.
3.10.6 Context 2405 (151/509). Large rounded shoulder V6 (44 g) with grass-wiped surface. Sooting on the exterior and charred residue on the interior. Fabric FQ2. Colour: ext. black: core grey: int. brownish-grey. Condition: average.
3.10.7 Context 2405 (151/509). Base with expanded foot B3 (4 g). Charred residue on interior surface. Fabric FA3. Colour: dark grey throughout. Condition: average.
3.10.8 Context 2405/5. Base B2 (12 g). Fabric A1.

Colour: ext. reddish-brown: core and int. black. Condition: average-worn.

Figure 3.11.1–14: context groups 2414 and 2409

3.11.1 Context 2414 (149/507). Flared rim R9, V9 (4 g). Fabric F3. Colour: grey throughout. Condition: average.

3.11.2 Context 2414 (151/507). Everted rim R8, V5 (6 g). Fabric F1. Colour: grey throughout. Condition: average.

3.11.3 Context 2414 (151/507). Everted rim R8, V5 (6 g) with impressed decoration on rim and sooted exterior surface. Fabric F1. Colour: grey to yellowish-brown throughout. Condition: average.

3.11.4 Context 2414 and 2409. Several refitting sherds from the same round-shouldered vessel (44 g). Cabled flared rim R9, V7. Sooting on exterior surface. Fabric F2. Colour: dark grey throughout. Condition: average.

3.11.5 Context 2414 (153/505). Expanded rim R12 (5 g). Dia. 200 mm. Fabric QA2. Colour: ext. brown: core and int. dark grey. Condition: average.

3.11.6 Context 2414 (153/503). Rounded shoulder with smoothed surfaces (15 g). Fabric QA2. Colour: ext. and core grey: int. dark grey. Condition: average.

3.11.7 Context 2414 (153/507). Squared everted rim R7 (4 g). Fabric A1. Colour: grey throughout. Condition: average.

3.11.8 Context 2414 (153/507). Rim and shoulder V5 (46 g). Fabric F1. Colour: grey throughout. Condition: average.

3.11.9 Context 2414 (153/507). Expanded flaring rim R9, V9 (8 g). Fabric A1. Colour: yellowish-grey throughout. Condition: average-worn.

3.11.10 Context 2414 (153/507). Base B2 (13 g). Burnished surfaces. Fabric Q2. Colour: grey throughout. Condition: average-worn.

3.11.11 Context 2414 (153/507). Base with slight protruding foot B3 (30 g). Finger-dimple impressions around base. Smoothed surfaces. Dia. 140 mm. Fabric QA2. Colour: grey throughout. Condition: average.

3.11.12 Context 2409. Base with slight protruding foot B3 (7 g). Fabric FA2. Colour: ext. greyish-brown: core grey: int. dark grey. Condition: average.

3.11.13 Context 2409 (151/507). Shoulder (13 g). Some surface loss. Sooting on exterior surface. Fabric F2. Colour: grey throughout. Condition: average-worn.

3.11.14 Context 2409 (151/507). Flaring rim R9, V9 (13 g) with cabled decoration. Fabric QA2. Colour: ext. greyish-brown: core and int. grey. Condition: average.

Figure 3.12.1–25: context groups 2403 and 2402

3.12.1 Context 2403 (top of layer). Simple squared rim R1 (11 g) broken at the shoulder. Fabric F2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: worn.

3.12.2 Context 2403 (top of layer). Neck (6 g) with grass-wiped exterior surface. Fabric QA2. Colour: grey throughout. Condition: average-worn.

3.12.3 Context 2403 (top of layer). Rounded shoulder (5 g). Fabric F1. Colour: ext. brown: core and int. black. Condition: average.

3.12.4 Context 2403 (153/495). Upright pointed rim R3 (4 g). Fabric FQ2. Colour: ext. grey to reddish-brown: core and int. grey. Condition: average-worn.

3.12.5 Context 2403 (153/499). Rounded angular shoulder (7 g). Fabric A1. Colour: grey throughout. Condition: average.

3.12.6 Context 2403 (153/495). Shoulder with fingertip impressions (9 g). Fabric FA2. Colour: ext. reddish-brown: core grey: int. greyish-brown. Condition: average.

3.12.7 Context 2403 (153/499). Large sherd broken at base angle with finger dimples around the base (37 g). Fabric F2. Colour: ext. reddish-brown: core and int. grey. Condition: average.

3.12.8 Context 2403 (153/501). Upright rounded rim R2 (4 g). Fabric FA2. Colour: ext. brown: core grey: int. greyish-brown. Condition: average-worn.

3.12.9 Context 2403 (153/501). Upright squared rim R1 (5 g). Fabric FA1. Colour: ext. brown: core grey: int. yellowish-brown. Condition: average-worn.

3.12.10 Context 2403 (153/501). Base B2 (17 g). Fabric FQ2. Colour: ext. and core grey: int. brown. Condition: average.

3.12.11 Context 2403 (153/501). Shoulder. Fabric Q2. Colour: ext. and core grey: int. dark grey. Condition: average-worn.

3.12.12 Context 2403 (155/503). Flared rim R9, V9 (3 g) with fingertip decoration. Fabric FA2. Colour: ext. reddish-brown: core grey: int. reddish-brown. Condition: average.

3.12.13 Context 2403 (155/503). Everted rim R8 (2 g). Fabric FA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.

3.12.14 Context 2403 (155/503). Hooked rim R10 (3 g) probably from a jar V2. Fabric A1. Colour: ext. and core greyish-brown: int. yellowish-brown. Condition: average.

3.12.15 Context 2402 (153/495). Simple squared rim R1 (2 g). Fabric FA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.

3.12.16 Context 2402 (153/495). Upright pointed rim R3, V5 with smoothed surfaces (5 g). Fabric QA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average.

3.12.17 Context 2402 (153/495). Simple squared rim R1, V1 (3 g) with grass-wiped surfaces. Fabric F1. Colour: black throughout. Condition: average.

3.12.18 Context 2402 (153/495). Base with protruding foot B3 (25 g). Finger-dimple impressions around foot. Fabric F2. Colour: ext. reddish-brown: core grey: int. greyish-brown. Condition: average-worn.

3.12.19 Context 2402 (153/497). Simple squared rim R1 (2 g). Fabric GF2. Colour: ext. brown: core grey: int. brown. Condition: average.

3.12.20 Context 2402 (153/497). Squared everted rim R7 (7 g). Fabric FA2. Colour: ext. brown: core grey: int. brown. Condition: average.

3.12.21 Context 2402 (153/497). In-turned rim R10 (4 g). Fabric QA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: worn.

3.12.22 Context 2402 (153/497). Rounded shoulder (9 g). Fabric FA2. Colour: ext. brown: core grey: int. brown. Condition: average.
3.12.23 Context 2402 (153/499). Squared slightly everted rim R7, V8 (15 g) with cabled decoration. Fabric FA2. Colour: grey throughout. Condition: worn.
3.12.24 Context 2402 (153/499). Angular shoulder (5 g). Fabric QA1. Colour: ext. brown: core and int. grey. Condition: average.
3.12.25 Context 2402 (153/503). Flared rim R9, V9 (5 g). Fabric FA2. Colour: ext. and core grey: int. yellowish-grey. Condition: average-worn.

Figure 3.13.1–25: context group 2505 (A–C)

3.13.1 Context 2505/A/1. Flared rim R9, V9 (4 g) with fingertip decoration. Fabric F2. Colour: ext. brown: core and int. black. Condition: average.
3.13.2 Context 2505/A/1. Angular shoulder (11 g). Fabric F3. Colour: ext. brown: core and int. grey. Condition: average.
3.13.3 Context 2505/A/1. Base B3 (18 g). Fabric F2. Colour: ext. reddish-brown: core grey: int. black. Condition: average.
3.13.4 Context 2505/A/2. Flared rim R9, V9 (4 g). Fabric Q2. Colour: ext. brown: core grey: int. greyish-brown. Condition: average.
3.13.5 Context 2505/A/2. Flared rim R9, V9 with cabled decoration (5 g). Fabric Q2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.
3.13.6 Context 2505/A/2. Indeterminate rim with fingertip decoration (3 g). Fabric Q2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.
3.13.7 Context 2505/A/2. Flared rim R9, V9 (4 g). Fabric G2. Colour: grey throughout. Condition: worn.
3.13.8 Context 2505/A/2. Simple out-turned squared rim R4 (4 g). Fabric F1. Colour: black throughout. Condition: average-worn.
3.13.9 Context 2505/A/2. Simple in-turned rim R5, V4 (3 g) from a bipartite vessel. Smoothed surfaces. Fabric G2. Colour: black throughout. Condition: average.
3.13.10 Context 2505/A/2. Large shoulder V5 (46 g) decorated with diagonal fingertip impressions. Interior carries oblique finger moulding. Neck and interior have grass-wiped surfaces. Fabric F2. Colour: ext. black and yellowish-brown: core black: int. brown to black. Condition: average.
3.13.11 Context 2505/A/3. Angular shoulder (6 g) with smoothed surfaces. Fabric F1. Colour: grey throughout. Condition: average.
3.13.12 Context 2505/B/1. Squared everted rim R7, V8. Fabric F2. Colour: dark grey throughout. Condition: average.
3.13.13 Context 2505/B/2. In-turned rim R5 (7 g) with cable decoration. Fabric F2. Colour: dark grey throughout. Condition: average.
3.13.14 Context 2505/B/2. Rim and shoulder from a large decorated jar (68 g). Rim is squared everted R7, V5, and cable decorated. The shoulder has fingertip impressions. The neck has been wiped and the interior has vertical finger marks. Rim Dia. 260 mm. Fabric F2. Colour: ext. brown: core grey: int. dark grey. Condition: average.
3.13.15 Context 2505/B/2. Pointed everted rim R8 (4 g) which is decorated with fingertipping. Fabric FA2. Colour: ext. brown: core grey: int. brown. Condition: average.
3.13.16 Context 2505/B/2. Rounded slack shoulder (5 g) with fingernail impressions. Fabric Q2. Colour: dark grey throughout. Condition: average.
3.13.17 Context 2505/B2. Three shoulder sherds (34 g) from the same vessel decorated with fingertip impressions. Fabric QA2. Colour: ext. brown: core grey: int. brown. Condition: average.
3.13.18 Context 2505/B/2. Base with protruding foot B3 (21 g). Fabric F3 (the fabric contains calcined flint as well as gravel flint). Colour: ext. reddish-brown: core grey: int. reddish-brown. Condition: worn.
3.13.19 Context 2505/B/2. Base (5 g) with protruding foot B3. Fabric QA3. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average.
3.13.20 Context 2505/B/2. Base B2 (22 g). Dia. 120 mm. Fabric F2. Colour: ext. dark brown: core and int. dark grey. Condition: average.
3.13.21 Context 2505/B/3. Base with protruding foot B3 and with flint gritting on basal surface (22 g). Dia. 120 mm. Fabric F2. Colour: ext. brown: core black: int. reddish-brown. Condition: average.
3.13.22 Context 2505/C/1. Slightly flared rim R9, V9 (9 g) with cabled decoration. Fabric QA2. Colour: ext. yellowish-brown: core grey: int. reddish-brown. Condition: worn.
3.13.23 Context 2505/C/1. Beaded rim R6, V5 and shoulder (5 g). Fabric A1. Colour: ext. reddish-brown: core grey: int. reddish-brown. Condition: worn.
3.13.24 Context 2505/C/1. Pointed everted rim R8, V8 (3 g). Fabric QA2. Colour: grey throughout. Condition: worn.
3.13.25 Context 2505/C/2. Beaded rim R6 (3 g) with smoothed surfaces. Fabric FQ2. Colour: ext. reddish-brown: core and int. grey. Condition: average.

Figure 3.14.26–47: context group 2505 continued (C–D)

3.14.26 Context 2505/C/2–3, 2506/2. Three neck sherds (54 g) with cabled cordon from the same vessel. Fabric Q2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average.
3.14.27 Context 2505/C/3. Three sherds including a rounded shoulder (40 g) with fingertip impressions all from the same vessel V5. Fabric F2. Colour: ext. reddish-brown: core and int. grey. Condition: average.
3.14.28 Context 2505/C/2. Two slightly flaring rim sherds R9, V9 (22 g) with cabled decoration. Fabric F2. Colour: ext. dark brown: core grey: int. reddish-brown. Condition: average.
3.14.29 Context 2505/C/2. Neck and shoulder V5 (12 g). Fabric F2. Colour: ext. yellowish-brown: core and int. grey. Condition: average.
3.14.30 Context 2505/C/2. Indeterminate rim (2 g),

possibly flared. Smoothed surfaces. Fabric F2. Colour: grey throughout. Condition: average.

3.14.31 Context 2505/C/2. Rounded everted rim R8, V5 (4 g) broken above the shoulder. Fabric FQ2. Colour: black throughout. Condition: average.

3.14.32 Context 2505/C/3. Slack shoulder (9 g) with impressed decoration. Fabric QA2. Colour: ext. dark grey: core and int. grey. Condition: average.

3.14.33 Context 2505/C/3. Base with protruding foot B3 (22 g) with flint gritting on basal surface. Fabric Q1. Colour: yellowish-brown throughout. Condition: average.

3.14.34 Context 2505/D/2. Everted pointed rim R8, V4 (2 g) probably from a bipartite vessel. Fabric A1. Colour: ext. brown: core grey: int. brown. Condition: worn.

3.14.35 Context 2505/D/2. Rounded shoulder V5 (13 g) with fingertip decoration. Fabric QA2. Colour: ext. brown: core and int. grey. Condition: average.

3.14.36 Context 2505/D/3. Rounded everted rim R8 (4 g). Burnished surfaces. Fabric FA1. Colour: grey throughout. Condition: average.

3.14.37 Context 2505/D/3. Rounded shoulder (10 g) with wiped surface. Fabric FA2. Colour: ext. and core dark grey: int. dark brownish-grey. Condition: average.

3.14.38 Context 2505/D/3. Rounded shoulder V7 (8 g) with fingertip decoration. Fabric F2. Colour: grey throughout. Condition: worn.

3.14.39 Context 2505/D/3. Pointed everted rim R8 (3 g). Fabric A1. Colour: ext. and core dark grey: int. brown. Condition: average.

3.14.40 Context 2505/D/3. Beaded rim R6 (6 g). Fabric FA1. Colour: ext. brown: core grey: int. brown. Condition: average.

3.14.41 Context 2505/D/3. Expanded rim R12 (2 g) with impressed decoration. Fabric FA2. Colour: yellowish-brown throughout. Condition: average.

3.14.42 Context 2505/D/3. Simple squared rim (3 g) with cabled decoration. Fabric F2. Colour: ext. yellowish-grey: core and int. grey. Condition: worn.

3.14.43 Context 2505/D/3. Flared rim R9, ?V9 (3 g) with cabled decoration. Fabric FA2. Colour: ext. yellowish-grey: core and int. grey. Condition: average.

3.14.44 Context 2505/D/3. Rounded shoulder (7 g). Fabric FA2. Colour: ext. and core brown: int. grey. Condition: worn.

3.14.45 Context 2505/D/3. Rounded shoulder (2 g) with fingertip decoration. Fabric F2. Colour: ext. brown: core and int. grey. Condition: worn.

3.14.46 Context 2505/D/3. Base B2 (9 g). Fabric QA2. Colour: ext. yellowish-grey: core grey: int. yellowish-grey. Condition: average.

3.14.47 Context 2505/D/3. Base B2 (8 g). Fabric F2. Colour: grey throughout. Condition: average.

Figure 3.15.48–59: context group 2505 continued (D–E)

3.15.48 Context 2505/D/2–4. Rim R9, V9, neck and shoulder from a large vessel (202 g). The rim is flared with cabled decoration. The neck carries an applied cordon with fingertip impressions. Rim Dia. 350 mm. Fabric FQ3. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average-worn.

3.15.49 Context 2505/D/4. Four rim R9, V9 and neck sherds (49 g) probably from the same vessel. Rim is cabled and the neck has a plain cordon. Fabric FQ2. Colour: ext. grey: core dark grey: int. grey. Condition: worn.

3.15.50 Context 2505/D/4. Flaring rim R9, V9 (13 g) with cabled decoration. Sooting on exterior surface. Fabric QA2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: average.

3.15.51 Context 2505/D/4. Rim and shoulder V9 (14 g). Rim is cabled and expanded and slightly flared. Shoulder has fingertip impressions. Fabric FQ2. Colour: ext. reddish-brown: core grey: int. yellowish-brown. Condition: average.

3.15.52 Context 2505/D/4. Base with slight protruding foot B3 (13 g). Fabric FQ2. Colour: ext. reddish-brown: core and int. dark grey. Condition: average.

3.15.53 Context 2505/E/1. Simple rounded rim R2 (2 g). Fabric QA2. Colour: ext. yellowish-brown: core grey: int. black. Condition: worn.

3.15.54 Context 2505/E/1. Neck (2 g). Fabric F2. Colour: ext. brown: core black: int. brown. Condition: average.

3.15.55 Context 2505/E/1. Angular shoulder V5 (6 g). Smoothed surfaces. Fabric QA2. Colour: grey throughout. Condition: average.

3.15.56 Context 2505/E/2. Two base sherds B2 (40 g). Dia. 80 mm. Fabric F2. Colour: ext. brown: core and int. black. Condition: average.

3.15.57 Context 2505/E/3. Rim R8, V5, and shoulder (17 g) from a bipartite jar. Smoothed surfaces. Fabric FA2. Colour: ext. and core grey: int. dark grey. Condition: average.

3.15.58 Context 2505/E/3. Simple upright rounded rim R2, V9 (3 g). Fabric QA2. Colour: grey throughout. Condition: worn.

3.15.59 Context 2505/E/3. Simple upright squared rim R1 (6 g). Fabric F2. Colour: grey throughout. Condition: average.

Figure 3.16.60–7: context group 2505 continued (E)

3.16.60 Context 2505/E/3. Base B2 (26 g). Fabric FQ2. Colour: ext. reddish-brown: core and int. grey. Condition: average-worn.

3.16.61 Context 2505/E/4. Base with protruding foot B3 (10 g). Fabric F2. Colour: ext. yellowish-brown: core grey: int. black. Condition: average-worn.

3.16.62 Context 2505/E/4. Everted squared rim R7, V8 (6 g) decorated with cabling. Fabric F2. Colour: ext. yellowish-grey: core and int. grey. Condition: average.

3.16.63 Context 2505/E/4. Flaring rim R9, V9 (11 g) broken at neck. Smoothed surfaces. Fabric QA2. Colour: ext. yellowish-grey: core grey: int. yellowish-grey. Condition: average.

3.16.64 Context 2505/E/4. Rim and shoulder (13 g) from a globular vessel V6. Rim is rounded and everted with fingernail decoration. Smoothed surfaces. Fabric FA2. Colour: ext. reddish-brown: core grey: int. brown. Condition: average.

3.16.65 Context 2505/E/4. Neck and shoulder (6 g). Fabric FA2. Colour: ext. yellowish-brown: core and int. grey. Condition: worn.
3.16.66 Context 2505/E/4. Rounded shoulder (22 g). Fabric FA2. Colour: ext. yellowish-brown: core and int. grey. Condition: average.
3.16.67 Context 2505/E/4. Rounded shoulder (25 g) with fingertip impressions. Wiped outer surface. Fabric FQ3. Colour: ext. reddish-brown: core and int. dark grey. Condition: average.

Figure 3.17.1–15: context groups 2604–5, 2703 and 2705

3.17.1 Context 2604/1. Slightly in-turned rim R10, V2 (5 g). Fabric F2. Colour: ext. yellowish-brown: core grey: int. yellowish-brown. Condition: worn.
3.17.2 Context 2604/1. Out-turned squared rim R4 (2 g). Fabric FA2. Colour: grey throughout. Condition: average.
3.17.3 Context 2605/1. Neck (14 g) with fingertip decoration. Fabric F2. Colour: ext. reddish-brown: core grey: int. reddish-brown. Condition: average.
3.17.4 Context 2605/2. Simple upright and in-turned rim (2 g). Fabric Q1. Colour: ext. black: core grey: int. black. Condition: average.
3.17.5 Context 2605/2. Simple base B2 (22 g). Fabric FQ3. Colour: ext. reddish-brown throughout. Condition: worn.
3.17.6 Context 2605/3. Simple pointed everted rim R8, V5 (11 g) from a slack-shouldered vessel. Fabric F1. Colour: dark grey throughout. Condition: worn.
3.17.7 Context 2605/3. Simple rounded everted rim R8 (10 g). Fabric F2. Colour: grey throughout. Condition: worn.
3.17.8 Context 2605/3. Neck (6 g) from an angular possibly carinated and tripartite vessel V10. Fabric Q2. Colour: grey throughout. Condition: worn.
3.17.9 Context 2705/3. In-turned rim (6 g) decorated with impressed finger dimples. Fabric F2. Colour: grey throughout. Condition: worn.
3.17.10 Context 2705/1. Refitting rim R8 and shoulder (15 g) possibly from a small cup or bowl V5. Fabric F2. Colour: dark grey throughout. Condition: average.
3.17.11 Context 2705/2. Rim R8, V3 and shoulder from a slack-shouldered vessel (21 g). Fabric F2. Colour: ext. greyish-brown: core grey: int. greyish-brown. Condition: average-worn.
3.17.12 Context 2705/3. Rounded everted rim R8 (22 g). Fabric Q2. Colour: reddish-brown throughout. Condition: worn.
3.17.13 Context 2705/4. Expanded rim R12, V8 and shoulder from an angular jar (36 g). Fabric F2. Colour: dark grey throughout. Condition: average.
3.17.14 Context 2705/4 and 2605/3. Two shoulder sherds probably from the same vessel (17 g). Fabric F2. Colour: dark grey throughout. Condition: average.
3.17.15 Context 2705/4. Shoulder (19 g). Smoothed surfaces. Fabric F2. Colour: ext. yellowish-brown: core and int. dark grey. Condition: worn.

IRON AGE AND ROMAN POTTERY

by Paul Booth

Only 11 sherds (38 g) of Iron Age and Roman pottery were recovered. A single context (1703) contained five sherds (17 g) in a variety of fabrics, tempered principally with sand, flint, shell and uncertain white inclusions (two examples). There were no diagnostic features among this group and they cannot be dated more closely than to the Iron Age. The remaining sherds, all Roman, were in the following ware groups (defined by the OAU pottery recording system, further details of which may be found in the site archive):

E20 'Belgic type' ware, principally fine sand inclusions: 1 sherd.
R10 General fine reduced coarsewares: 2 sherds.
R30 General medium sandy reduced wares: 3 sherds.

Again there were no diagnostic pieces. While fabrics such as R30 have a wide date range it is possible that all this material was of 1st–2nd-century date, with a 1st-century date being certain for fabric E20. The very small average size of both Iron Age and Roman sherds suggests a high degree of redeposition and probably does not indicate domestic activity at the site.

POST-ROMAN POTTERY

by Lucy Whittingham

A small quantity of later pottery was recovered. This material is summarised here, but further details may be found in the site archive; the methodology employed is described in Chapter 5. Four undiagnostic, small hand-built sherds are of indeterminate date. One sherd with quartz, organic and calcareous temper is possibly early/middle Saxon, but the three vesiculated sherds with possible fibrous gypsum/calcite inclusions are of unknown date or provenance. One small copper-glazed sherd of Brill/Boarstall (OXAM) pottery was recovered from context 1703.

FIRED CLAY

by Alistair Barclay

Introduction and methods

A total of 72 pieces (397 g) of fired clay were recovered from the excavations. A spindlewhorl fragment and some structural clay are the only diagnostic pieces, while most of the assemblage comprises amorphous fragments.

The material was quantified by number of fragments and weight (Table 3.19). The assemblage is divided into broad fabric types. Although there is evidence for metalworking from the site no crucible or mould fragments were found among the assemblage.

Table 3.19 Summary of all fired clay (number of fragments, weight)

Trench	Context	Fabric	Object	Daub	Amorphous
I	103/1 2–3 m	1			2, 10 g
	103/2 0–1 m	2			1, 7 g
	103/3 0–1 m	1			4, 12 g
	103/4	2			1, 9 g
II	203 1.5–2 m	1			1, 4 g
	203/3 2–3 m	2		2, 2 g	
	203/4	1			2, 2 g
III	303/2	3			1, 10 g
XVII	1703 0–1 m	4		20, 103 g	
	1703 2–3 m	4			3, 25 g
	1703 4–5 m	2			3, 5 g
XVIII	1803/1 1–2 m	4			4, 27 g
	1803 4–5 m	4			6, 17 g
	1803 8–9 m	4			1, 20 g
XXIV	2402	5			1, 1 g
	2402 153/495	5			1, 1 g
	2402 153/499	5			4, 5 g
	2403 153/495	2			1, 3 g
	2403 153/499	2			1, 3 g
	2403/2 153/505	2			1, 1 g
	2411/A 153/495	3			1, 3 g
	2414 149/507	3		2, 46 g	
	2414 153/505	3			1, 11 g
XXV	2505/B/2	1			1, 5 g
	2505/C/1	1		1, 45 g	
	2505/C?3	3			1, 2 g
	2505/E/2	2			1, 2 g
	2505/E/4	6	1, 3 g		
XXVI	2605/1	1			2, 4 g
XXVII	2705/4	3			1, 9 g
Total			1, 3 g	25, 196 g	46, 198 g

Fabrics

1. Soft fabric with a silty texture with no inclusions.
2. Soft fabric with a sandy texture which is either fine or coarse.
3. Soft fabric with calcareous grit inclusions (gravel and fossil shell).
4. Soft fabric with calcareous grit and sand inclusions.
5. Soft fabric with very sparse fine (<1 mm) flint.
6. Hard fabric with moderate medium (<3 mm) angular flint inclusions = pottery fabric F2.

Six different fabrics have been identified. Most of these can be described as unmodified clay, and with the exception of fabric 6 none had added inclusions. Fabrics 1–4 had been used as structural daub, while fabric 6, which equates to pottery fabric F2, was used to make the spindlewhorl.

Objects

The only recognisable object is a small fragment from a spindlewhorl of bipartite form (not illustrated). This was manufactured from the pottery fabric F2. The fragment is of similar form to examples published by Thomas *et al*. (1986) from the site that were also manufactured from flint-tempered fabrics.

Structural clay

A total of 26 (196 g) fragments of structural clay were recovered. Small quantities of this material came from trenches II, XVII, XXIV and XXV (see Fig. 2.10, Table 3.19). All the structural clay had been fired usually to a reddish-brown colour, although some was yellowish-brown. A number of pieces had single flat surfaces and two fragments had wattle impressions (contexts 1703 0–1 m and 203/3 2–3 m). This type of structural clay probably comes from oven structures rather than the walls of buildings. None of this material was recovered from *in situ* structures.

Amorphous fragments

The majority of the fired clay consisted of amorphous fragments (46, 198g). This material was mostly oxidised reddish-brown and was found in many of the excavation trenches (see Fig. 2.10, Table 3.19).

Discussion

Both amorphous and structural fired clay was found in many of the excavated trenches, although never in large quantities and the only significant deposit was the structural clay from trench XVII. Most of the fired clay was recovered as relatively small amorphous fragments which seldom weighed more than 20 g. Figure 2.10j illustrates that although the distribution covers much of the island the relative density was very low. The location of the spindlewhorl fragment from trench XXV is of interest, as a total of four others – recovered either from excavation (two from 1959, one from 1951) or the collapsed riverbank (one example) – have been found in approximately the same area of the eyot (Thomas *et al*. 1986, 191).

The range of fired clay from the 1985 and 1991 excavations is typical for a late Bronze Age site in the Upper Thames Valley. Both metalworking debris (crucibles and moulds) and loomweights are notably absent from this assemblage and to date have not been found at the site (cf. Thomas *et al*. 1986). Thomas *et al*. publish a range of spindlewhorls including one decorated example and a piece of moulded clay that is likely to derive from a structure such as an oven (1986, 191 and fig. 5.6–10), and this evidence complements the small assemblage under discussion here. In summary, the fired clay assemblage from the site indicates the use of clay ovens, although none of this material has ever been found *in situ*. The five spindlewhorls provide evidence for the production of textiles.