Chapter 4: Later Prehistoric and Roman Finds (Phases 3 and 4)

Middle to late Iron Age pottery *Jane Timby*

Introduction and methodology

The archaeological work at Kingshill resulted in the recovery of approximately 675 sherds of later prehistoric pottery, weighing 27.1 kg. The assemblage was extremely poorly preserved with an overall average sherd size of just 4 g. Pottery was recorded from some 109 individual contexts, many of which produced fewer than five sherds.

The assemblage was sorted into fabric groups based on the principal inclusions present and further sub-divided on the basis of the size and frequency of the inclusions, following the recommended guidelines for the analysis of later prehistoric pottery (PCRG 1997). Very small crumbs were counted and weighed only. The sorted sherds were quantified by count and weight for each recorded context. Details such as surface finish, was noted along with evidence for use in the form of sooting, residues or leaching.

Description of fabrics and forms

Five basic ware groups were identified: calcareous, sandy with limestone/shell, flint, Malvernian rock, and grog-tempered. Three of the groups are further sub-divided giving a total 14 defined fabrics (Table 6). The commonest group is the calcareous wares including fossil shelly wares and Jurassic oolitic limestone-tempered wares, with varying quantities of fossiliferous matter, both fabrics occurring in various grades and mixtures. In addition the calcareous group contained Palaeozoic-limestone and calcite-tempered wares.

Overall calcareous wares (Jurassic source limestone and shelly wares) account for 66% by count, 76.8% by weight of the total later prehistoric assemblage. Most or all of these wares could have been locally made. The Palaeozoic limestone-tempered wares are imports to the site probably originating from the area of May Hill, the Woolhope Hills or Glass house Hill, south of Newent on the other side of the Severn. These sherds account for 14.1% by count (8.8% by weight). More imports to the site are the flint-tempered wares which account for 1.5% by count (6.7% by weight), the Malvernian sandstone-tempered group, representing 11.3% by count (5.4% by weight), and the Malvernian rock-tempered represented by a single sherd. The local mixed sandy with calcareous wares account for just 0.7% by count (0.5% by weight), while the grog-tempered wares contribute less than 1%.

Calcareous/shelly

SH1: a moderate to common frequency of coarse fossil shell and very sparse fossiliferous matter. Shell fragments up to 5 mm.

Table 6: Middle-late Iron Age pottery (sherd count & weight)

	Fabric	*Description*	*No*	*No %*	*Wt*	*Wt %*
Calcareous	SH1	coarser fossil shell	5	0.7	58	2.1
	SH2	finer sparser shell	5	0.7	57	2.1
	SH3	very dense fine shell/limestone	5	0.7	38	1.4
	CA	mainly calcite	5	0.7	10	0.4
	L1	dense limestone and fossil shell	250	37.0	1046.5	38.6
	L2	mainly oolitic limestone, some fossil	88	13.0	461	17.0
	L3	mixed shell/fossil and oolitic limestone	100	14.8	408.5	15.1
	L00	miscellaneous limestone	2	0.3	3	0.1
	MALREB	Palaeozoic limestone-tempered	95	14.1	239	8.8
Sandy/calcareous	SALI	sandy with limestone/shell	5	0.7	13	0.5
Flint	FL	calcined flint-tempered	10	1.5	181	6.7
Malvernian	MAL RE A	Malvernian rock-tempered	1	0.1	17	0.6
	MAL RE C	Malvernian sandstone-tempered	76	11.3	147	5.4
Grog (LIA)	GR	grog-tempered	6	0.9	21	0.8
CRUMBS	OO	undiagnostic small crumbs	22	3.3	12	0.4
TOTAL			675	100.0	2712	100.0

SH2: a sparse to common frequency of predominantly fossil shell fragments finer than 5 mm.
SH3: sparse fine fossil shell fragments in a very calcareous clay matrix which at x20 magnification contains a fine admixture of very fine shell and limestone.
L1: common to moderate frequency of ill-sorted limestone and fossiliferous matter including fragments of bryozoa, shell and other detritus.
L2: Common to abundant frequency of oolitic limestone, mainly as discrete ooliths and rarely as a conglomerate. Very occasional fossiliferous matter is also present. Mainly fine (less than 2 mm).
L3: Common inclusions of oolitic limestone with a mixture of shell and other fossiliferous detritus 2 mm in a fine calcareous matrix.
CA: calcite-tempered ware. A sparse to moderate frequency of calcite in crystalline form. The source of this ware is not known, possible contenders being the Malvernian area or the Mendips (cf. Allen 1998).
MAL RE B: Palaeozoic limestone-tempered ware (Peacock 1968, fabric B). The likely source of the clays used for this ware are within the Woolhope limestone series (Morris 2005), which outcrops south of the Malverns in the May Hill area, Glasshouse Hill and the Woolhope Hills (Worssam *et al*. 1989).
SALI: sandy, slightly micaceous ware with rounded quartz ($ 0.5 mm) and sparse limestone, some as ooliths or voids (up to 2mm) and/or fossil shell fragments.

Non-calcareous

FLINT: a generally black compact, hard fabric with a red-brown or grey interior tempered with a sparse to moderate frequency of crushed, calcined, angular flint.
MAL RE A (Peacock 1968, fabric A; Tomber and Dore 1998, 147). Metamorphic/ igneous rock-tempered ware originating from the Malvern Hills.
MAL RE C (Peacock 1968, fabric C) Malvernian/ Forest of Dean sandstone-tempered ware. A black ware with a brownish exterior and quite a compact, gritty textured fabric. The paste contains a rare scatter of fine quartz sandstone inclusions 1–2 mm in size and sparse sub-angular quartz and rare limestone.
GROG: a usually brown, occasionally black, ware with a soapy feel containing a sparse to moderate frequency of sub-angular to rounded grog /clay pellets. Equivalent of Cirencester fabric C (Williams 1982, 201).

Vessel forms

Most of the assemblage was very fragmentary, making it difficult to confidently ascribe rims to forms. All the pots were handmade with unfinished, smoothed, or more rarely burnished, finishes. Only 17 rim fragments were recorded and most of these were too small to measure or identify to overall form shape. The only decoration present is some slight finger-tipping on one vessel rim (Fig. 34.4). Most of the rims come from vessels in the calcareous group with two in fabric MAL RE B, single examples in fabric MAL RE A and the grog-tempered ware.

Amongst the featured sherds are some barrel-shaped vessels with in-turned rims (Fig. 34.6), smooth globular-profiled jars or bowls with simple rims (Fig. 34.1-3) and vessels with flaring rims (Fig. 34.5, 7). These vessels are all typical of middle Iron Age forms and can be paralleled, for example, amongst middle Iron Age assemblages from sites to the east within the Cotswold Water Park, and the Upper Thames Valley and to the west (see below for discussion of contemporary sites). Two joining sherds from pit 8747 possibly base sherds come from an uncertain form with a central opening.

Evidence of use

Evidence for use was observed on a number of vessels in terms of external sooting or burnt internal residues and interior surface pitting where calcareous inclusions have been leached out. No limescale deposits were observed. All the deposits were on calcareous wares with five examples with internal sooted residues and six with external sooting. Five of these eleven sherds came from pit 8851.

Dating

Dating the assemblage is slightly problematic due to the very small sizes of the individual feature assemblages and of the degraded state of the sherds themselves. As noted by Morris (2005, 136), any ceramic phasing has to be based on an established minimum quantity of material generally accepted to be around 25 sherds. On this basis just eight of the Kingshill features qualify: seven pits (8311, 8320, 8382, 8655, 8851, 8901 and 8988) and one ditch (8419, group 8425). It is clear that there are a small number of redeposited sherds present dating to the earlier prehistoric period. The absence of any decorated wares, carinated or angular forms or obvious early Iron Age rim forms along with the coarser shell-tempered wares more typical of this period suggests that there was no earlier Iron Age activity at the site. The featured sherds are indicative of a middle-late Iron Age phase of occupation. Both the Malvernian rock-tempered (MAL RE A) and Palaeozoic limestone-tempered wares (MAL RE B) were in circulation from the middle Iron Age period, continuing with little evident technological change into the early Roman period. There is surprisingly very little sandy ware with limestone and no sandy wares proper which feature on most other middle Iron Age sites in the region. Conversely there is a much higher proportion of Palaeozoic limestone-tempered ware and flint-tempered ware compared

with most middle Iron Age and middle-late Iron Age sites in the Cotswold Water Park. At many sites in Gloucestershire where there is a late Iron Age-early Roman transition, there is clear evidence of an increasing presence of grog-tempered wares from the early 1st century AD alongside with Palaeozoic limestone-tempered wares.

Phase 3

Just over 50% of the later prehistoric assemblage came from contexts allocated to Phase 3. Within this group Jurassic source calcareous wares very much dominate, accounting for 88.8% by count. There were 17 sherds of sandstone-tempered ware, all from pit 8771 and thus likely to be from one vessel. Single sherds of MAL RE B and flint-tempered ware are present.

Phase 4

Only four sherds of MAL RE B were recovered from posthole 8731 (group 8563) in Phase 4a. A single flint-tempered sherd was recovered from Phase 4b. Slightly more significant amounts of pottery were recovered from Phases 4c and 4d (125 and 115 sherds respectively) and were either residual or demonstrate continued currency of the pottery in the 1st century AD. MAL RE B wares account for 40% of the assemblage from 4c and 14% of the assemblage from 4d, the latter being slightly skewed by a 59 small sherds of MAL RE C. Small quantities of both flint and grog-tempered ware are also present in both. At least one feature in Phase 4c, pit 8830, is likely to be early Roman. Of the contexts allocated to Phase 4c – ditches 8268 (group 8255), 8421 and 8419 (both in group 8425), along with pit 8829 – all contain small quantities of grog-tempered ware and are thus likely to date to the 1st century AD. Similarly in Phase 4d the later prehistoric wares appear in a number of early Roman pits (8747, 8741, 8752, 8887 and 8900) when the ware may well have still been in circulation.

Affinities

The composition of the assemblage differs slightly from other known middle Iron Age sites nearby. Immediately to the south-east along the A419 is the site of a middle Iron Age enclosure at Preston, and slightly beyond is a second enclosure at Ermin Farm (Mudd *et al*. 1999b). The early-middle Iron Age assemblage from Preston is dominated by Jurassic limestone-tempered wares with a very small number of sandy wares but no clear regional imports (Timby 1999, table 7.7). The dominant fabric at Preston (L2) equates with L1 here. A similar range of wares was documented from Ermin Farm (Timby 1999, table 7.8) where again, apart possibly from a few sandy wares, there are no regional imports. By contrast the middle-late Iron Age site at Highgate House near Birdlip to the north-west of Cirencester had an assemblage dominated by sherds of MAL REB (57.8% by count) accompanied by a range of Jurassic limestone wares and a few sherds of MAL RE A. This might suggest an influx of MAL RE B to this area in the later part of the Iron Age.

Pottery from a number of other middle Iron Age sites within the Cotswold Water Park has been studied over recent years, notably Shorncote Quarry (Brossler *et al*. 2002); Eysey Farm (Timby 2008), Dryleaze Farm (Timby 2010) and Horcott (Harrison and Timby 2004). These appear to show a typical progression from a dominance of local calcareous wares in the early Iron Age accompanied by increasing numbers of sandier wares moving into the middle Iron Age. Generally speaking, most of the assemblages are plain with a small number of exceptions. Moving through the middle Iron Age into the late Iron Age, the assemblages start to diversify with a number of regional imports reaching the sites; glauconitic sandy wares, flint-tempered wares and the various Malvernian area wares demonstrating an expansion of trading networks at this time. The apparent absence of the transition into the sandier wares at Kingshill could conceivably indicate either a slight hiatus or shift in occupation during the latter part of the middle Iron Age but the quality of the assemblage is poor and such subtle changes are difficult to identify.

Catalogue of illustrated sherds (Fig. 18)

1. **Globular-shaped vessel**, probably a bowl with a simple, slightly out-turned rim. Fabric: L2. Pit 8311 (8309), Phase 3.
2. **Barrel-shaped** or **ovoid vessel with an in-turned rim**. Fabric: SH2. Pit 8320 (8323), Phase 3.
3. **Ovoid-bodied vessel with a short, vertical rim**. Orange-brown surfaces with a dark grey core. Fabric: L3. Pit 8851 (8947), Phase 3.
4. **Wide-mouthed vessel with a vertical, squared rim** and hint of a slight carination at the break. Lightly finger-tipped upper rim surface. Fabric: SH3. Sooted exterior. Pit 8951 (8946), Phase 3.

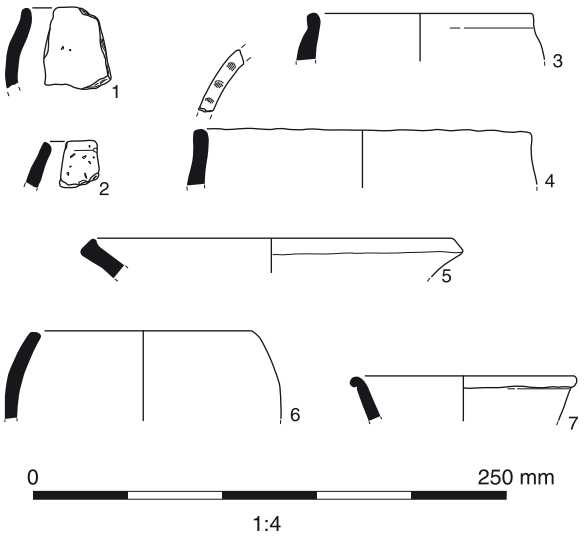

Fig. 34 Middle to late Iron Age pottery

Table 7: Late Iron Age and Roman pottery, quantification by fabrics

Fabric	*Sherds*	*%*	*Weight (g)*	*%*	*MV*	*%*	*EVE*	*%*
Amphora fabrics								
A10 Buff ware amphora	1	0	224	2				
A11 South Spanish amphora	1	0	94	1				
Black-burnished wares								
B10 Black-burnished ware category 1	119	6	241	2	1	1	0.64	6
Calcareous wares								
C10 Shelly ware	1	0	3	0				
C20 Limestone-tempered ware	1	0	5	0				
Late Iron Age/early Roman wares								
E20 Fine sand-tempered ware	35	2	149	1	2	3	0.13	1
E30 Coarse sand-tempered ware	14	1	175	1				
E40 Shelly ware	49	2	206	15	3	4	0.09	1
E50 Limestone-tempered ware	331	15	941	7	8	10	0.58	5
E60 Flint-tempered ware	31	1	260	2				
E80 Grog-tempered ware	675	31	4771	35	30	39	4.47	42
E80(RS) Red-surfaced grog-tempered ware	224	10	1191	9	7	9	1.28	12
G21 Malvernian rock-tempered ware	151	7	768		7	9	0.86	8
Oxidised wares								
O10 Fine oxidised ware	5	0	6	0	2	3	0.06	1
O20 Sandy oxidised ware	4	0	7	0				
O30 Wiltshire sandy oxidised ware	5	0	11	0				
O40 Severn Valley ware	29	1	112	1	1	1	0.08	1
O60 Calcareous oxidised ware	1	0	22	0				
O80 Oxidised storage jar fabric	16	1	186	1				
White-slipped ware								
Q10 Fine white-slipped oxidised ware	7	0	15	0				
Reduced wares								
R10 Fine grey ware	9	0	23	0				
R101 Very fine grey ware	10	0	20	0				
R20 Coarse sandy grey ware	9	0	39	0				
R30 Medium sandy grey ware	64	3	323	1	2	3	0.27	2
R35 Wiltshire grey ware	18	1	122	1				
R39 Alice Holt sandy grey ware	1	0	21	0				
R50 Black-surfaced ware	94	1	183	1	5	6	1.05	10
R90 Reduced storage jar fabric	68	3	1253	9	1	1	0.45	4
R95 Savernake grey ware	160	7	2339	17	8	10	0.84	8
Samian wares								
S20 South Gaulish samian ware	3	0	4	0				
S30 Central Gaulish samian ware	1	0	1	0				
White wares								
W20 Sandy white ware	2	0	22	0				
W30 Fine (imported) white wares	8	0	8	0				
Unidentified								
Z Unidentified pottery	3	0	4	0				
TOTALS	2150	-	13749	-	77	-	10.8	-

5. **Sharply everted, squared rim**. Black throughout. Fabric: L3. Sooted on the top of the exterior rim. Pit 8795 (8967), Phase 4.
6. **Barrel-shaped** or **ovoid vessel** with a simple, undifferentiated in-turned rim. Fabric: MAL RE A. Ditch 8571 (8569), Phase 4c.
7. **Rolled rim, everted necked vessel**. Fabric: L3. Pit 8582 (8583). Unphased.

Late Iron Age and Roman pottery *Edward Biddulph*

Introduction

Some 2150 sherds, weighing 13.7 kg, were recovered from the excavation (Table 7). A fraction over half of the assemblage (52% by weight) was recovered from deposits dated to the late Iron Age and up to the mid 1st century AD (phases 4a, 4b and 4c). A further 37% belonged to the early Roman period, while 5% of pottery was collected from late Roman deposits. The remainder of the assemblage could not be closely dated within Phase 4. This is a substantial addition to the 231 sherds recovered from the evaluation stage of fieldwork (Timby 2006). Overall, the condition of the pottery was moderate to poor. The average sherd weight of 6 g is indicative of relatively small fragments, and on average, just 15% of the circumference of each rim survived. This made form identification difficult (many vessels could only be assigned to broad vessel class), although recording was possible at a sufficiently detailed level to address key themes of supply, chronology and function.

The assemblage was sorted within context-groups into 'sherd-families' – for example the fragments of a single vessel or the mass of undiagnostic sherds in the same fabric – and quantified by sherd count, weight in grammes, vessel count based on rims, and rim-EVEs, which records the surviving percentage of a rim (a complete rim is recorded as 1 EVE, half a rim as 0.5 EVEs). The data were entered on to a database (one record per sherd-family). Each record was given a date range, and a context-group date was entered on the basis of the group's constituent record dates. Fabrics and forms were identified using standard Oxford Archaeology guidelines (Booth nd), though reference was occasionally made to regional typologies, for example the *Camulodumum* series (Hawkes and Hull 1947) and Webster's Severn Valley ware corpus (Webster 1976).

Assemblage composition and pottery

Phases 4a and 4b describe a stratigraphic sequence, but are otherwise contemporaneous in terms of ceramic dating; their assemblages have therefore been combined here (Table 8). In total, this group accounted for 25% of the entire assemblage by EVE. The pottery was dominated by grog-tempered wares, which represented 72% of the phase group. Most of this comprised reduced fabrics (E80). Forms identifiable to type (as opposed to broad class) were confined to necked jars, though other types of jars may have been available. There is a hint that one of the necked jars was a pedestal jar; the base was broken in such a way to suggest that the footring extended into a deeper pedestal. As red-surfaced grog-tempered fabrics tend to be finer than the reduced fabric, a beaker in this ware is expected. A beaker, possibly a butt-beaker, was also recorded in the reduced fabric. Malvernian rock-tempered (limestone) ware (G21) was another important category, taking a 21% share of the phase assemblage by EVE. The ware emerged in the middle Iron Age – and indeed was present in the middle Iron Age settlement, identified as fabric MAL RE A (see Timby, this volume) – and continued in use in the region into the 2nd century AD (Timby 1999, 322). Vessels recorded in this group were restricted to one of the fabric's commonest forms, a barrel-shaped jar with everted rim. Fabric R50 was another limestone-tempered ware; its source is unknown, but a reasonably local origin is likely. Sand-tempered (E20 and E30), shell-tempered (E40) and flint-tempered (E60) fabrics were present during the late Iron Age, but were very minor components of the assemblage. Grog-tempered fabric – Savernake ware (R95) – was recorded in small quantities. The prevailing view places the ware's origin in the mid 1st century (Swan 1975; Timby 1999, 324). This is not the assemblage with which to challenge the conventional dating, and given that a range of post-conquest wares (R20, R30, R50, O10, Q10) were also collected from Phase 4a deposits, the Savernake ware could well be intrusive. It is not unreasonable to suppose that parts of enclosure 8563, from which

*Table 8: Pottery from late Iron Age deposits (phases 4a and 4b). Quantification by EVE. Forms: C jars (general), CB barrel-shaped jars, CE high-shouldered necked jars, CP pedestalled jar; E beaker. * = present, but no with no rim surviving.*

Ware	*C*	*CB*	*CE*	*CP*	*E*	*Total EVE*	*%*
E20						*	
E30						*	
E40						*	
E50	0.05					0.05	2%
E60						*	
E80	0.28		0.27	1	0.14	1.69	62%
E80(RS)					0.05	0.05	2%
G21		0.58				0.58	21%
O10	0.01					0.01	1%
O80						*	
Q10						*	
R20						*	
R30						*	
R50	0.12					0.12	4%
R90						*	
R95			0.23			0.23	8%
Total	0.46	0.58	0.5	1	0.19	2.73	-
%	17%	21%	18%	37%	7%	-	-

*Table 9: Pottery from late Iron Age/early Roman deposits (Phase 4c). Quantification by EVE. Forms: C jars (general), CB barrel-shaped jars, CC narrow-necked jars, CE high-shouldered necked jars, CG globular jars, CH bead-rimmed jars, CN storage jars; E beaker; H bowls (general), HA carinated bowls. * = present, but no with no rim surviving.*

Ware	*C*	*C/H*	*CB*	*CC*	*CE*	*CG*	*CH*	*CN*	*E*	*HA*	*Total EVE*	*%*
E20	0.09										0.09	3
E30											*	
E40	0.03										0.03	1
E50	0.18		0.14			0.05					0.37	10
E60											*	
E80	0.2	0.29	0.06		0.25		0.21			0.1	1.11	30
E80(RS)	0.13			0.88							1.01	28
G21	0.06		0.19								0.25	7
O40				0.08							0.08	2
O60											*	
O80											*	
R10											*	
R20											*	
R30											*	
R50									0.6		0.6	17
R90											*	
R95								0.06			0.06	2
W20											*	
Total	0.69	0.29	0.39	0.96	0.25	0.05	0.21	0.06	0.6	0.1	3.6	-
%	19	8	11	26	7	1	6	2	17	3	-	-

*Table 10: Pottery from early Roman deposits (Phase 4d). Quantification by EVE. Forms: C jars (general), CB barrel-shaped jars, CC narrow-necked jars, CD medium-mouthed necked jars, CE high-shouldered necked jars, CG globular jars, CN storage jars; E beaker; H bowls (general), HA carinated bowls. * = present, but no with no rim surviving.*

Ware	*C*	*CB*	*CC*	*CD*	*CE*	*CG*	*CN*	*E*	*H*	*HA*	*Total EVE*	*%*
A11											*	
E20		0.04									0.04	1
E40	0.03										0.03	1
E50	0.08							0.08			0.16	5
E60											*	
E80	0.38		0.86					0.04	0.14	0.12	1.54	48
E80(RS)											*	
G21		0.03									0.03	1
O10								0.05			0.05	2
O40											*	
O80											*	
R10											*	
R101											*	
R20											*	
R30					0.08						0.08	2
R35											*	
R39											*	
R50				0.25		0.08					0.33	10
R90							0.45				0.45	14
R95				0.07		0.1	0.35				0.52	16
W30											*	
Z											*	
Total	0.49	0.07	0.86	0.32	0.08	0.18	0.8	0.17	0.14	0.12	3.23	-
%	15	2	27	10	2	6	24	5	4	5	-	-

Savernake ware was recovered, remained open for deposition after AD 43. There is also the possibility, though, that a form of Savernake ware existed in the years approaching the conquest period as potters were introduced to different styles (chiefly 'Belgic') and influences.

Compared with phases 4a and 4b, a larger amount of pottery was deposited during the latter part of the late Iron Age and beginning of the Roman period (Phase 4c; Table 9). Some 33% of pottery by EVE was recorded in deposits assigned to this phase. In broad terms, there was little difference between phases 4a and 4b on the one hand and Phase 4c on the other. Grog-tempered wares continued to dominate the assemblage, although the fabrics collectively took a smaller share of 60%. The reduced fabric (E80) was available, again largely as jars. There was greater variety, though; high-shouldered necked jars were joined by bead-rimmed and barrel-shaped types. Carinated bowls were also recorded. Red-surfaced grog-tempered ware was almost as well represented as the reduced fabric, though this was due to the anomalous survival of a near-complete jar rim. A storage jar was present in Savernake ware (R95). Barrel-shaped jars in Malvernian rock-tempered ware (G21) continued to arrive at the site though they were less important in this phase. Part of the market for this ware appeared to have been taken up by more local limestone-tempered fabrics (E50), in which barrel-shaped jars were also available. Other wares of late Iron Age tradition remained a minor part of the assemblage; jars were identified in shelly ware (E40) and sand-tempered fabrics (E20). The range of essentially post-conquest wheel-thrown, sand-tempered wares was more diverse, although few forms were identified by rim. A beaker was recorded in black-surfaced ware (R50), while a narrow-necked jar was seen in Severn Valley oxidised ware (O40).

Pottery recovered from deposits dated to the second half of the 1st century AD (Phase 4d) took a 30% share of the entire assemblage by EVE (Table 10). Pottery of late Iron Age tradition made a smaller contribution to the group compared with Phase 4c, although grog-tempered ware remained the best-represented fabric within it. This is partly due to the good survival of a narrow-necked jar, although the fabric remained reasonably diverse in terms of vessel types. It is noticeable, however, that some of the standard jar forms – high-shouldered jars and bead-rimmed or globular jars – were no longer available in the fabric, but were instead taken up by producers of wheel-thrown sandy reduced wares. This appeared to restrict grog-tempered ware to forms approaching a specialist use – the narrow-necked jar (possibly for liquids), a beaker, and fine carinated bowls (including an example reminiscent *Cam* 212). Other wares of late Iron Age tradition were present, but like grog-tempered ware, made a smaller contribution than in Phase 4c. As noted, the main jar forms were supplied in sandy reduced wares. Black-surfaced ware (R50) was dominant among these fabrics. The ware – identical to grey wares (for example R30) except for its darker surfaces – may have represented a continuation of the late Iron Age tradition, whose fabrics (for example E80 and G21) usually had dark grey or black surfaces, though was based on post-conquest technology. That said, the presence of a typical late Iron Age form – a high-shouldered necked jar – in fabric R30 indicates that aspects of earlier traditions could be expressed in different ways.

Most of the reduced wares had been made reasonably locally, but pottery was arriving from further afield. Savernake ware (R95) was more important in this phase compared with the earlier phases. This is reflected in the increased range of forms available: a medium-mouthed jar, a globular jar, and a storage jar. Possibly in imitation of fabric R95, local potters increased the output of their storage jar products (fabric R90). North Wiltshire potters were also responsible for sandy grey ware (R35); unsurprisingly, the fabric was present in small quantities; production would not increase until the mid 2nd century (Biddulph 2010, 35). Fabric R101 was a fine grey ware a dark core, and micaceous fabric with occasional calcareous fragments. It was present in small quantities here, though a reasonably local source is suspected; the fabric was present at Cotswold Community where a beaker and Gallo-Belgic-style cup, both dating to the early Roman period, were found (Biddulph 2010, 31). Another fragment of grey ware was identified as coming from Alice Holt (R39), though this is a late Roman fabric and certainly intrusive. Severn Valley oxidised ware (O40) was present, though no rims survived. Fragments of a butt-beaker were recorded in fabric W30, a fine white ware possibly imported from northern Gaul. A definite import was a fragment of a South Spanish amphora (A11).

No context-groups were dated exclusively to the mid-Roman period (*c* AD 120-250), and Phase 4e, which encompasses this period was represented by an unfurnished burial only. A single small sherd of Central Gaulish samian ware was dated to the 2nd century, but it was found in late Roman ditch 8203 and so was residual. In fact, the ditch was the only feature to be assigned to the late Roman period (Phase 4f). Pottery collected from the ditch was consistent with a late Roman date, but carried a broad date range that did not necessarily confine the group to that period (Table 11). The date for the ditch derived from a coin dated to AD 332-3, which suggested that the pottery was deposited in the 4th century. Though it is possible that 81% of the pottery by sherd count could have been used in the 4th century, it is also possible – likely, even, given the amount of known residual pottery present – that the group was somewhat older than the date of deposition and had been redeposited. If that were the case, the group implies 2nd-century activity in the area. The presence of Central Gaulish samian

Table 11: Pottery from late Roman deposits (Phase 4f)

Ware	*Sherds*	*Weight (g)*	*EVE*
B10	119	241	0.64
C10	1	3	
E40	2	15	
O20	3	1	
O30	5	11	
O80	2	39	
Q10	6	14	
R10	3	5	
R30	35	192	0.19
R35	17	117	
R95	3	45	
S20	3	4	
S30	1	1	
W30	7	5	
Total	207	693	0.83

has already been noted, but in addition, the black-burnished ware (B10) did not arrive in any quantity before the AD 120. Just two vessels were identified by rim. Both, one in black-burnished ware, the other in a sandy grey ware (R30), were cooking jars with everted rims.

Pattern of pottery deposition

The pottery was collected from a restricted range of features. The bulk of the assemblage was recovered from ditches, naturally reflecting the dominance of the feature type at the site (Table 12). Pottery was deposited into pits only when there were pits (or quarries) available to receive material in the second half of the 1st century AD (Phase 4d). Even then, more pottery was deposited into ditches than pits. In terms of pottery condition, the pottery entering ditches was in marginally better condition than the pottery in pits (Table 13). The mean sherd weight (calculated by dividing weight by sherd count, with values expressed in grams) of pottery in ditches was higher than that of pottery from pits, indicating that sherds were larger, on average, and may have undergone fewer episodes of disturbance and redeposition. However, the difference of 4 g hardly seems significant, and it is reasonable to suggest that ditches and pits both received material that was very fragmented. Their assemblages are likely to represent pottery subject to redeposition long after initial breakage. This is consistent with the view given by the general paucity of structures across the site that the excavated area was located away from the core of settlement.

Table 12: Pattern of pottery deposition – quantification by EVE

	Phase 4a/4b	*Phase 4c*	*Phase 4d*	*Total EVE*	*%*
Ditch	2.1	2.74	1.83	6.67	69%
Gully			0.09	0.09	1%
Pit		0.86	1.36	2.22	23%
Structural	0.63		0.63	7%	
Total EVE	2.73	3.6	3.28	9.61	

Aspects of pottery use

There was little evidence of pottery use (beyond, that is, standard assumptions deriving from vessel shape, for example jars being used for cooking and beakers for drinking). Three pieces had been drilled after firing. Three or more holes had been drilled through the body sherd of a Savernake ware storage jar. The holes were possibly made to effect a repair, though this is not certain. Another storage jar, in fabric E80 (or possibly Savernake ware), was transformed into a strainer-type vessel as at least one hole was knocked through its base. A grog-tempered pedestal jar had its pedestal removed and its base perforated with at least three holes to form a strainer. Evidence of burning was recorded on a number of pottery fragments, but these were associated with very few identifiable forms. The narrow-necked jar mentioned above (Phase 4d) was burnt externally and so may have been used to heat liquids.

The pottery in its regional context

Comparison of broadly contemporaneous pottery assemblages from the region reveals ceramic zones or areas of cultural difference. The pottery from Kingshill North, dominated as it is by locally-produced coarse wares, closely resembled that from Cotswold Community. The site, some 5 km south of Kingshill North, was similarly characterised by grog-tempered wares and other wares of Iron Age tradition (E wares), as well as black-surfaced and Savernake ware and other wheel-thrown reduced (R) wares (Table 14). The sites were matched, too, by

Table 13: Pattern of pottery deposition: mean sherd weights (MSW) by phase and feature type

	Phase 4a/4b (g)	*Phase 4c (g)*	*Phase 4d (g)*	*Overall MSW (g)*
Burial	13			13
Ditch	8	6	13	9
Gully	14		3	9
Natural		13		13
Pit		4	6	5
Spread	4		6	5
Structural	6	2		4
Overall MSW	7	6	8	8

their relatively small proportions of Gloucestershire/Severn basin wares, including Malvernian rock-tempered ware and Severn Valley ware, and paucity of fine and specialist wares, such as samian and mortaria. The assemblages from both sites, then, generally exhibited profiles weighted towards local producers. There was far less concordance between the post-conquest assemblage of Kingshill North (phases 4c and 4d) and pottery attributed to the earliest activity in Cirencester itself. The defensive ditch of Leaholme fort, which pre-dated the town, produced an assemblage dated *c* AD 45-75 (ceramic phase 1 – Cooper 1998, 325). The striking aspect about this group is its large quantity of imported wares, notably South Gaulish samian and Lyons ware, which collectively took a 68% share of the assemblage by vessel count. Oxidised wares were well represented, too, for which Kingsholm flagons were chiefly responsible. Clearly the military supply pattern was very different from supply to a native settlement, even one so close to the fort. The military market did not eschew locally suppliers completely, but it had to fit the cultural traditions brought by the soldiers, for example the preference for flagons, and that excluded potters with restricted, essentially pre-conquest, repertoires. A similar dichotomy between civilian and military markets was noted at Kingsholm, Gloucester (Cooper 1998, 327). On first impression, the assemblage belonging to the first civilian phase of Cirencester (ceramic phase 2 – AD 75-100/120) continued the military traditions, given its relatively high proportion of samian and oxidised wares, for example (Cooper 1998, 328). That said, while we do not have a contemporaneous assemblage from Kingshill North for comparison, there are signs that pottery supply to the town returned largely to local suppliers as trade links with Gloucester and elsewhere disappeared with the army (Cooper 1998, 329). This is evident from the increased proportion of grey wares, mainly Wiltshire (Table 14). This also helps to explain the peculiar distribution of wares in an assemblage associated with the town defences at Trinity Road and dated to AD 70-100 (McSloy 2008, 99). Two assemblages can be offered by Ditches, the site of a late Iron Age enclosure and early Roman villa (Trow *et al*. 2009). Group A, from the enclosure ditch, dated to AD 45-55, while group B2, a quarry deposit, may have dated up to *c* AD 70 (Moore 2009, 107, 114). Both, though, have a largely identical composition. Wares of Iron Age tradition made an important contribution to the groups, and it is this factor that sets them apart from Cirencester. But it does not necessarily move them closer to the Kingshill North profile. Though the levels of wheel-thrown reduced wares was similar, the Ditches groups (Table 14), contained much higher quantities of Severn Valley ware, which was not present in any great amount at Kingshill North (or, indeed, early Cirencester). Even among the Iron Age-style wares, Malvernian rock-tempered ware found a more significant place at Ditches compared with Kingshill North. The Ditches groups also included 'Bagendon black' grog-tempered fine ware, described at the oppidum (?equivalent to fabric R101), as well as samian and white wares. Overall, then, the Ditches groups show a supply network that linked more strongly with suppliers in the Severn basin and permitted a greater volume and range of continental wares. The similarities and differences in the pottery across these sites allow us to rank Kingshill North, Ditches, and Cirencester. The pottery from Kingshill North, focused on local, 'native', traditions, is consistent with a low-ranking agricultural settlement. The pottery from Ditches, with its mixture of fine and coarse local and traded wares, no doubt reflected the site's status as an elite centre (Trow *et al*. 2009, 67). Pottery supply to Cirencester at first had a military profile, but then changed as the town emerged to include the local aspects of Kingshill North and regional aspects of Ditches. This

Table 14: Inter-site comparison: Percentages of ware groups by site. Quantification by EVE, except Cirencester (CP1), which is based on vessel count. Data: Cotswold Community – Biddulph 2010, table 2.5; Cirencester defences – McSloy 2008, table 11; Cirencester (ceramic phase 1) – Cooper 1998, table 18; Cirencester (ceramic phase 2) – Cooper 1998, table 19; Ditches group A – Moore 2009, table 7 and Willis with Dannell 2009, 80; Ditches group B2 – Moore 2009, table 8 and Willis with Dannell 2009, 80-2.

Ware group	*Cotswold Community*	*Kingshill North (Phase 4a/b)*	*Kingshill North (Phase 4c/d)*	*Cirencester defences*	*Cirencester (CP1)*	*Cirencester (CP2)*	*Ditches (Group A)*	*Ditches (Group B2)*
A amphorae					4	5		
E 'Native' wares	59	87	69				39	41
F Fine wares					19	2		1
M Mortaria					1			
O Oxidised wares	3	1	2		17	26	32	24
R Reduced wares	34	12	30	98	14	53	26	34
S Samian wares	4			2	43	13	2	
W White wares					2		1	
Total EVE	11.6	2.73	6.88	2.5	206	8.4	15.25	13.39

phenomenon is not inconsistent with a population that accommodated both the high and the low born.

More sites are available for comparison using sherd count, rather than EVEs. On the whole this confirms the local outlook described at Kingshill North. Middle Duntisbourne, situated on Ermin Street north of Cirencester, produced groups dating to the 1st century AD. Wares of Iron Age tradition (E wares) were important, but their proportion was considerably lower than that recorded in Kingshill North's phase 4c/4d assemblage (Table 15). Even then, Malvernian rock-tempered wares were better represented than grog-tempered pottery (Timby 1999, table 7.10), a reverse of the relationship between those two wares recorded at Kingshill North. Another difference is the greater range and quantity of traded wares displayed at Middle Duntisbourne. Savernake grey ware, Severn Valley wares and continental imports take larger shares. Much of the site's ceramic needs, including supply of utilitarian coarse wares, were therefore being fulfilled by non-local suppliers. The pottery from the neighbouring site of Duntisbourne Grove had an understandably similar profile (Timby 1999, table 7.11); Malvernian rock-tempered wares, Severn Valley wares and Savernake grey ware were predominant. It is possible that the two sites benefited from their proximity to Ditches, which was 2.5 km to the north. The three sites generally had similar supply pattern. The pottery from Claydon Pike, south west of Cirencester, is more difficult to characterise. Its assemblage is different in a number of ways from Kingshill North; it saw lower proportions of Iron Age-style pottery, and higher proportions of fine and specialist wares, including white-slipped wares, samian and white wares (Table 15). The pottery also contrasted with Cotswold Community in these respects. On balance, the pottery appears to indicate that Claydon Pike was higher status than Kingshill North and Cotswold Community (Smith 2010, 92).

The relationships between these sites are illustrated by correspondence analysis. The resulting scattergrams show associations and disassociations between the assemblages; sites that are clustered or positioned reasonably close to each other tend to have similar assemblages in terms of ware groups. Figure 35, based on EVE data, confirms the pattern suggested by the percentages given in Table 14. In the top left corner of the plot, Cotswold Community and Kingshill North are both strongly associated with E wares. The assemblages from Ditches, shown below the axial intersection, form a second grouping; both appear to be strongly associated with oxidised wares, largely Severn Valley wares. The two Cirencester sites shown here are less homogeneous, but both fall into the top right portion of the chart and are linked by samian. Looking at assemblage data quantified by data based on weight, Figure 36 also indicates that assemblages from Cotswold Community and Kingshill North were very similar and again focused around coarse wares of Iron Age tradition. The almost identical groups from Ditches share space in the top right corner of the scattergram and are also relatively close to assemblages from Duntisbourne Grove and Middle Duntisbourne. All four appear to be strongly associated with oxidised wares. Claydon Pike contained a more diverse assemblage, and this is reflected in its position close to a variety of ware types.

The pottery from Kingshill North cannot be precise enough to pinpoint when in the second half of the 1st century AD the settlement was largely abandoned. However, the composition of the pottery does provide some clues. Apart from the dominance of wares of native tradition, the absence of South Gaulish samian in Phase 4d groups is especially telling. It is rare that the ware makes no appearance, even in a low-status site – samian took a 3% share of the early Roman assemblage at Cotswold Community (Biddulph 2010, table 2.5).

Table 15: Inter-site comparison: Percentages of ware groups by site. Quantification by sherd count. Data: Claydon Pike – Booth 2010, table 4.1; Cotswold Community – Biddulph 2010, archive data; Middle Duntisbourne – Timby 1999, table 7.10; Duntisbourne Grove – Timby 1999, table 7.11; Ditches group A – Moore 2009, table 7 and Willis with Dannell 2009, 80; Ditches group B2 – Moore 2009, table 8 and Willis with Dannell 2009, 80-2.

Ware group	*Kingshill North (Phase 4c/d)*	*Claydon Pike (Phase 2)*	*Cotswold Community*	*Middle Duntisbourne*	*Duntisbourne Grove*	*Ditches (Group A)*	*Ditches (Group B2)*
A Amphorae		1			1		
E 'Native' wares	75	40	62	18	37	40	49
F Fine wares		1		4		1	2
O Oxidised wares	3	10	8	51	34	24	18
Q White-slipped wares		1					
R Reduced wares	21	41	28	23	25	26	25
S Samian wares		1	1			3	3
W White wares		4		3	2	5	3
Total count	619	4970	1110	698	1401	649	853

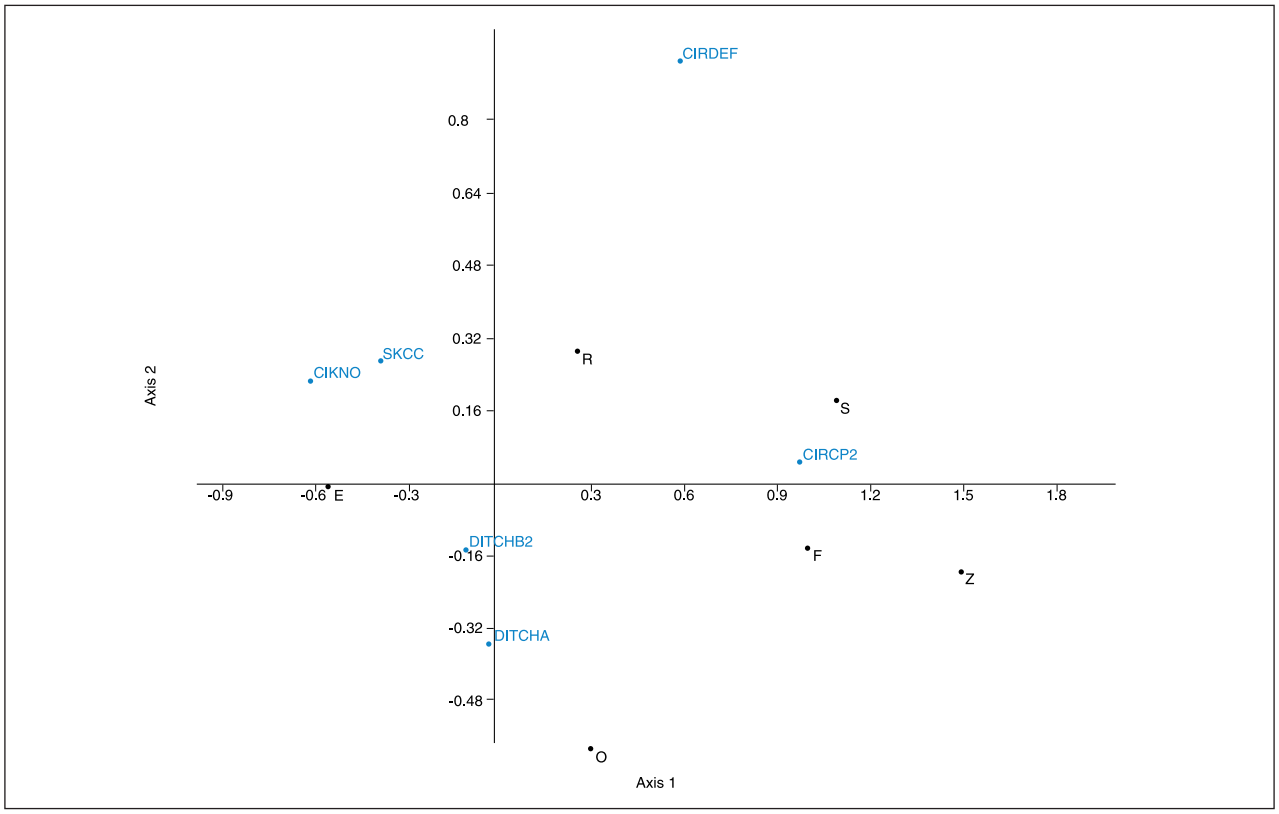

Fig. 35 Correspondence analysis plot showing the relationship between sites and ware groups. Data based on quantification by EVE.

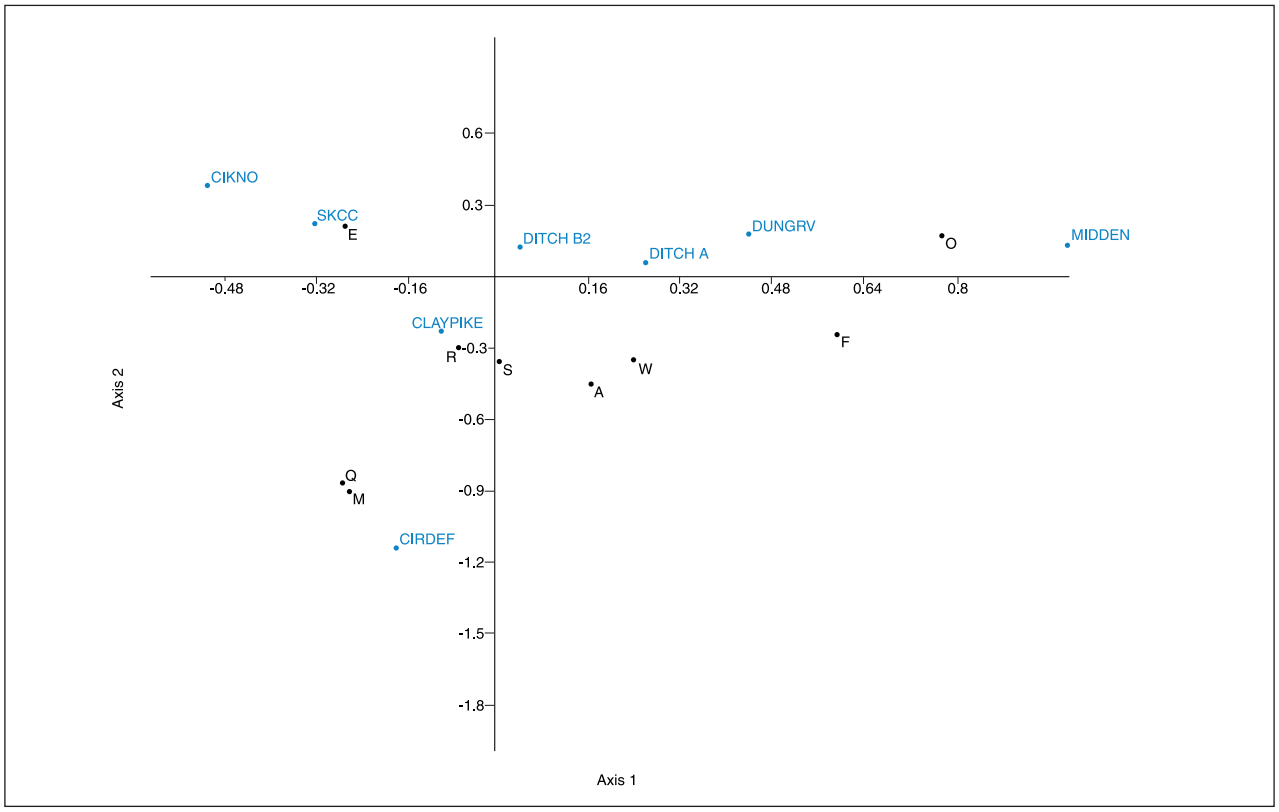

Fig. 36 Correspondence analysis plot showing the relationship between sites and ware groups. Data based on quantification by weight.

The reason could well be chronological. The importation of South Gaulish samian into Britain reached a peak in *c* AD 75/80 (cf. Dannell 1999, fig. 2.1), and it is in this period that we should expect small amounts of samian to arrive at the lower-ranking settlements. Its absence at Kingshill North (apart from a residual occurrence) suggests that the settlement was abandoned before this date. The chronology fits well with the inception of the civilian settlement at Cirencester. It is generally agreed that the military phase of Cirencester, which preceded the town, lasted from *c* AD 50/55 to 65/70 (Faulkner 1998, 377), and evidence from an early street surface at Trinity Road appears to confirm an early Flavian date for the laying out of the urban street system (Holbrook 2008a, 138). If the inhabitants of the countryside around Cirencester did relocate (or were relocated) into the town in its earliest years (Faulkner 1998, 377), then the chronology of the post-conquest phase at Kingshill North, suggested by the pottery, is consistent with this.

Catalogue of illustrated pottery (Fig. 37)

Enclosure 8563 (Phase 4a)

1. **Barrel-shaped jar** (CB), fabric G21. Context 8730, posthole 8731
2. **Jar with footring base** (CP), fabric E80. Context 8720, ditch 8719

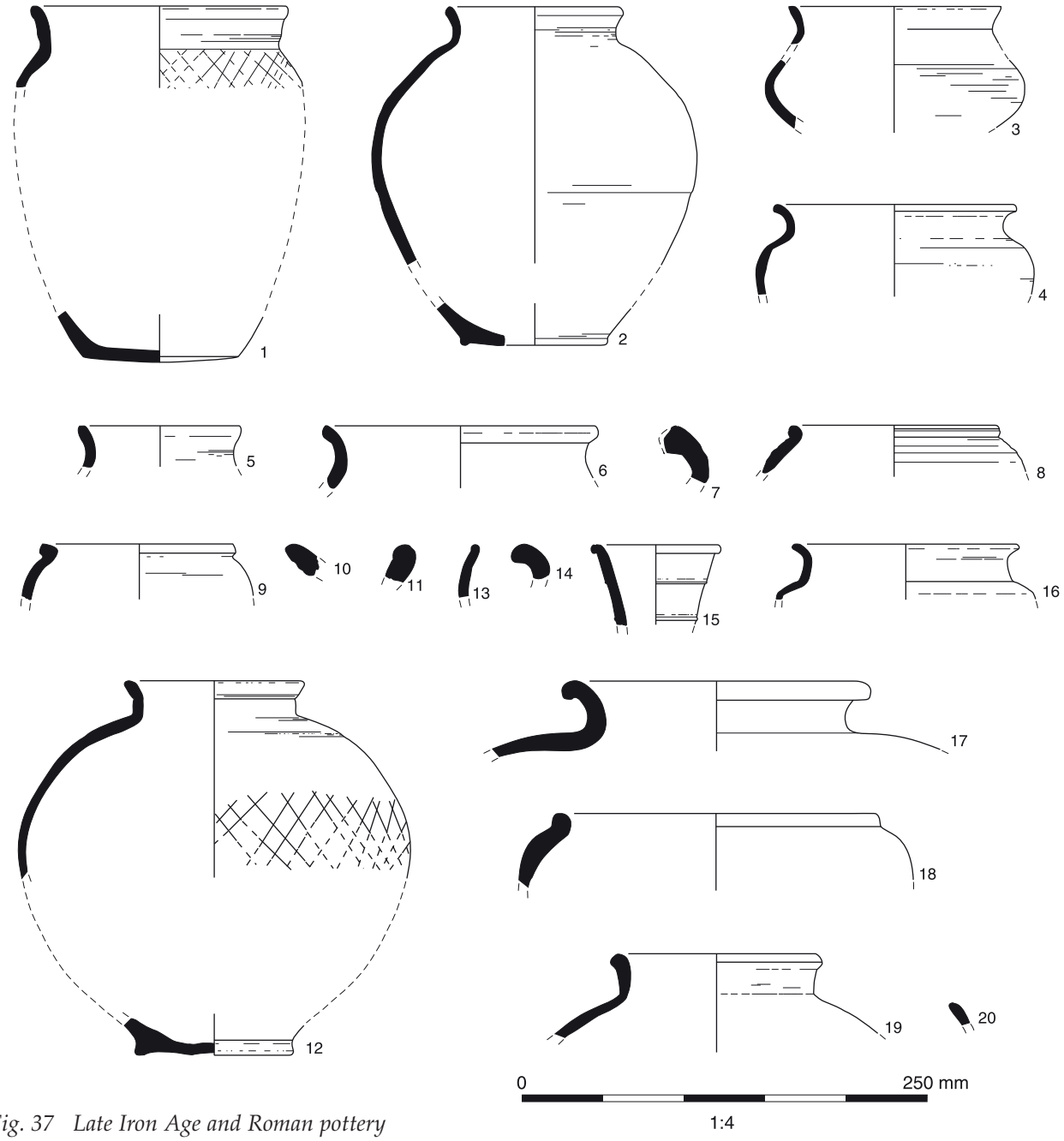

Fig. 37 Late Iron Age and Roman pottery

3. **High-shouldered, necked jar** (CE), fabric E80. Context 8720, ditch 8719
1. **High-shouldered necked jar** (CE), fabric R95. Context 9060, ditch 9059
4. **? Butt-beaker** (E), fabric E80. Context 9040, ditch 9038

Ditch group 8413 (Phase 4c)

6. **Narrow-necked jar** (CC), fabric O40. Context 8683, ditch 8684
7. **Storage jar** (CN), fabric R95. Context 8683, ditch 8684
8. **Globular jar** (CH), fabric E80. Context 8637, ditch 8628
9. **Bead-rimmed jar** (CH), fabric E80. Context 8498, ditch 8497
10. **Barrel-shaped jar** (CB), fabric G21. Context 8498, ditch 8497
11. **Globular jar** (CG), fabric E50. Context 8801, ditch 8789

? Structural slot 9028 (Phase 4c)

12. **Narrow-necked jar** (CC), fabric E80. Context 9030, slot 9028
13. **Barrel-shaped jar** (CB), fabric E80. Context 9030, slot 9028
14. **Barrel-shaped jar** (CB), fabric E50. Context 9030, slot 9028

Quarry group 8895 (Phase 4d)

15. **Carinated bowl** (HA), fabric E80. Context 8748, pit 8747
16. **High-shouldered necked jar** (CE), fabric R30 (sand and limestone fabric). Context 8902, pit 8900
17. **Storage jar** (CN), fabric R90. Context 8957, pit 8941

Ditch group 8537 (Phase 4d)

18. **Globular jar** (CG), fabric R95. Context 8566, ditch 8568
19. **Narrow-necked jar** (CC), fabric E80. Context 8567, ditch 8568
20. **Beaker** (E), fabric O40. Context 8465, ditch 8467

Fired clay *Cynthia Poole*

The assemblage comprised 193 fragments weighing 651g, with a mean fragment weight (MFW) of 3.4 g. The MFW reflects the poor preservation of the material with almost 66% (by weight) or 85% (by count) of fragments being unclassified (Table 16).

Table 16: Quantification of fired clay

	Count	*% Count*	*Wt (g)*	*% Wt*
Oven wall	1	0.52%	14.3	2.2%
Oven structure	1	0.52%	14	2.15%
Oven/hearth lining	17	8.81%	64.3	9.88%
Triangular brick	9	4.66%	105.5	16.21%
Utilised	82	42.49%	275.6	42.3%
Unidentified	82	42.49%	150.8	23.16%
Slingshot	1	0.52%	26.5	4.07%
Total	193		651	

Fabrics

Fabrics were characterised on visible macroscopic features and with the use of a x10 hand lens. Two fabrics were identified. Both were found in a range of colours and shades in combinations of red, yellow, brown and grey depending on the degree of firing levels of oxidisation or reduction during heating.

Fabric A was characterised by the presence of shell grits ranging in size from 0.5-4 mm. This was very similar to the local soil found adhering to some pieces of fired clay and it is likely that this fabric was obtained from the Oxford Clay or other clay soils and subsoils on or close to the site.

Fabric B was a fine sandy-silty clay containing no coarse inclusions visible macroscopically. A small number of samples were examined with a hand lens, and some variety was noted with medium-coarse quartz sand, occasional micaceous clay, and the fine shelly component. However, the majority of fragments in fabric B were not examined with a hand lens and have not been allocated to any sub-category. One sub-category visible macroscopically was designated as B/E3 on the basis of its similarity to the fabric E3 identified at Cotswold Community and used for fired clay and ceramic building material (Poole 2010, 153). This was a laminated clay with paler cream or brown streaks within the main matrix and no coarse inclusions. It was suggested that fabric E3 came from the Minety production area, though sources closer to Cirencester are possible. Fired clay normally derives from locally sourced clays and the probability is that the fired clay has utilised a number of local clay deposits or clay subsoils.

Forms

The number of diagnostic forms is extremely limited. Two fragments were identified as oven structure or wall on the basis of wattle impressions and possible straw impressions. A small quantity was identified as oven or hearth lining, having the appearance of *in situ* burnt soil or subsoil. One certain and one possible triangular perforated brick was found. The definite brick was pierced by a perforation 11 mm diameter widening to 14 mm at the edge. The full width of the brick was estimated to be c 50 mm, suggesting it falls into the lower end of the size range of this object type. The remainder of the structural fired clay was undiagnostic, consisting of fragments with a single surface or completely amorphous. The majority of the undiagnostic material is likely to derive from oven or hearth structure, though a few pieces had surface characteristics similar to the triangular brick. The triangular bricks were probably used as oven lining or oven/hearth furniture and normally date from the Iron Age or early Roman periods.

A complete slingshot of typical Iron Age ovoid form measured 41 mm long by 25-26 mm diameter and was made in fabric B/E3.

Table 17: Fired clay from phased contexts

Phase	*Weight (g)*
1	43
2	13.1
3	122
4	17.7
4a	48.1
4b	3.2
4c	88.3
4d	149.6
4f	3
6	7.5
Total	495.5

Discussion

This assemblage consists of hearth and oven structure, probably indicative of domestic (or agricultural) activity associated with cooking or crop processing. The presence of typical Iron Age forms suggests that the majority of the assemblage is likely to be contemporaneous, though the majority of pieces cannot be dated on their intrinsic characteristics. Relatively large quantifies of fired clay were recovered from Phase 3 pits and features dated to Phase 4d (Table 17), particularly ditch 8537 and pits 8742 and 8895.

Later prehistoric and Roman worked stone

Ruth Shaffrey

Iron Age

A single piece of worked stone recovered from middle Iron Age contexts is also the earliest chunk of perforated limestone with definite evidence for use (8310; Fig. 38). The hole is naturally occurring in the rock and although the rock demonstrates no signs of having been shaped or used, there is wear within the perforation indicating that it was suspended (see below).

Catalogue of Iron Age worked stone

Context 8310 **Possible weight** (Fig. 38). Shelly limestone. Large unworked chunk with natural perforation. The inside of the hole is slightly worn around the top edge. Measures 180 x 180 x max 45 mm thick. Fill of pit 8311 (8310). Phase 3: Iron Age.

Late Iron Age/Roman

This phase produced the largest assemblage of worked stone, including processors and a quern involved in food production, suggesting the presence of a dwelling or dwellings. Several weights were also recovered and are discussed in detail.

A single quartzite hammerstone was recovered from pit 8458 (fill 8457). One face is smoothed and the other is damaged, suggesting use as a multi-functional tool. Tools like this could have been put to a variety of uses, such as pounding and grinding organic or inorganic materials.

A single almost complete upper rotary quern of beehive style (SF 10073; Fig. 38) was recovered from phase 4c pit 8806 (8808), where it had been curated as part of a special deposit. It had been placed centrally in the pit, grinding surface upwards. Its deposition is extremely significant, but although other activity was occurring on site during the same phase, the pit cannot be related to any dwellings on site with certainty and little can thus be said about exactly what the deposition was intended to represent.

The quern was extremely well used with the grinding surface worn so close to the handle socket that the quern had broken across that area, rendering it unusable. The quern is made of Old Red Sandstone (ORS), almost certainly from the Wye Valley, which saw rotary quern production from the Iron Age onwards. It is a thick quern with concave grinding surface, convex upper surface and handle slot in the side, not piercing the feed pipe. It is of typical Iron Age design but not exactly like any illustrated by Curwen (1937, 141); nor does it match any examples recorded in an extensive survey of over 1200 Roman querns of the same lithology (Shaffrey 2006). It is classified as a beehive quern because of its overall shape and thickness, although it is not as exaggerated as Hunsbury or Yorkshire querns, the thickness of which can equal the diameter. A small number of beehive-style examples of ORS querns have been recovered from late Iron Age or very early Roman contexts (Shaffrey 2006, 37), but these are also so unusual that they can be confidently classified as being of pre-Roman origin. Thus it is likely that the initial period of use of this quern could be much earlier than its date of deposition, especially considering that it demonstrates extensive wear suggesting that it had seen long service and was first used in a much earlier phase.

Gloucestershire is one of the most likely places to find ORS querns of Iron Age date or form (Shaffrey 2006, 64). An example with a similar handle socket to this was recovered from a 1st-century AD context at Vineyards Farm, Charlton Kings, some 20 km to the north (Rawes 1991). Other examples of similar form have also been found at Cheltenham (West Drive), Cirencester (The Ditches), Fairford (Thornhill Farm) and Frocester (Shaffrey 2002; Shaffrey 2004; Price 2000).

Four chunks of limestone with naturally occurring holes were recovered from late Iron Age/early Roman phases. These are comparable with stones found in earlier phases, except that all the Roman examples demonstrate evidence of use. Two of the larger stones were shaped around at least one edge and were worn inside the perforation, suggesting suspension (SF 10082, not illustrated; context 8643, Fig. 38). One of the items is small and smooth with

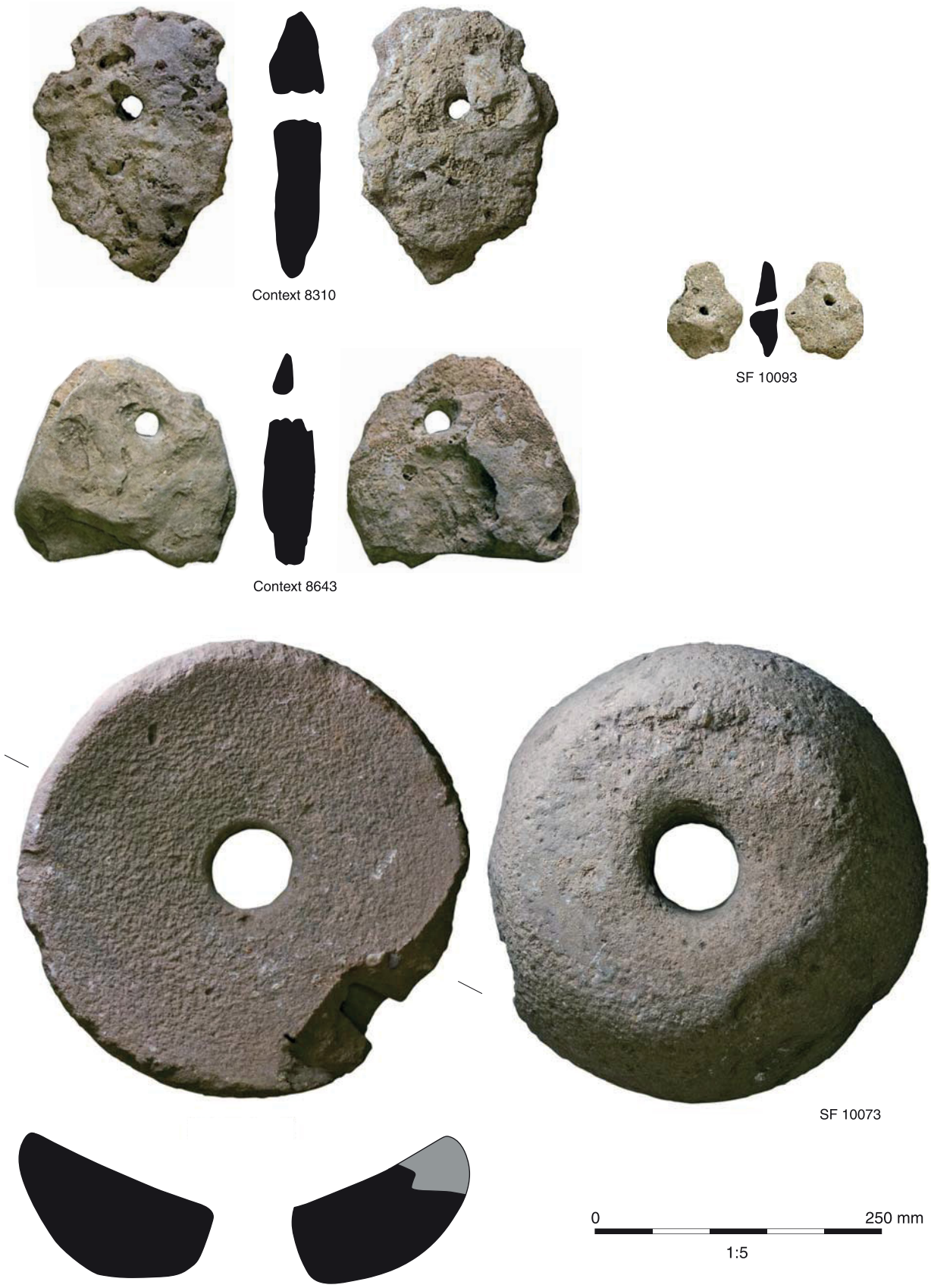

Fig. 38 Worked stone objects, phases 3 and 4

some possible wear from suspension (SF 10093); it weighs only 115 g. The remaining rock (context 8311) demonstrates no signs of having been shaped or used, but may have been collected with use in mind as all three items weigh between 1300 g and 1700 g and are of similar dimensions.

The four 'perforated' stones recovered from this phase are in addition to four from earlier phases. What appear to be perforations in the limestone are probably what remains of voids naturally formed in the rock when carbon dioxide dissolved the calcium carbonate of the rock fabric in joints up to tens of millimetres across (Sumbler *et al.* 2000, 7). Thus, naturally 'holey' rocks were taken advantage of; all the examples found at Kingshill North have a hole approximately in the middle, suggesting that stones were carefully selected. In earlier phases, these stones appear to have been collected but probably remained unused. In Iron Age and Roman phases, the stones were shaped and/or used. The natural availability of perforated stones is illustrated by an unworked example from a Phase 3 pit (8311).

Large stones were used as weights for a variety of functions throughout time, including as thatch weights, gate or door weights and most notably as fishing weights or net sinkers. Generally they are shaped and finished. Examples of weights that made use of stones left in a near natural state are known, however, for example at Horcott Pit (Shaffrey 2009), and it is reasonable to assume that this sort of artefact will be most commonly found on sites in areas where those types of stones occur naturally. But the fact that they are naturally occurring also means that they are more difficult to identify in the field and may well be overlooked. It is therefore likely that practical weights like these may have more commonly in use than the archaeological record would currently suggest.

The assemblage also contains approximately 3 kg of burnt but otherwise unworked stone. This was recovered from 14 contexts, details of which can be found in the archive.

Catalogue of LIA/Roman artefacts

Context 8457 **Processor** (not illustrated). Quartzite pebble. Pebble, smoothed on one face and smashed on another indicating use as both a hammerstone and a smoother. Measures 60 x 62 x 51 mm. Fill of pit 8458 (8457). Phase 4: LIA/Roman.

SF 10093 **Pierced pebble** (Fig. 38). Shelly limestone pebble with natural perforation and some possible wear from suspension. Measures 80 x 60 x 22 mm. Fill of pit 8747 (8748). Phase 4d: LIA/ER (Early-mid 1st century AD).

SF 10073 **Incomplete upper rotary quern** (Fig. 38). Old Red Sandstone, Quartz Conglomerate. Pecked all over. Handle slot in the side measuring 60 mm long and 42 mm wide at the edge. Quern is overall slightly oval shaped. Measures 380 mm diameter x 90 mm maximum thickness. Fill of pit 8806 (8808). Phase 4c: LIA/ER (Early-mid 1st century AD).

Context 8643 **Possible weight** (Fig. 38). Limestone. Stone with a hole measuring 20 mm positioned roughly in the centre. The edges may be shaped and there is some possible suspension wear above the hole on one or both sides of the stone. Hole. Measures 240 x

Fig. 39 Antler comb

150 x 50mm. Fill of pit 8642 (8643). Phase 4c: LIA/ER (Early-mid 1st century AD)..

SF 10082 **Possible weight** (not illustrated). Limestone. The edges look like they have been shaped and there is some possible suspension wear above the hole on one side of the stone only. Hole measures 30 mm diameter and is positioned roughly in the centre of the stone. Measures 200 x 150 x 40mm. Fill of pit 8900 (8903). Phase 4d: ER (mid-late 1st century AD).

Antler comb *Leigh Allen*

A complete antler comb (SF 10052) was recovered from the fill of Phase 3 middle Iron Age pit 8114 (Fig. 39). The comb is relatively small, measuring only 115 mm in length; the shaft is wider at the dentate end, narrowing towards the butt end, which is roughly circular. The comb is undecorated, apart from a single transverse groove just above the inter-dentate notches, but it does display a high degree of wear, particularly to the teeth.

The comb originally had six teeth, rectangular in section and tapering towards the tips. The inter-dentate notches are wide and U-shaped. Only four teeth remain; the tooth on the right-hand outside edge is missing and has been worn smooth almost to the level of the base of the inter-dentate notch. The tooth next to it survives only as a stump. The comb obviously underwent heavy use on this right-hand edge and continued to be used after these teeth had broken (or been worn away). The surviving teeth (including the stump) all have transverse grooves worn into them on the upper and lower surface. The narrow edges of the shaft are also highly polished through wear.

Combs of this type are fairly common finds on Iron Age sites. Large numbers have been recovered from Danebury (Cunliffe 1984), Meare Village East (Coles 1987), Maiden Castle (Sharples 1991), Glastonbury (Bulleid and St George Gray 1911-1917) and Cadbury Castle (Barrett *et al.* 2000). There remains considerable controversy about the possible use of this type of comb. There are arguments for and against their use as weaving tools, specifically in the pushing of the weft threads into position before they are beaten into position with a weaving sword, as discussed fully by Sellwood (1984, 371-378). Alternatively, they could have been used for combing sheep's wool during shearing or plucking, where the tips of the teeth would become worn through contact with the animals hide. Perhaps, with their careful manufacture and individual decoration, they were personalised hair combs (Coles 1987, 105-117).

Metal objects *Ian Scott, with a contribution by Paul Booth*

Composition of the assemblage

The metal finds assemblage comprises at least 1,236 objects or 1,716 fragments. (Each object was assigned a unique object or 'small find' number, prefixed below with SF.) Most of the metal finds are securely stratified and phased (Table 18). The assemblage consists almost exclusively of iron objects; there are six copper alloy objects, including three coins, and one lead object. The majority of identified objects are nails or nail fragments (91.2% by object count or 93.4% by fragment count). Two contexts (pit fills 8833 and 8799) produced numerous small unidentified fragments or crumbs of iron which have not been quantified, but no other metal finds. Context 8228, fill of grave 8227, produced some unquantified and unidentified small fragments, but also at least 1,092 nails (1,564 fragments), 68 hobnails and a single small miscellaneous fragment of iron. Indeed, context 8228 produced most of the metal finds from the site (93.9% by object count or 95.1 % by fragment count; Table 18).

Phase 1, unstratified and unphased

There are a few finds from natural features and from Neolithic layers and must be intrusive. The finds from natural features include a horseshoe nail

Table 18: Metalwork: Summary quantification by phase and function (object count)

	Function								
Phase/Date	*Coin*	*Transport*	*Personal*	*Structural*	*Nails*	*Misc*	*Query*	*Waste*	*Total*
Phase 0 - Natural		2			5	3		2	12
Phase 1 - Neolithic			1			1			2
Phase 3 - Mid Iron Age					1	2			3
Phase 4a - Late Iron Age			1		1	1			3
Phase 4c – Late Iron Age/early Roman		1	1	1	5	2		1	11
Phase 4d – Early Roman			1		5				6
Phase 4e - early/mid Roman			68		1092	1			1161
Phase 4f – Late Roman	1		3		5		1		10
Phase 6 - Post-medieval/modern		1	1		11	5			18
Unphased	2	2			2	2	1	1	10
Total	3	6	76	1	1127	17	2	4	1236

and three miscellaneous fragments. The finds from Neolithic deposits comprise a hobnail and a fragment of iron plate. In addition, there are ten objects from unstratified or unphased contexts. These include a copper alloy coin and an unidentified coin-sized disc (see below; SF 10015 and 10020).

Phase 3

Middle Iron Age contexts produced a single nail from the fill of pit 8826, and two fragments of iron rod or bar from the fill of pit 8382.

Phase 4a

Contexts of late Iron Age date produced three objects: one fragment of iron strip from context 8985, a nail from context 9040, and a fragment of a possible copper alloy buckle frame from context 9054. All contexts were deposits within ditch 8563.

Phase 4c

Contexts of late Iron Age/early Roman date produced 11 metal objects from nine contexts, and small unidentified iron fragments or crumbs from context 8833. The identified objects include a clearly intrusive horseshoe nail from context 8200 in ditch 8255; a fragment of copper alloy spring probably from a brooch, found in ditch 8413 deposit 9167, and a large spike or nail and two other nails from contexts 8412 and 8580, also from ditch 8413. Single nails were recovered from posthole 8702, and from pits 8808 and 8879. An eroded fragment of iron strip and a small piece of slag were collected from context 8637, a fill of ditch 8413, while ditch 8978 contained a bent and twisted fragment of iron strip.

Phase 4d

Contexts of early Roman date produced six metal finds from five contexts. These comprise a copper alloy spring fragment possible brooch, possibly partially melted, from pit 8747, and nails from ditch 8537 and pits 8575, 8741 and 8887.

Phase 4e

The majority of the metal finds came from a single context (8228) from early or mid Roman grave 8227. The grave fill produced at least 1062 nails, 68 hobnails and one small miscellaneous fragment of iron. Such a number of hobnails might indicate the presence of a nailed shoe. All the identifiable nails are Manning Type 1b wood nails with flat circular or near circular heads and tapering square section stems (Manning 1985, 134; fig. 32). The preservation of the nails ranges from very poor laminating examples to examples with no visible corrosion. It seems probable that the nails were buried in groups or heaps and that the outer nails corroded and eroded and protected the nails within the heaps or clumps from corrosion. Because many of the nails are extremely well-preserved and many are complete, or near-complete, it is possible to see that they have been bent or clenched. It seems certain that most if not all the nails had been used prior to burial.

A concentration of nails like this requires an explanation. As Manning (1985, 134) has noted, nails seem to span a range of lengths from under 20 mm long to 100 mm long, with a greater number of smaller nails. Complete nails from context 8228 were measured and allocated to length groups (Fig. 40). Only 165 of the at least 1062 nails could be measured with confidence. This gives a sample of 15.5 % of the nails. The suspicion is that larger nails are under-represented in the sample of complete nails, but the extent to which they may be under-represented has not been quantified. What the measurements show is that there is some clustering by length. There is a cluster of nails measuring between 20 mm and 30 mm long, with most examples measuring c 25 mm long. Only a small number of nails measured between 31 mm

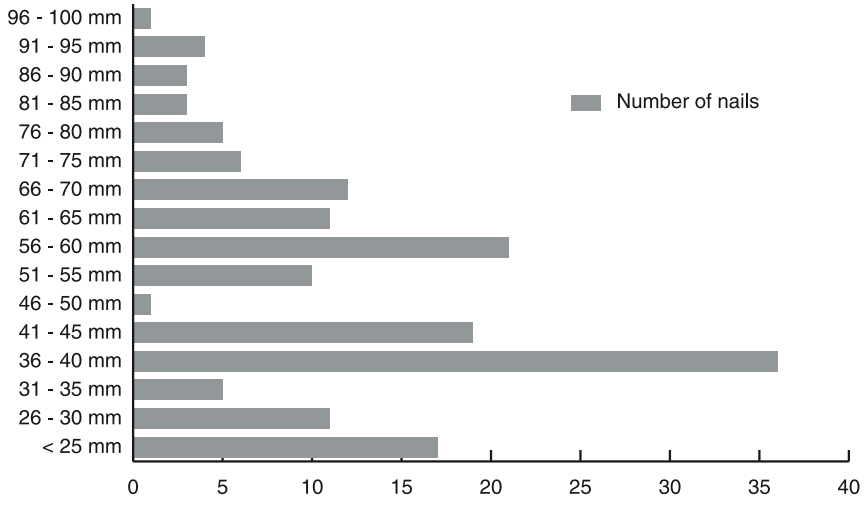

Fig. 40 Context 8228: Distribution of complete nails by length groups. Quantification by count (n = 165)

and 35 mm long. A second cluster measures between 35 mm and 45 mm long; again most examples in this group measure c 40 mm long. Only one nail measuring 46 mm to 50 mm long was recorded. The next cluster comprises nails measuring between 51 mm and 70 mm long with a definite peak of nails measuring 56 mm to 60 mm long. Longer nails occur in small numbers. Given that the majority of the complete nails were comparatively small and had been used before burial, it is suggested that the nails represent some form of wooden litter to support the body, which was burnt on the pyre and the remains gathered together and buried with the cremated bone and at least one shoe.

Phase 4f

There were just ten finds from 4th-century contexts. All were recovered from ditch 8203. There are five nails, three hobnails, and an iron fitting of uncertain function. The ditch also contained a Roman coin dated to AD 332-3 (see below).

Phase 6

Finds from post-medieval contexts number 18, including 11 nails. One of the nails is a modern wire nail from pit 8143. Among the other finds are a lead parcel seal and a rectangular iron buckle frame, both from the topsoil, and a number of miscellaneous pieces.

Coins *Paul Booth*

SF 10020 (unstratified): Incomplete AE3
Obverse: illegible
Reverse: Gloria exercitus (1 standard)
AD 335-341

SF 10080 (Fig. 41; context 8939, fill of ditch 8203): AE3 (17mm)
Obverse: FLIULCONSTANTIUSNOBC
Reverse: GLOR IAEXERC ITUS (2 standards), TRS* (Trier)
AD 332-3 (RIC VII Trier, 546)

SF 10015 (unstratified): unidentified copper alloy fragment; unlikely to be a Roman coin.

Fig. 41 Coin, SF 10080

Conclusions

The composition of the metalwork assemblage is very distinctive. It lacks any domestic or household element; personal items are limited to hobnails and two fragments of possible copper alloy brooch spring. The main component of the assemblage comprises the wood nails and hobnails from context 8228. It is suggested that the wood nails from this grave fill represent the remains of a litter burnt on the pyre.

Slag and related high temperature debris
Lynne Keys

A very tiny quantity (126g) of slag and heat-magnetised debris was recovered, mostly from soil samples. It was examined by eye and a magnet was used to test for magnetised material. Details are given in Table 19.

The diagnostic iron slags were produced by iron smithing. They are of two types: hammerscale from ordinary hot working of a piece of iron (making or repairing an object), and tiny spheres from high-temperature welding used to join or fuse two pieces of iron. Both are so small that they are invisible to the naked eye when in the soil, but they are virtually pure iron and highly magnetic. Once recovered by sampling they can be easily recognised and examined using a magnifying glass.

Their presence in small quantities in pit and ditch fills would normally pass without much comment, but some features containing iron microslags are of Neolithic or Bronze Age date. The features concerned are pits 8058, 8064, 8100, 8455, 8928 (Phase 1), and ring-ditch 8454 (Phase 2). The presence of iron working microslags in pre-Iron Age features raises questions that have to be addressed. No large iron slags were found in any Neolithic and Bronze Age features and, as the microslags are very tiny or fragmentary, it is likely that they were moved downwards from the Iron Age and later layers (which also contained iron working microslags) by worm action. For the Iron Age and later periods, virtually no bulk (larger) slags were present, so it may be that some smithing took place on the site during the past and the bulk slags produced were removed for recycling in roads or yard surfaces elsewhere.

Human remains from late Iron Age inhumation burials *Alistair Zochowski and Helen Webb*

Late Iron Age (Phase 4a/b)

Skeleton in grave 1104

This skeleton was between 50% and 75% complete. The cranium, mandible, vertebrae, ribs, the major long bones and hand and foot bones were all present, although none was entirely complete. No dentition had survived. These bones were in a good

Table 19: Summary of metalworking debris

Context	*Sample*	*Slag identification*	*Weight (g)*	*Comment*
8007	187	magnetic residue	1	fired clay & grit; 25pct iron microslags.
8031		iron-rich undiagnostic	17	
8057	33	magnetic residue	3	fired clay, grit, very, very occasional tiny frags. hammerscale flake & several tiny spheres.
8062	20	magnetic residue	2	fired clay, several tiny hammerscale spheres.
8063	21	magnetic residue	10	fired clay, charcoal, fired grit, one hammerscale sphere, one frag. iron microslag.
8089	22	magnetic residue	6	mostly fired clay, crushed charcoal.
8097	34	magnetic residue	4	fired clay, very occasional pieces broken hammerscale flake
8190	90	magnetic residue	1	tiny crushed material including one hammerscale sphere & bits of crushed flake, fired clay.
8212	91	magnetic residue	1	crushed fired clay & microslags, incl. two tiny hammerscale spheres.
8462	81	magnetic residue	1	mostly burnt, crushed material, occ. very tiny hammerscale spheres.
8474	76	magnetic residue	1	fired clay, broken hammerscale flake, one sphere & fragments of microslags.
8482	80	magnetic residue	3	some crushed hammerscale flake, occasional tiny spheres, crushed charcoal, fired clay.
8492	99	magnetic residue	1	fired clay & tiny undiagnostic slag.
8493	98	magnetic residue	6	fired clay, tiny charcoal bits and grit.
8494	100	magnetic residue	0.5	fired clay.
8498	94	magnetic residue	3	fired clay, charcoal bits, grit.
8530	86	magnetic residue	2	fired clay & grit; several tiny hammerscale spheres, one fragment of microslag splash.
8720	-	magnetic residue	0.5	fired clay
8793	192	magnetic residue	1	tiny crushed charcoal, fired clay, crushed hammerscale flake.
8793	192	undiagnostic	0.5	
8794	190	fuel ash slag	1	
8794	190	iron-rich undiagnostic	0.5	microslag fragment.
8808	186	magnetic residue	13	fired clay & grit; occ. microslags inc. one large and many small hammerscale spheres & lots broken flake.
8808	186	undiagnostic	0.5	microslag fragment.
8819	189	magnetic residue	11	fired clay, crushed charcoal, grit, very very occ. frags. broken hammerscale flake & occasional spheres.
8828	191	magnetic residue	0	crushed bits hammerscale flake & fired clay.
8833	195	magnetic residue	3	fired clay.
8833		iron-rich undiagnostic	5	
8920	248	magnetic residue	1.5	crushed bits fired clay & some broken hammerscale flake.
8929	228	magnetic residue	5	one tiny piece broken iron microslag, fired gravel & clay.
8938	232	magnetic residue	5	crushed fired clay & tiny stones, occ. hammerscale spheres.
9097	286	magnetic residue	5	fired clay; some pieces charcoal fragments etc.
9097	289	magnetic residue	3	fired clay & tiny stones.
9102	273	magnetic residue	2	fired clay & fired pea grit.
9142	300	magnetic residue	2	one large hammerscale sphere, some pieces broken flake, microslag pieces, tiny undiagnostic, iron bits, fired clay, crushed charcoal.
		TOTAL	122	

condition, or grade one (McKinley 2004, 16), with surfaces that showed slight, patchy erosion. No attempt was made to assess the sex of the individual in accordance with accepted practice. The skeleton was aged using diaphyseal lengths with reference to Scheuer *et al.* (1980) and Scheuer and Black (2000), and was estimated to have been between 38 and 44 weeks old. No pathology was observed.

Infant 1104 had been buried in the base of a ditch without grave goods. The presence of an unadorned burial within a ditch is typical for the Iron Age period (Whimster 1981, 10). A large limestone capping slab had been placed over the top of the burial. This is also not an uncommon feature of Iron Age inhumation burial. Other infant burials associated with capping stones include one at Winnall Down, Hampshire, where the infant had been buried within a posthole with flint packing, and at Maiden Castle, Dorset, where the infant had been buried in a rampart, and overlain with limestone blocks (Wilson 1981, 141). It has been suggested that in some cases, such blocks were used to keep the body in position during interment, but, particularly where they overlay the burial, they may have been to protect the body, perhaps against disturbance by animals, as suggested for the female rampart burial at Bury Hill, Hampshire (Wilson 1981, 141). Cunliffe (1995, 100) suggests

that such burials may represent victims of ritual killings, their bodies placed as offerings to the earth deities.

Skeleton 8724, grave 8723

This skeleton was between 50% and 75% complete. Some of the elements were moderately fragmented, while the skull and pelvis were highly fragmented. The bones had suffered erosion and showed some root action, changes that are consistent with grade 2 of McKinley's (2004,16) condition categories.

Dental attrition suggested an age of over 30 years (Miles 1962), but this is based on an incomplete set of molar teeth (see above). Only fragments of sexually dimorphic skull features had survived. The supraorbital ridges of the skull were prominent, suggesting a male individual, and the mastoid processes were large and vertically aligned, which are also male traits. It was therefore concluded that the individual was male.

No long bones had survived intact to allow stature estimation. No non-metric traits were observed. Several teeth were present, but no mandible or maxilla had survived. The teeth included three left maxillary molars, three mandibular molars and three incisors. One of the incisors had a linear defect on the enamel surface. Such defects, known as enamel hypoplasia, are formed during periods of growth arrest when the enamel crown is developing. These periods of arrested growth have been linked to episodes of childhood disease, malnutrition and weaning (Hillson 1996, 166-167). Cribra orbitalia was present on the right orbit and was recorded as type 1 after Stuart-Macadam (1991, 109). Osteoarthritis, a joint disease that affects synovial joints, was present in the thoracic spine. Osteoarthritis is diagnosed on dry bone by the presence of eburnation (polishing) or at least two of either: pitting, bony contour change, and/or marginal osteophyte. The cause is multi-factorial, in which the advancement of age increasingly becomes a predisposing factor. There was also osteophytosis throughout the vertebral column.

Other pathology included hyperostosis frontalis interna (HFI) on the endocranial surface (inside surface) of the frontal bone. HFI is identified on dry bone as thickening and nodule formation and in the present skeleton the changes were slight. The condition has associations with virilism and obesity and is common amongst post-menopausal women. The cause of HFI is unknown but implies some sort of pituitary gland disorder in its aetiology (Aufderheide and Rodriguez-Martin 1998).

Prime adult male 8724 was buried in a small grave (8723) cut into a gully (8703). The gully and grave were aligned roughly north east-south west. The grave itself was just 1.02 m in length and 0.4 m in width, and the individual appeared to have been 'squeezed' into the grave. He had been placed on his left side, the side on which the majority of Iron Age inhumations are found, judging from other burials in southern Britain (Whimster 1981, 11). The head was at the very south-west end of the grave. Wilson (1981, 138) and Whimster (1981, 14) established that, while heads have been found towards almost every direction, there is a bias towards the heads being directed between north and east. The skull of skeleton 8724 faced upwards, but it is possible that the head had originally been placed with its left side up against the edge of the grave, it having tilted backwards (south-easterly) during decomposition. The arms were extended, the left arm underlying the body, and the right against the north west edge of the grave. The legs were flexed at the knees. The lower right leg (tibia and fibula) overlay the left femur, and the lower left leg was raised upwards against the bottom (north east) edge of the grave cut, with several foot bones outside the actual grave cut.

Crouched inhumation burials placed within pits and ditches in and around settlements are the principal archaeologically-visible burial rite of central southern England in the Iron Age (Whimster 1981), with antecedents in the late Bronze Age (Brück 1995). Burial 8724 indicates that the practice continued into the late Iron Age. The position of this burial, appearing as though it had been crammed into the grave, is perhaps not unusual for an Iron Age inhumation. Settlement burials run the gamut of contracted body positions, from very tightly crouched – the individuals probably having been bound – to loosely flexed (Wilson 1981, 136; Whimster 1981, 11). The fact that a grave had been specifically dug for skeleton 8724 is perhaps significant. Often Iron Age burials are found within pits or other features originally dug for a purpose other than disposal of the dead, for example, storage of grain, or for refuse (Whimster 1981, 10). Whether this was simply because when they went out of use they were convenient, ready-made graves, or whether there was some ritual significance is not clear. The cutting of a specific grave for skeleton 8724 may indicate therefore that this individual was different from the rest of the community in some way. Deposition in a specially dug grave implies more care, or investment of energy in the disposal rite, but it could simply be that no empty or half-filled pits were available (Wilson 1981, 143). The grave was possibly dug into the less compact ditch fill as it required less physical effort than cutting a grave through the natural, although it is perhaps more likely that the location was coincidental, the important factor being a location adjacent to the ditch bank. Recut pits have been recorded at Twywell, Hod Hill and Maiden Castle, Winterbourne Stoke and Beckford (Whimster 1981, 10). 'Scoops', and perhaps generally small graves, such as that belonging to skeleton 8724, may be regarded as less distinguished graves, possibly reflecting the status of the corpse, or the time and/or number of people available to perform the interment (Wilson 1981, 143).

Table 20: Summary of cremation burial 8228, grave 8227

Category	*Value*
Context	8228
Total weight (g)	673
<10mm weight (g)	103
10-4mm weight (g)	375
4-2mm weight (g)	194
Un-identified %	79
Skull %	5
Axial %	2
Upper limb %	3
Lower limb %	10
Maximum fragment size (mm)	20x12

Cremated human remains *Sharon Clough*

A single cremation burial (context 8228) comprising the remains of a single adult, probably of early-mid Roman date (Phase 4e), was recovered from grave 8227 (Table 20). The cremated remains were highly fragmented and were variable in colour and weighed in total 672 g

Methodology

The cremated bone was processed as environmental samples, which involved wet sieving at three fraction sizes, <10 mm, 10-4 mm and 4-2 mm. The human bone was extracted from the samples in the <10 mm and 10-4 mm fractions and the 4-2 mm fraction was retained for examination. The weight of the bone retained in each fraction and spit was recorded and its percentage of the total weight of the cremation calculated. This enabled the degree of fragmentation, which may indicate further processing of the cremated bone after the burning of the body on the pyre, to be quantified.

The bones retained from each sieve size were examined in detail and sorted into the following identifiable bone groups: skull (including mandible and dentition); axial (clavicle, scapula, ribs, vertebra and pelvic elements); upper limb and lower limb. The separation of the bone into these groups helps illuminate any deliberate bias in the skeletal elements collected for burial. Each sample was weighed on digital scales and details of colour and largest fragment were recorded. Where possible, the presence of individual bones within the defined bone groups was noted. Any unidentifiable fragments of long bone shafts or cancellous bone, which are often the majority recovered from cremations, were weighed and incorporated into any subsequent quantitative analysis. The prevalence of unidentifiable bone is largely dependent on the degree of fragmentation, since larger fragments are easier to identify than smaller ones.

It must also be taken into consideration that some skeletal elements are more diagnostic and more easily identifiable than others and, therefore, more often recorded. This may create bias in calculations of the relative quantities of skeletal elements collected for burial.

Age estimations from cremated remains are dependent on the survival of particular age diagnostic elements. In adult cremations, the most useful age indicators are degenerative changes to the auricular surface (Lovejoy *et al.* 1985), pubic symphysis and cranial suture closure (Meindl and Lovejoy 1985).

Weight

The cremation burial weighed 673 g in total. It is frequently found that 50% or less of the bone available after cremation is included in the burial (McKinley 2000). Experiments have found that it is fairly easy to collect all the bones from an undisturbed pyre, which often remain in anatomical order (McKinley 1997). McKinley (2000, 404) states that the weight of bone of an adult cremation from a modern crematorium varies from about 1000 to 3600 g. This would suggest that cremation deposit 8228 comprised only part of the individual. The identified elements were low in quantity, 79% remaining unidentified. The lower limbs were best represented, followed by the skull. Both these areas are more easily identified in very small fragments compared with other bones. Also identified were carpal bones, hand and foot phalanges and tooth roots. These are small bones, and low in weight, but their presence suggests that collection of bone from the pyre was not confined to large long bones and skull fragments.

Colour

The efficiency of a cremation is influenced by the following factors: the construction of the pyre, quantity of wood, position of the body, tending of the pyre, weather, duration of the cremation and pyre temperature (McKinley 2000, 407; McKinley 1994, 82-84). The colour of the cremated bone after cremation reflects the temperatures achieved during the cremation process (McKinley 2000, 405). The cremated bone of context 8228 varied considerably in colour: cranial fragments were largely white; long bone, especially lower leg bones were black or brown; higher up the leg the bone became whiter. Some of the distal phalanges were also noted to be black in colour. There was iron staining on some bone, assumed to be from close proximity to iron nails. A vertebral spinous process was brown and black in colour. From the distribution of colour changes observed it can be inferred that a range of temperature was achieved for the cremation. The pyre must have reached over 645°C some of the time, hence the white colour of, for example, cranial fragments. However, it appears the extremities and lower leg did not achieve temperatures above 285°C, suggesting that the entire body was not within the hottest part of the cremation pyre.

Fragmentation

The majority of fragmentation occurs after burial and then upon excavation (McKinley 1994), and predominantly occurs along the dehydration fissures which formed during the cremation process. McKinley (1994, 340-1) observed that in a sample of over 4000 cremations, over 50% of bone fragments were in excess of 10 mm in size, with the largest fragment being 134 mm and an average maximum fragment size of 45.2 mm (including immature and disturbed cremations). The largest fragment from Kingshill North was 20 x 12 mm, which is substantially smaller than this and the majority of fragments were within the 5-10 mm fraction. This suggests that there was more than average fragmentation of the cremated bone.

Skeletal biology and palaeopathology

The cremated bone deposit was found to be an adult and from a single individual. A distal femoral condyle fragment appeared to have eburnation on the surface, suggestive of osteoarthritis. A molar crown, unworn but burnt, was recovered and possibly survived the fire (the enamel of teeth usually explodes during the cremation process, leaving only the roots) because it had been impacted or unerupted within the mandible at the time.

Animal Bone

A single unfused cremated femoral head of a small mammal (for example pig, sheep, dog) was recovered from the deposit. It is possible this is an incidental intrusion, as so little of the animal was identifiable. However, it is also possible that a small mammal was included on the pyre. An additional sliver of unburnt animal tooth was also found.