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A ROMAN POTTERY KILN, KILN FURNITURE AND NEW VESSEL FORMS FROM ALICE HOLT FOREST, HAMPSHIRE

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ABSTRACT

Excavations during road repairs in the Alice Holt Forest Roman pottery manufacturing site revealed, among other features, the remains of a double-flue updraught kiln, with a mortar base, stone walls and a clay lining. In its last firing, archaeomagnetically dated to between AD 220 and AD 280, the kiln had been fuelled by mainly coppiced oak in one flue and a combination of more varied woods in the other, perhaps to aid temperature control. It was overlain by an extensive dump of late Roman pottery wasters. Further dumps (previously surveyed by Lyne and Jefferies in the 1970s), which together spanned the duration of the Alice Holt industry starting in the late 1st century, were also sampled, producing not only familiar Alice Holt coarseware types, but also a significant number of forms not previously recognised at the site. Pieces of fired clay kiln furniture were also recovered along with fragments of ceramic building material used either in the kiln structures or as further items of kiln furniture.

INTRODUCTION

The extensive Roman pottery production centre in Alice Holt Forest, on the Hampshire-Surrey border, manufactured coarseware pottery on an industrial scale from the 1st to the 5th century AD, supplying London and south-east England. The kilns, first recorded in 1839 and excavated intermittently during the last century, were first surveyed systematically during the 1970s, revealing the extent of the numerous kilns and waster dumps in the area, the corpus of pottery types produced and their distribution on Roman sites in southern Britain (Lyne & Jefferies 1979). The site is now a Scheduled Monument (HA244).

Repairs in 2004/5 along the A325 trunk road between Frith End (NGR SU 808399) and Bucks Horn Oak (SU 807416) provided an opportunity to add to the findings of the earlier survey (Fig. 1). The widening of the road embankment involved the construction of a trench for a gabion wall and the excavation of a new V-profiled drainage ditch on the west side. Watching briefs at four sites to the north of the Scheduled Monument revealed no archaeological remains, but excavation at four of the five areas examined within it (Areas 1 and 3–5) revealed the remains of a kiln and a number of pottery waster dumps, as well as other features (Fig. 2). No archaeology was recorded in the northernmost area (Area 2).

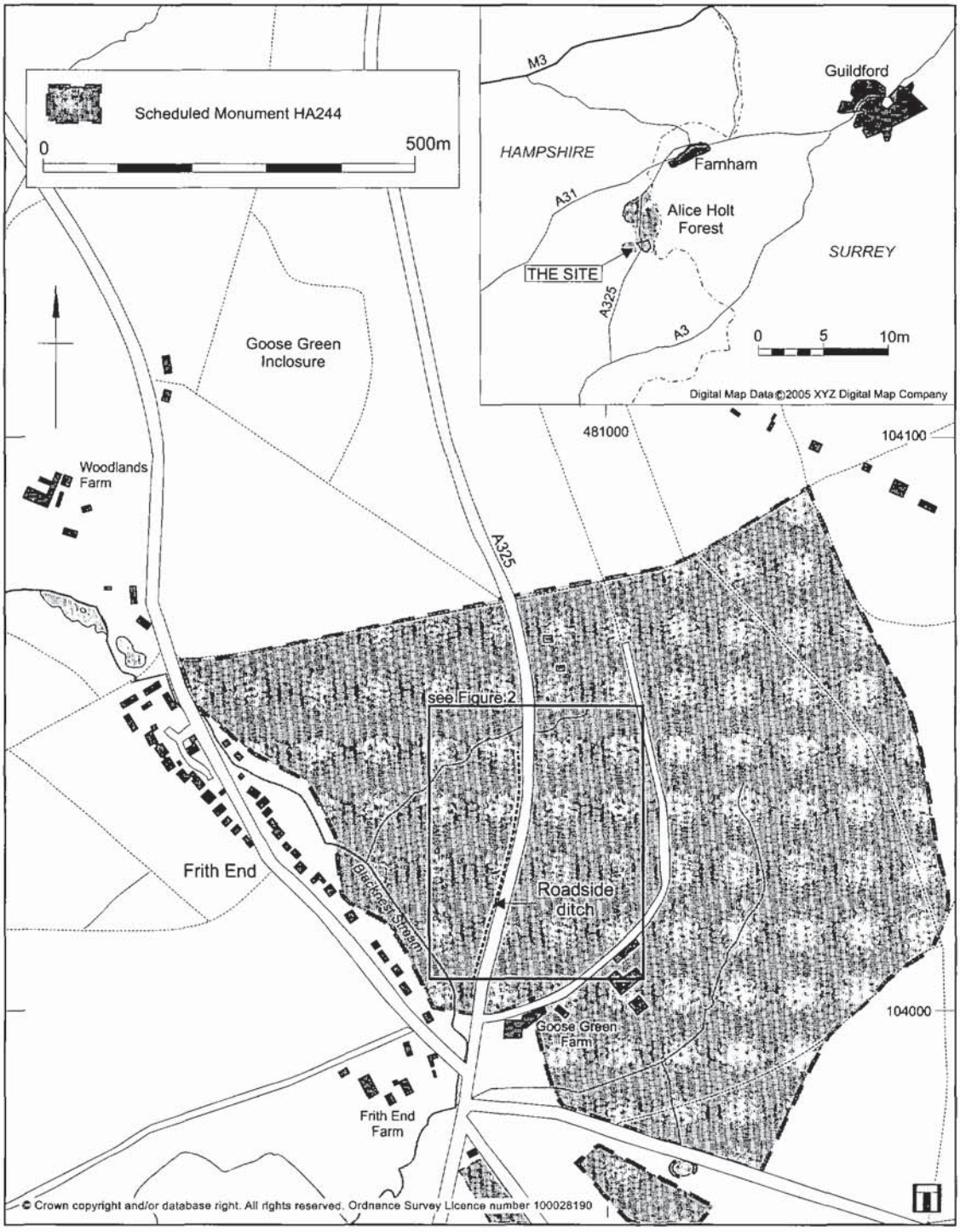
AREAS 1 AND 5

Near the centre of the road's route through the Scheduled Monument, Area 1 (excavated for the gabion trench) and Area 5 (the roadside ditch) 3m to the west were located within an extensive cluster of large overlapping waster dumps as previously mapped by Lyne and Jefferies (1979, fig. 2) (Fig. 3).

Pre-waster dump features

A number of pre-dump features were recorded in both areas although little correlation between them could be discerned, possibly

Fig. 1 (*opposite*) Site location


Scheduled Monument HA244
0
500m
M3
Guildford
HAMPSHIRE
Farnham
A31
Alice Holt
Forest
SURREY
THE SITE
A325
A3
0
5
10m
Digital Map Data ©2005 XYZ Digital Map Company
Goose Green
Inclosure
481000
104100
Woodlands
Farm
A325
see Figure 2
Frith End
Blackbrook Stream
Roadside
ditch
104000
Goose Green
Farm
Frith End
Farm
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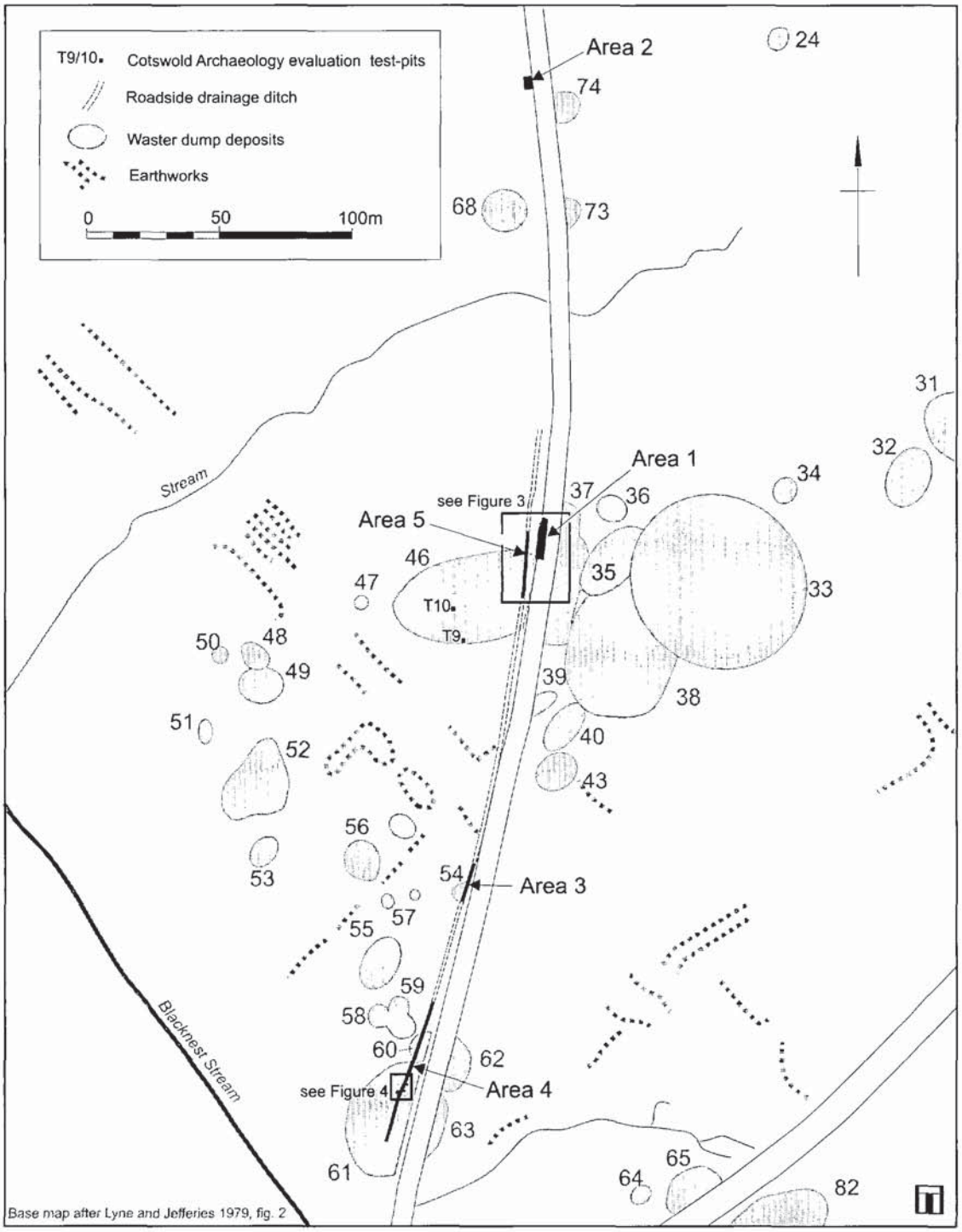
T9/10 Cotswold Archaeology evaluation test-pits
Roadside drainage ditch
Waster dump deposits
Earthworks
0
50
100m
Area 2
Area 1
Area 5
Area 3
Area 4
see Figure 3
see Figure 4
T10
T9
Stream
Blacknest Stream
24
74
68
73
31
32
34
37
36
46
35
33
47
50
48
49
39
38
51
52
40
43
56
53
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57
55
59
58
60
62
63
61
65
64
82
Base map after Lyne and Jefferies 1979, fig. 2

due to their truncation during the road's construction. The features included, in Area 1, two approximately concentric curving gullies (0107 and 0122) *c.* 0.4–0.5m wide and 0.1–0.2m deep with steep, concave sides and base, filled with dark greyish-brown silty clay possibly the result of natural silting. A broad gully (0512) in Area 5 may be associated; it was 1m wide and 0.14m deep with moderate-shallow, straight sides and a concave base containing a single dark greyish-brown silty clay fill.

The south-western terminal of a small north-east-south-west aligned gully (0102) recorded at the north end of Area 1 was 0.6m wide and 0.1m deep with shallow concave sides and concave base.

Four pre-dump postholes (0115, 0119, 0124 and 0126) were identified, all between 0.35m and 0.5m in diameter and 0.1–0.2m deep, but they were widely spaced and formed no discernible structure. Posthole 0115 was sealed beneath one (0112) of a number of shallow, irregular features (also 0116, 0504 and 0505) that may represent localised small-scale clay extraction or could be natural hollows that were filled by the overlying waster dump.

Most of these pre-dump features produced pottery of late lst–2nd century AD date, although fragments of vessels from the later industry were also identified in posthole 0124 and feature 0504 (the latter still dominated by earlier forms). Pre-dump deposits and features producing 1st century AD pottery were also recorded in two test pits (T9 and T10), to the south-west of Areas 1 and 5, that were excavated as part of the evaluation that preceded the excavation (Cotswold Archaeology 2003, 10–11). These deposits included successive clay floors or surfaces, dumps of charcoal-flecked sandy clay and a small pit.

Waster dump

The pottery waster dump (1001) recorded in Areas 1 and 5 comprised an extensive deposit of very dark greyish-brown to black silty clay loam. It was approximately 30m across from north to south and up to 0.25m deep. Since Area 1 lay under the existing road embankment the extent of the deposit here had not been previously recorded by Lyne and Jefferies (1979, fig. 2), but the extent of the deposit in Area 5 corresponded closely to their waster dump AH46. According to Lyne and Jefferies (1979, 7), AH46 comprised an earlier core of material dated AD 60–150 spreading to the east, with a later spread of material, dated AD 150–270, extending from the core to the west. Pottery recovered from layer 1001, in the eastern part of the dump, was datable to the late 1st and 2nd centuries AD, broadly confirming the previous dating. Also recovered was part of a devolved trumpet-headed brooch of 2nd century AD date – an unexpected find on a site of such industrial nature. In the evaluation test pits T9 and T10, to the south-west, where the waster dump was 0.4m and 0.8m thick respectively, its lower part produced 1st century AD pottery, and its upper part pottery dated to the 2nd or 3rd centuries AD

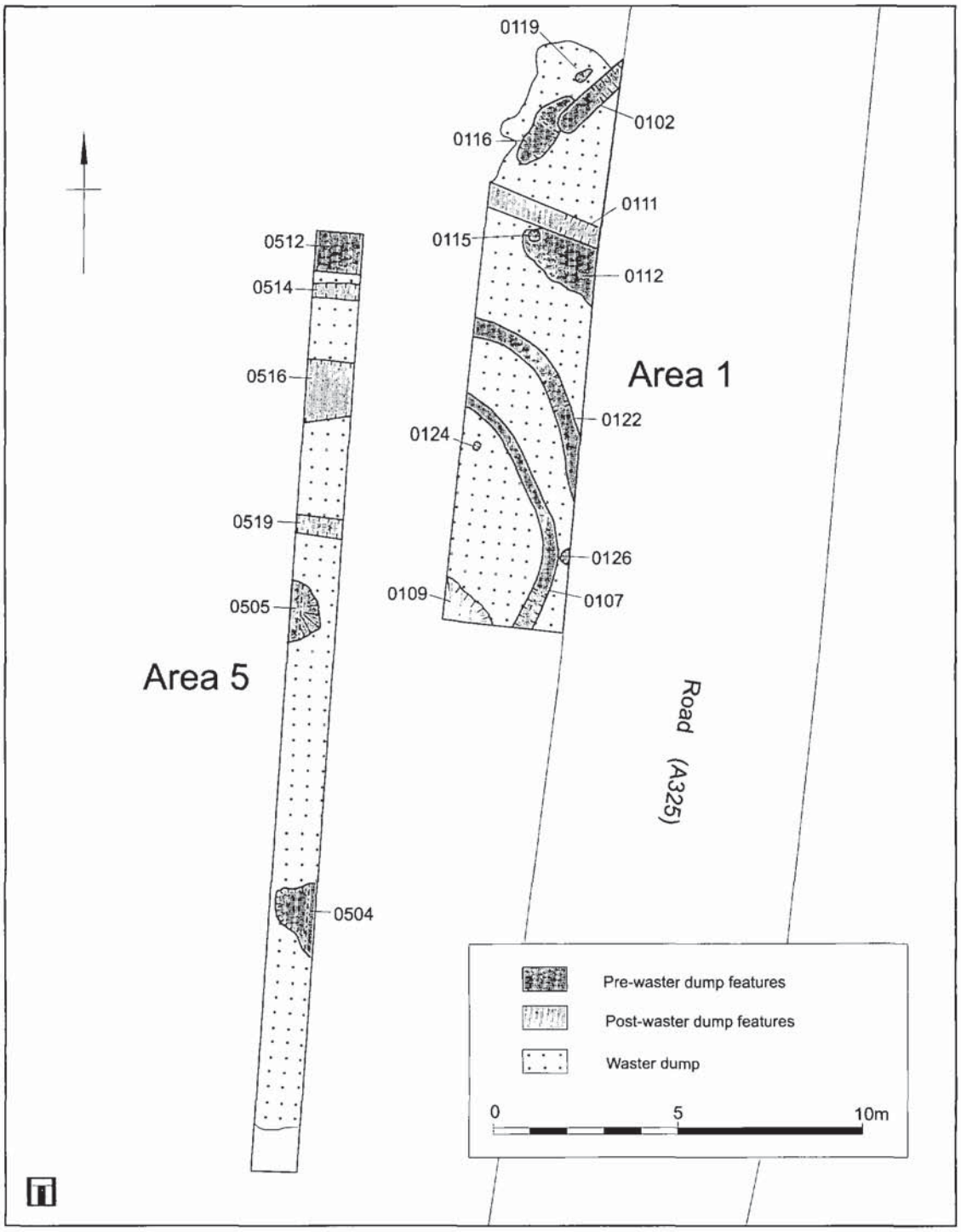
Post-waster dump features

The waster dump deposit was cut by five later features, including three gullies or small ditches (0111, 0514 and 0519) between 0.7m and 1m wide and 0.15–0.45m deep, and a substantial ditch (0516), 2.2m wide and 0.55m deep. There was also a large pit-like feature (0109) in the south-west corner of Area 1, 0.33m deep with moderately steep, concave sides and a concave base, and with a single fill of very dark greyish-brown silty clay (0108). Dating these features, from which large quantities of Roman pottery were recovered, is problematic because of the presence of residual finds from the underlying dump. The assemblage from pit 0109 was of 2nd/3rd century date, whilst gully 0111 also contained two small sherds of post-medieval pottery.

AREA 3

A waster dump approximately 15m wide, mapped by Lyne and Jefferies (1979, fig. 2) as AH54, was

Fig. 2 (*opposite*) Archaeological Areas 1–5


0119
0102
0116
0111
0115
0112
0512
0514
0516
Area 1
0122
0124
0519
0126
0109
0107
0505
Area 5
Road (A325)
0504
Pre-waster dump features
Post-waster dump features
Waster dump
0
5
10m

cut by the roadside ditch and excavated in Area 3 in three 5m by 1.5m slots (Fig. 2). It was up to 0.43m thick in the centre, thinning towards the north and south, and comprised a homogeneous deposit of very dark greyish-brown to black silty clay loam with no discernible stratification. Although Lyne & Jefferies (1979, 8) dated AH54 to between AD 60 and AD 200, the pottery recovered during the excavation had a far wider date range, extending into the later 3rd or even 4th centuries AD

AREA 4

Towards the southern edge of the Scheduled Monument the roadside ditch crossed previously mapped waster dumps AH60 and AH61 (Lyne & Jefferies 1979, fig. 2) (Fig. 2). Underlying the dump deposits, near the centre of AH61, the remains of a pottery kiln were revealed in the base of the existing ditch (Fig. 4).

Kiln

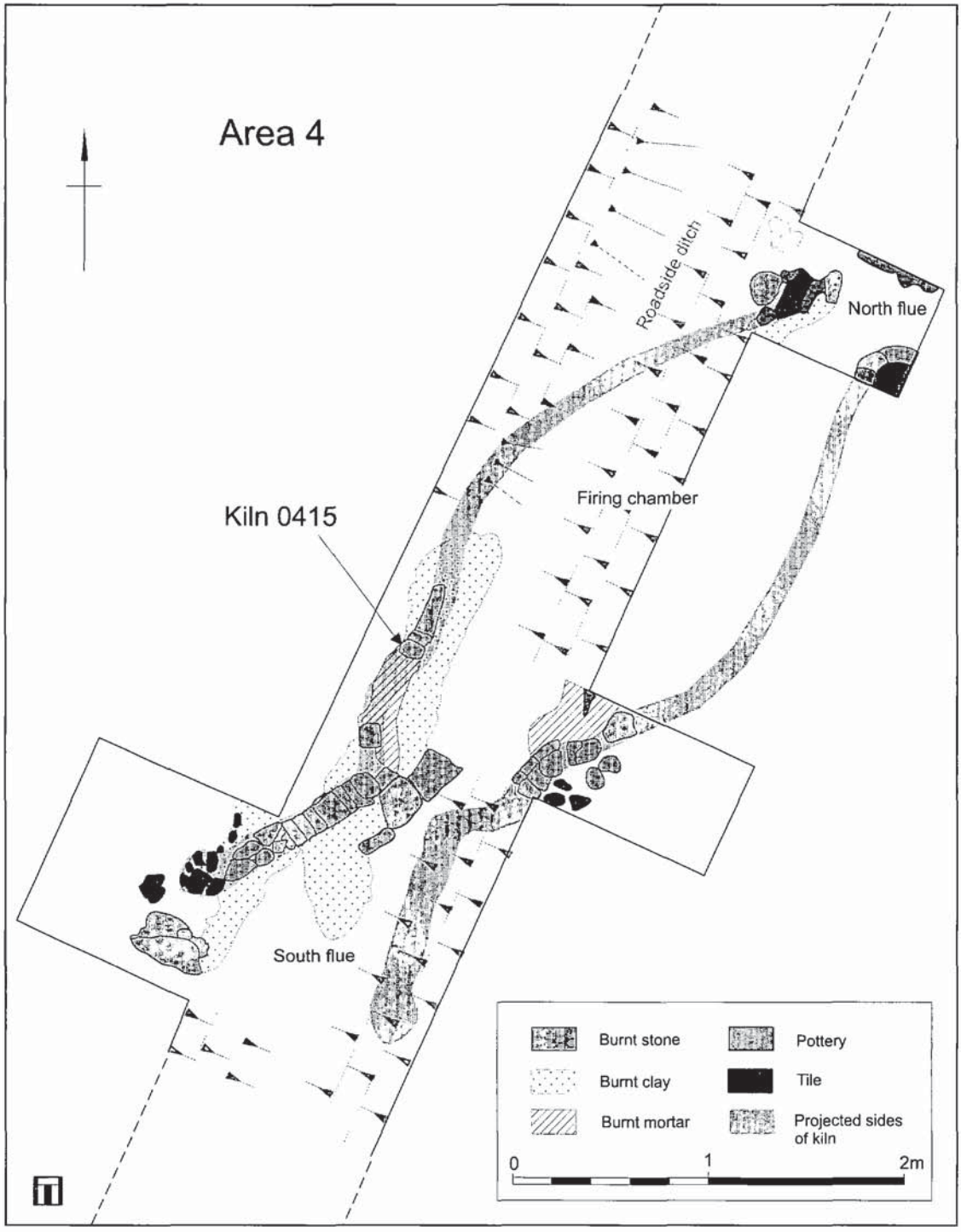
The kiln (0415) had been severely damaged by the cutting of the ditch and only a small part of the western side of the firing chamber and southern flue were initially visible. In order to clarify the structure of the kiln and to identify its northern flue, three small slots perpendicular to the ditch were excavated into the overlying waster dump, exposing the western side of the southern flue, the eastern wall of the firing chamber and a small part of the northern flue. Excavation was then limited to the recovery of bulk environmental samples from the two flues and archaeomagnetic samples from the kiln structure, after which the kiln was preserved *in situ*.

The kiln is identified as a double-flue updraught kiln, a type characteristic of the Alice Holt industry (Swan 1984, 117–19, fig. xviii). It was *c.* 4.7m long, orientated north-east-south-west, with a central firing chamber 3m long and 1.5m wide. The surviving base of the chamber, a thin layer of pale grey lime mortar, was laid directly on the natural clay before the walls of the chamber, made of local stone and ceramic fragments bonded with clay, were built. The firing chamber was then given a *c.* 5mm thick lining of clay, apparently renewed once (possibly twice) during the life of the kiln. The mortar base, walls and clay were all heavily heat-affected.

Analysis of the charcoal from charcoal-rich deposits found in the flues shows that a range of woods species were used for fuelling the kiln, with grass and weeds stems possibly used as tinder or to help boost temperatures temporarily during firing. Differences were noted between the charcoal assemblages in the two flues. In the northern flue almost half the charcoal was of mature oak, there also being substantial quantities of alder and hazel, usually mature roundwood, and a lesser quantity of young oak roundwood. Also represented in small numbers were field maple (both mature and juvenile), birch, hazel, ash, willow/poplar and pomaceous fruits (which includes hawthorn, apple, and pear). Oak was also dominant (64%) in the southern flue, but at least half of it was young coppiced roundwood – rod-like pieces up to 15mm in diameter, cut from two to five year old growth (most of it at three years). Many of the fragments were fissured and partly vitrified, indicating high temperatures and possibly the use of damp wood. The southern flue also contained willow/poplar (13%) and birch (9%), with lesser quantities of hazel, ash, holly and pomaceous fruits also present.

The charcoal is comparable to a smaller assemblage previously described from waste dump AH5, where roundwood dominated, mostly oak but with hazel and possible willow also noted (Pratt 1979). The management of coppiced oak stands/woodland, well-documented in modern times to provide vigorous straight shoots as a crop (e.g. Edlin 1949, 82–4), is unsurprising given the amount of fuel that would have been required by the Alice Holt pottery industry. An experimental firing of the type of kiln found at Alice Holt found that long, straight (coppiced) poles 20mm in diameter and 0.6m long worked best for the main firing in the constricted flues,

Fig. 3 (*opposite*) Archaeological remains, Areas 1 and 5


Area 4
Roadside ditch
North flue
Kiln 0415
Firing chamber
South flue
Burnt stone
Burnt clay
Burnt mortar
Pottery
Tile
Projected sides of kiln
0
1
2m

with finer brushwood being used for producing higher temperatures (Lyne & Jefferies 1979, 13).

Although no datable finds were recovered from the kiln fabric itself, 12 samples of clay lining or tile were collected for archaeomagnetic dating, of which three from the southern flue proved to have useful archaeomagnetic directions. The specimens from these samples provided a mean direction (variation corrected) of declination = 4.8°, inclination = 56.6°, 95 = 2.3°, K = 2892, producing a direction corrected to Meriden of declination = 4.6°, inclination = 57.7°, 95 = 2.3°. This direction and its confidence interval, when compared to the UK master curve (Clark *et al.* 1988) suggests that with an approximate 95% probability, the date of the last major heating of the kiln was between AD 220 and AD 280.

Waster dump

A waster dump deposit of very dark greyish-brown to black silty clay loam, up to 0.4m deep, was recorded overlying the kiln, for some 60m along the line of the roadside ditch in Area 4, extending some 10m to the north of the mapped edge of AH60 (Fig. 2). There was no discernible difference in the colour or texture of the dump along the length of the ditch. Twelve 5m long slots were excavated through it, two to the north of AH60, two within AH60 and eight within AH61.

The pottery recovered from the AH60 area was broadly datable to AD 220–270 (as also dated by Lyne and Jefferies), while that from the AH61 area was of late Romano-British date (again conforming to Lyne and Jefferies' date of AD 270–420; 1979, 8). This latter date range also fits well with the date of the last firing of the underlying pottery kiln (see above). However, the pottery recovered from the two slots north of AH60 did not form a homogeneous group. That from the northernmost slot was mostly of late 3rd or 4th century date and may represent a small, previously unrecognised, late waster dump. In contrast, the pottery from the other slot, to its south, was of 2nd to 3rd century date; this could represent an extension of waster dump AH59, dated to AD 150–200 (Lyne and Jefferies 1979, 8) and mapped as lying just a few metres to the west.

FIRED CLAY KILN FURNITURE

Almost 400 fragments of fired clay were recovered from the excavation, of which most comprised pieces of lining from the Area 4 kiln. However, 40 items of prefabricated, portable kiln furniture were also recovered from all four Areas, although none is a complete object. Their fabrics vary – most are in sandy fabrics with a noticeably 'gritty' feel; some are in slightly finer sandy fabrics, with one or two pieces in very fine, silty, slightly micaceous fabrics with no visible inclusions. Only one example is in a non-sandy (grog-tempered) fabric.

They include 'feet' of varying form and size, either from vessels or possibly trivets or gridirons, most having broken off just before the junction. Two are fairly well made, straight, bar-shaped objects, slightly tapering, one with circular and one with rectangular section; both are relatively long (65mm and 95mm respectively) (Fig. 5, 1, 2). One other large 'foot' (length 90mm) is a much more crudely formed, tapering object (Fig. 5, 3). The other three examples are smaller (lengths 32–50mm); one is a short, stubby object with roughly circular section and flattened end in an unusual grog-tempered fabric. The second is a slightly curving, flat piece; the curvature gives an external diameter of *c.* 80mm (Fig. 5, 4). The final piece is the only object for which more survives than just the foot; this is a tapering, bar-shaped foot with rounded end, apparently supporting a flat, circular or sub-circular stand, possibly a trivet (Fig. 5, 5). If circular, this would have had a diameter of *c.* 200mm. A seventh object, a short length of an oval-sectioned bar could also derive from a foot, or could be a kiln bar (see below).

Two slightly 'waisted' objects, possibly pedestals, were recovered. Both are fairly crudely

Fig. 4 (*opposite*) Kiln 0415, Area 4

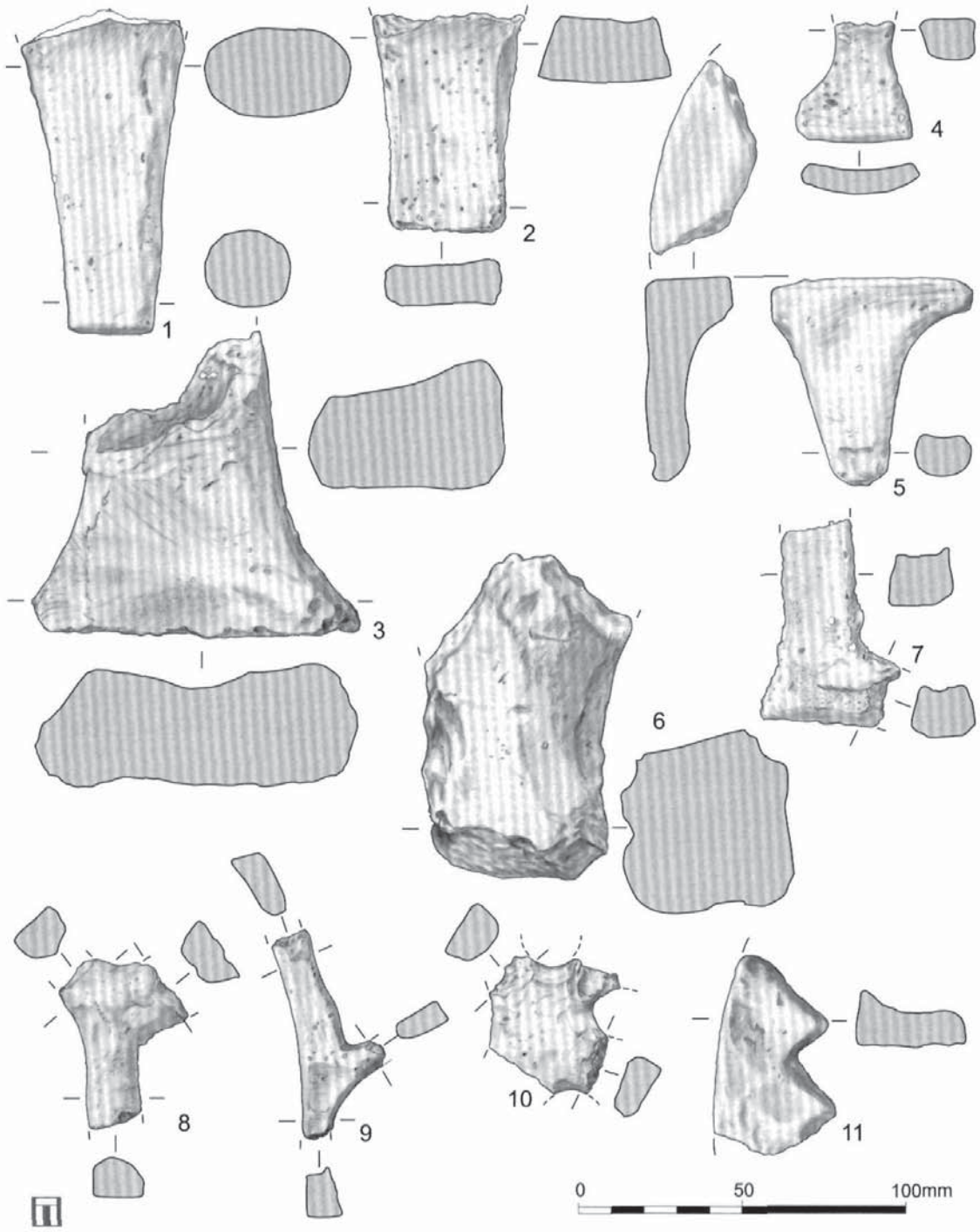


Fig. 5 Romano-British kiln furniture (1–11)

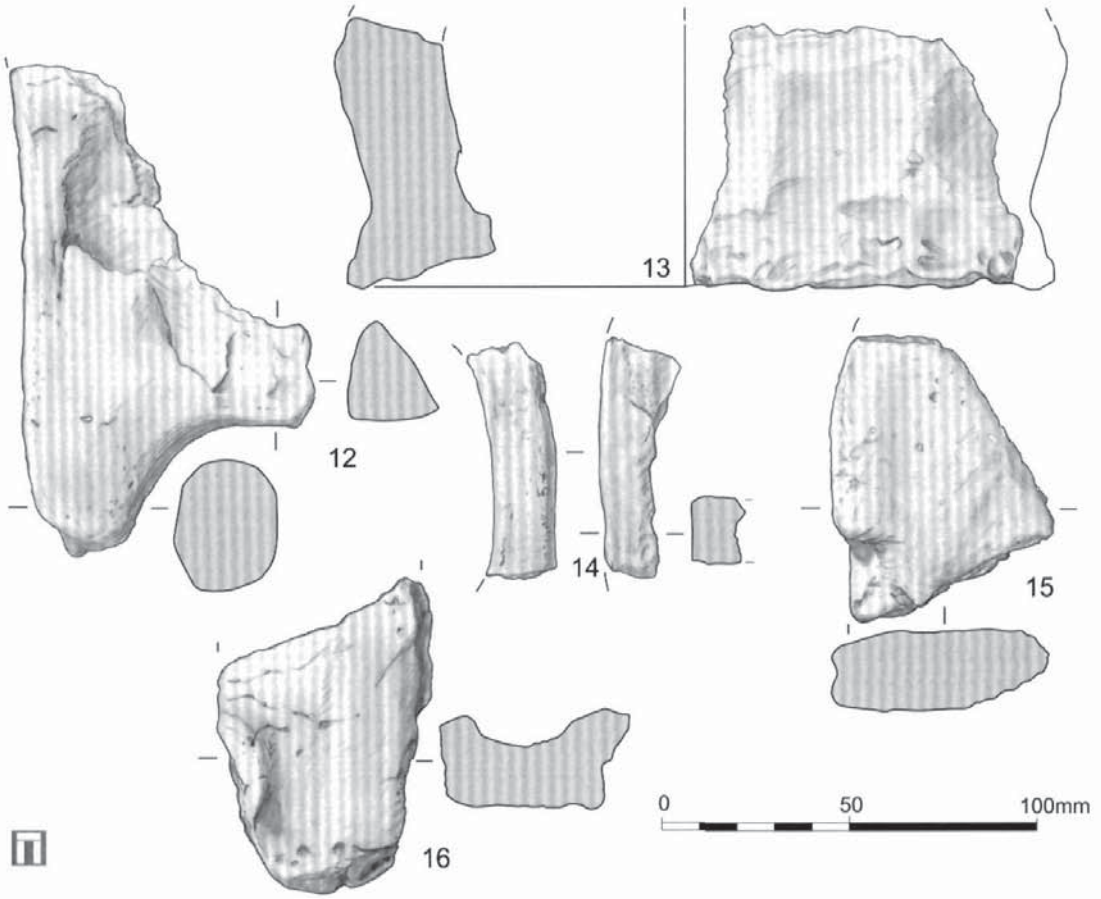


Fig. 6 Romano-British kiln furniture (12–16)

shaped, with roughly sub-circular section; one has one flattish end surviving (Fig. 5, 6). These objects appear to be of similar form and dimensions to an example found on a salt-extraction and pottery production site in the Isle of Purbeck, Dorset (Cleal 1991, fig. 66, 24).

A number of gridiron or trivet fragments were recovered. Most comprise thin bars (width 10–22mm, thickness 12–20mm) in varying arrangements – two bars at right angles (Fig. 5, 7), three bars in approximate Y-shape (Fig. 5, 8), four radiating bars (Fig. 5, 9) and two curving bars (Fig. 5, 10). One example comprises a small, flat fragment with one straight edge and the opposite edge apparently cut into chevrons (Fig. 5, 11). A somewhat larger object could also be part of a trivet, representing either two fairly thick bars at right angles, or a slab-like fragment with one corner protruding into a short, round-ended bar (Fig. 6, 12). An object identified as a trivet or gridiron from a site at Shedfield, Hampshire (close to a pottery production site) provides a parallel for this latter piece (Holmes 1989, fig. 7, 7). Interestingly, this object was examined by Vivian Swan, who ruled out a function as kiln furniture, although a parallel from Alice Holt (unpublished) is cited (Holmes 1989, 38). No parallels for the other forms have been found.

Six possible ring-shaped supports, setters or spacers were identified. They include one very

short length of curving bar, which could form part of a ring, or perhaps a sausage-shaped bar (see Swan 1984, pl. 8). The others, which vary in size, have one flat edge and two curving sides (Fig. 6, 13, 14); the one of which the most survives is part of a thick-walled, cylindrical object with an external diameter of *c.* 250mm and roughly smoothed surfaces. Such objects could have fulfilled several functions in the kiln, possibly as floor supports or spacers (Swan 1984, 66), or stacked to form pedestals (Corder 1928, fig. 18; Evans 1989, 49). Clay rings occurred on the earliest Alice Holt waster dumps (Lyne & Jefferies 1979, 17).

Also found was the edge of a small, circular plate, with a diameter of *c.* 200mm (Fig. 6, 15). Circular plates, both perforated or unperforated, are fairly common items of kiln furniture, with several possible functions, including floor supports or spacers (Swan 1984, 64–5). A number of roughly flattish, slab-like pieces 18–25mm thick, each with one or two surfaces and one straight edge surviving, are of uncertain function but could also have been part of floor supports, pedestals (e.g. Swan 1984, fig. ix), or acted as spacers. Kiln bars used as floor supports, generally in conjunction with a central pedestal (e.g. Swan 1984, pi. 20), are relatively common on pottery production sites but no examples were positively identified here, although some of the objects identified as feet or trivet could alternatively have been kiln bars. A number of small and/or irregular pieces of various forms had insufficient portions surviving for interpretation (Fig. 6, 16).

Because of their fragmentary nature most of the fired clay objects were difficult to assign to specific categories of object. It is possible that many pieces of kiln furniture were made on an *ad hoc* basis, rather than to standardised forms, and reused for different functions, e.g. floor supports reused as spacers. A similar, relatively unstandardised range of objects was recovered from Late Iron Age and Roman sites within the Wytch Farm oilfield in the Isle of Purbeck, Dorset, variously associated with briquetage production, pottery manufacture and salt extraction (Cleal 1991).

Nonetheless, there are relatively good parallels for pedestals (or props), rings (or cylinders), bars, slabs and plates on pottery production sites in various parts of Britain, their use generally confined to the Late Iron Age and early Roman period (1st century BC–2nd century AD), and prefabricated kiln furniture in the form of 'coil-built clay rings and perforated clay sheeting' was previously recorded as being a feature of early Alice Holt waster dumps (Lyne & Jefferies 1979, 17). The trivet or gridiron fragments, however, have a more tenuous link with pottery production, although other examples are known from waster dump AH52 (M. Lyne, *pers. comm.*), as well as from a site close to the early Roman pottery kilns at Shedfield, Hampshire. Alternatively, they could be kiln products, although in the absence of known parallels from settlement sites this remains a supposition.

CERAMIC BUILDING MATERIAL

The excavation produced 159 pieces (14,974g) of Romano-British ceramic building material (CBM). Most of it was in visually quite homogeneous fabrics that can be described as visibly sandy, with sparse to common quartz grains (mostly <1mm) often giving a 'gritty' feel, and frequently appearing poorly wedged, with prominent clay pellets, iron compounds and other 'impurities'. Only two fragments occurred in a visually distinctive fabric type – two joining pieces of an *imbrex* in a coarse, grog-tempered fabric from Area 5 gully 0514. While generally oxidised, sometimes with a grey core, a significant proportion (*c.* 20–30%) is grey in colour, reflecting its subjection to temperatures beyond what might be expected under normal firing conditions, leading to burning or over-firing and, in a few instances, partial vitrification. Some of these pieces have a slightly powdery surface feel, and some have partially laminated.

Diagnostic pieces included *tegula, imbrex* and brick fragments although the majority were flat or featureless and often rather battered and abraded. This is reflected in the low mean fragment weight of just 98.5g for this assemblage. Twenty-eight *tegulae* fragments were identified, exclusively from flange fragments. All flange profiles were rectangular or sub-rectangular,

with external depths ranging from 35–45mm (Brodribb records the average depth as 50mm; 1987, 13). Three cut-aways survived, one from the top end of the *tegula*, one from the bottom end, and one uncertain. The predominance of *tegulae* (28 examples) over *imbrices* (a single example) is not surprising as this is generally the case (see Brodribb 1987, 24), and may be due in part to the fragmentary nature of the assemblage in which the diagnostic features of *tegulae* might be more easily recognised than those of *imbrices*. Pieces classified as 'flat fragments' (undiagnostic fragments with thickness <35mm) may therefore include both *tegulae* and *imbrices* and possibly also box-flue tiles, although no fragments with characteristic combing were present. Six flat fragments carry finger-smeared 'signatures', and one has a pre-firing nail hole. Bricks were defined solely on thickness (>35mm); no complete widths or lengths survived and specific types could not therefore be identified.

There is a strong possibility that at least some of the material was made in the immediate vicinity of the Alice Holt potteries, if not by the potters themselves, a suggestion supported by the visual homogeneity of much of the assemblage, and the presence of over-fired/burnt pieces which could be 'wasters'. It may be significant that *c.* 80% of the assemblage was found in Area 4, and although the relatively small quantity suggests that it is unlikely to have been made in kiln 0415 itself, it is quite possible that pieces were used within the kiln, either built into its structure or used as kiln furniture, which in either case would further account for the burnt nature of some of the pieces.

ROMAN POTTERY

Not surprisingly, the pottery assemblage, comprising 31,534 sherds (349,128g), was dominated by the products of the Alice Holt industry. Most of the forms identified correspond to the published type series (Lyne & Jefferies 1979), but some had not previously been recognised on the site, and these are described in detail below and illustrated in Fig. 7.

The condition of the material was highly varied, with an average sherd weight of 11g and moderate to severe abrasion with few surfaces being fully preserved. As rims were generally broken at the neck/shoulder junction, hampering the precise identification of vessel form, certain classes have been combined, such as the straight-sided dishes and bowls (Lyne & Jefferies 1979 Classes 5A and 6B, 5B and 6C). Very few sherds showed clear signs of over-firing, such as blistering, spalling and distortion, although a significant proportion were discoloured (orange, red or brown), or very soft compared to 'successful' Alice Holt products found on settlement sites.

The fabrics conform to those described by Lyne and Jefferies (1979, 18, fabrics A-F), although they varied widely in the frequency and coarseness of the sand filler used; no example of the grog-tempered fabric (G) was recovered. The use of the coarsest fabrics (E and F) for small, relatively thin-walled vessels, as well as the much larger thick-walled storage vessels with which these fabrics are more commonly associated, is interesting to note; it may suggest that, from time to time at least, fabric choice owed more to the materials readily available to hand, than considerations of vessel size, form and function.

The surface treatments and decoration, too, conform to those outlined by Lyne and Jefferies, although any comments are necessarily restricted by the comminuted and abraded nature of the sherds. Decoration was comparatively rare, being noted on only 4% of the sherds, but included a handful of rusticated pieces as well as the more common cordoned, combed, incised and burnished motifs.

There are parallels for 3178 of the rims in the published type series, 1462 representing the early industry and 1716 the later industry (Table 1). The only types not seen are the Class 3 devolved butt beaker from the early industry, and the Class 2 jar with pedestal and the Class 5E large reeded-rimmed bowl from the later industry.

New pottery forms

Thirty-eight vessels, however (37 rim sherds and one sherd from a mortarium base), had no

Table 1 Number of rims present in each context group. Dates after Lyne & Jefferies (1979)

		Context group										
		1000	1001	1002	1003	3000	3001	4000	4002	4003	4004	**Total**
Early industry forms												
Class 1	Cordoned jars (to c 150 AD)	25	73	1	36	2	14	47	63	40	0	**301**
Class 1a	Cordoned and necked jars (to c 150 AD)	0	29	0	17	32	0	1	1	0	0	**80**
Class 2	Jars with pedestals (to c 150 AD)	1	4	2	0	0	0	0	0	0	0	**7**
Class 3A	Flat-rimmed jars (90–150 AD)	30	144	0	26	107	15	32	26	57	1	**438**
Class 4	Bead-rimmed jars (to c 150 AD)	57	250	1	17	21	3	6	5	8	0	**368**
Class 5	Atrebatic bowls (c 60–100 AD)	8	41	0	8	13	3	1	0	4	0	**78**
Class 6	Dishes/lids imitating Gallo-Belgic forms (c 60–100 AD)	13	51	0	4	0	0	0	0	0	0	**68**
Class 7	Lids (90–150 AD)	0	33	0	4	11	0	0	8	6	0	**62**
Class 8	Flagons (to c 150 AD)	0	6	0	0	0	0	13	8	1	0	**28**
Class 9	Handmade storage jars (to c 150 AD)	2	19	2	1	0	1	4	1	2	0	**32**
Late industry forms												
Class 1	Cordoned jars (AD 150+)	0	0	0	0	1	0	1	2	0	1	**5**
Class 1A	Cordoned and necked jars (AD 180–400+)	1	0	0	0	6	4	18	9	1	3	**42**
Class 1B	Flasks (AD 150+)	0	11	0	0	2	0	1	25	3	2	**44**
Class 1C	Large cordoned storage jars (AD 220+)	1	1	0	0	10	3	4	14	1	1	**35**
Class 2	Jars with pedestals (AD 150+)	0	0	0	0	0	0	0	0	0	0	**0**
Class 3A	Flat-rimmed jars (2nd to 3rd century)	2	74	6	0	12	1	11	14	17	3	**140**
Class 3B	Everted and 'cavetto' rimmed jars (from mid 2nd century AD)	1	25	3	0	106	23	124	193	13	14	**502**
Class 3C	Triangular and hooked rimmed jars (AD 220+)	0	0	0	0	53	7	45	93	6	2	**206**
Class 4	Bead-rimmed jars (AD 150+)	1	23	0	0	0	0	6	2	1	0	**33**
Class 5A/6B	Flat and triangular rimmed bowls/dishes (AD 150–180 to 3rd century)	2	38	0	4	8	10	54	37	13	3	**169**
Class 5B/6C	Beaded and flanged bowls/dishes (AD 200/220+)	0	4	0	1	43	2	16	89	21	4	**180**
Class 5C	Strainers (AD 200–400+)	0	2	0	0	1	0	2	5	3	1	**14**

		Context group										
		1000	1001	1002	1003	3000	3001	4000	4002	4003	4004	**Total**
Class 5D	Deep, decorated bowls (AD 150+)	0	1	0	0	0	0	0	0	0	0	**1**
Class 6A	Straight and convex-sided dishes (c AD 180+)	0	9	0	0	45	9	78	104	14	6	**265**
Class 7	Lids (decline in 3rd century)	0	3	0	0	8	1	7	9	0	0	**28**
Class 8	Flagons (AD 150+)	1	10	0	0	12	0	0	5	0	1	**29**
Class 10	Large cable-rimmed jars (AD 180+)	0	1	0	0	2	0	11	9	0	0	**23**
New forms												
R100	Flared rim jar	1	7									**8**
R101	Small, everted rim jar		1									**1**
R102	Lid–seated, cup-mouthed jar	1										**1**
R103	Long–necked, low-waisted beaker				1							**1**
R104	Small, carinated bowl		1									**1**
R105	Shallow dish with flat, out-turned rim and curved wall body	1										**1**
R106	Slightly carinated bowl/dish with curved rim		2									**2**
R107	Carinated bowl with flatter, out-turned rim		4									**4**
R108	Bowl/dish with grooved, out-turned rim		4									**4**
R109	Long-necked, carinated bowl										1	**1**
R110	Bowl with flange a short way below the rim		1									**1**
R111	Imitation butt-beaker		1									**1**
R112	Indented beaker		2							2		**4**
R113	Long-necked beaker		2	1								**3**
R114	Bead-rimmed beaker	1	1									**2**
R115	Flat, decorated rim, probably from a bowl		1									**1**
R116	Necked, carinated bowl	1										**1**
R117	Mortaria (body sherd only)					1						**1**
		150	**879**	**16**	**119**	**496**	**96**	**482**	**722**	**213**	**43**	**3216**

such parallels, although their fabrics were sufficiently similar to the known forms to suggest that they had also been manufactured on site.

Jars

R100: flared rim jar (Fig. 7, 1–3) – neckless jar with short, flared rim and high, rounded shoulder, probably with a rounded/ovoid profile; usually one or more grooves under the rim, emphasising the angle change; rim diameter: 130–220mm; variation of the late industry Class 3B.

R101: small, everted rim jar (Fig. 7, 4) – very small Class 3B everted rim jar, possibly a 'miniature' jar or beaker; rim diameter: 90mm.

R102: lid-seated, cup-mouthed jar (Fig. 7, 5) – necked jar with lid-seated, cup-mouthed rim, grooved internally; rim diameter: *c.* 220mm, much larger than most Alice Holt vessels, which are commonly 150–170mm in diameter (Lyne & Jefferies 1979, 13). An unusual and very much a one-off piece, possibly not a product of these kilns.

Bowls

R104: small carinated bowl (Fig. 7, 7) – very small carinated bowl, or possibly a lid, with flat-topped rim and slightly footed base; uneven height, 40–45mm; rim top decorated with short notches, perpendicular to rim edge; irregular burnished line decoration present on the body; rim diameter: 80mm.

R105: shallow dish with flat, out-turned rim and curved wall body (Fig. 7, 8) – two grooves located between rim and shoulder, rim defined by a single groove; rim diameter: 170mm. A similar vessel has been illustrated from a mid 4th century context at Wanborough (Seager Smith 2001, fig. 97.474).

R116: necked, carinated bowl (Fig. 7, 9) – slightly lid-seated bowl/dish with cordon at the point of carination; rim diameter: 200mm.

R106: slightly carinated bowl /dish with curved rim (Fig. 7, 10) – vessel walls are straight above the carination; rim diameters: 170mm and 220mm.

R107: carinated bowl with flatter, out-turned rim (Fig. 7, 11 and 12) – similar profile to the R106 but has an out-turned rim with rounded terminal; rim diameters: 160mm and 180mm.

R108: bowl/dish with grooved, out-turned rim (Fig. 7, 13–15) – rim with single groove and rounded terminals, profile unknown, walls curving into a point of carination or base; rim diameters: 160–200mm.

R109: long-necked carinated bowl (Fig. 7, 16) – long-necked carinated bowl with simple flared and rounded rim; the carination is emphasised by a cordon; thin-walled, oxidised vessel; rim diameter: 140mm. The style of this bowl has its origins in the late Iron Age, although this example is probably early Roman (Neronian/early Flavian).

R110: bowl with flange a short way below the rim (Fig. 7, 17) – body of vessel is missing but was probably similar to Neatham type 54, dated mid 2nd to 4th century AD (Millett 1979, 125, fig. 2.13, table 1).

R115: flat, decorated rim, probably from a bowl (Fig. 7, 25) – decorated with fine comb-impressed diagonal lines between two grooves.

Beakers

R103: long-necked, low-waisted beaker (Fig. 7, 6) – long-necked, low-waisted beaker with slight footring base, defined by a groove; rim is missing but may have been similar to the R113 (Fig. 7, 20–22).

R111: imitation butt-beaker (Fig. 7, 18) – probably a local copy of a Cam 113, made using a white firing clay. Iron free clays were available locally but were mostly used for slipped decoration in the Roman period, with the exception of small quantities of 4th century forms (Lyne & Jefferies 1979, 12); the Cam 113 was manufactured at Colchester 'from pre-conquest times (Tiberian) until the Boudiccan destruction' (Hawkes & Hull 1947, 238).

R112: indented beaker (Fig. 7, 19) – four indented beakers were represented by body sherds, including a nearly complete profile from the base to the neck of one vessel, forming quite a short, square-shaped beaker; the fabric is relatively fine and micaceous. This vessel type is typically of late 3rd or 4th century date (AD 240–400+ for Oxfordshire industry type R36, Young 1977, 217). Indented beakers have been identified at Neatham and are dated slightly earlier, with the smaller Neatham type 101 dating from the beginning of the 3rd century and the larger Neatham type 106 from the second quarter of the 3rd century (Millett

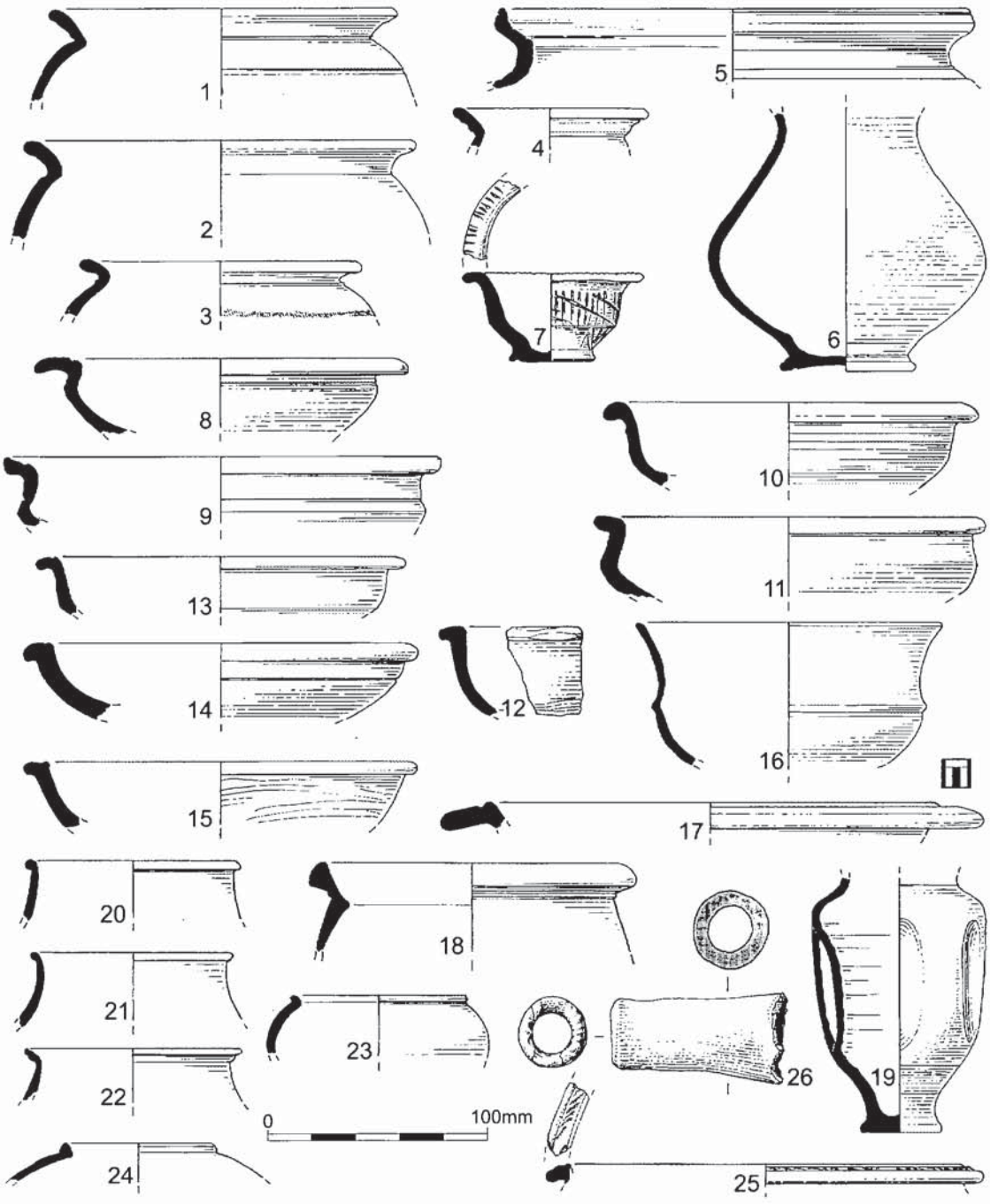


Fig. 7 Romano-British pottery

1979, fig. 7.33 and 34, table 1). The Neatham examples are further evidence of the production of indented beakers at Alice Holt, although Millett notes that beakers 'appear to be an unimportant element in the industry's production' (Millett 1986, 78).

R113: long-necked beaker (Fig. 7, 20 – 22) – three beaker with long, sloping neck. Beaded and everted rim forms have been recorded. The profile is probably variable but may include carinated and/or globular forms. Thin-walled, rim diameters: 90mm and 100mm.

R114: bead-rimmed beaker (Fig. 7, 23 and 24) – rim defined by an external groove beneath the bead. Rim diameter: 70–80mm. The fabric of one vessel is quite coarse.

Mortaria

R117: a single sherd from the base of a mortarium. The fabric is an unoxidised coarse sandy ware, well within the range of Alice Holt fabrics and may be a local product. It is worn and abraded but has trituration grits of quartz and flint.

Other

An unoxidised tapering tube, broken at one end, was recovered from context 302 (waster dump AH54; Fig. 7, 26). It was probably a vessel handle, but alternatively may have been a spout or gridiron/trivet leg.

Non-local Roman pottery

Other Roman pottery fabrics included flint-tempered ware, samian, mica-dusted ware and New Forest colour-coated ware, as well as red-slipped and white-ware fabrics (both including mortaria) from the Oxfordshire industry. The potters themselves presumably used these vessels.

DISCUSSION

It is important to emphasize that the limited extent of the remains encountered, and hence the limited conclusions that can be drawn from them, are a result of the success of the project design which enabled essential maintenance of the A325 to be undertaken with minimum disturbance to the archaeological remains. However, while the narrow range of features and deposits encountered are fairly typical of the sorts of features that would be expected to be associated with the Roman pottery industry, the work has provided significant information about the structure and operation of a pottery kiln, and has identified a number of pottery vessel forms not previously associated with the Alice Holt industry.

The only clearly identifiable structure was the remains of the double-flue updraught kiln, the date of whose final firing – between AD 220 and AD 280 – conforms well with the suggested date of *c.* AD 270–420 for waster dump AH61 sealing it. The charcoal assemblages recovered from the two opposing flues may provide insight into the technicalities of temperature control within such kilns. The use of young coppiced roundwood in the southern flue, possibly in charcoal form, may have been selected to achieve a high, steady temperature, while the use of more varied and mature timber in the northern flue could indicate that the temperature there was of less importance, or was deliberately kept lower. This contrast may also be reflected in the structure of the kiln itself, with the angle between the sides of the northern flue and the sides of the firing chamber appearing to be far more abrupt than that in the southern flue; however, this is not certain as only a very small part of the damaged northern flue was exposed, and it would be at variance with other known examples of Alice Holt kilns.

The fired clay and CBM recovered during the excavation reflect both the structure and operation of such kilns. Most of the fired clay and some of the CBM is likely to derive from the kiln structure and clay lining, but other fragments comprise pieces of kiln furniture – the pedestals, rings and other objects used to ensure that the pottery vessels were suitably spaced and supported during firing. Some pieces were of specific although variable form, while others appear to have been less standardised, possibly employed on an *ad hoc* basis.

While the range of pottery vessels recovered

during the work conforms largely to the corpus of types identified by Lyne and Jefferies, some vessels, of forms not previously identified from the site, add to that corpus. However, each of these new forms occurred in such small numbers that they probably only ever represented one-offs or very minor components of the industry and were not distributed beyond the site. Parallels for these forms are therefore difficult to find, although the pottery from Neatham includes a number of similar vessels (Millett 1979, 1986). Portions of four previously identified pottery waster dumps were investigated, although it was not possible to differentiate AH60 from AH61. In addition, it is possible that a small, previously unrecognised late 3rd–4th century dump was identified in the very north of Area 4; although the homogeneity of the dump deposits meant that this dump was not identified during excavation, its presence is suggested by the pottery assemblage from that location.

The forming of pottery vessels, their drying before firing and their storage after firing would probably have taken place under cover, and covered areas would also have been needed for the storage of fuel and raw materials. The only other features recorded – the small group of gullies, postholes and possible pits in Areas 1 and 5 – could have had a range of possible functions associated with the wider production site. Where extensive area excavations have been undertaken of Roman pottery production sites a wide variety of structures, interpreted as possible workshops, drying sheds and storage buildings, have been recognised (Young 1977, 44–50; Wild 1973, 136–7). Although no definable ground-plans, or even partial ground-plan, were recognised during this excavation, the four postholes recorded in Area 1 may represent some form of structure relating to these functions. Similarly, the series of clay floors or surfaces recorded in test pit T10, to the south-east of Area 5, may represent the internal surfaces of such buildings. The curvilinear gullies were presumably either for drainage, to intercept ground water and divert it away from a kiln or working area, or were perhaps associated with some form of levigation or puddling processes.

While the irregular scoops and pits may simply have been the result of root action, it is possible that they represent areas of small-scale clay extraction. The dumps of charcoal-flecked sandy clay located in the evaluation test pits T9 and T10 may represent unused stocks of clay for use in potting, or raw material awaiting processing. Once extracted, the clay had to be weathered by exposure to the sun, wind, rain and frost to break down the particles and increase its plasticity before being mixed with temper, which usually comprised sand, although small fragments of pottery and charcoal have also been noted in fabrics previously recovered at Alice Holt (Swan 1984, 43–44). Deposits of unused clay have been recorded on other contemporary pottery production sites, such as Pitts Wood in the New Forest (Swan 1984, 43–4) and Cowley and the Churchill Hospital in Oxfordshire (Young 1977, 15–16).

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REFERENCES

Brodribb, G 1987 *Roman Brick and Tile*, New Hampshire.

Clark, A J, Tarling, D H & Noel, M 1988 Developments in archaeomagnetic dating in Britain, *J Archaeol Sci* **15(6)** 645–67.

Cleal, R M J 1991 Fired clay, in Cox, P W & Hearne, C M (eds), *Redeemed from the Heath: the Archaeology of the Wytch Farm Oilfield (1987–90)*, (Dorset Natur Hist Archaeol Soc Monogr **9**), Dorchester, 149–56.

Corder, P 1928 *A Roman Pottery at Crambeck, Castle Howard* (Roman Malton & District Rep **1**), Leeds.

Cotswold Archaeology 2003 *A325 Frith End to Bucks Horn Oak, Alice Holt, near Farnham, Hampshire – Volume 1: Topographic Survey and Archaeological Evaluation*, unpublished client report 03118.

Edlin, H L 1949 *Woodland Crafts in Britain, an Account of the Traditional Uses of Trees and Timbers in the British Countryside*, London.

Evans, J 1989 Crambeck; the development of a major northern pottery industry, in Wilson, P R (ed.), *Crambeck Roman Pottery Industry*, Leeds, 43–90.

Hawkes, C F C & Hull, M R 1947 *Camulodunum* (Rep Res Comm Soc Antiq London **14**), London.

Holmes, A G 1989 A Romano-British site at Shedfield, Hants, *Proc Hampshire Fld Club Archaeol Soc* **45** 25–41.

Lyne, M A B & Jefferies R S 1979 *The Alice Holt-Farnham Roman Pottery Industry* (CBA Res Rep **30**), London.

Millett, M 1979 The dating of Farnham (Alice Holt) pottery, *Britannia* **10** 121–37.

Millett, M 1986 The pottery, in Millett, M & Graham, D (eds), *Excavations of the Romano-British Small Town at Neatham, Hampshire* (Hants Fld Club Archaeol Soc Monogr **3**), Gloucester, 62–93.

Pratt, J E 1979 Charcoal samples from Dump AH 5, Pit B. 1, in Lyne, M A B & Jefferies, R S (eds), *The Alice Holt-Farnham Roman Pottery Industry* (CBA Res Rep **30**), London, 62.

Seager Smith, R 2001 The coarse pottery, in Anderson, A S, Wacher, J S & Fitzpatrick, A P *The Romano-British Small Town at Wanborough, Wiltshire* (Britannia Monogr **19**), London, 232–300.

Swan, V 1984 *The Pottery Kilns of Roman Britain* (RCHM Supp Ser **5**), London.

Wild, J P 1973 A fourth-century porter's workshop and kilns at Stibbington, Peterborough, in Detsicas, A P (ed.), *Current Research in Romano-British Coarse Pottery* (CBA Res Rep **10**), London, 135–8.

Young, C J 1977 *Oxfordshire Roman Pottery* (BAR Brit Ser **43**), Oxford.

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