Excavations South-East of Park Farm, Ashford, Kent

Part 2: Finds and Environmental Reports

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EXCAVATIONS SOUTH-EAST OF PARK FARM, ASHFORD, KENT

By Andrew B. Powell

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Part 2: Finds and Environmental Reports

Contents

The following specialist finds and environmental reports relate to stages of archaeological fieldwork undertaken by Wessex Archaeology on land south-east of Park Farm, Ashford, Kent, between 2003 and 2007. The results of that fieldwork are reported in a separate document (Part 1 – http://www.kentarchaeology.ac).

Finds

Metal objects

by Nicholas Cooke

A preliminary metal detector survey of the site produced large quantities of metal objects (iron, copper alloy, lead, tin and white metal) from topsoil contexts, mostly of relatively recent (*c.* 1850 – present) date. Most were discarded without further record – scrap iron, nails, bullets, gun cleaning caps, buttons, bicycle bells, fragmentary lead soldiers, sheet metal fragments etc). A total of 66 objects, however, was retained from the metal detector survey, including 30 coins and tokens, although only two were recovered from stratified contexts.

Coins and tokens
Thirty coins and tokens were examined – eleven from Area 1, ten from Area 2 and nine from Area 3. All except one of the coins examined were metal detector finds recovered from the topsoil removed from the site, and are therefore unstratified. In general, their condition is very poor, with many coins badly corroded, which is consistent with their having been exposed to chemical fertilisers. However, their number and chronological distribution is sufficient to confirm the presence of Late Iron Age and early Romano-British settlement in Areas 1 and 3, along with some significant post-medieval activity in Area 2.

All eleven of the coins recovered from the topsoil of Area 1 (11001) date to the early Romano-British period. Many of these are very badly worn and corroded, and can only be dated on the basis of their size to the 1st–3rd centuries AD. Four, however, can be dated more closely. These are a *dupondius* of Marcus Aurelius (Object number (ON) 10015, AD 161–180), a *sestertius* of Sabrina, wife of Hadrian (ON 10017, AD 117–138), a *sestertius* of Julia Mamaea (ON 10016, AD 222–235), and a *sestertius* of Postumus (ON 10014, AD 260–268). The last three are relatively rare as site finds, in particular the large *sestertius* of Postumus. The absence of any later coins, especially radiate coins of the last third of the 3rd century, or any small *folles* of the 4th century, suggests that the Romano-British activity in this area had ceased by the last third of the 4th century.

Four of the nine coins recovered from Area 3 are Late Iron Age or Romano-British in date. Only one of these, a small potin coin (ON 30041), was recovered from a stratified context – a fill (31122) of pit/post-hole (31118) within Roundhouse 4. This would have been struck during the Late Iron Age, although it may have remained in circulation during the years following the Roman conquest. The three Roman coins from Area 3 are all badly corroded, and none can be dated closely. They do indicate activity in the area throughout the Romano-British period, but need not indicate continued settlement activity within the area into the 4th century. The remaining five coins date to the post-medieval period or later, and include a Guernsey coin, and a penny of Edward VII dated to 1905.

All ten of the coins from Area 2 are post-medieval or later in date, and all were recovered unstratified from the topsoil (21001). Seven are lead tokens, two are copper alloy tokens and one is a milled coin (probably a penny of Queen Victoria). The preponderance of tokens recovered from this area is unusual, particularly as the

majority take the form of crude lead tokens which are likely to have been struck locally, and enjoyed only a limited circulation; a number contain no diagnostic marks, and cannot be closely dated. The two copper alloy tokens are also too badly worn to be dated closely. The assemblage may indicate that the area was a focus for activity in the post-medieval period, perhaps as the site of a fair or market, or it may represent the remains of a dispersed hoard of tokens.

This assemblage of coins and tokens is too small for detailed intra-site comparisons to be drawn with other sites, either locally or nationally, and they add little to the interpretation of the site other than to confirm the dates of the Late Iron Age and Romano-British activity and highlight the presence of an unusual assemblage of post-medieval tokens from Area 2.

Table 1. Summary coin list

ON	10014	***Context***	10014
Metal	Copper alloy	*Denomination*	Sestertius
Diameter	30 mm	*Reverse axis*	180
Issuer	Postumus	*Issue date*	AD 260 - 8
Obverse	Bearded radiate bust r. Text: IMPCPOSTVMVSPFAV-.	*Obverse condition*	Fair
Reverse	Soldier l. S C to either side. Text: -I- -AVG	*Reverse condition*	Fair
Mint	N/a	*References*	RIC V (II) Postumus 180
Notes	May be a double sestertius		

ON	10015	***Context***	11001
Metal	Cu alloy	*Denomination*	Dupondius
Diameter	26 mm	*Reverse axis*	160
Issuer	Marcus Aurelius	*Issue date*	AD 161–180
Obverse	Radiate bust r. Text: ANTONINV-.	*Obverse condition*	Fair
Reverse	Winged Victory r. S C on either side.	*Reverse condition*	Poor
Mint	N/A	*References*	As RIC III, Marcus Aurelius, 892
Notes	Corroded, especially on reverse		

ON	10016	***Context***	11001
Metal	Cu alloy	*Denomination*	Sestertius
Diameter	30 mm	*Reverse axis*	0
Issuer	Julia Mamaea	*Issue date*	AD 222–35
Obverse	Female bust r. - -AVG-. Worn and corroded	*Obverse condition*	Poor
Reverse	Fig l w/ staff. S C on either side. Text:-S-.	*Reverse condition*	Badly corroded; poor
Mint	N/A	*References*	RIC IV (II), Julia Mamaea 708
Notes	Corroded, especially on reverse		

ON	10017	***Context***	11001
Metal	Cu alloy	*Denomination*	Sestertius
Diameter	32 mm	*Reverse axis*	200
Issuer	Sabrina, wife of Hadrian	*Issue date*	AD 117–38
Obverse	Female bust r. with unusual head dress (Sabrina).	*Obverse condition*	Badly worn and corroded; very poor
Reverse	Fig standing; otherwise illegible.	*Reverse condition*	Badly worn and corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly corroded; heavily worn		

ON	10018	***Context***	11001
Metal	Cu alloy	*Denomination*	As/Dupondius
Diameter	28 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	1st–3rd centuries AD
Obverse	Bust r; otherwise illegible	*Obverse condition*	Badly worn and corroded; very poor
Reverse	Illegible	*Reverse condition*	Badly worn and corroded; very poor

Mint	N/A	*References*	-
Notes	Too badly worn and corroded to be legible		

ON	10019	***Context***	11001
Metal	Cu alloy	*Denomination*	As/Dupondius
Diameter	29 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	1st–3rd centuries AD
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Badly worn and corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly corroded; dated on the basis of its size		

ON	10020	***Context***	11001
Metal	Cu alloy	*Denomination*	As/Dupondius
Diameter	29 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	1st–3rd centuries AD
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Badly worn and corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly corroded; dated on the basis of its size.		

ON	10021	***Context***	11001
Metal	Cu alloy	*Denomination*	As/Dupondius
Diameter	27 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	1st–3rd centuries AD
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly corroded; very poor
Mint	N/A	*References*	
Notes	Very badly corroded; dated on the basis of its size		

ON	10022	***Context***	11001
Metal	Cu alloy	*Denomination*	Sestertius
Diameter	30 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	1st–2nd centuries AD
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly corroded; dated on the basis of its size and thickness		

ON	10023	***Context***	11001
Metal	Cu alloy	*Denomination*	As
Diameter	23 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	C1 – C3
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly corroded dated on the basis of its size		

ON	10024	***Context***	11001
Metal	Cu alloy	*Denomination*	As
Diameter	23 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	1st–3rd centuries AD
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly corroded; dated on the basis of its size		

ON	20014	***Context***	21001
Metal	Cu alloy	*Denomination*	Penny
Diameter	29 mm	*Reverse axis*	180
Issuer	?Victoria	*Issue date*	?19th century
Obverse	?Female bust r. Otherwise illegible	*Obverse condition*	Very Poor
Reverse	Seated figure (?Britannia).	*Reverse condition*	Very Poor
Mint	N/A	*References*	-
Notes	Badly worn and corroded; a milled coin, which is probably of Victoria		

ON	20015	***Context***	21001
Metal	Cu alloy	*Denomination*	Token
Diameter	29 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Bust r. Otherwise illegible	*Obverse condition*	Worn and corroded; very poor
Reverse	Illegible	*Reverse condition*	Heavily worn and corroded; very poor
Mint	N/A	*References*	-
Notes	Large flat flan, slightly bent; very badly corroded and worn		

ON	20017	***Context***	21001
Metal	Cu alloy	*Denomination*	Token
Diameter	21 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Illegible	*Obverse condition*	Very badly worn and corroded; very poor
Reverse	Illegible	*Reverse condition*	Heavily worn and corroded; very poor
Mint	N/A	*References*	-
Notes	Milled copper alloy disc, probably a post-medieval token, but now completely illegible		

ON	20019	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	23 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Centrally pierced. Text: IB, presumably the initials of a local trader	*Obverse condition*	Fair
Reverse	Blank	*Reverse condition*	Fair
Mint	N/A	*References*	-
Notes	Slightly dished flan, with central piercing which appears to post-date the striking of the token. Lead tokens such as this were issued throughout the Post-medieval period		

ON	20020	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	24 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Pierced, with thicker cross bars in between the piercings	*Obverse condition*	Poor
Reverse	Blank	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Roughly trapezoidal flan, pierced in 3 places. Lead tokens such as this were issued throughout the Post-medieval period		

ON	20021	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	17 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Large raised T in the centre of an otherwise blank face	*Obverse condition*	Poor
Reverse	Blank	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Small slightly dished flan, raised on obverse. Lead tokens such as this were issued throughout the Post-medieval period. The 'T' may represent one of the initials of the issuer		

ON	20022	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	20 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Slightly raised obverse. Traces of an 'A' scratched into the surface	*Obverse condition*	
Reverse	Blank	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Slightly oval flan, apparently broken on one side; flat reverse with domed obverse. The incision of the 'A' appears to have taken place after the blank was formed		

ON	20023	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	16 mm	*Reverse axis*	0
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Some text visible in 3 lines:H- /H. / FOOD	*Obverse condition*	Poor
Reverse	Worn, with only some text visible: -WICH	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Folded piece of lead, not quite circular in form. Both sides appear slightly off centre. Lead tokens were issued throughout the Post-medieval period, although the lettering on this particular token suggests a late date within this period		

ON	20024	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	16 mm	*Reverse axis*	0
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Some evidence of engraving - central 'T' apparently surrounded by a circle of pellets	*Obverse condition*	Very Poor
Reverse	Illegible text	*Reverse condition*	Badly worn. Poor
Mint	N/A	*References*	-
Notes			

ON	20025	***Context***	21001
Metal	Lead	*Denomination*	Token
Diameter	19 mm	*Reverse axis*	180
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Two lines of text: TPH/B	*Obverse condition*	Fair
Reverse	Central 'e'.	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Circular flan is bent. The lettering on the obverse probably relates to the issuer of the token Lead tokens such as this were issued throughout the Post-medieval period		

ON	30002	***Context***	31001
Metal	Cu alloy	*Denomination*	As
Diameter	25 mm	*Reverse axis*	180
Issuer	Unknown Roman Emperor	*Issue date*	1st–3rd centuries AD
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly worn and corroded		

ON	30011	***Context***	31001
Metal	Cu alloy	*Denomination*	follis (AE 4)
Diameter	12 mm	*Reverse axis*	
Issuer	Unknown Roman Emperor	*Issue date*	C4
Obverse	Illegible	*Obverse condition*	Very badly corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly corroded; very poor
Mint	N/A	*References*	-
Notes	Very badly worn and corroded; central piercing for suspension		

ON	30023	***Context***	31001
Metal	Cu alloy	*Denomination*	Coin
Diameter	26 mm	*Reverse axis*	180
Issuer	Unknown (Island of Guernsey)	*Issue date*	18th century
Obverse	Shield containing 3 lions rampant. Text: GUERNSEY	*Obverse condition*	Poor
Reverse	Central text: DOR- -S above date (-10)?.	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Coin from Guernsey – bent, damaged and corroded. Likely to be 18th century in date. Unknown denomination		

ON	30025	***Context***	31001
Metal	Lead	*Denomination*	Token

Diameter	23 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	Post-medieval
Obverse	Illegible	*Obverse condition*	Poor
Reverse	Illegible	*Reverse condition*	Poor
Mint	N/A	*References*	-
Notes	Flat featureless disc of lead. May either have been a token in its own right or a blank for a token. Lead tokens were issued throughout the post-medieval period		

ON	30027	***Context***	31001
Metal	Cu alloy	*Denomination*	Coin
Diameter	28 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	18th century/19th century
Obverse	Illegible	*Obverse condition*	Very poor
Reverse	Illegible	*Reverse condition*	Very poor
Mint	N/A	*References*	
Notes	18th century or 19th century milled coin – too badly corroded to be identified		

ON	30033	***Context***	31001
Metal	Cu alloy	*Denomination*	Coin
Diameter	25 mm	*Reverse axis*	
Issuer	Unknown	*Issue date*	18th century/19th century
Obverse	Illegible	*Obverse condition*	Very badly worn and corroded; very poor
Reverse	Illegible	*Reverse condition*	Very badly worn and corroded; very poor
Mint	N/A	*References*	-
Notes	18th or 19th century milled coin – too badly corroded to be identified		

ON	30035	***Context***	31001
Metal	Cu alloy	*Denomination*	Penny
Diameter	30 mm	*Reverse axis*	0
Issuer	Edward VII	*Issue date*	AD 1905
Obverse	Bearded bust r. text: EDWARDVS VII DEI GRA BRITT OMN REX FID: DEF: IND: IMP	*Obverse condition*	Fair
Reverse	Britannia seated r. Text. ONE PENNY. 1905 beneath Britannia	*Reverse condition*	Fair
Mint	N/A	*References*	-
Notes	Some damage. Fairly worn		

ON	30036	***Context***	31001
Metal	Cu alloy	*Denomination*	Follis (AE2)
Diameter	Unknown Roman Emperor	*Reverse axis*	0
Issuer	20 mm	*Issue date*	C3–C4
Obverse	Illegible	*Obverse condition*	Badly worn and corroded; very poor
Reverse	Illegible	*Reverse condition*	Badly worn and corroded; very poor
Mint	Illegible	*References*	-
Notes	Badly corroded		

ON	30041	***Context***	31122 (Fill of pit 31118)
Metal	Potin	*Denomination*	
Diameter	15 mm	*Reverse axis*	0
Issuer	Unknown Iron Age ruler	*Issue date*	Late Iron Age
Obverse	Geometric design. Central rectangle with crescents close to edge	*Obverse condition*	
Reverse	Geometric design. Central circular roundel, with crescents close tot he edge	*Reverse condition*	Fair
Mint	N/A	*References*	-
Notes	Late Iron Age potin coin. Still retains some of tangs. Possibly remained in use into the early Romano-British period		

Other metal objects

Copper alloy

Apart from coins and tokens, the 13 copper alloy objects recovered (all metal detector finds) are all apparently of post-medieval date. They include two buckles, a key, a Jew's harp, a spike-type candlestick, a thimble, a fragment of a small bell, two toy wheels, a stud, a rivet, a watch-winder, a fob, a locket, a small padlock ?charm, and a perforated object probably from a mincing machine.

Lead

Apart from tokens (above), the lead objects (all metal detector finds) include weights of various forms, and a lead shot.

Iron

The iron objects comprise three possible nails (one from a stratified context), a small strip fragment (stratified), and a 'pig'.

Pottery

by Grace Perpetua Jones

A total of 5909 sherds of pottery, weighing 63,638 g, was recovered from the excavations at Park Farm East/South East. With the exception of a small group of medieval sherds, the date range of the assemblage is Middle Bronze Age to early Romano-British. The condition of the pottery is very poor, despite an average sherd weight of 10.8 g. The surfaces are highly abraded or missing entirely, and inclusions have leached from many of the sherds. A fairly large proportion appear to have been burnt or re-fired.

The pottery was recovered from 364 contexts across Areas A–D. Of these, 52 contexts contained 25 or more sherds, and 185 contained five sherds or less. A range of feature types are represented, predominantly ditches, gullies, roundhouse gullies, hearths, pits and post-holes.

All the pottery had been previously recorded at a basic level (level 1), comprising quantification by number and weight for each broad ware group in every context. Selected groups of pottery were targeted for full analysis (level 2, carried out in accordance with nationally recognised guidelines, PCRG 1997), specifically those that offered the potential to tighten the chronology for key features across the site. In total, 2916 sherds (25,934 g) were recorded to level 1, and 2993 sherds of pottery (37, 704 g) to level 2. The fully analysed pottery forms the basis of this report, but the level 1 data has been included in Table 3 to present a more detailed account of the Late Iron Age/Early Romano-British assemblage.

Middle to Late Bronze Age

A total of 520 sherds (7287 g) of Middle to Late Bronze Age pottery (ceramic phases 1 and 2, included in **Table 2**) came from six features, four in Area 1 and two in Area 3. The fabrics (F2, FG1, GF1, GF2) contain varying amounts of flint and grog temper in silty clay matrices, dominated by a very common amount (20–30%) of one inclusion, with moderate to sparse quantities of the other (7–15%). Most are rough in texture, with the exception of the soapy GF2. The rims of five vessels were recorded.

A large group of Middle Bronze Age pottery (299 sherds, 4412 g) came from the second of two fills in pit 31321. All appear to be from the same vessel, a Middle Bronze Age bucket-shaped jar (not illustrated). The sherds are highly abraded, but a few diagnostic traits were noted. Five sherds appear to be from an undifferentiated rim. The rim top is quite narrow (9 mm) and decorated with fingertip impressions. It is not possible to ascertain the rim diameter, but the sherds have little curvature and the diameter would appear to be in the region of 400 mm. The wall thickness is around 16 mm, the base is 21 mm thick. Seven body sherds (two of which join) demonstrate evidence of an applied cordon with fingertip decoration. The fabric is flint-and-grog-tempered (FG1).

A second group of Middle Bronze Age pottery (79 sherds, 1254 g) was recovered from an adjacent slot (31266) through ditch 31716 and is likely to represent disturbance of pit 31321. It too contained body sherds in the FG1 fabric, but also sherds in another fabric with a greater quantity of grog (GF1).

Four features in Area 1 produced pottery dating to the earlier part of the Late Bronze Age (ceramic phase 2), approximately 12th–10th centuries BC (equivalent to Needham 1996, Period 6). Pit 11797 contained part of a hooked-rim jar, with fingertip impressions on the top (**Fig. 1.1**). The grog-and-flint-tempered fabric (GF2) of this vessel has a very soapy texture, despite a high level of abrasion and the presence of post-depositional concretions. The rim from another, smaller jar of ovoid profile was present in the same fabric (**Fig. 1.2**), along with flint-tempered body sherds. Adjacent pit 11795 contained a similar range of fabrics and would have been contemporary. To the south, pit 11843 also produced a comparable group of sherds, very similar pottery to those from pits 11795 and 11797. Of note is the complete profile of a crude little cup (**Fig. 1.4**). It would have stood 61 mm high, with an irregular rim of approximately 70 mm, 58% of which is present. The rim is flat but incurves slightly, the profile has a little foot. It too had been made from a grog-and-flint-tempered fabric (GF2). Just to the south again, pit 11430 contained 23 sherds (206 g) of grog-tempered pottery, including the rim from an ovoid jar (R34, **Fig. 1.3**). Burnt residue from a similar form from Gravesend has been dated to 1230–980 cal BC (Barclay 1994, 389, fig. 10.8).

Late Bronze Age

Late Bronze Age pottery (ceramic phase 3) was recovered from a single context of Roundhouse 2 gully 31701 (terminal slot 31153), but may have been disturbed and therefore not contemporary with the feature. It is a large group, comprising 137 sherds (2147 g), all but one of them (sandy ware, Q99, 15 g) from a single shouldered jar with short, upright neck and flat-topped rim, and with a slight irregular lip on the exterior (**Fig. 1.5**). The rim is 240 mm in diameter, approximately 45% survives. Base fragments indicate the base is plain and flat, but these sherds could not be re-joined to the profile of the body. A number of sherds have burnt residue around the interior shoulder region. Overall, the vessel is now in very poor condition, with evidence of burning/re-firing and abrasion, and with post-deposition concretions on many of the sherds. The fabric differs from the Middle Bronze Age vessels, containing a moderate amount (15%) of flint and red iron oxides in a silty clay matrix, with occasional rounded coarse quartz grains (IF1). Iron-gritted fabrics were recorded from sites along the route of the Channel Tunnel Rail Link (CTRL) from the Early/Middle Iron Age period onwards (Morris 2006a, 81-85). The form is paralleled from Early Iron Age groups at Whitehorse Stone (Morris 2006b, R3).

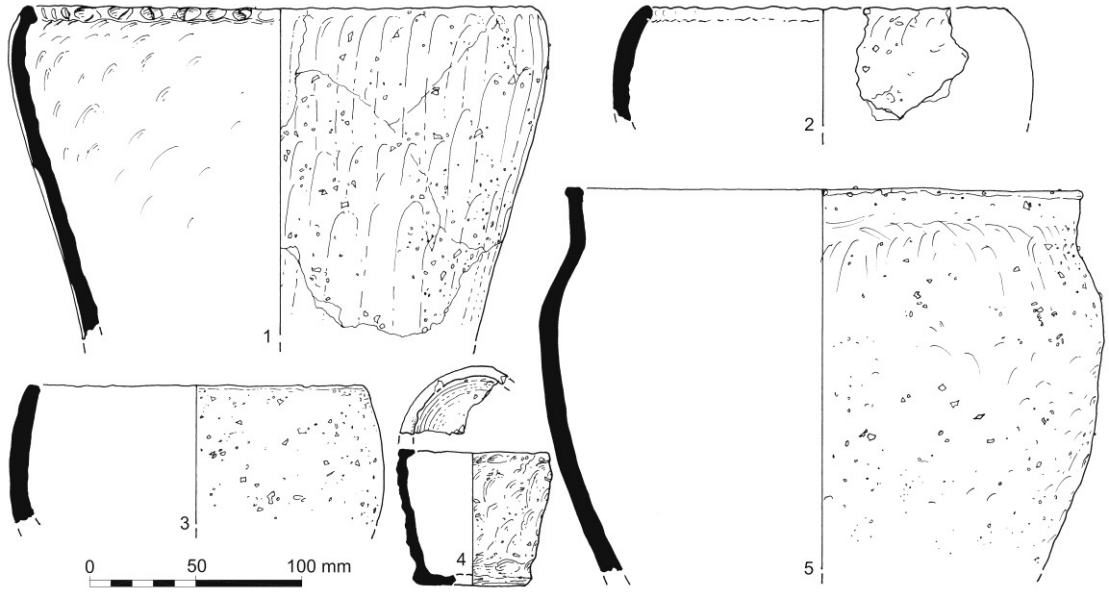


Fig. 1: Bronze Age pottery (1-5)

Table 2. Quantification of Middle and Late Bronze Age pottery (fully recorded), by fabric (number and weight in *grammes*)

Fabric/phase	*no.*	*g.*
Middle Bronze Age (cp 1)		
FG1	345	*4830*
GF1	33	*836*
Late Bronze Age (cp 2)		
F2	55	*475*
GF2	87	*1146*
Late Bronze Age (cp 3)		
IF1	136	*2132*
Total	656	*9419*

Middle/Late Iron Age

Fabrics

Pottery of Middle/Late Iron Age date (ceramic phase 4) was exclusively recovered from Area 3, totalling 505 sherds (3575 g, **Table 3**). A wider range of fabrics was utilised than in the proceeding phases. Grog continued to be added to the clay, but was no longer used in conjunction with flint (a single sherd with these inclusions was residual in this phase). The most commonly recorded fabric amongst the Iron Age assemblage is GI1 (25% by number of sherds), a soft, sandy ware containing only sparse amounts (7%) of grog and iron oxides. A fabric containing greater quantities (20%) of these inclusions (GI2) is also relatively frequent (17% by number). A fabric containing iron and flint (IF1) accounts for 7% of the pottery from this phase, and small quantities of a distinctive silty fabric with iron inclusions (I1) were also recorded (1%). Sherds with grog temper amount to 17% and 4% contain fine flint temper. Sandy wares come into use during this phase and include glauconitic fabrics (11%), recorded from the CTRL sites from the Early/Middle Iron Age onwards (Morris 2006a, 81-85), and those with moderate amounts of iron oxides (14%). The site sits on the Cretaceous Wealden Clay, but deposits of the Lower Greensand were locally

available (the Sandgate Beds, Hythe Beds and Atherfield Clay), as were alluvial deposits. There is therefore nothing amongst the fabrics that need not have been locally obtained.

Table 3. Quantification of Middle to Late Iron Age pottery (fully recorded), by fabric (number and weight in *grammes*)

Fabric	*no.*	*g.*
Flint-tempered		
F1	22	*121*
F99	3	*15*
Grog-tempered		
G1	13	*183*
G3	7	*70*
G4	46	*512*
G99	22	*57*
Grog-and-flint-tempered		
GF99	1	*11*
Grog and iron-gritted		
GI1	127	*836*
GI2	86	*673*
Iron-gritted		
I1	5	*28*
Flint and iron-gritted		
IF1	35	*358*
Sandy wares		
Q2	10	*72*
Q3	53	*187*
Q4	17	*242*
Q5	44	*149*
Q6	13	*46*
Q99	1	*15*
Total	505	*3575*

Forms

Eight vessel forms were identified, and an additional code was created for everted rims broken at the neck. An ovoid vessel with internally bevelled rim (R10, **Fig. 2.7**) is similar to examples from White Horse Stone (Morris 2006b, R2, R6, R8). This form had a long currency, with Middle–Late Iron Age examples from Park Farm East (R34) and other sites in the region (discussed in Barclay 1994, 384). Seven vessels are also characterised by undifferentiated rims, but are of neutral profile or from bowls/dishes (R9, R11, R36). The R9 appears to be quite shallow (**Fig. 2.6**); the R11 has a squared rim and appears to have been quite squat (**Fig. 2.8**); the R36 is a bowl with a rounded, undifferentiated rim (**Fig. 2.9**). Also related was the straight-sided R12 (**Fig. 2.10**). Vessels of neutral profile, such as saucepan pots, are characteristic of Middle Iron Age sites in the Wessex region, notably Danebury (Brown 2000), but they have also been seen on a number of sites in Kent, including nearby Beechbrook Wood (Jones 2006) and Little Stock Farm (Bryan 2006). At the latter they continued in use into the Late Iron Age, and were found in association with wheel-made pottery. Other forms include three everted rim jars of S-shaped profile (R13, **Fig. 2.11**) and two similar vessels with a slightly more upright neck (R14, **Fig. 2.12**). This vessel form was a common theme through the Beechbrook Wood assemblage and has been seen on other Middle Iron Age sites in the region, including Cliffe, Kent (Trow and Cameron 1998, fig. 20 nos 31–32) and Little Waltham, Essex (Drury 1978, fig. 47, 176).

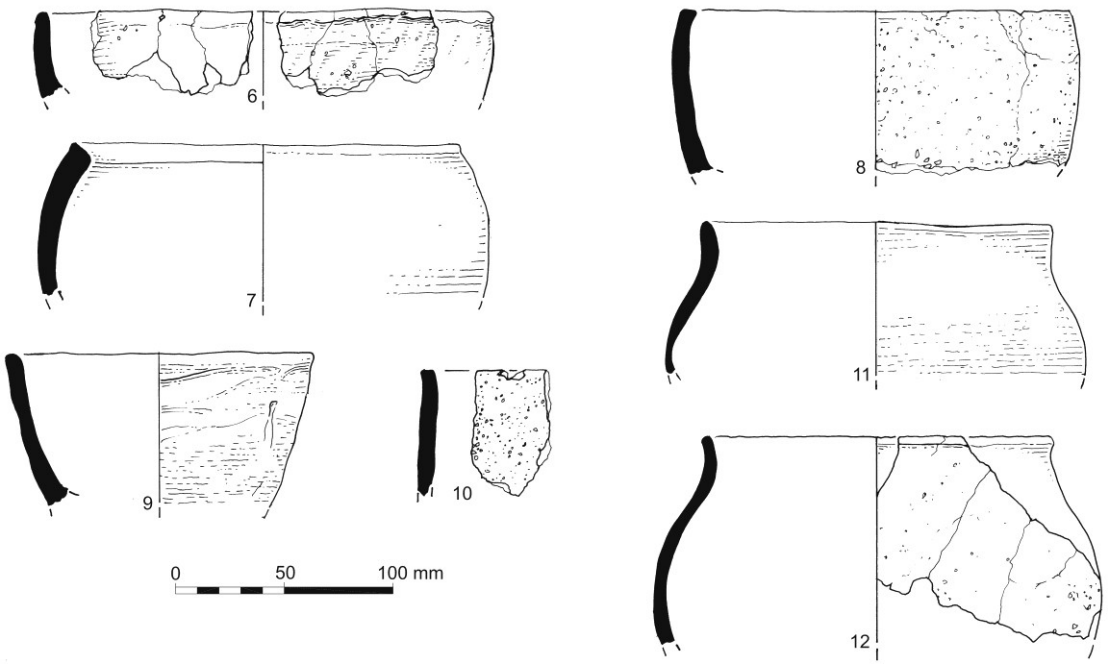


Fig. 2: Middle-Late Iron Age pottery (6-12)

R2 (x3) Everted rim jar, broken at the neck (not illustrated).

R9 (x3): Undifferentiated rim with rounded or squared top, incurving, from rounded bowl/dish (**Fig. 2.6**).

R10 (x1): Ovoid profile vessel with internally bevelled rim (**Fig. 2.7**).

R11 (x3): Squared, undifferentiated rim, slightly in-turned, from vessel of neutral/open profile (**Fig.2.8-9**).

R12 (x3): Neutral-profile vessel with flattened rim top, slightly out-turned (**Fig. 2.10**).

R13 (x3): Everted rim jar, probably of S-shaped profile (**Fig. 2.11**).

R14 (x2): Round-bodied jar with short, upright rim (**Fig. 2.12**).

R15: Vessel with upright neck and thin beaded rim (not illustrated).

R36 (x1): Bowl with undifferentiated, rounded rim (not illustrated).

Key features

Roundhouse 1

Penannular gully 31705 produced an assemblage of 27 sherds (92 g), comprising a foot-ring base in a sandy fabric, and body sherds in a glauconitic ware and also flint-tempered examples. Foot-rings are a relatively common form of base from Middle Iron Age assemblages in Kent and south-eastern England in general. Related

enclosure ditch 31718 contained ten sandy body sherds that could not be dated more closely than Middle/Late Iron Age.

Roundhouse 2
Pottery was recovered from five slots through inner gully 31700. The largest group came from context 31005 (157 sherds, 1161 g), although the condition of the pottery was very poor with a high level of surface damage. The fabrics are predominantly tempered with inclusions of grog and iron, although flint and grog-tempered wares are also present, along with small quantities of sandy wares and grog-tempered fabrics. The forms include two shallow bowls/dishes with incurving, undifferentiated rims (R9), broadly dated to the Middle Iron Age, in a grog and iron-gritted fabric. Three sherds in a sandy ware with inclusions of fine flint and iron come from an ovoid-profile vessel with internally bevelled rim (R10), covered in post-depositional concretions, heavily pitted and with deteriorations on the interior surface. Much smaller groups of pottery were recovered from the other contexts, mostly undiagnostic body sherds in a similar range of fabrics to those of context 31005, with the addition of a couple of glauconitic sherds.

Concentric gully 31701 contained a large group of Late Bronze Age pottery from terminal 31153, but all other pottery (35 sherds, 278 g) is of a similar range and condition to that of gully 31700, including an incurving jar rim fragment (R9).

Roundhouse 4
Six slots through gully 31706 produced Iron Age pottery, as did two post-holes (31118 and 31212). The range of fabrics includes grog-tempered, grog and iron-gritted and sandy wares, as well as small quantities of flint-tempered fabrics. Seven of the eight sherds from the post-holes come from the rim of a neutral-profile vessel. Sherds of a similar form and fabric suggest fragments from the same vessel had been incorporated into both post-holes. Five vessels were identified by form from the gully, four of neutral profile (R11, R12) and an everted rim jar, possibly of S-shaped profile (R13). All suggest a date in the Middle Iron Age.

Roundhouse 5
A total of 28 sherds (195 g) was recovered from four slots through gully 31708. Most are undiagnostic body sherds, but there is a rim from an everted rim jar, possibly of S-shaped profile, in a grog-tempered fabric of soapy texture, and two foot-ring bases. The group cannot be dated more closely than Middle/Late Iron Age. Post-hole 31114, located close to the entrance of Roundhouse 5, contained five joining sherds from an S-profiled vessel (R13) with smoothed surfaces, in a very silty fabric with ferric inclusions (I1); it is of Middle Iron Age date.

Roundhouse 6
Gully 31583 produced only five body sherds of Iron Age date.

Roundhouse 7
Eleven sherds of pottery were recovered from gully slot 31584, including the rim from a neutral profile vessel (R12) in a grog and iron-gritted fabric (GI2) and a grog-tempered S-profiled jar, of Middle/Late Iron Age date.

Roundhouse 8
Gully 31707 contained only seven body sherds of Iron Age pottery.

Other features

Pit 31257, located to the south-east of Roundhouse 4, contained seven sherds of pottery belonging to this phase, including a small fragment from an everted rim jar. Ditches 31396 and 31399, bordering the western edge of Area 3, contained small groups of pottery (a total of 16 sherds, 111 g), including five sherds from a thin-walled, round-bodied jar with a short, upright rim (R14). Two slots through ditch 31712 produced 36 sherds (195g), including a number of joining sherds from the base of a vessel, and 18 sherds (98g) of a glauconitic fabric. Ditch 31720 contained 35 sherds (117g), including glauconitic body sherds, an upright, beaded rim (R15) from a vessel in a sandy fabric, and a similar rim (R14) in a grog and iron-gritted ware.

Late Iron Age/early Romano-British

Differentiating between Late Iron Age and early Romano-British groups has been carried out using the presence or absence of Romanised fabrics such as greywares, oxidised and white wares. Contexts containing Late Iron Age pottery without these indicators have been recorded as ceramic phase 5, and those with Romanised wares as ceramic phase 6, although it is entirely possible that some recorded as ceramic phase 5 may extend into the post-Roman Conquest period. Certainly, many of the fabrics and forms were current before and after the Conquest and for this reason the pottery of the 1st century BC to the early Romano-British period is presented together.

Fabrics and forms

The Late Iron Age and early Romano-British phases are dominated by traditional fabrics characteristic of the Late Iron Age, principally those tempered with grog, with Romanised wares accounting for only 9.3% of the assemblage by number and 5% by weight (this takes account of fully recorded pottery, and those sherds recorded only at the basic level, **Table 4**). These Romanised wares include samian, Terra Nigra (a platter from context 11097), Terra Rubra, whitewares, oxidised wares and greywares, but none that need be later in date than the 1st century AD. All came from Areas 1 and 2, indicating that activity in Area 3 had ceased prior to the Conquest, but appears to have extended into the second half of the 1st century AD in the other areas.

Table 4. Quantification of Late Iron Age/early Romano-British pottery, ceramic phases 5 and 6 (recorded at basic and full levels of analysis), by ware group (number and *weight in grammes*)

Ware group	*Full analysis*		*Basic recording*		*Overall totals*	
	no.	*g.*	*no.*	*g.*	*no.*	*g.*
Fine, micaceous fabric	5	*9*	-	-	5	*9*
Glaunconitic sandy ware	-	-	51	*337*	51	*337*
Greyware	98	*721*	102	*573*	200	*1294*
Grog-tempered	1666	*23610*	2264	*21738*	3930	*45348*
Oxidised	28	*81*	128	*579*	156	*660*
Samian	-	-	12	*29*	12	*29*
Sandy ware	6	*52*	11	*40*	17	*92*
Terra Nigra	-	-	7	*178*	7	*178*
Terra Rubra	-	-	1	*4*	1	*4*
Whiteware	28	*236*	5	*16*	33	*252*
Totals	1831	*24709*	2581	*23494*	4412	*48203*

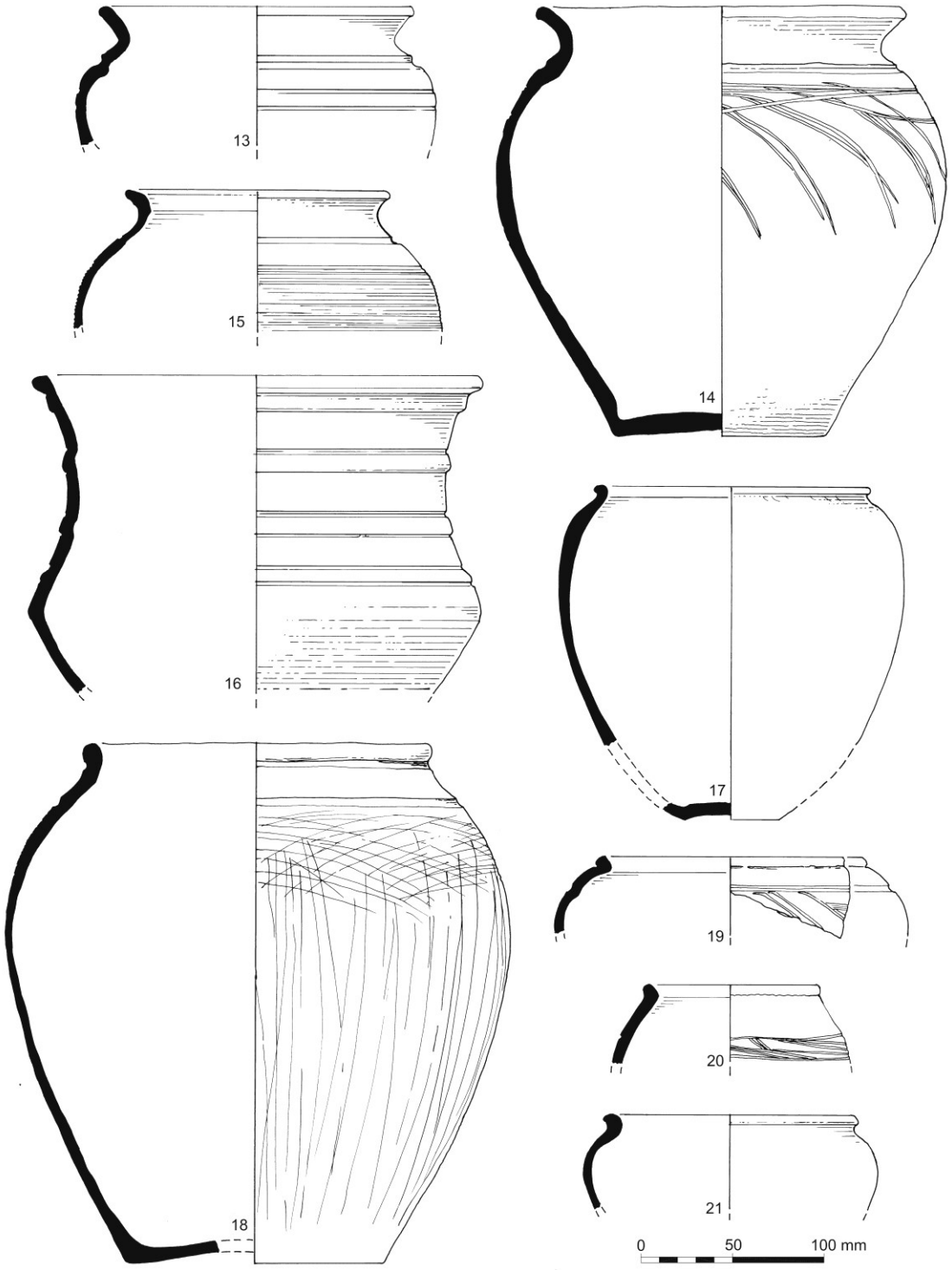


Fig. 3: Late Iron Age–early Romano-British pottery (13-21)

Few post-conquest forms were identified. They included a whiteware flagon, CAM 136B (Hawkes and Hull 1947, 242), from pit 11987 (not illustrated) and a reed-rimmed carinated bowl from hearth 21226, in a greyware fabric **(Fig. 5.38**). The flagon had broken at some point during its use, and an attempt had been made to

repair it, as evidenced by traces of a black resin or glue on the edges of two sherds. The reed-rimmed bowl is paralleled at Richborough (Bushe Fox 1926, plate XXVII.80) and is a form introduced during the mid-Flavian period (Pollard 1988, 67).

A range of forms is present in the grog-tempered wares. The most commonly occurring are round-bodied bowls and jars with everted rims, characterised by the presence of cordons and grooves. Also common are vessels with corrugated neck/shoulder areas, bead-rimmed jars and high-shouldered vessels with beaded or out-turned rims. Other forms include a storage jar, a low carinated bowl with multiple cordons (Thompson 1982, E1-2, pre-Conquest); a small cup with low waist, and a pedestal urn with dished foot, identified from its base (Thompson 1982, A4). A possible girth beaker was represented amongst the body sherds. Such forms are typical of the 'Belgic' repertoire of the south-east (Thompson 1982, 4–5).

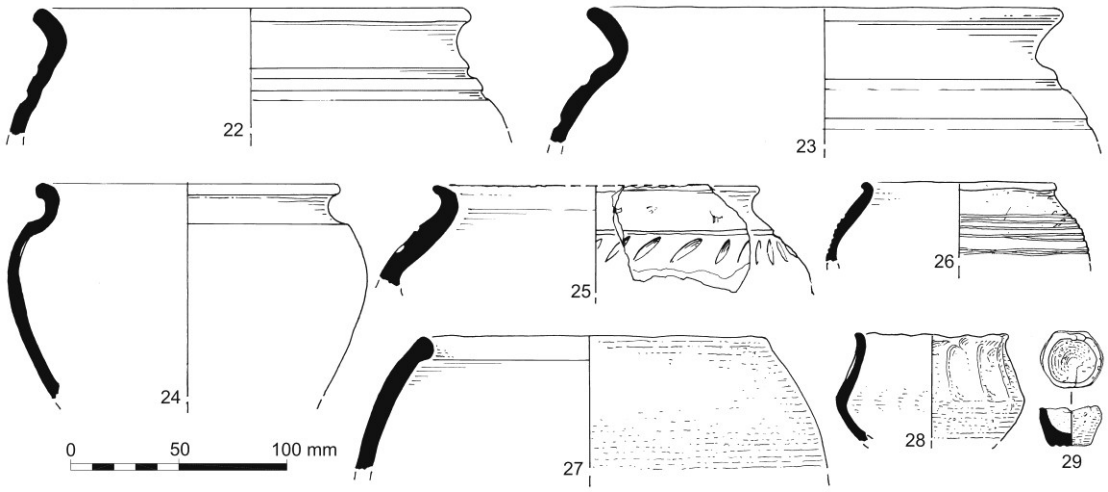


Fig. 4: Late Iron Age-early Romano-British pottery (22-29)

Vessels characterised by cordons and/or grooves
R1 (x12): Jar/bowl with everted rim and wide groove at neck/shoulder junction, may have another groove at widest point of body. The creation of the groove has pushed up a cordon. Diagonal scoring is present below the shoulder of one vessel (**Fig. 3.13–14; Fig. 5.31–34**).

R3 (x1): Low carinated bowl with multiple cordons (**Fig. 3.16**).

R4 (x2): Bowl/jar with lid-seated rim (traces of wear in this area). Groove at neck/shoulder junction, slight cordon above. Belly of vessel has closely spaced horizontal grooves (**Fig. 3.15**).

R30 (x6): Necked cordoned jar (**Fig. 5.30**).

Bead-rimmed jars
R17 (x9): Bead-rimmed jar (**Fig. 3.17**).

R23 (1): Bead-rimmed jar with wiped exterior (**Fig. 3.18**).

High shouldered vessels with beaded or out-turned rim
R24 (x2): Vessel with short, upright or slightly out-turned/pulled rim and high rounded shoulder (**Fig. 3.21**).

R25 (x3): Small, round-bodied vessel with beaded rim, wide horizontal groove at top of shoulder, wiping below (**Fig. 3.19**).

R26 (x1): Vessel with beaded/pulled rim, incised horizontal line at top of shoulder, scored exterior below (**Fig. 3.20**).

Corrugated vessels
R18 (x5): Jar with everted rim and corrugated neck/shoulder (**Fig. 4.22**).

R20 (x4): Everted rim jar with corrugated shoulder (**Fig. 4. 23; Fig. 5.35–36**).

R31 (x1): Flat-topped rim with corrugated exterior surface (not illustrated).

Other forms
R5 (x1): Storage jar with everted rim (not illustrated).

R16 (x3): Round-bodied vessel with out-turned rim, may have cordon and slashed decoration on shoulder (**Fig. 4.25**).

R19 (x1): Bowl/jar with short, upright neck, beaded rim and sharp shoulder (**Fig. 4.24**).

R21 (x1): Small vessel with beaded rim and rounded shoulder, irregular horizontal scored lines on exterior (**Fig. 4.26**).

R28 (x1): Round-bodied jar with incurving rim (**Fig. 4.27**).

R32 (x1): Small cup with low waist (**Fig. 4.28**).

CAM 136B (x1): Small flagon with out-curved lip (not illustrated).

R100 (x1): Carinated bowl with reeded rim (Bushe Fox 1926, no. 80) (**Fig. 5.38**).

R101: Small thumb pot (**Fig. 4.29**).

Rims broken at the neck, profile unknown (not illustrated)
R2 (x9): Everted rim jar (MIA–ERB).

R6 (x1): Rim expanded on the exterior and pulled on the interior.

R15 (x1): Upright necked vessel with thin beaded rim (M–LIA).

R22 (x2): Upright necked jar with rounded shoulder.

R27 (x1): Upright necked jar with flattened, externally expanded rim.

R29 (x2): Jar with internally bevelled rim.

Key features

The two roundhouses in Area 1 contained sherds in a soapy-textured, grog-tempered fabric. The gully of Roundhouse 10 produced only 17 small and abraded body sherds, whilst the group from Roundhouse 11 was slightly larger (36 sherds), with a rim fragment from a jar with out-turned rim and high rounded shoulder (**Fig. 3.21**), and another from a closed rounded/ovoid form (**Fig. 4.27**). These forms would not be out of place in a Middle Iron Age assemblage, but the fabric suggests a slightly later emphasis, and these roundhouses may represent a shift of the settlement to the north-west. Other features include recut pit 11545; the pottery of the original pit and the recut is very similar, all in extremely poor condition, heavily abraded and burnt or re-fired. Few diagnostic rim sherds are present, with the exception of four joining sherds from an everted rim jar with slightly corrugated neck (PRN 234). Two bases appear to have been reshaped, perhaps to be used as lids (SF 10002, context

11453, 16 mm diameter, and a possible example from context 11456). A small piece of potting clay that had been irregularly flattened and covered in organic impressions and fired, no doubt accidentally, was recovered from context 11460.

Pit 21011 contained a Late Iron Age assemblage of grog-tempered pottery, including a low carinated bowl with long, slightly concave neck, an out-turned and beaded rim, and four cordons decorating the body (**Fig. 3.16**). The form is encompassed by Thompson's E1-2, 'carinated wide-mouthed cups/bowls with multiple cordons'. The type is related to CAM 51 and has parallels from the Continent, but is described as 'at home in Kent' and is of pre-conquest date (Thompson 1982, 358). Other vessels from this pit comprise approximately 25% of a bead-rim jar (PRN 415), fragments of a second bead-rim jar (PRN 416) and a burnt/re-fired rim from a storage jar.

A large group of Late Iron Age/early Romano-British pottery came from pit 11214. It was in extremely poor condition, with high levels of post-depositional concretion (particularly in the lower fills), and the surfaces of many sherds laminating or missing. The pottery came from the lowest of the secondary fills (11240 and 11239) and the uppermost fill (11237), and cross-joining sherds between fills 11239 and 11237 suggest the pit was infilled relatively rapidly. Many of the sherds from fill 11240 came from a single grog-tempered vessel that appears to have been burnt. The rim is everted with a wide groove (6 mm) at the base of the neck (R1, **Fig. 3.14**). The upper body is irregularly scored, horizontally and diagonally. A single sherd from fill 11239 also joined this vessel. There is also part of a very fine, grog-tempered carinated vessel, possibly a girth beaker (PRN 15). A grog-tempered bowl/jar with lid-seated rim was distributed between fills 11237 and 11239. Traces of wear on the interior of the rim suggest that this vessel was used with a lid. A cordon and groove is present at the base of the neck, and below this there is a zone of closely spaced horizontal wiping. Romanised fabrics include two highly abraded greyware sherds from fill 11240, 35 sherds (146 g) from the base of a fine greyware vessel in fill 11239, and three sherds of fine oxidised ware and greyware from fill 11237.

Pit 11317 contained approximately one third of a grog-tempered bead rim jar (**Fig. 3.18**). A groove is present at the base of the neck, the shoulder is rounded, and the base is plain and flat. It is remarkable in this assemblage for the size of the sherds, but is otherwise in very poor condition. Most of the surfaces are missing, but those that remain have evidence of wiping, predominantly, but not exclusively, vertically. All the sherds are grey from being burnt or re-fired, and post depositional concretions are present on some. Other rims include a bead rim jar (R17); an upright-necked jar (R22); a short, upright and slightly pulled rim from a vessel with high, rounded shoulder (R24); a small ovoid jar with beaded rim and wide, horizontal groove at the top of the shoulder, with diagonal wiping below (**Fig. 3.19**); and a bead-rimmed vessel with an incised horizontal line at the top of the shoulder, and a scored zone below with horizontal/diagonal lines probably made with a twig (**Fig. 3.20**). The latter two appear to be a Thompson (1982) type C4, 1st century AD, often post-Conquest. There are also five small body sherds, and a tiny rim fragment, probably from an everted rim jar, in a fumed whiteware fabric, again hinting at a post-Conquest date for this pit. On balance, a date in the second half of the 1st century AD seems appropriate.

Metalworking furnace 11924 contained 46 sherds of undiagnostic pottery, nearly all burnt, grog-tempered body sherds. A much larger group came from adjacent pit 11987 (228 sherds, 2923 g), again dominated by grog-tempered wares but also including 55 Romanised sherds. The latter included a whiteware flagon, CAM 136B, distributed between fills 11860 and 11862; whiteware sherds in fills 11859 and 11863

are probably also from this vessel. It is highly abraded, and the surfaces are now so powdery that reconstruction is not possible. However, this vessel had broken at some point during its useful life and an attempt made to repair it. A black resin is present on the break of single sherds in fills 11862, 11860 and 11858. Three greyware sherds from fill 11855 also have a resin on their surfaces which appears to be some kind of bitumen. A 'dense black substance of bituminous appearance' was also noted along the edge of a sherd from Boys Hall Moat, Ashford, again interpreted as an adhesive used to repair a vessel (Booth and Everson 1994, 427). Other vessels include three necked cordoned jars (R30); three bead-rim jars (R17); two round-bodied jars with beaded rims (**Fig. 5.30–41**); a corrugated vessel (R31); and a low-waisted cup (**Fig. 4.28**).

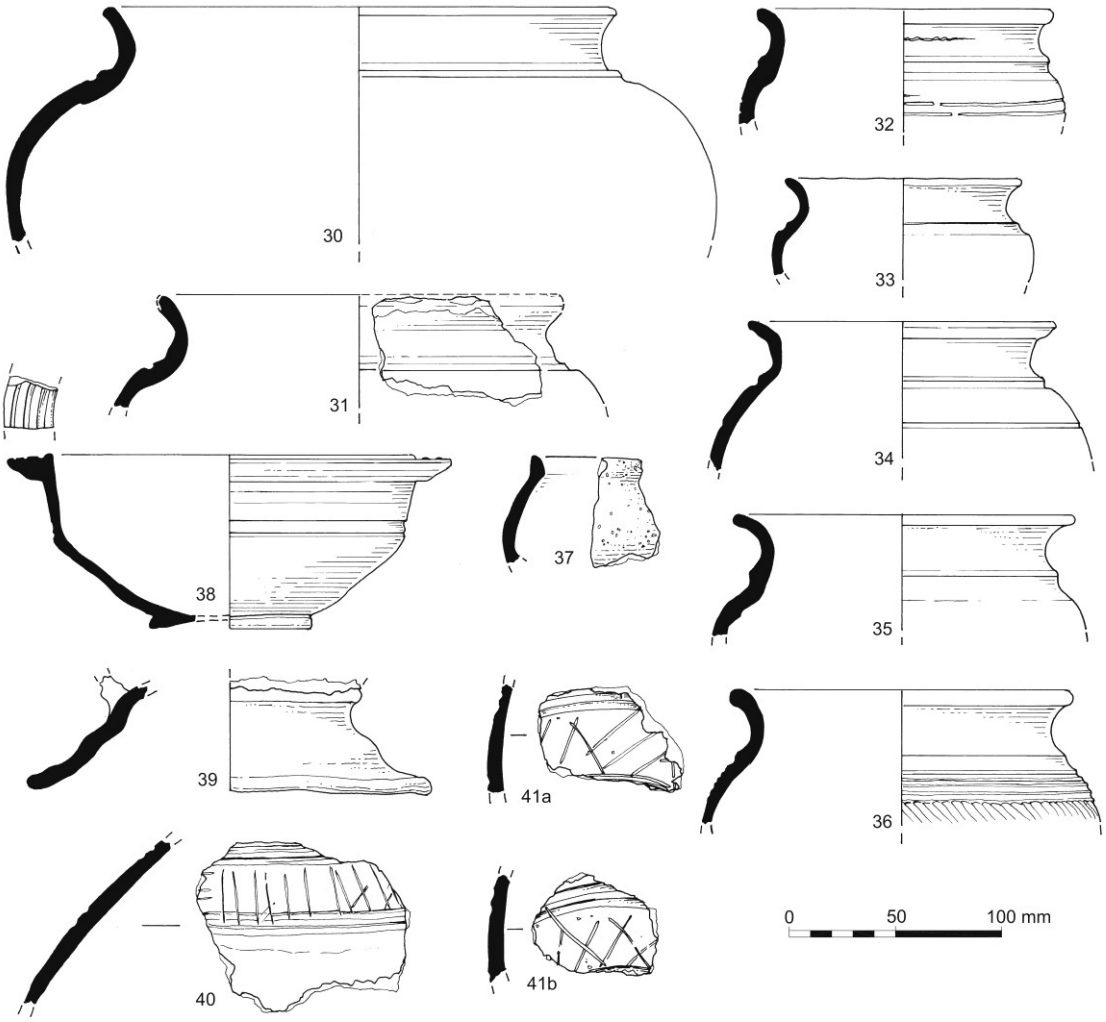


Fig. 5: Late Iron Age-early Romano-British pottery (30-41)

A large assemblage was recovered from hearth 21226 in Area 2, comprising 467 sherds (8593 g) (**Fig. 5.30–41**). Despite an average sherd weight of 18.4 g, the result of a number of very large sherds, the overall condition of the group is very poor and burnt, with many of the surfaces missing. Most of the pottery is grog-tempered, but small amounts of greyware and oxidised ware are also present. The rims include seven necked, cordoned and/or grooved jars (R1, R30); two corrugated vessels (R20); and a carinated bowl with reeded rim (R100). Also present are two almost complete bases, and parts of another six bases, three of which appear to have been deliberately shaped (walls removed). Part of a dished base from a pedestal urn was also recorded (**Fig. 5.39**). One grog-tempered vessel appears to have had scratched decoration applied prior to firing, but the motif is irregular, including vertical lines and lattice, and it is not possible to ascertain if they are from two different zones on the vessel, or just represent a change in decoration in the same band (PRN 40–1). Seven highly abraded and burnt sherds appear to have come from a narrow necked vessel, perhaps a flagon, flask or jug. Traces of decoration are present on the surviving surface areas, comprising circular indents, perhaps from a face although the condition is so poor that this could not be confirmed.

Amongst the early Roman assemblage from ditch 21405 (687 sherds, 5247 g) was a tiny 'thumb pot' (**Fig. 4.29**). The external diameter measures only 27mm and it is a maximum of 18.7mm tall, however the rim is highly irregular. It had been made from a grog-tempered fabric and is almost completely oxidised, with only a small unoxidised area on the lower exterior. The intended/actual use of this little vessel is unknown. Its manufacture was crude, it had not been used as a crucible. Traces of a black tar-like substance are evident on the interior and a smaller amount on the exterior, although traces of soil were noted between this residue and the vessel wall. A similar small vessel came from a slightly later deposit (AD 150-200) at nearby Westhawk Farm (Lyne 2008, fig.6.14, 276), interpreted as being possibly 'used to burn cannabis or hallucinatory drugs for inhalation' and 'may be evidence for shamanistic practices' (Lyne 2008, 251-2), however the Westhawk Farm miniature vessels are larger than the those from Park Farm, with vessel 276 measuring approximately 36-7 mm in diameter and height.

Discussion

Sporadic Middle and Late Bronze Age activity was noted in the north-west of Area 1 and the central part of Area 3. The vessel forms include a bucket-shaped jar, a typical form of the Deverel-Rimbury tradition of the Middle Bronze Age; and a hooked-rim jar, ovoid-profile jars and a cup, more typical of the earlier phase of the Late Bronze Age (Needham 1996, Period 6). Forms such as the ovoid jar have been recorded from several transitional Middle to Late Bronze Age assemblages, such as at Coldharbour Road, Gravesend (Barclay 1994, fig. 9.6; 9.7, 390) and Tutt Hill, Westwell (Morris 2006c, nos. 14–15). Such 'transitional' assemblages have been recognised on a number of other sites in southern Britain such as Pingewood, Buckinghamshire (Bradley 1985), and Kimpton, Hampshire (Ellison 1981). Similar vessel forms at Beechbrook Wood (Jones 2006, R2, No. 6) were associated with earlier radiocarbon dates (1430–1260 cal BC, NZA-22878; and 1410–1260 cal BC, NZA-22877).

The fabrics of the Middle Bronze Age vessels from Park Farm East/South East all include a mix of grog and flint inclusions that had been added to silty clay matrices. The use of grog-temper was first noted during the Late Bronze Age phase of Beechbrook Wood (Jones 2006), although Morris (2006a, 79–80) discusses a

change in the ceramics of Kent during the 14th to 12th centuries BC, 'marked by the use of grog temper as a significant additive or sole additive to fabrics creating grog- and flint-tempered or simply grog-tempered fabrics'. The fabric and forms from Park Farm suggest a slightly later date, perhaps in the 12th to 10th centuries BC. A single, later group of Late Bronze Age pottery was recovered from the terminal of roundhouse gully 31701 in Area 3, but is not thought to be contemporary with it.

Ceramically, the fourth phase of activity was recognised from Area 3. The roundhouses, several of the ditches (including 31712, 31396 and 31399) and pits contained pottery that broadly dates to the Middle-Late Iron Age, although the more diagnostic groups indicate a Middle Iron Age date for some of these features. A wider range of fabrics came into use, with the continuation of the use of grog, but also of iron and quartz. Such fabrics have been recorded from other sites in the region during this period. A similar range of wares was present at Beechbrook Wood, where the sandy wares also included glauconitic fabrics during the Middle Iron Age phase (Jones 2006). The forms include an ovoid vessel, neutral-profile vessels and S-profiled jars. Again, these have been recorded from a number of other sites in the region, including the sites along the route of the Cross Channel Rail Link (White Horse Stone; Beechbrook Wood; Little Stock Farm; Cuxton; Eyehorne Street and Saltwood Tunnel).

The latest phase of activity dates to the Late Iron Age and early Romano-British period. The bulk of the pottery of this phase was grog-tempered, as at other sites in the Ashford area excavated during the course of the Channel Tunnel Rail Link (for example Leda Cottages, Beechbrook Wood) (Booth 2006, 174), and sites such as Boys Hall Moat (Booth and Everson 1994, 426). The pottery has many characteristics of the Aylesford–Swarling or 'Belgic' style of pottery (as defined by Thompson 1982, 4–5), in the occurrence of corrugation, cordons, the dominance of grog-tempered fabrics, and combed or furrowed decoration. This style is typical of the 1st century BC and continues into the immediate post-conquest period. The relatively small quantities of Romanised wares at Park Farm East/South East indicates that activity continued into the second half of the 1st century AD, but probably not beyond it. The quantities of the non-Romanised wares at Park Farm East/South East and Beechbrook Wood are very similar, 90.7% and 92.9% respectively, indicating that activity at the latter had also ceased by the end of the 1st century AD (Booth 2006, 178). Features dating to this phase include the pit cutting the metalworking furnace in Area 1 and the hearth of Area 2, while Roundhouses 10 and 11, and the furnace itself, may belong to the earlier part of this phase.

Pottery illustrations

Bronze Age (ceramic phases 1-3)

1. Hooked rim jar, R33, GF2, PRN 350, context 11798, pit 11797.
2. Ovoid profile jar, R34, GF2, PRN 351, context 11798, pit 11797.
3. Ovoid profile jar, R34, GF2, PRN 230, context 11431, pit 11430.
4. Crude cup, R35, GF2, PRN 358, context 11845, pit 11843.
5. Shouldered jar, R8, IF1, PRN 49, context 31155, slot 31153, within Iron Age ring gully 31701.

Middle–Late Iron Age (ceramic phase 4)

6. R9, GI2, PRN 75, context 31005, ring gully 31700.
7. R10, Q4, PRN 85, context 31005, ring gully 31700.

8. R11, G4, PRN 117, context 31275, ring gully 31706.
9. R11, GI1, PRN 109, context 31122, ring gully 31706.
10. R12, GI1, PRN 116, context 31275, ring gully 31706.
11. R13, I1, PRN 174, context 31115, post-hole 31114.
12. R14, G4, PRN 157, context 31397, ditch 31396.

Late Iron Age to early Romano-British (ceramic phases 5-6)

Vessels characterised by cordons and/or grooves

13. R1, G1, PRN 8, context 11280, ditch 11276.
14. R1, G1, PRN 32, context 11240, pit 11214.
15. R4, G1, PRN 29–30, context 11239/7, pit 11214.
16. R3, G1, PRN 418, context 21009, pit 21011.

Bead-rimmed jars

17. R17, G1, PRN 415, context 21009, pit 21011.
18. R23, G1, PRN 260, context 11321, pit 11317.

High shouldered vessels with beaded or out-turned rim

19. R25, G1, PRN 267, context 11321, pit 11317.
20. R26, G1, PRN 269, context 11321, pit 11317.
21. R24, G1, PRN 278, context 11594, ring gully 12015.

Corrugated vessels

22. R18, G1, PRN 207, context 11258, ditch 11378.
23. R20, G1, PRN 208, context 11233, ditch 11378.

Other forms

24. R19, G1, PRN 205, context 11258, ditch 11378.
25. R16, G1, PRN 179, context 11175, pit 11172.
26. R21, G1, PRN 244, context 11450, hearth 11459.
27. R28, G1, PRN 291, context 11631, ring gully 12015.
28. R32, G100, PRN 336, context 11883, pit 11987.
29. R101, G100, PRN 421, context 21009, pit 21011.

Hearth 21226, context 21225

30. Necked, cordoned jar, R30, PRN 387
31. Necked, cordoned jar, R1, PRN 389
32. Necked, cordoned jar, R1, G100, PRN 390
33. Necked, cordoned jar, R1, PRN 393
34. Necked, cordoned jar, R1, G100, PRN 394
35. Everted rim jar with corrugated shoulder, R20, G100, PRN 386
36. Everted rim jar with corrugated shoulder, R20, G100, PRN 395
37. Jar with internally bevelled rim, R29, G100, PRN 392
38. Carinated bowl with reeded rim, R100, Q100, PRN 404
39. Dish-shaped pedestal base, G100, PRN 406
40. Decorated body sherds, G100, PRN 400
41. Decorated body sherds, G100, PRN 401

The slag and other metalworking remains

by Patrice de Rijk

Slag from an iron smelting furnace (11987) and several other contexts, broadly dating to the Late Iron Age (1st century BC), was examined macroscopically and physically to determine the type and scale of the activities. The slag largely comprises irregularly shaped lumps, coated with an iron concretion resulting from iron(-oxide) leaching from the slag which cemented the surrounding soil particles, and giving the slag a reddish brown colour.

Although superficially similar in appearance, characteristics of the slag such as size, inclusions, shape and magnetism allowed different types to be recognised, including

production (smelting) slag, smithing slag, vitrified clay and iron ore (**Table 5**). For example, production slag tends to be larger than smithing slag as more slag is set free during the production process than during smithing. Production slag can also show flow structures whereas smithing slag mostly consists of conglomerated slag droplets. In addition, vitrified surfaces, imprints and inclusions of charcoal are more common in smithing slag than in production slag.

However, where the slag is covered in a thick, rusty crust which obscures the original surface, or where it comprises small lumps lacking characteristic elements, it is not possible to determine the process involved, in which case it has been categorised as 'undiagnostic'. In addition, 222 samples were checked for hammerscale, using a magnet.

Table 5 Quantification of slag and other categories (number and weight in grammes)

Type	*no.*	*g.*	*no. (%)*	g. (%)
Production (smelting) slag	85	*25,727*	11.1	39.8
Furnace bottom	*70*	*25,065*	*82.4*	*97.4*
Tap slag	*15*	*662*	*17.6*	*2.6*
Smithing slag	83	*5,662*	10.9	8.8
Smithing hearth bottom	22	*4961*	26.5	87.6
Silicate-rich slag lumps	60	*700*	72.3	12.4
Hammerscale	>1	*>1*	>1.2	-
Undiagnostic slag	404	*26,105*	53.0	40.4
Vitrified clay	143	*4,365*	18.7	6.7
Iron ore	8	*440*	1.1	0.7
Unid./concretion	40	*2,358*	5.2	3.6
Total	763	*64,657*	100.0	100.0

Results

The bulk of the slag (by number and weight) is undiagnostic (**Table 5**). Production slag comprises 12% by number and 41% by weight, the difference in values being due to the usually larger size of the production slag lumps. The amount of smithing slag is considerably smaller as is the amount of vitrified clay.

Production (smelting) slag

Until the medieval period, iron was produced in small furnaces. The furnace shaft was charged with alternate layers of iron ore and charcoal and the furnace lit. During the production process, part of the iron oxide in the ore was reduced to metallic iron grains and the other part combined with the non-metallic component of the ore, forming slag, which either remained within the furnace or was tapped through a hole in the furnace wall.

The iron grains remained in the solid state and collected near the base of the furnace. This agglomeration of iron mixed with slag and charcoal is called a bloom. Primary smithing involves hammering and folding the hot bloom, during which slag is expelled and the iron grains are compressed. The iron from this process can be subsequently shaped by the smith during secondary smithing – the production of objects.

Two types of production slag were identified – furnace bottoms and tap slag (**Table 5**); it is likely that the bulk of the undiagnostic slag is also from furnace bottoms. A furnace bottom is the result of slag dripping or flowing to the base of the furnace where it consolidates. Most fragments found weigh up to 200 g and are not magnetic, although approximately 35% of the slag lumps are partly magnetic, especially at the

top. Many fragments have burnt clay adhering to the side and/or bottom, or show flat sides when the clay has not survived, and these can indicate where on the base the slag solidified. This was probably in a shallow pit, at least 0.1 m deep and over 0.2 m in diameter, with a slightly concave base and a transition between base and side of *c.* 45°. Imprints of charcoal or wood can be seen in the slag and some parts at the top are lightly glazed due to the presence of silica. It appears that the slag ran into the pit from one side only.

Tap slag is formed when viscous slag is free-flowing, usually when tapped from the furnace, but also when flowing into a pit below the furnace shaft. Tapping from the furnace results in flow structures, like 'fingers' or 'runs', visible on its upper surface. The assemblage shows both horizontal and diagonal flow structures, indicating that slag was flowing slightly downwards when tapped.

Smithing slag
During smithing, slag is formed both in the hearth and around the anvil. Three kinds of smithing slag were identified in the assemblage – smithing hearth bottoms (SHB), silicate-rich (smithing-)slag lumps, and hammerscale (**Table 5**).

A smithing hearth bottom is formed when the iron oxide at the surface of the heated iron reacts with the fuel ash in the hearth and with the hearth's clay coating, and it has a characteristic plano-convex shape. It is made up of conglomerated slag droplets, with imprints of charcoal seen in a few pieces and small pieces of charcoal visible in others. The 22 smithing hearth bottoms measured on average *c.* 70–75 mm across and 40–45 mm thick and had an average weight of 236 g. They are only very slightly magnetic, although a quarter of them are partly magnetic at the top.

The silicate-rich (smithing-)slag comprises mainly small, irregularly shaped vesicular lumps, often with areas of greenish to blackish glaze. It can be produced in various kinds of hearth, as it is mainly formed of fuel ash and clay lining, but most of it was found with the smithing hearth bottoms.

Several sub-classes of hammerscale can be identified, the two main ones being flakes and spheres, both of which are produced by hammering red-hot iron on an anvil, although spheres are generally indicative of welding. The flakes are pieces of iron oxide that flake off the surface of the iron, while the spheres are droplets of molten slag that are squeezed out of the iron by the force of the hammer and solidify in the air. Whereas almost all flakes are magnetic, not all spheres are. One large flake was found, measuring 14 mm by 8 mm, while some other, smaller flakes were found in the rusty crust of the smithing hearth bottoms, clay lining and undiagnostic slag. Both flakes and spheres were also found in nine bulk soil samples.

Vitrified clay
There are 143 fragments of vitrified clay which, like the silicate-rich (smithing-)slag lumps, can derive from various types of hearth. However, as it was found together with iron slag, it is reasonable to assume that it derived form an iron production (smelting) furnace and/or smithing hearth. The fragments are partly vitrified on one side, changing to a reddish-brown to orange on the other. A number are relatively large, including a slightly curved piece from the east end of the furnace, indicating a diameter of *c.* 0.5 m for this part of the structure comprising the furnace wall. Three other fragments each show parts of a tuyère hole (one with a 17 mm diameter hole and two at 30 mm diameter) through which air was blown into the hearth or furnace. The larger holes were possibly associated with a furnace, whereas the smaller hole probably came from a smithing hearth (De Rijk 2007, 160).

Iron ore
Several small fragments have been identified as iron ore, including four lumps of iron-rich friable sandstone and an ironstone pebble, probably from the Lower Greensand.

Undiagnostic slag
This category mainly consists of small slag pieces. Most of them will be fragments of production slag, and to a lesser extent, smithing slag.

The furnace
Late Iron Age feature 11924 was identified as a part of an iron production (smelting) furnace on the basis of the slag and fired clay found associated with it, as well as the structure itself. It consisted of a relatively narrow and steep-sided pit, at least 1.7 m long, 0.6 m wide and up to 0.4 m deep. A relatively large piece of slag was found apparently *in situ* at the slightly rounded eastern end of the pit, suggesting that it was formed at the bottom of the furnace, but the precise nature of the furnace is somewhat uncertain. Its western end was cut by a large early Romano-British (probably 1st century AD) pit (11987) which contained a considerable quantity of redeposited slag and furnace lining.

Until recently, theories concerning the early iron industry in Britain considered the small, non-tapping 'bowl' furnace to be characteristic for this period (Clough 1992, 179). Cleere described such a furnace as 'essentially a hollow in the ground, usually hemispherical, ranging in diameter between 30 cm and 1.50 m, and lined with clay. Into this was packed a mixture of ore and charcoal, which was heaped above the bowl, and a bellows was inserted into the side of the charge. In order to minimize heat loss and re-oxidation of reduced iron, it would seem likely that the mass was covered over with turf or clay, a hole being left in the top for the escape of waste gases' (Cleere 1972, 8). However, experiments with 'bowl' furnaces, and the study of the thermodynamic requirements of the bloomery process, have shown that only a small quantity of iron (a few hundred grams) could have been produced in this kind of furnace (Clough 1992, 182), and it is therefore assumed that they actually had a clay superstructure, and consequently were a kind of 'shaft' furnace.

Feature 11924 resembles a 'slag pit' furnace, a type well-known throughout central and northern Europe in a pre-Roman to Migration period context (Bielenin 1983, 47 ff; Tylecote 1981, 22), and thought to have been introduced to England by the Saxons. A slag pit furnace comprises a pit and a clay shaft set on top of it. Prior to smelting, the pit was filled with wood or straw, preventing the charge in the shaft, consisting of alternate layers of charcoal and iron ore, from falling into the pit. During the operation of the furnace the slag flows to the base of the pit through the voids in the filling, its heat charring the filling which is eventually replaced by the slag. The charcoal imprints in the slag are made when the slag solidifies before the organic filling or charcoal is fully burnt away.

The shape and dimensions of such a pit can vary, but it is usually sub-cylindrical or sub-conical and *c.* 0.4–0.5 m in both diameter and depth (Bielenin 1976, 24; 1983, 47 ff). The shaft is generally slightly conical with the same internal diameter as the pit, and a height of 1.0–1.5 m. As generally only small pieces of the furnace shaft are found (if any at all), reconstructions of this type are often based on a well preserved example from Scharmbeck near Hamburg, Germany, the shaft of which was *c.* 1.0 m high, 0.41 in diameter at the bottom and 0.22 m in diameter at the top (Wegewitz 1957, 14 ff).

The *in situ* slag furnace bottom from feature 11924 reflects a rather shallow slag pit with a diameter of *c.* 0.5 m and a depth of *c.* 0.15 m. The pit had sides which sloped at a moderate angle to a flat or convex base. The slag flowed from the furnace into the pit, resulting in vertical and diagonal flow structures. A further 'batch' of slag flowed over the already solidified slag, filling up the rest of the pit. Other slag fragments, with horizontal flow structures, may be the result of slag running over the bottom of the pit, or of slag having been tapped out of the furnace; both could have occurred in the same furnace. (In the Scharmbeck furnace the massive block of slag from the slag pit had a rectangular extension at one side showing that slag that had also been tapped from the furnace (Wegewitz 1957, 13)).

Therefore, with the help of the *in situ* slag furnace bottom, we can try to reconstruct furnace 11924. It has similarities to a slag pit furnace, its pit measuring *c.* 0.5 m in diameter and 0.4 m deep, on top of which a shaft was built with least one tuyère or blowing hole at the side. Two fragments of furnace lining contain parts of one or more tuyère holes with an estimated diameter of 30 mm. It is not known if the pit was filled with some kind of organic material like wood or charcoal prior to the reduction process. However, the shaft would have been filled with alternating layers of charcoal and iron ore. During smelting, slag dripped or ran along the furnace wall into the pit below the shaft, while the iron bloom, the desired product of the production process, formed on top of the slag. Usually, the furnace shaft would have been demolished in order to recover the bloom, but in this furnace the ironworkers may have dug a channel and opened the slag pit from one side. After cooling, the slag was generally removed and the iron bloom was collected for smithing. The shaft might have been repaired, if necessary, making the furnace ready for another smelting operation.

Conclusions
Evidence for iron production is not uncommon in Britain in the Late Iron Age. The earliest known iron production furnace, a 'bowl' furnace F247 at Brooklands, Surrey, can be dated to the 5th century BC (Clough 1992, 180). However, the best example of an early iron production site with furnaces is probably that found at Kestor, near Chagford in Devon, which is dated after 400 BC (Tylecote 1962, 195).

It is interesting that Late Iron Age furnace 11924 has several characteristics of slag pit furnaces, and could be used more than once with minimal repairs to its superstructure. The iron blooms were apparently worked close to the furnace, for smithing hearth bottoms and hammerscale were found in the same contexts as the production slag, most notably in early Romano-British pit 11987, which cut the furnace and contained 80% of all the slag recovered from the site. There is also some evidence, provided by several crucible fragments, for copper alloy working in the same area at the same time (Lucas and Paynter, below).

Crucibles

by Victoria Lucas and Sarah Paynter

Eight fragments representing three separate crucibles were submitted for analysis as well as a complete thumb-pot of unknown function.

Visual examination
Crucibles ON 10005 (context 11881) and ON 10007 (context 11868) are very similar, both in terms of form and fabric (**Fig. 6**). They have grey reduced firing interior and

exterior surfaces with extensive bloating and red vitrification of the rim and upper outside surfaces; this indicates exposure to high temperatures and that they were heated from above (Bayley and Rehren 2007). Both fabrics contain quantities of quartz of variable coarseness, which comprises approximately 80–90% (by volume) of the crucible fabric. There are also relatively large amounts of copper alloy adhering to the upper portion of the interior surface of several of the crucible fragments. ON 10005 has a pouring spout which appears to have been pinched from the rim of the crucible; this is where the greatest quantity of copper alloy is found. The fragments are likely to be sherds from the small triangular-plan crucibles typical of the Iron Age (Gregory 1991, 139, type B; Paynter 2002; Wainwright 1979, 125–49). The reconstructed crucibles have an internal diameter of about 90 mm at their widest point, and a maximum depth of approximately 70 mm. When in use they appear to have been filled to within about 20–30 mm of the rim.

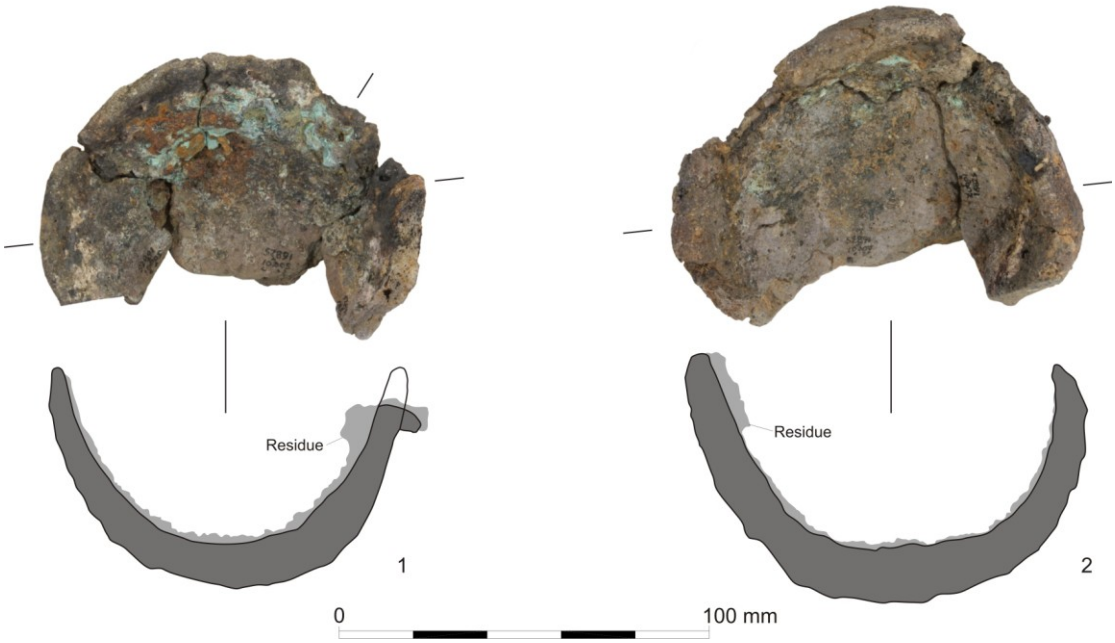


Fig. 6: Crucibles

The thumb-pot (ON 20010) is about 25 mm in diameter and 15-20 mm tall. It is tempered with yellow/white grog and some fine quartz, about 60–70% of the fabric. The vessel is red oxidised throughout and shows no sign of bloating or vitrification; there are no visible traces of copper alloy. Based on these attributes (and the results of analysis) it was concluded that this vessel was unlikely to have been used as a crucible.

Analysis

Full details of the analytical methods and results are provided in archive (Lucas and Paynter 2010).

Surface energy dispersive X-ray fluorescence (EDXRF) analysis detected zinc on ON 10032, and also lead, copper and tin. Copper, tin, zinc and lead were detected on

crucible ON 10007. Copper, tin, lead and a trace of zinc were detected on ON 10005. This confirms that these crucibles were used to melt copper alloys.

Quantitative scanning electron microscopy energy dispersive spectroscopy (SEM-EDS) analysis was carried out on ON 10005, ON 10007 and ON 10032.

SEM-EDS analysis revealed that in terms of chemical composition the fabrics of the three crucibles are very similar being roughly 79wt% silica with the remainder dominated by alumina (Al_2O_3) and iron oxide (*c.* 10wt% and c. 6wt% respectively). The majority of the fabric is poorly sorted quartz, explaining the high silica content obtained by the bulk analyses, in a matrix of clay with high proportions of alumina and iron oxide. The fabric displays considerable vitrification resulting from exposure to high temperatures and reactions with fuel ashes; little of the original clay matrix remains unreacted. ON 10032 shows marginally less bloating than the other two, indicating perhaps slightly lower temperatures or less prolonged exposure to high temperatures. The fabric of these crucibles is well suited to its purpose having relatively high proportions of silica, which would have ensured that it was suitably refractory (Dungworth 2001). All three crucibles also contained some zirconium inclusions, whilst ON 10032 contained a very small amount of rutile (TiO_2) and lathes of iron oxide (Fe_2O_3) as well as some monazite ([Ce, La, Nd] PO_4).

Many areas of the crucibles display vitrification, which falls into two categories: that found at the interior edges of the crucible and that found in the body of the crucible. The vitrification at the interior edges is generally the most extensive with the crucible fabric having become fully fused. SEM-EDS analysis showed that the concentrations of K_2O are enhanced in these edge-vitrified zones, probably due to reactions with fuel ash, and increased levels of copper and tin were often detected. In the case of ON 10005 this is particularly evident and the cassiterite (SnO_2) and copper oxide dendrites. ON 10032 also contained some droplets of what was originally tin bronze in the vitrified zones, however these were heavily corroded and only minute traces of copper remained. Vitrification of areas in the body of the crucible is localised and characterised by high proportions of Fe_2O_3 and TiO_2. These areas of vitrification result from the reaction of mineral inclusions, such as rutile, with the surrounding clay fabric.

Remnants of copper alloy were only found in significant quantities in the sample from ON 10005 within the vitrified zone of the interior edge. Small amounts of cassiterite and corroded, tin-rich metal droplets were found in the sample from ON 10007, but very little in the sample from ON 10032.

The outer edges of the vitrified zone of ON 10005 contain large amounts of crystalline cassiterite (SnO_2). There also appear to have been some copper oxide dendrites but the copper-rich phases have been preferentially dissolved post-burial, leaving mainly the insoluble cassiterite phase. The copper- and tin-rich phases are derived from slaggy corrosion products on the surface of the melt (Dungworth 2000), and the molten metal itself, and have all been altered by the post-depositional environment.

Metallic droplets were also found in the sample from ON 10005. The majority of these contained high concentrations of tin overall, largely ranging from 20–30wt%, but this is unlikely to be representative of the original melt. The values for tin detected in the droplets are enhanced relative to their original values due to corrosion, which has resulted in the copper being depleted (Dungworth 2001; Scott 1991). Traces of lead and sometimes arsenic were occasionally detected in the droplets; one copper

droplet contained significant quantities of antimony. Small amounts of nickel were often present. Zinc was detected in bulk analyses of the crucible surface but rarely in the metallic droplets.

The alloy melted in the crucibles was probably bronze, typical of the Iron Age (Dungworth 2001). The detectable zinc and lead on the surfaces of the crucibles, however, may indicate small amounts of these metals were also present in the alloys (although both are volatile and so very small amounts in the metal melted may have given rise to disproportionately large amounts in the crucibles). If alloys containing zinc were in circulation, this would suggest that the crucibles were used in the Late Iron Age, perhaps the 1st century AD, when increasing amounts of zinc-containing alloys, like brass, were introduced from the Roman Empire. The presence of nickel may also suggest a later date (Dungworth 2001).

Fired clay

by Grace Perpetua Jones

A total of 1004 fragments of fired clay, weighing 58 kg, was recovered from 115 contexts across Areas 1–4. Of these, 40 contexts produced more than 100 g and 17 contained more than 500 g. With the exception of three portable objects, all appear to have a structural origin, either from pit or hearth linings, or from upstanding structures.

Part of the assemblage is highly fired, and includes 143 vitrified fragments. In several contexts this highly fired clay was found in association with ironworking slag (scoop 11391, ditch 11871, pit 11987); the latter two features were immediately adjacent to metalworking furnace 11957 (see de Rijk).

Other groups from the furnace (11987) and adjacent features are not so highly fired but have at least one flat surface and appear to come from large, subrectangular blocks. Examples from ditch 12000 (context 11827) had a thickness of 60–80 mm, and where two adjacent faces are present, these meet at an angle of approximately 160°. A large, irregularly shaped four-sided block from 11239 has surviving sides of 110 mm and 130 mm, with a tapering hole through one side, up to 30 mm wide and 60 mm deep, presumably designed to hold a support or other fitting. It is uncertain whether these fired clay blocks were associated with the nearby ironworking or some other, domestic activity.

Two slingshots were recovered, from Late Iron Age pit 21293 (ON 20011) and Middle–Late Iron Age Roundhouse 2 (31701, ON 30013). They are ovoid in shape, pointed at each end. One measures 40 mm by 25 mm and weighs 22 g (ON 20011); the other measures 45 mm by 27 mm and weighs 27 g (ON 30013). Each is made from a sandy fabric with ferruginous inclusions. This type of object is frequently encountered on Iron Age sites (Poole 1984, 398).

Part of a triangular loomweight was residual in ditch 31673 (ON 30021), comprising a corner perforated from side to side. Very little of the faces remain and are highly abraded, but they suggest a thickness of 57 mm. It must be noted that Poole (1995, 285) has argued that such objects may in fact be triangular oven bricks. A second perforated fragment, recovered from Middle/Late Bronze Age pit 11430 (ON 10001) may be part of a perforated clay plate. It is highly abraded but would appear to have

been 32 mm thick. Such objects have been recorded from Late Bronze Age sites in the region such as Springfield Lyons (Major 1987, 11) and North Ring, Mucking, Essex (Barrett 1988, 39

Other finds

by Lorraine Mepham, R.H.Seager-Smith and Stephanie Knight

Glass

An annular bead (ON 10000) in two fragments came from an undated posthole (11018) within Roundhouse 10). The bead is of medium size (diameter 23 mm), in clear glass, and is assumed to be of Late Iron Age date. Colourless glass beads are not common in Britain; examples are known of Late Iron Age and Romano-British date, their distribution mainly confined to the west of the country, with one possible manufacturing centre at Meare in Somerset (Guido 1978, 9–11).

Worked and burnt flint

The worked flint assemblage (115 pieces, weighing 3027 g) is both chronologically and technologically mixed. Raw material comprises mainly gravel flint (including a few pieces of Bullhead flint), with a few pieces of more cherty material. Its condition varies widely – some pieces are heavily patinated and/or rolled, while others are unpatinated and appear fresher, but most exhibit at least some edge damage. It is likely that much if not all of this material is redeposited.

Chronologically, the assemblage includes pieces of potential Palaeolithic (including one possible handaxe fragment), Mesolithic (including one burin spall) and later date. Much of the assemblage, however, is not chronologically distinctive; tools and utilised pieces comprise three scrapers, six possible hammer-stones and one miscellaneous retouched piece.

Burnt, unworked flint was recovered in small quantities (55 pieces weighing 1551 g) and no concentrations were noted.

Stone

The stone assemblage (29 pieces weighing 6553 g) consists largely of two types of object – small to medium sized, rounded, water-worn pebbles of flint or quartz, possibly utilised; and a few fragments of burnt, unworked stone (sandstone). Some of the pebbles, given their size and shape, could have functioned as slingshots (see, for example, Brown 1984).

Animal bone

Of the 427 bone fragments recovered, over 81% were from the sieving of samples, Most were in poor condition, and only two could be identified – a cattle tooth fragment and a possible bird shaft fragment. Almost 90% had been burnt, with calcined bone being far more common than carbonised bone, suggesting that most bone had been exposed to very high temperatures over an extended period of time.

Of the hand-recovered assemblage, only 12 bones (15%), mainly teeth, could be identified, of which most were cattle, with sheep/goat and horse also present. Butchery marks were noted on only two bones, probably due to the poor survival of the bone surface, and four bones provided evidence of age. What appears to be a pig-sized rib had broken and re-healed badly, with exostoses and porosity of the extra bone growth.

The environmental evidence

Two hundred and seven environmental samples of between 10 and 40 litres were taken during the excavation, processed by standard flotation methods and assessed for wood charcoal and charred plant remains (Wessex Archaeology 2007a-b; 2008b).

A series of monolith samples was taken through ditch sequences in Areas 1–3. However, pollen preservation is generally poor on brickearth sites and no samples were analysed for pollen. There were no waterlogged features and given that the deposits in the sampled features displayed clear iron (and often manganese) mottling, demonstrating that they were subjected to gleying, in turn indicative of fluctuating wet/dry conditions, pollen preservation appropriate for analysis was considered extremely unlikely. Similar observations were made at Westhawk Farm where, despite the presence of waterlogged deposits, only a single well with good waterlogged preservation was deemed suitable for pollen analysis (Wiltshire 2008).

Charred plant remains

by Chris J. Stevens

Charred plant remains were generally very sparse, with relatively few samples containing more than ten items of cereal remains, and most with less than five items. On the basis of the assessment, 11 of the richer samples were chosen for full analysis (**Table 6**).

Four of the analysed samples came from Middle to Late Iron Age features in Area 3. It might be noted that while one of these (pit 31371) contained no dating evidence, a Middle–Late Iron Age date is tentatively ascribed on the basis of its proximity to Roundhouse 4. Three samples from Area 2 were also of Middle–Late Iron Age date. Three samples from Area 1 were of Late Iron Age to early Romano-British date. One sample from Area 3 was from a medieval gully containing 12th/13th century pottery.

Methods
Samples were sorted and charred material extracted, identified and quantified (**Table 6**). The nomenclature follows that of Stace (1997) for wild plants and the traditional nomenclature given in Zohary and Hopf (2000, 28; tables 3 and 65), for cereals. Three of the samples had exceedingly large fine fractions (0.5 mm and 1 mm), containing a high numbers of glume bases. For each of these samples only 10% of these fractions were examined and the resultant counts were then multiplied by 10 to provide estimates, prefixed by an ‘e.’ in **Table 6**.

Results
The samples contained mainly remains of hulled wheat (*Triticum dicoccum/spelta*). Remains of barley (*Hordeum vulgare*) were present within several of the samples, but generally in fewer numbers. The one exception was grain within possible Iron Age pit 31371 where there were high numbers of grains in general, with those of hulled wheat and barley in roughly equal proportions. Rachis fragments of barley were present in a few of the samples and even outnumbered grain in the sample from early Romano-British hearth 11459. In two cases, from pit 31371 and Roundhouse 8 gully 31707, these rachises could be identified as from six-row barley.

In most of the samples, glumes and spikelet forks of hulled wheat outnumbered grains, in particular from pits 11172 (Late Iron Age) and hearth 11459 (early Romano-British) where they were present in the thousands. The exception was the grain-rich deposit from pit 31371 which had comparatively few glume bases. It might be noted that early Romano-British pit 21223 had several grains still within the spikelet; however, the ratio of glumes to grain was too high to suggest that only burnt spikelets had originally been present.

While chaff of spelt (*Triticum spelta*) was better represented in pits 11172 and 21226 (early Romano-British), within most of the other features both emmer (*Triticum dicoccum*) and spelt were equally well represented. Occasional grains and rachises of free-threshing wheat (*Triticum turgidum/aestivum*) were recovered from pits 21226 and medieval gully 31691.

Of interest were a number of germinated grains, probably mainly of spelt wheat, along with detached germinated coleoptiles (acrospires) or sprouts. These came from pit 11172 and hearth 11459, with smaller numbers from pit 21223. In hearth 11459 it is probable that most of the grains were germinated.

No other crop remains were found, although it is possible that the fragments of hazelnut (*Corylus avellana*) within pit 31706 may represent nuts that were collected from the wild for use as food. Similarly the fragment of sloe (*Prunus spinosa*) from pit 21226 might be similarly derived.

Several of the richer samples, from pits 11172 and 21226 and hearth 11459, also had charred cupules of acorn (*Quercus* sp.), along with buds and oak charcoal.

The main other materials of interest were amorphous conglomerated lumps of charred material, mixed with mineralised cess. This was from hearth 11459 and pit 21229, and comprised of glumes and charcoal respectively.

A number of charred seeds of wild species were identified. These probably derive from plants that grew as weeds amongst the cereal crop and were brought back after harvesting. In most of the samples, seeds of larger-seeded species predominated over those of smaller-seeded species.

The main seeds represented were of larger-seed grasses, oats (*Avena* sp.) and brome grass (*Bromus* sp.). While oats could be wild or cultivated, a few identifiable floret bases were present and these indicate only wild oats to have been present. These were particularly common in the richer samples from Areas 1 and 2 and the grain-rich pit (31371) in Area 3. They were also present in the sample from medieval gully 31691.

The other commonly occurring seeds were those of fat-hen (*Chenopodium album*), and dock (*Rumex* sp.), both common arable weeds. Other species present were clover (*Trifolium* sp.), vetch/wild pea (*Vicia/Lathyrus* sp.), knotgrass (*Polygonum aviculare*), redshank/pale persicaria (*Persicaria maculosa/lapathifolium*), black bindweed (*Fallopia convolvulus*) and cleavers (*Galium aparine*). Most of these are also common arable weeds and not particularly ecologically distinct in terms of preference for soil type or cultivation conditions. However, a single capsule of rush (*Juncus* sp.) may relate to crops grown on wetter soils; few other wetland indicators

were present, although heath-grass (*Danthonia decumbens*) represented by a single seed is also more common on damper acidic soils. In contrast, a single seed of field madder (*Sherardia arvensis*) is more likely associated with crops growing on drier calcareous soils.

The only other species of interest was stinking mayweed (*Anthemis cotula*) represented by some seed-head fragments in the sample from medieval gully 31691. This species is associated with heavy clay soils and is a common constituent of charred assemblages of Saxon, medieval and post-medieval date.

Discussion

Emmer and spelt were the main wheats cultivated in Kent during the Iron Age (Stevens 2009; cf. Stevens 2006a; 2006b; Giorgi 2006; Davies 2006), but by the Romano-British period emmer seems to have gone out of favour in the region, with spelt predominating at many sites (Stevens 2006c; 2009; Stevens *et al.* forthcoming). At Park Farm East/South East, however, emmer still predominates in the only early Romano-British sample examined, from hearth 11459. This contrasts with the assemblage, mainly from early Romano-British features, at Westhawk Farm, where remains of emmer were far outnumbered by those of spelt (Pelling 2008).

There was a high predominance of glumes in all of the samples, but that from pit 31371 indicates that most of the charred material comes from the burning of waste produced during the pounding of the grain. In the case of pit 31371 it is likely that either whole spikelets or relatively clean grain was charred.

The predominance of seeds of larger seeded species suggests that crops arrived on the site in a relatively processed state, after threshing, winnowing, coarse and probably fine-sieving. In the case of barley, this would have been as relatively clean grain, and in the case of emmer and spelt as spikelets.

The range of wild species is fairly undiagnostic of the type of soils on which crops were cultivated, but it is likely that both wet acidic and drier calcareous soils are represented.

One of the main points of interest is the predominance of germinated grain and coleoptiles in the Late Iron Age deposit from pit 11172 and the Romano-British deposit from hearth 11459. The grains were mainly of spelt, but occasionally also germinated grains of barley and even oats and brome grass occurred. Such assemblages have been seen on other sites in the region e.g. Bower Road (Stevens 2006c), Westhawk Farm (Pelling 2008), and Springhead Roman Town/Northfleet villa (Stevens *et al.* forthcoming), but only associated with Romano-British deposits, albeit frequently of a 1st century AD date. Generally, these types of deposit are associated with the production of malt from the germination and dehusking of spelt wheat in the spikelet (Stevens forthcoming; Stevens *et al*. forthcoming).

By their nature such activities would have been carried out *en masse* and would inevitably have led to the glume-rich assemblages seen at both this and other sites,

in Kent and beyond, with malting evidence (Stevens *et al.* forthcoming). However, given that just two such samples were recovered, such activities may have been carried out only occasionally. It might be noted that at Westhawk Farm, lying 2.5 miles along the Roman road to the north-west, germinated grain was relatively

common in several samples (Pelling 2008). Such assemblages have generally been associated with more Romanised settlements, or occasionally with native settlements lying close to Roman Roads, as with a site at Camborne, Cambridgeshire (Stevens 2008); Romano-British hearth 11459 lies less than 500 m south-west of the line of the Roman Road.

With the exception of these glume-rich malting-related samples, given the large number of samples taken, the low quantity of material in the samples stands in contrast both to other sites in the area, in particular Westhawk Farm (Pelling 2008), but also those dating to the Iron Age such as White Horse Stone (Giorgi 2006), Eyhorne Street (Davies 2006), and Little Stock Farm (Stevens 2006a), and to the Romano-British period at Saltwood Tunnel and Bower Road (Stevens 2006b; 2006c). Such low levels of charred cereals can reflect relatively short-lived, intermittent or even seasonal occupation. As much charred waste relates to the processing of crops taken routinely from storage throughout the year, another possibility is that cereals were almost fully processed prior to coming to the site, resulting in little charred cereal waste, perhaps with processing conducted in parts of the settlement lying just outside the area of excavation.

While some of the differences in the weed flora between this site and Westhawk Farm may be due to the paucity of material in the samples, some general comparisons can be made. The main difference is that the more typical Romano-British assemblage seen at Westhawk, in particular the appearance of stinking mayweed (*Anthemis cotula*) (Pelling 2008), is not seen at this site. Stinking mayweed is a species associated with the cultivation of clay soils and tends to be found on more Romanised sites, probably accompanied by the use of asymmetrical plough shares rather than the continued use of the more traditional native ard. Such a difference may be reflective of slight differences in the degree of Romanisation, for example it is notable that Westhawk has a much more characteristic Roman pottery assemblage than Park Farm East. Although much of the evidence from Westhawk Farm is later, the features with seeds of stinking mayweed are dated to the 1st century AD and as such probably broadly contemporary with the assemblages from this site.

The deposit from medieval gully 31691 reflects many of the changes that occurred within the Saxon and medieval periods. The main difference is the predominance of free-threshing wheat alongside barley, and the presence of stinking mayweed, also typical of this period, indicating the cultivation of clay soils, probably with heavy mouldboard ploughs. There are generally few weed seeds, mainly of larger seeded species, and it is probable that crops were harvested, threshed, winnowed and sieved in the field prior to being stored.

Table 6. Charred plant remains

	Date	*Middle Iron Age*			*Possible Iron Age*		*Late Iron Age*		*Early Romano-British*		*Undated*	*Medieval*
	Feature	*Pit*	*RH 8 gully*	*Encl. ditch*	*Pit*	*Pit*	*Pit*	*Pit*	*Hearth*	*Pit*	*Pit*	*Gully*
	Group	*31706*	*31707*	*31718*	-	-	-	-	-	-	-	-
	Cut	*31118*	*31429*	*31404*	*21229*	*31371*	*11172*	*21011*	*11459*	*21226*	*11189*	*31691*
	Context	*31122*	*31430*	*31406*	*21228*	*31374*	*11175*	*21010*	*11450*	*21223*	*11724*	*31674*
	Sample	*38020*	*38070*	*38050*	*28024*	*38045*	*18006*	*28002*	*18032*	*28023*	*18081*	*38093*
	Original volume (l)	*20*	*30*	*40*	*10*	*10*	*40*	*40*	*10*	*10*	*5*	*10*
	Flot	*240*	*300*	*1675*	*250*	*70*	*2200*	*160*	*675*	*500*	*50*	*240*
Cereals									most germinated	some germinated		
Hordeum vulgare L. *sl* (grain)	barley	-	7	-	4	94	-	1	1	1	-	1
Hordeum vulgare L. *sl* (germinated grain)	barley	-	-	-	-	-	2	-	6	-	-	-
Hordeum vulgare L. *sl* (rachis frag.)	barley rachis frag.	-	1sr	-	-	1+1sr	-	-	e.58	-	-	-
Triticum sp. (grain)	wheat grain	1	-	3	1	-	-	-	51	-	-	2
Triticum turgidum/*aestivum* L. *sl* (grain)	free-threshing wheat	-	-	-	-	-	-	-	-	11	-	3
Triticum turgidum/*aestivum* L. *sl* (rachis frag.)	free-threshing wheat	-	-	-	-	-	-	-	-	e.20	-	2
Triticum dicoccum/spelta (grain)	emmer/spelt wheat	-	8	4	5	93	108	7	31	1178	1	-
Triticum dicoccum/spelta (1-grain spikelet)	emmer/spelt wheat	-	-	-	-	-	-	-	-	2	-	-
Triticum dicoccum/spelta (grains in spikelet)	emmer/spelt wheat	-	-	-	-	-	-	-	cf.1	8	-	-
Triticum dicoccum/spelta (germinated grain)	emmer/spelt wheat	-	-	-	-	-	74	-	28	3	-	-
Triticum dicoccum/spelta (glume bases)	emmer/spelt wheat	-	27	-	29	20	e.13550	14	e.10200	e.3360	1	-
Triticum dicoccum/spelta (spikelet fork)	emmer/spelt wheat	-	-	-	-	-	-	-	e.33	e.21	-	-
Triticum dicoccum (glume bases)	emmer wheat	5	12	2	54	-	-	1	e.31	-	-	-
Triticum dicoccum (spikelet fork)	emmer wheat	-	-	1	9	4	-	1	e.42	-	-	-
Triticum spelta L. (glume bases)	spelt wheat	-	10	14	3	14	e.435	4	45	61	-	-
Triticum spelta L. (spikelet fork)	spelt wheat	-	-	-	-	-	e.30	-	e.34	5	-	-
Cereal indet. (grains)	cereal	3	9	6	2	50	21	1	4	75	-	3
Cereal indet. (germianted coleoptile)	cereal	-	-	-	-	-	e.80	-	e.11	-	-	-
Cereal frag. indet. (est. whole grains from frags.)	cereal	4	10	-	1	110	-	3	-	-	-	3
Cereal indet. (rachis frag.)	cereal	-	-	-	-	-	-	1	-	1	-	-
Cereal indet. (culm node)	cereal	-	-	-	-	-	3	-	1	-	2	-
Cereal indet. (culm internode)	cereal	-	-	-	-	-	1	-	-	-	-	-
Other crop species												
Quercus sp. (acorn cups)	oak	-	-	-	-	-	2	-	7	2	-	-
Indet parenchyma cf. *Quercus* sp. (acorn)	oak	-	-	-	-	-	1	-	-	-	-	-
Quercus sp. (buds)	oak	-	-	-	-	3	1	-	16	2	-	-
Corylus avellana (frags.)	hazelnut	20f.	1	-	-	-	-	-	-	-	-	-
Atriplex sp.	orache	-	-	-	2	-	-	-	-	-	-	-
Chenopodium album	fat-hen	3	7	-	5	2	-	2	1	e.30	-	-

	Date	*Middle Iron Age*			*Possible Iron Age*		*Late Iron Age*		*Early Romano-British*		*Undated*	*Medieval*
	Feature	*Pit*	*RH 8 gully*	*Encl. ditch*	*Pit*	*Pit*	*Pit*	*Pit*	*Hearth*	*Pit*	*Pit*	*Gully*
	Group	*31706*	*31707*	*31718*	-	-	-	-	-	-	-	-
	Cut	*31118*	*31429*	*31404*	*21229*	*31371*	*11172*	*21011*	*11459*	*21226*	*11189*	*31691*
	Context	*31122*	*31430*	*31406*	*21228*	*31374*	*11175*	*21010*	*11450*	*21223*	*11724*	*31674*
	Sample	*38020*	*38070*	*38050*	*28024*	*38045*	*18006*	*28002*	*18032*	*28023*	*18081*	*38093*
	Original volume (l)	*20*	*30*	*40*	*10*	*10*	*40*	*40*	*10*	*10*	*5*	*10*
	Flot	*240*	*300*	*1675*	*250*	*70*	*2200*	*160*	*675*	*500*	*50*	*240*
Chenopodium polyspermum	many-seeded goosefoot	1	-	-	1	-	-	-	-	-	-	-
Chenopodiaceae	goosefoots	1	-	-	-	-	-	1	-	-	-	-
Persicaria lapathifolia/maculosa	persicaria	-	-	3	7	-	-	1	-	1	-	-
Polygonum aviculare	knotgrass	1	-	1	-	-	-	-	-	-	-	-
Fallopia convolvulus	black bindweed	-	-	-	-	-	-	-	5	-	-	-
Rumex sp.	dock	3	18	-	1	-	e.20	4	1	e.33	-	1
Prunus spinosa	sloe	-	-	-	-	-	-	-	-	1	-	-
Vicia./Lathyrus sp.	vetch/pea	-	-	-	16	-	-	1	-	1	-	1
Trifolium sp.	clover	2	-	-	1	-	e.30	1	-	-	-	-
Plantago lanceolata	ribwort plantain	1	-	-	-	-	-	-	-	-	-	-
Sherardia arvensis	field madder	-	-	-	-	-	-	-	-	-	1	-
Galium aparine	cleavers	-	-	1	3	-	-	-	-	-	-	-
Tripleurospermum inodorum	scentless mayweed	-	1	-	-	-	-	-	-	-	-	-
Carduus/*Cirsium* (flowerhead)	thistles	-	-	cf.1	-	-	-	-	-	-	-	-
Anthemis cotula (seedhead)	stinking mayweed	-	-	-	-	-	-	-	-	-	-	1+3frag.
Anthemis coltula	stinking mayweed	-	-	-	-	-	-	-	-	-	-	1
Monotcot culm node+internodes	sedge/grass stem node	-	-	-	-	-	-	2	-	-	-	-
Juncus sp.(capsule)	rush capsule	-	-	-	-	-	-	-	-	1	-	-
Lolium sp.	rye-grass	1	-	-	-	-	-	-	-	-	-	-
Avena sp. L. (grain)	oat grain	1	6	4	1	28	e.397	-	e.35	e.167	2	21
Avena sp. L. (germinated grain)	oat grain	-	-	-	-	-	1	-	2	-	-	-
Avena sp. L. (w=wildspikelet/i=indet.)	oats spikelet	-	-	-	-	-	1w	-	-	11i+3w	-	-
Avena sp. L. (floret base)	oat floret	-	-	-	-	-	e.20	-	-	-	-	-
Avena sp. L. (awns)	oat awns	1	-	-	-	-	+++	-	-	-	-	++
Avena/*Bromus* sp.	oats/brome grass	-	1	2	-	-	e.190	1	e.90	2	-	11
Avena/*Bromus* sp. (germinated)	oats/brome grass	-	-	-	-	-	cf.2	-	2	-	-	-
Bromus sp. L.	brome	-	1	-	-	-	e.20	1	e.56	2	-	-
Bromus sp. L. (germinated)	brome	-	-	-	-	-	-	-	4	-	-	-
Danthonia decumbens	heath-grass	1	-	-	-	-	-	-	-	-	-	-
Poa/Phleum sp.		-	-	-	-	1	-	-	-	-	-	-
Cess type material with charred glumes etc		-	-	-	-	-	-	-	+++	-	-	-
Cess type material with charcoal		-	-	-	++	-	-	-	-	-	-	-
Seed capsule		-	-	-	-	1	-	-	-	-	-	-
Seed indet.		-	-	-	-	1	-	-	-	-	-	-
Bud indet.		-	-	6	-	-	-	-	-	-	-	-
										spikelets		
	% grain	20.00%	41.38%	41.94%	24.49%	87.78%	29.53%	39.13%	40.43%	84.28%	25.00%	20.45%
	All weeds	**16**	**34**	**18**	**37**	**33**	**680**	**14**	**196**	**238**	**3**	**35**

	Date	*Middle Iron Age*			*Possible Iron Age*		*Late Iron Age*		*Early Romano-British*		*Undated*	*Medieval*
	Feature	*Pit*	*RH 8 gully*	*Encl. ditch*	*Pit*	*Pit*	*Pit*	*Pit*	*Hearth*	*Pit*	*Pit*	*Gully*
	Group	*31706*	*31707*	*31718*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*
	Cut	*31118*	*31429*	*31404*	*21229*	*31371*	*11172*	*21011*	*11459*	*21226*	*11189*	*31691*
	Context	*31122*	*31430*	*31406*	*21228*	*31374*	*11175*	*21010*	*11450*	*21223*	*11724*	*31674*
	Sample	*38020*	*38070*	*38050*	*28024*	*38045*	*18006*	*28002*	*18032*	*28023*	*18081*	*38093*
	Original volume (l)	*20*	*30*	*40*	*10*	*10*	*40*	*40*	*10*	*10*	*5*	*10*
	Flot	*240*	*300*	*1675*	*250*	*70*	*2200*	*160*	*675*	*500*	*50*	*240*
	All grain	**4**	**24**	**13**	**12**	**237**	**285**	**9**	**133**	**1276**	**1**	**9**
	Glumes	**5**	**49**	**18**	**104**	**42**	**14045**	**21**	**10494**	**3473**	**1**	**0**
	Log grain/glumes	-0.1	-0.3	-0.1	-0.9	0.8	-1.7	-0.4	-1.9	-0.4	0.0	#DIV/0!
	Large weed seeds	3	8	12	27	28	e.610	4	194	173	3	33
	Small weed seeds	12	26	0	8	3	50	8	2	63	0	2

[Report continued below]

Wood charcoal

by Dana Challinor

Areas 1–3 produced samples from Middle–Late Iron Age and early Romano-British settlement features, with a large quantity of ironworking debris associated with a metalworking furnace in Area 1. Charcoal was abundant and a selection of 24 samples was provided for analysis, with the aim of comparing the wood fuel used for iron-working and domestic activities.

Methods
Charcoal was abundant in many of the samples, some of which contained several thousand fragments, but the taxonomic diversity of the assemblages was often very limited. For this reason, the approach to the quantification of the charcoal was varied according to the individual sample; 100 fragments were identified from samples with apparent taxonomic diversity, while 50 fragments sufficed for those which were clearly dominated by a single taxon. In four instances, where the samples were particularly poorly preserved and of limited potential, estimates of taxonomic abundance were noted only.

The charcoal was fractured and sorted into groups based on the anatomical features observed in transverse section at x7 to x45 magnification. Representative fragments from each group were then selected for further examination in longitudinal sections using a Meiji incident-light microscope at up to x400 magnification. Identifications were made with reference to Schweingruber (1990), Hather (2000) and modern reference material. The maturity of the wood was noted where possible and the presence of roundwood, sapwood and heartwood is noted in the tables. Classification and nomenclature follow Stace (1997).

Results
The results by fragment count are given in **Tables 7–9**, according to excavation area. The preservation of the charcoal was generally poor, perhaps due to the clay content in the soil, which expands and contracts with water, causing mechanical damage to charred remains (Mark Robinson, pers. comm.). There were two particular issues in the identification of the material:

- extreme softness or friability leading to difficulty in fracturing the charcoal without reducing it to dust;

- covering/infusion of sediment which inhibited the visibility of key diagnostic characteristics.

The identification of oak (*Quercus* sp.) was relatively straightforward as it is has a very clear, ring porous anatomical structure which is easily identified in the transverse section alone. However, the identification of diffuse porous species was frequently less certain and in some samples it is possible that these species are under-represented in the fragment counts (although the overall interpretation is unlikely to be affected).

Ten taxa were recorded, some to species level, depending upon the anatomical distinctions between genera and the condition of the charcoal. All were consistent

with native species, and no exotics were positively identified. Several samples contained large quantities of roundwood fragments, with ring curvature indicating small to medium diameter wood, with age ranges of <10 years. Tyloses were also noted in oak charcoal, indicating the presence of mature heartwood, but the identification of sapwood is more difficult as it is based on the absence of tyloses. Given the poor state of much of the charcoal, it is likely that sapwood is under-represented in the record.

Taxa list and notes on identifications

Fagaceae:

- *Quercus* spp. (oak), large tree, two native species, not distinguishable anatomically.

Betulaceae:

The genera of this family can be difficult to distinguish anatomically in poorly preserved specimens. Two genera were confirmed:

- *Alnus glutinosa*, Gaertn. (alder), tree, sole native species.
- *Corylus avellana* L. (hazel), shrub or small tree, sole native species.

Salicaceae:

- the genera *Salix* spp. (willow) and *Populus* spp. (poplar) are rarely possible to separate. Both are trees although there is variation within the genera.

Rosaceae:

- *Prunus* spp., trees or shrubs, including *P. spinosa* L. (blackthorn), *P. avium* L. (wild cherry) and *P. padus* L. (bird cherry), all native, which can sometimes be separated on the basis of ray width. Only *P. spinosa* was positively identified, but the key distinguishing characteristics were often not visible.
- Maloideae, subfamily of various shrubs/small trees including several genera, *Pyrus* (pear), *Malus* (apple), *Sorbus* (rowan/service/whitebeam) and *Crataegus* (hawthorn), which are rarely distinguishable by anatomical characteristics.

Fabaceae:

- *Cytisus/Ulex* (broom/gorse), shrubs, several native species, not distinguishable anatomically. The presence of *Ulex* spines in a number of the samples suggests that this species is likely to be represented.

Celastraceae:

- *Euonymus europaeus* L. (spindle), shrub or small tree, native.

Aceraceae

- *Acer campestre* L. (field maple), tree, sole native species. The species was confirmed by the small ray widths.

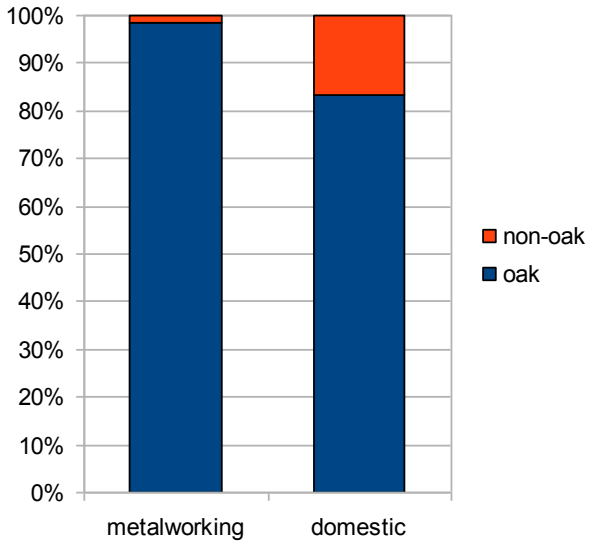
Oleaceae:

- *Fraxinus excelsior* L. (ash), tree, sole native species.

Area 1

The samples from this area were characterised by those associated with Late Iron Age metalworking furnace 11924, the early Romano-British hearth 11459 and various ditch and pit deposits (**Table 7**). The dataset represented the largest from the site. The samples were all dominated by oak, with some hazel and a few fragments of other taxa, including the hawthorn group and broom/gorse. There were no significant differences between the two phases; of greater interest is the slightly higher use of non-oak charcoal in hearth 11459 and other deposits of probable domestic waste. An analysis based upon fragment count, shows that the assemblages associated with metalworking produced 98% oak charcoal, while the domestic-related assemblages produced 83%, with 17% other taxa (**Fig. 7**).

Figure 7 Percentage frequencies of oak and non-oak charcoal by activity type



[Table 7 below]

Table 7 Charcoal from Area 1 features

Phase		*Late Iron Age*							*Romano-British*					
Feature type		*Pit*				*Ditch*			*Pit*				*Hearth*	
Group		-	-	-	-	*11641*	*12000*	*12009*	*11987*	*11987*	*11987*	-	-	-
Cut		*11003*	*11391*	*11472*	*11951*	*11323*	*11575*	*11660*	*11854*	*11854*	*11872*	*11214*	*11459*	*11459*
Context		*11008*	*11390*	*11175*	*11953*	*11324*	*11577*	*11663*	*11862*	*11863*	*11881*	*11239*	*11450*	*11454*
Sample		*18077*	*18025*	*18006*	*18080*	*18016*	*18048*	*18051*	*18057*	*18058*	*18064*	*18012*	*18032*	*18033*
Quercus sp.	oak	++++r	49rhs	47rhs	50rhs	43r	++++rh	++++r	50rhs	49rhs	50rhs	48r	40rh	36rh
Corylus avellana L	hazel	-	-	-	-	6r	+r	+	-	-	-	1r	-	1
Betulacaea	birch family	-	1	-	-	-	-	-	-	-	-	1	-	-
cf Maloideae	hawthorn group	-	-	2	-	-	-	-	-	-	-	-	8r	8r
Cytisus/Ulex	broom/gorse	-	-	-	-	-	-	-	-	-	-	-	2r	-
Indeterminate	bark	-	-	-	-	1	-	-	-	1	-	-	-	-
Indeterminate	diffuse porous	-	-	1	-	-	+r	-	-	-	-	-	-	5r
Total		++++	50	50	50	50	++++	++++	50	50	50	50	50	50

Key: +=present; ++++=abundant; h=heartwood; s=sapwood; r=roundwood

Area 2

Five samples from pits and ditches were examined from Area 2, including one from 21226, a hearth with a flue and broken pottery lining (**Table 8**). The exact nature of this feature is unclear as it may have had an industrial function, but the other samples probably represent spent fuel-wood from domestic cooking or crop processing fires. A range of taxa was identified, including hazel, broom/gorse, spindle, hawthorn group, poplar/willow, blackthorn and oak. The majority of the samples were dominated by oak, including the ones from hearth 21226 which comprised a large quantity of roundwood fragments from immature wood.

The charcoal from ditch 21054 (suggested to be of Iron Age date but containing localised deposits, eg 21052, of early Romano-British date) was of particular interest, with a mixed assemblage of oak, poplar/willow, blackthorn and spindle tree. Spindle tree is not a common recovery from archaeological fuel-wood assemblages, although it does make a good charcoal fuel (Edlin 1949). Almost all of the diffuse porous fragments came from small to medium roundwood.

Table 8 Charcoal from Area 2 features

	Date	*Late Iron Age*		*LIA/RB?*		*Romano-British*
	Feature type	*Pit*	*Hearth*	*Ditch*		-
	Group	-	-		*21405*	*Pit*
	Cut	*21011*	*21226*	*21050*	*21054*	*21034*
	Context	*21010*	*21223*	*21052*	*21056*	*21033*
	Sample	*28002*	*28023*	*28006*	*28008*	*28004*
Quercus sp.	oak	+++r	41rs	50r	24rh	43rh
Corylus avellana L	hazel	+r	1r	-	-	-
Betulaceae	birch family	-	4r	-	-	-
Populus/Salix	poplar/willow	-	1r	-	32r	-
Prunus spinosa L.	blackthorn	-	-	-	28r	-
Prunus sp.	cherry type	-	-	-	-	5r
Maloideae	hawthorn group	-	1	-	-	2
Cytisus/Ulex	broom/gorse	-	2r	-	-	-
Euonymus europaeus L.	spindle	-	-	-	11r	-
Indeterminate	bark	-	-	-	2	-
Indeterminate	diffuse porous	-	-	-	3	-
Total		+++	50	50	100	50

Key: +=present; +++=frequent; ++++=abundant; h=heartwood; s=sapwood; r=roundwood

Area 3

The samples from Area 3 came mostly from settlement features of an earlier Middle–Late Iron Age phase (**Table 9**). Hearths 31026 and 31047 and samples from the gully of Roundhouse 4 (31706) were dominated by oak, with a few fragments of hazel and possible hawthorn group. The samples from enclosure ditch 31718 and the gully of Roundhouse 8 (31707) produced more diverse assemblages, including the additional taxa of field maple, alder, ash and poplar/willow.

Table 9 Charcoal from Area 3 features

	Date	*Middle–Late Iron Age*					*Late Iron Age*
	Feature type	*Hearth*	*RH4 gully*		*Encl. ditch*	*RH8 gully*	*Hearth*
	Group	-		*31706*	*31718*	*31707*	-
	Cut	*31026*	*31078*	*31137*	*31404*	*31429*	*31047*
	Context	*31027*	*31079*	*31140*	*31406*	*31430*	*31046*
	Sample	*38007*	*38015*	*38023*	*38050*	*38070*	*38009*
Quercus sp.	oak	49h	49rs	37rh	33r	37r	46rhs
Alnus glutinosa Gaertn.	alder	-	-	-	9r	-	-
Corylus avellana L.	hazel	1r	-	13r	2r	-	4r
Betulacaea	birch family	-	-	-	6r	3	-
Populus/Salix	poplar/willow	-	-	-	5r	1	-
cf Maloideae	hawthorn group	-	1	-	-	-	-
Acer campestre L.	field maple	-	-	-	31r	2	-
Fraxinus excelsior L.	ash	-	-	-	11r	4r	-
Indeterminate	diffuse porous	-	-	-	-	3	-
Total		50	50	50	100	50	50

Key: h=heartwood; s=sapwood; r=roundwood

Discussion

Iron-working, domestic fires and fuel selection

The charcoal record from Areas 1–3 is overwhelmed by oak, which was the predominant taxon (at least 70%; many with 98–100%) in 22 of the 24 assemblages. The use of oak for iron-working is well attested at Romano-British sites (Campbell 1998, 37; Cleere & Crossley 1985, 37; Figueiral 1992, 189; Gale 1999, 378), in particular at the adjacent site of Westhawk Farm (Challinor 2008, 348). It is generally agreed that the activities of iron smelting and smithing would both have required the use of charcoal as fuel (Goffer 2007, 174), as it provides a high heat and produces less smoke than wood fuel. Oak makes a good charcoal fuel (Edlin 1949), though it does have a tendency to fragment, so conversion would likely have taken place in nearby woodland to avoid unnecessary transportation. That the domestic-type fires in Area 1–3 were also primarily fuelled by oak indicates that oak woodland was plentiful and that there were no pressures on resources. The minor increase in use of other non-oak taxa in the domestic assemblages is consistent with more opportunistic firewood gathering practices. This is similar to the conclusions drawn from the material at Westhawk Farm, where there were no significant changes in taxonomic composition between metalworking and domestic contexts (Challinor, 2008, 349). Nor, indeed, does there appear to be significant changes in fuel-wood selection between the Middle–Late Iron Age at Park Farm and the 4th century AD at Westhawk Farm.

Woodland management and resources

The analysis of the material at Westhawk Farm included an examination of roundwood data, which indicated evidence for woodland management (Challinor 2008, 347). Such analysis was not possible at Park Farm East due to the poor condition of the material, but it is reasonable to note that many of the assemblages were characterised by abundant roundwood fragments, indicating that the wood derived from branch or immature coppice rather than large trunkwood. The metalworking activity at both sites was on a small scale, and the needs of those individual settlements are unlikely to have required management regimes.

Consequently, this is not reflected in the fuel-wood record, even if the oak woodlands of the Weald were managed for construction or other purposes.

Clearly, oak–hazel woodland is well-represented in the charcoal record, and the nature of the contexts/selection of taxa confirms that resources were plentiful. Some exploitation of lower-lying, damp areas in Area 3 is indicated by the presence of alder and willow/poplar. Ash and blackthorn are light-loving species and would have thrived in cleared areas or woodland margins. Heathland is suggested by the gorse or broom, but was not extensively exploited. With so few fragments, it is possible that the material derived from broken artefacts, rather than selected fuel-wood.

Conclusion
The results of the charcoal analysis are entirely consistent with those of Westhawk Farm. Oak forms the primary fuel-wood, for both iron-working and domestic activities. The small presence of other taxa suggests that wider environment types were accessible but were not preferred, presumably due to the proximity and availability of oak woodlands. While these woodlands may have been managed, there is little evidence to indicate this in the fuel-wood residues.

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The project archive will be held at Wessex Archaeology, under project codes WA 52891, 55420 and 65480–4, until accepted by a Kent museum.

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Appendix 1. Pottery fabric descriptions, by phase

Ceramic phase 1, Middle Bronze Age to Middle/Late Bronze Age

F2: A soft, rough fabric containing a common amount of flint (30%), white and grey, up to 10mm, poorly sorted; and sparse (7%) grog, angular, up to 2 mm.

FG1: A soft, rough fabric, containing a common amount (20%) of flint, calcined, white, sub-rounded to sub-angular, <6 mm, poorly sorted; sparse (7%) grog, grey and silty, sub-rounded to sub-angular, moderate to well-sorted; hackly fracture.

GF1: A soft, rough fabric containing a very common amount (30%) of grog, sub-rounded, unoxidised, up to 7 mm, moderately sorted; 15% moderate flint, white, grey and black, up to 6 mm, sub-angular to

GF2: A soft, soapy fabric containing a very common amount (30%) of grog, sub-rounded to sub-angular, up to 7mm, poorly sorted; sparse (7%) white and grey flint fragments, up to 7 mm, angular.

Ceramic phase 2, Late Bronze Age

IF1: A soft, rough fabric containing a moderate amount (15%) of red iron oxides, 1–2 mm, well sorted; moderate (10%) flint, white, pink, grey and black, up to 5 mm, poorly sorted; in a silty clay matrix with occasional rounded coarse quartz grains.

Ceramic phase 3, Middle to Late Iron Age

F1: Fine, flint-tempered fabric.

G3: A soft, soapy and slightly sandy fabric containing a common amount (20%) of ?grog, sub-rounded, up to 7 mm, moderately sorted, in a silty clay matrix with occasional fine flint inclusions.

G4: Grog-tempered, less soapy and more silty than G1 but otherwise generic.

GI1: A soft, sandy fabric containing a sparse amount (7%) of grog, up to 4mm, sub-angular; sparse (7%) red iron oxides, up to 3 mm, round, poorly sorted; sparse (7%) quartz, sub-rounded, coarse-grained, in a fine sandy matrix.

GI2: A soft silty/soapy fabric containing a common amount (20%) of grog, sub-angular, up to 6 mm, poorly sorted; common (20%) red iron oxides, up to 6 mm, rounded, poorly sorted, in a fine, sandy matrix with frequent sub-rounded quartz grains.

I1: A soft, silty fabric containing a common amount (20%) of iron, up to 4 mm but mostly 1–2 mm, moderately sorted, sub-angular; moderate (10%) quartz, medium-coarse-grained, sub-rounded, silty clay matrix.

Q2: A soft, sandy fabric containing very common to abundant (30–40%) glauconite, fine to medium-grained, rounded, very well sorted; sparse (5%) detrital flint, up to 5mm, poorly sorted; occasional coarse-grained quartz, sub-angular.

Q3: A soft, sandy fabric containing a common amount (20%) of quartz, sub-rounded, medium-grained with a few coarse-sized grains; moderate (10%) iron, sub-rounded, up to 2 mm, moderately sorted.

Q4: A soft, sandy fabric containing abundant (40%) quartz, sub-angular, medium-grained; moderate iron oxides, sub-angular, up to 5mm, well-sorted; occasional fine flint inclusions.

Q5: A soft, sandy fabric containing an abundance (50%) of glauconite, fine-grained, sub-rounded to rounded, very well sorted; and moderate (10%) coarse-grained quartz, sub-rounded to rounded.

Q6: A soft, silty fabric with occasional fine flint inclusions and coarse-grained quartz.

Ceramic phase 4/5, Late Iron Age to early Romano-British

G1: Coarseware grog-tempered fabric, soapy texture.

G100: Grog-tempered.

G5: Generic grog tempered fabric, coarse, with sandy texture.

Q1: Hard, sandy fabric.

Q100: RB sandy greyware.

Q101: RB oxidised ware.

Q102: RB fine greyware.

Q103: Fine micaceous fabric, may have had a colour coat but now too abraded to tell.

Q104: RB fumed whiteware fabric.

Q105: RB whiteware.

Q7: A soft, sandy fabric containing abundant (40–50%) medium to coarse-grained quartz, sub-angular, well sorted.