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The later prehistoric Pottery from Tollgate, Cobham, Kent (ARC TLG 98)

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1 INTRODUCTION

A total of 1706 sherds of later prehistoric pottery, weighing 25,554 g, was recorded from a watching brief of construction activities at Area 330 Tollgate, archaeological Zone 4, 1998-2000. The assemblage was recovered in accordance with the Fieldwork Event Aims, particularly the research objectives relating to the period 'farming communities (2000-100 BC)'. These included spatial organisation of the landscape and the arrangement and functioning of settlements over time. For the most part the pottery was in good condition, with a mean sherd weight of 15 g. The material derived from 66 contexts. It ranged in date from the middle Bronze Age to the early/middle Iron Age, but the dominant focus was in the early and early/middle Iron Age. The pottery was recorded using the methodology designed for the route-wide scheme in accordance with the recommendations set out by the Prehistoric Ceramics Research Group (PCRG 1997). Identification of the briquetage fabrics and forms was carried out by Elaine Morris.

2 CHRONOLOGY

The earliest material (ceramic phase 1, cp1) dates from the middle Bronze Age and is represented by two coarsely tempered sherds weighing 50 g, residual in context 400. A single feature, pit 537, produced material dating from the mid to late Bronze Age period (cp 2), with 34 sherds, weighing 246 g, all recovered from context 529.

The bulk of the assemblage derives from the early to middle Iron Age, with two ceramic phases identified. The first (cp 3) may be dated to the early Iron Age (6th to 5th centuries BC). The second (cp 4) has only a slightly later focus, the early Iron Age to early/middle Iron Age (6th to 3rd centuries BC). The assemblage is dominated by shouldered forms with relatively few more rounded profiles, suggesting that the assemblage does not represent use of the site later than the 3rd century BC.

3 RECOVERY

The pottery derived from 66 contexts, comprising 21 pits, eight ditches, one posthole, one oven/hearth feature and five layers. The bulk of the material was recovered from pits, which accounted for 98% of the total count and 99% of the total weight (Table 1). Twenty-one contexts contained more than 25 sherds, the minimum number recommended by the PCRG for an estimation of ceramic date (PCRG 1997, 21). These key context groups originated from 12 pits in groups 1, 2 and 3, with the exception of context 529 (late Bronze Age pit 537). The breakdown of pottery by feature is shown in Table 2. A summary of the percentage of total count and weight by pit group is shown in Table 3.

Table 1: Quantification of ceramics by feature type

Feature type	Count of sherds	% of count	Weight (g)	% of weight
Pit	1674	98.1	25413	99.4
Posthole	7	0.4	56	0.2
Ditch	14	0.8	25	0.1
Oven/hearth	1	0.1	14	0.1
Layers	10	0.6	46	0.2

Table 2: Quantification of ceramics by feature

Feature number	Feature type	Pit group no.	CT	% of count	Weight (g)	% of weight	MSW (g)	Phase
173	Ditch		1	0.1	2	<0.1	2.0	LPP
182	Layer		6	0.4	20	0.1	3.3	LBA residual
372	Pit	1	292	17.1	6728	26.3	23.0	EIA – E/MIA
374	Pit	1	286	16.8	5999	23.5	21.0	EIA – E/MIA
387	Pit	1	111	6.5	1622	6.3	14.6	EIA – E/MIA
398	Posthole	1	7	0.4	56	0.2	8.0	EIA – E/MIA
414	Pit	1	18	1.1	272	1.1	15.1	EIA – E/MIA
435	Pit	1	28	1.6	343	1.3	12.3	EIA – E/MIA
437	Pit		2	0.1	8	<0.1	4.0	LPP
449	Pit		5	0.3	13	0.1	2.6	LPP
503	Oven / hearth		1	0.1	14	0.1	14.0	LPP
522	Ditch		4	0.2	4	<0.1	1.0	LPP
537	Pit		34	2.0	246	1.0	7.2	LMBA-LBA
554	Ditch		2	0.1	7	<0.1	3.5	LPP
615	Layer		1	0.1	2	<0.1	2.0	LPP
630	Pit		3	0.2	5	<0.1	1.7	LPP
679	Pit	3	69	4.0	834	3.3	12.1	EIA – E/MIA
692	Layer		1	0.1	21	0.1	21.0	LPP
702	Pit	3	4	0.2	95	0.4	23.8	EIA – E/MIA
740	Pit	2	100	5.9	985	3.9	9.9	EIA – E/MIA
810	Ditch		1	0.1	3	<0.1	3.0	LPP
834	Pit	3	1	0.1	2	<0.1	2.0	LPP
866	Pit		26	1.5	167	0.7	6.4	EIA – E/MIA
871	Pit	3	73	4.3	827	3.2	11.3	EIA – E/MIA
874	Pit	3	3	0.2	7	<0.1	2.3	LPP
879	Pit	3	41	2.4	409	1.6	10.0	EIA – E/MIA
887	Pit	3	2	0.1	8	<0.1	4.0	LPP
958	Ditch		1	0.1	1	<0.1	1.0	LPP
961	Ditch		2	0.1	2	<0.1	1.0	LPP
984	Layer		1	0.1	2	<0.1	2.0	LPP
1044	Pit		2	0.1	4	<0.1	2.0	LPP
1172	Pit	2	167	9.8	1869	7.3	11.2	
1174	Pit	2	407	23.9	4970	19.4	12.2	
1198	Ditch		2	0.1	1	<0.1	0.5	
1213	Ditch		1	0.1	5	<0.1	5.0	
1230	Layer		1	0.1	1	<0.1	1.0	

Table 3: Percentage of total assemblage present in the dominant pit groups

Feature group	% of total count of ceramic assemblage	% of total weight of ceramic assemblage
Pit group 1	43.1	58.6
Pit group 2	39.5	30.6
Pit group 3	11.3	8.5
Totals	93.9	97.7

4 FABRICS

Thirty two pottery and briquetage fabrics were identified at Tollgate (Fig. 1). Where necessary, thin sections of the fabrics were taken for petrological analysis to confirm or enhance the fabric descriptions. Sherds that could not be clearly identified to a fabric type were recorded using the code '99' prefixed by a letter to represent the dominant inclusion. The fabrics are detailed below and quantified in Table 4. The grain size classifications used are those advised by the PCRG (1997, appendix 7).

Figure 1: Quantification of fabric groups, by percentage of total weight

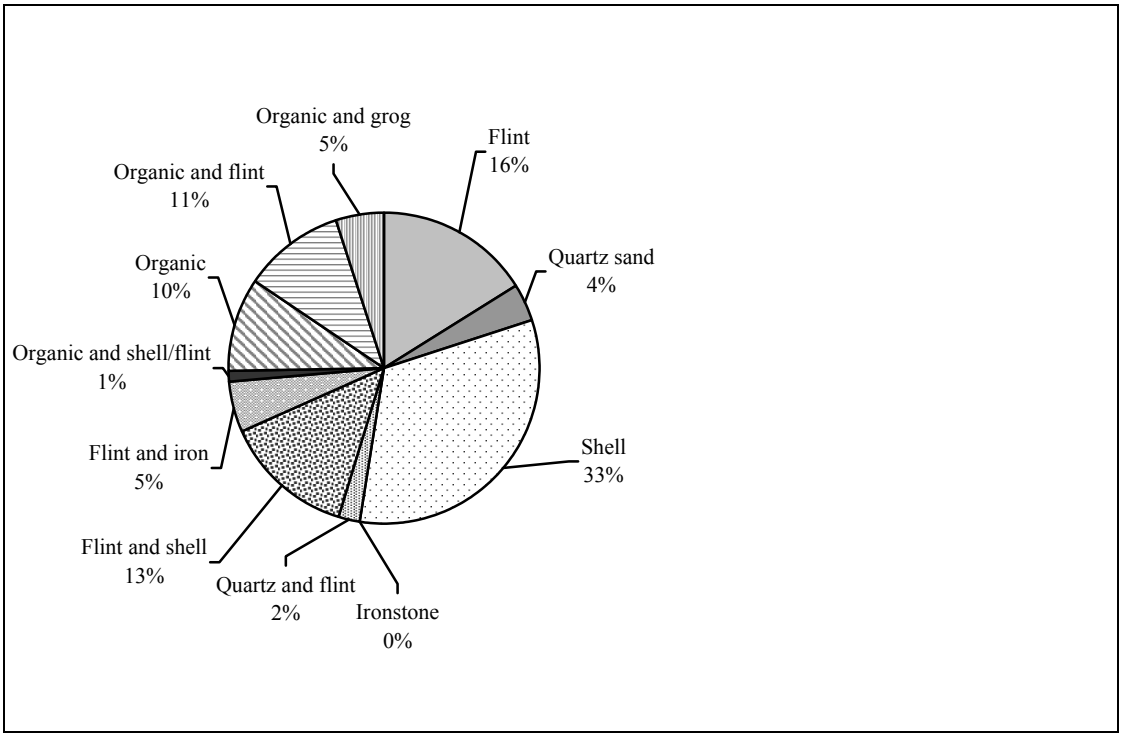


Table 4: Quantification of later prehistoric pottery fabrics present in the assemblage

Fabric	Count	% of count	Weight (g)	% of weight	MSW (g)
F 1	19	1.1	498	1.9	26.2
F 2	196	11.5	2750	10.8	14.0
F 3	11	0.6	152	0.6	13.8
F 4	20	1.2	266	1.0	13.3
F 5	26	1.5	118	0.5	4.5
F 6	2	0.1	50	0.2	25.0
F 7	8	0.5	46	0.2	5.8
F 8	10	0.6	79	0.3	7.9
F 9	1	0.1	11	<0.1	11.0
F 10	11	0.6	77	0.3	7.0
F 11	12	0.7	64	0.3	5.3
F 99	15	0.9	24	0.1	1.6
FI 1	59	3.5	588	2.3	10.0
FI 2	2	0.1	16	0.1	8.0
FI 3	49	2.9	756	3.0	15.4
FS 1	173	10.1	2960	11.6	17.1

Fabric	Count	% of count	Weight (g)	% of weight	MSW (g)
FS 2	26	1.5	383	1.5	14.7
FS 3	2	0.1	70	0.3	35.0
FV 1	10	0.6	72	0.3	7.2
FV 2	19	1.1	153	0.6	8.1
G 1	92	5.4	752	2.9	8.2
Q 1	16	0.9	190	0.7	11.9
Q 2	40	2.3	377	1.5	9.4
Q 3	1	0.1	12	<0.1	12.0
Q 4	25	1.5	376	1.5	15.0
Q 99	1	0.1	2	<0.1	2.0
QF 1	37	2.2	608	2.4	16.4
R 1	1	0.1	8	<0.1	8.0
S 1	374	21.9	8300	32.5	22.2
V 1	166	9.7	2452	9.6	14.8
V 99	1	0.1	1	<0.1	1.0
VF 1	226	13.2	2522	9.9	11.2
VG 1	46	2.7	562	2.2	12.2
VS 1	8	0.5	151	0.6	18.9
VS 2	1	0.1	108	0.4	108.0
Totals	1706	100.1	25554	100.1	

4.1 Flint-tempered fabrics

F1. A hard, slightly sandy intermediate to coarse ware fabric containing sparse (5-7%) burnt, crushed angular flint, ≤2 mm with rare fragments up to 4 mm, moderately to well sorted; rare (1%) shell, ≤1 mm, and iron oxides, ≤2.5 mm, may also be present. Rare linear voids up to 4 mm indicate burnt out organic matter. The clay matrix is sandy and contains moderate to common (15-20%) silt-sized quartz. Petrological analysis also revealed moderate (10%) iron oxides that were present in the clay matrix but not visible at x30 power. The fresh fracture is conchoidal. The fabric is irregularly fired, usually oxidised on the exterior (reddish-brown in colour). The core and interior may be oxidised or unoxidised.

F2. A soft, sandy coarse ware fabric containing moderate (10-15%) calcined, angular flint, ≤4.5 mm, poorly sorted. It may also contain up to 3% angular or platy shell, ≤7 mm, and 1% linear organic inclusions. The clay matrix contains abundant (40%) sub-angular to angular fine-sized quartz grains, very well sorted. The fresh fracture is hackly. The fabric is irregularly fired, usually oxidised on the exterior, and more irregular through the core and on the interior surface.

F3. A soft, sandy intermediate fabric containing moderate (15%) calcined, angular flint, <1.5 mm, moderately sorted, within a sandy clay matrix of abundant (40%) angular grains of fine-sized quartz. The fresh fracture is fine, the fabric is most commonly oxidised although more variable firing conditions are also represented.

F4. A hard, harsh coarse ware fabric containing sparse to moderate (7-10%) angular calcined flint, ≤4 mm, poorly sorted. The clay matrix contains sparse to moderate (7-10%) angular, silt-sized quartz grains with occasional (2-3%) larger, more rounded, coarse-sized grains. The fresh fracture is conchoidal and the fabric is irregularly fired.

F5. A soft, slightly sandy intermediate ware fabric containing sparse to moderate (7-10%) angular, calcined flint, ≤1 mm, well sorted; sparse (3%) voids from linear organic inclusions; and rare (1%) angular iron oxides, ≤2.5 mm. The clay matrix appears to contain silt-sized quartz grains not clearly visible at x30 power, occasional angular coarse-sized grains are also present. The fresh fracture is fine, the fabric is often unoxidised.

F6.A hard, rough coarse ware fabric containing moderate (10%) angular grey flint fragments, ≤6 mm, the majority of pieces are 4 mm, moderately sorted. Rare (1%) rounded iron oxides,

≤1 mm. Quartz was not visible in the clay matrix at x30 power. The fresh fracture is hackly, the fabric is represented by a single sherd which is completely oxidised, possibly as a result of refiring.

F7. A soft but rough coarse ware fabric containing moderate to common (15-20%) angular calcined flint, ≤3 mm, well-sorted. The clay matrix is slightly micaceous and appears to contain silt-sized quartz, not clearly visible at x30 power. The fresh fracture is hackly, the firing is irregular.

F8. A soft, slightly sandy fine to intermediate ware fabric containing common (20%) angular, calcined flint, <3 mm, moderate to poorly sorted; and sparse (3%) voids from linear organic inclusions. The fresh fracture is fine, the fabric is most commonly unoxidised.

F9. A soft, smooth fine to intermediate ware fabric containing very common (30%) angular calcined flint, ≤1.5 mm. Silt-sized quartz may be present in the clay matrix but is not clearly visible at x30 power. The fresh fracture is fine, the fabric is unoxidised.

F10. A soft but rough coarse ware fabric containing moderate to common (15-20%) angular calcined flint, ≤6 mm, poorly sorted; sparse (3%) burnt out organic material and rare (1%) rounded red iron oxides, ≤1 mm. The clay matrix appears to contain silt-sized quartz grains, but this is not clearly visible at x30 power. The fresh fracture is irregular, the fabric is irregularly fired.

F11. A soft and slightly sandy intermediate ware fabric containing moderate (15%) angular, calcined flint, ≤4 mm, moderately sorted. Rare (1%) sub-angular iron oxides, ≤1 mm, are also present. The clay matrix is slightly sandy and micaceous. The fresh frature is mildly hackly, the fabric is irregularly fired.

4.2 Sandy wares

Q1. A soft, sandy fine ware fabric. The clay matrix consists of abundant (≥40%) sub-angular to angular quartz grains, silt to fine-sized, well-sorted. Occasional medium and coarse-sized grains are also present, these range from rounded to angular in shape. Rare (1%) flint detritus or shell may also be present, ≤4 mm. Petrological analysis has shown the clay matrix to be very similar to F2, the same clay source may have been exploited. The fresh fracture is fine. The fabric is irregularly fired, but the exterior and core tend to be oxidised (reddish brown in colour). The interior is usually unoxidised (greyish black).

Q2. A soft, sandy fine to intermediate fabric. The clay matrix contains abundant (≥40%) sub-angular to angular quartz grains, very fine to fine-sized, very well sorted. Occasional grains of coarse or very coarse-size may also be seen, varying in shape from angular to rounded. This may be punctuated by up to 5% with angular flint, ≤4 mm, well sorted, and up to 3% of sub-angular to angular shell fragments, <4 mm. Petrological analysis shows that the clay matrix is different from that of Q1 and Q4 (Q3 has not been thin-sectioned). The fresh fracture is fine. The fabric is often oxidised, reddish brown in colour.

Q3. A soft, sandy intermediate ware fabric containing very common (25%) fine to medium sub-angular to angular quartz grains, with a scatter of larger, more sub-rounded coarse-sized grains, poorly sorted. Sparse angular flint (≤3%), ≤1 mm, and rare (1%) rounded iron oxides, ≤1 mm are also present. The fresh fracture is fine, the firing is irregular.

Q4. A soft and silty intermediate ware fabric containing abundant (40%) densely packed silt to very fine-sized angular quartz, very well sorted, within the clay matrix. Sparse grains of glauconite and fragments of mica were visible in thin section. Sparse (3%) angular calcined flint fragments, <6 mm, moderately sorted, are also present. The fabric may contain up to 3%

linear organic impressions, <5 mm. The fresh fracture is fine, and the fabric is usually fully oxidised.

4.3 Shelly fabric

S1. A soft and soapy coarse ware fabric, containing common to very common (20-25%) angular shell, ≤7 mm, poorly sorted. Sparse (5%) angular, calcined flint may be present, ≤2 mm, moderately sorted, which occasionally includes pieces of rounded flint detritus. Rare (1%) iron oxides were also recorded. Petrological analysis indicated that the shell was too degraded to ascertain if it derived from a fossil or fresh source. The fresh fracture is laminated to hackly. The fabric is irregularly fired, the exterior tends to be a yellowish brown colour, the core and interior may be either oxidised or unoxidised.

4.4 Ironstone fabric

R1. A soft and smooth intermediate to fine ware fabric containing common (25%) angular ironstone rock inclusions, ≤1 mm, well sorted. The clay matrix contains a background of silt-sized quartz grains that are not clearly visible at x30 power. The fresh fracture is irregular. The fabric is unoxidised.

4.5 Quartz and flint fabric

QF1. A soft, sandy coarse ware fabric containing moderate to common (15-20%) sub-rounded to sub-angular quartz grains, coarse in size, well-sorted, and moderate (10%) calcined, angular flint, ≤4 mm, poorly sorted. The fresh fracture is hackly, and the firing is irregular.

4.6 Flint and shell fabrics

FS1. A soft, slightly soapy intermediate to coarse ware fabric containing sparse to moderate (7-10%) sub-angular to angular flint fragments, ≤5 mm, poorly sorted, occasional (<1%) larger pieces of flint detritus, ≤11 mm, and sparse (5-7%) shell, <5 mm, moderately to poorly sorted. Petrological analysis indicated the presence of moderate (10-15%) very small iron oxides in the clay matrix, but few quartz grains were present. The fresh fracture and firing are irregular. A small number of sherds in this fabric had white residues on their surfaces, but on the whole there is very little indication of salt colours and the fabric is not silty in texture. These sherds may therefore have been associated with the salt production process, but are not actual briquetage containers (see below for defining criteria).

FS2. A soft but harsh coarse ware fabric containing moderate (10-15%) angular, calcined flint, ≤3 mm, poorly sorted; and sparse to moderate (5-10%) angular shell fragments, ≤8 mm, poorly sorted. Sparse (3%) rounded iron oxides, ≤1 mm and rare (2%) voids from linear organic inclusions are also visible. The fresh fracture is hackly, the firing is irregular.

FS3. A soft and silty coarse ware fabric containing common (20%) angular calcined flint, ≤2 mm, poorly sorted; moderate to common (15-20%) angular or platy shell, ≤8 mm, poorly sorted; sparse (7%) linear organic voids. The fresh fracture is hackly, the firing is irregular.

4.7 Flint and iron fabrics

FI1. A soft but harsh coarse ware fabric containing common (20%) angular, calcined flint, ≤4 mm, poorly sorted. Common (20%) sub-angular to angular red iron oxides, ≤5 mm, are also present. The clay matrix contains rare (1%) sub-angular medium-sized quartz grains. The fresh fracture is hackly, the firing is irregular.

FI2. A soft and smooth intermediate ware fabric containing sparse to moderate (7-10%) angular, calcined flint, ≤2 mm, moderately sorted; sparse (3-5%) sub-rounded to sub-angular

red iron oxides, ≤5 mm, poorly sorted; rare (1-2%) angular shell, ≤5 mm. The fresh fracture is fine, the firing is irregular.

FI3. A soft, sandy coarse ware fabric containing moderate (15%) angular, calcined flint, <4 mm, moderately to poorly sorted. Sparse to moderate (7-10%) rounded red iron oxides, ≤3 mm, moderately sorted, are also present. The clay matrix contains rare (1-2%) sub-angular fine-medium sized quartz grains. The fresh fracture is hackly, the firing is irregular.

4.8 Organic and shell or flint fabrics

VS1. A soft, sandy coarse ware fabric, containing up to 20% organic inclusions, indicated by linear cylindrical voids, ≤4 mm, well sorted; sparse to moderate (7-10%) angular shell, ≤4 mm, poorly sorted; rare (1%) sub-angular iron oxides, ≤2 mm, and rare (2%) angular flint, ≤3 mm, may also be present. The clay matrix contains abundant (≥40%) angular quartz grains, fine to medium in size, well sorted. The fresh fracture is fine. The fabric is irregularly fired. It is mostly oxidised on the exterior, and either oxidised or unoxidised through the core and interior.

VS2. A soft and silty coarse ware fabric containing moderate to common (15-20%) angular shell, ≤5 mm, moderately to poorly sorted; and up to 15% linear, organic voids. Rare (1-2%) red, sub-angular iron oxides, ≤1 mm, and sub-angular detrital flint fragments, ≤8 mm, are also present. The clay matrix is sandy and contains abundant (40%) sub-angular to angular quartz grains up to medium size, well sorted. Petrological analysis indicated that the clay matrix is similar to that of fabrics Q1 and F2, and may therefore represent the same clay source. The fresh fracture is irregular and the fabric is oxidised.

FV1. A fairly hard and slightly soapy fabric containing moderate (10-15%) angular flint, ≤8 mm, poorly sorted; moderate (10-15%) voids from linear organic material, mostly ≤5 mm, moderately sorted. Rare (1-2%) rounded red iron oxides, ≤1 mm, and inclusions of shell, ≤3 mm, may also be seen. The fresh fracture is irregular. There is one example of full oxidisation (PRN 1470).

4.9 Briquetage fabrics

4.9.1 Organic-tempered

V1. A soft and silty briquetage fabric containing moderate (15%) organic inclusions, indicated by linear voids (which appear cylindrical in section). The clay matrix contains abundant (40%) angular, silt to very fine sized quartz grains, very well sorted. The fabric has a very silty and powdery texture and feels rather vesicular, the fresh fracture is hackly. The fabric is usually oxidised, the colour is variable and include pink, lavender and a greyish orange ('salt colours'; Morris 2001a), more irregular firing conditions are also represented. Petrological analysis has revealed that the clay matrix is very similar to that of briquetage fabrics VF1 and G1.

4.9.2 Flint and organic-tempered

VF1. A soft and silty briquetage fabric containing common (20%) organic inclusions and sparse to moderate (7-10%) calcined, angular flint, ≤7 mm, poorly sorted. The clay matrix contains abundant (40%) angular, silt-sized quartz grains, very well sorted. The fresh fracture is hackly and the firing is quite often fully oxidised, but not exclusively so. Thin section analysis has revealed that the clay matrix is very similar to that of briquetage fabrics V1 and G1.

FV2. A soft and silty briquetage fabric containing moderate (15%) angular, calcined flint, ≤4 mm, moderately sorted; moderate (10%) voids, ≤1 mm, indicating linear organic inclusions.

Sparse (3%) sub-rounded red iron oxides, ≤3 mm, but mostly ≤1 mm, moderately sorted, are also present. The fresh fracture is laminated, the fabric is fully oxidised.

4.9.3 Grog and organic tempered

G1. A soft, silty briquetage fabric containing sparse to moderate (7-10%) linear organic voids, ≤10 mm. The fabric is characterised by a sparse amount (5-7%) of angular grog, ≤10 mm although most fragments are approximately 2 mm in size, moderately sorted. It may also contain up to 5% angular, calcined flint, ≤4 mm, moderately to poorly sorted. Petrological analysis has revealed that two types of grog are present. One is anisotropic and in its original state was unoxidised. It contains inclusions of sand and flint. The briquetage vessel itself was neither fired to, or used in, a higher temperature than the original vessel, as the grog has remained the same colour. The other is isotropic grog that had been very highly fired, clearly visible under polarised light. This indicates that two different pots were crushed up to make grog for the new vessel. The anisotropic grog has fine sand but the quartz in the isotropic grog is much smaller (silt sized). The clay matrix is very similar to fabrics V1 and VF1, and contains an abundance of angular silt-sized quartz grains, very well sorted. The fresh fracture is fine, and the firing is irregular. The external surfaces are usually oxidised orange in colour. The core and the interior tend to be unoxidised, a dark greyish-brown colour. This fabric is not immediately recognisable as briquetage, yet it possesses the distinctive silty texture and organic tempering, and a number of sherds have salt colours or the white residue. At least one sherd displayed the extra layer on the interior. Many of the sherds are abraded on the interior, yet harder on the exterior. As a group the G1 fabric displays the characteristics of briquetage, although some of the individual sherds may not.

VG1. A soft and soapy briquetage fabric containing common (20%) small cylindrical voids indicating organic inclusions. The fabric contains up to 5% angular isotropic grog, ≤9 mm, and sparse (5-7%) sub-angular to angular flint, ≤4 mm, poorly sorted, occasionally up to 10% in quantity. It may also sometimes contain up to 5% shell, ≤5 mm, but this has mostly dissolved. Rare (1%) rounded iron oxides are present, ≤1 mm. The clay matrix contains only low amounts of silt-sized quartz and represents a different clay source to fabrics V1, VF1 and G1, although this fabric is linked to the latter by the presence of isotropic grog. The fresh fracture is irregular, the firing is usually fully oxidised but not exclusively so. This fabric appears to have been used in the salt working process as a number of sherds show the pink colours or tinges, and one has a white skin on the exterior.

4.9.4 Criteria for identifying briquetage at Tollgate

The later prehistoric ceramic assemblage from Tollgate contains both pottery and briquetage fabrics. The briquetage material originates from containers used in the salt production process. Material in this assemblage is classified as salt container when a sherd displays at least two of four identifying traits: organic temper in the fabric; the presence of 'salt colours' such as clear pinks and lavenders; the appearance of patches or areas similar to a 'white skin'; and unusually flat body form (Elaine Morris pers comm).

Work by Morris (2001a; 2001b, table 98; in press) on salt production in the Lincolnshire Fenland has found that organic temper is synonymous with salt containers from the second century BC onwards in the Fenland region and during earlier periods elsewhere in the country. The choice of organic temper is seen as a development from the use of a single fabric type for both pottery and briquetage vessels. The organic material present in the briquetage and pottery fabrics at Tollgate has not been identified, but it was particularly

common in the very silty fabrics where it would have been necessary to open the otherwise quite dense clay matrices. Inclusions that occur naturally in the clay or are added as temper help reduce excessively plasticity and improve workability. They can also prevent shrinkage during drying and allow the fabric to dry without warping, allow steam to escape, stop cracks from spreading, and increase resistance to mechanical and thermal shock (Braun 1983, 122-3; Sinopoli 1991, 15). Morris has furthermore suggested that organic temper may have been preferred for briquetage containers 'for specific technological reasons' (Morris in press), such as an ability to withstand more intense and repeated heating (Morris 2001a, 41). The fact that the organic matter would have burnt out during the initial firing would have created the porosity necessary for firing and use, but also reduced the weight of the containers (ibid., 38).

The briquetage sherds often had pink, lavender and purple colours which are commonly seen on vessels, supports and structures involved in the salt manufacturing process. These 'salt colours' indicate vessels that have come into contact with soluble salts and been heated to different temperatures. At Cowbit Wash, Lincolnshire, it was shown that these colours 'were particularly prominent on organic-tempered containers which may have been heated to higher temperatures than other fabrics' (Morris 2001a, 41). A white 'skin' is present on the exterior and/or interior of a number of the briquetage sherds at Tollgate. This whitening may result from an accumulation of salts on the surfaces or be an effect of salt bleaching (Morris in press). This would be particularly prominent with repeated use of the containers, and 'the bleaching could be viewed as salt saturation of the briquetage' (ibid.).

Salt container fragments tend to be relatively flat in comparison to pottery sherds as they are often from trough shapes or shallow pans (Elaine Morris pers. comm.). The form of the Tollgate vessels is not certain but they would appear to demonstrate little curvature. Furthermore, less care is exhibited in the forming of salt container vessels than tends to be seen in the pottery vessels. More minor defining characteristics include internal abrasion, a result of salt being scraped from the container (ibid.). Briquetage vessels tend to be fully oxidised, but more irregularly fired examples were also recognised in the Tollgate assemblage. These less oxidised sherds may have been used only once and therefore the perceived firing differences may in fact equate to differences in actual use of the vessels (ibid.). Extra layers of clay were visible on a number of sherds, possibly a result of vessels being reused and relined. The salt appears to have built up beneath the layer, causing it to flake off (ibid.).

4.10 Resources for ceramic manufacture and fabric summary

The solid geology of Area 330, Zone 4, consists of Upper Chalk, overlain by a fine-grained silty sand of the Thanet Sand Formation (a member of the Eocene group); and the locally shelly sand and clay of the Lambeth Group (Woolwich and Reading Beds, also of the Eocene

group). Other deposits present in the immediate vicinity include patches of sand with black flint pebbles, locally shelly, of the Harwich Formation; undivided clay and silty sands of the London Clay Formation; and drift deposits of Head consisting of silt, sand and clay with variable gravel. To the south of the site other members of the chalk group are present, and also drift deposits of Clay-with-flints. To the east are the Blackheath and Oldhaven Beds, Pebble Beds of the Palaeocene and London Clay of the Eocene (information from British Geological Survey 1:50 000 Series, England and Wales sheets 271 and 272).

Fabrics dominated by inclusions of shell accounted for 33% of the later prehistoric ceramic assemblage by weight, and 45% of the pottery fabrics specifically. Brown (1995, 30) has found that shelly fabrics are particularly common during the early Iron Age in south-east Essex. Shell occurs naturally in the Woolwich Beds, particularly the Shell Beds of this formation which are described as 'well laminated dark clays, crowded with estuarine fossils' (Dewey *et al.* 1924, 57). A variety of shells including oyster and freshwater shells have been recorded during geological survey (ibid.*)*. Shell-tempered fabrics recorded from the late Iron Age site at Farningham Hill in the Darent Valley are also thought to have been made from an estuarine phase of the Woolwich Beds Formation (Couldrey 1984, 42).

Flint is also commonly seen in the later prehistoric assemblage from Tollgate. Pottery fabrics dominated solely by flint represent 16% of the overall weight of the ceramics, however a further 22% contained flint in combination with another inclusion, namely shell, quartz, iron or organic matter. Briquetage fabric VF1 contained inclusions of flint and organic temper and accounted for 10% of the ceramic assemblage by weight. Flint suitable for inclusion in ceramic vessels is widely available in the Upper Chalk. The silty fabrics used for the briquetage vessels may have originated from the Thanet Beds which 'consist mainly of fine sand, passing downwards into silt' (Dewey *et al.* 1924, 50). Iron oxides and ironstone are also recorded in this deposit (ibid., 52).

Morris (1994a; 1994b) has advocated the use of Arnold's 1985 ethnographic study to define local resource procurement. Arnold found that the preferred distance potters are willing to travel for clay is less than 7 km, or up to 10 km for additional tempering material. The inclusions identified in the fabrics of the ceramic vessels from Tollgate are available within 7 km of the site; all the pottery may therefore have been produced locally.

5 FORMS

The pottery assemblage from Tollgate comprised ten jar forms, five bowls and one possible cup. A further five briquetage forms were recorded, mostly exhibiting only minor variations. These are detailed below.

5.1 Pottery forms

5.1.1 Jars

R1. Short-necked coarse ware jar with flat-topped upright or slightly everted rim, and well-defined shoulder which may be carinated or more rounded. This form often has finger-impressed cabling on the top of the rim (pie-crust effect) and occasionally also has a band of fingertip decoration on the shoulder. The form spans the earliest Iron Age to the early Iron Age, and contextual associations suggest that at Tollgate it represents the latter end of the range, approximately 6th to 5th centuries BC. Fig. 3, Nos 1, 2, 3, 11, 12, 16, 19, 20, Fig. 4, Nos 28, 33, 36, Fig. 5, Nos 40, 41.

R2. Neutral form vessel with slack-sided profile. The rim is flattened, causing thickening on the exterior. Finger-impressed cabling is present on the top of the rim. Early Iron Age to early/middle Iron Age, an approximate range of 6th to 3rd centuries BC. Fig. 3, No. 4.

R3. Intermediate to coarse ware jar with flat-topped upright rim and long neck leading to low sloping or rounded shoulder. Finger-impressed cabling may be present on the top of the rim. Early Iron Age to early/middle Iron Age. Fig. 3, Nos 5, 6, 13, 17, Fig. 4 Nos 21, 27, Fig. 5, Nos 42, 48.

R4. Coarse ware jar with concave neck and very well-defined shoulder. Finger-impressed cabling is usually present on the top of the rim. A variant of the R1 form. Early Iron Age. Fig. 3, Nos 7, 8, Fig. 4, No. 22, Fig. 5, No. 46.

R5. Neckless ovoid jar with with flat-topped undifferentiated rim. First half of the first millennium BC. Fig. 3, No. 14.

R6. Coarse ware bowl with flat-topped upright rim, slightly concave, and a very strong hipped shoulder. Early Iron Age. Fig. 4, No. 35, Fig. 5, No. 37.

R7. Upright, flat-topped rim on probable neutral form, profile uncertain. May be related to the R10. Fig. 3, No. 18, Fig. 4, No. 24.

R8. Long-necked coarse ware jar with rounded rim and sharply carinated shoulder. A band of vertical fingernail impressions is visible on the shoulder. Early Iron Age. Fig. 4, No. 34.

R9. Coarse ware jar with short, upright flat-topped rim, concave neck and slack/soft shoulder. Fingertip and nail impressions are present around the shoulder. Early Iron Age to early/middle Iron Age. Fig. 4, No. 23.

R10. Straight-sided neutral form with flat-topped undifferentiated rim. A band of fingertip and nail impressions is commonly seen on the upper exterior of the vessel. There is a slightly bulge in the shoulder region, however this appears to be a result of manufacture rather than the design of the vessel. Early Iron Age to early/middle Iron Age. Fig. 4, Nos 29, 30, 31, 32, Fig. 5, No. 43.

R11. Round shouldered jar with short neck and slightly flattened rim, causing a thickening or irregular bead on the exterior. Vertical slashes are present on the exterior of one example (Fig. 5, No. 45). Early Iron Age to early/middle Iron Age. Fig. 4, No. 26, Fig. 5, No. 47.

R12. Thin-walled vessel with rolled/beaded rim and slack to straight sides. Small diameter, possible cup form. Fig. 5, No. 38.

5.1.2 Bowls

R20. Necked bowl with rounded shoulder and rounded, slightly everted rim. Early Iron Age to early/middle Iron Age (*c* 5th to 4th centuries BC). Fig. 3, No. 9, Fig. 4, No. 25.

R21. Necked bowl with flat-topped everted rim. Heavily burnished. Late Bronze Age/early Iron Age to early Iron Age. Fig. 3, No. 10.

R22. Shouldered bowl with long flaring rim. Early Iron Age to early/middle Iron Age (*c* 5th to 4th centuries BC). Fig. 6, No. 45.

R23. Vessel with fairly long flaring neck and rounded rim, probable bowl. Fig. 5, No. 44.

5.2 Briquetage forms

R60. Open form with apparently conical (neckless) vessel profile and fairly straight walls and flattened rim which displays finger-impressed cabling, often expanded on the interior. Surfaces are irregular, with finger impressions often visible on the exterior. Fig. 6, Nos 49, 50 and 51.

R61. Open form with apparently conical profile and fairly straight walls and flattened rim which often displays finger-impressed cabling. This form is very similar to R60 but the rim is not expanded on the interior, although there is still a lip which was probably formed by the maker of the vessel running a finger around the interior of the rim. Fig. 6, Nos 52-55.

R62. Open vessel with conical profile and straight walls. Similar to R60 and R61 but the rim form which is almost internally bevelled. Faint finger impressed cabling is visible on the inside of the rim. Fig. 6, No. 56.

R63. Thin, straight-walled vessel with undifferentiated rim. Fig. 6, No. 57.

R64. Long-necked, slack-sided vessel with flattened, everted rim, externally thickened. Fig. 6, No. 58.

5.3 Base forms

B1. A plain flat base, may have finger-pinching at the wall/base join. Twenty five bases of this form were recorded, in both pottery and briquetage fabrics.

B2. This base form is similar to B1 but has a slightly more upright wall. Only two examples were recorded, both in briquetage fabrics.

B3. A foot-ring base, early-middle Iron Age. Two examples present.

A number of the bases in briquetage fabrics did not appear to be entirely circular in plan, with some having obtuse angles. This may be simply a result of the manufacturing technique and the fragmentary nature of the bases, but it may offer further clues as to the shape of the containers.

5.4 Discussion of the forms

Forms R1 and R4 are extremely similar and probably represent subtle variations on the same theme. They are the most commonly occurring form, with R1 represented by 16 vessels and R4 by 4 examples, totalling 40% of the identified pottery forms. They occur mostly commonly in the coarse shelly fabric S1, although flint-tempered examples are also present (Table 5). The majority have finger-impressed cabling on the top of the rim, and fingertip impressions may also be present around the shoulder of the vessel. Form R8 at Tollgate also bears a resemblance to this form and is represented by a single example in a flint and shell fabric. Parallels may be drawn from Highstead, Chislet during Periods 2-3a, earliest Iron Age to early Iron Age (unpublished illustrations) and Fox Hall, Southend, (Brown 1995, 24, fig. 8: nos 9 and 10). The Southend assemblage is dominated by early Iron Age (6th to 5th centuries BC) forms. A similar form is present at Barham Downs, Kent (A2 Site 1; Macpherson Grant 1980, 138, no. 3). The date range for this site as a whole is 5th to 3rd centuries BC (Cunliffe 1980, 178). Forms 1 and 2 at Little Waltham are also similar and were popular during Period II at that site (Drury 1978, 52-4).

Table 5: Correlation of form to fabric types

	Fabric													
Form	**F1**	**F2**	**F4**	**FI1**	**FI2**	**FS1**	**FV1**	**Q1**	**Q2**	**QF1**	**S1**	**V1**	**VS1**	**Total**
R1		1		1		1	1	1			11			16
R2											1			1
R3	2		1								4	1		8
R4				1							2		1	4
R5											1			1
R6							2							2
R7		1									1			2
R8						1								1
R9		1												1
R10		2				1			1	1				5
R11		1	1											2
R12										1				1
R20		1											1	2
R21								1						1
R22								1						1
R23					1									1
R60												3		3
R61												4		4
R62												1		1
R63												1		1
R64												1		1
Totals	2	7	2	2	1	3	3	3	1	2	20	11	2	59

Form R9 has a much softer shoulder and is paralleled at Fox Hall, Southend by early Iron Age jar Form D (Brown 1995, fig. 8:6). At Tollgate it has been found in a slightly later context (373), of early to middle Iron Age date. Form R3 has a much longer neck than the other jar forms. In contrast, R2 has a very short neck and a slacker profile than the above mentioned forms but can be accommodated within the same date range of early Iron Age to

early/middle Iron Age. R11 is a round-shouldered jar and is paralleled by Little Waltham Form 5, seen mostly during Period II but also continuing into Periods III and IV (Drury 1978, 54).

The R10 form is unusual in that there is no obvious shoulder, although two of the five examples of this form had a band of fingertip decoration in the shoulder region. The rim is undifferentiated from the body and the vessel walls are fairly straight. R10 is paralleled at Highstead in Period 2, earliest Iron Age to early Iron Age (unpublished illustrations). It is similar to Form 7 at Little Waltham (periods III and IV) (Drury 1978, 54). Tollgate form R5 is a rough version of an ovoid jar and as such is chronologically indistinct, but by contextual association it may be suggested that at Tollgate it lies somewhere in the early or early/middle Iron Age.

Five bowl forms were recorded, although the profiles of two (R21 and R23) were too short to allow parallels to be identified. A date of 5th to 4th century BC may be suggested for R20 and R22, both of which are paralleled at Danebury in forms BA2.2 and BA2.3 (Brown 2000, 107). Bowl form R6 was rather different with its upright neck and strongly carinated shoulder. The two vessels of this form were originally thought to represent briquetage containers as one is fully oxidised and the other has salt colours and an area of white residue. However the form and fabric suggest that R6 is actually a pottery vessel, which may have been used in the salt manufacturing process. The form of R12 is uncertain but it would appear to be a cup. The profile is too incomplete to allow parallels to be identified. The briquetage forms are unique in the region.

6 MANUFACTURING

The later prehistoric ceramic vessels were all handmade. The inclusions identified in the fabrics were available in the local clay sources. The firing colours exhibited on the pottery indicate that the vessels were fired in a relatively simple manner, probably a form of bonfire firing, causing the irregular colour seen on the vessels (Drury 1978, 62). Overfiring was occasionally noticed, such as on the R3 vessel PRN 1001 several sherds of which showed clear signs of bloating and twisting. No investment in equipment for either pottery production or salt manufacture, such as drying facilities, was identified at the site. It is therefore proposed that the manufacturing of vessels was carried out on a part-time domestic basis, at the level of household production (cf Peacock 1982, 13-16). This lack of drying facilities and kilns suggest that production was very much affected by seasonality, and would have to be scheduled to avoid conflicting with subsistence activities (Arnold 1985).

A number of traits were noticed on the pottery and briquetage vessels which appear to act as ‘signatures’ (Morris, pers. comm.) and suggest that the potters may have been the saltmakers (Morris 2001b). On three of the pottery rims (illustrations 00.12; 00.24; 00.36) and

four briquetage examples (illustrations 00.46; 00.47; 00.53; 00.55) the clay appeared to have been smoothed, almost folded, from the back of the rim and over the top, causing an irregular lip on the exterior. It created a weak spot as this extra lip of clay was not well bonded to the rest of the body, and is now prone to flaking off. This would seem to be some kind of manufacturing trait that was not smoothed out during the final forming of the vessel. In more general terms the pottery, and in particular the briquetage, showed traces of the manufacturing process such as strong finger marks (illustration 00.20, 00.49 and 00.50 for example).

It is not certain whether the 'pie-crust' effect visible on the top of a number of pottery and briquetage vessels is decoration, or simply another remnant of the manufacturing process. Likewise the band of fingernail impressions around the shoulder of PRN 1451 (illustration 00.36) could be either decoration, or the traces of a manufacturing stage that were not smoothed over.

7 SURFACE TREATMENT

Six different forms of surface treatment were recorded in the assemblage from Tollgate. These comprise burnishing (BU), smoothing (SM), wiping with vegetation or cloth (WP), finger wiping (FWP), roughening (RG) and also the addition of an extra layer (EL), this last seen exclusively on briquetage fabrics G1 and VF1. These surface treatments were often used in combination, and on one or both surfaces (Table 6). In all, 19 variations were recorded on a total of 550 sherds (11,829 g). This is a significantly higher proportion than recorded amongst the slightly larger assemblage from Northumberland Bottom (316 sherds).

Table 6: Quantification of surface treatments recorded on ceramic vessels

Surface treatment type	Number of records	Count of sherds	Weight (g)
BU on both surfaces	38	85	759
BU on exterior only	17	21	287
BU on interior only	10	19	149
BU and EL on interior	2	2	77
BU and FWP on exterior	1	1	16
BU interior; FWP exterior	5	12	407
BU exterior; SM interior	1	1	37
BU interior; SM exterior	2	2	14
BU interior; WP exterior	1	1	58
EL interior	1	1	20
FWP exterior	29	160	5128
RG exterior	3	3	57
SM all over	5	8	187
SM exterior	8	9	170
SM interior	8	9	230
SM and EL interior	1	1	39
WP on both surfaces	3	3	112
WP exterior	76	200	3801
WP interior	3	8	207
WP and FWP on exterior	1	1	29
WP both surfaces: FWP exterior	1	3	45
Totals	216	550	11829

The most commonly occurring surface treatment at Tollgate was wiping of the surfaces, usually only on the exterior surface, with some form of vegetation or cloth. The technique was widely used across most of the fabric groups, particularly the shell and shell-and-flint groups. It was much rarer on the organic briquetage fabric (V1) and the sandy pottery fabrics (Table 7). Wiping is an effective way to smooth a vessel's surface with little risk to the potter's hands from sharp inclusions. The dominance of this technique on the coarser fabrics may be a result of this practical consideration. The external surfaces of a number of vessels had been wiped directly by hand, leaving finger marks in the clay (Fig. 6, No. 50 for example). This technique was employed on both pottery and briquetage fabrics, particularly the latter. On the pottery vessels it is seen more on the coarse ware fabrics such as S1 and FS1, but in much lesser quantities than wiping using organics or cloth. The two techniques were combined on two briquetage vessels.

Burnishing was also a commonly recorded treatment, occurring on 65 records totalling 125 sherds (weighing 1195 g) as the only surface treatment. It tended to be applied to thinner walled vessels, with many <9 mm thick. Sandy fabrics were the most commonly burnished with 32 out of 54 records for this ware group exhibiting burnishing, 23 of which were burnished on both surfaces suggesting bowl forms. The briquetage vessels show burnishing on 13 records, seven of which were burnished on the interior only. Burnishing was also seen in combination with other surface treatments. Burnishing or smoothing was recorded on the interior of three briquetage records where an extra layer, a possible re-lining, was also noted on the interior. A further six records of briquetage indicate internal burnishing and external wiping or finger-wiping. This apparent correlation between internal burnishing and briquetage vessels would appear to be functional. Internal burnishing may have created a better surface from which to scrape out the salt (Morris, pers. comm.), and it may also have been designed to increase heating effectiveness. Work by Schiffer (1990, cited in Skibo 1992, 156) has shown that vessels 'without an impermeable surface treatment have a much lower heating effectiveness and may be unable to boil water'. Sealing the internal surface by burnishing may therefore have solved two problems.

Smoothing was present on 21 records, and indicates a vessel was given something of a slurry finish. It was seen on both pottery and briquetage vessels in a number of fabrics. Roughening of the exterior of vessels was noted on three records. This surface treatment appears to be related to the technique of rustication, an East Kent phenomenon with a Continental origin. It is most commonly seen during the early Iron Age period, particularly at Highstead, and continues into the early-middle Iron Age (Macpherson-Grant 1991, 41-8).

Table 7: Correlation of surface treatments and fabric group

Fabric groups													
Dominant inclusion	**Ceramic type**	**Total number of records**	**BU on one or both surfaces**	**SM**	**WP**	**FWP**	**WP and FWP**	**EL**	**EL and BU or SM**	**Int. BU and ext. WP or FWP**	**External BU and FWP**	**BU and SM**	**RG**
Flint	Pottery	148	15	4	13	3							3
Quartz sand	Pottery	54	32	4	1							2	
Shell	Pottery	120			19	5							
Ironstone	Pottery	1	1	5									
Quartz and flint	Pottery	20	1										
Flint and shell	Pottery	78			26	5							
Flint and iron	Pottery	25	2		1								
Organic and shell / flint	Pottery	10	1	1	1								
Organic	Briquetage	94	2	4	2	11	2			6	1		
Organic and flint	Briquetage	118	9	3	12	1		1	2			1	
Organic and grog	Briquetage	51	2		7	4			1				
Totals		719	65	21	82	29	2	1	3	6	1	3	3

As many of the identified forms from Tollgate are present in very small numbers it has not been possible to draw many conclusions concerning the types of surface treatments that were considered appropriate for certain vessels. The four bowl forms were all burnished on both surfaces, a phenomenon widely seen on bowls. The shouldered jar forms R1, R4 and R8 numbered 21 vessels, yet only two displayed external wiping suggesting that this form was rarely given any form of surface treatment, however this may also be a result of adverse depositional factors. The briquetage forms R60, R61, R62 and R63 frequently showed surface treatments, particularly finger-wiping but also smoothing, burnishing and wiping, on one or both surfaces, alone or in combination.

8 DECORATION

Decorative techniques recorded from the Tollgate assemblage are mostly fingertip impressions or finger-impressed cabling, but incising, tooling and slashing are also present in small numbers. The finger-impressed cabling is a technique that is applied to the rim tops creating a pie-crust effect. However, as mentioned above, it is not certain if this is a purposeful form of decoration or more of a functional effect that is residual from the forming of the vessel, just as it is on the pie. There were 23 records of finger-impressed cabling, 6 on briquetage containers and 17 on pottery vessels (12 from the shell fabric group; three flint; one flint and shell; and one organic and shell).

Fingertip impressions were recorded as a single decorative technique on 20 records. One example was from the top of the rim, seven from the shoulder region and 13 could only be shown to be on the exterior as they were mostly body sherds. A single example of a fingertip with nail impression has also been recorded from the top of one rim. A combination of finger-impressed cabling on the top of the rim and finger impressions around the shoulder were recorded on two R1 vessels. Interestingly only two of the examples of finger impressions were present on briquetage vessels, perhaps suggesting that decoration was not considered worthwhile on these more roughly constructed containers.

Three parallel, incised lines were recorded from a single sherd in context 416 (pit 414). Another sherd combined parallel, incised lines with an overlying wider tooled line (residual in medieval/post-medieval context 182). Tooled lines were also noted on three records in contexts 392, 872 and 691. Finally, vertical slashes are present on the shoulder of an R11 vessel from context 875 (illustration 00.45).

9 EVIDENCE OF USE

Very few traces of actual use were present on the Tollgate ceramics. Evidence for use in a cooking or heating capacity was found on ten records in the form of internal burnt residue or external sooting. Less convincing evidence was recorded on a further four records. Of these

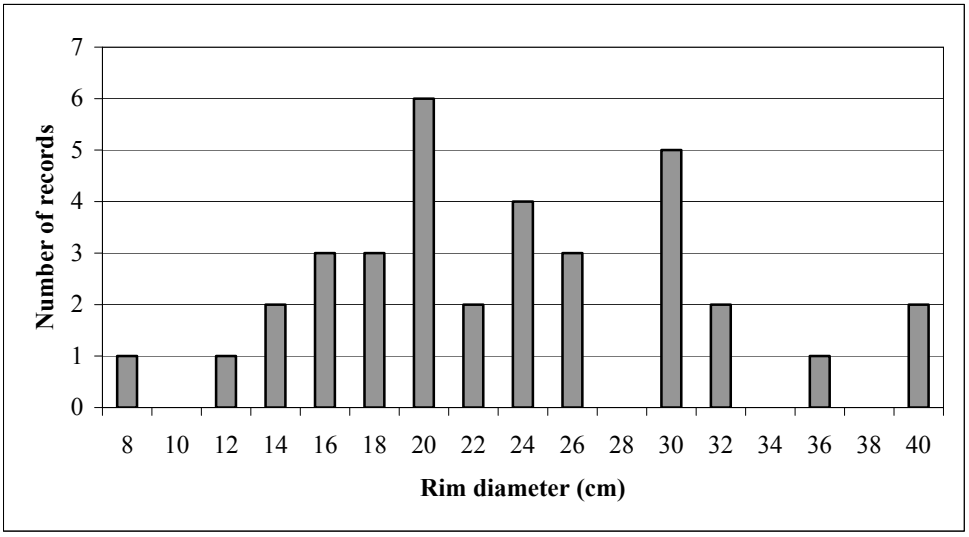
possible 14 cooking / heating vessels, only one is a briquetage container. Pitting was present on the interior of nine pottery records, including an R3 form (illustration 00.22) and suggests that these vessels may have held acidic contents. Abrasion was recorded on the interior of one briquetage vessel, presumably from the scraping out of the salt contents.

By far the most commonly occurring evidence of use is the 'white skin' (see above: Criteria for identifying briquetage) that is left behind on vessels associated with salt manufacture. This was noted to varying degrees in 55 records, only six of which are of pottery. It was most commonly seen on the exterior (25 records), but also on the interior (19 records), both surfaces (8 records), and on the exterior and into the core (3 records). One of the pottery records includes three sherds that were originally assessed as part of a 'polychrome' bowl (PRN 1440, context 1180, pit 1174). The purple, white and grey colours present on the sherds of PRN 1440 are extremely similar to the salt colours and white skin, it is therefore more likely that this vessel was in some way involved with the salt manufacturing process and that this has left its mark on the sherds (Elaine Morris pers. comm.).

10 VESSEL SIZE

A total of 35 vessels had measurable diameters, all between 8 cm and 40 cm (Fig. 2). Of these, one may be described as very small (<10 cm diameter), nine as small (10-18 cm), 15 as medium (20-28 cm), nine as large (30-38 cm) and one as very large (40 cm or more). The graph shows that there is a peak from 16 cm to 30 cm, and a general dominance of medium sized vessels. At Tollgate, the percentage of rim present for each vessel was very low; less than 5% of the rim was present for 47 rim records (including those not identifiable to form), 5-9% was present for 19 records, and only 7 records had more than 10% present. The total estimated vessel equivalent from Tollgate is 4.31.

Figure 2: Range of vessel rim diameters



Vessel bases ranged from 7 cm to 20 cm in diameter, with seven in the 12 cm or less range. Vessel wall thickness varied from less than 5 mm to 18 mm (Table 8), but for both pottery and briquetage vessels there is a concentration of vessels with a wall thickness in the range of 7-10 mm. This is common on Iron Age sites in southern Britain, but the Tollgate vessels have larger diameters than would commonly be seen in such assemblages. Unfortunately too few examples of the different form types are present to allow any correlation between form and vessel size.

Table 8: Vessel wall thickness for pottery and briquetage vessels

Thickness range	Count	Weight (g)	MSW (g)
< 5 mm	1	3	3
5 - < 7 mm	56	390	7
7 - <9 mm	568	6016	10.6
9 - < 11 mm	494	6674	13.5
11 - <13 mm	252	5207	20.7
13 - <15 mm	196	5993	30.6
15 - <17 mm	9	243	27
17 - < 19 mm	2	84	42
Not measurable	120	944	7.9

11 DISCUSSION

Middle Bronze Age activity on the site is attested by the discovery of two sherds from a coarse flint-tempered pottery base, residual in context 400, pit 435. A mid to late Bronze Age transitional or late Bronze Age presence on the site is indicated by 34 body sherds weighing 246 g, from context 529, pit 537. No prehistoric material of a later date was recorded from this feature and the pottery recovered is not considered to be residual.

The main focus of later prehistoric activity occurred during the early to middle Iron Age. The ceramic evidence suggests a date range of 6th to 3rd centuries BC, with a possible focus on the 5th to 4th centuries. The vast majority of this Iron Age material was recovered from three groups of pits located to the west of Church Road, which together account for 94% of the overall count of the ceramics and 98% of the weight. Seventeen of these pits contained later prehistoric pottery, with ten producing more than 25 sherds. For the purposes of this report, these contexts have been defined as ‘key groups’ (Tables 9 and 10). The only other feature to contain a key group is late Bronze Age pit 537. Early to middle Iron Age pit 866 contained 30 sherds, but these were in two contexts. The pit groupings form the framework for this discussion as their spatial relationships suggest they may relate to specific activity areas within the landscape, although it is recognised that such grouping is an artificial division of the features.

Pit group 1 contained the largest ceramic assemblage (Table 11), consisting of 735 sherds weighing 14,964 g. The mean sherd weight for this group of features is very high at 20.4 g. The briquetage component was just below average for the site and accounts for 22%

of the count (19% of the weight) of the ceramics in group 1. The briquetage fabrics were dominated by fabric V1 (66% of the assemblage by weight), fabric VF1 accounting for the remaining 34%. The pottery fabrics were wide ranging (Table 11) but dominated by coarse shelly wares (67% of weight) and flint-tempered fabrics (23%).

In comparison to pit group 1, group 2 contained half as much ceramic material by weight (7824 g), although the sherd count remained high (674 sherds), decreasing the mean sherd weight to 11.6 g. The percentage of briquetage increased and accounted for 54% of the count and 44% of the weight of the ceramics. A wider range of briquetage fabrics appear to be in use than was seen in group 1, with V1 accounting for only 17% of the weight, and VF1 for 45%. This pit group contained all the grog-tempered briquetage fabrics with G1 and VG1 representing 22% and 16% of the briquetage weight respectively. Quite a wide range of pottery fabrics is again seen, with a dominance of flint and shell mixed fabrics (64% of weight) and flint-tempered wares (18% of weight). The same major inclusions are present but are more mixed than in pit group 1. Sandy wares are also more commonly seen.

Pit group 3 contained a much smaller assemblage, only 185 sherds weighing 2129 g. The briquetage component is minor, accounting for 6% of the count and 7% of the weight. The single briquetage fabric, FV2, was not present amongst the assemblages of pit groups 1 and 2. The pottery fabric range is also different with flint and iron mixed fabrics accounting for 65% of the pottery from this group. A further 25% of the pottery is represented by the flint and shell group, and 9% by the flint-tempered group. The variation in both the pottery and briquetage fabrics across the three pit groups is suggestive of a chronological difference, but it was not possible to ascertain the sequence of use and abandonment within the early Iron Age and early-middle Iron Age range suggested by the forms. The most commonly occurring form, R1, was present in all three pit groups.

Of the 59 identified forms from the site, 54 were recovered from pit groups 1-3, the majority (43) occurring in pit group 1. It is surprising that only five forms were identified in pit group 2, and six from group 3. Pit 372 alone contained 53% of the identified forms from the site, and accounted for 36% of the overall assemblage by weight. The pit was remarkable in that it held every briquetage rim from the site. The pottery included both jar and bowl forms. The forms indicate a broad date range from 6th-3rd centuries BC, but the presence of bowl form R21 potentially narrows this to the 5th-4th centuries. A number of the sherds from this pit were covered in post-depositional concretions such as iron, which may suggest a midden environment. Two large joining base sherds from a single vessel had entirely different colouring, again indicating at least post-breakage, and probably post-depositional, changes. Many of the sherds had been hardened and suffered from leaching on both surfaces, a condition which can mask both surface treatments and evidence of use. Pit 374 contained much of a large jar (Fig. 4, No. 24), plus two other jars and one bowl form. Less than 1% of

the assemblage from this pit comprised briquetage. Although there were no significant differences in the forms types recovered from the two pits, the presence of the more softly shouldered jar (R9) might suggest a slightly later date. A La Tène I brooch was recovered from this pit.

The occurrence of a high proportion of briquetage in the Tollgate assemblage is very important in regional terms owing to the rarity of such evidence from Kent. The Tollgate briquetage consists entirely of container fragments with no evidence for production equipment such as pedestals and structures. The lack of production equipment at Tollgate, coupled with the height of the site above sea level, suggests that the actual evaporation procedures were taking place away from this area (Elaine Morris pers. comm.). The excavation transect through the landscape at this location does not define the relationship of these pits to any settlement, but it seems likely that they were located at a settlement margin. Although the manufacture of salt may not have taken place at this location, it may be suggested that an activity that utilised salt did take place here within the early Iron Age and early/middle Iron Age. The variations in the fabric proportions between the pit groups indicate that this activity may have taken place on a number of different occasions, possibly seasonally or annually, using a slightly different location each time. The low occurrence of rim forms in pit groups 2 and 3 precludes an estimation of the sequence of pit use, but the high percentage of pure organic-tempered fabrics in group 1 may indicate a refinement of the fabric and as such this group may be the latest.

The Tollgate later prehistoric ceramic assemblage therefore suggests the practice of a low-scale cottage industry that utilised salt. This resource may have been extracted in the tidal areas and brought back to the site by the same people making the pots. The pits were also used for domestic debris. The site appears to have been repeatedly used during the early Iron Age and early to middle Iron Age periods, possibly on a seasonal basis.

Table 9: Count and weight (g) of fabric groups present in key features

		FAB GROUP											
FEAT	**Data**	**FLINT**	**FLINT AND IRON**	**FLINT AND SHELL**	**IRON-STONE**	**ORGANIC**	**ORGANIC AND FLINT**	**ORGANIC AND GROG**	**ORGANIC AND SHELL / FLINT**	**QUARTZ AND FLINT**	**QUARTZ SAND**	**SHELL**	**Grand Total**
372	CT	25		2	1	77	1		4		22	160	292
	WT	666		57	8	1707	21		172		364	3733	6728
374	CT	80				3			4		12	187	286
	WT	1585				50			43		58	4263	5999
387	CT	10		3		4	64		1	13	5	11	111
	WT	233		15		69	796		44	173	165	127	1622
435	CT	10	2	2		3	9			1	1		28
	WT	99	4	40		14	125			49	12		343
537	CT	34											34
	WT	246											246
679	CT	10	28	28								3	69
	WT	62	329	422								21	834
740	CT	71					9			16	2	2	100
	WT	614					132			180	7	52	985
866	CT	19	6				1						26
	WT	94	56				17						167
871	CT	24	30				19						73
	WT	115	559				153						827
879	CT	1	40										41
	WT	4	405										409
1172	CT	1		24		34	57	31		2	15	3	167
	WT	13		491		320	534	353		7	114	37	1869
1174	CT	9		138		43	84	107	10	1	13	2	407
	WT	141		2288		285	894	961	72	158	155	16	4970

Table 10: Presence of form types for each key group (features with >25 sherds), by number of records

	Form																					
Feature	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**R11**	**R12**	**R20**	**R21**	**R22**	**R23**	**R60**	**R61**	**R62**	**R63**	**R64**	**Total**
372	9	1	6	1	1		1						1	1			3	4	1	1	1	31
374				1			1		1				1									4
387	1		1							4	1											7
435	1																					1
537																						0
679	2		1							1						1						5
740																						0
866											1											1
871				1																		1
879																						0
1172																						0
1174	2					2		1														5
Totals	15	1	8	3	1	2	2	1	1	5	2	0	2	1	0	1	3	4	1	1	1	55

Table 11: Summary of pottery and briquetage fabrics present in pit groups 1, 2 and 3

Pit gp	**Total count**	**Total weight (g)**	**% of briquetage**		**% of pottery**		**% of the briquetage fabrics by weight**					**% of the pottery fabrics by weight**							
			CT	WT	CT	WT	V1	VF1	G1	VG1	FV2	Flint	Flint and iron	Flint and shell	Iron-stone	Organic and flint/shell	Quartz	Quartz and flint	Shell
1	735	14964	22	19	78	81	66	34	0	0	0	23	<1	1	<1	2	5	2	67
2	674	7824	54	44	46	56	17	45	22	16	0	18	0	64	0	2	6	8	2
3	185	2129	6	7	94	93	0	0	0	0	100	9	65	25	0	0	0	0	1

12 CATALOGUE OF ILLUSTRATED VESSELS

(PRN, Pottery Record Number in database)

12.1 Pottery forms

Figure 3

1. Shouldered jar, R1. Fabric S1; finger-impressed cabling on the top of the rim, finger impressions around the shoulder; PRN 1014, context 352, pit 372. Probably the same vessel as No. 2.
2. Shouldered jar, R1. Fabric S1; finger-impressed cabling on the top of the rim, finger impressions around the shoulder; PRN 1010, context 352, pit 372. Probably the same vessel as No. 1.
3. Shouldered jar, R1. Fabric S1; fingertip impressions on the top of the rim; PRN 1007, context 352, pit 372.
4. Neutral form, R2. Fabric S1; finger-impressed cabling on the top of the rim; PRN 1009, context 352, pit 372.
5. Long-necked, shouldered jar, R3. Fabric F1; wiped exterior; PRN 1001, context 352, pit 372.
6. Long-necked, shouldered jar, R3. Fabric S1; finger-impressed cabling on the top of the rim; PRNs 1008 and 1073, contexts 352 and 385 respectively, pit 372.
7. Shouldered jar, R4. Fabric S1; wiped exterior; finger-impressed cabling on the top of the rim; PRN 1038, context 352, pit 372.
8. Shouldered jar, R4. Fabric S1; PRN 1027, context 352, pit 372.
9. Round-shouldered bowl, R20. Fabric S1; burnished both surfaces; PRN 1006, context 352, pit 372.
10. Necked bowl, R21. Fabric Q1; burnished both surfaces; PRN 1130, context 379, pit 372.
11. Shouldered jar, R1. Fabric S1; finger-impressed cabling on the top of the rim; PRNs 1076 (context 385), 1077 and 1107 (context 386), pit 372.
12. Shouldered jar, R1. Fabric S1; wiped exterior; finger-impressed cabling on the top of the rim; PRN 1075, context 385, pit 372.
13. Long-necked shouldered jar, R3. Fabric S1; finger-impressed cabling on the top of the rim; PRN 1137, context 385, pit 372.
14. Ovoid jar, R5. Fabric S1; wiped exterior; PRN 1074, context 385, pit 372.
15. Plain base, B2. Fabric S1; pitted interior; PRN 1071, context 385, pit 372.
16. Shouldered jar, R1. Fabric F2; finger-impressed cabling on the top of the rim; PRN 1090, context 386, pit 372.
17. Long-necked shouldered jar, R3. Fabric S1; wiped exterior; PRN 1109, context 386, pit 372.
18. Neutral form, R7. Fabric S1; PRNs 1108 and 1111, context 386, pit 372.
19. Shouldered jar, R1. Fabric S1; finger-impressed cabling on the top of the rim; PRN 1113, context 392, pit 372.
20. Shouldered jar, R1. Fabric S1; finger-impressed cabling on the top of the rim; PRN 1114, context 352, pit 372.
21. Long-necked shouldered jar, R3. Fabric S1; finger wiped on exterior; pitted interior; PRN 1139, context 373, pit 374.

Figure 4

22. Shouldered jar, R4. Fabric VS1; finger-impressed cabling on the top of the rim; sooting on the upper exterior; PRN 1224, context 373, pit 374.

23. Slack-shouldered jar, R9. Fabric F2; finger-wiped exterior, wiped interior; fingertip decoration around shoulder exterior; PRNs 1214, 1222 and 1223, context 373, pit 374.
24. Neutral form, R7. Fabric F2; PRN 1194, context 373, pit 374.
25. Round-shouldered bowl, R20. Fabric F2; burnished both surfaces; PRN 1193, context 373, pit 374.
26. Round shouldered jar, R11. Fabric F4; wiped exterior; small amount of burnt residue on interior; PRN 1314, context 390, pit 387.
27. Long-necked shouldered jar, R3. Fabric F2; wiped exterior; PRN 1288, context 388, pit 387.
28. Shouldered jar, R1. Fabric S1; fingertip impressions around shoulder; PRN 1254, context 389, pit 387.
29. Neutral form, R10. Fabric Q2; fingertip impressions around upper exterior; PRN 1262, context 389, pit 387.
30. Neutral form, R10. Fabric QF1; fingertip impressions around upper exterior; PRNs 1278 and 1303, context 389, pit 387.
31. Neutral form, R10. Fabric F2; finger impressed cabling on the top of the rim; PRN 1274, context 389, pit 387.
32. Neutral form, R10. Fabric F2; fingertip impressions around upper exterior; PRN 1301, context 389, pit 387.
33. Shouldered jar, R1 variant. Fabric S1; finger impressed cabling on the top of the rim; PRN 1471, context 1178, pit 1174.
34. Jar with carinated shoulder, R8. Fabric FS1; a band of fingernail impressions is present in the shoulder region; PRN 1451, context 1181, pit 1174.
35. Shouldered bowl with upright rim, R6. Fabric FV1; salt residue/bleaching on interior; PRN 1662, context 1177, pit 1174.
36. Possible shouldered jar, ?R1. Fabric FV1; PRN 1469, context 1178, pit 1174.
37. Shouldered bowl with upright rim, R6. Fabric FV1; PRN 1470, context 1178, pit 1174.

Figure 5

38. Possible cup form, R12. Fabric QF1; PRN 1582, context 415, pit 414.
39. Footring base, B3. Fabric VF1; burnished exterior; PRN 1253, context 741, pit 740.
40. Shouldered jar, R1. Fabric S1; PRN 1653, context 681, pit 679.
41. Shouldered jar, R1. Fabric FI1; PRN 1639, context 680, pit 679.
42. Long-necked shouldered jar, R3 variant. Fabric F4; PRN 1654, context 681, pit 679.
43. Neutral form, R10. Fabric FS1; finger wiping on exterior; PRN 1629, context 691, pit 679.
44. Probable bowl with flaring neck, R23. Fabric FI2; burnished on both surfaces; PRN 1630, context 691, pit 679.
45. Shouldered bowl, R22. Fabric Q1; burnished on both surfaces; PRNs 1666 and 1667, context 693, pit 702.
46. Shouldered jar, R4. Fabric FI1; tooled horizontal line on upper exterior; PRN 1615, context 872, pit 871.
47. Round shouldered jar, R11. Fabric F2; smoothed interior; vertical slashes on exterior; PRN 1706, context 875, pit 871.

12.2 Briquetage vessels

Figure 6

48. Long-necked shouldered jar, R3. Fabric V1; finger wiped and burnished exterior; finger impressed cabling on the top of the rim; PRN 1051, context 352, pit 372.
49. Open form with conical profile, R60. Fabric V1; finger wiped exterior; PRN 1054, context 352, pit 372.

50. Open form with conical profile, R60. Fabric V1; finger wiped exterior, burnished interior; finger impressed cabling on the top of the rim; salt residue/bleaching on interior; PRN 1058, context 352, pit 372.
51. Open form with conical profile, R60. Fabric V1; finger wiped exterior, burnished interior; salt residue/bleaching on exterior; PRN 1055, context 352, pit 372.
52. Open form with conical profile, R61. Fabric V1; wiped exterior, burnished interior; finger impressed cabling on the top of the rim; PRN 1057, context 352, pit 372.
53. Open form with conical profile, R61. Fabric V1; finger wiped exterior; salt residue/bleaching on exterior; PRN 1052, context 352, pit 372.
54. Open form with conical profile, R61. Fabric V1; salt residue/bleaching on exterior; PRN 1053, context 352, pit 372.
55. Open form with conical profile, R61. Fabric V1; smoothed interior; PRN 1056, context 352, pit 372.
56. Open form with conical profile, R62. Fabric V1; wiped and finger wiped exterior, possible finger impressed cabling on the top of the rim; PRN 1136, context 386, pit 372.
57. Straight-walled neutral form, R63. Fabric V1; finger wiped exterior; PRN 1147, context 386, pit 372.
58. Long necked neutral form, R64. Fabric V1; context 386, pit 372.

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