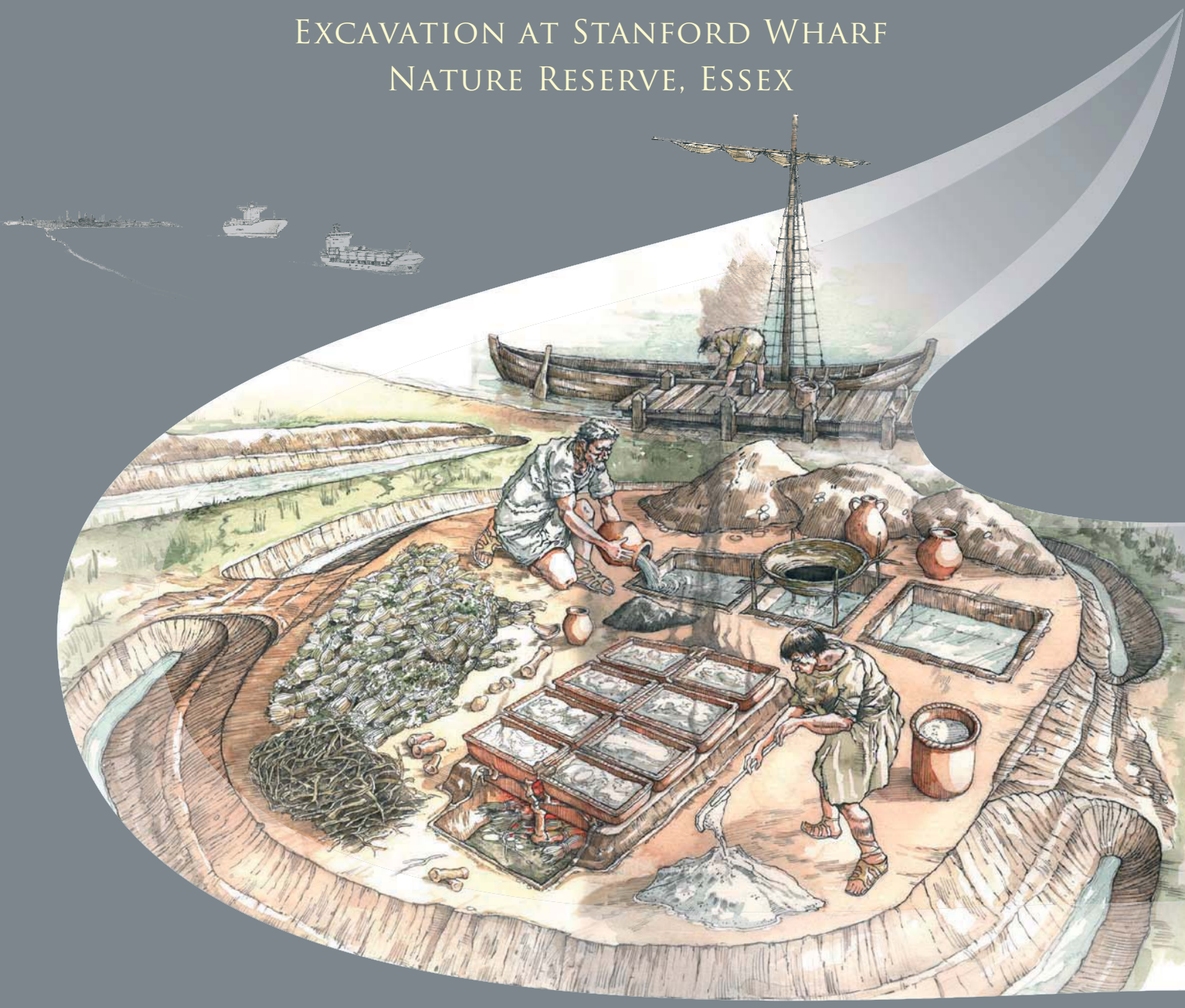
London Gateway

Iron Age and Roman Salt Making in the Thames Estuary

Excavation at Stanford Wharf Nature Reserve, Essex



Specialist Report 8

Briquetage and Fired Clay

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Introduction

Fired clay and briquetage was recovered predominantly from Areas A and B, together with small quantities from Areas C and D. Material was recovered by hand and wet and dry sieving, the latter to address specifically the composition of the 'red hill' deposits. In total, 6891 fragments weighing 344.252kg were recovered, of which approximately three quarters (248kg) has been fully recorded on an Excel spreadsheet, which forms part of the archive. Of the remainder, 22% (76kg) was quantified by context only and scanned during the assessment. A further 6% (21kg) wholly obtained from sieved samples is quantified by contexts though counts were estimated (and fall considerably short for larger groups), but otherwise remains unrecorded.

The preservation of material is inevitably very variable with a high proportion of very small fragments (<1g) obtained from the sieved material compared to pieces up to 750g obtained from hand excavated material. The overall mean fragment weight (MFW) for the assemblage is 5g. Hand excavated material amounted to 20,874 fragments weighing 278,920g (MFW: 13.4g) compared to sieved samples amounting to over 48,107 fragments weighing 65,333g (MFW: 1.4g). Counts for the larger recorded sieved samples were estimated on the basis of a counted and weighed representative sub-sample. Abrasion was generally low to moderate, though fragmentation could be high reflecting the fragility of certain fabrics, especially X1. All quantifications and percentages used for the analysis of the assemblage are based solely on the fully recorded element of the assemblage. Unless otherwise stated, percentages are based on weight.

The assemblage comprises briquetage vessel fragments, hearth or oven furniture, hearth or oven structure and probable fuel debris. Material was recovered from all phases of activity from the early Iron Age to Late Roman, in association with *in situ* hearth structures, deposited in primary and reworked 'red hills' and dumped in a variety features including settling tanks, pits, ditches, channels and other features. Small quantities from later phases are residual. The proportion of the main function

groups is shown in tables 8.1 and 8.2 in relation to fabrics and phase.

The fabrics

Fabrics were characterised with the aid of a x20 hand lens, though the majority of the recorded material was assigned to fabric types on the basis of visible macroscopic characteristics. The fabrics were divided for recording into fired clay (prefixed FC) and briquetage (prefixed X) types, though there is some overlap between the two in terms of usage. The fabrics fall into two broad groups: one used a fine smooth micaceous clay and the other a sandy clay. These appear to derive from clay deposits available on site: the natural alluvial clay and the brickearth deposits. Both groups had varieties with added organic inclusions. A sample was assessed for plant remains by Kath Hunter and the results are summarised in Table 8.3. Many of the impressions could not be more closely identified than monocot, or cereal/grass. The inclusions derived from stem/leaves, chaff, spikelets and seeds of cereals, including spelt and emmer and grasses oat/brome. This is similar to the results obtained from the analysis of plant impressions, apart from the absence of barley in briquetage at sites in Essex and elsewhere (Barford 1995, de Brisay 1978).

Group 1: alluvial clays

This group comprises fabrics X1, X2, FC1 and FC2. Samples were taken of unfired clay from several deposits of the natural alluvium and one from clay lining of settling tank 1316. They were all virtually identical in character, consisting of a dark greyish brown dense clay, sometimes with ferruginous mottles and fine mica present, but rarely other inclusions, though one sample contained fine rounded quartz sand. These clays are indicative of the character of the raw clay that formed the basis for the group1 fabrics.

Fabric X1 had a fine smooth clay as a basis mixed with a high density of voids from coarse chaff temper and was red, orange or brown in colour, sometimes with a lavender hue or with grey-black or brown core. Sherds were examined for plant remains. Fabric X2 was similar but the clay was slightly more silty and contained a lower density of smaller chaff and organic voids.

Fabric FC1 was a fine sandy- silty micaceous clay slightly powdery in some cases and found in a range of colours: buff, pink, purple, pinkish mauve, red, orange,

light orange and grey.

Fabric FC2 had the same range of characteristics as FC1, but was differentiated on the presence of frequent organic inclusions, commonly chaff or chopped straw, but in some varieties the plant remains may have occurred naturally derived from peaty deposits. A sub-type FC2b had a very light soft powdery ashy texture, possibly an effect of using peaty clay resulting in a high proportion of burnt out organic matter. This sub-type was almost always cream or buff in colour, though occasionally with a superficial pinkish tinge. Analysis of the plant impressions indicated the presence of monocot stem/leaf and grass/cereal impressions, charcoal/CPR fragments and indistinct silicified ashy remains confirming the ashy characteristic (Table 8.3).

Group 2: sandy clays or brickearth

This group comprises X3, X5, X6, X7, FC3, FC4 and FC5. The fired clay fabrics FC3-FC5 were all similar with a basic fine sandy-silty clay containing fine-medium rounded–subrounded quartz sand and red ferruginous mottles or grits. They were most commonly fired to red, orange or brown, though a variety of other colours, including pink, cherry, lavender and green, occurred as either the dominant colour or mottles. Fabric FC4 was differentiated by the presence of coarse flint grits up to 12mm, rarely 20mm, and FC5 assigned to only a small number of pieces contained additionally buff-cream clay pellets. Occasionally some organic voids were present.

The briquetage fabrics X3, X5 and X6 were assigned to take account of types identified during the assessment. However, though the types could be separated, the differences do not appear to be significant and many of the larger groups contained a mix of the three. It would seem they represent variations within a single fabric. They were predominantly red and orange in colour, with less common occurrences of brown, grey, pink and lavender, and contained a high density of well sorted medium quartz sand *c* 0.5mm in size, usually rounded-sub-rounded. Fabric X5 was differentiated by the presence of scattered coarse angular white flint grits *c* 1-2mm size and X6 by the presence of very fine organic inclusions, the only deliberately added component of very fine chaff or broken straw.

Fabric X7 was identified in only two records and was brown or orange, containing a high density of coarse white angular grit and sand 1-4mm of quartz and flint.

Form and function

The reporting of fired clay and briquetage from salt working sites has tended to focus on the obvious well-preserved pieces with diagnostic characteristics and distinctive form, while little attention has been paid to the less easily defined items. This analysis has attempted to characterise some of the more enigmatic forms that pervade the assemblage in addition to providing descriptions of the more readily recognisable objects. Where comparisons are made to known forms, this is based on the published literature, not on direct comparison with actual objects.

Briquetage vessels

Briquetage vessels formed 59% (204kg) of the assemblage and were ubiquitous in areas A and B. No complete vessels were recovered and though some joining fragments were found it was difficult to calculate overall size or definitive shape of the containers. Six categories were defined based on general known forms to which material could be assigned during recording and some were refined with sub-types added during recording as different characteristics became apparent.

The vessel forms were V1: cylindrical vessels, V2: flared vessels, V3: rounded bowl shaped vessels, V4: troughs, V5: trays, V6: cone, V7: flat sherds, V8: curved sherds, V9: indeterminate. Types V5 and V6 were not found on the site. A range of rim types (R1-R13) were also defined.

V1: cylindrical vessel or mould

The major characteristics assigned to this type was a cylindrical form with flat base, vertical walls, generally with vertical finger marks on the exterior surface sweeping up from the base. Size could be estimated on a small number of examples: diameters of rims were 250, 300, 350, 370, 440 and 640mm and of bases 130 and 380mm. However, the curvature of some sherds suggests that some vessels may have been oval rather circular in section. Oval or sub-circular evaporating vessels have been found at Funton Marsh, Kent (Miles 1965). The tallest fragment survived to 70mm high, though the impression is that the complete container would have been considerably taller than this. Walls were 10-13mm thick.

The base angle was either a simple right angle or pinched out or thickened

slightly. Rim types associated with this form were type R9a, R8, R10. A cut edge (R13b and c) was also found running parallel to the finger marks and which in the early stages of recording was thought to be the top of a trough of semi-circular section. However, as more material was recorded, examples of this cut edge sliced through the moulded rims at right angles, and so it became clear that these were salt moulds. In most instances the cut edge was only partly sliced into the wall pre-firing (R13b), allowing the vessel walls to be snapped when the salt cake was ready to be removed resulting in a rough broken inner angle. On a number of examples, a second incised line occurred parallel just to one side of the cut edge; it was found sufficiently often to suggest that it was a deliberate feature rather than accidental. A slight variant in the form of the cut edge was the addition of a stab mark from the blade through the full thickness of the wall at intervals (type R13c). This form was fired red-orange and evidence of white salt veneer on the surfaces was absent or rare.

These were all made in fabrics X3, X6, and X3/5/6 and were most prolific in middle Iron Age contexts, as well as occurring in middle and late Roman contexts. The two largest groups were unphased. The quantity of moulds that was being broken up suggests that at least here the salt cakes were removed and not transported in the containers.

V2: flared vessel ('flowerpot' form)

This vessel was circular with flared straight sides, akin to a traditional flower pot in shape. It was only rarely identified, largely on the evidence of base fragments, where the flared character was most apparent. One measured *c* 180mm diameter and had walls 8-10mm thick; two others were *c* 170mm and *c* 250mm in diameter. One with patchy white salt discolouration on both the inside and outside measured 70-80mm diameter and had walls 8-12mm thick. One example from 6150 had walls 12-14mm thick and had an R8 rim with evidence of an R13 cut edge at right angles. If this type was also used as a mould it could be difficult to separate body sherds from V1.

This was made in fabrics X3, X6 and X3/5/6 and was found in middle Iron Age and late Roman contexts.

V3: curved bowl

This type is a rounded curving bowl shaped vessel. Base fragments had a pinched or everted form, sometimes with pie crust effect or knife trimmed into scallops and one

had a pedestal type foot similar to late Iron Age examples from Kelvedon (Rodwell 1988, fig. 68, 5 and 7). Base diameters were 90, 100 and 130mm, while rim diameters were 280, 320, 440 and 560mm. Wall thickness fell into two groups of 7-11 mm and 12-15mm. Rim types associated with this form were R3 and R3 everted, R8, R12, R1, R6 and R9. This form occurred in middle Iron Age made in a mix of fabrics (X2, X1/X2, X2/3, X3, X6, X3/5/6), and late Roman contexts, when it was made in fabrics X1 and X3.

V4: trough

This was sub-divided into three subcategories: V4.1 rectangular profile with vertical sides, V4.2 trapezoidal profile with flared sides and V4.3 with rounded U-shaped profile.

The form of straight sided varieties is based on the evidence of a number of corner fragments which had parts of both base and sides with both vertical and flared walls present. It was impossible to make any estimate of overall size: maximum surviving lengths were in the region of 90-150mm, surviving widths up to 145mm and heights rarely survived more than 70-85mm with only one more at 130mm. Wall thickness was most commonly *c* 10-12mm in the middle Iron Age, but from the early Roman phase there was greater variety with thicker walled vessels in 14-18mm size range with bases up to 25-30mm thick on some. Fabrics X3, X6 and X3/5/6 were used in the Iron Age, but fabric X1 dominated throughout the Roman period, with only a few examples of X3 and one of X2 in these forms. Salt encrustation or veneer was fairly common and occasionally vitrification was present.

During the course of recording it became apparent that many of the groups initially identified as type V4.3 were in fact probably of type V1 especially those associated with R9 type rims. These had diameters of *c* 200, 220 and 260mm, which fall at the lower end of the V1 range. There are some examples with a flat edge cut right through the wall or finger smoothed parallel to the long straight axis and with semi-circular ends luted onto the walls, which appear to be pinched out into a flange to provide a wider surface to attach the ends. These may indeed be troughs, unless some moulds were cut in half entirely before firing and then secured in some other manner to keep the sections of mould together. Without any complete vessels this must remain uncertain. However no examples of moulded rims sliced at right angles were associated with the groups identified as type 4.3. These were found in Roman

and early Roman contexts; most were made in fabric X1 and one example in X3/5/6.

V7: flat body sherds

This category was used for flat body sherds, which were found through all phases and in all fabrics. Though it might be assumed that these would represent troughs of type V4.1 and V4.2, it is possible some could come from V1 or V2 vessels where curvature would be difficult to detect on smaller sherds from larger vessels of this type. They occur in all fabrics and throughout all phases.

V8: Curved sherds

Type V8 was used for curved sherds with subtype V8a used for plano-convex sherds, which usually had longitudinal finger marks along the outside and are likely to be derived from V1or V2 moulds. The distinction between convex and plano-convex sherds was not made in the earlier stages of recording.

Hearth and kiln furniture

Hearth and kiln furniture accounted for 11% (37.3kg) of the assemblage. A range of portable furniture was identified. Some of these have a very clear-cut form, and were clearly prefabricated and possibly fired prior to use, while others are more variable in shape and character being made on the spot as and when required and fired as a result of use.

Pedestals

Pedestal type PD1 was a hand squeezed lump. Four examples were allocated to this category. Two were irregular and sub-oval in form with deep finger depressions, one of which measured 60x42x40mm. Two others were more regular and closer to cylindrical or tapered form. One had a flat end and curving flared surface. Another had a rough plano-convex surface and bevelled back pressed against another surface and measured 102x76x48mm: this was similar to the ‘platforms’ as defined by Morris (2001, fig. 116) from sites in Lincolnshire. A large number of fragments were categorized as hand-squeezed lumps, generally quite irregular in form, which may fall into this category, but could derive from other roughly moulded structural elements, or supports or stabilisers created on an *ad hoc* basis.

Two examples of pedestal type PD2 were found, though rather similar objects

have been found amongst the hand moulded wedges (W2) and pinch props. One was found in a middle Iron Age layer (5960) of red hills deposit in Area A and the second in the upper fill 4319 of a late Roman hearth 4317 in Area B. Both were small hand moulded hour-glass or cylindrical shaped props with one flat or convex surface and one concave. They measured 31 and 35mm wide and one 11-23mm high, the other 16mm. Both were made in a sandy fabric with organic inclusions (FC3veg). This form is similar to some wedges and pinch props, which may all have served similar functions.

Pedestal type PD3/PD16 was fairly common with eleven incomplete examples found and two or three uncertain pieces. These were of plain cylindrical form and all fragments came from the central body of the stem except for a small fragment from the end of a piece. A number of different size ranges appears to be present with diameters of 25, 31, 35, 40 and 45mm in the smaller group, a medium group with diameter or width *c* 70mm, and a large group of 90 and 120mm diameter. The maximum surviving length of the small group is 48mm, of the medium group 120mm and of the large group 105mm. Some had areas of thick cream salt encrustation, while others had just a patchy veneer, or none at all. Most were made in sandy fabrics either X3/6 or FC3/4, which were generally oxidised and fired to a reddish orange colour, with just one each in X1 (fired purple) and FC1, FC2 and FC2b, which were cream, pink or lavender in colour. One of the small group types has part of a splayed sub-rectangular end and one of the large examples was starting to widen at one end, suggesting that these are parts of T-shaped pedestals. Two of the medium size pedestals have an oval (68x72mm) or D-shaped (53x71mm) cross-section, which also suggests a similarity to the T-pedestals (PD16) of the type found at Tollesbury (de Brisay 1979) and Blackwater (Barford 1995).

All were found in Area A, six in primary red hill deposits of middle Iron Age date, and the remainder in middle and late Roman deposits. All size groups occurred in both phases.

Pedestal type PD15: Triangular perforated bricks

Only one certain identification of this form was made, although another fragment may have come from the corner of such an object. The diagnostic piece formed part of the corner split vertically and broken across the perforation, which measured 12mm in diameter. The estimated thickness is 60mm, which puts it at the smaller end of the

range for this type. Though traditionally regarded as loomweights, this function has been questioned (1995), and there is increasing evidence for their use as oven or hearth furniture. Clear evidence for there use as briquetage pedestals was found in excavations at Thanet, Kent, where examples had the distinctive whitened surface typical of salt production around the apex (Poole 2011b).

Pedestal type PD18

This was the most common type identified largely on account of a single group of 14 examples from a late Roman context (4245) dumped in ditch 8539. All were found in area B. Most were made in fabric X1, with a few in intermediate fabric X1/X2, one in X2 and two in X6. The distinctive form was a rectangular tapered bar with a narrow square base end *c* 40-55mm, widening to a rectangular top 56-60 mm by 78-82mm, with a bevelled end sloping in towards the inner face. All the base ends found had been luted into a structure and the surface protected by a layer of clay from excessive heat up to 50mm from the base. The inner face and sides were thickly coated with a greenish-cream salt glaze which was absent from the back (outer) face and the lowest 35-40mm of the foot. It is clear these were set vertically in rows to support the evaporating troughs resting in the gap between the two rows. The sloping ends suggest they held either V4.2 or V4.3 troughs. This type of pedestal has not been identified at other sites, though partial fragments could have been mistaken for firebars.

Pedestal type PD19

This type is represented by a group of three fragments and a fourth possible fragment from a layer (6031), and a fifth from fill 5168 of hearth 5475, both deposits phased to the middle Iron Age. These take the form of tall narrow three-sided pyramidal pedestal with a triangular base and pointed apex. The bases measured from 48-62mm wide and the height was 110 and 125mm. The surfaces were smooth and well finished though shallow longitudinal finger marks were visible on some faces. Angles were sharp, though tended to become more rounded to the base and had sometimes been flattened off. The two surviving apexes were damaged or worn asymmetrically with salt whitened patches around these on some areas of the sides and towards the base. These are clearly pedestals and perhaps functioned in groups of three as a tripod to support a circular vessel during the evaporation process. This type does not appear to

have been recorded at other sites, but may have been identified as a triangular wedge rather than a pedestal. All were made in fabric X3 and were fired to an oxidised orange/red colour. Four objects, all fragmentary, were initially identified as some sort of wedge or firebar of triangular section. They were made in fabrics FC3, FC5 and FC1 and measured from 16-33mm thick, 20-50mm wide and over 60mm long. They were found in early and middle Iron Age and Roman deposits. However, based on the more complete examples all have been allocated to this pedestal type.

Firebars and rods

Thirty-four objects have been identified as firebars and three possibly as rods during analysis. A further 30 objects with both rectangular and circular sections were identified as firebars during the assessment, though these may include pedestal fragments. Firebars would have been used horizontally to span a gap, whilst a pedestal stood vertically as a support. The function of rods in the salt working process is unclear.

Objects identified as rods on Essex salt working sites generally take the form of a roughly hand-moulded bar with a circular section *c* 30mm diameter and up to 180mm long, bearing impressions at their ends of rounded objects (Fawn *et al.* 1990, 14). No certain examples of rods have been found at Stanford Wharf. Three crudely moulded cylindrical fragments with finger marks over the surface may be rods; the more complete measured 28mm in diameter and 32x43mm and over 50mm long. However, these could belong in the generalised category of hand-squeezed lumps (below).

Fragmentary linear objects of circular section could equally derive from pedestals or firebars of cylindrical form or the stems of T-pedestals. No firebars of circular section (FB1) were positively identified and it is thought that most of the fragments of cylindrical form derive from pedestals on this site. Similarly incomplete rectangular sectioned objects are equally difficult to assign with any certainty to pedestal or firebar. Six objects were tentatively identified as rectangular firebars (FB2) and ranged in thickness from 25-40mm and 40-68mm in width; one had evidence of a slight taper, though this characteristic occurs on both firebars and pedestals. One measuring 33x42mm wide and over 55 mm long had a groove 22mm wide formed lengthways probably with finger or thumb on one of its surfaces.

Two objects were identified as tapered bars (FB4) with both circular and

rectangular sections represented. The circular sectioned example was found in a middle Iron Age red hill layer (1300) and the other of rectangular cross-section in a late Roman pit (1249). These may in fact be parts of the triangular and boomerang-shaped firebars (FB6) commonly found on Essex salt working sites. However, only one definite example of the triangular type was found in a late Roman layer (6622), which produced three of the flattened truncated ends 22-29mm wide and over 75mm long. They were made in fabric FC2. Another piece from a late Roman ditch (5099) appears to be the central section of a boomerang-shaped firebar having a more rounded profile and hand moulded surfaces compared to the triangular variety. Both ends were missing; it measured 40mm thick, 62-65mm wide and over 180mm long. This was made in briquetage fabric X1.

Hand-squeezed lumps

Twenty 'hand-squeezed lumps' were identified, of which seven occurred in MIA phased deposits and the remainder in Roman, which included both early and late Roman contexts. These were irregular lumps with finger marks, depressions and grooves in the surface, suggesting they had been squeezed into a lump, but not moulded to a specific shape, though tending to a rough sub-oval form. The more complete examples measured 15-30x30-48x45-80mm. Most were made in fabric FC3, with a small number in FC2b and one each in X1, X3 and FC4. Six were found in area B and the remainder in area A. One was found in the debris of the demolished oven 1406.

Wedges

Three forms of wedges have previously been described for Essex sites: equilateral (W1a), isosceles (W1b) and fan-shaped (W1c). Only the second of these has been recognised in the Stanford Wharf assemblage, though a number of more informal objects roughly moulded (W2) may also have served as wedges.

The isosceles triangle type of wedge were well made with smooth flat surfaces, straight edges and slightly rounded corners and angles. The two triangular faces diverged so that one long edge was wider than the other, resulting in a trapezoidal cross-section. It would appear that the wedges were made to rest on the thicker edge and the evidence of salt whitened areas also indicates this. Ten examples were found, all broken except one, though apparently of very similar size. The

complete example measured 83mm long, 60mm at its widest and 16mm thick. The others widen from 10 to 18mm thick at the pointed end increasing to 28-40mm at the wider end. Maximum surviving width is 77mm and length 112mm. The latter length is estimated to be *c* 150-160mm when complete, though it could be a little longer depending on how acute or rounded the apex was. One of these was found in middle Iron Age red hill deposits (5814). Five were found in early Roman fills in the top of a pit (4821) and ditches (4046, 4208, 4832) in area B, and four were found in late Roman layers (5105, 5140, 6622) of Area A. Two were found in deposits no more closely phased than Roman. The association with middle Iron Age deposits suggests that this type was introduced at this period, though the quantity in Roman deposits may indicate that the form continued to be produced until at least the early Roman phase. These wedges are most common in the south of the county on sites of late Iron Age–early Roman date, with numerous examples from Canvey Island (Fawn *et al.* 1985).

In addition to the standardized triangular wedges a variety of small irregular hand moulded objects with a tapered profile were also found. These were generally made in fabrics FC1 and FC2 and measured *c* 40-46mm long or more, 30-40mm wide and ranged in thickness from 1-10mm at the narrowest edge increasing to 10-25mm at the widest edge. The overall shapes were difficult to define as edges were poorly preserved, though some appeared to be sub-circular or semi-circular discs. The only example made in a sandy fabric (X6/FC3veg) was found in a middle Iron Age deposit in hearth 4575. All the remaining examples were found in Roman levels, predominantly late Roman, in both areas A and B, mostly from ditches, a pit and layers, and one with a whitened surface in kiln 4227.

Plates

Eight examples were identified as fragments of flat plates. All were found in late Roman layers (6622, 6669) apart from one in an early Roman ditch. Most were made in fabric FC2, with others in FC3, X1 and X5. They ranged in thickness from 15-28mm thick, had flat fairly even moulded surfaces and rounded curving edges or straight vertical flat edges. One example had a reduced grey oval patch 80x60mm apparently where it had rested on a pedestal end. It is possible that some of the thicker vessel fragments could in fact be derived from plates, though the impression is that these were infrequent and do not appear to normally occur in the Essex suite of salt

production equipment in contrast to north Kent, where they form a more common accessory at sites such as Springhead (Poole 2011a, 321).

Discs and plaques

Sixteen small discs or plaques and fragments of others were found mainly in middle Iron Age red hill deposits, late Roman deposits and one unphased context. Some were chipped from briquetage vessels (all in sandy fabrics) to form circular discs and square plaques, whilst others were hand moulded in fabric FC2 to sub-circular, oval or sub-rectangular shapes with rounded edges, and sometimes with organic material impressed on one or both faces. Most measured 6-12mm thick and 30-60mm in width/length, though a few were larger up to 24mm thick and 100mm wide. They were probably used as a stabiliser or prop. Such objects do not occur exclusively in association with briquetage, but similar moulded discs occur in association with domestic oven or hearth debris on Iron Age and Roman settlement sites (Cunliffe and Poole 1991, 149; Poole 2011a, 322) but are rarely reported generally.

Miscellaneous supports and stabilisers

A variety of small hand-moulded objects of non-standard form occurred throughout all phases. There is considerable variety in shape, with most probably moulded and pressed into position as wet clay. Some appear to have been used set between the briquetage vessel and a surface – either the hearth floor or pedestal. In addition to the pinch props described below, the small hand moulded wedges (W2), discs and small hour-glass pedestals (PD2) were probably used in the same way. Pinch props and clips may have served the same function. Morris (2001, 370) uses the term clips for the clay used between the rims of adjacent vessels and pinch props is often used to refer to such objects in the literature relating to Essex and Kent briquetage though they may have been used as wedges or stabilisers in a variety of positions (de Brisay 1978, 45).

Pinch props and clips

Pinch props, or packing pieces, have been described for Essex sites as irregular pieces of originally raw lumps of clay that had been pressed against a flat surface and another at an angle suggesting they were pressed into gaps between briquetage components. Ten pieces have been allocated to this category, though the hand-moulded wedges (W2) and PD2 pedestals have much in common, as do the clips. In

many cases the allocation to one category or another is somewhat arbitrary and it is likely that all served a similar function to stabilise the briquetage containers during use. Those categorized as pinch props are pyramidal in form or roughly so and generally fairly small, ranging from 7-29mm high, 20-38mm wide and 25-36mm long except one 54mm long. Apart from one from a middle Iron Age context, all were found in Roman layers and features of all phases, all but one in area A and with the largest number occurring in late Roman deposits.

A small number of clips, about a dozen in number, were identified. These small irregular hand moulded lumps usually had some evidence of one or two curved grooves where the soft clay had been pressed over adjacent vessel rims to stabilize the containers during the evaporation process. They ranged in size from 24-60mm long, 22-50mm wide and 8-30mm thick. The irregularity of these objects makes them difficult to classify though examples similar to types CL3 and CL7 as described by Morris (2001, 370, fig.113) were identified. One type was in the form of a flat plaque with a central ridge on one side, where clay had squeezed between adjacent vessels. They were made predominantly in FC1 and FC2 with an example each in FC3 and X3. Two occurred in middle Iron Age contexts and the remainder in late Roman except for one early Roman context.

Luting

Seventeen records of luting amounting to about 1kg of material were noted. It mostly occurred in fabric FC2, and in lesser quantities of FC1 and FC3. It was not easily distinguished from some of the hearth lining or supports/stabilisers, though some pieces appeared to have been wrapped around another object or had a hollow from the end of an inset object. The clearest evidence for luting came from the base of the PD18 pedestals whose bases had clearly been covered by clay securing them to the hearth floor and protecting them from the brine.

Bellow's guard and plate

A bellow's guard was found in a middle Iron Age pit (6361). It took the form of a curving tubular object with a diameter of *c* 120mm (100mm internally) and a surviving length of 62mm. The walls were 15-18 and 28mm thick. All pieces have a rough moulded surface with greenish grey salt vitrified surface. The general characteristics would be consistent with a tubular bellows guard. A similar example

was found at Danebury, Hampshire (Poole 1984b, 407, fig. 7.49 7.71) in middle Iron Age levels and at Springhead in a mid-Roman pit (Poole 2011a, 322).

A second object from a late Roman feature (4412) took the form of large blocks of fired clay 45-50mm thick from a flat plate. Two corner fragments indicate it was a square or rectangular object with straight flat or slightly bevelled sides. One side is extremely heavily vitrified with thick green glaze. The fired clay shows the typical colour gradation of green vitrified surface → purple-grey → lavender → pink → reddish-orange that is commonly seen in furnace lining. The surviving back face has been less intensely fired and it is possible that the original surface remained unfired and has worn away. These characteristics are typical of bellows plates. Similar items are more commonly found in association with metalworking such as those from Ireland (Scott 1990, 162-8), where it is suggested they were associated with iron smithing and forging and at the late La Tène enclosure at Trégueux, Côtes d'Armor, France (Poole 2012).

Hearth or oven structure

Structural fired clay accounted for 17% (57.7kg) of the assemblage. There are few pieces that are of a distinctive form, and much of the material allocated to this category has a single moulded surface or is amorphous. Generally, the moulded surface is flat and fairly even, though sometimes undulating and on some finger grooves and depressions are visible from shaping the clay. Hearth floor could sometimes be differentiated from walling by the smooth flat surface discoloured white or pale grey to a depth of 5-6mm or more rarely by a green vitrified surface. Green-glazed floor surface was found *in situ* in hearths at Peldon (de Brisay 1978, 35-8). The underside is either a sheared surface or formed a constructional interface, where laid or moulded over another surface – probably in most cases the surface of the construction cut or material on which it was laid. In a few cases pebble or stone impressions are visible. These pieces were 10-53mm thick.

Thin discs of clay 5-15mm thick, rarely up to 22mm with one moulded surface and one pressed over another surface are probably fragments of lining. Some of these have a relatively even back face, suggesting that they were smoothed over the face of pre-existing clay wall. Others have a much more irregular back face sometimes with the appearance of plugging gaps in a surface whilst others have an irregular granular surface that looks as though it represents an organic material. It is possible that these

pieces represent lining over a turf superstructure, though no evidence for turfs has been found amongst the carbonised plant remains. Most of the wall lining occurred in fabrics FC1 and FC2, though occasionally found in one of the sandy fabrics. Wall lining was found in all phases, from middle Iron Age to late Roman.

Only four fragments produced evidence of wattle or small stem impressions, all between 7mm and 11mm diameter apart from a group from context 1415, which produced evidence of 38 wattles ranging in size from 5 to 11 mm with a modal value of 8mm (Fig. 8.1). These wattles are at the lower end of wattle sizes found in association with oven structure, but are comparable to those found at the late La Tène site of Trégueux, France, where there is an indication that flat panels supported on small wattles or stems of similar size may have been associated with salt production (Poole 2012). From the small quantity of structural material of this type it is clear that it was not the norm at this site to use structures supported on a wattle framework. The majority was found in Roman contexts apart from one from a middle Iron Age layer. Better preserved fragments have been found at other sites such as Osea Road (de Fawn et. al. ibid.). It is possible they formed flat panels on which the salt crystals could be dried following the evaporation and crystallisation process.

Waste debris

Small fragments of fired clay of two distinctive types were recovered from a large number of the sieved samples, especially those taken from the red hills layers. All occurred in fabrics FC1 and always coloured pale pink, lavender, cream or greenish cream, although much of it was classified as FC2 during recording on the basis of apparent organic impressions, as these are not deliberately added temper; the fabric should all be regarded as FC1. The mean fragment weight was less than 1g for this debris. One type took the form of thin flat flakes of clay with a cut surface, sometimes on both sides, and sometimes curled as a result of the cutting. They usually measured *c* 20-40mm long by 1-5mm thick. If only one surface was cut the opposite face was usually irregular and uneven with a fine granular structure. The majority had circular stem voids *c* 1-3mm diameter, probably monocot stems, projecting through the cut surfaces. One also had stem and root impressions possibly of grass on the surface. It is uncertain what activity resulted in the formation of these flakes, but a possibility is that they relate to the cutting of blocks of clay or turf and the slivers of clay arise at the uneven interface cut through between the two.

They usually occur in association with the second type of waste debris which are small irregular sub-spherical fragments of fired clay with a granular surface which looks as though it formed around fine organic matter such as roots or perhaps rotted plant remains. The fragments were generally less than 30mm in size and more commonly *c* 5-15mm. These are similar to the lumps of burnt soil that result from the burning the roots of grass or other plants. It was initially thought that these two types of waste debris resulted from the fuel used to heat the brine. However, the carbonized plant remains have produced no evidence for the burning of turf or peat to support this hypothesis. Whether this material could result from the use of turves in oven structures without producing some carbonized plant evidence seems unlikely. The colouring of the fragments suggests a close association with the salt production process and the character of the material suggests some connection with the use of fuel. Some fragments of fuel ash slag were found amongst it and the small fired clay lumps may have arisen in a similar manner.

Small object

A cylindrical spindle whorl was recovered from a middle Iron Age red hill layer. It was barrel shaped in profile measuring 22mm high by 35-40mm diameter and was pierced by a central axial perforation 4.5mm diameter. It was made in fabric FC1.

Site structural evidence

The majority of the briquetage and fired clay was found discarded in features unrelated to its primary use: the breakdown is 48.4kg (5863 fragments) from ditches; 14.9kg (2081 fragments) from pits, 5.7kg (3336frags) from postholes and 163.5kg (33545 fragments) from layers. Only a small proportion came from hearth or oven bases, most of which are of Late Roman date.

Area A

This area produced 239kg of briquetage and fired clay of which *c* 130kg was briquetage vessel, 44kg structural and fuel and 23kg furniture. Furniture included a wide range of forms, including more standardized firebars (FB6, FB7) pedestals (PD4, PD8), and wedges (W1b), which were probably made and fired prior to used, as well as a wide range of roughly moulded supports, stabilisers, pinch props, clips,

wedges, plaques, pedestals, bars and hand-squeezed lumps, which were probably set in position as soft malleable clay and fired during the evaporation or drying process. Structural material comprised hearth or oven floor, wall or lining together with a high proportion of indeterminate material. Briquetage vessels included the full range of types.

Hearth 1484, roundhouse 9501

This structure, dated to the late Roman phase, produced a total of 19kg of briquetage, fired clay and clay samples, which was found in a range of features including the ditches, wall slot and settling tanks. Slightly less than half was briquetage vessel, 0.5kg structural and *c* 100g each of furniture and indeterminate. The rest comprised two large clay samples from the lining of the settling tanks and the hearth 1484. Both samples were alluvial clay, though that from the settling tank was discoloured slightly with a pinkish tinge from fine briquetage dust. The clay from the hearth was superficially burnt and blackened on the surface exposed in the hearth floor or wall, but was not heated to any depth. It is unclear whether this is typical of the whole hearth surface or whether certain areas were more heavily fired. No fired clay or briquetage occurred within the fill of hearth 1484 except a small indeterminate fragment of fired clay.

The briquetage found associated with the circular structure was mostly classified as indeterminate flat and curving sherds, though including some from troughs. The furniture included a pinch prop, hand-squeezed lump and flat plate or slab. The impression is that most, if not all, is residual, redeposited material, rather than primary material derived from the activity within the circular structure.

Kiln 1581, saltern 5808

This late Roman hearth contained 4.7kg of structural material, mostly comprising indeterminate fragments, but including wall lining and a sample of *in situ* clay natural wall. Mixed with this was probable fuel debris. Briquetage vessels (V7, fabric X1) only accounted for 265g.

Hearth 6061, saltern 6090

The only material recovered was a sample of clay from the kiln walls, which had been used as the bedding material for the tile wall structure. Most of it was effectively

unheated with only slight reddening on some pieces.

Other features

Hearth 5245 (Area A), Late Roman 45g: structural (indeterminate)

Hearth 5475 (Area A Redhill 9504), middle Iron Age 3.2kg: vessel (V3, V7, V8); 1.8kg of furniture (FB4a, PD8, PD3, W2)

Hearth 5541 (Area A), unphased 294g: Briquetage vessel (V7); furniture (firebar); structural oven wall and lining, indeterminate

Hearth 5551 (Area A), Late Roman 60g: structural (indeterminate)

Hearth 5918: sparse small indeterminate fragments of fired clay from fill 5946 and 5951 – probably hearth floor.

Area B

This area produced nearly 64kgs of briquetage vessel of which almost all was in organic tempered fabric X1, with less than 500g in the sandy fabrics. Furniture amounted to 13kg and comprised a range of items including pedestals, wedges, firebars, props, clips and miscellaneous stabilisers. The most significant group comprises parts of fourteen pedestals (PD18) dumped in ditch 8539 of late Roman date. Other fragments probably of this type also occurred in ditches 4208 and 8538, tank 4278 and layer 4261. This type of pedestal was only found in Area B and no parallels have been found for this precise design. Three examples of triangular firebars (FB6) with blunt ends and five wedges of type W1b were found. The majority of the early Roman phased material occurred in this area.

Group 4227 (Kiln 4224) was an isolated late Roman feature lying to the southern periphery of the area. It produced 37kgs from the kiln (4224), stokehole (4229) and associated gully (4235); *c* 30kgs consisted of briquetage vessel debris including V1, V3, V4.1, V4.2, V7, and V8, all in fabric X1, and two ceramic discs. Structural material comprised lining and a 5kg sample from subsurface wall. Furniture included wedge, rods, hand squeezed lumps and clips.

A group of three hearths 4317, 4352 (recut as 4361) and 4379 were situated within the bend of channel 8536/8540. All were similar shallow oval hollows and produced only small quantities of fired clay and briquetage or none in the case of 4379. A few fragments (74g) of briquetage vessel, structural material and furniture were recovered from the associated settling tanks.

- Hearth 4317 (Area B) Late Roman 83g: briquetage vessel (V7, V8); structural; furniture (PD2); indeterminate.
- Hearth 4352 (Area B) Late Roman 155g: briquetage vessel (V4, V7), furniture (firebar, hand squeezed lumps), indeterminate.
- Hearth 4361 (Area B) Late Roman 500g: briquetage vessel (V4?, V7); structural oven wall and lining.

Hearths survived as oval or rectangular hollows cut into the natural clay, which retained some evidence of heating, though on the basis of the retained samples, does not appear to have been great (unless the *in situ* fired natural was excavated as a 'layer' and the underlying alluvium sampled rather than the hearth surface). Those with elongated sub-surface flues probably functioned as semi-enclosed hearths with evaporation containers spanning the gap or possibly with fire bars providing a grill for the vessels to sit on. In the late Roman phase two of the structures are circular (4224, 1568), which may reflect changes in the technology, the tile built kiln perhaps a response to the introduction of lead pans, though briquetage containers continued in use. Shallow hearths may represent the open hearth type with vessels supported wholly on pedestals.

Chronological Summary

Early Iron Age

Only one context (1875) of this phase produced any briquetage, amounting to just over 1kg of material and comprising briquetage vessels (V7, V8), which possibly included troughs, a pedestal/firebar (PD19) and hearth or oven wall structure and lining. This group includes none of the forms dated as late Bronze Age-early Iron Age at Mucking (Jones 1977), suggesting that a later phase may be more realistic.

Middle Iron Age

A considerable quantity (94kg) of briquetage and fired clay was assigned to this phase. The majority of the material assigned to this phase derives from red hill deposits, both *in situ* and redeposited. Both type of deposits comprised briquetage vessels, furniture, structural material and fuel debris. However, *in situ* deposits were

composed of about two thirds vessels, compared to nearly three quarters of the material from redeposited material, which contained less than 5% each of the other types. *In situ* deposits contained 18% furniture and 7-8% each for structural and fuel; vessels included type V1, V3 and V4, and furniture included cylindrical pedestals (PD3/PD16), tapered firebars (FB4) and triangular pedestals (PD19). The latter is the only form that occurred exclusively in middle Iron Age deposits. There were much fewer recognisable forms from the redeposited layers, although vessel forms included types V1, V2 and V4, and furniture included a cylindrical pedestal and rectangular sectioned firebar. Fabrics were dominated by the sandy group (X3, X5, X6), with few organic tempered vessels (X1, X2).

There is also *c* 15kg of material from contexts originally phased to the Iron Age, but whose contexts contained Roman tile. It is possible that the tile is intrusive rather than the briquetage and fired clay being residual.

Early Roman

Relatively little material (23kg) was found in early Roman deposits, with briquetage vessels accounting for over half of this. They included, moulds (V1), troughs (V4) and some round vessels (V3) with organic tempered (X1, X2) vessels accounting for the vast majority. Furniture included pedestals (PD18), firebars (FB2, FB6), wedges (W1b) and a variety of hand moulded wedges, pinch, props, plaques, hand-squeezed lumps and pedestals. Structural elements comprised luting, lining, probable fuel debris and indeterminate walling or flooring.

Middle Roman

A very small quantity (5.2kg) of material was assigned to this phase predominantly briquetage vessel in sandy fabrics (X3, X5, X6), plus two pedestals (PD3) and a pinch prop, and a small amount of oven wall and lining.

Late Roman

The late Roman (and undifferentiated Roman) accounted for almost 167kg of briquetage and fired clay. Briquetage vessels accounted for 54%, furniture for about 10% and structural and fuel debris for 21%

Briquetage vessels included troughs (V4), bowls (V3) and moulds (V1, V2). A wide range of rim types were present, though finger impressed (R8, R12) were

frequent, together with rounded rims (R3), flat rims (R1, R6). Cut edges (R13) indicative of split moulds were also common. The organic tempered fabrics X1 and X2 were considerably more common (62kg) than the sandy fabrics (15kg).

Furniture included several pieces of triangular fire bar (FB6), a range of pedestals (PD2, PD3, PD4, PD18), wedges (W1b) and a wide variety of hand moulded supports and stabilisers, including wedges, pinch props, plaques, plates, clips, rods and hand-squeezed lumps.

Structural material was largely indeterminate hearth or oven wall or floor, lining and occasional luting.

Discussion

The assemblage is very coherent with a very uniform range of material throughout all periods, with little to distinguish each phase. The impression is of a long-lived industry undergoing little technological change. At all periods the assemblage divides into more standardised items that were made and fired prior to use, which included all briquetage vessels and selected types of furniture and pieces made on an *ad hoc* basis from the clay, which was roughly shaped and pressed into position, before firing took place during the salt production process. Structural material and furniture of non-standardised form relating to salt production were roughly hand moulded or squeezed to shape to serve as a range of supports and stabilisers, and would have been used just once. The diagnostic fired clay is more typical in character of a native tradition of late Iron Age–early Roman date. By the late Roman period, tile has generally replaced manufactured fired clay objects utilised in conjunction with hearths or ovens, and so in some respects the introduction of a new type of pedestal and the large quantity of material of late Roman date is somewhat surprising, especially in view of the presence of copious tile being used at this stage (Shaffrey, specialist report 9) and that the red hills salt industry in Essex is generally regarded as being of late Iron Age–early Roman date (de Brisay 1975). However, dating at many sites has been difficult in the absence of pottery.

The site phasing and dating has emphasised middle Iron Age and the late Roman as the periods of most intense activity. One might expect these phases to produce significant observable differences. Evidence for the intervening period is of limited activity in the early Roman phase in Area B and minimal activity in the

middle Roman phase. However, the general impression from the overall assemblage was for very little change in the technology. Some of the more standardised items have been analysed in an attempt to characterise the different periods of use and the results are summarised in tables 8.1 and 8.2. Many of the forms were found in both Middle Iron Age and Roman phases, as were the two fabric groups. All the vessel forms were found in both Iron Age and Roman phases, though the cylindrical moulds were most common from the Iron Age deposits. There does appear to be some difference in the preferred fabrics used between the Iron Age and Roman: the organic tempered fabrics dominated in the Roman phase, in contrast to Iron Age when the sandy fabrics were most commonly used. Chaff tempered fabric was the only type found at Roman sites on Canvey Island (Rodwell 1966) and at Springhead, Kent, chaff tempered fabrics was used for 99% of the briquetage dated to late Iron Age to middle Roman (Poole 2011a). The very soft organic fabric FC2b was almost exclusive to the Roman period for structures and furniture. Of the furniture, pedestals of type PD3/PD16 and PD19 were in use during the Iron Age, while pedestals of type PD18, tapered triangular firebars (FB6/4a), plates and triangular isosceles wedges (W1b) are most common or only found in the Roman levels. The firebars and pedestals have been found at sites on the Blackwater Estuary (Barford 1995, figs 109, 112) as have wedges (de Brisay 1978, figs 6-9). Wedges are more common in south Essex with more numerous examples found at Canvey Island (Rodwell 1979).

The closest parallels outside of Essex are, unsurprisingly, across the Thames estuary in Kent (Rodwell 1979), where both briquetage vessels and furniture have similar forms with flared vessels, T-shaped pedestals and pinch props or clips found at Scotney Castle (Barber 1998), and triangular wedges, a tapered firebar and sub-rectangular troughs at Funton Marsh (Miles 1965). Pedestals with splayed or T-shaped ends occur in other areas of Britain and Europe with examples from the Somerset Levels (Rippon fig. 4.3.2 and 4), Dorset (Farrar 1975, fig.8b.18) and Charente Maritime, western France (Daire 2003, 110). Triangular firebars of similar, though not identical, form to type FB6 have been found in Brittany, France, where they were used in conjunction with linear hearths (Daire 2003, 37). Similarly cylindrical and flared moulds and rectangular troughs, with both vertical and flared sides, have been found on many British sites and at a number of salt working sites in France (Daire ibid.) and other areas of coastal and inland NW Europe (Fries-Knoblach, figs7, 21, 46) from the Halstatt to the Roman period.

The conservative character of the material, which shows little change at Stanford Wharf over a period of about 800 years on the present site phasing, may be accounted for by the specialised nature of the industry, with the requirements of the production process dictating the forms, which resulted in similar vessels, furniture and structures arising in separate regions of north-west Europe. Some changes, however, can be detected between the earliest and latest phases. The Iron Age assemblage suggests the use of open hearths with the evaporating vessels supported on cylindrical pedestals with T-ends. The smaller triangular pedestals may have been used for circular vessels. The same equipment may have been used to dry the salt in the moulds, unless an enclosed hearth or oven was used. The structural material suggests some form of simple oven or enclosed hearth was in use, which would allow the moulds to be supported on a suspended floor, and not over direct heat, though evidence for oven plates or suspended floors was lacking among the Iron Age material. It is possible firebars were used, and though a number of objects were identified as firebars, it is impossible to be certain they were firebars rather than pedestals, when only incomplete examples survive. Appropriate objects have been found at other sites (de Brisay 1978, figs 13 and 14.32), such as wattle supported panels, and from Canvey Island a plate with a central opening to hold a vessel encircled by small holes. This is almost identical in design to plates from Danebury, Hampshire (Poole 1984a, fig. 4.77) and an example from Orsett 'Cock' (Carter 1998), which are very similar to the covers of traditional clay stoves from various parts of the world, which have a central opening to hold a pot surrounded by small flue holes (authors private collection). The absence of plates at Stanford Wharf in the Iron Age deposits may be genuine as fragments of plates are present in the Roman period, suggesting that they were introduced at a later date here.

Another introduction in the early Roman phase is the triangular isosceles wedge, which first appears at this time. It is uncertain how it was used, although one reconstruction of them inset into the walls of a linear enclosed hearth seems unlikely. No evidence of luting appeared on any from Stanford Wharf, and they were evenly fired, though salt whitening and wear is most intense at their tips; they are most stable when resting horizontally on their wider edge. However, to account for the wear and whitening pattern at their tips they may have been used wedged at an angle between the vessel and the hearth wall with the tips placed under the everted flanged rims (type R9) of some vessels.

In the late Roman phase, the introduction of the PD18 pedestals suggests a further development took place, possibly indicating the use of larger vessels or a change of shape in the evaporating vessels. They could have been used either with rectangular vessels with flared sides or with large rounded vessels with a convex base or possibly even lead pans. However, briquetage vessels had not gone out of use in the late Roman phase judging by the increase in quantities of briquetage vessel debris. Although there must have been some element of residual material from the earlier red hills cut through by later features, the degree of abrasion does not indicate considerable reworking of material, and much of the softer fired clay fabric such as FC2b would not have survived if not rapidly deposited and buried.

The assemblage exhibits considerable uniformity especially in view of the apparent gaps in production in the late Iron Age and middle Roman periods. These gaps may be apparent rather than real if the local community periodically changed the location of production in a response to other factors, perhaps the availability of fuel or changes in coastal geomorphology. Some hint of this is provided in the concentration of early Roman material in Area B, the main area of production perhaps being further east, as no *in situ* structure of this period was identified. It seems more likely that, rather than there being hiatus in production during the late Iron Age and Middle Roman periods, the local community continued salt production in adjacent coastal areas.

Finally a factor that almost went unnoticed while working on the assemblage was the sheer quantity of briquetage debris, especially the broken discarded vessels. When compared to the average quantity of briquetage recovered from a typical Iron Age or Roman site involved in salt-production around the coast of Britain, it is clear that production at Stanford Wharf was on an industrial scale, which implies a ready market. Though London may appear the obvious choice, an alternative is that the site was in fact supplying salt for the Roman army in Britain.

Catalogue of illustrated briquetage and fired clay (Figs 8.2-8.7)

Vessels (Fig. 8.2)

1. Type V7, ?trough. Fabric X3. Context 1415, middle Iron Age
2. Type V7, ?trough. Fabric X3. Context 5537, middle Iron Age
3. Type V7, ?trough. Fabric X3. Context 5537, middle Iron Age

4. Type V1, V7, V8a, ?mould or trough. Fabric X6. Context 5960, middle Iron Age
5. Type V1, V7, V8a, ?mould or trough. Fabric X6. Context 5960, middle Iron Age
6. Type V1, ?mould. Fabric X6. Context 6014, middle Iron Age
7. Type V1, V7, V8a, mould. Fabric X3/5/6. Context 6028, middle Iron Age
8. Type V1, V7, V8a, mould. Fabric X3/5/6. Context 6028, middle Iron Age
9. Type V1, mould. Fabric X3/6. Context 6031, middle Iron Age
10. Type V4, V1, trough or cylinder. Fabric X3. Context 6150, middle Iron Age
11. Type V4, V1, trough or cylinder. Fabric X3. Context 6150, middle Iron Age
12. Type V4, V1, trough or cylinder. Fabric X3. Context 6150, middle Iron Age
13. Type V4, V1, trough or cylinder. Fabric X3. Context 6150, middle Iron Age
14. Type V3c, bowl. Fabric X1. Context 5434, Iron Age
15. Type V4.1, trough. Fabric X1. Context 1375, late Roman phase 2
16. Type V4.2, trough. Fabric X1. Context 4298, late Roman
17. Type V1, V4, V7, V8a, mould or trough. Fabric X3/6. Context 6083, unphased
18. Type ?V1, mould. Fabric X3. Context 6083, unphased

Pedestals (Fig. 8.3)

19. Type PD3, pedestal. Fabric X3/6. Context 5198, middle Iron Age
20. Type FC2, ?pedestal. Fabric FC3. Context 1782, late Roman phase 1
21. Type PD4/18 or FB3, pedestal or firebar. Fabric X1b. Context 4098, late Roman
22. Type PD18, pedestal. Fabric X1. Context 4245, late Roman
23. Type FC7a/?PD18, pedestal or firebar. Fabric X1/2 or FC2. Context 4225, late Roman
24. Type W1b or PD19, wedge or pedestal. Fabric FC3. Context 5168, middle Iron Age.
25. Type PD19, pedestal. Fabric X3. Context 6031, middle Iron Age

Firebars (Fig. 8.4)

26. Type FB2, firebar. Fabric FC3. Context 6150, middle Iron Age
27. Type FB4a, firebar. Fabric FC1. Context 5168, middle Iron Age
28. Type FB6e, firebar. Fabric X2. Context 4153, late Roman
29. Type FB2, grooved firebar. Fabric FC2b. Context 4828, Roman
30. Type FB6i, firebar. Fabric X1. Context 5102, late Roman phase 2
31. Type PD, pedestal. Fabric FC3/X6. Context 5537, middle Iron Age

Wedges (Fig. 8.5)

32. Type W1b, wedge. Fabric X6. Context 4288, early Roman

33. Type W1b, wedge. Fabric X6. Context 5140, late Roman

34. Type W1b, wedge. Fabric X1. Context 5800, middle Iron Age-late Roman

Miscellaneous furniture (Fig. 8.6)

35. Type V10, plate or lid. Fabric X6. Context 5198, middle Iron Age

36. Type L9, hand-squeezed lump. Fabric X3. Context 6083, unphased

37. Type PPr, pinch prop. Fabric X3. Context 6083, unphased

38. Type PLQ, plaque. Fabric X3/5/6. Context 6028, middle Iron Age

39. Type V7/8, disc. Fabric X3/6. Context 6028, middle Iron Age

40. Type V7/D, disc. Fabric X3/5/6. Context 6138, middle Iron Age

41. Type CL, clip. Fabric FC2b. Context 4824, early Roman

42. Type CL, clip. Fabric X3/6. Context 5842, middle Iron Age

43. Type CL7, clip. Fabric FC1/2. Context 6622, late Iron Age phase 1

44. Type FC1, FC2, L9, luting, disc, plaque or rods. Fabric FC2b. Context 4824, early Roman

Structural briquetage (Fig. 8.7)

45. Type PL, bellows' plate. Fabric X1/FC2. Context 4298, late Roman

46. Type FC1, hearth floor. Fabric FC1. Context 5236, late Roman

47. Type FC7, ?oven wall. Fabric FC1/3. Context 6445, middle Iron Age

48. Type FC1, hearth wall/floor. Fabric FC3/4. Context 5772, Iron Age-Roman

49. Type TFT, LN2, W2, trimmings, lining, or wedge. Context 4544, unphased

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Briquetage and Fired Clay Tables

TABLE 8.1: SUMMARY (BASED OF NUMBER OF RECORDS, NOT COUNT OR WEIGHT) OF DIAGNOSTIC VESSEL FORMS AND FURNITURE BY PHASE.

Forms	Fabrics	IA(most MIA)	ERB	MRB	LRB/RB
V1 mould	Gp B (sandy)	17	0	1	4
V2 mould	Gp B (sandy)	2	0	0	1
V3 bowl	GpA (vegetal)	2	1	0	3
	Gp B (sandy)	6	0	0	5
V4 trough	GpA (vegetal)	0	5	0	27
	Gp B (sandy)	10	0	0	6
Briquetage vessels (all)	GpA (vegetal)	19	40	3	208
	Gp B (sandy)	75	6	9	197
Pedestal PD3/PD16	GpA (vegetal)	2	0	0	2
	Gp B (sandy)	11	0	1	0
Pedestal PD18	GpA (vegetal)	0	0	0	16
Pedestal PD19	Gp B (sandy)	8	0	0	2
Firebar FB6/FB4a	GpA (vegetal)	1	1	0	4
	Gp B (sandy)	0	0	0	1
Plates	GpA (vegetal)	0	0	0	6
	Gp B (sandy)	0	0	0	2
Wedge W1b	GpA (vegetal)	0	4	0	5
	Gp B (sandy)	0	0	0	1

TABLE 8.2: QUANTIFICATION BY PHASE OF MAJOR BRIQUETAGE AND FIRED CLAY GROUPS (EXCLUDING POST-ROMAN AND UNDATED MATERIAL)

Forms	Fabrics	IA(most MIA)	ERB	MRB	LRB/RB
Briquetage vessels	GpA (vegetal)	1031g	9435g	18g	62618g
	Gp B (sandy)	44523g	297g	3414g	14818g
Furniture	GpA (vegetal)	1207g	3313g	3g	10982g
	Gp B (sandy)	9980g	64g	745g	4228g
Structure	GpA (vegetal)	3614g	4153g	138g	25587g
	Gp B (sandy)	4943g	75g	180g	3523g
Structure/fuel/waste	GpA (vegetal)	3313g	442g	0	3870g
	Gp B (sandy)	78g	0	0	0
Briq/FC misc.	~	6802g	444g	500g	15385g

TABLE 8.3: SUMMARY OF PLANT IMPRESSIONS IDENTIFIED IN BRIQUETAGE AND FIRED CLAY FABRICS

Phase	Fabric X1
MIA	Cereal/grass internodes, ?glume base; monocot stem.
ERB	Cereal glumes and silicified remains, spelt, ?emmer; grass stem/leaf, straw, chaff,
MRB	No samples
LRB	Cereal, chaff incl. wheat/oat chaff, spelt, wheat spikelet, glumes, leaf, stem, occasional grass.
	Fabric X2
MIA	Cereal and grass stem/leaf, glume, lemna, palea.
ERB	Wheat glumes, straw internode.
MRB	Grass stem/leaf
LRB	Spelt glume, wheat glume, oat/brome grain, silicified chaff
	Fabric X6
E-MIA	Grass, grass/cereal, monocot stem/leaf, rare floret chaff.
ERB	Cereal, grass, glume, wheat spikelet, floret chaff.
MRB	Cereal/grass stem/leaf; grass seed.
LRB	Grass/cereal, straw internode, wheat glumes, monocot fragments.
	Fabric FC2
MIA	Grass/cereal stem and leaf impressions
ERB	Cereal straw, leaf, internodes, wheat glume bases
MRB	No samples
LRB	Cereal/monocot; possible reed stem/leaf

Figure 8.1: distribution of wattle sizes on structural fired clay from 1415

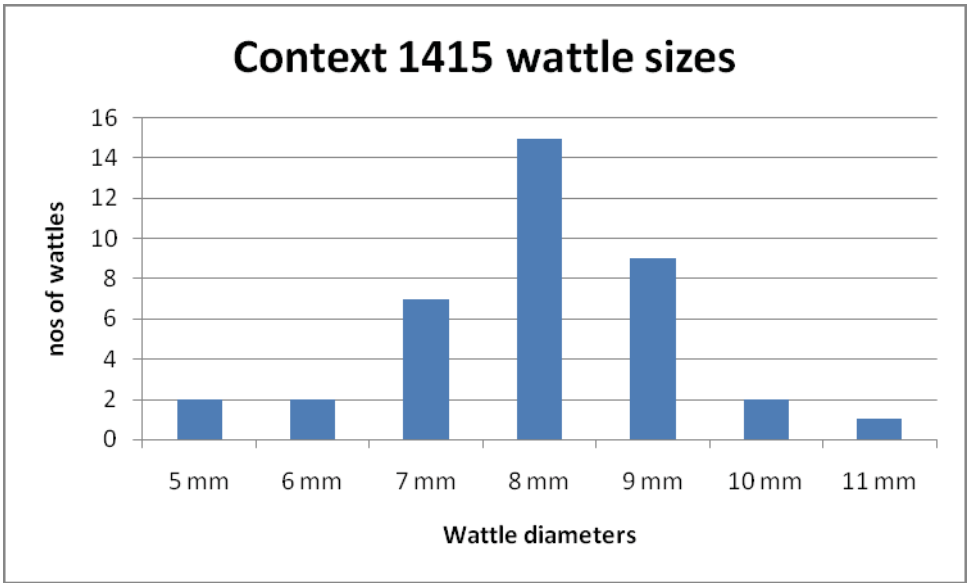

Figure 8.2: Briquetage vessels 1-18

Figure 8.3: Pedestals

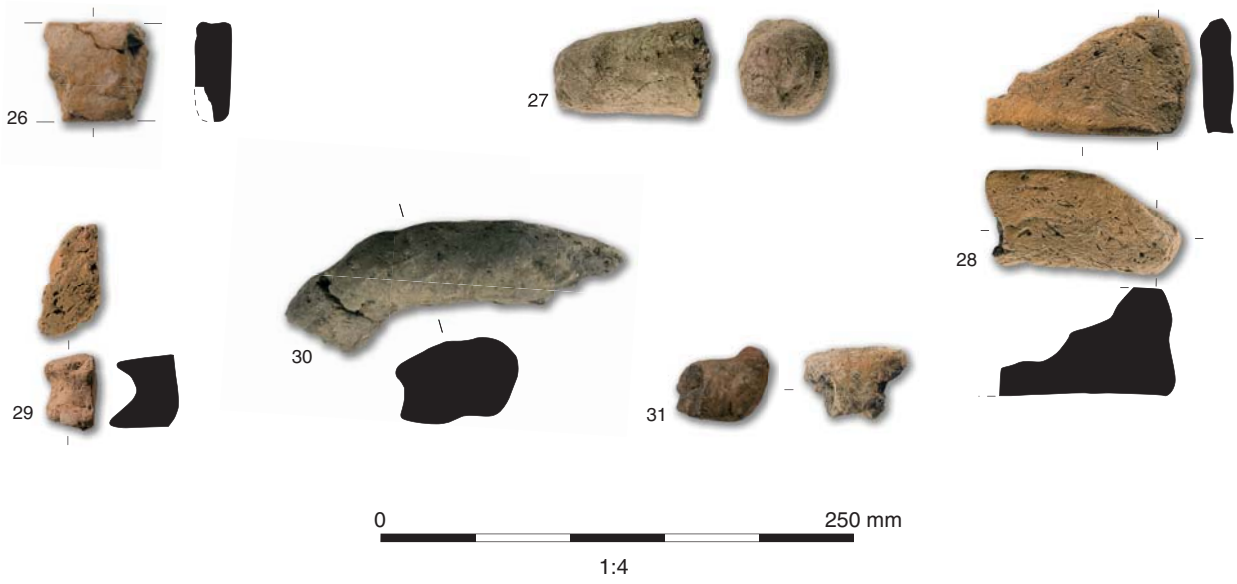

Figure 8.4: Firebars

Figure 8.5: Wedges

Figure 8.6: Miscellaneous furniture

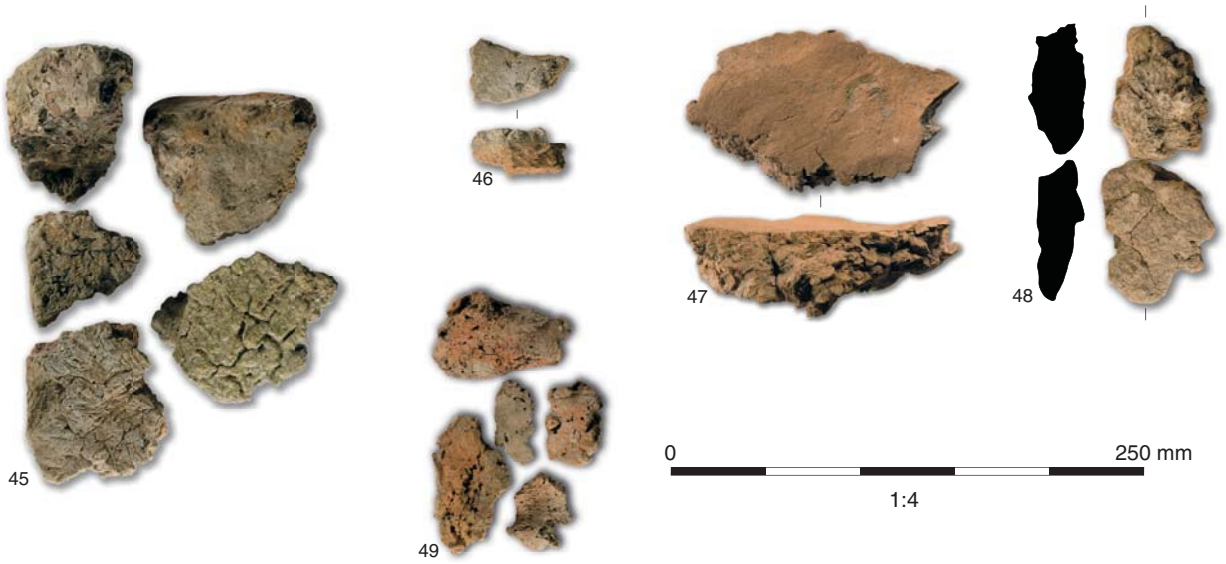

Figure 8.7: Structural briquetage

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