

Archaeological investigations at the Ropetackle site, Shoreham-by-Sea, West Sussex

By Simon Stevens

with contributions from

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Archaeology South-East undertook a programme of archaeological work at Ropetackle, Shoreham-by-Sea, West Sussex between 2000 and 2003. A range of archaeological features were recorded, dating from the Late Iron Age to the post-medieval period, although the majority represented medieval activity. The medieval remains consisted predominately of pits, including cesspits, and wells, which produced substantial assemblages of artefacts and environmental evidence dating to the 13th and 14th centuries. Significant assemblages of local and imported pottery including a near-complete aquamanile were recovered, alongside ceramic building material, stone, metalwork, plant remains, and animal and fish bone. Large assemblages of post-medieval finds were also recovered, including significant groups of 17th- to 19th-century pottery from cesspits in former back yards.

THE POTTERY

THE POST-MEDIEVAL ASSEMBLAGE

Fabric series

English red earthenwares

PM1 – *Fine sandy oxidised earthenware.* A very fine well-fired fabric with dull orange to brown surfaces. Cooking pots/jars predominate. Usually unglazed though some vessels have patches sporadically applied. (Marlipins fabric FSE/O1). C16th–early 17th.

PM2 – *Fine sandy oxidised earthenware.* Only found at Marlipins (FSE/O2). As PM1 but with rare white chalk/shell inclusions to 1mm and harder-fired. Slightly reduced brown/mid grey surfaces. C16th–early 17th.

PM3 – *Fine sandy reduced earthenware.* As PM1 but with notably less sand and deliberately reduced surfaces (light/dark grey). Mainly unglazed jars and pitchers though some have patches of thick green/brown glaze. (Marlipins fabric FSE/R1). C16th–early 17th.

PM4 – *Sparse medium sand-tempered oxidised earthenware.* A fine fabric but with notable sand inclusions. Usually well/hard-fired with dull red/orange surfaces, though some vessels have reduced grey surfaces. A variety of forms, including jars, pipkins and bowls are present. Generally with a thick red, red/green patchy, or green glaze internally with spots/splashes externally. There is a lot of variation in the application of the glaze, probably representing a chronological development as this is a long-lived fabric. (Marlipins fabrics PMR/GBG1 and PMR/GBG2). Early/mid C16th–17th.

PM5 – *Fine oxidised earthenware with sparse white clay inclusions to 1mm.* Only found at Marlipins (PMR/RG1). Medium/well-

fired and oxidised orange. Thick but patchy clear (red) glaze, usually on interior of vessels. C16th–early 17th.

PM6 – *Sparse fine sand-tempered earthenware with rare black iron oxide inclusions.* Usually medium/well-fired with brown or more commonly grey surfaces. A variety of forms, including jars, pipkins and bowls are present. Generally with a thick green/dark green (occasionally with metallic sheen) internal glaze with spots/splashes externally. (Marlipins fabrics PMR/GG1 and PMR/BI G1). Early/mid C16th–mid 17th. Catalogue No. 134

PM7 – *Fine oxidised earthenware with sparse/moderate white clay and rare iron oxide inclusions to 1mm.* As PM5 but harder-fired and with dark green glaze. Only found at Marlipins (PMR/BIG2). Mid C16th–17th.

PM8 – *Red Border Ware with brown all over glaze* (Pearce 1992). Only found at Marlipins (PMR/BG1). Mid C16th–17th.

PM9 – *Fine oxidised earthenware with tan glaze.* Only found at Marlipins (PMR/YG1). Medium-fired and oxidised light orange. Thick internal glaze, generally on quite thin-walled hollow-wares. Mid C16th–17th.

PM10 – *Sparse medium sand-tempered oxidised earthenware.* A fine fabric but with notable sand inclusions and undoubtedly a development of PM4. Usually medium-fired with dull red/orange surfaces. A variety of forms, including jars, pipkins and bowls are present. Generally with a thick and even clear (light to dark brown) glaze internally. Some smaller vessels, such as mugs, are glazed all over. There is a lot of variation in the application of the glaze, probably representing a chronological development as this is a long-lived fabric. Darker glazes appear to be later and the fabric is present in a number of

late 17th to early 18th century contexts at Ropetackle (e.g. contexts [78] and [120]). (Marlipins fabrics PMR/RG2). Later C16th–early/mid 18th.
Catalogue No. 109

PM11 – Fine oxidised earthenware. Medium/well-fired and oxidised light orange. Thick and even internal clear (light/mid red brown) with occasional black flecking. Jars and bowls mainly. C18th–early 19th.
Catalogue Nos. 110, 139, 166 and 206

PM12 – Fine oxidised earthenware with sparse fine sand. As PM11 but with notable sand inclusions and higher-fired than PM10. C18th.
Catalogue Nos. 111–12 and 135

PM13 – Fine oxidised earthenware with sparse white clay inclusions to 0.5mm. Medium/well-fired and oxidised light orange. Thick and even internal clear (light red brown) with occasional black flecking. Jars and bowls mainly. Mid/late C18th.
Catalogue No. 133

PM14 – Fine oxidised earthenware with rare sand and black iron oxide inclusions to 0.5mm. Medium/well-fired and oxidised light orange. Thick and even internal clear glaze (light/mid red brown) with sparse black flecking. Storage jars. Mid/late C18th.

PM15 – Fine oxidised earthenware. As PM14 but with virtually no inclusions. Thick and even internal clear glaze (mid/dark red brown) with moderate black flecking. Large jars mainly. (Marlipins fabric PMR/RG4). Later C18th–19th.
Catalogue Nos. 150, 184–6 and 189

PM16 – Fine oxidised earthenware with sparse black iron oxide inclusions to 1mm. Well/hard-fired and usually oxidised orange. Thick and even internal clear (mid/dark red brown) with moderate black flecking. Large jars and bowls mainly. A development from PM15. C19th.
Catalogue Nos. 167–169 and 187–188

PM17 – Unglazed earthenware with moderate/abundant fine/medium sand. Oxidised orange and medium fired. Mainly flower pots. C19th.
Catalogue Nos. 148–149

PM18 – Unglazed earthenware with occasional iron oxide inclusions. Oxidised orange and well/hard-fired. Mainly flower pots, some with white slip decoration. Later C18th–19th.
Catalogue Nos. 164–165 and 183

PM19 – North Devon Gravel Tempered Ware (MoLSS Fabric NDGT). A hard-fired earthenware tempered with abundant quartz grits to 2mm. This fabric was only found in three contexts at the site, all dated to the mid C18th (contexts [124], [570] and [684]). Green glazed jars/pipkins. C18th.
Catalogue No. 136

PM20 – Staffordshire coarse earthenware with black glaze. Brick red fabric with moderate white and black inclusions to 2mm. Heavy vessels with thick black glaze, sometimes all over. A Midlands/Staffordshire product. C19th.

PM21 – Staffordshire coarse earthenware with black glaze. Brick red fabric with abundant white streaks from poorly mixed clay. Heavy vessels with thick black glaze, sometimes all over. A Midlands/Staffordshire product. C19th.

PM22 – Fine earthenware with black glaze. Brick red to grey fabric with thick all over glossy black glaze. Only found at Marlipins (PMR/BIG 3). Mid C17th–mid 18th.

PM23 – Refined earthenware with black glaze. Very hard-fired brick red fabric with thin all-over glossy black glaze. Thin-walled vessels such as mugs. Staffordshire black glazed ware. C18th.

PM24 – Fine earthenware with matt black glaze. Brick red fabric with thick all-over matt black glaze. Only jars noted. Although in a 19th-century deposit it is likely that this fabric is earlier. Staffordshire. Mid C18th–early 19th.

PM25 – Rockingham hard-fired slightly sandy refined earthenware. Brick red fabric and all-over even brown glaze. Teapots appear to be the most common. Mid C18th–19th.

English slipped redwares

PM26 – Fine red earthenware with trailed slip. White slip under clear (red/brown) glaze. Usually plates. Probably a local product. C17th–18th.
Catalogue No. 113

PM27 – Fine red earthenware with internal white slip, with brown marbling. Fabric similar to PM25. Mainly bowls. The earliest vessels are more refined and thin-walled (context [124], dated mid C18th). Midlands. Closely related to PM28. Mid C18th–mid 19th.
Catalogue Nos. 137, 170–171, 190 and 207

PM28 – Fine red earthenware with sparse white clay inclusions to 0.5mm and internal patchy white slip, glazed green. Only bowls noted. Mid C18th–early/mid 19th.

PM29 – Fine red earthenware with sparse fine sand and thick trailed white slip. Mainly square dishes, glazed dark brown. Sunderland-type slipware. Similar fabric to PM30. C19th.
Catalogue No. 191

PM30 – Fine red earthenware with internal white slip. A later development of PM27 but similar to PM29. Mainly bowls. Midlands, or possibly Sunderland. Late C18th–19th.
Catalogue Nos. 172

English whitewares

PM31 – Border Ware with yellow glaze. (Pearce 1992). (Marlipins fabric PMW/YG2). Mid C16th–17th.

PM32 – Fine sand-tempered whiteware with yellow glaze. Only found at Marlipins (Fabric PMW/YG3). This fabric is a little finer than Border Ware and it is possibly a Graffham copy of it (Aldsworth and Down 1990). Mid/late C16th–17th.

PM33 – Border Ware with green glaze. (Pearce 1992). (Marlipins fabric PMW/GG1). Mid C16th–17th.

PM34 – Border Ware with brown glaze. (Pearce 1992). (Marlipins fabric PMW/BG1). Mid C16th–17th.

PM35 – Verwood-type Ware. (Copland-Griffiths 1989; Young 1979). An off-white to buff fine sand tempered medium fired fabric with internal, brown streaked, dull green glaze. Similar wares have been located in Lewes. C17th–mid 18th. Catalogue No. 114

PM36 – Verwood Ware. (Copland-Griffiths 1989; Young 1979). An off-white to buff fine sand-tempered medium/hard-fired fabric with sparse black iron oxide inclusions to 0.5mm. Internal, brown streaked, dull green glaze. C17th–mid 18th.

PM37 – Sparse very fine sand-tempered whiteware with moderate black iron oxide inclusions to 1mm. Only found at Marlipins (Fabric PMW/BG2). Although similar to some German whitewares the source of this fabric could be from the West Country. Mid/late C16th–17th.

PM38 – Staffordshire buff ware with white and red streaks. Medium-fired with a thick all-over dark brown glaze. Only found at Marlipins (Fabric PMW/BG3). Later C17th–18th.

PM39 a–c – Staffordshire buff slipwares. Medium/well-fired slightly sandy buff earthenwares with a variety of slip decorations: a) combed slip (PM39a), b) internal white slip with lines of raised white slip creating a pattern/design infilled with red (glazing brown) slip (PM39b) and c) internal white slip with red slip (glazing brown) mottling/streaking under the glaze (PM39c). Only bowls and plates present. Mid/late C17th–mid/late 18th. Catalogue No. 115

PM40 – Staffordshire red slipped whiteware. A hard-fired refined earthenware with internal red slip (glazed black) with white trailed slip decoration. Small bowls only. Mid/late C18th. Catalogue Nos. 116–17

PM41 – Agate Ware. A hard-fired refined earthenware with a mixed buff/ref fabric and all-over even glaze giving marbling effect. Mid/late C18th.

PM42 – Refined white earthenware with rich brown glaze. Hard-fired. Mainly teapots. A Staffordshire product. (PM: WWB 4). Late C18th–19th.

English tin-glazed earthenware

PM43 – External lead glaze with internal white tin-glaze. Decorated with blue designs. (Marlipins fabric TGW 1). Late C16th–mid 17th.

PM44 – All-over white tin glaze with no decoration. (Marlipins fabric TGW 3). C17th–early 18th.

PM45 – As PM44 but with blue/yellow/purple painted decoration. Only at Marlipins (Fabric TGW 2). C17th–early 18th.

PM46 – All-over blue-tinged tin-glaze with no decoration. Late C17th–late 18th.

PM47 a–b – All-over blue-tinged tin-glaze with blue painted decoration (PM47a) and similar but with certain areas of the blue decoration having a gold sheen over them (PM47b). This may well be due to degrading of the blue pigment in certain contexts, though it is not universal on all blue decoration on

a particular vessel. Late C17th–late 18th. Catalogue Nos. 118–123

PM48 – All-over blue-tinged tin-glaze with polychrome painted decoration. Late C17th–late 18th.

English stoneware

(see also PM 62)

PM49 – London stoneware (early). (Green 1999). Late C17th–late 18th.

Catalogue Nos. 124 and 182

PM50 – Scratch Blue. (Jennings 1981). Staffordshire. Early to late C18th.

PM51 a–b – Staffordshire white salt-glazed stoneware. Plain wares (PM51a) dominate the assemblage and include a number of dinner plates, bowls, jugs and chamber pots. The iron-dipped variety (PM51b), usually occurring as mugs, is far scarcer. Early–late C18th.

Catalogue Nos. 125–130 and 140

PM52 – Basaltes (unglazed). (Gunson 1982). A few decorated teapot sherds are present. Later C18th–19th.

PM53 – Basaltes (glazed). (Gunson 1982). A few decorated teapot sherds are present, all from C19th contexts. Later C18th–19th.

PM54 a–b – Nottingham Stoneware. (Lockett 1982). Two variants are present. The first has a granular buff fabric with matt brown salt glaze (PM54a) while the other has a harder grey body with glossy brown salt glaze. (PM54b). The latter, which is decorated with incised stamps and rouletting, is probably a later product. C18th–early 19th.

PM55 a–f – Late English Stoneware. (see also PM62). Six variants are present. A clean buff to grey fabric with thin/thick salt glaze, usually with an iron wash (PM55a); a more granular buff to grey fabric with 'Bristol-type' glaze (PM55b), an off-white clean fabric with smooth/lead glaze (PM55c); blue stoneware (PM55d) sometimes with relief decoration highlighted in silver lustre; an off-white fine fabric with a Bristol glaze (PM55e) and a fine off-white fabric but with salt-glaze (PM55f). Blacking pots, ginger beer bottles, jars and ink pots are the most common vessel types. Late C18th–19th. Catalogue Nos. 160–162, 181, 198–205 and 211–12

PM56 – White feldspathic glazed stoneware. A white vase, decorated with foliage in relief under a thin glaze externally and with smooth thick internal glaze, and a cylindrical mug, with hunting scenes in white sprigged decoration over a blue washed body, were located in 19th-century contexts. C19th.

English industrialised wares

PM57 a–c – English Porcelain. The earliest material in this group (PM57a) consists of mid/late C18th material with blue painted decoration in Chinese style. The remaining two groups are of late C18th to 19th date and consist of lustre decorated vessels (PM57b) and a miscellaneous group of either plain, coloured, transfer-printed and occasionally sprigged decoration (PM57c). The vast majority of vessels are 'tea wares'.

PM58 a-e – Creamware. There are five sub-divisions of this group: plain creamware (PM58a), overglaze black transfer-printed (PM58b), coloured with green/brown (PM58c), with lustre decoration (PM58d) and industrial slip (PM58e). A variety of forms are present but plates and bowls are the most common. Mid C18th–early 19th. Catalogue Nos. 141–145

PM59 a-i – Pearlware. There are nine sub-divisions of this group: plain pearlware, often with blue shell-edge decoration on plates (PM59a), hand-painted blue/polychrome underglaze decoration (PM59b), underglaze black/brown transfer-printed (PM59c), blue underglaze transfer-printed decoration (PM59d), red/purple/green underglaze transfer-printed decoration (PM59e), lustre decorated (PM59f), flow blue (PM59g), sponged/marbled decoration usually in blue or purple (PM59h) and industrial slipware (PM59i). A variety of forms are present including side/dinner plates, ‘tea wares’; bowls and chamber pots are the most common. Later C18th–19th. Catalogue No. 146

PM60 – Industrial slipware (refined white earthenware type). This group contains non-creamware/pearlware vessels with industrial slip decoration. A range of mugs and measure jugs are present with mocha and ‘wormed’ slip decoration. C19th.

PM61 – Plain refined white earthenware. White ‘china’. Occasionally with coloured lines around rims of vessels. Mainly plates, jars and chamber pots. C19th. Catalogue No. 197

PM62 – Plain low-fired white/buff stoneware with moulded relief or sprigged decoration. One jug was recovered with a scene of Robinson Crusoe in relief but vessels usually consist of hunting jugs, some with brown-glazed uppers to the vessel with white-sprigged decoration. C19th.

PM63a-b – Hand-painted refined white earthenware. White refined earthenware with usually sparsely spaced floral decoration in various colours (PM63a) and with decoration in relief overpainted in green/red, etc. (PM63b). Mainly ‘tea wares’. C19th.

PM64 – Coloured refined white earthenware. White refined earthenware glazed, one of a number of colours such as yellow. Mainly cups/mugs. C19th.

PM65 – Refined redware with copper/gold lustre glaze. The fabric is similar to PM30 and a similar Midlands source is likely. Some vessels have a rich brown glaze on the exterior. No recognised forms. C19th.

PM66 – Refined buffware with internal white slip and hand-painted lustre decoration on the exterior. Only a single jug was recovered in context [649]. C19th.

PM67 a-h – Transfer-printed refined white earthenware. There are eight sub-divisions of this group based on the colour/type of decoration: Black (PM67a), Brown (PM67b), Blue (PM67c), Red (PM67d), Green (PM67e), Purple (PM67f), polychrome (PM67g) and sponged/marbled (PM67h). The latter usually consists of blue coloured sponged decoration, though brown,

black, green and purple are also present. A wide variety of forms are present including side/dinner plates, ‘tea wares’, bowls and chamber pots. C19th.

PM68 a-b – Yellow Ware. This fabric makes up a large part of the early/mid C19th kitchen wares. Baking dishes and bowls are common, as are jugs and chamber pots. Mocha decoration in blue, green, black and brown is common, as are plain coloured horizontal lines (PM68a). Some mixing bowls, usually with slight moulded decoration on their exterior, have a white internal slip glazing very pale blue (PM68b). Late C18th–19th (though PM68b goes into the C20th). Catalogue Nos. 147, 151–159, 173–180, 192–196 and 208–210

Imported post-medieval wares

IMP 1 – Dutch Redware – A medium-fired red earthenware with moderate fine/medium sand tempering and rich thick clear (red) glaze. (Marlipins fabric PMR/RG3). Only a few sherds are present, probably from cauldrons (context [431], dated mid C16th). These wares formed a much larger proportion of the assemblage at Winchelsea and Camber (Orton 2004; Whittingham 2001) though the paucity of C16th contexts at the current site does not allow a reliable comparison. C16th.

IMP 2 – Beauvais Green glazed Whiteware. (Hurst *et al.* 1986). A virtually untempered whiteware with rich bright green glaze. Also found at Camber (Whittingham 2001). Only part of a handled bowl was located (residual in context [124]). C16th. Catalogue No. 108

IMP 3 – ?German Whiteware. (Hurst *et al.* 1986). A well-fired fabric with moderate fine/medium well-sorted sand tempering. Rich dark green. Only one unstratified sherd was recovered (Area 4c). Mid C16th–early 17th.

IMP 4 – ?German Whiteware. A similar fabric to IMP3 but with either no or pale yellow glaze. Only found at Marlipins (PMW/YG1). Mid C16th–early 17th.

IMP 5 – Raeren stoneware. (Gaimster 1997). Late C15th–mid 16th.

IMP 6 – Langewerhe stoneware. (Gaimster 1997). Mid/late C15th–early/mid 16th.

IMP 7 – Cologne/Frechen stoneware. (Gaimster 1997). Mid C16th–17th.

IMP 8 – ?Aachen stoneware. (Gaimster 1997). A buff coloured stoneware. Only found at Marlipins and grouped under Cologne/Frechen. Mid/late C16th.

IMP 9 – Westerwald stoneware. (Gaimster 1997). Both vessels decorated with cobalt blue and manganese purple are present but are scarce. Late C16th–early/mid 18th.

IMP 10 – ?Late Frechen stoneware. An off-white/buff granular stoneware with light brown iron wash under thin salt glaze on exterior. Found in Context [124] (dated mid C18th). C18th.

IMP 11 – ?Late Frechen stoneware. A buff/pink granular/sandy low-fired stoneware with mid brown mottled iron wash under salt glaze on exterior. Found in Context [124] (dated mid C18th). C18th.

IMP 12 – ?Late German stoneware. A buff/pink low-fired granular fabric with thin and patchy salt glaze on exterior. Found in context [124] (dated mid C18th). C18th. Catalogue No. 138

IMP 13 – Late German stoneware. From Seltzer bottles. C19th. Catalogue No. 163

IMP 14 – Buff earthenware with matt red colour coat. A German moulded slipware. The only sherd present is a lid decorated in relief with a German Imperial eagle motif. Found in context [644] (dated mid C19th). C19th.

IMP 15 – Spanish white-slipped and green-glazed olive jar. A notably coarse low/medium-fired fabric. Only found at Marlipins (green glazed coarseware). Late C16th–17th.

IMP 16 – Spanish Lustreware. (Hurst *et al.* 1986). Only found at Marlipins (TGW lust). Late C15th–16th.

IMP17 – ?Martabani-type jar. (Hurst *et al.* 1986, 11). A low-fired white stoneware with purple/brown glaze. A single sherd was recovered from context [655] (dated later C18th). Possibly the result of East India Company trade. Asia/Burma. C18th.

IMP18 – Chinese Porcelain with blue painted underglaze decoration. Small quantities were found in mid C18th–mid C19th contexts. C18th–19th.

IMP19 – Chinese Porcelain with red/gold painted overglaze decoration. Small quantities were found in C19th contexts (e.g. context [649]). C18th–19th. Catalogue No. 132

THE CERAMIC BUILDING MATERIAL

by Susan Pringle

Introduction

A total of 2358 items of building material weighing 165,645g was recorded, all of which was from medieval and post-medieval deposits. A summary quantification by material and chronological period is set out in Table 17.

Methodology

All the available building material has been quantified by form, fabric, fragment count and weight. Where the form was not identifiable, fired ceramics have been recorded as 'tile'. Records have been entered on an Excel spreadsheet. The retention and discard policy adopted is that set out in the

Guidelines of the Society of Museum Archaeologists (1993). Fabrics have been examined with a binocular microscope at x10 magnification. In the absence of a fabric type series the material has been dated by form and typological characteristics with reference to the site phasing and the pottery dates. It had been hoped to base the analysis of the tile from Ropetackle on the building materials type series from the Marlipins site in Shoreham (Barber 2005b), thus forming the basis of a medieval and post-medieval ceramic building material fabric type series for the town. However, as the fabric samples from Marlipins are currently unavailable for study, the fabric type series for the building materials from Ropetackle has been compiled without direct comparison with them. Where appropriate, fabrics have been referenced to the Museum of London (MoL) type series for tile fabrics.

The material

The Roman assemblage

No securely identified Roman tile was recorded, but abraded brick and tile that may have been of Roman date was noted in the fills of post-medieval pits [302], [328] and [652], and well [388]. Worn 'pebbled' tile came from pits [302], [423] and [428].

The medieval assemblage

The medieval deposits are dominated by roof tiles. Peg tiles (plain tile) are the most abundant tile type, although a few nib tiles are present, as well as small quantities of hip and ridge tiles. Notable finds from the site are the assemblage of 13th century chimneys and a green-glazed louver, probably dating to the 14th century. Also of interest are imported medieval Flemish bricks and a 'Dieppe group' decorated floor tile of late 14th or early 15th century date, which are residual in post-medieval deposits.

The earliest medieval building material on the site is represented by several fragmentary chimneys from pits [312], [362] and [505], all in Area A and dated by pottery to the first half of the 13th century (Fig. 41, T1–T6). There is no roof tile in these pit fills; buildings of this period would have been roofed with either stone or thatch. The first deposits of roof tile occur in the later 13th century, mostly in pits [156] and [440] on Area 4A and pits [32], [540] and [665] on Area 4B.

Virtually all the tiles of this period have distinctly sandy fabrics. Six groups of sandy fabrics have been identified based on the size and frequency of the quartz sand temper. The coarsest of these are fabric 1, which accounts for 38% (by weight) of the tile in this phase, fabric 13 (11%), which also contains coarse flint and shell, and fabric 7 (2%) which has numerous very coarse siltstone fragments. Fabrics 3 (15%)

Table 17. Quantification of the building materials by material, weight and count. * This percentage is distorted by the decayed and crumbled condition of much of the mortar.

Material	Weight	% of total weight	Count	% of total count
Medieval roof tile	42,609g	26%	777	33%
Post-medieval roof tile	41,354g	25%	431	18%
Medieval/post-medieval brick	71,837g	43%	581	25%
Undated brick and tile	28g	2%	150	6%
Floor tile	2110g	1%	5	<1%
Plaster, mortar and concrete	4887g	3%	414*	18%*
Totals	165,645g	100%	2358	100%

and 5 (3%) reflect a similar geology to fabric 1, but contain respectively fine and medium grade quartz. Fabric 2, second most abundant at 27%, contains a black gritty sand not seen in the other three fabrics and is thus likely to have been made from clay from a different source. Also from another clay source is fabric 4 (<1%), an orange-red fabric with white calcareous inclusions which occurs as small amounts of abraded tile in every phase but is probably a medieval type.

The tile types present on the site from this period, the later 13th and 14th centuries, are peg and ridge tiles. All the peg tiles are similar in appearance, with two round nail-holes and glaze on the lower part of the tile (glaze not recorded for fabrics 7 and 13), although there is a group of fragments, most of which come from the fill of pit [440], which may have a single nail-hole. Another unusual tile fragment in fabric 3 has a nib placed only 25mm from the corner of the tile. This is a feature sometimes seen in tiles which have both a nib and a nail-hole (Lewis 1987, 8–9, Fig. 2) (Fig. 42, T8).

Although none of these tiles can be directly linked to 13th or early 14th century buildings, there is some evidence of patterning in their distribution. Tiles in fabric 1 are most abundant on Area 4a, where they account for 46% (by weight) of the peg tile fabrics, with lesser quantities of fabrics 13, 3 and 5, and fabric 2 accounting for less than 2%. On Area 4b, however, fabric 2 predominates, accounting for 80% of the peg tile assemblage by weight, with small quantities of fabrics 1 and 5. Patterning is also visible in the distribution of chimney fragments in Phase 3 deposits, where they occur in association with tiles in fabric 2, clustering in pits [32], [222], [246] and [540]. Of these, only pit [32] also contains tile in fabric 1.

Conversely, an elaborate green-glazed louver in fabric 1 (Fig. 42, T7) was found in pit [156], which contained other fabric 1 roof tile but none in fabric 2. We do not have a complete profile, the rim and top not having survived, but sufficient survives to show that it is a Dunning type 1 louver which would have fitted into a circular hole in the roof (Dunning 1972). The lowest part would have had four semicircular cut-outs below a horizontal band of thumbled decoration. Above are four tall hooded openings with, on the shoulder, four smaller ovoid hooded apertures offset over them; the remainder is missing. The louver has features in common with Dunning's type specimen from Great Easton, Essex (Hurman & Nenck 2000, Fig. 10, no. 21). The type is 14th century.

The contents of these pits appears to reflect a variety of the tile types used on higher status buildings on or close to the site in the later 13th and 14th centuries.

The Transitional assemblage

The late medieval period is represented by the contents of a single pit, [99], which contained very little material other than peg tile in fabric 5 and what may be a fragment of Roman tile. The later medieval and early post-medieval tile types are probably best seen in pits [55], [119] and [423] (Area 4A) and [681] (Area 4B).

A change in roof tile fabric types is evident between c. AD 1400 and 1500. The early sandy fabrics in these deposits have almost disappeared and are replaced by new orange or orange-red fabrics. Fabric 6 is a finer version of fabric 7 with quartz sand and blocky siltstone inclusions. Fabric 8 is fine in texture with cream banding and a scatter of coarse white chalk inclusions. Again, there is some patterning in the distribution, with fabrics 6 and 7 occurring mainly on Area 4a and fabric 8 mainly on 4b. Peg tiles occur in all

these fabrics, and ridge tiles in fabrics 6 and 7, including a crested ridge in fabric 6 from the fill of pit [423]; no glaze was noted (Fig. 42, T9). Also from Phase 5 deposits is a very worn two-colour decorated floor tile of the 'Dieppe group', imported from Normandy in the late 14th or early 15th century, probably between 1375 and 1405 (Fig. 42, T10). The heraldic design shows three lions couchant, and the tile is of particular interest because neither of the examples of this design cited by Norton, from museum collections in France and London, has a provenance (Norton 1993, 87–9, Fig. 2, no. 7). It may have been re-used, its original location a church or other ecclesiastical building.

The post-medieval assemblage: introduction

The post-medieval period on the site is characterised by relatively large quantities of bricks, which form approximately 60% of the assemblage by weight (50% by fragment count). The fabrics of most of the post-medieval peg tiles are hard, having been fired at higher temperatures than the medieval tiles, and the round nail-holes of the early tiles have mostly been replaced by square holes, often set diagonally. Pantiles, imported initially from the Low Countries, are introduced in the 17th century.

The early post-medieval assemblage

Most of the building material comes from Area 4A, most of it from pits [117], [123], [165], [328] and [388]. The most abundant peg tile fabric at this period is fabric 12, which seems to be a slightly finer and more highly-fired version of fabric 7 and probably exploits the same clay source. The pantiles, which first appear in this period, are predominantly (98% by weight) in fabric 11, an orange fabric with some medium quartz and cream silty streaks. Most of these are from pits [123] and [83]. The remainder of the pantiles are in lighter orange fabric 10.

The late post-medieval assemblage

The later post-medieval building material comes mainly from pits [83], [315] and [355] on Area 4a and pits [565], [642] and [652], and from the sawpit on Area 4b. Peg tile fabrics are 9, 10 (in Area 4A), 11 (in Area 4B), 12 and 14. These last two fabrics often occur together as, for example, in pits [355] and [387] and from the saw-pit, which suggests that the tiles once roofed red brick buildings.

The late post-medieval features contain pantiles in a greater variety of fabrics than is seen in the earlier post-medieval phase: fabrics 9, 10, 11 and 14 from Area 4a, fabrics 12 (pit [652]) and 14 (pits [642]) and from the saw-pit in Area 4b. On Area 4a, there is an association between bricks in fabric B3 and pantiles in fabric 11 in pit [83], and between bricks in B3 and peg tile in fabrics 12 and 14 in pits [315] and [355]. On Area 4B, pit [652] contains brick in fabric B3 and peg and pantile in fabric 12. The saw-pit contains brick in B3 and peg tile in fabric 12. This may also represent individual building assemblages. Peg and pantiles may have been used on the same buildings, the peg tiles to roof the main building and the pantiles for roofing ancillary structures such as sheds, workshops or privies.

The bricks

Of the 580 bricks recorded, all are fragmentary and only six are from structural features. The earliest types present are the small Flanders bricks which were being imported for

the construction of various ancillary domestic or industrial structures such as hearths, vats and paving from the late 14th to the mid 16th century. These occur on Area 4A, mainly in pit [328] where they are probably residual (MoL fabrics 3031, 3208). A slightly later Flemish type, a small hard-fired yellow brick known as a 'clinker' and imported in some numbers in the 17th and early 18th centuries, is unstratified in Area 4A (MoL fabric 3036).

The majority of the bricks are in either red or orange clays. Red clay bricks account for approximately 80% by weight of the Period 5 and Period 6 brick, with orange bricks at approximately 10% and 20% respectively.

The most common red fabric has a fine sandy matrix with variable amounts of calcium carbonate (fabric B3). A less abundant version has more medium quartz, which gives it a sandy feel (B6). The orange fabrics have inclusions of cream clay or siltstone and dark red or brown iron-rich material. The finer version is smooth with cream banding (B5); the coarser has blocky inclusions and moderate medium to coarse quartz (B4).

Within these categories, fine orange fabric B5 and sandy red fabric B6 are relatively more common in Period 5 than Period 6, and may be slightly earlier in date than fabrics B3 and B4. Evidence of indented margins, a feature not usually seen after the end of the 17th century, on bricks in fabrics B5 and B6 supports an early post-medieval date for their manufacture. The types occur together on site 4A ([23], [83], [119], [165], [175] and [328]), which may also be evidence of contemporaneity. Red bricks in B3 dating to the late 18th/early 19th centuries are typically well-made with sharp arrises (edges). Bricks of this type from pit [652] were noted with worn surfaces indicating they had at some time been used as paving.

Of the few bricks which can be related to structures, those from masonry feature [389] are in fabric B3 and, with a thickness of 60mm, probably date to the 18th or early 19th century. The vitrified brick from well [385] is probably also fabric B3; a thickness of 65mm suggests a similar date. The brick from cesspit 648 on Area 4b has a light-yellow fabric with specks of orange clay and some carbonised inclusions not seen elsewhere on the site. At 108mm wide and 65mm thick, with what looks like a very shallow frog, this probably dates to the later 18th century.

Roof-tile fabrics

In the following fabric descriptions, the dates are conjectural and are based on the pottery dates of the features in which they appear. In the fabric descriptions the following conventions are used. The frequency of inclusions is described as sparse, moderate, common or abundant; the size categories for inclusions are fine (up to 0.25 mm), medium (between 0.25 and 0.5 mm), coarse (between 0.5 and 1 mm) and very coarse (greater than 1 mm). Samples of the fabrics have been retained.

Chimneys

The chimney fabrics have been divided into three broad groups according to their salient characteristics. Group A fabrics contain fine quartz as well as some flint and calcareous material; Group B fabrics contain coarser quartz and pellets of iron-rich clay; Group C fabrics are characterised by coarse quartz, flint and calcium carbonate inclusions. The fabrics in Group A are closely similar and probably from one source; the textural differences in the fabrics within groups B and C suggest that several sources may be represented.

1. Curved profile; plain top, sooted, c. 111mm diam., hole 33mm diam; base missing; vertical thumb-pressed strip. Fragmentary. Fabric A. [362]. Pit [313]. Fig. 41, T1
2. Curved profile; top, sooted, 125–135mm diam., hole c. 45mm diam., with two concentric stabbed circles. Fragmentary. Fabric A. [309]. Pit [335]. Fig. 41, T2
3. Curved profile; coarse stabbing on top (sooted); two diagonal thumb-pressed strips on body. Fragmentary. Fabric A. [350]. Pit [246]. Fig. 41, T3
4. Body sherd, no features. Fragmentary. Fabric A. [33]. Pit [32]. Not illustrated
5. Curved profile, top damaged, most of outer edge missing. Sooted. Fragmentary. Fabric B. [521]. Pit [505]. Fig. 41, T4
6. Three conjoining beaded basal rim fragments, sooted; diameter c. 150mm. Fabric B. [520]. Pit [505]. Fig. 41, T5
7. Body sherd, no features. Fragmentary. Fabric B. [541]. Pit [540]. Not illustrated
8. Cylindrical profile; concentric circles of fine stabbing on top and random fine stabbing on body wall. Fragmentary. Fabric C. [541]. Pit [540]. Fig. 41, T6
9. Top, very abraded. Fragmentary. Fabric C. [347]. Pit [246]. Not illustrated
10. Body sherd. Fragmentary. Fabric ? [386]. Well [387]. Not illustrated
11. Top, damaged, with vertical thumb-pressed strip. Fragmentary. Fabric C. [223]. Pit [222]. Not illustrated
12. Basal rim. Fragmentary. Fabric C. [233]. Pit [222]. Not illustrated

Louver

Dunning type 1 louver, top and base missing. Glazed. Fabric 1. [163] [192] [193]. Pit [156]. Fig. 42, T7

Nib tile

Nib tile, fragment. The nib is placed off-centre approximately 25mm from the corner of the tile. Fabric 3 (calcareous version). [196]. Pit [156]. Fig. 42, T8

Ridge tile

Crested ridge tile, unglazed, fragment. Fabric 6. [424]. Pit [423]. Fig. 42, T9

Floor tiles

All the floor tiles come from post-medieval features where they are probably residual.

Dieppe tile

A single two-colour decorated floor tile in very worn condition was residual in pit [328]. These tiles have a distribution centred on Dieppe in Normandy and were probably imported from France in the last quarter of the 14th century or very early 15th century. The fine sandy fabric is orange-brown in colour

Table 18. Medieval and post-medieval tile fabrics.

Fabric code	Description	Suggested date range
rop/1	Light brown fabric, grey reduced core. Inclusions: abundant medium to coarse quartz, sparse very coarse quartz; sparse white shell and dark red iron-rich inclusions. Glaze.	1250–1400
rop/2	Light orange, grey core. Inclusions: abundant medium to coarse quartz, common dark grey/black grits also medium to coarse (siltstone or chert?). Sparse white calcareous inclusions and grey flint flakes. Glaze.	1250–1400
rop/3	Light orange, grey core. Inclusions: abundant fine to medium quartz; sparse dark grey/red inclusions and white calcareous material, including shell. Finer version of rop/1 and rop/5. Glaze?	1250–1450
rop/4	Light orange fabric, some tiles have white marbling; frequent to abundant fine to medium quartz, common medium white calcareous inclusions and sparse very coarse grey/brown mudstone. Fine moulding sand. No glaze recorded.	1250–1500?
rop/5	Similar to rop/1, but slightly finer quartz component. Coarser than rop/3. Some contains blocky siltstone, near rop/6. Glaze.	1300–1450
rop/6	Orange fabric, common medium quartz, very coarse chunks (over 1mm) of orange siltstone. Near rop/5 but probably less quartz.	1300–1500
rop/7	Orange matrix (M: reddish yellow, 5YR 6/6), reduced core. Common medium to very coarse quartz; sparse calcium carbonate including shell.	1250–1400
rop/8	Fine-grained orange fabric with silt-sized background quartz. Moderate white fine to very coarse calcareous inclusions and very sparse medium to coarse quartz. No glaze or nail holes recorded.	1400–1800?
rop/9	Orange-red: fine sandy fabric, some cream silty streaks. Fine well-sorted moulding sand. Peg and pantile.	1600–1800
rop/10	Light orange fabric, moderate to common fine quartz, inclusions of red clay, mode is fine but occur < c. 2–3mm. Mainly pantile, some peg tile.	1630–1800
rop/11	Orange fabric, some lighter yellow streaking. Common fine to medium quartz, moderate medium red iron-rich and sparse white calcareous inclusions. Mainly pantile, some peg.	1630–1850
rop/12	Orange fabric, very coarse silty chunks and some iron-rich nodules, not much quartz. Peg tile, some pantile.	1600–1850
rop/13	Light brown to orange, common medium to coarse quartz, coarse to very coarse white and dark grey flint flakes, moderate white shell, some very coarse < 3 mm.	1250–1400
rop/14	Orange-red fabric, some fine cream silty streaks. Mod. inclusions fine sand, sparse dark red iron-rich and fine calcareous material. Pantile and peg tile.	1600–1850

Table 19. Medieval chimney fabrics.

Fabric	Description
A	Reduced core; fine quartz sand with sparse medium/coarse grains; moderate fine white shell and coarse flint flakes < c. 2mm, sparse coarse fragments of chalk, balls of reduced iron-rich clay and organic voids.
B	Surfaces light yellowish-brown, core lightly reduced. Poorly sorted quartz sand, medium to very coarse, coarser grains are rounded. Sparse pellets of dark brown iron-rich clay and white calcareous material.
C	Common medium to coarse quartz, mode c. 0.5mm; moderate coarse flint flakes and sparse to common white calcareous material; some examples have black organic voids.

with occasional lighter streaking. It contains abundant very fine black iron oxides, common very fine white shell and sparse to moderate coarse red iron-rich clay inclusions. (MoL fabric 3241).

Floor tile with two-colour decoration. Knife-cut bevelled sides and smooth sanded base and 20mm thick. Fabric MoL 3241. Dieppe Group design 7. [168] Fig. 42, T10

Flemish tile

Three very abraded glazed tiles in a fine red sandy fabric with a calcareous speckle were found in Phase 5 and Phase 6 contexts. The fragment from well [388] is 35mm thick and has a square nail-hole in one corner. Although very worn

and reduced, it was probably originally glazed over a white slip [384]. Two tiles, 33mm and 35mm thick, from the fill of cesspit[647] are also very worn but have retained vestiges of a greenish-brown glaze [648]. All three tiles are likely to date from the later 15th or early 16th century.

Tile from unknown industry

A single floor tile 31mm thick in a fine sandy red fabric came from context [84], Area 4a. Although it had a nail hole in one corner, suggesting that it might be of Flemish origin, no glaze was visible. Date uncertain, perhaps later 15th or early 16th century.

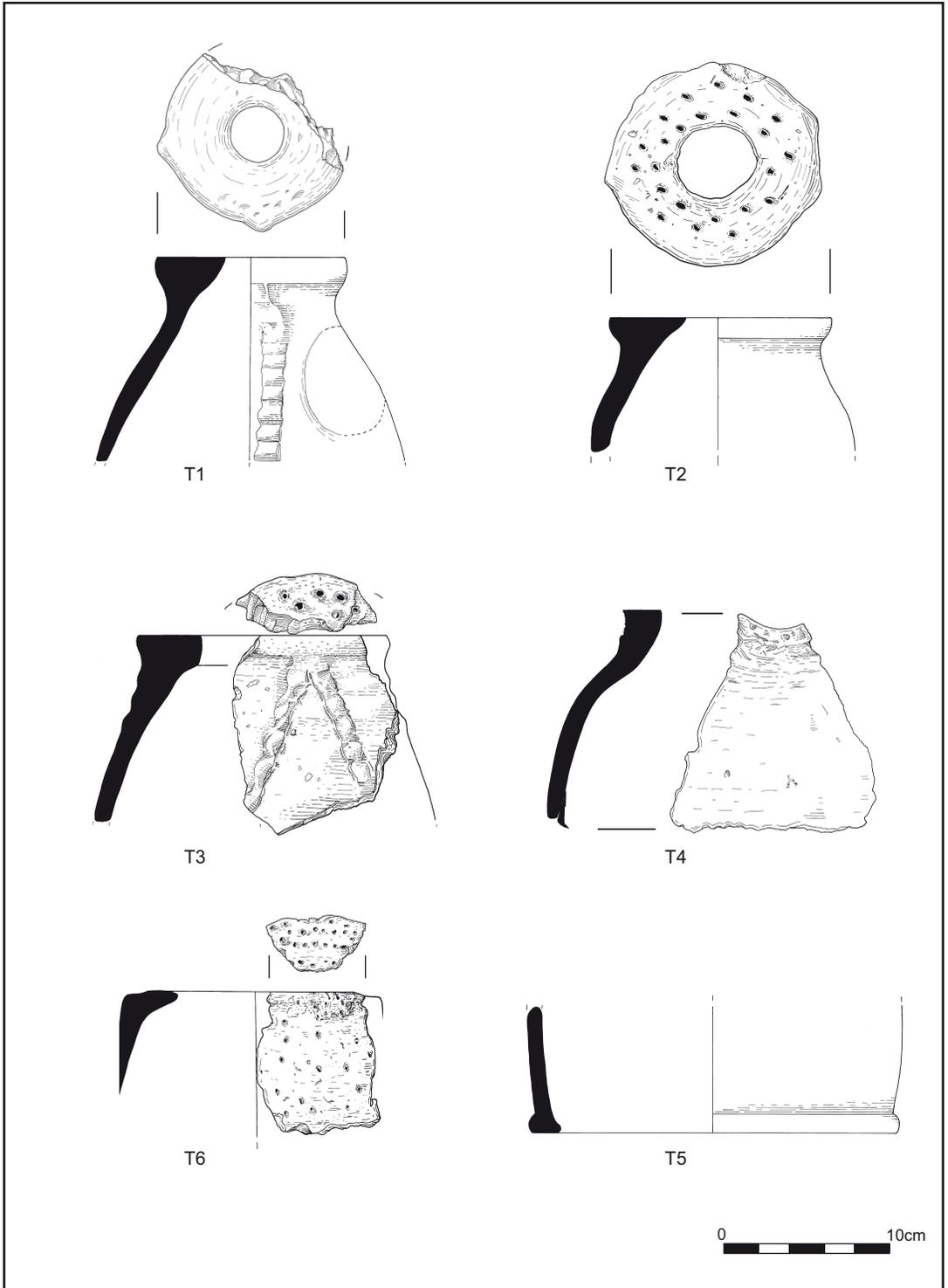


Fig. 41. Medieval ceramic chimneys T1-T6.

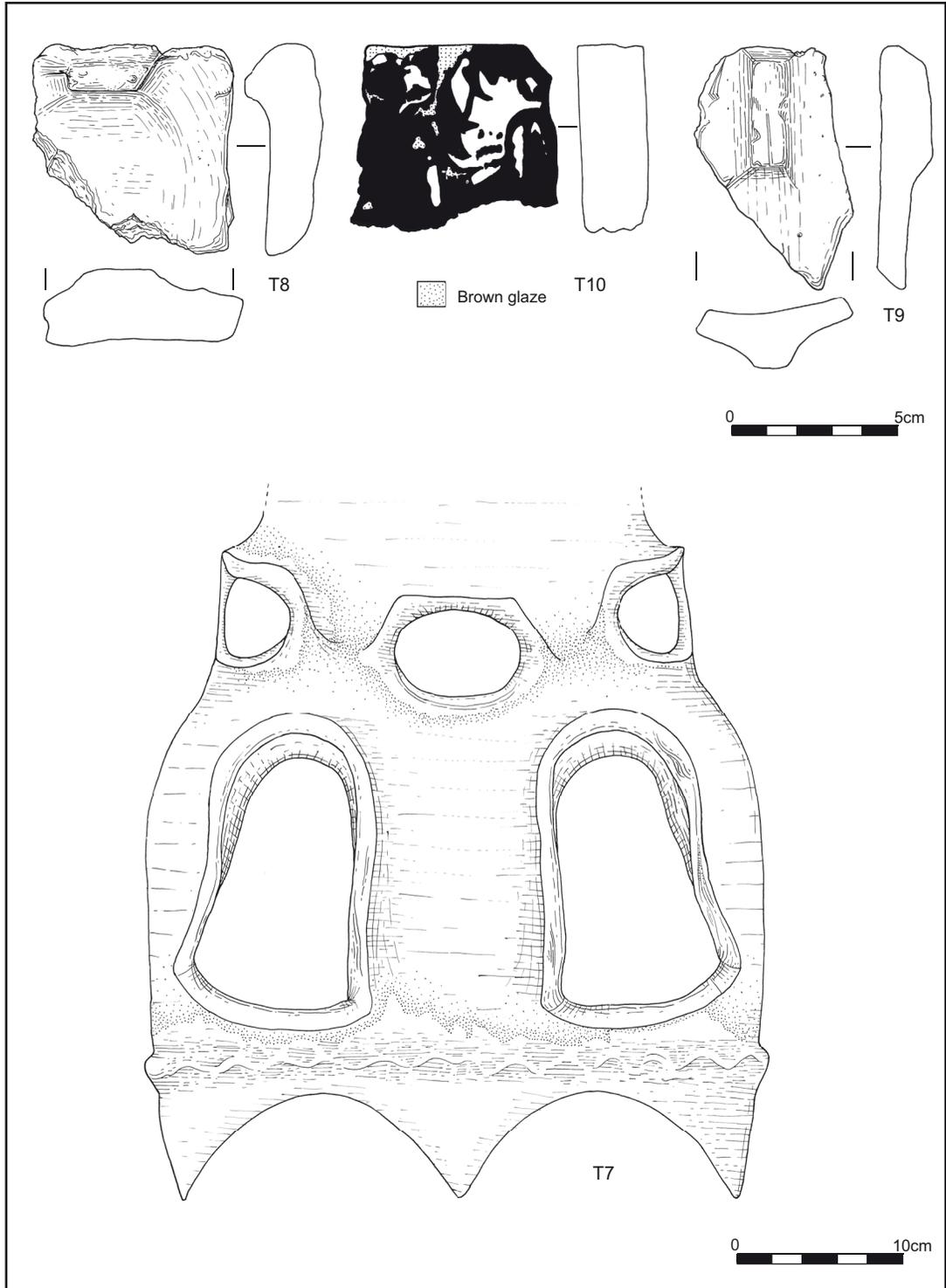


Fig. 42. Ceramic tiles and louver T7-T10.

THE BURNT CLAY by Trista Clifford**Introduction**

A total of 3059 pieces of burnt clay, weighing 20,270g, were recovered from the site. The material was recovered from 98 separate contexts, mainly pits, wells and gullies. The analysis aimed to identify the form and function of the burnt clay assemblage in order to illuminate the range of activities taking place on the site, such as textile production, particularly during the earlier phases of occupation.

Methodology

The fragments were examined with the naked eye and under a 20x binocular microscope for diagnostic characteristics indicating form and/or function. The primary characteristics indicating function used in the analysis include wattle impressions, smoothed surfaces, diagnostic piercings or being part of a known form, the presence of at least two diagnostic features informing identification.

A series of fabric groups were devised, described below. Analysis of the fabrics appears to indicate that the clays used were fairly similar and probably local, and sandy in nature with natural flint and chalk inclusions, and that fabrics were differentiated by density of matrix, temper and firing temperature. As noted in the assessment report, the distinction between low-fired brick and well-fired clay has proven problematic.

Group A (1)

Dense fine to medium fine micaceous sandy matrix. Mid orange to dark red with some marbling indicating mixing of clays. Sparse iron oxide type inclusions up to 1mm. Sparse angular flint up to 2mm. Rare chalk up to 10mm. Moderate sub-circular organic voids.

Group C (2)

Similar to fabric A, somewhat finer matrix with marked marbling. Pale buff to pale orange. Sparse organic circular voids, fewer inclusions.

Group D (3)

Fine to medium micaceous sandy matrix. Buff to mid orange. Sparse angular flint less than 2mm. Moderate striated voids and circular voids up to 1mm diameter. Moderate chalk and iron oxide type inclusions up to 2mm.

Group E (4)

Micaceous fine to medium fine sandy matrix with abundant, large striated organic-temper voids. Sparse angular flint up to 5mm. Poor sorting. Typically hard, well-fired surface with a softer, reduced core.

Group G (5)

Fine fabric, similar to A with fewer inclusions. Very abundant grass/straw temper. Rare (natural?) angular flint up to 5mm.

Group J (6)

Medium fine sand, well-fired, with a laminated appearance. Frequent organic voids (circular).

Group K (7)

Fine sand to silty matrix. Fairly soft and generally reduced. Sparse rounded chalk, angular flint and iron oxide type inclusions up to 10mm. Fairly common short striated organic-

Table 20. Quantification of structural fired clay in medieval contexts.

Context	Context type	Fabric/count
140	Pit	K/1
163	Pit	G/1
174	Gully	A/1
217	Pit	D/1
223	Pit	G/1
354	Well	J/1
446	Pit	L/2, E/1
451	Pit	E/1
465	Pit	E/2

temper voids occurring in pockets.

Group L (8)

Medium sand with moderate circular organic voids. Frequent angular flint c. 20mm. Frequent quartz, sand and charcoal inclusions up to 10mm, very poorly sorted.

Discussion

The assemblage is typified by its fragmentary and abraded nature. It was not possible to assign a form or function to most of the assemblage due to a lack of diagnostic characteristics. Most of the assemblage lacked any diagnostic features at all, whilst many fragments exhibited only one diagnostic feature.

The majority of fragments of Group C fabrics originated from features of the Late Iron Age-Romano British phase. Three pieces from [550] slot 2 (Fabric group A) showed possible wattle impressions, whilst several fragments from [309] are thin in section with two flat surfaces. However, survival of evidence of the use of burnt clay objects during this phase is ephemeral at best, there being no evidence for weights, spindle whorls, etc. which might have been expected on a domestic site of this date. Hence a more specialised 'industrial' function is suggested, and it is possible that some of the burnt clay could be briquetage, strongly suggesting salt production on or near the site.

The largest proportion of the assemblage was recovered from features of medieval date, with all fabrics represented to a greater or lesser extent. Pieces with wattle impressions or possible wattle impressions were recovered from a range of contexts (Table 20). Only one, from [140], has an opposing smoothed surface. The far greater number of fragments with one smooth surface, although likely to be structural, cannot be definitely assigned a function.

Two conjoining fragments of the same, well-fired Fabric D, object were recovered from pit [440], fills [448] and [468]. The object is cylindrical and has been flattened and smoothed along one side. Its purpose is unknown, although it has been suggested that it is repair patch from a wall (Barber *pers. comm.*) Fragments of Fabric group E from contexts [451] and [465], from the same pit, are very thick in section, with oxidised outer surfaces and a much softer reduced core, indicating an object or structure of substantial size, since the heat was not able to penetrate the section. Again, no other diagnostic features are present.

A small amount of material was recovered from post-medieval contexts, and is likely to be residual.

Table 21. Characterisation of metalwork assemblage.

Period	No. of contexts	Iron nails (small)	Iron nails (large)	Iron clench bolts	Iron objects	Copper alloy	Lead	Pewter	Total
Undated/ U/S	20	29	4	4	22	6	-	-	65
LIA-ER-B (if not residual)	3	2	-	-	-	3	-	-	5
12th–13th	26	149	14	25	51	1	2	-	242
M 13th–M 14th	65	694	86	59	157	33	2	-	1031
M 14th–M 16th	34	341	16	12	74	15	1	-	459
M 16th–17th	13	73	20	8	16	7	1	-	125
18th	22	123	22	2	31	10	1	-	189
19th	25	91	13	1	94	100	2	4	305
Totals	208	1502	175	111	445	175	9	4	2421

Conclusion

The lack of recognisable object forms unfortunately makes it impossible to ascertain activity patterns. Most of the assemblage most probably relates to structural use such as wall and oven construction. The spread of fabrics across the site, both chronologically and spatially, together with the abraded nature of the material, is evidence for redeposition and/or residuality within contexts.

THE METALWORK by Elke Raemen and Luke Barber Introduction

The excavation produced a total of 2421 pieces of metalwork from 208 individually numbered contexts. Iron clearly dominates the assemblage (2233 pieces), copper alloy, lead and pewter being represented in much smaller quantities. The material is predominantly of the 13th to 14th and 18th to 19th centuries, though small assemblages of early post-medieval ironwork are also present. This report concentrates primarily on the medieval assemblage. All material is listed in full by context on metalwork record sheets which form part of the archive. The assemblage is characterised in Table 21.

The medieval assemblage

The medieval assemblage consists of 1732 pieces, of which 1678 pieces are ferrous and 54 pieces non-ferrous. Context [108] (dated mid/late 13th to mid 14th century) provided the largest context group with 413 pieces, consisting mainly of iron nails (numbering some 326).

Iron

The iron on the whole is in poor to fair condition, and is usually characterised by heavily encrusted corrosion products, often incorporating other items such as stones and shells.

Nails

Most of the medieval ironwork consists of nails (1300 pieces). These are very variable in size, particularly notable in the 13th to 14th century contexts, which contain the largest group of nails (numbering 780). Owing to the presence of heavy corrosion products it is only possible to classify the nails into size categories rather than detailed type. However, it is notable that there is quite a high proportion of large nails (numbering 116) which would have been used in structural work. These range in length from 69mm to 121mm, with head diameters ranging from 17mm to 46mm. The small nails (numbering 1184) range in length from 34mm to 116mm, with head

diameters ranging from 4mm to 36mm. The overlap can be explained by the fact that their assignment was based largely on the diameter/strength of the shank. The large nails do not appear to have any notable spatial concentration, either between the two areas or within the excavated areas.

Clench bolts

There is a relatively small quantity of clench bolts for securing timbers. Clench bolts with circular domed heads and diamond-shaped roves dominate, with head diameters varying from 21mm to 44mm and rove dimensions varying between 28mm × 29mm and 49mm × 54mm. The thicknesses of the timbers secured (the measurement between the inner surfaces of the bolt head and rove) measure between 16mm and 62mm. A few triangular roves (dimensions between 23mm × 26mm × 31mm and 31mm × 33mm × 34mm) are also present. Clench bolts appear from at least the late 12th to the early 13th century (25), with a peak between 1250 and 1350 (59). After 1350 there is a decline, with only 12 clench bolts recovered for the period 1350–1550 and some of these may even be residual. The distribution of the clench bolts is similar to that of the large nails – indeed the highest concentration comes from well [87] and it is clear that the assemblage has been redeposited in features of a 'domestic' type.

Other objects

Of the other objects (282 pieces), although it is clear that they are not nails, most are undiagnostic of form/function. Many of these pieces are simply sheeting fragments (9 pieces) or strip fragments (22 pieces), the latter probably primarily binding strips from wooden containers such as buckets and barrels. A large number (224 pieces) are totally mineralised heavily encrusted amorphous lumps. Of the more diagnostic pieces (numbering 27), 7 items could be determined as knives, 2 being tanged knives (contexts [108] and [301]) and 5 whose type could not be established. Three blade fragments possibly represent knives as well, though they could equally represent tool fragments. Definite tools are all but absent, with only one possible fragment from context [437]. Three hinge pivots for a wooden doorframe or window shutters (with tapering fixing spike) were recovered. Overall, the quantity of 'building' fittings is very limited.

Of particular interest are the remains of six fish hooks, one of which is very large (Fig. 43, F1). The x-ray shows that the hook is barbed and had a chain attached to it (from [651],

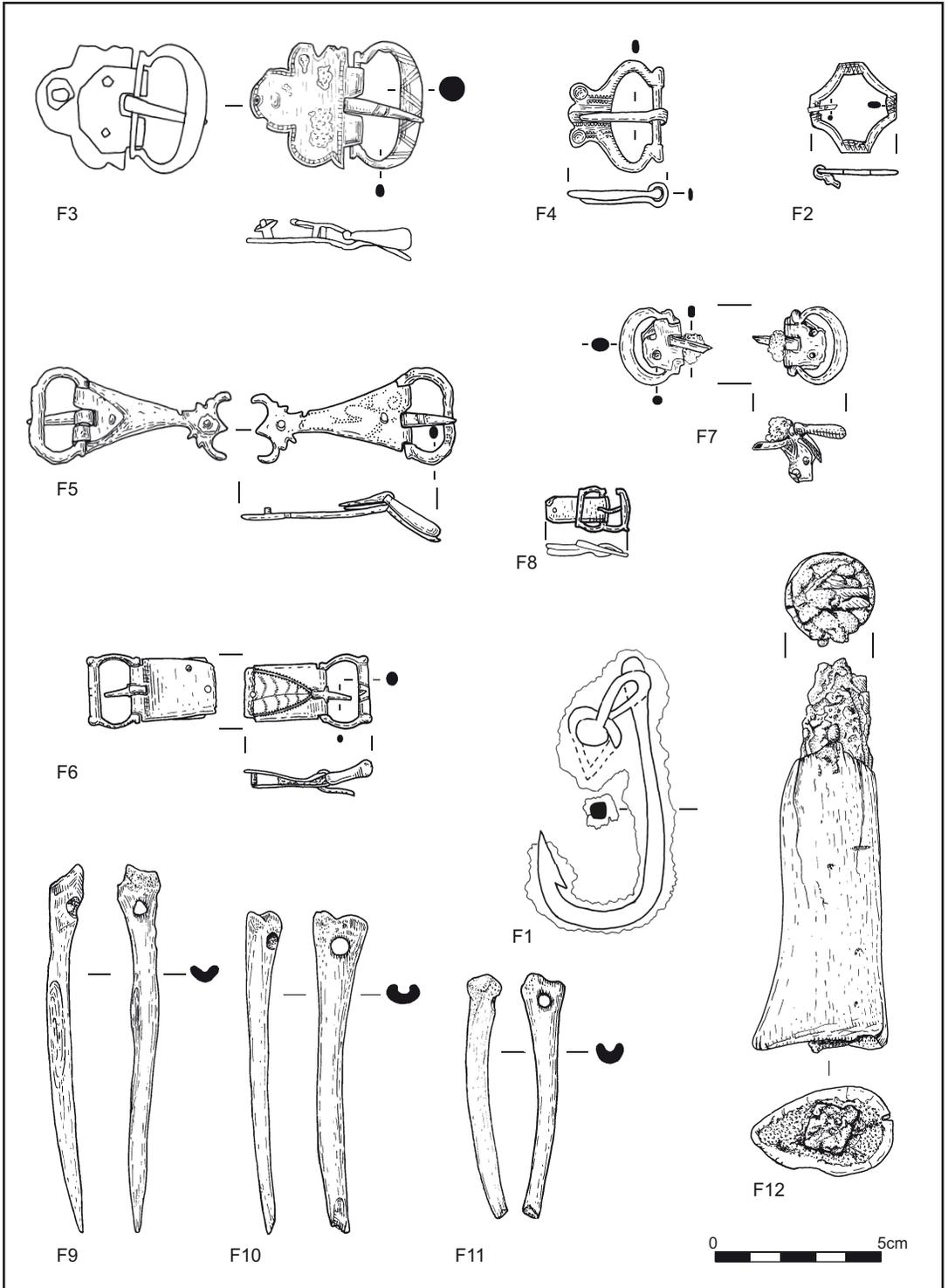


Fig. 43. Metal and worked bone objects F1-F12.

dated mid 13th to mid 14th century). The others are of the more usual, smaller, proportions and, though too corroded to be certain, it is likely that all were barbed, with a spade end as in other published examples (Barber 1993b; Barber 2008c; Steane and Foreman 1991)

Non-ferrous

A large proportion of the medieval assemblage consists of copper alloy and lead strip fragments (3 pieces) and sheeting fragments (11 pieces) of indeterminate function. Other lead objects were 2 rolled fish net weights (context [102], dated late 13th to 14th century, and context [467], dated mid to late 13th century), weighing 34g and 52g respectively. Most, however, consist of copper alloy dress accessories such as one strap guide, one strap end, one buckle plate, one stud and one lace-tag (all mid 14th to mid 16th century). A brooch (context [354], dated 14th century) consisting of an open, quatrefoil frame with a separate, incomplete, pin (Fig. 43, F2) is also present. The main categories of dress accessories are described below.

Pins

One complete (length: 40 mm) and 16 fragments of copper alloy pins were recovered. All have spherical heads varying in diameter from 1mm to 3mm. They may have been used for a number of purposes.

Buckles

Buckles are frequently more diagnostic of date, and a number of them (seven pieces, dated mid 13th to mid 14th century) were recovered from sealed medieval contexts. The most important ones are catalogued below. All are in copper alloy, unless stated otherwise.

D-shaped buckle (context [135], dated mid to late 13th to mid 14th century) with pin and three-lobed plate, containing three rivet holes. The X-ray shows that the plate is decorated with a double incised line along the edge (Fig. 43, F3).

D-shaped buckle (context [468], dated mid 13th century to early/mid 14th century) with two lobed knobs on straight outer edge. Plate cast with frame with fitting for pin, though interestingly the pin is fitted on the straight outer frame, suggesting that the piece had been modified/repared. The x-ray shows two rivet holes on the plate (Fig. 43, F4).

D-shaped buckle (context [541], dated mid/late 13th century to mid 14th century) with pin and trefoil plate folded through frame, held in place by rivet. The plate has a second rivet (Fig. 43, F5).

Oval framed buckle (context [678], dated mid 13th century to mid 14th century) with pin, thickened and straightened outer frame and rectangular plate with a single rivet. The x-ray shows double parallel lines of incised dots in a simple chevron on the plate (Fig. 43, F6). A similar example is noted from London, dated between the late 12th and the late 14th century (Egan and Pritchard 1991, 315).

Oval framed buckle (context [802], dated mid 13th to mid 14th century) with tapering (incomplete) plate containing two rivets and traces of iron, possibly from pin (Fig. 43, F7). A similar example is dated between 1250 and 1500 (Whitehead 1996, 59).

Pewter double-looped buckle frame (context [737], dated 13th to early 14th century) with copper-alloy pin and plate (Fig. 43, F8). A similar example is noted from London, though dated between 1350 and 1400 (Egan and Pritchard 1991, 340).

Mounts

Three copper-alloy bar-mounts were recovered. One is a bar-mount with terminal and central lobes (context [108], dated mid to late 13th century to mid 14th century), while the other (context [148], dated late 13th century to mid to late 14th century) is of similar shape but has studs instead of terminal lobes. Close parallels to these have been found in London (Egan and Pritchard 1991, 1157). A third D-sectioned simple bar-mount (context [535], dated mid 13th century to mid 14th century) had two surviving rivets. A parallel to this was also found in London (Egan and Pritchard 1991, 1145).

The post-medieval assemblage

Most of the diagnostic material of the post-medieval assemblage is of 19th-century date, including items such as pins, spoons, iron nails and knives. The most interesting items are two circular roves (context [240], dated mid 16th to early 17th century) with external diameters of 44mm and 42mm (internal diameters 17mm and 14mm). Full details of the post-medieval assemblage are housed with the archive.

Discussion

Most of the metalwork is typical of domestic medieval sites, with large quantities of nails and a smattering of knives and dress accessories. The exact source of much of this material is uncertain, as the site was obviously used for disposal of domestic refuse from nearby houses as well as material waste generated on the site itself. However, the assemblage does shed light on aspects of the medieval economy. Although only a few fish hooks were recovered, their poor condition suggests that many others have not survived. However, the surviving hooks demonstrate that fishing with lines was undertaken and their size suggests that larger offshore species were sought. The chain attachment on the largest hook strongly suggests that species with teeth, such as from the shark family (Steane and Foreman 1991), were included in the catch. The presence of the lead net weights also suggests that inshore fishing was undertaken, though the small quantities involved might suggest either that it was not a dominant part of the industry or that the weights were remelted/recycled. Alternatively, such weights are notoriously difficult to locate during excavation (Barber 2008c.).

Although clench bolts were used for a variety of purposes (for example in door construction) the relatively large quantity found in the excavations, together with the small number of household fittings, suggests that most or all relate to boat-building, or at least boat repair on or close to the site. This would appear to have occurred from at least the late 12th to early 13th century. After a peak between 1250 and 1350, clench bolts, though fewer in number, are still present. However, it cannot be stated for certain that boat-building or repair was still one of the activities after 1350, since the small number of clench bolts in these contexts might indicate that they are residual. The evidence of the fishing industry from the current site is meagre. However, this is fairly typical, and compares well with other assemblages from south coast sites such as Hastings and Denge (Barber 1993b; 2008c). Despite this it is an important contribution to the growing corpus of data for this somewhat elusive industry.

THE COINS by Elke Raemen and Luke Barber

The excavations recovered only three coins, all from post-medieval contexts, despite the use of a metal detector. Two

coins are badly mineralised (a 1797 'Cartwheel' penny [598] and an illegible silver shilling of 19th century date from [644]). The other coin is a 4th issue George III penny, dated 1807 from [146].

THE METALLURGICAL REMAINS by Luke Barber

The excavations at the site produced only 184 pieces of slag, weighing 14,702g, from 24 individually numbered contexts. In addition there were many pieces of rust concretion from corrosion of iron objects, usually with adhering pebbles and shell fragments, among the slag, but these are not considered further here. The assemblage is from contexts spanning the 13th to 19th centuries and consists of several different types of slag, though the majority of them relate to iron-working. The material has been fully listed on pro forma for the archive.

Only one possible piece of bloomery slag was recovered (131g), presumably residual in 19th-century pit [355]. It is likely that it relates to Roman or medieval smelting but was unintentionally transported to the site. Most of the assemblage consists of iron smithing slag (132 pieces weighing 13,090g). Of this total only 28 pieces (3,858g) are from deposits dated to the 13th to 14th centuries. Pit [440] contained a single piece (1,389g), while three fills in pit [601] contained the remainder of the medieval assemblage. In addition another six pieces (20g) of iron slag, undiagnostic of process, were recovered from other fills in pit [601] but, considering their location, they are also likely to be the result of smithing. It is considered likely that all the 14 pieces (1,089g) of 'undiagnostic' iron slag recovered from the site are the result of smithing.

Most of the rest of the slag assemblage is of the 18th to 19th centuries. The single largest group consists of 100 pieces (8,597g) of smithing slag from late 18th- to 19th-century pit [183] and certainly suggests a forge in the vicinity at this time. Pit [145], dated to the mid 19th century and lying only some 7m south of [183], contained a further five (275g) pieces of smithing slag.

Other material in the assemblage includes 10 pieces (59g) of fuel ash slag, which could have derived from any high temperature process including domestic hearths. The material is sparsely spread between contexts ranging in date from the 13th to 19th centuries. The 27 pieces (333g) of clinker recovered are all derived from 18th- and 19th-century burning of coal. Unsurprisingly, most of the assemblage was

recovered from contexts of this date, though a few intrusive pieces were located in medieval deposits.

Small-scale secondary iron-working was obviously occurring near the site in the 13th to 14th centuries, probably associated with the manufacture and repair of items in a smithy. The small quantity of medieval slag involved does not suggest that this activity occurred close to the excavation area. Although some of the slag in the post-medieval contexts may be residual medieval material, the quantities are still small. However, the large size of the assemblage from pit [183] certainly suggests that a smithy was in operation in the vicinity in the later 18th to 19th centuries.

THE GLASS by Luke Barber

Introduction

The excavations recovered 1087 pieces of glass, weighing just over 44kg, from 62 individually numbered contexts. The material has been fully listed by context on Glass Record Forms for the archive. The assemblage is characterised in Table 22. Few large context groups are present and all containing over 50 pieces are of 19th-century date.

The Roman and medieval periods

The only Roman material from the site is a rim fragment from a blue/green glass bottle from context [677]. Too little is present to ascertain whether the bottle is of square or round-sectioned form; both types are common in the 1st to 2nd centuries AD. No definite medieval glass was present in the assemblage. Although seven medieval contexts produced glass, all were intrusive post-medieval pieces (grouped under *unstrat.* in Table 22).

The 17th to early 18th centuries

The earliest post-medieval glass from the site consists of a few pieces from 17th- to early 18th-century contexts, though a few old/residual vessels of this period are present in some mid 18th-century groups. Wine bottles dominate, though the only notable piece is a fragment with applied seal from context [245]. Unfortunately the seal is broken and only part of the name (*l. Po...*) is legible. In addition, some finer bottles (cylindrical and square sectioned) and beakers are also represented, though none of these pieces is large enough to establish exact form. The lack of glass of this period suggests little activity at this time, a point confirmed on the whole by the ceramics.

Table 22. Characterisation of glass assemblage (number of fragments/weight in grams).

Period	Unstratified	Roman	C17th-18th	C18th	C19th	Totals
No. of contexts	11	1	6	22	22	62
Wine bottle	27/290g	-	9/248g	160/8054g	189/17,213g	385/25,805g
Other bottle	12/161g	1/5g	3/3g	51/353g	274/10,798g	341/11,320g
Phial	1/1g	-	-	17/98g	6/114g	24/213g
Decanter	-	-	-	-	20/792g	20/792g
Beaker	1/20g	-	4/2g	2/21g	-	7/43g
Wine glass	3/39g	-	-	2/81g	33/1245g	38/1365g
Tumbler	-	-	-	-	36/1592g	36/1592g
Other	-	-	-	-	60/1596g	60/1596g
Window	3/11g	-	2/10g	15/70g	156/1328g	176/1419g
Totals	47/522g	1/5g	18/263g	247/8677g	774/34,678g	1087/44,145g

Table 23. Comparison of C18th-century groups [124], [570] and [684]. Numbers in brackets show the minimum number of vessels represented.

Context/type	124 (pit [123])	570 (pit [565])	684 (pit [681])
Deposition date	Mid C18th	Mid/late C18th	Mid C18th
Wine bottles	12/1357g (5)	47/2221g (5)	17/1464g (2)
Oval/cylindrical bottles (fine)	10/81g (1)	11/135g (5)	27/127g (3)
Phials	5/25g (1)	2/26g (2)	1/8g (1)
Ink wells	–	1/9g (1)	–
Beakers	1/20g (1)	–	–
Window	2/2g	7/45g	–
Totals	30/1485g	68/2436g	44/1599g

The 18th century

Many more contexts of mid/late 18th-century date were excavated at the site and the quantity of glass reflects this. However, individual context assemblages are still never large. There is a notable dominance of wine bottles, which constitute 65% of the 18th-century assemblage by number of pieces (93% by weight), though other drinks, such as beer, may have been held in such bottles. Most are of cylindrical form, though more squat 'onion-type' examples of late 17th- to early 18th-century are also present alongside the cylindrical types in some contexts. Fine bottles, mainly of cylindrical form, and phials are also well represented. Drinking glasses are notably few in number, and consist of the base of a clear wine glass (conjoining sherds from contexts [167] and [219]) and two small scraps of beaker. A small scattering of thin window glass is also present.

Three of the largest groups of this period are summarised in Table 23. They typify the overall 18th-century assemblage. The lack of drinking vessels may indicate either a low level of settled domestic activity or, more probably, that occupation was of generally lower status, ceramic and wooden tankards making up the majority of such vessels.

The 19th century

This period produced by far the largest part of the overall glass assemblage despite having the same number of contexts producing glass as the preceding century. Several moderate/large context groups (see below) are present and these, along with most of the 19th-century assemblage in general, appear to belong to around the middle of the century. As before, cylindrical wine bottles dominate and constitute 24% of the 19th-century assemblage by number of pieces (50% by weight). Some definite beer and spirit bottles are also present. There is a dramatic increase in the number of other bottles (Table 22), as this period saw a notable increase in diversity with the industrial developments of the time. Mineral water and medicine bottles, some embossed with company names, become common, and the increase in food and household/personal cleaning products gave rise to a huge expansion of types. There is a notable increase in wine glasses and tumblers.

Four assemblages, from cesspits in neighbouring properties, have been summarised in Table 24 for comparative purposes. The earliest appears to be context [649], though it need be by only a few years. It is interesting to note that this group contains some old/residual 18th-century material. Of note is the lack of any mineral water bottles of G. W. JAMES of Brighton in [649], who is known to have been producing under this name from the mid 1850s (Askey undated). The

other three groups that contain such bottles must date from the late 1850s despite containing clay pipes and ceramics covering a period from at least 1820/30.

Wine bottles are again well represented, most notably from context [649], which also has a correspondingly large number of (generally mis-matching) wine/spirit glasses, as well as a decanter, to go with them. Contexts [598], [644] and [647] are quite closely matched in their contents, though [644] contains notably more medicine bottles (including one embossed 'Sussex County Hospital'). Tumblers are more common in contexts [598] and [647], interestingly the contexts that produced beer bottles. The other material shows a general scatter of domestic waste including food/domestic bottles, mineral water bottles, a green vase (context [644]), heavily moulded condiment trays for jam/sugar etc., inks and perfume bottles (only context [647]).

The differences noted in the glass assemblages from these four contexts is interesting because they, along with differences within the ceramic groups, start to highlight the degree of variability that may be encountered in adjacent houses of the same (working) class. This variability mirrors both the physical characteristics of an individual family/tenant and their interests and social aspirations. Only one group of this nature has been excavated in Sussex, and although it shows some similarities in the proportion of glass types, it is of slightly later date than the current assemblages and its social status is not clear (Butler 2003). It is hoped that future assemblages of this nature will be excavated and analysed in order to allow broader trends to be recognised and fuller interpretations made.

THE GEOLOGICAL MATERIAL by Luke Barber (incorporating comments by Bernard Worssam)

Introduction

The site produced a large assemblage of stone: 1865 pieces (other than flint), weighing a little under 660.5kg, from 219 individually numbered contexts. Size ranges of individual pieces vary from as little as 2g to as much as 30kg. The material was located in Late Iron Age/Roman, medieval and post-medieval contexts, though by far the largest proportion was from deposits dated to the mid/late 13th to early/mid 15th centuries (1241 pieces, weighing just over 263.5kg from 120 individual contexts). The full assemblage has been summarised in Table 25.

Although the Late Iron Age/Roman and later 12th- to mid/late 13th-century deposits have no/low residuality, those of the later 13th to early/mid 15th centuries appear to have the potential to contain low to moderate residual earlier material.

Table 24. Comparison of C19th-century groups [598], [644], [647] and [649]. Numbers in brackets show the minimum number of vessels represented.

Context/type	598	644	647	649
Deposition date	1850s	1850s	1850s/60s	1830-50
Wine bottles	7/610g (1)	10/1103g (5)	23/1129g (4)	32/5109g (10)
Beer bottles	2/322g (1)	-	5/401g (2) spirit 2/243g (1)	-
Mineral water bottles	2/810g (2) x2 G.W. JAMES, BRIGHTON	20/591g (3) x1 G.W. JAMES, BRIGHTON	15/906g (3) x3 G.W. JAMES, BRIGHTON	-
Medicine bottles	10/163g (5)	74/1552g (12)	9/211g (4)	3/39g (3)
Other bottles/jars	4/262g (3)	39/1539g (13)	11/214g (3)	5/129g (4)
Ink bottles	-	3/143g (2)	2/29g (2)	-
Perfume bottles	-	-	4/72g (2)	-
Decanters	-	-	-	6/323g (1)
Wine glasses	-	-	9/447g (4)	13/581g (9)
Tumblers	3/380g (2)	-	7/337g (4)	2/78g (1)
Condiments	-	3/84g (1)	3/137g (2)	-
Vases	-	22/101g (1)	-	-
Mirror	-	-	-	1/115g
Window	9/96g	72/829g	23/113g	3/9g
Other	-	Gaming piece 1/14g	Twisted rod 1/47g	-
Totals	37/2643g (14)	387/5956g (37)	112/4286g (31)	65/6383g (28)

This is certainly in evidence from the ceramics, which show a generally low, but consistent, level of residual mid/late 12th- to mid 13th-century pottery in many of these contexts. Despite this, there does not appear to be a major shift in stone sources between these periods and it is considered that any residual material does not pose too much of a problem. Residuality, or re-use, is a much more acute problem for the early and late post-medieval periods when trying to judge stone supply. It is quite clear that stone brought in during medieval times was re-used to a great extent, perhaps because the existing material was sufficient, in combination with local building materials such as flint, chalk and brick, not to warrant bringing more stone in. Although this report covers all periods on the site, it concentrates on the medieval assemblage because this is deemed the most informative.

The main aim of the analysis was to establish the range of stone types exploited by the site through time and the reason why the stone was exploited (if discernible), and to see whether the sources of exploitation could increase understanding of the port's trading contacts.

The whole assemblage has been fully quantified by stone type and context on Geological Record Forms, which are housed with the archive. Stone identifications were undertaken with the help of Bernard Worssam by examination with a hand lens, with the use of source samples where appropriate. The assemblage has been fully characterised by period in Table 25.

A wide variety of stone types/variants is present; in all 110 stone types were identified from the site. However, a number of these are simply variants of the same general type and probably simply reflect different outcrops, or indeed variation within one single outcrop, of the same geological rock type. A full list, with descriptions, of all the stone types is housed in the archive. For the purposes of the current report they are

combined together into their related groups in Table 25. The material is from a wide geographical range and is dominated by types not locally available.

The Romano-British assemblage

The small selection of stone for this period consists exclusively of Wealden material. No worked pieces are present although the fragment of Lower Greensand is almost certainly from a Lodsworth quern (Peacock 1987).

The medieval assemblage

With a few exceptions the stone types are the same for the later 12th-/mid 13th- and later 13th- to early/mid 15th-century deposits and so will be discussed together. Definite worked medieval stone residual/re-used in the post-medieval period will also be touched on where relevant. Many pieces of stone, whether worked or not, show signs of having been burnt, though whether this took place on the site or elsewhere is uncertain. The overall assemblage can be divided into three categories: building materials, objects and other, though the division between the first and third categories is often not clear because many unshaped pieces could be equally employed as ballast, walling or both. The medieval assemblage was recovered primarily from infilled pits/wells spread across the whole of both excavation areas. Only one notable concentration was present; some 230 pieces of stone (just over 129kg) were recovered from 20 fills in pit [440], most notably fill [448] (106 pieces weighing just over 86.5kg). This pit group exhibits a very mixed assemblage, containing roofing/building material, artefactual material and irregular/ballast stones from a variety of sources.

Building material

Building material on site relates to either roofing or walling.

Table 25. Quantification of geological material by period (no./weight in grams).

Period	LIA/ R-B	LC12th- m/1 13th	L C13th- e/m 15th	C16th-e 18th	M C18th- 19th	Undated	Totals
No. of contexts	3	29	120	21	39	7	219
Local							
Chalk	–	6/5260g	10/4361g	1/214g	2/1086g	–	19/10,921g
Fissure fill (from chalk)	–	–	–	1/7000g	–	1/7700g	2/14,700g
Tertiary ferruginous sst (clay with flints)	–	2/136g	13/10,372g	1/30g	1/5g	–	17/10,543g
Concreted beach deposit	–	2/36g	8/6342g	–	1/3025g	–	11/9403g
Wealden (SE England)							
Horsham stone (W. Sussex)	–	3/1770g	17/7372g	6/671g	12/4259g	1/28g	39/14,100g
Lower Greensand (W. Sussex)	1/20g	11/18,364g	32/17,387g	–	2/27,006g	–	46/62,777g
Tertiary shelly lmst (Newhaven?)	–	1/2g	1/14g	–	–	–	2/16g
Upper Greensand (W. Sussex)	–	6/10,744g	9/2495g	–	1/30g	–	16/13,269g
Clay Ironstone (Weald)	4/492g	–	15/5073g	–	2/422g	7/1850g	28/7,837g
Wealden sst	1/3g	4/381g	46/7702g	1/46g	2/8294g	2/52g	56/16,478g
Sussex Marble (E. Sussex)	–	–	1/294g	–	–	–	1/294g
Folkestone stone (Kent)	–	–	7/9352g	3/1920g	2/447g	–	12/11,719g
Hampshire/Dorset							
Tertiary Sst (Hants)	–	4/467g	6/2466g	–	2/434g	1/2g	13/3369g
Bembridge Lmst (IoW)	–	1/90g	3/5691g	–	1/2195g	–	5/7976g
Quarr Lmst (IoW)	–	–	–	–	1/15,000g	–	1/15,000g
Purbeck Lmst (Dorset)	–	1/922g	11/9552g	2/572g	3/20,095g	–	17/31,141g
Purbeck Marble (Dorset)	–	–	7/952g	1/12g	–	–	8/964g
Portland Stone (Dorset)	–	–	–	–	1/10,500g	–	1/10,500g
Shale (Dorset)	–	1/88g	6/164g	–	1/56g	–	8/308g
Jurassic Lmst (Dorset)	–	8/652g	35/10,620g	–	–	1/20g	44/11,292g
Devon/Cornwall							
West Country slate	–	131/5772g	721/21,310g	106/6599g	111/4129g	7/70g	1,076/37,880g
Granite	–	2/38,000g	9/20,388g	–	–	–	11/58,388g
Diorite	–	–	1/8g	–	–	–	1/8g
Schist	–	1/6g	1/72g	–	–	–	2/78g
Quartzite	–	–	2/106g	1/20g	–	–	3/126g
Paleozoic Sst	–	1/230g	2/1945g	1/10g	–	–	4/2185g
Devonian Sst	–	2/10g	5/5325g	5/1122g	1/4000g	–	13/10,457g
Other British							
Welsh slate (N. Wales)	–	–	–	–	47/5702g	–	47/5702g
Coal (Wales/N. England)	–	–	2/10g	–	4/108g	–	6/118g
Yorkshire Sst	–	–	–	–	3/305g	–	3/305g
Foreign							
Caen Stone (France)	–	16/20,059g	47/47,659g	5/18,346g	8/103,850g	–	76/189,914g
French Oolitic Lmst	–	–	2/2924g	–	–	–	2/2924g
Mayen Lava (Germany)	–	28/1724g	169/19,744g	8/256g	1/20g	2/8g	208/21,752g
Norwegian Ragstone (schist)	–	–	5/360g	1/74g	1/316g	–	7/750g
Uncertain origin							
Iron pan (possibly Wealden)	–	–	9/3527g	–	–	–	9/3527g
Miscellaneous sst (various non-Wealden sources)	–	2/5660g	31/25,969g	–	6/27,925g	–	39/59,554g
Green igneous rock (possibly SW or continent)	–	–	6/2060g	–	–	–	6/2060g
Green schist (possibly SW or continent)	–	1/150g	–	–	–	–	1/150g
Basalt (British/continental?)	–	–	2/11,990g	–	–	–	2/11,990g
'Graphite'	–	–	–	–	3/4g	–	3/4g
Totals	6/515g	234/110,523g	1241/263,606g	143/36,892g	219/239,213g	22/9730g	1865/660,479g

The presence of West Country roofing slate in medieval Sussex deposits has been well established (Holden 1965; 1989; Murray 1965). It is most common on higher status buildings, particularly close to ports due to the coastal nature of the mainly 12th- to 13th-century trade. It is not surprising therefore that the Ropetackle site has produced moderate quantities, though few large pieces are present: only two complete widths measuring 66mm and 127mm wide. Most pieces fall within the standard 7mm to 14mm thickness, but the presence of a 30mm thick piece from pit [32] (fill [49]) hints that some slates may have been split on site after arrival. As with many of the building materials, it is uncertain whether the recovered slate was dumped at the site after being removed from buildings or represents wastage during initial unloading, as very few pieces have mortar adhering to them. West Country slate is often residual in post-medieval contexts (some are notably water-rounded: pit [428], fill [431]) though some of this may be due to the longevity of some of the medieval slate roofs in the town. The other stone roofing material represented at the site is Horsham stone 'tiles'. Although Horsham stone is represented from the 13th century on, the first definite roof 'tile' is from context [217] and probably relates to the 14th century. Surprisingly few pieces of Horsham stone were recovered, and most of those that were are not definitely from roofing 'tiles'. Many more Horsham stone 'tiles' were encountered at the Marlpin site, mainly in late 14th- to 15th-century contexts, a period when this type of roofing appears to have become more common in Sussex (Barber 2005b).

Stones used in wall construction are also present in the assemblage. Those with mortar adhering, whether shaped or not, are easily placed in this category, but many unshaped pieces without mortar are more difficult to classify. Flint would undoubtedly have been the main walling material during this period, heavily supplemented by chalk for internal/foundation work as well as any other suitable ballast stone lying around on the foreshore. More diagnostic non-local/imported stone was brought in for quoins and architectural details. Perhaps the most common on the Ropetackle site is Caen stone. A number of ashlar block fragments are in evidence from the 13th century on and it is interesting to note the presence of an 'unshaped' Caen building block from pit [440] (fill [448]) suggesting that material was imported for finishing on site.

A number of architectural pieces are also present, mainly small fragments of simple jamb mouldings, though a voussoir block was recovered from pit 216 (fill 217) and a re-used fragment of window tracery from 19th-century cesspit 648 (Fig. 44, S1). This 19th-century lined cesspit had been largely constructed of re-used late medieval/early post-medieval ashlar blocks and architectural fragments, principally in Caen stone, but also in Quarr and Lower Greensand. Most of the architectural fragments cannot be dated closely, though some pieces, such as the window tracery, are of later medieval/early post-medieval date (D. Martin *pers comm.*).

In addition, medieval building stone appears to have included French Oolitic limestone (pit [440], fills [448] and [451]), some Wealden sandstone ashlar blocks (well 95, fill 518) and possibly some Purbeck limestone blocks too (C19th cesspit 648). Nearly all the shaped building stone from the site relates to a building of some substance elsewhere in the town and, as has been noted, many pieces show signs of having been burnt. Why the stone should be have been brought to the

excavation site to be disposed of in cut features is uncertain, but many pieces may relate to wastage since ship's cargos were unloaded on the foreshore. Pieces broken in transit or dropped into shallow water/mud may have been left where they fell, only to be used later by people working in the area.

Stone objects

A number of different objects are represented in the assemblage. The most common are rotary quern fragments, though most pieces are too small to be certain whether the upper or lower stone is represented. Only two stone types were noted for querns: Lower Greensand (Lodsworth type; Peacock 1987) and German lava. It is probable that all pieces, whether exhibiting a worked face or not, are from querns. The Lower Greensand quern fragments are frequently larger than the lava pieces, though many are burnt post-breakage. One complete but fragmented burnt upper stone from a 'squarish' quern with shallow handle socket was recovered from 13th-century pit [402] (fill [476]: eight pieces weighing 4.275kg) (Fig. 44, S2). Another upper stone fragment, measuring 46mm thick, was recovered from a similarly dated context (pit [335], fill [410]). The remaining Lower Greensand quern fragments relate to the later 13th to 14th centuries and include both upper and lower stone fragments (thicknesses ranging between 25mm and 76mm), the largest part coming from a lower stone with a diameter of c. 540mm (pit [440], fill [448]: Fig. 44, S3). The fragmentary nature of the lava querns meant that it was not possible to positively identify upper/lower stones, though the stone thicknesses, which vary between 45mm and 83mm, suggest that both are represented. Interestingly, two fragments of broken lava quern have been re-used as roughly bun-shaped 'rubber' stones (pit [16], fill [46] (690g) and well [87], fill [108] (434g): Fig. 45, S4 and S5 respectively). Similar re-use of obviously valued quern stones has been noted in a Roman assemblage from Angmering (Barber 2003).

The medieval assemblage also includes a number of generally small fragments of stone mortar, which appear in later 13th- to 14th-century deposits. These are mainly in Caen stone (four examples), the largest of which consists of the base of a double-handled vessel, though too little is present to assign it a type (Dunning 1977) (pit [440], fill [448]: Fig. 45, S6). Two small fragments from Purbeck Marble mortars are also present (pit [75], fill [76] and pit [440], fill [448]) as well as two possible fragments from a mortar derived from the Folkestone formation of the Lower Greensand (pit [156], fill [195]).

Three spindle whorls/weights are present in the assemblage, suggesting the possibility of cloth manufacture in the vicinity. Half a spindle whorl from pit [346] (fill [349], dated later 12th to 13th century) is in chalk and, although incomplete, has a diameter of approximately 44mm with a 10mm diameter central hole (original weight c. 32g). A fragment from pit [146] (fill [148], dated later 13th to 14th century) is in hard chalk and, although incomplete, has a diameter in excess of 52mm with a 15mm diameter central hole. The only complete example is much larger (72mm diameter; 222g), possibly representing a loom/household weight (pit [440], fill [467], dated later 13th century). This is in a calcareous Tertiary sandstone, probably from Hampshire, and is decorated with a number of incised lines (Fig. 45, S7).

Whetstones are not common in the medieval assemblage. The earliest consists of a fragment (12g) of Wealden sandstone from 13th-century pit [310] (fill [313]). The later 13th- to 14th-

century deposits produced two fragments from a probable whetstone in Upper Greensand (pit [601], fill [812]) and a quartzite pebble whetstone (pit [30], fill [31]). The absence of locally/regionally available whetstones is quite surprising, considering how common they are at other sites in the south-east, such as Lydd (Barber 2008d). The most common stone type for whetstones during this period was Norwegian Ragstone (schist), perhaps as a result of easy importation of this more suitable stone direct to the port. All this stone type in Table 25 can be seen to be from whetstones, even if no diagnostic features are present. At least five different stones are present, the most complete of which are from contexts [504] (well [353]) and [541] (pit [540]) (Fig. 45, S8 and 9 respectively). Norwegian Ragstone from post-medieval contexts, including a large part of a whetstone from 19th-century cesspit [597] (fill [598]), are almost certainly residual medieval pieces.

Other objects include fragments of two small anchors, one circular, the other more elongated. (Fig. 45, S10 and Fig. 46, S11 respectively). Both are from fill [448] of pit [440], and are in unprovenanced sandstones. Both were likely to have been discarded after breakage rendered them useless. The original weight of the circular example would have been in the region of 5–5.5kg, while the elongated example currently weighs 5kg, with the extent of the missing section uncertain. Even when whole, both weights would only have been suitable for small boats. In addition, the excavations produced three conjoining fragments (2.002kg) from a triangular-sectioned bar in Wealden sandstone (pit/well [353], fill [354]) (Fig. 46, S12). The piece is heavily burnt and it is possibly a bar from the internal structure of a kiln.

Other stone

The remaining part of the medieval stone assemblage consists of a wide variety of irregular pieces or rounded/semi-rounded cobbles and boulders. Although some of this material may relate to stone brought in for building, most may well represent ship's ballast (even if subsequently used in construction). Although the interpretation of ballast has its difficulties (Peacock 1998), the current assemblage is considered to be a fairly good indicator of trade as, to a certain extent, it reflects the ceramics. The locally available material appears to have been derived from the Downs to the north, though the presence of some chalk boulders with marine burrowing activity demonstrates that some of this material was collected from the shore (e.g. pit [732], fill [733] dated to the 13th century). It is possible that these boulders were used as ballast by ships sailing along the coast from places such as Seaford, where chalk is more abundant on the beach due to the cliffs (the presence of the shelly limestone from the Tertiary Beds at Newhaven would strengthen this suggestion).

In addition to the building material/worked stone, a number of other Wealden stones are represented, most notably Upper Greensand (malmstone), again, often present as boulders (pit [732], fill [733]), Wealden sandstones and clay ironstone. Although the latter two may have come from the Hastings area to the east, the former may have been more locally available in the Adur valley. Trade with Kent is represented by the Folkestone stone, usually in the form of beach cobbles/boulders and thus presumably collected from the shore.

Westward trade is indicated by the Tertiary sandstones from Hampshire as well as the Quarr and Bembridge

limestones from the Isle of Wight. Although the residual Quarr block is from building, the Bembridge limestone is irregular and water-worn, often with traces of marine burrowing animals. This stone appears in both 13th- (pit [732], fill [736]) and later 13th- to 14th-century (well [95], fill [518]) contexts and has clearly been collected from the shore. Stone from Dorset is well represented, both as building stone/objects in the case of the Purbeck Marble and as irregular pieces of various types of Purbeck and Jurassic limestone, some of which are again water-worn boulder fragments (e.g. pit [45], fill [116] and pit [440], fill [448] respectively).

Although West Country slate was the main stone type present from the south-west, a number of other types are represented in small numbers. With the exception of the diorite and quartzite pebbles, which could have been available more locally due to longshore drift, most of these stones have been brought to the site by man. The largest pieces consist of granite boulders up to 22.5kg in weight in 13th- and later 13th- to 14th-century contexts which must represent ballast (pit [732], fill [733] is notable because it contains two boulders weighing a combined 38kg). The Devonian sandstone is also probably ballast material and includes a 2.8kg boulder with marine burrows on its surface (well [95], fill [518]). A number of the stone types of uncertain origin, such as the basalt, schist and green igneous rock, may also come from this south-west source but other origins, including the Continent, cannot be ruled out. Other English stone in the medieval assemblage is confined to a few fragments of coal, which are almost certainly intrusive in these deposits.

The only definite Continental stone in the assemblage appears to be the result of deliberate importation of building material, querns or whetstones.

The post-medieval assemblage

The post-medieval assemblage is totally dominated by residual or re-used medieval stone which has already been discussed above where relevant. This is most notable with the residual West Country slate and the architectural pieces used in the construction of cesspit 648 (this accounts for nearly all of the Caen stone, Wealden sandstone, Horsham stone, Lower Greensand and Quarr stone in the mid 18th- to 19th- column in Table 25). The period first sees the use of the ferruginous fissure fill from the chalk for building (the piece from pit [165], fill [168] has mortar adhering), though this too could be residual.

Portland stone consists of a single piece built into 19th-century cesspit 648 and is probably re-used from an earlier post-medieval context. It may be that the port was in decline and did not warrant bringing in the better English building stones by this time, and/or the local building materials were sufficient. The mid 18th to 19th century unsurprisingly sees the first introduction of Welsh roofing slate, graphite/slate pencils and the increase in coal. Interestingly there are two 19th-century whetstones in Tertiary sandstone (probably from Hampshire) (well [582], fill [583] and cesspit [648], fill [647], Fig. 46, S13) and three in probable Yorkshire sandstones (pit [648], fill [647] x2; Fig. 46, S14 and S15 and pit [705], fill [715], Fig. 46, S16) though the exact source of these stones has not been proven.

Discussion

The stone assemblage from the site has shed far more light on the exploitation of the local/regional geological resources as

well as the trade network of the port during the High Medieval period than previous stone assemblages in the town (Barber 2006a; 2009b). Certain stone types clearly relate to specific goods imported for the suitability of the stone. This is the case whether the items are rotary querns from West Sussex or Germany, building material from France, the West Country or the Weald, or whetstones from Norway or the Weald. The assemblage of objects is fairly typical for an urban domestic context. However, the large proportion of Caen mortars over Purbeck examples hints at stronger links with Normandy than one might expect (Dunning 1977), and querns are well represented for an urban context. The anchors are in keeping with the site's location.

The unworked material, much of which is probably ship's ballast, demonstrates a number of contact points along the south coast including Cornwall, Devon, Dorset, Hampshire (including the Isle of Wight) and West Sussex. Eastward contacts are certainly suggested for East Sussex and Kent. The proportion of trade with each contact point cannot be estimated from the stone assemblage because the amount of material that has been removed, whether for re-use in construction or as ballast for another voyage, cannot even be guessed at. Although the ceramics indicate contact with the east coast, there is no such evidence in the current medieval stone assemblage unless some of the unprovenanced sandstones are from this area. At Lydd Quarry there was only slim evidence of this contact (Barber 2008d) in the form of an ammonite fossil in Lias. However, if the main contact with this area was related to summer fishing by the south coast fleets, it is more likely that they would have taken ballast from the south coast on the outbound trip, returning with their catch, and thus no ballast, at the end of the season.

Larger assemblages of stone are needed from the town itself to identify re-use of ballast on inland buildings. Similarly, larger stone assemblages from other ports on the south coast would be useful for comparative purposes; until now most excavated stone assemblages have been subject to a heavily biased collection policy towards the worked material. The published assemblage for Winchelsea, East Sussex demonstrates a similar range of purposely imported commodities such as Caen and Oolitic limestone building material, West Country roofing slates and German lava querns and Norwegian whetstones (Cartwright 2004). Although Winchelsea produced Kentish stone and a small amount of shale, indicating westward and eastward contacts, the town has yet to yield the great diversity of types represented by the Ropetackle site. Although this may be in part due to selective collection on older excavations in Winchelsea, it may well be because the harbour, where most of the ballast would be expected, lies below and outside the town, so it may be that most ballast, if present, was not carried up into the town. Future excavations on medieval Sussex ports should practise total recovery of stone to enable more direct comparisons to be made.

THE WORKED BONE ASSEMBLAGE

by Trista Clifford

Introduction

The worked bone assemblage consists of a total of 34 objects from 16 separate dated contexts. Objects of 18th- to 19th-century date predominate, few objects from other dated contexts surviving. The objects are generally in a good state of preservation, the composite objects slightly less well preserved due to their iron content.

This report provides an overview of the 18th- to 19th-century assemblage with the medieval objects considered in greater detail. A full catalogue of worked bone objects is recorded for the archive.

The medieval worked bone objects

Three bone needles or dress pins and an antler tool or knife handle were recovered from four separate contexts, catalogued below.

Context [96] Fill of Well [95] RF <1> (Fig. 43, F9)

Complete, made from the radius of an adult sheep. Large circular perforation at the distal end, c. 3mm diameter
Length 109mm

Context [518] Fill of Well [95] RF <90> (Fig. 43, F10)

Incomplete, made from the tibia of a juvenile sheep. Large circular perforation at the distal end, c. 6mm diameter
Length 91mm

Context [108] Fill of Well [87] RF <91> (Fig. 43, F11)

Incomplete, made from the radius of an adult sheep. Large circular perforation at the proximal end, c. 4mm
Length 73mm

Context [124] Fill of Pit [123] RF <95> (Fig. 43, F12)

Red deer antler. Fully perforated one-piece handle containing the corroded remains of an iron tang. Undecorated. Length 111mm, maximum diameter 41mm. Crummy (1988, 73) describes such antler handles of being of 'some antiquity', the example illustrated dating to the medieval period.

Discussion

Opinion is divided as to whether this type of bone needle was used as a needle or as a dress pin. A useful discussion in Crummy (1988, 6) suggests that such needles were used for netting, basketry or manufacturing braids, since they are clearly too large for ordinary sewing. Alternatively, Macgregor (1985, 120–1) interprets them as dress pins, suggesting that the large hole contained a cord which either linked it to a second pin on the opposite shoulder of the wearer or acted as a rudimentary safety pin. A similar needle from Southampton (Holdsworth 1976, 47) is interpreted as used for sacking and the examples from Norwich are also described as probably dress pins, but possibly needles used for coarse work such as netting.

Parallels from Southampton (Holdsworth 1976), Lewes (Freke 1976), Old Erringham, further up the Adur valley (Holden 1976), Coppergate (MacGregor *et al.* 1999) and Norwich (Margeson 1993) encompass a broad date range from early Saxon to the 13th century. Pottery from the three contexts has been dated to the 13th- to 15th-century.

The post-medieval worked bone objects

The post-medieval assemblage consists mainly of discarded household objects dating to the 18th-19th century. Several toothbrushes were recovered from contexts [373] and [647], one of which was engraved 'GHAS[S]EREAU BRIGHTON'.

The majority of the objects were recovered from context [647], the fill of a cesspit, and included a number of perforated buttons and furniture fittings. Context [684] contained a double-sided comb with concave teeth, a form typical of the 16th century onwards; a similar comb made of wood is dated to the 17th century (Egan 2005, 65).

THE LARGER MAMMAL BONE by Gemma Ayton**Introduction**

The bone assemblage recovered during excavation is extensive, with more than 6500 fragments collected from 224 contexts dating from early Romano-British to late post-medieval. Most of the assemblage is dated to the 13th–14th centuries, with some 148 contexts containing more than 4600 fragments attributed to this period. This report concentrates on the material from this period since the bone assemblages from the other phases are not large enough to be statistically viable, although period-by-period summaries are included below.

Methodology

All phases were studied in order to identify which species were present and the relative importance of each. From the resulting data NISP (Number of Individual Species Present) counts were produced. NISP totals include all skeletal elements such as ribs, vertebrae and cranium.

Assemblages from the 13th- to 14th-century phase, weighing over 50g, were studied and full quantification of the selected material was undertaken. The resulting data produced NISP and MNE (Minimum Number of Elements) counts. MNI totals were calculated using MNE counts by looking at the most common element and taking sides into consideration. Epiphyseal fusion was recorded and subsequently interpreted using data provided by Silver (1969). Dental wear was recorded using Grant's system (1982). Dental eruption was calculated using data from Silver (1969). Each fragment was then studied for signs of butchery, gnawing, burning and pathology.

In studying the assemblages no attempt was made to differentiate between sheep and goat, or horse and donkey. Undiagnostic fragments, categorised as cattle size or sheep size, have been included in the percentages of identifiable bone.

The Late Iron Age/Early Romano-British assemblage

A total of 192 fragments from eight contexts were dated to this period. Of these 164 fragments were identifiable and NISP counts show that the assemblage is dominated by sheep, totalling 76%. Cattle make up 11% of the assemblage and pig bones represent just 2%. The large percentage of sheep bone could represent a wool herd as can be seen in phase 3. Cattle and pig may have been kept primarily for meat, which would explain the small percentage of fragments.

The Late Saxo-Norman assemblage

Some 96 fragments from five contexts were recovered from this period. The assemblage is dominated by sheep fragments, totalling 77%, with cattle forming 19% of the assemblage and pig 4%. There is very little evidence to permit any formal conclusions, though it would seem that there was no remarkable shift in animal husbandry patterns during this phase.

The High Medieval assemblage*The assemblage*

The preservation of the bone from this phase was relatively good. There were many large fragments but few complete bones. This can be attributed to favourable soil conditions, and also suggests that the bone was not left on the surface for long before deposition. This idea is supported by the lack of evidence indicating gnawing from animals such as rodents

Table 26. Quantification of NISP and MNI for main species.

Taxon	NISP	MNI
Cattle	1667	10
Sheep	2079	11
Pig	151	3
Horse	8	1
Dog	2	2
Cat	1	1

Table 27. Relative percentages of main species.

Taxon	%
Cattle	43
Sheep	53
Pig	4

and carnivores, and by the presence of juvenile bones which are more susceptible to taphonomic processes.

The following taxa were identified: cattle (*Bos taurus*), sheep/goat (*Ovis/Capra*), pig (*Sus*), dog (*Canis familiaris*), horse (*Equidae*) and cat (*Felis domesticus*). Table 26 is a quantification table showing NISP and MNI counts for the main species. NISP for cattle is calculated by counting all bone that can be attributed to cattle and all bone classed as cattle size. This may have resulted in over-representation of cattle bone at the expense of horse. NISP for sheep also includes sheep-sized bone, which may be over-represented at the expense of pig.

Table 27 shows the relative percentages of the three main domesticated species. Sheep makes up the largest percentage of the assemblage in terms of NISP, with cattle forming the next largest and then pig. If we take into consideration MNI counts then the population of cattle and sheep were relatively similar. It also suggests that pigs were better represented than the fragment count would suggest. It is worth taking into consideration that a single cow provides a much higher meat yield than either pig or sheep. Although cattle have a lower NISP count than sheep, they would still have provided the bulk of the meat.

The range of species represented and their predominance are fairly typical of the food animals that would have featured in the diet of a medieval population. Excavations at Tanyard Lane, Steyning (O'Connor 1977) concluded that cattle and sheep predominate, with sheep slightly the more widespread of the two. This can be linked to the South Downs wool industry (Sykes 2005). The paucity of pig bones perhaps indicates a preference for pork or ham off the bone (Clements 1993). It may also reflect the fact that pigs were less economically viable because they produced no secondary products, making them an expensive luxury not many could afford.

Body-part data

Table 28 shows the calculated MNE for the main domesticated species for a selection of elements. Bones from cattle elements are all present in relative quantities, with bones from the main meat joints and skeletal extremities represented. Sheep provide slightly different evidence, bones from the main meat-producing joints being the most common, and there is a significant lack of metapodials and phalanges. Bone from pig

Table 28. MNE for main domestic species.

	Cattle	Sheep	Pig	Total
Mandible	15	22	11	48
Scapula	21	27	13	61
Humerus	17	45	8	70
Radius	19	46	7	72
Ulna	16	15	5	36
Pelvis	12	17	4	33
Femur	13	19	2	34
Tibia	20	42	7	69
Calcaneum	12	12	5	29
Metapodial	29	12	16	57
PHG1	19	3	1	23
			TOTAL	532

shows a reverse of this trend, with a significantly more marked lack of meat-producing elements than of skeletal extremities.

The evidence for butchery is limited, only 3.6% of bones showing any signs. Both sheep and cattle bones provide evidence for primary butchery and dismemberment, with a greater number of skeletal extremities showing signs of butchery. Combined with the data from the MNE count, it would suggest that some sheep were arriving as butchered joints or that discard was carried out away from the site. It also suggests that some sheep were kept as livestock, since some primary waste is present.

Butchery evidence for cattle reveals that primary butchery practices and discard were taking place on the site, with a number of marks recorded on skeletal extremities. There is also evidence of later butchery stages, with chop marks on vertebrae and ribs indicative of carcass reduction and cuts to the humerus indicative of dismemberment.

Butchery evidence suggests that pigs were also slaughtered on site, though only primary butchery practices were carried out. This supports the evidence from the MNE counts that suggests that the animals were eaten elsewhere.

Ageing data

Dental eruption and wear were recorded for the main domestic species with reference to Grant (1982). This provided very little data for cattle and pig due to the absence of complete mandibles. We were able to estimate the approximate age Tooth Wear Stage (T.W.S) for 11 sheep mandibles. This data is limited, but most mandibles fall into the later wear stages, indicating that the site was dominated by older animals. This supports the idea that livestock were kept primarily for wool rather than being killed at a young age for meat.

The ageing data for epiphyseal fusion is tabulated in Tables 27–29. The quantities involved are relatively large due to good preservation and have thus provided some useful information.

Cattle: Age data for cattle suggests that a majority of the animals lived to over 4 years though some were slaughtered at approximately 2–3 years. This suggests that a small quantity of cattle were killed for meat but the majority of the population was used for dairy.

Sheep: A small number of juvenile bones were present, suggesting that some animals were being slaughtered for meat. Most animals lived beyond 18 months but only half survived over 4 years. This supports the theory that livestock was kept for wool and juvenile animals were brought in for meat. This is also supported by tooth wear data. O'Connor (1977) suggests that sheep were not kept primarily as a meat animal before the 18th century, but as a producer of wool milk and manure.

Pig: The majority of pigs were killed at 2–3 years, suggesting that this was the prime meat-producing age. A small number survived beyond this, perhaps for breeding purposes.

Contextual analysis

There are a few large contexts from this period and the four largest are outlined below.

Context [33], Fill of Pit [32]

124 fragments were recovered from this feature. Cattle, sheep, pig and dog were represented. The relative proportions of the main species closely match those of the overall 13th- to 14th-century picture (sheep 51%, cattle 44%, pig 5%). The cattle assemblage is dominated by meat-producing elements (humerus, radius, femur and tibia) with a distinct lack of skeletal extremities. This is in contrast to the general picture, which presents all cattle elements in relative quantities. The picture for sheep is similar to that for cattle, though it conforms to the overall picture for sheep during this phase. The limited numbers of pig remains are dominated by mandible and metapodial fragments as well as teeth. This conforms to the overall picture of the site.

Context [80], Fill of Pit [79]

256 fragments were recovered representing cattle, sheep, pig and horse. Of the main meat species 52% are sheep, 41% cattle and 7% pig. The relative proportions of the meat-bearing animals are representative of the overall 13th- to 14th-century phase. Cattle and sheep are dominated by meat-bearing elements, though non-meat-bearing elements are present. This shows a slight deviation from the overall phase 3 assemblage, where cattle elements are evenly represented. Pig elements are also evenly represented, in contrast to the overall picture which is dominated by non-meat-bearing elements.

Context [108], Fill of Well [87]

From this feature 581 fragments were recovered, representing cattle, sheep and pig. Of the main meat species, 60% are sheep, 38% cattle and 2% pig. Sheep are slightly over-represented at the expense of pig. The skeletal representation of cattle and sheep conforms to the general picture as outlined above. Pig fragments are evenly represented, with both meat-bearing and non-meat-bearing elements present. This is in contrast to the general picture which is dominated by non-meat-bearing elements.

Context [541], Fill of Pit [540]

695 fragments were recovered from this feature, which is the largest of the period. Of the main meat species, 48% are sheep, 50% are cattle and 2% are pig. Cattle representation is higher at the expense of sheep and pig. Cattle and sheep fragments conform to the overall view of the site though, once again, pig fragments show a reverse trend, with meat-bearing joints dominating the assemblage.

Discussion

The four largest assemblages are dominated by the three main meat species with a small quantity of horse. Generally, sheep fragments dominate the assemblage, with cattle the second most frequent. In all four assemblages, sheep elements are dominated by meat-producing fragments, suggesting that primary butchery was taking place away from the site. This supports the results for the overall assemblage. Generally cattle bones are evenly distributed, though in contexts [33] and [88] meat-producing elements are more common. There is evidence that, unlike sheep, primary butchering of cattle was carried out on site and the waste deposited there. Generally, the pig assemblage is dominated by non-meat-producing elements, though in contexts [88], [108] and [541] we see a reversal of this trend. These contexts were used mainly for disposal of secondary waste, suggesting that primary butchery of pigs was carried out elsewhere, though still within the confines of the site.

Discussion

By combining the above data we are able to produce some useful information about the animal husbandry practices carried out at Ropetackle during the 13th and 14th centuries. The presence of juvenile bones suggests that this was a producer site with emphasis on secondary products such as wool and milk. Cattle, sheep and pig were all consumed within the site.

Cattle

Cattle were kept primarily for secondary products rather than for meat. Some animals were slaughtered on site, with evidence for both primary and secondary butchering stages. The animals were probably consumed within the household.

Sheep

Age data suggests that sheep were also kept primarily for secondary products, though a minority were slaughtered and probably consumed within the household. MNE counts show a lack of skeletal extremities, suggesting that some of the meat came from elsewhere and was already partly butchered, or that primary butchery took place away from site. It seems more likely that this is due to poor preservation, the smaller sheep bones such as phalanges being more susceptible to fragmentation, producing a biased count.

Pig

Pig bones show the opposite picture, with a large number of animals being slaughtered at prime meat-producing age. MNE counts suggest that primary butchery of the pigs is carried out on site but then the meat is consumed elsewhere.

Horse

Only four horse bones from four contexts were identified in this assemblage. They included fragments from the mandible, maxillae, vertebrae and tibia. A fragment of proximal tibia showed a fusion line ageing the horse to roughly 3.5 years (Silver 1969).

Cat

Two cat bones were recovered, including one skull with a large chop mark across the cranium. Cat skeletons are not uncommon in medieval domestic rubbish; two were found in deposits from Marlipins, including a skull displaying cut marks (Sykes 2005). This suggests that urban households

occasionally supplemented their income by sales of cat fur.

Dog

Dogs are represented by only two phalanges. One displays an unfused proximal end and the other does not, suggesting that there are two animals, one over seven months and one under (Silver 1969).

The Transitional assemblage

Thirty-eight fragments from three contexts were recovered from this period. Although sheep fragments still dominate the assemblage (68%), the number is smaller and there is a corresponding increase in cattle (29%). This follows the trend from the 13th to the 14th century when cattle were to be used for dairy as well as meat.

The early post-medieval assemblage

A total of 677 fragments from 28 contexts were recovered from this period. Cattle and sheep are both evenly represented (45% and 46% respectively), the number of pig fragments still remaining low (3%). The percentage of cattle fragments is higher than is generally found along the south coast during this period, though in keeping with national trends (Sykes 2005). A similar situation can be seen at the Phoenix Brewery Site in Hastings, where it is interpreted as tanning waste, based on the intensity of horn cores (Clements 1993). An analysis of body part representation (Table 29) shows that no horn cores were present in the assemblage and no parallels can be drawn between Hastings and Ropetackle. The cattle and sheep assemblage shows an even number of skeletal extremities and meat-producing elements. This suggests that cattle and sheep were slaughtered and consumed on site, which is supported by the presence of butchery marks. The assemblage is too small to carry out any further analysis.

Table 29. Early post-medieval body part representation.

	Cattle	Sheep	Pig
Mandible	8	9	2
Cranium	8	6	
Teeth	2		2
Scapula	6	9	1
Humerus	10	8	2
Radius	8	3	2
Ulna	3	1	
Pelvis	10	3	
Femur	8	4	
Tibia	5	4	1
Calcaneum	1	1	
Metapodial	10	4	
PHG1	2		

The late post-medieval assemblage

Some 682 fragments from 32 contexts were recovered from this period. Sheep dominate the assemblage (52%) and there is a decrease in cattle fragments (36%). Pig fragments make up eight percent of the assemblage, a slight increase. Nearly all post-medieval sites from this region yield a caprine-

dominated assemblage (Sykes 2005). This may represent a shift to keeping sheep for meat as well as milk, wool and manure (O'Connor 1977).

Discussion

In summary, the Ropetackle assemblage conforms to the general picture of medieval urban life on the south coast. Sheep fragments dominate the assemblage and were kept mainly for wool rather than meat. Cattle would have provided the bulk of the meat as well as being used for dairy. The diet would have been supplemented with pig, though not all the pigs were consumed by the local households.

There appears to be little change in the animal husbandry regimes at Ropetackle throughout the six phases of occupation. The percentage of sheep fragments is generally higher than that of cattle and pig, though the number of cattle tends to fluctuate. There is a paucity of pig bones throughout all phases, which has long been a local archaeological puzzle (Clemons 1993).

THE BIRD AND FISH REMAINS

Additional figures

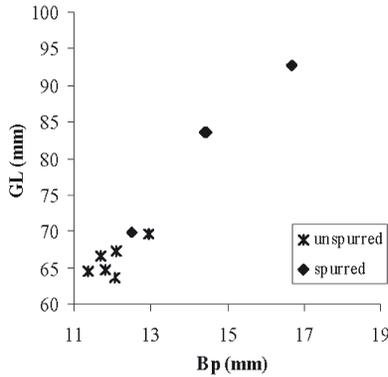


Fig. 47. Scatter plot showing greatest length (GL) relative to proximal breadth (Bp) of chicken tarsometatarsii from 13th-/14th-century deposits.

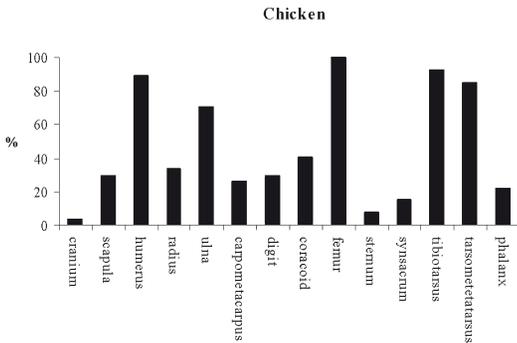


Fig. 48. Relative frequencies of main skeletal elements for chicken based on total fragment counts for each element — the values being calculated by comparing each element with the most frequently occurring ones (i.e. the element or elements represented by 100% in each graph) — from the 13th to 14th centuries.

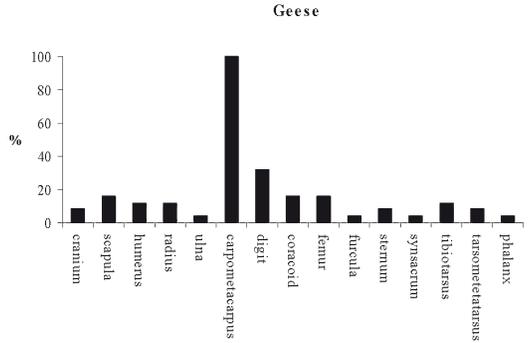


Fig. 49. Relative frequencies of main skeletal elements for geese based on total fragment counts for each element — the values being calculated by comparing each element with the most frequently occurring ones (i.e. the element or elements represented by 100% in each graph) — from the 13th to 14th centuries.

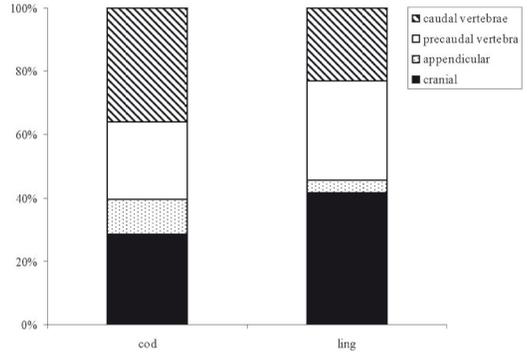


Fig. 50. Proportions of cranial, appendicular and vertebral elements in the gadid remains recovered from 13th-/14th-century deposits. Only remains representing cod and ling of over 0.75m in length were used (includes remains from hand-collection and from the eight sieved samples).

THE MARINE MOLLUSCS by David Dunkin

The excavation, together with the evaluation, at Ropetackle, Shoreham produced 249 contexts which contained marine molluscs and weighed in total 391.404kg. The assemblage is dominated by the Common Oyster (*Ostrea edulis*).

Four main periods are represented and from these 20 contexts have been selected for analysis (Table 37). Fourteen species were identified: *Ostrea edulis* (Common Oyster), *Pecten maximus* (Great Scallop), *Mytilus edulis* (Common Mussel), *Cerastoderma edule* (Common Cockle), *Buccinum undatum* (Common Whelk), *Littorina littorea* (Periwinkle), *Venerupis decussata* (Carpet Shell), *Cypraea pantherina* (Panther Cowrie), *Haliotis tuberculata* (Ormer), *Acanthocardia tuberculata* (Rough Cockle), *Acanthocardia aculeata* (Spiny Cockle), *Patella vulgata* (Limpet), *Chlamys varia* (Variegated Scallop) and a segment of unidentified *Turritellidae*. Oyster remains were found in all 20 contexts and by weight (200.836 kg) represented 87% of the total assemblage analysed (231.536 kg) (Table 38).

Table 37. Periods and contexts of analysed marine molluscs.

Periods	Contexts examined/feature type
Early Roman	553 (Ditch)
C13th/14th	33 (pit) 88 (well) [96] (well) 116 (pit) 347 (cesspit) 354 (well) [541] (pit) 611 (cesspit) 736(pit)
C16th/17th	225 (pit) 372 (pit) 431 (pit)
C18th/19th	239 (cesspit) 386 (well) 570 (cesspit) 583 (well) 598 (cesspit) 644 (cesspit) 647 (cesspit)

Great Scallop remains were found in eight contexts and, apart from three fragments from a 13th/14th-century pit, all were recovered from 18th/19th century features. The total weight of Great Scallop was 25.601kg, and this represents c. 11% of the total weight. Common Mussel was identified in 13 contexts and came exclusively from 13th/14th and 18th/19th century features. The total weight of Mussel is 2.293kg, which is c. 1% of the total weight. All other species identified were <1% by weight of the total (Table 38), so only the oyster and Great Scallop are of statistical significance for the analysis. Cowrie shells have been collected for millennia because of their decorative attributes; all the other species identified at Ropetackle were used for food. The Ormer is also collected for its 'mother of pearl'.

The early Roman assemblage came from a ditch (context [553]), and Table 37 indicates that the medieval and post-medieval marine molluscs were retrieved from the sealed contexts of pits/wells/privies.

Table 38. Total weight of individual marine mollusc species examined.

Species	Weight kg
Oyster (<i>Ostrea edulis</i>)	200.836 (87%)
Great Scallop (<i>Pecten maximus</i>)	25.601 (11%)
Common Mussel (<i>Mytilus edulis</i>)	2.293 (1%)
Common Cockle (<i>Cerastoderma edule</i>)	1.197 (c. 0.5%)
Common Whelk (<i>Buccinum undatum</i>)	0.763 (<0.5%)
Periwinkle (<i>Littorina littorea</i>)	0.566
Carpet Shell (<i>Venerupis decussata</i>)	0.199
Panther Cowrie (<i>Cypraea pantherina</i>)	0.032
Ormer (<i>Haliotis tuberculata</i>)	0.020
Rough Cockle (<i>Acanthocardia tuberculata</i>)	0.019
Spiny Cockle (<i>Acanthocardia aculeata</i>)	0.005
Variegated Scallop (<i>Chlamys varia</i>)	0.002
Limpet (<i>Patella vulgata</i>)	0.003
<i>Turritellidae</i> (not weighed or identified to species)	0.000
Total	231.536kg

Age analysis of all contexts by period of collected oyster shows some interesting differences (full details are housed with the site archive). Oyster usually live to an age of 10 to 12 years, and reach maturity at 4 years, which is the minimum age at which they are usually collected for consumption. The Roman context [553] produced over 1000 oyster valves but only 13% of these were aged 5–10 years+. Although a number

of the <5 year old valves were of sufficient size to be edible, a significant number were not. This strongly suggests that the oysters from Roman sources at Ropetackle were collected from an over-exploited wild colony (see below). By contrast, the oyster shells (left and right valves) in excess of 5 years (5–10 years+) from the C13th/14th- and the 16th/17th -century contexts were 60% and 54% respectively. These figures lie within normal parameters and could suggest either a farmed or a wild colony source, depending on exploitation levels. Approximately 70% of the oyster valves retrieved from the later post-medieval contexts (C18th–19th) were in the upper age range (5–10 years+). This suggests that at least some of the seven assemblages collected from this later period were retrieved from farmed colonies. This corroborates the fact that oyster-stations are known to have existed in the Shoreham area by the 19th century (see below).

In formal food preparation it is the left or lower valve of the oyster that is served. This means that in rubbish disposal there may be some patterning in the occurrence of upper and lower valves. Of the 20 contexts examined, 17 had a greater number of the left/lower valves and in no case was there a standard deviation of >26% in the ratio of left to right shells. Thus the number of left and right valves from all the contexts examined is in keeping with the disposal of everyday domestic rubbish.

The levels of infestation by polychaete worm (e.g. *Polydora ciliata*/P. *Hoplura*) and burrowing sponge (*Cliona celata*) together with distortion of the valves are variable across the four periods. The oyster valves retrieved from the early Roman ditch on the site, context [553], show high levels of worm infestation and distortion of shell. Both these parameters are close to 30% of the total recovered and this, together with the large number of young individuals from the context, further corroborates the probability that this resource derived from a wild colony which may have been over-exploited. By contrast, the majority of the medieval (13th/14th century) and early post-medieval (16th/17th century) contexts (Table 37) have very low levels of infestation and shell distortion. The one exception to this is a 13th-century pit, context [736]. This has 25% polychaete worm infestation, with 40%+ of the shells showing distortions, many of which have been caused by 'adhering' shells. Context [736] also has a large number of inedible individuals within the younger grouping of valves. It is therefore unlikely that the oyster from this context were recovered from a 'farmed' colony.

Generally speaking, the oyster valves from the later post-medieval contexts show a low level of shell distortion but four of the seven contexts ([239], [598], [644], [647]) for this period have evidence for significant infestation by the burrowing sponge (*Cliona celata*) (e.g. context [239]: 74%). Recent excavations at Manor Cottage, Southwick (Stevens 2006) also show very high levels of sponge attack in Victorian contexts (e.g. 50%+). Oyster from the nearby Marlpinis site, which had a terminal date of the 17th century, also produced evidence for low levels of *Cliona celata* up to this date. It is therefore possible that by the late 19th century oyster-stations at Shoreham were suffering from significant infestation, particularly by *Cliona celata* (polychaete worm levels were low). Retrieval of further oyster assemblages of the period from the area may help clarify this in the future.

The site at Ropetackle also produced quite large assemblages of the Great Scallop. All of these came from later post-medieval contexts (18th/19th century), in particular

[570], [583], [644] and [647] (Table 37). Context [583], a post-medieval well, produced the largest assemblage, which comprised 228 left and right valves, weighing 12.54 kg, and displayed high levels of worm (44%) and burrowing sponge (36%) infestations. The majority of the valves were of adult age and therefore edible, measuring up to 14cm x 13cm. The Great Scallop has been a popular food since at least the Roman period, and is known to have been harvested on the South Coast and sent to the markets in Shoreham during the 19th century. In more recent times it is known on menus as Coquilles St. Jacques. Similar to Ropetackle, it was almost entirely absent from the earlier contexts (pre-18th century) at the Marlipins site (Thomas 2005).

It is not possible to identify the source of the oyster, but they almost certainly derive from the estuarine reaches of the River Adur in the vicinity of the town. New Shoreham itself received new borough status in the early years of the 13th century and the town's importance as a port and a trading centre grew from that time. By the later 19th century Shoreham possessed a large fishing fleet and oysters had become an important component of this (Erlington 1980, 163). The 1855 'Kelly's' notes that Shoreham had an 'excellent oyster-station' and that there had previously been an underground pound for storage of oysters at Ropetackle. The location of farmed oyster beds in the Adur estuary close to the site may be seen on the 1st edition Ordnance Survey map. The assemblages of oyster remains from the later post-medieval contexts (Table 37) therefore almost certainly derived from these locations.

The prevalence of oyster at the site since early Roman times (first century AD) shows its importance as a food resource in the area over a very long period. Its history of exploitation, however, can be charted more closely from the early beginnings of the town in the 13th century to the opening years of the 20th century, by which time the industry had gone into decline. Apart from oyster and scallop, the relatively small quantities of the other four principal edible species (Common Mussel, Cockle, Whelk and Periwinkle) (Table 38) indicate that they were probably only a supplementary food resource from the early medieval period. The very low levels of the other species (Table 38) suggest that their presence is accidental or residual, and they cannot be regarded as an important food resource at the site. The two exotics reflect the longer-distance connections of Shoreham as a port in the later post-medieval period. The panther cowrie (*Cypraea pantherina*) from context [583] is only to be found in the Red Sea/Gulf of Aden, and it would be interesting to know whether its journey to Shoreham pre-dated the opening of the Suez Canal in 1869. The unidentified *Turritellidae* is likely to derive from the Mediterranean region.

THE CHARCOAL AND WATERLOGGED WOOD

by Rowena Gale

Introduction

Charcoal was recovered from a large number of late medieval features but often in poor condition or in insufficient quantity to warrant detailed analysis. Samples were selected from five contexts for full analysis. These included pits and a well feature dating from 13th–15th centuries. Each context also included abundant pottery and bone, thereby implicating associated charcoal as domestic waste, although the presence of slag and iron in well [87] could suggest that industrial fuel debris was also present. Species identification

was undertaken to indicate the character of the fuel and to obtain environmental evidence, particularly with reference to woodland management on the coastal plain.

In addition, the report includes the identification of worked wood (probably mostly structural in origin) and other waterlogged fragments from Area 4B. These date to the medieval and later periods, although a number are undated.

Methods

Bulk soil samples were processed by flotation and sieving using 250micron and 1mm meshes. Flots and residues were examined under low magnification and the seeds separated from the charcoal. The latter was mostly fairly firm and well preserved, although sample <1008> (context [108]) was friable and degraded. Intact segments of roundwood were rare. Sample <1050> (context [448]) was 25% sub-sampled. The samples were prepared using standard methods (Gale and Cutler 2000). Anatomical structures were examined using incident light on a Nikon Labophot-2 compound microscope at magnifications up to x400 and matched to prepared reference slides of modern wood. When possible, the maturity of the wood was assessed (heartwood/sapwood) and stem diameters recorded. It should be noted that during the charring process wood may be reduced in volume by up to 40%.

The condition of the waterlogged (worked) wood was rather variable, with some affected by desiccation. Most of the wood examined was seen as intact timbers although, for practical reasons, small pieces suitable for examination were removed from the larger timbers from contexts [721], [724], [744] and [806]. The samples were prepared using standard methods (Gale and Cutler 2000). Anatomical structures were examined using transmitted light on a Nikon Labophot-2 compound microscope as described above.

Results

The taxa identified are presented in 42. Classification follows that of Flora Europaea (Tutin *et al.* 1964–1980). Group names are given when anatomical differences between related genera are too slight to allow secure identification to genus level, for example members of the Leguminosae (*Ulex* and *Cytisus*) and Ericaceae (*Calluna* and *Erica*). When a genus is represented by a single species in the British flora, it is named as the most likely origin of the wood, given the provenance and period, but it should be noted that it is rarely possible to name individual species from wood features, and exotic species of trees and shrubs were introduced to Britain from an early period (Godwin 1956; Mitchell 1974). The anatomical structure of the charcoal was consistent with the following taxa or groups of taxa.

Aceraceae. *Acer campestre* L., field maple.

Betulaceae. *Alnus glutinosa* (L.) Gaertner, European alder; *Betula* sp., birch.

Corylaceae. *Corylus avellana* L., hazel.

Ericaceae. *Erica* sp. and *Calluna vulgaris*, heathers and ling. Many members of the heather family are anatomically similar.

Fagaceae. *Fagus sylvatica* L., beech; *Quercus* sp., oak.

Oleaceae. *Fraxinus excelsior* L., ash.

Leguminosae. *Cytisus scoparius* (L.) Link, broom or *Ulex* sp., gorse.

Rosaceae. *Prunus spinosa* L., blackthorn.

Ulmaceae. *Ulmus* sp., elm.

Pinaceae. *Pinus sylvestris* L., Scots pine.

Table 42. Quantification of charcoal and waterlogged wood. Key for charcoal: h = heartwood; r = roundwood (diameter <20mm); s = sapwood (diameter unknown). The number of fragments identified is indicated.

Sample	Context	Description	Acer	Alnus	Betula	Corylus	Ericaceae	Fagus	Fraxinus	Prunus	Quercus	Ulex/Cytisus	Pinus
Charcoal													
<i>13th–14th century</i>													
1000	74	Fill of pit [73]	1	–	–	–	–	10	1	2	15h	–	2
1008	108	Fill of well [87]	–	–	16	–	–	37	1	–	46h, 29s	–	–
1029	163	Fill of rubbish/cesspit [156]	–	–	–	3r	–	1	1h, 3r	1	34h, 1r, 13s	8r	–
1050	448	Fill of pit [440]	–	–	–	1r	–	4	–	–	57h, 13s	–	–
<i>14th–15th century</i>													
1006	100	Fill of pit [99]	–	3	4	–	1	16	–	–	11h, 1s	1	–
Waterlogged wood from Area 4B													
<i>13th–14th century</i>													
–	108	Fill of well [87]	1 × oak (<i>Quercus</i> sp.) heartwood. 1 × beech (<i>Fagus</i> sp.) roundwood, diameter 11mm.										
1074	453		A mix of degraded roundwood and plank fragments. Roundwood includes oak (<i>Quercus</i> sp.) and willow (<i>Salix</i> sp.)/poplar (<i>Populus</i> sp.), diameter 20mm. Plank: oak (<i>Quercus</i> sp.) heartwood.										
			Fragmented artefact (?base of bowl): field maple (<i>Acer campestre</i>)										
1107	803	Fill of pit [665]	Fragments from largewood, ?plank, 25mm thick. Beech (<i>Fagus</i> sp.)										
1088	673		Long slivers of largewood, up to 310mm in length. Oak (<i>Quercus</i> sp.) heartwood.										
–	804		Oak (<i>Quercus</i> sp.) heartwood from largewood.										
1114	770	Lower fill of burnt pit [601]	Small degraded fragments about 10mm thick. Oak (<i>Quercus</i> sp.) heartwood.										
<i>16th–17th century</i>													
–	692	Fill of posthole [691]	Oak (<i>Quercus</i> sp.) heartwood from knotty largewood.										
<i>18th century</i>													
–	748	Fill of [747]	Oak (<i>Quercus</i> sp.) ?wood chips.										
<i>?18th century, residual medieval, intrusive 19th century</i>													
1091	719	Fill of saw-pit	Oak (<i>Quercus</i> sp.) ?wood chips.										
<i>undated</i>													
–	694	Fill of posthole [693]	Oak (<i>Quercus</i> sp.) heartwood. Tapering, wedge-shape, length 190mm. Very abraded.										
–	721	Plank in saw-pit	Oak (<i>Quercus</i> sp.) heartwood. Diameter of heartwood area examined: 210mm.										
–	723	Plank in saw-pit	Oak (<i>Quercus</i> sp.) heartwood. Plank dimensions: 400 x 150mm x 30mm thick.										
–	724	Post-pad in saw-pit	Oak (<i>Quercus</i> sp.) heartwood. Section from larger timber.										

Table 42. (cont.)

Sample	Context	Description	Acer	Alnus	Betula	Corylus	Ericaceae	Fagus	Fraxinus	Prunus	Quercus	Ulex/Cytisus	Pinus
-	725	Plank in saw-pit	Elm (<i>Ulmus</i> sp.) heartwood. 2 fragments from plank, outer surface abraded.										
-	744	Roundwood	Oak (<i>Quercus</i> sp.) roundwood including both heartwood (probably at least 14 growth rings) and sapwood, the latter very degraded										
-	783	Timber in saw-pit	Elm (<i>Ulmus</i> sp.) fragmented plank, 10mm thick.										
-	784	Timber saw-pit	Elm (<i>Ulmus</i> sp.) knotty plank, 25mm thick.										
-	796	Wedge to it of plank off floor	Oak (<i>Quercus</i> sp.) 5 fragments										
-	797	Wedge to it of plank off floor	Elm (<i>Ulmus</i> sp.) heartwood. Larger piece, slightly wedge-shaped, ?tangential conversion, depth 900mm.										
-	798	'Stop' in saw-pit	Oak (<i>Quercus</i> sp.) heartwood. ?squared plank. Length 1250mm, width c. 35mm.										
-	806	Timber post-pad	Oak (<i>Quercus</i> sp.) heartwood. Outer surface very abraded. Diameter of heartwood area examined: 210mm.										
1110	807	Floor layer	Large irregularly-shaped fragmented plates (15mm thick) made up of compressed and degraded plant material probably including wood particles but too degraded to identify. Possibly trampled sawdust.										

Discussion

Occupational debris dating from the medieval period was widespread across the site, particularly in pits and similar features. They frequently included the remains of hearth debris (charcoal) which, given the high incidence of domestic waste, such as pottery, bone, shell and other artefactual material (e.g., daub, basketry and rope), probably originated mostly from domestic sources.

A number of large worked timbers were recovered from waterlogged pits and postholes, and from floor layers; these were probably mostly structural in origin. They varied considerably in preservation. A good percentage of them related to the medieval period, although some remain undated (Table 42).

13th–14th centuries

Charcoal examined from the fills of pits [73], [440] and [156] and well [87] indicated use of fuel gathered from multiple species (Table 42). Although predominantly oak (*Quercus* sp.), mostly from wide roundwood or largewood, other taxa included beech (*Fagus* sp.), ash (*Fraxinus excelsior*), hazel (*Corylus avellana*), blackthorn (*Prunus spinosa*), gorse (*Ulex* sp.) and/ or broom (*Cytisus scoparius*), field maple (*Acer campestre*) and pine (*Pinus* sp.). Hazel and gorse/ broom occurred as narrow roundwood (e.g. sample <1029> included hazel fragments with diameters of 7mm). Growth rates in oak and ash (samples <1008>, <1029> and <1050>) ranged from slow to fast.

Although attributed to dumped domestic fuel, slag in the fill of well [87] implies that industrial waste, perhaps including fuel debris, may also have been disposed of in this feature. The charcoal from this context (sample <1008>), however, indicates little if any difference from that from the remaining samples examined (Table 42). It is not clear whether iron, recorded in samples <1008> and <1050>, related to industrial or artefactual origins.

Waterlogged wood was obtained from the fills of well [87] and pits [665] and [601] (Table 42). Although some pieces were clearly artefactual, e.g., the base of a maple (*Acer*) bowl and oak (*Quercus* sp.) and beech (*Fagus* sp.) plank fragments, it was more difficult to interpret the origin of many of the smaller pieces, especially the roundwood, which included beech (*Fagus* sp.) and willow (*Salix* sp.) or poplar (*Populus* sp.).

14th–15th centuries

It is probable that sample <1006>, from the fill of pit [99], also derived from dumped domestic fuel debris although, here again, iron deposits in this feature could imply that some portion of the charcoal was industrial fuel. In common with earlier samples, oak (*Quercus* sp.) and beech (*Fagus* sp.) probably provided the bulk of the fuel, which was supplemented with gorse (*Ulex* sp.) and/or broom (*Cytisus scoparius*), alder (*Alnus glutinosa*), birch (*Betula* sp.) and heather (Ericaceae). Interestingly, alder, birch and heather were not recorded in the earlier samples, which could suggest either that supplies were obtained from a different source or differential selection. Although minimally represented here, heather was economically important in rural areas as a fuel, bedding material, fodder and for numerous other uses (Edlin 1949; Mabey 1996).

Undated timbers

Most of the undated timber was obtained as planks or timbers from saw-pit [708] (Table 42) and indicated structural use

of oak (*Quercus* sp.) and elm (*Ulmus* sp.). The base of an oak (*Quercus* sp.) post was recorded in the fill of post-hole [693]. Several plate-like pieces from floor layer (807) were ascribed as trampled sawdust. They consisted of a compressed matrix of degraded plant material, probably with a high percentage of wood particles.

Environmental evidence

The site was on the coastal plain, separated from the Sussex Weald by the South Downs. Evidence from the charcoal indicates availability of a wide range of woody taxa. Larger woodland trees included oak (*Quercus* sp.), beech (*Fagus* sp.), ash (*Fraxinus excelsior*), field maple (*Acer campestre*), alder (*Alnus glutinosa*), birch (*Betula* sp.), pine (*Pinus* sp.) and hazel (*Corylus avellana*). Shrubby/scrubby species included blackthorn (*Prunus spinosa*), gorse (*Ulex* sp.) and/or broom (*Cytisus scoparius*) and heather (*Ericaceae*). Despite the proximity of the chalklands, heather, pine, gorse and birch are indicative of acid or nutrient-depleted soils and almost certainly reflect the local terrain and geology. Evidence from the waterlogged wood indicates access to elm (*Ulmus* sp.).

Owing to the paucity of narrow roundwood, direct evidence of woodland management was sparse. The fast growth rates recorded in some fragments of both oak and ash, however, are consistent with fuel woods supplied from managed sources, although origins from trees growing in optimal conditions in non-managed woodland (e.g. in hedgerows or as free-standing specimens) cannot be entirely ruled out.

During the medieval period, land clearance in favour of agriculture (to feed the rapidly increasing population in southern Britain) reduced woodland, probably to its lowest percentage of land cover since the Neolithic period. Rackham (1986) estimates that in the mid-14th century only 10% of the countryside remained wooded. Thus extant woodland was under immense pressure to maintain supplies of fuel and timber, which could be achieved only by rigorous management. At this time, woodlands were subject to numerous statutes, especially in areas where industrial iron-working and glass-making were practised, such as parts of the Sussex Weald (Armstrong 1978; Galloway *et al.* 1996). It therefore seems probable that fuel supplies to the settlement at Ropetackle would have been dependent mainly on coppiced/managed woodland.

Evidence of woodland management on the coastal plain was recorded at the contemporary site at Little High Street, Worthing, where coppiced hazel (*Corylus avellana*) occurred in 13th-century deposits (Gale 2001). Additional taxa named from this site included oak (*Quercus* sp.), blackthorn (*Prunus spinosa*), the hawthorn/*Sorbus* group (Pomoideae) and willow (*Salix* sp.)/poplar (*Populus* sp.). Further to the east, charcoal deposits from a medieval saltern (spot-dated to 11th/12th century) in the Ouse Estuary indicated selective use of beech (*Fagus* sp.), although here evidence for use of coppiced wood was inconclusive (Gale, forthcoming).

The remains of large waterlogged timbers named as oak (*Quercus* sp.) and elm (*Ulmus* sp.) demonstrate that the community had access to fairly substantial trees. Although the elm timbers were undated, they may relate to the medieval period. The condition of the wood was poor and it was not possible to assess the ages of these timbers from the wood structure, or whether they had grown as managed woodland. However, since elm suckers prolifically, it is not

generally suited to coppicing (Rackham 1986) and the timber may, therefore, have been obtained from trees growing in unmanaged areas.

THE PARASITE EGGS by John Carrott

Introduction

Samples were submitted for investigation of their content of the eggs of intestinal parasitic nematodes. The samples were examined using the 'squash' technique of Dainton (1992). Assessment slides were scanned at 150× magnification with 600× used where necessary. Although primarily for detection of intestinal parasitic nematode eggs, the 'squash' technique routinely reveals other microfossil remains, and where present these have also been noted.

Results

Context [490], fill of pit [402]

The 'squash' was approximately half inorganic material and half organic detritus. Many plant 'hairs' and tissue fragments were noted, together with many pollen grains/spores and two live soil nematodes. Fifteen poorly preserved *Trichuris* eggs and three ?*Ascaris* eggs were seen. Additionally, one egg of ?*Capillaria* was tentatively identified.

Context [491], fill of pit [402]

The 'squash' was mostly inorganic, with some organic detritus and pollen grains. Two live soil nematodes were also seen. A small number of parasite eggs were observed (3 *Trichuris* and 2 ?*Ascaris*) in a similarly poor state of preservation as those recorded from context [490] (Sample 1054, above).

Context [611], fill of pit [536]

The 'squash' was almost entirely inorganic with just a trace of organic detritus. Three structures were observed that might have been the extremely poorly preserved remains of trichurid eggs.

Discussion

Both the samples from fills of pit [402] (contexts [490] and [491]) contained eggs of intestinal parasitic worms, indicating a faecal component to these deposits. Three structures observed in sample 1094 (context [611]) could possibly have been very decayed *Trichuris* eggs. In addition, a single ?*Capillaria* egg was tentatively identified from context [490]. Eggs of this genus of parasitic nematodes of birds and mammals have been recorded from deposits elsewhere (e.g. at 16–22 Coppergate, York; Kenward and Hall 1995). Here poor preservation prevented more definite identification.

Where positively identified, the *Trichuris* eggs were very poorly preserved, none of those seen retaining even one polar plug and often with the shell itself highly decayed. Comparison of these eggs (via an estimation of their original size from a few spot measurements of the remains) with data for modern trichurids (Ash and Orihel 1984; Kassai 1998) indicated that the eggs seen were probably of either *Trichuris trichiura* (Linnaeus) or *T. suis* (Schrank), the whipworms of humans and pigs respectively, or perhaps of both.

Even when well preserved, it is particularly difficult to distinguish these two species purely by visual examination of their eggs because the normal size-range for the eggs of *T. trichiura* is a wholly contained subset of that for *T. suis*. When, as here, the trichurid eggs are not measurable, a statistical approach to their identification, or determination

of the presence of more than one population, is not possible. Similarly, the eggs of the ascarids *Ascaris lumbricoides* (Linnaeus) and *A. suum* (Goeze), the roundworms of humans

and pigs respectively (though some parasitologists believe that there is just one species of *Ascaris* that infests both humans and pigs), are morphologically almost identical.

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