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ROMANO-BRITISH AND MEDIEVAL EXTRA-MURAL SETTLEMENT AT CHESIL STREET, WINCHESTER

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ABSTRACT

Excavations were undertaken in 2016 in advance of development at Chesil Street car park, Winchester, to the east of the Roman and medieval city defences, in a part of the eastern suburb that has seen little previous investigation. The work revealed four Romano-British pits – at least one possibly a lime kiln, extensive areas of chalk quarrying and several medieval features including a chalk-lined cess pit that contained well-preserved environmental evidence. Post-medieval remains comprised five wells in addition to wall foundations alongside Chesil Street, while the east side of the site had been truncated by construction of a railway opened in 1895.

INTRODUCTION

In 2016, following the granting of planning consent for housing development, Wessex Archaeology undertook a programme of archaeological work at Chesil Street car park, Barfield Close, Winchester, centred on National Grid Reference 448700 129050 (Fig. 1).

The site consists of an approximately triangular parcel of land orientated on a north–south axis and measuring some 0.4 hectares in extent. Chesil Street, a major thoroughfare into the city centre of Winchester, borders the site to the west, while to the east is Barfield Close, the location of the former Chesil Street Station and railway line. To the east of Barfield Close is a steep tree lined embankment, which formed the eastern side of the former railway cutting, the embankment rising from 6 to 10m in height at the southern end of the site where the former railway cutting passed under Chesil Street.

The site slopes down from an elevation of some 44m above Ordnance Datum (OD) at its southern edge to approximately 40.2m OD in the north. The underlying bedrock geology is mapped as Chalk of the Holywell Nodular Chalk Formation and the New Pit Chalk Formation (British Geological Survey, online viewer). No superficial deposits are recorded.

Archaeological background

Cist burials of possible Bronze Age date were reportedly uncovered in the late 19th century during the construction of the railway which traversed the eastern portion of the site, while sporadic prehistoric findspots have also been recorded in the vicinity of the River Itchen less than 100m to the west (Pastscape; Ottaway 2017, figs 2.4, 2.5 and 2.10).

Chesil Street follows the projected route of the Roman road from Winchester to Wickham (Ottaway 2017, fig. 3.1). Although the site is situated just to the east of the core of Roman Winchester (*Venta Belgarum*), outside the defences and to the south of the East Gate (Fig. 1), the proximity of the Roman road provides the potential for associated activity, particularly within the western half of the site. This could include the remains of suburban roadside settlement, field systems and burials, as have been found further north in the eastern suburb at St Johns Street and Chester Road (Ottaway 2017, fig. 3.39), and there are 19th-century reports of Roman structures being found south of the East Gate in the vicinity of the former railway station (Ottaway 2017, 135).

The site is situated beyond the core of the Saxon town and within the extramural area to the east of the medieval walled city (Ottaway 2017, fig. 6.5). Documentary evidence indicates that the area containing the site was populated

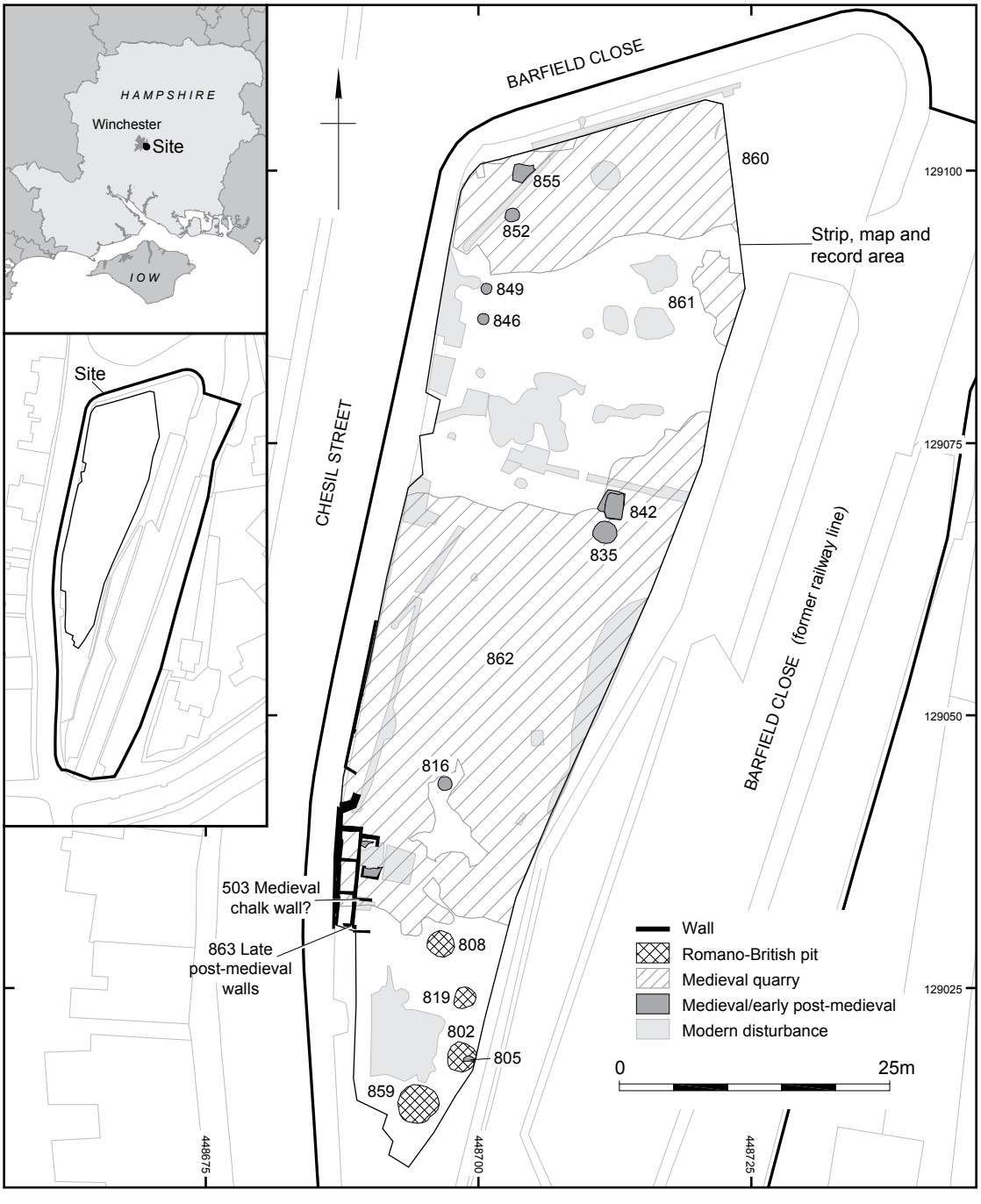

Fig. 1 Site location plan, showing excavated areas and archaeological features

by medieval and later tenement and garden plots which fronted onto Chesil Street, these properties held by the Cathedral, St Mary's Abbey and Winchester College among others (Keene 1985, figs 13 & 14). Previously identified archaeological evidence for medieval activity within the vicinity of the site includes a possible ditch of 13th–14th-century date at 52 Chesil Street, while a small evaluation to the north of the site at 14–20 Chesil Street, adjacent to St Peter's Church, revealed a sequence of deposits which may have been laid in an attempt to raise the ground level to reduce the risk of localised flooding. The deposits appeared to correspond with three separate phases, the first phase possibly dating from the 3rd/4th century AD, the second from the 13th/14th century, and the third from the late medieval to the post-medieval periods. However, no evidence of intensive activity or complex archaeological features or deposits was encountered (Wessex Archaeology 2009).

The First Edition 25 inch Ordnance Survey map of 1870–3 depicts a number of structures fronting onto Chesil Street, with a series of associated gardens or plots extending back from these. It is thought that many of the property boundaries depicted on the First Edition map may correspond with the footprints of the documented medieval tenement plots.

The Didcot, Newbury and Southampton Railway was opened in 1885, and later connected to the London and South Western Railway in 1891. A cutting was created through the eastern half of the site and many of the structures on the eastern side of Chesil Street demolished at the same time to make way for construction of the railway and enable access to the station. The railway line was closed in the early 1960s, after which the last remaining structures on the site were cleared and a car park established, with Barfield Close, following the course of the former railway, being constructed in the early 1980s.

PROGRAMME OF INVESTIGATIONS

Due to extensive truncation and remodelling of the natural topography during construction of the railway in the late 19th century the larger, eastern part of the site was excluded from the programme of archaeological investigation (Fig. 1). In contrast, initial evaluation of the western part in February 2016, comprising four 20 by 2m machine-dug trial trenches, revealed a Romano-British pit and evidence for extensive chalk quarrying of probably medieval date. Quarrying activity was confirmed by a subsequent watching brief on ground investigation works in March 2016, which also exposed some late medieval/early post-medieval structural remains close to Chesil Street. In April–May 2016, an area approximately 100m long and 25m wide (subsuming the evaluation and watching brief trenches) was subject to a strip, map, sample excavation, this covering most of the undisturbed (by railway construction) eastern half of the site.

Full details of the excavation, recording, finds and environmental sampling strategies are set out in the assessment report (Wessex Archaeology 2016).

Site sequence

The stratigraphic sequence observed across the site was relatively uniform, with the tarmacadam car park surface overlying a 0.2m thick base layer of compact gravel in yellow clay. In the northern part of the site increasing thicknesses of made ground overlay the weathered and degraded upper surface of the underlying chalk bedrock, into which archaeological features were cut.

Romano-British

A group of four, relatively large, sub-circular Romano-British pits were encountered in the southern part of the site (Fig. 1), three of which were similar in size, form and fill sequence. Small quantities of Romano-British pottery were also found residually in later contexts (mainly quarry pits) across the site.

Pit 808 was 2.3m in diameter and 0.8m deep, with near vertical sides and a flat base (Fig. 2). The chalk bedrock exposed in the base and sides of the cut was discoloured, with a bluish grey hue, indicating that these had been exposed to heat. The basal fill (809) was a 0.1m thick, very dark brown to black sandy silt, incorporating occasional chalk and relatively

Fig. 2 Romano-British pit 808 (from north-west)

abundant charcoal fragments. The basal fill was sealed by a 0.3m thick layer of chalk rubble (811) containing a large block of chalk, overlain in turn by a 0.15m thick light brownish grey silty clay incorporating pottery and a considerable quantity of animal bone, probably a dump of domestic refuse. The final fill of the pit (813) was a 0.2m thick layer of chalk rubble, which likely formed a deliberate infill or capping layer. Evidence recovered from environmental samples (see below) taken from the basal fill of pit 809, along with the heat-affected base and sides of the cut indicate that this feature may possibly have been a lime kiln. If so, the size and shape of the cut, and the absence of evidence for flues or stoke holes, are consistent with this being a clamp-type kiln, the chalk rubble perhaps representing the remains of an unburnt charge left in the kiln.

Pit 859, which had very steeply sloping sides, measured 3.45m in diameter, and was excavated to a depth of 1.2m; the full depth could not be ascertained. The fill sequence recorded included several deposits predominantly comprising chalk rubble, separated by a 0.7m thick layer of grey silty clay. These produced Romano-British pottery, ceramic building material (CBM) and animal bone, but the function of this large feature remains uncertain; it too may possibly have been a lime kiln. Pit 802 had moderately to steeply sloping sides and a flat base, was 2.7m in diameter and 0.5m deep. The primary fill was a thin layer of dark brownish grey silty sand, overlain by chalk rubble which incorporated pottery, animal bone, CBM and oyster shell. A rubbish pit appears the most likely interpretation. Pit 819 was of a similar size to the other Romano-British pits, though much more irregular and shallow. It measured 2.1m by 1.8m, but only 0.22m deep. The single fill comprised compacted chalk rubble, containing a moderate quantity of CBM.

No other features of conclusively Romano-British date were encountered. However, it is conceivable that some of the large areas of quarrying, which were infilled during the medieval period (see below), may have been originated in the Romano-British period, possibly for lime production as well as building material.

Medieval

Extensive areas of chalk quarrying were revealed in the central and northern parts of the site (860, 861, 862; Fig. 1). Sondages were excavated through these, to a depth of 0.3m in 860, 0.55m in 861 and 1.6m in 862, though none reached the base of the respective quarries. The sondages did, however, reveal that the quarry pits were infilled with complex

Fig. 3 Medieval cess pit 842 (from north)

sequences of deposits, most likely formed as a result of multiple episodes of deliberate infilling or dumping of material. In addition to modest quantities of residual Romano-British pottery, medieval pottery and animal bone were recovered from the fills of the quarry pits. Of particular note are two Saxo-Norman (10th–12th century) coarseware sherds from quarry 861, as no material of later date was recovered from this feature. This might indicate that the quarrying activity may have begun early during the medieval period. However, as noted above, the identification of a possible Romano-British lime kiln (808) suggests that some areas of the site may have been exploited for chalk extraction much earlier.

The absence of post-medieval artefactual material within the backfill of any of the quarry pits, as well as the stratigraphic relationship between quarry 862 and medieval cess pit 842 (see below), which cut it, demonstrates that quarries had been deliberately backfilled by the end of the medieval period, with no evidence for chalk extraction later than this.

Cess pit 842, of probable 13th–14th-century date, was cut through the northern edge of infilled quarry 862 (Fig. 1). Pit 842 was sub-rectangular, 2.4m long and 2.1m wide, and had a lining of small, roughly shaped chalk blocks (844) built against the vertical sides of the cut (Fig. 3). The full depth was revealed at 2.1m, using a machine, the base of the pit was flat and unlined. The basal fill consisted of a very fine dark red brown silty loam (841), which contained pottery, animal bone and oyster shell. This deposit appears to have been formed during the use of the feature as a cess pit (see below), which may have been of prolonged

duration given the thickness of the layer (1.1m). The upper part of the feature was infilled with a 0.8m thick layer of chalk rubble (843), which was presumably used to seal the primary and, presumably, noxious deposits.

A small sub-circular pit (805), approximately 1m in diameter and 0.2m deep, cut through the upper part of Romano-British pit 802 in the southern part of the site. A layer of domestic waste containing medieval pottery and animal bone was sealed by chalk rubble.

The only surviving structural remains assigned to this period comprise a short length of north-west to south-east aligned chalk rubble wall footing (503), approximately 0.9m wide, close to the Chesil Street frontage (Fig. 1). This footing had been largely removed by later brick walls but, more significantly, it had been cut by quarry 862, of presumed medieval date. Wall footing 503, therefore, probably belongs early in the medieval period, though might conceivably be of Roman date.

Post-medieval

Five circular chalk-lined wells, ranging in diameter from 1–2.2m, were exposed, three of these (846, 849, 852) situated in the north-western part of the site, one (835) close to the eastern edge of the excavation area, and one further to the south (816) (Fig. 1). Two of the wells (852 and 835) were cut through areas of backfilled medieval quarrying, indicating a later medieval or post-medieval date. Although the other three wells were cut through the chalk bedrock, with no stratigraphic relationships with other dated layers or features, their similarity in form and construction suggest that they may have been broadly contemporary with 852 and 835. None of the wells was excavated to the base, but the upper fills produced considerable quantities of CBM, pottery and glass, which indicated that these features had been infilled by the later post-medieval period; most clearly in one case (835) by the first half of the 18th century. The upper fill of well 816 contained only medieval and early post-medieval (15th–16th century) material, suggesting an earlier date for its disuse.

All of the wells would have been situated within the area occupied by the yards or gardens of properties that once fronted Chesil Street to the west, as shown on late 19th- and early 20th-century Ordnance Survey maps, the boundaries of these later properties perhaps coinciding with a number of documented medieval tenements.

A 1.8m by 1.6m sub-rectangular chalk-lined feature, 855, in the north-west of the site was not excavated, but the upper fill contained post-medieval material. The interpretation of the feature is uncertain, though it may have been a cess pit.

Late post-medieval – modern

Brick walls belonging to group 863, adjacent to Chesil Street, formed three east to west aligned rooms which extended beyond the western limit of the site (Fig. 1). Further walls to the east represented the remains of two adjoining outbuildings or extensions to the rear of the structures on the street frontage. Only the lowest courses of the brickwork and the underlying chalk rubble foundations survived, the interiors of the structures infilled with demolition material, with no floors remaining. These structural remains correspond with a group of terraced houses depicted on late 19th-century Ordnance survey maps along the eastern side of Chesil Street, which were demolished during the mid–late 20th century.

THE FINDS by Rachael Seager Smith, L Higbee (animal bone) and Esther Cameron (textile) (see also: AM 1 online)

Overall, 24.3 kg of finds were retained. Two struck flint flakes found in medieval contexts indicate general, low-level prehistoric activity in the area.

Romano-British

The Romano-British pottery assemblage (Table 1) is predominantly of 2nd- to 4th-century AD date. It includes two pieces of 2nd-century AD Central Gaulish samian – a form 33 cup rim from quarry pit 862 and body sherd from a form 31 bowl from pit 802. A Late Roman New Forest colour-coated ware beaker base came from pit 808, while the remainder of the assemblage is comprised entirely of utilitarian

Table 1 Pottery totals by chronological period and ware group

Ware	*No. of pieces*	*Weight (g)*
Romano-British:		
Samian	2	32
New Forest colour coat	1	67
Greyware	23	211
Grog-tempered ware	4	111
Black Burnished ware	2	22
subtotal:	*32*	*443*
Medieval:		
Chalk-tempered ware	2	31
South Hampshire redware	10	245
Coarse sandy wares	10	95
Glazed sandy ware	3	25
Tudor Green	1	1
subtotal:	*26*	*397*
Post-medieval:		
Redware	10	712
English stoneware	3	252
Tin glazed wares	2	43
White salt-glazed ware	1	5
Notts-type English stoneware	1	5
subtotal:	*17*	*1017*
Total:	*75*	*1857*

coarsewares. These are dominated by sandy grey coarsewares from the New Forest and/or the Alice Holt production centres, including rims from a narrow-necked jar and two shallow, plain rimmed dishes, one with convex sides indicating that this material extends into the late 4th or even early 5th century AD. Thick-walled body sherds from Hampshire grog-tempered storage jars came from pits 808 and 859, the latter group each having internal finger-nail 'pulls' roughening their inner surface. Black Burnished wares from the Wareham/Poole harbour region of Dorset include a rim from an everted rim jar of late 3rd or 4th century AD date. Although residual (in a medieval quarry pit), a single copper alloy coin is also of late 3rd- or 4th-century date.

The ceramic building material includes pieces from imbrex and tegula roof tiles as well as a single, residual box flue/voussoir block fragment from medieval quarry pit 862. The thickness of the brick fragments (30–38mm), suggests that these derived from the smaller, thinner types (bessales, pedalis and lydion), predominantly used in hypocausts and in lacing/bonding courses in walls. These were especially prolific in pit 859.

The entire animal bone assemblage comprises 342 fragments (or 4,579 kg). The Romano-British assemblage amounts to just 57 fragments, small compared with many assemblages from Winchester (Maltby 2010). However, a relatively large concentration was recovered from possible pit 808, these bones being extremely well preserved with many of the bone elements complete or nearly complete. Most of the identified bones belong to horse and are from at least two adult animals. The majority of the elements come from the forequarters and axial skeleton (i.e. vertebrae and ribs). Butchery marks consistent with the processing of horse carcasses for meat were recorded on the mid-shaft region of a humerus, but otherwise the bones show no sign of utilisation. The rest of the identified bones from pit 808 consist of a few cattle and sheep/goat elements, and the pelvis from a cat. A few cattle, sheep and pig bones were also recovered from the fills of pits 802, 805 and 859.

Medieval

The pottery includes two chalk-tempered Saxo-Norman (10th–12th century) coarseware sherds from quarry 861, which could indicate the date of this feature. One of these derived from a jar rim with finger-impressed decoration on its upper surface.

Small quantities of medieval wares of 12th–14th-century date came from pit 805 and quarry pits 860 and 862. These include rims from two jars, in moderately coarse sandy fabrics, and three externally glazed, sandy sherds (Table 1). The sandy fabric group also includes rims from two jugs (quarry pit 862) and six sherds from the pinched base/lower body of a 13th-century jug from cess pit 842.

A small piece from a medieval floor tile and a tiny sherd of South Hampshire Redware were

found in the upper fill of well 816, but a flake of 'Tudor Green' indicates at least a 15th–16th-century date for this deposit. Although residual, an encaustic floor tile (123mm square, 25mm thick) of Winchester College tile group 1 (Norton 1974, fig. 1, 7) came from well 835, while a second tile (125mm square, 30mm thick) is worn to plain red; both date from the 1300s.

A rod-shaped whetstone and a fragment of a worked chalk building block from quarry pit 862 could both be of either Romano-British or medieval date. The roofing slate fragments from cess pit 842 are certainly of medieval or later date, this material known to have been imported in considerable quantities from Devon, via Southampton, from at least the 12th century onwards (Wood 1983, 295).

A fragment of human tibia came from probable medieval quarry pit 862. The bone has several fresh breaks but is otherwise un-abraded which suggests that there are probably graves close by, perhaps more likely Romano-British than medieval.

A total of 285 animal bones were recovered from probable medieval quarry pits 860, 861 and 862, medieval cess pit 842 and late medieval/early post-medieval well 816, with the largest concentrations from quarry pit 862. The identified bones are mostly from cattle and sheep/goat, but there are also a few elements from pig, horse, goose and cod. The basal fill (841) of cess pit 842 was also quite rich in animal bones and included food waste from preparation of poultry (chicken) and fish (cod, whiting eel and thornback ray), as well as the remains from a few pit fall victims (house mouse and frog/toad) and garden birds (blackbird).

Medieval cess pit 842 also contained some textile, with the upper part of fill 841 producing a number of small fragments amounting to an area 50 × 40mm (see Cameron, online for full report). The largest fragment measures approximately 50 × 20mm and there are many smaller ones. Although clean and dry the condition of the textile is brittle as though partially mineralised by phosphates.

All these fragments of textile are the same plain weave with little sign of wear and no evidence of fulling, napping, pigment or dye (Walton & Eastwood 1984). There is no starting or finishing border; the edges are broken. The appearance of the weave, front and back, is the same. It is not obvious which sets of threads belong to warp or weft and therefore the two directions are referred to below as System 1 and System 2. The weave is a plain tabby, in which each thread in System 1 passes alternately over and under the threads of System 2. The thread count, which is the number of threads perpendicular to a 1cm rule, is 14 to 15 in System 1, 17 to 20 in System 2 (Walton and Eastwood 1984, 10–11). The thread diameter in System 1 is greater than that in System 2; the threads of both systems are evenly spun with a loose Z twist. The fibres are separate, pale/white, combed and glossy. Fine 'tracking' on the surface of the best preserved fibres at x50 magnification suggests they are animal fibre.

This is good middle-quality worsted, a category of woollen cloth widely used from the 14th century onwards for furnishings and light summer clothing (Owen-Crocker *et al.* 2012, 653–4). Unlike softer clothing fabrics of the period which were processed to raise the nap, worsteds had a natural crisp sheen achieved by combing rather than carding the wool and the avoidance of fulling and napping the woven product. Plain weaves became increasingly common throughout Europe in the 14th and 15th centuries, a trend which peaks in London during the period 1350–1450 (Crowfoot *et al.* 1992, 26–27, 43, table 1; Forster *et al.* 2005, 30, table 2.6; Walton Rogers 1991, 340). The majority were made from Z and S spun threads because it is easier to raise a nap on fabrics made with 'mixed spinning', whereas fabrics made with 'same spinning', such as ZZ, are associated with the production of worsteds (Crowfoot 1990, 476). The textile from fill 841 of cess pit 842 is, therefore, more likely to be a worsted than an unfinished plain weave destined for further processing.

Post-medieval

All of the post-medieval pottery (Table 1) came from the upper fill of chalk-lined well 835, and indicates a date in the first half of the 18th century for this deposit. Vessels include an almost complete English stoneware tankard with a small, incompletely impressed 'GR'

stamp near its rim and a thin-walled mug/jug rim in Nottinghamshire-type stoneware. The white salt-glazed ware sherd is from the rim of a small jar or bowl, while the two tin-glazed sherds probably come from the same commemorative bowl, with floral decoration externally and internally, the incomplete inscription ']the Induftry,st[with]Forfter.' on the line below. The Redwares include pieces from a convex slipware bowl, two plain convex bowls and a pipkin. The early 18th century date of this deposit is further reinforced by the clay tobacco pipe fragments, two with incuse marks of John Sims, a known pipemaker in Winchester during the late 17th/early 18th century; these pipes were probably made between 1700 and 1720 (Oswald 1975, 173; https://finds.org.uk/database/artefacts/record/id/533097: unique ID HAMP-8DD507). A plain, very worn copper alloy disc of uncertain function and two incomplete peg-hole roof tiles were also recovered from this deposit.

ENVIRONMENTAL REMAINS

Wood charcoal from Romano-British probable lime kiln 808 by Dana Challinor

A single sample from Romano-British pit 808 was analysed. Evidence of *in situ* burning and a large quantity of chalk lumps, with interspersed charcoal, indicated that the feature may have functioned as a clamp-type lime kiln. The basal deposit (809) was covered with a layer of chalk rubble (811) and a large chalk block (810), effectively sealing the deposit, the charcoal in this interpreted as fuel remnants from the last firing of the kiln.

Standard identification procedures were followed, with 50 fragments examined in longitudinal sections at high magnification (up to x400). Identifications were made according to appropriate keys (Hather 2000; Schweingruber 1990) and modern reference material. Observations on maturity and other features were made where possible. Classification and nomenclature follow Stace 2010.

The sample contained mostly small, fine, comminuted fragments that were <4mm in transverse section. This inhibited the examination of maturity indicators. Positive identification was also hampered by the tendency of the material to fragment on fracturing and the presence of calcium inclusions, which particularly obscured perforation plates, limiting the differentiation of *Alnus* (alder) and *Corylus* (hazel). Only two taxa, *Quercus* sp. (oak) and *Alnus glutinosa* (alder) were positively identified (19 – including four roundwood – and four fragments respectively), but it is thought that at least three, and probably four taxa, were present in the sample examined. Although it could not be confirmed by the perforation plates, it was thought possible (on the basis of texture and pore size) that *Corylus avellana* may have been present (there were 26 fragments – including 12 roundwood – of *Alnus* or *Corylus*). Additionally, the indeterminate fragment was of a diffuse porous type, exhibiting short radial files (unlike *Alnus* or *Corylus*) consistent with taxa such as *Betula* (birch) and *Acer* (maple). Charred fungal hyphae were observed in some of the *Alnus/Corylus* fragments.

A clamp kiln, such as proposed here, consisted of a mound of inter-layered wood fuel and limestone or chalk, covered with turf or clay (N Smith 2011), presumably with a flue hole for kindling to ignite the fire. Lime kilns were usually situated close to both raw materials (chalk and woodland). In the absence of other charcoal samples from this site, it is impossible to assess any specific selection in fuelwood for the lime kiln, except to say that oak and alder were definitely used. Oak would have been drawn from local supplies of oak (-hazel) woodland while alder would have grown on riversides or wet ground, which is suggested locally by waterlogged deposits in the sequence from 14–20 Chesil Street (Wessex Archaeology 2009), with the River Itchen close by. The presence of fungal hyphae suggests that the wood had been seasoned prior to use and it was evident that some small roundwood had been utilised.

Charred and mineralised plant remains from medieval cess pit 842 by Wendy Carruthers and Inés López-Dóriga (see also: AM 2 online)

Information about animal-based foods,

specifically meat and milk, is relatively abundant for medieval Winchester, but that relating to plant foods is poorer (Ottaway 2017, 433).

Data from several comparable sites in southern England, including Winchester Staple Gardens (Carruthers 2011), Southampton French Quarter (W Smith 2011), Stour Street, Canterbury (Carruthers & Allison 2015) and Cople near Bedford (Carruthers 2003), are presented in Table 2 in order to allow comparisons with Chesil Street of status and access to imported foods (economic plants only). The sites were selected because the state of preservation was reasonably good in all cases and because they include cess pits of a similar date in urban and rural locations.

Despite the presence of some exotic plant remains (see below), the status of the people using cess pit 842 at Chesil Street in the 13th century is uncertain, and there is the possibility that both low-status workers and higher status occupants might have had access to exotic fruits and medicinal plants being grown in orchards and physic gardens associated with, for example, the Cathedral and St Mary's Abbey. Alternatively, these people had sufficient resources to occasionally purchase luxury goods from markets. Irrespective of this, the evidence here suggests a 'fly blown', unsanitary and particularly smelly cesspit (see Smith, online), presumably lying towards the rear of the property, which the occupiers probably tried to 'sanitize' by dumping soil, crop processing by-products such as charred grains and hazelnut shells, and domestic waste (see López-Dóriga, online). Cesspits like this would often have been cleaned out, the contents disposed of on arable fields and gardens outside towns, and perhaps also in watercourses, until they fell into disuse and were simply covered over to save the cost of maintenance (Greig 1982; van Oosten 2017).

As shown in Table 2, well preserved medieval cess pits often contain evidence for the consumption of cereal-based foods, pulses and native fruits such as bramble, apple and sloes/cherries/plum (*Prunus* sp.), but exotic fruits and flavourings are more limited in distribution until the late medieval/post-medieval period (Greig 1991, 325).

Whole cereal grains are relatively rarely preserved by mineralisation (as noted online), but it is also likely that in an urban setting most of the cereals being brought into towns would have already been ground into flour, particularly high status cereals such as bread wheat. Still, some whole grain may have been sold in local markets for use in pottages and as animal fodder for horses, pigs and poultry being kept in stables and back yards. Barley (*Hordeum* sp.) and oats (*Avena* sp.) are the most suitable cereals for these uses. Wheat and barley grains were recovered here (see López-Dóriga, online), and both cereals were present in samples at Staple Gardens/Jewry Street, Winchester (Carruthers 2011).

A small quantity of pulses which included peas (*Pisum sativum*) and beans (*Vicia faba*) was also present (see Carruthers, online, and López-Dóriga, online). Sites such as Mid-Saxon *Hamwic* (Southampton; Carruthers 2005) and late Saxon Winchester (Staple Gardens/Jewry Street; Carruthers 2011) have demonstrated how widespread and dominant pulses were in the diet in the Saxon period. However, there appears to have been a gradual decline in the use of pulses through the medieval period, although this could be due to a change in the way the crops were used rather than their cultivation as a whole. Common vetch became a useful fodder crop, valued in crop rotations for increasing the nitrogen content of the soil (Campbell & Robinson 2010). Peas and beans may also have increasingly been used for fodder and as green vegetables. Fewer mineralised pulse fragments were recovered from Southampton French Quarter (W Smith 2011), perhaps due to its urban character and because a much wider range of foods was available at a port. Pulse testa fragments were common in the Stour Street, Canterbury, cess pit and in the rural cess pit at Cople, Bedfordshire, and both pea and bean hila were recorded, albeit in low numbers. These sites were a little earlier in date than Chesil Street, which could be significant in this respect.

Aromatic herbs such as dill and fennel are occasionally recovered from Saxon and medieval waterlogged and mineralised assemblages in southern England. Comparisons with the selected sites in Table 2 shows that flavourings may not have been consumed on a large scale, although this refers to the use of whole seeds

Table 2 Mineralised plant remains from medieval cess pit 842 and comparative cess pits from southern England (continued on the opposite page)

	Chesil Street	*Winchester*	*Southampton*	*Canterbury*	*Cople, Beds*
	C13	*Anglo-Norman & Medieval*	*Anglo-Norman & Medieval*	*Mid C11 – early C13*	*C9–C11*
	2 samples	*4 AN & 2 M samples*	*6 AN & 5 M samples*	*1 sample*	*1 sample*
CEREAL GRAINS					
Hordeum sp. (barley grain)	+	AN			
Indeterminate cereal frag	cf.1	AN		+	+
Indeterminate cereal bran in faecal concretions	++	AN, M		++++	++++
CEREAL CHAFF					
straw-sized culm nodes	+				
matted straw/grass concretions	++			++	++
straw/grass stem fragments	++	AN, M	AN, M	+++	++++
FRUITS, PULSES & FLAVOURINGS					
Vicia faba L. (broad bean)	+	AN		+	+
Pisum sativum (pea)	+	AN	M	+	+
Pisum/Vicia sp. (pea/bean)	+	AN		+++	+++
Prunus sp. (sloe/cherry/bullace) HSW	+++	AN, M	AN, M	++++	
Malus sp. (apple pip)	+	AN		+	++
Malus sp./*Pyrus communis* (apple/pear pip)	+	AN, M	AN	+	++
Fragaria vesca (strawberry)	cf. +	M	cf. AN	+	
Brassica/Sinapis sp. (mustard, charlock etc) CD	+	AN, M			+
Linum ussitatisimum (flax)		AN			
Vitis vinifera (grape pip)	+		M		
Morus nigra (black mulberry)		M			
Ficus carica (fig seed)	+++	M	AN, M		
cf. Anethum graveolens (cf. dill mericarp)	+				+
Cuminum cyminum L. (cumin)			M		
Daucus carota (carrot)		AN			
Foeniculum vulgare (fennel mericarp)	+				cf.+

Table 2 Mineralised plant remains from medieval cess pit 842 and comparative cess pits from southern England (continued from the opposite page)

WEEDS & WILD PLANTS				
Brassicaceae siliqua cf. Sinapis sp. (charlock) ADY	+			
Agrostemma githago (corn cockle) A	++			
Chenopodiaceae cf. *Atriplex* sp. (orache) CDn	+			
Centaurea sp. (knapweed coatless achene) GDY	cf. +			
Viola sp. (violet) G	cf. +			
Scandix pectens-veneris L. (shepherd's needle) AD	+			
Apiaceae	+			
Juncus sp. (rush stem fragments) GwM	+	M		
Poaceae (cereal/grass caryopsis) CGD	+			
Poaceae (grass spikelet or inflorescence frag.)	+++			
Sambucus sp. (elder)			AN, M	M
Rubus spp. (bramble)			AN	M

Sites: Winchester The Brooks (Jones *et al* 1991); Winchester Staple Gardens (Carruthers 2011); Southampton French Quarter (W Smith 2011); Canterbury Stour Street (Carruthers & Allison 2015); Cople, near Bedford (Carruthers 2003).
cf. = uncertain; +=occasional (1–5); ++=several (6–20); +++=frequent (21–100); ++++=abundant (>100)

rather than ground spices and leaves, and relies on the recovery of identifiable remains following consumption. At Staple Gardens/Jewry Street, Winchester, carrot seeds were recovered, perhaps representing use as a condiment or for a wide variety of medicinal purposes. In Southampton French Quarter, cumin seed was identified in a medieval context, this being a widely used spice at this time that had a range of medicinal uses including relieving colic. At Cople, Bedfordshire, traces of dill and possible fennel were recovered, demonstrating that Mediterranean spices may have been grown (or sold at markets) more widely than expected, including some rural sites, where the need for medicinal plants would have been just as great as in the towns.

As may be expected, ports are the most likely place to find a wider range of imported foods. The analysis of charred, waterlogged and mineralised evidence from a large number of Mid-Saxon cess pits at St Mary's Stadium, Southampton demonstrated that a wide range of fruits and flavourings were available to some people from an early period (Hunter 2005; Clapham 2005; Carruthers 2005). It should be noted that a large number of samples were examined from this site and the three methods of preservation greatly increased the range of exotic taxa preserved. The Anglo-Norman and medieval example given in Table 2, Southampton French Quarter (W Smith 2011), also recovered a wider range of food remains due to preservation by all three methods, but only the mineralised material has been cited in the table for comparative purposes.

The main difference between the mineralised plant assemblages in cess pits from five sites in southern England (Table 2) is the absence of exotic fruits in the Staple Gardens/Jewry Street, Winchester samples (inside the city walls; Carruthers 2011), the Stour Street, Canterbury sample (inside the city walls; Carruthers & Allison 2015) and the rural Bedfordshire cess pit (Carruthers 2003), and the presence of fig and grape in the Chesil Street, Winchester cess pit and Southampton French Quarter cess pits (Anglo-Norman and medieval in the case of fig; old town within the city walls). Exotic flavourings were also present in the latter two examples (dill and fennel at Chesil Street and cumin in Southampton French Quarter), with just a trace of dill and possible fennel being found in the rural cess pit at Cople, Bedfordshire. Figs were the cheapest of the exotic fruits in medieval times, costing about the daily wage of a labourer *c.* 1300 (Greig 1982). By comparison the contents of a cess pit on the property of a wealthy merchant at Upper Brook Street, Winchester, contained a wide range of luxury food remains including fig, black mulberry, cherry, plum, strawberry, leeks and onion, though this did include both waterlogged and mineralised material (Jones *et al.* 1991).

Common hedgerow/scrub fruits such as bramble and elder were present in the urban Southampton and Canterbury cess pits as well as in the rural Bedfordshire cess pit. Charred hazelnut shells were recovered at Chesil Street (see López-Dóriga, online) and 'fruits gathered in local orchards and from the wild' were also identified in other Winchester sites (Green in prep). Cultivated pulses such as peas and beans were also present. These are considered the staples of lower-status households, being used in pottages along with oats and barley grains as well as sometimes used as flour in bread (Hammond 2005) and fed to livestock. At Chesil Street, where both exotic fruits and flavourings and beans, peas and orchard fruits were being consumed it is possible that the users of the cess pit were either of intermediate status, having some access to high status foods through their links with the religious establishments, or that both low-status staff and higher status householders were using the cess pit.

It should be remembered that these comparisons have been made using data from only 13 cess pits that span about five centuries in date, and geographically stretch from the south coast at Southampton to the east coast in Canterbury. The comparisons are very broad in nature, therefore, and a much larger quantity of data is required to produce statistically viable interpretations. Differences in preservation may also have affected the results to some extent, although this was minimised by selecting well-preserved deposits where possible. Southern England is particularly well suited to preservation by calcium phosphate replacement due to its chalk and limestone geology, and it is hoped that future excavations will provide larger amounts of data from these productive features so that more detailed investigations into the diet of different sections of the population can be made.

DISCUSSION

The site at Chesil Street lies to the east of the River Itchen, beyond the Roman and medieval defences of Winchester, and at the base of the eastern spur of land which forms St Giles' Hill.

In the early Romano-British period the focus of settlement lay along the present High Street, extending into the floodplain, one or more channels taking the water further to the west of the current course of the River Itchen. When the defences were constructed around AD 70, these channels and low-lying ground formed an integral part of the circuit, which may not have been completed until the late 2nd century, a masonry wall being added in the early 3rd. Initial construction of the defences was synchronous with the development of the street grid, followed by a drainage system, with domestic timbers buildings succeeded by masonry structures from the late 2nd century onwards (Ottaway 2017, 77–8, 97).

Beyond the main gates to the Roman town, suburbs developed along the various long-distance routes, the steepness of St Giles' Hill restricting expansion to the east. Here, the road passing through the East Gate turned at 90° to the north and south, the southern route running to Wickham and thence Chichester to

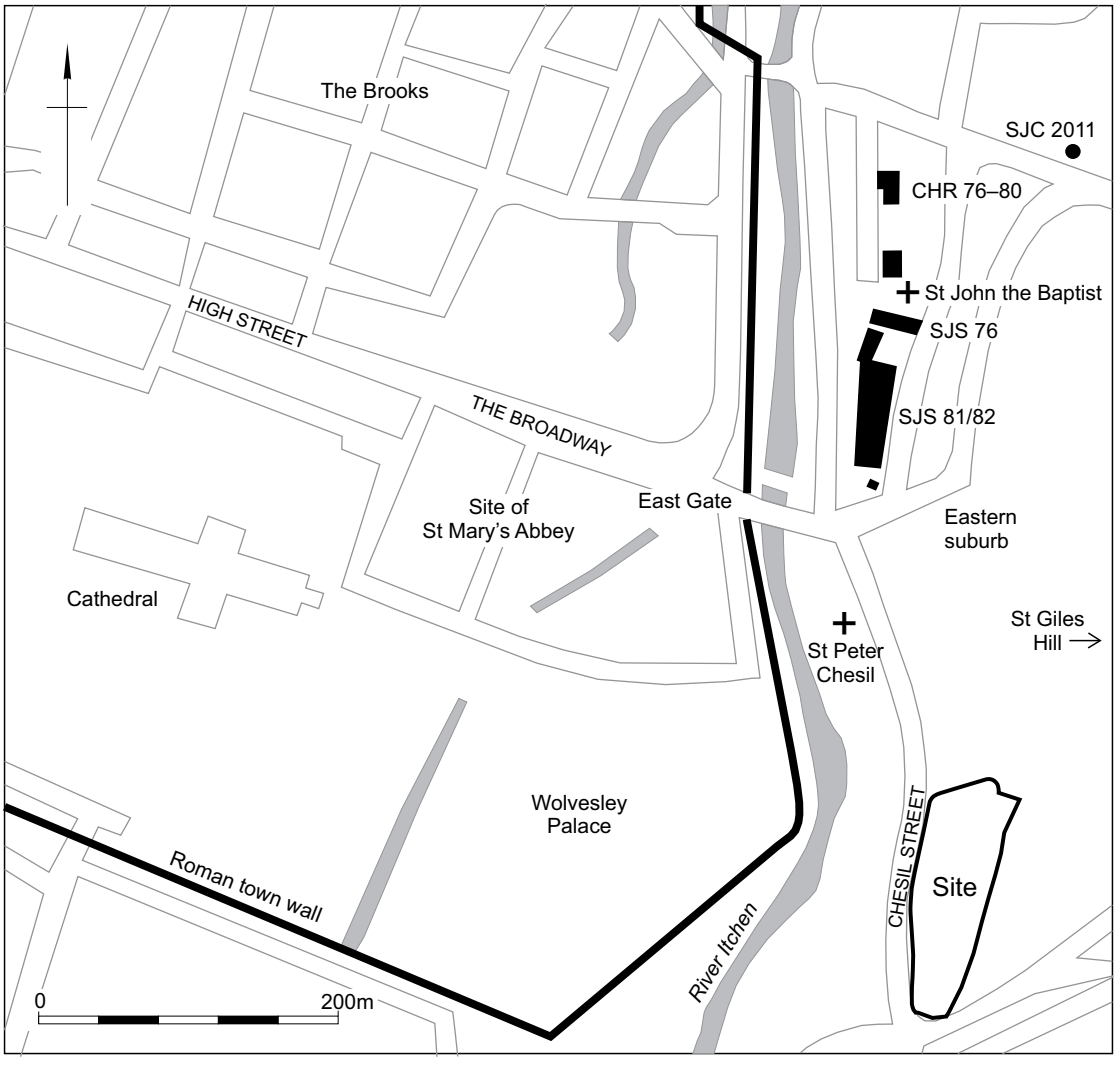

Fig. 4 Site in relation to previous investigations in the eastern suburb

the south-east and Bitterne (Southampton) to the south, whilst the northern route led towards Neatham (Ottaway 2017, 87, fig. 3.1). A small number of early Roman burials are known from outside the defences to the east, but this area did not become a regular burial ground until the 3rd century, when the cemetery developed alongside the road heading to the north (the Chester Road (CHR) and St John's Street (SJS) sites; Ottaway 2017, 135–9. Fig. 4).

The excavation at Chesil Street shows that if burial did take place to the south of the East Gate, then it did not extend this far (though a single cremation burial was recorded in 1933 100m to the south-west at Wharf Hill). However, there is now some evidence for mid–late Romano-British settlement in this part of the eastern suburb, south of the East Gate, for which virtually none had previously been found, though Roman structural remains were reported in the area in the 19th century (Ottaway 2017, 135, 433). No structural remains were, however, revealed in 2016, perhaps because they lay outside the site and adjacent

to Chesil Street, which is likely to broadly follow the course of the Roman road, but the few pits and pottery attest to at least a modest level of activity. This is likely to have been generally domestic in nature, but the existence of at least one probable lime kiln suggests some 'industrial' production of building materials, and some Romano-British quarrying activity may have not been recognised amongst the plethora of medieval chalk quarries.

The Late Saxon and medieval city retained the Roman town defences and gates, which were rebuilt in the 13th century, and several of the external routes, though the internal street pattern changed substantially (Ottaway 2017, fig. 5.1). To the east, the route now followed by Chesil Street is certain to have remained in use, the eastern suburb forming part of the Soke of the Bishop of Winchester (Ottaway 2017, fig. 6.2). Little is known of its early development, either from documentary sources or the limited archaeological investigations, and the excavations at Chesil Street have contributed only a couple of sherds of Saxo-Norman pottery. Pit digging may have begun at Chester Road and St John's Street to the north (Fig. 4) as early as the 10th century, some perhaps defining property boundaries, and this continued throughout the medieval period, with evidence of both timber and masonry buildings from the 13th century onwards; a little further to the north-west, at St John's Croft (SJC 2011), further medieval pits, ditches and later medieval building remains have also been recorded (Ottaway 2017, 243, 276, 336).

There are two medieval churches which served the eastern suburb, St John the Baptist, to the north of the East Gate, which is first mentioned *c.* 1142, and St Peter, Chesil to the south, on the west side of Chesil Street, first mentioned in 1148 (Ottaway 2017, 336; Fig. 4). Upslope to the east, the proximity of the annual St Giles' Fair may have been a significant factor in the development and relative prosperity of the eastern suburb. With a licence granted in 1096, this fair reached its peak in the late 12th–late 13th centuries, when it was one of the largest in the country, but a century later it had declined to a level where the Bishop no longer collected tolls (Ottaway 2017, fig. 6.40, 337).

Apart from the possible exception of a single, fragmentary chalk wall foundation, no medieval structures were found at Chesil Street, presumably in part because the excavated area did not extend up to the former street frontage. However, further back were extensive areas of chalk quarrying, probably reflecting the demand for chalk and lime for new buildings in the developing 11th–13th-century city; the area immediately to the east of the site here may have been known as 'Pytt Close' at the end of the 16th century (Keene 1985, 1080). The quarries were subsequently backfilled, and one was cut by a chalk-lined cess pit (842) of 13th-century date. This contained a particularly informative environmental assemblage, including mineralised and charred plant remains, as well as insect pupae, and fragments of textile (see Cameron, above and AM1). The presence of fig and grape hint at the possibility of a property of above average status, perhaps in some way related to the cathedral or abbey across the river to the west. Keene (1985, figs 14 & 142) records that property 1050, in which the cess pit probably lay, belonged to the Bishop in the later 16th century.

Although Winchester was a major centre of production of woollen cloth in the 12th and 13th centuries, very few archaeological textiles of that period survive, with just a possible gown or tunic and cushion from a burial in the Cathedral (Ottaway 2017, 345); this deposit therefore adds some useful information. Good middle-quality worsted, as represented by the fragments here, are likely to have been re-cycled at least once, so it is possible that small offcuts or old pieces of clothing such as these might have been reused as toilet wipes.

Winchester saw a decline from the 14th century onwards, in part perhaps due to the Black Death, generally depressed economic conditions and the failure of St Giles' Fair, though these – and particularly the latter – do not appear to have had an obviously detrimental effect on the eastern suburb. There is evidence at the beginning of this period of re-building along St John's Street, including three barrel-vaulted cellars, while 1 Chesil Street is an extant mid-15th-century timber-framed building of some quality which suggests a number of relatively wealthy people lived here (Ottaway

2017, 377–81). Somewhat later, evidence from Speed's map of 1611 suggests that the eastern suburb was by now the most extensive of the four beyond the city gates, and the Godson map of 1750, like Speed's, shows Chesil Street extensively built up along both sides, including the area excavated in 2016. The archaeological evidence from both here and to the north at St John's Street confirms this.

Some of the five chalk-lined wells at Chesil Street may have had their origins in the later medieval or early post-medieval periods, and the distribution of the group of three at the north end of the excavation area can be linked to the existence here of several relatively long (up to 55m in length), narrow (up to 10m wide) properties extending back to the east from the street frontage (Keene 1985, fig. 140). In the late 16th century, the occupants of these properties included a fletcher, labourer and fuller, while the part of the site further to the south included three larger properties, the southernmost (outside the excavation area) comprising a croft with a dove cot (Keene 1985, 1079–80). Though not excavated, the wells appear to have been backfilled by the 18th or early 19th centuries, after which the construction of terraced housing, and later the railway, reflect the subsequent growth of the eastern suburb of Winchester.

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AM 1

TEXTILE REMAINS

By ESTHER CAMERON

The upper part of fill 841 of cess pit 842 contained small fragments of textile amounting to an area 50 × 40mm. The largest fragment measures approximately 50 x 20mm and there are many smaller ones (Fig. AM 1.1). Although clean and dry the condition of the textile is brittle as though partially mineralised by phosphates.

All these fragments are the same plain weave with little sign of wear and no evidence of fulling, napping, pigment or dye (Walton & Eastwood 1984) (Fig. AM 1.2). There is no starting or finishing border; the edges are broken. The appearance of the weave, front and back, is the same. It is not obvious which sets of threads belong to warp or weft and therefore the two directions are referred to below as System 1 and System 2. The weave is a plain tabby, in which each thread in System 1 passes alternately over and under the threads of System 2. The thread count, which is the number of threads perpendicular to a 1cm rule, is 14 to 15 in System 1, 17 to 20 in System 2 (Walton & Eastwood 1984, 10–11). The thread diameter in System 1 is greater than that in System 2; the threads of both systems are evenly spun with a loose Z twist (Table AM 1.1). The fibres are separate, pale/white, combed and glossy. Fine 'tracking' on the surface of the best-preserved fibres at ×50 magnification suggests they are animal fibre.

This is good middle-quality worsted, a category of woollen cloth widely used from the 14th century onwards for furnishings and light summer clothing (Owen-Crocker *et al* 2012, 653–4). Unlike softer clothing fabrics of the period which were processed to raise the nap, worsteds had a natural crisp sheen achieved by combing rather than carding the wool and the avoidance of fulling and napping the woven product. Plain weaves became increasingly common throughout Europe in the 14th and 15th centuries, a trend which peaks in London during the period 1350–1450 (Crowfoot *et al* 1992, 26–7, 43, table 1; Forster *et al* 2005, 30, table 2.6; Walton Rogers 1991, 340). The majority were made from Z and S spun threads because it is easier to raise a nap on fabrics made with 'mixed spinning', whereas fabrics made with 'same spinning' such as ZZ are associated with the production of worsteds (Crowfoot 1990, 476). The textile from fill 841 is, therefore, more likely to be a worsted than an unfinished plain weave destined for further processing.

Table AM 1.1 Details of the textile threads

	Thread count per cm	*Spin direction*	*Thread diameter (mm)*
System 1	14–15	Z	0.5
System 2	17–20	Z	0.25

Fig. AM 1.1

Fig. AM 1.2

AM 2

DIETARY AND SANITARY EVIDENCE FROM THE ENVIRONMENTAL SAMPLES OF A MEDIEVAL (13TH CENTURY) CESS PIT

By WENDY CARRUTHERS, INÉS LÓPEZ-DÓRIGA AND DAVID SMITH

Introduction

by Inés López-Dóriga

Archaeological cess pits, despite being 'among the most fascinating of features to the true archaeologist' (Greig 1982, 49), are unfortunately relatively rare. For this reason, when the excavations revealed the remains of a medieval cess pit, bulk sediment sampling for the retrieval of environmental evidence was undertaken. During the excavation, two sediment samples were taken from the basal fill (841) of the 2.4m by 2.1m sub-rectangular, 2.1m deep chalk-lined pit (842). Context 841, of 1.10m thickness, was described as a 'very fine dark red/brown silty loam containing medieval pottery, animal bone and marine molluscs (Wessex Archaeology 2016), and had been sealed with 0.8m of chalk rubble. The finds in context 841 included six sherds of a 13th-century pinched base pottery jug and roofing slate fragments, the latter known to have been imported in considerable quantities from Devon, via the major port at Southampton, from the 12th century onwards.

The samples consisted of <801> (9 litres of sediment) taken from the top of context (841) and <802> (10 litres) taken from the bottom of the deposit. The two sediment samples were processed by WA trained staff using standard methods of flotation. A 250 micron mesh was used to catch the flots and a 500 micron one to retain the residues. The residues were fractionated into 5.6mm and 1mm fractions and dried, and the coarse fraction sorted and discarded. The flots were sorted by WA trained staff (Nicki Mulhall), using a Leica MS5 microscope at magnifications of up to ×40 and assessed by the author.

Although the number of features on the site was limited, the detailed analysis of the environmental evidence from pit 842, with remains (mineralised plants, charred plants, insects, textiles, animal bones, mollusc shells), of an exceptional quality and diversity was deemed an excellent opportunity to gain a deeper insight into past diets and lives. Indeed, although a considerable amount of archaeological work has been carried out in Winchester, there is relatively little data on 13th-century deposits in the eastern suburb (Ottaway 2017), and even less on features of such exceptional potential as cess pits. A comparable deposit from the 13th–14th century was recovered at Upper Brook Street (Jones *et al* 1991), but other potentially rich deposits have not always been sampled (Teague 1991). In addition, the archaeobotany of medieval Britain has not received as much attention as it should have and, this contribution aims to provide new data to address some of the research priorities for the period (van der Veen *et al* 2013).

The comparison with other broadly contemporary cess pits, including examples inside Winchester city walls (Jones 1991*et al*; Carruthers 2011; Serjeantson & Rees 2009) and at other urban sites in the region, for example Southampton (Carruthers 2005; Pelling 2011;

Pelling 2012), has the potential to provide a glimpse of life and social differences in medieval times.

Mineralised plant remains by Wendy Carruthers

Methods

The residues from the processed sediment samples were sorted and analysed by the author, along with the extracted mineralised plant remains from the flots and coarse residue fractions. An Olympus SZX7 stereoscopic microscope was used to sort the residues (magnification from ×10 to ×50), and both modern and the author's own mineralised reference collection were used to assist identification. To make sorting more efficient a graduated set of sieves (3mm, 1mm and 250 microns) was used to separate the residues into different size fractions. Nomenclature and habitat information follows Stace (2010), with other sources being consulted for ecological information, in particular Hill *et al* (1999). For the sake of simplicity, the term 'seed' will be used to describe items that are in some cases, botanically speaking, fruits, for example *Anethum graveolens* (dill).

Some notes on mineralisation and cess pits

Mineralisation is commonly found in cess pits, middens and other deposits where organic waste has accumulated under moist conditions (Green 1979; Carruthers 2000; McCobb *et al* 2003). Preservation is usually by calcium phosphate replacement of the softer tissues, so fruits and seeds are often preserved without their thick-walled seed coats. This can make identification difficult, particularly in taxa that rely of characteristics of the seed coat to differentiate between species. It also means that the mineralised remains are often too dense to be recovered by flotation, so most need to be microscopically sorted from the residues, which can be very time consuming. Variations in the ways cess pits were constructed, and the types of waste being deposited in them, mean that some faecal deposits produce very well-preserved, identifiable and productive assemblages (generally thought to be where concentrated faecal waste was deposited in moist conditions), whilst others are too poorly preserved or dilute to be useful (probably because the pits dried out periodically, mixed industrial waste and other dry wastes were added, or levels of organic material were too low). Practices such as liming the pit or dampening odours with charred materials can also affect preservation. Where a lot of potentially mineralised deposits are being assessed it can be helpful to assign a rough value for the 'percentage of mineralised concretions' in the residue to help decide which samples are worth analysing. This can rapidly be done by scanning several petri-dishes of residue and visually determining what percentage of each dish contains the fawn-coloured amorphous concretions of faecal material, at least some of which should contain recognisable small curled fragments of cereal bran. The two samples from Chesil Street were classified by this method as comprising approximately 70% faecal concretions for sample <801> and 90% for sample <802>, making them concentrated enough to be worth analysing in full. Most of the comparative cess pit samples from other sites in southern England mentioned in this report (see below) also contained concentrated faecal waste, meaning that the plant remains within them were more likely to have a faecal origin rather than coming from mixed waste containing some cessy material.

Mineralisation is of major importance in revealing aspects of the diet that are rarely preserved by charring or waterlogging, such as the significance of pulses and access to imported fruits and spices by different communities. Cess pits are also more straightforward to interpret than many archaeobotanical contexts, in that there is much less ambiguity as to whether the taxa present were being consumed and what processes lead to their preservation. However, it should be remembered that, as with all types of preservation, there are some biases as to which taxa become mineralised and which are rare in a mineralised state. Dry or woody remains, such as nutshells and fruit stones, rarely become completely mineralised. However, in cess pits where fluid levels remain high, items such as whole sloes can become

preserved by a combination of waterlogging (mainly the toughened endocarp of the fruit stone) with some degree of mineralisation (primarily the seed or kernel). Whole pulses rarely become mineralised, but when broken up, fragments of seed coat and cotyledon can both become preserved. Where hila are present these can be identified as peas (*Pisum sativum*) or beans (*Vicia faba*). Whole cereal grains are also relatively uncommon. On the other hand, flavourings and certain fruit seeds are readily preserved, making it possible to start to compare where these foods were being consumed on a fairly unbiased level, since the process of preservation in cess pits is not influenced by human behaviour.

Results

Table AM 2.1 presents the results of the analysis. Mineralised cess pit assemblages often consist predominantly of important but difficult to quantify components, such as faecal concretions (described above), fragments of straw or coarse grass stems (and sometimes rushes and sedges), matted straw concretions and fragments of pea/bean testa. It is impossible to accurately quantify some of these items as they can be abundant and material is hidden within concretions. Therefore, a rough method of frequency is usually used by the author (see Table AM 2.1). Since quantities of bran and straw cannot be converted back into any meaningful data, this is considered to be the most efficient method of recording variation within cess pit deposits. Other mineralised remains recovered from the residues in fairly high numbers were fly puparia (see Smith, below), fragments of woodlouse and occasional rodent droppings. In addition, a large number of unidentified 'nodules' or 'cysts' (Carruthers 1989) were recovered from the lowest sample.

Although both the upper and lower parts of basal deposit (841) were analysed, it is not possible to be certain that differences observed between the two samples represent changes in use. This is because the state of preservation varied to some extent between the levels, possibly as a result of differences in factors such as moisture content. Some observations can be made that could be significant, such as the presence of frequent fragments of textile in the upper sample but only a trace in the lower sample, but overall there were no major differences in the key factors such as the occurrence of exotic foods, the presence of pulses, and the dominance of faecal concretions with bran and straw fragments in both samples.

The differences between the two samples (for example in the occurrence of fig and *Prunus* stones) may have been due to varying preservation within the deposit, since the lower part of the cess pit is likely to have remained moister and may also have accumulated higher concentrations of nutrients as organic material decayed in the pit. Other factors such as overall variation within the pit, sample size and the chance of selecting a particular area for sampling will have played a part. However, one interesting difference was the distribution of mineralised 'nodules', (Carruthers 1989) which occurred in the lowest sample in high numbers (78 nodules in 10 litres of deposit) but were not recovered from the upper sample. These items are useful indicators for the presence of mineralised remains, since some are large enough to be observed during soil processing. Although they are thought to be more of a pedological than biological entity by the author, their presence in only the lower deposit does suggest that conditions of preservation were significantly different in the lower part of the deposit. As noted above, this is most likely to be due to an increase in moisture levels and perhaps nutrients in solution. It should be borne in mind when making comparisons between the two assemblages.

Dietary information

The principal component of both of the samples was faecal concretions, some of which contained recognisable cereal bran, suggesting that bread and cereal-based foods were of major importance in the diet.

The next most frequent category of identifiable food items was the remains of fruits, including (in descending order of frequency) fig pips (*Ficus carica*), which were concentrated into the lower level of deposit, and sloe/

Table AM 2.1 Mineralised plant remains from medieval cess pit 842 and comparative cess pits from southern England (continued on the opposite page)

	Chesil Street	*Winchester*	*Southampton*	*Canterbury*	*Cople, Beds*
	C13	*Anglo-Norman & Medieval*	*Anglo-Norman & Medieval*	*Mid C11 – early C13*	*C9–C11*
	2 samples	*4 AN & 2 M samples*	*6 AN & 5 M samples*	*1 sample*	*1 sample*
CEREAL GRAINS					
Hordeum sp. (barley grain)	+	AN			
Indeterminate cereal frag	cf.1	AN		+	+
Indeterminate cereal bran in faecal concretions	++	AN, M		++++	++++
CEREAL CHAFF					
straw-sized culm nodes	+				
matted straw/grass concretions	++			++	++
straw/grass stem fragments	++	AN, M	AN, M	+++	++++
FRUITS, PULSES & FLAVOURINGS					
Vicia faba L. (broad bean)	+	AN		+	+
Pisum sativum (pea)	+	AN	M	+	+
Pisum/Vicia sp. (pea/bean)	+	AN		+++	+++
Prunus sp. (sloe/cherry/bullace) HSW	+++	AN, M	AN, M	++++	
Malus sp. (apple pip)	+	AN		+	++
Malus sp./*Pyrus communis* (apple/pear pip)	+	AN, M	AN	+	++
Fragaria vesca (strawberry)	cf. +	M	cf. AN	+	
Brassica/Sinapis sp. (mustard, charlock etc) CD	+	AN, M			+
Linum ussitatisimum (flax)		AN			
Vitis vinifera (grape pip)	+		M		
Morus nigra (black mulberry)		M			
Ficus carica (fig seed)	+++	M	AN, M		
cf. Anethum graveolens (cf. dill mericarp)	+				+
Cuminum cyminum L. (cumin)			M		
Daucus carota (carrot)		AN			
Foeniculum vulgare (fennel mericarp)	+				cf.+

Table AM 2.1 Mineralised plant remains from medieval cess pit 842 and comparative cess pits from southern England (continued from the opposite page)

WEEDS & WILD PLANTS				
Brassicaceae siliqua cf. *Sinapis* sp. (charlock) ADY	+			
Agrostemma githago (corn cockle) A	++			
Chenopodiaceae cf. *Atriplex* sp. (orache) CDn	+			
Centaurea sp. (knapweed coatless achene) GDY	cf. +			
Viola sp. (violet) G	cf. +			
Scandix pecten-veneris L. (shepherd's needle) AD	+			
Apiaceae	+			
Juncus sp. (rush stem fragments) GwM	+	M		
Poaceae (cereal/grass caryopsis) CGD	+			
Poaceae (grass spikelet or inflorescence frag.)	+++			
Sambucus sp. (elder)			AN, M	M
Rubus spp. (bramble)			AN	M

Sites: Winchester The Brooks (Jones *et al* 1991); Winchester Staple Gardens (Carruthers 2011); Southampton French Quarter (W Smith 2011); Canterbury Stour Street (Carruthers & Allison 2015); Cople, near Bedford (Carruthers 2003).
cf. = uncertain; +=occasional (1–5); ++=several (6–20); +++=frequent (21–100); ++++=abundant (>100)

cherry/bullace type *Prunus* sp. stone kernels (again, almost all in the lower sample <802>). The *Prunus* sp. kernels were in too poor a state of preservation to determine from the size and form whether they were from small, round sloe/cherry stones or broader, flatter bullaces (or gages or damsons). There did not appear to be any very large plum-type kernels. A few apple pips (*Malus* sp.) and an apple/pear coatless pip (*Malus* sp./*Pyrus communis*) were present in each of the samples, as was a single grape pip (*Vitis vinifera*). Seven very small possibly immature strawberry seed embryos (cf. *Fragaria* sp.) were recovered from the lower sample <802>. The wide range of fruit remains in these samples, including two exotic taxa that may have been imported, suggest that the people using the pit either had access to orchards and fruit gardens, for example associated with the religious establishments located a short distance away across the River Itchen, or that they had sufficient resources to buy these foods at market. Because all of the fruits could have been preserved as dried fruits or jams, no inference with regards to season of deposition can be made. The deposit represents an accumulation of faecal material that built up over a period of time and compacted into about a metre of sediment. According to historical records cess pits would have been emptied every few years (van Oosten 2017), so the material studied for this report represents the contents of the pit at the time of abandonment, not the lifetime of the pit. Although it seems surprising to modern day consumers, large fruit stones appear to have

often been swallowed whole in the medieval period (Greig 1991, 317).

Other non-native plant remains in the deposit included the seeds of aromatic herbs used as flavourings. A fennel seed (*Foeniculum vulgare*) and possible dill seed (cf. *Anethum graveolens*) were recovered from the upper part of the deposit, <801>. Both plants are native to southern Europe, the Mediterranean and western Asia, and were familiar to Greek, Roman and later herbalists such as Dioscorides (40–90 AD; De Materia Medica). As well as being valued for flavouring food, the seeds and leaves of both plants have important medicinal properties, so would have been grown in physic gardens associated with religious establishments. Dill seed was said by Galen (*c.*130–*c.*210 AD) to 'procureth sleep' and dill water (gripe water) was used for generations to help to sooth wailing infants. It also settles the stomach and has been used in pickling (Gordon 1980; Stuart 1987). Fennel aids intestinal colic and was once used to promote lactation, for jaundice and as a laxative (Gordon 1980; Stuart 1987). An additional taxon possibly used as flavouring is *Brassica/Sinapis* sp., a group of species that includes mustards (e.g. black mustard; *Brassica nigra*) as well as common arable weeds such as wild charlock (*Sinapis arvensis*). The coatless seeds commonly preserved by mineralisation cannot be identified beyond this grouping because of the absence of distinguishing features, but where large numbers of seeds are found in a cess pit context it is likely that they had been used as flavourings. The remains of food contaminants and materials probably used as toilet wipes are discussed below, but apart from corn cockle seeds, which had been ground up into numerous small fragments of testa (seed coat), these were only present in low numbers.

The final category of food remains was the pulses, which included peas (*Pisum sativum*) and beans (*Vicia faba*) at this site. Although the number of identified pulse remains was not high at Chesil Street, peas and beans do not preserve well unless the seeds are broken open (perhaps by chewing or having been milled into flour), so only identifiable fragments of pea or bean hilum or testa (identifiable only as pulse testa) survive to be quantified.

Materials used as toilet wipes, weed contaminants and possible medicinal plants

The main non-food items in the assemblage were large numbers of straw- or large grass-sized Poaceae (grass family) stem fragments, as well as some indeterminate complete spikelets and inflorescence fragments of grasses (mainly in sample <801>). Although unidentifiable to species level, the inflorescences do confirm that hay as well as (probably) straw was present. Poaceae stem fragments are commonly recovered in large numbers from mineralised cess pit assemblages. They are usually considered to represent material deposited to soak up fluids and reduce odours, as well as vegetation probably used as toilet wipes or as floor covering. A single fragment of rush stem (*Juncus* sp.) in sample <802> demonstrated that hay from damp meadows had also been used for this purpose. In addition, frequent small fragments of mineralised textile were present, perhaps providing evidence of a higher quality of toilet wipe, or possibly rags used for women's sanitary purposes. The textile fragments were almost exclusively found in the upper sample <801> (see Cameron, above [=AM1]), which may reflect a change in the users of the pit.

Weed seeds that had probably been consumed as contaminants of foods such as bread or pottages included frequent impressions of small fragments of corn cockle seed coat (*Agrostemma githago*) in faecal concretions. These were more numerous in the upper sample than the lower one (33 in <801>; 13 in <802>), though this might be an artefact of preservation. Although poisonous, corn cockle seeds have been used (presumably cautiously) to cure dropsy and jaundice in the past (Grieve 1931), as well as to remove worms (Hagen 1992, 116). It is impossible to tell whether native plants have been used for medicinal purposes unless they are recovered in unusually large numbers or from specific contexts (e.g. the fill of a pot). It is even more difficult to determine this for food plants, such as fig (useful as laxatives) and fennel (used for coughs, as a carminative and to dispel fleas).

The arable weed shepherd's needle (*Scandix pectens-veneris*) is a weed of dry, fairly alkaline soils

Table AM 2.2 Charred plant remains

Feature	*Context*	*Sample*	*Grain*	*Chaff*	*Other*	*Taxa*
842	841	801	A	C	C	*Triticum aestivum/durum/turgidum* grains (A) and rachis segments (C), *Hordeum vulgare* rachis segments (C); *Avena* sp. (C), *Corylus avellana* (C), Vicieae (C), *Cenococcum geophilum*
842	841	802		-	-	-

of the kind found locally around Winchester. Its presence as a contaminant suggests that cereals being consumed by the cess pit users were likely to have been grown locally. Similar light, calcareous, infertile soils would have suited the grassland herb, burnet saxifrage (*Pimpinella* sp.). The root of *Pimpinella saxifraga* has been used for a variety of digestive and respiratory complaints, as well as for its antiseptic properties. The mineralised remains did not have the characteristics of anise (*Pimpinella anisum*), a useful plant for flavouring and for medicinal use. Together with other grassland herbs such as violet (*Viola* sp.) and knapweed (*Centaurea*-type), these remains were most likely present due to being gathered amongst grassy vegetation for use as toilet wipes or flooring material. The possibility that some were used for medicinal purposes should be borne in mind, however, particularly if the users of the pit had access to the physic gardens of the local religious establishments.

Charred plant remains by Inés López-Dóriga

Methods

Charred plant identifications are noted (Table AM 2.2) following the nomenclature of Stace (2010) for wild plants, and traditional nomenclature, as provided by Zohary & Hopf (2000), for cereals. All identifiable charred plant macrofossils have been extracted from the flot and the finer residue fractions using stereo incident light microscopy at magnifications of up to x40. Abundance of remains is qualitatively quantified (A = 10–30, C = <5) as an estimation of the minimum number of individuals and not the number of remains per taxa.

Results

A small assemblage of by-products of different food processing activities was recovered in sample <801>, from the upper part of the deposit (841). The assemblage included cereal grains (naked wheat) and cereal chaff (naked wheat and barley), seeds of possible wild taxa (grasses, legumes), fruit remains (hazelnut shell fragments) and fungi sclerotia. A very small amount of wood charcoal was also recovered.

Discussion

The presence of fungi sclerotia (*Cenococcum geophilum*), but no intrusive recent roots, might indicate that soil was deposited as well as cess and other material. This supports the interpretation of the charred assemblage as processing by-products possibly dumped, together with the soil, to reduce the odour (see Carruthers above). Cess pits were often also the recipients of kitchen waste (Grieg 1982), including animal bone (see Higbee, in the main report). Consistently, however, charred plant macroremains were absent from the lower part <802> of the deposit (841). This is consistent with only very small assemblages of either charred plant remains or crop processing by-products being retrieved from deposits within the city walls in Winchester (Serjeantson & Rees 2009; Ottaway 2017), suggesting that mostly finished products were processed in the urban and suburban areas (see Carruthers, above).

Whilst mineralised plant assemblages are better suited for identifying plant foods, charred assemblages are the most suitable

plant remains for the characterisation of crop-processing activities and arable agriculture. Unfortunately, the single assemblage recovered at Chesil Street is small and relatively poorly preserved, being far from an ideal assemblage in terms of quantity and diversity (van der Veen *et al* 2013). The three species of naked wheat (*Triticum aestivum/turgidum/durum*) are not distinguishable from the morphological point of view when only grains are recovered, or when the rachis segments are poorly preserved as is the case in this assemblage. However, bread wheat (*T. aestivum*) seems to have been the main crop in medieval times in southern England (Rippon *et al* 2014) and was also the most frequently occurring cereal in charred assemblages from other medieval pits in Winchester (Green in prep) and the wider region, including the Isle of Wight (Vitolo & Campbell 2017). The presence of both grains and chaff elements (rachis segments) from wheat and barley (*Hordeum vulgare*) seem to suggest that these cereals might have been introduced in an unprocessed state and perhaps mostly used for feeding domestic animals such as chickens (see Carruthers, above), with only a few stray items being burnt in fires and thus making it into the charred state. Oat (*Avena* sp.) grains are not identifiable to species level without chaff remains (lemma bases). Therefore, it is not possible to tell whether the taxa present in this assemblage was a wild one (although the size of the grain seems to suggest this), oats being a frequent crop-field weed, or the domesticate, which was widely cultivated in the South West in medieval times (Rippon *et al* 2014). The small size of the vetch (Vicieae) seeds could suggest that it was a wild plant rather than one of the cultivated ones (although some of these, including bitter vetches, are rather small in size) but positive identification is again difficult, with poor preservation and seed testa absent. Hazel (*Corylus avellana*) nutshell fragments are frequent in medieval latrines (Greig 1982), and suggest the exploitation of local hedgerow wild resources (see Carruthers, below).

Insect remains: fly pupae by David Smith

Methods

The material was initially sorted from the flots and the finer residues by WA staff (Nicki Mulhall). The finer residues were split using a riffle box and each subsample was sorted, with up to 200 individual puparia and all of any other remaining insect fragments and different fly puparia being extracted. Relevant insect remains were then resorted from the four individual subsamples (one from the flot and one from the residue of each sample) and examined under a low-power binocular microscope by the author. The system for 'intensive scanning' of faunas as outlined by Kenward *et al* (1985) was followed. The dipterous (fly) puparia were identified using the drawings in Smith (1973; 1989) and, where possible, by direct comparison to modern specimens identified by Peter Skidmore.

Results

The identified remains were the puparia of Diptera (flies) and whole adults of Isopoda (woodlice) and one Coleoptera (Beetles). The insects recovered are listed in Table AM 2.3. The taxonomy used for the Diptera is that of Smith 1989.

Discussion

The insect and arthropod faunas from these samples were often preserved by mineralisation, with any organic material replaced. The fly puparia from this feature suggest that it was a cess pit and are highly comparable to those found in a large number of waterlogged medieval cess pits (Jones 2011; Smith 2013). The faunas are dominated by considerable numbers of the small fly *Thoracochaeta zosterae* (see Fig. AM 2.1). This is a species that Skidmore (1999) suggests is typical of archaeological cess pits, a

Table AM 2.3 Fly fauna

Sample	801	801	802	802
Context	841	841	841	841
Tube	A	B	A	B
ISOPODA				
Armadillidiidae				
Armadillidium vulgare Lat.	-	+	+++	-
COLEOPTERA				
Rhizophagidae				
Rhizophagus spp.	-	-	-	+
DIPTERA				
Scatopsidae				
Scatopse notata L.	-	-	-	+
Syrphidae				
Eristalis ?tenax (L.)	++	+	-	-
Sphaeroceridae				
Thoracochaeta zosterae (Hal.)	+++++	++++	++++++	++++

KEY
The numbers of individual insects present are estimated using the following scale:
+ = 1–2; ++ = 2–5; +++ = 5–10; ++++ = 10–20; +++++ = 20–100; +++++++ = more than 100

conclusion that recently has been supported by a large-scale study by Smith (2013). Today these fly puparia are only found in accumulations of seaweed at the high-water mark on coastal shores (Belshaw 1989; Skidmore 1999; Smith 1989; Webb *et al* 1998). Belshaw (1989) holds that its presence suggests that archaeological cess pits often contained water and other substances with a highly 'saline' nature, and that this probably resulted from the inclusion of both faecal material and stale urine. The number of fly pupae recovered also indicates pit 842 may have been 'fly blown', unsanitary and particularly smelly. Several of the fly pupae were almost ready to 'hatch', with the imprint of the adult fly clearly visible (see Fig. AM 2.1). This type of preservation has been used to suggest a 'sudden kill off' event may have occurred, and that this may have resulted from the deliberate 'liming' of the pit to deal with the problems of a fly blown cess pit and/or particularly foul odours (Skidmore 1999; Smith 2013).

Also present were a number of individuals of *Eristalis tenax*, 'the rat-tailed maggot' or the

Fig. AM 2.1

'drone fly'. Larvae of this species are rather specialised inhabitants of water and wet compost containing high concentrations of faecal material and other foul matter. The larva floats just below the surface or on the bottom of shallow ponds of faecal material and uses its 'rat tail' as a snorkel (Skidmore 1999: Smith 1973; 1989). *Scatopse notate*, or the 'drain fly', whose larvae are associated with mats of microbial slime developing around drains and filter beds in sewage works (Smith 1989) also was recovered in these samples. In addition, a number of mineralised individuals of the common pill woodlouse (*Armadillidium vulgare*) were noted.