



Saxon, Jewish, Later Medieval and Post-Medieval Occupation on St Aldates and Queen Street, Oxford

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Saxon, Jewish, Later Medieval and Post-Medieval Activity on St Aldates and Queen Street, Oxford

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SUMMARY

Excavations at 114-19 St Aldates and 4-5 Queen Street, Oxford, shed light on some of the oldest and grandest parts of the medieval city. The earliest evidence comprised sunken floors and pits that date to the middle/late Saxon period. The evidence, relating to wooden buildings, predates the Saxon burh, which was founded by the early tenth century. A series of later rubbish pits dating to the late Saxon and early Norman period was cut through this horizon. The pits contained pottery and bone fragments, representing general rubbish, as well as faecal material and the raked-out fuel waste from ovens, fires and hearths. A stone-lined latrine cut through the rubbish pits. The latrine contained a rich assemblage of twelfth- or early thirteenth-century pottery, animal bone and other domestic material. The well-constructed nature of the feature suggests that it was associated with a house of a wealthy individual. It is known that during this period part of the site was in Jewish ownership, and this is supported by the faunal remains and organic residues on pottery, which are consistent with Jewish dietary laws. A stone-built structure, part of a below-ground cellar, lay to the east of the latrine. The later fills of the cellar contained a small assemblage of fifteenth- or sixteenth-century pottery, which almost exclusively comprised drinking vessels that are likely to have derived from Battes Inn (by then known as the Fleur de Luce) that fronted St Aldates. Another latrine, of seventeenth- and eighteenth-century date, contained an assemblage of pottery, vessel glass, clay pipes and fruit remains that indicate wealthy inhabitants here during this time. Subsequent levels were poorly preserved owing to modern truncation.

INTRODUCTION

Oxford Archaeology (OA) was commissioned by Gilbert-Ash on behalf of Reef Estates and the British Airways Pension Trust, with consultation by Will Bedford of Orion Heritage, to undertake an archaeological investigation at 114-19 St Aldates and 4-5 Queen Street, Oxford, ahead of redevelopment (Fig. 1). An evaluation by OA in 2015 identified extensive remains of undisturbed late Saxon to early medieval horizons preserved underneath the basement levels at the site.¹ Where possible, the proposed development was designed to minimise the impact on the archaeological remains. A programme of archaeological excavation and watching brief was devised where impacts could not be avoided. A post-excavation assessment presented the preliminary findings of the fieldwork and identified the potential of the results to address research questions and contribute to a better understanding of the site and development of the medieval and post-medieval city.²

[Insert Figure 1]

The area of development, located at grid reference SP 51320 06130, encompasses an area of 0.135 hectares. The north end of the site lies at about 64.7m above Ordnance Datum (aOD), with a gentle slope to the south. Terraces were created on this slope in order to accommodate the construction of the buildings on the site. The natural fall of the slope is visible along St Aldates. The first river terrace lies approximately 250m to the south at around 58.5m aOD, and the River Thames lies 450m to the south. The geology of the area is made up of the second gravel terrace of the River Thames, though the first terrace starts just to the south (Brewer Street). The underlying solid geology is Oxford Clay and Kellaways Beds.³

The site lies in the heart of the Saxon town and just off the Grandpont, one of the principal crossing points over the River Thames. The south gate of the town was located at the southern end of St Aldates. Queen Street was also laid out in the Saxon period,⁴ and parts

¹ '114-119 St Aldate's and 4-5 Queen Street, Oxford: Archaeological Evaluation Report', unpublished report by Oxford Archaeology (2015).

² S. Teague, '114-119 St Aldate's and 4-5 Queen Street, Oxford: Post-excavation Assessment', unpublished Oxford Archaeology report (2017).

³ British Geological Survey, Sheet 236.

⁴ 'Archaeological Desk-Based Assessment: 114-119 St Aldates & 4-5 Queen Street, Oxford', unpublished report by CgMs Consulting (2014), pp. 11–12.

of the late Saxon street frontage have been recorded in various interventions along Queen Street, including at 4 Queen Street, 7-8 Queen Street, and 11-12 Queen Street.⁵

The twelfth and thirteenth centuries saw the development of Oxford's Jewish quarter around St Aldates, following William the Conqueror's invitation to Jews from France to settle in England and establish a network of credit and trading functions. The earliest documentary evidence for the Jewry at Oxford dates to 1142 when Matilda was besieged at Oxford Castle. Two of the four properties partly exposed by the area of excavation have been identified as being in Jewish ownership. Both fronted onto St Aldates (formerly Fish Street), with one, Jacobs Hall, being one of the most substantial private houses in Oxford. The other two properties were held by the Bishop of Lichfield and fronted onto Queen Street (formerly Butcher Row/Great Bailey). The Jewry came to an end in 1290 when the Jews were expelled from England by Edward I. By the fourteenth century, all properties were in Christian ownership. Several drinking establishments existed around Carfax, Queen Street and the northern end of St Aldates, with two in the investigation area being recorded as the site of Battes Inn and the Red Lion.⁶ The former inn was apparently favoured by royal justices and other dignitaries. By 1514 it was known as the Fleur de Luce and had closed down before 1804.⁷ Extensive cellars belonging to the Swindlestock tavern, which was established on the southwest corner of Carfax in the thirteenth century and pulled down in the early eighteenth century (by which time the tavern was known as the Mermaid), were used as wine cellars in the eighteenth and nineteenth centuries.⁸

Excavations at Carfax, the Post Office on St Aldates and 117-18 St Aldates have uncovered the remains of medieval plots, rubbish pits and other evidence for occupation, with traces of the probable road surface buried some 4 m below the modern ground level. Loggan's map shows that the medieval plots along St Aldates had been subdivided by the seventeenth century, and the 1876 Ordnance Survey map shows that site was occupied by up to six buildings on St Aldates and two on Queen Street. By the mid twentieth century, the

⁵ Ibid.

⁶ P. Manix, 2004 'Oxford: Mapping the Jews', in ed. A. Haverkamp (ed.), *The Jews of Europe in the Middle Ages (Tenth to Fifteenth centuries): Proceedings of the International Symposium held at Speyer, 20-25 October 2002* (2004), pp. 405–20.

⁷ E. Chance, C. Colvin, J. Cooper, C J Day, T G Hassall, M. Jessup, and N. Selwyn, 'Social and Cultural Activities', in A. Crossley and C R Elrington (eds), *A History of the County of Oxford: Volume 4, the City of Oxford* (1979), pp. 425-441, British History Online <http://www.british-history.ac.uk/vch/oxon/vol4/pp425-441> [accessed 30 October 2018].

⁸ Ibid.

properties had been amalgamated into two main blocks, and remained in this form to the time of excavation.⁹

EXCAVATION METHODOLOGY

The archaeological mitigation strategy involved the combination of excavation by hand and machine, and a watching brief on service trenches. A summary of the areas excavated and how they were approached is provided in Table 1, with their locations shown on Figure 2.

[Insert Figure 2]

DISCUSSION

Saxon

Apart from two sherds of residual pottery that suggest Roman-period activity in the vicinity of the site, the earliest activity dates to the middle/late Saxon period. Evidence for two structures were uncovered. Structure 1.1 in Area 5 comprised a series of floor layers and an associated posthole. Structure 1.2 in Area 3 was represented by a sunken floor. A stakehole against the side of the floor and filled with organic matter is likely to be a remnant of a wattle lining. Potentially, both structures are contemporary. A radiocarbon date obtained from charred grain from Structure 1.1 spanned the late eighth to late tenth century cal AD, while a determination from Structure 1.2 ranged from the late seventh to late ninth century cal AD. At a 68.2 per cent confidence level, however, both results match each other more closely, sitting within the late eighth to late ninth century. Pits dug in Area 1, presumably an open area at this time, received domestic waste, possibly belonging to the occupants of Structure 1.1. Pottery from the features indicate that these continued to fill up to the late tenth or early eleventh century.

Structure 1.2 was replaced by another structure (2.1) with a sunken floor or cellar by the late tenth or early eleventh century, based on pottery recovered from the gravel floor of the later structure. Postholes suggest that the structure had a timber revetment around the sides. Pottery from backfill deposits and the fills of a pit cut into the infilled cellar suggests

⁹ CgMs, 'Archaeological Desk-Based Assessment', pp. 13–15.

that the structure had been abandoned by the end of the eleventh century. An area of pits in Area 10 may be contemporary with Structure 2.1, though the ceramic dating is equivocal.

The evidence from Phase 1 is limited, but critical, providing as it does tentative evidence for settlement in St Aldates predating the Saxon *burh*, founded by the early tenth century.¹⁰ The occupation lay along a routeway that passes close to the reputed site of St Frideswide's minster, believed to have been founded in the early eighth century, and led to the middle-Saxon river crossing, established by the end of the seventh century.¹¹ Evidence of contemporary occupation at other nearby sites is sparse, but tantalising. A feature recorded as a cellar pit with the remains of a timber lining at 6-8 High Street, some 100m to the north-east of the current site, may have been contemporary with Structure 1.2. Charred grain from the degraded remnants of its floor surface was radiocarbon dated to the late eighth or ninth century cal AD.¹² While the level of the floor was higher than that of Structure 1.2 at c.61.4m aOD, compared with c.60.3m aOD, this corresponds to the difference in topography at the two sites, rather than the height of occupation levels.¹³ Together, the structures suggest that occupation before the *burh* extended to either side of Carfax.

Phase 2 structure 2.1 belongs more certainly to the occupation that developed after the *burh* had been established. Postholes and a hearth below street surfacing associated with the *burh* have been recorded at 8 Queen Street,¹⁴ while evidence for late Saxon occupation nearby includes cellars associated with street surfaces and pits at 4 Queen Street and 7–8 Queen Street.¹⁵ A posthole within the cellar in the former site, which must have been close to the structures reported here, may relate to a pit lining,¹⁶ similar to those seen in Structures 1.2 and 2.1 and the cellar pit from the High Street. A late Saxon bun-shaped loomweight found beneath 121 St Aldates during building work in 1931¹⁷ joins the evidence for domestic craft activity at the current site.

Artefactual and ecofactual evidence paints a similar picture of life in this part of Saxon Oxford in both Phases 1 and 2. Meals were prepared in jars over a fired clay hearth or

¹⁰ A. Dodd, 'Synthesis and Discussion', in A. Dodd (ed.), *Oxford Before the University: The Late Saxon and Norman Archaeology of the Thames Crossing, the Defences and the Town*, Oxford Archaeology Thames Valley Landscapes Monograph, 17 (2003), p. 31–2.

¹¹ *Ibid.*, p. 17–19.

¹² SUERC-43616, cal AD 771–898 (91.2 per cent probability); J. Boothroyd, '6–7 High Street, Oxford: Archaeological Excavation Report', unpublished report by Oxford Archaeology.

¹³ *Ibid.*, fig. 4, section 1001.

¹⁴ *Ibid.*, p. 17.

¹⁵ A. Dodd, 'Appendix 1: Gazetteer of Anglo-Saxon and Medieval Archaeological Sites in the City Centre', in Dodd, *Oxford Before the University*, p. 408.

¹⁶ *Ibid.*

¹⁷ CgMs, 'Archaeological Desk-Based Assessment'.

in an oven. Charred plant remains comprised mainly grain, dominated by free-threshing wheat and hulled barley, which would have been made into pottages, porridges and bread. Smaller quantities of oats and rye were recorded, the former providing fodder for livestock; sheep-breeding or keeping is attested in Phase 2. Beef (including the marrow), mutton and pork was consumed. Butchery marks on cattle vertebrae suggest that the emphasis was on good-sized portions, rather than the quality or attractiveness of the cut. Chickens were kept for eggs, and oysters and freshwater fish were occasionally eaten. Spinning and bone-working, the latter utilising deer bones as well as (probably) waste from domesticated species, were among the craft or domestic activities carried out within the properties represented here or nearby. No germinated grain, potential evidence of malting and brewing, was identified. There was, however, some indication of change. The locally-produced late Saxon Oxford shelly ware, in which all the pottery from the site's pre-*burh* phase was found, had been replaced after the establishment of the burh entirely by St. Neots shelly ware from Cambridgeshire. Exotica in the form of a jar or pitcher in Beauvais ware from France, possibly used for transporting wine, was also found. This reason for this difference is unclear – late Saxon Oxford shelly ware is found in burh-phase deposits elsewhere in Oxford – but it is possible that the area around this part of Queen Street and St Aldates was settled after the establishment of the burh by a different social group with high-status connections or wider trade links.

Medieval Period

During the late eleventh and twelfth centuries (Phase 3), the site is likely to have become an open area or yard. Excavation revealed pitting across the site, which received household waste presumably from nearby properties. Stone-built structure 3.1 is identified as a latrine and was similarly located outside the building it served. Postholes in Area 3 relate to a fence or other timber structure, while Structure 3.2 belonged to a wall that divided two buildings, one extending to the north, the other to the south (and beyond the area of investigation). Rectangular holes and stone projections seen on the north face of the wall marked the position of a wooden floor.

Phase 3 corresponds with the earlier part of the date range ascribed to Oxford's Jewish quarter, which developed around Carfax and along St Aldates and is conventionally

dated to the twelfth to late thirteenth century.¹⁸ The site is situated within two properties mapped as being in Jewish ownership, Jacob's Hall and a property owned by Elias or Elekin.¹⁹ Structure 3.1 appears to be within the boundary of Jacob's Hall, and it is in this structure that archaeological evidence consistent with Jewish inhabitation was found. An obvious means by which an archaeological 'signature' of Jewish inhabitation might be detected is through a comparison of the animal bone assemblage with Jewish dietary law or *kashrut*. A Jewish assemblage would not be expected to contain any wild animals (including birds), pig bones, horse bones, bones showing disease, or bones from the hind-quarters of cattle. Shellfish and fish without fins or scales (for instance eels) would also be absent. What is remarkable about the assemblage from Structure 3.1 is that pig specimens are completely absent, while domestic fowl specimens (mainly goose) dominate, being even more common than cattle bones. Fish bones from the feature included herring, but no eel. Of the 89 fragments of marine shell recovered from Phase 3 deposits, just one came from Structure 3.1. The animal bone assemblage stands in sharp contrast to that of Phase 2, in which pig bones were present in quantity and bird bones barely present. As the animal bone analysis was targeted on selected groups, no Phase 4 groups were analysed, but assessment data showed that pig was present in thirteenth- to fourteenth-century contexts.²⁰ The pattern also contrasts with the assemblage recovered from Phase 3 pits within Area 1, again recorded, but not subject to detailed analysis. Notably, these features contained pig bones, marine shell and eel bones, and it is probable that the pits predate the latrine and relate to a period in the earlier part of the phase before the property was transferred to Jewish ownership. This is supported by the ceramic data. Pottery from the pits was characterised by medieval Oxford ware, with a date range commencing in the late eleventh century, and Cotswold ware, which dates from the late tenth century. The pottery assemblage from Structure 3.1, however, contained early Brill/Boarstall ware dating after c.1200 (technically belonging to the earliest part of Phase 4).

Evidence supporting the findings of the animal bone analysis was obtained by organic residue analysis (ORA). Samples from 10 vessels, mainly jar rims but including some body sherds, from Phase 3 and 4 contexts were analysed by gas chromatography and carbon isotope analysis. The samples were compared to 10 contemporaneous samples from Queen's College (this volume), and results of ORA on samples from Phases 1 and 2 of St Aldates

¹⁸ Manix, 'Oxford: Mapping the Jews'.

¹⁹ Ibid.

²⁰ L. Broderick, 'Animal Bone', in '114-119 St Aldate's and 4-5 Queen Street, Oxford: Archaeological Evaluation Report', appendix C.1.

from an earlier study were also considered. The analysis showed in Phase 3 and 4 samples an absence of non-ruminant fats (that is, porcine) and presence in all but one of the samples of ruminant fats (cattle and sheep). In contrast, two samples from Phase 1 and 2 were mixed, with both ruminant and non-ruminant fats represented. While seven of the Queen's College samples showed ruminant fats only, the remainder fell within the ruminant/non-ruminant part of the spectrum, demonstrating mixed use. In summary, the Phase 3 and 4 samples show that the pottery was not used to process or cook pork and suggest that, as with the animal bone assemblage from Structure 3.1, pork was absent from the pottery users' diet. In contrast, pottery was used in the processing of pork in the middle/late Saxon phases of St Aldates and at early medieval Queen's College, at least some of the time.

One other interesting observation is that the pottery in Phases 1 and 2 and Queen's College show mixed fats; in other words, the same pottery vessels were used to cook beef or mutton and pork. Dairy fats were occasionally recorded – such fats were identified in one sample from Phase 1/2 and one from Phase 4 at St Aldates – but in those vessels, no other fats were seen. This suggests that dairy processing, such as the production of cheese or butter, was rarely undertaken at a domestic level in Oxford whatever the period – possibly such products were acquired ready-made from sellers – but when it was undertaken, it was done so in jars dedicated to the task. This aspect is consistent with Jewish inhabitation, as according to the principles of *kashrut*, it was important to keep meat and dairy separate, although on current evidence, a similar separation is apparent in pre-Jewish phases.

It should be noted that none of the Phase 3 ORA samples came from Structure 3.1, but instead were taken from vessels recovered from Area 1 pits. However, their respective contexts were in the upper part of the sequence of filling and contained no pig bones, eel bones or marine shell, and may belong to episodes of levelling related to the construction of the property (Jacob's Hall?) represented by the Structure 3.1. While the combined evidence of ORA and the animal bone does not conclusively identify Jewish habitation at St Aldates, it nevertheless points very strongly to it. Given the stratigraphy and the dating evidence from Area 1, a case can be made for dating this Jewish phase from the later part of the twelfth to the early thirteenth century, certainly after the period of pit-digging, and perhaps spanning a single generation of residents. This is some decades before the expulsion of the Jews from England in 1290 and suggests that the property had been taken relatively abruptly out of Jewish ownership, possibly having been confiscated, rather than being allowed to pass to heirs.

The finds and environmental evidence from the areas of excavation reveal interesting aspects about daily life in and around the site during the late eleventh and twelfth centuries. A leather shoe from a pit in evaluation test pit 1 and broadly contemporary with Structure 3.1 may have been worn by the Jewish residents. Ceramic building material suggests that buildings had tiled roofs with chimneys and (at least partially) tiled floors. This is consistent with the stone walls of structures 3.1 and 3.2, which denote wealthy buildings (contrasting with the wooden buildings of earlier phases). The pottery was generally of a domestic character, but included ceramic crucibles that point to small-scale metalworking. Craft or industrial activity is also suggested by a whetstone, while a possible hoe among the metal objects suggests garden-related or horticultural work. Apart from abstinence from pork, shellfish and eel in the Jewish phase, diet consisted of bread and grain-based pottages, the latter including beef or mutton, at least occasionally. Goose was consumed by Jewish residents. Fish was presumably purchased from stalls from the north end of St Aldates (formerly Fish Street) and included freshwater species, such as pike, burbot and (before the Jewish phase) eels, and marine species, among them herring, haddock and plaice, which arrived in barrels preserved in salt or brine.

During the fourteenth and fifteenth centuries (Phase 4), all properties represented at the site reverted to Christian ownership, indicated not least by the recovery of oyster shell, pig bones and eel bones from deposits associated with this phase. Structures assigned to this phase comprise walls (Structures 4.2, 4.3, 4.4 and 4.5) that correspond to property boundaries mapped by H. E. Salter as belonging to Battes Inn and the Red Lion.²¹ Part of a cellared structure (4.1) was also recorded. This may relate to the cellars of the Swindlestock tavern that extended below the southwest corner of Carfax.

The contents of pits and layers dated to this phase reveal something of the diet, activities, and status of the people who lived here at the time. Grain continued to be used mainly for bread (albeit made with refined flour) and pottages. (Cats, attested in this phase, had been kept at least since the eleventh century at the site to prevent mice reaching stores of grain.) Small quantities of barley might have been used for malting and brewing ale, though no definitive evidence for such activities was found. Beef, mutton and to a lesser extent pork were consumed, as well as the occasional hare and freshwater and cured marine fish. A relatively large quantity of fruits, among them sloe, cherry, damson-type fruit, grape, fig, wild strawberries and pear or apple, were recovered from a layer of domestic and faecal

²¹ H. E. Salter, *Map of Medieval Oxford* (1934).

waste (10013), with coriander and fennel also recorded. Meals were cooked and served in a fairly standard range of domestic pottery, but a fragment of early Malagan or Valencian lustreware points to the presence of rare and exotic household items. The roofs of the buildings here or nearby were tiled, but floors were generally plainer – timber boards or trampled-earth floor were more usual than tiles – and part of the properties provided accommodation for animals, as indicated by the recovery of stabling waste in layer 10013. Window glass was recorded, and light was also provided by an oil lamp. The overall impression of the Phase 4 material is of high-status households, perhaps those of merchants with connections with coastal trade.

The late medieval period (Phase 5: fifteenth to mid sixteenth century) saw the construction of several new structures (Structures 5.1 and 5.2 and drainage group 13004) relating to the construction of cellars and division of properties. The composition of the pottery assemblage was noticeably different to that of Phase 4, comprising almost exclusively drinking-related vessels (cups, mugs and jugs), rather than the jars and bowls of a more domestic character seen in the previous phase. The mercantile households, it seems, had been replaced by the commercial activity of an inn, probably Battes Inn, within whose boundary structures 5.1 and 5.2 lie. Less likely, but still a possibility, the assemblage may relate to some form of industrial or building activity, the character of the assemblage being typical both of drinkers and labourers.

Post-Medieval Period

Part of the site became open between the mid sixteenth and mid seventeenth centuries (Phase 6), as the drains in Area 11 were removed and the immediate area levelled, while in other areas rubbish pits were dug. It is uncertain whether this relates to activity associated with inns, as the pottery recovered is of a domestic character. However, evidence of Phase 7 (mid-seventeenth to early eighteenth century) can be linked to activity related to drinking establishments more readily. In Area 1, a thirteenth/fourteenth-century building associated with Structure 4.1 is likely to have been demolished. This may be the Swindlestock tavern (known as the Mermaid in the later seventeenth century), which was pulled down in *c.*1708.²² A stone-lined latrine (Structure 7.1) was inserted against what has been mapped as the

²² Chance *et al.*, *A History of the County of Oxford: Volume 4, the City of Oxford* (1979).

southern wall of Battes Inn,²³ its function as a latrine revealed by the presence of faecal matter and traces of sedge collected from the riverbank or the floor of stables to dampen aromas. While its use by the patrons of the inn cannot be confirmed, the latrine was certainly filled with some evidence of drinking-related activity; the glass assemblage included fragments of ‘globe and shaft’ bottles carrying the seals of two other establishments, the Mermaid and the Crown, the latter being located at no. 3 Cornmarket. A large group of clay tobacco pipes was also recovered from the feature; twenty or so complete or near-complete examples could be reconstructed from the fragments. Among the ecofactual evidence from the feature were the remains of fig, blackberry, raspberry, grape, strawberry, elder and apple. Such fruit was also recorded at Corpus Christi College and Merton College and points to a high-status diet.²⁴ The animal bone assemblage, comprising domestic mammals and fowl, was typical of an urban pattern of consumption.

Given their quantity and nature of deposition, the pipes are likely to relate to a level of use beyond that of a normal household. The glass bottle seals point to the supply of wine from a variety of local drinking establishments, while the fruit represent the consumption of relatively exotic foodstuffs. Taken together, the contents of the latrine are likely to represent the dumping of waste deriving from a source of some affluence, perhaps accommodation or an establishment favoured by wealthy individuals from a mercantile or collegiate background.

Evidence belonging to Phase 8 (early eighteenth to nineteenth century) was restricted to the remains of at least two buildings that fronted a passage leading off St Aldates adjacent to the New Inn. A cobbled surface also uncovered is likely to have been a modern repair of an earlier surface associated with this passage. A possible bone stylus or quill-holder attests to literacy in this area, possibly relating to commercial activity.

ARCHAEOLOGICAL DESCRIPTION

Phases 1-2: (Middle to Late Saxon) (Fig. 3)

²³ H. E. Salter, *Map of Medieval Oxford* (1934).

²⁴ W. Smith, ‘Charred and waterlogged plant remains’, in R. Bashford, A. Dodd and D. Poore, ‘Medieval and Post-Medieval Remains from Excavations on the Site of the New Auditorium, Corpus Christi College, Oxford, 2008’, *Oxoniensia*, 79 (2014), p. 206; J. Giorgi, ‘The Plant Remains from Merton College Lift Pit (OXMEGH16)’, unpublished Oxford Archaeology archive report (2017).

[Insert Figure 3]

Structure 1.1 Within Area 5, there was a laminated sequence of compacted clay/gravel floors and charcoal-rich occupation deposits suggesting the presence of a structure (Structure 1.1; Figs 3 and 4). These sealed a posthole (5033) that may have been associated with an early phase of the structure. A charred grain from the posthole produced a radiocarbon date of cal AD 769-969.²⁵ Part of one floor showed evidence of scorching, suggesting the presence of a nearby hearth. The earliest floor produced a sherd of medieval Oxford ware dating from the late eleventh century, although it is likely to be intrusive from the pits that subsequent cut these levels during Phase 3.

[Insert Figure 4]

Structure 1.2 Within Area 3 was a sunken timber-built structure (Structure 1.2) that probably represented a precursor to cellared Structure 2.1. Only part of its eastern edge was visible, having been largely truncated by the later structure, but it measured at least 1.48 x 1.20 m and survived to a depth of 0.95 m. At its base, close to its eastern edge, was a shallow posthole (3084), 0.36m in diameter, that may have held timber shuttering that once lined its sides. A 'stakehole' (3091) filled with decayed organic material that was revealed in section (Fig. 5, Section 3002) against its eastern edge may have marked the position of one such shutter or an earlier lining of wattle. No evidence for internal floors were found and the structure appears to have been deliberately dismantled and levelled with material containing sherds of late Saxon Oxford shelly ware. A radiocarbon date of cal AD 689-893 was obtained from a grain recovered from within the infilled posthole.²⁶

[Insert Figure 5]

Structure 2.1 Structure 1.2 was replaced by a second probable timber-lined cellar pit (Structure 2.1) during Phase 2 (Figs 3 and 6). Its extents, apart from its southern side, lay beyond the trench edges, but must have measured over 2.7 x 2.6 m and was c. 1.84 m deep. A line of five postholes cut into the base of the pit probably formed part of a post and plank

²⁵ SUERC-78795 (95.4 per cent probability) (BP 1173 ± 35)

²⁶ SUERC-78794 (95.4 per cent probability) (BP 1213 ± 35)

revetment along its southern side. At least one of the postholes (3048) seems to have rotted *in situ* after the cellar was backfilled (Fig. 5, Section 3003). It had a 'floor' of concreted and laminated gravel on which large sherds of late Saxon Oxford shelly ware were recovered, together with Cotswold-type ware, suggesting a late tenth or early eleventh century date. Overlying the floor were silt spreads that were rich in charcoal and charred cereal grain, including free-threshing wheat, and also produced a ceramic spindle whorl of late Saxon/early medieval type. The cellar pit was backfilled by the end the eleventh century, after which pit 3027 was cut through its fills. This pit also contained eleventh-century pottery. It is possible that the cellar extended eastwards into Area 14 where the fill (1485) of a large early feature that encompassed the whole trench was recorded. However, no dating evidence was recovered.

[Insert Figure 5]

Pits Area 1 contained several pits that were probably used for the disposal of rubbish, possibly from the occupants of Structure 1.1. The earliest of these (1288, recut as 1162) was rectangular and 0.70m in depth and was filled with succession of dumps containing appreciable quantities of pottery and animal bone. The pottery comprised solely late Saxon Oxford shelly ware, apart from a single sherd of red-painted Beauvais-type ware, suggesting a ninth- or tenth-century date. In contrast, later pits 1298 and 1302, both circular, each contained a single sherd of St Neots ware and must date after the mid-ninth century. Pit 1302 was 0.90m deep and was later recut during Phase 2 as pit 1330. It contained further sherds of St Neots ware, together with large sherds of Cotswold-type ware and Flemish/Rhenish greyware, suggesting a late tenth or early eleventh century date for deposition.

Several inter-cutting rubbish pits (10024, 10026, 10030 and 10034) were found within Area 10. The phasing of these pits is tentative, given the lack of excavation and dating evidence obtained from them. Pit 10026 (=10034), which post-dated pit 10030, contained Cotswold-type ware, suggesting a late tenth or eleventh century date for deposition.

Phase 3 (Late Eleventh to Twelfth century) (Fig. 7)

[Insert Figure 7]

This phase saw an increase in the degree of pitting within Area 1 and for the first time pitting within Area 5, presumably after Structure 1.1 had been demolished. Further pits were recorded in Area 10, implying that much of the site was external during this time. Two postholes found within Area 3 suggest the presence of a timber structure or fence. This phase saw the construction of the first stone-built structures (Structures 3.1 and 3.2).

Structure 3.1 This rectangular structure, probably a latrine, comprised a rectangular shaft measuring 1.7 x 1.3 m and about 1.1 m deep, lined with roughly squared limestone blocks bonded by a firm reddish brown sandy/gravel mortar (Figs 7–9). There was a pair of opposing putlog holes on its east and west walls near to its excavated depth, presumably to hold temporary supports during its construction. Its internal wall faces were rendered with a thin whitish mortar wash. Its basal fill (1101) comprised a thin greenish silty sand with lenses of charcoal that contained small amounts of mineralized concretions, potentially faecal waste. The shaft was subsequently infilled with a considerable quantity of domestic waste, suggesting that it later served as a rubbish pit. The animal bone assemblage was notable for its predominance of bird bones and a complete absence of pig bones. The pottery from its earliest fill comprised a large number of early Brill ware sherds datable from the early thirteenth century. A sheep or goat bone from a later fill was radiocarbon dated to cal AD 1023-1184 and is likely to be residual.²⁷

[Insert Figure 8]

[Insert Figure 9]

Structure 3.2 This structure represented the earliest evidence for stone-built buildings on the site and extended along the southern side of Area 4. It terminated and possibly returned towards the south at its western extent, suggesting that it formed the north wall of building that lay to the south outside the excavated area. It appears to have been demolished and robbed during this phase as it was overlaid by a sequence of dumps containing medieval Oxford ware.

Pits It is likely that most of the pits recorded in Areas 1 and 5 were used for the disposal of rubbish, though their intercutting nature also suggests that some may have originally

²⁷ SUERC-78793 (95.4 per cent probability) (BP 930 ± 35)

served as gravel quarries. In contrast to latrine Structure 3.1, the pottery from them was dominated by medieval Oxford ware and Cotswold-type ware, suggesting a date prior to the late twelfth century. A pig mandible from pit 1051 returned a radiocarbon of cal AD 904-1119 with high probability that it dates before the Norman conquest, suggesting residuality.²⁸ Within Area 1 the animal assemblage, in contrast to that recovered from the latrine, included a wide range of meat-bearing domesticated mammals, including pig and appreciable quantities of shellfish, largely oyster. The upper fill (1214) of pit 1225 contained an exceptionally rich charred wheat assemblage, whilst pit 1279 (a recut of 1225) contained probable charred hay, either stabling or floor covering waste (fill 1129).

Within Area 10 pit 10018 was notable for containing possible faecal waste and uncharred fruit seeds (fill 10019). This part of the site appears to have formed part of a yard since the pit cut a compacted gravel surface which was replaced after the pit was filled.

Phase 4: Thirteenth to Fourteenth Century (Fig. 10)

[Insert Figure 10]

This phase probably saw the construction of a series of structures that ran alongside the southern edge of Areas 3 and 4 (Structures 4.2, 4.3, 4.4 and 4.5) and along the east side of Area 1 (Structure 4.1), the last probably the rear extent of a substantial building (Fig. 10). Structures in Areas 3 and 4 probably marked the division between two properties. Owing to the truncation by the modern basement, evidence for structures on the north side of the basement in Area 4 did not survive. Any associated structure to the south side lay largely outside the area of the excavation. Probable garden soils were revealed immediately below the modern basement slab across Area 4 and within Areas 7-9. A small area along the southern side of Area 4 was investigated. Here, the soil was found to contain Brill/Boarstall ware. Similar pottery was recovered from the garden soils recorded in Areas 7 and 8. The only pit assigned to Phase 4 was possible cesspit 4087 that contained Brill/Boarstall ware.

Structure 4.1 Straddling the east side of Area 1, this structure formed the south-west corner of a cellared building that apparently abutted a limestone wall foundation (1048) that corresponds to the rear extent of Salter's property SW133, known later in the medieval period

²⁸ SUERC-80171 (95.4 per cent probability) (BP 1025 ± 29)

as the Red Lion. The interior of the structure could not be investigated, though a small sondage suggested that cellar was at least 1.4 m in depth. The structure was constructed with randomly-coursed limestone blocks that had been roughly squared to form its interior sides, bonded by a yellowish mortar (Fig. 11). Unfortunately, no dating evidence was recovered, though the nature of its construction suggests a medieval date. It cut Phase 3 pits 1334 and 1357 that contained medieval Oxford ware. Overlying the pits to its west were trampled spreads of silt and charcoal, over which was a trampled dump of mortar-like gravel reminiscent of the walls of Structure 4.1, suggesting construction debris. The underlying silt contained Minety-type ware datable from the early thirteenth century.

[Insert Figure 11]

Structure 4.2 This undated, but possibly medieval, limestone wall within Area 3 was 0.85 m wide, sufficiently substantial to support a two-storey building (Fig. 12). A second but much narrower wall, bonded by yellowish mortar, ran perpendicular to its north side within Area 14 to the east. It is feasible that this wall was contemporary and formed an internal wall of this structure.

[Insert Figure 12]

Structure 4.3 This was formed by an east-west wall foundation that replaced the earlier boundary wall of Phase 3 (Structure 3.2). It may have formed the wall of a building that extended to the north, since a contemporary wall projected northward from it. Alternatively, the north-south wall could have represented a subsequent boundary, as it corresponds with rear of Salter's Property SW133 (the Red Lion). Both walls comprised limestone rubble foundation bonded with a firm brownish yellow silty sand. Sherds of Brill/Boarstall ware were recovered from their foundation trenches and from an earlier garden soil that survived the basement truncation, along the southern edge of Area 4.

Structure 4.4 This limestone wall foundation may have been the westwards extension of Structure 4.3, although at this point it corresponds with the southern boundary of Salter's property SW134 (Battes Inn) that doglegs behind the rear of the Red Lion. A probable

southwards return was recorded during the watching brief in Area 13, which would also correspond to Salter's eastern boundary of this property.

Structure 4.5 Located within the internal angle of boundary Structure 4.4 (within Property SW134) was a probable stone-lined cesspit that remained largely unexcavated. Though no dating evidence was recovered, a garden soil that accumulated against it and Structure 4.4 contained Brill/Boarstall ware.

Phase 5 (Fifteenth to Mid-Sixteenth Century)

Several new structures have tentatively been assigned to the late medieval period (Fig. 10), though given the paucity of the dating evidence and the lack of excavation (within Area 14) a later date is feasible for some of these structures. The cellared building (Structure 4.1) in Area 1 was infilled with rubble containing fresh sherds of late medieval Brill/Boarstall ware and Raeren stoneware, suggesting a late fifteenth- or sixteenth-century date.

Structure 5.1 Two east-west aligned limestone wall foundations were revealed in Area 5, though it is uncertain whether they pertained to the same building. The more substantial, north wall was built on relieving arches (Fig. 4), which presumably carried it over underlying soft ground resulting from earlier pitting, suggesting that it was load-bearing and formed part of a building. Pottery from an earlier pit, likely to represent its foundation trench, produced appreciable quantities of Brill/Boarstall ware. No surfaces were found that were contemporary with the walls, although a garden soil containing Frechen stoneware and clay pipe fragments dating to the seventeenth century apparently abutted the south wall, suggesting that this area was external by this time.

Structure 5.2 Evidence for a building was revealed in Area 13 and positioned, according to Salter, within a parcel of land located to the rear of Battes Inn. Parts of its north, south and west walls were exposed, which showed that the structure measured 5.3 m across (north-south) and that its west wall had an internal buttress that was added later (Fig. 13). Its walls were fairly substantial at 0.70-0.75 m thick, constructed with limestone rubble bonded by yellowish grey clay mortar. Late medieval Brill/Boarstall ware, dating to the fifteenth to early

seventeenth centuries, was recovered from its north wall and its walls cut into a pre-existing garden soil.

[Insert Figure 13]

Group 13004 A system of stone-built drains, some with capping stones still surviving, were located immediately to the north of Structure 5.2 and appear to have predated the building. As with Structure 5.2, they were constructed over a pre-existing garden soil. A small sherd of Cistercian ware of late fifteenth or sixteenth century date was recovered from the fabric of a drain wall.

Phase 6 (Mid-Sixteenth to Mid-Seventeenth Century)

The drains within Area 11 appeared to have been robbed during this phase and the area levelled. Subsequently, rubbish pits 1388 and 1450 were dug (Fig. 10). Pit 1388 was cut up to and possibly encroached on the north wall of Structure 5.2. Pit 1450 contained mid-seventeenth century clay pipe fragments and pottery spanning the mid-sixteenth to mid-seventeenth century, whilst a sherd of Frechen stoneware recovered from the top fill of pit 1388 suggests a similar or possibly slightly earlier date. Pit 1388 also contained medieval roofing tile fragments together with a late medieval ridge tile and glazed brick fragment of fifteenth- to seventeenth-century date. Within Area 4, stone-lined well 4193, a late feature within the unexcavated levels of Area 4, is probably post-medieval in date.

Phase 7 (Mid-Seventeenth – Early Eighteenth Century)

There was little evidence for activity during this phase. The building to which cellared Structure 4.1 may have belonged in Area 1 was probably demolished by this time (Fig. 10).

Structure 7.1 A stone-lined latrine (4073) was built against the boundary wall that extended alongside the southern side of Area 4. It measured 2.3m across (east-west) and probably no more than 2.1m (north-south), though its walls here did not survive the basement truncation. It was constructed with roughly hewn limestone blocks that had been rudimentary faced on their internal sides, bonded by reddish brown sandy mortar. It survived to ten courses deep or

about 1.2m in depth. Its fill was rich in cess-like deposits, one of which (4061) containing an abundance of mineralised fruit remains, largely grape, fig, blackberry/raspberry and elderberry seeds. A large assemblage of clay pipe, tightly dated to c. 1650-70, was recovered from the feature. The pottery included a near-complete chamber pot and other pottery of seventeenth-century date. Also recovered were number of wine bottle fragments, some bearing the seal of Mermaid tavern and the initials of Anthony Hall, the licensee of the tavern until his death in 1675. Another seal has the letters 'W.M.A.' above a crown, this coming from the Crown Inn on No. 3 Cornmarket and identifying William Morrell, who died in 1679, and his widow Anne, who continued as licensee until 1696.

Structure 7.2 Traces of a north-south substantial limestone wall foundation, probably a boundary wall, were revealed in section after the removal the western wall of the basement. Deposits adhering to its north side though were either remnants of earlier stratigraphy or fills of its construction trench. Although pottery predominantly of thirteenth- or fourteenth-century date was retrieved, several mid-seventeenth-century clay pipe stems were recovered from the lower levels of these deposits. A fragment of the same wall was revealed in plan immediately to the south-west of basement and seventh-century glass was recovered from its foundation trench.

Phase 8 (Early Eighteenth – Nineteenth century) (Fig. 14)

[Insert Figure 14]

The bulk of the evidence was recorded during the watching brief in Area 13 and comprised parts of at least two buildings revealed within its southern arm that probably formed part buildings fronting a passage leading off St Aldates adjacent to the New Inn (Fig. 14). A cobbled surface of granite within bluestone repairs that directly underlay the existing slab was observed throughout the length of the southern arm of Area 13. The bluestone cobbles were probably a modern repair of the surface of nineteenth-century phase of this passage.

Structure 8.1 This was length of wall composed of brick and limestone and corresponds to a building depicted on Ordnance Survey map of 1871, but is not present on Taylor's map of 1750.

Structure 8.2 This substantial wall was composed of limestone blocks and had a stone-built threshold presumably leading out on to the lane. A large sherd of post-medieval Redware obtained from the wall would support a late seventeenth- or eighteenth-date for the construction of this building. It had been demolished prior to the construction of the cobbled surface.

POTTERY by PAUL BLINKHORN

The pottery assemblage comprised 2028 sherds with a total weight of 38,767 g. The estimated vessel equivalent (EVE), by summation of surviving rimsherd circumference, was 24.57. It was recorded using the conventions of the Oxfordshire county type-series,²⁹ as follows.

OXAC	Cotswold-type ware, AD 975-1350. 268 sherds, 4861 g, EVE = 2.78.
OXAG	Abingdon ware, late eleventh–fourteenth century. 3 sherds, 94 g, EVE = 0.19.
OXAM	Brill/Boarstall ware, AD 1200 – 1600. 225 sherds, 3717 g, EVE = 1.88.
OXAW	Early Brill coarseware, AD 1180-1250. 83 sherds, 2371 g, EVE = 1.71
OXB	Late Saxon Oxford shelly ware, late eighth–early eleventh century. 121 sherds, 2381 g, EVE = 1.09.
OXBB	Minety-type ware, early thirteenth–sixteenth century. 4 sherds, 95 g, EVE = 0.05.
OXBF	North-East Wiltshire ware, AD 1050–1400. 34 sherds, 798 g, EVE = 0.19.
OXBK	Medieval shelly coarseware, AD 1100–1350. 5 sherds, 79 g, EVE = 0.
OXBN	Tudor green ware, late fourteenth–sixteenth century. 2 sherds, 6 g, EVE = 0.
OXBS	Beauvais-type ware, ninth–eleventh century. 6 sherds, 186 g, EVE = 0.
OXBX	Late medieval Brill/Boarstall ware, fifteenth–early seventeenth century. 29 sherds, 947 g, EVE = 1.00.
OXCL	Cistercian ware, AD 1470–1600. 10 sherds, 84 g, EVE = 0.07.
OXR	St Neots ware, AD 850–1200. 43 sherds, 571 g, EVE = 0.68.
OXY	Medieval Oxford ware, AD 1075–1350. 1065 sherds, 17138 g, EVE = 12.57.

²⁹ M. Mellor, 'Oxford Pottery: A Synthesis of Middle and Late Saxon, Medieval and Early Post-Medieval Pottery in the Oxford Region', *Oxoniensia*, 59 (1994), pp. 17–217.

OXZ Stamford ware, AD 850–1150. 7 sherds, 55 g, EVE = 0.30.

The post-medieval wares were recorded using the conventions of the Museum of London Type-Series,³⁰ as follows:

BORDB Brown-glazed Border ware, 1600–1700. 2 sherds, 6 g.
BORDG Green-glazed Border ware, 1550–1700. 3 sherds, 44 g.
BORDY Yellow-glazed Border ware, 1550–1700. 55 sherds, 557 g.
CREA Creamware, 1740–1830. 1 sherd, 6 g.
DERBS Derby stoneware, 1700–1900. 10 sherds, 17 g.
FREC Frechen stoneware, 1550–1750. 13 sherds, 553 g.
LONS London stoneware. 1680+. 6 sherds, 118 g.
METS Metropolitan-type slipware, 1480–1900. 2 sherds, 34 g.
MLOJ Montelupo oil jar, 1750–1900. 1 sherd, 246 g
PMBL Post-medieval black-glazed redware, late sixteenth–seventeenth century. 1 sherd, 14 g.
PMR Post-medieval redware, 1550+. 28 sherds, 1852 g.
RAER Raeren stoneware, 1480–1600. 8 sherds, 992 g, EVE = 1.82.
REFW Refined whiteware, 1800–1900. 21 sherds, 219 g.
STSL Staffordshire slipware, 1650–1800. 1 sherd, 4 g.
SWSG Staffordshire white salt-glazed stoneware, 1720–1800. 1 sherd, 2 g.
TGW English tin-glazed ware, 1600–1800. 3 sherds, 23 g.

The following, not included in the Oxford type-series, were also noted:

F1 Early/middle Anglo-Saxon organic-tempered ware, 1 sherd, 15 g, EVE = 0.
F102 Thetford-type ware.³¹ 2 sherds, 48g, EVE = 0.06.
F104 Flemish/Rhenish greyware, eleventh–twelfth century. 5 sherds, 138 g, EVE = 0.

³⁰ E.g. A.G. Vince, AG, 'The Saxon and Medieval Pottery of London: A Review', *Medieval Archaeology*, 29 (1985), pp. 25–93.

³¹ A. Rogerson and C. Dallas, *Excavations in Thetford 1948-59 and 1973-80*, *East Anglian Archaeology*, 22 (1984).

- F401: Spanish tin-glazed ware, late fourteenth–sixteenth century. 1 sherd, 15 g, EVE = 0.11.
- F1001 Romano-British. 5 sherds, 96 g.
- F1002 Iron Age. 4 sherds, 159 g, EVE = 0.07.

The general range of pottery types is fairly typical of sites in Oxford, albeit with some exotica in the form of late Saxon, medieval and post-medieval imports. This is a pattern that has been noted in the past at other excavations in the St Aldates area of the city. The excavations in the late 1960s and early 1970s, centred around 79-87 St Aldates, produced an assemblage similar to this one.³² There, the middle-late Anglo-Saxon assemblage was dominated by OXB, with St Neots ware (OXR) a relatively minor ware, and a number of mainly Saxo-Norman continental imported types, such as Andenne, North French and Rhenish/Flemish greywares,³³ also present. Here, pottery from France (Beauvais ware) and the Low Countries/Germany (Flemish/Rhenish greyware) is present. Such pottery is not common in Oxford, but similar types were also noted at nearby excavations in St Aldates,³⁴ Queen Street and All Saints Church.³⁵ In most cases, OXB was also the dominant middle-late Saxon pottery type. The sherds of Beauvais ware do not refit, but appear to be mostly, if not entirely from the same vessel, a red-painted, fairly large jar or pitcher, a typical product of the tradition. The inner surface is somewhat degraded, which is typical of pottery that was used to store slightly acidic liquids,³⁶ so the vessel may have been used for transporting wine.

The single sherd of early/middle Anglo-Saxon hand-built pottery is a rare find in the city, although one of the very few relatively large assemblages from Oxford occurred at nearby 31-4 Church Street.³⁷ Thetford ware, represented here by two sherds from pitchers or storage jars, is also an uncommon occurrence in Oxford, although some sites have produced

³² R. Haldon, 'Late Saxon and Medieval Pottery', in B. Durham, 'Archaeological Investigations in St Aldate's, Oxford', *Oxoniensia*, 42 (1977), pp. 111–39.

³³ *Ibid.*, table 1.

³⁴ *Ibid.* table 1.

³⁵ E.g. M. Mellor, 'The Saxon and Medieval Ceramic Finds from the Town Sites', in Dodd (ed.), *Oxford Before the University*, table 6.7.

³⁶ G. Perry, 'Beer, Butter and Burial', *Medieval Ceramics*, 32 (2011), pp. 9–22.

³⁷ M. Mellor, 'Pottery', in T.G. Hassall, C.E. Halpin and M. Mellor, 'Excavations in St Ebbe's, Oxford, 1967-1976. Part I: Late Saxon and Medieval Domestic Occupation and Tenements, and the Medieval Greyfriars', *Oxoniensia*, 54 (1989), p. 198.

one or two sherds, such as Lincoln College.³⁸ It is likely that these pots were arriving as containers for traded goods, rather than as desirable goods in their own right.

Surprisingly, given the amount of well-documented late Saxon activity within the immediate vicinity of these excavations, stratified late Saxon pottery is very scarce, with just eight sherds noted, although it is possible that some of the groups which only contained OXB date to this time. As noted above, OXR is rare in this area of the town, with OXB seeming to have continued to be the dominant ware in the late Saxon period, possibly reflecting the ethnic identities of populations of differing backgrounds living in the city at that time.³⁹ Thus, some of the contexts which produced only OXB and are dated to ceramic phase (CP) MSAX (Table 2), may be of late Saxon (LSAX) date.

The bulk of the Saxo-Norman (CP SN) material consists of OXB (55.4 per cent of the CP assemblage by weight) (Table 3). It is possible that it could all be residual, and that there was considerable disturbance of late Saxon strata during CP SN, but many of the OXB sherds are large and fresh, suggesting that this was not the case. Another possibility is that OXB may have carried on in use for a little longer than its traditional dating suggests, or, alternatively, that some of the OXAC from the site is earlier than is usual for sites in Oxford, and that contexts containing just OXB and OXAC are late Saxon rather than Saxo-Norman. While OXAC is not normally found in quantity in Oxford before the eleventh century, earlier groups are known; for example, a vessel was found in a secure early-tenth century context at Trill Mill.⁴⁰

The Saxo-Norman and medieval pottery is much more typical of other sites of the period in the town, being dominated first by OXAC, then OXY, and finally with Brill/Boarstall wares (OXAW, OXAM and OXBX) common from the thirteenth century onwards. The largest assemblages, as is often the case in Oxford, date to the late eleventh to fourteenth century, with deposition dropping off quite sharply after that time. The late medieval and post-medieval assemblages mostly comprise small groups of mainly residual material with a few large fragments of well-represented contemporary pottery.

³⁸ P. Blinkhorn, 'The Pottery', in Z. Kamash, D.R.P. Wilkinson, B.M. Ford and J. Hillier, 'Late Saxon and Medieval Occupation: Evidence from Excavations at Lincoln College, Oxford 1997–2000', *Oxoniensia*, 67 (2002), p. 232.

³⁹ P. Blinkhorn, 'No Pots Please, We're Vikings: Pottery in the Southern Danelaw, 850–1000', in D. Hadley and L. Ten Harkel, *Everyday Life in Viking Towns: Social Approaches to Towns in England and Ireland c.800–1000* (2013), pp. 157–71.

⁴⁰ Mellor, 'Oxford Pottery', p. 51.

Much of the earlier medieval material is the product of secondary deposition, as is often the case, with the pottery presumably having been first deposited in domestic middens or the like before being utilized as back-fill for earth-cut features such as pits, etc. The CP M1 material is largely typical of domestic assemblages of the period in the city, other than the fact that there are a relatively large number of crucible fragments present, with such vessels making up 8.4 per cent of the rim assemblage (five examples) and body sherds from another two noted, suggesting that metalworking or the like was taking place at the site. However, the crucible assemblage all appears to have not been subjected to intense heat for prolonged periods. One or two of them show very slight vitrification on the outer surface, and others appear to have oxidized, but none of them had any visible residues on either surface, and either they were not used, or they were used in relatively low temperature environments, probably below 900 degrees centigrade, the temperature at which earthenware begins to vitrify.⁴¹ All the crucible fragments except one came from Area 1, with the other occurring in Area 4. It is perhaps significant that the lamp rim also came from this area of the site. Recent work has suggested that lamps were often used as illumination in relation to craftwork in some areas of the country, particularly to the west of Oxford.⁴² Relatively large groups of crucible fragments are not common from Oxford sites of this date. Industrial activity dating to the late eleventh–mid-twelfth century was noted at 79-80 St Aldates,⁴³ but crucibles were not among the finds from there,⁴⁴ although a number were noted at 31-4 Church Street, probably of late eleventh–twelfth-century date.⁴⁵ One or two fragments of crucibles were also noted in the Saxo-Norman levels at All Saints Church.⁴⁶

The CP M2 (thirteenth–fourteenth century) assemblage is large and entirely typical of the period in Oxford, and appears to be of a domestic nature, with vessels associated with eating, drinking, cooking and lighting noted (Table 4). A single crucible rim was noted, but it is of Stamford type, and thus very likely to be residual, and presumably contemporary with those noted in the previous phase. One rarity is a fragment of a rim sherd in Spanish tin-glazed ware. Such pottery is a very rare find in Oxford and, assuming it is not intrusive, it is

⁴¹ P.M. Rice, *Pottery Analysis: A Sourcebook* (1987), p. 5.

⁴² P. Blinkhorn, L. Cramp, P. Prior, G. Glass and M. Horton, M, 2017 'Fiat Lux: Functional Analysis of Three Saxo-Norman Pottery Lamps from Berkeley, Gloucestershire', *Medieval Archaeology*, 61 (2017), pp. 104–16.

⁴³ B. Durham, 'Archaeological Investigations in St Aldate's, Oxford', *Oxoniensia*, 42 (1977), p. 100.

⁴⁴ Haldon, 'Late Saxon and Medieval Pottery', p. 132.

⁴⁵ Mellor, 'Pottery', pp. 201, fig. 45, no. 4.

⁴⁶ Mellor, 'The Saxon and Medieval Ceramic Finds from the Town Sites', p. 338.

likely to be a fragment of early Malagan or Valencian lustreware.⁴⁷ Such pottery has become reasonably well-recognised in England in the past couple of decades, and while it occurs at high-status ‘magnate’ residences, it is also found at urban sites away from the coast.⁴⁸ Its presence here may be an indication that people of greater than normal wealth and/or status lived at the site in the fourteenth century or thereabouts,⁴⁹ so the site may have been the residence of a merchant at this time. Given that such pottery often had Islamic or, later, Christian themes or motifs,⁵⁰ it seems unlikely to have been used by members of the Jewish community in Oxford, and corresponds with the sites being known to be owned by Christians in the 14th century.

Pottery deposition at the site drops off very rapidly after this time. The pottery assemblages dating to the early-late fifteenth century and late fifteenth–mid-sixteenth century (CP M3 and M4) weighed just *c* 2.5 kg in total, much of which was residual, with most of the rest made up of a handful of well-represented vessels. The CP M4 assemblage is made up almost entirely of drinking vessels. Given the dearth of pottery of this date, it may be that the site was undergoing a period of reorganization and consolidation, and that most of the pottery was deposited by labourers, although the presence of an inn cannot be discounted. Other sites of the late medieval period have shown a correlation between industrial activity and large quantities of drinking pottery.⁵¹ Previous excavations in St Aldates have shown a similar picture, with relatively little fifteenth–sixteenth-century pottery occurring.⁵²

The entire post-medieval and modern assemblages totalled around 6 kg of pottery, with the CP assemblages showing a similar pattern to those of the late medieval period, being groups of small and mostly residual sherds along with a few large fragments of individual vessels, such as the near-complete BORDY chamber-pot from CP PM2. Perhaps the most notable was the large sherd from an eighteenth-century context of a Montelupo oil-jar. Such pots, used for transporting Italian olive oil, were extremely large, with a capacity of around 20 gallons not unusual, and are known from many eighteenth–nineteenth-century sites in Britain, Europe and North America, and once empty, were often used as shop signs or garden

⁴⁷ A. Gutierrez, ‘Cheapish and Spanish: Meaning and Design on Imported Spanish Pottery’, *Medieval Ceramics*, 21 (1997), pp. 73–82.

⁴⁸ *Ibid.*, fig. 3.

⁴⁹ *Ibid.*, p. 79.

⁵⁰ *Ibid.*, pp. 73–4.

⁵¹ Eg M. Shaw, ‘The Excavation of a Late 15th–17th-Century Tanning Complex at The Green, Northampton’, *Post-Medieval Archaeology*, 30 (1996), pp. 63–128. (1996)

⁵² Haldon, ‘Late Saxon and Medieval Pottery’, pp. 135 and 137.

ornaments.⁵³ The oil-jar aside, the post-medieval material appears entirely of a domestic nature.

Overall, the assemblage has many parallels with material from previous excavations in the St Aldates area of Oxford. In the Saxo-Norman and earlier medieval periods in particular, the area was a thriving centre, with the presence of imported pottery and crucibles showing that there was industrial activity and trade, and suggesting that the area was an area of economic importance in the city. By the thirteenth–fourteenth century, the pottery assemblages have a much more domestic nature with a sharp drop-off in pottery deposition from the fifteenth century onwards.

Catalogue of Illustrated Pottery (Fig. 15)

1. Fabric OXY. Full profile of a jar. Uniform light grey fabric, outer surface is evenly sooted below the neck, patches of burning on the inner surface of the body and base. Context 1167, pit 1334, Phase 3.
2. Fabric OXAW. Near-complete miniature jar. Orange-pink fabric with grey surfaces. Patch of glaze on interior surface of base. Context 1090, pit 1058 (latrine 3.1), Phase 3.
3. Fabric OXAM. Complete small bowl. Buff fabric with partially unvitriified green glaze on the inner surface. Context 10011, Phase 5.
4. Fabric OXBX. Base and lower body of jug. Dark red fabric with dark grey surfaces, patchy dark green glaze on the outer surface, inner fairly extensively lime-scaled. Context 10011, Phase 5.
5. Fabric RAER. Full profile of mug. Uniform grey fabric with patches of brown iron-wash on the outer surface under a clear salt-glaze. Inner surface unglazed pale brown. Large fragment of kiln waste stuck to the outside of the base. Context 1069, Phase 5.
6. Fabric BORDY. Near-complete chamber-pot. White fabric with pale grey surfaces, even yellow glaze on the inner surface Contexts 4067 and 4102, Structure 7.1, Phase 7.

ORGANIC RESIDUE ANALYSIS by JULIE DUNNE AND RICHARD P. EVERSLED

⁵³ J. Ashdown, 'Oil Jars', *International Journal of Nautical Archaeology*, 1/1 (1972).

Selected pottery vessels from Phases 3 (four samples) and 4 (six samples) were examined to determine whether organic residues were preserved and, if so, which commodities were processed in the vessels and whether a ‘Jewish’ signal could be identified. For the purposes of comparison, organic residue analysis was additionally carried out on a contemporaneous assemblage (ten samples) from Queen’s College, Oxford.⁵⁴ The Queen’s College material derived from domestic and industrial deposits that was away from the Jewry and predated the college and therefore should not correlate to restricted or high-status diets. Furthermore, comparison was also made to pottery samples from Phase 1 and 2 of the St Aldates site (eight samples) and Phase 3 and 4 (two samples) previously analysed by Lucy Cramp and Helen Whelton from the University of Bristol.⁵⁵

There is extensive regulation and detail regarding animal consumption within the Jewish faith, but, in brief, in terms of the mammal species allowed, they need to have both cloven hooves and chew their cud (that is, be ruminants). Animals that only meet one characteristic (such as pig) are not permitted. Aquatic species with both fins and scales are allowed as are certain bird species, including chicken, geese and duck.⁵⁶ The results, determined from high-temperature gas chromatography (GC), gas chromatography-mass spectrometry (GC-MS) and carbon isotope analyses (GC-C-IRMS), demonstrate that six of the eight lipid residues from the earlier non-Jewish phases (1 and 2) at St Aldates were predominantly used to process ruminant products (cattle, sheep or goat), but with the addition of some non-ruminant products (pig). Two vessels were used to process dairy products (milk, butter or cheese). In these phases, animal bones comprised 40 per cent domestic cattle, 40 per cent caprine and 20 per cent pig. The presence of unsaturated fatty acids C_{20:1}, C_{22:1} and C_{24:1} suggests that seed oil from *Brassica* species may have been used in the cooking of the ruminant carcass products in two vessels.

In contrast, nine of the twelve pottery samples from St Aldates Phase 3 and 4 vessels were used solely to process ruminant carcass products, with a very minor amount of mixing of animal products in a further two potsherds. This could originate from non-ruminant products (pig) or possibly from birds, such as chicken, geese or duck. These data strongly suggest vessel specialisation, in that they were only used to process ruminant products,

⁵⁴ See article in this volume.

⁵⁵ H. Welton and L. Cramp, ‘Summary of the Organic Residue Analyses of Norman pottery from Southern England’, unpublished report, University of Bristol (2017).

⁵⁶ S. Valenzuela-Lamas, L. Valenzuela-Suau, O. Saula, A. Colet, O. Mercadal, C. Subiranas and J. Nadal, ‘Shechita and Kashrut: Identifying Jewish Populations through Zooarchaeology and Taphonomy. Two Examples from Medieval Catalonia (North-Eastern Spain)’, *Quaternary International*, 330 (2014), pp. 109–17.

confirming a possible Jewish origin. One vessel was used solely to process dairy products, which is consistent with the known Jewish prohibition against the mixing of meat and milk.

Lipid residue results from the contemporaneous site at Queen's College show that four vessels were used to process solely ruminant carcass products with the remainder being used to process both ruminant and non-ruminant products, whether contemporaneously or over the lifetime of use of the vessel.

In summary, this data provides strong evidence that, at both the earlier St Aldates Phases 1 and 2, and the contemporaneous site of Queen's College, vessels were being used to process both ruminant and non-ruminant (porcine) products. In contrast, during the 'Jewish' phase, it seems that non-ruminant (pig) processing was either very minor, or effectively, non-existent.

A further question raised by this study is the near absence of dairy products found in the vessels. This is in contrast to lipid residue studies of prehistoric pottery in Britain⁵⁷ and late Saxon to early medieval pottery from West Cotton, Northamptonshire,⁵⁸ where dairy products are shown to play a significant part in local subsistence strategies. This absence may be because dairy products were processed in different types of vessels (e.g. wooden bowls) or were perhaps not produced in individual households but rather purchased ready-made from sellers of butter and cheese. Certainly, dairy products, sometimes referred to as 'white meats' of the poor, are thought to have been mainstays of the medieval peasant's diet.⁵⁹

CLAY TOBACCO PIPES by DAVID HIGGINS

The excavations produced 160 fragments of pipe (50 bowl, 104 stem and 6 mouthpiece fragments) weighing a total of 1,614 g. The pipes were recovered from 22 different contexts in five of the excavated areas (1, 4, 5, 10 and 11). The pipe assemblage as a whole is in very good condition with many large stem fragments and most of the bowls comprising complete examples. Almost all the pipes recovered belong to a very narrow time band; almost all of the stems are of general seventeenth-century types while the more closely datable bowls range from c.1640-80, with the majority dating from c.1650-70. The only notable exceptions are

⁵⁷ E.g. M.S Copley, R. Berstan, S.N. Dudd, V. Straker, S. Payne and R.P. Evershed, 'Dairying in Antiquity. I. Evidence from Absorbed Lipid Residues Dating to the British Iron Age', *Journal of Archaeological Science*, 32.4 (2005), pp. 485–503.

⁵⁸ S.N. Dudd and R.P. Evershed, 'Direct Demonstration of Milk as an Element of Archaeological Economies', *Science*, 282.5393 (1998), pp. 1478–81.

⁵⁹ M.W. Adamson, *Food in Medieval Times* (2004).

two stems of late eighteenth-century or later date from context 1376. From the pipe evidence, it would appear that there was a brief but intense period of activity resulting in the deposition of archaeological material across this site during the third quarter of the seventeenth century.

The majority of the pipes were recovered from the fills of postholes or pits, the most notable of which was Phase 7 stone-lined cesspit 4073. This feature produced by far the largest number of pipes from the site (82 per cent of all the pipes recovered) and is discussed in detail below. None of the pipes from the excavations are marked and the only decorated examples come from latrine fill 4073. A context summary of all the pipes has been provided for the site archive but just the large pit group is discussed here.

Latrine Group 4073

There were nine pipe-bearing contexts (4005, 4006, 4013, 4014, 4044, 4058, 4061, 4066 and 4067) associated with this cesspit, which produced a total of 131 pipe fragments (43 bowl, 82 stem and 6 mouthpieces). There were numerous cross joins between these fragments showing that the pit was filled as a single event. It was also possible to reconstruct around twenty substantially complete pipes and three fully complete pipes, all of which date from c.1650-70. Complete pipes are rarely recovered and only around 30 seventeenth-century examples were recorded during a study in the 1980s to which another 20 or so have since come to light.⁶⁰ These are the first examples of any date from Oxfordshire or its surrounding counties and the recovery of three together makes this group of national significance. The pit was located behind the site of the Red Lion inn and the fill included sealed bottles made for Anthony Hall, who was licensee of the Mermaid tavern until his death in 1675. Numerous fig and grape seeds were also found in the pit, suggesting an affluent establishment/clientele. The pipe group can, therefore, be interpreted as having been discarded at one point in time from a prosperous tavern, most likely sometime around 1660.

A number of other closely datable mid-seventeenth century pipe groups have recently been recovered from Oxford,⁶¹ but this is the only one to have produced fitting fragments that

⁶⁰ D.A. Higgins, *The Interpretation and Regional Study of Clay Tobacco Pipes: A Case Study of the Broseley District*, doctoral thesis submitted to the University of Liverpool (1987), https://www.academia.edu/34528546/Higgins_1987_-_The_Interpretation_and_Regional_Study_of_Clay_Tobacco_Pipes.

⁶¹ D.A. Higgins, 'Clay Tobacco Pipes', in 'Excavations in the Provost's Garden, the Queen's College, Oxford'; D.A. Higgins, 'Clay Tobacco Pipes', in *An Early Ditch, Medieval Boundary and Post-Medieval Quarrying at the President's Garden, St John's College, Oxford* (both in this volume).

now allows a number of substantially complete pipes to be compared and contrasted. The other sites do, however, provide useful reference points for the bowl forms and manufacturing techniques. Where more than one bowl occurs in any of the contexts from this pit it has been allocated an additional suffix (A, B, C, etc.) to act as a unique identifier so that it can be individually referred to, the relevant letter having been pencilled inside the bowl.

At least 43 pipes were discarded in the pit, 40 of which fit well as a contemporary group. There was one bowl from the wall of the pit itself that seems unusually large for the group, and must represent an early introduction of a form that would otherwise be dated *c.*1660-80 (Fig. 16, no. 8). The other two slightly later looking forms also date from *c.*1660-80, but came from 4014, one of the upper fills of the pit, where they could be intrusive or have been introduced from elsewhere when the pit was being filled. Unlike most of the other pieces, neither has any surviving stem and they are so similar that they were probably made in the same mould (Fig. 16, no. 9). They also stand out as being the only two bowls from the pit made of a fine sandy fabric from Shotover Hill.⁶² The author has noted that this sandy fabric declined in use during the Commonwealth and does not appear to have been used at all during the 1660s, with a resurgence towards the end of the century.⁶³ The material from 4073 supports this observation and shows that imported clays were almost exclusively used for pipemaking in Oxford when the pit was filled.

One bowl was missing its base, but the others comprise 36 spur forms and six heel forms. One or two of the pipes had stem bores of either 6/64" or 9/64" but the rest were all of either 7/64" (16 examples) or 8/64" (23 examples). Only four of the heel forms had complete heels and all of these were round or oval in plan (e.g. Fig. 16, nos 3-4); none had the pointed tail sometimes found on early to mid-seventeenth century pipes in Oxford. Spur forms appear to have been regarded as the more prestigious style of the two and this is reflected by the fact that 34 of these had burnished bowls (94 per cent), whereas none of the heel bowls were burnished (cf. Fig. 16). Furthermore, 29 of the spur bowls (81 per cent) had a good or fine quality burnish (i.e. better than average) and 27 of 31 examples with surviving stem also had this burnish as well (87 per cent). The quality of the stem burnish was often a little less good than that of the bowls but the overall pattern is clear – spur pipes almost all had burnished bowls and most of them had burnished stems too, while the heel forms were completely unburnished. Reconstruction of around 20 substantially complete pipes has also allowed the

⁶² See Higgins, 'Queen's College Provost's Garden' for a discussion of this fabric.

⁶³ Higgins, 'St. John's College'.

length of the stem burnishing to be assessed for the first time. There were 16 spur pipes where this could be measured, showing that burnishing extended to between 130 mm and 205 mm from the bowl junction (the length of the longest strokes measured), invariably ending with strokes of irregular length so as to fade into the unburnished section running up to the mouthpiece. Most of the examples had between 150 mm and 185 mm of burnished stem (12 examples, representing 75 per cent of the sample).

There was less distinction with regard to the amount of rim milling between the two forms, with both styles exhibiting both fully milled and unmilled examples (four of six heel forms were fully milled and eight of 36 spur types; one of six heel types were unmilled and twelve of the 36 spur types). Although these two extremes (either completely milled or completely unmilled) were the most numerous types, there were also various intermediate levels of milling for both styles. This general pattern accords with a group of *c.* 1650-70 from the Queen's College, where more variable levels of milling were found to have replaced the almost consistently fully milled pipes from earlier groups.⁶⁴ Milling is generally taken as an indicator of the quality of a seventeenth-century pipe, the more complete the milling the better the quality. In mid-seventeenth century Oxford, however, this does not seem to follow, with the burnished spur forms being just as variable as the cheaper heel types. Figure 17, no. 11, with its ornately decorated stem and finely burnished bowl, must have been a more expensive pipe and yet it has no rim milling at all.

Makers' marks are not very common on Oxford pipes and none was recovered from the excavation. Likewise, decoration at this period was rare and only two decorated pipes were present. One just has a single band of milling 20 mm from the bowl where the stem has been repaired during manufacture (Fig. 17, no. 10). The pipe had broken again at this point showing where the broken ends had been pushed back together and there are irregularities flanking the milling where the stem has been smoothed. Repairs of this type, usually disguised with milled bands, are not infrequent finds across the country. In contrast, the other decorated piece has an ornately decorated stem that starts 60 mm from the bowl and extends for a further 127 mm along the stem (Fig. 17, no. 11). The central section comprises chevron decoration that has been created by scraping a toothed implement, perhaps a milling tool, at alternate angles across the stem. This created slight facets to the stem, 12 or 13 in total, with one small strip that has been missed or left plain deliberately on each side. The chevron decoration is flanked at each end by a series of stem borders that have been created by

⁶⁴ Higgins, 'Queen's College Provost's Garden'.

impressing a toothed blade into the clay at a slight angle to form each band – eight on the bowl side and nine towards the mouthpiece end. This technique of using a decorated blade in an opposing manner to form paired bands is a technique that appears to be peculiar to Oxford region, where it was used from the mid-seventeenth century to the early eighteenth century.

The bowl forms all suggest local production for this pipes from this pit. The high level of finish on the spur forms makes it impossible to carry out reliable mould identification using surface flaws, but subtle differences in profile and overall shape show that several (perhaps many) different moulds must be represented. Apart from the three larger types mentioned above (Fig. 16, nos 8–9) the spur bowls are all a very uniform style, showing that the Oxford makers were working to a common standard of shape and finish (Figs. 16, nos 5–7 and 10–11). The principal variation is simply that of overall size, which varies slightly, probably reflecting the gradual evolution towards larger size that was a characteristic of the seventeenth century (cf. Fig. 16, nos 5 and 7). The heel forms are almost as uniform, with just two slightly smaller and more variable pieces (Fig. 16, nos 1 and 2), but the other four being very similar in size and shape (e.g. Fig. 16, nos 3 and 4).

The most important outcome of this study is the reconstruction of three complete pipes from this group. Only six mouthpieces were available and, had more been recovered, there is no doubt that many other pipes could have been reconstructed. A study of the evolution of stem length has shown that stems got longer during the course of the seventeenth century, but that different lengths also existed at any one time, being related to the style and quality of pipe.⁶⁵ The three pipes reassembled from this pit are all spur types (Fig. 17, nos 5–7). The shortest has a relatively small bowl form and thin stem, with a stem length of 289 mm (11 3/8"; Fig. 17, no. 5). The other two pieces both have slightly larger bowls and chunkier stems, with lengths of 293 mm (11 1/2"; Fig. 17, no. 6) and 304 mm (12"; Fig. 17, no. 7). These two are so similar in bowl form that it is likely that they come from the same mould, the difference in length being accounted for by the stretching/compression of the clay during manufacture, the point at which the stem was cut off to form a mouthpiece, and shrinkage during firing. Similar differences between pipes made in the same mould has been noted previously⁶⁶ and so some variation is not unexpected. In broad terms, however, these spur pipes had stem lengths that ranged from around 11 1/2" to 12". No complete heel pipes were recovered, but two almost identical examples each had surviving stems of around 245 mm

⁶⁵ Higgins, *The Interpretation and Regional Study of Clay Tobacco Pipes* (1987).

⁶⁶ *Ibid.*, pp. 56–60.

(e.g. Fig. 17, no. 4) and their stem taper suggests that they would have been of a comparable length.

The complete pipes are of a similar length to the mid-range of other known examples of this period.⁶⁷ Without more complete examples to compare, it is not known whether longer or shorter examples were also current in Oxford at this time (perhaps with identical bowl forms) or whether this was the standard length for all pipes produced at this particular centre. The former is more likely, since various prices/lengths are recorded in many other parts of the country. Of particular significance in relation to these new finds is the 1710 mould size agreement implemented by the Bristol pipemakers to standardise their products. This listed six different styles of pipe with stem lengths ranging from 8" to 16", including 'Pened Heels' and 'Gauntletts' of 11 ½" each.⁶⁸ These two styles almost certainly equate, respectively, to the spur and heel forms found at Oxford, showing that these forms already existed with comparable stem lengths some half a century before the mould size agreement was drawn up.

List of Illustrations (Figs 16 and 17)

A representative range of bowl forms, together with the decorated pieces from pit 4073, are shown at life-size in Figure 16, with reduced illustrations showing the overall form of some of the more complete pieces in Figure 17. All these pieces come from contexts associated with the pit fill of c.1650-70, although bowl 9 is a slightly later style of c.1660-80 from one of the upper fills of the pit, and so could be intrusive.

1. Three quarters milled; stem bore 7/64". 4067.
2. Fully milled; stem bore just over 8/64". 4014.
3. Fully milled; stem bore just over 7/64". 4067.
4. Fully milled; 8/64". 4066.
5. Three quarters milled; good burnish on bowl and poor burnish on the rather thin and waney stem; stem bore 7/64". Stem is 289 mm (11 3/8") long with 175 mm burnished. 4067.

⁶⁷ *Ibid.*, p. 64.

⁶⁸ R. Jackson and R. Price, *Bristol Clay Pipes: A Study of Makers and their Marks*, Bristol City Museum Research Monograph, 1 (1974), p. 85.

6. Fully milled; good burnish on bowl and stem; stem bore 9/64". Stem is 293 mm (11 1/2") long with 207 mm burnished. Stem bends slightly to the right, but much straighter than no. 5. Possibly made in the same mould as no. 7. 4014.
7. Three quarters milled; good burnish on bowl and stem; stem bore 8/64". Stem is 304 mm (12") long with 180 mm burnished; good straight stem. Possibly made in the same mould as no. 6. 4067 with joining fragments from 4058.
8. One quarter milled; stem bore just over 8/64". 4005.
9. Half milled; stem bore just over 8/64". A near identical example from the same context (4014 (L)) was probably made in the same mould. 4014.
10. Fully milled; stem bore 7/64". The stem was broken and repaired during manufacture, the mend being partially disguised with a band of milling 20 mm from the bowl. The stem is burnished up to 155 mm from the bowl. 4006.

BUILDING MATERIALS

Structural Fired Clay by Cynthia Poole

The structural fired clay comprised 70 fragments (874 g), much of which was indeterminate and either entirely amorphous in character or with a single moulded, usually flat, surface. One piece may have been shaped into a ball, but this could be the accidental effect of breakage and wear. Shaped pieces included several fragments with wattle impressions, some of which had a roughly moulded curving surface with finger marks typical of oven walls. The wattle impressions included interwoven examples based on their angles to one another, or lying flat and parallel. The wattles ranged in size from 10-20 mm in diameter (Fig. 18). The fabrics consisted of a fairly coarse sandy clay matrix, which sometimes contained limestone grit, and at least one was heavily micaceous. Organic or grass inclusions were present in a few pieces. Most were fired to varying shades of red, pink and brown, with occasional black or grey reduced areas or mottles.

The structural fired clay derives from oven or hearth structures and occurs predominantly in Saxon or early medieval deposits of Phases 1-3. Though the fragments are not intrinsically datable, fired clay started to be replaced by brick and tile in the later medieval period for structures such as ovens and hearths that required fireproof materials.

The assemblage probably reflects activities of a domestic character related to cooking or food preparation or artisan activities undertaken on the site during the earlier phases of its use.

One fragment (context 11023) had a rough exterior surface and two wide flat impressions of laths or split poles each over 30 mm wide. These were separated by a narrow ridge of clay 7 mm wide. The fragment was 22-36 mm wide and is possibly the daub render of a wattle and daub wall panel.

Plaster and Mortar by Cynthia Poole

There are 28 fragments (1475 g) of mortar, wall plaster, cement and concrete. This included coarse sandy cream or brown lime mortar, frequently with coarse grits used as wall render. The fragments ranged from 6-30 mm thick, though most were under 20 mm thick. Some of the plaster or render had lath impressions ranging in size from 17-27 mm wide and 6-16 mm deep. Some fragments of plaster are painted in white or where coloured mostly dull shades of green, but also brown and anil. Most of this mortar and plaster comes from Phases 6-9; where it occurs in earlier deposits it is in several cases associated with intrusive nineteenth-century material.

Ceramic Building Material by Cynthia Poole

The assemblage (1262 fragments, 120 kg) is dominated by roofing tile, which includes some unusual pieces, among them a peg tile with a single central peg hole and a ridge tile with a peg hole, two varieties not previously noted in Oxford. A possible chimney pot is also a rare find, though one, dated to 1150-75, had previously been found at St Aldates and another is known from the Hamel, where it is dated to the early thirteenth century.⁶⁹ Ceramic building material was used on the site predominantly for roofing during Phases 3 and 4, which are dated to the late eleventh to fourteenth centuries, though it is unlikely that tile came into use before the late twelfth century towards the end of Phase 3.

The medieval buildings standing on the site were roofed with glazed and unglazed peg tile surmounted by plain glazed ridge tile without crests as is typical of many buildings in Oxford at this period (Table 5). The roof tile in Phase 3 deposits of late eleventh-twelfth-

⁶⁹ Haldon, 'Late Saxon and Medieval Pottery', fig. 19, no. 16; M. Mellor, 'Pottery', in N. Palmer, 'A Beaker Burial and Medieval Tenements in the Hamel, Oxford', *Oxoniensia*, 45 (1980), fig. 9, no. 18.

century date was concentrated in Area 1. Flat roof tiles of plain rectangular form are referred to in documentary evidence and roof tile has been found in later twelfth-century contexts in several English towns and cities, including London, and at Eynsham Abbey, Oxfordshire.⁷⁰ An assemblage of roof tile very similar in character and of similar date to the St Aldates assemblage was recently found at Merton College relating to buildings of twelfth- to thirteenth-century date, preceding the college foundation.⁷¹ Nearly all the roof tile deposited during Phase 4 was recovered from Area 4, much of it coming from the garden soil layers. The tile was still predominantly in group VII fabrics, but included a proportion in fabric IIIB. Later roof tile in fabric IIIA and fabric IVA/B, which appear from the fourteenth century, occurred in small quantities mostly in post-medieval levels. About a dozen fragments of medieval roof tile had burnt edges, indicating that they had been used (or re-used) set on edge in the floors of hearths or ovens.

The very small quantity of plain floor tile suggests that this was restricted to small areas of flooring and that in general other materials such as timber boards, stone paving or trampled earthen floors were the norm. Previous excavations at St Aldates produced similarly small quantities of floor tile, though this included two decorated ‘stabbed-Wessex’ type floor tiles.⁷²

Structural Stone by Ruth Shaffrey

Structural stone includes blocks of oolitic limestone ashlar from Phase 3 pit fill 10019 and Phase 7 structure 7.1, and a piece of dwarf column, probably originally octagonal, also from structure 7.1. The last is made from a spar prominent oolitic limestone, possibly from the Windrush valley. This presumably originated in the higher-status buildings known to have been on the site.

A relatively small quantity of stone roofing was also recovered, perhaps reflecting a preference for ceramic roofing. It includes six fragments (2.1 kg) with diagnostic perforations and 54 non-diagnostic fragments (4.9 kg), probably but not certainly, used as roofing. These

⁷⁰ T.P. Smith, ‘London’s Earliest Medieval Roofing Tiles: A Comparative Study’, *Medieval Ceramics*, 22–23 (1998–9), pp. 66–71; N. Mitchell, ‘The Floor and Roof Tile’, in A. Hardy, A. Dodd and G.D. Keevill, *Aelfric’s Abbey: Excavations at Eynsham Abbey, Oxfordshire, 1989–92*, Oxford Archaeology Thames Valley Landscapes Monograph, 16 (2003), p. 214.

⁷¹ C. Poole, ‘Ceramic Building Material’, in ‘Medieval and Later Evidence at St Alban’s Quad and Patey’s Quad, Merton College (this volume).

⁷² Durham, ‘Archaeological Investigations in St Aldate’s, Oxford’, p. 140.

are of the shelly limestone (Pusey Flags) and calcareous sandstone (Stonesfield Slate type) so typical of Oxford roofing.

Window Glass by Ian R Scott

Fourteen fragments of window glass were recovered, occurring in contexts from Phase 3 onwards. A small weathered and devitrified sherd of window glass from layer 1029 was possibly medieval, and a small piece of window glass from context 1390 (Structure 4.5) with opaque weathering might be medieval or post-medieval in date. The remainder of the material is post-medieval or undated.

VESSEL GLASS by IAN R. SCOTT

The glass assemblage is quite small (89 fragments) but it is clearly dominated by bottles, particularly wine bottles of seventeenth to nineteenth century date, and also contains a small number of sherds from drinking vessels.

Phase 6 context 11021 produced two pieces of post-medieval vessel glass, one a body sherd with optic blown ribs, the other a pedestal base. Although there is no refit, it is possible that the sherds are from the same pedestal beaker. The form dates to the second half of the sixteenth or first half of the seventeenth century.

The vessel glass from Phase 7 context 4056 comprises a distinctive baluster from a stemmed vessel of early seventeenth-century date and possibly of Venetian manufacture, but more likely to be English in the *façon de Venise*.

The most interesting wine bottles were two seventeenth-century 'globe and shaft' bottles from Phase 7 context 4014, both which have datable bottle seals. One seal shows a mermaid, with the waves of the sea in the background, holding a mirror and apparently brushing her hair (Fig. 19). The letters 'A.H.' to the right are the initials of Anthony Hall senior, who was licensee of the 'Mermaid' from c.1660 to 1675 and was mayor of Oxford in 1673-4.⁷³ His son, also Anthony Hall, was licensee from 1675-91. The second seal has the letters 'W.^M.A.' above a crown. The letters form the cipher of William and Anne Morrell, who were licensees of the 'Crown' from 1660-79. William Morrell died in 1679 and his

⁷³ E.T. Leeds, 'Oxford Tradesmen's Tokens, 355-453', in H.E. Salter (ed.), *Surveys and Tokens*, Oxford Historical Society, 75 (1923), pp. 405-7; E.T. Leeds, '17th and 18th century wine-bottles of Oxford Taverns', *Oxoniensia*, 4 (1941), pp. 46-7, pl. ix, no. 5.

widow Anne continued as licensee until 1696.⁷⁴ The Crown was located at what is now No. 3 Cornmarket and is not to be confused with the present Crown Inn at 59A Cornmarket.⁷⁵

Unstratified vessel glass includes the neck and shoulders of mid-eighteenth-century pickle or condiment jar with cracked-off rim and hand-applied string rim, and also necks and body sherds from small cylindrical pharmaceutical bottles or phials of similar date.

Illustrated Glass

Figure 19 Seal of the Mermaid tavern. Portrays a mermaid holding a mirror and combing or brushing her hair against a background of waves, together with the initials 'A.H.', probably for Anthony Hall senior, who was licensee of the Mermaid c.1660-75. From 'globe and shaft' bottle. Green glass. Context 4014, Structure 7.1, Phase 7.

FIRED CLAY ARTEFACTS by CYNTHIA POOLE

Two spindle whorls, one complete and a broken half made in fine sandy clay, were found in occupation layers 3071 and 1010 respectively. The former context was phased to the eleventh century and its spindle whorl is likely to be broadly contemporary in date. The broken whorl must be residual in layer 1010, which is phased to the eighteenth-nineteenth century. Both spindle whorls are typical of Saxon or early medieval forms, though they are notably heavier than the average weight of 20-30 g quoted by Wild⁷⁶ and are similar to disc-shaped examples from Mucking.⁷⁷ Examples of spindle whorls with concentric incised decoration have been found at Blue Boar Lane in York in features dating to the 9th century.⁷⁸ Hemispherical and disc-shaped fired clay spindle whorls were found at Barrow Hills, Radley, in the back fills of sunken-featured buildings.⁷⁹ A ceramic spindle whorl was found in previous excavations at St Aldates, but stone spindle whorls were more common including two with incised concentric

⁷⁴ Leeds, *Oxoniensia*, pp. 47–8, pl. ix, no. 9.

⁷⁵ *Ibid.*, p. 46.

⁷⁶ J.P. Wild, *Textiles in Archaeology* (1988), p. 55.

⁷⁷ H. Hamerow, *Excavations at Mucking Volume 2: The Anglo-Saxon Settlement*, English Heritage Archaeological Report, 2 (1993), p. 65.

⁷⁸ C. Spall and S. Ashby, 'Craft and Industries: textile working', in C. Spall and N. Toop (eds.), *Blue Bridge Lane and Fishergate House, York: Report on Excavations; July 2000 to July 2002* (2005).

⁷⁹ R. Chambers and E. McAdam, *Excavations at Barrow Hills, Radley, Oxfordshire, 1983-5. Volume 2: The Romano-British Cemetery and Anglo-Saxon Settlement*, Oxford Archaeology Thames Valley Landscapes Monograph, 25 (2007), pp. 254–5.

circles.⁸⁰ The ceramic spindle whorls would have been personal items and provide evidence for the primary phases of cloth production.

WORKED STONE ARTEFACTS by RUTH SHAFFREY

A small fragment of Mayen lava is almost certainly from a rotary quern but was an unstratified find (36 g). A rectilinear-sectioned whetstone demonstrating significant use across all its faces was found in Phase 3 pit fill 1063. It is made of a very fine-grained sandstone. Such finds are generally typical of medieval Oxford, representing domestic, or in the case of the whetstone, possibly light industrial activity.

METALWORK AND WORKED BONE by LEIGH ALLEN

A single metal artefact, a cylindrical lead pan (lay) weight with a slightly domed top was recovered from a Phase 1 dump layer in Area 3. The object weighs 6¼ ounces (178 g). These weights are for setting in the pans of scales rather than for suspension from the arms of a steelyard and would have been used in shops, markets and fairs to check on the weight of goods.

Phase 2 contexts produced mainly fragments of lead waste from occupation and dump layers within timber lined cellar pit 3059. A hemispherical worked bone spindle whorl fashioned from the head of a bovine femur was also recovered from this feature. Femur head spindle whorls first appear in the Iron Age and continue in use sporadically into the Norman period when they enjoyed a renewed burst of popularity.⁸¹

Phase 3 contexts produced four items of horse gear, a knife, a socketed implement, and a staple. The tips from two horseshoes and two horseshoe nails came from dump layers in Area 1. The shoe fragments both have two circular nail holes set in rectangular countersinkings and are from a form of shoe that predominated throughout the twelfth century.⁸² The horseshoe nails are of two different forms. One is a 'fiddle key' nail designed for use with the type of shoe mentioned above, while the other, with its rectangular, tapering head, is generally used on later shoes. The knife and the socketed implement came from the

⁸⁰ Durham, 'Archaeological Investigations in St Aldate's, Oxford', pp. 152–3.

⁸¹ A. MacGregor, *Bone, Antler, Ivory and Horn. The Technology of Skeletal Materials Since the Roman Period* (1985), p. 187.

⁸² J. Clarke, *Medieval Finds from Excavations in London: The Medieval Horse and its Equipment c.1150-c.1450* (1995), p. 96.

fills of cesspit 1058, in Area 1. The knife is complete and has a centrally placed whittle tang and a long, triangular blade. Knives of this simple form date from the tenth century and continued in use into the late medieval period.⁸³ The socketed implement has two prongs or arms and could be an incomplete hoe used in gardening for weeding and breaking up the soil.⁸⁴ The double-spiked U-shaped staple was recovered from the fill of pit 4113 in Area 4. It would have been used to secure chains and hasps on doors and gates and to support tethering rings and various types of handle.⁸⁵ Numerous nails (32) were recovered from this phase mainly from the fills of latrine 1058 (Structure 3.1).

The majority of the copper alloy objects came from Phase 4 contexts and include dress accessories, lock furniture, domestic items and fixtures and fittings recovered from garden soil and occupation layers in Area 4 and an additional dress accessory from a dump layer in Area 10. The dress accessories comprise a hooked tag, a moulded pin from a buckle, a solid spherical button with an integral attachment loop and a tongue-shaped strap-end with a forked spacer. Hooked tags were used to secure light clothing or hose. Buttons probably first came into common use in Britain in the early thirteenth century, when the new close fittings fashions of the day demanded a fastener at the collar and on the sleeves.⁸⁶ Composite strap-ends with forked spacers were introduced in the late thirteenth/early fourteenth century.⁸⁷

A small incomplete copper alloy key (the bit is missing) was recovered from context 4047 (an occupation layer). Only the ring bow and part of the stem survives and there is a moulding at the junction of the bow and the stem. Small keys such as this could have been used on caskets, cupboards or padlocks.

The domestic items were recovered from garden soil in Area 4 (4008) and comprise a long needle with a damaged eye and a small circular, shallow lipped dish (diameter 67 mm), which could be a pan from a 'cresset' oil lamp (Fig. 20). Lamps such as these would have been filled with oil with a wick floating in it. The pan has a small hole in the base indicating that it was probably mounted on a stand or bracket. Four lengths of chain were also recovered

⁸³ I. H. Goodall, 'Knives', in M. Biddle, *Object and Economy in Medieval Winchester*, Winchester studies 7.ii (1991), p. 838.

⁸⁴ I. H. Goodall, *Ironwork in Medieval Britain: An Archaeological Study* (2011), pp. 79–80.

⁸⁵ *Ibid.*, p. 162.

⁸⁶ G. Egan and F. Pritchard, *Medieval Finds from Excavations in London: 3. Dress Accessories c.1150-c.1450* (1991), p. 272.

⁸⁷ *Ibid.*, pp. 145–6.

from Area 4 garden soil (4001). They are made up of S-shaped links, each link measuring *c.* 12 mm in length. Chains have a variety of uses, both ornamental and practical.

Structural objects recovered from this phase include a U-shaped staple from context 1027 and a wall hook from context 4047 with a tapering shank for driving into wood or masonry joints. A small number of nails (13) were recovered from the fill of pit 4048.

The only identifiable objects recovered from Phases 5-7 are nails. In Phase 5 they come exclusively from contexts associated with decayed timbers within context 1069. In Phase 7 they are all from demolition layers and cesspit fills (4004).

A possible stylus fashioned from a goose radius with an obliquely cut end was recovered from context 1007, a trample layer in Area 1 (Fig. 21). The function of these objects is a subject of debate.⁸⁸ They could have functioned as rudimentary pens, although they lack the cleft point which would have given the necessary flexibility for writing. However, they may have been better employed for line drawing. It has also been suggested that they could have been used for holding broken quills.⁸⁹ These objects first appear in the thirteenth/fourteenth century.

LEATHER SHOE by GERALDINE CRANN

The remains of a leather boot upper and a boot lace fragment, together weighing 187 g, were recovered from the fill (101) of pit 102, uncovered in evaluation Test Pit 1 (Fig. 22). Based on the associated pottery and ceramic building material, the shoe is likely to date to the thirteenth-fourteenth century.

ANIMAL BONE by LEE G. BRODERICK

In all, 5,072 animal bone specimens were recovered from the site, mostly through hand-collection although environmental samples were taken and sieved at 10 mm, 4 mm and 2 mm fractions (Table 6). This material was assessed according to current guidelines⁹⁰, and a subset was selected for full recording on the basis of that assessment and the project research aims. The final selection of material for study targeted the Saxon layers of the site (Phases 1 and 2)

⁸⁸ MacGregor, *Bone, Antler, Ivory and Horn*, pp. 125–6.

⁸⁹ M. Henig, 'Objects of Bone, Antler and Shell', in B. Durham 'Archaeological investigations in St Aldate's, Oxford', *Oxoniensia*, 42 (1977), pp. 160–3.

⁹⁰ P. Baker and F.L. Worley, *Animal Bones and Archaeology: Guidelines for Best Practice* (2014).

as well as cesspits from Phases 3 and 7. This selected assemblage consists of 798 specimens, including 131 recovered through environmental sampling. It was recorded using a diagnostic zone system⁹¹ and the reference collection kept by OA. Material from the environmental samples that could not be identified using the diagnostic zones was not recorded, except for vertebrae and rib fragments, which were recorded as large, medium or small mammal or bird.

Phases 1 and 2: Middle-Late Saxon

The Saxon assemblage was dominated by the three principal domesticates – domestic cattle (*Bos taurus taurus*), caprine (sheep *Ovis aries* and/or goat *Capra hircus*) and pig (*Sus ferus domesticus*). Of these, domestic cattle was the most common species by NISP (Number of Identified SPecimens). No obvious bias to any particular body part was observed among these specimens, with head, limb and torso elements all being present. Butchery consisted exclusively of chopmarks; of nine specimens observed with chopmarks, eight were axial chops. Four of these specimens with axial chops were humeri and the ninth specimen was also a humerus, with an oblique chop through the proximal end and possible signs of helical fracture. Two other specimens showed signs of helical fracture as well and, taken together with the axial chops through bones it suggests that, whether due to taste or necessity, marrow fat formed a regular part of the diet of the site's inhabitants.

Cutmarks were observed on five large mammal ribs from this phase, whilst six vertebrae had been chopped through, three obliquely and three axially, suggesting that more concern was paid to meat portion size than to anatomy. Although horse (*Equus caballus*) was observed in the assemblage, it was rare, with just one specimen each in Phases 1 and 2. As such it is very probable that the large mammal specimens are also domestic cattle.

Unfortunately, the sample size was too small to offer meaningful insight into the age profile of any of the animals in the site, although it is possible to state that both young and old individuals were present.

All these statements – about sample size, ageing and butchery – could equally be written about the caprine specimens from the site, among which it was possible to identify sheep but not goat. There were more oblique chopmarks among the caprine bones (four of seven specimens) but axial chopmarks (two) and a cutmark were also present, as were helical

⁹¹ A. Cohen and D. Serjeantson, *A Manual for the Identification of Bird Bones from Archaeological Sites* (1996); D. Serjeantson, 'Animal Bone', in S. Needham and T. Spence, *Runnymede Bridge Research Excavations, Volume 2: Refuse and Disposal at Area 16 East, Runnymede* (1996), pp. 194–223.

fractures. It was also possible to identify a foetal/neonatal metacarpal, suggesting that breeding (or, at least, housing) of stock was taking place on or near the site.

Butchery marks were rarer on the pig bones but these were far more likely to be unfused epiphyseally, suggesting a mainly young population. Since pigs have little economic use other than their meat, and reach slaughter weight before being skeletally mature, this is not surprising.

Poultry (domestic fowl *Gallus gallus* and goose *Anser anser*) were present in small numbers, and although wild species are represented in the assemblage by both red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) it is far from clear that these represent food waste. The red deer specimen is a shed antler with a chop through the base of the first spine. As such, this almost certainly represents craft activity. The roe deer specimen is more equivocal in its possible interpretation, however, being a metatarsal, which could potentially have been left attached to a hide. This specimen also had an exostosis on the anterior of the midshaft. Unfortunately, it is not possible to suggest a cause of the pathology.

Phase 3: Late Eleventh – Twelfth Century

All the material analysed from Phase 3 came from a single feature – Structure 3.1 – which was a latrine conjectured to be associated with Jacob's Hall within Oxford's Jewry. Jewish laws contain specific proscriptions on the types of animals and the parts thereof that can be eaten. This is in contrast to Roman Catholic Christianity, which adopts a far more laissez-faire attitude to what food its followers consume outside fasting periods. This is of importance for the zooarchaeological investigation of the site, since the potential for differentiating between these two religious groups might be possible if their refuse disposal on the site was intensive.

Specifically, according to the ways that rabbinic law was interpreted in medieval Northern Europe, we would not expect to find any of the following in deposits associated with Jewish sites:

- Any wild animal, including birds
- Pig bones
- Horse bones
- Bones showing pathologies, particularly any which might be linked with TB or other lung diseases

- Bones from the hind-quarters of cattle

Interpreting the assemblage in this light, two factors leap out – the complete absence of any pig specimens and the dominance of domestic fowl specimens (with goose specimens also more common than those of domestic cattle). Material recovered through environmental samples suggests that this pattern may be even more dramatic than might appear from the hand-recovered assemblage. The high proportion of bird bones recovered from the site, in particular, is exceptional and demands comparison not only with other British sites, including those from Oxford, of this period but also with sites in Europe where zooarchaeological investigations into medieval Jewries have been carried out.⁹²

Lesions consistent with osteochondrosis were present on some of the domestic cattle bones, but this is a relatively benign condition which would not have caused the animal any discomfort in life and so people would be unlikely to suspect the condition.⁹³ Among the twenty-one caprine specimens recovered from this feature were five foetal or neonatal specimens recovered from context 1071. These may represent an ABG (Associated Bone Group) and include left and right, hind- and fore-limbs. Being small it is reasonable to suspect that other bones of the individual may have been missed. It is not clear how such an individual would end up in this feature were it simply stillborn and it may be that it represents a delicacy.

Eight of the domestic fowl bones were also from juvenile individuals and one adult specimen came from a male individual. It is possible that the juvenile specimens also come from males, since they would not be able to lay eggs and it is not needed to keep male and female fowl in a fifty/fifty ratio for a viable flock.

Phase 7: Mid-Seventeenth – Early Eighteenth Century

Another latrine was identified in Phase 7 (Structure 7.1) and the assemblage derived from it stands in stark contrast to that from Phase 3, both in terms of size and in terms of composition. With regards to species proportions, it is far closer to the Saxon assemblage

⁹² L. Daróczy-Szabó, 'Animal Bones as Indicators of Kosher Food Refuse from 14th Century Buda, Hungary', in S. Jones O'Day, W. Van Neer and A. Ervynck (eds), *Behaviour Behind Bones: The Zooarchaeology of Ritual, Religion, Status and Identity* (2004), pp. 252–61; S. Valenzuela-Lamas, L. Valenzuela-Suau, O. Saula, A. Colet, O. Mercadal, C. Subiranas and J. Nadal, 'Shechita and Kashrut: Identifying Jewish Populations Through Zooarchaeology and Taphonomy. Two examples from Medieval Catalonia (North-Eastern Spain)', *Quaternary International*, 330, pp. 109–17.

⁹³ L. Sewell, 'Osteochondrosis in Sheep and Cattle: Differential Diagnosis and Estimating Prevalence', unpublished, University of York (2010).

than to that other latrine and, indeed, resembles a typical British urban medieval or post-medieval assemblage, containing domestic animals, principally domestic cattle and caprines, but also domestic fowl, geese and pig. The exception to the domestic mammals is the presence of black rat (*Rattus rattus*), which would have been a pest in early modern Oxford.

Conclusions

The material recovered from the Saxon phases on the site adds to our developing understanding of this phase of Oxford's history and is consistent with other sites studied to date. Of particular interest, though, is the latrine associated with Jacob's Hall. This is the first time that a Jewish signature has been identified in British zooarchaeology, and just the third time in medieval Europe.

AVIAN EGG SHELL by REBECCA NICHOLSON

A small quantity of avian eggshell (4 g) was recovered from cesspit 1058 and pit 1225, both belonging to Phase 3. It is very likely that these are the remains of domestic fowl (chicken) eggs.

MARINE SHELL by REBECCA NICHOLSON

A total of 273 fragments of marine shell, weighing 3034 g, were recovered by hand from the excavations, with an additional 73 g of shell extracted from sieved soil sample residues. The material was rapidly scanned and appears to comprise exclusively valves of European flat oyster (*Ostrea edulis*) in variable condition and size, although lacking very large examples. Oyster shells are a common find in medieval and post-medieval assemblages, and the assemblage from St Aldates confirms that they must have been regularly eaten, although not in large amounts in the properties relating to this site. Only three fragments come from deposits provisionally phased as late Saxon (Phase 1) and ten contexts phased as early-late eleventh century (Phase 2).

FISH REMAINS by REBECCA NICHOLSON

A single clupeid (probably herring) vertebra came from the flot of sample 3007, from dump or occupation layer 3088 in Phase 1 structure 1.2. Dating to Phase 2, a single eel vertebra came from occupation layer 3071 in structure 1.2 and a large salmonid caudal vertebra, probably salmon, came from occupation layer or dumped deposit 3068 in structure 2.1.

All the fish remains from Phase 3 deposits came from Areas 1 and 10, mostly from pits containing domestic refuse and/or latrine waste. The identified remains include marine fish (herring, gadids including haddock and whiting, and plaice, flounder or dab). The herrings are likely to have been cured by salting and packing in barrels with salt or brine. It is also likely that the gadids and flatfish were preserved by salting and/or drying, but a whiting articular from dump deposit 1188 shows that fish were purchased with their heads on.

Freshwater fish are fairly common and are likely to have been caught locally in the Thames or Cherwell and eaten fresh. The remains include small pike (generally *c.*300-350 mm in total length based on visual comparison with modern specimens), small cyprinid and probable immature burbot (total length of *c.*180 mm based on comparison with a modern fish), the only freshwater gadid. Burbot are now probably extinct in British waters, but other examples of this nocturnal fish have been reported from late Saxon and medieval sites in Oxford⁹⁴ and it seems likely from the small size of the bones that they were captured locally; it has previously been suggested that burbot may have once been found in the Thames.⁹⁵ Burbot are bottom-living fish that frequent the river edge and can be caught on eel lines set overnight.⁹⁶ Eels are one of the most common fish identified in Saxon fish assemblages and in Domesday records and are likely to have been locally abundant, particularly around the mill leats.

As a fish without fins and scales, eels should have been avoided by any Jewish inhabitants (kosher fish including only those with fins and scales, following Leviticus 11:9), and so evidence of eel in pit fills 1129, 1188, 1214 and 10019 suggests that these deposits predated the Jewish occupation.

The only other context from this phase that produced fish remains was cesspit fill 1080, from Structure 3.1, and the sample from that fill included only a single herring vertebra and indeterminate fin rays. Since pig bones were also absent from the fills of this structure, it may be directly associated with the Jewish occupation and so it can perhaps be tentatively

⁹⁴ E.g. R.A. Nicholson, 'Fish Bones', in A. Norton and J. Mumford, 'Anglo-Saxon Pits and a Medieval Kitchen at The Queen's College, Oxford', *Oxoniensia*, 75 (2010), pp. 210–4.

⁹⁵ B.J. Muus and P. Dahlström, *The Freshwater Fishes of Britain and Europe* (1971), pp. 154–5.

⁹⁶ *Ibid.*; R. Philipps and M. Rix, *Freshwater Fish of Britain, Ireland and Europe* (1985), p. 118.

suggested that the Jewish occupants ate little fish. However, this supposition has to be qualified because of the small number of soil samples that were processed and, in particular, from deposits dating to the later part of the twelfth century.

Phase 4 comprised 17 bones identified from six processed soil samples, most of them from occupation layer 10013. Apart from herring, unidentified gadid and flatfish, all the remains come from freshwater fish or eel. Bones from eel were identified in contexts 10013 and 5034. A large salmonid (probably salmon) caudal vertebra from pit fill 1333 probably came from a cured fish since barrelled salmon was widely traded (Locker 2009, 50, 74-83).

Phase 5 bones were limited to a single fragment of a ling parasphenoid, comparable in size to a fish of a total length of 780 mm, from levelling deposit 1122 and a cleithrum fragment from a fairly large flatfish came from pit fill 10011. Both bones were hand recovered on site.

The most notable feature of the Phase 7 assemblage is the presence of at least three cleithra (minimum two fish) and other bones from the back of the head and posterior part of the spine of extremely large ling that were recovered by hand from cesspit fill 4067 in structure 7.1. The exclusive presence of these elements, together with cut marks to a ling post-temporal (oblique knife cut at the base of the articular facet, medial aspect and the inferior process has been chopped through) and to a ling supracleithrum (two cuts to the caudal aspect) suggests these were dried fish. A large cod supracleithrum from fill 4061 from the same latrine is also likely to come from a stored fish. When large gadids are preserved by air drying (stockfish) sometimes accompanied by salting (klippfish), most of the head elements are typically removed at the production site and only a few appendicular elements (those from the back of the head including the cleithra, post-temporals and supracleithra) and some of the vertebrae, especially those closest to the caudal fin, are left in the fish to provide support to the fillet.

The ling would have been substantial fish. Very much larger than any of the available reference material, these fish are likely to have been at least 1.4 m long (total length). Jennings *et al.* report that a fish of this length would weight about 16.5 kg.⁹⁷ Ling is found throughout the north-east Atlantic; along with other whitefish, dried ling was a significant

⁹⁷ S. Jennings, J.K. Pinnegar, N.V.C. Polunin and T.W. Boon, 'Weak Cross-Species Relationships Between Body Size and Trophic Level Belie Powerful Size-Based Trophic Structuring in Fish Communities', *Journal of Animal Ecology*, 70.6 (2001), table 3.

export from Shetland in the sixteenth and seventeenth centuries.⁹⁸ Other fish from this phase include herring, eel and perch.

Discussion

The small fish assemblage from medieval contexts includes fish acquired from both coastal and freshwater fisheries. Much of the sea-fish, and probably also the salmon, is likely to have been preserved by pickling or salting, since transporting fresh fish to Oxford rapidly enough to avoid spoiling would have been expensive. Fish was, however, readily available, since their remains regularly feature in samples from the late Saxon period onwards in the city. In the early fourteenth century, fishmongers' stalls were located in Fish Street (now St Aldates), with permanent shops grouped in a side street known as Winchelsea Row, and by 1360 fishboards had been erected against properties near the town hall. In 1360, the fishmongers' stalls in St Aldates comprised 18 stalls for 'Winchelsea fish', and others for stockfish and herrings. To what extent the inhabitants of Jacob's Hall and surrounding properties enjoyed the fish is unclear, since the recovered assemblage is small for an urban site in the city, although this may simply be a reflection of the relatively small volume of sieved soil from rubbish deposits and cesspits. Likewise, the possibility of identifying a Jewish signature by the absence of eel is intriguing, but would require a greater sample size and securely dated deposits to be conclusive.

Cured fish were widely traded throughout the medieval period. By the sixteenth century North Sea, Icelandic and Newfoundland fisheries for cod and other large gadids were at their peak and purchase of stored fish, including 'stockfisse', was a regular part of household expenditure.⁹⁹ The ling and cod bones in latrine Structure 7.1 evidence the consumption of this popular stored product, which requires soaking for several days before cooking.

PLANT REMAINS by JOHN GIORGI

⁹⁸ H. Smith, *Shetland Life and Trade 1550-1914* (1984).

⁹⁹ J. Wubs-Mrozewicz, 'Fish Stock and Barrel. Changes in the Stockfish Trade in Northern Europe c.1360-1560', in L. Sicking and D. Abreu Ferreira, *Beyond the Catch. Fisheries of the North Atlantic, the North Sea and the Baltic 900-1850* (2009), pp. 187-209; A. Locker, *The Role of Stored Fish in England 900-1750 AD: The Evidence from Historical and Archaeological Data* (2000).

Following assessment, twenty-two samples were selected for analysis; four from middle/late Saxon deposits (Phase 1), 16 from medieval contexts (Phases 2 to 4) and two from post-medieval fills (Phase 7). Variable amounts of charred plant remains were recovered from all the samples, with the bulk of this material being from the middle to late Saxon and early medieval deposits. The charred remains consisted of almost equal amounts of cereal grains (52%) and other plant/weed seeds (48%), with only traces of cereal chaff (<1%). The cereal grains were poorly preserved and many were unidentifiable with variable but sometimes large amounts of uncounted small cereal grain fragments in all the samples. There was a rich ‘waterlogged’ plant assemblage in a Phase 4 layer, while two fills of a Phase 7 stone-lined latrine contained good amounts of both mineralized and ‘waterlogged’ botanical remains. There were occasional and small numbers of uncharred seeds in most of the other samples, but it is difficult to establish whether or not these are contemporary with the sampled features; *Sambucus* (elder) seeds were the most common, these being fairly robust seeds which may survive for long periods in the soil.

Phase 1: Middle to Late Saxon

Four samples from this phase contained charred plant remains; one from the fill of a possible pit/cellar in Area 3, and three from Area 5, two from a sequence of compacted gravel floors and charcoal-rich deposits, and one from a posthole fill.

The four samples contained broadly similar charred plant assemblages consisting largely of cereal grains. The two main cereals represented in these samples were (six-row) hulled barley (*Hordeum vulgare*), particularly in layer 5027, and free-threshing wheat (*Triticum aestivum/turgidum*), the main cereal in fill 3088; a rachis fragment in layer 5027 showed the presence of hexaploid bread wheat (*Triticum aestivum*). The samples contained only a few grains of oat (*Avena*) and rye (*Secale cereale*). These grains may have become accidentally burnt while being dried before milling and/or storage or as a result of cooking accidents.

These assemblages represent virtually fully processed cereals, grains making up 96 per cent and 86 per cent of the quantified remains in the two richest assemblages from fill 3088 and layer 5027 respectively. The samples contained few chaff fragments or potential arable weed seeds, the latter including *Agrostemma githago* (corn cockle), *Fallopia convolvulus* (black bindweed) and *Bromus* (brome), all large weed seeds difficult to separate

from the grain other than by hand-sorting and often found in cereal storage deposits. An *Anthemis cotula* (stinking chamomile) seed in one sample may point to the cultivation of calcareous soils while a few *Eleocharis* (spike-rush) and *Carex* (sedge) seeds suggest that this included damper areas of ground. All four samples also contained a few charred hazelnut fragments (*Corylus avellana*), probably food waste from the collection and consumption of this wild food resource.

The two main cereals in these samples, free-threshing wheat and hulled barley, along with a little evidence for rye and oats, are the main grains found in the late Saxon period in southern England,¹⁰⁰ free-threshing wheat and hulled barley being the dominant grains from other sites of this period in Oxford, for example, in mid to late Saxon deposits close-by at 11-12 Queen Street,¹⁰¹ while other late Saxon deposits included a large assemblage of free-threshing wheat at All Saints Church¹⁰² and another of barley and wheat on the north side of Lincoln College.¹⁰³

Cereals during the Saxon period may have been used for gruel or porridge, which probably made up a significant part of the diet¹⁰⁴ although the main use of the wheat grains would have been for bread, a staple food at the time with a preference for white leavened wheat bread.¹⁰⁵ Other uses of barley were for ale – although there were no germinated grains to suggest such a use – and animal fodder.

Phases 2 to 4: Eleventh to Fourteenth Century

There is a similar range of cereals in all three medieval phases (eleventh to fourteenth-century) of the site with free-threshing (including bread) wheat (*Triticum aestivum*) and hulled barley (*Hordeum vulgare*) being the main grains together with smaller amounts of oats (*Avena*) and traces of rye (*Secale cereale*), similar to the results from the middle to late Saxon phase. This is the usual range of cereals for the medieval period in southern Britain¹⁰⁶ with similar dated (eleventh to thirteenth century) finds from other medieval sites in Oxford, free-

¹⁰⁰ J. Greig, 'The British Isles', in W. van Zeist, K. Wasylikowa and K.-E. Behre (eds), *Progress in Old World Palaeoethnobotany* (1991), p. 315.

¹⁰¹ M. Robinson, 'Waterlogged Plant and Invertebrate Evidence', in C. Halpin (ed.), 'Late Saxon Evidence and Excavation of Hinkey Hall, Queen Street, Oxford', *Oxoniensia*, 48 (1980), p. 69.

¹⁰² M. Robinson, 'Environmental Evidence from All Saints Church', in Dodd, *Oxford before the University*, p. 389.

¹⁰³ Z. Kamash, D.R.P. Wilkinson, B.M. Ford and J. Hiller, 'Late Saxon and Medieval Occupation: Evidence from Excavations at Lincoln College, Oxford, 1997-2000', *Oxoniensia*, 67 (2002), pp. 199–286

¹⁰⁴ A. Hagen, *A Handbook of Anglo-Saxon Food. Processing and Consumption* (1994), p. 60.

¹⁰⁵ *Ibid.*, p. 125.

¹⁰⁶ Greig, *Progress in Old World Palaeoethnobotany*, p. 321.

threshing (including bread) wheat often being the main cereal; for example, from Corpus Christi College,¹⁰⁷ Jesus College (along with hulled barley),¹⁰⁸ the Nun's Garden, Queens College¹⁰⁹ and Merton College.¹¹⁰ Closer to the site, free-threshing (including bread) wheat, hulled barley and oats were the main grains in eleventh to thirteenth century deposits from excavations at Queen Street.¹¹¹ The only other evidence for arable crops in the medieval samples were a few possible peas (cf. *Pisum sativum*) and perhaps some of the larger legume fragments which may be from cultivated pulses.

Wheat made the best and therefore most sought after and expensive bread in the medieval period,¹¹² particularly wheat bread using the finest and well sieved flour to remove as much bran as possible; the very fragmented cereal bran in Phase 4 occupation layer 10013 also suggests well-sieved flour. Barley was used for bread and ale, but there was no evidence except a few loose cereal coleoptiles to suggest brewing activities on site. All the cereals may have added to pottage,¹¹³ while barley and oats were used as fodder.

Historical records from around 1300 suggest that the catchment area for cereal production and supply to the Oxford extended to a radius of no more than twelve miles,¹¹⁴ with the virtually clean grain assemblages in the samples suggesting that they were being imported into the city as processed cereals.

There are similar weed seed assemblages in the different medieval phases of the site with a number of weeds, including stinking chamomile (*Anthemis cotula*) and corn gromwell (*Lithospermum arvense*) and thorow-wax (*Bupleurum rotundifolium*), suggesting the cultivation of calcareous loams. A similar range of weeds has been found on other medieval sites in Oxford including the Nun's Garden, Queen's College¹¹⁵ and Queen Street.¹¹⁶ Several other species, however, for example corn cockle (*Agrostemma githago*) and knotgrass

¹⁰⁷ Smith, *Oxoniensia*, 79, p. 207.

¹⁰⁸ W. Smith, 'Charred and Mineralised Plant Remains', in R. Bashford, 'Eleventh-century, later medieval and early post-medieval evidence from investigations at Jesus College and Market Street, Oxford', *Oxoniensia*, (forthcoming).

¹⁰⁹ J. Giorgi, 'Plant Remains', in S Teague, A. Norton and A. Dodd, 'Late Saxon, Medieval and Post-Medieval Archaeology at the Nun's Garden, The Queen's College, Oxford', *Oxoniensia*, 80 (2015), pp. 179–185.

¹¹⁰ Giorgi, 'Merton College'.

¹¹¹ J. Giorgi, 'The Plant Remains from Queen Street, St Ebbes, Oxford (OXCMS97)', unpublished Oxford Archaeological Unit archive report (1999).

¹¹² P.W. Hammond, *Food and Feast in Medieval England* (1995), p. 2.

¹¹³ C.A. Wilson, *Food and Drink in Britain* (1991), p. 199.

¹¹⁴ B.M.S. Campbell, J.A. Galloway, D. Keene, M. Murphy, *A Medieval Capital and its Grain Supply. Agrarian Production and Distribution in the London Region c.1300*, Historical Geography Research Series, 30 (1993), p. 173.

¹¹⁵ Giorgi, *Oxoniensia*, 80, pp. 179-185.

¹¹⁶ Giorgi, 'The Plant Remains from Queen Street, St Ebbes, Oxford (OXCMS97)'.

(*Polygonum aviculare*), may tentatively suggest that sandy loams were also used for growing crops, while sedge (*Carex*) and *Eleocharis* seeds in the medieval grain assemblages suggest that areas of cultivation may have included damper areas of ground probably closer to the river.

There is tentative evidence from the weed seeds for both the spring-sowing of cereals, for example black bindweed (*Fallopia convolvulus*), and autumn-sowing, for instance thorn-wax and cleaver (*Galium aparin*). Of the two main cereals in the samples, bread wheat would have usually been winter-sown, while barley may have been sown in both winter and spring.¹¹⁷ The presence of relatively short weeds, including stinking chamomile and thorn-wax, suggests that the cereals were reaped fairly low on the straw.

'Waterlogged' plant assemblage from layer 10013 (Phase 4)

This layer produced plant assemblage dominated by large amounts of fruit remains. Large numbers of *Prunus* fruit stones included plum/bullace-type, probably *P. domestica* spp. *insititia* (bullace/damson/greengage) on the basis of the size and morphology of the better preserved stones. Both cultivated and wild plum stones, however, were identified in a thirteenth-century pit fill from Merton College.¹¹⁸ There were also fruit stones of *Prunus spinosa* (sloe/blackthorn), cherry and possibly *Prunus cerasus* (sour/dwarf/Morello cherry). Other fruits were represented by large numbers of grape (*Vitis vinifera*), fig (*Ficus carica* L.), wild strawberry and *Rubus glandulosus* (blackberry) seeds, smaller numbers of apple (*Malus*) and pear/apple (*Pyrus/Malus*) seeds and occasional records for *Morus nigra* (mulberry) and *Sorbus* fruits including possibly rowan (cf. *Sorbus aucuparia*). There was also a small amount of fragmented hazelnut shell in this sample.

The fruits represented in this layer have been found on other medieval sites in Oxford, for example in eleventh to thirteenth-century deposits from Merton College.¹¹⁹ Grapes and figs may have been imported as dried fruits, while grapes may have also been locally grown at this time during the early medieval warm period (AD 950-1250). Some of these fruits may have been cultivated in kitchen gardens and in orchards while the wild fruits and nuts

¹¹⁷ L. Moffet, 'The Archaeology of Medieval Plant Foods', in C.M. Woolgar, D. Serjeanston and T. Waldron (eds), *Food in Medieval England. Diet and Nutrition* (2006), p.48.

¹¹⁸ R. Pelling, 'Charred and Waterlogged Plant Remains', in D. Poore, D. Score and A. Dodd, 'Excavations at No. 4A Merton St., Merton College, Oxford: The Evolution of a Medieval Stone House and Tenement and an Early College Property', *Oxoniensia*, 71 (2006), p. 335.

¹¹⁹ Pelling, 'Charred and Waterlogged Plant Remains', pp. 326 and 335.

(blackberry, hazelnuts, sloe/blackthorn, possible rowan and dog rose) may have been gathered from hedgerows and woodlands outside the town.

Other food plants included evidence for culinary herbs, represented by a few finds of coriander (*Coriandrum sativum*), fennel (*Foeniculum vulgare*) and possibly some of the mineralized Apiaceae seeds in this sample. Coriander and fennel were both common flavourings at the time according to the archaeobotanical evidence.¹²⁰ There were also large amounts of fragmented cereal bran, some of which was identified as wheat and/or rye, both cereals also being represented by small numbers of charred grains in this sample. These fine bran fragments (mainly smaller than 1 mm) may indicate finely milled or well-sieved wholemeal flour. There were also large amounts of very fragmented corn cockle seed in the sample, such fragments frequently found together with cereal bran because these large weed seeds were difficult to remove other than by hand-sorting and therefore were often milled together with the grain.

Occasional hemp (*Cannabis sativa*) seeds were also identified in this sample. This plant was mainly grown for its fibres, although the oil from the seeds may have been used for cooking and lighting and as animal feed.¹²¹ Cannabis was also identified in a thirteenth-century pit fill from Merton College.¹²² The *Brassica/Sinapis* (cabbages, turnips, mustards) seeds in this layer may also be food remains.

The sample also contained evidence for a small range of potential cereal weeds, by-products from the final stages of crop-cleaning, together with evidence for the residues of hay fodder represented by *Ranunculus acris/repens/bulbosus*, *Leontodon* (hawkbit), *Prunella vulgaris* and good number of *Carex* seeds. The sedges may also be from flooring materials, possibly collected from the margins of the river along with several other wetland plants, *Eleocharis* and *Oenanthe* (water dropwort) identified in the sample and possibly incidentally collected at the same time. Indeterminate stem fragments may also be from flooring materials. Seed remains of *Rosa canina* (dog-rose) and *Cornus sanguinea* (dogwood) along with the *Rubus* (brambles) seeds may be evidence for hedgerows close-by.

The botanical remains in this sample represent general food waste as well as probably faecal remains given the presence cereal bran, small-seeded fruits and large amounts of fly

¹²⁰ J. Greig, 'Archaeobotanical and Historical Records Compared – a New Look at the Taphonomy of Edible and other Useful Plants from the 11th to the 18th centuries AD', *Circea: The Journal of the Association for Environmental Archaeology*, 12 (2) (1996 for 1995), p. 217.

¹²¹ J. Greig, 'Plant Resources', in G. Astill and A. Grant (eds), *The Countryside of Medieval England* (1988), p. 122

¹²² Pelling, 'Charred and Waterlogged Plant Remains', p. 335.

puparia. There is also evidence for the residues of hay and flooring (including possibly stabling) materials.

The plant remains from this layer provide a partial insight into the diet of the inhabitants in this area at the time although it is not possible to establish whether this deposit is associated with Jewish or post-Jewish occupation of the site because the context was dated to the thirteenth to fourteenth-century therefore covering the period prior to and post-dating the expulsion of the Jews from the city. In any event, it is not possible to distinguish a Jewish diet on the basis of the plant remains alone; suffice to say, however, that the range of foodstuffs represented in this sample suggest a high-status diet.

Phase 7: Mid-Seventeenth to Early Eighteenth Century

Two samples from the fills of a stone-lined latrine (4073) produced rich and similar botanical assemblages. Both contained a few charred grains, including wheat and oat, but the bulk of the plant remains consisted of ‘waterlogged’ and mineralized fruit remains, including large numbers of fig, blackberry and raspberry (*Rubus idaeus*) seeds, smaller numbers of grape pips and occasional wild strawberry, elder and apple (*Malus domestica*) seeds. There were also a few plum/bullace fruit stones in fill 4014 and a charred hazelnut shell fragment in fill (4061). These remains, particularly the small fruit seeds, may be indicative of faecal waste, which is also suggested by large amounts of mineralized concretions and mineralized fly puparia in both fill samples.

Other post-medieval deposits from sites in Oxford have produced similar ranges of fruit; for example, in sixteenth to eighteenth-century fills from two stone-lined cesspits at Corpus Christi College¹²³ and in the fills of an eighteenth-century well at Merton College.¹²⁴

There was also a good number of *Carex* seeds in both samples, which may be the residues of discarded flooring materials dumped in the pit to dampen down the smells; the presence of several wetland plants in the samples, including *Ranunculus sceleratus* (celery-leaved crowfoot), *Alisma* (water plantain), *Juncus* (rush) and *Eleocharis*, may suggest that the sedges were collected from the river bank; mineralized ribbed stem fragments in both samples may be from flooring/stabling materials.

¹²³ Smith, *Oxoniensia*, 79, p. 207.

¹²⁴ Giorgi, ‘The Plant Remains from Merton College Lift Pit (OXMEGH16)’.

INSECTS by ENID ALLISON

One sub-sample from a waterlogged occupation deposit (10013) assigned to the thirteenth to fourteenth century (Phase 4) was submitted for examination of insect remains. The proportions of various ecological groups of insects in the assemblage are shown in Table 7, and a full list of insects and other invertebrates in Table 8.

The deposit had clearly contained a significant amount of cess. The most numerous insect remains were fly (Diptera) puparia, the dominant species being *Thoracochaeta zosteræ*, which is particularly characteristic of medieval cess deposits, even though its natural habitat appears to be in wet decaying seaweed.¹²⁵ The species appears to be indicative of cesspits containing foul matter graduating from saturated to damp through to drier conditions.¹²⁶ Spiracles of rat-tailed maggots (the larvae of a hoverfly (Syrphidae), probably *Eristalis tenax*) were common, these being characteristic of foul standing liquids.

Beetles were well-represented (a minimum of 214 individuals of 47 taxa, a concentration of >100 individuals per litre), and a large proportion (75 per cent) were synanthropes. The rove beetle *Creophilus maxillosus* is a predator typically found in carrion but it would probably also exploit other habitats rich in fly larvae.¹²⁷ Several *Bruchus rufimanus* are likely to have arrived directly in faeces, adding to evidence for diet. The larvae develop within medium and large legume seeds, especially in field beans¹²⁸ and they were frequently consumed within infested pulses. The beetles survive passage through the gut well, and in archaeological contexts the presence of their remains is generally characteristic of faeces. No pulses were noted among the plant remains from this sample, but this is not unusual in waterlogged deposits since legume seeds that are neither charred nor mineralised do not preserve well.¹²⁹

¹²⁵ R. D. Belshaw, R D, 'A Note on the Recovery of *Thoracochaeta zosteræ* (Haliday) (Diptera: Sphaeroceridae) from Archaeological Deposits', *Circaea*, 6(1) (1989), pp. 39–41; S.C. Webb, R.E.M. Hedges and M. Robinson, 'The seaweed fly *Thoracochaeta zosteræ* (Hal.) (Diptera: Sphaeroceridae) in Inland Archaeological Contexts: $\delta^{13}C$ and $\delta^{15}N$ Solves the Puzzle', *Journal of Archaeological Science*, 25 (1998) pp. 1253–7.

¹²⁶ D.N. Smith, 'Defining an Indicator Package to Allow Identification of 'Cesspits' in the Archaeological Record', *Journal of Archaeological Science*, 40 (2013), pp. 526–43.

¹²⁷ D.A. Lott and R. Anderson, 'The Staphylinidae (Rove Beetles) of Britain and Ireland Parts 7 & 8: Oxyporinae, Steninae, Euaesthetinae, Pseudopsinae, Paederinae, Staphylininae', *Handbooks for the Identification of British Insects*, 12, Part 7 (2011), p. 252.

¹²⁸ A. Hoffman, 'Coléoptères Bruchides et Anthribides', *Faune de France*, 44 (1945), p. 43.

¹²⁹ E.P. Allison and A.R. Hall, 'The Plant and Invertebrate Remains', in M. Hicks and A. Hicks, *St Gregory's Priory, Northgate, Canterbury: Excavations 1988-89*, The Archaeology of Canterbury, New Series Volume II (2001), pp. 334–338; W. Carruthers and E. Allison, 'Plant and Insect Remains from Medieval Features at 70

Almost half of the beetles (47 per cent) consisted of taxa that are characteristic of litter from ancient houses or other buildings.¹³⁰ Such material appears to have been used in many cess-containing features, perhaps to reduce odours. It is also possible that some taxa within this group lived in the drier parts of cess deposits or in associated structures. The group was dominated by *Epauloecus unicolor* (formerly *Tipnus unicolor*), found in damp mouldy debris,¹³¹ on its own accounting for a fifth of the whole beetle assemblage. Archaeological evidence suggests that this spider beetle is particularly characteristic of long-lived high-quality buildings, with the proportion increasing with general cleanliness.¹³² Other members of the building fauna included *Ptinus ?fur*, *Tenebrio obscurus*, *Blaps*, *Xylodromus concinnus*, *Latridius minutus* group, *Cryptophagus* spp., *Atomaria* spp., *Aglenus brunneus* and *Mycetaea subterranea*. Modern records of *Mycetaea subterranea* are mainly from decaying straw and wood in dry cellars, barns and stables and in association with the dry rot fungus *Merulius lacrymans*.¹³³ Woodworm (*Anobium punctatum*) and death watch (*Xestobium rufovillosum*) beetles were probably also associated with the building fauna. Death watch beetle primarily infests oak timbers that have been subject to microbial attack following exposure to damp.

Distinguishing the types of buildings that litter might have come from is often not possible, since from a beetle's point of view human dwellings with floors strewn with cut vegetation or other organic litter, would have included many of the same habitats as stables. Here, ectoparasites provided a hint that at least some of the litter was from human habitation; human louse (*Pediculus humanus*) can exist only in close proximity to man, although human flea (*Pulex irritans*), while primarily associated with human dwellings, can sometimes be found in buildings occupied by domestic animals.¹³⁴

Stour Street, Canterbury, Kent (Site Code SSC(70).EX13)', Canterbury Archaeological Trust Report 2015/79 (2015).

¹³⁰ A.R. Hall and H.K. Kenward, 'Environmental Evidence from the Colonia: General Accident and Rougier Street', *Archaeology of York*, 14 (6) (1990), pp. 289–434; H.K. Kenward and A.R. Hall, 'Biological Evidence from 16-22 Coppergate', *The Archaeology of York*, 14 (7) (1995), pp. 435–797; J. Carrott and H. Kenward, 'Species Associations among Insect Remains from Urban Archaeological Deposits and their Significance in Reconstructing the Past Human Environment', *Journal of Archaeological Science*, 28 (2001), pp. 887–905.

¹³¹ A.F. O'Farrell and P.M. Butler, 'Insects and Mites Associated with the Storage and Manufacture of Foodstuffs in Northern Ireland', *Economic Proceedings of the Royal Dublin Society*, 3 (1948), pp. 343–407.

¹³² H. Kenward, *Invertebrates in Archaeology in the North of England, Northern Regional Review of Environmental Archaeology*, Research Department Report Series 12-2009 (2009), p. 309.

¹³³ H.E. Hinton, 'The Ptinidae of Economic Importance', *Bulletin of Entomological Research*, 31 (1941), pp. 331–81; T. Palm, 'Die Holz- und Rinden-Käfer der süd- und mittelschwedischen Laubbäume', *Opuscula Entomologica Supplementum*, 16 (1959).

¹³⁴ F.G.A.M. Smit, *Siphonaptera, Handbooks for the Identification of British Insects*, 1 (16) (1957); R.S. George, in P. Harding (ed.), *Atlas of the Fleas (Siphonaptera) of Britain and Ireland* (2008), p. 14.

Stable waste can often be identified if several characteristic groups of insects are present, namely a fauna from within buildings, grain pests, insects either collected with hay or exploiting it in storage, and decomposers living in foul, open-textured nutrient-rich material.¹³⁵ Two species of grain pests were recorded (*Sitophilus granarius*, *Oryzaephilus surinamensis*; 4 per cent of the assemblage) and the numbers are probably not high enough to indicate the dumping of spoiled cereals. In deposits interpreted as dumps of spoiled grain, the pest species often make up over 50 per cent of the insect fauna.¹³⁶ While an origin in human faeces is possible, is probably unlikely in this case since the cereal bran is indicative of finely milled flour and the beetles are largely represented by complete undamaged sclerites. It may therefore be more likely that the grain pests arrived with stable litter or straw containing a residue of grain. The saw-toothed grain beetle (*O. surinamensis*) is particularly found in damp, mouldy cereals, and poor-quality grain is more likely to have been used for animal feed rather than for human consumption. The plant remains have provided convincing evidence for the presence of a residue from hay in this deposit, and the beetles *Typhaea stercorea* and *Omonadus floralis* or *formicarius* are suggestive of mouldering hay. *Sitona* and an ?apionid weevil, the only two plant-feeding taxa in the assemblage, are both common in grassland habitats and are often found with other insects where hay is suggested.¹³⁷ Decomposers associated with foul matter, typically dung, were very poorly represented, however (a single specimen of *Platystethus arenarius*; <1 per cent of the assemblage), but it is possible that this might simply reflect the rapid and regular clearance of manure from stables, perhaps on a daily basis, leaving insufficient time for substantial populations of foul decomposers to develop.

There was little unequivocal evidence for an outdoor component in the beetle assemblage (that is, taxa not usually found within buildings or in accumulations of decomposing organic material), although *Lesteva longolytrata* and Dryops may suggest damp ground and wet muddy conditions. The general lack of outdoor taxa suggests that the material making up the deposit had accumulated under closed conditions.

ACKNOWLEDGEMENTS

¹³⁵ H. Kenward and A. Hall, 'Enhancing Bioarchaeological Interpretation Using Indicator Groups: Stable Manure as a Paradigm', *Journal of Archaeological Science*, 24 (1997), pp. 663–73.

¹³⁶ D. Smith and H. Kenward, H, "Well, Sextus, What Can We Do With This?" The Disposal and Use of Insect-Infested Grain in Roman Britain', *Environmental Archaeology*, 17 (2) (2012), pp. 141–50.

¹³⁷ Kenward, *Invertebrates in Archaeology*, p. 289.

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Area	Method	Notes
Area 1	Full excavation to natural	Crane base
Area 3	Full excavation to natural	
Area 4	Plan of exposed archaeological horizon only. Limited excavation along the southern edge of the slab. Watching brief	Removal of existing basement slab
Area 5	Machine assisted excavation to natural	
Area 7	Limited machine-assisted excavation to formation level. Watching brief	Pile cap/groundbeam
Area 8	Limited machine-assisted excavation to formation level. Watching brief	Pile cap/groundbeam
Area 9	Limited machine-assisted excavation to formation level. Watching brief	Pile cap/groundbeam
Area 10	Full excavation to natural	
Area 11	Machine excavation to latest archaeological levels only	
Area 13	Limited machine-assisted excavation to formation level. Watching brief	Service run
Area 14	Limited machine-assisted excavation to formation level	Service run

Table 1: Excavation areas and methods of excavation

Phase	Defining wares	Date	No Sherds	Wt. (g)	Mean Sherd Wt	EVE
RB	All Roman	1 st – 4 th C	2	39	19.5g	0
MSAX	OXB	E8 th – 9 th C	31	741	23.9g	0.14
LSAX	OXBS, OXR, OXZ	10 th -early 11 th C	8	60	7.5g	0
SN	OXAC, OXBF	E - L 11 th C	80	1844	23.1g	1.08
M1	OXY	L 11 th – 12 th C	837	12924	15.4g	9.64
M2	OXAM	13 th – 14 th C	823	15415	18.7g	8.9
M3	OXBX, OXBN	E-L 15 th C	24	851	35.5g	1.24
M4	OXCL, RAER	L15 th – M 16 th C	45	1760	39.9g	3.16
PM1	PMR, FREC, BORDY, BORDG	M-L 16 th C	35	1502	42.9g	0
PM2	TGW, WEST, PMBL	E-M 17 th C	31	1659	53.5g	0
PM3	TGW*	M-L 17 th C	0	0	0	0
PM4	LONS	L17 th – E18 th C	7	500	71.4g	0
PM5	DERBS, MLOJ, SWSG	18 th C	13	270	20.7g	0
MOD	WHEW	19 th C	92	1202	13.1g	0
		Total	2028	38767		

Table 2: Ceramic phase chronology, occurrence and defining wares

Fabric	MSAX	LSAX	SN	M1	M2	M3	M4	PM1	PM2	PM4	PM5	MOD
OXB	100%	0	55.7%	3.4%	0.9%	0	0	0	0	0	0	2.3%
OXR	-	90.0%	5.4%	2.0%	1.0%	1.3%	0	0	0	0	0	0
OXZ	-	0	0.5%	0.2%	0.1%	0	0	0	0	0	0	0.4%
OXBS	-	10.0%	8.4%	0.2%	0	0	0	0	0	0	0	0
OXAC	-	-	22.4%	22.9%	8.3%	11.2%	0	4.5%	0.4%	0	0	1.4%
OXBF	-	-	2.6%	1.1%	2.2%	0	0	17.3%	0	0	0	0
OXY	-	-	-	67.1%	52.0%	18.7%	6.8%	0.9%	0.9%	8.0%	0	7.1%
OXAW	-	-	-	-	15.5%	0	0	0	0	0	0	0
OXAM	-	-	-	-	17.9%	37.4%	5.9%	1.5%	0	10.8%	0.4%	29.7%
OXBX	-	-	-	-	-	31.1%	29.4%	4.4%	1.7%	0	0	5.8%
OXCL	-	-	-	-	-	-	1.6%	2.4%	1.2%	0	0	0
RAER	-	-	-	-	-	-	56.3%	0	0	0	0	0
PMR	-	-	-	-	-	-	-	58.2%	20.8%	80.6%	0	19.1%
FREC	-	-	-	-	-	-	-	7.0%	25.0%	0	0	2.7%
BORDY	-	-	-	-	-	-	-	3.5%	43.8%	0	0	0
BORDG	-	-	-	-	-	-	-	0	2.6%	0	0	0
TGW	-	-	-	-	-	-	-	-	0.8%	0	0	0.7%
PMBL	-	-	-	-	-	-	-	-	0.8%	0	0	0
LONS	-	-	-	-	-	-	-	-	-	0.6%	0	9.6%
DERBS	-	-	-	-	-	-	-	-	-	-	6.3%	0
MLOJ	-	-	-	-	-	-	-	-	-	-	91.1%	0
WHEW	-	-	-	-	-	-	-	-	-	-	-	18.2%
Total	741	60	1844	12924	15415	851	1757	1502	1659	500	270	1202

Table 3: Pottery occurrence per ceramic phase by fabric type, expressed as a percentage of the total weight (g) per phase, major fabrics only. Shaded cells = residual material

Vessel	MSAX	LSAX	SN	M1	M2	M3	M4
Jar	100%	0	85.2%	83.1%	62.8%	15.3%	1.9%
Bowl	0	0	14.8%	3.4%	5.3%	84.7%	0
Jug	0	0	0	3.9%	30.6%	0	31.6%
Lamp	0	0	0	1.1%	0	0	0
Crucible	0	0	0	8.4%	1.3%	0	0
Lid	0	0	0	0	0	0	6.6%
Cup/mug	0	0	0	0	0	0	59.8%
Total EVE	0.14	0	1.08	9.64	8.90	1.24	3.16
Dripping Dish*	0	0	0	0	0	0	1

Table 4: Vessel occurrence per ceramic phase by EVE, expressed as a percentage of the total per phase

Context	Id	Length mm	Width mm	Thickness mm	Fabric	Comments
1046	40	>210	190	14-20	VIIB	Type 1
1079	65	>160	197	14-20	VIIB	Lower half; olive green glaze
1079	76	280	>140 [est. c.155]	15	VIIBB	Type 2; dark brown-olive glaze. RH peg hole blind.
1090	107	>205	206	18	VIIBB	Lower half; amber glaze
1090	108	>195	214	17	VIIBB	Lower half
1090	109	290	198	15	VIIA/B	Type 2
1090	110	300	202	15	VIIB	Type 2; amber glaze
1101	120	c 342	>100	18	VIIB	Type 2; olive green glaze
1135	139	>205	220 (base)-210 (middle)	16	VIIBB/IIIB	Lower half; olive green-brown glaze. Tapered form.
1135	140	>255 [est c.325]	210 (top) - 220 (middle)	20	VIIBB	Type 2; amber glaze. Tapered form.
1135	141	>95mm	212-215mm	17	VIIB	Lower half; weathered glaze remnants
11004	315	>105	172	17	IIIB	Type 2

Table 5: Peg tiles with complete or near complete width and / or length. Incomplete dimensions are preceded by >

	1	2	3	7	2 (sieved)	3 (sieved)	7 (sieved)
domestic cattle	26	72	12	11		1	2
domestic cattle?	2	3	1	1			
caprine	20	41	21	18	6	1	2
caprine?		1	1	1			
sheep	2	7	2	3			
pig	12	29		3			1
pig?	2	2					
horse	1	1					
cat			1		1		
red deer		1					
roe deer		1					
small rodent					1		
black rat							2
small mammal			4			2	
medium mammal	14		43	4	5	18	
large mammal	39	102	34	15	5	1	
Total Mammal	118	260	119	56	18	23	7
bird			3		1	39	
greylag/domestic goose		1	12	1		2	1
domestic duck/mallard						1	1
domestic fowl	1		43	2	1	34	
domestic fowl?		3					
domestic fowl/pheasant		1					
woodcock						2	
Total Bird	1	5	58	3	2	78	2
frog/toad			1		1		
Total Amphibian	0	0	1	0	1	0	0
Total NISP	119	265	178	59	21	101	9
Total NSP	128	283	192	64	21	101	9

Table 6: NISP (Number of Identified SPecimens) and NSP (Number of SPecimens) figures for the hand collected and sieved components of the assemblage.

Total individual adult beetles	214
% Dry decomposers [rd]	41%
% Foul decomposers [rf]	<1%
% Eurytopic decomposers [rt]	32%
% Total decomposers [rd+rf+rt]	73%
% Aquatics [w]	0%
% Damp ground taxa [d]	1%
% Plant-associated taxa [p]	1%
% Outdoor taxa [oa]	2%
% Grain pests [g]	4%
% Wood/timber taxa [l]	3%
% House/building fauna [h]	47%
% Strong synanthropes [ss]	38%
% Typical synanthropes [st]	15%
% Facultative synanthropes [sf]	21%
% Total synanthropes [ss+st+sf]	75%

Table 7: Proportions of beetles from different ecological groups (ecological codes shown in square brackets are explained in Table 2)

Context	10013
Sample	10000
Sub-sample volume	2L
INSECTA	
PHTHIRAPTERA (lice)	
<i>Pediculus humanus</i> Linnaeus	+
COLEOPTERA (beetles)	
Hydrophilidae	
<i>Cercyon</i> sp. (decomposer group) [rt]	1
Histeridae (clown beetles)	
Histerinae sp. [rt]	3
Histeridae sp. [u]	1
Staphylinidae (rove beetles)	
<i>Phyllodrepa floralis</i> (Paykull) [rt-sf]	7
<i>Omalius ?allardii</i> Fairmaire & Brisout de Barneville [rt-sf]	30
<i>Xylodromus concinnus</i> (Marsham) [rt-st-h]	4
<i>Lesteva longoelytrata</i> (Goeze) [oa-d]	1
Aleochariinae spp. [u]	15
<i>Platystethus arenarius</i> (Geoffroy in Fourcroy) [rf]	1
<i>Anotylus complanatus</i> (Erichson) [rt-sf]	1
<i>Anotylus rugosus</i> (Fabricius) [rt]	1
<i>Oxytelus sculptus</i> Gravenhorst [rt-st]	1
<i>Gyrophypnus</i> sp. [rt]	1
<i>Creophilus maxillosus</i> (Linnaeus) [rt]	1
<i>Bisnius</i> or <i>Philonthus</i> spp. [u]	16
Staphylininae spp. indet. [u]	2
Dryopidae (long-toed water beetles)	
<i>Dryops</i> sp. [oa-d]	1
Dermestidae (larder beetles)	
?Dermestidae sp. [rt-sf]	1
Ptinidae (spider and woodworm beetles)	
<i>Epauloecus unicolor</i> (Piller and Mitterpacher) [rd-ss-h]	42
<i>Ptinus?fur</i> (Linnaeus) [rd-st-h]	4
<i>Xestobium rufovillosum</i> (De Geer) [l-sf-h]	1
<i>Anobium punctatum</i> (De Geer) [l-sf]	5
Monotomidae	
<i>Monotoma</i> sp. indet. [rt-st]	1
Silvanidae	
<i>Oryzaephilus surinamensis</i> (Linnaeus) [g-ss]	6
Cryptophagidae (silken fungus beetles)	
<i>Cryptophagus scutellatus</i> Newman [rd-st-h]	2
<i>Cryptophagus</i> sp. [rd-st-h]	7
<i>Atomaria</i> spp. [rd-st-h]	4
Endomychidae (handsome fungus beetles)	
<i>Mycetaea subterranea</i> (Fabricius) [rd-ss-h]	18
Latridiidae (minute brown scavenger beetles)	
<i>Latridius minutus</i> group [rd-st-h]	6
<i>Dienerella</i> sp. [rd-sf]	3

Corticariinae spp. [rt]	4
Mycetophagidae (hairy fungus beetles)	
<i>Typhaea stercorea</i> (Linnaeus) [rd-ss-h]	1
Tenebrionidae (darkling beetles)	
<i>Tenebrio obscurus</i> Fabricius [rt-ss-h]	1
<i>Blaps</i> sp. [rt-ss-h]	1
Salpingidae	
<i>Aglenus brunneus</i> (Gyllenhal) [rt-ss-h]	10
Anthicidae (ant-like flower beetles)	
<i>Omonadus floralis</i> or <i>formicarius</i> (Goeze) [rt-st]	1
Chrysomelidae (seed and leaf beetles)	
<i>Bruchus ?rufimanus</i> Boheman [st]	4
Apionidae	
?Apionidae sp. [oa-p]	1
Dryophthoridae	
<i>Sitophilus granarius</i> (Linnaeus) [g-ss]	3
Curculionidae (weevils)	
<i>Sitona</i> sp. [oa-p]	1
DIPTERA (flies)	
Syrphidae sp., probably <i>Eristalis tenax</i> , larval spiracular processes	+++
Diptera spp. fragments	+++
Diptera spp. puparia	++++
HYMENOPTERA (bees, wasps and ants)	
Formicidae spp.	+
Hymenoptera Parasitica spp.	+
SIPHONAPTERA (fleas)	
<i>Pulex irritans</i> Linnaeus	+
Siphonaptera sp. indet. leg segments	+
Insecta spp. indet. larval fragments	+++
ARACHNIDA	
Acarina spp. (mites)	++++
Pseudoscorpiones sp. (pseudoscorpions)	+
TOTAL ADULT BEETLE INDIVIDUALS	214

Table 8: Insects and other invertebrates recorded from the samples (ecological codes shown in square brackets are: d - damp ground/waterside, g - grain pests, h - house/building, l - wood/timber, oa - outdoor taxa not usually found within buildings or in accumulations of decomposing matter, p- plant-associated, rd - dry decomposers, rf - foul decomposers, rt - eurytopic decomposers, sf - facultative synanthropes, ss - strong synanthropes, st - typical synanthropes, u - uncoded. Abundance of taxa other than beetles and bugs has been recorded on a four-point scale as follows: occasional +, moderately frequent ++, frequent +++, abundant +++++.)



Figure 1: Site location

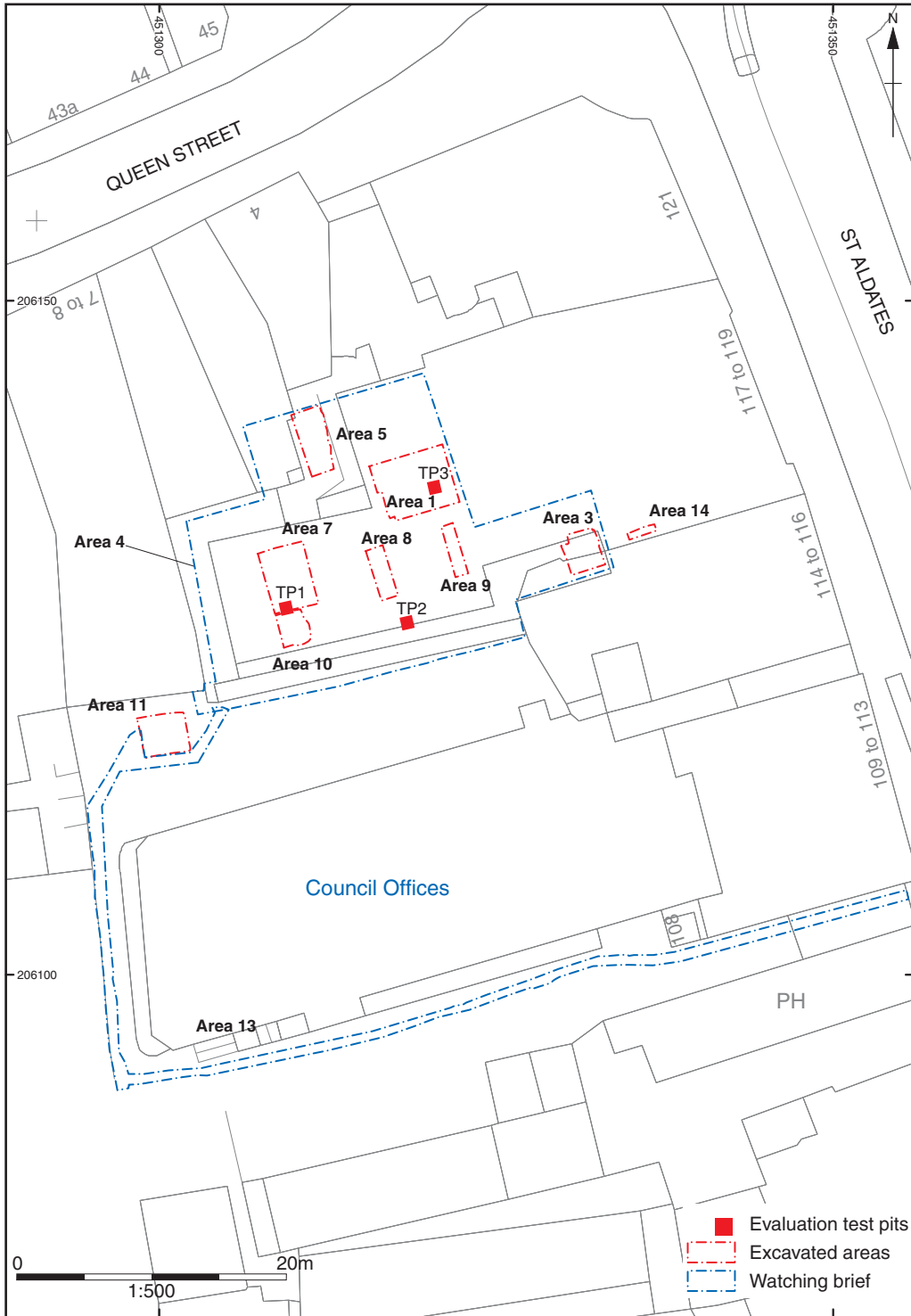


Figure 2: Method and areas of investigation



Figure 3: Phases 1 and 2: Late Saxon



Figure 4: Floors of structure 1.1 with north wall of Structure 5.2 behind figures.
View towards north

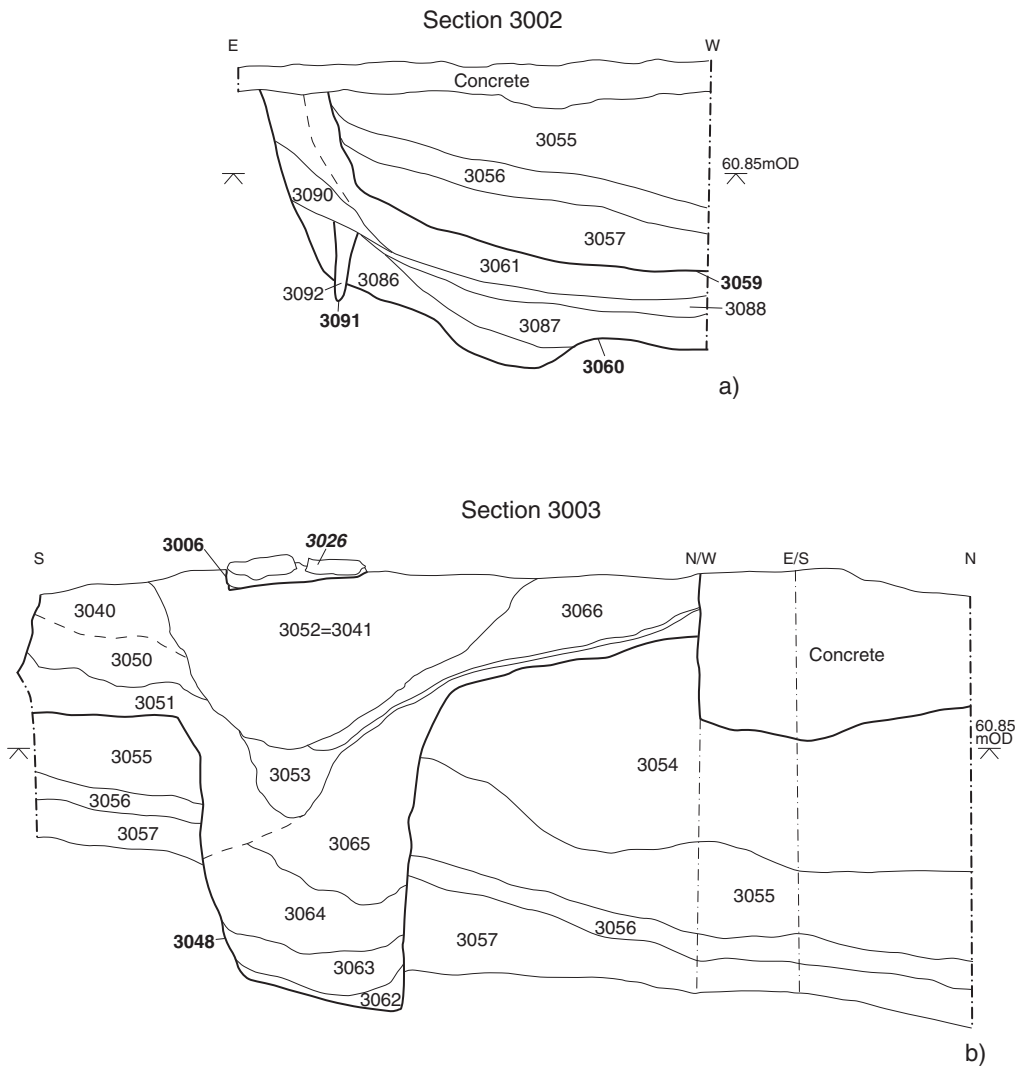


Figure 5: a) Section 3002; b) Section 3003



Figure 6: Cellar pit Structure 2.1 with earlier Structure 1.2 under excavation.
View towards south-east

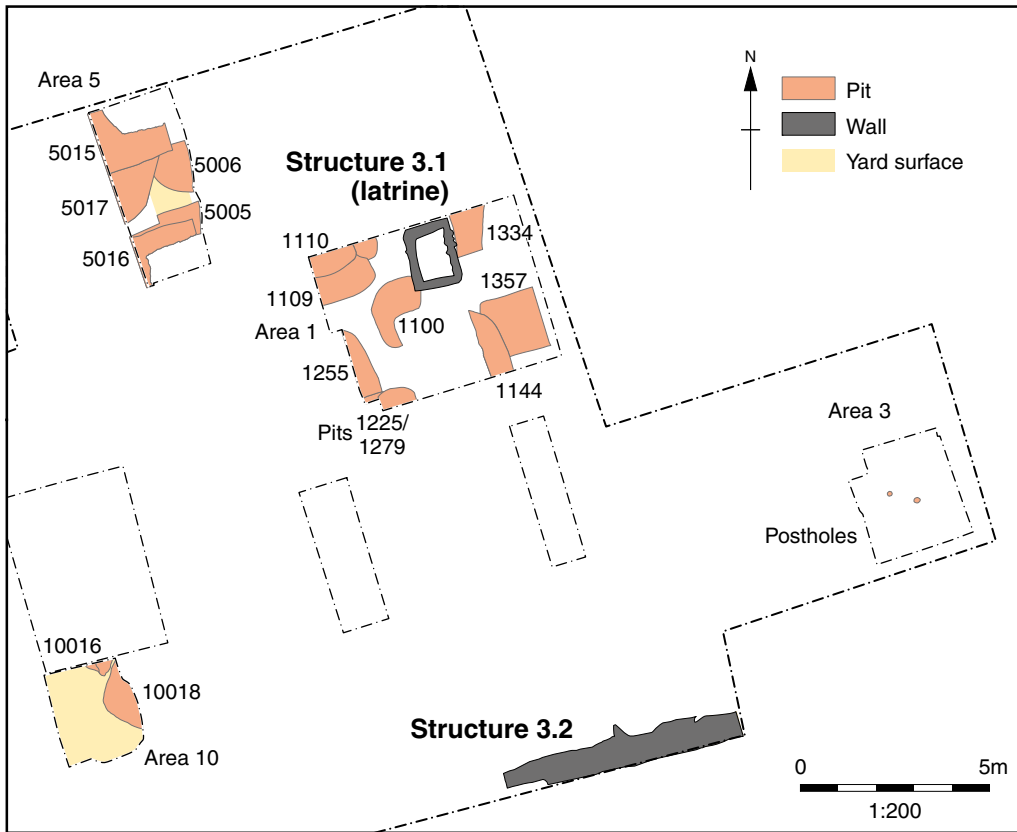


Figure 7: Phase 3: Late eleventh to twelfth centuries



Figure 8: Area 1 under excavation, showing latrine Structure 3.1 with cellared Structure 4.1 in foreground. View towards south-west



Figure 9: Detail of latrine Structure 3.1, after removal of south wall.
View towards north

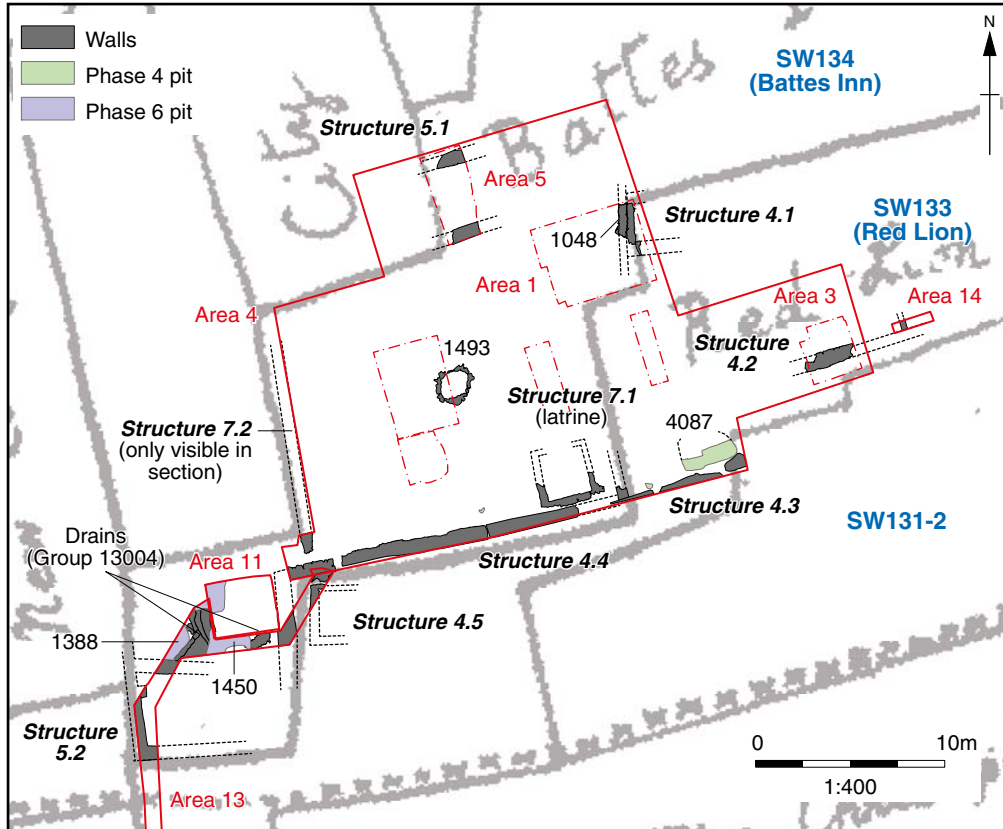


Figure 10: Phases 4 to 7: Thirteenth to early eighteenth century



Figure 11: Detail of cellared Structure 4.1

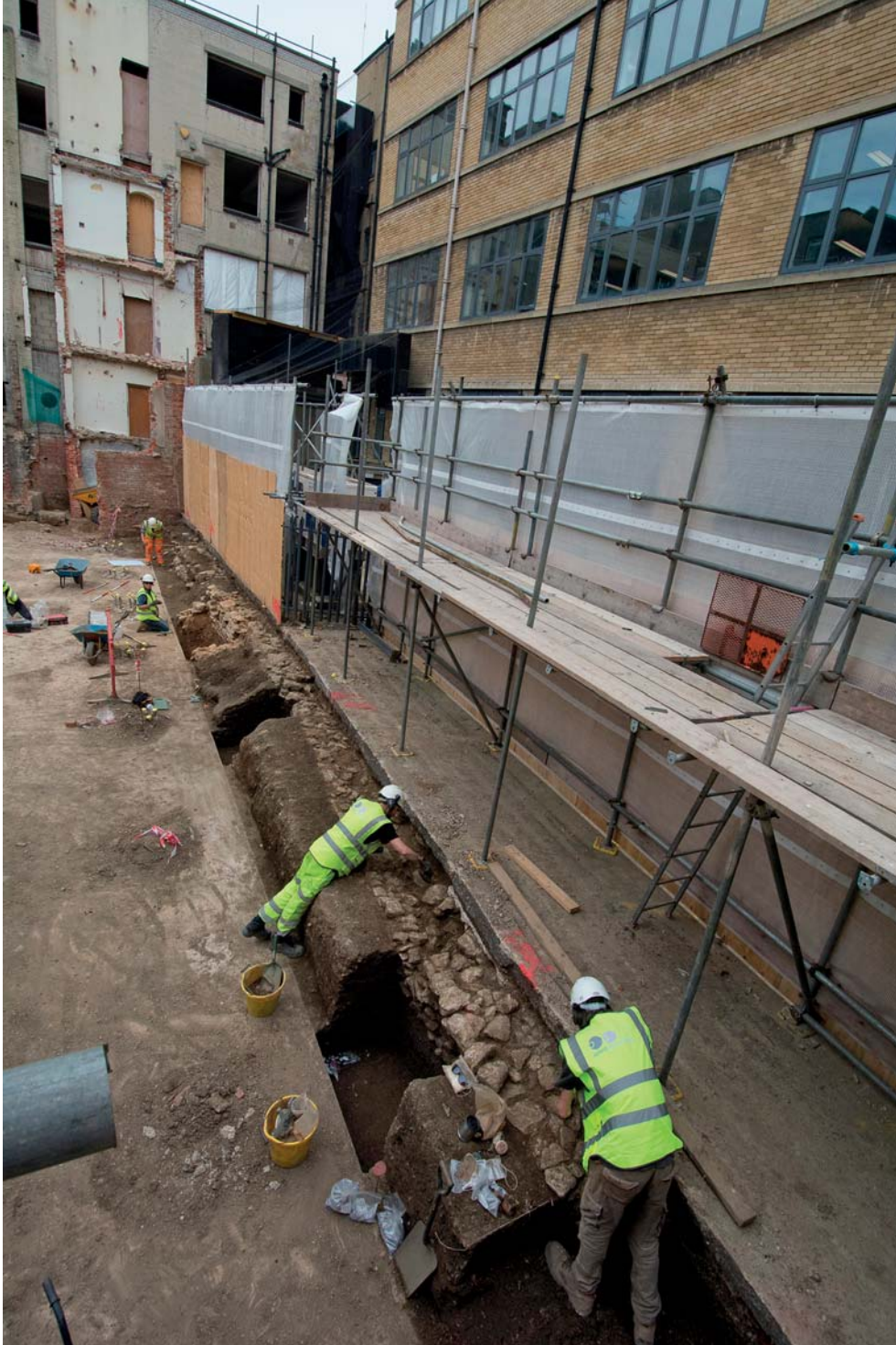


Figure 12: South side of Area 4 with basement slab in-situ, showing Structure 4.2 with latrine Structure 7.1 in background. View towards east



Figure 13: The south part of Structure 5.2 within Area 13. View towards south

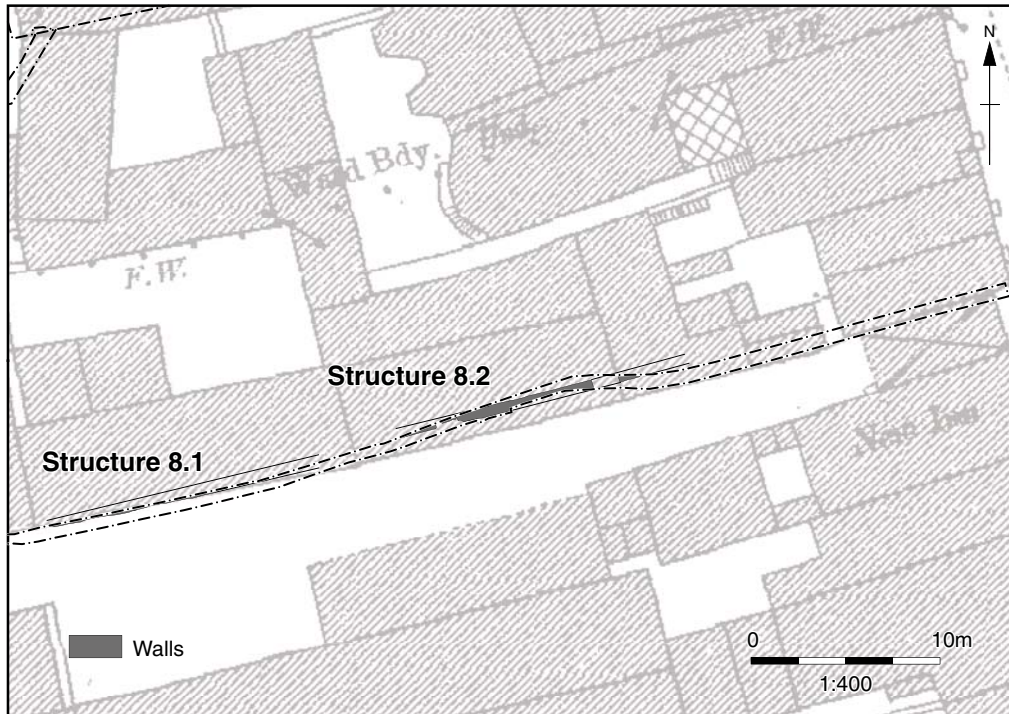


Figure 14: Phase 8: Early eighteenth to nineteenth century.
Background is 1st Edition OS (surveyed 1876)



Figure 15: Photographs of selected pottery

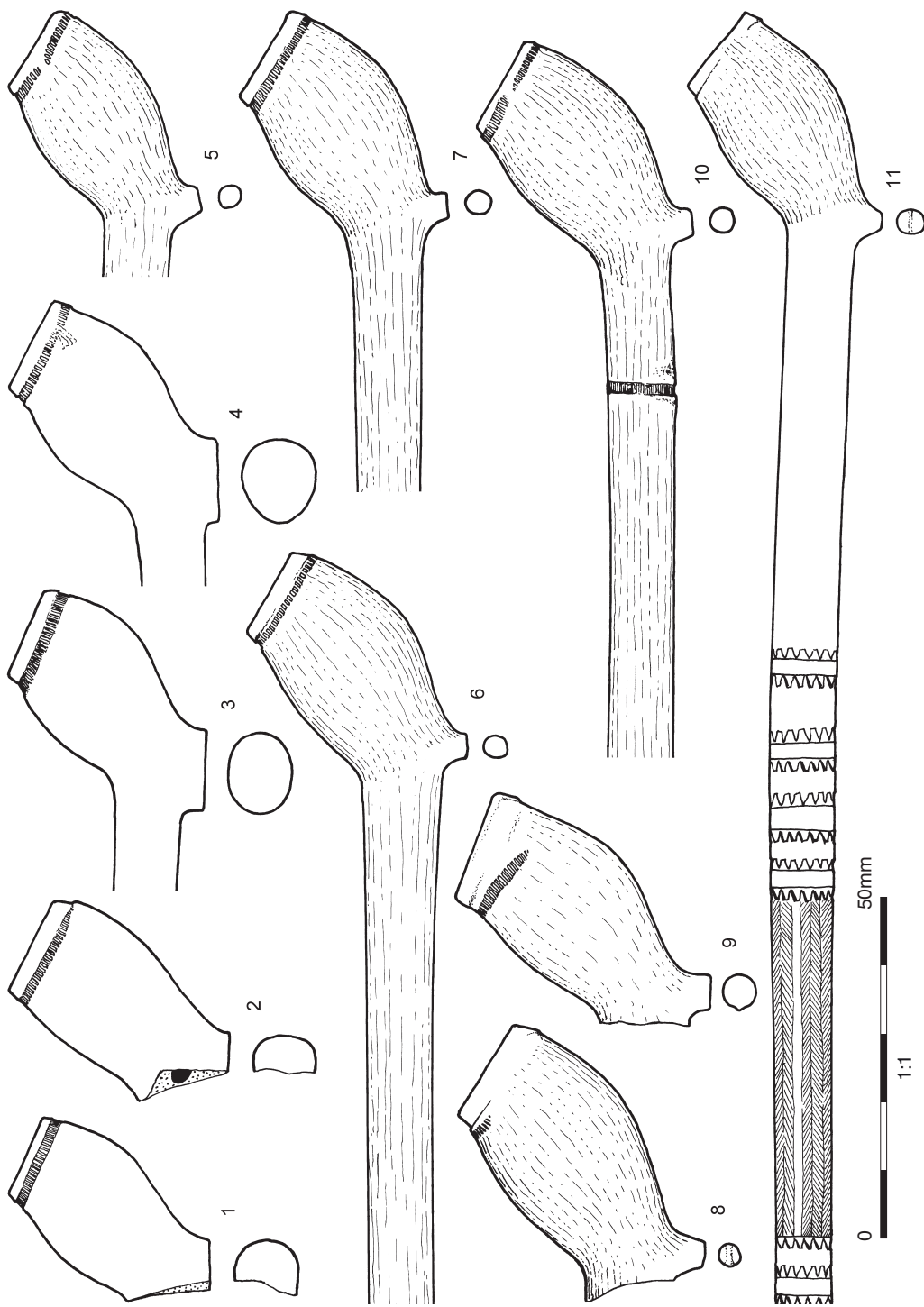


Fig 16: Clay tobacco pipe bowl forms from pit group 4073 of c.1650-70 at life size

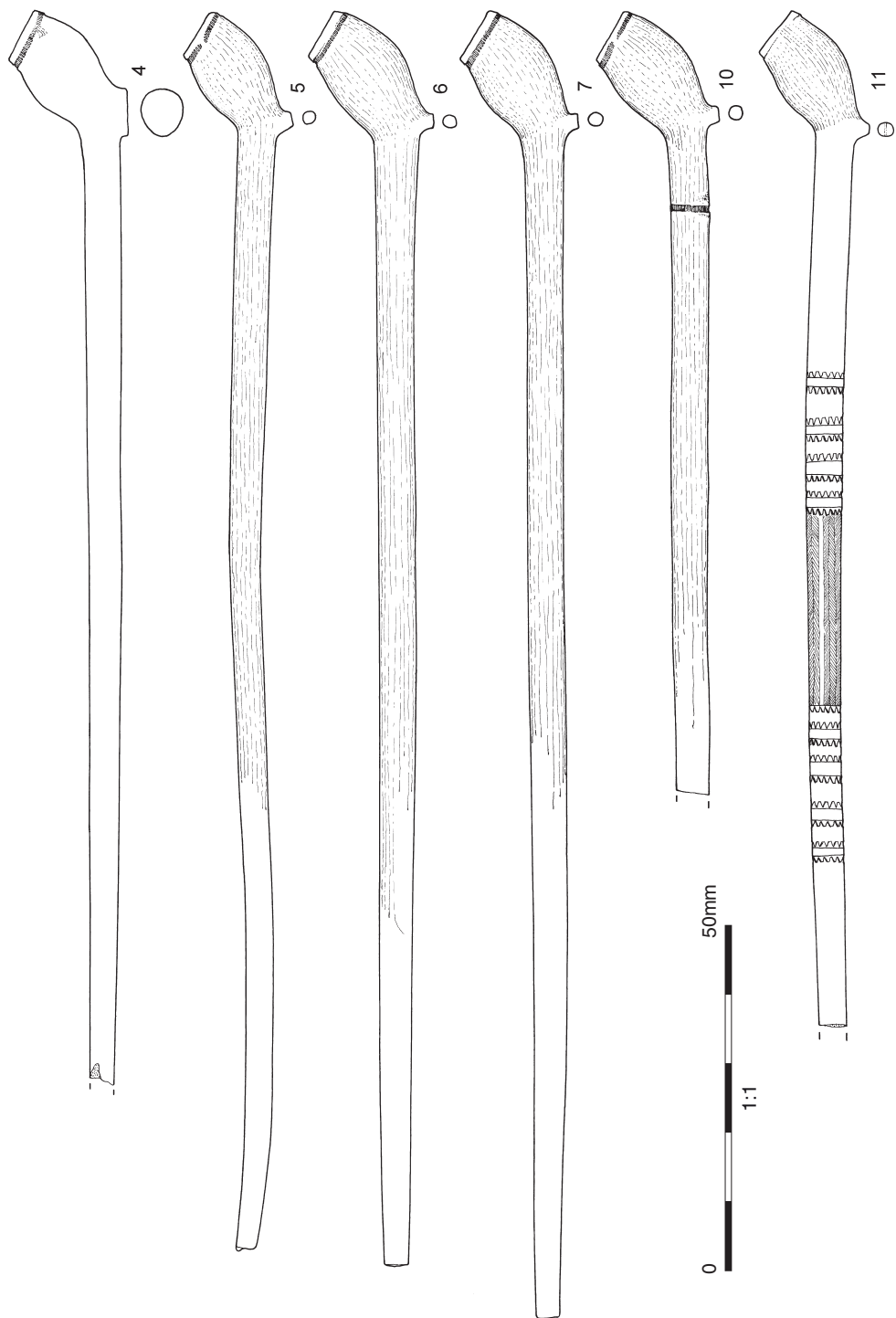


Fig 17: Clay tobacco pipes from pit group 4073 of c.1650-70 showing stem form and finish

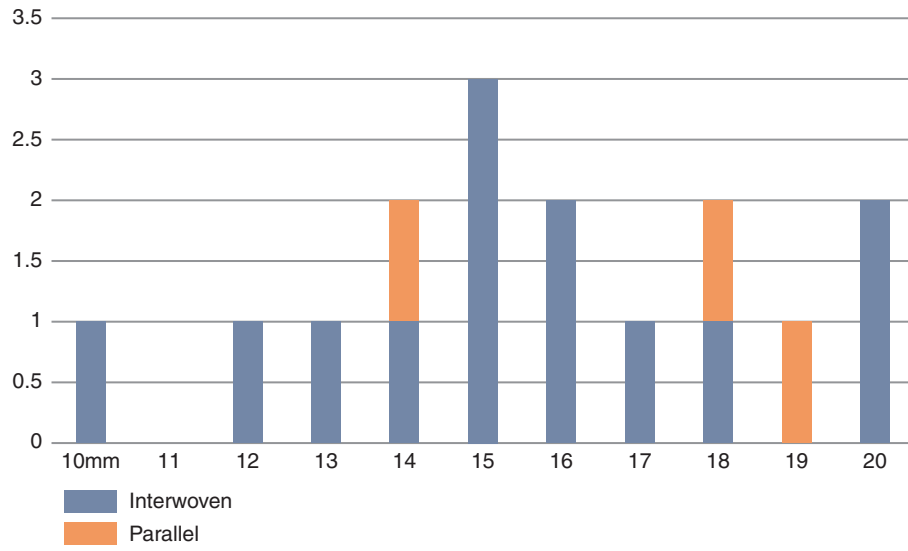


Figure 18: Chart showing diameter range of wattles



Figure 19: Seal of the Mermaid tavern on 'globe and shaft' bottle.
Green glass. Context 4014, Structure 7.1, Phase 7

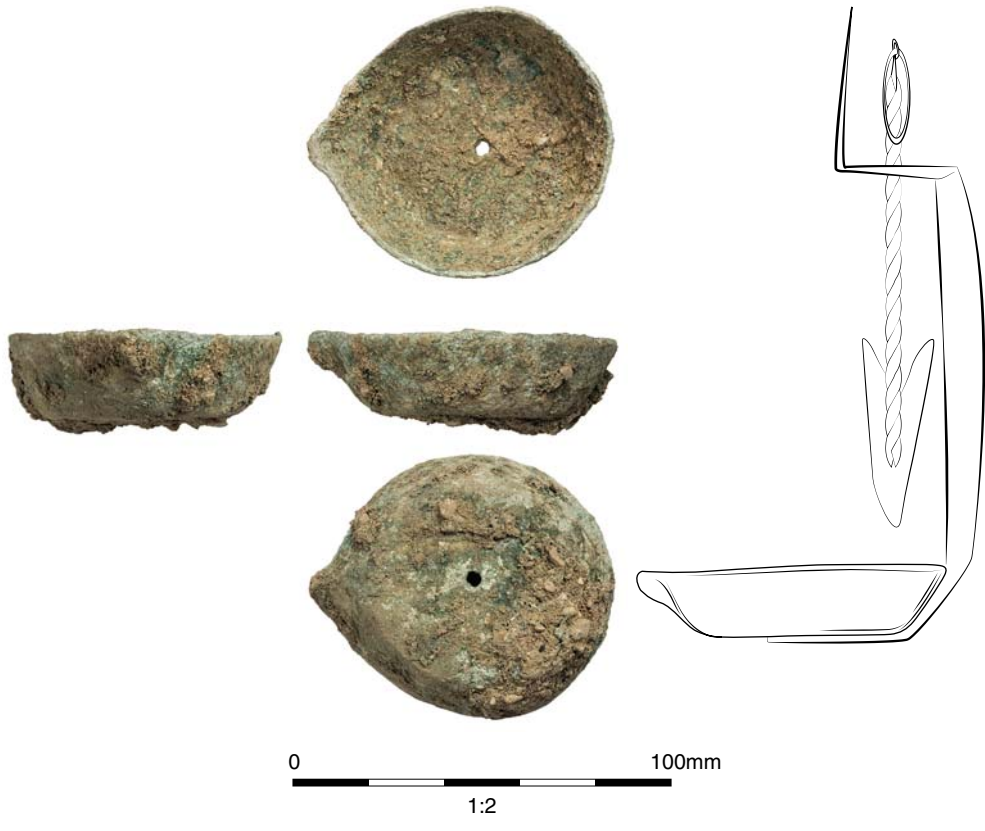


Figure 20: Shallow lipped dish, possibly a pan from a 'cresset' oil lamp.
Context 4008, Phase 4



Figure 21: A possible stylus fashioned from a goose radius. Context 1007, Phase 8



Figure 22: Remains of a possible thirteenth-fourteenth century leather shoe recovered from pit 102.



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