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HOLOCENE ENVIRONMENTAL CHANGE AND ROMAN FLOODPLAIN MANAGEMENT AT PILGRIMS' SCHOOL, CATHEDRAL CLOSE, WINCHESTER, HAMPSHIRE

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ABSTRACT

Archaeological investigations undertaken by Oxford Archaeology between 2005 and 2007 within the gardens of Pilgrims' School, in the precinct of Winchester Cathedral, revealed floodplain deposits and stratified archaeological remains. Detailed archaeological and palaeoenvironmental investigations at the site identified a sequence of sedimentary and environmental change that spans the Mesolithic period to present day.

The work identified a former channel of the River Itchen running through the site and dating prior to the later Roman period, when the river was diverted eastwards and outside the town walls. It also revealed the remains of the Roman town defences and evidence for floodplain reclamation. Systematic drainage of the Itchen floodplain appears to have started by the late 2nd century AD, followed by dumping in order to level and transform the land. This process appears not to have been completed by the late 4th century, at which point Winchester's civic structure had largely broken down and the town drainage system had started to fail. The post-Roman environment reflects a return to wetter conditions on the floodplain with increased flooding during the early medieval period. During the later medieval period it supported a series of fish ponds which were later infilled and transformed into the Prior's garden. This garden then became part of the Pilgrims' School at its foundation in 1931.

INTRODUCTION

Proposals by The Pilgrims' School to extend their pre-preparatory and sports facilities at Cathedral Close, Winchester (Scheduled Monument – HA 585) led to a programme of staged archaeological work undertaken by Oxford Archaeology. During August 2005 three evaluation trenches (Fig. 1 Trenches 1–3) were excavated on the site of the proposed development, in order to characterise the archaeological deposits and to assess the impact on them by the new structures. Based upon the results of this evaluation, design parameters were established by Richard Massey (English Heritage Inspector of Ancient Monuments), Tracy Matthews (Sites and Monuments Officer, Winchester City Council) and the Cathedrals Fabric Commission (England) to minimise damage to the buried heritage resource from the development. These were integrated into a design statement (November 2005) which was submitted to the Department for Culture Media and Sport for Scheduled Monument Consent. The evaluation results demonstrated that that all foundation levels, apart from piling, were positioned above the level at which significant archaeological remains could be expected.

Planning consent was granted in March 2006 subject to a second stage of archaeological evaluation undertaken during May/June 2006. This comprised a fourth evaluation trench (Fig. 1 Trench 4) designed to confirm that significant archaeological levels lay below the formation level of a new swimming pool.

A geoarchaeological borehole survey was also undertaken in order to mitigate the impact that piling for the new structures would have on the underlying archaeological and floodplain sequence, which would otherwise have been unaffected by foundations of the new structures. The aim of the borehole survey was to provide a comprehensive coverage of the site's stratigraphic sequence, assess the extent

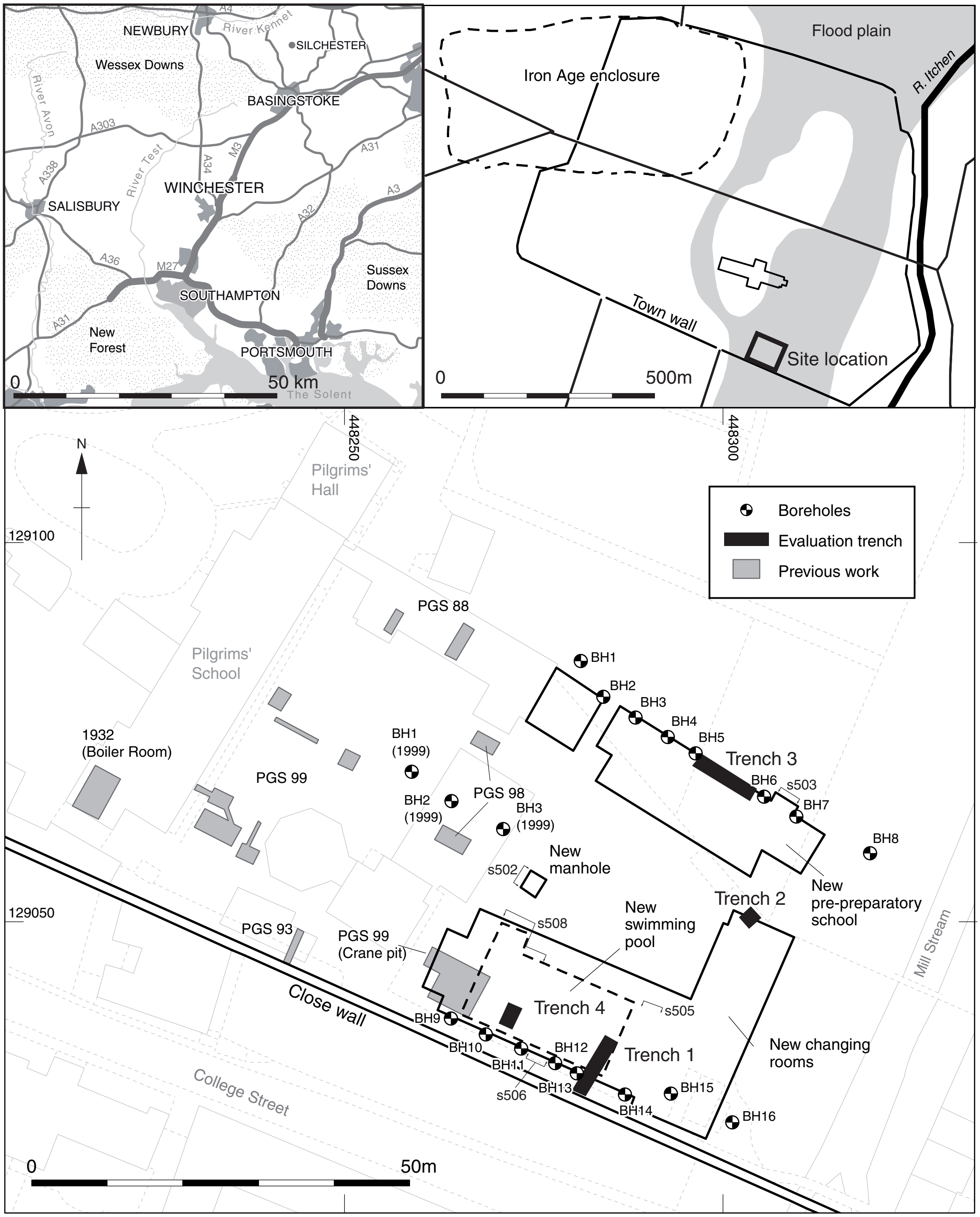


Fig. 1 Site Location

of waterlogged organic deposits and to retrieve samples suitable for palaeoenvironmental analysis and radiocarbon dating.

Between July 2006 and February 2007 a watching brief was also maintained during groundworks for the construction of the new structures.

This report summarises the results from the excavations, watching brief and borehole survey. The results of the specialist assessments and, where appropriate, analyses have been integrated into the discussions below. Summaries of the artefact and palaeoenvironmental specialist analysis reports can be found at the end of this paper. Full specialist assessment and analysis reports and tabulated data can be found in the site archive (http://library.thehumanjourney.net/680/).

Location, geology and topography

The site lies within the south-eastern corner of Winchester Cathedral Close and within the gardens located in the eastern part of the present curtilage of Pilgrims' School (centred on National Grid Reference SU 4829 2905) (Fig. 1). It is bounded to the south by the Close Wall (the successor to the town wall), to the west by the existing school buildings (Stancliffe Building, Millennium Building and Selwyn Building), to the north by the Deanery Garden and to the east by a strip of land forming part of the school's garden adjacent to the Mill Stream.

The site is situated on the floor of the river Itchen at *c* 33.5m above OD, some 250m west of the present course of the River Itchen that flows from north to south. It is located on what is believed to be the prehistoric floodplain of the River Itchen, which originally flowed from near Durngate to just east of the Pilgrims' School (Scobie 1995a). This is one of the narrowest points of the current Itchen floodplain, an otherwise broad floodplain surrounded by moderately steep hills.

The geology of the site comprises Upper Chalk of the Cretaceous Epoch, overlain by floodplain gravels dating from the Late Quaternary period which are in turn overlaid by Holocene peats and floodplain/alluvial silts (BGS sheet 299D, 1:50,000). The geological mapping within the city suggests that the site is located at the edge of the floodplain, near to the first river terrace mapped just to the west on the line of the main school building. However the accuracy of the geological mapping of the terrace edge has been brought into question by excavations on the floodplain just north of the Cathedral (Scobie 1995a). Tufa deposits were found to underlie the Cathedral and the area known as The Brooks to the north, indicating that the floodplain was much wider then previously thought (Scobie 1995a). Examples of tufa islands, or mounds, are common features within the Itchen floodplain and have previously been observed to rise 1.8–2.5m above the level of the river (Zant 1993). Within Winchester these floodplain islands have been the focus for early human activity from at least the Early Roman period as demonstrated by excavations at The Brooks (Zant 1993). Their presence also is thought to influence the siting of a pre-Roman ford across the floodplain on approximately the line of the High Street and is ultimately why Winchester is located where it is within the Itchen Valley (Scobie 1995b).

Archaeological background and previous work

At least five hand-axes and several Mesolithic flint blades have been found, redeposited in later contexts from the Cathedral Green excavations of 1963–70 (UAD No 883), but elsewhere within the city evidence for early prehistoric occupation is slight, and consists of flint scatters recovered from excavations and a number of stray finds (Qualmann *et al.* 2004). All substantial evidence for Neolithic and Bronze Age activity is confined to a series of excavations carried out in advance of the extension of the M3 motorway, which overlooks the Itchen Valley to the west. Three monuments, all of a funerary nature, have been tentatively identified as belonging to this period, two of which were revealed by excavations on Winnall Down (Fasham 1982 & Fasham *et al.* 1989).

During the Middle Iron Age a large enclosure occupied the western slopes of the river valley located some 0.5km north-west of Pilgrims' School, which controlled a ford overlying a narrowing of the valley bottom on approximately the line of the High Street (Qualmann *et al.* 2004). It is possible that some habitation occurred on a tufa island or raised area within the floodplain such as was found during excavations at The Brooks (Zant 1993). However, only stray finds have been found within the channels that flanked the western and eastern banks of the Itchen.

The Pilgrims' School site lies within the Roman town of *Venta Belgarum* and occupies a position immediately adjacent to its southern defences and towards its south-eastern corner. The lower lying parts of the Roman settlement were probably progressively drained as it expanded eastwards, the River Itchen being diverted outside the eastern boundary (Scobie 1995b). Initially the floodplain may have been deemed an adequate defence, since the 1st century earthen rampart has not been identified during excavations within the low-lying eastern part of the settlement (Wacher 1997, 297 and fig. 131). However, during the late 2nd century a second rampart encompassing the whole circuit was constructed and reinforced shortly afterwards by a masonry wall some 3m thick (Wacher 1997). After the withdrawal of the Roman administration in the early 5th century, there is little evidence for occupation within the town until the founding around 648 of a church (the Old Minster) by Cenwalh of Wessex. This was perhaps originally a royal chapel, but after 662 became the centre of the bishopric of Winchester (Biddle 1972). During the late 9th century the site fell within the Saxon burh of Winchester, utilising the Roman defences.

Winchester was re-established as an urban centre, although it is unclear if the new street grid ever extended into the south-eastern corner of the town. By the monastic reforms of the 960s the Pilgrims' School site formed part of the extended precincts of the Old Minster (Biddle 1972, fig. 8). The present Mill Stream that flows to the east of Pilgrims' School appears to have been established by the time of these monastic reforms (Biddle *et al.* 1976, 323). There is no evidence, however, that monastic buildings, which formed part of the medieval cathedral precinct, ever extended this far east, and by the late medieval period the site lay within the gardens and orchards of the Prior's house. From the 1660s it formed part of the garden of Canory House, which became the main Pilgrims' School building upon its foundation in 1931.

Little archaeological work has been undertaken in the south-eastern corner of Cathedral Close, particularly within in the curtilage of The Pilgrims' School. In 1987, evaluation work in advance of the construction of Stancliffe Building revealed deep waterlogged silts over two phases of 'peat' separated by Roman demolition debris at a depth of 2.15m (PGS 88). This debris possibly came from 'a Roman building of some pretension' (Whinney 1988) and may have been related to the traces of a Roman building that were observed by Sydney Ward-Evans at a similar depth for the construction of a boiler room during work on an extension to the original school building during 1932–3 located some 40m to the south-west (UAD No 750). Evaluation trenches excavated during 1998 (PGS 98), prior to construction of the Millennium Building adjacent to the western side of the present site, revealed post-Roman waterlogged silts sealed below 1.3–1.4m of late medieval rubble and post-medieval garden soils (Winchester Museums Service 1998). Subsequent geoarchaeological boreholes in the area revealed that braided river gravels from the Early Pleistocene occurred below 29.97m aOD, and were overlain by 0.5–0.6m of macrofossil-rich peat probably dating to the Mid-Late Holocene (5500–2500 BP). Overlying the peat were floodplain deposits, which included Iron Age pottery fragments. Above this at 30.97m aOD or at depth of 1.83m, was chalk demolition rubble which contained a sherd of late 1st – early 2nd century Roman pottery and domestic debris (COAS 1999).

A watching brief (PGS 99) during the construction of the Millennium Building revealed a sequence of medieval structural remains during the insertion of a pumping chamber and grease trap to its west (Teague 2000). One or more substantial medieval buildings were revealed some 15m to the west of the Millennium Building, constructed during the 13th or 14th centuries and demolished by the end of the 16th century. Directly underlying the eastern extent of the medieval buildings were alluvial silts that may have been derived from a water channel of early medieval date, cut by a timber-lined channel with timbers which were dendrochronologically dated to AD1055–1070 and AD1043–1074 (Tyers 2001). Immediately to the south-east of the Millennium Building, observations during the excavation for a crane pit recorded the top of the Roman defensive bank, along with a large post-medieval rubble-filled feature, possibly an infilled medieval fish pond (Teague 2000).

EXCAVATION METHODOLOGY

The four evaluation trenches were excavated within the area of the proposed development in order to identify the location of any archaeological deposits or features (Fig. 1). Trench 1 (8 × 2m) was located adjacent and perpendicular to the Close Wall with the aim of investigating the survival of the Roman defensive town rampart and any impact that the new swimming pool would have on its remains. Trenches 2 (1.5 × 1.5m) and Trench 3 (9 × 2m) were located within the footprint of the new changing rooms and preparatory school with the aim of establishing the full depth, character and significance of the archaeological deposits. Trench 4 (4 × 3m) was excavated to confirm, or otherwise, that the formation level of the new swimming pool (31.78m aOD) lay above the level of significant archaeological deposits. Only in the ends of Trenches 1 and 3, (at 31.66m aOD at the northern end of Trench 1 and 31.45m aOD within Trench 3) were significant archaeological levels reached where deeper sondages were used to investigate the lower deposits. The maximum depth achieved by trenching was 2.7m (30.56m aOD*)* in Trench 3 and this was the only one to reach natural gravel.

The piled foundations of the proposed development were mitigated by 16 borehole samples arranged in two transects (Fig. 1: BH 1–16). A program of 8 boreholes was placed at 5m intervals along the northern-most alignment of piled foundations on a broadly E-W alignment (Transect 1). A further 8 boreholes (Transect 2) were placed 5m apart along the south side of the proposed swimming pool (the southern-most alignment of piled foundations) on a broadly E-W alignment. The boreholes were drilled using a Terrier percussion rig capable of extracting continuous 100 mm diameter cores in 1m lengths suitable for sedimentary and palaeoenvironmental analysis. Each location was drilled until the underlying Pleistocene gravel was reached. The cores were returned to OA premises where they were extruded, photographed, logged and sub-sampled. Ordnance Survey co-ordinates were retrieved for each sample location with the use of digital mapping and hand tapes with surface heights transposed from the Cathedral benchmark (35.95m aOD).

Palaeoenvironmental recording and dating

The sedimentary sequence has been characterised both on the basis of field description and by consideration of the detailed sediment descriptions made during the logging of the borehole samples. Two representative borehole sequences (BH 3 and BH 13) were selected for the assessment of palaeoenvironmental remains and for detailed sediment analysis. A sequence of environmental change has been established for the site based on this work, which included the investigation of soil micromorphology, chemistry and pollen (R. I. Macphail, J. Crowther and G. M. Cruise), plant macrofossils (W. Carruthers (2005) and W. Smith), insects (D. Smith), Mollusca (C. Champness) and diatoms (N. G. Cameron). The microstratigraphic investigations involved 13 thin-section samples taken from three important locations, namely Boreholes 3 and 13, and Trench 3 (monolith 36).These were augmented by seven bulk samples taken for chemical analyses and sub-samples taken through the sequences for pollen analysis. Eight main interpretative stratigraphic units have been identified as a result of this work, and these are discussed below and illustrated in Figures 2a and 2b.

The sequence has been dated by artefacts, dendrochronology and AMS radiocarbon. Samples selected for AMS dating included charcoal and other charred remains together with bulk organic sediment. Samples were processed and dated at the Rafter Laboratory, GNS Science, New Zealand (lab. code NZA) and at the University of Oxford Radiocarbon Accelerator Unit (lab. code OxA). Results are presented in Table 1. The radiocarbon results

Table 1 Radiocarbon dates

Lab code	Event code	Context	Depth bgl	Depth m aOD	Material	δ13C ‰	Result BP	Calibrated date at 2σ
OxA-17170	WINCM:AY234 BH13	Peat (13014)	2.95–2.98	30.53– 30.56	Organic deposits (acids)	–28.11	6747±34	5720 (95.4%) 5610 BC
OxA-17231	WINCM:AY234 BH13	Peat (13011)	2.47–2.50	31.07–31.04	Organic deposits (acids)	–26.92	5379±35	4340 (65.1%) 4220 BC 4210 (16.9%) 4150 BC 4130 (13.4%) 4060 BC
OxA-17232	WINCM:AY234 BH13	Peat (13010)	2.41–2.45	31.13–31.09	Organic deposits	–28.25	5181±33	4050 (95.4%) 3945 BC
OxA-17233	WINCM:AY234 BH3	Peat (3011)	3.82–3.85	29..39–29.36	Organic deposit	–28.59	7272±39	6230 (95.4%) 6050 BC
NZA-32758	WINCM:AY234 BH3	3004	2.03–2.08	31.18–31.13	Charcoal (indet. species)	–25.4	1736±25	AD 240 (95.4%) 390
NZA-32759	WINCM:AY234 sample 52	154			Charred roots (matted: cf. grass-type)	–26.9	6314±30	5360 (95.4%) 5210 BC

are quoted in accordance with the international standard known as the Trondheim convention (Stuiver & Kra 1986). They are conventional radiocarbon ages, where 0 BP is the year 1950 (following Stuiver & Polach 1977; Mook 1986). All dates have been calibrated using datasets published by Reimer *et al.* (2004) and the computer program OxCal (v3.10) (Bronk Ramsey 1995; 1998; 2001). The calibrated date ranges cited in the tables, as in the text, are those for 95.4% (2σ) confidence.

Nine oak planks from medieval cess pit 118 (14 sequences, with ring counts ranging from 29 to 234 years) were submitted to Dr Daniel Miles of the Oxford Dendrochronology Laboratory for dendrochronological dating. A full report is held in the site archive and the results discussed below.

SITE STRATIGRAPHY

Pre-Holocene deposits and basement topography

The chalk bedrock was not reached in any of the boreholes, but angular chalk fragments were recorded from the floodplain gravel deposits, potentially indicating outcrops in the immediate vicinity. The river gravels (29.25m–30.60m aOD) directly overlie the bedrock geology and consist of a light grey matrix-supported and well-sorted rounded gravel. These deposits represent a period of high-energy deposition in a cold periglacial environment, probably relating to the development of braided river systems dating from the Late Pleistocene (*c* 20–10,000 BP). The surface of the sandy gravel deposits may help to define the topography of the Early Holocene landscape. By plotting this surface across the site it can be seen that gradually lower elevations exist at the edge of the Stancliff Building, likely to represent a former prehistoric channel of the River Itchen (Fig. 2a). This palaeochannel was identified within boreholes 1–3 and 9 and appears to run north-south across the site from the Cathedral to the town wall. It is approximately 10–15m wide and 1m deep (2m in depth from the top of the buried floodplain deposits). No signs of the former route of the palaeochannel were identified on the present ground surface.

The borehole survey also indicates that higher ground may have been located near to or possibly on the line followed by the eastern side the old Pilgrims' School building, along with The Pilgrims' Hall. Previous investigations within this area showed that the remains of medieval buildings overlay dry ground deposits of Late Roman 'dark earth' which were in turn overlain by dry post-medieval rubble and garden soil (Teague 2000). Floodplain deposits have been previously identified within the School courtyard immediately to the south-east (COAS, 1999) indicating that the western edge of the floodplain lay between the two. The eastern boundary of the floodplain is likely to be located just east of Wolvesey Palace, where excavations revealed substantial remains of Roman buildings and streets that overlay a high point or island on the floodplain (Biddle 1975, 321–6).

Phase I: Pre-Roman floodplain deposits (29.30m – 31.25m aOD)

The borehole survey revealed a palaeochannel sequence of peats (Unit Ia) and silty sands (Unit Ic) at the western edges of Transects 1 and 2, surrounded by more wide spread deposits of peat and tufa (Unit Ib, Transect 2) overlying the floodplain gravels.

The earliest deposits identified within the Pilgrims' School sequence are from the basal Mesolithic peat deposits identified within the main palaeochannel located in Borehole 3, towards the western edge of Transect 1(Fig. 1). Deposits at the base of the channel comprised compact (but fissured) humified peat (3011) containing plant fragments (Fig. 2a). This peat, which has been has been dated to 6230–6050 cal. BC (7272±39 BP; OxA-17233) also contains occasional wood charcoal up to 2 mm long, as well as rare 1–2 mm long leaf fragments. Pollen was too poorly preserved to be interpretable, but the waterlogged plant remains produced a reasonable diversity of taxa and together with evidence from the diatoms and Mollusca indicated slow-flowing water within a channel relatively free from vegetation. This is the only surviving remnant of the earliest channel fills,

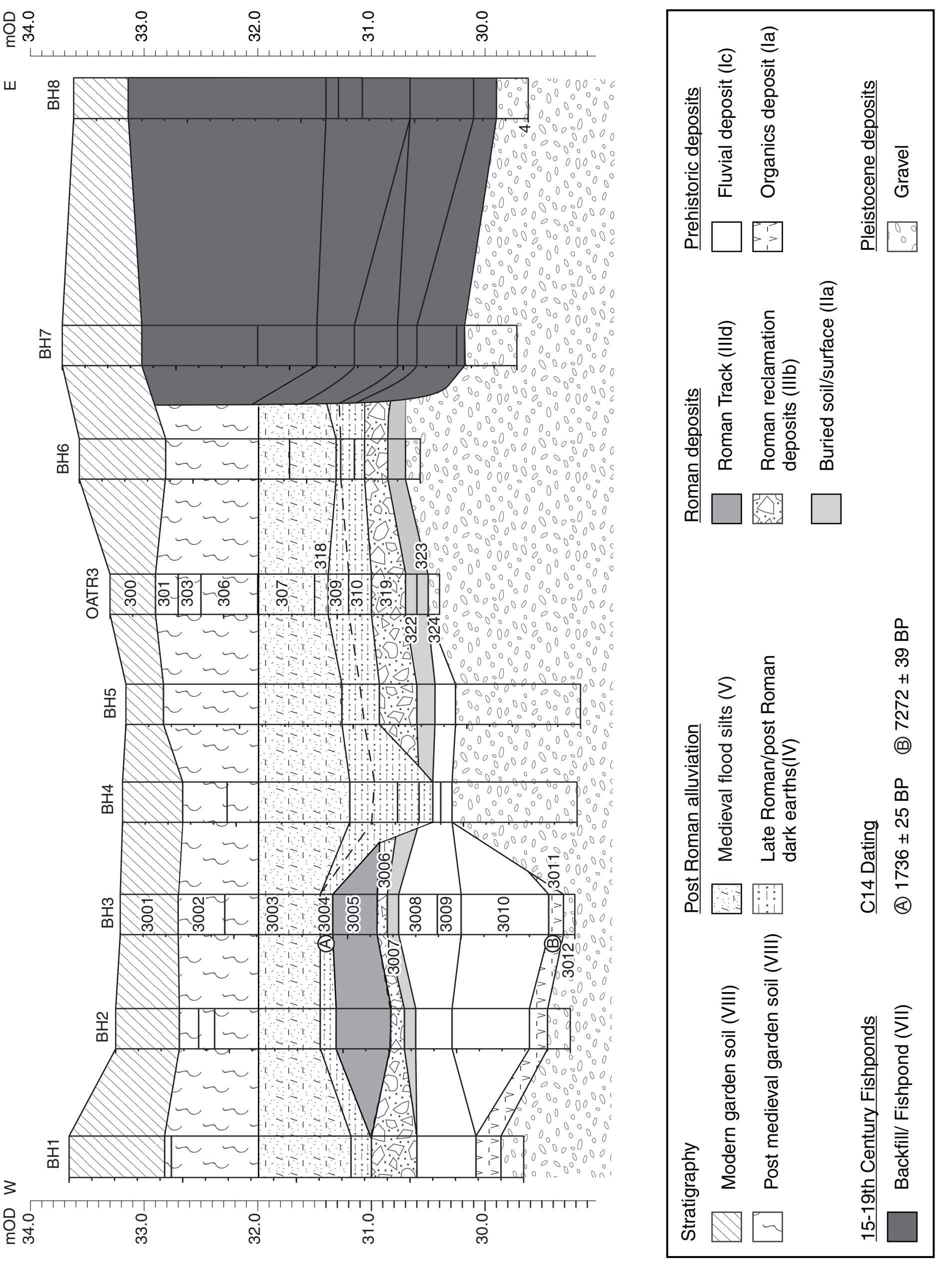


Fig. 2a East-west cross section: Transect 1

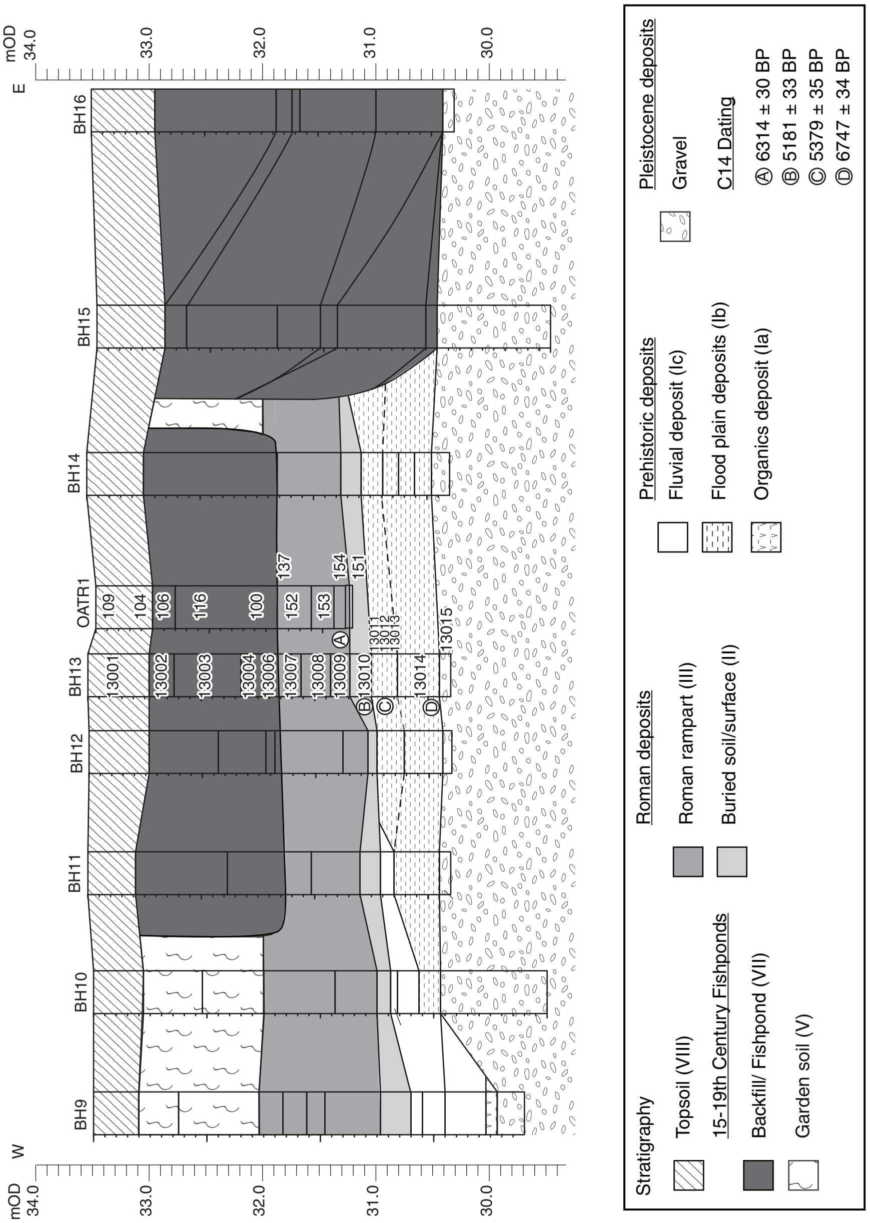


Fig. 2b East-west cross section: Transect 2

draining a predominantly wooded landscape. Thin-section analysis revealed the upper part of the 'peat' to be instead a mature humic soil, possibly formed under woodland and later reworked by soil organisms, implying a period of environmental stability. This deposit appears to have been truncated prior to the deposition of mixed coarse silt and sand (3010), which appears to have been originally composed of thickly-bedded, probably once-finely laminated sediments, recording mixed energy episodes of peat, silts and sands, and fine gravel sedimentation.

Overlying fluvial sandy silts (3009 and 3008) in Borehole 3, Transect 1 provide evidence of later tufa formation, followed by weathering and possibly burrowing by invertebrates. The latter, if present, implies exposure of the surface to sub-aerial effects. The pollen evidence from (3008) suggests that alder carr had largely disappeared and there was little woodland either on the floodplain itself or on raised, drier areas and valley slopes. Arboreal taxa account for only 7% of the count and alder only 1%. Some scrub or hedgerows may have been present but generally the area was herb-rich grassland and fen with lower lying wet ponds or depressions. Grasses account for 30% of the pollen, while the herbaceous flora include knapweed (*Centaurea nigra*), thistles (*Cirsium* type), cleavers (*Galium* type), plantain (*Plantago lanceolata*), dock (*Rumex acetosa)* and daisy family (Asteraceae including members of the Lactuceae and woundwort (*Solidago virgaurea*)). Taxa of ponds and moist ground include pondweed (*Potamogeton*) and sedges (Cyperaceae). There would have been patches of nutrient enrichment and soil disturbance (*Artemisia* sp., chenopods (Chenopodiaceae) and nettle (*Urtica* sp..). Cereal type pollen suggests cultivation probably on more freely draining soils of raised ground.

An extensive pre-Roman floodplain sequence was sampled in borehole Transect 2 (Fig. 2b), consisting of a sequence of interdigitating calcareous silts (12008, 13011–13013 and 14005), silty peat (13012, 14006), calcareous silt/tufa (14007 and 13013), and woody peat (10009, 11007, 12009, 13014, 14008) .Organic horizon 13014, from borehole 13, has been dated to 5720–5610 cal. BC (6747 ±34 BP; OxA-17170). In places, the boundary between deposits could not always be clearly identified. Here, the floodplain sequence (Unit Ib) indicates that for most of the Holocene the site would have been a continually changing wetland environment with a network of slow-moving channels. There are at least two main transitions within the sequence from predominately organic deposits to minerogenic calcareous silts/tufa deposition. This accumulation of peat and tufa probably indicates fluctuating water-levels within the floodplain during prehistory.

The pollen from peat 13014 was dominated by grains from tall woody and arboreal taxa, particularly alder (*Alnus* sp.)and hazel (*Corylus avellana*), with a presence of lime (*Tilia* sp.) and elm (*Ulmus* sp.) (Fig. 3: pollen zone 1). The preservation of the pollen was good from the basal deposits, implying a general lack of reworking. The rise in alder frequencies from 22% to 67% in the lower part of the sequence (Fig. 3, samples at samples at 30.57m aOD and 30.79m aOD: 2.97m and 2.75m bgl, context 13014) from BH13 is entirely consistent with the regional expansion into and dominance by alder in Mid-Holocene floodplains. At the base of the sequence (sample at 30.57m aOD) there was already a notable presence of alder on the floodplain, but at that time the dominant vegetation type was likely to have been tall fen and reed communities dominated by grasses and sedges with some reedmace (*Typha* sp.) and tall herbs. On drier, raised areas of the floodplain and on valley slopes there would have been mixed deciduous woodland.

The first evidence of woodland clearance within the floodplain sequence is recorded at 31.07m aOD (–2.47m bgl) from peat (13011) that was radiocarbon dated to 4340–4060 cal BC (OxA-17231: 5379 ± 35 BP) at the top of the natural floodplain sequence (Fig. 3: Pollen zone 2). This broadly matches the regional pollen picture for an early phase of Late Mesolithic woodland reduction of trees like elm at around 5600 years BP in this part of southern England (Greig 1986). This is followed by a possible phase of secondary woodland regeneration of locally growing elm and lime, with alder and hazel pollen possible being reworked from 31.11m aOD (–2.43.5m bgl; Fig. 3: Pollen zone 3). This event has been dated to 4050–

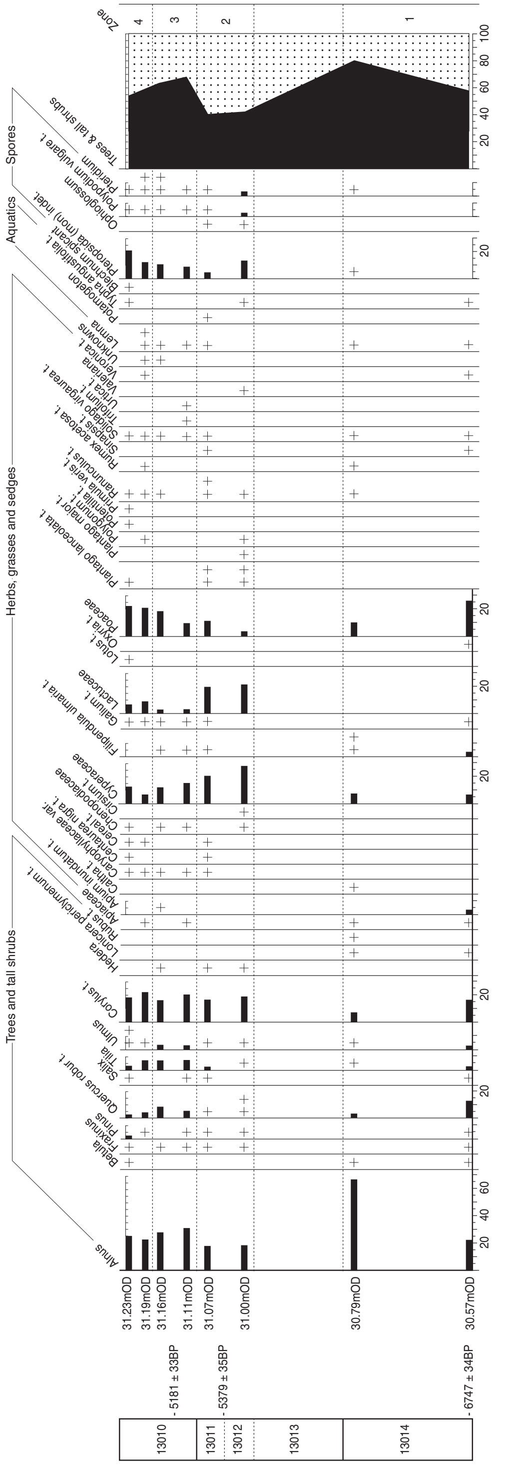


Fig. 3 Pollen diagram from Borehole 13 (x axis is % of Total Land Pollen)

3645 cal BC (OxA-17232: 5181 ± 33 BP) placing it within the Early Neolithic period. Soil formation appears to have started on the floodplain from the Early Neolithic, representing a period of more stable conditions. Alder was still frequent on the floodplain, but it would appear that the woodland had undergone a process of fragmentation and opening up of its canopy. Decreasing aquatic and marsh species within the snail assemblage would suggest seasonally drier conditions on the floodplain . Elsewhere on the drier ground, possible cultivation and forest disturbances may be inferred from increasing levels of cereal pollen during later prehistory (Fig. 3: Pollen zone 4).

The main pre-Roman floodplain landscape would therefore appear to have consisted of a patchwork of different wetland environments that may have ranged from wet grassland to flood meadow with alder carr woodland possible nearby at the floodplain edge. Spring activity would also have appeared to be very vigorous during this period depositing thin bands of tufa on the floodplain. Throughout the pre-Roman period most of the site appears have been too wet for human habitation, but would have probably provided seasonal pasture.

Phase II: The Early Roman pre-reclamation floodplain

The drainage of the site appears to have started from the later 2nd century AD, with the pre-reclamation soil developing within the silted up and infilled prehistoric Itchen. The waterlogged plant remains and pollen suggest a tree-less herb-rich grassland and fen with lower-lying wet ponds akin to fen meadow, as described by Rodwell (1991a;1991b).

Evidence from Trench 3 suggests that here the site remained at least seasonally flooded to and throughout the early part of the Roman period (Fig. 2a). The sondage excavated at its east end revealed that the river gravels (324, at 30.56m aOD) were directly overlain by a loose layer of coarse sand and gravel (323), 0.08m thick that probably formed a sand bar – a submerged ridge of fluvial sand at the edge of the channel – over which a firm mid green-grey organic silt-sand (322), thickness 0.12m had accumulated. This later deposit contained dumped domestic rubbish including a range of 1st to 2nd century decorated Samian vessels as well as Early Roman pottery, animal bones and the waterlogged remains of food plants including walnut (*Juglans regia*). Walnut is a Roman introduction to Britain (van der Veen *et al.* 2008, p. 13 table 1). However, it is probable, given the difficult and waterlogged excavation conditions, that some of this material may derive from the overlying rubble (319) as discussed below. That these deposits included material deposited in flowing water is reflected by the insect remains, which include 'elmid' riffle beetles; species such as *Elmis aenea, Oulimnius, Limnius volckmari and Riolus subviolaceus* are usually found in clear, fast flowing water where they are associated with rough water and riffles (Holland 1972). However, other species associated with slower areas of water, such as pools and slack water, were present, suggesting that at some point the river had begun to silt up. The presence of certain slum species like *Anisus leucostoma* would indicate that the environment was seasonally inundated and would probably have been lightly grazed during the drier months. Similar silty deposits were recorded within Boreholes 5 and 6 (5005 and 6008) suggesting that the channel and the floodplain may have been still active at this time, making the surrounding area unsuitable for habitation.

Phase III: Mid-Late Roman reclamation of the floodplain

Roman reclamation deposits

By the late 3rd century flint and chalk rubble deposits (Unit IIIb) identified in Transect 1 appears to represent a deliberate attempt to reclaim the floodplain , to level out undulations in the topography and to create an elevated surface above the water table (Fig. 2a). The apparently homogeneous nature of the Unit IIIb suggests that it represents a deliberate dump, with material probably carried from some distance, since no evidence for the substantial structure, to which the material had presumably pertained, was found in the trenches. This surface, dated to the late 2nd and 3rd century AD, was investigated in the two sondages excavated at either end of Trench 3

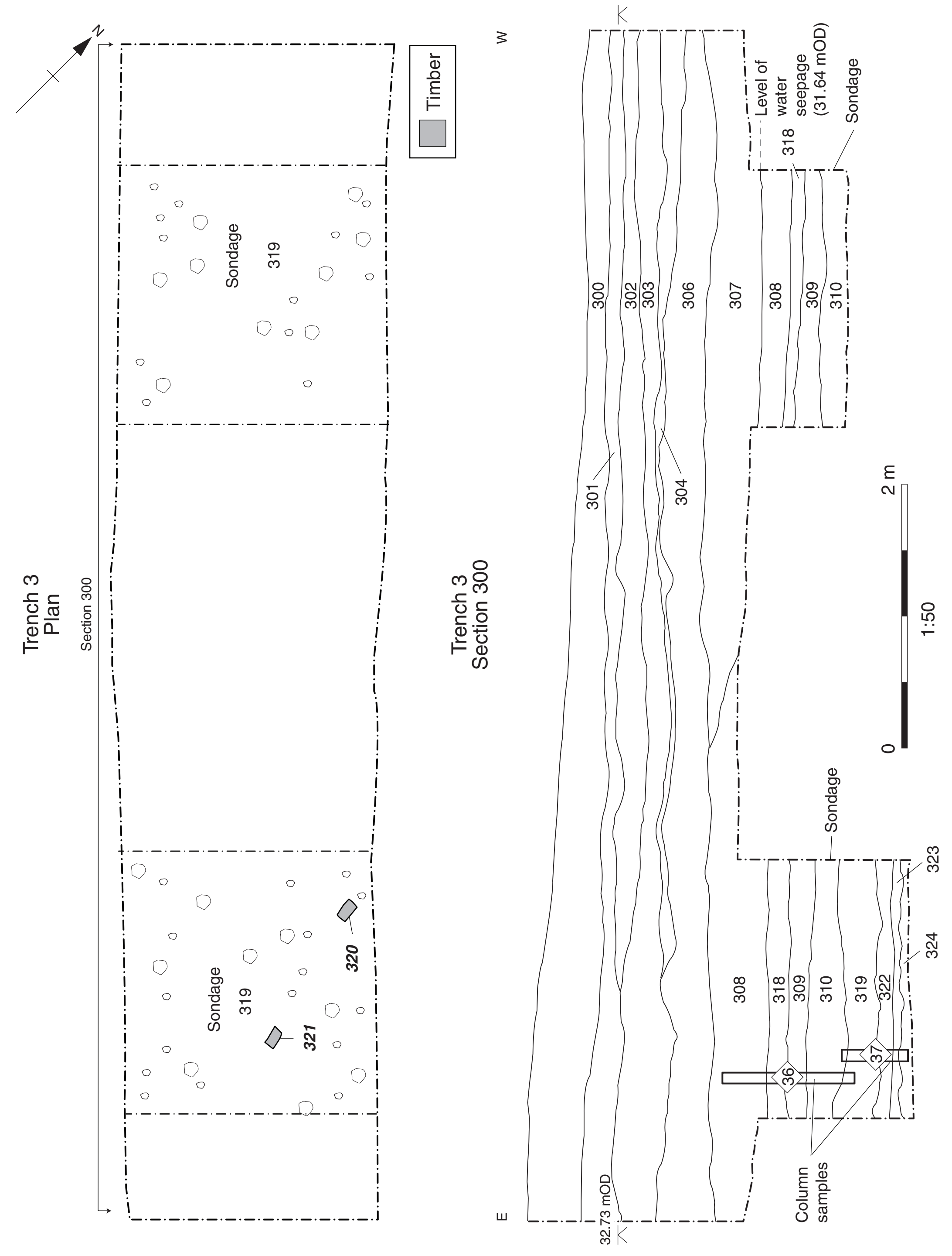


Fig. 4 Evaluation Trench 3: Plan and section

and within Boreholes 1–3, 5 and 6 (1005, 2007, 3006, 5004 and 6007). Within Trench 3 the deposit (319) comprised a compact deposit of chalk and flint rubble found at a depth of *c* 2.2m below the extant surface. It contained pottery datable to after AD 250/270 and four late 3rd century coins, including an issue of Carausius datable to AD 286–293.The surface sloped away slightly from east to west from 31.03m to 30.97m aOD. Further excavation within the eastern sondage revealed (319) to be 0.28m thick and containing much Roman building material including ceramic roofing tiles, ceramic and limestone tessera and domestic refuse, especially animal bone and waterlogged food plant remains including nutshells, fruit stones and seeds including fig (*Ficus carica*), blackberry (*Rubus* section Rubus), strawberry (*Fragaria vesca*), sloe (*Prunus spinosa*) and elderberry (*Sambucus nigra*).The presence of these food remains, including imported luxury fruits like fig, indicate that faecal material was present. The origin of some of the waste may have been sewage discharge or dumping onto the reclamation surface, or sewage may have been washed into the deposits through episodes of flooding.

The palaeoenvironmental evidence suggests the local landscape was open dry grassland with some pasture. The weed/ wild component of the plant macrofossils is more typical of grassland/ meadow than weeds of arable crops and is dominated by taxa such as buttercups (*Ranunculus* spp.), self-heal (*Prunella vulgaris*) and sedge (*Carex* spp.). Fairy flax (*Linum catharticum*) was also found but normally is a plant of dry or sandy soils, possibly indicating the importation of sediment from elsewhere. There is little indication of trees in the insect fauna with only isolated fragments of the tree dependent scolytid 'bark beetles' recovered (D. Smith 2005).

Driven some 0.50–0.60m into the rubble, within the eastern sondage (see Fig. 4), were two rectangular oak timber posts (320 and 321) measuring 0.12–0.14m across, which presumably formed part of a fence or a possible structure, though little more can be said given the small area excavated. It possible that they could have originally cut through the overlying organic silt (310) and therefore were contemporary with post-Roman timber group 305 which was exposed in the western sondage (see below). However, these timbers were more substantial and unlike group 305 had decayed above the level of rubble 319 (Fig. 2a).

Roman defences

At the same time, or possibly slightly earlier than the floodplain reclamation, the town defences appear to have been extended across the floodplain alongside the southern edge of the site. The remains of the Roman town ramparts appear to survive up to a height of approximately 1.00m above the level of the floodplain in Transect 2 (Unit III), preserving the Early Roman floodplain surface beneath, but has been largely demolished towards the east, especially within Trench 1 (Fig. 2b).

The rampart was constructed of a core of stacked (in places burnt) grass turves which were overlain by reddish brown clay with flints and various dumps of domestic and industrial rubbish. Micromorphological analysis of thin-sections from the rampart deposits in Borehole 13 revealed a sequence of dump deposits (13007–13009, 31.23–31.75m aOD) with evidence of continued floodplain sedimentation during the construction of the rampart (Fig. 2b). Context 13008 was a very mixed dump of constructional and industrial material, as inferred from strongly burnt material, vesicular iron slags and strongly enhanced magnetic susceptibility, with both soil and silty alluvium also present. The fact that it has been bioturbated may also indicate dumping in open ground, perhaps as general ground-raising/embanking activity. Micromorphological analysis of a soil thin sections from context 13007, representing the upper part of the rampart, indicated that it comprised a compact mixture of moderately humic to strongly humic 'loess turf', with calcareous silty and 'peaty' alluvial fragments, chalky soil, chalk, stone-size flints, mollusc fragments, earthworm granules and abundant charcoal. This suggests that the deposit formed from a partially biologically worked dumped mixture of both wetland and dryland soils and domestic rubbish deposits.

Deposits possibly representing the basal levels of the slighted Roman rampart were revealed in a small sondage excavated at the southern end of Trench 1 and were found to be cut by the foundation trench of the Roman town wall (Fig. 5). These deposits lay directly above the surface of peaty sediment (151) which occurred at 31.23m aOD or 2.0m below the extant ground level.

The earliest rampart deposit is represented by context (154) which comprised light greyish silt, 0.24m thick with banding of dark grey/black silt, which possibly formed from decayed turf (Fig. 5). Given its location, it may have represented the remnants of two or more stacked turves that may have revetted the front of the rampart or at least the initial dump for the bank. A radiocarbon date of 5360 – 5210 cal BC (NZA 32759: 6314 ± 30BP) was obtained from charred fine root matter extracted from the sediment (the only datable material present); such an early date is probably a consequence of older organic material within a waterlogged sediment. Given this Mesolithic date for (154), it is possible that the peat within dump deposit 13008 could have been dug up from a similar source but also mixed with contemporary industrial and constructional waste

Only a few 'damp to wet ground' plant remains were present in the assessed soil sample flot from (154), consisting of sedge nutlets and aquatic buttercups (*Ranunculus* subg. *Batrachium*). Since thin-walled grass seeds do not preserve well even in fully anaerobic conditions, these few seeds probably represent turves cut from damp to wet grassland, such as probably existed close by(Carruthers 2005a). Context 154 was overlain by a 0.13m thick dump of loose light greyish white fine sandy silt (153) and then by a thin, fairly compact and clean dark grey-brown clay-silt (152) which may represent subsequent dumping. Both deposits were devoid of finds.

Cutting the possible rampart dump 152 in Trench 1, was a substantial E-W aligned wall footing (117), that probably represents the foundation of the Roman town wall (Figs 5 & 6). It was well constructed, comprising coursed flint nodules bonded by hard pale-yellowish/buff lime mortar surviving to a maximum height of seven flint courses. The wall was at least 1.15m wide upon a slightly off-set footing approximately 0.23m thick (its southern extent lay below the existing Close wall, which had been built directly above it). It was built free standing within a construction trench, 0.31m deep and greater than 1.55m wide. The construction trench was filled with a dark grey clay loam (143 and 144) that contained mortar and mottled brown clay patches. No useful dating evidence was recovered from these fills.

Roman track/embankment

A second embankment appears to have been constructed on the floodplain during the Roman period. This can be seen in section within Transect 1 running from north to south towards the Roman rampart, on the alignment of a projected Roman road that Biddle believed to run through the site (Wacher 1997, fig. 132). A mixed deposit of silty clay and gravel deposits (Unit IIId) identified within Boreholes 2 and 3 (Fig. 2a) appear to represent part of this Roman embankment running at right-angles to the Roman town defences, the top of which occurs at 31.31m – 31.34m aOD. A stabilisation horizon has been identified on the surface of the embankment (context 3005) which developed into a weathered soil horizon during this period with signs of animal trampling. This surface was capped by a compacted metalled surface of rounded gravel cobbles, 0.10m in thickness, potentially representing a Roman trackway (the top of context 3005, Fig. 2a). This group of discrete deposits directly overlies the floodplain soil (3006) and was sealed by dark organic silts.

The micromorphological analysis of thin sections identified (3005) as a burrowed and weakly humic soil. Biological mixing of the deposit appears to have introduced large quantities of rubbish materials, including abundant cracked burned flint, fine iron-stained bone (burned and coprolitic bone; max size 1 mm), fine charcoal (max 2 mm), occasional plant tissue fragments and coarse shell/burned shell, with 'brick' and tessera fragments. The upper part of (3005) has been shown to be a 'terrestrial' weathered dark earth-like soil that had been reworked by earthworms and small mammals. It seems likely to have formed through the build up of dumps of domestic food, building and latrine waste, together with an input of alluvial silt. The pottery from asso-

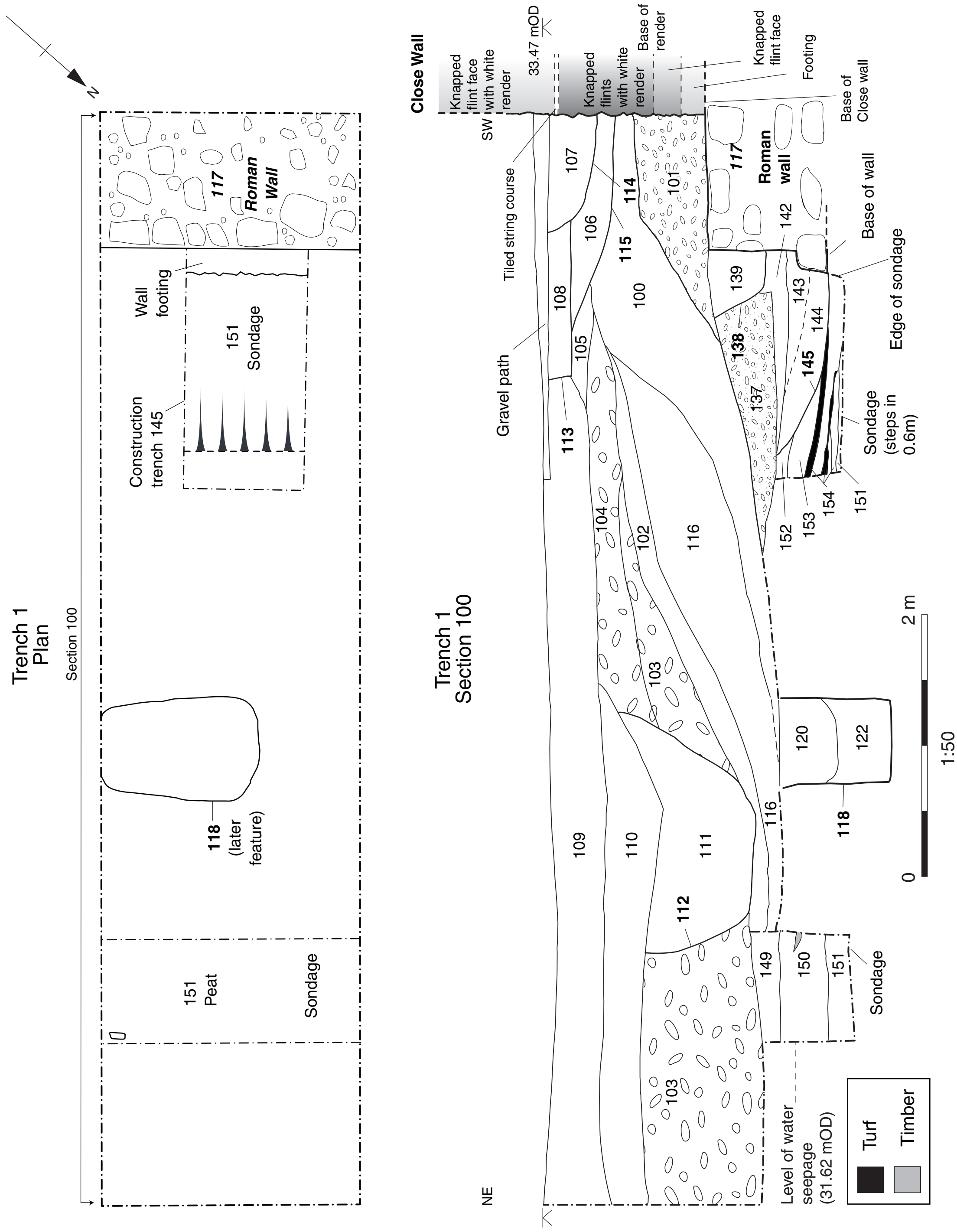


Fig. 5 Evaluation Trench 1: Plan and section

Fig. 6 Trench 1: Roman town wall foundation 117

Fig. 7 Trench 3: Roman rubble 319 overlain by organic silts 309 and 310

ciated deposits suggests a Roman date for the formation of (3005).

A possible roadside ditch was also identified within Borehole 4 (contexts 4005–4008) associated with the trackway. The ditch was cut into the surface of the Roman reclamation deposits and was filled with organic clayey silts.

It is possible that the embankment was created to provide access to the area during the reclamation of the floodplain and it seems likely that this was followed by a renewal of activity in Late Roman times. This model is consistent with the Roman deposits excavated at Staple Gardens (north west Winchester) where renewed Late Roman activity is recorded over 'mature' dark earth soils (Macphail & Crowther 2011). This renewal of Late Roman activity can also be found in Canterbury, Deansway (Worcester) and Leicester (Macphail *forthcoming*).

Phase IV: Late Roman and early medieval deposits (30.85m to 32.25m aOD)

Overlying context 3005 in borehole 3, dark earth deposit 3004 is composed of broadly bedded humic and base-rich silts, which vary in their organic content, and seem to have undergone bioturbation under predominantly open conditions. A possible period of stabilisation is likely and charcoal from within the deposit has been radiocarbon dated to cal AD 240–390 (NZA 32758: 1736±25BP). Much of the site appears to have returned to wetter conditions in the Late Roman period as a result of increased flooding and/or a rise in the water table and these sediments probably record damp/commonly waterlogged meadows that were seasonally subject to floodplain sedimentation and soil development (*cf.* Drayton, Oxfordshire; Barclay *et al.* 2003; Robinson 1992).

In Trench 3, Transect 1, an accumulation of organic silt (contexts 310) Unit IV) developed over Roman dump deposit 319 (Figs 2a, 4 & 7). Deposit 310 was up to 0.30m thick, mid reddish-brown in colour and contained lenses of green-brown fine silt forming a dark earth type deposit. It contained several sherds of late 3rd century Roman pottery and ceramic building material but also at least one sherd of from a 13th or 14th century jug as well as fragments of medieval brick and roofing tile. However, it possible that the medieval material is intrusive as a result of later disturbance or biological reworking of the deposit. The formation of this dark earth type deposit therefore probably commenced in the Late Roman period.

The waterlogged remains from (310) included food plants such as hazelnut, strawberry and elderberry. The weed/ wild taxa recovered are most frequently attributed to grassland taxa or wetland/ water plants. Grassland taxa include buttercups, knotgrass, dock and greater plantain (*Plantago major*). Wetland/ water plants recovered include arrowhead/ water plantain (*Sagittaria* spp./ *Alisma* spp.), bulrush (*Typha* sp.), common/ slender spike rush (*Eleocharus palustris / uniglumis*), duckweed (*Lemna* spp.), pondweed (*Potamogeton* spp.), rush (*Juncus* spp.) and sedge (*Carex* spp.). These waterside/ water plants are not food plants for cattle or other livestock and are more likely to derive from a flooding event, or possibly riverbank or river channel clearing. The insect fauna from (310) was essentially similar to that recovered in the Roman period, suggesting that river conditions and the landscape was similar in the two periods. There is evidence for both fast flowing and slow flowing waters with many of the same species of water beetles and riffle beetles recovered. Rough grass or waste ground in the area is suggested by the phytophage species of beetle recovered

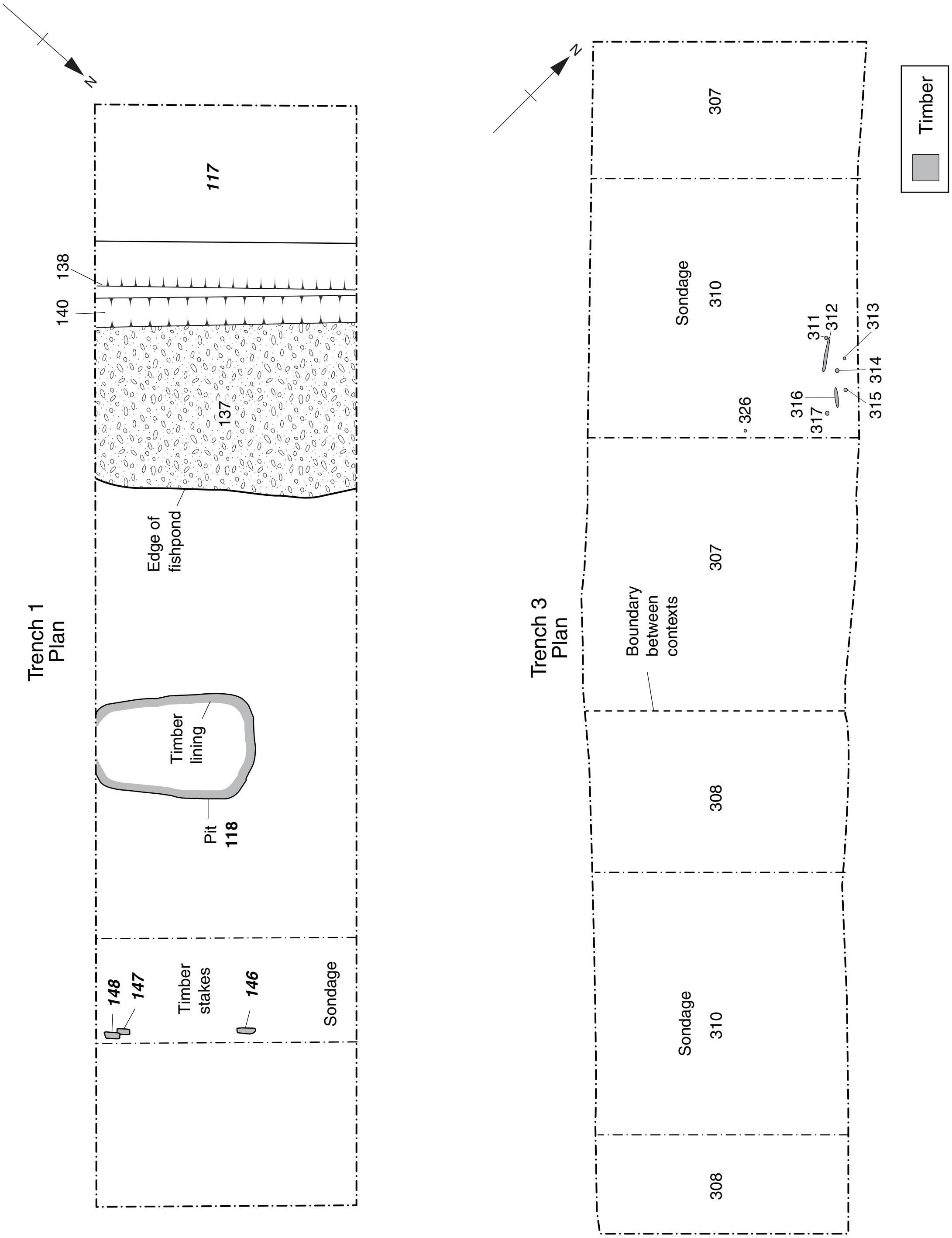


Fig. 8 Plans of evaluation trenches 1 and 3

with many of the same taxa present as seen in the Roman period including a range of indicators for stinging nettle. Additional indicators for grassland in this sample are the 'garden chaffer' *Phyllopertha horticola* and the 'click beetle' *Athous haemorrhoidalis*. *Aphodius* 'dung beetles' indicate that cattle or other herbivores grazed in the area. The insect remains again provide indications that waste material was dumped into this area of low-lying ground. This is suggested by the presence of a number of Kenward's 'house fauna' and other synanthropes (see Kenward & Hall 1997 for details). This includes the 'carpet beetle' *Anthrenus* and a range of 'grain pests'.

Micromorphological analysis of thin sections seems to record, at this location, the change from a wet meadow that was undergoing seasonal flooding to an area of man-made rubbish deposition and activity. The palynological assessment from sediments below (310) (at 31.12m OD) found predominantly grassland types consistent with a meadow environment . The lower part of (310) appears to have been originally composed of finely laminated alluvial sediments, but seems to have been partially bioturbated at a later date by mesofauna and also possibly by stock such as pigs. The presence of the latter is perhaps indicated by humified plant fragments and fine coprolitic bone, as well by secondary calcium-phosphate-features. Bulk analyses found the sediment to have 8.69% organic matter and to be phosphate enriched (3.22mg g^{-1} phosphate-P) and to show very strong magnetic susceptibility enhancement (28.5% χ_{conv}). Later disturbance/mixing introduced chalk and flint-rich chalky sediment containing charcoal and probably also human and/or animal excrement. Evidence from the diatom assemblage indicated that lower organic silt (310) included a significant proportion of attached (i.e. epiphytic) diatom communities as well as rheophilous species associated with flowing water.

Post-Roman track

Directly overlaying the remains of the Roman rampart and abutting the northern face of Roman wall was a spread of tightly packed flint nodules (137) that may have formed a rough track that ran immediately and parallel to the inside of the wall (Figs 2b & 5). It survived for a width of 2.0m from the edge of the wall, although its northern extent may have been removed by the digging of a medieval fish pond (see below). Along its southern side and against the wall was a U-shaped narrow gully (138) 0.35–0.40m wide and 0.42m deep that was filled with a mottled orange grey-brown clay loam (139), similar in composition to the silt that had accumulated over its surface (Fig. 8). Since there was no evidence for the face of the Roman wall being robbed it may have served as a drainage gully for the track. A second, very shallow and more ephemeral gully (140) ran parallel and immediately to its north (see Fig. 8), that may have served a similar purpose, perhaps for a later surface of the track that did not otherwise survive. Alternatively, given its shallow depth (0.03m) and the compacted nature of its silty fill, it may have represented a wheel rut. No useful dating material was obtained from these deposits, though they pre-dated the rebuild of the town wall during the 12th–13th century (see below). Also given that the track overlay the remains of the Roman rampart, a post-Roman date can be assumed.

Early medieval cess pit

Located some 2m north of the surviving edge of the possible track was a timber-lined cess pit (118) (Figs 5, 8 & 10). Sub-rectangular in shape, it measured 1.27m × 0.80m and was 1.3m in depth. It was lined on each side by oak timber boards that had been driven into its base vertically with no evidence for horizontal bracing (Allen below and archive report). The boards seem to have been cut for purpose and the lack of woodworm would support the view that they were inserted into the pit shortly afterwards. Dendrochronological dating of five dated timbers suggests felling during AD 1091 (Miles and Worthington archive report) with their use in the construction probably taking place within 1–2 years afterwards. The primary fill of pit (118) comprised a thick soft anaerobic dark brown 'cessy' deposit (122) that contained part of a cooking pot of late 10th–12th century date (Fig. 5). Above was a similar but more compact dark brown organic-rich fill (120) that contained a large sherd of a large tripod pitcher datable to the late 11th–12th centuries.

The former produced well preserved wood fragments, molluscs, charcoal, insects, fish bones and mineralised faecal concentrations containing bran, corn cockle impressions and straw. The remains are typical of *in situ* human faecal deposits, with the straw having been used as toilet paper and/or dumped into the pit to help soak up liquids and dampen the smell. The abundance of fly puparia and mineralisation demonstrates that the fills were nutrient rich, moist to wet, and probably very smelly. The upper fill (120) also produced a wide range of waterlogged edible fruits and seeds like blackberry, strawberry, elder and sloe/plum stones, but lacked the luxury imported remains of the Roman diet. The seeds of several general ruderal weeds including long head poppy (*Papaver rhoea./dubium*), fumitory (*Fumaria* spp.) and goosefoot/orache (*Chenopodium* spp./*Atriplex* spp.), were also present, perhaps indicating that either the pit was more open to the elements or that a wider range of waste was being dumped into it

The Roman and medieval town wall

The Roman town wall was demolished to the contemporary ground level and the existing Close wall constructed immediately upon its remains but set back 1.0m south from the inside edge of the former wall. It was constructed on a footing comprising a single course of mortared roughly squared chalk blocks above which two courses of knapped flint facing were visible. Above this level the facing had been given a whitish render. Abutting the lower part of the wall was a dump of mortar rubble (101), up to 0.52m thick, that may have represented construction debris associated with the new wall (Fig. 5). It also contained fragments of slate and pottery suggesting a date sometime during first half of the 13th century.

Phase V: Medieval alluvial silts

Cutting into (310) (Phase IV, above) and towards the west of Trench 3, were a group of five closely spaced round timber stakes (311, 313, 314, 315 and 317) that formed an approximate NW-SE alignment (Fig. 6). A sixth stake (326) was located 0.55m to the south of this alignment and a further two lay horizontally on the surface of (310). All the stakes were of hazel and measured 20–25mm in diameter and given their size probable formed a light fence, perhaps as part of an enclosure such as an animal pen.

Similar to, and accumulating directly over organic silt (310) described above (Phase IV) an almost black organic silt (309) covered the surviving top of the possible fence (Figs 2a & 4, Phase V). Like the earlier silt it was firm and almost peaty in nature, but an evaluation of the diatoms suggested that they derived from a shallow water environment. The assemblage was dominated by non-planktonic diatoms with a mixture of attached (e.g. epiphytic and epilithic) and benthic (eg. epipelic, mud-surface) species. Planktonic (open water) diatoms were rare with only occasional occurrences of planktonic diatoms such as *Cyclotella meneghiniana* and poorly preserved valves of *Stephanodiscus* sp.

Context 309 contained parts of 2–3 baluster jugs of probable 14th century date as well as domestic refuse, including a leather sole, the preservation of which also suggested that (309) like underlying (310) had accumulated under damp conditions and remained anoxic. However, unlike (310) analysis of the plant and insect remains all suggest that the deposit was rich in dung and stabling waste composed of straw, chaff and grass hay. Sample 3, from (309) contained large concentrations of cereal / grass (Poaceae) stalks, as well as a few identifications of elderberry (*Sambucus nigra* L.), with no other non-cereal foodstuffs noted. A diverse and relatively abundant weed/ wild flora was indentified including grassland taxa such as buttercups, knotgrass, black medick (*Medicago lupulina*), clover (*Trifolium* spp.) and greater plantain. That this deposit represents a drier surface than underlying deposit (310) is demonstrated by the fact that only 8.7% of the beetle fauna recovered came from either the wider environment or nearby bodies of water; the vast majority consisted of a range of synanthropic species such *as Xylodromus concinnus, Cryptophagus, Enicmus minutus, Mycetea hirta, Tipnus unicolor* and *Ptinus fur*. Perhaps more indicative of the nature of this deposit is the presence of a range of species which Kenward & Hall (1997) suggest is particularly indicative of stabling material. The clearest indicator for this is the comparatively large numbers of *Anthicus formicarius* recovered. This species is associated with the hot interiors of large fermenting middens of stable waste (Koch 1989; Smith 2000). It is therefore fairly clear that this layer represents a solid dump of stable waste discarded into this area of low lying ground.

Pollen analysis also revealed a significant presence of cereal types (19%) and grasses (57%) as well as a range of herbaceous taxa representative of damp pasture and meadows (21%). Taken together, the pollen assemblage is also considered to be representative of dung/stabling waste composed of straw/ chaff and grass hay, rather than crop processing waste. Micromorphological analysis of one thin-section representing a sub-unit of (309) also indicated the presence of a dump(s) of phosphate and iron stained stabling waste or possibly fodder, as suggested by differential preservation and humification of the organic matter, a very high organic matter component and phosphate-enrichment. Also included in context (309) and evident in micromorphological thin-section was wood, chalk, mortar, charcoal and building debris, as well as food waste including burned bone and eggshell. It therefore appears that (309) was made up of mixed organic dumps containing both wood and possible constructional debris occurring alongside minor kitchen waste in a deposit dominated by stabling waste. It seems possible that (309) represents a backyard middening area where byre waste was dumped and animals were being kept.

Phase VI: Later medieval – Post-medieval alluvial silts

Directly overlying organic deposit 309 in Trench 3, a 0.70m thick succession of green-stained silts (Unit Va; contexts 318, 308 and 307 in Trench 3, phase VI) developed. The pottery assemblage includes relatively high quantities of medieval glazed jug sherds, but also a few sherds of later medieval redwares and whitewares, together suggesting a date for the accumulation of around 1375–1450. Considered together, the macrofossils and microfossils from these deposits suggest that the area had been subject to episodes of flooding at this time, possibly during the breakdown of the town's drainage system (Figs 2a & 4). Such a change of environment may tentatively be reflected in the assessed diatom assemblage, which indicated that the dominant species in (318) and (308) differed from those found in the underlying peaty silts (309 and 310) with species in (318) and (308) typically favouring nutrient-rich shallow conditions, typical of a flooded environment. While the samples from (308) and (318) again have a range of non-planktonic diatoms there are also some indications from the diatom composition that the assemblages are derived from flooding. The dominant components of the assemblage have changed compared with the underlying levels. For example *Achnanthes minutissima* is common in (318), *Amphora veneta*, and *Fragilaria vaucheriae* in both (308) and (308). A range of *Nitzschia* taxa *(N. amphibia, N. frustulum, N. palea* and undifferentiated *Nitzschia* spp.) also become more common. These *Nitzschia* spp. are often found growing where nutrient levels are moderately high.

Like (309), the plant remains from (318) included large concentrations of cereal / grass (Poaceae) stalks, together with a few identifications of elderberry. A relatively limited range of weed/ wild taxa were recovered. Sedge nutlets were quite frequent in (318), but the range of other plant remains in this silt, however, was not as great as in the peat samples, perhaps because of poorer conditions of preservation or perhaps because of the dilution effect of the silts being washed into the deposit (Carruthers 2005a). The presence of marsh/damp ground plants could represent the habitat in the damper winter months, or the remains of flooding. As before, sewage and/or domestic waste was still a component of the assemblage, with occasional charred cereals, a few fig seeds and apple endocarp comprising the evidence for this suggestion (Carruthers 2005a). The plant remains from (308) and (307) were fairly frequent and diverse, but the flots were small. Most of the taxa present represent disturbed and often nutrient-enriched habitats, such as fumitory, stinging nettle and henbane. The presence of sedges and thistles could indicate a damp, grazed pasture-type of environment, since thistles often become abundant where livestock graze (Carruthers 2005a).

Phase VI: Medieval fish ponds

Deep post-medieval 'garden soils' were evident in Trench 3 and Trench 4 (see Phase VII, below) were not present over all of the site and were 'cut' into and levelled by several large rubble-filled features interpreted as infilled fish ponds (see Figs 2a & 2b). The extent of these features was revealed during the watching brief, which allowed for the examination of the upper 1.2–1.4m levels of a large part of the site and also aided the interpretation of the post-medieval rubble deposits found within the earlier evaluation Trenches 1, 2 and 4 (see below). During machine excavation for the new swimming pool, two large hollows in the post-medieval garden soils were revealed, extending below the base of the new swimming pool and filled with mortar rich chalk rubble and post-medieval tile fragments (Fig. 9, Section 508; Fig. 11). The eastern hollow extended eastwards to the new changing rooms for a distance of approximately 16m (Fig. 9, Section 505). A third hollow filled

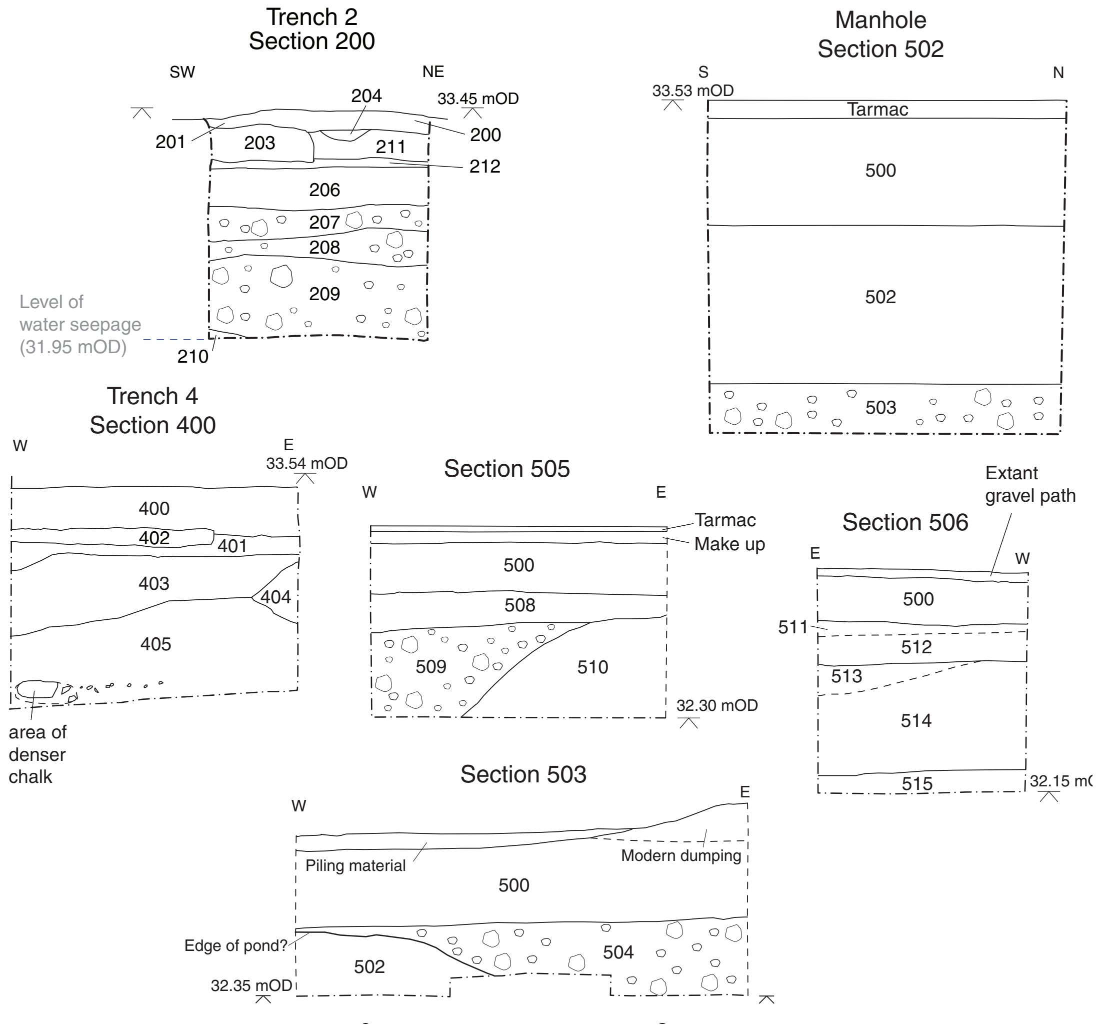
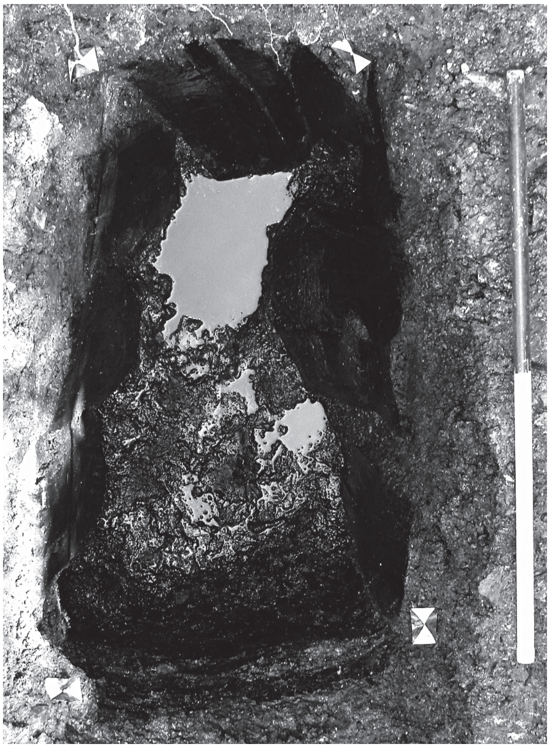


Fig. 9 Watching brief and Trench 2/4 sections



with similar deposits was located *c* 2m further to the east and extended beyond the east wall of the new building for a distance in excess of 12m. It also extended northwards beyond the north wall of the new preparatory school for a distance in excess of 44m (Fig. 9, Section 503; Fig. 12).

Trench 1 allowed the examination of southern edge of the central hollow which appeared to have cut into deposits that derived from the construction of the Close wall (101), possibly during the 13th century (Fig. 5). A sondage excavated close to the northern end of the trench revealed that the rubble infill (103 – see below) overlay a homogeneous and waterlogged grey-brown clay-silt (150), 0.38m thick which in turn lay above pre-Roman 'peat' 151. Deposit 150 contained late 11th-early 13th century pottery and a fragment of glazed medieval ridge tile. Plant remains recovered

Fig. 10 (*left*) Trench 1: Medieval timber-lined pit 118

Fig. 11 (*below*) New swimming pool showing rubble filling of possible medieval fishpond

Fig. 12 East end of new preparatory school showing rubble filling of possible medieval fishpond

from (150) were fairly limited and dominated by 'robust' seeds. Henbane and common nettle were present: these are indicators of high nitrogen input and wet, waste places (Stace 1997).As a whole, it can tentatively be suggested that the flora is typical of plants invading abandoned water features such as ditches, moats or ponds. However, while significant numbers of shade-loving Mollusca (*Discus rotundatus*, *Carychium minimum* and *Oxychilus cellarius*) were also recovered from (150), there were no clear indicators for standing water. However, as a note of caution when interpreting all of these macrofossils, the possibility of mixing due to the later dumping within this feature should be borne in mind.

Deposit (150) overlay three oak stakes on an east-west alignment which had been driven into the underlying peat. Further remains of timbers occurred loosely within (150) including parts of a board that may have originally adjoined the stakes and possibly formed a revetment on the edge of the pond. The board also appears to have delimited a sequenced of silts (100, 116 and 102) that pre-dated rubble infill (103) and which seem to have accumulated on the bank of the pond. The earliest of the silts, context (100) was rich in mortar, perhaps derived from erosion of, or repairs to, the adjacent Close wall (the medieval town wall) whereas the latest of the contexts (102), a clean friable mid grey silt, may represent a period of inactivity, possibly a turf line. Evidence from the pottery suggests that collectively these silts formed during the late medieval period, evidence for which includes sherds from a German Raeren stoneware mug from 102, indicating a date between the late 15th to mid 16th centuries. These deposits were levelled with 1.1m of mortar and chalk rubble (103–104) which appear to represent infilling of the postulated fish pond to the contemporary ground level. The deposits probably represent debris from demolished buildings, although any reusable material such as flint or large stone block appears to have been removed beforehand.

The sequence of deposits described above was identical in nature to those revealed within the swimming pool (518, 520, 521; Fig. 9, Section 508) and on the eastern side of Trench 4 (404; Fig. 9, Section 400). Rubble 103 contained post-medieval Surrey/Hants Border Ware datable to mid 16th–17th centuries and clay pipe stems of 17th to early 18th century date. A large fresh sherd of Verwood Ware was also recovered from rubble 518 during the watching brief further confirming that the infilling occurred after the late 17th century.

Evaluation Trench 2 and borehole Transect 1 revealed a similar sequence of rubble infilling associated with the easternmost hollow (Figs 2a & 9, Section 200). The trench was excavated to a depth of 1.50m revealing a 0.53m thick deposit of chalk and stone rubble (209) that extended below its base (31.95m aOD) apart from along its south-western corner where the upper level of a clean light grey sandy silt (210) was revealed. Unfortunately too little of this earlier deposit was exposed to ascertain its character and date – although it may be an alluvial deposit. Rubble 209 contained part of a Verwood collared rim bowl datable to late 17th or early 18th centuries. Further thick dumps of chalk and tile rubble (207 and 208) followed, the earlier deposit containing an assemblage of clay pipes datable to 1690–1730.

Phase VII: Post-medieval and modern deposits

Evidence from Trenches 3 and 4 suggests the areas between the extant fish ponds had become sufficiently dry to allow for the accumulation of thick deposits of dark grey loamy sediments (e.g. Trench 3, context 306; Trench 4 context 405; Section 508, context 519) (Figs 4 & 9). This suggests a change of use on the site from a meadow to horticulture and probably reflects the establishment of an orchard by the Dean. Such an Orchard is mentioned in the Chapter Act (Winchester Cathedral, Chapter Acts, 22 September 1663): 'That a parcell of Mr Deanes close bounded on the south part with the Wall, on the north parte with a rowe of bushes & young trees, and on the east with Wolvesey wall, shalbe layd to it for outlett and gardening, As also the kitchen garden on the west side now belonging to Archdeacon Ryves'.

Pottery obtained from deposit 306 within Trench 3 suggests that this accumulation had commenced during the 17th century. These garden soils and the in-filled fishponds were overlain by a silty loam that makes up the modern garden soil of the school (Phase VIII).

CONCLUSIONS: THE DEVELOPMENT OF PRE ROMAN, ROMAN AND POST-ROMAN WINCHESTER

The Pilgrims' School investigations have provided a rare opportunity to address specific research questions concerning the development of the Roman town and its post-Roman environment. More crucially, the project has enabled the investigation of the pre-Roman floodplain sediment sequence. This has not been previously investigated in any detail within the south-east corner of the city. The location of the Pilgrims' School excavations, at the edge of the Roman town and encompassing part of the Roman wall, has provided an opportunity to investigate an area of the city which had previously not been studied in any detail and to re-examine the accepted model for the Roman and post-Roman development of Winchester. One of the most important results of the Pilgrims' School excavation has been to clarify the Roman reclamation of the Itchen floodplain; in spite of the best attempts of the Roman engineers, this area of the Roman town never appeared to have supported buildings. Equally the absence of later medieval buildings over the floodplain suggests that wet conditions returned following the collapse of the Roman drainage system. An interpretative sequence of the changing environment at Pilgrims' School is presented in Figure 8. This interpretative site model is discussed in more detail below.

The pre-Roman Holocene

Previous evidence, from the underpinning of the Cathedral and nearby boreholes, has indicated that before the River Itchen was diverted during the Roman period, it flowed in at least two main channels, to the east and west of the tufa island to the north (Qualmann 1993; James 1997, 29–30). The more easterly channel was conjectured to flow through the Pilgrims' School site, flowing north to south between the tennis courts and Mill Stream; and the westerly channel, north to south just west of the main school building. The present work has confirmed the presence of at least one channel running on the same alignment at the edge of the Stancliffe Building. Based on the descriptions given above, the most likely scenario is that this represents part of the eastern channel sequence. The course of the western channel is not currently known.

The prehistoric Itchen channel appears to have been rejuvenated during the later prehistoric period, possibly as a result of more widespread woodland clearance and soil erosion. The erosional contact between the peats and overlying minerogenic silts appears to represent a significant truncation of an earlier channel sequence. Pollen from the upper part of the channel silts suggests a rich herb community had developed, with plants typically found growing on moist soils. Detailed sediment analysis and enhanced nutrient levels have indicated that latrine waste and other rubbish deposits were being thrown into the river.

Early Roman period (1st – 2nd century AD)

Roman Winchester (*Venta Belgarum*) was established in the late 1st century AD on the western bank of the Itchen. An earthwork rampart was erected in the late Neronian-early Flavian period – coin evidence suggests AD 75 – and may point to the town's status as a *municipium*. To allow the street system to extend over the floodplain, an extensive program of drainage works was implemented. This included at some time the diversion of the River Itchen into an artificial channel positioned hard against the eastern side of the valley (Scobie 1995a).

Early Roman activity on the site appears to have focussed around the gravelly sand deposits at the edge of the channel identified within Trench 3, indicating that much of the surrounding area was probably still too wet for occupation (Fig. 13A). This phase of activity (perhaps seasonal?) has been dated to the 2nd century AD based on pottery recovered from the sandy deposit (323) that overlies the Pleistocene gravel. The former Pleistocene channel of the River Itchen that ran through the site may still have been active into the Early Roman period.

The site area appears to have been progressively drained possibly as the settlement expanded eastward during the late 2nd century, as the limits of the *civitas* capital were established and the river was diverted outside the eastern boundary. The construction of the defensive embankment occurred shortly after, possibly because prior to this the wet floodplain may have offered adequate protection. The siting of the town over the floodplain was a deliberate move in order to provide access to flowing water for the baths, town houses and for drainage (Scobie 1995a). This would have involved the construction of a network of drainage channels that would have channelled water to where it was needed within the town. Evidence for such a network of managed channels is indirect; south of Durngate a stone water gate was found to have been built into the early 3rd century town wall, with the rebates to house a wooden sluice that would have allowed water to flow into the town (Gomersall 1996, 3–5). A timber lined channel was found at The Brooks along the southern edge of a major Roman street (Zant 1993, 21).

The Roman rampart was constructed from a mix of reworked sediments: clay with flints, alluvium and anthropogenic material. Micromorphological analysis of thin sections indicates that the embankment was constructed first of a core of stacked grass turfs and then had several phases of dumped layers placed over the top. The rampart was affected by flooding during its construction.

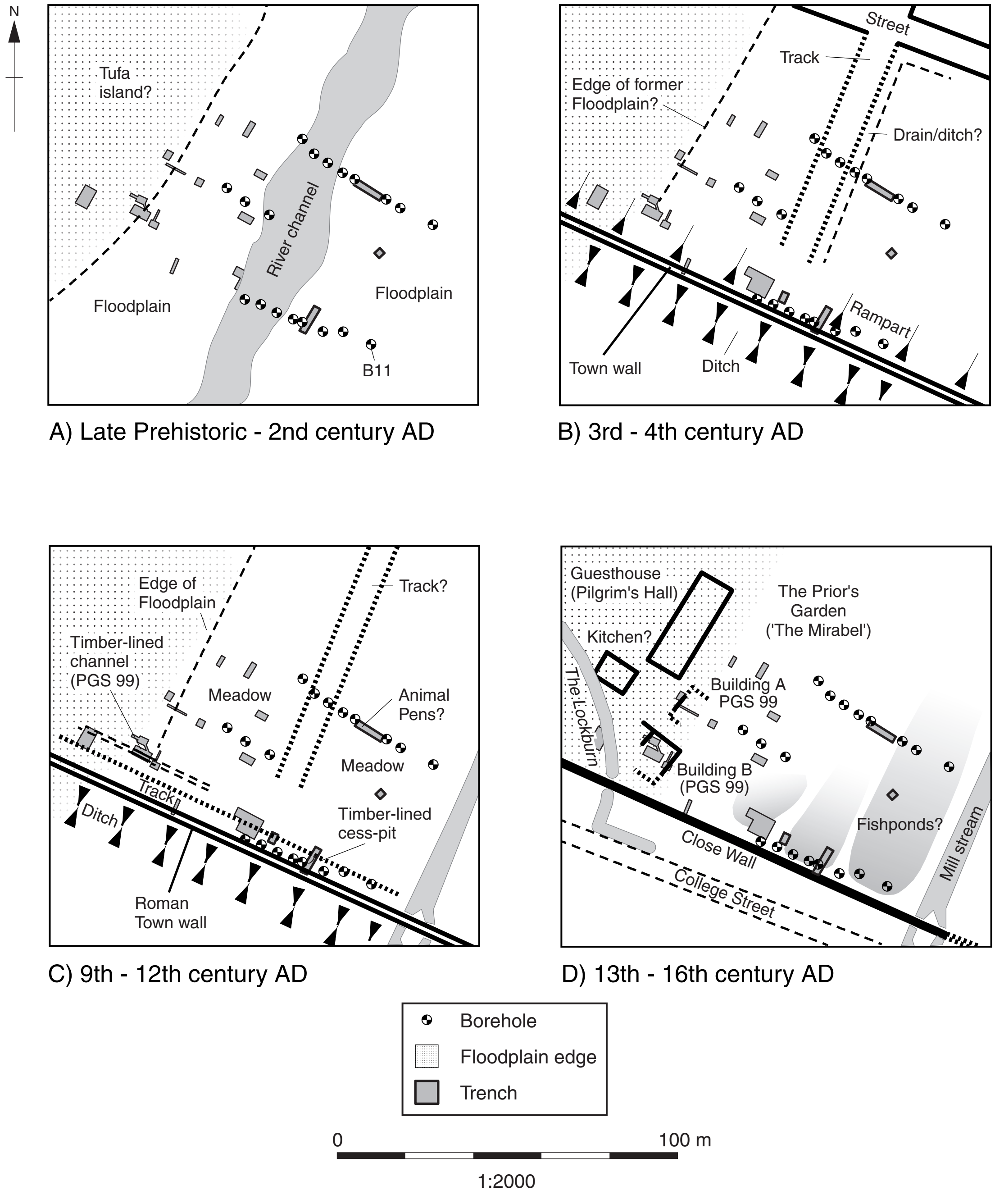


Fig. 13 Site interpretation plans

Late Roman period (3rd – 4th century AD)

During the late 2nd century the urban core was enclosed with earthen defences and strengthened in the early 3rd century with the addition of a masonry-built wall (Wacher 1997, 296) (Fig. 13B). The wall was constructed out of well-rounded compacted flint gravel that was dug into the top of the rampart to the level of the prehistoric sediments. By this date, areas of the low-lying ground were drained and the surface augmented by dumping, with the intention of enabling the town to spread across the floodplain.

Several large deposits of chalk and flint were dumped on to the floodplain in the late 2nd and 3rd century in order to elevate the ground above the water-level and to reclaim the floodplain. These deposits appear to have been compacted in order to create a stable and usable surface. They were also used to infill and level off any undulations associated with the former palaeochannel of the River Itchen. The Roman town engineers obviously expended considerable effort to create a surface that was suitable for occupation. It does, however, appear that they were not entirely successful in this aim, and there is no evidence to indicate that this reclaimed floodplain was ever used to support Roman buildings. It may have been that development of the floodplain was originally intended to accommodate an expanding Roman town, but the town fell into decline before this aim was realised. Equally it may have been that Roman building did extend across the floodplain but was not located within the area of the Pilgrims' School. Clearly the absence of any evidence for *in situ* building remains or foundations suggests that the Pilgrims' School area was perhaps used for for activities like gardens/horticultural plots or for pasture rather than for building.

The Roman track identified at the edge of the Stancliffe Building running north-south across the site suggests that the street grid was originally planned to extend across the complete interior of the town. The line of the track clearly follows the projected street alignment proposed by Biddle (1975, fig. 132) across the town. Unlike the well-constructed streets identified elsewhere within the town, which had multiple gravel surfaces and deep foundations (such as the street found at The Brooks; Zant 1993), this track was constructed of dumps of material and a single gravel surface with an associated roadside drainage ditch. It seems likely that this represents a pre-cursor to road construction, providing access to aid in the reclamation of the floodplain. It may have been intended at some later date the track would be more formalised into a continuation of the Roman street system.

The biological and geological evidence from the overlying Late Roman dark earth deposits and silts indicated that the area became increasingly wet and comprised damp grassland with areas of nearby marsh. Although low-level activity can be detected in association with these deposits, the evidence suggests that wetter conditions returned by possibly the late 3rd to early 4th centuries AD. The presence of wooden stakes that formed indiscernible structures may indicate the area was used for seasonal pasture.

Anglo-Saxon period (5th – 10th century)

Urban occupation in Winchester is believed to have largely ceased following the collapse of the Roman administration of the town in the early 5th century. Defensive ditches and embankments were placed at the former entrances to the town (Biddle *et al.* 1976, 109–119 and 206), while dark earth deposits started to accumulate across the town, as at Staple Gardens (Ford *et al.* 2011). Much of the low-lying and peripheral areas of the town were probably abandoned, with activity confined to high ground and the floodplain islands. Scobie (1995c and 1996) has suggested that any permanent occupation was confined to the islands and the edges of the floodplain. This model of post-Roman development of Winchester is borne out by the evidence from Pilgrims' School. No traces of Anglo-Saxon buildings or other types of industrial activity were identified on the floodplain.

What happen within the former floodplain areas of the town is more difficult to determine during this period. Very little is known about the Roman drainage pattern within the town and how it collapsed (Zant 1993, 53). Biddle *et al.* (1976) suggest that if the Roman channel of the Itchen was the only conduit, then the collapse of the floodplain drainage could have been catastrophic. Such a scenario could have resulted in the destruction of areas of the Roman town defences on the floodplain. Based on the continuation of dark earth deposit into the Anglo-Saxon period on the site, this catastrophy does not appear to have occurred. Instead there is evidence for a gradual break down in the Roman drainage system, suggesting that the drainage through the town was much more extensive then previous envisaged. Only in the Late Anglo-Saxon/early medieval period is their evidence for significant overbank alluviation and a possible breakdown in the town's drainage system. By the start of the period of monastic occupation, the Roman wall does appear to have been in need of rebuilding and the rampart slighted to a height of below 1m. It is possible that this may have been as a result of flood damage.

The post-Roman deposits suggest that conditions remained unchanged from the Late Roman period, with the environment consisting of increasingly damp grassland and areas of marsh/ponds. Evidence of cereal growth and possible seasonal grazing is also indicated within the local area. Previously it has been suggested that the River Itchen re-established its former route through the town during this period (Qualmann 1993). A possible post-Roman channel was previously identified at Pilgrims' School (Teague 2000), which was cut by a timber lined channel dated to the early medieval period. Certainly the presence of early medieval flood silts would suggest that there were active channels nearby. In fact it is possible that the Mill Stream could actually be one such former channel or Roman waterway that was later canalised in the early medieval period.

Evidence of Late Saxon activity at the site is notable by its absence. It is possible that the metalled surface identified in Trench 1 is of this date, constructed over the slighted Roman rampart along the side of the town wall (Fig. 13C). The track may have been constructed to provide access to the wall to facilitate repairs. The Roman track used in the floodplain reclamation appears to have continued in use since a silty clay deposit within Borehole 2 and 3 within Transect 1 may possibly represent a trampled dark earth surface and is perhaps consistent with the re-organisation of the town in the late 9th century. This may have part of the reconstruction of the town and its defences by King Alfred or his predecessor, intended to provide rapid access to the town walls for defensive purposes, though unlike other such streets, it was not metalled. If so, it would help to confirm Biddle's suggestion (1983, 119–26) that the new Saxon street pattern completely filled the former Roman town, including the south-east corner. However, despite this evidence the site appears to have remained unsuitable for permanent occupation.

Period of monastic occupation (c AD 970–1538)

The Mill Stream is believed to have been constructed with the re-organisation of the town in the late 9th century and to be contemporary with the laying out of The Brooks water courses north of the present High Street (Scobie 1996). Certainly the Mill Stream appears to have been established by the time of the monastic reforms in *c* 970 which enclosed the site within the precinct of the Old Minster and its successor the Early Norman cathedral (Fig. 13C). The organic alluvial silts overlying the Late Roman deposits within Transect 1 possibly indicate a rising water table and alluviation in the early medieval period as the infrastructure behind the Roman drainage systems struggled to cope. Certainly during this period a number of canalised streams flowed through the city along what is now Lower, Middle and Upper Brook Streets. It is possible that this network of organised channels re-used elements of the Roman town drainage system that fed the forum and baths. The Brooks waterways still flow through the city today but were culverted in the Victorian period.

Analysis of pollen, diatoms and micromorphology has confirmed that a return to wetter conditions occurred during this period, probably associated with increased ground water flooding and overbanks alluviation. It is possible that at certain times of the year the

Mill Stream and other managed watercourses within the town could not cope with the flow of water and overbank flooding occurred frequently over the site between the Late Saxon and medieval periods

The only significant feature from the early part of this period is the late 11th century-lined cesspit (118) that lay close to the edge of metalled surface identified on the slighted Roman rampart within Trench 1 (Fig. 13C). Its isolated nature some distance away from the monastic structures that lay to the west of site suggests it may have met the temporary needs of workers during maintenance and repair of the city/close wall.

The remains of probable fish ponds found at Pilgrims' School potentially date from the medieval period (Fig. 13D). They would have been part of the Bishop's estate and would have supplied his house with freshwater fish. The monastic orders placed restrictions on the consumption of meat so the availability of fresh fish was of some importance. It has been calculated that monks of large religious houses such as Winchester could together have consumed 1400kg of fish per year and this does not take into account guests, servants, and alms for the poor (Greene 2005, 124).

Post-medieval and modern garden soils (c AD 1538-present)

During the Commonwealth (1649–60) the Dean and canons were ejected from the Close and the properties were shared out amongst Parliamentarian supporters. Many buildings were totally or partly demolished and in 1660 the Chapter returned to a devastated Close. It was probably shortly after this time that the fish ponds were filled with remains from the demolished buildings and the site was levelled up in order to provide a base for gardens and orchards, such as those depicted on Godson's AD 1750 map of Winchester.

THE FINDS

The following are summary reports of the more significant finds recovered. Full reports can be found in the site archive.

Roman pottery by Edward Biddulph

A total of 156 sherds, weighing 2179g, was recovered from the site (Table 2). Most of the pottery – 139 sherds – was recovered from three Roman deposits in Trench 3 (319, 322 and 323), which represent dumping episodes. Most context-groups were chronologically-mixed, but the assemblage's relatively good condition suggests that its place of final deposition was close to the location of original discard and, no doubt, use. The assemblage therefore provides a good indication of pottery supply and periods of activity in the area of excavation.

Grey wares made the largest contribution to the assemblage and sandy grey ware (ZM) was dominant. Vessels made of this fabric were mainly jars, including necked jars and cooking-pot-style jars with everted rims, which arrived from the 2nd century onwards. A high-shouldered necked jar was probably earlier, mid 1st to early 2nd century. Other coarse wares were present in small quantities. Flagons and bowls were supplied in oxidised wares. Among the more notable pieces were a large flange-rimmed flagon in a sandy buff ware (YC) from deposit 323 and a bead-and-flanged mortarium, probably from a Hampshire source (although the fabric (JHA) was a greyer than usual) dating to the later 2rd or early 3rd century. A few sherds of late Roman grog-tempered ware were recorded, pointing to occupation after AD 270.

British colour-coated finewares were exclusively from the New Forest. No rims were seen, but bowls in an oxidised fabric (TF) and beakers in a reduced fabric (TR) were represented by body and base sherds. Vessels in these fabrics arrived after the mid 3rd century. Two roughcast colour-coated fragments probably belonged to beakers from North Gaul (TBB). Samian was exceptionally well represented at the site, accounting for one in every four sherds in the assemblage. . The latest pottery indicates that the groups were deposited after AD 250/70. However, the groups also contained a significant amount (15% by sherd count) of earlier 1st and 2nd century pottery. Given the character of the deposits, most of the pottery is likely to have been gathered away from the area of excavation, although the

Table 2 Quantification of Roman pottery by fabric (codes after Holmes and Matthews, forthcoming)

Fabric	*Sherds*	*% sherds*	*Weight (g)*	*% wt*
JHD: Hampshire mortarium in pale brown/orange brown fabric	1	1%	254	12%
NF: Micaceous red ware with moderate fine sand and iron oxides	4	3%	9	0%
SG: Late Roman Hampshire grog-tempered ware	3	2%	39	2%
SGA: Grog-tempered storage jar fabric	1	1%	26	1%
T: Unidentified fine ware	1	1%	3	0%
TBB: ?North Gaulish colour-coated ware	2	1%	3	0%
TCA: Central Gaulish samian ware, Lezoux	12	8%	76	2%
TCB: Central Gaulish samian ware, Les Martres-de-Veyre	1	1%	5	0%
TF: New Forest colour-coated ware (Fulford 1975a, 25, fabric 1b)	3	2%	12	1%
TR: New Forest colour-coated ware (Fulford 1975a, 25, fabric 1a)	5	3%	69	3%
TSA: South Gaulish samian ware, La Graufesenque	21	13%	92	4%
TUS(EG): East Gaulish samian ware	1	1%	10	0%
UF: Fine white ware	1	1%	2	0%
UF(NOG): North Gaulish fine white ware	1	1%	15	1%
UM: Sandy white ware	4	3%	70	3%
X: Miscellaneous fabrics of Iron Age tradition	4	3%	23	1%
XM: Handmade fabric with medium sand and common flint	1	1%	19	1%
YC: Buff fabric with medium to coarse sand and iron oxides	5	3%	202	9%
ZF: Fine grey ware	19	12%	97	4%
ZM: Sandy grey ware	63	40%	1125	52%
ZMA: Handmade black-burnished ware	3	2%	28	1%
TOTALS	156		2179	

condition of some of the pieces suggests that the pottery had not been excessively disturbed and relocated after original discard. On that basis, the pottery points to high-status later 1st and 2nd century activity (possibly commencing before AD 70) reasonably close to the area of excavation. It is worth noting that the earliest occupation at Wolvesey Palace, represented by a timber building fronting on to a street, dates to the early Flavian period (Biddle 1975, 324) and is therefore potentially contemporary with the decorated Samian bowls.

Medieval and post-medieval pottery by John Cotter

A total of 292 sherds of post-Roman pottery (6.693kg) were recovered (Table 3). Around 62% of the pottery by sherd count and 49% by weight is of medieval date (taking *c* 1500+ as post-medieval), and 38% by sherd count and 51% by weight is of post-medieval date. The pottery is in a fairly mixed and fragmentary condition, and the range of fabrics and vessel forms present is fairly typical of Winchester

Table 3 Post-Roman pottery types

Fabric	*Name*	*Date*	*Sherds*	*Weight*
UNID	Unidentified	450–1900	2	18
MBX	Chalk-temp ware	850–1150	1	13
MAV	Chalk-temp ware with flint	1000–1200	28	563
MAQ	Coarse sandy ware with flint	1000–1250	3	37
MAF	Late Saxon 'organic'-temp ware	1050–1150	8	153
MBK	Fine sandy with flint and chalk	1050–1150	1	8
MTE	Newbury B-style flinty ware	1050–1200	1	65
MAD	Tripod Pitcher ware	1050–1225	1	78
MDF	Medium grained sandy (common med)	1050–1350	16	197
MOE	Coarse grained sandy ware	1070–1225	1	14
MNV	North French green glazed white ware	1150–1300	1	2
MMG	Pink quartz-temp ware (coarser)	1225–1400	3	23
MMH	Common white ware	1225–1400	42	472
MMI	South Hampshire red ware	1225–1400	28	409
MMQ	Pink quartz-temp ware (finer)	1225–1400	6	80
MCK	Kingston-type ware	1240–1400	1	45
MDG	Late med red ware	1350–1500	7	185
MLB	White ware (Coarse Border ware?)	1350–1500	2	15
PN	White ware (Cheam?)	1350–1500	2	70
MMS	Late med red ware (coarser)	1400–1550	18	425
PFR	Raeren stoneware	1475–1550	7	241
PFF	Frechen stoneware	1525–1750	3	64
PG	Surrey/Hants Border ware	1550–1700	43	1015
PB	Post-med glazed red earthenware	1550–1900	10	328
TGW	English tin-glazed ware	1570–1800	22	262
WEST	Westerwald stoneware	1590–1750	7	156
PMR FLP	Post-med redware flowerpot	1650–1900	1	6
PV	Verwood ware	1650–1900	19	1376
CREA DEV	Developed Creamware	1760–1830	1	12
TPW	Transfer-printed whiteware	1780–1900	1	2
YELL	Yellow ware	1780–1900	1	14
REFW	Refined white earthenware (Staffs etc)	1800–1900	1	2
ENGS BRST	English stoneware (Bristol glaze)	1830–1900	4	343
TOTAL			292	6693

(Cunliffe 1964; Holmes & Matthews *forthcoming*, Cotter 2011).

Apart from the Roman pottery, the earliest pottery present on the site comprises handmade Late Saxon and early medieval local wares covering the period from the 9th century through to the early 13th century. However, only a single very worn sherd of chalk-tempered ware (MBX) is likely to be pre-conquest. The other chalk, flint, and sand-tempered wares (MAV, MAD, MAF, MBK) are likely to be of 11th–12th century date and some of these are residual. Small timber-lined pit 118, produced fresh sherds of two vessels which are probably contemporary fills. These included sherds from a single chalk and flint-tempered cooking pot (MAV, context 122) and a large fresh sherd in Tripod Pitcher ware (MAD, context 120) datable *c* 1050–1225.

The medieval pottery (13th to early 16th century) comprised local unglazed sandy cooking pot fabrics (MDF mainly) and wheel-thrown glazed jugs, some with applied strip decoration. These are predominantly South Hampshire redwares (MMI), together with similar glazed whiteware (MMH) and pink ware jugs (MMQ, MMG) dating to *c* 1225–1400. At the base of the waterlogged medieval sequence here were four deposits which produced relatively high quantities of medieval glazed jug sherds (contexts 308, 318, 309 and 310). These may date solely to the 14th century but the presence of sherds tentatively identified as late medieval red ware (MMS, or a coarse variant of the South Hampshire redware MMI), and one or two sherds of possible late medieval whitewares (PN) suggest an overall date of *c* 1375–1450 may be likely for the deposition of this material. Other than Hampshire products there are a few sherds from green-glazed Surrey or Surrey/Hampshire border whiteware jugs and a cooking pot (MCK, MLB, PN). There is also a single small sherd from a North French green-glazed whiteware (MNV) jug with applied scale decoration and probably dating to *c* 1250–1325 (residual in 303). Late medieval imports include a few Raeren stoneware drinking mugs from the Rhineland – a common import of the period *c* 1475–1550. Most of the post-medieval pottery occurs in just one or two contexts (mainly 207) apparently dumps of rubble and pottery, and from garden soils. These include types closely datable to *c* 1680–1725 or to 1750.

Architectural stone by Alison Kelly and Julian Munby

Four worked limestone items were recovered from context 209, a 0.53m thick rubble make-up/dump layer that also contained 17th–18th century pot and glass. The only noteworthy piece was ST1, an octagonal shaped piece with a curved interior suggestive of a font or basin (Fig. 14). This appears to be a finely worked piece, however, the upper face of the rim has score lines and some tool marks, which would normally have been hidden beneath a font cover protecting the holy water within. There is detailing to the edge with hollow chamfer and fillet moulding, dating from the 14th/15th century.

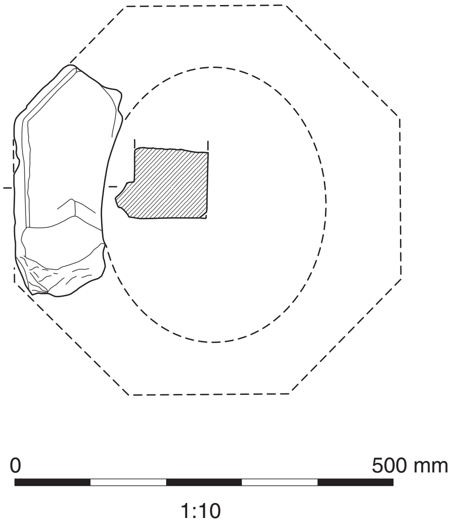


Fig. 14 Octagonal shaped piece of limestone, possibly a basin or font

Worked wood by Steven J Allen

Thirty pieces of waterlogged wood were recovered, which included ten oak boards used to line medieval cess pit 118. Five of the timbers have been dated by dendrochronology, suggesting felling during AD 1091. The boards have radially faced conversions and were cut from fairly straight grained and generally knot free timber. Each board was finished with a dressing axe, used to remove small shavings and remaining irregularities from the surface. The absence of shrinkage or woodworm damage would indicate the boards had been seasoned before use. Only one (133) has slight woodworm damage, indicating that the other boards were put into the ground before wood boring beetles could attack them. These are, however, high quality boards and it is quite possible that they originate in offcuts from much longer boards, which have been cut to length for another purpose.

We can say that the boards were properly prepared for use in the cesspit where they were located on site, and therefore the felling date of the timbers provides a date within a year or so of when they were placed in the ground. Many have both edges hewn to produce a point that could be driven into the subsoil to anchor their lower ends. The others generally have a slight bevel, which could achieve the same purpose. None of the boards survived to their full original height, and we cannot be sure whether the boards were tied or fastened to their neighbours.

Metalwork by Leigh Allen and Paul Booth

A total of seven copper alloy objects and 152 iron objects were recovered from the excavation at the site, mostly from rubble dumps and make up layers of both Roman and post-Roman date. All copper alloy finds were of Roman date or from Roman contexts and comprise four coins, two miscellaneous fragments of sheet and an amorphous lump of melted copper, possibly waste from copper working. The four coins are of late 3rd century date and in moderate to good condition.

SF 10. IMP C TETRICUS P F AUG. Rev, PA[X AUG, Pax left. Irregular. AD 270–273 or later.
SF 12.] TETRICUS [. Rev, standing figure. Irregular. AD 270–273 or later.
SF 15. IMP C CARAUSIUS AUG. Rev, MO]NET AUG, Moneta left. AD 286–293.
SF 20.] C CLAUDIUS [. Rev, ?MARTI [, Mars left. AD 268–270.

The issues of Claudius II and Carausius appear to be regular, though on the latter coin the dies are quite imperfectly located on the large flan. The two certainly irregular coins could date as late as *c* AD 295.

Leather by Quita Mould

Leather was recovered from three contexts [309, 319 and 322] in Trench 3. At least two shoes of nailed construction and a shoe of one-piece construction along with a very small amount of waste leather were recovered from Roman deposits [319 and 322]. Shoe parts of medieval date were found in a deposit of upper peat [309] tentatively dated to the 14th-early 16th century.

Clay tobacco pipes by John Cotter

The excavation produced a total of 98 fragments of clay pipe weighing 459g, which include a small number of interesting stamped pipes. The largest number of fragments came from context 207 (63 fragments), which produced the widest range of datable pipes including all three stamped examples. Pipe bowls from this context range in date from *c.* 1600–40 to *c.* 1690–1730. The three heal stamped pipes are all 17th century types. Two of the stamps are heart-shaped, one with initials TR and the other possibly figurative or heraldic. The remaining stamp was of a mailed gauntlet.

Worked bone by Leigh Allen

Two worked bone objects were recovered from the archaeological investigations; a fragment from a Roman bone pin (SF 17) came from the reclamation deposits (319) and a heavily used/worn cattle metacarpal came from context 310.

Animal bone by Lena Strid and Rebecca Nicholson

A relatively small assemblage of animal bone was recovered from the excavations, consisting of 1605 fragments. Approximately 50% (820 fragments) of these have been summarily recorded and of these 318 (38.8%) of bones were identified to species. Just under half of the identifiable assemblage was recovered from Roman contexts, with the remaining bone mainly recovered from late medieval or post-medieval dumps of uncertain provenance, and hence of limited value.

Considering the small number of speciated bones, a wide range of animals were present in the Roman contexts. Taking the assemblage as a whole, the three common domesticates: cattle, sheep and pig dominated by number of fragments, but also present were bones from horse, roe deer, dog, cat, and domestic fowl, together with indeterminate fish and micro-mammals, rodents and amphibians.

The medieval assemblage also included bones from hare, partridge, rat, duck and goose as well as salmon or sea trout and conger eel. Disarticulated human bone was recovered from post-medieval contexts 306 and 103.

THE PALAEOENVIRONMENTAL EVIDENCE

The following are summary reports. Full reports and tabulated data can be found in the site archive (http://library.thehumanjourney.net/680/).

Waterlogged plant remains by Wendy Smith

Following an assessment by W. Carruthers, archaeobotanical samples from Trenches 1 and 3 were fully analysed. Nomenclature follows Stace 1997.

Sample 7 (Roman dump deposit context 319) contained one mineralised concretion and a number of food plants; fig (*Ficus carica* L.), hazel (*Corylus avellana* L.) nutshell, blackberry (*Rubus* section Rubus), strawberry (*Fragaria vesca* L.), sloe (*Prunus spinosa* L) and elderberry (*Sambucua nigra* L.). Traces of waterlogged and charred wheat (*Triticum* sp.) chaff and waterlogged possible barley (cf. *Hordeum* sp.) chaff also were noted. The weed/ wild component is more typical of grassland/ meadow than weeds of arable crops and is dominated by taxa such as buttercups (*Ranunculus acris* L./ *repens* L./ *bulbosus* L. and *Ranunculus* subg. Ranunculus), self-heal (*Prunella vulgaris* L.) and sedge (*Carex* spp.). A small-sized, clearly wild flax seed was relatively frequent in this sample. It has been identified as fairy flax (*Linum catharticum* L.). Fairy flax normally is a plant of dry or sandy soils, which could suggest a source outside the immediate area of the Cathedral Close.

Sample 9 (context 322) was broadly similar to sample 7, but not as rich. A more limited range of native nuts and fruits were observed, and a walnut (*Juglans regia* L.) nutshell fragment was also recovered. Walnut is a Roman introduction to Britain (van der Veen *et al.* 2008, p. 13 table 1) but its presence does not preclude material of mixed chronological origin entering this layer (possibly through re-working) or deposition occurring over an extended period of time. The weed/ wild taxa recovered were again typical of grassland, such as river meadow, rather than arable weeds of crop.

Both the waterlogged and dry flots from sample 53 (medieval pond context 150) were dominated by a limited and robust range of wild taxa such as elder (*Sambucus nigra* L.), nettle (*Urtica dioica* L.), hemlock (*Conium maculatum* L.) and, especially, henbane (*Hyoscyamus nigra* L.). Henbane and common nettle are both typical of soils with a high nitrogen content, often in close association with cattle (Stace 1997, 117 and 527). However, with such a limited range of taxa this should be treated with some caution.

Two samples from a timber-lined pit (feature 118) were collected. Sample 5 (120) frequently contained waterlogged fragments of cereal bran, small quantities of wheat (*Triticum* sp.) chaff and a relatively rich assemblage of native fruit and nut species. Minute and unquantifiable fragments of corncockle (*Agrostemma githago* L.) seed coat were frequently noted. The weed/ wild taxa included a range of arable weeds such as common/ long headed poppy (*Papaver rhoeas* L./ *dubium* L.), fumitory (*Fumaria* spp.) and goosefoot/ orache (*Chenopodium* spp./ *Atriplex* spp.). Sample 6 (122) produced abundant cereal/ large grass (Poaceae) stalk fragments. Notably, this sample was not as rich in terms of food plants. Markedly fewer seeds of weed/

wild plants were present in this sample, but this may be a factor of the large concentration of cereal straw contained in this deposit. Carruthers (2005, 161) has suggested that cereal straw, as well as rush and sedge stems, would have been used in pits, especially cess-pits, to soak up liquid and, possibly, damp down odours. Such an explanation may explain the abundance of cereal straw in the deposit and the limited recovery of other remains, such as foodstuffs or weed/ wild taxa.

Three samples were taken from a vertical stratigraphic sequence of organic, "peaty" silts. In both cases, these samples only produced a few identifications of elderberry (*Sambucus nigra* L.), with no other non-cereal foodstuffs noted. The upper sample (sample 2, context 318) had a relatively limited range of weed/ wild taxa recovered; however, sample 3 (context 309) produced a diverse and relatively abundant weed/ wild flora typically found in grassland. Given an abundance of fly puparia, particularly in sample 3, it seems likely that both of these deposits are related to stabling matter (including manure), rather than any other possible accumulation of straw rich material (disused thatch, bedding, floor litter, etc). The lowest sample in this sequence, sample 4 (context 310) was slightly different. First, only a single culm node of cereal/ large grass was noted and cereal/ grass stalk fragments were otherwise absent. Second, although limited, a wider range of food plants were recovered; such as hazelnut (*Corylus avellana* L.) and strawberry (*Fragaria vesca* L.), in addition to elderberry (*Sambucus nigra* L.). The weed/ wild taxa recovered are most frequently attributed to grassland taxa or wetland/ water plants. Wetland/ water plants recovered include arrowhead/ water plantain (*Sagittaria* spp./ *Alisma* spp.), bulrush (*Typha* sp.), common/ slender spike rush (*Eleocharus palustris* (L.) Roem. and Schult/ *uniglumis* (Link) Schult.), duckweed (*Lemna* spp.), pondweed (*Potamogeton* spp.), rush (*Juncus* spp.) and sedge (*Carex* spp.). These waterside/ water plants are not food plants for cattle or other livestock and, therefore, are more likely to derive from a flooding event, or possibly riverbank or river channel clearing.

Insects by David Smith

Six samples from a vertical sequence of deposits within Trench 3 were chosen for analysis based on the recommendations made in an earlier assessment phase (Smith 2005). The taxonomy for the Coleoptera (beetles) follows that of Lucht (1987).

The two later prehistoric – Roman insect faunas (from contexts 323 and 322) give an indication of the water conditions and landscape that existed on the floodplain. In both faunas, species from the wider environment are dominant, with the majority associated with aquatic conditions and watersides. Both faunas contain a range of 'elmid' riffle beetles. Species such as *Elmis aenea, Oulimnius, Limnius volckmari and Riolus subviolaceus* are usually found in clear, fast flowing water where they are associated with rough water and riffles (Holland 1972). Equally, these species are often associated with gravely and sandy stream beds (Holland 1972; Smith and Howard 2004). *Riolus subviolaceus* is also associated with calcareous waters (Holland 1972; Friday 1988). Other water beetles recovered are associated with slower areas of water such as pools and slack water in river systems. Typical of this type of water conditions are the 'diving beetles' *Coelambus parallelogrammus* and *Colymbetes fuscus*, the Hydraenidae and the hydrophilids *Coelostoma orbiculare, Cercyon ustulatus* and *Chaetarthria seminulum* (Hansen 1986: Nilsson & Holmen 1995). There are indications that duckweed (*Lemna* spp.) and water-milfoils (*Myriophyllum* spp.) covered the water surface in some parts of the channel. This is indicated by the weevils *Tanysphyrus lemnae* and *Eubrychius velutus* which feed only on these species of plants (Koch 1992).

Other species recovered from the Roman organic silt are associated with rough ground, agricultural land or pasture. Ground such as this, in and around settlement, is often favoured by the carabid 'ground beetles' *Nebria brevicollis, Pterostichus madidus* and *Calathus fuscipes* (Lindroth 1974). Several of the weevils recovered are associated with a range of weed species of plant common in rough ground and grassland such as clover (*Trifolium* spp. – the host plants of *Sitona lineatus*), vetches (*Vicia* spp. – the host plants of *Sitona suturalis*) and plantains (*Plantago lanceolata* L. – the host plant for *Gymnetron labile, G. pascuorum* and *Mecinus pyraster*) (Koch 1992). Equally, several of the elaterid 'click beetles', such as *Agriotes* spp. and *Adelocera murina* are also associated with this type of environment. There is also evidence for stands of stinging nettle (*Urtica dioica*) since this is the host plant of *Brachypterus urticae, Apion urticarium* and *Cidnorhinus quadrimaculatus*. Also recovered were a range of *Aphodius* 'dung beetles' which may be associated with cattle (and other large herbivore) dung, lying in open pasture (Jessop 1986).

There is also evidence that rubbish material from settlement entered these deposits. This is most clearly suggested by the recovery of a wide range of species that are synanthropic or that Kenward (Hall & Kenward 1990; Kenward & Hall 1995) has labelled as 'the house fauna'. Synanthropic species account for 26.4% of the fauna recovered. This includes a species such the cryptophagids, lathridiids, *Typhaea stercorea* and the two species of 'spider beetles' *Tipnus unicolor* and *Ptinus fur*. The 'woodworm' *Anobium punctatum* and the 'powder-post beetle' *Lyctus linearis* are also often associated with prepared timbers in buildings. *Dermestes* spp. and *?Attagenus pellio* are both particularly strong synanthropes that are mainly associated with housing and very established settlements (Kenward 1997). Also present are several individuals of grain pests such as the 'granary weevil' *Sitophilus granarius*, the 'saw toothed grain beetle' *Oryzaephilus surinamensis*, the 'rust red grain beetle' *Laemophloeus ferrugineus* and the 'small eyed flour beetle' *Palorus ratzburgi*. There is also a hint that human or animal cess may have entered this deposit since this material is favoured by the larvae of the *Sepsis* flies (Smith 1989).

The insect faunas from the Roman deposits in Trench 3 therefore appear to indicate that The Itchin as it passed through this area of town contained both still pools and fast flowing 'riffles' at this time. There is also clear evidence settlement waste, including discarded grain and cess, was dumped into this area of low-lying land.

The lower (sample 51: context 310) of the two deposits (309 upper peat and 310 lower peat) from the post-Roman – medieval 'peat' layers produced an insect fauna which was essentially similar to that recovered in the Roman period, suggesting that river conditions and the landscape was similar in the two periods. There is evidence for both fast flowing and slow flowing waters with many of the same species of water beetles and riffle beetles recovered. Rough grass or waste ground in the area is suggested by the phytophage species of beetle recovered with many of the same taxa present as seen in the Roman period including a range of indicators for sting nettle. Additional indicators for grassland in this sample are the 'garden chaffer' *Phyllopertha horticola*, the 'click beetle' *Athous haemorrhoidalis*. *Aphodius* 'dung beetles' indicate that cattle or other herbivores grazed in the area. Similar to the samples discussed above for the later prehistoric – Roman period, there are again indications that waste material was dumped into this area of low-lying ground. This is suggested by the presence of a number of Kenward's 'house fauna' and other synanthropes. This includes the 'carpet beetle' *Anthrenus* and a range of 'grain pests'.

Context 309 (sample 49) is strikingly different. Only 8.7% of the beetle fauna recovered came from either the wider environment or nearby bodies of water. The vast majority of the fauna consists of a range of synanthropic species such *as Xylodromus concinnus, Cryptophagus, Enicmus minutus, Mycetea hirta, Tipnus unicolor* and *Ptinus fur*. Perhaps more indicative of the nature of this deposit is the presence of a range of species, which Kenward and Hall (1997) suggest is particularly indicative of stabling material. The clearest indicator for this is the comparatively large numbers of *Anthicus formicarius* recovered. This species is associated with the hot interiors of large fermenting middens of stable waste (Koch 1989; Smith 2000). Kenward (Kenward & Hall 1997) has also suggested that the 'rove beetles' *Lithocharis* spp. and *Leptacinus* spp. and *Monotoma picipes* are often associated with stable waste in the archaeological record. Both the 'house fly' *Musca domestica* and the 'stable fly' *Stomoxys calcitrans* are also often found in this type of deposit (K.G.V. Smith 1989). It is therefore fairly clear that this layer represents a solid dump of stable waste discarded into this area of low-lying ground.

Diatoms by Nigel Cameron

Boreholes 3 and 13 were sub-sampled for diatom evaluation from the same levels that were sampled for pollen analysis. Diatom assemblages of high quality were only present in the four uppermost samples from BH3 and are composed mainly of benthic and epiphytic (or other attached) non-planktonic diatoms. These non-planktonic diatoms are restricted to the photic zone in shallow-water. However, three samples have a small component of open water, planktonic diatoms eg.*Cyclotella kuetzinghiana*, *Cyclotella radiosa, Melosira varians* (the latter species appears from the scan of the slide to be absent in any numbers in BH3 at 2.38m). The dominant diatoms in all four samples are epiphytic or are from other non-plankton habitats (epilithic, epipsammic). Common epiphytes include *Cocconeis placentula, Achnanthes lanceolata, Fragilaria brevistriata, Fragilaria pinnata and Fragilaria construens* var. *venter*. In addition the benthic, mud surface habitat is represented by species such as the large diatom *Gyrosigma attenuatum*.

Aerophilous, desiccation tolerant, diatoms associated with semi-terrestrial habitats (damp soil) or sediments subject to cycles of wetting and drying, or from the inwash of eroded bank or terrestrial sediments form a small component of the diatom assemblages in BH3. The exception is in the top sample where the aerophile *Navicula cincta* is common along with the presence of other aerophilous taxa such as *Pinnularia microstauron* var. *brebissonii, Hantzschia amphioxys* and chrysophyte stomatocysts. However, a number of true aquatic, non-planktonic diatoms such as *Achnanthes lanceolata, Diploneis oblongella, Fragilaria virescens* and *Fragilaria brevistriata* are also common in this sample.

A rare occurrence of a few valves of *Didymosphenia geminata* (found on both coverslips prepared from the sample) is restricted to the sample from 3.55m in BH3. This species is generally found in low numbers in the north of the UK in circumneutral, oligotrophic rivers in cooler temperatures (Kaweka and Sanecki 2003). The record in Winchester seems to be a southerly record for the species in the UK, where *Didymosphenia* is typically a small component of the diatom assemblage of streams in northern Britain. The species is usually found in clean, unpolluted water, in cool and unshaded conditions. *Didymosphenia geminata* is found where there are low rates of water flow and stable habitats where there is a low level of scour and with low levels of suspended solids. The presence of the rheophilous diatoms *Meridion circulare* and *Melosira varians* in samples from BH3 also indicate the presence of flowing water. The nutrient levels indicated by the diatom assemblages in BH3 are likely to be moderate or low.

In addition a rapid scan (phase contrast ×400 magnification) was made 26 samples prepared from Trench 3. Ten of these samples with high or moderately high concentrations of diatom valves were evaluated further.

Samples from context 319 (a Roman dump deposit) have in common a range of non-planktonic aquatic species. The species include the consistent presence of a number of *Fragilaria* taxa (*F. brevistriata, F.construens* var. *venter, F. lapponica, F. pinnata*) which are early colonisers of new and ephemeral aquatic habitats. However, there is a diverse range of other diatom types in this group of samples and the assemblage does not show evidence for mixing of diatoms from disparate sources. Other common species include *Achnanthes minutissima, Amphora pediculus* and *Cocconeis placentula* and its varieties. *Amphora pediculus* is particularly common in two of the samples along with *Cymbella sinuata* in one of them. These and other common taxa may grow both as epiphytes or as benthic species. However, the presence of relatively high numbers of *Achnanthes* species (*A. lanceolata* and its varieties, *A. minutissima, A. lauenburgiana*) probably reflects the presence of a large aquatic macrophyte habitat. Further, from the skeleton counts of common taxa there appear to be changes in the relative numbers of these species.

Diatom assemblages derived from peat are often poorly preserved. However, the quality of diatom preservation is excellent in the samples from contexts associated with peat formation (from contexts 310 and 309). The presence of rheophilous diatoms in some samples has been noted, eg. *Melosira varians* is particularly common in a sample from (310). Maxima of *Cocconeis placentula* occur in this group of samples. This species is commonly epiphytic. Also of note is the common occurrence of *Achnanthes hungarica*. This diatom is particularly associated with the water plant *Lemna* and moderately high levels of nutrients.

Samples from the probable flood deposits (308 and 318) again have a range of non-planktonic diatoms. The quality of preservation in these samples is poorer and there is more silt visible on the diatom slides. There are also some indications from the diatom composition that the assemblages are derived from flooding. The dominant components of the assemblage have changed compared with the underlying levels. For example *Achnanthes minutissima* is common in (318), *Amphora veneta*, and *Fragilaria vaucheriae* in both (318) and (308). A range of *Nitzschia* taxa *(N. amphibia, N. frustulum, N. palea* and undifferentiated *Nitzschia* spp.) also become more common. These *Nitzschia* spp. are often found growing where nutrient levels are moderately high. This is also supported by the consistent occurrences of *Gomphonema* spp. (*G. angustatum* var. *productum, G. clavatum, G. minutum, G. parvulum, G. truncatum*) in one of the samples. These attached diatoms are often associated with higher nutrient levels.

Mollusca by Carl Champness

Mollusca from 9 samples were analysed, deriving from a range of different deposits within the former river Itchen floodplain and cover the early prehistoric to the late medieval period. Preservation and abundance was highly variable, ranging from low to poor from the samples examined from the palaeochannel sequence in BH2 and moderate to good from the floodplain sequence in BH14. The samples from the floodplain sequence, contexts 1404, 1405, 1406, 1407 and 1408 produced well preserved and rich assemblages. Also sample 52 (154) from part of the possible Roman rampart deposit and sample 53 from possible medieval pond fill (150) produced a rich assemblage of well preserved shells.

Floodplain taphonomies can be difficult to interpret as the molluscan assemblages can be very mixed and receive inputs from several sources. A pragmatic approach has been adopted here, in that the samples are taken to represent the wider floodplain environment and due consideration has been given to the fact that they are likely to have undergone a degree of reworking.

The pre-Roman floodplain assemblage (contexts 1405–1408) consisted of totally open country/wetland grassland fauna up until the Early Roman period. They include, *Vallonia pulchella, Vallonia excentrica, Succinea* or *Oxyloma, Cochlicopa lubericella, Trichia hispida and Cepaea sp.* A small range of freshwater species of *Valvata cristata, Valvata piscinalis, Bithynia sp. and Lymnaea truncatula* were also present. The presence of both a typical damp grassland fauna with a amphibious element have been previously thought to indicate floodmeadow (Robinson 1992). The presence of certain slum species like *Anisus leucostoma* would indicate that this environment was seasonal inundated and would probably have been lightly grazed.

The Early Roman soil assemblage (context 1404) shows a continuation of open grassland conditions and a gradual reduction in aquatic species. The presence of *Vallonia costata* and *Vallonia excentrica*, and absence of *Vallonia pulchella*, might indicate a drying out of the floodplain consistent with Roman drainage of the site. The reduction of fresh water and slum species within the sample corresponds with the reclamation of the floodplain in the 2nd century AD within the Roman town. The Early Roman land surface would likely have become much drier as indicated by the increase of terrestrial/marsh species compared to that of aquatics. The area may still have been prone to waterlogging and occasional flooding as indicated by the presence of *Valvata cristata* and *Valvata piscinalis* within the assemblage. By the time of the construction of the Early Roman town rampart (context 154), the assemblage is still dominated by a mixture of terrestrial open country species, but sees a resurgence of freshwater elements. The presence of *Vallonia pulchella, Vallonia excentrica* and *Pupilla muscorum* would indicate that the rampart was kept relative free of shrub vegetation.

The overlying medieval alluvial silts (307) produced a more diverse and abundant assemblage of both shade-loving and wet grassland species. The presence of *Discus rotundatus* and *Carychium minimum,* alongside drier grassland species like *Vallonia costata* and *Pupilla muscorum* would suggest a mosaic of both open and more shaded environments existed on the floodplain. The nature of this deposit and high number of fluvial species in the deposit like *Valvata piscinalis* could indicate that a percentage of this assemblage has derived from flooding.

Context 150, from the possible fish pond contains more of a terrestrial assemblage. There is nothing within the assemblage to suggest standing water. Shade loving species of *Discus rotundatus*, *Carychium minimum* and *Oxychilus cellarius* appear in the assemblage, possibly indicating the presence of nearby hedges or scrub vegetation and possible shaded environments. Open wet grassland fauna continued to dominate, which may indicate that a much more diverse range of habitats existed in the area at this time. One note of caution is that this mixed assemblage could also be the result of reworking caused by the practice of rubbish dumping within the pit fills.

Soil micromorphology, pollen, chemistry and magnetic susceptibility by Richard Macphail, John Crowther and Gill Cruise

The Early Holocene to late medieval natural sediments and anthropogenic deposits at Pilgrims' School, Winchester underwent bulk chemical (and magnetic susceptibility), pollen and soil micromorphological assessments. Seven bulk, 16 pollen and 12 thin section samples were considered. These assessments allowed the microstratigraphic investigations to focus on key locations in the sequences from three important locations, namely boreholes 3 and 13, and monolith 36 (Trench 3).

Full analysis of 13 bulk, 9 pollen and 13 thin section samples from two borehole and one monolith sequences, recorded natural sedimentation and anthropogenic activities from Mid-Holocene to medieval times (full report in archive and see Fig. 3 for pollen from BH13). During the Mid-Holocene (Phase I) reed and swamp carr was affected by hydroseral succession(s), which involved the invasion of alder and other broad-leaved woodland and the episodic formation of soils within peat and humic alluvial sequences. Palynology also identified seral regression and decline in alder and other tree species, as well as possible Mesolithic affects on this woodland, which could also be inferred from the presence of possible detrital charred bark in thin section. The site then underwent woodland regeneration and the possible effects of Early Neolithic (*c.* 4000 BC) local grazing and cultivation of drier ground as recognized in the pollen data. Late prehistoric to 2nd century AD (Phase II) alluvial sedimentation appears to show the impact of human management on the stream, with intermittent sedimentation and ephemeral soil development, and with anthropogenic inclusions indicating low to moderate levels of middening at times. The area seems to have been almost totally cleared of woodland and can be described as a 'fen meadow' mainly employed for grazing, at a time when it was probably too wet to allow middening. During the 3rd–4th centuries AD (Phase III) deposits are anthropogenic in character, and associated with likely ground-raising employing the dumping of both wetland and dryland soils, along with anthropogenic domestic and industrial waste. It is possible that, as found elsewhere in Roman England and locally within Winchester, such ground-raising activities ceased and dark-earth like soils formed when urban populations and activities declined; these dark earth soils were then affected by renewed midden dumping in this Late Roman Period. Alluvial sedimentation then ensued at some locations. Post-Roman and medieval Phase IV and V sedimentation was often dominated by dumping of large amounts of domestic, constructional and especially stabling waste.

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