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# Between River, Priory and Town: Excavations at the former Cambridge Regional College site, Brunswick, Cambridge

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*Excavations on the south bank of the River Cam provided a rare opportunity to study preserved prehistoric, Roman and medieval land surfaces, flood deposits and hillwash, beneath which were Early Neolithic pits. During the medieval period, the land lay adjacent to Barnwell Priory, one of the wealthiest and most important religious establishments in East Anglia. Large quantities of imported soil were dumped here during the 13th to early 16th centuries, perhaps to facilitate farming or to improve access to the river. The dumped material contained a diverse assemblage of finds including book fittings and iron working waste.*

## Introduction

Oxford Archaeology East undertook archaeological works in advance of a new housing development on the former Cambridge Regional College site, Brunswick, which lies adjacent to Midsummer Common (Fig. 1; TL 4604 5894). An evaluation in 2009 uncovered a probable medieval cultivation soil in the north-western corner of the site, which perhaps derived from middens associated with Barnwell Priory (Atkins 2010a). Subsequent excavation of this deposit (c. 450 m<sup>2</sup>) took place in 2010 and found evidence of underlying prehistoric and Roman buried soils. These deposits were investigated using a chequerboard of 5m squares to examine alternate hand excavated squares (HES) 1–12; (Fig. 2) and were also recorded in section (e.g. Fig. 3). The individual buried soils within each square were assigned a context number and excavated in 20cm spits, subdivided 1 to 4 (e.g. context 123.1), the spits broadly equating across contexts. These contexts were grouped together in three 'layers' (1–3), reflecting their prehistoric, Roman and medieval/early post-medieval dates.

This article is designed as a synthesis of the excavated findings and is supplemented by the full analytical reports which can be freely accessed at <http://library.thehumanjourney.net/view/subjects/UK-Medieval.html>.

## Geology and Topography

The underlying geology of the site is Gault clay overlain by 2nd Terrace gravels in the northern part, with a thin tongue of chalk in the north-eastern corner (British Geological Survey 1981). The terrace gravels were laid down by previous courses of the River Cam under predominantly cool or cold (glacial) climatic conditions (Boreham 2002). An ancient (Palaeolithic) course of the River Cam originally flowed northwards close to this location, while several undated palaeochannels of possible prehistoric origin were observed during a watching brief c. 1km to the north-west of the site in 2004–8 (Cambridgeshire Historic Environment Record (CHER) 1447; Davenport *et al* 2008, 23–28 and fig. 6). The River Cam moved progressively towards a more easterly-flowing course, so that by the Upper Palaeolithic it adopted a route similar to that of the present day.

The river currently flows close to the northern boundary of the development area at a height of c. 4.9m OD. From the river to the site (a distance of approximately 60m), there is a gradual rise in ground height to c. 8m OD. The site's northern boundary sits on a steep east to west bank, more than 1.5m in high, at 9.6m OD. Excavation has now confirmed that this bank in part resulted from human modification. The height of the land increases towards Newmarket Road to the south, where it lies between 12.20m OD and c. 13.20m OD.

Riverine flood deposits have been recorded across Midsummer Common: 17th-century pottery and a residual Roman sherd were recovered from the uppermost levels (Davenport *et al* 2008; Boreham 2002, 26).

## Archaeological and Historical Background

Several archaeological findspots and sites lie close to the east and west of the development area (Fig. 1). Palaeolithic implements include an abraded hand axe found by a gravel digger in 1878, 200m to the south-east of the subject site (CHER 04531). An Early Bronze Age type 'A' Abercromby Beaker was found 50m to

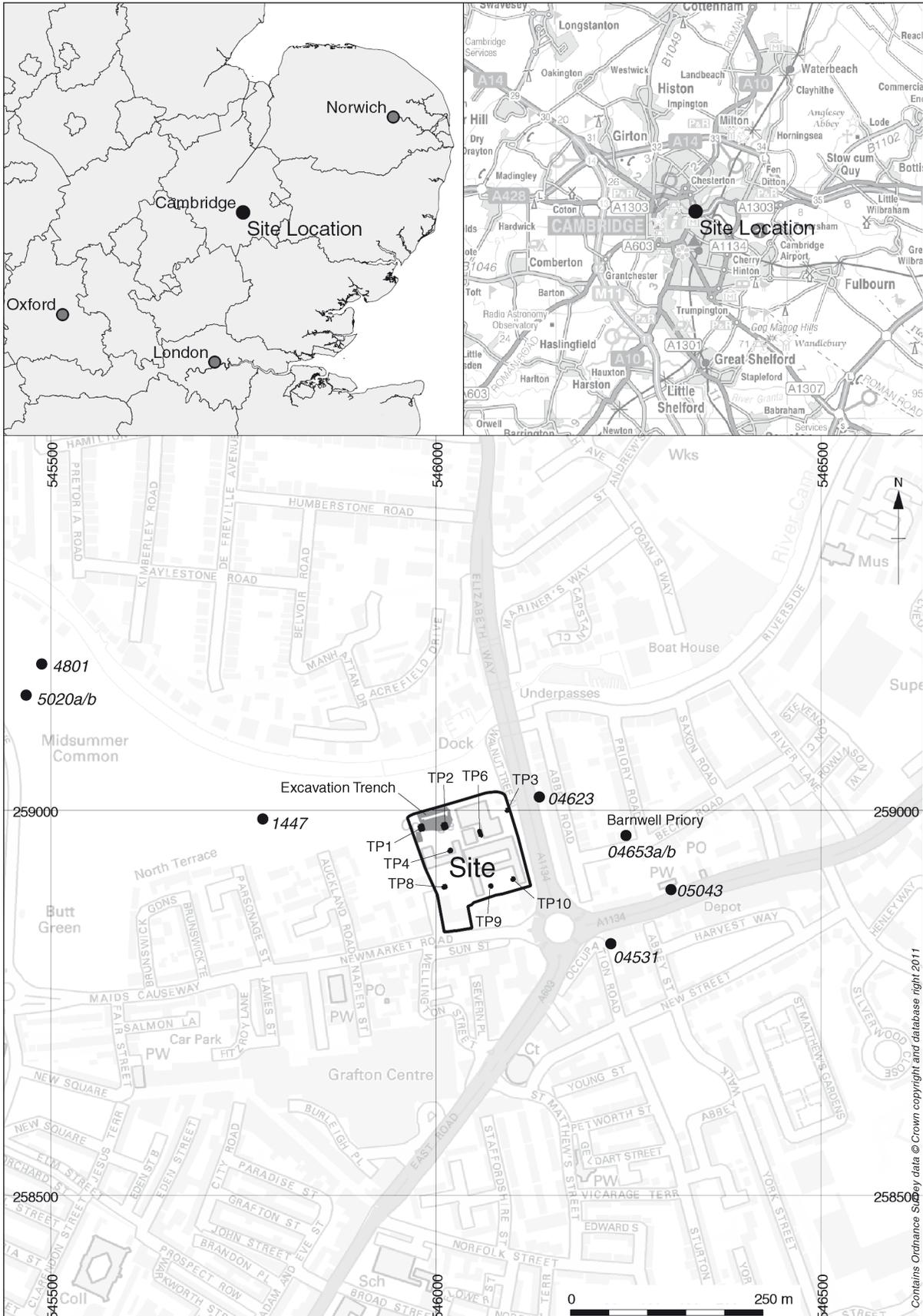


Figure 1. Site location and surrounding CHER sites mentioned in the text.

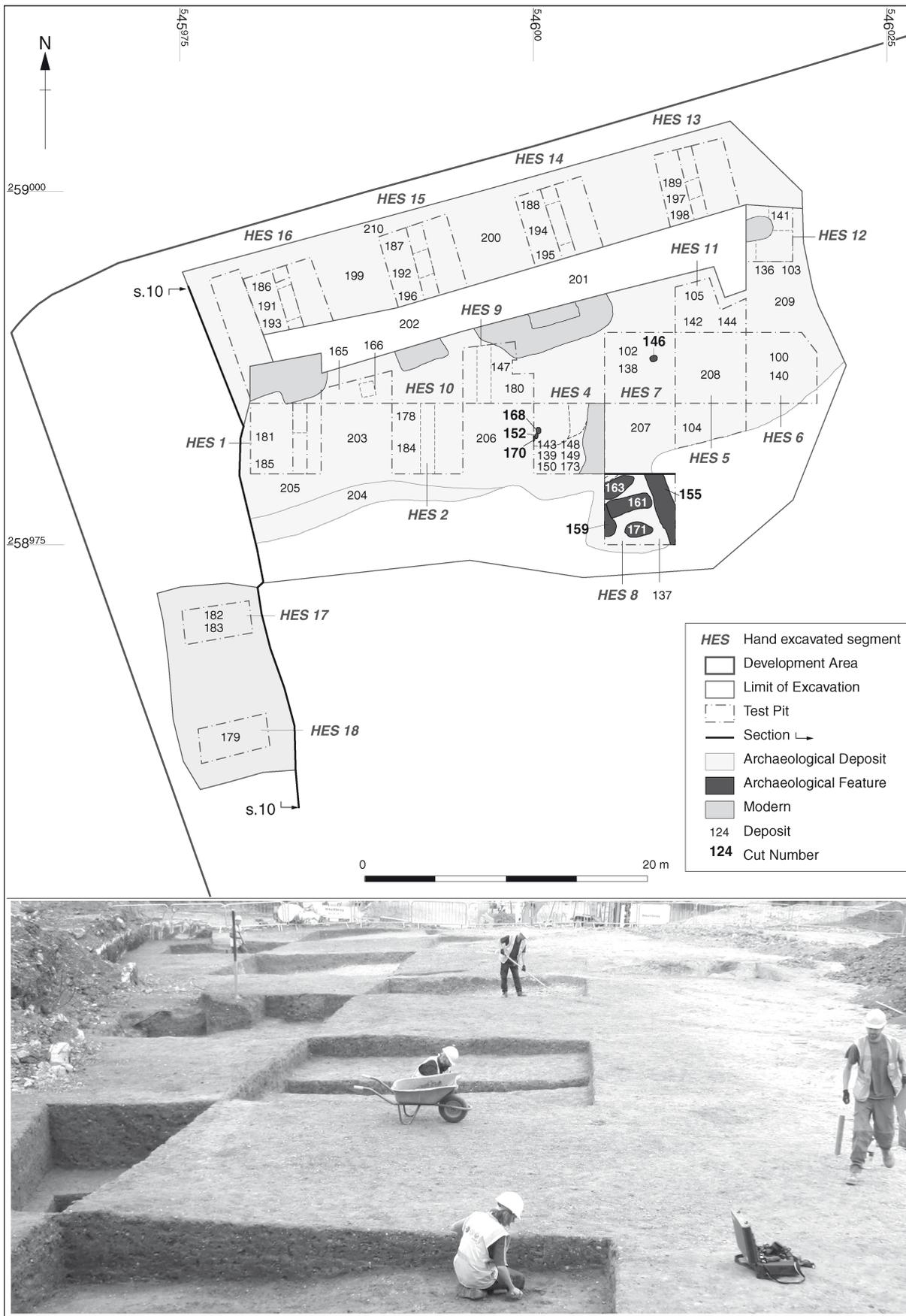


Figure 2. Site plan and the site during excavation (looking east).

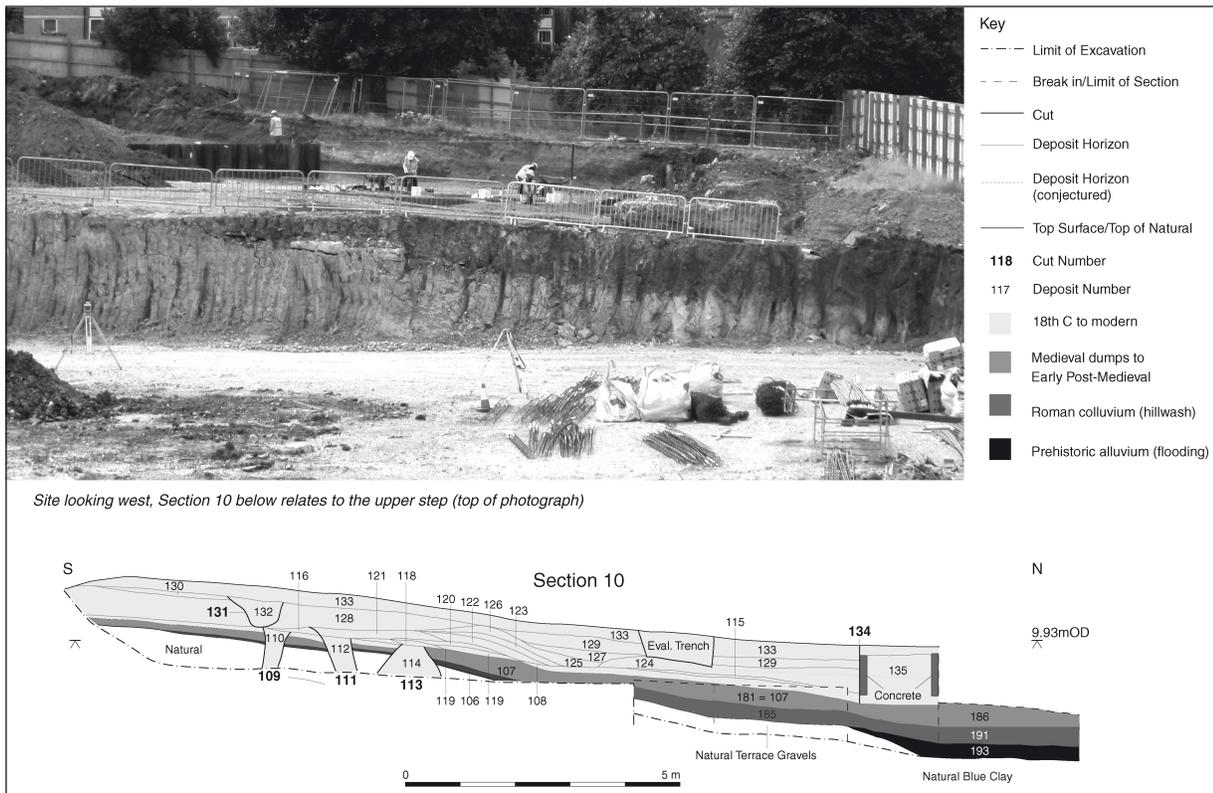


Figure 3. Section across the various deposits, sloping towards the River Cam.

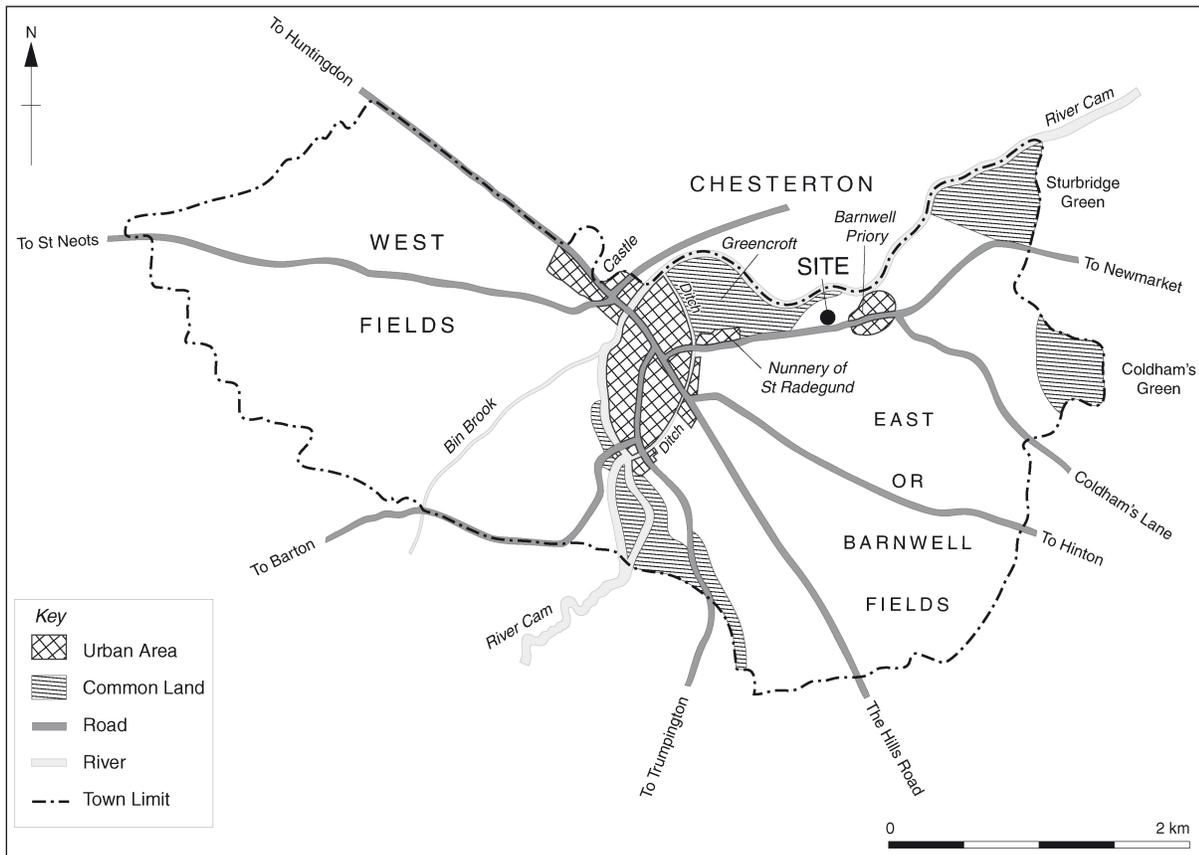


Figure 4. Site in relation to medieval Cambridge (after Maitland 1964, facing p.54).

the east (CHER 04623) and a cremation of indeterminate prehistoric date 0.5km to the west (CHER 05020A). Two food vessels and a small bowl of Early Bronze Age date were found in gravel diggings on Midsummer Common in about 1860 (CHER 04801). Roman and Saxon pottery were found nearby during construction of a sewer and may relate to settlement or manuring scatters (CHER 05020B; Browne 1974, 23).

Barnwell Priory, an Augustinian foundation of the Canons Regular (originally sited near Cambridge Castle), was re-founded at the current site in 1112 on land given by Henry I to Sheriff Pain Peverel (CHER 04653; Salzman 1967, 235). The newly re-founded priory was described as being 'a place lying in the fields of Cambridge, to wit 13 acres around the springs of Barnwell which King Henry gave rise... extends along the high-road the full length of the Canons' courtyard, while in depth it stretches over dry land ... to the river bank' (Maitland 1964, 191). A small ribbon development ran from Cambridge along the Newmarket Road but apparently ended at the nunnery of St Radegund, about a kilometre from the priory (Fig. 4). The development site formed part of the Sturbridge sub-field of the East Fields, located between Greencroft Common (later Midsummer Common) directly to the west and Barnwell Priory and related settlement to the east.

The priory was the main place of residence when royalty visited Cambridge; such visitors included King John, Henry III, Edward II and Richard II (and his court), as well as the bishops of Ely in the 15th and early 16th century (Salzman 1967, 244–6). One of main sources of its substantial revenue was Barnwell Fair (also called Midsummer Fair), which was granted to the canons of Barnwell in 1211.

After the priory's dissolution in 1538, most of the lots were bought by John Lacy, a farmer, who leased the former priory lands and tithes for some years, although various lots were purchased by Dr Legh (Danckwerts 1980, 211). The Lacy acquisitions can probably be traced: in 1550 the priory and its lands

were granted to Sir Anthony Browne and resold twice in three years, the last time to Thomas Wendy of Haslingfield in 1553 (*ibid*, 211–212). The land probably became Barnwell Abbey Farm which was owned by Thomas Panton II at the time of the 1807 Act of Enclosure. It was auctioned off in 1809 when the area of the farm roughly corresponded with the 391 acres the Prior of Barnwell is said to have held in 1279, leading to the suggestion that the abbey farm was probably the core of the former Barnwell Priory estate (*ibid*, 212 and fig. 1). The subject site itself was not part of Barnwell Abbey Farm and it therefore remains uncertain whether it related to the remaining part of the former priory property (i.e. that bought by Dr Legh in 1538) or whether it was never owned by the priory.

Settlement around the former priory and its church (St Andrew the Less; CHER 05043) survived the Dissolution, although further demolition and robbing of the remaining priory structures took place in the early 19th century. The only extant building is a single vaulted chamber of mid 13th-century date (the Cellarer's Chequer) and some 15th-century walling that now forms part of the boundary wall of Abbey House (CHER 04653a). A medieval fish pond (CHER 04653b) is recorded on the 1888 1st Edition Ordnance Survey Map (1: 2500) c. 50m to the east of the excavation site.

The first cartographic evidence for development at the subject site itself is the 1811 Enclosure map, which shows several buildings fronting onto Newmarket Road in the southern part of the development area (Gailey and Hawkins 2009, fig. 6). By this time the site was called Woolpocket Close and was owned by Jesus College, being leased to John Hemington (Cambridge Records Office Q/RD/26, 200). Between 1811 and 1888 the ground level at the site and elsewhere along the River Cam was raised by a series of embankments to mitigate river flooding (Gailey and Hawkins 2009). The 1888 Ordnance Survey shows much of the site occupied by landscaped grounds, two tennis courts and a sports pavilion. In 1930 the subject site came

**Table 1.** Number and type of lithics from each phase.

Phase	Arrowhead	Backed blade	Blade	Chip	Chunk	Core	Core fragment	Flake	Misc. retouched blade	Misc. retouched flake	Notch	Scraper	Worn edge	Total
Neolithic pits			8	37	1			13		1			1	61
Alluv. & Colluv.		1	58	34	4	6		58	5	6	2	6	1	181
Medieval	1		26	1	4	1	2	41	4	7	2	3	3	95
Quarry Pits			1		1			4		2				8
unstratified			1											1
<b>Total</b>	<b>1</b>	<b>1</b>	<b>94</b>	<b>72</b>	<b>10</b>	<b>7</b>	<b>2</b>	<b>116</b>	<b>9</b>	<b>16</b>	<b>4</b>	<b>9</b>	<b>5</b>	<b>346</b>

into the ownership of Cambridge Borough as part of a land exchange with Jesus College (Peter Glazebrook, pers. comm.). Apart from the frontage buildings on Newmarket Road, the entire site was then cleared and Brunswick County Primary School was built, later becoming Cambridge Regional College.

### Prehistoric Pits and Flintworking

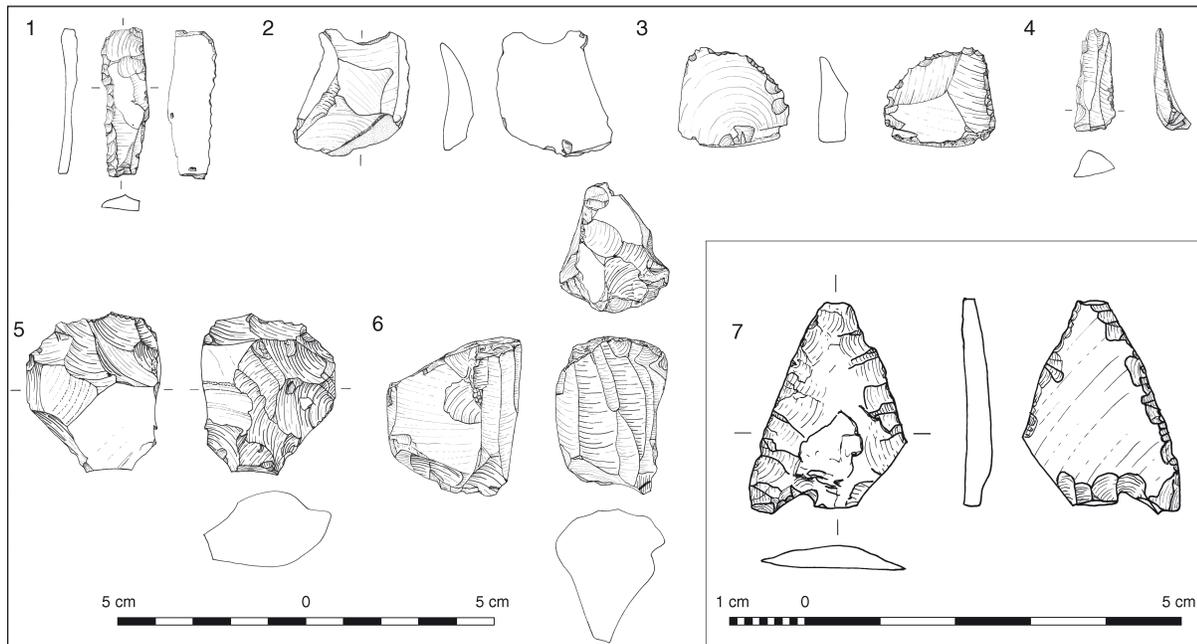
The earliest activity discovered by the excavations took the form of four shallow pits (Fig. 2). One of these (pit 146; HES 7) yielded a single sherd of Early Neolithic pottery, 61 worked flints of comparable date, charred cereal grains and a large quantity of charcoal. The other pits (152, 168 and 170; HES 4) contained no datable finds although charcoal and charred cereal grains were found.

The worked flint from pit 146 is dominated by flake and blade debitage, with a few complete flakes and blades (Table 1). Among the latter are several narrow examples (between 5 and 8mm in width; Wickham-Jones 1990, 64–86), while two are bladelets. The flakes generally comprise small pieces (with the largest flake having a length/breadth ratio of 1.67:1), some of which are blade-like in form. A careful approach to production using soft hammer technology was apparent and an Early Neolithic date is possible, given the presence of true blade forms and narrow flakes.

Layers sealing the pits (contexts 150, 148, 149 and 173) yielded a ?Neolithic pottery sherd and 23 worked flints including 9 blades, 9 flakes and a scraper.

A sequence of clean alluvial silts recorded towards the northern edge of the site (HES 13–16; contexts 193, 194, 195, 196 and 198; Figs 2 and 3) provides evidence of episodic flooding. The few finds include two small fragments of quartz-tempered pottery and 11 worked flints. These flooding episodes occurred after the Early Neolithic and before deposits of colluvium began to accumulate in the Late Iron Age to Roman period (see below), but cannot be more closely dated. A flint concentration was found within the Roman colluvium (in HES 12; contexts 136 and 141), *c.* 15m to the north-east of the Neolithic pits, and comprised 49 worked flints.

While the lithics from these deposits are residual (a total assemblage of 181 items; Table 1), the diagnostic tool types and core technologies indicate a Late Mesolithic/Early Neolithic to Early Bronze Age date for the combined assemblage. A possible backed blade (Fig. 5, No. 1) may date to the Final Upper Palaeolithic/Earlier Mesolithic, while a fine concave scraper (No. 2) could be Late Mesolithic/Early Neolithic. Among the other diagnostic tools are side, side and end (No. 3) and possible end (No. 4) scrapers of Early to Late Neolithic date. The cores include examples with opposed and multi-platforms and discoidal forms (No. 5), most of which are attributable to the Neolithic/



**Figure 5.** Worked flint.

1. Possible backed blade. (140; HES 6). Roman colluvium
2. Concave scraper on a patinated flake. (185.2; HES 1). Roman colluvium
3. Side and end scraper. (187.3; HES 15). Medieval to early post-medieval dumping
4. Possible end scraper on the distal end of a blade. (186.1; HES 16). Medieval to early post-medieval dumping
5. Partially worked discoidal core with remnants of patinated flaked surfaces. (140; HES 6). Roman colluvium
6. Opposed platform blade core with medium patination. (136.1; HES 12). Roman colluvium
7. Damaged/partially worked barbed and tanged arrowhead. (187.4; HES 15). Medieval to early post-medieval dumping

Early Bronze Age. The possible exception to this is a small core which was used predominantly for the production of narrow blades (No. 6); this piece could be Late Mesolithic/Early Neolithic.

Several fragments are associated with the setting up and maintenance of cores: a crested blade, several core preparation/trimming flakes and possible core tablets. Furthermore, the relatively high numbers of complete primary and secondary pieces (55) in relation to tertiary pieces (41) appears to indicate that there was a focus on the initial stages of core reduction. A damaged or unfinished barbed and tanged arrowhead (No. 7) of Early Bronze Age (Green 1980) date was found in a medieval deposit.

Interestingly, equal numbers of unmodified blades and flakes came from the alluvium and colluvium (Table 1). Most of the blades can be classified as broad (with widths >8mm; Wickham-Jones 1990, 64–86), but there are a number of narrow blades and bladelets (15). Several of the flakes can also be described as blade-like in form. Again, an apparent emphasis on soft hammer blade production may indicate an Early Mesolithic/Early Neolithic date for a significant proportion of the debitage.

### **Roman Arable Farming?**

Layers of colluvium or hillwash sealed the earlier flooding and were traced in section along the western edge of the site (106=185=191; Fig. 3). Starting as a thin band near the southern extent of the excavation at 10.30m OD, they gradually increased to c. 0.7m thick down-slope towards the river. The colluvium sealed natural clay or terrace gravel on the southern side and alluvium closer to the river. Many of the finds were residual, and may have rolled down hill from agricultural land during episodes of Roman ploughing. The diagnostic metalwork includes a rectangular strap-guide from a Roman harness and part of an open-socketed flanged ploughshare (Manning 1985, 43). In addition, six Roman coins ranging in date from the 2nd to late 4th century were found in medieval/early post-medieval deposits or unstratified.

### **Medieval to Early Post-Medieval Land Reclamation**

#### *Depositional Processes*

Overlying the Roman colluvium was a series of dumped soils (collectively termed 'layer 3'), consisting of various contexts (100, 102–105, 107, 139, 147, 165, 178, 179, 181, 182, 186, 187, 188 and 189), each of which were excavated in spits within each excavation square. These deposits were again thinnest at the top of the slope (only 0.25m) becoming thicker towards the river and reaching a depth of 0.90m at the northern edge of the excavation. The layers consisted of mid grey brown sandy silt with a little clay. The uppermost deposits (Spit 1) had suffered low level contamination

from post-medieval material, but also included late medieval finds. Overall, the deposition spanned the 13th to early 16th centuries. The dumps produced a moderate quantity of finds (Table 2), dominated by pottery, but also including roof tiles, metal objects and metalworking debris. Low levels of animal bone, plant macrofossils and mollusca were also recovered.

Examination of the spatial distribution of finds from each excavated square suggests concentrations within contexts 105 (HES 11), 147 (HES 9), 181 (HES 1), 187 (HES 15) and 189 (HES 13), across different parts of the site (Fig. 2). Context 105 (HES 11) was particularly rich in finds, despite the fact that only 50% of the square was excavated (the buried soil appeared to have been removed during the construction of an air raid shelter). In contrast some squares were relatively unproductive, in particular contexts 100 (HES 6), 139 (HES 4) and 178 (HES 2). It is possible that the concentrations of finds derived from individual cart loads of material dumped to raise the ground.

Examination of the distribution of finds vertically within the dumps by spit (Table 2), shows that the upper spit (Spit 1) yielded the most finds with progressively fewer further down. The paucity of material from Spits 3 and 4 can, however, be partly explained by the fact that the layer was less than 0.40m deep in nearly half of the excavated areas.

Pottery recovered from the dumps amounted to 1440 sherds (Table 2). With the exception of two sherds, the lowest three spits did not contain intrusive material. Spits 3 and 4 appeared to date before AD 1400, whilst Spit 2 may have been mid 15th or early 16th century in date. Some intrusive pottery was apparent within Spit 1 but the vast majority of the pottery was medieval or late medieval with only a small proportion being post-medieval or later in date. It seems likely that this upper spit was contaminated by later activity such as ploughing and was in the main pre-Dissolution.

In terms of its spatial distribution, pottery from the lowest deposits (Spit 4, from three HES) amounted to 43 sherds, all pre-dating AD 1400. Spit 3 yielded 330 sherds (from nine HES) and all except one sherd dated before AD 1400. The single exception was a post-medieval red ware bowl sherd from HES 7 (AD 1500–1700) which was presumably intrusive. The pottery from Spit 2 amounted to 574 sherds (from fourteen HES). In eight of the HES the pottery dated before AD 1400, while in five squares the latest pottery was AD 1400 or 1450 to AD 1550 or 1600. One square (HES 17) produced a single intrusive Cream ware sherd (AD 1730–AD 1900) as well as five sherds of medieval/late medieval pottery. The uppermost deposits (Spit 1), contained 493 sherds. In six squares all the pottery from this spit dated before AD 1500 and in a further four squares the pottery dated from the late medieval to AD 1550 or 1600. Five squares had at least one pottery sherd of definite post-medieval date with the latest pottery in four of these dating to AD 1600 to 1750 and the final square to AD 1800–1900.

In terms of the distribution of metal items, the lowest deposits (Spit 4) contained only four iron nails (all

Spit (No. exc.)	Pottery (no. sherds)	Metal objects (excl nails)	Nails	Roof tile	Floor tile	Brick	Lava	Shell	Total	Ave. no. finds per HES	Animal bone (kg)
Spit 1 (17)	493	31	62	512	5	24	3	134	1264	74.4	2.635
Spit 2 (14)	574	21	80	116	-	12	3	86	892	63.7	1.251
Spit 3 (9)	330	11	25	4	-	1	2	32	405	45	0.825
Spit 4 (3)	43	-	4	1	-	-	-	3	51	17	0.062
<b>Total</b>	<b>1440</b>	<b>63</b>	<b>171</b>	<b>633*</b>	<b>5</b>	<b>37</b>	<b>8</b>	<b>255</b>	<b>2612</b>		<b>4.773</b>

**Table 2.** *Distribution of finds within the medieval to early post-medieval dumps.*

\* 622 ceramic roof tiles, 11 limestone roof tiles

from context 187.4). Spits 3 and 2 contained no intrusive late material, but the datable items in the former were medieval items while those in the latter were either very late medieval or early post-medieval. The uppermost deposits (Spit 1) contained a greater number of objects that ranged in date from late medieval to modern.

There was some difference in the character of material across the spits, with a ratio of iron to non-ferrous metals (copper alloy and lead) across the spits that highlights a change in the character of the site. Ironwork is almost the only material represented in Spit 3 (34 iron objects and two copper alloy), with a ratio of iron to non-ferrous metals of 17:1. In Spit 2 there are 94 iron and seven copper alloy objects (13:1). These ratios are characteristic of a site with little or no domestic occupation, but one that may have been used for agriculture or industry – primarily a working environment. Non-ferrous metals temper the high level of ironwork in Spit 1, reducing it to slightly over 4:1, a proportion characteristic of sites with domestic occupation. The later deposit (Spit 1) may therefore contain dumps of midden waste from nearby houses or from Barnwell Priory itself. There does not, however, appear to be any strong evidence for an episode of major post-Dissolution dumping of debris from the priory, and the absence of lead scrap and definite medieval window glass is consistent with this interpretation.

Roof tile was concentrated within four adjacent squares (HES 7, 11, 4 and 9) in the south-eastern part of the site and one other square (HES 1; spit 181) on the far western side; these areas collectively yielded 466 fragments (75% of the total ceramic roof tile assemblage).

Metal-working waste was found in seven contexts relating to the medieval to early post-medieval dumping sequence (two from Spit 3, three from Spit 2 and two from Spit 1). The material came from six HES spread across the site, with no suggestion of a geographical concentration.

An assemblage of 4.773kg of animal bone was recovered from the dumps. Of this, only 0.062kg came from Spit 4, 0.825kg from Spit 3, 1.251kg from Spit 2

and 2.635kg from Spit 1. The bone was spread relatively evenly across the site.

An overview of the finds assemblages from the medieval dumping sequence is given below, presented under general themes. The full archival reports are available in the digital report noted at the beginning of this article.

#### *Household and Monastic? Items*

Few items, if any, in the assemblage need be of monastic origin. The exceptions are two copper-alloy fittings. One is a folded strap-end with a quincunx of large globular-headed rivets (Fig. 6, SF 60). Folded strap-ends of this size generally come from book straps and often have a central hole to slot over a pin on the front cover of the book. A knobbed triangular mount still attached to a fragment of thick leather may also be a book fitting (Fig. 6, SF 20). Its form is unusual, but a pair of knobbed triangular mounts with a slight projection at the wide end from Colchester and one with a bird's head at the apex from Northampton are of similar general form and size and the Colchester and Cambridge mounts also share the integral clenched shanks on the underside, which distinguish them from the general run of riveted belt, girdle and harness strap mounts (Crummy 1988, 19, fig. 20, 1792–3; Oakley 1979, 253, fig. 108, 30). Use on book covers or book straps is a likely alternative for these mounts.

An iron mount fragment (context 139.2) has a dragon-like animal executed in white metal inlay on the upper surface (Fig. 6, SF 127). In general style this piece can be attributed to the later medieval period; earlier pieces are generally not two-dimensional and decorated with animal shapes, but are three-dimensional zoomorphs with features picked out in white-metal. It may be a piece of harness decoration, similar to the copper-alloy mounts with heraldic devices popular in the later 13th and 14th centuries (Clark 1995, 61–3).

A fragment of an iron strip, part of an iron barrel padlock and a small iron key all relate to chests or caskets, possibly even from a single piece (SF 36, SF

58, SF 102; unillustrated). All are common as site finds on medieval sites. Part of a small Norwegian ragstone hone had been pierced for suspension at one end (SF 22; not illustrated).

Moving on to the pottery, the vessels present are primarily domestic in character and forms are dominated by jugs, which account for almost a quarter of the assemblage. Small quantities of Late Saxon to early medieval fabrics were found (64 sherds, 0.462kg). The substantial medieval assemblage (13th–15th centuries; 1,301 sherds, 9.460kg) contains both glazed and unglazed wares; overall the ceramic assemblage is abraded (with an average sherd size of 8g), making its appearance consistent with mid-denning/dumping processes. The fabrics are a range of local and non-local wares from the surrounding counties, and are types commonly found on medieval sites along the south Cambridgeshire border. The assemblage is dominated by Medieval Sandy Ware (3.044kg), some originating in Essex. Medieval Ely Ware is the second largest group (2.049kg), present in both glazed and unglazed forms, with East Anglian redwares forming the third largest group (1.822kg). All other fabrics are present in restricted numbers. The largest of these are 96 sherds (0.602kg) of mainly glazed Sible Hedingham Ware jugs, including sherds from a Scarborough style jug, stamped strip jugs and combed sherds from pear-shaped or biconical jugs. Also present are a small number of Norfolk wares (mainly Grimston jug sherds), fragments from Brill vessels produced in Buckinghamshire and Stamford and developed Stamford sherds from Lincolnshire.

Some of the redwares identified as post-medieval are likely to be the 15th–16th century products of the Ely kilns. In the late medieval and early post-medieval periods, continental imports (such as Dutch red earthenwares and Raeren stonewares) appear in the assemblage, although no early Siegburg stonewares were identified. Other early post-medieval wares present include Surrey Border ware sherds (mid 16th century).

### *Craft and Trade*

A small group of coins was recovered from the medieval to early post-medieval layers, of which two are residual 4th-century issues (see above) and two are intrusive post-medieval to modern issues. The contemporary items are a worn long cross penny from the York mint which probably dates to the reign of Richard II (1377–99). Two small fragments of a second silver medieval issue are too worn to be closely identified, although the reverse design suggests a French issue. An early post-medieval Nuremberg rose/orb jetton was also found.

Two 16th-century cloth-seal fragments, both from the upper part (Spit 1) of the medieval and early post-medieval layers, point to the importance of the textile trade in the economy of late medieval and post-medieval eastern England. One is a London alnage seal bearing the arms of Tudor England flanked by E R, more likely standing for Elizabeth Regina than Edwardus Rex (Fig. 6, SF 51). This seal would have

been put on woollen cloth by an alnager, a crown official responsible for ensuring that bales of cloth were of good quality and that the required tax had been paid; without an alnage seal the cloth could not have been sold (Egan 1988, 33; 1995, 11, 40–1; 2001, 43–5, 51–2). London would not have been the source of the fabric, but it would have passed through the city for finishing, quality control and taxation, before being sold on and reaching Cambridge (Egan 1995, 39). The style of lettering on the second seal points to a rather later date. It is a weaver's, clothier's or searcher's personal seal with the initials W S flanking a damaged privy mark (Fig. 6, SF 53). This item may have come from locally-produced cloth, or it may again have been applied to a bale as a mark of tax and quality control by a searcher acting on behalf of the crown (Egan 1995, 78).

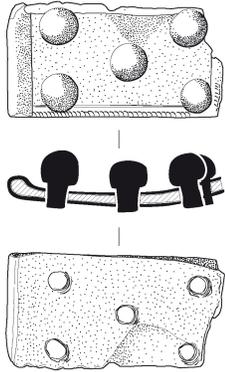
An unstratified lead weight is probably medieval (Fig. 6, SF 8), weighing 20.76g. It does not appear to conform to any of the systems in use in the medieval period, but the number of ounces in a pound varied, and unscrupulous merchants may have tried to give short measure, making comparison difficult. Three 14th- or early 15th-century examples from London weigh between 20 and 22.5g, and all three, together with the Cambridge piece, may fall into a common system (Egan 1998, tables 14–15, 311–17).

A major component of the finds assemblage from the medieval to early post-medieval dumps is a group of iron smithing debris, with three bar-iron offcuts coming from Spit 2 (Fig. 6, SF 37, SF 119, unillustrated SF 134), and another bar-iron offcut and a strip of unfinished hold-fast roves from Spit 3 (Fig. 6, SF 103, SF 61). Two further bar-iron offcuts came from 17th-century quarrying (Fig. 6, SF 83, SF 84). Although the fragments were not closely associated on the site, they probably all represent the same iron-working operation, having been dumped there when a nearby smithy went out of use or was cleared out. Other ironwork from the site may have come from the same source, either as scrap collected for recycling or as unsold and therefore unused items.

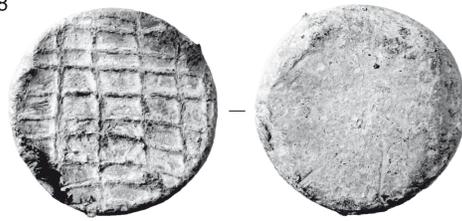
In addition to the smithing debris noted above, some 1.396kg of metalworking debris was recovered, of which a proportion was identified as roasted ore (0.101kg) and the remainder as smelting slags. Iron ore is not common in Cambridgeshire and may have been imported (see further discussion below). Iron-rich ores would have been roasted prior to smelting to reduce the quantities of impurities (gangue). The square nature of the piece of ore from context 102.1 (HES 7) is the result of fragmentation when it was heated to prepare it for the smelting process.

Bloomery smelting during the medieval period produced a solid iron bloom along with iron-rich slags. The bloom required consolidation into bar-iron which often took place in associated smithies. From the 15th century blast furnace smelting became more common and produced liquid iron which was cast into objects or ingots (English Heritage 2001). Limestone (calcium carbonate) was commonly added to lower the melting point of the ferrous component

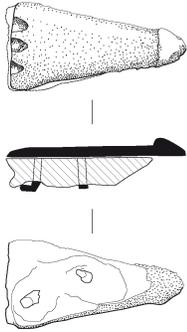
SF 60



SF 8



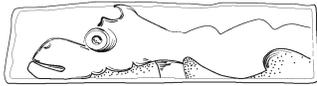
SF 20



SF 51



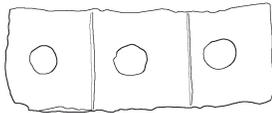
SF 127  
from x-ray



SF 53



SF 61  
from x-ray



SF 84  
from x-ray



SF 103  
from x-ray



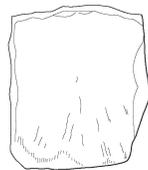
SF 37  
from x-ray



SF 119  
from x-ray



SF 83  
from x-ray



of the ore by combining with the non-ferrous impurities and by increasing the amount of carbon monoxide produced during the heating process, helping to extract the non-ferrous elements to a higher efficiency. This addition would produce calcium-rich slags. The tap slag from context 186.2 (HES 16) has inclusions of shell which itself is composed of calcium carbonate, presumably having the same effect. Smelting slags would have been removed from the furnace as they formed, allowing the smelt to continue for longer and produce larger blooms. Tap slag is the bloomery smelting slag that has been tapped from a furnace whilst it is still molten giving it a characteristic 'flowing' appearance. The morphology of the tap slag from context 186.2 suggests that a pit was used to catch such run off, which would explain the larger voids and the smoother surface of the side that cooled quickest. The adhesions on the surface of the slags recovered from two spits within context 188 (HES 14, 188.2 and 188.3) are either clay or chalk that has adhered during the cooling process suggesting a

lined cooling pit outside the smelt furnace for catching the tapped slag.

This small assemblage of metalworking debris is of note, since it shows evidence of the smelting of iron in an area where there is a limited supply of iron ore. It also demonstrates advances and possible experimentation in smelting technology and the bloomery process. It is of interest that, as noted above, several off-cuts of bar-iron were also recovered; such iron bars are produced by consolidation the iron bloom at the smelting site and are generally rare finds at smithing sites.

### *Building Materials*

The building material assemblage forms a moderate collection of 735 roof tile fragments (22.339kg), most of which came from the dumps (622 fragments), but also 133 fragments from post-medieval and modern deposits. These were almost entirely peg tiles, with only a single sherd of ridge tile. In addition, 11

### *Figure 6. Medieval and later metalwork.*

- SF 60 Rectangular copper-alloy folded strap-end with part of the leather strap remaining between the plates. On the upper plate one long edge and part of the open short edge are missing. There is delicate rouletted decoration on the undamaged margins. The fold is very tight. The strap and plates are secured by five prominent globular-headed rivets set in a quincunx. Length 29 mm, width 15 mm; rivets 6 mm long. (187.3; HES 15), layer 3. Medieval to early post-medieval dumping.
- SF 20 Triangular copper-alloy mount, the wide end decorated with three notches, the tip knobbed. On the underside are two integral clenched shanks passing through a thick fragment of leather. Length 22.5 mm, maximum width 11 mm; thickness of leather 4 mm. (100.1; HES 6), layer 3. Medieval to early post-medieval dumping.
- SF 51 One disc from a two-disc lead-alloy London alnage seal. The face of the disc bears a crown over the arms of Tudor England flanked by E R and the legend S-/PAO VIALLE LON. On the underside the burred rivet shows traces of an ornate shield that would have included the arms of London. Textile imprint on the underside shows coarse woollen Z-spun threads. Diameter 23 mm. (189.1; HES 13), layer 3. Medieval to early post-medieval dumping.
- SF 53 One disc and part of the connecting strip from a two-disc lead-alloy clothier's, weaver's or searcher's seal with privy mark. The face is worn and bears only a vertical scratch with a second at right angles passing over it; the latter may be accidental. On the underside the burred rivet has part of a privy mark consisting of W S flanking a bar rising from a suspension line. Diameter 19 mm. (210), surface find in layer 3. Medieval to early post-medieval dumping.
- SF 8 Lead-alloy disc weight with coarsely hatched upper face and plain underside. Diameter 27 mm; weight 20.76 g. (206), surface find in layer 3. Medieval to early post-medieval dumping.
- SF 127 Iron rectangular mount fragment with white-metal plating on the margins and with a zoomorphic design in white-metal inlay on the upper surface. The design is damaged at one end, but retains a clear dragon-like head with heavy snout, small ear and an eye formed by a white-metal plated rivet. Length 42 mm, width 11 mm. (139.2; HES 4), layer 3. Medieval to early post-medieval dumping.

### *Iron smithing*

- SF 37 Offcut from a smith's blank of dense bloomery iron. The sides and the narrow rectangular section taper to one worn and broken end; the other end has been cut. Length 50 mm, width 25 mm. (147.2; HES 9), layer 3. Medieval to early post-medieval dumping.
- SF 119 Offcut from a smith's blank of dense bloomery iron, the section narrow and rectangular but with rounded sides. The original end is tongue-shaped, the other end is cut straight across. Length 37 mm, maximum width 25 mm, 10 mm thick. (178.2; HES 2), layer 3. Medieval to early post-medieval dumping.
- SF 61 Iron strip of unfinished clench-bolt roves. The strip is marked into three squares, each pierced centrally. Length 71 mm, width 27 mm, perforations 7 mm in diameter. (187.3; HES 15), layer 3. Medieval to early post-medieval dumping.
- SF 103 Offcut from a smith's blank of dense bloomery iron, square in section at the surviving original end, tapering to a thin ragged edge. Length 42 mm, section 17 by 17 mm, tapering to 17 by 8 mm. (188.3; HES 14), layer 3. Medieval to early post-medieval dumping.
- SF 83 Offcut from a smith's blank of dense bloomery iron, tapering from a narrow rectangular section to a ragged chisel edge. Length 44 mm, width 35 mm, section 38 by 10 mm at the thicker end. (137.1; HES 8), Seventeenth century quarrying.
- SF 84 Offcut from a smith's blank of dense bloomery iron, rectangular in section and slightly curved. One end is original, the other is raggedly cut. Length 44 mm, width 19 mm, 12 mm. (137.1), 17th century quarrying.

limestone roof tile fragments (1.148kg), five unglazed medieval floor tile fragments (527g) and 98 pieces of brick (6.72kg) were found, 37 from dumps and 61 from post-medieval and modern deposits. The average roof tile fragment size (30.4g) is relatively small compared with other sites (such as Huntingdon Town centre at 83g per sherd; Atkins and Fletcher 2009), reflecting the depositional character at the Brunswick site.

The limestone tiles may have been medieval and would have been an expensive commodity at the time, perhaps indicating high status buildings; for example 3,000 slate tiles were transported by river to Wisbech Castle from King's Lynn in the mid 14th century (Sherlock 1998, 64).

The few pieces of brick recovered from the medieval dumps (37 fragments: 2.49kg) are likely to be very late 15th/early 16th century in date, with two intrusive 17th-century fragments also being found. There are no known 15th-/early 16th-century brick making sites in Cambridge. Both archaeological and documentary evidence suggest that medieval bricks were commercially produced at Ely, Ramsey and Wisbech. The Ely and Wisbech brickworks were both on Ely Cathedral land and these workings would have used the river network to transport the bricks. Ely had a wide distribution market for its bricks and tiles, including Cambridge (Lucas 1993, fig 1); Ely brick was, for example, purchased by Trinity College in 1528/9 (*ibid*, 158). At Ramsey Abbey there are numerous records of bricks and brick moulds being produced in the early 16th century, the finished products again being transported by river (DeWindt and DeWindt 2006, appendix 8). It notable that some of the Brunswick bricks are very similar to those recovered from the site of the late 15th-century Bishop's Palace at Wisbech (Atkins 2010b) and those evident in the extant Ely Palace (built by Bishop Alcock 1486–1500).

### *Economy and Environment*

Evidence for the local environment and economy was limited, suggesting that the 'midden' source for the medieval dumping did not include significant quantities of food waste. Animal and bird bones were relatively scarce, with a small assemblage of faunal remains being recovered (4.773kg). The group is dominated by domestic taxa with sheep/goat being the most prevalent species, along with slightly smaller numbers of cattle. Roughly equal numbers of pig and horse remains were found, along with small amounts of bird, dog and rabbit. Butchery marks were observed on many elements.

Lava quern fragments came from eight medieval to post-medieval contexts, while environmental samples yielded a range of cereal types, legumes and weed seeds. Barley (*Hordeum* sp.) was relatively common, along with rye (*Secale cereale*) and oats (*Avena* sp.). The weed seed assemblage is largely uninformative since it represents common plants growing in a variety of habitats that include crop fields, disturbed ground and pasture. Saw-sedge nutlets (*Cladium mariscus*) may indicate the use of this wet-land plant as

thatch and/or fuel.

Of the relatively small assemblage of marine shell (1.97kg) recovered from the excavations, oyster (*Ostrea edulis*) was the most common (1.86kg), with few mussels (*Mytilus edulis*) (0.07kg) and cockles (*Cerastoderma edule*) (0.01kg) represented.

### **Post-Medieval/Early Modern Quarries and Modern Activities**

Two small areas of 17th- to 18th-century quarry pitting were identified within the southern part of the excavation area (HES 8) and during the 2009 evaluation at the extreme north-eastern area of the development area (Test Pit 3) (Fig. 1). These small scale quarry pits were evidently extracting both chalk and terrace gravels. Sealing the quarries were layers dating to the later 18th and 19th centuries which denoted further dumping/raising of the ground level. Cutting these layers were probable mid/late Victorian coprolite trenches and a network of World War 2 air raid shelters.

Small quantities of pottery, metalworking waste and animal bone (0.976 kg) were recovered. By the 17th century the early factory wares are represented in the pottery by Staffordshire slipwares and London stonewares, and the 18th century saw the appearance of Cream wares and later refined white earthenwares from factories in the Midlands and elsewhere. Several post-medieval coins and a jetton were found including a Royal farthing token of Charles I, minted 1625–34.

### **Discussion**

#### *The Site in Earlier Prehistory*

The Brunswick site has provided new evidence for earlier prehistoric activity along the south bank of the River Cam, lying at c. 8m OD. The discoveries suggest that the area was exploited between the Mesolithic and Early Bronze Age, with an absence of evidence for activity in the Iron Age. This is typical of sites of this period, since earlier prehistoric sites appear to have gravitated to lower lying ground close to rivers. The Brunswick site provides the first evidence for earlier prehistoric activity (rather than casual finds) in this part of Cambridge and as such is a useful indicator of early exploitation of the river bank. Comparable sites are relatively scarce in the vicinity, with the nearest example being that c. 5km to the north-east at Stowcum-Quy (Bishop 2007). The latter site, however, lay c. 1km to the north of the Little Wilbraham River and was on higher ground (c. 13m OD). Both sites provide evidence for the manufacture of flakes and blades between the Mesolithic and Neolithic, suggesting short term occupation.

Early Bronze Age findspots have been recorded in the CHER to the east (50m) and c. 0.5km west of the Brunswick site, suggesting that occupation continued during this period. The fact that no Later Bronze Age,

Early or Middle Iron Age findspots have been recorded in the immediate vicinity of the site reflects evidence elsewhere that later prehistoric sites generally lay further away from rivers and on higher ground (Atkins and Connor 2010, 107).

### *Farming and Flooding*

The episodic flooding evident at Brunswick, *c.* 2km to the west of the Roman town of *Duroliponte*, probably began during the Late Iron Age period as a result of increased farming on the river banks, which is likely to have silted up the river (Boreham 2002). Flooding in this part of Cambridge appears to have occurred at a consistent level of *c.* 6m OD.

Similar alluvial deposits have been excavated at six other sites in the Cambridge area (Table 3), all of which lay on land far lower than Brunswick, with natural deposits lying between 0.60m OD and 4.69m OD and the overlying alluvial sequence varying between *c.* 1.30m and 3.6m OD thick. These differences result from the fact that the ancient river channel varied in width and depth over its course; the Cam runs through a channel which at Cambridge varies in width between 200m and 400m and is presently filled with alluvium (Whitelaw 1991, 2). It is likely that the main channel of the river meandered across this originally marshy floodplain, since several old channels can be seen further along the Cam at Sheeps Green (*ibid*, 2). The layer excavated at Brunswick is presumably part of the same alluvial deposit found at Jesus Green and Midsummer Common (Davenport *et al* 2008). Significantly, the work at Brunswick has defined the uppermost southern bank of the river for the first time.

### *Barnwell Priory?*

During the medieval period, the site may have been agricultural land owned by Barnwell Priory or may simply have lain adjacent to the priory's holdings. There were clearly substantial attempts to level the area, resulting in a deep and extensive dumped layer.

This layer continued beyond the excavation area to east and was recorded during building works in 2011 for at least a further 50m westwards towards the former priory buildings (Atkins 2011). The northern boundary of the site was partly formed by an east to west bank which rises more than 1.5m higher than land to the north. This drop can be partly explained by the presence of nearly a metre of medieval to early post-medieval deposit at this point. The remaining drop may be the result of the land having been worn down through use as a droveway or other route between the boundary and the river. This route may have been referred to in a document from Edward I's time, when the prior was accused of obstructing the route directly to the east of the site as 'townsmen were wont to try and get their animals from Greencroft to Sturbridge Common, through Barnwell Priory between the bake house and the river' (Maitland 1964, 192). The raised boundary appears on the earliest map of the area (1811 Enclosure plan) and continues several hundred metres to the west, with Midsummer Meadow directly to the north.

The general lack of Late Saxon and early medieval finds from the site accords with the date of the priory's foundation in 1112. Most of the finds date to the 13th to early 14th centuries, although the presence of 15th- or early 16th-century material implies continued disposal and/or levelling activities.

### *Medieval Ironworking*

The evidence for metalworking is significant, since relatively few sites have yet provided similar results. The few records present in the CHER for medieval smelting and smithing (Table 4) include several workshops and furnaces used for both ferrous and non-ferrous working.

Two of the smelting and smithing sites noted in Table 4 were owned by abbeys and priories (Ramsey and Sawtry). This is not surprising, since these religious entities played a major role in trade and industry from at least the Middle Saxon period. The monastic sites had incredible power and wealth, al-

**Table 3.** *Comparable riverside excavations in Cambridge (in order of location from north to south), after Davenport et al 2008, table 6.5.*

Site Name	River bank	Distance from river	Height of natural (m OD)	Depth of alluvial sequence	Date 'sealed'
Gonville and Caius Boathouse	West	3m	0.60m	<i>c.</i> 3.60m	?
Jesus Green and Midsummer Common	East	5–50m	3.77m–4.69m	1.35m+	17th century
Brunswick, former Cambridge Regional College	East	<i>c.</i> 60–70m	5.50m	0.64m	Roman colluvium
24 Thompson's Lane	East	35m	2.97m	2.10m	13th century
St John's College (Chapel Court and Master's Garden)	East	50m	<i>c.</i> 4.20m	<i>c.</i> 1.30m	13th century
Trinity Hall (New Library Extension)	East	<i>c.</i> 5m	3.03m	1.91m	16th century
Clare College (Master's Garden)	West	<i>c.</i> 90m	2.60m	3.40m	19th century

lowing them to engage in a multitude of activities. The major houses were largely self sufficient and produced surplus goods to sell at markets. The partially made roves found at Brunswick may reflect their manufacture or use within the priory or related buildings (or perhaps boat building), or may have derived from nearby settlement. Metalwork was produced at many monastic sites, either within the precinct itself or outside (as at Sawtry in the Grange Farm; Delve 1980). Metalworking was, however, ubiquitous in medieval towns across the country and the material found at Brunswick need not necessarily link to the adjacent priory. The zoning of urban industries, often on the outskirts, was common in medieval villages and towns and Brunswick was in just such a location.

Iron was the most indispensable metal during the medieval period, being essential for all manner of tools and implements and 'by the end of the 13th century this diversified industry was established in every part of the country where ore could be dug and fuel was available to smelt it' (Miller and Hatcher 1995, 61). Cambridge had no local source of iron ore but its position adjacent to the River Cam would have facilitated the transport of ore and fuels such as coal to the site. It is worthy of note, however, that 'metal ores were generally refined close to the point of extraction because of the cost of transport of low value materials' (Blair 2007, 92).

The nearest iron ore deposits to Cambridge lie in

the Wansford/Castor area near Peterborough but it is uncertain how extensively ore was extracted from here: the scale of these workings would have been minor in comparison to the ironworking industry of Rockingham Forest (Bellamy *et al* 2000/2001, 105). The geology producing nodular ore suitable for iron working is mainly located in north Northamptonshire, although it extends into east Rutland and just into the Cambridgeshire/Peterborough District (as far as Wansford and Castor) but less abundantly (*ibid*, 105–8).

It seems likely that the source of the Brunswick ore was Northamptonshire where there were two separate main focii of iron production (Foard 2001, 69). One was the Whittlewood Forest area located near Towcester, *c.* 10km to the south of Northampton on the River Tove which feeds into the Great Ouse that flows through Cambridgeshire. The other major iron production centre was at Rockingham Forest on the River Welland where ironworking was recorded in the medieval period and was noted in the Domesday Book (although it had considerably earlier origins; Wall 2011). In the vicinity of Rockingham Forest, the Welland flows near Collyweston, Barnack, King's Cliffe and Weldon, the famous medieval roof tile and stone quarries. Both ore and pig iron would probably have been transported from the Rockingham Forest area to Cambridge, as this location is known to have supplied Cambridge with other commodi-

**Table 4.** *Known medieval smithing and smelting sites in Cambridgeshire (CHER records).*

HER Site	Location	Result	Publication
14619	Wisbech	Mid 14th- to mid 15th-century metalworker's workshop (Building 7; Phase 6, Period 2), containing a working 'trough' or drain and associated water storage within ceramic vessels. Both ferrous (probably smithing) and non-ferrous working are indicated and it is possible that padlocks and bells were being manufactured, although this material may simply have been gathered as scrap.	Hinman and Popescu 2012, (26–29)
01020	Sawtry St Judith	Excavations within a moated enclosure found 14th- to early 16th-century remains at Grange Farm owned by Sawtry Abbey. Building 1, a possible industrial outbuilding, contained ironworking evidence with iron ore and slag. Building 2 contained a hearth with copper slag embedded. 50–60 pins recovered.	Delve 1980
16055	Ramsey	Excavations in Ramsey Abbey found secondary evidence of iron working in the 12th century with smithy hearth bottoms deposited in the backfill of a watering hole.	Spoerry <i>et al</i> 2008, 170–210
15551	Ely	Secondary evidence of smithing with iron slag found within several medieval features, dating to 1150–1350.	Kenney 1999
02650	Godmanchester	13th-century buildings found. One had been used as a blacksmith's shop. At the rear four shaft furnaces for smelting iron were found.	Green 1975
00565; 00566	St Neots, The Cross	Smeltery: 13th-century buildings and metal workings. Two iron-smelting furnaces and a bowl-shaped hole containing dross from the melting of copper. It was suggested that iron ore was brought in from greensands 7 miles away.	Tebbutt and Rudd 1966, 158–160
16865	Bourn	Possible extraction pits behind 12th- to 15th-century properties. Evidence rests on small quantities of slag found as secondary deposits.	Spoerry 2005
15489	Cambridge	Secondary evidence of iron smithing waste in 16th-century quarry pits.	Mortimer 2000
18196	Cambridge	A 15th- to 17th-century possible blacksmith's workshop with quenching pit containing metalworking debris.	Newman 2008
17229	Fulbourn	An evaluation found a possible medieval furnace.	Bailey and Spoerry 2005
11697	Hinxton	Medieval metal working debris found in an evaluation.	Leith 1993

ties, including building stone. Cambridge Castle was built from Barnack stone in the late 13th century (Alexander 1995, 116) and large quantities of King's Cliffe and Weldon stone were used in the building of the Cambridge colleges in the mid/late 15th and 16th centuries (*ibid*, 116–117).

Although no medieval records have yet been traced for the suggested movement of ore and pig iron from the Rockingham Forest area to Cambridge, this is unsurprising given that 'little is known of the social context of iron working and the mechanism for distribution, such as to what extent smelted iron was worked into finished objects on site, or sold in pig form for finishing elsewhere' (Lewis 2006, 208). The recovery of burnt ore at Brunswick does suggest that this movement of raw material took place, despite the expense, perhaps indicating that Barnwell Priory or metalworkers in the vicinity were producing their own specialised iron objects.

### *Post-Dissolution*

There was seemingly no post-dissolution dumping of debris from the priory, indeed relatively few artefacts dating to the late 16th century and early 17th century were found. The two 16th-century cloth seals recovered from medieval to early post-medieval dumped deposits would have been attached to woolpackets. Notably, the earliest documentary reference to the subject site in 1811 was to 'Woolpocket Close', perhaps originating from woolpacket. A parallel comes from Woolpack Public House in Norwich which was known as The Woolpocket in 1760 (Norwich Heart 2011). This Norwich pub lay outside the city, on the north side of the river and was where carriers met before selling their wool in the city. It is therefore possible that the land at Brunswick, in a similar location to the Norwich example, performed a similar function.

Later use of the site for minor quarrying would no doubt have related to local use in building construction. By this time, the population in the parish of St Andrew the Less had presumably declined since only 48 houses were recorded within the parish in 1749.

### **Conclusions**

Archaeological investigations at Brunswick have provided the first known Neolithic 'domestic' site in Cambridge, albeit suggesting very short term and sporadic activity on the river bank. During the Late Iron Age and Roman periods the local landscape was cleared for arable farming. The resultant silting into the River Cam caused it to flood, with later colluvial layers accumulating along the bank and presumably also filtering into the river. It is likely that these events related directly to the increasing population, with new farmsteads being established.

The medieval period saw a more orderly use of the site, with the River Cam protected from silting by a bank which prevented soil movement. To the south of the bank, the land was raised well above the flood-

plain by the deposition of domestic and industrial waste, thus allowing the ground to be intensively used for agricultural activities. The recovery of finds from these deposits has permitted new insights into the character of the area, some of which may have been associated with Barnwell Priory.

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