

IV: Boughton Retail Centre, Chester, 2012–2013

A Nineteenth-Century Tannery and Other Discoveries

by **Andrew B Powell*** with contributions by **Lorrain Higbee, Lorraine Mephram, Richard O’Neill and Ruth Pelling,** with illustrations by **Rob Goller**

Excavation at Boughton, to the east of the Roman fortress and medieval city, revealed part of an early nineteenth-century tannery in the form of timber-lined tanning pits and other structures connected by lengths of bored timber piping. A small number of earlier ditches, at least one of them probably Roman, were also recorded. Cartographic evidence suggests that in the sixteenth century the site was used to hold possible tenter frames but subsequently consisted of gardens behind the street frontage until the tannery was built. The tannery, possibly shown on a tithe map of 1848, appears to have been short-lived, being replaced by warehouses and then a candle factory by the 1850s. By 1875 the site was occupied by terraced housing, the remains of which were also recorded.

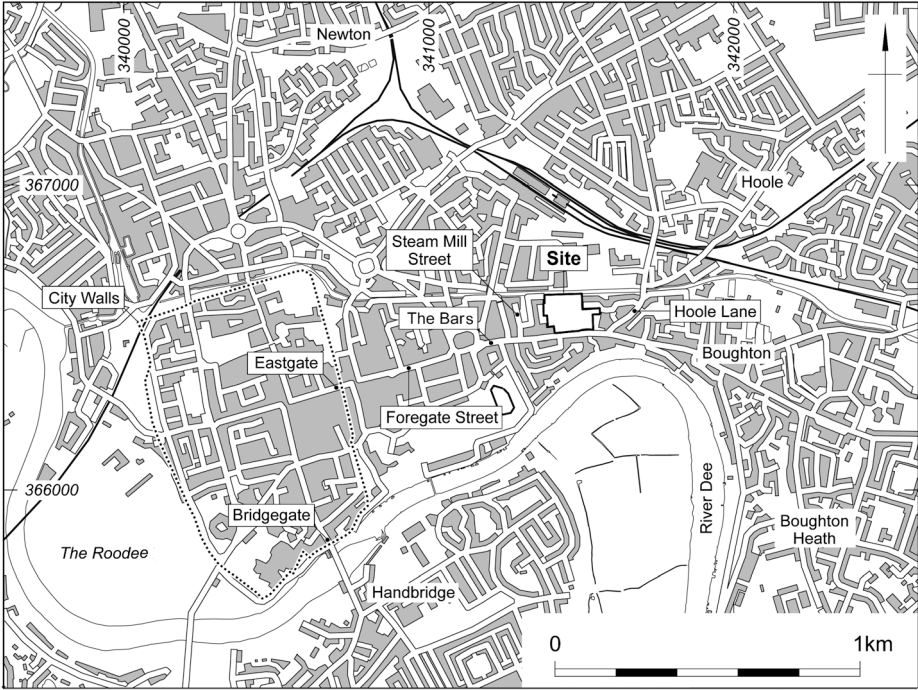
Introduction Andrew B Powell

The site and project

In 2012–2013 a programme of archaeological works, comprising desk-based assessment, watching brief, trench evaluation and strip, map and record excavation, was undertaken on land at the Boughton Retail Centre in advance of redevelopment (CgMs 2012; Pack 2013; Wessex Archaeology 2015). The 1.6-hectare development area, centred on NGR SJ 41430 66600, lies 1km east of the centre of the Roman legionary fortress and on the fringes of the medieval and early post-medieval city (Ill IV.1). The likely presence of archaeological remains was suggested by cartographic and documentary evidence, and the fieldwork was undertaken to determine the presence and character of any surviving remains and to mitigate damage to them. The works revealed evidence for low-level Roman activity, an early nineteenth-century tannery, and the foundations of later nineteenth-century terraced housing. The project archive will be deposited with Grosvenor Museum under accession number CHEGM:228.

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III IV.1 Site location plan. (Scale 1/25,000). Contains Ordnance Survey data © Crown copyright and database 2015

The site lies on the north side of Boughton (A51), which follows the line of the Roman road that ran from the east gate of the fortress. The name Boughton refers both to the road – the continuation of Foregate Street to the east of the Bars (medieval Chester’s outer defensive gate) – and to the medieval and later settlement to the east of Chester; to avoid ambiguity the road will be referred to below as Boughton road. The site is bounded to the north by the Shropshire Union Canal (originally known as the Chester Canal), completed in 1779 (Emery ed 2005). It had formerly been occupied by a school and retail premises and associated car park. To the east are further retail premises and a health centre and to the west are residential properties.

The west-flowing River Dee lies to the south of Boughton road, while natural springs in Boughton have been used to supply the city with water since Roman times. The site is relatively flat at an average height of 21m AOD, although the natural topography is likely to have been obscured by extensive development. The underlying solid geology is the Chester Pebble Beds Formation, comprising pebbly sandstone, which is overlain by superficial till deposits of Devensian Diamicton (British Geological Survey online viewer).

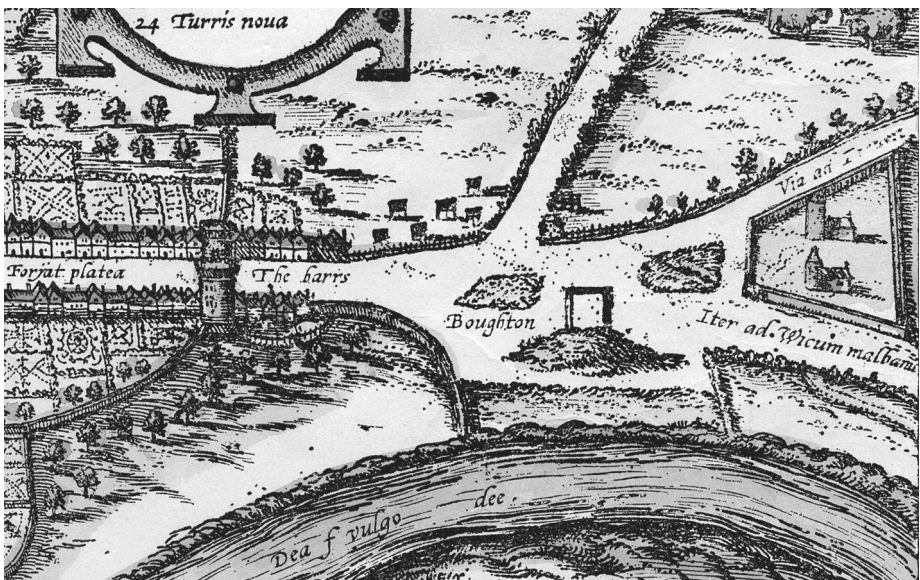
Archaeological and historical background

There is no recorded evidence for prehistoric or Roman finds on the site (CgMs 2012, 12–14), although the line of the Roman road from Chester to Manchester, known locally as Watling Street (Margary 1957, Route 7a), crosses the southern part of the development

area, while ditches and gullies together with tile, brick and pottery suggestive of widely spaced houses set in individual enclosures have been found nearby (Carrington 2012, 304–5, 334–5). The Roman town was supplied with water piped from wells and springs in Boughton, where an altar dedicated to the Nymphs and Fountains was discovered in 1821 (*RIB* 1, 460). The main water supply line is believed to have lain south of the Roman road, entering the fortress near the Eastgate (Mason 2005, 110–18). Boughton continued to supply water to the town, the Dominican friars being licensed in 1276 to pipe water thence through the city wall (Barrow *et al* 2005, 35). In 1583 a conduit running along the riverside to the Bridgegate was realigned along Foregate Street and Eastgate Street (*op cit*, 35–49).

The earliest cartographic depictions of the site are on Braun and Hogenberg's 1581 map and William Smith's 1585 map. Both show suburban settlement extending east along Foregate Street and beyond the outer gateway at the Bars; indeed, Smith's map shows it extending on the north side of Boughton road almost as far as its junction with Hoole Lane. On both maps there appears to be open farmland to the north of the road frontage, although they also show what appear to be two rows of structures. On Braun and Hogenberg's map these are shown as raised up on legs and therefore were probably tenter frames used for stretching cloth from fulling mills (Ill IV.2). However, the known fulling mills lay on the south side of the Dee, near the weir (Lewis & Thacker eds 2005, 44–55). Given the later use of the site for tanning and allied activities, it is possible that these were open-sided sheds for drying hides, or even just lines of skins hung in the open, similar to the depictions on Boydell's *South prospect of the city of Chester* (1749).

The site may have straddled the line of the Royalist outworks built in 1643–4 during the Civil War and later captured by the Parliamentary forces. The outworks would have comprised



Ill IV.2 Detail from Braun and Hogenberg's 1581 map of Chester showing possible tenter frames. (Not to scale). Reproduced by courtesy of Cheshire Archives and Local Studies, PM 14/1

an earthen rampart with a ditch, dug in straight lengths with salients and flanks, mounts for cannon, pitfalls and heavy gates (Lewis & Thacker eds 2003, 115–25). Hemingway's 1836 depiction of the defences shows them crossing Boughton road east of the former Horn Lane (later Steam Mill Street), and therefore possibly lying within the western part of the site. As suggested by Ward (1987, 6–11), however, they may have continued further east past the site towards Hoole Lane before turning south to the river.

The siege of Chester in 1644–6 saw considerable destruction, with large parts of the eastern suburbs burnt along Foregate Street and at Boughton. Among the demolitions reported by Randle Holme 'were all the houses, barns, and buildings near to The Barrs, with Great Boughton, and Christleton' (quoted in Hanshall 1817, 162). The fulling mills in Handbridge, south of the river, were also destroyed but were rebuilt (Lewis & Thacker eds 2005, 100–104). Hollar's map of 1653, dating from just after the war, shows the housing along the street frontage, but now with garden plots laid out to the rear.

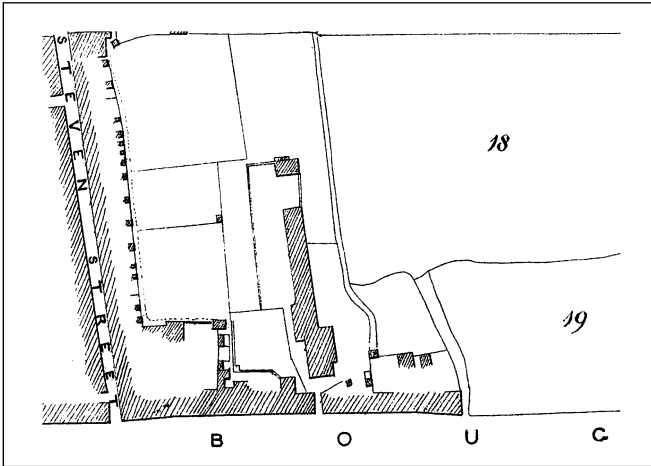
Almost a century later, De Lavaux's map of 1745 shows the area to the rear of the houses still laid out as garden plots, with a patchwork of small irregular fields to their north. In the 1770s the southern ends of these fields were cut across by the building of the Chester Canal, which followed a straight line between Hoole Lane and Frodsham Street. Wood's map of 1833 shows the entire area between the houses and the canal infilled with a grid of garden plots, albeit with the earlier field boundaries still evident. However, by then a new street, Steven Street, had been laid out at the western edge of the site, with terraced housing along both sides, and the area between it and Steam Mill Street was largely infilled with further housing.

By 1848 there was a linear, south–north arrangement of buildings in the centre of the site accessed by a passage from Boughton road: this is shown on the St John the Baptist parish tithe map (*see* Ills IV.3 and IV.7 inset). The main building appears to have comprised two parts: a long, narrow (6m-wide) range to the north and a smaller, offset, structure to the south. Its use is not indicated but its location corresponds closely to the distribution of tannery pits revealed by the excavation (*see below*). The Ordnance Survey 1875 25-inch map of Chester shows that these buildings had been replaced by two new streets of terraced housing: Fosbrook Street, overlying the building, and Victor Street to its west (Ill IV.4). The eastern part of the site had also been developed, with two schools on the road frontage. Only the north-eastern part of the site remained open ground until built upon in the second half of the twentieth century.

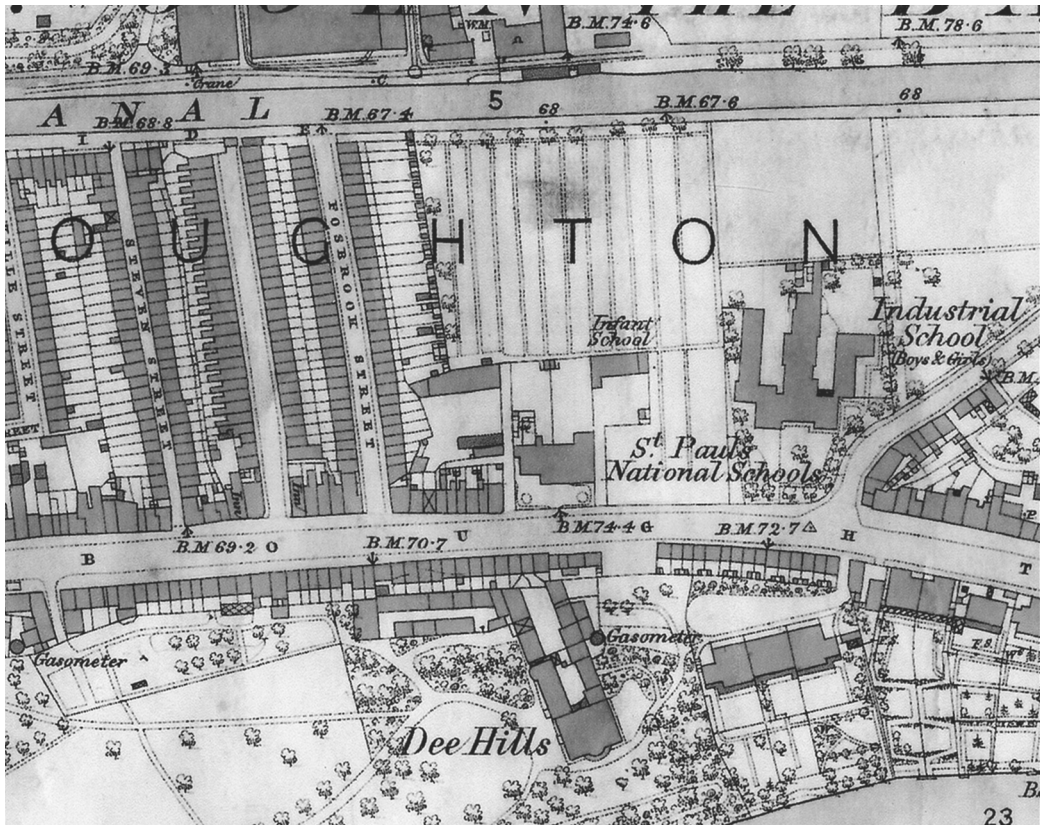
The excavation Andrew B Powell

Methods

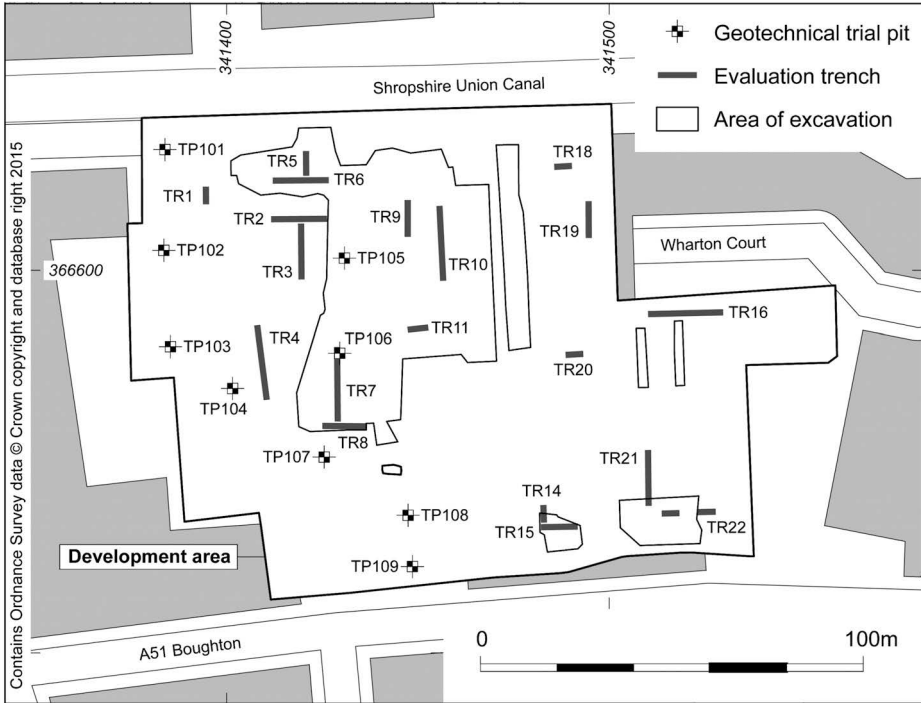
A watching brief was maintained during the excavation of nine geotechnical trial pits (TPs) across the accessible parts of the site (Pack 2013) (Ill IV.5). TP105 and TP106 contained a soil horizon from which two sherds of Roman pottery and fragments of ceramic building material were recovered. TP102 revealed a large ditch containing eighteenth- to nineteenth-century pottery, as well as one Roman sherd. TP101–7 and TP109 contained deposits relating to nineteenth-century terraced housing, with TP109 also having the cobbled surface of an associated street, with post-medieval deposits below.



III IV.3 Extract from the 1848 St John's tithe map. (Not to scale).
 Reproduced by courtesy of Cheshire Archives and Local Studies, EDT 95/2



III IV.4 Extract from the Ordnance Survey 1875 25-inch map of Chester, showing the development of the area in the second half of the nineteenth century. (Scale approx. 1/2500). Reproduced by courtesy of Cheshire Archives and Local Studies



III IV.5 Trench location plan. (Scale 1/2000). Contains Ordnance Survey data © Crown copyright and database 2015

During the evaluation nineteen trenches (of a proposed twenty-two) were opened, in five of which (Trenches 10, 16, 18, 19 and 20) there was further evidence for an early but undated soil horizon, (23002), lying between modern made ground and the natural. In Trench 10 this sealed two linear features cutting the natural. Trench 8 revealed a timber-lined, sub-rectangular feature containing sherds of eighteenth- to nineteenth-century pottery, red brick fragments and animal bone. Structures associated with the nineteenth-century terraced housing, backyards and street were noted in Trenches 1–3, 5–11, 14 and 15. A length of north–south sandstone wall was recorded in Trench 22.

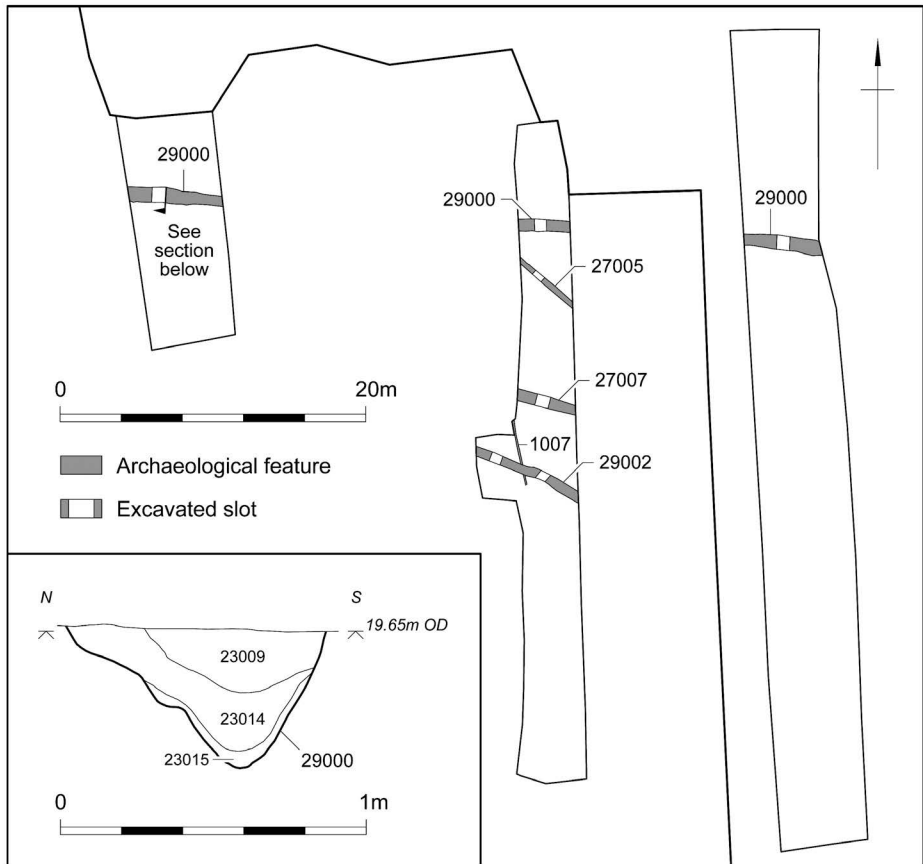
On the basis of these results, areas totalling 3500m² were subject to strip, map and record excavation, including a large area within the former primary school yard and the car park, two areas along the Boughton road frontage, and the excavated footprints of the proposed pile caps. The ground was machine-stripped, and the exposed structures and deposits cleaned, mapped and selectively excavated. Further selected areas within the main area were subject to locally deeper excavation.

Three main phases of archaeologically significant activity were recorded on the site: Phase 1, relating to pre-industrial activity; Phase 2, to an early nineteenth-century tannery; and Phase 3, relating to the later nineteenth- to twentieth-century terraced housing. The overall orientation of the Phase 2 features – slightly west of north to slightly east of south (referred to here as north–south) – matches that of the post-medieval (and possibly earlier) property

boundaries, as shown on Hollar's 1653 map, and was replicated in the layout of the Phase 3 housing.

Phase 1

A number of broadly east–west ditches were recorded cutting the natural (Ill IV.6). One east–west ditch, (29000), recorded at three locations, was traced for over 45m. It was 0.9m wide and up to 0.56m deep, with a V-shaped profile slightly stepped on the north side and with up to three fills. Nine sherds of Roman pottery were recovered, but some of these were abraded and could be residual.



Ill IV.6 Plan of Phase 1 features and west-facing section of ditch (29000). (Scale: plan 1/500; section 1/25)

A second ditch, (27007), 10m to the south, was 0.7m wide and 0.3m deep, while a third, (29002), aligned west-north-west–east-south-east, was 1m wide and 0.4m deep; both had U-shaped profiles. Neither contained finds and they are both undated, as is a gully, (27005), 0.5m wide and 0.16m deep, aligned north-west–south-east.

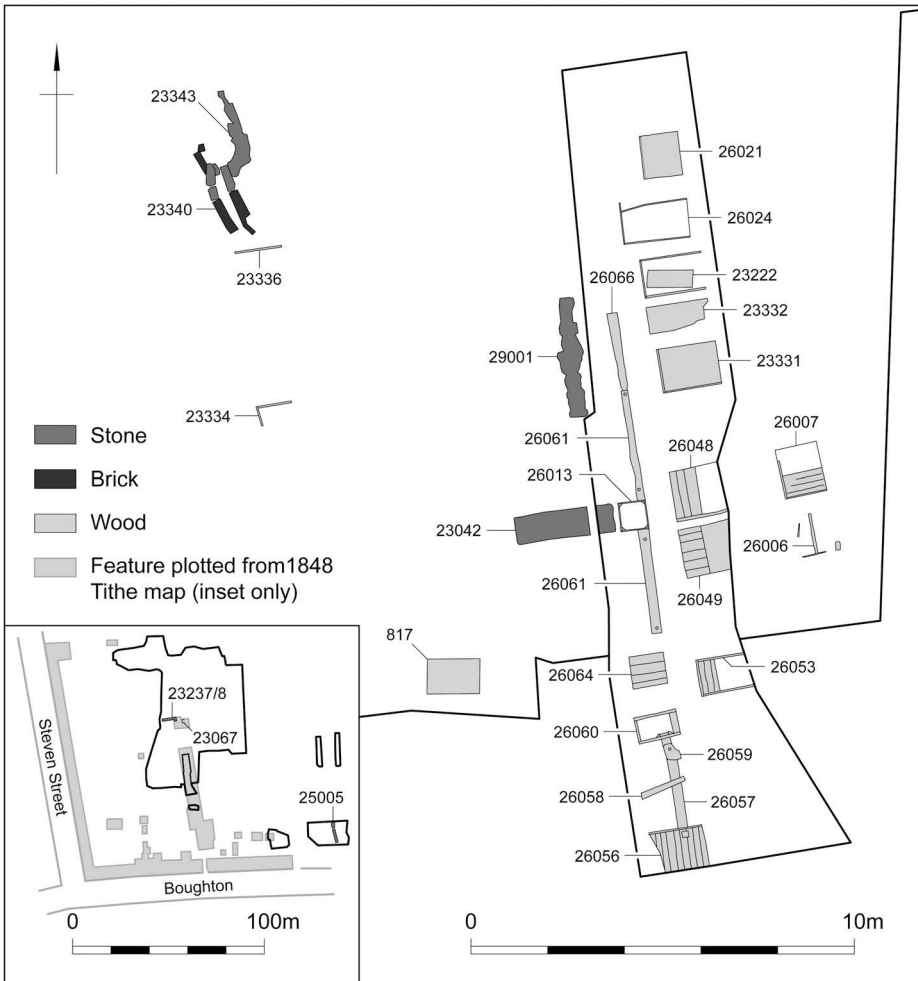
A sherd of Roman pottery and pieces of ceramic building material had been previously recovered from the secondary fill, (203), of what may have been the large east–west ditch

(205) observed cutting the natural in TP102 near the western edge of the site, predating the nineteenth-century terraced housing (Pack 2013).

A narrow linear feature, (1007), 0.1m wide and 0.17m deep and interpreted as a possible beam slot, was recorded during the evaluation as being cut by ditch (29002). However, its relationship with the ditch was not securely established, and its north-south line closely matches that of the nineteenth-century features.

Phase 2

During the watching brief and evaluation, an early soil horizon, (23002), was identified 1.1–1.4m below ground level, overlying the natural clay in the north-central and north-eastern parts of the site. It was not recorded during the subsequent excavation.



III IV.7 Plan of Phase 2 features in relation to structures shown on the 1848 tithe map. (Scale 1/200; inset 1/4000)

All the features belonging to this phase, comprising a number of stone and timber structures, were recorded in the south-western part of the main excavation area (III IV.7). While the limited nature of the stone structures makes them hard to interpret or date, the location of the timber structures closely matches that of the buildings shown on the 1848 tithe map. Further light is shed on the structures of this phase by the documentary evidence discussed below.

Stone structures

A 6.3m-long stone wall, (23237/8), aligned approximately east–west, was recorded on the western side of the excavation (III IV.7 inset). It was 0.6m wide and roughly constructed from blocks of pale red sandstone bonded with lime mortar. Its location suggests that it may have formed part of a wall running west from the smaller building shown on the tithe map. It lay within the footprint of a later terraced house on the west side of Fosbrook Street (*see* III IV.14), where a narrower (0.3m-wide) stone wall, 2.1m to its north (but not indicated on the tithe map) was on the line of one of the house foundations. The latter may simply represent the reuse of nearby building material in the construction of the later housing rather than being contemporary with wall (23237/8); stone was also used in the east side of the fireplace abutting the south side of the wall.

A number of other short lengths of north–south stone wall were recorded, again corresponding to wall lines associated with the terraced housing (*see* III IV.14), although one 3m length, (29001), also corresponded to the western wall of the building shown on the 1848 tithe map.



III IV.8 Phase 2 culvert (23340), viewed from the north

A short length (2m) of a curving brick and sandstone culvert, (23340), was recorded close to the western side of the 1848 works yard (Ills IV.7–8). Its northern end appeared to be connected to a rough, possibly oval sandstone structure, (23343), of uncertain character, which had a fill, (23344), containing a large quantity of cattle horn and bone fragments (*see* Higbee, *below*). To the south of the culvert were two badly truncated timber-lined features, (23334) and (23336), but it is unclear whether these were directly associated with it. This complex of structures, which had been disturbed by later activity, was preserved *in situ* and therefore not fully excavated, limiting its interpretation.

Towards the south-east of the site there was a 10m length of north–south stone wall, (25005), initially recorded during the evaluation, comprising fragments of roughly dressed red sandstone and lime mortar. It did not match any features shown on the 1848 tithe map but probably related to one of the buildings fronting onto the north side of Boughton road.

Timber structures

The majority of the recorded timber structures, including probable tanning pits, were located in a north–south arrangement, in a position that corresponded with the northern half of the long building shown on the 1848 tithe map (Ills IV.3 and .7 inset), although it is possible that their distribution reflects in part the subsequent variable truncation of the site rather than their original arrangement. In addition, three further timber structures, (817), (23334) and (23336) (*see above*), lay to the west, apparently outside the mapped buildings, while another, (23067), lay within the footprint of the small building to the north.

The structures consisted mainly of a series of rectangular timber-lined pits, some of them connected by bored timber piping. The pits were surrounded by homogeneous pale red clay, probably imported onto the site. In most cases the timber lining comprised a ‘box’ formed of four side planks and a series of base planks (Ill IV.9). Typically, their corners



Ill IV.9 Phase 2 pits (23331), (23332) and (23222), viewed from the south-west

were secured using iron nails, with the joints between individual planks being either tongue-and-groove or secured by wooden pegs in subcircular holes. The upper edges of the pits had been truncated by later activity but they do not appear to have been covered. All but one had been deliberately backfilled with material unrelated to their use, the exception, pit (26053), being sampled for environmental remains (*see* Pelling, *below*).

Within the footprint of the long building, the timber features were arranged over at least 19m in three north–south rows measuring 5.5m east–west. The eastern row consisted only of pit (26007) and part of the adjacent pit, (26006); they appear not to have been connected. It is likely that others were either not exposed or have not survived. The central row comprised eight unconnected pits, with five close together at the north, then a further two after a 2.0m gap, and then one after a 2.2m gap (Ill IV.7).

The pits in these two rows varied in dimensions, measuring on average approximately 1.4m east–west by 1.1m north–south. The four pits in the western row were smaller, averaging 1.0m east–west by 0.9m north–south, and clearly had a different function, being more widely spaced and linked by lengths of bored timber piping (Ill IV.10). The northernmost length of pipe, (26066), consisted of a square beam at least 2m long and 0.27m wide, with a 0.1m-diameter aperture. Its southern end was tapered so that it could fit into the widened (0.2m-diameter) aperture at the northern end of pipe (26061).



Ill IV.10 Phase 2 timber pipes and associated pits, viewed from the south

At about its mid-point, pipe (26061), which was of similar dimensions to (26066) but 6.4m long, passed through the base of a small square timber-lined pit, (26013) (Ill IV.11), situated at the eastern end of the stone wall (23042), with which it appears to have been closely associated, being of similar width. The wall was built of sandstone bonded with lime mortar, with three courses surviving. Another timber pipe, (26001), not shown on Ill IV.7, was recorded as running from the wall and was possibly connected to the pit. A post-excavation photograph of a short length of this pipe indicates that it was much less substantial, approximately 0.1m wide externally and thin-walled.

Unlike the other pits, only the sides of pit (26013), and not its base, were lined with planks, and its corners were braced with triangular-sectioned uprights (Ill IV.11), those to the east resting on the pipe. Where pipe (26061) passed through the base of the pit, a 0.3m-long opening had been cut into the former, apparently by a line of drill holes rather than by a saw. This might indicate that the cut was made when the pipe was already in place and that pit (26013) was therefore a subsequent addition. It is unclear whether the pit was supplied with water by the pipe or, alternatively, functioned as a cistern from which water, supplied from another source, was distributed via the pipe to the adjacent pits to the east: three holes had been drilled through the pipe's upper surface at locations opposite pits (23331), (26048) and (26049), with a fourth near its southern end. The southern end of the pipe was blocked with a timber plug.



Ill IV.11 Phase 2 pit (26013) with three sides removed to show cut in pipe (26061)

Another square-sectioned timber pipe, (26057), ran south from pit (26060), on the same line as pipe (26061). The pipe's northern end, within the pit, was flanked on either side by triangular-sectioned uprights (Ill IV.12). Just south of the pit, a heavily damaged and eroded piece of timber, (26059), was attached to the upper surface of the pipe, using a timber peg in a copper alloy fitting (Ill IV.12). This may indicate the junction with another pit, possibly also represented by a single piece of timber, (26058), overlying the pipe to the immediate

south. It is possible that other holes in the pipe originally had similar fittings. An interesting feature of this pipe was that one surface bore a daisy-wheel apotropaic mark (III IV.13). This geometric compass-inscribed symbol is commonly found on timbers in late medieval building onwards, possibly to provide ritual protection (Easton 1999, 26–7).



III IV.12 Phase 2 pit (26060) and northern end of pipe (26057), flanked by triangular-sectioned uprights, viewed from the north



III IV.13 Apotropaic mark on Phase 2 pipe (26057)

Further south the pipe passed below pit (26056), to which it was connected by a square, leather-lined hole in the base of the pit. The presence of degraded wood within this hole suggests that a timber upright or plug had also been used. The pipe continued south of pit (26056) (not shown on plan), where a hole in its upper face also contained a timber plug. As no plug was observed at its southern end when the pipe was lifted, it may have connected

to a pit lying outside the trench. (A photograph of the lifted pipe also shows what appears to be at least one plugged hole in its eastern side).

Some timbers bore evidence of surface matter. In most cases this was a firm black coating surviving in patches, likely to be pitch used to protect and waterproof the timbers on the inner surfaces of the pit linings. Five timbers were sampled for residue analysis (two from pit (23331), one from pit (23222), one from pit (26024) and one from pipe (26001)) to try to determine the process (-es) for which the pits were used, and particularly to see whether they showed evidence of exposure to chemicals commonly used in tanning activities. The analysis, by X-ray diffraction (XRD) and portable X-ray fluorescence (p-XRF), showed a high degree of chemical variability but the bulk chemical composition of all samples showed elevated levels of key indicator elements for the use of calcic or potassic alum, which could indeed suggest the use of the pits for tanning (Badreshany 2016) (but *see* Discussion).

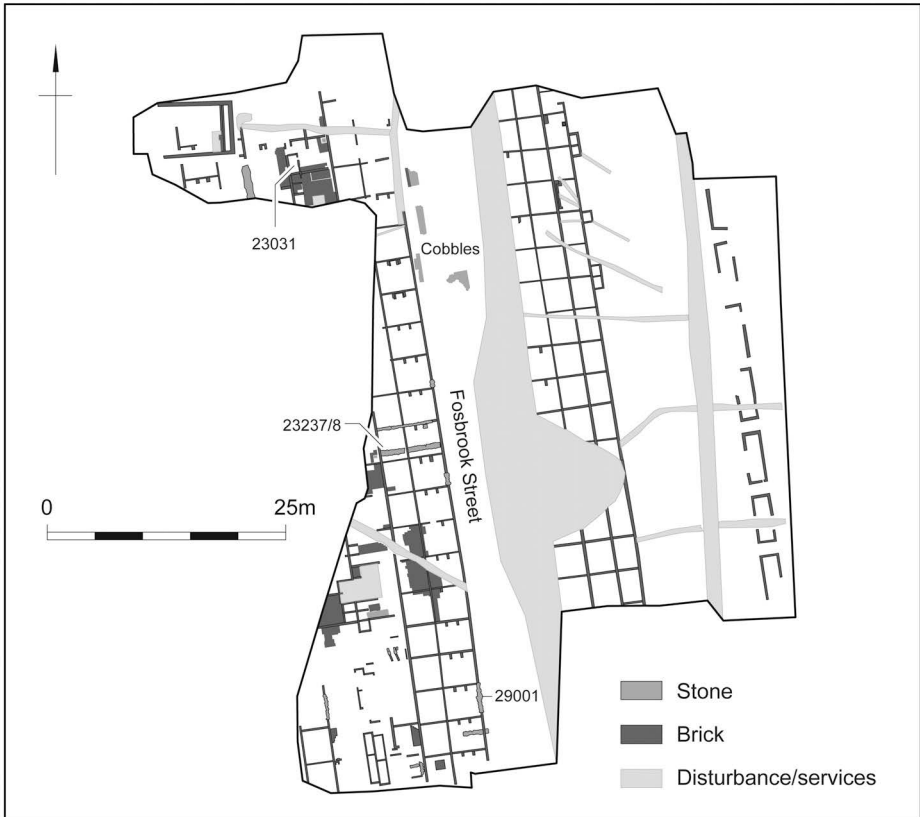
Five samples (two from pipes and three from planks) were submitted for dendrochronological dating (Tyers 2015). Although each sample contained measurable tree-ring sequences, none of the sequences cross-matched with each other, nor with softwood tree-ring data from across northern Europe, north-western Asia, north-eastern Canada or America.

Phase 3 Richard O'Neill

Extensive remains of the terraced housing shown on the 1875 Ordnance Survey map were recorded across the site (Ill IV.14). The houses and backyards of the properties fronting onto both sides of the former Fosbrook Street were identified, along with a number of features related to the backyards of the properties on the east side of Victor Street. Some of these houses included stone-built foundation courses identical to the Phase 2 stone structures (23237), (23042) and (29001) described above, showing that the house-builders had either utilised existing structures or reused materials.

The former Fosbrook Street road surface, (23076), consisted of large grey cobbles edged with square-cut setts, all within a gas-tar matrix and with stone slabs set upright to form a kerb (Ill IV.15). Beneath this lay a north–south cast-iron pipe which had supplied domestic gas to the properties.

The terraced houses along the western side of the street had a uniform layout. Each property consisted of two ground-floor rooms, front and back, constructed of red brick, stretcher-bonded with lime mortar. The front rooms measured 3.5m by 3m and the back rooms 3.5m by 2.5m. In each front room the base of a brick-built fireplace was exposed, built as part of the north wall of the property. There was no evidence that any of the properties were cellared. A number of floor surfaces survived, consisting of thin stone setts placed directly on clay. Fragments of various layers of linoleum floor covering were also visible on the stone floor surface. The rear yards varied in layout, reflecting modification during the lifetime of the structures. The yard surfaces were constructed of stone setts or red brick, often with drain heads still present. The boundary walls were red brick with lime-mortar bonding, as were the foundations of the small outbuildings, usually two or three in each yard, probably for coal storage and sanitation.



III IV.14 Plan of Phase 3 features. (Scale 1/800)

The houses on the eastern side of the street were essentially similar in plan to those on the western side but had smaller backyards. No floor surfaces were preserved in these properties. They also had long gardens to their east with outhouses at the eastern ends, although these structures are not visible on a 1920 aerial view of the northern part of the site (<https://chesterwalls.info/gallery/canalgallery5.html>).

The backyards of properties fronting onto the east side of Victor Street were also partially exposed and these appeared to be generally similar to those on the west side of Fosbrook Street. At the northern end of the excavated area, a red-brick surface between the two rows of backyards was interpreted as an alley providing access to the canal towpath.

Further nineteenth-century features were identified to the east in evaluation trenches 14 and 15 relating to the properties formerly fronting onto the north side of Boughton road. The identified remains included three parallel walls, all quite substantial and two or three bricks wide and presumed to be the main structures rather than outbuildings. The presence of a backfilled cellar was indicated by a loosely compacted deposit which contained a large assemblage of ceramic and glass fragments and demolition debris.



III IV.15 Phase 3 cobbled surface and kerbs of Fosbrook Street, viewed from the north

The finds

Portable artefacts Lorraine Mepham

This report summarises the range of material recovered during the evaluation and excavation; further detail can be found in the assessment report (Wessex Archaeology 2015) and in the project archive. Total quantities of finds other than animal bone (*see* Higbee, *below*) and wood are given in Table IV.1. In terms of date range, the assemblage has a clear emphasis on the post-medieval/modern period (mainly eighteenth century onwards, with some earlier post-medieval material, also Roman and medieval pottery), which reflects the change in use of the area from agriculture to industry and housing.

The post-medieval/modern assemblage comprises two main elements: material relating to the use of the site as a tannery and also suggestive of horn-working, in the early/mid-nineteenth century (the worked timbers from the timber-lined pits and cattle horn cores (on which *see* Higbee, *below*)); and structural material and domestic refuse, largely relating to the subsequent development of the site for terraced housing in the later nineteenth century (ceramic building material, pottery, glass, animal bone, oyster shell). Some personal items (leather shoes, clay pipes) could belong to either phase of activity, and there are some items that predate the tannery (pottery, bottle glass), but apart from the animal bone there is nothing that can be definitely tied to the tannery period.

Table IV.1 Finds excluding animal bone and wood, quantified by material, no of fragments and weight

<i>Material type</i>	<i>No frags</i>	<i>Wt (g)</i>
Ceramic building material	5	2677
Pottery	395	15363
Clay tobacco pipe	63	226
Glass	116	25871
Metal	16	
Leather	15	939
Shell	4	

Pottery: Introduction

The assemblage is largely of post-medieval/modern date, with a few Roman and medieval sherds. Condition is generally good, although the earlier wares have suffered higher levels of surface and edge abrasion. Pottery totals by ware type are given in Table IV.2.

Roman and medieval pottery

Pottery predating the post-medieval period is limited to ten Roman sherds (samian, greyware, oxidised ware) and one medieval sherd (red-grey sandy ware). All but one of the Roman sherds were recovered from the fills of ditch (29000); the tenth was found unstratified. The medieval sherd came from a mixed, unstratified deposit.

Post-medieval/modern pottery

The wares represented encompass the expected range for the area. Redwares make up just over a third of the total by sherd count. They include black-glazed wares and trailed slipwares and are likely to include a good proportion of products from the Buckley kilns (seventeenth to mid-twentieth century); these were produced in a range of utilitarian forms: bowls, flanged dishes and squat, straight-sided jars with heavy rims and side handles.

Alongside the coarsewares are early post-medieval finewares such as marbled slipware and manganese mottled ware, both produced in several centres, including Staffordshire; there is also one sherd from a polychrome slipware dish with embossed moulded decoration. Industrial wares include white salt-glazed ware, creamware, pearlware, bone china, refined whitewares and redwares, and yellow ware; these were supplying tablewares, in particular tea wares, as well as a smaller proportion of kitchen wares. Refined whitewares (including transfer-printed wares) make up just under half of the total assemblage by sherd count. There is one porcelain vessel – a doll’s teacup. Stonewares are restricted to modern English wares, including feldspathic-glazed vessels; one of the latter is from a beverage container and carries an applied medallion with the stamp of T Welsby of Chester (Thomas Welsby & Co are also represented amongst the glass assemblage: *see below*).

In terms of date range, possibly the earliest sherd represented is one of Cistercian-type ware (fifteenth/sixteenth century), comprising a small strap handle from a drinking vessel.

Table IV.2 Pottery quantified by period, ware, no of sherds and weight

<i>Period</i>	<i>Ware</i>	<i>No sherds</i>	<i>Wt (g)</i>
Roman	Samian	4	14
	Greyware	1	7
	Oxidised wares	5	171
Medieval	Red-grey sandy ware	1	66
Post-medieval/ modern	Basalt ware	3	28
	Black-glazed redware	96	7670
	Bone china	17	144
	Cistercian-type ware	1	4
	Coarse redware	20	833
	Coarse whiteware	1	43
	Creamware	1	7
	English stoneware	21	2180
	Jackfield ware	1	19
	Pearlware	7	140
	Porcelain	1	4
	Redware	28	1412
	Refined redware	3	26
	Refined whiteware	153	1958
	Staffs-type manganese mottled ware	2	97
	Staffs-type marbled slipware	3	19
	Other slipwares	14	324
	White saltglaze	3	27
	Yellow ware	9	170
		<i>Subtotal post-medieval/ modern</i>	384
<i>Total</i>		395	15363

A small proportion of wares, including most of the slipwares, belong to the seventeenth or early eighteenth centuries, and it is possible that at least some of the coarse redwares also belong to this period, but the majority of the assemblage appears to belong to the nineteenth or twentieth centuries. Even where potentially earlier wares were found, these generally appear to be residual. A large proportion (270 sherds; 82% of the total by sherd count) came from layer (23001), an unstratified deposit, with sixty-six sherds being found in the backfills of the tanning pits.

Clay tobacco pipes

The clay tobacco pipes consist mainly of plain stem fragments which cannot be closely dated. There are, however, a few datable pieces. One complete and one partial bowl are of mid- to late seventeenth-century spurred type (c 1640–80: Rutter & Davey 1980, fig 79).

One other partial bowl is a heeled example of similar date (*op cit*, fig 77), while another partial bowl is spurred and is of eighteenth-century date or later. A complete bowl of a spurless form imitating a briar pipe (Atkinson & Oswald 1969, fig 2, type 30, c 1850–1910) carries a London pipemaker’s mark, partially obscured (...ART / ...NDON). There are also two decorated stems, one with both spiral- and roller-stamped decoration (Rutter & Davey 1980, fig 61, no 96, dated c 1710–30; fig 63, no 1, dated c 1700–60), and a second with faint roller-stamped decoration (*op cit*, similar but not identical to fig 58, no 29, decorative type dated c 1690–1720).

Glass

The vessel glass consists largely of containers. Probably the earliest amongst these is a basal fragment from a green wine bottle of ‘onion’ form (c 1680–1730), occurring residually in a nineteenth/twentieth-century deposit. Other undiagnostic fragments of green wine bottle could date to this period or could equally well be later. Four wine bottle necks from the same context are of late eighteenth/early nineteenth-century form, with a fifth neck showing the flat band-like collar typical of continental bottles of the later nineteenth and early twentieth centuries (Dumbrell 1983, 134).

Fragments from green beer bottles (thirty-eight examples) are generally distinguishable from the wine bottles. These are all confined to structure (23031) (III IV.14), a latrine or other outbuilding in the rear yard of a property on the western side of Fosbrook Street at its northern end, and all appear to be of very similar type – one-pint bottles with cork closures, of late nineteenth- or early twentieth-century type. There is one complete example (carrying the mark of Thomas Welsby & Co, of Chester and Birkenhead); other marks include two from the Lion Brewery of Chester (one is marked ‘Chester and Seacombe’ and thus post-dates 1898 when the brewery acquired the business of John King of Seacombe (<http://newsfeed.rootsweb.com/th/read/BIRKENHEAD/2005-03/1111243215>), but predates the brewery’s closure in 1902 (Lewis & Thacker eds 2003, 187)). These bottles can be added to the collection of twenty-five complete bottles from the early twentieth century recovered from the evaluation; these carry the proprietary marks of C Beatson, J T Milne & Son, and the Dee Mineral Water Company, all local Chester manufacturers. Other beverage containers are represented by five bottles from the unstratified deposit (23001), including one Hamilton (egg) type and three with Codd closures. The fifth is embossed with the mark of T H Duckworth of Chester, and also with the bottlemaker’s mark (Alexander & Co of Leeds). The only other identifiable container is a square bottle or jar, presumably holding some kind of foodstuff.

Other finds

Other finds comprise small quantities of metalwork (including a button, saucepan lid, George VI halfpenny and possible knife blade); leather (a complete shoe of late eighteenth- or nineteenth-century date, and some shoe fragments); ceramic wall and floor tiles of nineteenth- or twentieth-century date (one polychrome and two plain white glazed wall tiles; two decorative floor tiles); and oyster shell.

Environmental remains

Animal bone Lorrain Higbee

The assemblage comprises 185 fragments (30.892kg) of animal bone; once conjoins are taken into account the figure falls slightly to 180 fragments (Table IV.3). Bone was recovered from six nineteenth-century contexts, including layers (23001) (unstratified), (23086) (rubble deposit below the terraced housing), (25003) (buried soil), culvert fill (23344) and probable tanning pits (817) and (26048). The largest concentrations came from the culvert fill (105 fragments/57%) and layer (23001) (70 fragments/38%); the other four contexts produced negligible quantities

Table IV.3 Animal bone quantified by species and no of fragments (joining fragments counted as 1)

<i>Species</i>	<i>No</i>
Cattle	89
Sheep/goat	9
Pig	7
Horse	6
Dog	1
Dog/fox	1
Rabbit	3
Domestic fowl	4
Duck	1
<i>Total identified</i>	121
<i>Total unidentifiable</i>	59
<i>% identified</i>	67
<i>Overall total</i>	180

The assemblage is well preserved and marks were recorded on only fourteen bones (8%), the majority of which came from layer (23001). Cattle bones make up 74% of the assemblage.

The large group of bones from culvert fill (23344) includes waste material from either tanning or horn-working. The latter interpretation is considered more appropriate since tannery waste usually includes foot bones as well as horn cores (*see* for example, Albarella 2003, 75–7; MacGregor 1989, 119; Serjeantson 1989, 136; Yeomans 2007, 112).

In total, there are seventy-four cattle horn cores, most of which are still attached to the frontal bone. A few of the more complete frontal bones have sub-circular fractures over the sagittal suture, evidence that these animals were dispatched, or at least stunned, by poleaxe. Cut marks around the base of many of the horn cores indicate that the outer sheath was removed with the aid of a sharp knife. The horn cores all came from breeds with medium-sized horns (205–327mm; *see* Sykes & Symmons 2007). The size and shape of the horn cores was used to determine the sex ratio of the sample. A scatterplot (in archive) of basal

circumference (or BC) and minimum width at the base (or Wmin) indicates that both bulls and cows are present in roughly equal numbers and that the number of bulls is far higher than would be expected in a normal dairy- or meat-based economy. This suggests that horn-workers preferentially selected the larger horns of bulls.

The material recovered from (23001) includes a number of complete horse bones, from at least two different animals. Measurements taken on two complete tibiae and a femur provide withers (or shoulder) height estimates of 14–16.2 hands. This deposit also included a small amount of domestic refuse, consisting of a number of broken rib fragments and several extensively butchered sheep/goat bones. This waste is typical of the secondary use of meat joints for marrow to flavour stews, broths and stocks.

Conclusions

Although the material from context (23344) has been interpreted as horn-workers' waste, given the documentary evidence and presence of possible tanning pits on the site, it is likely that the tannery did some of the preliminary processing (ie, removal of the outer sheath from the core) themselves.

Measurements taken on the base of the horn cores indicates that both sexes are represented and that large horn cores from bulls were preferentially selected. The group of horse bones from (23001) could represent waste material from a knacker's yard, or bones acquired by a bone-worker. Craft industries that use carcass byproducts tend to operate in close proximity to each other and the industries that supply them with raw materials (Yeomans 2005).

The composition of the domestic refuse from the site indicates that meat joints were extensively used; this is consistent with the diets of working-class people in industrial urban areas during the eighteenth/nineteenth century.

Plant remains Ruth Pelling

Methods

A single sample, <17>, from timber-lined pit (26053), context (26055), was processed by standard flotation methods: the flot was retained on a 0.5mm mesh and the residues fractioned onto 5.6mm, 2mm and 1mm mesh and then dried. The coarse fractions (>5.6mm) were sorted, weighed and discarded. The flot was submitted to the author for full analysis. It was split into manageable fractions through a stack of sieves and each fraction sorted under a x10–x40 stereo-binocular microscope. Its character was recorded in terms of dominant material type, consistency and preservation. Quantifiable seeds, fruits and other items were extracted and identified using modern comparative material held by the author and the Historic England collection at Fort Cumberland, Portsmouth. Other material was recorded as present, common or abundant. Wood fragments were fractured and examined in transverse section and separated into deciduous or coniferous taxa on the basis of visible vessel distribution. Nomenclature and taxonomic order follow Stace (1997). Counts are given in Table IV.4. Items recorded are seeds/fruits unless otherwise stated. Relative abundance is given for wood fragments and other non-seed items (+ = present; ++ = common; +++ = abundant).

Table IV.4 Plant remains from sample <17>

<i>Feature</i>		(26053)
<i>Context</i>		(26055)
<i>Sample</i>		<17>
<i>Sample volume (litres)</i>		18
<i>Ranunculus acris/repens/bulbosus</i>	Buttercup	1
<i>Fumaria</i> sp	Fumitory	1
<i>Ficus carica</i> L.	Fig	7
<i>Urtica dioica</i> L.	Stinging nettle	1
<i>Quercus</i> sp	Oak, acorn	2
<i>Quercus</i> sp	Oak, acorn base	21
<i>Quercus</i> sp	Oak, acorn cap	1
<i>Quercus</i> sp/ <i>Corylus avellana</i> L.	Acorn/hazelnut shell fragments	39
<i>Rumex</i> sp	Dock	1
<i>Brassica nigra</i> (L.) W.D.J. Koch	Black mustard	1
<i>Medicago/Melilotus</i> type	Medick/meliot	9
<i>cf Ornithopus</i> sp	Bird's-foot seed pod	1
<i>Medicago cf polymorpha</i>	Toothed medick seed pod	1
<i>Cornus mas</i> L.	Cornelian-cherry fruit stone	5
<i>Euphorbia helioscopia</i> L.	Sun spurge	1
<i>Vitis vinifera</i> L.	Grape seed	1
<i>cf Vitis vinifera</i> L.	<i>cf</i> Grape seed fragment	1
<i>Hyoscyamus niger</i> L.	Henbane	1
<i>Sambucus nigra</i> L.	Elderberry seed	7
Poaceae subfamily Panicoideae	Millet-type grasses, lemma	1
Type A	Seed pod	1
Type B	Large indeterminate seed pod	5
Indeterminate	Large seed pod fragment	1
Indeterminate		12
Coniferous wood fragments		++
Diffuse porous wood fragments		+
Indeterminate leaf buds		>50
Indeterminate bark fragments		+++
Indeterminate wood fibre		+
Indeterminate ?catkin/cone scales		5
Indeterminate catkin/cone base		5
Indeterminate cone fragment		1
Coleopteran elytra		+
Insect heads		+
<i>cf</i> worm capsule		+
Mouse dropping		+
Burnt bone fragment		1
Clinker		+
Coal		+
Indeterminate organic matter		+++

Results

The flot was large (4 litres), dark brown in colour and composed largely of dried organic matter including frequent degraded wood fibre and larger wood and bark fragments. A smaller component of identifiable seeds, seed pods, tree cones and catkins was also noted, some of which were encased in organic matter. Given the nineteenth-century date of the feature it is likely that non-native species are present. The preservation of the smaller seeds was very good, suggesting that organic decay had been slowed by the waterlogged conditions within the feature, but fragile leafy material had not survived. Large nut shell and wood fragments had shrunk, distorted and hardened as a result of drying out and were no longer sufficiently well preserved for firm identification.

Tree remains, including wood, bark and fruits, dominated the flot. Acorns (*Quercus* sp) were the most frequent tree fruit present. Given the potential for non-native species and poor preservation, it was not possible to identify the oak to species. Deciduous tree wood fragments were dominated by diffuse porous taxa, while oak did not appear to be particularly dominant, suggesting that the acorns may have been deliberately collected. However, given the degraded condition of much of the wood it is possible that oak was common but was no longer identifiable. Coniferous wood was particularly common and included worked chips showing one cut or sawn face. All the wood fragments in the flot were relatively small (4–10mm on their broadest plane). A number of cone and/or catkin fragments were present, although not identifiable during the rapid analysis. They are likely to include non-native coniferous taxa.

A small number of edible seeds were identified, of which grape (*Vitis vinifera*) and fig (*Ficus carica*) are typical of cesspit or other sewage-rich assemblages; both are likely to have been imported as dried fruit. An unusual find was a number of whole and partial stones of the fruit of cornelian cherry (*Cornus mas*). Cornelian cherry, a native of central and south-eastern Europe and western Asia (Clapham *et al* 1989, 276), produces a shrub or small tree (up to 8m) which grows successfully in Britain, although the fruits rarely ripen (Stace 1997). The astringent fruits are high in vitamin C and have both culinary and medicinal uses (<http://www.ueresgen29.unifi.it/ds10.htm>). The stones were up to 15mm long (Stace gives a size range of 12–15mm for the fruit), suggesting that they derive from good-sized fruits. Elderberries (*Sambucus nigra*) are native fruits which may have been consumed although they could have been growing in the vicinity of the pit. A single seed of black mustard (*Brassica nigra*) represents an additional edible food item.

The remaining identified seeds derive from herbaceous plants of catholic habitat requirements, including nitrogen-demanding urban weed flora (*Hyoscyamus nigra*, *Euphorbia helioscopia*) and grassland habitats (*Ranunculus acris/repens/bulbosus*, *Medicago/Melilotus*-type taxa). Some of the fabaceae seeds and pods (*cf Ornithopus* sp and *Medicago/Melilotus* types) were coated in organic matter and could potentially derive from animal dung.

Discussion

The large assemblage of wood chips, bark and acorns from pit (26053) is potentially indicative of tanning. Oak bark was traditionally used as the principal tanning agent (Steane 1985, 248; Burns 2012), and it is reasonable to assume that some acorns and wood fragments

would enter the solution at the same time. On the other hand, acorns have a high tannin content and can therefore be deliberately used as a tanning agent in their own right. Some of the coniferous wood chips may have been used in the tanning process, along with the cones and catkins and potentially some of the herbaceous plants, although it is likely that much of the coniferous wood derives from the timber lining of the pit (the larger pieces of worked wood were all identified as pine (*Pinus* sp)).

The range of other tree fruits and remains may also be related to tanning. The sample also produced general organic waste and possible animal dung. Sewage may again have been used in the tanning process, or the pit was subsequently used as a cesspit. The deposit is also useful in terms of providing evidence for the consumption of imported fruits including grapes, figs, and more unusually, cornelian cherry.

Discussion Andrew B Powell

The only feature of possible Roman date was the east–west ditch (29000). It was less than 1m wide and 0.56m deep, although the degree of truncation by post-medieval cultivation and nineteenth-century development is not known, and it is at least possible that it was originally a more substantial feature. The ditch lay over 100m to the north of the Roman road and on a slightly different orientation and may simply have marked a field boundary. The other early ditches remain undated. No traces were found of the Roman aqueduct, which on existing evidence lay to the south of the road (Mason 2005, 110–18).

While timber water pipes were found on the site, they were clearly associated with the nineteenth-century tannery. No evidence was found for the medieval and post-medieval water supply. The land on the north side of Boughton road was probably farmland during these periods, comprising part of the town field to the north-east of Chester. However, the earliest cartographic representations also indicate not only housing spreading eastward along Foregate Street and beyond the Bars into Boughton but also industrial activity in the form of possible tenter frames, or conceivably hide-drying structures, on the ground to the north and east of the houses. While their depiction is ambiguous on Smith's map of 1585, their nature is clearer on Braun and Hogenberg's map of 1581. No evidence was found on the site for these structures. Nor was there any evidence from the site for any Civil War outworks.

If the extensive soil horizon recorded in the trial pits and evaluation trenches represents a single deposit, the history of the site suggests that it was probably largely a product of the period of mid-seventeenth to early nineteenth-century horticultural use depicted from Hollar's 1653 map to Wood's map of 1833. While three sherds of Roman pottery were recovered during the watching brief, the intensive cultivation of the site suggested by the map evidence makes it likely that these were residual. Relatively small quantities of finds of sixteenth–eighteenth-century date (pottery, glass, clay tobacco pipe) were also found residually in later features.

There would seem to be little doubt that the main group of Phase 2 timber structures are associated with the tanning industry. The two rows of rectangular pits probably represent the different stages of soaking and processing the hide, while the western row of smaller structures connected by the timber piping possibly managed the supply of water to the pits.

This interpretation appears to be confirmed by the recovery of wood chips, bark and acorns from pit (26053), as well as evidence for sewage, general organic waste and possible animal dung, also possibly used in the tanning process. Unfortunately, the residue analysis of timber samples from three of the pits and one of the pipes was inconclusive. The last was mistakenly treated as a control sample unrelated to the tanning works, so that the fact that it produced evidence of possible tanning chemicals similar to the pit samples appeared to indicate that all the samples may have been equally contaminated from soil, ground-water percolation or some other process. Nonetheless, while the lack of a control sample means that such contamination cannot be ruled out, the findings are certainly consistent with the timber pits and pipes having been used in the tanning process.

The fact that the pits were timber-lined need not be an indication of an early date. The timbers, even the largest structural pieces, were of pine (*Pinus* sp), and while pine types cannot be identified to species, subtle anatomical differences indicate that two or more types are represented. Since only Scots pine (*Pinus sylvestris*) is native to, or widely grown in, Britain, it is quite possible that imported wood was used in these structures.

Tanneries relied on a steady supply of water for washing and soaking the hides at different stages in the tanning process, with pits of different size and construction being required at each stage. It is clear that only part of the tannery yard survived later developments on the site, and the features exposed may represent only part of the process. Both timber-lined and brick-lined pits were found, for example, in the eighteenth- to nineteenth-century tanneries in Bermondsey (Clarke 2013), the different materials being chosen perhaps on the basis of cost, function and properties. Cherry (1991, 297) suggests that the excavation of tannery sites is likely to reveal two different types of pit: shallow pits for the handling process during which skins are constantly moved to ensure an even spread of colour, and deeper pits where the hides would be left in solution for at least a year. The truncation of the pits on the present site by the later construction of Fosbrook Street, however, meant that their original depths could not be determined, nor was the source of the water used there identified.

Traditionally timber pipes were bored with iron augers increasing in diameter up to 150–200mm, powered either by hand if small, or by steam engine if large, and made of hard wood (Martin 1813, 479). By the early nineteenth century, however, they could be bored using a cylindrical cutter; the piece of wood bored out could itself be drilled to form small pipes.

One feature of interest is the hexafoil (daisy-wheel) apotropaic mark on pipe (26057). Such symbols, which are more typically seen in late medieval domestic contexts, are thought to be intended to guard potential access points, such as windows, doors and fireplaces, against entry by evil spirits (Easton 1999, 22), although they may also have had practical applications for carpenters and masons. The significance of such a mark in the context of a nineteenth-century tannery water pipe can only be guessed at.

The nature of feature (23340) containing the cattle horn cores is unclear, as is its relationship to two nearby timber-lined pits. The fact that it contained no foot bones might indicate that that it was related to horn-working rather than tanning, and it is notable that it was situated at a distance from the tanning pits.

Leather was a basic byproduct of animal husbandry. Animal skins were usually supplied from the slaughtermen with the horns and foot bones still attached, and these bone elements are commonly found on tannery sites. Steam Mill Street (formerly Steam Lane), running north from Boughton road just west of the site, was originally known (before the construction of the canal that cut across it) as Horn Lane. According to Hemingway (1831, 428), 'It is said to have received the former appellation, from one or both of its boundary banks having been formed of the hoofs and horns of cattle brought there from the various tanneries, with which the neighbourhood abounded.'

It is not surprising that there should be numerous documentary references to tanning in the post-medieval period, particularly in an area such as Boughton on the outskirts of Chester, where there was a ready supply of water. Medieval and post-medieval tanneries are recorded along Foregate Street and close to the Bars. The leather trades were important to Chester, which had little other industry, with the dairying areas of Cheshire and north Wales providing a ready supply of hides and skins. The trade declined in the eighteenth century, however, as a result of the imposition in 1711 of a tax on hides and the increasing shortage of oak bark owing to its shipment to tanneries in Ireland. The lists of freemen who voted in the parliamentary elections of 1747 contain the names of fifteen tanners, twenty-three glovers and 150 cordwainers (shoemakers) (Armour 1956, 34). However, *The Chester guide* for 1795 names just six tanners, while the 1797 edition names only one (Broster 1795; 1797).

The presence of a tannery on the site by the end of the eighteenth century is strongly suggested by the following entry in a Survey of Lands of the Dean and Chapter in and around Chester (Cheshire Archives and Local Studies EDD 10/7/29, not dated but stated in the online catalogue to be c 1790):

Mary Buckley for 1 Close formerly called Stubb's Croft used as a Garden heading east to Hoole Lane & abutting West to Mr. Croughton's Tan house & bounded on the South by the Street & North by Mr. Thos. Jenkins Croft.
A[cre]s 0 R[oods] 3 P[erches] 39

Yearly Value
[£] 4.10.0

The description of the close 'used as a Garden heading east to Hoole Lane' would appear to identify it as the property lying to the immediate east of the site, and therefore the site itself as the tannery. If there was a tannery on the site in 1790, then it would seem likely that it can be identified as the 'tan-yard ... lately occupied by Mr. Croughton' described in detail in the *Adams Weekly Courant* for that year (volume 58 no 3021 for Tuesday 5 December 1790, page 1), as follows:

Chester, Nov. 1, 1790.
To be sold by private contract,
All that messuage or dwelling-house, situate and being in Boughton, in the said city of Chester, on the north side thereof; together with a large and spacious tan-yard lately laid out, and built at the back part thereof, capable of carrying on an extensive trade in

the tanning line, consisting of bark-bays, drying-houses, leather-house, Stables, mill and Kilns; and also 40 bark-pits, four lime-pits, water-pits, and two mastering-pits, and an extensive piece of ground adjoining, calculated to augment the number thereof; and also, a large garden adjoining thereto, which terminates at the canal bank.

It is noteworthy that this account only refers to a bark tannery, whereas the chemical analysis showed elevated levels of calcic or potassic alum, suggestive of the tawing process associated with the sheepskins used for glovemaking.

The location of the tannery described in the *Adams Weekly Courant*, between the road and canal, is again consistent with that of site. However, it is notable that none of the maps postdating the completion of the canal in 1779 (eg Hunter 1789, Murray & Stuart 1791, Stockdale 1795, Roper 1805, Batenham 1819, Neele & Son 1817, Hemingway 1829, Wood 1833) show any buildings on the site (other than those on the street frontage) until the 1848 tithe map, the area to the rear being consistently depicted as open fields or gardens. It is clear that some of these maps are derivative and probably not the product of new surveys, and it may also have been the case that a tannery on the outskirts of the town was not considered significant enough to show. Nonetheless, the above description does suggest a substantial new industrial works comprising multiple buildings, and its absence from the maps appears to be a significant omission. There remains at least the possibility, therefore, that the 1790 Croughton tannery occupied some other site in Boughton, possibly in the more heavily built-up areas closer to the town.

Terraced housing had reached Steven Street on the western edge of the site by 1833. However, the presence of a tannery on the site at some point in the first half of the nineteenth century is confirmed by a description by E Jackson, who in ‘Recollections of Boughton’ (1922, 9), writing of the 1850s, stated how ground later occupied by Victor Street and Fosbrook Street (streets first shown on the 1875 OS map) ‘was used as a tanyard, and afterwards the warehouses, which stood on the site of Fosbrook-street, were used as candle works by Mr Wilcockson, who kept a grocer’s shop near The Cross’. These warehouses are almost certainly the buildings shown on the tithe map – whatever their actual use at that date – since they lay directly below the line of Fosbrook Street.

This passage raises the question of the date and function of the Phase 2 building. Interpreting and dating the small number of largely isolated lengths of stone walling is hampered by the fact that they shared the same general orientation as the post-medieval property boundaries and the nineteenth-century street plan, and it appears that some stone was reused in the foundations of the terraced housing. The only cartographic evidence for buildings in the excavated parts of the site predating the terraced housing is the 1848 tithe map (although it does not identify them as a tannery), and some of the excavated walls corresponded quite closely with these buildings. The linear form of the main building, overlying some of the timber tanks, suggests that it may well have been contemporary with the tannery and housed some of its operations, while the east–west wall (23042) appears to have been associated with the possible cistern (26013) that formed part of the tannery’s timber structures. It is also possible that the excavated remains and the buildings shown on

the tithe map represent the warehouses (later candle works) referred to above; whether these reused former tannery buildings or were newly constructed is unknown.

The excavation, therefore, has shed light on the evolving usage of the land on the margins of the Roman settlement and the medieval and post-medieval town. Most importantly it has provided detailed evidence for the final days of one of Chester's important industries during the rapid expansion of the city in the nineteenth century.

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Bibliography

- | | |
|------------------------------|---|
| <i>Adams Weekly Courant</i> | <i>Adams Weekly Courant</i> . Chester: Monk (printer) |
| Albarella, U 2003 | Tawyers, tanners, horn trade and the mystery of the missing goat. <i>In</i> : Murphy, P & Wiltshire, P eds. <i>The environmental archaeology of industry</i> . (Symposia of the Association for Environmental Archaeology 20). Oxford: Oxbow Books, 71–86 |
| Armour, C 1956 | The trade of Chester and the state of the Dee navigation 1600–1800. (Unpublished PhD thesis). University of London |
| Atkinson, D & Oswald, A 1969 | London clay tobacco pipes. <i>J Brit Archaeol Assoc</i> 32 , 171–227 |
| Badreshany, K 2016 | Boughton Centre: geochemistry analysis report. (Client report project 053/14). Reading: University of Reading Quaternary Scientific (QUEST) |

- Barrow, J S, Herson, J D, Lawes A H, Riden, P J & Seaborne, M V J 2005 Local government and public services: public utilities. *In: Lewis & Thacker eds*, 35–49. <http://www.british-history.ac.uk/vch/ches/vol5/pt2/pp35-49>. Accessed 15-05-2016
- Batenham, G 1819 *Plan of the city of Chester*. Chester: Batenham <https://chesterwalls.info/gallery/oldmaps/oldmap4.html>. Accessed 10-08-2017
- Boydell, J 1749 *South prospect of the city of Chester*. London. <http://www.sciencephoto.com/image/554794/530wm/C0185078-Chester-SPL.jpg>. Accessed 10-08-2017
- Braun, G & Hogenberg, F 1581 *Cestria (vulgo) Chester Angliae. Civitates orbis terrarum 3*. Cologne
- British Geological Survey Geology of Britain viewer. <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>. Accessed 25-03-2016
- Broster, J 1795 *The Chester guide*. Chester: Broster & Bulkley
- Broster, J 1797 *The Chester guide*. Chester: Broster & Bulkley
- Burns, C 2012 The tanning industry of medieval Britain. *Anthrojournal 2*. <http://anthrojournal.com/issue/may/article/the-tanning-industry-of-medieval-britain>. Accessed 18-12-2015
- Carrington, P 2012 The extramural settlements: an overview. *In: Ward, S W et al. Excavations at Chester, the western and southern extramural settlements: a Roman community on the edge of the world*. (Chester Archaeol Excav Surv Rep **15**; BAR Brit Ser **553**). Oxford: Archaeopress, 301–37
- CgMs 2012 Archaeological desk-based assessment: Boughton Retail Centre site, Chester. (Unpublished client report project **HS/12986**). London: CgMs
- Cherry, J 1991 Leather. *In: Blair, J & Ramsay, N. English medieval industries: craftsmen, techniques, products*. London: Hambledon Press, 295–318
- Clapham, A R, Tutin, T G & Moore, D M 1989 *Flora of the British Isles*. Ed 3. Cambridge: Cambridge University Press
- Clarke, C 2013 The excavation of a Romano-British trackway and a post-medieval tannery at Spa Road, Bermondsey. *Surrey Archaeol Collect 97*, 59–85
- De Lavaux, A 1745 *Plan of the city & castle of Chester*. <http://www.bl.uk/onlinegallery/onlineex/kinggeorge/p/zoomify82055.html>. Accessed 08-08-2017
- Dumbrell, R 1983 *Understanding antique wine bottles*. Woodbridge: Antique Collectors' Club
- Easton, T 1999 Ritual marks on historic timber. *Weald and Downland Museum Magazine* Spring ed, 22–8
- Emery, G ed 2005 *The old Chester canal: a history and guide*. Chester: Chester Canal Heritage Trust
- Hanshall, J H 1817 *The history of the county palatine of Chester*. Chester: Fletcher
- Hemingway, J 1829 Chester. Engraved for Hemingway 1831, vol 2, frontispiece. <http://www.pastpages.co.uk/site-files/maps-uk/Ox/OAM001.jpg>. Accessed 10-08-2017

- Hemingway, J 1831 *History of the city of Chester, from its foundation to the present time.* 2 vols. Chester: Fletcher
- Hemingway, J 1836 *Panorama of the city of Chester.* Chester: Griffiths
- Hollar, W 1653 *The ground-plott of Chester.* London: Overton. http://chester.shoutwiki.com/wiki/Hollar%27s_Map. Accessed 08-08-2017
- Hunter, J 1789 *Survey of the ancient and loyal city of Chester.* Chester: Hunter
- Jackson, E 1922 *Recollections of Boughton.* *Cheshire Sheaf* ser 3, **19**, 8–11
- Lewis, P & Thacker, AT eds 2003 *A history of the county of Chester 5 (1): the city of Chester: general history and topography.* (Victoria History of the Counties of England). Woodbridge: Boydell & Brewer for Institute of Historical Research. <http://www.british-history.ac.uk/vch/ches/vol5/pt1>. Accessed 18-05-2016
- Lewis, C P & Thacker, AT eds 2005 *A history of the county of Chester 5 (2): the city of Chester: culture, buildings, institutions.* (Victoria History of the Counties of England). Woodbridge: Boydell & Brewer for Institute of Historical Research. <http://www.british-history.ac.uk/vch/ches/vol5/pt2>. Accessed 18-05-2016
- MacGregor, A 1989 Bone, antler and horn industries in the urban context. *In: Serjeantson & Waldron eds*, 107–28
- Margary, I D 1957 *Roman roads of Britain.* 2 vols. London: Phoenix House
- Martin, T 1813 *The circle of the mechanical arts.* London: Rees
- Mason, D J P 2005 *Excavations at Chester, the Roman fortress baths: excavation and recording 1732–1998.* (Archaeol Serv Excav Surv Rep **13**). Chester: Chester City Council
- Murray & Stuart 1791 *A new & accurate plan of the city Chester.* Chester: Poole. http://freepages.genealogy.rootsweb.ancestry.com/~genmaps/genfiles/COU_files/ENG/CHS/murray-smart_ches_1900.html. Accessed 10-08-2017
- Neele & Son 1817 *Plan of Chester.* London: Lackington. http://freepages.genealogy.rootsweb.ancestry.com/~genmaps/genfiles/COU_files/ENG/CHS/neele_chester_1817.html. Accessed 10-08-2017
- Ordnance Survey 1875 *Cheshire and city and county of the city of Chester.* (Cheshire Sheet XXXVIII.11). Southampton: Ordnance Survey
- Pack, K 2013 *Archaeological watching brief for land at Boughton Centre, Chester.* (Unpublished client report **LP1475C-AWB-v1.2**). Chester: L-P : Archaeology. Cheshire HER ref **CHER R3483**
- RIB 1* Collingwood, R G & Wright, R P 1965. *The Roman inscriptions of Britain 1: inscriptions on stone.* Oxford: Clarendon Press
- Roper, J 1805 *Chester.* London: Vernor, Hood, and Sharpe. <http://www.antique-maps-online.co.uk/chester-cole-roper-2844.html>. Accessed 10-08-2017
- Rutter, J A & Davey, P J 1980 *Clay pipes from Chester.* *In: Davey, P J ed. The archaeology of the clay tobacco pipe 3: Britain: the North and West.* (BAR Brit Ser **78**). Oxford: British Archaeological Reports, 41–272
- Serjeantson, D 1989 *Animal remains and the tanning trade.* *In: Serjeantson & Waldron eds*, 129–46

- Serjeantson, D & Waldron, T eds 1989 *Diet and crafts in towns*. (BAR Brit Ser **199**). Oxford: British Archaeological Reports
- Smith, W 1585 Chester. British Library Harley MS 1046, f 172. <http://www.bl.uk/onlinegallery/onlineex/unvbrit/c/001hrf000001046u00172000.html>. Accessed 08-08-2017
- Stace, C 1997 *New flora of the British Isles*. Ed 2. Cambridge: Cambridge University Press
- Steane, J M 1985 *The archaeology of medieval England and Wales*. London: Croom Helm
- Stockdale, J 1795 A plan of Chester. In: Aikin, J. *A description of the country from thirty to forty miles round Manchester*, 384. London: Stockdale. <https://chesterwalls.info/gallery/oldmaps/stockdalemap.html>. Accessed 10-08-2017
- Sykes, N & Symmons, R 2007 Sexing cattle horn-cores: problems and progress. *Int J Osteoarchaeol* **17**, 514–23
- Tyers, I 2015 Tree-ring spot dates from archaeological samples: the Boughton Centre, Chester, Cheshire. (Unpublished client report site code **100901**). Sheffield: University of Sheffield
- Ward, S 1987 *Excavations at Chester, the Civil War siegeworks 1642–6*. (Grosvenor Mus Archaeol Excav Surv Rep **4**). Chester: Chester City Council
- Wessex Archaeology 2015 The Boughton Centre, Chester, Cheshire: assessment report and updated project design. (Unpublished client report **100901.3**). Sheffield: Wessex Archaeology
- Wood, J 1833 *Plan of the city of Chester*. Edinburgh. <https://www.llgc.org.uk/en/discover/digital-gallery/maps/john-woods-welsh-town-plans/chester-1833/>. Accessed 08-08-2017
- Yeomans, L 2005 Spatial determinants of animal carcass processing in post-medieval London and evidence for a co-operative supply network. *Trans London Middlesex Archaeol Soc* **55**, 69–83
- Yeomans, L 2007 The shifting use of animal carcasses in medieval and post-medieval London. In: Pluskowski, A ed. *Breaking and shaping beastly bodies: animals as material culture in the Middle Ages*. Oxford: Oxbow Books, 98–115

