GRAND ARCADE, MILLGATE, WIGAN,

Greater Manchester

Final Excavation Report

Oxford Archaeology North

July 2008

Modus Properties

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SUMMARY

In 2005-7, a major new retail facility in Wigan, known as the Grand Arcade Shopping Development, was constructed by Modus Properties. The development area lies on the eastern fringe of the centre of Wigan (centred on SD 5836 0571), and incorporates part of the historic town that is known to contain buried remains of Roman and medieval date. Large gaps exist in the current understanding of Wigan's history, and whilst its Roman origins have long been suspected, this period in the town's history has remained enigmatic. It has frequently been cited as the Roman settlement of *Coccium*, referred to in second-century literature, although corroborating evidence has been elusive.

In order to secure archaeological interests, a condition was placed on the planning application for the Grand Arcade Development, which allowed for a programme of archaeological investigation. An early stage in this programme of work was an archaeological evaluation, which was undertaken by Oxford Archaeology North between November 2004 and February 2005 (OA North 2005a). The results obtained from the evaluation identified two areas in particular that had significant *in-situ* archaeological remains, which comprised deposits of Roman, medieval and post-medieval date. It was recommended that these areas merited further, more detailed investigation in advance of construction work.

The first area to be subject to detailed investigation lay in the north-western part of the development area, comprising approximately 350 square metres and incorporating the former Ship Yard. The earliest archaeological features to be revealed comprised a series of ditches, seemingly representing Roman military activity dating to the late first century AD. Numerous archaeological features of medieval date were also exposed, including pits and ditches representing the occupation of the burgage plots to the rear of Millgate between the twelfth and fourteenth centuries. Evidence for the continued use of the site between the seventeenth and twentieth centuries was also recorded.

The second area comprised some 1310 square metres, incorporating adjacent plots of land situated on the eastern side of Millgate towards its southern end, and was excavated between March and May 2005 (Plate 1). Excavation revealed the foundations of a substantial building of an early second-century date, providing remarkable evidence for Roman activity in Wigan. The building was largely of stone construction and incorporated several rooms, three of which had contained *hypocaust pilae* and associated fire-pits, implying that the structure had been a bath-house. Analysis of the finds recovered from the excavation, coupled with archaeomagnetic dating of internal structures, has indicated that the building was abandoned in the mid-second century, and was seemingly deliberately dismantled at that time. This compares closely to the perceived chronology of Roman activity at the Wiend, situated a short distance to the north of the Grand Arcade site, which was subject to archaeological excavation during the 1980s. The character of the Roman remains exposed during that work, and indeed with the results obtained from excavations of other Roman extramural settlements in the North West, contrasted starkly with those

at the Grand Arcade site, which has provided important new information for the nature of Roman occupation in the region.

Physical evidence for activity during the medieval and post-medieval periods was also obtained from the second area of excavation, providing a stratigraphic sequence from the late first to the twentieth century. Medieval occupation of the site appears to have been dominated by domestic activity, whilst the excavated post-medieval remains provided evidence for the industrialisation of the town.

Analysis of the archaeological dataset has established a long and fairly complex sequence of activity on the site from the Roman to later post-medieval periods. The work has provided extremely important evidence for Roman occupation, in spite of extensive nineteenth- and twentieth-century disturbance, the most significant discovery being that of the bath-house. Few Roman bath-houses in the north of England have been excavated and analysed using anything like the range of techniques that are now available. In this respect, the bath-house excavated at the Grand Arcade site is particularly significant, since it was excavated and recorded in detail using modern techniques of controlled excavation, albeit in a 'rescue' environment. The bath-house would appear to be a rare (recorded) example of an early Roman military-style bath-house that was not associated with a fort, for whilst the existence of a fort at Wigan cannot yet be ruled out completely, it is looking increasingly unlikely. From what was known of the archaeology of Roman Wigan prior to the Grand Arcade excavations, the possibility that the settlement was an industrial complex akin to known examples elsewhere in the North West, including Wilderspool in Cheshire and Walton-le-Dale in Lancashire, had often been postulated. A feature of these sites, and one that appears to be reflected in the evidence from Wigan, is a marked reduction in the intensity of occupation after the second century; the coarse ware pottery recovered from the site suggests little activity until the Trajanic period, and the small numbers of vessels datable later than the middle of the second century suggest that the building fell into disuse not long after AD140/50. If Wigan was indeed an industrial site, the presence of a bath-house, together with the distinctive elements of the ceramic assemblage identified during the present assessment, provide strong indications of a military presence, although whether the complex was a strictly military enterprise, such as a works and/or supply depot, or was merely supervised by military personnel, remains an open question.

ACKNOWLEDGEMENTS

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Rowland, who also produced the finds drawings. The report was commented on for OA North by Rachel Newman.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Modus Properties recently submitted a proposal for the construction of a major new retail facility in the centre of Wigan, known as the Grand Arcade Shopping Development. The development site lies on the eastern fringe of the town centre (centred on SD 5836 0571), and incorporates part of the core of the historic town (Fig 1). From the results of earlier archaeological work in the vicinity of the site, it was clear that the construction programme was likely to have a negative impact on buried remains of Roman, medieval and earlier post-medieval date (*Section 1.3* below).

1.1.2 In order to secure archaeological interests, the Greater Manchester Archaeological Unit (GMAU), in its capacity as archaeological advisor to the Local Planning Authority of Wigan Metropolitan Borough Council (WMBC), recommended that a programme of archaeological investigation was carried out to inform the planning process. In accordance with this recommendation, WMBC attached an archaeological condition to the planning consent for the development, and a brief detailing the required archaeological works was prepared. In the first instance, a desk-based assessment of the development area was undertaken by the University of Manchester Archaeological Unit (UMAU 2001). The assessment highlighted those parts of the site that were considered to have some potential to contained buried archaeological remains, and concluded that a programme of targeted evaluation trenching should be carried out. The evaluation was intended to assess the nature, date, extent and significance of any buried archaeological remains in order to devise an appropriate mitigation strategy in advance of development work.

1.1.3 In October 2004, Oxford Archaeology North (OA North) was invited by Modus Properties to submit a costed project design to undertake the specified programme of archaeological evaluation. Following the acceptance of the project design, OA North was commissioned to carry out the work, which was completed between November 2004 and February 2005. The evaluation comprised the excavation of 36 targeted trial trenches, which were focused on nine areas of the site that were considered to have a potential to contain archaeological remains.

1.1.4 The evaluation demonstrated that, whilst archaeological levels had been removed by nineteenth- and twentieth-century disturbances over large parts of the site, important buried remains of Roman, medieval and earlier post-medieval date did survive in some areas, and that these sensitive deposits were threatened with damage or total destruction by the proposed development (OA North 2005a). Consequently, the Assistant County Archaeologist, in consultation with English Heritage's Regional Inspector of Ancient Monuments and representatives of WMBC, recommended that a more extensive programme of controlled archaeological excavation be undertaken in

these areas prior to the commencement of building works, since *in-situ* preservation of the remains was not a practical option.

1.1.5 Detailed excavation focused on two parts of the development site: Area G3 lay in the north-western part of the site, across the former Ship Yard; Area G7/10 lay to the south, incorporating the former Powell's yard and McEwan's Yard (Fig 2). The excavation of these areas revealed buried archaeological remains of significance (Plate 1), and particularly in Area G7/10, where the well-preserved remains of a Roman bath-house were discovered (OANorth 2006).

Plate 1: Aerial view of the Grand Arcade development in 2005, showing the location of excavation Areas G3 and G7/10

1.2 LOCATION, GEOLOGY AND TOPOGRAPHICAL SETTING

1.2.1 ***Location:*** Wigan lies close to the western boundary of the modern county of Greater Manchester, approximately midway between the rivers Mersey and Ribble. The town is situated on the northern bank of the river Douglas, a tributary of the Ribble. The development site covered an area of some 4.6ha on the eastern fringe of Wigan's historic core (centred on SD 5836 0571), bounded on the north-west by Standishgate, to the north by Crompton Street, to the east by River Way, and to the south-west by Millgate (Fig 1).

1.2.2 ***Geology:*** the geology of the Wigan area forms part of the Lancashire Coal Measures, which extend from the Mersey Valley in the south to the Amounderness Plain in the North West (Countryside Commission 1998, 172). The solid geology comprises productive coal measures, with Bunter sandstone and marls to the south (Ordnance Survey 1951). The overlying drift geology consists of glacial and post-glacial tills, with fluvial deposits of gravel along the course of the river Douglas (Countryside Commission 1998, 128), which today lies immediately east of the site.

1.2.3 ***Topography:*** Millgate rises fairly steeply from a height of 34m OD at its south-eastern end to a high point in excess of 50m OD near its junction with the area known as the Wiend. A greater understanding of the topography of the area was provided by a contour survey of the town centre undertaken in 1982 by the Greater Manchester Archaeological Unit (GMAU). The results demonstrated that the site straddles the eastern side of a spur on which the historic core of the town is situated. The lowest-lying section of the site lay between River Way and Station Road, and incorporated the former west bank of the river Douglas (the river itself was canalised into its present course during the nineteenth century, as shown on historical mapping). Ground levels in this area were, however, raised significantly during the late nineteenth and twentieth centuries. To the west and north-west the ground rises steeply from the former river bank, although there too the natural slope was altered substantially in places during the second half of the twentieth century.

1.2.4 The most significant changes to the topography of the site occurred in the 1960s during the erection of a large multi-storey car park on the corner of Millgate and Station Road, which was revealed during the excavation to have been terraced into the hillside. Conversely, the construction of the cinema on Station Road necessitated the raising of the ground level (UMAU 2001).

1.2.5 The land use of the site immediately prior to the Grand Arcade development varied across the site. The area to the east of Station Road and Watkin Street, forming the eastern part of the site, was dominated by car-parking facilities, including a multi-storey car park, and the embankment associated with the River Way dual carriageway. A multi-storey car park similarly dominated the southern edge of the site, situated at the junction of Millgate, River Way and Station Road. The northern part of the site, bounded by Crompton Street, Watkin Street and Standishgate, incorporated large retail outlets. The remainder of the site had a mixture of uses, including light woodland along the northern edge of Station Road.

1.3 HISTORICAL BACKGROUND

1.3.1 ***Prehistoric period:*** there is little evidence for prehistoric activity around Wigan, and none in the vicinity of the site. Stray finds are, however, known from the wider area, including a Neolithic polished stone axe found at Gidlow (Jackson 1936, 74), a Bronze Age axe-hammer, now lost, discovered near Bottling Wood to the north-east of the site (UMAU 2001, 7), and a polished stone axe recovered from Leigh cricket ground in 1912 (Aldridge 1999).

1.3.2 ***Romano-British period:*** Wigan has long been associated with the Roman site of *Coccium*, which is recorded as lying 17 miles from Manchester in a listing of roads, known as the *Antonine Itinerary*, which was probably compiled during the second century AD (Margary 1973). Firm evidence for this association has, however, been lacking, although antiquarian observations and chance finds of Roman artefacts indicated that occupation of some kind had occurred on the site during the Roman period. During the nineteenth century, artefacts were discovered during construction works in the Wallgate, King Street and Darlington Street area (Hannavy 1990, 8), and a particular concentration of finds was identified on the higher ground around Library Street and Millgate (Hawkes 1935, 43). The remains of a probable Roman cemetery were also discovered during the construction of a gas works on the southern edge of the town between 1822 and 1830 (Watkin 1883, 20). Also during the early nineteenth century, a defensive bank and ditch were purportedly visible on the north side of the town centre, although there is some debate over the veracity of this observation (SMR 4057.1.0).

1.3.3 It was not until archaeological excavations were carried out at the Wiend during the 1980s that actual settlement remains of Roman date were first identified in Wigan. These investigations revealed the remains of what has been interpreted as a Roman military industrial site, comprising a series of timber buildings, furnaces and hearths associated with a metalled road. It was considered likely that further Roman remains had existed near the summit of the hill in the town centre, but that these deposits had probably been largely destroyed by Georgian and Victorian cellars (Tindall 1983, 29-30). Whilst the results of the excavations added weight to the hypothesis that Wigan was indeed the site of *Coccium*, the nature, function and longevity of Roman settlement remained uncertain. Indeed, the main phase of intensive activity at the Wiend appears to have tailed off during the early years of the third century, and the nature of Roman activity during the third and fourth centuries remains entirely obscure. Similarly, it has been assumed that there was a Roman fort in Wigan, although firm evidence of genuinely military activity remains elusive.

1.3.4 Recent work by the Wigan Archaeological Society (WAS) has furnished information regarding the route of Roman roads in the vicinity of Wigan. One of the most important routes was the road between Wigan and Manchester, which, in general terms, is thought to take the same course as the modern A577 (Aldridge 2005). This has been investigated in several places, including Small Brook Lane, near Atherton, Hatton Fold, Amberwood Common in Higher Ince, and in Ellesmere Park (*ibid*).

1.3.5 ***Early medieval period:*** the character of occupation following the collapse of formal Roman administration in the early fifth century remain entirely obscure. Place-name evidence points to some form of native settlement (Tindall 1985, 20), and the name Wigan is thought to come either from an Old English personal name (*ibid*), or from the Saxon word *waeg*, meaning way, which is often associated with the existence of a Roman road (GMAU 2001, 9). There is no direct evidence for activity in the study area during this period, but the name Standishgate includes the Viking word for street, '*gata*' (Hannavy 2003, 15), which suggests it was a road of some significance. Folkard (1909, vii) claims that there was a church at Wigan before the Norman Conquest, but 'of subsequent re-buildings and restorations there remains no record until 1620, when the chancel was rebuilt'. It has similarly been postulated that the settlement at Scholes originated during the ninth century (Fletcher 2005, 7), but physical evidence is lacking.

1.3.6 ***Medieval period:*** following the Norman Conquest, William I assigned most of the land between the Ribble and Mersey rivers to Roger of Poitou, who made Wigan the administrative centre of the barony of Makerfield (*op cit*, 14). Wigan is not named in the Domesday survey, but is thought to be the 'church of the manor' of Newton (Powell 1998, 6). Nevertheless, much of the surrounding area was probably of little importance, reflecting the expansive peat mosses that dominated the landscape (Hall *et al* 1995, 122). Wigan began to prosper during the thirteenth century, in part due to the granting of a market charter and three-day fair in 1245 (Hannavy 1990, 20). The town attained Royal Borough status a year later and gradually grew in size and prosperity. As a Royal Borough, the citizens received the rights and privileges of freemen, or burgesses, which included the right to rent burgage plots as free tenants of the lord of the manor. The size of the burgage plots was specified as five roods of land, for which an annual rent of 12d was levied (Bridgeman 1888-90, 9-10). During this period, Wigan was influenced by the control of several prominent families, including the Norrises, Banastres, Standishes, and Gerards, all of whom owned large halls and land in the vicinity. By the end of the thirteenth century, however, the Bradshaighs began to emerge as the most influential family in the region, and acquired Haigh Hall in 1295 (Fletcher 2005, 14).

1.3.7 By the early fourteenth century, Wigan was one of the larger chartered towns of Lancashire, together with Lancaster, Preston, Liverpool, Manchester and Warrington (White 1996, 129), as demonstrated by its assessment in the exchequer lay subsidies of 1332 (Morris 1983). During the reign of Edward III (1327-77), charters were awarded to the town for the streets to be paved. The expansion of Wigan at this time was also reflected in the construction of a bridge over the river Douglas at the bottom of Millgate, which was authorised by an Act of Parliament in 1334 (Hannavy 1990, 36).

1.3.8 Whilst medieval Wigan was essentially an agricultural town, industrial activity is known to have developed at an early date, such as textile manufacture, coal mining and metal working, including the production of iron, pewter and brass (Powell 1998, 8). The manufacture of felt hats was also carried out, and whilst this was originally a cottage-based industry, mills for this purpose were built in

1782 (*op cit*). Textile production during this period was, however, dominated by the woollen industry, which was sufficiently well-established by the early fourteenth century to support three fulling mills (Hannavy 1990, 34). However, there was a significant decline in trade during the mid-fifteenth century and many burgage plots may have been wholly or partly abandoned at this time (UMAU 2001, 10). Despite this, it is probable that the modern street pattern in the town centre reflects the medieval development of the settlement and that many of the late post-medieval properties in the historic core originated during the medieval period.

1.3.9 It has been suggested that the town was provided with some kind of defensive circuit during the late medieval period, possibly in the form of an earthen bank and ditch (Powell 1998, 8). The putative defences may have enclosed an irregular, oval-shaped area bounded (approximately) by the river Douglas, Dicconson Street (towards the southern end of Standishgate), New Market Street, Dorning Street and King Street (*ibid*). Wigan was certainly one of the principal boroughs in Lancashire at this time, a fact reflected in the size of the contribution the town made to Charles I's 'ship-money' levy; Wigan contributed £50 to this fund, whilst Preston, Lancaster and Liverpool contributed £40, £30 and £25 respectively (Folkard 1909, ix).

1.3.10 Physical remains of medieval Wigan have been uncovered in several excavations within the town centre. Cultivation soils and a timber-lined well or cistern were excavated at the Wiend (Jones and Price 1985, 29), whilst postholes and pottery dating to the fourteenth or fifteenth centuries were uncovered at Chapel Street (GMAU 1987, 2). The remains of two medieval burgage plots and a substantial town house constructed of timber were also discovered on Hallgate (GMAU 2001). The excavated burgage plots were found to be at least 5m wide, and between 30m and 40m in length.

1.3.11 ***Post-medieval period:*** in broad terms, the period from the sixteenth to eighteenth centuries was one of increased growth and prosperity for Wigan. By 1538, John Leland was able to describe the settlement as 'a paved town as big as Warrington, but better builded...' (Chandler 1993). The town probably increased in size by almost a third during the sixteenth century, attaining a population of approximately 4000 by 1600 (Hannavy 1990, 46), and by the 1630s Wigan had become one of the largest towns in Lancashire. As a result of this population increase, new buildings appear to have been constructed in the central part of the town, infilling many of the medieval burgage tails.

1.3.12 In 1627, the Wigan Company of Pewterers was founded, and the town emerged as one of the most important centres for pewter production in the county (Powell 1998, 10), whilst other metal-working industries also developed (Tindall 1985, 23). In particular, the manufacture of brass products, bell founding and watch-making emerged as important industries during the seventeenth century. However, the outbreak of the Civil War in 1642 resulted in a severe check to the town's fortunes. Wigan entered the war as a Royalist stronghold, but was captured by Sir John Seaton in April 1643 and was later subjected to punitive taxation under the Commonwealth (Hannavy 2003).

1.3.13 It was not until the eighteenth century that the town once again achieved economic success and renewed expansion. An eyewitness account of Wigan towards the end of the century gives the impression that development at this time was rather *ad hoc*: 'The main streets of the town are broad, but irregularly built, with a mixture of old and modern houses' (Aiken 1795, 294). The growth of Wigan during this period was largely due to the coal, iron and textile industries, and in particular the manufacture of woollen cloths, linen, calicos and checks. The town specialised in woollen bedding textiles, which were produced in cottage hand-loom shops (Powell 1998, 9). The metal-working trades continued to be of importance to the town, as illustrated by a contemporary account of 1754, which observed that Wigan was noted for the design and manufacture of clocks and for its non-ferrous metal foundries, producing small bells, candlesticks and other household goods (Berg and Berg 2001, 295). Wigan also had a flourishing pottery trade, which can be traced back on documentary evidence at least as far as the mid-seventeenth century; in 1664, the rector allowed that 'the potters of Wigan for the tyme (*sic*) being may dig clay in the waste of the said manor as heretofore potters of Wigan have used to do…' (Folkard 1909, xiv). Pottery manufacture had ceased by the early part of the nineteenth century, however, presumably due to the growth of the industry in areas such as Stoke-on-Trent and Merseyside (*op cit*).

1.3.14 Coal mining in the Wigan area during the medieval period had been carried out on what was essentially small-scale, open-cast sites, but by the sixteenth century mining was mostly underground (Hannavy 1990, 69). A document of 1619 provides one of the earliest references to a coal pit on Millgate itself, whereby the rector gave permission to Peter Platt to drain 'water from his coal-pit near the Millgate into the street' (Folkard 1909, xi). By the late eighteenth century, the Wigan coalfield had become the centre of the region's coal trade, and was recognised as one of the most important of the Lancashire coalfields (Farrer and Brownbill 1908, 357). This was partially on account of rich deposits of cannel coal, which burns with a bright flame and produces very little ash, and thus was in great demand for household use and invariably sold for a higher price than ordinary coal.

1.3.15 One of the earliest maps of Wigan (LRO DP175) was produced in 1712 to illustrate the proposed river Douglas Navigation (Plate 2). Whilst schematic, the map shows relatively dense development along Millgate, although this appears to have been focused along the western side of the road. The completion of the Douglas Navigation in 1742 effectively provided Wigan with a direct link to the Ribble estuary and the sea, boosting trade outside of the region (Clarke 1994).

1.3.16 The advantages to trade provided by the Douglas Navigation were enhanced by the opening of the Leeds and Liverpool Canal in 1774. This important waterway generated large amounts of trade, not least with Ireland (Clarke 1994, 43).

Plate 2: A map of 1712, showing approximate location of the Grand Arcade

1.3.17 ***Industrial period:*** by the later eighteenth century, cotton was beginning to be the dominant element of the textile industry. In 1754, the Swedish industrial spy RR Angerstein noted that 'large numbers of women and children were occupied with the spinning of cotton' (Berg and Berg 2001, 295). Some 40 years later, Aiken (1795, 294) commented that 'the cotton manufactory, as in all other places, intrudes upon the old staple of the place'. Although slow by national standards, the introduction of steam-powered mills during the early part of the nineteenth century meant that the textile industry remained an important part of the local economy. At one point in the nineteenth century, the industry accounted for over 50% of the employment in the town (Hannavy 1990, 116). The new process of ring spinning was introduced in a Wigan textile mill in 1887, and from 1888 the Wigan firm of Ffarington, Eckersley & Co Ltd became for three decades the largest ring spinners in Britain (Williams and Farnie 1992, 35).

1.3.18 The earliest detailed survey of Wigan is provided by a map of the town drawn by Mather in 1827 (Plate 3). This shows clearly the three main streets in Wigan, radiating out from the church, and the outlines of long plots of medieval origin to the rear of buildings. In particular, the properties fronting onto Millgate are shown to have long burgage plots, with property boundaries extending down the bank to the river Douglas. It is of note that Mather's map shows that a meander in the river had been canalised, relative to the plan of 1712 (Plate 2). A more detailed plan of the town in the mid-nineteenth century is provided by the Ordnance Survey map of 1848, which shows considerable growth.

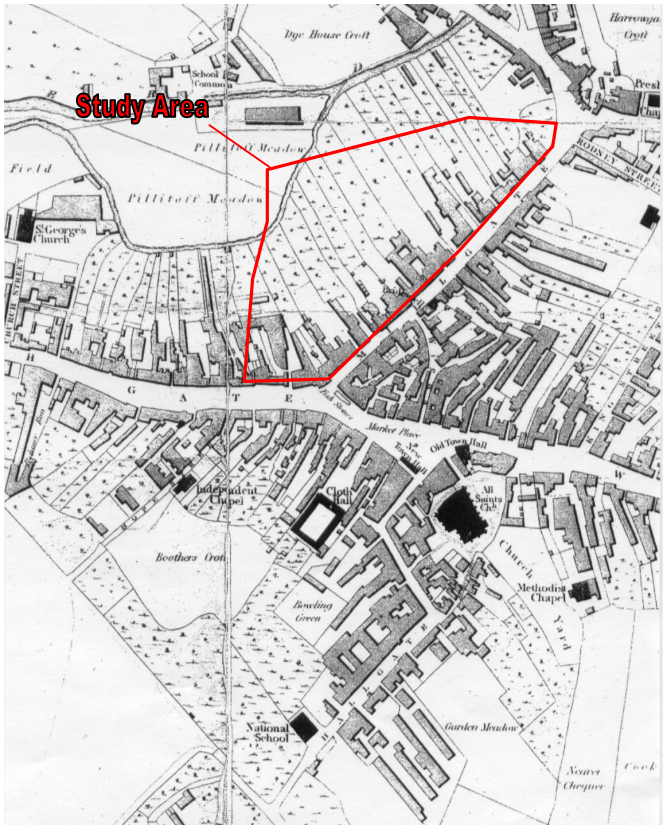

Plate 3: Extract from Mather's plan of 1827

1.3.19 Further improvement of transport links, including a canal branch to Manchester and the construction of the railways, continued to enhance Wigan's productivity during the nineteenth century. The construction of the Central Station a short distance to the east of Millgate is of particular relevance. This was the third railway station to be built in Wigan, and was erected in 1892 by the Grand Central Railway Company (Hannavy 1990, 96). Its construction demanded considerable landscaping works, which included infilling the original course of the river Douglas (which was canalised into its present course) and the raising of ground levels along the western side of the Douglas Valley. An indication of the resultant landscape is provided by the detail shown on Ordnance Survey mapping of the area (Plate 4).

1.3.20 The continuing prosperity of the town meant that the population increased at a tremendous rate during the nineteenth century. Many of the inhabitants were housed in tightly-packed courts and small terraces, as shown on Ordnance Survey mapping, with the result that sanitation was often extremely poor (UMAU 2001, 12). As a result, the waterworks and gas works were improved, public swimming baths were built and roads widened and improved (*op cit*). According to Edward Baines, writing in 1825, 'the springs in the neighbourhood of Wigan are numerous' and a new baths was 'recently built' to tap the water from a spring near Scholes Bridge. The water was 'strongly

impregnated with sulphur, and which, from its resemblance to the celebrated Yorkshire spa, obtained the name of "New Harrogate"' (Baines 1825, 612).

1.3.21 The coal industry continued to expand through the nineteenth century; by 1874 there were 140 collieries operating in the Wigan area, many of which continued in use into the twentieth century (Ashmore 1982). During the twentieth century, however, Wigan's two main industries, coal and textiles, declined, although engineering and food processing contributed increasingly to the area's economy (McNeil and Nevell 2000, 66). The Central Station was closed in 1965, and had been demolished by 1982. During the 1960s, the street plan in the vicinity of the site was remodelled through the construction of the modern ring road (UMAU 2001, 12). Of particular relevance to the present site is that part of the ring road known as River Way, which was driven across the old course of the river Douglas, immediately to the east of the development site.

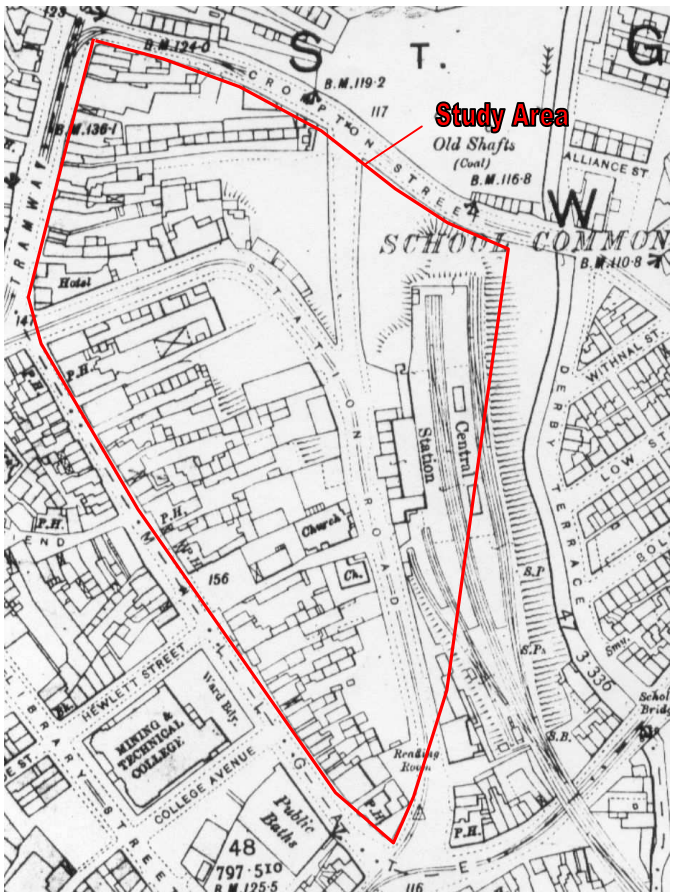

Plate 4: Extract from the 1908 Ordnance Survey map

2. ORIGINAL RESEARCH AIMS

2.1 ACADEMIC AIMS AND OBJECTIVES

2.1.1 The main research aim of the archaeological evaluation, given the commercial nature of the development, was to assess the survival of archaeological deposits across the proposed development site, and to attempt to characterise and date any remains that were encountered. The objectives of the evaluation were defined thus:

i) to assess the nature, date, density, extent, function and state of preservation of archaeological remains;

ii) to assess the potential of any surviving remains to inform a greater understanding of the development of land-use in the area;

iii) to formulate a strategy for appropriate mitigation, in consultation with the other relevant parties.

2.1.2 The aims of the subsequent excavations were to excavate and record in detail the surviving archaeological remains, and to obtain a full range of artefactual and environmental materials that would enable the stratigraphic sequence to be characterised, dated and interpreted. In particular, it was hoped to:

i) advance understanding of Roman occupation and land-use in this part of Wigan;

ii) contribute to existing archaeological knowledge relating to the material culture, form and development of Roman settlement in the North West;

iii) identify deposits relating to post-Roman occupation, in order to inform an understanding of the development of Wigan during the medieval and post-medieval periods.

2.1.3 Whilst remaining valid, the original aims of the fieldwork were updated in the light of the post-excavation assessment, and new aims and objectives were identified based on the potential of the dataset. The analysis of the dataset was intended to achieve two primary objectives: to add to the archaeological knowledge in the areas prioritised by the original fieldwork aims; and to understand how people lived in Wigan in the past.

2.1.4 The updated research aims considered the following:

i) the development of the site during the Roman period, including evidence for changes, both spatial and chronological, in the layout of individual structures and external areas, and the use of dating techniques to track these changes;

ii) changes in the nature of the community occupying the site through the Roman period, including evidence for military occupation and the possible presence of ‘non-military’ elements;

iii) evidence for military and civilian interactions throughout the period of Roman occupation, and for the relationship of the Grand Arcade site to the rest of the settlement;

iv) information on the economy of the Roman site and for manufacture and repair. Evidence for trade, supply, consumption, and resource exploitation and management;

v) daily life on the site in the Roman period, including diet, standards of living, pastimes, costume and personal adornment;

vi) the place of the Roman settlement in the wider context of the creation and development of what we see as a military zone in northern England. The relationship of the settlement to similar sites in the area, and the place of Wigan in the overall pattern of Roman occupation in the region;

vii) site development in the medieval and post-medieval periods;

viii) processes of change, particularly the transition from medieval to post-medieval traditions in this part of the town;

ix) the economy of the medieval and earlier post-medieval periods in this part of Wigan, including the development of crafts and industries, patterns of consumption and the use, management and origin of resources;

x) the character of occupation in the later post-medieval period, particularly the health and diet of the occupants and activity within surviving cellars.

3. STRATIGRAPHIC NARRATIVE

3.1 INTRODUCTION

3.1.1 This section presents the results obtained from the archaeological fieldwork undertaken as part of the Grand Arcade Shopping Development. Attention is focused upon two main areas of the development site that were subject to detailed excavation (Area G3, Ship Yard; and Area G7/G10, Powell's and McEwan's Yards; Fig 2), although pertinent data derived from the programme of evaluation trenching are summarised where relevant. Area G7/G10 was the largest area, comprising approximately 1310 square metres, whilst the excavation of Area G3 examined some 350 square metres.

3.1.2 In the following narrative, a broad phasing has been compiled, representing the major events in the evolution of the site, based on the occupational evidence identified and recorded in the field. Seven broad periods (Periods 1-7) were identified in the main area of excavation (Area G7/G10; Powell's and McEwan's Yards), with clear evidence for the sub-phasing of Period 2 (Table 1). The same numbering system has also been imposed on the stratigraphic sequence in Area G3 (Ship Yard) to the north, although there not all the periods of activity recorded in Area G7/G10 were identified.

Period	**Sub-Period**	**Date Range**
Period 1		Late first – early second centuries (Flavian/Trajanic)
Period 2		Early second – third centuries (Hadrianic/Severan)
	Period 2A	*c* AD 117-38 (Hadrianic)
	Period 2B	*c* AD 138-61 (early Antonine)
	Period 2C	*c* AD 161-235 (late Antonine/Severan)
Period 3		Twelfth – mid-sixteenth centuries
Period 4		Mid-sixteenth – seventeenth centuries
Period 5		Eighteenth century
Period 6		Nineteenth century
Period 7		Twentieth century

Table 1: Periods of archaeological activity identified

3.2 NATURAL SUBSOILS

3.2.1 The natural subsoil in Area G7/G10 comprised a mid-orange till or boulder clay up to 0.5m thick (***19***), overlying a bedrock of soft, greyish-yellow laminated mudstone (***20***), which had been terraced by Roman activity (Phase 2A; *Section 3.4.5 below*). The clay contained frequent small and medium-sized sub-rounded and sub-angular stones, and greyish silty mottled inclusions and lenses of sand. The natural subsoil exposed in Area G3 was a yellowish sandy-clay (***3056***).

3.3 PERIOD 1: EARLY ROMAN (LATE FIRST – EARLY SECOND CENTURIES)

3.3.1 Period 1 pertains to the inital Roman occupation of the site, and represents the earliest anthropogenic activity identified during the entire scheme of archaeologcal work; absolutely no evidence for prehistoric activity was recovered. Within Area G7/G10, Period 1 comprised a small group of features and deposits which included fragments of two slight timber structures: a small, rectangular building associated with several phases of lead-working hearths (Structure ***950***), which was situated on the northern part of the excavated area; and a second structure (Structure ***951***) to the south (Fig 3).

3.3.2 The archaeological evidence recovered from Area G3 suggests that Roman activity on this part of the site was relatively unintensive, although this may be a reflection of poor survival. In view of the current uncertainty regarding the character and extent of Roman Wigan, however, the discovery of even a few Roman features in Area G3 is potentially of considerable significance. Since the few Roman features recorded in this area were stratigraphically isolated from the more extensive Roman remains found in Area G7/G10 to the south, it has not been possible to integrate them into the G7/G10 phase sequence precisely. However, the pottery recovered from these features suggest a late first- / early second-century date, consistent with the Period 1 activity in Area G7/10.

3.3.3 ***Structure 950:*** a fairly dense concentration of features was recorded towards the northern end of Area G7/10, all of which had been dug directly into the natural geology and were, in most cases, cut or overlain by deposits associated with Building ***1000*** (Period 2). These features appeared to represent the poorly-preserved remains of a small, rectilinear timber structure (Structure ***950***), measuring in excess of 6.2m east/west, and approximately 2.2m wide internally. Neither end of the building was identified with complete confidence, so it may originally have been longer than the recorded dimension; it is, however, conceivable that the structure was open-ended.

3.3.4 *Phase 1 - Construction and primary occupation:* the putative north wall of Structure ***950*** was defined by a row of four oval or sub-square postholes (west to east: ***556***, ***487***, ***940***, ***939***), measuring from *c* 0.3 x 0.25m to *c* 0.4 x 0.4m and 0.05-0.25m deep, set at intervals of *c* 0.5-0.8m (Fig 3). Spacing suggests that a fifth posthole might once have existed between features ***556*** and ***487***, but if so it had been completely removed by a Period 2 construction trench; the eastern part of the north wall had been completely destroyed by later activity. The surviving section of the putative south wall comprised five sub-circular or oval postholes of similar size and depth to those in the north wall (west to east: ***931***, ***934***, ***935***, ***936***, ***937***). It seems possible that the eastern end of the structure was represented by postholes ***938*** and ***944***. Numerous small, randomly-distributed stakeholes (***941***) were also present along the length of the wall, between and around some of the larger posts, whilst others were found within the building's interior. At least some of these features may have been associated with the construction of the south wall, but if so they did not have a particularly coherent distribution.

3.3.5 Posthole ***937*** appeared to have been cut through a small, sub-rectangular pit or hollow (***899***), measuring 0.7 x 0.4m and 0.25m deep, which was filled with charcoal-rich silt containing burnt tiles (***900***). The precise stratigraphic relationship and significance of feature ***899*** remains unclear, but if it was truly cut by ***937***, then it must have pre-dated Structure ***950***.

3.3.6 Internally, a shallow slot (***945***), 0.15-0.2m wide and 0.05m deep, ran south from posthole ***940***, some 2m inside the surviving western end of the structure. Whilst this feature could conceivably have marked the position of an internal partition, the fact that it was sealed by a primary internal deposit (***540***) makes this interpretation unlikely. All the structural elements of the building were infilled with deposits of grey sandy-clay mixed with redeposited orange subsoil. The postholes in the south wall, together with feature ***939*** in the north wall, also contained quantities of broken ceramic brick and tile, which may have been used as packing around the vanished uprights.

*Plate 5: Series of Period 1 furnaces inside Structure **950***

3.3.7 Just inside the putative south wall of the building were the remains of a small hearth or bowl-furnace (***897***), the earliest of four such features found within Structure ***950*** (Plate 5). A fifth example was also recorded immediately outside the south wall (***901***). Feature ***897*** was sub-circular in plan, with vertical or near-vertical sides and an almost flat base, and measured approximately 0.5m in diameter by 0.2m deep (it was cut away to the north-east by a later feature). A small flue, 0.3m long and 0.2m wide, with a base sloping at an angle of approximately 45^{o} towards the chamber, was situated to the north-west. The feature was filled with dark grey-brown sandy-silt (***898***) overlying a thin basal deposit of charcoal-rich material. Numerous fragments and spills of melted and oxidised lead recovered from these deposits attested to the function of the hearth. Following its infilling, ***897*** was replaced by a very similar feature (***895***), situated only a few centimetres further north. Feature ***895*** was of similar size and appearance, both in plan and profile, to its predecessor, but was slightly

shallower, at only 0.15m. No flue had survived; it was presumably situated on the eastern side of the chamber, which had been destroyed by a later feature. Like ***897***, hearth ***895*** was filled with a charcoal-rich silt (***896***) containing fragments of melted lead.

3.3.8 Over most of the surviving internal area of Structure ***950***, the primary occupation deposit comprised a layer of mixed mid-brown sand and grey silty-sand (***540***), 0.03-0.08m thick. This material yielded many small pieces of melted lead and powdery, oxidised lead spills, and is thought to have been contemporary with hearths ***897*** and ***895***, although it had no direct stratigraphic relationship with either feature. It was, however, cut by a third lead-working hearth (***920***), which had also been dug through the infilled remains of the two earlier hearths. This feature was sub-rectangular in plan, 0.75 x 0.5m and 0.45m deep, with a steep-sided, U-shaped profile. A small, flat-bottomed flue, 0.3m long and 0.15m wide, extending from the east side of the chamber, was floored with a single rectangular slab of dark blue-grey stone (possibly a siltstone), 0.04m thick (***925***). The sides of the chamber itself were crudely lined with a firm yellow-brown sandy-clay, containing some large fragments of stone and ceramic building material (***921***). The feature was infilled ultimately with deposits of mixed yellow-orange sandy-clay and grey sandy-silt (***922***, ***923***, ***924***).

3.3.9 *Phase 2 - Occupation:* hearth ***920*** and deposit ***540*** were overlain by a probable make-up layer of compacted, broken ceramic building material fragments up to 0.05m thick (***539/872***). This covered most of the area west of the earlier hearths, but did not extend over the eastern part of Structure ***950***. It was sealed by a highly compacted surface of small and medium-sized sub-rounded pebbles (***538/870***), 0.15-0.19m thick, that covered the whole of the surviving internal area. Cutting through this surface at the eastern end of the structure was a lead-working hearth (***876***) of greater size than the earlier examples, all three of which it cut into. This feature comprised a sub-rectangular chamber with maximum dimensions of 1.5m east to west by 1.3m and 0.48m deep. For the most part the edges were vertical or near-vertical to a flat base, although the upper part of the south-east corner was less steeply sloping. A well-defined flue, 0.6m long and 0.5m wide (narrowing to 0.25m at the base), was situated on the north side of the chamber. The primary fill of black, charcoal-rich silt (***869***) extended from the chamber, through the flue and into the area immediately around the flue entrance, where it attained its greatest thickness (up to 0.25m). Within the flue, the silt was overlain by a dump of redeposited orange-pink natural clay (***863***), which was in turn sealed by a mixed fill of orange-brown sand, grey sandy-silt and natural clay (***534***=***857***) that filled both the flue and the chamber. The upper part of the chamber was finally infilled with mid-brown silty-sand (***533***).

3.3.10 *Phase 3 - Occupation:* hearth ***876*** was sealed by a probable surface composed of compacted, crushed and broken ceramic building material fragments and small, sub-rounded pebbles (***536***), 0.02-0.07m thick. This deposit, which, over the western part of the structure, sealed a patchy layer of compacted sand and mixed silt up to 0.09m thick (***537***), represented the latest phase of internal

refurbishment within Structure ***950***. It does not appear to have been associated with a contemporary lead-working hearth.

3.3.11 ***Structure 951:*** the ephemeral remains of a possible timber building (Structure ***951***) were exposed some 8m south of Structure ***950***. The principal feature was a slot or gully (***891***), 0.1-0.15m wide and 0.08m deep, marking the putative north wall, which was traced east/west for approximately 2.6m beneath R2 of Period 2 Building ***1000*** (*Section 3.4.14 below*). The joist-slots for the timber floor of the later room had fragmented the slot, whilst to west and east it had been completely destroyed by later features. However, enough survived to demonstrate that at least two other slots of similar type, possibly marking the position of internal partitions, extended south at 90° from ***891***. These features (***912***, ***914***) were 0.1-0.11m wide and 0.06m deep, and extended for only *c* 0.3m before being completely removed by the construction cut for heated room R1 in Building ***1000***. A sub-circular posthole, (***916***) *c* 0.6m in diameter at the lip (but only 0.2m at the base) and 0.2m deep was situated at the junction of ***891*** and ***914***, and a second, smaller posthole (***918***) was excavated south of the western end of ***891***. No floors or other deposits were found in association with any of the excavated features.

3.3.12 In total, the surviving area occupied by these features measured no more than 2.6m east/west by 0.55m north/south. Consequently, their interpretation as part of a timber structure is far from secure, although this seems the most likely hypothesis in view of the character of the remains.

3.3.13 ***External areas:*** Immediately outside the putative south wall of Structure ***950*** was a small bowl-furnace similar to those associated with the primary phase of occupation within that building. The feature comprised a shallow (probably truncated), oval chamber (***901***), measuring 0.55 x 0.35m and 0.1m deep, with a flue 0.3m long and 0.12m wide on its eastern side. The base of the flue sloped towards the bottom of the chamber, which was infilled with charcoal mixed with a few lumps of redeposited natural clay (***902***). Fragments of melted lead were recovered from this material.

3.3.14 With the exception of feature ***901***, Period 1 deposits between Structures ***950*** and ***951*** survived only on a small island of stratigraphy, measuring no more than 4.2m east to west by 1.25m, situated approximately 2.4m north of Structure ***951*** and isolated stratigraphically from the remains of both buildings by later disturbances. In this area, the earliest surviving deposit comprised a layer of grey-brown sandy material up to 0.2m thick, containing numerous small and medium-sized stones and pebbles and a few larger, angular stone fragments (***880***). This deposit was cut by an isolated sub-circular posthole (***877***), measuring 0.5 x 0.4m and 0.37m deep, which was in turn sealed by a spread of compacted, broken ceramic building material fragments and some small pebbles (***872***), up to 0.08m thick. In the primary records, layer ***872*** is equated with deposit ***539***, a probable make-up deposit associated with the second occupational phase within Structure ***950*** some 6m to the north. However, whilst the two layers were undoubtedly of very similar character,

they cannot have formed part of the same deposit, unless Structure ***950*** was considerably larger than the excavated evidence suggests.

3.3.15 Layer ***872*** was overlain by a patchy spread of charcoal-rich sandy-silt up to 0.04m thick (***871***), that was itself sealed by 0.06m of pale grey-brown silty-sand containing many small stones and pebbles (***870***). As with ***872***, the site records equate deposit ***870*** with a layer to the north, in this case surface ***538*** of Phase 2 in Structure ***950***, but again a direct correlation seems unlikely. Perhaps the similarity between layers ***870*** and ***872*** in this part of the site and deposits ***538*** and ***539*** in Structure ***950*** simply reflects the use of what were essentially the same materials for both interior and external surfaces during this phase of occupation.

3.3.16 ***Ship Yard:*** the most significant Roman features encountered in Area G3 comprised the remains of two or three ditches running east/west across the trench (Fig 4). The southernmost (***3020***) was recorded at the south-west corner of the trench, where the surviving segment was 10.4m long, at least 1.2m wide, and 0.56m deep (Plate 6), with an open, V-shaped profile (Fig 5). A continuation (***1104***) of ditch ***3020*** was recorded in a small area immediately to the west that was excavated subsequently, although it had been largely destroyed by a modern service trench (Fig 5); the eastern part of ditch ***3020*** had similarly been obliterated by later features. The base of the cut was filled to a depth of 0.15m with mid-grey clay-sand (***3072***), sealed by an upper fill of dark grey-brown sandy-clay (***3021***). The latter contained an abundance of wood fragments, including tent pegs, small stakes, twigs, and plank fragments. Many of the planks lay recumbent below the stakes, suggesting that they may have been the remains of a collapsed fence. The presence of several lumps of fire-hardened clay or daub also hinted at the possible existence of timber structures in the vicinity.

*Plate 6: Area G3, showing Roman ditch **3020***

3.3.17 Some 3.5m north of feature ***3020***, a second east/west-aligned ditch (***3069***) was recorded. The vestiges (***1100***) of this ditch were also exposed in the short extension of the excavated area to the west (Fig 4). As it survived, ditch ***3069*** was 0.9m wide and up to 0.25m deep, with a V-shaped profile similar to that of ***3020***, and was filled with mid-grey sandy-clay silt (***3055***). It extended into the site for 6.5m from the western trench edge, but had been removed beyond this point by later disturbances. What may have been the same feature was, however, recorded some 12m to the east (***3105***), although there it seemed to curve from north-west to south-east across the trench. Feature ***3105*** appears to have been in excess of 3m wide and 0.7m deep (Fig 5), with gradually sloping sides and a flat base (Plate 7). The base of the cut was filled with a pale brown, moist silty-clay up to 0.18m thick (***3106***). This deposit was sealed by a thin (0.04m) layer or lens of pale yellow silty-clay (***3117***), which was in turn overlain by an upper fill of light grey sandy-silt (***3086***), 0.4m thick. Whilst this feature may have been the same as ***3069*** to the west, it is also possible that it formed part of a separate, third, ditch that curved north-west to run north of ***3069***, beyond the limits of the excavation.

*Plate 7: Area G3, showing south-east-facing section across ditch **3105***

3.3.18 With the exception of the ditches, only one other Roman feature, a short segment of a narrow, east/west-aligned gully (***3107***), was recorded within Area G3. The gully was 0.3m wide and 0.2m deep, with a U-shaped profile, and was filled with a sticky grey-brown clay (***3108***). It lay on the southern edge of the trench, approximately 5m south of curving ditch ***3105***, and appeared to continue the line of ditch ***3020*** eastwards. Ditch ***3020*** was not recorded in the eastern part of the trench, although this area had suffered particularly badly from post-medieval disturbance.

3.3.19 In the area immediately south of Area G3, earth-moving works associated with the new development were monitored by means of an archaeological watching

brief. This revealed that extensive late post-medieval disturbance had destroyed any Roman remains that may once have existed in this part of the site.

3.3.20 ***Period 1 Dating:*** the small ceramic assemblage recovered from Period 1 deposits in Area G7/10 would be consistent with a late first- / early second-century (Flavian/Trajanic) date, although the only reasonably closely datable sherd was a fragment of samian attributable to the period *c* AD 70-100/110 (*Section 4.2.6 below*), which came from possible make-up layer ***539*** of the second occupational phase in Structure ***950***. In the same phase, archaeomagnetic dating of lead-working hearth ***876*** indicated that its last firing very probably occurred sometime in the period AD 80-180 (*Appendix 8*). If Structure ***950*** was associated with an early phase of occupation distinct from that which followed (Period 2), then a late first- / early second-century date would be entirely appropriate. However, if the hypothesis that the structure was associated with the construction of the Period 2A bath-house (Building ***1000***) is correct, then it must date to the Hadrianic period, since there can be little doubt that Building ***1000*** was Hadrianic (*Section 3.4.32 below*).

3.3.21 The upper fill (***3021***) of ditch ***3020*** in Area G3 yielded 44 fragments of pottery, mostly derived from a single vessel of probable Flavian/Trajanic (late first- / early second-century) date, whilst the topmost fill (***3086***) of feature ***3105*** contained material dating to the Hadrianic/early Antonine period. Ditch ***3069*** contained no datable artefactual material, but gully ***3107*** produced a near-complete spouted flanged bowl imitating samian form Curle 11, which is attributable to the period *c* AD 120-145/50 (*Appendix 2*).

3.3.22 ***Period 1 Form and Function:*** for the most part, the surviving remains of Period 1 in Area G7/10 were too fragmentary to characterise, although it seems possible that they represented parts of two small timber buildings (Structure ***950*** and, less certainly, Structure ***951***) separated by a roughly metalled external area. Too little of the putative southern structure (***951***) remained for meaningful interpretation to be feasible, but Structure ***950*** was clearly associated with intensive leadworking activity and may therefore have been a small workshop. Stratigraphically, there can be no doubt that Structure ***950*** pre-dated R9 at the north end of the Period 2A bath-house (Building ***1000***; *Section 3.4.28 below*), whilst putative Structure ***951*** certainly lay beneath the main part of that building. However, comparative evidence from other Roman bath-houses similar to Building ***1000*** suggests that the entrance hall and changing area at the front of the building, of which R9 is an example, was often the last part of the structure to be erected. Whilst incapable of proof, it is therefore stratigraphically possible that Structure ***950*** was contemporary with the construction of the main part of the bath-house, and that it was there that the many lead fixtures and fittings (including piping, roofing materials, and possibly window kames) needed to fit-out the baths were produced. Following this hypothesis, Structure ***950*** would have remained in commission until the bulk of Building ***1000*** was complete, being demolished towards the end of the construction programme to make way for the entrance hall.

3.3.23 The assemblage of artefacts retrieved from the ditches in Area G3 was insufficient in either quality or quantity to permit close dating. However, if these features are taken to have been broadly contemporary, which seems likely on spatial and comparative grounds, then the possibility that they represented the heavily truncated remains of a double (or even triple) ditch system associated with a Roman military installation presents itself. Following this hypothesis, the fragments of possible stake-and-wattle fencing found at the base of ditch ***3020*** could be interpreted as the remains of a palisade associated with the ditch system. The paucity of artefactual material in the ditch fills might be indicative of a relatively brief phase of activity, perhaps relating to a temporary structure such as a marching camp, rather than an actual fort, although the presence of a military-type bath-house of Hadrianic/Antonine date (Building ***1000***) approximately 140m to the south strongly suggests that Wigan was home to a large body of military personnel for a prolonged period around the middle of the second century AD, though whether this was a conventional fort garrison or something else remains a matter for debate.

3.4 PERIOD 2A: THE BATH-HOUSE - CONSTRUCTION AND PRIMARY OCCUPATION (*C* AD 117-38)

3.4.1 Whatever the precise character of activity during Period 1 may have been, it is clear that it was followed by the construction of a substantial Roman stone building (Building ***1000***) on the eastern part of Area G7/G10 (Fig 6). In spite of extremely thorough robbing of most of its structural elements during the Roman period, and severe truncation resulting from late post-medieval construction works, the ground plan of the building, together with the character of the surviving remains, was elucidated. Elsewhere in Area G7/G10, and indeed across the development site as a whole, Roman levels had been even more badly damaged and truncated, with the result that evidence for Roman occupation over the wider area was confined, for the most part, to a small number of truncated and often fragmentary cut features, such as ditches, pits and postholes. The majority of these features were stratigraphically isolated, both from each other and from the structural sequence recorded in Building ***1000***.

3.4.2 The construction and primary occupation of Building ***1000*** have been attributed to Period 2A. The limited evidence for subsequent repairs or alterations to the structure is assigned to Period 2B, whilst the demolition and robbing of the building are described in Period 2C (three sub-phases: Phases 1-3). All external features in G7/G10 that may have been broadly contemporary with Building ***1000*** are attributed to Period 2A-C, since it has not proved possible to tie any of them down to a more specific phase. There was no convincing stratigraphic evidence for continued Roman occupation on the site following the demolition of the bath-house, although a few potsherds that appear to be slightly later than most of the material associated with the demolition and robbing were recovered from external features adjacent to the building. It is possible that later Roman deposits had been removed by post-

medieval levelling of the site, but even if this were so, a few truncated late Roman features might have been expected to survive.

3.4.3 Directly above the remains of Period 1 Structures ***950*** and ***951***, and the associated external deposits, was a substantial rectilinear stone building (Building ***1000***). The ground-plan of this structure (Plate 8), and the character of its surviving remains, leave no doubt that it was a bath-house of military form.

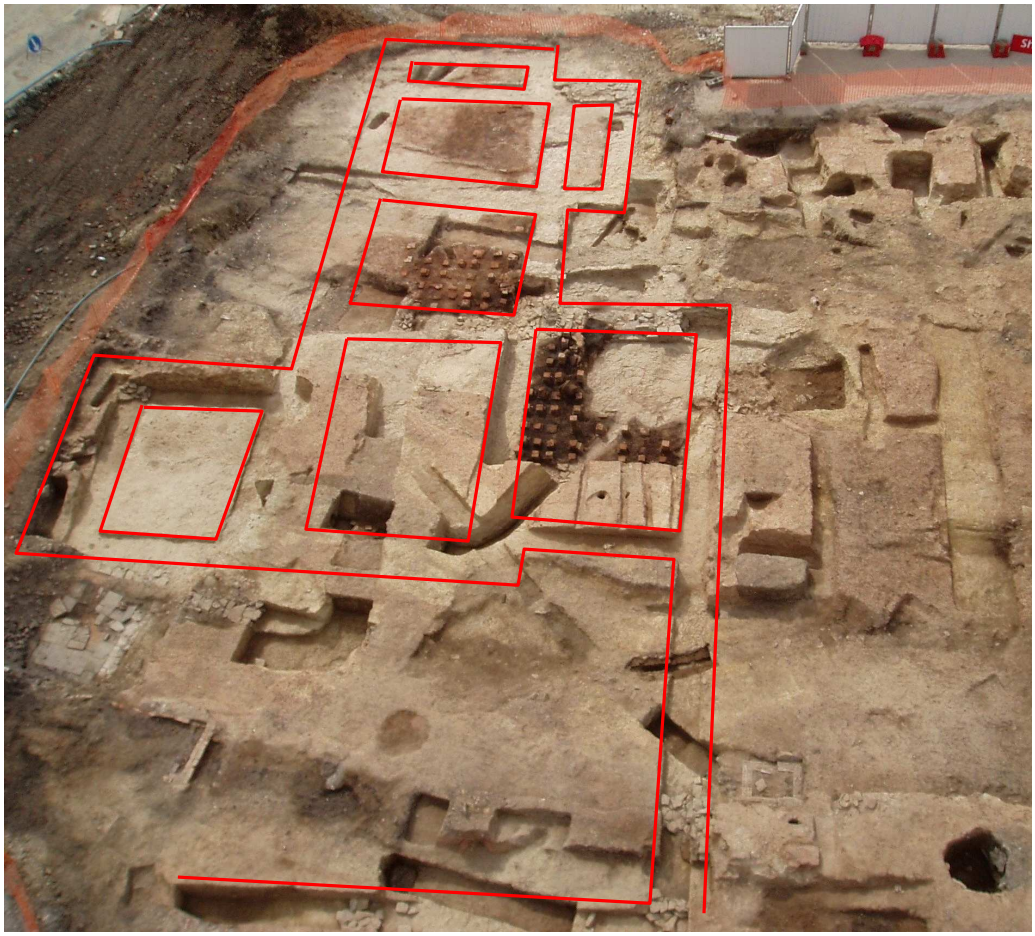

*Plate 8: Footprint of Building **1000** superimposed on a view across Area G7/G10*

3.4.4 Including the colonnaded portico on the north side of the structure, Building ***1000*** measured 35.8m north/south and 17.9m east/west, at its widest, and occupied the whole of the eastern side of the site. It is considered likely that the entire building, comprising a total of nine or ten rooms (R1-R9, and perhaps R6a), lay within the excavated area, although the metrology of the building suggests that an hypothetical eleventh room (R9a) may also have existed at the north-east corner of the structure, which had been completely destroyed. Certainly, all or most of the facilities that might be expected in a bath-house of this type, including the requisite number of heated and unheated rooms, a probable plunge pool, and an entrance hall/changing area, can be identified within the excavated ground plan (Fig 7). The only major element not obviously present was a latrine, although comparative data suggest that this is likely to have been the function of hypothetical room R9a. Be that as it may,

the metrology of the building (*Section 3.7.1*) provides a clear indication that its full extent was exposed during the excavation, and that, with the probable exception of a fire-pit outside the south wall, no part of the structure lay beyond the limits of the site.

3.4.5 There was evidence, in the form of an irregular north/south cut observed at a number of points just west of the building (***433***, ***435***, ***589***), that a shallow terrace had been cut into the natural west/east slope in order to provide a level building paltform. So far as it was possible to tell, given the almost total absence of surviving wall masonry and the removal or truncation of construction trenches by later robbing, all the walls of Building ***1000*** were of a single structural phase. The vertical-sided, flat-bottomed foundation trenches appear to have been continuous (*ie* interlinked), and had been dug through the natural clay into the underlying bedrock. In R1, the wall-trenches were a few centimetres deeper than the construction-pit for the heating system (*c* 2m), and it seems likely that those in the other heated rooms were once of similar depth, although these had all been heavily truncated in recent times. Elsewhere, away from the heated rooms, wall-trenches were approximately 0.8-1m deep. For the most part, the trenches seem to have been completely filled by the foundations, leaving no gaps that required infilling once the walls had been built. Each of the three principal heated rooms (R1, R3, R4) was dug-out to a depth of *c* 2m (due to modern levelling, the full depth survived only in R1), in order to accommodate the sub-floor elements of the heating systems, forming large, vertical-sided and flat-bottomed construction-pits. The interior of the probable plunge-pool (R5) was also reduced to a depth of at least 1.1m (presumably more, since this area had suffered truncation). The foundations for the walls of these rooms were built around the edges of the construction-pits, in trenches a few centimetres deeper than the rest of the cut.

3.4.6 Although the combined length of all the excavated construction trenches amounted to just over 140m, little more than 19m of actual walling remained *in-situ*, and even this was fragmented into ten short sections, the best preserved not much more than 4m in length. At the southern end of the building, a fragment of masonry up to 3m long (***559***) survived at the south-west corner of R8, and another 0.9m in length (***868***) was present in the construction trench for the east wall. A very small fragment of walling (***673***), measuring 0.6m, was found at the south-east corner of R5, whilst another up to 3m long east/west and 2 m north/south (***592***) survived at the north-west corner of R3. In R1, part of the south wall (***577***), up to 4.23m in length, remained *in-situ*, whilst the north wall comprised two fragments (***865***, ***866***), the best preserved (***865***) being some 2m long. At the northern end of the building, the wall masonry survived in three places within R9 - in the north wall and at the south-west corner (***464***), and in the west wall (***565***). However, even the best preserved segment (***565***) was no more than 2m in length.

3.4.7 The walls were constructed of locally quarried, coursed, yellow dolomitic sandstone (*Section 4.15.4 below*), bonded with a hard, buff sandy mortar. The masonry at the base of the construction-pits for the heating systems was given a facing of roughly squared sandstone blocks on the internal face only, but not

on the face that abutted the edge of the construction-pit. Elsewhere, the freestanding walls appear to have been faced on both sides with roughly dressed blocks, averaging *c* 250 x 200 x 100-150mm. For the most part, the surviving masonry was only one or two courses high (*c* 0.1-0.2m), but walls ***565*** and ***577*** were up to five courses in height (*c* 0.5-0.55m), whilst three courses (0.3m) remained at the southern end of ***464***. Most of the surviving walls were approximately 0.9-1m wide (ranging from 0.86m, in the case of ***577***, to 1.2m for ***592***). However, the north wall of R1 (***865***, ***866***) appears to have been slightly less substantial, at 0.7m, and the poorly-preserved fragment of walling at the south-east corner of R5 (***673***) was also only 0.7m in width.

3.4.8 ***R1:*** R1 was the most northerly of the three principal heated rooms within Building ***1000***. It was situated on the west side of the building, flanked by R2 to the north, R6/R6a to the east, and R3 to the south-east. By analogy with similar bath-houses elsewhere in the North, R1 can probably be identified as the hot-dry room, or *sudatorium*. The room was square, measuring 4.5m east to west by 4.4m north to south, internally, and in common with the rest of the building, no internal features or deposits survived at or above contemporary floor level. The remains of the hypocaust system comprised a total of 40 *pilae*, although it is estimated that another 30 or so had been destroyed. The *pilae* stacks were built of square ceramic bricks bonded with clay (Plate 9). Both bricks and clay bonding had clearly been affected by intense heat, the clay having been scorched to a brick-red colour. Many of the stacks had been reduced to only a few tiles in height, but ***788*** survived to nine courses (0.56m) and ***796*** to eight (0.48m). For the most part, the stacks were composed of bricks approximately 170-80mm square and 50mm thick (ranging from 166 x 160mm to 182 x 180mm and 48-52mm thick). In all but 11 cases, however, the basal tile was considerably larger, generally 260-70mm square and 55mm thick (ranging from 245 x 235 x 45mm to 280 x 270 x 55mm).

Plate 9: Area G7/G10, showing arrangement of pilae in north-east corner of R1

3.4.9 It is not clear if the distribution of *pilae* without a larger basal brick has any significance. It is, however, perhaps worthy of note that all the stacks in the northernmost east/west row (***776***, ***777***, ***778***, ***779***, ***785***, ***794***, ***795***, ***796***) were of this type, but whether this points to an episode of repair or reconstruction, or was due to other factors, cannot be determined. The other examples were ***881*** and ***882***, situated in the extreme south-east corner of the system, and ***836*** towards the centre of the room.

3.4.10 With the exception of the *pilae* themsleves, the only primary deposit to survive within the area of the heating system in R1 was a layer of soft, black silty material that covered the base of the hypocaust around the *pilae*. This deposit consisted almost entirely of charcoal and soot, mixed with a few small pieces of burnt clay and ceramic building material, and was only 0.06m thick at the north-west corner of the room (***774***), but was considerably deeper to the east, where it was up to 0.35m thick (***775***). As a result of the comprehensive stone robbing, no evidence for vertical flues channelling hot air up the walls from beneath the floor was noted, either in R1 or elsewhere within the building.

3.4.11 The hypocaust system in R1 was heated from a fire-pit (*praefurnium*) situated outside the west wall of the building (***216***). As it survived, ***216*** was sub-rectangular in plan, measuring 3.4m east/west and up to 3m wide at its western end, although it narrowed to only 1.6m adjacent to the west wall of R1 (Fig 7). For the most part, the edges of the fire-pit were vertical or near-vertical, although the western end had a more gently-sloping edge, perhaps for ease of access into the feature. The base exhibited a slight west/east slope but was otherwise level, although towards the centre was a deeper, rectangular cut, 1.1m north/south by 0.5m and 0.4m deep, from which a shallow slot or gully 0.25m wide and 0.1m deep extended east towards R1 (Plate 10). The precise significance of these features remains unclear, but it seems likely they marked the position of structural elements relating to an otherwide vanished flue. Since all the masonry in the west wall of R1 had been robbed-out, nothing survived of the flue at the point where it passed through the wall.

3.4.12 There was no firm evidence that the pit had been protected from the elements within a separate room built onto the west side of the building. However, a north/south-aligned slot, 3.6m long, up to 0.45m wide and 0.44m deep (***193***), situated in close proximity to the western edge of the pit, could conceivably have marked the position of a wooden wall or screen, perhaps the west wall of a lean-to structure measuring approximately 4m square, or simply the remains of a wind-break. Although originally interpreted as a possible drainage channel, the feature was devoid of the dark, silty fills that might be expected within a drainage feature. Instead, the base of the cut contained a thin (0.03m) deposit of burnt wood, perhaps the remains of a number of small pieces of timber, overlain by orange silty-clay (***194***).

*Plate 10: Fire-pit **216** fully excavated*

3.4.13 The eastern part of the fire-pit, extending approximately 1.7m from the west wall of R1, was ultimately filled with a layer of black, charcoal-rich silt, containing some burnt clay lumps and small ceramic building material fragments (***909***). This deposit, which attained a maximum thickness of 0.1m, was presumably much the same material as layer ***774/775*** at the base of the hypocaust, being the residue left from the firing of the system. Two phases of repair or alteration to the fire-pit have been attributed to Period 2B.

3.4.14 ***R2:*** R2 was a narrow, rectangular room, 4.5m north/south by 1.8m internally, situated on the north side of R1, with the northern part of R6 on the east and the south-west corner of R9 to the north (Fig 7). Identical rooms in the same position in other excavated bath-houses of the same type as Building ***1000***, such as that at Bewcastle (Gillam *et al* 1993), have sometimes been interpreted as vestibules, giving access from the entrance hall/changing room on the front of the building (R9 in this case) into the main suite of rooms. In Building ***1000***, robbing of the wall masonry had been so thorough that the position of doorways could not be determined. Consequently, it was not possible to tell whether R2 served as a vestibule for R1 alone or whether access was also possible from this room into R6. It is presumed that a doorway existed between R2 and R9, but no evidence survived. What is clear is that R2 was provided with a boarded floor supported on wooden joists, since some of the joist-slots were recorded (Plate 11). In total, five slots survived (***271***, ***277***, ***281***, ***283***, ***288***) and it seems likely that one, perhaps two, others on the eastern side of the room had been destroyed. The slots were 0.15-0.2m wide and 0.1-0.15m deep (although ***288*** was much shallower, at only 0.03m), and had been cut through a make-up deposit (or, just possibly, an earlier floor) of compacted red-brown clay (***434***), 0.08m thick. They were aligned north/south, and extended across the full width of R2, spaced at intervals of 0.4-0.6m.

Plate 11: R2, showing excavated joist-slots

3.4.15 ***R3:*** R3 was a rectangular room, measuring 5.8m east to west by 4.5m internally, situated at the centre of the building, between R6 (or putative R6a) on the north, R4 on the south, and R1 to the north-west (Fig 7). Like R1 and R4, it had been provided with a heating system, and can probably be identified as the warm room, or *tepidarium*. The sub-floor remains of the hypocaust comprised 35 surviving *pilae*, although it is estimated that another 50-60 had been removed. As in R1 (and also in R4, though there the evidence had barely survived), the *pilae* were formed from stacks of square ceramic bricks bonded with clay. Increasingly severe post-medieval truncation over the central and southern parts of the building meant that preservation of the *pilae* in R3 was inferior to that in R1. For the most part, the stacks survived to only one or two courses in height, and in a number of cases a stack had been removed completely, its position marked only by a square or rectangular clay pad. Preservation was, however, slightly better on the north side of the room, where a single stack seven courses (0.4m) high (***691***) was recorded. Where the evidence survived, it was clear that, in the great majority of cases, the basal brick in each stack was larger than those in the upper course, with a range of *c* 240-80mm square (mostly 250-60mm) compared to 150mm square for most of the other bricks. Several of the larger bricks were, however, only 30mm thick, as opposed to 50mm for most of the smaller examples. A few *pilae* were composed of bricks of a single size (including ***691***, the seven surviving courses of which were all 260mm square), but the distribution of these features did not appear significant.

3.4.16 As in R1, the hypocaust was heated from a fire-pit situated outside the west wall of the building, in this case at the north-west corner of the room, in the angle formed by the west wall of R3 and the south wall of R1. The pit survived

as a rectangular cut (***460***), 3.4m east to west by 1.85m and up to 0.58m deep, with a flat base and mostly vertical or near-vertical sides, the exception being the western end, which was stepped, perhaps to facilitate access. Traces of a flue 0.6-0.65m wide, constructed of roughly dressed sandstone blocks bonded with clay, were discernible in the fragment of wall masonry that survived at the north-west corner of R3.

3.4.17 At the base of the hypocaust construction-pit, the bedrock immediately adjacent to the flue was discoloured due to the intense heat produced when the system was fired (***911***). The flue itself, and the base of the hypocaust adjacent to it, were partially filled with interleaving lenses of black, charcoal-rich silt and pale grey-buff ash within a mixed matrix of soft ashy material (***574***), which perhaps represented wood ash. The accumulation of this deposit pre-dated what seems to have been a crude modification to the flue at the point where it opened into the hypocaust system (Period 2B). The base of the fire-pit was surfaced with compacted yellow-orange sandy-clay (***474***), 0.15m thick, that had been scorched to a brick-red colour adjacent to the flue. Overlying this deposit was a layer of black, charcoal-rich silt and ash (***473***), which was itself sealed by a sequence of five phases of clay surfacing (earliest to latest: ***472***, ***458***, ***456***, ***450***, ***448***), all but the very latest of which were also overlain by thin layers of dark silt containing much charcoal and ash (earliest to latest: ***459***, ***457***, ***455***, ***449***). It is possible, perhaps even likely, that some of the later deposits within this sequence post-dated the flue-repair of Period 2B, but this could not be demonstrated due to the absence of stratigraphic links between the fire-pit deposits and those (including layer ***574*** and the Period 2B modification itself) within the flue.

3.4.18 ***R4:*** R4 was the southernmost of the three heated rooms within Building ***1000***, situated immediately south of R3, and is likely to have served as the hot room, or *caldarium* (Fig 7). The room was rectangular and of almost identical size to R3, measuring approximately 5.8m east/west and 4.5m north/south, internally (Plate 12). It was flanked to the south and west by two narrow, rectangular rooms (R7, R8), with floors sunk to the same depth as the construction-pit for the adjacent hypocaust. The heating system in R3 had been almost completely destroyed, but it seems clear that it was constructed in the same way as those in R1 and R3. The positions of 27 brick-built *pilae* were recorded, but in only seven cases had any part of the tile stack actually survived, and even these comprised only a single, often fragmentary, brick. The remainder were marked only by the heavily scorched square or rectangular clay pads, laid directly on the bedrock, on which the stacks had been set. In a few cases the pads also retained a few small fragments of broken brick. It seems likely that the system originally contained a similar number of *pilae* to the hypocaust in R3 (estimated at *c* 80-100). In all cases, the remaining bricks were of the larger type, ranging from 260mm square to 320 x 280mm, the same as the basal course of most of the *pilae* in R1 and R3.

Plate 12: R4, showing the vestiges of the pilae

3.4.19 That the hypocaust had been fired to a particularly high temperature, seemingly more intense than that generated in R1 and R3, was clear from the severe discolouration of the bedrock at the base of the construction-pit, which had been scorched a deep pink-red in the central and southern parts of the cut, fading to a paler pink further north and around the edges of the room. That R8 had also been heated, presumably from the same source, was suggested by the fact that the bedrock at the base of the room was also discoloured, although there the natural geology was only a very pale pink colour, suggesting that the heat was not very intense. Although no fire-pit was found, it was clear that R4 had been heated from the south, since a very distinct, linear band of extremely heavily burnt bedrock was visible where the flue had once been situated. This feature extended south from the hypocaust, passing through the south wall (the masonry for which had been completely robbed-out) and crossing the full width of R7, before passing out through the south wall of that room (which had also been robbed). On this evidence, it would appear that R4, R7 and R8 had all been heated from a single source to the south of R7, in an area that had been completely destroyed by twentieth-century building works.

3.4.20 ***R5:*** this was a rectangular, sunken-floored room, 4.5m north/south by 3.6m internally, situated on the east side of the building, east of R6 and south of R9 (Fig 7). Although the interior of the room had been dug-out to a depth of at least 1.1m, R5 was not furnished with a hypocaust (Plate 13). The walls of the room had been removed entirely, except in the south-eastern corner, where a fragment of masonry survived, and also a stone-lined channel or drain (***675***) running through the east wall. The presence of this drain, and the apparent lack of a hypocaust, suggests that the room had another purpose, one connected with the use of water. Comparing the plan of Building ***1000*** with those of similar bath buildings from northern England (Gillam *et al* 1993), the most

likely interpretation is that R5 was a cold plunge-pool situated next to the *frigidarium* (R6; *Section 3.4.23*), which could be drained periodically through the stone channel at its base. It is, however, unclear just how watertight this pool would have been, since the vertical edges and flat base, although dug into bedrock, do not appear to have been lined with clay or any other material. Furthermore, the presence of a group of postholes and stakeholes at the base of the cut suggests that it may once have contained some sort of timber structure. The principal features were five postholes, four (***853***, ***855***, ***858***, ***889***) situated close to the four corners of the room, the fifth (***861***) towards the eastern edge of the room, roughly equidistant between those at the north-east and south-east corners. These features were circular or sub-circular in plan, 0.17-0.19m in diameter (except ***853***, which was 0.28m in diameter) and 0.16-0.21m deep, and were set approximately 0.8-1m in from the walls of the room. Additionally, 42 small, sub-circular and oval stakeholes (***887***) were recorded. These varied in size between *c* 0.03-0.12m in diameter and 0.03-0.07m deep, and, whilst clearly concentrated on the eastern side of the room, appeared to have no obviously meaningful distribution.

*Plate 13: R5 during excavation, showing drain **675** on the left*

3.4.21 The precise significance of these features remains unclear. Although the purpose of the stakeholes is not known, the most likely interpretation of the postholes is that they marked the position of supports for a timber structure running around at least three sides of the room (the lack of an intermediate posthole on the west, opposing ***861***, suggests that the structure may have been absent on this side). On the basis of such slight evidence, it is clearly impossible to know exactly what this feature was, although two possibilities present themselves. If, as the comparative data suggest, R5 was indeed a pool,

the posts may have supported a low 'shelf' or bench-like structure, set below the water-line, on which bathers could sit. Alternatively (and much less probably), R5 may have served as a latrine, in which case a more elaborate timber superstructure would have been required, comprising a raised platform incorporating rows of toilet seats. There was no other evidence, however, to support the idea that R5 was a latrine, and indeed the comparative data would argue strongly against such an interpretation.

3.4.22 Drain ***675*** was 0.35m wide internally and extended through the base of the east wall of R5 (which had been comprehensively robbed) for 1.6m before being completely destroyed by late post-medieval disturbance (Plate 14). Its sides were lined with undressed and roughly squared sandstone blocks (***678***), 0.36 x 0.21 x 0.06m to 0.6 x 0.27 x 0.08m, bonded with a mid-brown sandy-clay. The lining, which survived to a maximum of three courses (0.34m) in height, had been set within a much wider construction trench, the spaces between the back of the stonework and the edges of the cut being infilled with clay and broken sandstone rubble (***847***, ***849***). The channel itself was partially filled with mid-dark silty soils (***685***, ***686***, ***687***), overlain by upper fills, probably derived from the demolition of the building (Period 2C). It seems likely that the drain emptied down the natural west/east-aligned slope towards the river Douglas, which would have lain much closer to the east side of Building ***1000*** in Roman times than the modern, canalised, river channel.

*Plate 14: Stone drain **678** at eastern edge of R5*

3.4.23 ***R6 and R6a:*** R6 was rectangular in plan, *c* 7.1m north/south by *c* 5.9m internally, and was situated in the centre of the northern part of the building, between R9 on the north, R1 and R2 to the west, R3 on the south and R5 to the east. It was not provided with an underfloor heating system (nor had its internal area been dug-out for any other reason), and can probably be identified as the cold room (*frigidarium*). No trace of the north wall was found, not even

a robber trench, so whilst it is assumed that R6 was separated physically from R9, it is not clear precisely how this was achieved. Although several Roman features were found within the area of R6, severe post-medieval levelling meant that none could be certainly attributed to the use of the room, and no floors or occupation deposits survived.

3.4.24 Stratigraphically, the earliest feature may have been a small pit (***684***) situated towards the south-east corner of the room (Fig 6). This had a U-shaped profile and may have been roughly circular in plan, *c* 0.8m in diameter and 0.11m deep, but its southern half had been removed by a later feature. It was filled with a dark orange-brown clay-silt (***683***) and was probably cut (some uncertainty remains about the precise stratigraphic relationship) by a roughly east/west-aligned trench (***682***), 0.75m wide and 0.22m deep, which ran across almost the full width of the room approximately 2.5m inside the south wall (Fig 6). The discovery of a fragment of what appeared to be sandstone masonry (***681***), *c* 2.6m in length, at the western excavated end of the cut suggested that this feature may have been a construction trench for a stone wall. The masonry, of which only a single course survived, comprised undressed and roughly squared sandstone blocks, apparently unmortared, set in an orange-brown clay matrix. The significance of this feature is unclear; the obvious explanation, that it was the remains of an internal wall partitioning-off the southern end of R6, is cast into doubt by the fact that it did not share quite the same alignment as the other walls. That said, comparative data suggest that in bath-houses of similar type to Building ***1000***, it was usual for a small, rectangular room to be located in this position, between the *frigidarium* and one of the principal heated rooms (Gillam *et al* 1993). If this interpretation is correct, it may be that the southern 2.2-2.4m of R6 was in fact a separate room (designated R6a), although it should be noted that elsewhere this room seems usually to have been heated, which was certainly not the case here.

3.4.25 Towards the northern end of R6, a small surviving fragment of a slot or gully was found that seems to have shared a common alignment with possible wall ***681***. This feature (***885***) was 0.3m deep and at least 0.4m wide, and was traced roughly east/west for 2.4m, but had been cut away at both ends. It was filled with dark grey-brown sandy-silt (***886***). To the west, ***885*** was cut by a large, north/south-aligned trench (***115***), up to 1.15m wide and 0.7m deep, situated slightly west of the centre-line of the room. The southern end of this feature cut across the line of the putative north wall of R6a (construction trench ***682***), but extended into that room for no more than 1m before terminating abruptly. From this point, it ran north for approximately 9m, crossing R6 and extending some 3m beyond the projected line of its north wall, before turning through 90^{o} to run east through R9 for a further 4m, beyond which point it had been destroyed by modern levelling. Approximately 2m north of its south end, a smaller, curving gully (***875***), 0.6-0.8m wide and 0.13m deep, filled with a hard, off-white mortar or cement, extended north-west for 2.3m from the edge of ***115*** to the north-east corner of R1 (Fig 6), where it was cut by the trench robbing the walls of that room. The south end of trench ***115*** was cut by a sub-circular pit (***113***), approximately 1.7m in diameter and 0.6m deep. This feature also cut possible foundation ***681*** for the putative north wall of R6a.

3.4.26 Although thought initially to post-date the demolition of Building ***1000***, it seems that trench ***115***, and possibly also pit ***113***, may in fact represent robbed sub-floor features relating to the use of the bath-house. Comparative data (*eg* Gillam *et al* 1993) suggest that ***115*** may have been the robber trench for a sub-surface drain, whilst ***113*** could conceivably represent the robber-pit for a wash-basin or some such feature associated with the drain. Similarly, feature ***875*** may have marked the position of a small feeder drain running into ***115***. If this interpretation is correct, however, it would imply either that foundation ***681*** was not the remains of a partition between R6 and R6a, or that features ***113*** and ***115*** represent a later modification that necessitated the removal of an earlier partition wall. It should be noted that, whilst features ***113***, ***115*** and ***875*** are described in Period 2A (since they provide the only surviving evidence for probable vanished fixtures and fittings associated with the occupation of Building ***1000***), as robber trenches they actually relate to the demolition and robbing of the building in Period 2C.

3.4.27 ***R7 and R8:*** these were two small, narrow rooms, or room-like features, attached to the southern and western sides of R4, the probable *caldarium* at the south end of Building ***1000*** (Fig 7). Both were identical, measuring 4.4-4.5 x 1.2-1.3m internally, with their floors reduced to the same level as the base of the adjacent hypocaust system. Neither contained any internal features or deposits but the underlying bedrock was heat-affected, far more severely in R7 than R8, since the flue for the hypocaust in R4 ran beneath this room. With the exception of a small fragment of stonework at the south-west corner of R8, the walls in this part of the building had been comprehensively robbed and any clue to the function of these rooms had been completely destroyed. Given the fact that the rooms were sunken-floored, and had clearly utilised the heat from the hypocaust in R4 (although they themselves appear not to have contained *pilae*), it is possible they served as small baths or pools, one warm, one hot.

3.4.28 ***R9 and R9a:*** the large, rectangular room at the northern end of Building ***1000*** can be identified as the entrance hall and changing room (*apodyterium*) that was commonly placed at the front of Romano-British bath-houses (Yegul 1992). The eastern part of the room had been completely destroyed by modern levelling (Fig 7), so it is not clear if it originally extended east to west across the full width of the building or was somewhat smaller, perhaps with its east wall aligned on the west wall of R5. From what is known of similar bath-houses elsewhere, the former seems more likely, although in some baths of this type, such as those at Chesters on Hadrian's Wall and at Benwell, also on the Wall (Breeze 2006), one end of the *apodyterium* was partitioned-off to create another room. At Chesters, this room served as a latrine (the function of that at Benwell is not known). Whilst there was no direct evidence for such an arrangement in Building ***1000***, the metrology of the building provides a hint that the eastern part of R9 may indeed have been occupied by a separate room measuring *c* 9m north/south by *c* 3.6m east/west, internally (*Section 3.7 below*). This putative room has been designated R9a.

3.4.29 Aside from a few patchy spreads of loosely compacted sandstone rubble and earth situated towards the south-west corner of the room (***531***, ***532=535***),

which may represent construction and/or make-up levels, all contemporary deposits within R9 had been removed by modern truncation. Adjacent to the west wall of the room, these deposits were cut by a pit (***524***). This feature had been partly removed when the west wall was robbed in Period 2C, but may have been roughly circular in plan, *c* 0.65m in diameter and up to 0.72m deep, with steeply sloping sides narrowing to a rounded base. It was filled with layers of dark brown or grey sandy soils (***525***, ***526, 527***), and was sealed by a soil deposit that was probably associated with the disuse and/or demolition of Building ***1000*** (Period 2C; *Section 3.6.1 below*). The only other feature recorded within R9 was a shallow, circular pit (***873***), situated towards the centre of the room. This was 1.15m in diameter and 0.25m deep, with vertical sides and a flat base, and was filled with a clean brown clay-sand (***874***). It directly cut the natural subsoil and was truncated by the late post-medieval levelling of this part of the site.

3.4.30 Extending around the north-west corner of R9, parallel to, and at a distance of *c* 2m from, its walls, were the remains of a probable colonnaded portico or arcade. Although only extant within an area measuring no more than 5.5m north/south by 5m east/west, it seems probable that this feature extended around all three sides of the *apodyterium*, providing an impressive frontage to the building. All stratigraphic links between the colonnade and R9 had been removed by late post-medieval levelling of the site, but the metrology of the building leaves no doubt that it was a primary feature (*Section 3.7 below*).

3.4.31 The surviving remains comprised an L-shaped gully or slot (***247/267/268***) running around the north-west corner of R9, and the remains of three large sandstone blocks (***223***, ***265***, ***266***) situated immediately adjacent to the inner lip of the gully. The blocks can be interpreted as column or pier-bases, whilst the gully/slot probably served either as an eavesdrip to catch rainwater running off a pitched roof or a beam slot for a timber wall. The best preserved column base (***223***) was situated at the north-west corner of the colonnade and comprised a well-dressed block of coarse-grained, red-brown sandstone, with dimensions of 780 x 730 x 270mm (Plate 15). The upper surface had been smoothed-off, but the other faces exhibited diagonal tooling marks.

3.4.32 Immediately beneath the block was a shallow, rectangular pit (***221/903***), 0.6 x 0.4 x 0.22m, filled with mixed grey-brown sandy-silt, clay, and some charcoal (***904***). This feature served no obvious structural purpose in relation to ***223***, and may therefore have been an earlier feature unrelated to the construction of the colonnade, and associated with Phase 1 activity.

3.4.33 Features ***265*** and ***266*** were situated, respectively, 3.6m and 3.5m due south and due east of ***223***, attesting to the regular spacing of the columns/piers. Both were fashioned from the same type of sandstone as ***223***, but were less well preserved. Feature ***265***, which measured 640 x 560 x 170mm, was substantially complete, but ***266*** survived as little more than a slight impression associated with a few broken sandstone fragments, though enough survived to suggest it had originally measured *c* 800 x 600mm.

*Plate 15: Well-dressed sandstone block **223***

3.4.34 Gully/slot ***247/267/268*** was, for the most part, 0.4-0.5m wide and 0.16-0.27m deep, with vertical or near-vertical sides and a flat base, although in places the northern arm was up to 1m wide. This part of the feature had also been dug through a patchy layer of orange-brown silty-clay and broken ceramic building material fragments (***298***) 0.1m thick, which spread over an area of *c* 1.5 x 0.8m. That ***247/267/268*** may have been a beam slot rather than an eavesdrip was suggested by a highly compacted deposit of orange-brown clay mixed with ceramic building material fragments (***249***), which was found along both edges of the cut, as though packed on either side of a vanished beam, within the eastern surviving fragment of the feature's northern arm (***247***). The position of the putative beam was marked by a fill of grey-brown silt (***248***), 0.4m wide. The possible packing was not noted in the other two surviving slot fragments, which were filled (***263***, ***264***) with material similar to ***248***.

3.4.35 ***Period 2A Dating:*** the distinctive ground-plan of Building ***1000*** leaves little doubt that it was built during the reign of the emperor Hadrian (AD 117-38) (Breeze 2006). A construction date no earlier than *c* AD 120 is further indicated by the recovery of Black-Burnished ware Fabric 1 and Hadrianic/early Antonine samian from construction features in the colonnade on the north side of the building (*Section 4.4.4 below*).

3.4.36 With the exception of the ceramics from the portico, datable material from the construction levels of Building ***1000*** was sparse. The earliest feature in R6 (pit ***684***), which could conceivably pre-date the construction of the building, produced a *quadrans* of *c* AD 100 (*Section 4.9.1 below*). Although of Trajanic date, the moderately worn condition of this coin indicates that it was deposited sometime later, so a Hadrianic date for feature ***684*** is entirely feasible. Elsewhere, the little pottery recovered from construction levels included small quantities of Flavian material (and a Neronian or early Flavian samian sherd from *praefurnium* ***216***), though most of the material was of late first- to early second-century date (*Appendix 3*).

3.5 PERIOD 2B: THE BATH-HOUSE - REPAIRS AND ALTERATIONS (MID-SECOND CENTURY)

3.5.1 Period 2B consists of the limited surviving evidence for repairs and alterations made to Building ***1000*** during its lifetime. As a consequence of the extremely thorough robbing that occurred during Period 2C, which removed virtually all wall masonry and other structural features, the evidence was confined to the fire-pits (***216*** and ***460***; Fig 6) that served the heating systems in R1 and R3.

3.5.2 ***R1:*** in R1, two phases of modification to the flue connecting the sub-floor heating system with fire-pit, or *praefurnium*, ***216*** beyond the west wall were recorded. There was also structural and spatial evidence to suggest that the hypocaust was at some point linked to fire-pit ***460***, which had previously served only R3, by the insertion of a flue in the south wall of the room. It is not known if this modification occurred at a time when feature ***216*** was still in use, in which case it was presumably designed to boost the temperature of the heating system in R1, or was necessitated by the disuse of ***216***.

3.5.3 In *praefurnium* ***216***, two square stacks of broken ceramic bricks, roofing tiles and stone (***879***), bonded with a soft, gritty mortar were constructed (Fig 8), one on either side of the flue at the point where the fire-pit abutted the west wall (Plate 16). These features overlay the earliest fill of the *praefurnium* (***909***, Period 2A; *Section 3.4.13*), proving beyond doubt that they were not primary. The northernmost stack measured 0.75 x 0.53m, whilst that to the south had dimensions of 0.7 x 0.63m; both survived to a height of 0.2m and the width of the flue between them was 0.6m. No evidence was found to suggest that these features had ever supported an arch or some other superstructure, although there was a suggestion that the outer (western) face of each stack had been plastered with clay.

Plate 16: Brick stacks added to praefurnium ***216***

3.5.4 Following the construction of the tile stacks, a layer composed largely of broken ceramic roofing tiles, mixed with a little charcoal-rich silt and clay (***908***), was deposited within the fire-pit, possibly as a make-up or levelling deposit for an overlying surface of compacted orange-brown sandy-clay (***907***) that covered much of the base of the pit at this level. The clay was itself overlain by a layer of black, charcoal-rich material (***906***) up to 0.15m thick, representing the residue from another phase of firing. This was sealed by two further deposits, a mixed grey-brown silty-clay, 0.2-0.25m thick, containing broken ceramic tile and pottery fragments (***905***), and a spread of orange-brown sandy-clay silt (***878***) that also filled the flue. Both deposits may represent deliberate infilling resulting from disuse, since feature ***216*** was recut subsequently. The new fire-pit (***591***) was rectangular in plan and very similar to the primary feature, measuring 3.6m east to west, up to 3m wide (although for the most part no more than 2m in width) and 1.05m deep, with near-vertical sides and a somewhat undulating base that sloped gradually from west to east. The eastern 2m of the pit contained a well-defined flue (***571***), 0.4m wide internally, crudely built of roughly dressed and undressed sandstone rubble, *c* 0.18 x 0.14 x 0.04m to *c* 0.27 x 0.1 x 0.04m, and smaller quantities of ceramic brick and roofing tiles, bonded with yellow-orange clay (scorched brick-red in the flue channel itself). The internal elevation of the flue was faced in places with some roughly squared sandstone blocks. The entire construction survived to a maximum height of 0.65m.

3.5.5 The base of the flue channel was filled to a depth of 0.15m with dark brown silt, containing much charcoal, ash, and burnt clay flecking, and some small ceramic building material fragments (***852***). This was overlain by 0.3m of orange-red burnt clay, mixed with small quantities of charcoal (***848***), which was also confined to the flue. Neither of these layers appeared to relate to the firing of the hypocaust, but seemed rather to represent material deposited after the feature had gone out of use. Ultimately, the whole pit was filled with a dump of dark yellow-orange clay up to 0.6m thick (***217***) that was cut by the robber trench for the west wall of R1 (***576***, Period 2C; *Section 3.6.7 below*).

3.5.6 On spatial evidence, the insertion of a flue in the south wall of R1 (***201***) was probably undertaken in order to link the heating system to fire-pit ***460***, although no statigraphic links are recorded between the flue and feature ***460***. Neither can the flue be linked to the stratigraphic sequence in the western *praefurnium*, so it is not clear whether this modification was intended to increase the temperature of R1 through the provision of two heat sources, or was an expedient necessitated by the final disuse of the other fire-pit. Feature ***201*** had been badly damaged by later activity, but survived as a north/south channel *c* 0.6m wide, cut through a fragment of *in-situ* masonry (***577***) in the south wall of R1. The western edge of the flue had been almost completely destroyed, but the eastern side was crudely constructed of roughly dressed and undressed sandstone rubble, and some ceramic brick and tile fragments bonded with clay. All the building material had clearly been scorched by the heat from the adjacent fire-pit. Three roughly-laid courses remained in position, *c* 0.5m wide and *c* 0.5m in height, extending up to 1.1m into the heating system.

3.5.7 The base of the flue was filled to a depth of 0.2m with fine, pale yellow-grey ash, probably a reduced wood-ash, containing no charcoal or other inclusions (***569***). This deposit was overlain by 0.05m of black silt composed almost entirely of charcoal, including some larger pieces (***568***), which was itself sealed by a similar thickness of pale, buff-brown burnt clay, ash and charcoal (***475***). The upper fill of the feature comprised a further accumulation of black, charcoal-rich silt, containing several larger pieces of carbonised wood (***567***).

3.5.8 ***R3:*** the only evidence for later modification in R3 came from the *praefurnium* outside the west wall (***460***), where the remains of a crude masonry construction (***860***) were found at the point where the flue channel opened into the hypocaust system. The feature comprised a linear spread of clay-bonded sandstone rubble and some larger blocks, which was up to 0.8m wide and 0.35m high. This overlay the burnt deposit associated with the primary use of the hypocaust (***574***, Period 2A) and extended north/south for 1.4m across the base of the heating system, immediately adjacent to the eastern end of the flue. The burnt clay bonding the masonry also extended further north and east to cover the base of the hypocaust at its north-west corner. The function of feature ***860*** remains unclear; it does not appear to have constituted a repair to the flue, nor can it be interpreted as a repair or reinforcement to the wall through which the flue passed. If anything, its seems to have been intended partially to block the end of the flue, perhaps to restrict the flow of hot air into the hypocaust. This is of some interest, since at some point fire-pit ***460*** appears to have been provided with a second flue connecting it with the heating system in R1 to the north. There are, however, no recorded stratigraphic relationships between the construction of the new flue (***201***, R1; *Section 3.5.6 above*) and the insertion of feature ***860***, but it is tempting to link the two events, and to speculate that the old flue serving R3 was partially blocked in order to re-direct some of the heat from *praefurnium* ***460*** into R1. Whatever its purpose, feature ***860*** was partially overlain by up to 0.15m of mixed charcoal and fine, pale grey-buff ash (***573***), representing fuel residue from the final use of the heating system. This material filled the flue channel and extended east into the base of the hypocaust, but was not present within the fire-pit itself.

3.5.9 ***Period 2B Dating:*** the deposits associated with both phases of modification to *praefurnium* ***216*** (features ***879*** and ***591***) produced only a few pieces of Flavian samian, including a sherd of *c* AD 80/85-100 from the fill (***905***) of feature ***879***. Fill ***475*** of flue ***201*** yielded samian of Flavian/Trajanic date, whilst deposit ***569*** in the same feature contained a small amount of late first- to early second-century pottery (*Appendix 3*). Archaeomagnetic dating of the last firing of this flue produced a wide date range of 100 BC to AD 200, although this at least indicates that firing ceased sometime before the beginning of the third century. The excavated deposits ascribed to Period 2B yielded a small ceramic assemblage, which appears to be entirely Flavian/Trajanic in date (*Appendix 2*). However, this cannot be considered to represent the date range for activity in this period, as later material was recovered from Period 2A deposits (*Section 3.4.35 above*). Indeed, a Hadrianic date for the construction of Building ***1000*** is not in doubt, and it is probable that the modifications attributed to Period 2B must have occurred in the Hadrianic/Antonine period.

3.6 PERIOD 2C: THE BATH-HOUSE - DEMOLITION AND ROBBING (LATE SECOND AND EARLY THIRD CENTURIES)

3.6.1 Ultimately, Building ***1000*** was demolished and its walls and other structural elements comprehensively robbed, so that no internal fixtures and fittings (with the exception of the sub-floor remains of the heating systems) and scarcely no wall masonry remained *in-situ*. Three sub-phases of demolition and robbing could be identified from the surviving archaeological remains. Firstly, the upper superstructure of the building, including the roof, was dismantled (Phase 1). That the floors of the heated rooms were also removed at this time was indicated by the presence of many broken fragments of ceramic roofing tiles within the primary demolition deposits infilling the hypocaust systems in R1, R3, and R4. Next, the walls and their foundations were thoroughly robbed to the bottoms of the construction trenches (Phase 2), leaving only a few small fragments of stonework in place. Finally, demolition debris mixed with earth was dumped into the hypocaust systems and the pool in R5 (Phase 3), completely infilling these features. Any demolition debris that may have accumulated in areas outside these sub-floor features had been removed by post-medieval activity.

3.6.2 ***Phase 1:*** much of the interior of R1 had been removed by a large post-medieval pit (Plate 17), but enough survived to show that the base of the hypocaust system was filled with 0.35-0.4m of mixed, reddish-brown sandy-clay-silt containing many fragments of broken ceramic roofing tile and some burnt clay patches (***253***=***255***). This was overlain by 0.1-0.15m of similar material (***252***=***254***), containing an even greater quantity of broken ceramic roofing tile (making up *c* 70-80% of the deposit). These layers had clearly been deposited prior to the robbing of the walls of the room.

*Plate 17: Post-medieval pit (**220**) excavated through the infill of R1*

3.6.3 At some stage, the timber floor in R2, including the joists, was removed. The joist-slots became filled with layers of grey-brown sandy-silt. No demolition deposits were recorded within the area of R2.

3.6.4 Except where removed by later features, the whole of the hypocaust system in R3 was filled to a depth of 0.2m with a mixed reddish-brown sandy-clay silt (***572*** overlain by ***554***), containing numerous fragments of roofing tile and other ceramic building materials (representing *c* 30% of the matrix), frequent patches and mottles of burnt clay, and some charcoal fragments. As with the very similar deposits in R1, the deposition of this material occurred prior to the robbing of the walls of the room.

3.6.5 What remained of the heating system in R4 was filled to a depth of up to 0.3m with a mixed deposit of compacted, mid-dark grey-brown sandy-clay-silt, containing fairly small quantities of broken ceramic roofing tile, burnt clay and charcoal (***551***, ***588***). This material had been deposited before the adjacent walls were robbed to their foundations.

3.6.6 Unlike the hypocausts in R1, R3, and R4, the probable pool in R5 did not become filled with debris prior to the robbing of its walls. However, the upper fills of stone-lined drain ***675*** on the east side of the room, comprising layers of mixed brown sandy-silt, containing moderately large quantities of broken ceramic building materials and sandstone rubble (***545***, ***676***, ***677, 679***), were probably deposited during the demolition process and were cut by the robber trench for the east wall.

3.6.7 ***Phases 2 and 3:*** following the removal of the building's roof and upper superstructure, the walls were comprehensively robbed to the base of their foundations (Phase 2), leaving behind only a few small fragments of stonework. In view of this, it was surprising to find that two of the column/pier bases in the colonnade at the north end of the building, which were fashioned from large and eminently reusable sandstone blocks, should have been left in position. For the most part, the robber trenches were of similar width to the construction trenches, though in some places they were slightly wider, the widest (***688***) being *c* 1.5m in the south wall of R3. So far as it was possible to tell, the robbing occurred in a single phase, since the trenches were continuous, with no evidence for intercutting. The only exception was the robber trench for the east wall of R2 (***238***), which was cut by the robbing of the north-east corner of R1 (***576***). The thoroughness of the robbing might suggest that, at the time Building ***1000*** was demolished, a considerable amount of new construction work was being underaken elsewhere in Roman Wigan, creating a demand for building stone.

3.6.8 In R9, the robber trench for the west wall (***793***) was partially overlain by a patchy spread of dark grey-brown sandy-silt, up to 0.18m thick, containing small quantites of ceramic building materials and small sandstone fragments (***438***). There, and in R2 immediately to the south, which had not been dug-out for hypocaust systems or pools, the robber trenches (***238***, ***239***, ***793***) were readily identifiable as well-defined linear features filled with mixed dark soils and rubble that closely followed the original wall-lines. In each of the heated

rooms, however (R1, R3, R4), and also in the pool in R5, robbing of the wall masonry around the edges of the original construction-pit simply resulted in the creation of an even larger hole. In R1 and R5, the only rooms where sufficient evidence had survived, discrete robber trench fills were discernible only towards the bottom of the sequence of infilling; higher up, each large hole, comprising both the original construction-pit and the surrounding robber trenches, was filled with a single sequence of dumped materials (Phase 3). In the case of R1 and R3, it was clear that infilling had occurred concurrently, since, at the junction between these rooms, interleaving of the fills was evident across robbed wall-lines, with deposits from R1 encroaching into R3, and *vice versa*.

3.6.9 In R1, the trench robbing the walls of the room (***576***) was filled to a depth of up to 0.4m with no less than 32 interleaving layers and lenses of mixed dark soil and rubble, above which the entire construction-pit was completely infilled with more extensive dumps of similar material (***117***, ***163/164/215***, ***170/190***, ***196***). In R5, the four walls were robbed by a continous trench (***566***), the base of which was filled to a depth of *c* 0.3m with mixed grey-brown sandy-silts, containing varying quantites of stones, sandstone rubble, and ceramic building material fragments. Above this level, the entire room was filled with dumps of mixed earth and some rubble. The increasing severity of modern truncation in the southern part of the site meant that similar evidence had not survived in R4, R7 and R8, or in all but the extreme north-west corner of R3. In these areas, only the very bottoms of the robber trenches remained.

3.6.10 In R6, a probable sub-floor drain and a possibly related feature, perhaps a wash-basin or some such thing, were removed sometime during the demolition programme, creating robber trench ***115*** and robber-pit ***113***. The principal fills of feature ***115*** comprised a deposit of clean, dark grey sandy-silt (***125***), 0.2m thick, overlain by 0.5m of dark silt containing many stones, ceramic building material fragments and potsherds (***116***), whilst ***113*** was filled with dark-grey-brown sandy-silt, containing some broken sandstone rubble (***114***).

3.6.11 ***Period 2C Dating:*** dating evidence from Phase 1 demolition deposits was confined to a few sherds of mid-second-century samian from layer ***253*** in R1 and sherds of Black Burnished ware Fabric 1 of Hadrianic or early Antonine date from ***554*** in R3 (*Appendix 3*). Hadrianic/Antonine pottery also came from the fills of several Phase 2 robber trenches, including ***256***, ***262*** and ***469*** in feature ***576*** (R1), ***492*** in feature ***590*** (R3), ***546*** and ***550*** in feature ***566*** (R5), ***482*** in feature ***480*** (R8), and ***444*** in feature ***793*** (R9). That the robbing occurred during the second half of the second century rather than earlier was, however, clear from the presence of late second-century pottery in several other robber trench fills, including ***226*** and ***555*** in feature ***576*** (this feature also produced mid-second-century samian), ***671*** in feature ***566***, and ***528*** in feature ***793*** (*Appendix 3*). Fill ***560*** in feature ***480*** also yielded samian of mid-second- to early third-century date, together with a single sherd of grogged ware that may date no earlier than the late second century (*Appendix 3*). In R6, the upper fill of robber trench ***115*** (***116***) contained a very worn *as* of Hadrian (AD 117-38), which, in view of its condition, is unlikely to have been deposited before

the mid-second century (*Appendix 3*). This deposit also produced Hadrianic/Antonine Black Burnished ware Fabric 1 and samian of *c* AD 120-145/60 (*Appendix 2*).

3.6.12 The ceramic assemblage from the Phase 3 demolition deposits exhibited a similar date range to that from the robber trenches, the latest material dating to the second half of the second century, together with a single sherd of a possible third-century or later date from deposit ***190***. Small amounts of intrusive post-Roman material were recovered from two Phase 2 contexts; ***125*** (a fill of robber trench ***115***) and ***420*** (a fill in robber trench ***576***).

3.7 THE BATH-HOUSE - METROLOGY

3.7.1 It seems highly likely that Building ***1000*** was laid out using the *pes Monetalis* (*p M*) as the standard unit of measurement, since, if the *p M* is taken as 0.29617m (Walthew 2005), the building can be shown to have measured almost exactly one *actus* (120 *p M*) north/south (as measured to the outer face of the column bases in the portico colonnade) by half an *actus* (60 *p M*) east to west, at its widest point (actual figures 120.88 *p M* and 60.44 *p M*), giving a length to width ratio of exactly 2:1. This evidence proves that the colonnade on the north side of the building must have been an integral part of the original design rather than being a later addition.

3.7.2 Internally, too, the use of the *p M* can be detected in the layout of the individual rooms (Table 1), although the recorded measurements may have been distorted somewhat by the extensive wall-robbing. The only room which, on the basis of the surviving evidence, did not have both dimensions corresponding to a fraction of an *actus* was R9, the probable *apodyterium* at the northern end of the building, which, if it had extended across the full width of the structure, would have measured *c* 54 *p M* internally (actual measurement 54.02 *p M*, or 16m). This anomaly, together with comparative data from similar bath-houses, led to the suspicion that the destroyed east side of R9 may in fact have been occupied by a separate room (designated R9a), possibly a latrine. Since the putative room did not survive, its width, east to west, is not known, but again metrology provides a possible clue, for if the west wall of R9a was on the same line as that of R5 immediately to the south, it would have measured *c* 9m north/south by 3.6m east/west (*c* 30 x 12 *p M*, or one-quarter x one-tenth *actus*?) internally, which would mean that the rest of R9 would have had internal dimensions of *c* 40 x 30 *p M* (one-third x one-quarter *actus*).

Room	Approximate dimensions (m)	Approximate dimensions (*p M*)	Intended dimensions (*p M)*	Intended dimensions (fractions of one *actus*)
R1	4.5 x 4.4	15.19 x 14.86	15 x 15	One-eighth x one-eighth
R2	4.5 x 1.8	15.19 x 6.07	15 x 6	One-eighth x one-twentieth
R3	5.8 x 4.5	19.6 x 15.19	20 x 15	One-sixth x one-eighth
R4	5.8 x 4.5	19.6 x 15.19	20 x 15	One sixth x one-eighth
R5	4.5 x 3.6	15.19 x 12.15	15 x 12	One-eighth x one-tenth
R6	5.9 x 4.4	19.92 x 14.86	20 x 15	One-sixth x one-eighth
(R6a)	5.9 x 2.3	19.92 x 7.77	20 x 8	One-sixth x one-fifteenth
R7	4.4 x 1.2	14.86 x 4.05	15 x 4	One eighth x one-thirtieth
R8	4.5 x 1.3	15.19 x 4.39	15 x 4	One-eighth x one-thirtieth
R9	11.6 x 9	39.17 x 30.39	40 x 30	One-third x one-quarter
(R9a)	9 x 3.6	30.39 x 12.15	30 x 12	One-quarter x one-tenth

*Table 2: Dimensions of rooms in Building **1000***

3.7.3 In view of this layout, together with its substantial stone construction, and the character of the associated building materials, Building ***1000*** was almost certainly a small bath-house. A military connection also seems highly probable, an hypothesis strongly supported by the pottery recovered from the site (*Appendix 3*). Although a reasonably large number of small, 'auxiliary-sized' bath-houses of similar type to Building ***1000*** are known from northern Britain, current knowledge of many of these structures is restricted to fragmentary ground plans revealed, as often as not, during the course of antiquarian investigations or early excavations, the quality of which, by today's standards, leaves much to be desired. Even on those sites where a complete plan is available, many of the buildings were excavated during the nineteenth and earlier twentieth centuries (or in some cases even earlier) using very rudimentary and unsystematic excavation techniques. On Hadrian's Wall, for example, the bath-house adjacent to the fort at Benwell was excavated in 1751, that at Haltonchesters in 1827, Carrawburgh in 1873 and Greatchesters in 1897 (Daniels 1978, 69-70, 87, 127-8, 181-2), whilst those associated with the outpost forts at Risingham and Netherby to the north of the Wall were uncovered in 1839-40 and 1732 respectively (*op cit*, 291-2, 313). The well-preserved bath-house at Chesters on the Wall was also unearthed during the nineteenth century (Birley 1977, 28). Consequently, whilst complete or near-complete ground plans of all these buildings were recovered, very little is known of their detailed structural histories, the way in which they were constructed, or the spatial and chronological distribution of the associated artefacts.

3.7.4 More recently, controlled excavations of a considerably higher standard were undertaken during the 1950s on the bath-houses at Red House (Corbridge), just to the south of the Wall (Daniels 1978, 100-1), and the outpost fort at Bewcastle (Gillam *et al* 1993). The mid-second-century bath-building at Vindolanda, though subjected to investigations as early as the late seventeenth century (Birley 1977, 26), was systematically excavated during the early 1970s

(*op cit*, 34-7), whilst at the same site a completely separate bath-house of early second-century date has also been revealed in recent years (Birley 2002, 30f). During the 1970s an unfinished bath-building of late third or early fourth-century date was excavated within the fort at Caernarvon in north Wales (Goodburn 1976, 292-4; fig 3), whilst in Scotland complete or near-complete plans of the bath-houses adjacent to the forts at Bearsden on the Antonine Wall and at Bothwellhaugh in Lanarkshire were obtained (*op cit*, 302-5).

3.7.5 In north-west England, the bath-building at Hardknott in Cumbria was excavated in 1892 and its remains consolidated during the late 1950s (Bidwell *et al* 1999, 61). The baths at Ribchester in Lancashire, first discovered in 1837, were subjected to partial excavation in 1927 and were re-excavated in 1964 and 1978 (Edwards 2000, 35-8). These investigations resulted in the production of a partial plan of the building (*op cit*, 41; fig 18). At Lancaster, excavations in the early 1970s revealed a bath-house of probable earlier second-century date. This structure underwent a number of extensive alterations and modifications during its lifetime, which extended on coin evidence into the third quarter of the third century (Jones and Shotter 1988, 19-20, 61-76). From this brief and very incomplete survey it can be seen that few northern bath-houses have been excavated and analysed using anything like the range of techniques that are now available.

3.8 PERIOD 2A-C: ROMAN ACTIVITY ADJACENT TO THE BATH-HOUSE (EARLY SECOND TO EARLY THIRD CENTURIES)

3.8.1 Immediately to the west of Building ***1000***, several intercutting features, including ditches, pits and postholes, of clearly Roman date were excavated (Fig 6). Although representing more than one phase of activity, it proved impossible to link any of these features to the sequence of construction, occupation and demolition within Building ***1000*** itself, since any stratigraphic relationships that may once have existed had been removed when the site was levelled in the late post-medieval period. Consequently, all external features of certain or probable Roman date in Area G7/G10 have been attributed to a less precise stratigraphic phase, designated Period 2A-C, indicating that they could be contemporary with some or all of the activity represented by Periods 2A, 2B, and 2C within Building ***1000***. Although there is no stratigraphic reason why some of the earliest features could not be associated with Period 1 rather than Period 2, the presence of Trajanic/Hadrianic and later pottery in some of the features, and the lack of evidence for pre-Hadrianic occupation elsewhere on the site, makes it more likely that all were broadly contemporary with the life of Building ***1000***. The possibility that a few features were of earlier date cannot, however, be completely discounted on the available evidence.

3.8.2 A notable external feature situated close to the bath-house was a north/south-aligned ditch or channel (***43***=***150***=***178***) that ran parallel with the building some 8.5-9m to the west. This feature entered the excavated area from the south and was traced northwards intermittently for 25.4m; it appears to have terminated approximately 2.5m short of the northern end of Building ***1000*** (*c* 4.7m, if the portico is included). At its southern and northern excavated ends, the cut (***43*** and ***150*** respectively) was 1.2-1.3m wide, but the middle section (***178***) narrowed to as little as 0.7m. Unlike the remains of Building ***1000***, where truncation increased in severity from north to south as a result of post-medieval levelling, feature ***43*** was deepest at its southern end (0.93m; Plate 18) and became progressively shallower to the north (0.4m in the middle section and only 0.23m at its northern end), suggesting that its base was cut with a deliberate north/south slope.

*Plate 18: North-facing section through ditch **43***

3.8.3 At the best-preserved southern end, the sides of the cut were vertical to 0.5m above the base, beyond which they sloped at an angle of around 40-45°. In the other two excavated sections, where only the bottom of the feature survived, it was found to have vertical sides and a flat base. That the base of the ditch had been lined or revetted with timber was indicated by the presence of stakeholes along the edges of the cut in the central and southern sections. To the south, three circular stakeholes, *c* 0.05m in diameter and 0.17-0.3m deep (***79***), were present on the eastern side of the cut, whilst further north a row of ten stakeholes of similar type (***189***) were found on the western edge. For the most part, the stakes seem to have been set at intervals of *c* 0.4-0.6m, although in places considerably wider gaps were evident.

3.8.4 In the northern and central sections of the ditch, the cut was completely filled with reddish-orange or yellow-orange redeposited sandy-clay (***148***, ***149***, ***179***). In the better-preserved southern section, the base of the feature contained similar material up to 0.4m thick (***60***, ***71***, ***77***), above which the upper part of the cut was filled with layers of dark grey or grey-brown sandy-silt (***32***, ***47***, ***65***) interleaved with several thin layers and lenses of yellow-brown and pinkish-brown sandy deposits (***44***, ***48***, ***62***).

3.8.5 Approximately 8m north of the northern end of ditch ***43/150/178***, a second ditch or gully (***198***) was aligned north-west/south-east and extended into the site from the northern trench edge for 15.8m. It terminated to the south-east *c* 0.7m short of the north-west corner of the portico on the north side of Building ***1000***. As it survived, ***198*** was 1-1.5m wide at the lip and up to 0.55m deep, with rounded, gradually sloping sides and a flat base. The sides of the south-east terminal were, however, much steeper and the base much narrower, creating a narrow, U-shaped profile. At the base of the ditch, a pair of opposed stakeholes (***208***), situated on either edge of the cut *c* 8m west of the south-east terminal, provided an indication that the feature may once have been timber-lined. Indeed, the preserved remains of what might have been part of the lining (***209***) were found at the base of the ditch, within the basal fill of mixed grey-brown silt and redeposited natural clay (***200***) that filled the feature to a depth of 0.3m. The upper part of the ditch was ultimately infilled with layers of mixed grey sandy-silt and pinkish clay (***199***, ***203***).

3.8.6 The principal concentration of Roman features adjacent to the west side of Building ***1000*** was located close to the southern edge of the site, between the west wall of the building and ditch ***43***. There, the natural subsoil was cut by a group of truncated features, the most notable being a large, sub-rectangular pit (***41***), measuring 1.95m north/south by 1.5m and 1.2m deep. This had steep, near-vertical edges and a flat base, and was filled with a sequence of grey-brown sandy-silt soils interleaved with layers and lenses of yellow-brown and orange-pink sandy-clay (earliest to latest: ***56***, ***55***, ***54***, ***53***, ***52***, ***40***). The quantities of pottery and other artefactual materials recovered from these fills suggest that ***41*** served as a rubbish-pit. Several large fragments of charred wood, including the remains of a timber measuring 0.8 x 0.11m, were recovered from deposit ***53***.

3.8.7 A little under 2m east of pit ***41***, a short segment of a north-west/south-east-aligned ditch was excavated (***34***). This feature was 1.4m wide at the lip and 0.8m deep, with a steep-sided, U-shaped profile, and was traced for a distance of 4.2m. To the south, it extended beyond the excavated area, whilst to the north it had been destroyed by later disturbances. The base of the ditch was filled to a depth of 0.2-0.4m with weathered natural clay, mixed with some grey-brown sandy-silt (***60***), whilst the upper fill comprised a mixed, grey-brown sandy-clay-silt (***33***), containing numerous charcoal flecks and quite large quantities of pottery. This upper fill was subsequently cut by two pits - a large, sub-square feature (***27***) measuring 1.3 x 1.1 x 0.7m, and a smaller example (***46***), with dimensions of 0.77 x 0.3 x 0.28m. Pit ***27*** was infilled with a sequence of grey-brown sandy-silts interleaved with deposits of reddish-brown redeposited clay (earliest to latest: ***28***, ***26***, ***25***, ***24***), whilst ***46*** contained a single fill of mixed dark grey silt and orange clay (***45***).

3.8.8 Situated between feature ***27*** on the east and pit ***41*** to the west was a shallow pit (***38***), measuring 0.9 x 0.65 x 0.14m, and another example (***74***), 0.6m square and 0.6m deep, was situated immediately south of ***41***. Feature ***38*** was infilled with redeposited natural clay (***39***), whilst ***74*** contained two deposits of grey-brown sandy-silt (***75***, ***76***).

3.8.9 Elsewhere, the only other Roman features recorded within Area G7/G10 were a heavily truncated pit (***97***), situated *c* 2.5m west of the central section of ditch ***43***/***150***/***178*** (*c* 13m west of Building ***1000***), a probable posthole (***96***) that cut the pit, and what may have been the remains of an isolated pit (***893***) on the east side of the building. The eastern half of feature ***97*** had been destroyed, but it may have been sub-square or sub-rectangular in plan, measuring 1.3m north/south, in excess of 0.4m wide, and 0.14m deep. It was cut to the south by ***96***, which was probably circular, 0.55m in diameter and 0.1m deep. Both features were filled with deposits of grey sandy-silt (***99*** and ***98*** respectively). Feature ***893*** was situated a few metres east of R3 in Building ***1000***. Although poorly preserved, it may have been roughly circular in plan, *c* 1.3m in diameter and 0.4m deep, with steeply sloping sides and a flat base. It was filled with compacted silty-clay containing small brick and tile fragments (***894***).

3.8.10 ***Period 2A-C Dating:*** the lower fills of ditch ***43***/***150***/***178*** contained good quantities of samian and coarse pottery of probable Hadrianic date. The upper fills of this feature produced much material of similar date, although mid-second-century and early Antonine forms were also present, together with a single sherd of late second- to early third-century Black Burnished ware Fabric 1 from deposit ***47***. Ditch ***198*** contained no Black Burnished ware or other Hadrianic/Antonine forms and, on the evidence of pottery alone, could be Trajanic (*Appendix 3*), although its spatial relationship with Building ***1000*** points to a Hadrianic or later date.

3.8.11 Pit ***41*** produced some of the latest Roman material recovered from the Grand Arcade site, although in origin it may have been broadly contemporary with Building ***1000***. Its primary fill (***56***) produced Hadrianic/early Antonine pottery, including samian of *c* AD 125-45, some of which was probably Antonine rather than earlier. The tertiary fill (***54***) contained an Antonine mortaria, mid-late second-century Black Burnished ware Fabric 1, and a very worn *as* of Antoninus Pius (AD 138-61), whilst late second- to early third-century Black Burnished ware Fabric 1 and samian of *c* AD 140-80 came from the penultimate fill (***52***). However, it was the uppermost fill (***40***) that produced the latest pottery, in the form of a few scraps of Black Burnished ware Fabric 1 with obtuse lattice burnish, a form of decoration dated to after *c* AD 223-5 (*Appendix 3*). With the exception of a single intrusive medieval sherd from feature ***46***, the small ceramic assemblage recovered from other Period 2A-C features contained nothing that need post-date the mid-second century, the bulk of the material being of Hadrianic or early Antonine date.

3.8.12 The excavation produced no evidence for any Roman activity in the area during the late third or fourth centuries. Similarly, there was no evidence for human activity during the immediate post-Roman period (*ie* pre-Norman).

3.9 PERIOD 3: MEDIEVAL OCCUPATION (TWELFTH TO MID-SIXTEENTH CENTURIES)

3.9.1 Period 3 represents the earliest post-Roman activity recorded in Area G7/G10 (Powell's and McEwan's Yards), which can be dated to the medieval period (twelfth to mid-sixteenth centuries). Extensive levelling for building works in the post-medieval period, and particularly during the nineteenth and twentieth centuries, resulted in the truncation of most earlier deposits, with the exception of deeper-cut features. Medieval activity on the site was therefore represented by several truncated features, mostly pits, dated to the medieval period by the pottery recovered from their fills (Fig 9).

3.9.2 For the most part, the Period 3 pits appeared to be clustered in two groups (Feature-groups 1 and 2), located to the rear (east) of post-medieval cellared buildings fronting Millgate. Spatially, it is conceivable that these features were situated within two medieval tenements running back from Millgate, the boundaries of which had been fossilised by the later buildings. No evidence for medieval boundary markers such as ditches or fence-lines was, however, recorded archaeologically in this part of the site.

3.9.3 ***Feature-group 1:*** this comprised four features (***04***, ***23***, ***29***, ***37***) situated at the southern edge of the excavated area (Fig 9). Three of the four (***04***, ***29***, ***37***) formed an intercutting group (Plate 19), feature ***29*** being the earliest, followed by pit (***37***) and, latest of all, feature ***04***. Pit ***29*** was sub-oval in plan, 2.2 x 1.56m and 0.97m deep, with near-vertical sides and a slightly rounded base (Fig 10). A primary fill of friable pink-brown silty-sand (***42***), 0.12m thick, was overlain by 0.41m of dark grey-brown, sticky sandy-clay-silt (***35***), possibly a cess deposit. This was in turn sealed by a deliberate infill of compacted mid-brown gravelly sandy-clay (***30***), and an upper fill of compacted grey-brown sandy-clay (***31***). Feature ***37*** was probably roughly circular in plan, although its northern half had been destroyed, with steeply sloping sides and a rounded base. It was probably *c* 1.5m in diameter, survived to a depth of 0.74m, and was filled with dark grey-brown silty-clay containing numerous small stones (***36***). Pit ***04*** was sub-circular, *c* 1.8m in diameter and 0.38m deep, with an open, rounded profile. It was filled with compacted, mottled pink-brown clay (***03***).

3.9.4 Approximately 5m south-east of these three features was the fourth pit (***23***). This extended south beyond the trench but was probably roughly oval in plan, measuring 2.5m east to west, in excess of 1.8m north/south and 1.2m deep, with sloping sides and a flat base. The lower 0.7m of the pit was filled with a soft, dark brown sandy-clay-silt containing few stones or other inclusions (***22***). This was overlain by 0.5m of mid-brown clay silt (***21***).

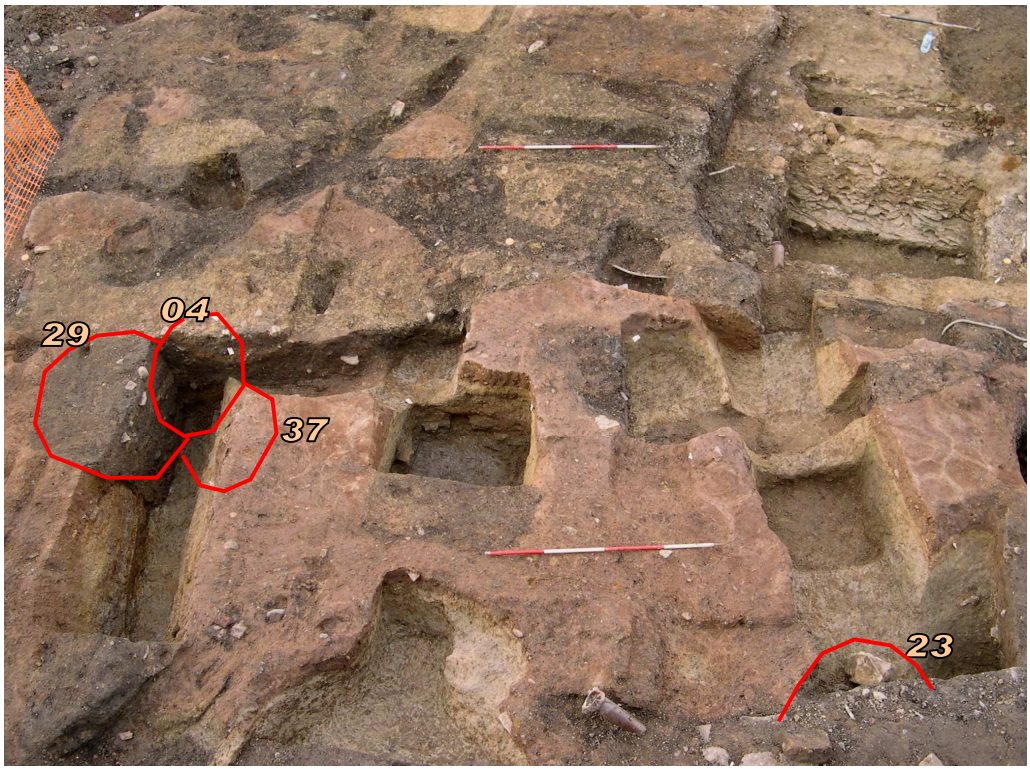

Plate 19: Medieval pits (Feature group 1) situated at the southern edge of Area G10

3.9.5 ***Feature-group 2:*** this rather scattered group of seven features (***118***, ***233***, ***159***, ***161***, ***850***, ***928***, ***930***) was situated some 23m north of Feature-group 1 (Fig 9). There, too, three of the features (***118***, ***159***, ***161***) formed an intercutting group, with two others (***928***, ***930***) situated further east. Pit ***850*** was situated approximately 6m north of ***928/930***, whilst feature ***233*** (Plate 20) was located *c* 12m east of ***850***.

3.9.6 The earliest of the three intercutting features (***161***) was probably linear and aligned north/south, although both its ends had been removed. It was 0.55m wide, 0.21m deep, and survived to 0.94m in length. It was filled with large, sub-angular stone fragments and broken slabs, together with smaller sub-rounded stones, in a matrix of grey-brown, plastic clay (***162***). Too little survived of this feature for its precise character and function to be determined, though it is possible that it served either as a wall-footing, or a sump/drain. It was cut to the south and north by two large, sub-circular pits (***118*** and ***159*** respectively). Feature ***118*** was sub-circular, 3.3 x 2.7m and 1.2m deep, with steeply sloping, rounded sides and a stepped base that was slightly deeper to the south (Fig 10). The lower 0.4m of the cut was filled with a cess-like deposit of soft, dark grey-brown silt (***132***). This was sealed by a layer of mixed orange-brown plastic clay and silt up to 0.25m thick (***143***), which was in turn overlain by another cess deposit up to 0.35m thick (***130***), comprising a soft, black silt interleaved with lenses of fine, yellowish sandy-silt. The upper part of the pit was ultimately infilled with dumps of mixed red-brown clay and grey or brown sandy-clay-silt (earliest to latest; ***131***, ***122***, ***121***, ***119***). Pit ***159*** was also sub-circular, 2.8 x 2m and 0.76m deep, with steeply sloping, rounded sides and a slightly rounded base (Fig 10). The primary fill comprised weathered natural clay (***166***), which was overlain by 0.15m of loose grey-brown sandy-silt (***169***).

A further dump of mixed pink-brown clay and stone fragments (***167***) was overlain by 0.2m of dark brown sandy-silt (***168***). The upper 0.6m of the cut was ultimately infilled with mid-grey-brown silty-clay (***160***).

*Plate 20: Section excavated across pit **233***

3.9.7 Pit ***928*** was situated some 4m east of pit ***118***, and had been truncated by post-medieval activity. It was oval in plan, 1.8 x 1.6m but only 0.2m deep, with rounded sides and a rounded base, and was filled with a cess deposit of mid-brown, soft organic silt (***927***). Feature ***930*** was oval in plan, 1.1 x 0.72m and 0.22m deep, and lay immediately east of ***928***. It had near-vertical sides and a flat base and was filled with redeposited natural clay (***929***). It produced no artefacts but was tentatively assigned a medieval date due to its morphology and proximity to other medieval features. To the north, pit ***850*** was sub-oval, 1.7 x 1.2m and 0.7m deep, with near-vertical sides and a flat base. It was filled with a cess deposit of dark green-grey or grey-brown organic sandy-silt (***851***). Further east, isolated feature ***233*** was 1.4m in diameter and 0.8m deep, with near-vertical sides and a flat base (Fig 10). A thin deposit of greenish-grey silty-sand (***242***), only 20mm thick at the base of the cut, was sealed by a deliberate infill of orange-brown sandy-clay-silt (***234***).

3.9.8 ***Medieval features in Area G3:*** evidence for medieval (twelfth- to mid-sixteenth-centuries) occupation within Area G3 to the north was confined largely to the remains of a few pits, all of which had been heavily truncated by late post-medieval development. Two poorly preserved fragments of possible stone walls or foundations (***3109***, ***3116***) were, however, recorded in the central and eastern parts of the trench (Fig 11). Feature ***3109***, which was situated adjacent to the southern trench edge, comprised four courses of unbonded and undressed sandstone blocks, 0.8m wide and standing up to 0.7m in height. The blocks had been roughly hewn and varied in size from *c* 50 x 50mm to *c* 300 x

150mm and 80mm thick. The lower course was laid directly on the natural clay. The feature was traced east to west for 1.2m before it turned through 90° at its eastern end to run south into the trench edge, a distance of 0.8m; its western end had been removed by a later pit. Feature ***3116*** was situated 8.5m north-east of ***3109*** and may also have been the remains of a poorly-preserved stone wall. As it survived, it comprised an east to west alignment of six undressed and unbonded sandstone blocks laid directly on the natural subsoil. Only a single course, 0.66m wide, remained; it was traced east to west for 2.97m. Both ***3116*** and ***3109*** have been tentatively assigned a medieval date on stratigraphic grounds, but they produced no datable artefacts.

3.9.9 Elsewhere in the eastern part of the trench, only two probable medieval features were recorded (***3080***, ***3099***), both small pits. Feature ***3080*** was circular, 1.2m in diameter and 1m deep, with very steep, slightly undercut sides and a slightly rounded base. It was filled with pale grey silty-clay, containing mottles and patches of black, organic silt and some charcoal (***3079***). This feature was also partially excavated during the evaluation phase of the project, when it was numbered ***315*** (cut) and ***316*** (fill). Pit ***3099*** was a small, probably roughly circular, feature located *c* 1.2m north-east of ***3080*** (Fig 11). It had been damaged by later features, but may have been *c* 0.8m in diameter and survived to a depth of 0.32m. It was filled with greenish-grey organic sandy-clay containing some small coal and charcoal fragments (***3100***).

3.9.10 Towards the western end of the trench were two pits (***3028***, ***3077***). The westernmost (***3028***) was sub-oval in plan, 2.6 x 1.5m and 0.36m deep, with steeply sloping sides and a somewhat irregular base. The southern edge of the cut was filled with pale brown sandy-clay (***3066***), whilst to the north, a deposit 70mm thick, that appeared to be composed almost entirely of very decayed wood (***3068***), was recorded at the base of the pit. Both deposits were sealed by the principal fill of compacted black silty-clay (***3029***). This contained numerous small and occasional larger fragments of poorly-preserved wood and some sub-rounded stones. Pit ***3077*** was located *c* 6m east of ***3028*** and was oval in plan (Fig 11), 1.43 x 1.13m and 0.22m deep, with vertical sides and a flat base. It was filled with a dark greenish-grey, organic sandy-clay (***3078***).

3.9.11 ***Period 3 Dating:*** all four pits of Feature-group 1 in Area G7/10 produced small quantities of medieval pottery. Secondary fill ***35*** in pit ***29*** contained 12 sherds of thirteenth- to fourteenth-century date, whilst the upper fill (***31***) yielded another 12 sherds of twelfth- to thirteenth-century material. Four sherds of twelfth- to mid-thirteenth-century date came from feature ***37***, and seven twelfth- to thirteenth-century fragments were recovered from pit ***04***. However, since pits ***37*** and ***04*** both post-dated pit ***29***, they must date no earlier that the thirteenth/fourteenth century. The lower fill (***22***) of pit ***23*** also produced 25 thirteenth- to fourteenth-century sherds, and a further three sherds of twelfth- to thirteenth-century date came from the upper fill (***21***).

3.9.12 In Feature-group 2, possible foundation/drain ***161*** contained no datable artefacts. In pit ***118***, secondary cess deposit ***130*** contained three sherds of twelfth- to mid-thirteenth-century pottery, whilst no less than 45 sherds came

from the uppermost levels, which are likely to represent deliberate infilling. Of this assemblage, 14 sherds of twelfth- to thirteenth-century date came from fill ***122***, and 31 of the thirteenth/fourteenth century were recovered from fill ***121*** (five sherds) and upper fill ***119*** (26 sherds). A single sherd of post-medieval pottery, dated to the eighteenth or nineteenth century, was also present in fill ***119***. Pit ***159*** may have been of somewhat later date than the others, since its primary fill (***166***) yielded four sherds attributable to the fourteenth / fifteenth century, although a further nine sherds of twelfth- to thirteenth-century material came from the uppermost fill (***160***). Four fragments of twelfth- to mid-thirteenth-century date came from pit ***850***, whilst the upper infilling (***234***) of feature ***233*** produced a group of 43 twelfth- to fourteenth-century sherds, in addition to a single intrusive post-medieval fragment. Features ***928*** and ***930*** produced no datable artefacts.

3.9.13 In summary, it would appear that most of the medieval features in Area G7/G10 can be dated to the thirteenth and fourteenth centuries. Feature ***850***, which produced only twelfth- to mid-thirteenth-century material, could conceivably be slightly earlier, though this need not necessarily be the case. Pit ***159***, which contained pottery of fourteenth- to fifteenth-century date, was potentially the latest medieval feature recorded on the site.

3.9.14 In the eastern part of Area G3, fill ***3079*** in pit ***3080*** produced 17 sherds of twelfth- to mid-thirteenth-century pottery, and a further eight sherds of thirteenth- to fourteenth-century date were recovered from the same feature during the evaluation (pit fill ***316***; equated with ***3079***). Pit ***3099*** also contained a single twelfth- to mid-thirteenth-century sherd. A sherd of post-medieval material from fill ***3079*** can be regarded as intrusive. To the west, pit ***3028*** yielded two sherds of twelfth- to mid-thirteenth-century material, and pit ***3077*** contained one thirteenth- to fourteenth-century fragment.

3.10 PERIOD 4: EARLY POST-MEDIEVAL OCCUPATION (MID-SIXTEENTH AND SEVENTEENTH CENTURIES)

3.10.1 ***Area G7/G10:*** like the medieval features of Period 3, the remains of the early post-medieval period (*c* mid-sixteenth to seventeenth centuries) within Area G7/G10 were restricted largely to several truncated features, mainly pits, that had survived the extensive levelling and other groundworks associated with nineteenth- and twentieth-century building construction. As in Period 3, most of the surviving features seem to have been clustered into distinct groups, rather than being scattered randomly across the site. The exceptions were a large pit (***220***), situated on its own towards the eastern side of the excavated area (Fig 9), and a stone-flagged surface (***192***) enclosed by a shallow, curving gully and a stone kerb (***174***). Feature ***220*** appeared to have served some kind of industrial purpose, probably involving the processing of copper alloys, and seemed to be associated with a wooden channel (***155***) that ran into it from the north.

3.10.2 A group of four pits (***02***, ***13***, ***63***, ***72***) was exposed at the southern edge of the site (Fig 9), some 15m east of the Millgate frontage, in the same location as

Feature-group 1 of Period 3 (*Section 3.9.3 above*). Pit ***02*** was sub-oval in plan, 1.4 x 1m and 0.6m deep, with near-vertical sides and a flat base. It was filled with dark grey-brown silty-clay (***01***). On plan, it seems to cut the edge of medieval pit ***04*** (Period 3). Feature ***13***, situated 0.8m east of pit ***02***, was also oval, 2 x 1.4m and 0.5m deep, with sloping, rounded sides and a slightly rounded base. A primary fill of dark brown sandy-silt (***14***), 0.2m deep, was overlain by 0.15m of redeposited orange-grey clay (***15***) and an upper fill of mid-brown sandy-silt 0.1m thick (***16***). Feature ***72*** was located *c* 2.75m south of ***02*** and had been largely destroyed by pit ***63***, which had removed its southern half. It may have been roughly circular, *c* 1.05m in diameter and 0.23m deep, with near-vertical sides and a flat base, and was filled with mid grey-brown sandy-clay (***73***). Pit ***63*** extended south beyond the trench but may also have been circular, *c* 2.4m in diameter and 0.6m deep, with an open U-shaped profile; it was filled with grey-brown silty-clay (***64***).

3.10.3 A tight group of five intercutting features (pits ***105***, ***109***, ***111***, possible posthole ***107*** and linear feature ***103***) was exposed some 9m to the north, and situated *c* 20m east of the Millgate frontage (Fig 9), and slightly to the east of Feature-group 2 of Period 3 (*Section 3.9.5 above*). The earliest of these features (***103***) measured at least 2.7m north/south, in excess of 0.36m wide, and 0.3m deep, with a U-shaped profile. It was filled with dark grey-brown silty-sand (***104***) and was directly cut by ***105***, a sub-oval pit measuring 2.1 x 1.1m and 0.26m deep, filled with mid grey-brown silty-sand (***106***). Cutting through the centre of pit ***105*** was a large oval posthole or small pit (***107***), 0.85 x 0.65 x 0.4m deep, filled with dark grey-brown sandy-silt (***108***), whilst to the north, it was cut by another large pit (***109***). This feature was roughly circular, 2.25m in diameter and 0.75m deep, with near-vertical sides and a slightly rounded base, and was filled with dark brown sandy-clay-silt (***110***). The stratigraphically latest feature within the group was sub-rectangular pit ***111***, which cut the eastern edge of pit ***109***. This measured 1.74 x 0.78m and was 0.35m deep, with steeply sloping sides and a rounded base; it was filled with greenish-grey sandy-silt (***112***).

3.10.4 Another group of five pits (***129***, ***140***, ***141***, ***144***, ***158***) was situated towards the northern limit of the site, some 12m east of the Millgate frontage (Fig 9), just to the north of medieval Feature-group 2 of Period 3 (*Section 3.9.5 above*). Feature ***129*** was sub-oval, 2 x 1.37m and 1.1m deep, with a near-vertical sided, U-shaped profile (Fig 12). The base of the cut was filled to a depth of 0.3m with a dark grey-brown, organic silty-clay (***128***). This was sealed by 0.5m of highly organic dark brown/black silty-clay (***127***) that was in turn overlain by a similar upper fill of dark grey-brown organic silty-clay (***126***). Pit ***140***, situated *c* 3m south-west of ***129***, may have been sub-rectangular in plan, measuring in excess of 2m by 1.75m and 0.57m deep, with steeply sloping sides and a flat base (Fig 12). The lower 14mm of the cut was filled with mixed black organic clay-silt and redeposited natural clay (***139***) that was sealed by 0.13m of pale grey silty-clay (***138***), containing redeposited Roman tile and pottery. This was overlain by a dump of dark grey silty-clay (***137***), containing burnt bone and pottery, which was in turn sealed by deliberate infill of mixed dark grey silty-clay, redeposited natural clay and some sub-rounded stones (***136*** beneath ***135***). Pit ***158***, which was cut by feature ***140***, was oval in plan, 1.83 x 1.5m but only

0.1m deep. A thin band of mixed redeposited natural clay and grey silt at the base of the cut (***157***) was overlain by the principal fill, a dark grey-brown organic silty-clay cess deposit (***156***). Feature ***144*** was circular, 0.95m in diameter and 0.24m deep, situated 1.75m north-west of ***140*** and 3.5m west of pit ***129***. It had a flat-bottomed, U-shaped profile and was filled with dark grey sandy-clay (***145***). The fifth pit, ***141***, was a small sub-oval feature, measuring 1.2 x 0.6m and 0.3m deep, located 2.5m north of ***144***; it was filled with dark grey sandy-clay (***142***).

3.10.5 A fourth group of features, comprising three large pits (***410***, ***416***, ***418***), was situated at the extreme eastern edge of the excavated area (Fig 9). All three pits extended east of the trench, whilst the northern part of ***418*** had been removed by nineteenth-century building works; the northern edge of ***410*** had been removed by ***416***, which had been dug through it. The northernmost pit (***418***) had no direct stratigraphic relationship with the other two, being situated *c* 1.5m further north. It may have been roughly circular in plan, but only around one quarter of the feature was available for investigation. Nevertheless, the excavated portion measured 2.35m north/south by 1.08m and was 1.2m deep, with near-vertical sides and a rounded base. It was completely filled with a single deposit of dark grey-brown silty-sand (***419***). The earliest of the two intercutting features (***410***) may have been sub-rectangular or sub-oval, 1.28m wide, 0.35m deep and in excess of 1.5m long, east to west (Fig 12). It had steeply sloping sides and a flat base, the southern part of which was filled with 0.12m of pale grey-brown silty-sand (***411***), overlain by an upper fill of darker grey-brown sandy-silt (***415***). Pit ***416*** may have been roughly circular, although like ***410*** it extended east of the site. As excavated, it measured 1.7m north/south and at least 0.9m east/west, and was 0.27m deep, with a mixed fill of redeposited natural clay and dark grey sandy-silt (***417***).

*Plate 21: Pit **220**, cut through the infill of R1 in Building **1000***

3.10.6 Other features and deposits included pit ***220***, which was situated in the eastern part of the site, approximately 23m east of Millgate (Fig 9). It was sub-square in plan, measuring 3.3 x 3.2m and 0.6m deep (Plate 21), though as with all the other Period 4 features, it had probably been heavily truncated by nineteenth- and twentieth-century activity. It had vertical or near-vertical sides and a flat base, and bottomed onto the mudstone bedrock, although traces of a deliberately-laid surface of stone slabs and broken stone fragments (***244***), 0.12m thick, were noted at its base towards the south-eastern corner, covering an area of *c* 1.05 x 0.65m. The remains of what seems to have been a crude stone lining were also noted along the southern edge of the cut (***243***), comprising thick (80mm) slabs of mudstone, measuring up to 0.23 x 0.15m, that had been set on end against the sides of the pit. Five such stones were noted at the south-west corner and a single stone was also present in the south-east corner. There was no evidence that the stones forming the lining had been bonded with clay or mortar, and it is not known if the whole feature had originally been lined/floored in this way.

3.10.7 Immediately to the west of this possible surface (***244***), a small patch of highly compacted metalworking debris, derived from the processing of a copper alloy, was found, concreted to the natural bedrock at the base of the pit. Fragments of similar material were also recovered from some of the overlying fills, whilst a solid deposit of metalworking debris had also been used as packing around a wooden channel that seems to have been associated with the use of the pit (*Section 3.10.8 below*). The basal fill of ***220*** comprised a thin (70mm) layer of mid-grey clay silt (***240***) that covered the base of the cut, sealing surface ***244*** and the adjacent patch of concreted industrial waste. This was overlain by 80mm of mixed orange clay, possibly heat-affected material, and patches of black, charcoal-rich organic silt (***224***), that was in turn sealed by 0.3m of pink silty-clay mixed and interleaved with patches of dark brown/black organic silt (***218***). On the eastern side of the pit, ***218*** was overlain by a dump of mixed grey silt and decayed yellow-brown mortar (***219***). Both ***218*** and ***219*** were sealed by a mid grey-brown silty-clay (***207***), up to 0.3m thick, which was overlain by an upper fill of dark brown/black organic silt (***210***). Waste from the processing of copper alloys was recovered from fills ***240***, ***224*** and ***207***.

3.10.8 Running into the north-east corner of pit ***220***, and stratigraphically contemporary with it, was a wooden channel (***155***) set in a deep trench (***151***). This extended north-east from pit ***220*** for approximately 5m before turning sharply east to run towards the eastern trench edge (Plate 22). It was traced in this direction for over 12m, but became increasingly shallow as a result of the increasing severity of late post-medieval truncation in this area. Where best-preserved, the feature was 1.25m wide and 1.25m deep, with a somewhat variable profile. For much of its length it had a flat-bottomed, V-shaped profile (Fig 12), but close to pit ***220*** it had vertical or near-vertical sides and a flat base. At the base of the cut were the poorly preserved remains of a narrow wooden channel (***155***) with a U-shaped profile. This feature had decayed to the point where it survived, for the most part, as little more than a dark brown organic stain, but it seems to have been *c* 0.25m wide and 0.15m deep, and clearly extended into the northern part of pit ***220***. The best-preserved section,

some 2.46m in length, was located to the south, where it ran into the pit, although it was traced along the full length of the construction trench. The channel extended into the northern part of the pit before terminating adjacent to a sandstone slab that had been set upright in the base of the pit.

*Plate 22: Curvilinear feature **151**, looking south-east*

3.10.9 The channel was enclosed within a crudely constructed conduit, the sides and cover for which were formed of broken sandstone slabs (average size *c* 0.25 x 0.18 x 0.1m) and re-used fragments of Roman brick and tile, the latter clearly taken from the remains of Period 2 Building ***1000***, through which both the channel and pit ***220*** had been dug. None of this material was bonded; the stone and tile fragments making up the sides of the conduit were retained in position by a compacted deposit composed principally of metalworking slag and other industrial waste, which had been packed between the lining and the sides of the construction trench; the capstones had simply been laid across the top. Metalworking slag had also been packed beneath the southern end of the channel itself, where it ran into the pit. The upper part of the construction trench was infilled with dark grey-brown clay-silt (***154***) overlain by an upper fill of redeposited natural clay and mudstone fragments (***153***).

3.10.10 The function of pit ***220*** and channel ***155*** remains unclear, although that they were associated with some kind of industrial process, probably involving the working of copper alloys that resulted in the production of considerable quantities of metalworking debris, seems clear. There can be little doubt that the channel was directly associated with the use of the pit, although its precise purpose is obscure. Levels on the base of the construction trench suggest a

slight fall from south to north-east, from 40.29m OD at the point where it entered the pit to 40.22m OD at its north-eastern end. This suggests that it may have served to take water or some other fluid away from the pit rather than channelling it towards the pit from a source outside the site.

3.10.11 On the west, the infilled pit was subsequently cut by a smaller, sub-circular pit (***173***), which was 1.2m in diameter and 0.68m deep. The western edge of this feature, which had steeply sloping sides and a slightly rounded base, corresponded to that of pit ***220***, suggesting that the earlier feature may have remained partly open when ***173*** was dug. A basal fill of dark grey silty-clay (***206***), 0.3m thick, was overlain by an upper fill of mid-grey-brown silty-clay containing burnt clay and charcoal (***177***).

3.10.12 Approximately 9m east and slightly north of pit ***220*** lay feature ***174***/***192***, the function of which remains unclear. Only the western part remained, but it appeared to comprise a laid surface of broken sandstone slabs (***192***), 70mm thick, and bedded on a layer of yellow sand, which survived over an area measuring *c* 2.2 x 1.2m. This surface was enclosed or bounded (on the west at least) by a shallow curving gully describing a roughly semi-circular arc (***174***). This was 0.6-0.75m wide and up to 0.15m deep, with sloping sides and a base that sloped gently from west to east, and was filled with compacted, crushed sandstone rubble. At the northern surviving end of the gully, its western edge was bounded by a kerb of sandstone slabs 60-100mm thick, set end-on into the ground. The kerb was, however, straight rather than curved, and was aligned north-east/south-west; consequently, it diverged from the edge of the gully by up to 0.5m at its southern end. It survived to 3.1m in length, but had been destroyed to the north by later features. Both surface ***192*** and the crushed rubble infill of gully ***174*** were sealed by a deposit of black, humic silt (***175***), 0.12m thick, that contained much charcoal and numerous artefacts, including small pieces of wood, leather shoe fragments, glass, pottery and animal bone. This layer respected the position of the stone kerb on the west side of the gully and did not overlie that feature.

3.10.13 Adjacent to the northern surviving edge of feature ***174***/***192***, and itself truncated by a later cellar, was what may have been an oval pit (***184***), measuring in excess of 0.9m by 0.65m and 0.66m deep. This feature, which had a rounded, U-shaped profile and was filled with dark grey-brown clay-silt (***185***), is said to have pre-dated feature ***174***/***192***, although this was not obviously the case on the primary site drawings.

3.10.14 Several other features were assigned tentatively to Period 4 on stratigraphic grounds, although they produced no datable artefactual materials and could not be securely attributed to this phase on stratigraphic grounds. These features included a sub-rectangular pit (***70***), situated in the southern part of the site. This measured 1.1 x 0.62m and 0.5m deep, and was filled with dark grey-brown silty-clay (***78***).

3.10.15 ***Area G3:*** as with the medieval remains, evidence for occupation in Ship Yard (Area G3) during the early post-medieval period (*c* mid-sixteenth to seventeenth centuries) was restricted largely to a few pits that had suffered

severe truncation as a result of later post-medieval building works. In the eastern part of the site were two large pits (***3090***, ***3111***), situated approximately 1.2m apart, north/south (Fig 11). The northernmost feature (***3090***) was probably sub-circular in plan, *c* 2.4m in diameter and 0.8m deep, although it had been badly damaged by later activity. It had near-vertical sides and a slightly rounded base, and was filled with dark grey sandy-clay (***3091***). Pit ***3111*** had also been partially destroyed by later features, but may have been oval in plan, *c* 2.8 x 1.8m and 0.75m deep, with steeply sloping sides and a slightly rounded base. It was filled with dark brown sandy-silt-clay containing frequent small stones (***3112***) and sealed by a spread of mixed yellow-grey clay and redeposited subsoil up to 0.15m thick (***3110***). This layer covered an area measuring approximately 4m east/west by 1.5m north/south, but extended beyond the trench to the south and had been badly disturbed within the excavated area by later features. It contained numerous fragments of roofing slate and was sealed by a layer of probably eighteenth-century soil.

3.10.16 Some 6.75m west of feature ***3111*** was a third large pit (***3092***) that extended into the trench from the south (Fig 11). This was probably oval, 2.1m wide, in excess of 2.4m long and 1.3m deep, with steeply sloping sides and a rounded base. The bottom of the feature was filled with pale grey clay mixed with weathered orange subsoil (***3094***) that also extended up the sides of the cut. This was sealed by the principal fill, a dark grey-brown clay silt (***3093***). Situated *c* 4.2m west of ***3092*** was a fourth pit (***3036***), sub-oval in plan, 1.64 x 1.46m, and 1.2m deep, filled with mid-grey sandy-clay (***3037***). Also in the southern part of the trench was a circular posthole (***3071***), 0.2m in diameter and 0.15m deep, filled with dark brown sandy-clay (***3070***). The only other early post-medieval feature recorded in this area was a fragmentary gully or ditch (***3064***), situated 2.7m north of pit ***3092***. This feature had been mostly destroyed by later activity but was traced east/west for over 4m. Its full width could not be determined, as its northern edge had been removed by cellar ***3054*** (Period 6); as it survived it was 0.32m wide and 0.15m deep, with steeply sloping sides and a flat base. It was filled with grey silty-clay, containing much redeposited orange clay subsoil (***3065***).

3.10.17 ***Period 4 Dating:*** the upper fill (***16***) of pit ***13*** in Area G7/10 produced 14 sherds of pottery with a sixteenth- to eighteenth-century date range. Pit ***63*** yielded three sherds attibutable to the sixteenth or seventeenth century, together with four fragments of fourteenth- to fifteenth-century date, and a single sherd of sixteenth- to seventeenth-century date came from feature ***72***. The only pottery from pit ***105*** was a single sherd, which was probably of sixteenth-century date. The primary fill (***128***) of pit ***129*** contained only a single sixteenth- or seventeenth-century sherd, but a good group of 14 sixteenth- to eighteenth-century fragments came from the secondary fill (***127***), and four seventeenth- to nineteenth-century sherds were found in the uppermost fill (***126***). Pit ***140*** contained five sherds of post-medieval pottery, one of eighteenth-century date from fill ***138***, and a fragment of seventeenth-century lead-glazed earthenware from fill ***135***. A single fragment of sixteenth- or seventeenth-century date was recovered from feature ***141***, and the principal fill (***156***) of pit ***158*** yielded a sherd of probable Cistercian-type ware, to which

a fifteenth- to seventeenth-century date range may be ascribed. Of the three pits in Feature-group 4, Pit ***418*** produced 20 sherds of pottery dating to the seventeenth- or eighteenth-centuries; the other two features in the group are not closely dated but were tentatively assigned to Period 4 since their fills were very similar in character to that of ***418***.

3.10.18 Elsewhere in Area G7/10, pit ***220*** produced only five post-medieval sherds, three of sixteenth- or seventeenth-century date from stone surface ***244*** at the base of the cut, and two sixteenth- or seventeenth-century sherds from the penultimate layer of infill (***207***). One of the layers of fill ***153*** within trench ***155***, which contained timber channel ***155*** associated with pit ***220***, contained two fragments of tin-glazed earthenware dated to the early eighteenth century. The upper fill (***177***) of pit ***173***, which cut pit ***220***, produced 20 sherds of sixteenth- to eighteenth-century date, whilst pit ***184*** contained four sixteenth- to eighteenth-century fragments. The artefact-rich layer (***175***) overlying feature ***174***/***192*** yielded a good group of 98 potsherds. The assemblage included sherds of Midlands Purple-type wares, blackwares, and mottled wares, with a date range between the sixteenth and early eighteenth centuries.

3.10.19 In the eastern part of Area G3, pit ***3090*** produced four sherds of sixteenth- or seventeenth-century pottery, whilst feature ***3111*** contained a group of 16 sixteenth- to eighteenth-century sherds. Layer ***3110***, which sealed pit ***3111***, yielded seven sherds with a date range between the sixteenth and eighteenth centuries. Further west, pit ***3092*** produced a particularly good group of 53 sherds, 15 from primary fill ***3094*** and 38 from the upper fill (***3093***), the assemblage being predominantly of a seventeenth- to early eighteenth-century date. Linear feature ***3064*** did not contain any datable artefacts, but was assigned to the early post-medieval period on stratigraphic evidence.

3.11 PERIOD 5: LATER POST-MEDIEVAL OCCUPATION

3.11.1 As in earlier phases, evidence for eighteenth-century occupation in Area G7/G10 was largely restricted to the truncated remains of cut features, such as pits that had survived the extensive truncation associated with nineteenth- and twentieth-century building works. However, the remains of two stone-built cellars of probable eighteenth-century date (***90***, ***120***) were recorded in the western part of the site, adjacent to the Millgate frontage, and part of a third (***186***) was observed further east, beneath a later brick rebuild (Fig 9). All three had been modified and/or rebuilt during the nineteenth century, and may have continued in use into the twentieth century.

3.11.2 Cellar ***90*** was situated at the extreme south-west corner of Area G10, some 5m east of the Millgate street frontage. Although modified and partially rebuilt in brick, probably during the nineteenth century (Period 6; ***95***), the primary north and east walls survived, as did traces of the south wall, demonstrating that it was originally stone-built. In its most developed form, the cellar as a whole (comprising ***90*** and the later rebuild) was rectangular in plan, measuring in excess of 8.75m east to west (it extended west beyond the trench) by 4m north/south, externally, and survived to a depth of 1.2m. As

originally built, the feature seems to have been 4m wide but its east to west dimension is unclear; the primary north wall survived to 6m in length, but as the western end of the cellar had been completely rebuilt it was not clear if the north wall had originally been longer or if the cellar was extended westwards during the reconstruction. The north and east walls of the primary build were 0.46m and 0.8m wide respectively, and were constructed of coursed, buff sandstone rubble, faced internally with well-dressed rectangular sandstone blocks, from 220 x 100 x 40mm to 400 x 250 x 70mm; the stonework was bonded with a pale cream/buff lime mortar and survived between 10 and 15 courses in height. At a later date, contemporary with some of the brick-built modifications, both internal wall faces were covered with a pale lime render and a stone-flagged floor was laid. No trace of the primary floor was found; presumably it had been removed when the new surface was constructed.

3.11.3 The second stone cellar (***120***) was situated 14.5m north of ***90*** and formed the eastern end of a building fronting Millgate (Fig 9); it was situated approximately 7m east of the street frontage. The western excavated part of this structure was brick-built and appears to have been a later addition/rebuild (Period 6; ***93***). Feature ***120*** was 5m square externally and survived to a maximum depth of 1.65m; its south-east corner had, however, been removed by a modern building and other parts of the structure had been badly damaged by later intrusion, including a modern drain that had been inserted across it on an east to west alignment. As in cellar ***90***, the walls were constructed of roughly coursed, buff sandstone rubble, faced internally with dressed blocks. The masonry was bonded with a sandy mortar, most of which seems to have leached away. For the most part, the facing blocks varied in size from *c* 0.25 x 0.17 x 0.1m to 0.4 x 0.3 x 0.l5m, although a few much larger blocks, including one measuring 1.5 x 0.28 x 0.27m, had also been used. The best-preserved section of the north wall survived 12 courses (1.65m) high, but elsewhere the masonry was only up to 1.1m in height (Plate 23).

*Plate 23: Stone cellar **120***

3.11.4 The cellar was accessed by means of a flight of five stone steps *c* 1.1m wide, situated at its north-west corner. These steps were constructed of large sandstone slabs, up to 1.07 x 0.25 x 0.15m, each set on a compacted bedding layer of smaller stone fragments, 50-90mm thick. What may have been the remains of a small window, 0.4m wide, was visible in the north wall, adjacent to the staircase; this feature had subsequently been infilled with sandstone. As in cellar ***90***, the flagstone floor appears to have been a later addition, since it sealed a Period 6 ceramic drainpipe (*Section 3.12.4 below*); no trace of the primary floor was recorded. The character of the material infilling the cellar suggested that it did not go out of use until the twentieth century.

3.11.5 Feature ***186*** was located in the eastern part of the site, some 25m east of cellar ***120*** (Fig 9). It is possible that both cellars were situated on the north side of a narrow alley or ginnel, no more than 1.5m wide, running east from Millgate; certainly such a feature seems to have existed during the nineteenth century, but no direct evidence for its existence at an earlier date was found. Only the south-west corner of the cellar was available for investigation, measuring 5m east/west and 2.5m north/south; to the east, the feature extended beyond the limit of excavation, whilst to the north it had been completely destroyed. When ***186*** was rebuilt in brick during the nineteenth century (Period 6; (*Section 3.12.12 below*), the original stonework was removed down to the basal course, which was retained as a foundation for the brickwork. As in cellars ***90*** and ***120***, the walls were of mortared sandstone rubble, faced internally with dressed sandstone blocks up to 0.56 x 0.26 x 0.07m. The walls were 0.6m wide and survived to a height of 0.2m.

3.11.6 The slight remains of another stone-built structure were recorded 3m south of ***186***, possibly fronting the south side of an alleyway running east/west across the site. The only surviving remains of this putative building comprised a 3m stretch of east/west walling (***88***), 0.35m wide, that survived to five courses (0.65m) in height. The wall comprised roughly dressed and undressed sandstone blocks, varying in size from *c* 0.24 x 0.11 x 0.1m to *c* 0.65 x 0.3 x 0.1m, bonded with a pale sandy mortar. It pre-dated building ***87*** and surface ***86*** (Period 6), and may therefore have been of eighteenth-century date. To the east of this isolated wall fragment, archaeological levels of probable eighteenth- and early nineteenth-century date in an area of *c* 7 x 5.5m bounded by cellar ***186*** on the north, a nineteenth-century brick terrace (***85***) on the south (*Section 3.12.6 below*), and the limit of excavation to the east, were removed (by hand) as a single deposit 0.3m thick (***202***). No obvious features such as stone walls or large pits were recorded.

3.11.7 Elsewhere on the site, a layer of mid grey-brown silty-clay (***176***), 0.15m thick, was recorded overlying infilled Period 4 pit ***173***. This deposit measured 3m east to west by 1.5m north/south, but had been cut away on all sides by later features. Since it sealed pit ***173*** and lay beneath the foundations for a row of a nineteenth-century brick-built terrace (Period 6; ***85***), ***176*** has been tentatively assigned to Period 5.

3.11.8 The central-southern part of Area G3 was covered with a layer of mid-grey-brown humic silty-clay (***3095***), up to 0.15m thick. This deposit covered an area of approximately 5 x 3m and also survived in patches further north, but had been removed elsewhere by later features and modern truncation. It is possible that a patch of dark brown silty-clay in the eastern part of the site (***3115***), which survived in a strip measuring 2.4m by 0.5m along the extreme northern, edge of the trench, may have been part of the same deposit. Deposit ***3095*** was interpreted as a garden soil of eighteenth-century date. The soil was cut by two pits adjacent to the southern edge of the excavated area: a sub-rectangular pit (***319***), identified during the evaluation; and a larger pit (***3113***), recorded during the main excavation. Pit ***319*** measured 1.2 x 1m and was 0.42m deep, with near-vertical sides and a flat base, and was filled with dark grey sandy-silt (***320***). It was itself cut by a second sub-rectangular pit (***335***), 0.9m wide, 0.4m deep and in excess of 1.5m in length, the western end of which had been removed by a later feature. This was also filled with a dark grey organic sandy-silt (***334***). Pit ***3113*** was probably oval, *c* 2.7 x 2.1m and 0.5m deep, with sloping sides and a flat base. It was filled with dark brown organic silty-clay containing preserved plant remains (***3114***). This pit was cut by the brick-built boundary wall (***3013***) on the north side of the Ship Yard alley, which formed the southern limit of the excavation (*Section 3.12.19 below*), and by a poorly-recorded second pit (***3082***) that may be attributable to Period 5. This large oval feature measured 5 x 2.5m and 1.5m deep, and was filled with dark grey organic silty-clay (***3081***).

3.11.9 Approximately 1.5m north of pit ***319*** was another possible pit (***3058***=***3042***), only a fragment of which, measuring 0.55 x 0.5m and 0.4m deep, had survived. It was filled with a dark grey sandy-clay (***3057***=***3043***). Immediately north of ***3058*** lay ***3040***, a small, possibly circular pit, of which only the southern half remained. This may have been *c* 0.75m in diameter and was 0.18m deep, with steep sides and a slightly rounded base. It was filled with pale/mid-grey sandy-clay (***3041***) that had suffered from modern root disturbance.

3.11.10 Where deposit ***3095*** did not survive, eighteenth-century remains consisted mainly of pits and a few other negative features truncated by nineteenth- and twentieth-century activity, that had been dug through similarly truncated features and deposits of earlier periods. The only exception was a fragment of an east/west-aligned stone wall (***3085***) at the northern edge of the trench. As it survived, this was 0.28m wide, 0.4m in height, and was traced east to west for 1.2m. It comprised four courses of unbonded sandstone blocks; the lower two courses consisted of fairly well-dressed blocks, measuring *c* 120 x 70mm, whilst the upper courses were built of smaller, undressed stones. Running beneath the wall on a north-east to south-west alignment was a stone-lined drain or channel (***3097***), of which only a short fragment, 1.1m in length, had survived. This overlay layer ***3115***, which may have been the same as more extensive soil deposit ***3095***. The sides of the channel, which was 0.2m wide and 0.35m deep, were lined with three courses of unmortared, dressed sandstone slabs and blocks, whilst roughly dressed slabs, up to 0.5 x 0.3m and

0.05m thick, had been used to floor the cut and cap the top of the feature. The channel was ultimately filled with black, humic silt (***3098***).

3.11.11 The only other probable eighteenth-century features recorded in the eastern part of the trench were two truncated pits (***3073***, ***3101***). The former was oval in plan, 1.4 x 1.2m and 0.42m deep, and was situated 0.9m south of wall ***3085*** (Fig 11). It had near-vertical sides and a flat base, and was filled with mid-dark brown sandy-clay (***3074***). Pit ***3101*** had been largely destroyed, but may have been roughly circular, *c* 1.35m in diameter and 0.2m deep, with steep sides and a rounded base. It was filled with a loose, greenish-grey sandy-clay with a considerable amount of charcoal flecking (***3102***).

3.11.12 The principal Period 5 feature recorded in the western part of Area G3 was a large oval pit (***3034***), measuring 2.8 x 1.3m and 0.9m deep, which was filled with a highly organic, dark brown sandy-clay (***3035***/***3061***). The northern ends of a pair of small gullies situated less than 0.5m apart (***3016***, ***3018***) also extended into the south-west corner of the trench from the south (Fig 11). Gully ***3016*** was 0.3m wide and 0.4m deep, whilst ***3018*** was 0.25m wide and 0.35m deep. Both were filled with pale/mid-grey clay (***3017*** and ***3019***).

3.11.13 ***Period 5 Dating:*** although cellar ***120*** in Area G7/10 yielded 86 sherds of post-medieval pottery, including manganese mottled ware of an early eighteenth-century date, and Blackware datable to the seventeenth to nineteenth centuries, all of this came from the twentieth-century rubble infill, and cannot, therefore, be used to date the construction and primary occupation of the cellar itself. Deposit ***202***, which represented 0.3m of probable eighteenth- to early nineteenth-century levels that were removed as a single context over a fairly large area, produced, perhaps unsurprisingly, a large group of post-medieval pottery sherds, including Blackware, mottled ware, Rhenish-style stoneware, and tin-glazed earthenware, all dating broadly to the seventeenth or eighteenth century. However, the layer also yielded a good assemblage of clay tobacco pipes, which indicate a likely deposition date of *c* 1710-50 (*Section 4.7.5 below*).

3.11.14 Layer ***3095*** in Area G3 produced a group of 48 post-medieval sherds, ranging in date from the late seventeenth to nineteenth centuries. Good ceramic groups were also recovered from pit ***3113***, which cut layer ***3095***, and pit ***3082***, which cut ***3113***. The former produced 58 sherds with a broad seventeenth- to nineteenth-century date range, whilst 17 sherds of eighteenth- and nineteenth-century date came from the fill (***3081***) of pit ***3082***. The fill also yielded fragments of clay tobacco pipes dated to the late seventeenth to early eighteenth centuries. Fill ***3098*** of stone-lined drain ***3097*** contained 16 sherds of pottery dated to the eighteenth and nineteenth centuries, whilst the fill (***3035***) of pit ***3034*** yielded two sherds of eighteenth-century pottery, together with fragments of window glass and preserved leather. In addition to the pottery, fragments of clay tobacco pipe were recovered from stone drain ***3097***, linear feature ***3018*** and pit ***335***, whilst an ivory knife handle of a probable eighteenth- or nineteenth-century date came from the fill (***3017***) of linear feature ***3016***.

3.12 PERIODS 6 AND 7: NINETEENTH- AND TWENTIETH-CENTURY OCCUPATION

3.12.1 Brick-built cellared buildings that occupied most of the Millgate frontage within Area G7/G10, and other brick structures, with associated yards and lanes, behind the street frontage, were constructed during the nineteenth century (Fig 13). Extensive modern levelling and other disturbances had severely damaged many of the remains, especially in the central and eastern parts of the site, resulting in only patchy survival of earlier features and deposits.

3.12.2 On Millgate, Period 5 stone-built cellar ***90*** was remodelled extensively and extended (***95***). The south and west walls were demolished and the cellar was extended westwards, its western end extending beyond the limit of excavation. It now measured in excess of 8.75m east to west by 4m wide. The new walls (***89***) were constructed of brick and were bonded with orange sandy mortar. The individual bricks were *c* 0.23 x 0.22 x 0.07m and most appear to have been reused, as many broken examples and half-bricks were incorporated into the walls, which were actually very roughly built, with quite irregular coursing and no obvious or consistent bonding pattern. Where best-preserved, the walls survived up to 21 courses (1.5m) in height. The inner faces of both walls were covered with a pale lime render, which was also applied to the stonework of the original north and east walls, which had formed part of cellar ***90***. The cellar was floored with yellow sandstone flags (***91***) that abutted the new walls. The individual flagstones were 40mm thick, and varied in size from *c* 0.45 x 0.2m to *c* 0.9 x 0.6m. During the twentieth century, a concrete drain covered by an iron grate was inserted at the north-east corner of the cellar. At an unknown date, but perhaps during the nineteenth century rather than later, an alcove was created against the south wall, close to the south-east corner of the cellar, by the construction of a pair of short brick walls set 1.3m apart, that abutted the rendered face of the south wall and extended north into the cellar for 0.5m. That this had held a fireplace was suggested by blackening and sooting of the render on the cellar's south wall, which was confined to the area within the alcove.

3.12.3 Approximately 2m north of cellar ***95*** was the south wall (***92***) of what was probably a north/south row of two or three contemporary cellared buildings fronting Millgate, all of which were given a single context number (***93***) and extended west beyond the limits of the excavation (Fig 13). The 2m-wide gap between ***95*** and ***93*** almost certainly served as an alleyway running east from Millgate (it was probably the same as alley ***84*** to the east; *Section 3.12.7 below*). The southernmost structure was 5.25m wide externally, north/south, and was over 8.75m long east/west. That to the north was 4.75m wide and in excess of 4.5m in length; however, the existence of a probable doorway connecting this with the basement to the south suggests that these cellars may have been part of the same building, not two separate structures. To the north again, another structure had been built onto the west side of Period 5 stone-built cellar ***120***, which continued in use at this time. The new building was 5.25m wide, north/south, and extended over 4.25m west of cellar ***120***. Including the earlier cellar, the building measured in excess of 10.75m east to

west. It may have been separated from the structure(s) to the south by a narrow alley or ginnel no more than 1.3m wide that ran east from Millgate. This may have been the same as the alley/ginnel that ran between structure ***87*** and the brick rebuild of cellar ***186*** further east (*Section 3.12.12 below*). The new buildings were constructed entirely of brick, bonded with a very sandy, pale cream/buff mortar. Traces of contemporary, brick-built internal partitions were observed within the southern and central basements, but not in the northernmost feature.

3.12.4 Within cellar ***120***, a ceramic drain pipe was inserted on an east to west alignment adjacent to the north wall, following which a flagstone floor was laid. This surface comprised yellow sandstone flags 30-60mm thick, varying in size from *c* 0.25 x 0.2m to *c* 0.6 x 0.55m. That the cellar was used well into the twentieth century was suggested by the presence of numerous paint tins that had been dumped on the floor.

3.12.5 Attached to the east side of the central of the three new cellars, situated in the angle formed by the east wall of that structure and the north wall of the building to the south, which extended further east than its neighbour, was a substantial, brick-built oven (***94***), perhaps a bread oven (Fig 13). This comprised a domed or vaulted circular chamber, 1.8m in diameter internally and *c* 1m, deep constructed of yellow, heat-resistant bricks, each measuring *c* 237 x 113 x 75mm, bonded with a dark orange sandy mortar (Plate 24). The chamber was floored with thick stone flags (***181***), averaging *c* 300 x 300 x 100mm in size, laid on a bedding or sub-floor of bricks (including half-bricks) set in a pale sand and mortar matrix (***182***). The oven was accessed from the adjacent cellar on the west through a gap in the cellar wall 0.7m wide, the base of which was covered by an iron plate. This was later blocked with three courses of mortared brickwork (***183***), demonstrating that the oven went out of use before the cellar itself was abandoned. The chamber was ultimately infilled with mixed earth, mortar and brick rubble (***180***).

*Plate 24: Oven **94***

3.12.6 In the central part of the site, immediately east of the cellared buildings fronting Millgate, most nineteenth-century levels had been removed by modern truncation. Further east still, however, the remains of buildings, yards and alleyways had survived, although much had been lost to later disturbance. Some 14m east of the southernmost of the new cellared structures were the remains of an east to west row of brick-built terraced houses or cottages (***85***). These had been reduced to their foundations and badly fragmented by later activity, whilst the overlying deposits were removed mechanically (as layer ***101***; Period 7); however, the surviving remains appeared to represent parts of three small houses, each measuring 7 x 4m internally (Plate 25). The greater part of the two westernmost structures lay within the site, whilst the third extended east beyond the limit of the excavation. Each was divided into two rooms by north/south partitions, creating a western room 4m wide east/west and a smaller, eastern room, 2.75m in width. In the centremost of the three structures, traces of an east/west wall sub-dividing the eastern room into two even smaller rooms was recorded. The southernmost room measured only 1.25m internally, whilst that to the north was 2.5m in width. No other internal walls were noted, although it is possible that some partitions had been completely destroyed, or were of such insubstantial construction that they left little or no trace in the archaeological record. The external walls of the terrace were two bricks thick (*c* 0.22m), but internal partitions had a thickness of only a single brick (*c* 0.11m). The walls were constructed of bricks measuring 230 x 110 x 70mm, bonded with a sandy, cream-coloured mortar. The north wall survived up to eight courses (*c* 0.6m) in height, but the other walls were generally less well preserved. No internal fixtures, fittings or surfaces had survived.

*Plate 25: The foundations of nineteenth-century terraced housing (**85**)*

3.12.7 To the south, the terrace was fronted by a pavement of limestone flags (***83***), 1m wide, the southern edge of which was defined by a kerb of limestone slabs set on edge. The pavement ran along the northern edge of a brick-paved yard or alley 3m in width (***84***), the south side of which was also flanked by a limestone flagged pavement 1.4m wide (***82***), of which only fragments survived. A shallow stone gutter ran diagonally north-west to south-east across the alley towards its eastern excavated end. Most of the bricks in the alley surface had been laid in roughly north/south rows, except for one area on the west side of the stone gutter, which had been laid in rows aligned parallel to that feature. A shallow gutter along the northern edge of the alley, adjacent to the kerb, on the south side of pavement ***83***, was defined by two rows of bricks aligned east/west. Spatial considerations suggest that the alley extended west to Millgate, where it ran between cellared buildings ***90*** and ***93*** on the street frontage.

3.12.8 Beneath the surface of the alley, a complex of drain pipes was observed (***06***). Also present was a stone-lined and stone-capped channel (***49***=***477***), and a fragment of a poorly-preserved brick-lined feature of similar character (***59***). Feature ***49***/***477*** was 0.65m wide and up to 0.85m deep where it was best-preserved, and appears to have pre-dated the pipes. This feature extended into the site from the east and ran west on a somewhat sinuous alignment for *c* 11m before beginning to turn north-west towards the western surviving end of brick terrace ***85***. It was traced north-westwards for a further 6m or so but seems to have terminated some 3m short of the south wall of the terrace. Its eastern end, at the point where it extended beyond the excavated area, seems to have been cut by, or ran into, a brick-built structure of unknown form and function. Whilst this may have been an otherwise unrecorded cellar that truncated the channel, it could conceivably have been associated with it, since the drain lining of roughly dressed and undressed sandstone blocks and slabs (***51***) was replaced with brick in the section of the channel that approached this feature. The upper part of the construction trench for the drain, above the stone capping, was infilled with mid grey-brown silty-clay and stones (***50***). Feature ***59*** was situated immediately north of ***49***/***477*** and was also east/west-aligned, but only a short fragment, 2.2m in length, had survived, situated adjacent to the western recorded end of ***49***/***477***. This feature was 0.5m wide and 0.4m deep, and seems to have been both lined and floored with bricks (***58***). No evidence for a capping was found, and what remained of the channel was filled with mixed earth, clay and brick rubble (***57***).

3.12.9 It is not at all clear if features ***49***/***477*** and ***59*** were associated with alley ***84*** or the terraced housing to the north, although their position and alignment relative to that of the alley suggested a connection. Feature ***49***/***477*** did, however, cut across a large rectangular pit of probable late eighteenth- or nineteenth-century date (***478***) that certainly did pre-date the establishment of the alleyway. This feature measured 3.4m east to west by 2.4m north/south and was 1.45m deep, with near-vertical sides and a flat base, and was filled with very mixed, mid-dark grey-brown sandy-clay and redeposited natural clay (***479***). A second large pit (***171***), probably broadly contemporary with ***478***, was situated *c* 5m to the north-east. This vertical-sided feature was

rectangular, 2.8 x 2.2m and in excess of 1.65m deep, and was filled with mid-brown sandy-clay containing some brick and stone rubble and redeposited natural clay (***172***). Like ***478***, this pit must have pre-dated the establishment of alley ***84***. Fill ***172*** contained an assemblage of clay tobacco pipes, which have been dated to 1740–1800 (*Section 4.7.5 below*).

3.12.10 To the south of alley ***84***, most contemporary features and deposits had been destroyed, but slight traces of two structures flanking a narrow north/south alley no more than 1.65m wide, which ran south from ***84***, had survived. Only the extreme north-west corner of the easternmost building (***81***) remained, whilst of the western structure only a fragment of the east wall (***102***), 2.5m long, 0.5m wide and 0.8m in height, was found. The latter was poorly constructed of unmortated bricks, stone fragments and concrete, laid in rough courses; much of the brick and stone had clearly been reused. The quality of the build suggests that this was an insubstantial structure, whilst the presence of concrete indicates a twentieth-century date. Building ***81*** was composed entirely of bricks bonded with a hard, dark-brown/black mortar, that appeared to incorporate much crushed clinker or slag. The walls survived to a maximum of 12 courses (1.1m) in height. Like alley ***84***, the narrow alley or ginnel that separated buildings ***81*** and ***102*** seems to have been surfaced with brick, at least towards its northern end.

3.12.11 On the north side of terrace ***85*** was a yard (***86***), flanked to the east by the very poorly preserved remains of a probable brick-built structure (***87***), constructed back-to-back with the two easternmost houses in the terrace. This building may have replaced an earlier structure by the fragment of Period 5 east/west-aligned stone wall (***88***; *Section 3.11.6 above*). The yard seems to have been just under 6m wide, north/south, and measured in excess of 6.5m east/west, but had been destroyed to the north and west by later disturbances. It was surfaced with square and rectangular stone setts. The north wall of structure ***87*** survived as a brick-built fragment, 4.5m long, situated 5.25m north of, and running parallel with, the north wall of terrace ***85***. Part of a possible north/south brick partition was recorded running north from the north wall of ***85*** some 3m west of the eastern trench edge, but no other internal fixtures, fittings or surfaces had survived.

3.12.12 Some 1.5m north of ***87***, and separated from it by a narrow east/west-aligned alley or ginnel, was cellar ***186***. Although initially stone-built and probably eighteenth century in origin, this cellar was completely rebuilt in brick during the nineteenth century. The original stone walls were levelled to the basal course, which was retained as a foundation for the new brickwork. As in the earlier period, only the south-west corner of this feature, measuring in excess of 5m east/west and 2.5m north/south, could be excavated, since it extended beyond the trench to the east and had been destroyed to the north by modern disturbances. The walls survived up to 11 courses (1.5m) in height and were bonded with a soft, pale buff sandy mortar, whilst the floor was composed of sandstone flags of varying sizes, together with a few bricks. The cellar was ultimately infilled with brick rubble and earth, all of which was removed mechanically.

3.12.13 Cellar ***186*** appears to have cut the eastern excavated end of an east/west-aligned stone and brick-lined drain or channel (***205***) of similar character to feature ***49***/***477***, which was situated some 15m to the south (*Section 3.12.8 above*). In the same way that ***49***/***477*** was located beneath alleyway ***84***, it seems likely that ***205*** was situated beneath the narrow alley or ginnel that separated ***186*** on the north from building ***87*** to the south (and which also ran between the two northernmost buildings on the Millgate frontage to the west), since it was traced east/west across almost the full width of the site. The drain was 0.7m wide and 0.2m deep, although it had probably been severely truncated and it is likely to have been deeper originally. Its sides were lined with two courses of brick, and it was both floored and capped with sandstone slabs up to 0.1m thick. The base of the channel sloped gradually from west to east, indicating that it drained eastwards from Millgate; ultimately the feature became filled with dark silt.

3.12.14 One other brick-built basement of a nineteenth-century date was recorded within the area of G7/G10, at the north-east corner of the excavated area some 8m north-west of ***186***. This feature (***204***) measured 6.75m east/west internally and in excess of 3.75m north/south; it extended north beyond the trench. The walls were brick bonded with a pale cream/buff mortar and rendered internally with a hard plaster. The cellar was filled with brick rubble mixed with earth and industrial waste. This material was not removed during the course of the excavation, so the depth of the cellar was not determined and no internal features were recorded.

3.12.15 Other than the remains of substantial brick buildings, and the associated yards and alleyways, few features of nineteenth-century date were recorded within Area G7/G10. Approximately 11m east of cellar ***90***/***95*** was a group of four features (***08, 10***, ***12***, ***17***), two of which intercut. The earliest of the intercutting features was a sub-rectangular pit (***08***), measuring 1.37 x 0.86m and in excess of 0.7m deep. This had vertical sides and a flat base and was filled with dark brown, organic sandy-silt (***07***), perhaps a cess deposit. It was cut by a small, sub-oval pit (***10***), 0.7 x 0.46m and 0.45m deep, filled with dark brown/black sandy-silt (***09***). Immediately adjacent to the south-east corner of pit ***10***, but having no stratigraphic relationship with it, was a sub-circular posthole (***12***), measuring 0.5 x 0.45m and 0.48m deep, with vertical sides and a slightly rounded base. This was filled with dark brown/black sandy-clay (***11***). Feature ***17***, which was situated immediately north-west of pit ***08***, was linear in plan, aligned north-east/south-west, and cut Period 4 pit ***13*** (*Section 3.10.2 above*). It was 3.1m long, 0.5m wide and 0.55m deep, with vertical or near-vertical sides and a flat base, and was filled with mixed yellow-orange clay and dark brown sandy-clay (***18***). To the north of these features was a probable sub-circular pit (***69***), 0.9 x 0.8m and 0.4m deep, with steep sides and a slightly rounded base. Its base was filled to a depth of 0.3m with two layers of redeposited natural clay mixed with grey silt (***68*** beneath ***67***) that were sealed by an upper fill of dark grey-brown silty-clay (***66***), 0.1m thick.

3.12.16 Another probably circular pit (***269***) was recorded immediately outside the south-west corner of cellar ***186***, in the eastern part of the site. Only half this

feature survived, but it may have been 1.4m in diameter and 0.2m deep. Towards the eastern edge of the site, a pit of indeterminate character (***442***) was located. The size and shape of this feature were unclear, but it was 0.35m deep and was filled with dark brown sandy-silt (***471***).

3.12.17 At the extreme north-west corner of the site, most archaeological deposits had been completely destroyed during the twentieth century. The truncated remains of an isolated pit of eighteenth- or nineteenth-century date (***124***) were, however, recorded, some 5.5m north of the northernmost surviving structure (***93***/***120***) on the Millgate Street frontage. Pit ***124*** was circular, 0.8m in diameter and 0.3m deep, with steeply sloping sides and a flat base, and was filled with dark brown/black silty-clay containing some brick and sandstone rubble (***123***).

3.12.18 The western end of Area G3 was covered by the well-preserved surface of the Ship Yard (Plate 26), comprising rectangular stone setts (***3000***), each measuring 0.2 x 0.18 x 0.12m, laid on a bed of black, gritty material (***3002***), 0.1m thick. This surface, which was situated to the rear of the former Ship Inn, was probably of nineteenth-century date (Period 6), but was bounded on the west by a north/south brick wall (***3004***), dating to the twentieth century (Period 7), the construction trench for which had been dug through the western edge of the surface, resulting in the removal of some setts. The yard surface adjacent to the new wall was subsequently repaired with concrete (***3003***). The setts were laid in north to south rows, but the whole yard, which was traced for 12.4m east/west and 7.5m north/south, was crossed by a shallow east/west-aligned drainage gully (***3005***), 0.6m wide, comprising three rows of setts laid east/west at a slightly lower level than the rest of the yard surface. In the northern part of the yard, the setts were abutted by a contemporary surface of rounded cobbles (***3001***/***3006***) covering an area of 6 x 3.5m.

*Plate 26: Surface **3000***

3.12.19 The south side of Area G3 was defined by the northern boundary wall of the Ship Yard alley (***3013***), which was aligned east/west between Station Road and Millgate. The wall was constructed of moulded bricks bonded with a pale grey sandy mortar. It was two bricks (0.36m) wide and survived up to 1.2m in height, and was traced east/west for a distance of 34m. The contemporary surface of the Ship Yard alley itself comprised a layer of well-set, rounded cobbles, although this lay south of the excavated area. On the north side of the wall, within the excavation, fragments of cobbled surfacing were recorded towards the eastern end of the site. Abutting the north face of boundary wall ***3013*** were the remains of a surface of rectangular setts and cobbles (***3010***, ***3011***), cut through by a twentieth-century brick wall (***3012***) that abutted the face of boundary wall ***3013*** and ran north from it. What may have been part of the same surface was also recorded to the north-east (***3009***), where it extended over an area measuring at least 4 x 2.2m and overlay a bedding layer of dark, sandy material and stones (***3008***). This part of the surface was bounded on the south by a kerb, comprising a single row of cobbles (***3014***), and was later sealed beneath a modern concrete surface (***3015***). On the east, it respected the position of a north/south wall 0.6m wide (***324***), that extended north into the trench for 3m (Fig 14). The basal course of this feature comprised dressed sandstone blocks averaging 0.25 x 0.12 x 0.1m in size, and was overlain by two further surviving courses of smaller, roughly dressed blocks. Traces of a pale-coloured lime mortar were found in the upper courses. The north end of the wall terminated in a large stone block, suggesting the possible existence of an entrance giving access from the east.

3.12.20 At the northern edge of the excavated area, parts of the south walls of two nineteenth-century cellars were recorded. Both may have been constructed around the middle of the century, and may relate to buildings that are shown on the First Edition Ordnance Survey map of 1848, south of Crompton Street. The westernmost feature (***3054***) was 3.7m wide, externally, east/west, and was built of moulded bricks set in a construction cut (***3052***) infilled with earth and debris (***3053***). Very little was available for investigation, but the cellar was ultimately infilled with brick rubble and cut by a modern service trench (***3050***). Approximately 12m to the east was a second cellar (***3084***), of which only a fragment of the south wall lay within the excavated area. This comprised two large dressed sandstone blocks, each 1 x 0.2m, bordered on the south by a course of brickwork and sealed by later concrete (***3083***).

3.12.21 During the twentieth century, the surface of Ship Yard was cut by a large sewer trench (***3030***) that ran east/west for the length of the excavated area (Fig 14). A smaller pipe trench, aligned north-west/south-east (***3096***), fed into the north side of the sewer in the eastern part of the site. The western end of the sewer trench was cut by a smaller, north-east/south-west-aligned service trench (***3026***). Another east/west-aligned service trench (***3044***) also ran along the northern edge of the site, south of cellars ***3054*** and ***3084***.

3.12.22 ***Periods 6 and 7 Dating:*** layer ***101***, which represented overburden and other material excavated mechanically in Area G7/10 from above the remains of brick terrace ***85***, contained 15 post-medieval sherds varying in date from the eighteenth to nineteenth centuries. Likewise, finds recovered from machine clearance associated with the watching brief phase of the fieldwork, produced 25 sherds, including material of late nineteenth- and twentieth-century date, as well as some eighteenth- or nineteenth-century fragments. The fill of stone-lined channel/drain ***205*** produced five eighteenth- or nineteenth-century sherds, whilst pit ***08*** contained ten fragments of eighteenth- and nineteenth-century material, pit ***10*** also yielded three of eighteenth- or nineteenth-century date, and posthole ***12*** contained small amounts of seventeenth- to nineteenth-century Midlands Blackware and a single sherd of eighteenth-century unglazed, buff earthenware. A group of 23 sherds, attributable to the nineteenth and twentieth centuries, came from pit ***17***, and a single nineteenth-century fragment of a stoneware vessel was recovered from pit ***124***.

3.12.23 Sewer trench ***3030*** in Area G3 produced 39 sherds of post-medieval pottery, ranging in date from the seventeenth to the nineteenth century. Four sherds of eighteenth- or nineteenth-century date came from the construction trench for cellar ***3054*** in the northern part of the site, and a further four fragments, datable to the seventeenth to nineteenth centuries, were recovered from the construction trench for wall ***3004*** on the western edge of the excavated area.

4. THE FINDS

4.1 INTRODUCTION

4.1.1 The programme of archaeological investigation as part of the Grand Arcade Development produced a considerable assemblage of artefacts, as may be expected from the scale and nature of the excavations. The assemblage was dominated by ceramic objects, which included fragments of ceramic building material from the Roman bath-house, and pottery of Roman, medieval and post-medieval dates. Other material classes recovered included copper alloy, iron, lead, glass, and animal bone.

4.2 SAMIAN (*Margaret Ward*)

4.2.1 The entire assemblage of samian comprised 223 sherds, representing a maximum of 155 vessels (6.00 EVES; weight 3092g; Table 3). The material as a whole was in a very good condition, the fabrics being little eroded and most vessels being represented by medium-sized sherds of average weight (13.8g); correspondingly, relatively little (12%) was of indeterminate form. Conversely, only two or three vessels displayed complete or near-complete profiles (*Appendix 2*).

Form	South Gaul	Central Gaul	East Gaul	Total
Curle 11	3			**3**
15/17 or 15/17R	1			**1**
18	3			**3**
18 or 18R	2			**2**
18R	3			**3**
18 or 18/31	1			**1**
18R or 18/31R	1			**1**
18/31	1	5		**6**
18/31 or 18/31R		3		**3**
18/31 or 31		1		**1**
18/31R	1	10		**11**
27	4	6		**10**
27g	2			**2**
29	2			**2**
30	1			**1**
33	2	5		**7**
35	1	1		**2**
36		1		**1**
37	40	36		**76**
46		1		**1**
Ind	8	9	1	**18**

Table 3: All samian vessels, by form and fabric (maximum 155 vessels)

4.2.2 ***Methodology:*** each sherd was catalogued on a Microsoft Access database; a catalogue of the samian ware is presented as *Appendix 2*. Full details of sherds and numbers of vessels, including weights and measurements of rims for EVES, were recorded. Vessels selected on the basis of intrinsic interest or significance to the site are detailed in below. The abbreviations SG, CG and EG denote vessels which were produced in South Gaulish, Central Gaulish and East Gaulish workshops respectively. Vessel types are generally Dragendorff's form numbers unless otherwise stated (see Webster 1996 for other terminology). Date ranges, such as *c* AD 70-100 or *c* 120-200, were used rather than epochs (*eg* Flavian, or Hadrianic-Antonine), and merely to enable their entry into the database. They should therefore not be thought more precise than epochs.

4.2.3 Tables, bar diagrams and histograms summarise the forms, fabrics and date-ranges of the material according to the maximum numbers of vessels (estimation of minimum numbers is difficult, and probably misleading in the case of multiple fragments of indeterminate form; *Appendix 2*). Although measurements for EVES were recorded, EVES have been so little employed in samian reports that comparisons are virtually impossible (see Willis 1998, 94). Taking the wider view, though, provision of measurements for EVES will facilitate integration of samian ware into the pottery assemblage as a whole.

4.2.4 ***Provenance:*** the South Gaulish vessels comprised 49% of the total, and the Central Gaulish products comprised 50%; the single fragment that may have originated in East Gaul constituted only 1%. This was a fragment of indeterminate form, considered to be the work of a Trajanic-Hadrianic workshop in East Gaul, perhaps at Chémery rather than Blickweiler (Johns 1971). However, the sherd had suffered slight burning, and its identification as an East Gaulish product is questionable.

4.2.5 ***Samian stamps:*** there were two potters' stamps, one attributable to a specific potter, Macrinus ii (*Appendix 2*). The stamps comprised only 1.3% of the total, a relatively small proportion compared with assemblages from excavations at Mitchell's Brewery in Lancaster (2%; Ward in prep), the Carlisle Millennium excavations (3%; Ward forthcoming), the Middlewich *vicus* (5%), and the Piercebridge *vici* and villa (up to 7%; Ward in press). In contrast, the moulded bowls comprised a large proportion of the assemblage: 51% including, and 58% excluding, indeterminate sherds. The majority of the moulded pieces (76%) retained some decoration. Thus, moulded bowls are clearly much more preponderant than is suggested by the average figure quoted for extramural occupation at military sites (35%) or military sites (30%) in Willis 2005, table 42. In more recent reports, corresponding proportions have been noted at 39% and 30% for the Middlewich and Lancaster *vici* and 25% in Carlisle. The large proportion of moulded bowls from the Grand Arcade may be compared rather with the figure of 52% at Walton-le-Dale (F Wild, pers comm), although no moulded beaker forms were present.

4.2.6 ***Dating:*** several observations are pertinent in terms of the dating of the first-century samian ware on the site. First, two small fragments recovered from Period 1 deposits (surface ***539*** and associated levelling ***870*** in Area G7/10) could have been produced in the late Neronian to Flavian period, but are more likely to have been Flavian products. Second, the South Gaulish bowl form 29 is likely to have been produced before *c* AD 90; there appears to have been no more than two examples in the assemblage. Their ratio in relation to the South Gaulish bowls of form 37 is 1:20, an extremely small proportion. Third, of those South Gaulish bowl form 37s that were closely datable, almost all were produced in the range *c* AD 80-100/105. Fourth, the paucity of form 29 in this large assemblage of moulded bowls would be consistent with the formation of a group some time after *c* AD 85-90. It is likely that some of the South Gaulish ware was produced in the Trajanic period (Table 4).

Fabric	Potter	Nos of vessels	Start Date	End Date
South Gaulish	Form 29, Secundus/Virthus-related	1	AD 70	AD 85
	Frontinus derivative	1	AD 80	AD 100
	Albanus iii, Amandus, Coii Bass[and associates	1	AD 80	AD 105
	Germanus Ser[group	1	AD 80	AD 105
	Biragillus group	2	AD 80	AD 105
	Biragillus-related	1	AD 80	AD 110
Central Gaulish	**Les Martres-de-Veyre**			
	Drusus i	4	AD 100	AD 120
	X-9	1	AD 110	AD 125
	Lezoux			
	X-9?	1	AD 125	AD 140
	Drusus i	2	AD 120	AD 140
	Drusus ii	2	AD 125	AD 145
	X-13	2	AD 125	AD 140
	X-13/14 or Attianus	1	AD 125	AD 145
	Sacer-Attianus group	1	AD 125	AD 150
	Cettus **(Les Martres)**	1	AD 135	AD 160
	Cinnamus	1	AD 135	AD 160
	Criciro/Cinnamus/Divixtus	1	AD 135	AD 175
	Mammius	1	AD 150	AD 180

Table 4: Forms of samian vessels (% of maximum 155 vessels)

4.2.7 A large proportion of the Central Gaulish ware was made by potters at Les Martres-de-Veyre. There were as many as 15 Les Martres products, of which 13 may be considered Trajanic to very early Hadrianic in origin (*c* AD 100-120/125); two pieces were later, representing or contemporary with the workshop of the potter Cettus, active in the late Hadrianic to early Antonine period. The Les Martres products comprised as much as 19% of the Central Gaulish material and 10% of the total. Five of the attributable moulded bowls originated at Les Martres-de-Veyre in the Trajanic-early Hadrianic period; up to 12 were by Hadrianic or Hadrianic-early Antonine potters, of which the single Cettus example originated at Les Martres, the remainder all

representing workshops at Lezoux (Fig 15). Some at least of the Trajanic-early Hadrianic products will have arrived in Britain in the Hadrianic period. High levels of occupation on this site in the Hadrianic period are clear. A similar surge reflected by the Hadrianic Lezoux products has been recorded at sites such as Carlisle (Ward forthcoming), Walton-le-Dale (Evans forthcoming), Lancaster (Dickinson in prep b) and Middlewich (Dickinson 1990, 214).

4.2.8 The usual peak of supply in the Antonine period was missing from the assemblage. Only 13 vessels were dated firmly within the Antonine period; the only Roman contexts containing specifically Antonine products were in Period 2C (***226***, ***262***, ***163*** and ***170***). One of these, a moulded bowl in the style of Mammius, was recovered in pieces from contexts including ***226***, ***262*** and ***170***; this bowl was produced at some point in the range *c* AD 150/60-80. The cup stamped by Macrinus ii was an early-Antonine product, and another Antonine vessel had been reworked at some later date as a large disc (*Appendix 2*). None of the samian ware is necessarily later than *c* AD 160 (Fig 16). There were slightly more cups of form 27 (produced before *c* AD 160) than of form 33, which replaced form 27 in popularity over the course of the Antonine period. Indeed, there were none of the forms, such as the dishes 31R and 79, that were produced after *c* AD 160 and are usually found in abundance on sites under steady occupation in the Antonine period. Even the typically Antonine flanged bowl form 38 was absent. A shortfall in the later Antonine samian supply has also been noted at Carlisle, within the fort at both the Millennium site (Ward forthcoming) and at Annetwell Street (where the supply appeared to have declined after *c* 155; Dickinson in prep a). The lack of samian mortaria in the Wigan collection would also support an end to occupation before *c* AD 170. Although this sample is admittedly small, the total absence of late East Gaulish products suggests strongly that occupation was not resumed in the third century.

4.2.9 Some 8% of the samian displayed evidence of simple wear from primary use, all being footrings, except for one sherd whose interior had been scoured away completely (*Appendix 2*). There was at least one example of reuse: an unstratified Antonine product had been reworked as the large disc (*Section 4.2.8 above*). There were no graffiti, but there were three instance of repair-work: in Period 2, one South Gaulish bowl, showing wear from use, had been repaired with lead cleats; one Central Gaulish bowl of Trajanic origin had seen repair-work, successful or otherwise (it being difficult to judge the success of repair work when the vessel has broken through the repair and lacks rivets or cleats or even their traces). The third repair was of another South Gaulish bowl, whose drilled hole still retained the lead rivet when it was finally deposited in a post-Roman context (*Appendix 2*). All the repairs were on moulded bowls and they comprised 1.9% of the samian assemblage. At Piercebridge, Tofts Field, the repaired vessels constituted 3% of the total; at that site there was the workshop of a metalworker, who may also have taken on the repair of broken samian vessels (Ward 1993). Repaired samian vessels are frequently found on sites with metal-working or industrial

activities in the vicinity, as at Prestatyn, Holt, Heronbridge and Middlewich (Ward 1998).

4.2.10 Only 5% of the assemblage showed definite signs of burning. The only burnt sherds that were found in Roman contexts were deposited in Period 2C robber trench ***170***, and Period 2 ditch fill ***047*** and pit fill ***052***.

4.3 ROMAN STAMPED MORTARIA (*Kay Hartley*)

4.3.1 Two fragments of stamped mortaria were recovered from Area G7/10. The fill (***152***) of Period 7 ditch ***151*** yielded one fragment (6365), and the second (6376) was recovered from a fill (***179***) of Period 2 ditch ***178***. The fabric was examined with a hand lens at X20 magnification.

4.3.2 The first fragment (***152***/6365) was a self-coloured, cream fabric with moderate to fairly frequent, poorly sorted, transparent and pinkish quartz inclusions, with some opaque brown material. The abraded, fragmentary stamp is unidentifiable, although the mortarium can be attributed firmly to the Mancetter-Hartshill potteries in Warwickshire (Hartley 1973); its optimum date is mid-second century. The second fragment (***179***/6376) was a self-coloured, cream fabric, with a slightly powdery and somewhat friable texture. The fabric contains fairly frequent, ill-sorted, mostly very small, transparent and pinkish quartz inclusions, with rare black and orange-brown material. The trituration grit is mixed, mostly transparent quartz, with some quartz sandstone and rare orange-brown and black material. The poorly impressed, right-facing stamp survives. Only the first two letters, CO, are reasonably clear, but these are enough to permit its identification as a retrograde stamp of Coertutinus, from the less common of his two dies; the full reading of complete stamps from this die is COIRTVTIN retrograde, the I is standing in for E.

4.3.3 From the author's own research, mortaria of Coertutinus are now known from Alcester, Warkwickshire (three); Baginton; Barton-under-Needwood, Staffordshire; Coleshill; Holditch; Leicester (eleven); *Manduessedum* (two); *Margidunum*; Rocester (four); *Tripontium* (two); Wigan; and Wilderspool (two). The optimum date for his mortaria is AD 90-120. His distribution, with the high number at Leicester and the presence of his mortaria at *Manduessedum*, strongly indicates production in the Mancetter-Hartshill potteries. There is some circumstantial evidence to suggest that Coertutinus probably undertook minor activity elsewhere in the Midlands, but the Wigan mortarium can confidently be attributed to the Mancetter-Hartshill potteries.

4.4 ROMAN COARSE POTTERY (*Ruth Leary and David Williams*)

4.4.1 The excavations on the site of the Grand Arcade recovered just under 1800 sherds of Romano-British coarseware pottery (74.650kg). An archive catalogue was compiled for all the pottery according to the standard laid down by the Study Group for Romano-British Pottery (Darling 2004). Pottery was recorded detailing specific fabrics and forms, decorative treatment, condition, cross-joins/same vessel, and was quantified by sherd count, weight and rim percentage values, giving estimated vessel equivalents (EVES). All the pottery from the site was catalogued in the archive, and the stratified pottery was examined in order to date the features. Key groups are illustrated and catalogued in *Appendix 3*, and unillustrated material is summarised. The fabric series was cross-referenced to the National fabric collection codes (Tomber and Dore 1998) where possible.

4.4.2 ***Fabric descriptions:*** the fabric of the pottery was first examined by eye and sorted into fabric groups on the basis of colour, hardness, feel, fracture, inclusions and manufacturing technique. A sample of the sherds was further examined under an x30 binocular microscope to verify these divisions. The size of the sample was as large as was felt necessary for each fabric group. The fabric categories and sub-groups identified are described below.

4.4.3 *A: Amphora:* the amphorae assemblage from Wigan comprise 324 sherds, mostly of the Baetican olive-oil container Dressel 20. In Britain, Dressel 20 commonly reach 50-80% by weight of the total amphora assemblage at a variety of sites (Williams and Peacock 1983), and Wigan also falls into this pattern. Dressel 20 represents 92% by weight of the assemblage and 98% of the sherd count. However, these figures should be put into some kind of perspective since Dressel 20 were large, thick-walled vessels and many other amphorae forms, the Gauloise series for instance, were much smaller-sized and thinner-walled. While Dressel 20 bodysherds can prove difficult to date within the long production period of this form, rims provided a useful dating source, since they can be seen to evolve over the period of their production. Four Dressel 20 rims were recovered from Wigan. Comparison with the well-dated statigraphical classification of Dressel 20 rims from the Swiss forts of Augst and Kaiseraugst suggest all four of the Wigan rims date to around the period AD 110-50 (Martin-Kilcher 1987). This accords well with the Hadrianic date attributed to one of the two stamped handles from the assemblage (***264***/6037); the other stamp is unfortunately mostly illegible (***179***/673). The wine amphorae from the site consist of six sherds from the flat-based Gauloise amphorae series (Laubenheimer 1985), including a bead rim from Gauloise 4, and another bead rim, in this case probably from the cylindrical Dressel 2-4 type (Peacock and Williams 1986, class 9). Broadly speaking, Gauloise 4, the most commonly made form of the Gauloise series, can be dated in Roman Britain from the second half of the first century to the third century. The Dressel 2-4 rim is likely to be first century, but the form certainly continued in production up to the early third century.

4.4.4 *B: Black-burnished ware:* Black-burnished ware (BB) accounted for 13% of the assemblage, with only 6.6% in Period 2A, rising to nearly 17% in Period 2B. This accords well with the evidence for BB1 at contemporary sites at Manchester (Leary 2007), Middlewich (Leary forthcoming) and Warrington (Hinchliffe 1992), with the exception of Manchester, Barton Street, where BB1 was surprisingly low at 4% (Leary 2007). All the BB1 was of Dorset type, and the forms present included bowls with flat rims of Hadrianic-early Antonine type, grooved-rim dishes of mid- to late second-century type, one grooved flat-rim bowl of late second- to early third-century type, Hadrianic-Antonine necked jars with everted and bead rims (cf Gillam 1976 nos 2-4 and one no 9) with acute lattice burnish, and one small jar/beaker (Gillam 1976, no 17). Just under a fifth of the BB1 jars had burnished wavy lines around the neck, a feature which declined numerically after the mid-second century. One vessel with traces of burnished lattice, which appeared to be right-angled, and a second vessel with traces of obtuse lattice were found in pit ***41*** (Period 2). Bidwell has suggested a date of *c* AD 223-5 (1985, 174-6) for the emergence of the obtuse lattice burnish motif on BB1 jars, and a date at the end of the second century for the earliest jars with right-angled lattice burnish. The bowls and dishes were all decorated with acute lattice burnish rather than the later intersecting arcs or overlapping chevrons motifs of the mid- to late second century. The mid- to late second-century, and later, type came from the pits and ditches to the west of the Roman bath-house, and from medieval or later levels. Two BB1 lids were also present. The BB1 vessels were made up of *c* 52% bowls and dishes, 46% jars and 2% lids. No BB1 flagons were present.

- *BB1:* black or dark grey. Hard with grainy feel where unburnished and granular fracture. Abundant, well-sorted, medium-sized, sub-angular quartz. As Tomber and Dore 1998, South-East Dorset BB1 (DOR BB1).

- *BBT1:* grey-dark grey. Hard with sandy feel and irregular fracture. Moderate, medium, well-sorted, sub-angular quartz, and sparse, medium rounded black and dark brown inclusions. Very similar to BB1, but appears wheel-thrown. This fabric type was represented only by an everted rim jar.

4.4.5 *F: fine wares:* this category includes fine fabrics with surface treatments, such as mica-dusting and colour coats. Non-samian fine wares were uncommon on the site compared to national trends, *c* 5%, but this is high compared with other sites of the same period in the region, most of which yielded only 1-2%. The group from Manchester, Barton Street, was exceptional at 9%, and this was linked to the function of the site at this time, which probably had a ritual element (Gregory 2007). Around half the fine wares were roughcast ware beaker sherds, principally of local origin, with six Cologne colour-coated sherds and one probable Argonne colour-coated sherd. The abraded and eroded condition of the pottery made it difficult to identify mica-dusted wares and this group is likely to have been underestimated. At least one folded beaker in MG1 (*see below*) was identified and six further undiagnostic sherds, one of which probably came

from an open vessel. The MG2 sherd was undiagnostic. The grey mica-dusted sherd may well have come from the kiln at Manchester, which included reduced mica-dusted wares (Swan 1984). Examples of grey mica-dusted ware have also been identified at Middlewich (Leary forthcoming). The red-slipped wares can be paralleled at the Wilderspool kilns (Hartley 1981). However, red-slipped fine ware production is also known from Walton-le-Dale (Evans forthcoming), so not all examples need be from Wilderspool. The only form recovered was the common Dr 44 bowl copy, with everted rim and cordoned lower body. The majority of the fine cups, beakers and bowls were in samian ware.

- *CC1:* as OAB1 (*Section 4.4.11 below*) with brown slip roughcast ware. The fabrics compare to locally made Cheshire Plains oxidised wares. The Wilderspool kilns produced similar beaker types (Hartley and Webster 1973, nos 23-34).

- *CC4:* orange-buff with brown colour coat. Hard, smooth fabric with fairly smooth fracture. Sparse, ill-sorted fine quartz and ill-sorted, medium to fine red brown inclusions. These are probably imports, perhaps from the Argonne (Tomber and Dore 1998, ARG CC).

- *CC KOL:* Cologne colour-coated ware (Tomber and Dore 1998, KOLN CC).

- *MG1:* orange/buff with traces of mica gilt. Fairly soft and smooth irregular fracture common, well-sorted, fine-medium quartz and sparse ill-sorted fine to medium, rounded red brown and white inclusions. Similar to OAA2 (*Section 4.4.11 below*).

- *MG2:* buff-cream, possibly burnt. Hard with smooth feel and irregular fracture. Moderate, medium sub-angular quartz. Traces of gold mica on surface. Only one sherd.

- *GMG2:* hard, smooth, grey ware with irregular fracture. Moderate, well-sorted medium sub-rounded quartz. The surface of this vessel, the lower body and base of a small jar, was covered with medium mica flakes. This was only on the exterior and was evenly distributed, suggesting it was not a post-depositional effect of the pyrites in the soil. Mica-dusted grey ware is known from Manchester (Leary 2007), although there a finer fabric was used. This sherd was burnt and came from flue ***201*** (Period 2B).

- *RSA1:* red-brown slip orange ware. Soft and powdery with irregular fracture. Moderate, well-sorted, fine quartz and sparse ill-sorted fine to medium, rounded red brown inclusions. AS OAA2 (*Section 4.4.11 below*).

- *RSA2:* very fine orange ware similar to FLB3 with red slip (*Section 4.4.12 below*). Smooth, hard with fairly smooth fracture. Sparse, medium sub-angular quartz and some very fine quartz just visible, sparse coarse, rounded grey inclusions. Micaceous.

4.4.6 *G: coarse gritted fabrics:* only one sherd was present, belonging to the group to which the pink grogged wares from Bedfordshire and Northamptonshire belong, as discussed by Booth and Green (1989). The widespread distribution of these is generally dated to the third and fourth centuries. This fabric was present at Middlewich (Leary forthcoming), Walton-le-Dale (Evans forthcoming), Chester, and to the south at Wroxeter and Droitwich (Booth and Green 1989). At Middlewich (Leary forthcoming) and Walton-le-Dale (Evans forthcoming), an earlier Northamptonshire grog-tempered ware of the first and second centuries was also present in small numbers (<1%).

- *GT/PNK GT:* pink grogged ware. Hard, pinkish buff with grey core. Lumpy surface with inclusions protruding. Irregular fracture. Sparse, ill-sorted, medium-coarse sub-rounded quartz, moderate, ill-sorted, fine-very coarse, irregular, grey, buff and brown argillaceous inclusions. The largest examples have grey and brown inclusions, some of which may be grog. Others may be clay pellets or siltstones. Rare coarse, rounded voids with cream remains around the edge are likely to be some sort of calcareous inclusion.

4.4.7 *M: mortaria:* the earliest mortarium is that from the Oise/Somme region of northern France, dating to AD 50-85. Two Verulamium region mortaria were present, dated to AD 60-90 and AD 70-110, and a group of eight local vessels, including a Rhaetian type A mortarium, were probably all Trajanic in date. These were supplemented by vessels from the potteries at Mancetter-Hartshill and Wroxeter, with ten examples from the former, three from the latter, and a further two from the central or west Midlands. A stamped early Mancetter-Hartshill vessel dated to AD 90-120, and one sherd dated to after the mid-second century and perhaps as late as the third century. The remainder from the Midlands belonged to the first half of the second century, predominantly before AD 140.

4.4.8 The mortaria mainly or solely dating to the first century came from the same sources as those at other sites in the region, including Barton Street, Manchester (Leary 2007), and Middlewich (Leary forthcoming), namely from northern France and Verulamium. In addition, a first-century Cumbrian vessel is present at Manchester while at Middlewich, a site with early Flavian occupation, at least two Rhone Valley mortaria, of AD 50-85, were present.

4.4.9 The Trajanic - early Antonine mortaria are similar to those from Barton Street in the range of sources represented, but contrast in having most of the mortaria brought from elsewhere. Although five locally made vessels of Trajanic date were present, unlike at Barton Street, where Wilderspool products were the most common type, no examples from this source were identified. Unlike at Barton Street, the products of the kilns at Mancetter-Hartshill were the most common type, whilst only four vessels came from the kilns at Wroxeter, the second most common type at Barton Street. The range of mortaria occurring as single examples or small amounts at Manchester and Middlewich, such as vessels from Castleford, Derby, Colchester, Rocester or Northwich and Cumbria, are not present. This may be a result of the

specialised function of the bath-house rather than a true picture of the sources supplying Roman Wigan with mortaria.

4.4.10 The sub-groups of the mortaria are described below, and summarised in Table 5.

- *M1:* Oise/Somme area of northern France. There is sufficient evidence in the mass of sherds, including the presence of several stamps of C Iulius Priscus and some wasters, to show that this fabric was being produced at Noyon in Oise, but other potteries producing a similar fabric also existed elsewhere in the Oise/Somme area of northern France (Hartley 1998, 201; Tomber and Dore 1998, 75-6).
- *M3:* Verulamium region. Kilns are known at Bricket Wood, Brockley Hill, Radlett and Verulamium, but unless the specific kiln-site is known or suspected, the term 'Verulamium region' is used (Tomber and Dore 1998, 154-5). A granular, usually greyish-cream fabric sometimes with pink core; and often with cream to buff-cream slip; the fabric can be orange-brown but still granular. The texture is caused by the presence of a vast amount of moderately well-sorted, small quartz inclusions, with a little flint and very sparse red-brown material, all of which may be present in the clay (Seeley and Drummond-Murray 2005). The trituration grit consists of flint, red-brown material and a little quartz. Although this is the common fabric associated with these potteries, they also produced another fabric which is similar in every way, except for having smaller sized and perhaps fewer inclusions; it is consequently smoother to the touch.
- *M5:* fine-textured, cream fabric varying from softish to very hard, sometimes with pink core; self-coloured or with a self-coloured slip. Inclusions usually moderate, smallish, transparent and translucent white and pinkish quartz with sparse opaque orange-brown and rarely blackish fragments; rarely white clay pellets (or refired pottery). The range in fabric is, in fact, quite wide, from that with virtually no inclusions to fabrics with a fair quantity, and fabrics with hard, ill-sorted black inclusions. The trituration grit after AD 130-40 consisted of hard red-brown and/or hard blackish material (probably refired pottery fragments), with only very rare quartz fragments. Earlier mortaria usually have a mixed trituration grit in which quartz and sandstone are normal components and some early second-century mortaria probably have entirely quartz trituration grit. Mancetter-Hartshill mortaria of AD 130/40 onwards are usually easy to recognize, but Mancetter-Hartshill fabrics of AD100-30 are more variable. It is at this period when there can be difficulty in distinguishing Mancetter-Hartshill, Little Chester and Wroxeter fabrics.
- *M7:* Wroxeter (location of kilns unknown, but serving Wroxeter as their primary market). The *floruit* of these potteries was within the period AD 100-50/60. One or two potters may perhaps have started marginally earlier than AD 100. Cream fabric, varying in texture from softish to very hard and often with a buff-cream slip. Inclusions: again

varying, moderate to frequent, ill-sorted quartz, red-brown and opaque black material. Trituration grit: mainly quartz, quartz sandstone, red-brown sandstone, black rock. For a fuller description of the range produced in these potteries see Tomber and Dore 1998, 179.

- *M8:* Rhaetian. Orange with grey core with dark red slip over rim and upper flange surface. Hard, fairly smooth with irregular fracture. Moderate, medium, sub-angular quartz and sparse, medium rounded grey inclusions and rare, fine, rounded white inclusions.
- *M9:* orange with grey core and white slip. Hard, fairly smooth with irregular fracture. Moderate, medium, sub-angular quartz, sparse-moderate, medium, rounded red/brown inclusions, sparse, medium rounded grey inclusions and rare, fine, rounded white inclusions. Trituration grits: moderate amounts of small quartz and red/brown grits, 1-2mm.
- *M10:* orange with grey core and white slip. Hard, slightly sandy feel with irregular fracture. Moderate, medium, sub-angular quartz, sparse-moderate, medium, rounded red/brown inclusions, and rare, fine, rounded white inclusions. Trituration grits: moderate coarse-fine quartz, 1-4mm, rare medium mica, 1-2mm.
- *M11:* West Midlands. Cream, hard, smooth with irregular fracture. Moderate, well-sorted, medium, sub-rounded quartz with rare coarse sub-rounded quartz and sparse, medium, rounded black/grey inclusions. Very worn base – uncertain trituration grits.

Fabric	**Nos**	**Weight (g)**	**Rim %**	**Min no**
M1	1	266.6	15	1
M3	3	326	22	2
M5	21	1363.4	50	10
M7	1	62.3	7	1
M7 or M5?	1	39.6		1
M7 probably	1	20.2		1
M7?	1	37.3		1
M8	1	40.6	6	1
M9	5	377	22	4
M10	5	398.6	50	1
M11	1	67.5	5	1
Total	**41**	**2999.1**	**177**	**24**

Table 5: Summary of the mortaria assemblage

4.4.11 *O: oxidised wares:* over 16% of the assemblage by sherd count was in an oxidised quartz-tempered fabric. Nine sub-groups could be distinguished. Diagnostic vessel sherds were identified for groups OAA1, OAA2 and OAB1. Some of the sherds may well have been white slipped originally since deterioration of surfaces was common in this group. Two everted-rim, rouletted beakers or small jars were identified in fabric OAA1 and three further vessels of this type were found in fabrics OAA2 and OAB1. A samian form 44 copy in OAA1 may have been originally red-slipped. Also in OAA2 were a platter, a bead-rim bowl, a spouted flanged bowl copying Curle 11

(Curle 1911), a Dr29 copy and a narrow-mouthed, everted-rim jar. These types suggest a date in the late first-early second century for this fabric. Similar fabrics were found at Manchester and a local source may be suggested (Gregory 2007). However, without a programme of detailed petrological and chemical analyses, the specific sourcing of quartz-tempered Cheshire Plain wares is not possible. Group OAB1 is a coarser ware and would not be easy to distinguish from the Wilderspool products. In addition to the everted-rim beakers, a flat-rim bowl, three reeded-rim bowls, a sherd from a roughcast beaker, and a handled jar were identified. These forms are known from the Wilderspool kilns (Hartley and Webster 1973, nos 41, 48, 23-34 and 39). A bead and flange rim sherd may be from a bowl or possible an abraded M9 mortarium. A bodysherd in this fragment resembled part of an unguent pot. Bodysherds in fabric OBA2 came from a rouletted beaker and an OBA2 sherd came from a ring and dot beaker. A roughcast beaker was identified in OBB1 and an everted-rim narrow-mouthed jar in OAB2.

- *OAA1:* Cheshire Plains fine ware, orange to pale orange. Soft with powdery/sandy feel and smooth fracture. Sparse, well-sorted, fine quartz and sparse ill-sorted fine to medium, rounded red brown inclusions. Micaceous.
- *OBA1:* as OAA1 but buff or brownish-orange.
- *OAA2:* medium orange to pale orange/buff. Soft with powdery/sandy feel and irregular fracture. Common, well-sorted, fine quartz and sparse ill-sorted fine to medium, rounded red brown inclusions. As OAA1 but more quartz.
- *OBA2:* as OAA2 but buff.
- *OAB1:* Cheshire Plains, medium orange, hard to soft with rather sandy feel and quite smooth fracture. Sparse-moderate, ill-sorted medium to coarse sub-angular quartz, sparse, ill-sorted, rounded red/brown and grey.
- *OBB1:* as OAB1 but buff.
- *OAB2:* orange with grey streaks. Hard, sandy with irregular fracture. Moderate, well-sorted, medium sub-angular quartz and sparse, medium, rounded grey inclusions.
- *OAB3:* medium orange. Hard with rather sandy feel and irregular fracture. Moderate, ill-sorted medium, sub-angular quartz, sparse, ill-sorted, rounded red/brown and grey and sparse back inclusions, probably charcoal.
- *OAC1/OBC1:* orange/buff hard with gritty feel and hackly fracture. Abundant, well-sorted, medium-coarse sub-rounded quartz inclusions.

4.4.12 *FLB white-slipped wares:* fabrics FLB1 and FLB2 were similar to fabrics at Manchester Barton Street (Gregory 2007), but FLB3 did not compare so closely and may have been locally produced. Only basal and body sherds were found in this fabric, but these included a base and lower bodysherd which was cracked, perhaps as a result of firing conditions. These fabrics

were used in the production of ring-necked flagons, a 'honeypot' and a 'wine cooler'; similar vessels were made at Holt (Grimes 1930).

- *FLB1:* Orange, quite pale with white slip. Soft with smooth or sandy/powdery feel and slightly irregular fracture. Sparse well-sorted sub-angular quartz and rare rounded grey inclusions.
- *FLB2:* Red-orange. Hard with sandy feel and irregular fracture. Traces of white slip. Moderate well-sorted medium, sub-angular quartz, sparse, rounded grey inclusions.
- *FLB3:* medium-pale orange with white slip. Soft, sandy with fairly smooth fracture. Micaceous, rare, fine quartz and sparse coarse, rounded sandstone. Slightly finer than FLB1 but this fabric may be part of a continuum.

4.4.12 *FLA white wares:* FLA1 was the most common of this group, with only two and 23 sherds respectively of FLA3 and FLA4. Most of the FLA1 and FLA3 sherds were from the bases and bodies of flagons. Two rims were present in FLA1, a bead rim similar to the Gauloise 4 series and a heavy everted rim with internal rebate. Both came from large flagon/jug-like vessels, in contrast to the smaller vessels in the white-slipped series. Fabric FLA1 is not dissimilar to flagons from Mancetter-Hartshill and, in view of the mortaria on the site from these potteries (*Section 4.3.2 above*), a source there would not be unreasonable. The source of the FLA3 vessels is unknown. The FLA4 sherds include flat bases in the style of Gauloise amphorae and the fabric is similar to that made in the Verulamium region potteries. Verulamium amphorae are known in the region at Middlewich, Manchester, Walton-le-Dale and Chester (Leary forthcoming). The white ware group seems to be supplying the larger flagons/amphora-type vessels at Wigan in contrast to the situation at Walton-le-Dale, Manchester and Middlewich, where smaller ring-necked flagons were present in this ware group, as well as other forms, such as rouletted beakers, bowls, lids and platters.

- *FLA1:* White or off white, sometimes with darker cream slip. Fairly hard with smooth feel and fracture. Clean fabric with sparse medium sub-rounded quartz and rounded red/brown.
- *FLA3:* Yellowish cream with darker slip firing yellow-buff. Hard and smooth, slightly grainy on inside. Irregular fracture. Abundant, well-sorted, fine, sub-rounded quartz and sparse to moderate, ill-sorted, rounded medium to fine red inclusions.
- *FLA4:* Brockley Hill flagon/amphora ware.

4.4.13 *GR: Reduced coarse wares:* the reduced wares formed some 12% of the assemblage by sherd count, slightly less than the oxidised group. Only five fabrics were identified, the most common being GRB1 and GRA2, with around 100 sherds each. Only one vessel was found in fabric GRB2, while GRA1B and GRA4 amounted to 19 and 13 sherds each. The fine GRA2 group comprised neckless, short everted-rim jars of Flavian-Trajanic type, rusticated jars, rouletted beakers, a handled jug with flat out-turned rim, a narrow-necked, everted-rim jar, plain rim lids, a Dr 44 copy, and an everted

rim from a wide-mouthed jar of uncertain type. The rusticated jars included an example which had a thick slip worked into low linear rustication. Apart from the Dr 44 copy, the vessel types are late first- or early second-century type.

- *GRA1B:* this was used to make a beaker with ring and dot panels and a cordoned bowl, probably of early second-century date. The latter form is matched at Holt, where wasted examples were recorded (Grimes 1930). One base sherd was identified from a very thin-walled vessel similar to an eggshell-type ware, perhaps copying terra nigra eggshell ware. The GRA4 sherds were mostly undiagnostic but one bore traces of oblique combed decoration. Fabric group GRB1 was used almost entirely to make the neckless, everted-rim jars typical of the late first to early second century, including one with nodular rustication. Only one of the jars had the rebated neck of jars in the pre- and early Flavian period. In addition to these two narrow-necked everted–rim jars, a chamfered base and a flat-rim bowl were identified and jar bodysherds with acute lattice burnish were present. The chamfered base, from a bowl or dish, and the lattice burnish suggest vessels in this fabric group copied black burnished ware vessel types and date to the Hadrianic period or later. At Manchester, the finer reduced wares declined after the mid-second century, although the sandier wares did not (Leary 2007). As the fine reduced wares declined, the oxidised wares seemed to take their place. This pattern can also be found at Middlewich, where reduced local wares fall sharply in the Hadrianic-early Antonine phases (Leary forthcoming).
- *GRB2:* this was used in the production of one vessel, a flanged hemi-spherical bowl. The fabric was similar to one found at Middlewich (Leary forthcoming).
- *GRA1B:* pale grey with brown core. Fairly soft with smooth feel and fracture. Sparse, fairly fine quartz and grey inclusions. Similar to GRA1B at Middlewich.
- *GRA2:* grey, sometimes with paler core. Hard, smooth feel and fracture. Moderate very fine, sub-visible quartz (at x30).
- *GRA4:* reduced ware with fine vesicles and/or black inclusions – charcoal. Grey with reddish brown core. Fairly hard and smooth fracture and feel, moderate very fine quartz and sparse fine red/brown and black inclusions. Similar to Severn Valley reduced ware, but probably not fine enough. Webster (1976, 94) suggested that Severn Valley wares did not appear at Manchester until the mid- to late second century, but an earlier date is indicated at Chester and in the contexts from the Barton Street excavations (Gregory 2007).
- *GRB1:* as Martin 2004, GW1. Hard, with fairly smooth feel if surface unabraded. Sandy if surface abraded. Sparse-moderate, well-sorted medium sub-angular quartz as OAB1, sparse ill-sorted medium-fine rounded grey inclusions. Darker grey slip.

- *GRB2:* brownish-grey fabric, with soft, sandy feel and irregular fracture. Moderate fine-medium, sub-rounded quartz and sparse, fine, rounded grey inclusions. The fabric is somewhat vesicular in the break, perhaps caused by poor clay preparation rather than inclusions dissolving.

4.4.14 *Lamp:* it was difficult to assess these fabrics but a local origin is likely. The slightly rough and ready nature of the forms would be in keeping with this.

- *L1:* it was difficult to examine a clean break without damaging this item. Buff, hard, smooth feel and irregular fracture. Rare, medium, sub-rounded quartz, sparse, coarse, rounded red/brown inclusions and rare, medium, rounded soft white inclusions, not reactive. These white inclusions may be calcareous inclusions which have been almost completely dissolved by acidic soil conditions already since there are rare voids as well.

- *L2:* the base of a second small wheel-thrown vessel was found in pit fill ***130*** (Period 3). This was encrusted with black material, probably burnt on, and had signs of burning inside and outside. The fabric was buff with moderate, coarse, sub-rounded quartz and fine mica. The condition of the sherd made fabric identification difficult.

4.4.15 ***Period 1 stratified group:*** the few sherds from Period 1 deposits comprised a neck sherd from an FLB2 flagon from floor ***870***, with bodysherds of FLA1 and OAA2. Sherds from an OAB1 everted rim beaker and a samian vessel of *c* AD 70-100/110 came from surface ***539***, with an OAB1 scrap from stone surface ***538***. The absence of any BB1 may indicate a pre-Hadrianic date, perhaps Flavian-Trajanic, but the numbers preclude certainty. Only one oxidised scrap of pottery was associated with Building ***950***, from posthole ***935***, so no certain date can be advanced. The group is too small for analysis.

4.4.16 ***Period 2A stratified groups:*** the fill (***264***) of beamslot ***268*** contained three more Dressel 20 sherds (613g), sherds of FLA1, FLA3, FLB1, Gallic amphora, GRA2, GRB1, OAB1, and two large GRA1B sherds from a closed vessel which had been misfired or severely burnt, resulting in much of the surface being white. Fill ***264*** contained Hadrianic-Antonine samian, perhaps from AD 130-60, and some earlier pieces, of AD 70-100/110 and AD 100-25. The identifiable vessels are limited to oil and wine amphora, a small BB1 beaker, a worked BB1 sherd and flagon fragments. All these relate well to the activity within the bath-house.

4.4.17 The pottery assemblage recovered from foundation cut ***221*** included three Dressel 20 amphora sherds, and a burnt base of a BB1 bowl or dish came from pit ***903*** below stone block ***221***. Three sherds of samian from the fill (***222***) of ***221*** were dated to the Trajanic and Hadrianic-early Antonine periods. Related features ***193*** and ***247*** contained an oxidised sherd of uncertain date and two bodysherds of FLB2 and GRA1B respectively, which do not allow closer dating. Five sherds of samian, dated AD 70-100/10, came from fill ***194*** in ***193***.

4.4.18 A small group of sherds from terrace levelling layer ***298*** included two scraps of Gallic wine amphora, a grey ware sherd and a sherd from a BB1 jar with acute lattice burnish, of Hadrianic or early Antonine date. Dressel 20 amphora sherds and a BB1 sherd came from pit ***903***. An undiagnostic amphora sherd came from pilae ***698*** in R2 and posthole ***422*** contained another Dressel 20 amphora sherd.

4.4.19 Three FLB1 sherds came from fire-pit ***460***, including part of a flagon with a cordon at the base of the neck. Without the rest of the flagon, precise dating is not possible, although a range in the late first to second century is considered likely.

4.4.20 ***Period 2B stratified groups:*** excavation of flue ***201*** yielded a single jar or beaker base from this feature. It was in a medium coarse grey ware and its interest lay in the very micaceous surface presenting over the outside. This was even and covered most of the external surface except the base, suggesting it was an original feature rather than a post-depositional accretion. Mica-dusted grey ware is known from Manchester (Leary 2007). An example, a lid, was identified by the author in a group examined from the Severn Street kiln dated to the early second century, and further examples were identified at Barton Street in Flavian-Trajanic groups (*ibid*). A jar in this fabric was found in an early second-century group at Middlewich (Leary forthcoming).

4.4.21 ***Period 2C, Phase 1 stratified groups:*** four sherds came from primary demolition deposits ***253***, ***554*** and ***576***, including a sherd from a BB1 flat-rim bowl of Hadrianic-early Antonine type. Deposit ***253*** also yielded fragments from two samian cups, dated to AD 120-200 and 70-110.

4.4.22 ***Period 2C, Phase 2 stratified groups:*** robber trench ***115*** contained only vessel body sherds, but these included sherds from a BB1 jar with acute lattice burnish of the Hadrianic-Antonine period, and a sherd from a grey ware narrow-necked jar with neck cordon. Six samian sherds, dated to AD 70-100/10 and 100-40, were also recovered.

4.4.23 Four rim, body and base sherds from a bowl similar to samian forms Dr 44 and Dr 81 were recovered from the robber trenches of this phase. Traces of the red slip can be seen on the angle of the rim with the upper body, outside the base and lower body, and inside the lower body, with weak traces inside the base. Vessels of this type have long been known from the kilns at Wilderspool (Hartley 1981) where the slip compares with the Rhaetian slip used on mortaria made there. Hartley suggests that, rather than deriving directly from the samian bowls, both this type and the samian bowls may derive from a common ancestor. Hartley gave a date range of AD 110-60 for pottery production at Wilderspool, although the Rhaetian mortaria may have continued to be made later in the second century. Evans (forthcoming) has suggested at Walton-le-Dale that this type was of Antonine date and probably dates after the mid-second century. Evans points out that four vessels of this type at Ribchester are associated with Antonine material, including types dating to the late Antonine period (Edwards and Webster 1988, nos 286, 418,

360 and 446), at Watercrook, in a phase dating to the early-mid Antonine onwards, and Gillam (1970) type 200 is given a date range of AD140-200.

4.4.24 Fill ***480*** contained an OAB1 sherd, a Flavian samian sherd which had evidence of secondary usage, and a GT/PNK sherd. The latter compared well with pink grogged ware, a type with a more widespread distribution in the third and fourth centuries, coming from Bedfordshire and Northamptonshire (Swan 1984). This ware is known at Middlewich (Leary forthcoming) and at Walton-le-Dale (Evans forthcoming). The earliest instance of pink grogged ware outside its core distribution area is at Cramond (Holmes 2003) in the first decade of the third century. At both Middlewich and Walton-le-Dale, an earlier grogged ware, Warwickshire fabric G12, was present in small quantities (Leary forthcoming no 82; Evans forthcoming). At both sites there is also some evidence for a shell-gritted jar coming from Northamptonshire in the late first-early second century, suggesting low-level movement of pots through trade or people moving from an early date. This sherd compares with the later rather than the earlier grogged wares so, on present evidence, gives a *terminus post-quem* near the beginning of the third century. However, if the wider distribution of the PNK GT ware followed an earlier distribution pattern, it is possible that some examples in the typical fabric arrived in the second century. The typical fabric was certainly present in its core distribution area at this time (Booth and Green 1989, 82) and was found in early second-century deposits at Tiddington, Warwickshire. Unfortunately, the sherd from ***480*** was undiagnostic. In view of these possibilities and the general lack of third-century pottery from the site, a date in the mid-second century is suggested for the pottery from ***480***, admitting the probability of later activity in the early third century.

4.4.25 Other coarse wares included the rim of a GRB1 narrow-necked, everted-rim jar, Dressel 20 sherd, sherds from a BB1 bowl or dish from the fill (***491***) of robber trench ***590***, and, from robber trench fill ***447***, sherds of SV4 and the latest M5 sherd from the site, of at least mid-second-century date. The base of a GRA1B vessel with very thin walls was found in robber trench ***547***. This vessel was reminiscent of Terra Nigra eggshell ware, although the fabric suggested it was a copy rather than an imported beaker. A date in the Flavian period would fit this vessel (Greene 1979, 122). Similar vessels were found at the Barton Street excavations, Manchester (Leary 2007). These vessels were in fine grey ware fabrics like GRA2 and GRA1B and were in groups dated to the Hadrianic-early Antonine period, but including earlier, Flavian vessels, both coarse wares and samian. Robber trench ***231*** contained sherds of a CC1 roughcast beaker, a GRA1B ring and dot beaker, GRB1, OAB1 and Gallic amphora. Sherds of Dressel 20 amphora and an OAA1 rouletted beaker were found in robber trench ***239***.

4.4.26 ***Period 2C, Phase 3 stratified groups:*** some 32 sherds of coarse ware came from these levels, most, if not all, of which were redeposited sherds from the occupation phases. Sherds from a GRB1 narrow-mouthed jar with blunt-ended rim were also present with a neck from a GRA2 flagon, and bodysherds of an OAB1 roughcast beaker. The samian included two pieces

dated to AD 140-80 and AD 140-200, and one vessel each dated to AD 80-110, AD 100-40 and AD 120-60, and two sherds which could only be dated to AD 120-200.

4.4.27 Compared with the ceramics from Periods 2A, 2B and the pits and ditches of Period 2A-C, the pottery from Period 2C has quite a different character. There was an increase in the quantities of the coarser oxidised wares in Period 2C, which is consistent with robbing in the mid-late second century, when reduced wares declined and oxidised wares increased numerically. There was an increase in BB1 quantities in this phase, and most of the red slipped and Severn Valley wares came from the demolition levels. Amphora sherds were less common in the demolition layers and groups FLB and FLA, used principally for flagons, were also less common.

4.4.28 The forms contrast, with Period 2C having more narrow-mouthed and wide-mouthed jars, another development in the mid-late second century onwards. This might suggest that the pottery in Period 2C did not derive from the primary use of the bath-house. Indeed, if the nature of the oxidised vessel from the Period 2A-C pits and ditches is compared with those from the Period 2C robber trenches, it is noticeable that those from the pits are predominantly beakers, bowls and dishes, whereas there were few beaker sherds from the robber trenches, and narrow-necked jars are present. In addition, the Period 2A-C pits and ditches lack the later samian, having no sherd for which a start date after AD 130 is required.

4.4.29 Alternatively, these differences may reflect real differences in the functional make-up of the group. The group from the pits and ditches includes vessels relating to eating, drinking and anointing the body, whereas the narrow-mouthed jars from the robber trenches may have been used for water to cool the bathers, were left in the building, and were not so vulnerable to breakage. Narrow-necked jars are often associated with wells and have even been found with a scrap of cord still attached to a lug at Dalton Parlours, well 1 (Evans 1993, 96-7; Wrathmell and Nicholson 1990, 244), so their use as water-carriers is certain. At the Red House bath-house, Daniels noted a flagon which had been smashed against the side of a water tank during demolition. He suggested this late first-century vessel was in use in the bath-house at the time it was demolished (Daniels 1959, 106 and 173 no 12). This vessel may have been used in a similar way to the narrow-necked jars at Wigan. Certainly, bronze 'bath saucers' are known from other sites in Roman Britain, which are known to have been used to splash water over the bather while in the hottest room of the bath-house (from a grave at Stansted; Havis 2004, 224, who list other examples from Wroxeter, Ribchester and Corbridge). Havis refers to an example of this form found at Pompeii, hanging from a large ring with three strigils and a bottle for oil. Although such a vessel is not present at Wigan, these narrow-necked jars and the earlier flagon found beside the water tank at Red House may well contain the water used for such refreshing activity. Such vessels might also be used with the basins with piped water found in the *frigidaria* and *caldaria* of bath-houses (Daniels 1959, 115-16).

4.4.30 In the bath-houses at Bewcastle and Caerleon, the preponderance of beaker sherds are thought to be the result of broken beaker sherds being preferentially washed into the drains, on account of the smaller sherd size (Dore 1993; Greep 1986). At Red House, Corbridge, the main drain is described as 'choked with a mixture of debris, bones and pottery' (Daniels 1959, 140). This included window glass and samian in the lower silt and, although fine ware beakers are not listed, the rusticated jars included a small beaker-sized example, and these could have served as containers for beer and other suitable drinks (Daniels 1959). Two indented glass beakers also came from the latrine drain, and a glass flask came from the drain between the cold bath and the latrine (*op cit*, 166). A similar phenomenon may be at work at Wigan, with the beaker debris being cleared out into the ditches and pits regularly and the sturdier narrow-necked jars not entering the ceramic debris until the bath-house went out of use. This would also explain the date range of the samian from the robbing levels, which centred on the mid-second century, dating to the final use of the building, in contrast to the large number of late first-early second-century vessels from the Period 2A-C pits and ditches, which were accumulating throughout the life of the building.

4.4.31 It is suggested that the most likely source of the pottery sherds found in the robber trenches and demolition layers is the final phase of activity in the bath-house in the mid-second century, and that differences in the make-up of the groups in terms of fabrics and forms reflect both the late date and the types of pots located within the bath-house, contrasting with the debris cleared out into the ditches and pits outside the bath-house, perhaps fairly regularly.

4.4.32 ***Period 2A-C stratified groups:*** the majority of the Romano-British coarse pottery came from the Period 2A-C pits and ditches. The vessel types span the late first to the third centuries and both the samian and the coarse ware types indicate the bulk of the material dates to the early-mid second century (Table 6).

4.4.33 Ditch ***34*** contained fragments of a flanged mortarium, dated to AD 60-90, and an incomplete rim of a flanged mortarium, dated to AD 100-40. This ditch also contained the base and bodysherds in a coarse fabric in the style of a Gallic amphora, an RSA1 bodysherd from a bowl with lower body cordon, dated to the mid-late second century, an FLA1 flagon base, GRB1 sherd, an SV4 sherd and sherds from a Gallic amphora. A date in the mid-second century is suggested for the infilling of this feature.

Period	2A-C pits and ditches	2C robber trenches and demolition layers
Amphora	160	*
Bowl	132	11
Bowl/dish	87	4
Beaker	55	*
Dish	132	
Flagon	271	
Handled jar	20	
Jar	196	24
Narrow-necked jar		75
Wide-mouthed jar	9	
Roundel	*	
Unguent pot	*	
Wine cooler	*	
Lamp	*	
Mortarium	133	6
Lid	49	
Lamp	20	
Total of rim %	**1264**	**120**

*Table 6: Vessel typesTaTable 6: Vessel types in Period 2A-C pits (using rim % . *= present as bodysherds only)*

4.4.34 The primary fills of ditch ***43*** contained Dressel 20 amphora bodysherds, whilst sherds from a GRA2 roughcast beaker and a GRA2 jar with acute lattice burnish were found in primary fill ***77***. Grey ware roughcast beakers were present at Barton Street, Manchester, in association with Hadrianic-early Antonine pottery (Leary 2007). Although these may be misfired CC1 or OAB1 roughcast beakers, they were not obviously wasters. Roughcast beakers in reduced, oxidised and colour-coated wares seem to be the most common fine ware in the Hadrianic-early Antonine period at Walton-le-Dale (Evans forthcoming), Manchester Barton Street (Leary 2007), and Middlewich (Leary forthcoming). In pre-Hadrianic levels at Manchester Barton Street, small numbers of locally made roughcast ware beakers were present in Trajanic groups, but not at Middlewich, where the Flavian activity seemed to have ceased or diminished in the Trajanic period. The jar with acute lattice burnish may also be of this date range, since it echoes the decorative technique used on BB1 jars, a type not found before around AD 120. Also present were a rim sherd from a North Gaulish mortarium (AD 50-85) and a Mancetter-Hartshill mortarium sherd pre-dating AD 130. The sherds from fill ***71*** included bodysherds of OBA1, an MG2 beaker sherd, probably of early second-century date, FLB2 and FLA1 flagon sherds, a GRA4 jar and a M10 local mortarium, probably Trajanic. Fill ***65*** yielded more MG1 sherds, this time from an open vessel, and from the GRA2 jar with burnished lattice, bodysherds in fabrics OAA1, FLB3, Dressel 20 scraps and from a rusticated jar of early type. The primary fills did not include any samian sherds. This group is of mixed date, including first-century material. The absence of BB1 sherds may indicate a pre-Hadrianic date. However, at Manchester Barton Street, the level of BB1 is quite low (*c* 7-12%) in the Hadrianic phases compared with the level by the mid-second century (*c* 20%

rising to 30% in the late second century; Leary 2007). In addition, a cooking ware such as BB1 would be uncommon at a bathing establishment. A date in the Trajanic or Hadrianic period is likely.

4.4.35 The later fills contained rather more pottery, including substantial sherds of amphorae. These comprised 12 Dressel 20 amphora bodysherds from fill ***62***, a rim sherd, perhaps from the same amphora, and several sherds from the body, neck and handle stub of a Dressel 20 amphora came from fill ***48***, as well as the neck of a large flagon. The handle, neck and body sherds included several with incisions and some burnt sherds. The handle appeared to have been sawn off. The rim, neck and body of a Dressel 20 amphora also came from fill ***48***. A fragment from a BB1 lid came from fill ***60*** (probably second century). A near complete unguent pot from fill ***48*** relates rather well to the suggested function of Building ***1000***. Other fragments from fill ***48*** comprised sherds from an FLB2 flagon, an MG vessel, probably a bowl, BB1 bodysherds, Cologne roughcast-ware beaker sherds, an FLB1 flagon base and sherds from a bowl in fill ***47***. Two fine OAA1 sherds were identified. One came from the base of a footring dish or platter with an offset at the inner junction of base and wall. There was a double concentric groove on the inner base, where rouletting might occur on a samian form Dr 18/31R, The other sherd comes from a small jar or beaker with at least two zones of rouletting separated by a double groove, giving a cordon effect. The BB1 vessels indicate a mid-second-century date for fill ***48***.

4.4.36 Still more Dressel 20 amphora sherds were recovered from fill ***47***, including body sherds with a handle scar and a handle fragment. Sherds of the FLA1 flagon bearing the complex graffiti came from this layer, as well as from fill ***48***. The BB1 vessels included a later flat-rim bowl with traces of a groove, perhaps dating to the late second century or beginning of the third century. Sherds from two white-slipped flagons (fabric FLB1 and FLB3), a GRA2 jar, and an OAB1 roughcast beaker similar to those from the Wilderspool kilns, were also identified from ditch fill ***284***. A grooved flat-rim bowl gives a date in late second or the beginning of the third century for final deposition of this group, but most vessels could be dated to the early Antonine period.

4.4.37 A Hadrianic-early Antonine BB1 jar came from fill ***44***, along with sherds from a CC1 roughcast beaker, an FLB1 flagon handle, an FLA1 flagon neck with a handle scar, and an FLB3 flagon body with a handle scar. Hadrianic–early Antonine material was also present in fill ***32***. This last fill of ditch ***43*** included a small scrap from an FLB1 'wine cooler' of the same form as those made at Holt (Grimes 1930). This type of vessel is thought to have been associated with the preparation of some sort of alcoholic drink, probably not wine (Cool 2006, 146-7), and is common in the Rhineland. In London, a Continental origin for the form was put forward by Marsh and Tyers (1978, type 45, early second century) and he noted an example from Hedderheim on which the holes were arranged to form an inscription (Arthur and Marsh 1978).

4.4.38 Fill ***48*** contained an ungent pot. This vessel probably originally had a small splayed base but this is damaged all around the edges. The neck is curving out, presumably to form a simple everted rim but this has also been damaged and is completely broken off. A similar form was made at Holt and dated to AD 90-130 (Grimes 1930, no 231). Webster compares a similar vessel from Manchester to examples from groups dated to AD 122-40 and AD 139-200 at Turret 25b and Corbridge respectively (1974, no 159).

4.4.39 Ditch ***178*** contained a Dressel 20 amphora handle, which had been sawn off at both ends. A further 23 Dressel 20 amphora sherds came from this fill and these included two further sawn-off handle fragments and a bodysherd and neck sherd with the handle sawn off. The fill also contained very abraded sherds from the neck, rim and handles of an FLB2 flagon with a flat, out-turned rim. Two almost identical flagons from Middlewich (Leary forthcoming, nos 52 and 69) were associated with mid-second and early-mid-second-century pottery respectively. However, earlier parallels exist, for example at Derby in the Hadrianic phase (Birss 1985, table 9 no 49), made at kilns 2 and 4, which have been dated to the first quarter of the second century (Brassington 1971, no 145; 1980, no 336). A fragment of an F5 mortarium bearing a stamp was also recovered from ditch ***178***. Although poorly impressed, the stamp pemits a date of AD 90-120 to be ascribed to the vessel.

4.4.40 Nine FLA4 sherds from a flagon or amphora from ditch fill ***179*** included one burnt sherd. Scraps of amphora, more flagon sherds in fabric FLA1, and a fine buff ware (OBA1) beaker sherd were also present. A group of some 29 amphora sherds came from the fill, including two rim sherds and a handle, which had been cut flat at both ends. Fragments of three other handles were present, and in all cases these had been cut across the handle to form a flat surface. This group may date as early as the Trajanic era on the basis of the coarse pottery. The absence of BB1 sherds may support this, but its absence may be fortuitous, relating more to the function of Building ***1000*** than chronological considerations. A date range in the Trajanic or Hadrianic period is thus more likely.

4.4.41 The group of pottery recovered from the primary fill (***56***) of pit ***41*** included fragments of an OAB1 narrow-mouthed jar with everted rim and double shoulder grooves. There is a handle scar on the shoulder and another on the rim, and it is a honeypot type, similar to vessels from Wilderspool kilns (Hartley and Webster 1973, nos 21 and 39). There are also examples at Usk (Greene 1993, fig 18) in phase 1 contexts, in the late Flavian-early Trajanic kiln group at Gloucester (Timby 1990, fig 3, no 23), and Wroxeter in first-century contexts (Evans 2000). A late first-early second-century date is common, but Webster suggests a date in the late second to early third century for a honeypot at Whitchurch (Webster 1969, no 179). At Manchester Barton Street, this type occurs in association with mid-late second-century mortaria and samian types (Leary 2007) and at Middlewich a honeypot with a bifid rim was associated with mid-late second century samian (Leary forthcoming), although in both cases earlier pottery types dating to the Trajanic period were present. A similar vessel was found associated with samian dated to AD 140-

90 at Chester (Mason 1980, fig 19, no 12). In London, they occur in Antonine groups, and are dated from AD 50-150 (Marsh and Tyers 1978, form IIK). Fill ***56*** also contained nine Dressel 20 amphora sherds, and a GRA2 sherd, which may all be ascribed a Hadrianic date.

4.4.42 Fill ***52*** contained 46 sherds from the base, body and rim of a BB1 jar with everted rim and acute lattice burnish on the girth. Some of the lattice lines run at a shallow angle, but the intersection is acute. The rim form is similar to Gillam 1976, no 9, and a date in the late second - early third century would be appropriate, although an earlier date in the second century cannot be ruled out.

4.4.43 The upper fill (***42***) of pit ***41*** included a sherd with what appeared to be obtuse lattice burnish, a decorative motif dated from *c* AD 223-5 (Bidwell 1985, 174-6). Apart from this sherd, the pottery recovered from pit ***41*** suggests deposition took place in the mid- or late second century, and included some early second-century residual material. The samian date of AD 140-80 supports such a date range.

4.4.44 ***Site dating, Period 1:*** very few sherds were recovered from deposits dating to this period, although the absence of any BB1 or later types might suggest a Flavian-Trajanic date. Only one oxidised scrap of pottery was associated with Building ***950*** so no certain date can be advanced. Very few sherds were found in contexts pre-dating Building ***1000*** or contemporary with its use. The small number of sherds associated with floors and occupation deposits indicated a pre-Hadrianic phase of Flavian or Trajanic date (the samian being dated to AD 70-110).

4.4.45 Certainly, pottery from some of the later and unphased features included Flavian types. The rouletted beaker from ditch ***3020*** (Area G3) compared with Flavian-Trajanic vessels and was most likely to be late Flavian or Trajanic on typological grounds, while from gully ***3104*** (Area G3) a flanged bowl dated typologically to *c* AD 120-45/50 may indicate a date at the beginning of the Hadrianic period for part of the infilling process. The pottery from the initial evaluation trenching (Trench 3, deposit ***342***; Trench 7, layer ***719***) were also of Flavian-Trajanic date.

4.4.46 In Area G7/10, some of the Period 2A-C features contained late first- and early second-century pottery. Sherds from the primary fill of ditch ***43*** included some very early pottery, such as a North Gaulish mortarium of AD 50-85, as well as second-century types. At the north end of the site, ditch ***198*** lacked BB1 sherds and can be dated to the late first or early second century on the basis of the 155 sherds which included an OAB1 reeded-rim bowl and fine reduced- and oxidised-ware beakers. Four Flavian samian vessels came from ditch ***43*** and one each from pit ***41***, ditch ***34*** and ditch ***198***. As later pottery was found in these features, these are likely to be redeposited sherds from occupation adjacent to the site or related to the Period 1 activity.

4.4.47 ***Site dating, Period 2A:*** samian from furnace ***460*** was of Flavian-Trajanic date, and the pottery was of a similar date. The pottery from features ***221*** and

268, however, included BB1 vessels and a stamped amphora handle of Hadrianic date, and samian dated to AD 70-100/10, AD 100-25 and the Hadrianic-early Antonine period. The foundation cut in which stone block ***123*** was found contained BB1 sherds and Hadrianic-early Antonine samian, as did the earlier terrace feature, indicating a date in the Hadrianic period at the earliest for this feature. Beamslot ***268*** also contained BB1 sherds of Hadrianic or possibly early Antonine date and Hadrianic-early Antonine samian, perhaps as late as AD 130-60. One of the BB1 sherds had been shaped, perhaps for use in the bath-house. If this is accepted, then the bath-house must have been in use in the Hadrianic period.

4.4.48 ***Site dating, Period 2B:*** the few sherds of pottery from this period were all of Flavian-Trajanic type.

4.4.49 ***Site dating, Period 2C:*** most of the pottery from Building ***1000*** appeared to be from deposits associated with the abandonment of the building or its subsequent robbing. The robber trenches and infill groups from the rooms included sherds from BB1 flat-rim bowls/dishes and jars of Hadrianic-early Antonine date and mid-second-century samian. Very small numbers of sherds dating to the second half of the second century or third century, were identified and these may date the robbing activity, the earlier sherds being derived from rubbish left in the bath-house when it fell into disuse.

4.4.50 ***Site dating, Period 2A-C:*** the presence of grey ware jars with burnished lattice decoration in the style of BB1 jars in the primary fill of ditch ***43*** raises the possibility that the use of this feature began in the Hadrianic rather than the Trajanic era, although both Flavian and Trajanic vessels were present. The absence of BB1 in the primary fill may indicate pre-Hadrianic activity, although this could be related to the specialised function of the site where cooking pots were less numerous in the parent pot population. The roughcast ware is likely to be of Trajanic date at the earliest, suggesting the early fill belonged to the early second century. Similarly, in ditch ***178***, the pottery suggested a date in the Trajanic-Hadrianic period and included a worn early Mancetter-Hartshill mortarium stamped by the potter Coertutinus dated to AD 90-120, and a near complete profile of a worn samian bowl dated to *c* AD 85-110, but probably Trajanic.

4.4.51 The upper fill of ditch ***43*** contained a large number of amphora sherds, many of which had clearly been modified for secondary use, probably in Building ***1000***. The group included an unguent pot and BB1 sherds. The later fill (***47***) included a grooved flat-rim bowl with burnished lattice decoration, a decorative motif replaced by intersecting arcs in the late second to early third century. This date is consistent with a slight groove visible on the upper surface of the rim, suggesting it is an early version of the well-known grooved, flat-rim series of the late second to third century. This is the latest sherd vessel from the group, suggesting the upper fill of the ditch belongs principally to the end of Hadrianic period, perhaps extending to the middle of the second century, with some additions as late as the late second century. Ditch ***150*** also contained amphora sherds with BB1 sherds. Similarly, ditch

34, to the east of ***43***, also contained reused Dressel 20 amphora sherds, Hadrianic-early Antonine BB1, and a Wilderspool red slip bowl of a type common in the mid- to late second century, as well as an earlier Flavian mortarium sherd.

4.4.52 Pit ***41*** contained Hadrianic and early Antonine BB1 or BB1-type vessels, mortarium sherds and samian in their lowest fills, with a small number of sherds from a BB1 jar as late as the early third century from the latest fill. The date of the fills of pits ***27***, ***38*** and ***74*** is less clear, but they could belong to the Trajanic period since they lacked BB1 ware. However, stratigraphically, pit ***27*** post-dates ditch ***34***, so must belong to the Hadrianic-early Antonine period or later. It is likely that all these pits belong to an abandonment or change of use in the mid-second century. The latest vessels, those dating to the mid-second century or later, all come either from the late fills of ditches ***43*** and ***34*** and pit ***41***, or from robber trenches in Building ***1000***.

4.4.53 In terms of the overall character of the site assemblage, the majority of the vessels can be dated from the Trajanic or the Hadrianic period to the mid-second century. In total, 18 out of 27 jar rim sherds were BB1 Hadrianic to early Antonine jars, the remainder being the neckless everted-rim jar with shoulder groove and/or rustication typical of the late Flavian period to early second century. Of the bowls and dishes, 25 out of 34 were BB1 types of Hadrianic or Antonine date, the remainder being Flavian-Trajanic types, such as reeded-rim bowls and a cordoned form, apart from one samian form 29 copy, probably of Flavian date. The cordoned bowl is of Trajanic type. The beakers were predominantly simple everted-rim beakers or small jars and lack bodies, so cannot be dated firmly. However, a group of CC1 roughcast-ware sherds may belong with these rim sherds and come from a locally produced roughcast-ware beaker common in the Hadrianic-early Antonine period, but present from the Trajanic period. Only one earlier beaker type, of the late first to early second century, a ring-and-dot beaker, was present. The pouring vessels were almost equally divided between ring-necked flagons of the Trajanic/Hadrianic period, and jugs and 'honeypots', which may be earlier. The mortaria can be broken down by date (Table 7), and only two vessels must be of Flavian date, whereas the peak of mortarium usage lay in the Trajanic-Hadrianic period, with only two vessels later than AD 150.

4.4.54 The amphora rim types were all dated to AD 110-50, and one of the two stamped amphora handles was of Hadrianic date, the other being illegible. An unstratified Dr 2-4 rim is likely to be of first-century date, and the Gallic sherds are broadly dated from the mid-first to the third centuries. The coarse ware types thus suggest little activity until the Trajanic period on the site of Building ***1000***, and the small numbers of vessels datable later than the middle of the second century suggest that the building fell into disuse not long after AD 140/50. The peak of activity fell within the Trajanic-Hadrianic period, with the majority of sherds datable to the Hadrianic period.

Date	M1	M3	M9	M8	M5	M7	M5 or M7	M11	Totals
50-85	1								1
60-90		1							1
70-110		1							1
90-120					1				1
Trajanic			5	1					6
100-130					2				2
100-140					2	1		1	4
Mid-second					1	2	1		4
Second					2				2
Antonine					1				1
Mid-second +					1				1
Total	**1**	**2**	**5**	**1**	**10**	**3**	**1**	**1**	**24**

Table 7: Mortaria by date range and source (minimum vessel count)

4.4.55 ***Pottery supply:*** only half of the assemblage is local in origin by sherd count (63% by weight, excluding the amphora on account of their excessive weight), and this is largely the result of the specialised nature of the bath-house. Traded wares, such as white ware flagons, amphora and samian ware, account for 34% of the ceramics, and the remainder comprised BB1 (13%) from Dorset, Severn Valley vessels (0.3%) and mortaria from Mancetter-Hartshill (1%), Wroxeter (0.1%), Gaul (a single vessel) and Verulamium (0.1%). The relative quantity of BB1 compares well with the levels found at contemporary sites in the region. Grey wares are less common, probably as a result of the function of the building, and the quantities of oxidised wares are similar to that at Middlewich and Manchester Barton Street. The fine wares are more numerous than at other contemporary sites, apart from Barton Street, a site with a specialised function (Gregory 2007), and again this is likely to be the result of beakers being used in the bath-house. A similar pattern was recovered at Walton-le-Dale (Evans forthcoming), with almost 40% of the group being shipped in to the site and 31% coming from local sources. The larger proportion of imported and traded wares at Wigan is the result of the larger amounts of amphorae and flagons in this category.

4.4.56 Imported ceramics comprised samian wares, one mortarium from the Oise/Somme region in Gaul, imported roughcast beakers from the Argonne region and from the Cologne kilns, oil amphorae from Spain and wine amphorae from Gaul. FLA4 sherds (1%) resemble amphorae and flagons from the Verulamium region and are likely to have come to the site in the late first or early second century, probably with the Verulamium mortaria. Over 70% of the mortaria were traded from within Britain – Verulamium (7% of all mortaria), Mancetter-Hartshill (54%) and Wroxeter (7%). The white ware flagons, 7% of the assemblage, are not local and most of them compared well with the Mancetter-Hartshill white ware fabrics, with a small amount from the Verulamium region potteries (1% of all sherds). An unknown proportion may be from other sources, such a Wroxeter. Small amounts of Severn Valley ware (0.3%) were identified and this compares well with the small amounts present at contemporary groups apart, from Middlewich (Leary forthcoming), situated further south and nearer the Severn Valley kilns.

4.4.57 Regionally traded pottery may include some of the reduced and oxidised wares falling into the Cheshire Plains category, but for at least some of this a local origin at Wigan has been suggested, including a Rhaetian and white-slipped mortaria (27% of mortaria). Some of the white-slipped flagons may be of local origin and, since Kay Hartley favoured a local origin for the Rhaetian mortarium (*Section 4.3.2 above*), some of the red-slipped wares may also be locally manufactured. However, the late date of the vessel types, samian form 44 copies dating to the mid-second century and later, makes Wilderspool a more likely source, since the date of the vessels thought to be locally made lies in the early second century. A grey mica-dusted ware sherd compares well with a fabric made at the Severn Street kiln at Manchester (Swan 1984).

4.4.58 In conclusion, the group has highly specialised characteristics relating to the function of the site, and illustrates the emphasis on drinking and refreshments in bath-houses. The suggestion of a local pottery at Wigan supplying the settlement accords with growing evidence from elsewhere in the region. In the early second century there is evidence, in the form of kilns or wasters, for local potteries at Manchester, Northwich (Jones 1972), Wilderpool (Hartley and Webster 1973), Walton-le-Dale (Evans forthcoming), Middlewich (Leary forthcoming) and, perhaps, *Melandra* (Webster 1971, 63; 1974, 93). Finds from excavations at the Wiend included a clay artefact identified as possible kiln furniture (Tindall 1985), and the ceramic assemblage included a mortarium not dissimilar to the vessels from the Grand Arcade site, identified as possible local products. The evidence from Wigan certainly raises the possibility of local pottery manufacture in the early second century.

4.4.59 ***Spatial analysis of the Roman coarse ware, functional groups and site status:*** the assemblage or Roman artefacts recovered from the Grand Arcade site, though relatively small by national standards, represents an important addition to the corpus of Roman material from Wigan, and indeed from the North West generally. The recent publication of the *vicus* and fort assemblage from Castleford (Cool and Philo 1998) provides a scale against which the material can be measured. Like Castleford, the Wigan finds suggest a variety of activities, both industrial and domestic, and also a range in the status of the inhabitants of the settlement. Whilst evidence for industrial activity was not unexpected, the Grand Arcade site represents a significant addition to the handful of Roman sites within the region that have produced such evidence.

4.4.60 In terms of analysing the spatial distribution of the Roman coarse wares, it was very noticeable that a large proportion of the amphora sherds came from the area to the south-west of Building ***1000***, particularly from pits ***41*** and ***27***, and ditches ***43***, ***178*** and ***150***. About a third of these were burnt, particularly from pit ***27*** and lower fill ***62*** of ditch ***43***. Three of the amphora sherds bore vertical and horizontal scratch marks around the girth, which are likely to have been caused during transportation. Out of 11 handles, nine had been cut off leaving a flat surface. It is suggested that this was done to facilitate the reuse of the amphora containers. At both Barton Street, Manchester (Leary 2007), and Middlewich (Leary forthcoming), Dressel 20 amphorae were found which had had their rims cut off to allow greater access to the inside, perhaps to facilitate

their use for the storage of dry goods. In addition, at Barton Street, a Dressel 20 handle was noted with cut cross and a rim bore an incised W, both similar to those noted at De Horden and Augst (Martin-Kilcher 1987), where they were interpreted as indications of the reuse of the amphora once the original olive-oil contents had been used up. A small Dressel 20 sherd, from the upper fill of pit ***23***, had evidence of a perforation cut after firing. The sherd had broken across the perforation, perhaps during its drilling, and there were signs of working and flaking around the hole which would have been *c* 7-8mm in diameter. Such a hole may have been drilled to facilitate access to the oil in the lower part of the vessel as it emptied, or when the vessel was put to some secondary usage. At Middlewich, three Verulamium amphorae had post-firing perforations (Leary forthcoming). One had a row of three perforations on the lower body with at least one further perforation below; a second had a large central hole made in the base within the footring, and the third had at least two perforations through the base. Furthermore, two sherds of Dressel 20 amphora had a circular and square-shaped holes drilled through their bodies. The relative proportion of sawn-off handles appears very high, although comparative material is hard to come by. One would imagine that such vessels could be very useful in a bath-house, either to contain water or, indeed, oil to splash on the bathers or aid removal of dirt with a strigil or scraper, or perhaps as a urinal, since similar examples have been found inserted into ground at street corners of Pompeii. This interpretation has been suggested for a perforated amphora at Cramond (Holmes 2003).

4.4.61 A well-known phenomenon in bath complexes is the concentration of beaker sherds, particularly in the drains. This is thought to be the result of the breakage of fine beakers in the baths, that have found their way down the drains preferentially because of their small sherd sizes (Greep 1986, 50; Dore 1993, 38). At Wigan, using EVES values, beakers were not as common as at the Bewcastle (Gilliam *et al* 1993) and Caerleon baths (Greep 1986). There is a concentration of beaker sherds in ditch ***43***, with smaller groups from ditches ***150***, ***178*** and ***198***, and single examples in the robber trenches and later features. This distribution may reflect a similar phenomenon of small broken beaker sherds being swept out of the baths and deposited in the ditches. It is perhaps significant that the small fragment of 'wine cooler', a vessel probably used on the preparation of an alcoholic beverage of some sort, though not wine, was found in pit ***29***, a medieval pit cutting ditch ***43***. In a similar way, nearly all the bowls and dishes from the Roman phases came from ditch ***43***, with only 12 out of 34 vessels found in other features. Most of the bowls and dishes from ditch ***43*** came from the upper layers and represent dumped material. Unlike the beakers sherds, these represent larger sherds. Flagons and pouring vessels were also found in ditch ***43*** and ditch ***178***. A few sherds were also present in slots ***221*** and ***268*** and associated with *pila* ***698***, suggesting some loss within the buildings. It is small biases like these which shed light on the sort of activities being carried out in Building ***1000***.

4.4.62 The proportion of cups and beakers from the Grand Arcade site is average compared to other sites in the region, such as Barton Street, Manchester (Leary 2007), and the low quantity of lids and jars is consistent with a site at which

foodstuffs were not stored, although there is a relatively large proportion of functionally relevant vessels such as amphora and flagons. Narrow-necked jars were also more common at Wigan, perhaps related to their particular use as water pitchers.

4.5 MEDIEVAL POTTERY (*Jeremy Bradley and Ian Miller*)

4.5.1 A total of 389 fragments of medieval pottery, weighing 8.437kg, was recovered during the excavations of Areas G3 and G7/G10 (Table 8), and also from the combined programme of evaluation trenching, all of which were examined for the purpose of this report. The majority (306 sherds) of the combined total was recovered from Area G7/10, whilst Area G3 yielded 30 sherds, and the evaluation trenches produced 53 fragments.

4.5.2 The bulk of the medieval pottery from each of the excavated areas was retrieved from stratified medieval contexts. Indeed, the scarcity of intrusive and residual material is notable, and suggests that the medieval contexts had sustained little post-depositional disturbance. This may be corroborated by the unabraded condition and moderately large size of many sherds, which is indicative of contemporaneous dumping. As might be expected, the bulk of the medieval assemblage comprises vessel body sherds, although a variety of diagnostic rims, handles, and bases were also retrieved. Only a few sherds are decorated, suggesting the assemblage is dominated by functional utilitarian wares.

Area	Context	Period	Count	Weight	Approximate Date Range
G3	***3028***	3	2	25g	Twelfth – mid-thirteenth century
G3	***3035***	5	1	9g	Twelfth – mid-thirteenth century
G3	***3078***	3	1	10g	Thirteenth – fourteenth century
G3	***3079***	3	17	148g	Twelfth – thirteenth century
G3	***3100***	3	1	38g	Twelfth – mid-thirteenth century
G3	***3110***	4	4	78g	Thirteenth – fourteenth century
G3	***3115***	5	1	12g	Twelfth – mid-thirteenth century
G3	***Unstrat***		4	42g	Thirteenth – fourteenth century
Sub-total	*7*		*30*	*362g*	*Twelfth – fourteenth century*
G10	***01***	4	3	48g	Thirteenth – fourteenth century
G10	***03***	3	7	39g	Twelfth – thirteenth century
G10	***21***	3	3	53g	Twelfth – thirteenth century
G10	***22***	3	25	832g	Thirteenth – fourteenth century
G10	***31***	3	12	409g	Twelfth – thirteenth century
G10	***35***	3	12	520g	Thirteenth – fourteenth century
G10	***36***	3	4	109g	Twelfth – mid-thirteenth century
G10	***45***	2	1	21g	Twelfth – thirteenth century
G10	***64***	4	4	93g	Fourteenth – fifteenth century
G10	***119***	3	26	536g	Thirteenth – fourteenth century

Area	Context	Period	Count	Weight	Approximate Date Range
G10	***121***	3	5	62g	Thirteenth – fourteenth century
G10	***122***	3	14	253g	Twelfth – thirteenth century
G10	***126***	4	1	20g	Thirteenth – fourteenth century
G10	***127***	4	4	144g	Twelfth – mid-thirteenth century
G10	***128***	4	1	15g	Twelfth – mid-thirteenth century
G10	***130***	3	3	66g	Twelfth – mid-thirteenth century
G7	***137***	4	1	72g	Thirteenth – fourteenth century
G10	***152***	4	3	64g	Twelfth – mid-thirteenth century
G10	***160***	3	9	234g	Twelfth – thirteenth century
G10	***166***	3	4	140g	Fourteenth – fifteenth century
G10	***176***	5	1	12g	Twelfth – thirteenth century
G10	***177***	4	4	90g	Twelfth – mid-thirteenth century
G10	***202***	5	1	5g	Thirteenth – fourteenth century
G10	***234***	5	43	807	Twelfth – fourteenth century
G10	***239***	2C	9	251g	Fourteenth – fifteenth century
G10	***466***	5	11	511g	Thirteenth – fourteenth century
G10	***467***	5	3	61g	Twelfth – thirteenth century
G7	***851***	3	4	162g	Twelfth – mid-thirteenth century
G10	***Unstrat***	-	12	393g	Twelfth – fourteenth century
Sub-total	*28*		*215*	*5718g*	*Twelfth – fifteenth century*
Totals			**245**	**6383g**	

Table 8: Medieval pottery by context from the excavation of Areas G3 and G7/10

4.5.3 ***Methodology:*** the material was recorded so as to allow the quantification of separate fabric groups and vessel types. Quantification was by sherd count and weight, with individual rim, handle and base sherds recorded separately to allow an estimate of the minimum number of vessels present within the assemblage. Although few joins were evident, there were enough diagnostic sherds present to give some indication of the distinctive vessel type present.

4.5.4 ***Fabric types:*** in total, 11 separate medieval fabric types were identified during the analysis. Fabric types 1 to 3 were closely related, and may have the same provenance. In some cases, the number of sherds recovered was sufficient only to provide a basic outline of the pottery type. However, given that in some cases these appear to have been imports from outside the area, they have been retained within the typology. The pottery was examined using a x10 hand-lens.

- *Fabric 1:* this was the largest fabric type from the site, with some 154 sherds retrieved. The fabric belongs to the gritty ware tradition, as do the majority of the wares, and was likely to be, as with Fabrics 2 and 3, of local manufacture. The fabric varied in colour from pale grey, through buff to pale orange. The fabric was hard with a reduced grey core. Quartz was the predominant inclusion, with grains less than

0.5mm; small quantities of coal were also present. Occasional splash glazing, and very occasionally all over glazing, was noted. Decoration was entirely restricted to rilling. Vessel types represented were jugs with simple rims, and jars and/or cook pots, where sooting was present, in the case of the latter. Pipkins were also notable as all the characteristic handles were all from this fabric.

- *Fabric 2:* this was very similar to Fabric 1 and accounted for some 20.56% (80 sherds) of the total number of fragments of pottery. The fabric was generally orange in colour with a reduced core and coarsely gritted, with grains up to 1mm, with coal also present. Glazing, when present, was generally splashed. Vessel types were limited to jars/cook pots with everted or clubbed rims and jugs with strap handles.

- *Fabric 3:* some 55 sherds from this fabric were recovered during the excavations. The fabric was coarse grained with grains up to 1mm, but sparser than Fabric 2. The fabric was grey when overfired, though more usually orange with a grey core. Like Fabrics 1 and 2, quartz was the dominant inclusion, with coal in much smaller proportions. Splash glazing, sometimes orange in colour, was noted.

- *Fabric 4:* this was a white to buff, hard fabric, densely gritted, with small grains, and some flint and grog tempering noticeable. It had a yellow glaze, with patches of copper-derived green. Besides some deeply incised lines, likely to from a handle attachment, there were no other diagnostic features. The sherds were thought to be a regional import.

- *Fabric 5:* this was a partially reduced grey, finely gritted fabric. Glazing was light olive in colour with a light grey margin below. The only vessel was a jug form with a probable strap handle. This type of pottery was similar to the partially reduced ware common in Carlisle in the thirteenth and fourteenth centuries (McCarthy and Brooks 1992, 28-9).

- *Fabric 6:* Samlesbury-type fabrics from the production site of that name situated east of Preston (Bradley *et al* forthcoming). The fabric - 22 sherds of which were produced from the site - was quite fine grained and gritty, with quartz being the dominant tempering material, which makes then similar to Fabrics 1 to 3. Fabrics appear as overfired (reduced) jars with thin walls, but more commonly orange with a grey interior and green splash glazing. Besides the jars, jugs with strap handles, exhibiting two incised lines flanking wavy incised line, were common.

- *Fabric 7:* this was an off-white sparsely gritted quartz fabric (grains tending to be less than 0.5mm). Unglazed with a fine smooth matrix. This fabric was represented by a single sherd.

- *Fabric 8:* five sherds only represented this fabric type, which was fully reduced ware. The interior walls of the pottery were salmon pink. The pottery was tempered with quartz, the grains of which were less than 0.5mm in size. No trace of glaze was noted but this may have been because the sherds recovered were from the base.

- *Fabric 9:* this was a reduced fine, smooth sandy ware with dark green smooth glaze on both internal and external walls. A single sherd only was recovered from the excavations. This type of pottery conforms to the typical Reduced Greenware fabrics, as found at Carlisle, or from the Silverdale tradition (McCarthy and Brooks 1992, 28-9; White 2000). The pottery exhibited boss and rib decoration.

- *Fabric 10:* this was a fine oxidised sandy ware (six sherds), occasionally green glazed, with single jug and jar vessels represented.

- *Fabric 11:* Midlands Purple-type ware in a variety of fabric types, and usually found as single sherds. The fabric varied between pinkish-orange to orange with a purplish glaze or slip. No vessel types could be firmly identified, but a clubbed rim and an externally sooted sherd representing a cooking pot were noted. This type of ware dates to the late fifteenth or sixteenth century (Ford 1995, 36).

4.5.5 ***Dating and provenance:*** the medieval pottery is predominantly of a twelfth- to fourteenth-century date, and includes several different fabric types, ranging from locally produced Gritty wares and Partially-Reduced Grey wares, to imports from producers outside the region. The Gritty wares form part of a widespread 'Northern Gritty' tradition, and were the dominant pottery type throughout the region during the twelfth and early thirteenth centuries (J Edwards 2000). In broad terms, these were superseded by Partially-Reduced Grey wares during the later thirteenth and fourteenth centuries. Notably, the assemblage contains few Reduced Grey wares, which formed part of a widespread 'Reduced Greenware' tradition in northern England, and were the dominant fabrics across much of Lancashire during the fifteenth and sixteenth centuries (McCarthy and Brooks 1992, 29). The stratigraphic evidence and other categories of artefacts have indicated that the absence of these wares was due partly to the truncation of the later medieval deposits. However, there is some evidence in the form of several sherds of late medieval Midland Purple-type wares that could imply that pottery supply in Wigan did not subscribe to the Reduced Grey ware tradition.

4.5.6 Whilst the sources of pottery in the North West during the medieval period are not well understood, some of the fragments recovered from the excavations may be identified with known production centres. In particular, the lower fill (***22***) of medieval pit ***23*** in Area G10, yielded fragments of pottery manufactured at a recently excavated kiln site near Samlesbury in Lancashire (Bradley *et al* forthcoming). It is likely that the bulk of the medieval pottery was derived from local sources, which almost certainly included potters in Wigan.

4.5.7 *Area G7/10, Feature group 1:* three of the intercutting pits, and associated pit ***23***, within this group produced medieval as well as residual Roman pottery. Generally, this group of features produced twelfth- to thirteenth-century material, predominantly in Fabrics 1-3, with cook pots/jars being the only identifiable form. However, of note were two adjoining sherds in Fabric 4 from the fill (***03***) of pit ***04***, which were unusual in having copper within the glaze and were considered to be a regional import. Also of note was part of an all-over green-glazed thin-walled jar, in a reduced grey fabric, from the fill (***31***) of pit ***29***, with a rim form similar to an example found at the Samlesbury production site (Bradley *et al* forthcoming).

4.5.8 Material from pit ***23*** was notable in producing later Partially-Reduced Grey wares, 13 sherds in all, including a jug and a bung hole from a cistern Typically, cisterns were a fourteenth-century introduction (Jennings 1992, 11), which suggests a fourteenth-century date for deposition. A possible sherd of Midlands Purple-type ware with applied thumb strip decoration, from the upper fill (***21***) of the pit, might conceivably date this feature to the fifteenth century. This would explain the dearth of the gritty wares within this pit.

4.5.9 *Area G7/10, Feature group 2:* this was a rather scattered group of features, of which only the fills of ***118***, ***159***, and ***850*** and ***242*** yielded any fragments of pottery. The earliest of these features (***118***) produced pottery from four different contexts (earliest to latest; ***130***, ***122***, ***121***, ***119***). These deposits were dominated by gritty wares (Fabrics 1-3), as might be expected, which start in the twelfth century. However, the inclusion of Samlesbury products would suggest a thirteenth-century date for emplacement. Fabric 7 may be a regional import.

4.5.10 Pit ***159***, which was later than ***118***, also produced the latest pottery. The pottery from deposits ***166*** and ***160*** yielded three basal sherds from a Reduced Greenware vessel (Fabric 8), which had been used as a cooking vessel, and a single sherd of Partially-Reduced Grey ware (Fabric 5). Placed together, the assemblage from pit ***118*** would date to the fifteenth century.

4.5.11 An isolated pit to the north (***850***) was slightly earlier in date, producing only fragments of Fabrics 1 and 2, which would date from the twelfth to thirteenth century. East of this feature was a flat-based pit (***233***), the fill of which (***234***), yielded some 43 sherds of pottery, a group that was dominated by Fabrics 1-3 (*Appendix 4*). The pit was also notable for producing a minimum of four cooking pots as well as three jar fragments. A single waster sherd in an unclassified sandy ware, with part of another pot adhering to the rim, was yet more evidence of pottery production within the locality. The presence of a sherd of Fabric 10 from a jug with strap handle and simple rim might suggest that the broad twelfth- or thirteenth-century date for the rest of the material might be pushed into the fourteenth century.

4.5.12 *Area G3:* two medieval features were noted within the eastern part of the trench (***3080*** and ***3099***). The fill (***3079***) of pit ***3080*** was excavated initially during the evaluation phase, with the fill being numbered ***316***. The pottery

from this deposit was dominated by Fabrics 1-3, giving it a twelfth- to thirteenth-century date for emplacement. However, it should be noted that a single sherd of brown-glazed red earthenware was recovered from fill ***3079***, and from fill ***316*** there were three sherds of a post-medieval fabric, and a single sherd from a Reduced Greenware vessel. Although the post-medieval material and the single sherd might equally suggest contamination or a later date for the feature, the presence of 17 sherds of Fabrics 1-3 would indicate that a medieval date was appropriate. The fill (***3100***) of pit ***3099*** produced only a single base sherd in an unclassified pink gritty ware, datable from the twelfth to mid-thirteenth century.

4.5.13 Toward the western end of the trench were two further pits (***3028*** and ***3077***). Both contained single sherds of Fabrics 1 and 2, dating from the twelfth to thirteenth century. The sherd from ***3028*** was sooted externally, indicating its use as a cooking pot.

4.5.14 Other medieval ceramics were residual within post-medieval features. However, two are worthy of further note. Fill ***64*** of pit ***63*** (Period 4) produced a single sherd of Reduced Greenware, glazed on both internal and exterior walls and decorated with an applied strip and bosses. This might suggest that the deposit was certainly sixteenth-century in date. It should also be noted that the other Reduced Greenware from confirmed medieval deposits was not of the same origin as this sherd.

4.5.15 Deposit ***3110*** in Area G3 (Period 4) produced two sherds of Midlands Purple-type ware. Of the four contexts where Midlands Purple-type ware was identified amongst the medieval material, three of these (***152***, ***177*** and ***3110***) were post-medieval, while only pit fill ***21*** was from the medieval period. There it might be applicable to suggest a fifteenth- or sixteenth-century date for the feature.

4.5.16 ***Comparative material:*** clearly, there are parallels between the material from the Grand Arcade and earlier excavations at Hallgate in Wigan (GMAU 1991). The dominant fabrics from both excavations were gritty wares. Three fabric types, all gritty in nature, were identified from the Grand Arcade site (Fabrics 1-3), with two from Hallgate. There did appear to be some disparity between the two sites in terms of the material recovered, in that the medieval ceramic assemblage from the Grand Arcade had a more diverse repertoire of fabric types, and included two small assemblages of Partially-Reduced Grey ware and Samlesbury wares (20 and 18 sherds respectively).

4.5.17 Several jars from Hallgate have analogues with jars in Fabric 1 from the Grand Arcade site. The similarities are defined by everted or clubbed rims, some of which were probably intended to be lid seated. Two unstratified jars, which both exhibited thumbed rims, share these characteristics with numbers 9 and 29 from Hallgate (GMAU 1991 15, 16, fig 4:9 and fig 7: 29). Other similar jars included one from pit fill ***31***, which was closely analogous to that illustrated in the Hallgate Catalogue (*op cit*, 15, fig 4:10). The pipkin handles from the Grand Arcade, all in Fabric 1, barring one example, were also

closely identifiable with the illustrated example from Hallgate (*op cit*, 16, fig 6: 24).

4.5.18 There were no clear parallels between the jugs from Hallgate and the Grand Arcade site. This was partly due to the paucity of jugs with diagnostic features from the latter site, and the dearth of illustrated examples from Hallgate. A single example of pulled lip spouted jug in Fabric 1 from pit fill ***30*** at the Grand Arcade excavations had a simple rim, but was not similar to that found at Hallgate, which was identified as being in a Northern Gritty fabric ware (*op cit*, 16, fig 6:21).

4.5.19 Material from the Samlesbury pottery production site was recognised from the Grand Arcade site. The jugs were the most obvious form recognisable, because of their distinctive handle types. The forms from Wigan were of the strap handle type, with incised lines flanking a single wavy line, and a single example of rod handle with stabbing.

4.5.20 Jars with similar rims to those found at Samlesbury were observed at the Grand Arcade site. One example, from pit fill ***31***, was from a thin-walled jar with an everted rim, and was very similar to an example from Samlesbury. Other examples of Samlesbury-type jars were observed in pit fills ***30***, ***31*** and ***130***. No clear parallels between the Samlesbury material and the pottery from Hallgate was discerned, although it should be emphasised that in general the rim forms from the two Wigan sites and Samlesbury itself share the same characteristics of everted and/or lid-seated rims.

4.5.21 The presence of Midlands Purple-type ware within a Period 3 deposit casts light on the ceramic traditions in Wigan. Although it was only a single sherd within a single context, the presence of similar material from Period 4 and the small amount of Reduced Greenwares would suggest that the Wigan area was receiving pottery from the fifteenth century onwards from the south of the county. It may be possible to suggest that Lancashire below the Ribble was influenced by the Midlands, although it should be noted that Partially-Reduced Grey ware fabrics, which characterise thirteenth- and early fourteenth-century deposits throughout North Lancashire and Cumbria, are present in small but notable quantities. Thus, it may be suggested that prior to the fifteenth century, as well as the locally produced material, Wigan was receiving its pottery from the north, that is partly from Samlesbury, as well as Partially-Reduced Grey ware fabrics from an as yet unprovenanced source.

4.5.22 Several sherds of pottery from the site were clearly regional imports, most notably the two adjoining sherds in Fabric 4, which would appear to be from a thirteenth- or fourteenth-century jug. The sherds were notable for the presence of copper within the generally yellow glaze. Other sherds, Fabric 7 for instance, and an unclassified sherd of pinkish fabric with traces of orange glaze, were all also thought to be imports. Unfortunately, it was not possible to give a provenance for these fabric types with any degree of certainty. Moreover, few of the sherds suspected of being imports displayed much in the way of diagnostic features. Nevertheless, some similarity can be drawn with examples of white wares found at Castle Street, Carlisle (Jope and

Hodges 1955, 92-3). White wares, thought to be imported from Chester, have been found as far away as Kirkudbright in South-West Scotland, while pinkish wares were also noted from the same area (*ibid*).

4.5.23 ***Vessel types:*** the medieval vessel types found during the Grand Arcade excavations, and for that matter at the Hallgate site, were quite conservative in their repertoire, which was reflected in the range of vessel types found at Samlesbury (Bradley *et al* forthcoming). The vessel types are dominated by jars, some used as cooking pots, pipkins and jugs, and a single example of a cistern. The jars, like those from Hallgate, were often quite large, though smaller examples were noted, with everted or clubbed rims, often appearing to be lid-seated in character. Glazing, where seen, was splashed, although an all-over glazed jar was noted from pit fill ***31***. Decoration was limited to faint rouletting in the case of the latter, but more generally thumbing along the rim. Occasional examples were seen with applied thumb strips to the vessel wall. All the decoration and jar types were recognised at Samlesbury (*ibid*). Four pipkin handles were recovered from the site, as were examples from Hallgate (GMAU 1991). Unfortunately, no other parts of these vessels were recognised. The absence of feet would indicate that tripod pipkins were not current in the area.

4.5.24 The type of jugs was also difficult to discern and tended to be limited to handle fragments, which were the main identifying feature. Single sherds from an applied rim spout from pit fill ***119*** and a pulled rim spout from pit fill ***30*** were, however, detected; both of these types of jug were present at Samlesbury, as were the more distinctive, decorated strap handles jugs. Other jugs were identified by their simple rim forms. Besides glazing, no other decoration on jug forms was recognised.

4.5.25 Three counters formed from pottery sherds were recovered during the excavations (from fills ***121***, ***122*** and ***234***). Such items are not rare on archaeological sites, in this country and abroad, and are usually identified as being gaming pieces.

4.5.26 ***Conclusion:*** as well as providing some broad dating evidence for the excavated contexts and features, the assemblage of medieval pottery recovered from the Grand Arcade site has contributed to a broader understanding of production and consumption patterns within the wider area. Medieval ceramics in the North West are, as yet, poorly understood, reflecting the scarcity of good assemblages from excavations in the region (Mellor 1994). The *Archaeological Research Framework for North West England* has highlighted an urgent need to investigate medieval pottery kiln sites and the links between producers and consumers (Newman and Newman 2007, 113), and the material recovered from the Grand Arcade site has gone some way to addressing this aspiration.

4.6 POST-MEDIEVAL POTTERY (*Rebekah Pressler*)

4.6.1 ***Introduction:*** in total, 1298 fragments of post-medieval pottery, weighing approximately 73kg, were recovered during the Grand Arcade excavations. The fragments were generally in good condition, with many fairly large in size, large proportions of rims and bases, and many joining sherds. The numbers of fragments from each context are shown in Table 9 below. In total, 976 sherds (75%) were recovered from stratified deposits, whilst the remaining 322 fragments (25%) were unstratified.

Context	Context type	Quantity	Context	Context type	Quantity	Context	Context type	Quantity
01	fill	21	***145***	fill	3	***3007***	unstrat	150
07	fill	10	***147***	fill	4	***3031***	fill	39
09	fill	3	***153***	fill	2	***3035***	fill	2
11	fill	2	***156***	fill	1	***3053***	fill	4
16	fill	14	***175***	fill	98	***3074***	fill	1
18	fill	23	***176***	layer	16	***3079***	fill	1
64	fill	3	***177***	fill	20	***3081***	fill	17
73	fill	1	***184***	cut	4	***3091***	fill	4
101	surface	15	***202***	layer	287	***3093***	fill	38
106	fill	1	***205***	structure	5	***3094***	fill	15
119	fill	1	***207***	fill	2	***3095***	Layer	48
120	structure	86	***234***	fill	1	***3098***	Fill	16
123	fill	1	***244***	fill	3	***3102***	Fill	5
126	fill	4	***286***	fill	1	***3110***	Layer	7
127	fill	13	***419***	fill	20	***3112***	Fill	16
128	fill	1	***522***	layer	25	***3114***	Fill	58
135	fill	1	***947***	unstrat	30	***3115***	Layer	3
137	fill	3	***1004***	layer	1	***9991***	Unstrat	15
138	fill	1	***2000***	unstrat	106	***9994***	Unstrat	21
142	fill	1	***3004***	wall	4			

Table 9: Post-medieval pottery by context

4.6.2 The numbers of fragments from each of the periods are shown in Table 10. The majority was retrieved from contexts dated to the sixteenth-seventeenth centuries (Period 4; 678 fragments, or 52% of the total), with smaller quantities from contexts dated to the eighteenth-twentieth centuries (Periods 5-7; 260 fragments, or 20% of the total). Five fragments (0.4%) were intrusive in early Roman contexts (Period 1), eight in medieval deposits (Period 3), whilst the remaining 347 fragments were from contexts not closely phased (27%).

Period	Date	Quantity
Not closely phased	-	347
1	Late first – early second century	5
2	Early second – early third century	0
3	Medieval	8
4	Early post-medieval	678
5	Eighteenth century	123
6	Nineteenth century	94
7	Twentieth century	43

Table 10: Post-medieval pottery by period

4.6.3 The pottery, overall, is significant in illustrating the types present, both in Wigan and the North West. The assemblage includes a large proportion of pottery belonging to the sixteenth and seventeenth centuries. Historically and archaeologically speaking, the documented presence of John Dwight in Wigan, named 'Master Potter of Fulham', in the seventeenth century is interesting (Green 1999), and it may be that some of the earlier pottery of the assemblage could be his creation. John Dwight's presence in Wigan is somewhat mysterious, although much of his experimentation may have begun there. Indeed, there is a school of thought that he never in fact completely left the area, but continued to commute between London (Fulham) and Wigan. His pottery production is well documented as regards the white salt-glazed stoneware and German Rhenish or Westerwald-type copies. There are, however, references to other wares he may have either experimented with or produced in the earlier part of his career in Wigan (Green 1999).

4.6.4 ***Range of material:*** the majority of the assemblage comprised black-glazed red earthenware, with smaller quantities of paler-coloured glazes and earthenwares also present. Some fragments of high-fired self-glazed purple earthenware, purple salt-glazed stoneware, and brown and buff-coloured stonewares were also present. These types of wares may be dated to the seventeenth century or later. However, local post-medieval coarsewares in the North West are little studied (Newman and McNeil 2007, 128), and it is possible that some of them may date as early as the sixteenth century.

4.6.5 The seventeenth- and eighteenth-century finewares included high-fired self-glazed purple earthenware, mottled ware, red slip-coated cream-coloured earthenware, black-glazed cream-coloured earthenware, trailed and combed slipware, and fine brown stoneware. The eighteenth-century finewares included small quantities of tin-glazed earthenware, creamware and pearlware. White earthenware and porcelain were of nineteenth-century date, some of the former being transfer-printed with patterns including 'Willow', 'Broseley', 'Chinese Marine' and 'Wild Flowers' (Coysh and Henrywood 2001).

4.6.6 In total, 17 post-medieval fabric types were identified during analysis. Fabrics 1, 2 and 4 were fairly closely related and may have the same origins. In some cases, the number of sherds recovered was sufficient only to provide a basic outline of the pottery type. However, given that in some cases these appear to have been imports from outside the area, they have been retained within the typology.

- *Fabric 1:* a dense heavily fired coarse fabric ranging from red to dark purple in colour with small to large gritty inclusions. The fabric appears to be solely a blackware type. The vessel types represented appear to be mainly pancheons or similar large pots.
- *Fabric 2:* a light to mid orangeish-pink (salmon pink) with small to medium gritty inclusions. The fabric type appears to be the most common used solely for blackware. The vessel types represented appear to be mainly pancheons, storage jars and cooking pots.
- *Fabric 3:* finer deep red fabric with occasional very small quartz inclusions. The fabric again appears to be solely a blackware type. The vessel types represented appear to be jugs and other moderately sized vessels, including a possible tankard.
- *Fabric 4:* mid-orangeish-pink to pinkish-red with moderate gritty inclusions. Similar to Fabric 2. The fabric interestingly has been used for manganese mottled ware and blackware types. Fabric 4 appears in a number of forms including pancheons, cooking pots, large bowls and possible storage jars.
- *Fabric 5:* pink to buff sandy fabric with occasional small gritty inclusions. The fabric is of manganese mottled-ware type and includes large bowl or pancheon fragments and finer cup fragments.
- *Fabric 6:* pinkish to purplish-grey fabric with little notable inclusion. Appears to be solely a blackware-type fabric.
- *Fabric 7:* a very fine pale creamish-white sandy fabric with no visible inclusion. The fabric appears to have been commonly use for tin-glazed earthenware. Vessel types appear to be plates, bowls and cups.
- *Fabric 8:* pale grey-coloured stoneware fabric, including Westerwald/Raeren-type white salt-glazed stoneware. Not common within the assemblage, this type appears solely in conjunction with a drinking jug or flagon of probably sixteenth- or seventeenth-century date.
- *Fabric 9:* purple to black fabric with very occasional small inclusions. The fabric seems typical of Midlands Purple types of sixteenth- to perhaps eighteenth- or nineteenth-century date.
- *Fabric 10:* a brown salt-glazed stoneware, comprising a mid-grey stoneware fabric, with a small percentage of inclusions. Vessel types include large jar/bottles.

- *Fabric 11:* a mid pink with medium to large (over 0.5mm) inclusions/small stones. The pottery type is an orange-glazed coarseware of eighteenth-century (or possibly earlier) date. Vessel types include large bowl/pancheon material.
- *Fabric 12:* a buff to pink fabric with large and small gritty inclusions. The pottery type is associated with manganese mottled wares. The vessel types for this fabric are rather varied and include larger vessels, including pancheons/large dishes, and cups/small posset pots.
- *Fabric 13:* white with very small gritty inclusions, reminiscent of a type also recovered at a kiln in Bury dating to the eighteenth century. The wares associated include both manganese mottled ware and a very fine blackware of Jackfield type. The vessel types include both larger vessels such as pancheons and finer wares such as quart cups or mugs.
- *Fabric 14:* a very fine pale grey fabric with semi-vitreous stoneware-type qualities and no visible inclusions. The pottery types associated include both slipware and manganese mottled ware seen primarily around the Liverpool area, and it is conceivable it was manufactured at Prescot, Merseyside, where such wares were produced from the early eighteenth century (Davey 1987). The vessel types appear to be finewares such as tea/coffee cups.
- *Fabric 15:* a fine white (ware) fabric primarily used for pearlwares and creamwares of varying types (*eg* hand-painted, transfer-printed, polychrome etc), but also annular wares. Vessel forms include plates, platters, cups, quart cups, saucers.
- *Fabric 16:* an English porcelain - a white translucent, semi-vitreous fabric both decorated and undecorated. Much of the pottery of this type is likely to be of similar provenance to the pearlwares and creamwares of Fabric 15. The vessel forms are also similar to that of Fabric 15 and include small plates, cups and saucers.
- *Fabric 17:* a reddish-pink slightly gritty fabric (either glazed or self-glazed) associated with Midlands Purple types.

4.6.7 ***Dating and provenance:*** the post-medieval pottery dates between the seventeenth and nineteenth centuries. The predominant pottery type, however, appears to be blackware of eighteenth- or nineteenth-century date. The provenance of the blackware is unknown, and whilst it could have been produced locally, it may equally have been a product of the documented kilns at Rainford, Merseyside (Davey 1987).

4.6.8 The late medieval/early post-medieval Midlands Purple-type wares are somewhat difficult to ascribe a provenance, but are likely to be of local origin. Similar material has been recovered from excavations at Halewood and Speke Hall in Merseyside (*ibid*).

4.6.9 The tin-glazed earthenware present in the assemblage is likely to be a product of the delftware industry in Liverpool, which was established during the early eighteenth century (Archer 1997). Delftware was never cheap, reflecting the

laborious process of decoration involved in its manufacture, although it attracted a broad clientele; a piece of delftware in a humbler home was often a treasured possession, handed down through generations as an heirloom (Ray 2000, 5). However, delftware had reached the height of its popularity in the decades 1720-40, and demand declined rapidly thereafter; the industry was extinct by the end of the eighteenth century, reflecting the introduction and rapid dominance of refined earthenwares (Barker 1999, 226-7).

4.6.10 Both Staffordshire and Liverpool, similarly, are likely to have made a number of the pearlwares. A maker's mark on one base sherd, providing a provenance of Longton (one of the towns of Stoke-on-Trent), illustrates at least some of the imports were from Staffordshire. Several other fragments suggest they may have derived from the Herculaneum potteries in Liverpool.

4.6.11 ***Stratified groups:*** only a small amount of late medieval/early post-medieval pottery was recovered from Area G7/G10. Two medium to large vessels (possibly posset pots), found unstratified (***947***), have a dense, hard-fired dark purple body. One of the vessels has circular waffle decoration near to the rim, the other is undecorated. Both vessels have a purple to black glaze, suggesting it is a Midlands Purple or Blackware vessel (although it bears a greater resemblance to Midlands Purple types). It is most likely that they have the same provenance. Further Midlands Purple-type ware of sixteenth- to seventeenth-century date was recovered from the fill (***153***) of ditch ***151***, and the fill (***145***) of Period 4 feature ***144*** (*Appendix 5*, Fig A5.2). Another fragment from pit fill ***234*** possesses a red quartz-tempered fabric of an earlier appearance than most Midlands Purple types. The glaze is somewhat intriguing, being lead- and manganese-rich, creating a slightly greenish hint to the purple glaze. The sherd probably dates to the fifteenth to sixteenth century.

4.6.12 A Bellarmine bottle or jug fragment from layer ***202*** is of seventeenth-century date, and could be a Rhenish import or may be one of the John Dwight replicas and thus have a local provenance (Green 1999). A brown-glazed stoneware fragment from iron-rich clay (***337***) may be English or Rhenish, and of seventeenth- or eighteenth-century date.

4.6.13 A significant proportion of the pottery was recovered from Powell's Yard (Area G7). Structure ***120*** produced finds of eighteenth- to nineteenth-century date, particularly utilitarian vessels such as pancheons and cooking pots. The pottery types recovered were blackwares (Fabrics 1, 2, 3) and manganese mottled ware (Fabrics 4 and 5). Pottery of similar types was also noted in layer ***202***, as well as both decorated and undecorated tin-glazed earthenware with both stripes and zigzags, which probably originate from Liverpool (Archer 1997). Several mottled-ware sherds were recovered from pit fill ***172*** (Period 6) together with fragments of a Midlands Purple-type vessel with a thumbed rim (*Appendix 5*, Fig A5.4), and a large dark-glazed earthenwarte cistern (*Appendix 5*, Fig A5.9).

4.6.14 The pottery from layer ***202*** was mainly of an eighteenth-century date, the majority being black-glazed coarsewares (pancheon and other large vessel

material), other heavier vessels, including mottled wares of a similar fabric to the blackware, and orange-glazed vessels. A large brown English salt-glazed stoneware vessel (probably a large jar or bottle) is of eighteenth-century date. Finewares from this layer include 13 fragments of tin-glazed earthenware, both undecorated and with zig-zagged and striped decoration.

4.6.15 Some large fragments of mottled-ware pancheon/large bowl material of eighteenth-century date (Fabric 5) were recovered from the fill (***63***) of Period 4 pit ***63*** (*Appendix 5*, Fig A5.7). Period 4 layer ***175*** also yielded a good group of pottery, which included fragments of a mottled-ware vessel with applied vertical-strip decoration (*Appendix 5*, Fig A5.5), and a large Midland Purple-type ware vessel (*Appendix 5*, Fig A5.6).

4.6.16 Pottery recovered from layer ***522*** consisted mainly of utilitarian whitewares, pearlwares and porcelains of nineteenth- to early twentieth-century date. This included a probable chamber pot rim, transfer-printed with leaf decoration, a 'flow blue' bowl fragment, and plate rim fragment, probably 'Asiatic Pheasants' (Coysh and Henrywood 2001). A utilitarian white-ware coffee cup with 'England' on the base is probably late nineteenth or early twentieth century in date.

4.6.17 The excavation of Area G3 produced a significant assemblage of post-medieval pottery. The earliest material included Midlands Purple-type wares with a lead-rich purplish-brown glaze, recovered from the fill (***3102***) of pit ***3101*** (*Appendix 5*, Fig A5.4). The fragments are interesting because they represent the local wares from quite an early point in the post-medieval period. The vessel type is difficult to deduce, but it is probably a cup and is likely to date from the sixteenth or seventeenth century. A fine cup fragment, with a reddish-purple fabric, and purplish brown-glazed incised *sgraffito* style with lines and possibly a tulip, could be a variant of Cistercian-type ware, or possibly a John Dwight product. Sources for John Dwight and his pottery suggest he made a type of red ware, red stoneware or red porcelain, suggested by the fact that he successfully sued the Elers brothers for breaching his patent (Green 1999).

4.6.18 A Westerwald/Westerwald-type globular stoneware tankard or jug covered with applied hearts and beading, recovered from redeposited clay ***333*** and dating from the sixteenth to seventeenth centuries, is difficult to distinguish whether or not it is of Westerwald/Raeren origin, or one of John Dwight's late seventeenth-century replicas (Green 1999).

4.6.19 Layer ***3115*** produced two Midlands Purple-type vessels splashed with a lead-rich green glaze. Descriptions of similar types of vessels found at Speke Hall and the Old Hutt, Halewood, describe 'vitrified earthenware' and 'highly fired grey fabrics' (Higgins 1989), suggesting a late fifteenth- to sixteenth-century date for the context.

4.6.20 A faceted-stem drinking vessel *(*Davey 1991), with a red fabric and dark purple glaze, of seventeenth-century date, was recovered unstratified from the excavation. The vessel bears some resemblance to the Cistercian type,

suggesting it is probably a blackware, although it equally bears a resemblance to Midlands Purple ware. The same type of vessels have been found mainly on sites around Prescot and Rainford (notably on a kiln site for the latter), but also in Chester, suggesting the vessels may have imported from kilns in these areas (Davey 1987).

4.6.21 Fragments of a near complete manganese mottled-ware vessel of eighteenth-century date were recovered from pit deposit ***3114***, either a jar or possibly a posset pot. A further mottled-ware base came from another pit deposit (***3094***), and might be a bowl or a large tankard sherd.

4.6.22 Pottery from pit fill ***3093*** is interesting, including two body fragments of brown salt-glazed stoneware, with a heavy 'tiger glaze' of seventeenth-century date, which may be a German bellarmine, or again could be a replica of Dwight's. A yellow-ware cup base and Midlands Purple-type ware of sixteenth- or seventeenth-century date were also recovered. Pottery from wall ***3004*** was of a later date, and included three blackware sherds from a large vessel (probably a pancheon), and a small body sherd of manganese mottled fineware, most likely a cup.

4.6.23 Pit fill ***3094*** produced solely blackware dating broadly from the seventeenth to nineteenth centuries (Fabrics 9, 3 and 4). Whilst this group was dominated by fragments of eighteenth- to nineteenth-century pancheons, a few seventeenth- or eighteenth-century cups were also present.

4.6.24 A small quart cup or mug base fragment from layer ***3007*** may be dated stylistically to *c* 1790-1810. A fragment of a similar quart cup was recovered from pit ***107*** in Area G7/G10, which may be a product of the Herculaneum pottery in Liverpool (Rickard 2006). Layer ***3007*** also produced pottery of a later date, including fragments of a stoneware bottle and jar with a Bristol glaze, to which a later nineteenth- or early twentieth-century date may be ascribed. Fragments of a similar stoneware vessel were recovered from the watching brief, which was maintained during earth-moving works to the south of Area G3.

4.6.25 The fill (***3053***) of the construction trench for the cellar along the northern edge of Area G3 yielded three fragments of creamware and a small fragment of hand-painted underglaze blue pearlware. These fragments are likely to have been produced *c* 1780-1810, and were probably made in Liverpool (*ibid*).

4.6.26 Tentative evidence for the production of pottery in the vicinity was provided by the recovery of a saggar from a posthole (***644***), revealed in an evaluation trench placed to the north-east of Area G7/G10. The saggar is fairly coarse, with an inner manganese-rich glaze, suggesting an eighteenth- to early nineteenth-century date. Other material recovered from posthole ***644*** included fragments of blackware, creamware, and mottled ware, providing a date range centred on the late eighteenth century. A layer (***632***) excavated in an adjacent evaluation trench yielded a fragment of a cream-glazed, ribbed, circular cross-sectioned rod, which perhaps derived from a creamware production site.

4.6.27 ***Comparative material:*** there as is yet a lack of published material with regard to post-medieval pottery from excavations in the North West. Currently, in Merseyside, the only known kiln site is at Rainford, producing some early blackwares, notably faceted drinking vessels (Tomlinson *et al* 1986-7). Excavations at Old Abbey Farm, Risley, produced Cistercian-type pottery (Howard-Davis 2004) with decoration similar to that recovered from the Grand Arcade site. Cistercian-type vessels may have been manufactured at the Rainford site, or possibly elsewhere in Merseyside. Parallels might be considered in the material at both Wrenthorpe (Yorkshire; Moorhouse and Roberts 1992), Burslem and Hanley (Staffordshire; Barker 1986), and, to some extent, Ticknall (Derbyshire; Usher 2000). The material from Staffordshire, while producing little published on Cistercian ware to date, does illustrate a number of interesting forms. In particular, a cup with a pedestal base and purple/brown/grey fabric (Davey 1991) bears some resemblance to the multi-faceted cups found in Merseyside.

4.6.28 The excavations at both The Old Hutt, Halewood, and Speke Hall illustrate comparative material (Higgins 1989). The vitrified wares, redwares and highly-fired grey fabrics may be representative of the Midlands Purple-types seen at the Grand Arcade site.

4.7 CLAY TOBACCO PIPE (*David Higgins)*

4.7.1 A total of 162 fragments of clay tobacco pipe was recovered from the excavation of Areas G3 and G7/10, comprising 34 bowl fragments, 126 stem fragments, and two mouthpieces. The assemblage includes four moulded symbol marks and 13 bowl fragments with moulded decoration, all dating from the nineteenth century. There are no actual makers' marks of any date.

4.7.2 The assemblage is significant because there has been very little previous work on clay tobacco pipes from Wigan, despite the fact that it lies on the edge of the nationally important South Lancashire pipemaking area, which stretched from Liverpool across to Manchester, with an early focus of activity in the Rainford area. A small group of pipes was excavated from Hallgate in the centre of Wigan during the late 1980s (GMAU 1991). The material recovered included a mid-seventeenth-century group, containing 12 stamped pipes, which indicated that Rainford was the main supply source for pipes at this period. Apart from this unpublished group, there does not appear to be any other excavated material from the town, and the assemblage from the Grand Arcade Development makes an important contribution to the present state of knowledge.

4.7.3 The extent of pipemaking activity in the town is also poorly understood. There are some documented pipemakers who are known to have worked in Wigan during the nineteenth century (Oswald 1975, 176-7), but the earlier periods remain unstudied. Given the prevalence of pipemaking in the area, it would be surprising if there were not pipemakers working in the town from the seventeenth century onwards. An unusual giant pipe marked 'James Fare', with an ornately decorated bowl, was dug up at Wigan in 1769 (Bernhard

Smith 1869), and is now in Salisbury Museum (Oswald 1975, 177). The style of the mark suggests that this piece is of early eighteenth-century date.

4.7.4 The pipe fragments from the site as a whole range from the early seventeenth century through to the early twentieth century, and were recovered from a total of 20 different contexts (plus two unstratified groups). Most of the groups were only small, comprising nine fragments or less, with the notable exception of layer ***3007*** in Area G3, which produced 98 fragments of pipe. Although this was a cleaning layer, the majority of the finds recovered date from *c* 1820-40, suggesting that a coherent and closely datable deposit had been exposed. The other contexts produced late seventeenth- and eighteenth-century material so that, overall, a good range of pipes is represented. All of the fragments have been examined and details of each context group logged onto an Excel table, a copy of which is included as *Appendix 6*.

4.7.5 ***Datable stratified groups:*** clay tobacco pipes provide one of the most accurate and sensitive means of dating post-medieval deposits, particularly if they are present in some numbers. Unfortunately, most of the pipe groups recovered from the Grand Arcade Development are rather small, and so the reliability of the dating evidence they offer is not as great as if larger assemblages had been present. Despite this, the pipe fragments still offer a useful guide as to the date and nature of the excavated deposits; the most significant deposits are discussed below. Each entry starts with the context number, followed by the numbers of bowl, stem and mouthpiece fragments from each context, together with the total.

- ***172*** *(3/6/0 = 9):* the fill (***172***) of pit ***171*** in Area G10 produced stems of general late eighteenth- or nineteenth-century types, while the three bowl fragments probably all date from between *c* 1740 and *c* 1800. Two of the bowl fragments join to make the lower part of a burnished bowl, with heel or spur missing since manufacture. This piece probably dates from around 1740-80, and provides the most likely date for the group as a whole. The other bowl fragment is just a body sherd from a late eighteenth-century bowl.

- ***202*** *(5/1/0 = 6):* layer ***202*** in Area G10 produced a consistent-looking group of fragments, including five bowl fragments that range in date from *c* 1680-1750, but with a likely deposition date of *c* 1710-50. This group appears to represent a homogeneous and fairly well-dated deposit.

- ***3007*** *(20/76/2 = 98):* this cleaning layer in Area G3 produced by far the largest group of pipes from the site. Although one or two residual pieces are present, the majority cluster tightly within a data range of *c* 1820-40, while large stem fragments (up to 112mm in length) suggest that this is a little disturbed deposit (*Appendix 6*).

- ***3081*** *(0/3/0 = 3):* although only three stem fragments were recovered from the fill (***3081***) of pit ***3082***, they are all of late seventeenth- or early eighteenth-century date, and suggest a consistent date for the fill of this feature.

4.7.6 In addition, drain fill ***175*** and pit fills ***419*** (Area G7/10), ***3091***, ***3094***, ***3095*** and ***3098*** (Area G3) all produced pipe fragments dating from no later than the seventeenth or eighteenth century. While the small size of many of these groups does not allow for very reliable dating individually, the large number of contexts collectively that produced only earlier material may well be significant. Taken together, these deposits seem likely to represent the active formation of archaeological deposits on the site during the seventeenth or eighteenth century.

4.7.7 ***Early eighteenth-century forms:*** layer ***202*** (Area G10) produced five bowl fragments, four of which probably date from *c* 1710-50, and represent local forms of the period. Whilst these are rather damaged, three fragments were clearly very similar types, with large, flared, oval heels (*Appendix 6*). The junction of the heel is very narrow where it joins the bowl when viewed end on. This piece has a stem bore of 6/64" while an almost identical (but damaged) bowl from the same context has the unusually small bore for the period of 5/64". Neither of these two is burnished and both are made of fine fabrics that have probably been imported from the south or south-west of the country. In contrast, there is an even more fragmentary example of a similar form made of a coarse local fabric and with a poorly burnished surface and a stem bore of 7/64". These examples show that this was a distinctive local form, but one that was being made in a variety of fabrics and finishes, presumably by different local manufacturers. What is particularly interesting is that this form, with a sharply flaring oval heel, is not represented in the Merseyside bowl form typology (Higgins 2008). Either this form has simply not been encountered in the Merseyside area or it is distinctive to the Wigan area, in which case it is likely to represent local manufacture. There is just one spur fragment in this group, but this is unusually large and comes from a pipe made of a fine fabric without any burnishing (*Appendix 6*). This example suggests that a robust local style of spur pipe was being produced alongside the pipes with flared heels.

4.7.8 ***Spurless pipe of c 1760-1800 from pit 171:*** the fill of pit ***171*** produced six stems of late eighteenth- or nineteenth-century types, and three bowl fragments dating from *c* 1760-1800, which provide the most likely date for the group as a whole. Two of the bowl fragments join to make the lower part of a bowl with average burnish on its surface. Burnishing was usually a sign of quality that enhanced the value of a pipe. What is unusual in this instance is the fact that the heel or spur of the pipe failed to mould properly during the production process and has simply been smoothed over, leaving a lumpy patch at the base of the bowl. It seems odd that the pipe was considered worth finishing and firing given this obvious defect. The pipe also seems to have a slightly discoloured interior, indicating that not only was it completed and fired but also that it was sold and used. The occurrence of a burnished pipe, that would usually be taken as an indicator of a 'high-status' assemblage, as a defective 'second' clearly indicates that caution must be used in interpreting any group of archaeological material.

4.7.9 ***Group of c 1820-40, including Stag Head / Liver Bird / Masonic bowls:*** layer ***3007*** (Area G3) produced by far the largest group of pipes from the site, comprising 20 bowl, 76 stem and two mouthpiece fragments (98 pieces in all). Although described as a cleaning layer, this group is very consistent with just a few earlier residual fragments. All of the rest of the bowls and stems would fit well with a deposition date of *c* 1820-40. There are the remains of six plain nineteenth-century bowls, six with just leaf decorated seams, and six with leaf seams, stag's head, Liver Bird and Masonic motifs (*Appendix 6*). This layer appears to have been little disturbed, since many of the bowls are substantially intact, and stem fragments of up to 112mm in length survive. Moreover, the high degree of duplication of forms from the same mould that are present in this context further implies ***3007*** to have been a single contemporary deposit.

4.7.10 The most striking pipes in this group are the six ornately decorated examples with stag's head, Liver Bird and Masonic decoration. Five of these highly decorated bowls are from the same mould (*Appendix 4*), another example of which was also recovered from the fill (***07***) of pit ***08*** in Area G10. Other examples from this same mould have been noted previously by the author from other sites at Slackhouse Farm, Ormskirk (private collection), and from a pipe kiln waste dump at Adelphi Street, Salford (OA North 2008). Despite occurring in the Salford kiln dump, this design only occurred there as an isolated example and it not thought to have been actually produced at that site. This design, with the Liver Bird prominently displayed on the left hand side of the bowl, is interesting, since the motif would suggest that it was a Liverpool product, while the distribution of these finds might suggest more local production inland from the port. This general style of pipe, including the Liver Bird motif, was certainly being produced in the pipe workshops at Rainford (Dagnall 2001, figs 52-5) and so these examples could well have been made either there or even more locally to this site itself. It is also significant that the sixth example from this context has an almost identical design, but one that was produced in a different mould. This shows that the design was clearly popular in Wigan during this period.

4.7.11 Looking at the decoration on these pipes in more detail, it is interesting to note that the same details appear repeatedly on each example. One example, for instance, has a star motif that occurs once to the left of the wheat sheaf above the Liver Bird on the left hand side of the bowl, and then twice flanking the Masonic emblems and once as a flower head on the right-hand side (*Appendix 6*). This particular detail has a sunken, hollow, centre and then 11 arms to the star. A similar star with a hollow centre also occurs four times on the other mould type but, in this case, each star has only ten arms. The internal consistency of these features on each of the two moulds may indicate that small punches were being used to create the decoration in the mould itself, a process about which virtually nothing is known. If small dies were being used to build up the various elements, then the mould maker must have had a good range of them available to him. The second example employs at least four different star or rosette-type marks; the ten arm stars, some seven arm stars used as flower heads, some lobed shapes with a ring in

the centre used as flower heads, and a serrated ring mark used as a symbol mark on the spur. In addition, there are small open rings, dots, open lozenges and at least two different types of leaf represented, making a total of at least nine punch types before any other line engraving was employed. Although the two different mould types are clearly in very similar styles and copying the same basic theme and layout, there are differences in the detail of the individual elements, such as the stars and leaves, between the two examples. This may well indicate that the two moulds were created in different workshops, but clearly using the same methods and types of tool, and copying the same distinctive design.

4.7.12 The context group as a whole includes equal numbers of these elaborately decorated pipes, bowls with just leaf decorated seams, and pipes with plain bowls; the plain bowls include a range of different styles (*Appendix 4*). This range of both plain and decorated styles is typical of the period (for example, see the kiln waste of *c* 1800-40 in Dagnall 2001), and demonstrates that a range of different designs was being produced to meet the demands of the market. The Masonic elements contained within the design were particularly popular on pipes produced in the North West during this period. Although pipes with these emblems appear to have been in general use, rather than being specifically associated with Masonic sites, their widespread occurrence in the region may be indicative of a particular support for the Masonic movement in the region during this period.

4.7.13 With regard to the marking of the heels or spurs, it is worth noting that three of the seven surviving examples had marks on them (serrated ring marks on each side), but that all of these were on the elaborately decorated bowls. One of the plain spurs was on a plain bowl, and the other three were on bowls that just had leaf-decorated seams. A similar relationship can be seen amongst the numerous different patterns of pipe bowl dating from *c* 1800-40 from a kiln site at Rainford (Dagnall 2001). At this site, none of the 13 plain bowls of this date had marked spurs, just two of the seven bowls with leaf seams had symbol marks, but 14 of the 28 more elaborately decorated styles had this type of mark on their spurs. This suggests that the use of symbol marks was primarily seen as an integral part of the style or design of the pipe and not intended to identify the manufacturer themselves.

4.7.14 One of the stem fragments in this group has been ground smooth at both ends after having been broken (*Appendix 6*). It is 44mm long and the fact that both ends are rounded shows that this modification was not carried out to allow reuse of a broken pipe (when only one end would be smoothed off). The stem is too late for it to have been adapted for use as a hair curler, since the wearing of wigs went rapidly out of fashion around 1800, and so this was almost certainly the result of idle doodling, or of the stem fragment having been used like a stick of chalk to draw on a hard surface. Had this fragment subsequently been broken in half, both ends might have been interpreted as secondary working to allow the reuse of a broken pipe. As with the spurless bowl from ***172*** (*Section 4.7.8 above*), this is a useful reminder that the interpretation of archaeological material is fraught with dangers.

4.7.15 ***Cadger Pipe:*** the fill (***18***) of pit ***17*** produced a single plain sherd from the rim of a large 'cadger', or 'show' pipe. These giant pipes were most commonly produced *c* 1860-1920, although an example dating from the early eighteenth-century has previously been recorded from Wigan (*Section 4.7.3* above). These early examples, however, are extremely rare and may have been hand modelled as 'one off' pieces. The fragment from fill ***18*** is clearly mould made, and dates from a later period, when these pipes were manufactured commercially by many of the larger pipemaking firms. From the number of surviving examples, these pipes must have been relatively common during the late nineteenth and early twentieth centuries. Some of these examples may have been given away as promotional pieces, since some were produced with the manufacturer's name prominently displayed. Despite their apparent popularity, these pipes are rarely recovered from archaeological deposits and so this is an unusual find. Although the sherd is only *c* 25mm across and *c* 35mm deep, it is large enough to show that this piece came from the rim of a pipe with a plain bowl. This style of pipe was certainly made by a number of the manufacturers in Manchester, Rainford and Liverpool (Davey 1982). The original bowl would have been about 80mm in height and 45mm across, and these pipes must have been made as novelty items or souvenirs rather than for actual smoking. As such, this can be regarded as an ornamental item that reflects the growth of disposable income within households during this period.

4.7.16 ***Conclusion:*** as well as providing some dating evidence for the excavated contexts and features, the pipes also contribute to a broader understanding of production and consumption patterns within the wider catchment area of the site. The early eighteenth-century bowls are of a style not previously recorded from the region and may indicate local manufacture in or around Wigan itself. Quite a lot of the excavated contexts contained only seventeenth- or eighteenth-century material. Although these groups are only small individually, they collectively reflect the occupation and use of the site during this period. By far the best evidence for pipes, however, dates from *c* 1820-40, when a range of plain and decorated pipes was in use. The general range of forms and decorative motifs can be paralleled by kiln waste from Rainford (Davey 1982), while one of the highly decorated types adds to an interesting distribution pattern for this particular type. Cautionary notes for the interpretation of pipes are provided by the spurless bowl and reworked stem, while the fragment from a 'cadger' pipe provides a rare archaeological example of this distinctive type. By the early nineteenth century, south Lancashire was one of the most prolific pipemaking areas in the whole of the British Isles. Despite the importance of Wigan as an historic market town and its location on the edge of this nationally significant pipemaking area, there has been virtually no previous research into the pipes found there. This study goes some way to redressing this balance.

4.8 CERAMIC BUILDING MATERIALS *(Phil Mills)*

4.8.1 The assemblage of ceramic building material comprised 3144 fragments, weighing a total of 1124kg, from 201 different contexts. This included 3063 fragments from stratified contexts, and some 2443 fragments from Roman contexts. The assemblage was examined by context, with material separated into different fabrics and forms, and further grouped by the presence of deposits such as sooting, glaze or mortar.

4.8.2 ***Dating:*** the majority of the material was Roman in date. The two tegula cutaway forms identified match those of Warry's class A (Warry 2000, 4), which are dated AD 40-120. The majority match Warry type 28, but there is a single example of type 2, which would suggest that it was brought in from another structure, earlier than Building ***1000***. The half box-flue tile used for the heating elements of the structure (*Appendix 7*) may date to the second half of the first century (Brodribb 1987, 65-6; Betts 1986, 7), and have parallels in terms of form with material from Chester (Brodribb 1987, 65). There is also a combed box flue tile from robber trench deposit ***428*** from Period 2C. This can be dated to the second century, but does not to seem to have any direct connection with the bath-house.

4.8.3 Table 11 shows the amount of ceramic building material by period. It is clear that the majority of the material derives from Period 2C, both by weight and number. It also shows the expected pattern in later phases caused by medieval disturbance of underlying Roman rubble layers (*eg* the discrepancy in trends comparing weights and numbers from Period 2 to Period 6 (cf Mills 2006, 194-7).

Period	No%	Wt%	Cnr%	MT%	TE%	MSW
0	2.55%	1.77%	1.37%	2.10%	1.63%	250.59
1	4.31%	2.73%	1.37%	2.33%	1.80%	228.58
1/2	11.33%	3.67%	2.28%	3.26%	2.45%	117.15
2A	7.12%	6.95%	5.93%	7.69%	6.44%	352.72
2A-C	3.30%	0.69%	0.23%	0.47%	0.24%	75.90
2B	7.93%	16.07%	10.03%	10.49%	11.75%	731.71
2C/Phase 1	26.74%	46.35%	57.47%	55.94%	54.98%	626.32
2C/Phase 2	14.23%	10.12%	13.57%	11.42%	14.20%	256.74
2C/Phase 3	4.80%	2.20%	1.48%	1.63%	1.31%	165.78
3	7.12%	1.57%	1.48%	1.86%	1.55%	79.72
4	8.91%	7.48%	4.56%	2.80%	3.67%	303.29
5	0.13%	0.02%		0.00%	0.00%	64.00
6	1.53%	0.38%	0.23%	0.00%	0.00%	89.15
N/ Avg MSW	3063	1106619	877	429	15319	361.29

Table 11: The ceramic building materials assemblage by period

4.8.4 The amount of ceramic building material recovered from different deposit types is shown in Table 12. The majority of ceramic building material, by all measures, comes from demolition layers, with the most important context classes being pits, ditches and robber trenches, whereas the most important

context classes in terms of the minimum number per context (MT) also includes hearth/ovens – that is the fire pit deposits. This suggests that reused brick and tile were used in these structures, an observation supported by the high mean sherd weight (MSW) from this deposit type. High MSW is also seen for walls slots and construction layers, confirming the usefulness of large ceramic building material fragments recycled as hardcore, these different patterns reflecting the recovery of bricks, as opposed to roof tile from different context classes.

Cxt Class	No%	Wt%	Cnr%	MT%	TE%	MSW
Construction layer	7.1%	7.2%	4.9%	6.3%	6.0%	364.52
Demolition Layer	27.6%	43.5%	55.0%	52.7%	51.6%	569.76
Ditch	11.9%	3.7%	1.9%	3.0%	2.4%	112.86
Drain	0.5%	0.2%	0.1%	0.2%	0.2%	144.60
Floor layer	0.9%	0.6%	0.5%	0.9%	0.7%	218.83
Gully	0.8%	0.4%	0.2%	0.5%	0.3%	178.67
Hearth/oven	7.7%	12.0%	8.1%	9.1%	10.4%	562.43
Layer	3.0%	2.0%	1.6%	2.3%	1.8%	241.91
Pit	19.1%	8.9%	4.4%	5.6%	4.2%	169.18
Posthole	0.5%	0.2%	0.2%	0.5%	0.3%	168.07
Robber Trench	14.5%	10.0%	12.9%	11.2%	13.7%	248.64
Slot	1.2%	2.3%	1.8%	1.9%	2.0%	685.35
Wall	5.1%	8.9%	8.3%	5.8%	6.5%	634.55
N/ Avg MSW	3063	1106619	877	429	15319	361.29

Table 12: The ceramic building material assemblage by context class

4.8.5 Work in taphonomic characterisation is relatively undeveloped (Martin 2007, 86) and has mainly concentrated on pottery, but there is a growing database of comparable ceramic building material from Roman sites in Britain. Preliminary comparisons by basic divisions of rural and urban site types suggest that construction deposits and gullies tend to be significant ceramic building material-rich deposits for rural sites, whereas urban sites have a larger spread of deposit types from which ceramic building material is recovered. The detailed analysis of trends would require a larger database, comprising a range of more sophisticated site types, although these is an interesting comparison between this site and that of Alchester (Booth 2001).

4.8.6 The taphonomic profile of the roof tile shows that demolition layers, 'hearth/ovens', pits and robber trenches are the most significant deposit types (Table 13). As with the assemblage as a whole, the use of large roof tile fragments in the fire pits is highlighted, especially with the unusual ratio of the minimum number per context (MT) and tile equivalent (TE) to 'No' and 'Wt' in the 'hearth/ oven' context class. Pits and ditches seem to be important in terms of fragment count, so probably represent dumping areas for broken roof tile.

Cxt Class	No%	Wt%	Cnr%	MT%	TE%	MSW
Construction layer	8.6%	11.7%	11.8%	11.4%	10.8%	318.89
Demolition Layer	20.7%	25.4%	34.1%	35.3%	34.5%	289.23
Ditch	12.9%	5.5%	4.1%	5.0%	4.1%	99.46
Drain	0.6%	0.4%	0.3%	0.5%	0.3%	152.85
Floor layer	1.0%	1.0%	1.4%	2.0%	1.4%	232.09
Gully	1.0%	0.4%	0.3%	0.5%	0.3%	95.86
Hearth/oven	9.6%	22.2%	16.2%	14.4%	17.6%	544.53
Layer	3.0%	3.6%	3.4%	3.5%	3.0%	282.02
Pit	22.1%	8.3%	5.4%	6.5%	4.7%	89.12
Posthole	0.6%	0.4%	0.7%	1.0%	0.7%	150.69
Robber Trench	14.6%	11.1%	15.2%	12.9%	15.9%	179.78
Slot	1.5%	3.6%	3.0%	2.5%	3.0%	562.82
Wall	3.7%	6.5%	4.1%	4.5%	3.7%	413.84
N /Avg MSW	2165	510903	296	201	7399	235.98

Table 13: Roof tile only by context class

4.8.7 ***Fabrics:*** the quantities of the different types of building material by ware class are shown in Table 14, with brick fabrics signified by the prefix 'L' and roof tile fabrics by the prefix 'T'. It is clear that a relatively narrow range of fabrics was present in the assemblage; detailed description of the fabrics is presented in *Appendix 7*.

Fabric	No%	Wt%	Cnr%	MT%	TE%	MSW
L41	6.6%	7.0%	5.3%	4.8%	4.3%	425.80
L42	25.3%	47.5%	61.0%	48.8%	47.2%	755.56
T00	5.1%	1.5%		0.0%	0.0%	121.29
T41	62.9%	43.8%	33.0%	46.0%	48.0%	279.95
N/Avg MSW	2443	982450	810	400	14271	402.15

Table 14: The ceramic building material ware classes

4.8.8 ***Function:*** there are relatively few examples of specialist flue tiles from the assemblage as a whole, and very few possible examples of voussoir (Table 15). The ratios of tegula to imbrex from this assemblage as a whole are about 2:1 by No%, and around the same by MT%. The breakdown of the form classes by phase, however, allowing for the small sample sizes in Periods 1 and 2/A-C, suggests that some active sorting of ceramic building material, biasing against imbrex, can be seen in Periods 2A and 2B. This sorting is usually partly seen in the selection of tegula fragments for surfaces, but it also reflects the greater chance of an imbrex to survive complete demolition and destruction events, and so to be reused in other buildings (Mills 2006).

4.8.9 There were too few voussoir fragments to ascribe them comfortably to a specific part of the building. They were recovered from demolition layers associated with R1, R2, R4, R6 and R9 in the bath-house, with the armchair voussoir being recovered from the demolition deposit (***572***) in R2 (*Appendix 7*). The small quantity of possible voussoirs suggests that only one of the rooms would have been arched. Of note is the appearance of reworked ceramic building material as tessera in Periods 1 and 2C – the latter occurrence suggesting a tessellated pavement in one of the rooms of the bath-house being demolished at this stage.

Brick Type	No%	Wt%	Cnr%	MT%	TE%	MSW
B/T	24.6%	4.2%	0.2%	0.3%	0.2%	68.21
Brick	18.9%	46.0%	62.8%	47.8%	46.1%	981.11
Flue tile	5.7%	6.1%	3.1%	4.3%	4.0%	430.50
Imbrex	15.6%	8.3%	12.6%	19.3%	17.3%	213.37
Tegula	33.6%	34.3%	18.0%	25.8%	27.3%	409.89
Teaser	0.3%	0.1%	2.5%	1.5%	4.2%	70.50
Voussoir	1.3%	1.1%	0.7%	1.3%	0.9%	335.88
N/ Avg MSW	2443	982450	810	400	14271	402.149

Table 15: The range of brick forms

4.8.10 ***Markings:*** markings and deposits left by manufacturing, usage and post-depositional effects are shown in Table 16, compared to similarly catalogued material from several sites from around Britain. The percentage of fragments with animal prints is quite low, and is suggestive of the pattern to be expected from a relatively undisturbed assemblage reflecting a single commission (Mills 2006). Bricks were the most significant fabric with animals walking on them. The presence of cat prints may suggest the nearby presence of grain, with cats being used for vermin control. The high level of material marked as reused, that is with mortar present on breaks in the material, is of note, and seems to be of most significance in Period 2A (Table 17). This may represent the reuse of material from an older structure, as also suggested by tegula type T41T2.1 (*Appendix 7*), but also may be due to taphonomic factors, such as exposed mortar dissolving in rain and reforming over demolished ceramic building material rubble. The amount of mortar is relatively high, but is indicative of an assemblage that has seen relatively little curation for reuse as hardcore (when excess mortar is knocked off by builders).

Site Code	Abraded%	Animal%	Mortar%	Reuse%	Burnt%	N
ALC00	0.46%	0.00%	2.14%	0.88%	0.38%	2616
GAW04	0.65%	0.29%	8.43%	6.39%	13.59%	2443
TR99A	0.00%	0.00%	0.00%	0.00%	0.00%	19
TR99B2	0.00%	0.80%	0.32%	0.48%	5.74%	627
TR99H	0.00%	0.00%	0.00%	0.00%	6.67%	60

Table 16: Markings by site by No%

4.8.11 The amount of material that is burnt is significantly higher than may be expected from a normal assemblage of ceramic building material. The large amount of burning does not seem to concentrate within the fire pit contexts, and is more a result of the use of overfired material. Whilst there is some evidence for deliberately overfired roof tiles being used in late Roman buildings in the east of the country (Mills 1998; Mills in press) to create polychromatic effects in roofing, the presence of wasters in the assemblage in wall ***571*** (Period 2B), robber trench ***253*** (Period 2C), slot ***298*** (Period 2A), and residually in pit ***21*** (Phase 3) suggests that the material came from a local kiln.

Period	Abraded	Animal	Mortar	Reuse	Burnt	Water rolled	N
1	0.00%	0.76%	9.85%	7.58%	7.58%	0.00%	132
1/2	0.58%	0.00%	27.67%	21.90%	3.17%	0.86%	347
2A	0.46%	0.00%	10.55%	7.34%	12.84%	0.92%	218
2A-C	0.99%	0.99%	14.85%	9.90%	14.85%	0.99%	101
2B	0.00%	0.41%	4.53%	3.70%	12.35%	0.00%	243
2C/1	0.73%	0.49%	3.66%	3.42%	22.83%	0.00%	819
2C/2	0.69%	0.00%	3.90%	1.38%	10.78%	1.61%	436
2C/3	2.04%	0.00%	0.68%	0.68%	2.72%	0.68%	147

Table 17: Markings by phase

4.8.12 ***Numbers and costs:*** the original number of roof tiles used can be estimated from the plan of the building. Assuming that a simple roof over the entirety of the building was constructed, with a 20^0 pitch with imbrices used as ridge tiles and a one third overlap between tiles, this would suggest 96 columns of roof tiles made up of 47 rows, so 9024 tegulae and 9053 imbrices, with a total combined weight of 105.6 tons. Whilst no direct cost of roof tile survives, it has been estimated (Warry 2000; Mills 2006) from the Diocletian edict on prices, as well as the raw material used, that the best quality of roof tile would have cost approximately six *denarii* for tegula with imbrex, so that an estimate for the cost of the roof can be made at 54,000 *denarii*, or the equivalent cost of 24 person years of unskilled labour. These figures underline what a significant cost the construction of the bath-house represents, but also show just how much of the material is represented in the assemblage recovered.

4.8.13 ***Discussion:*** this assemblage represents a relatively short-lived building that is free (in ceramic building material terms) of the problems of residuality that usually bedevil ceramic building material studies. This site thus yields useful baseline taphonomic data for site characterization and comparison with sites in areas where Roman-style buildings continued to be built in the later Roman period.

4.8.14 The presence of voussoir bricks, especially the fragment of an armchair voussoir (*Appendix 7*), would seem to confirm the existence of arched structures within the bath-house, although probably in only a single room. The small amount of voussoir recognised suggests that these bricks were apparently removed upon the demolition of the building. The presence of voussoir bricks from Period 1 indicates that they formed part of the structure from the earliest design, and cannot be dismissed as rubble bought in after the final demolition. Some of the ceramic building material was reworked to form tessera for a tessellated pavement or *opus figlinium*-type floor, perhaps in R4, as suggested by the presence of a tessera in demolition layer ***588***.

4.8.15 The limited spread of fabrics, which are typically of Roman coarse wares of the region (Tomber and Dore 1998), with the high incidence of burnt or overfired examples, and the presence of wasters, suggests that the ceramic building material for this assemblage was made specially in a nearby tile kiln, which has not been recovered to date. There is, however, some slight evidence that a small amount of reused ceramic building material is present,

cannibalised from a mid-first-century structure. Building ***1000*** was largely demolished in Period 2. There is some evidence that in Period 2B some ceramic building material was curated and reused, as it would be in contempory structures in the east and south of Britain, where complete ceramic building material forms would be reused in other buildings, whereas broken fragments would be recycled as hardcore in different building projects. The presence of the slightly later flue tile, L42 F2.1 (*Appendix 7*), which would not have been used in the original structure, suggests that some building rubble was imported into the site. Perhaps this was undertaken with a view to using the site as a source of hardcore for future building projects. However, it is clear that, by Period 2C, even demand for recycled hardcore was non-existent and so the assemblage was left relatively undisturbed until the medieval period.

4.9 ROMAN COINS (*David Shotter*)

4.9.1 Despite uncovering a sizeable area, the excavations yielded only four Roman coins (Table 18); three of these were in a poor state of *preservation (Appendix 8*), which precluded recovery of detail beyond the identity of the issuer. For RIC see Mattingly *et al* 1923-84.

Context	Comments	Wear	Date Range
052	Æ *Dupondius*, Hadrian (reverse possibly *Salus*; this coin, although severely corroded, was probably not very worn at the time of loss, perhaps *RIC* II (Hadrian), 604)	VW	119-122
116	Æ *As*, Hadrian. Obverse and reverse illegible	VW	117-38
054	Æ *As*, Antonius Pius. Obverse and reverse illegible	VW	138-61
683	Æ *Quandrans*. Reverse type: Winged Caduceus S C; RIC II (Anon Quad), 32)	MW	100+

Table 18: Breakdown of the Roman coins

4.9.2 The dating and indeed the role of the small pieces known an *Anonymous Quadrantes* are not precisely known, although it is assumed that they should be placed in a period bounded by the reigns of Domitian and Antoninus Pius. The *Quadrans* (or quarter-*as*) will have played a diminishing part in the Roman money-system, as inflation bit harder; it does not appear to have been minted or circulated much beyond the reign of Hadrian (see *RIC* II, 214f).

4.9.3 It does not need to be emphasised that a total of four coins can make little firm impact upon our understanding of the site, although a few points can be usefully made: the issue-dates of the coins fall within a relatively short period of time (*c* AD 100-60); further, despite extensive damage due to corrosion and the difficulty that this poses for any assessment of wear, whilst two of the coins (Hadrian and Antoninus Pius) appear to have exhibited considerable wear at the time of loss, the early Hadrianic issue appears not to have been much worn. This suggests that collectively the coins point to a principal period of activity on this part of the site through the early to later years of the

second century, which is similar to that suggested for sites such as Wilderspool (Hinchliffe and Williams 1992, 171) and Walton-le-Dale (Gibbons *et al* in prep).

4.9.4 Further, the degree of wear, combined with the smallness of the sample and the fact that all four coins are of low denomination, does not immediately suggest the presence of people of particularly high status. However, the fact that a substantial portion of the excavated area was occupied by what appear to have been the underfloor levels of the heated rooms of a bath-house might serve to explain the low level of coin-loss; presumably these were areas into which money seldom found it way.

4.9.5 In the continuing absence of structures of a patently military character and in view of the narrow date-range of the coins and the low level of wealth hinted at by them, it is tempting to extend the parallel with Wilderspool and Walton-le-Dale, and see them all as elements of the infrastructure built up from the late first century to service the army and the progress of Romanisation in the North. Excavation by the Greater Manchester Archaeological Unit at The Wiend in the 1980s revealed the remains of timber buildings, reminiscent of workshops (Jones and Price 1985; Tindall 1985). Again, coin-loss was evidently at a low level, with just two *aes*-issues of Vespasian reported (including *RIC* II (Vespasian), 500). All of this perhaps points to a local population consisting largely of Romano-British artisans, possibly working under the general.

4.9.6 The absence from these excavations of any coins later than the second century suggest that activity may have been of limited duration in this part of Wigan. However, it should not be assumed that the present site is necessarily typical of Wigan as a whole in the Roman period. Local records, for example, suggest that, in other parts of the town, Roman activity may have been extended over a longer period (Watkins 1883, 199ff; *Palatine Notebook* 4 (1884), 134): most striking of such individual finds is an *aureus* of Vitellius (*RIC* I^2(Vitellius), 66), a rare find pointing to the presence of a person of some standing and authority.

4.9.7 Although it is hazardous to attach a particular significance to an individual coin-find, a rare piece such as the *aureus* of Vitellius (AD 69) might be thought to point to a military presence in the area in the wake of the rebellion of the Brigantian leader, Venutius, in AD 69 (Tacitus *Histories* 3.45, see Shotter 2004) and the subsequent Roman military action under the governor, Marcus Vettius Bolanus, which was concerned with rescuing the Roman 'ally', Cartimandua. If Cartimandua had, as some suppose, escaped from her principal centre at Stanwick to Barwick-in-Elmet, her rescue may well have been effected along the Ribble-Aire corridor (Shotter 2004, 22).

4.9.8 In additon to the coin of Vitellius, an issue of Vespasian (denominatin and date unspecified), two of Antoninus Pius (a *denarius* and an as - *RIC* III (Antoninus), 616), and several of the third and fourth centuries, have been recorded (Shotter 1990, 41; 1995, 15). These latter include an Alexandrian *Tetradrachm* of Aurelian (Milne 1971, 4420), perhaps suggestive of

commercial activity, two *aes*-issues of Maximian and one of Constantius I, and a coin each of Constantine I and Crispus; all of these would lie within the period *c* AD 270-337. Further finds (unspecified) have been made at the Market-site, Millgate, Bottling Wood, Cherry Gardens and the site of Woolworths store (Shotter 1990, 178).

4.9.9 Finds of hoards of Roman coins both within and in the vicinity of Wigan point to other dynamic activity in the area. First, two large hoards of silver coins have been found at Standish; the first, recovered in 1690, consisted of approximately 200 coins (*denarii* from Domitian to Pupienus, and a single *antoninianus* of Gordian III), which had been concealed in a bronze vessel. This hoard is unusual in that a relatively full account of it was given, with 98 engravings, by Dr Charles Leigh (1700, 92-100). The fact that there are no duplicates amongst the engravings suggests that the remainder of the coins were, in fact, duplicates of those illustrated by Leigh. The second hoard, which was recovered in 1926, consisted of 131 *denarii* from Nero to Severus Alexander. It was at one time thought to be another component of the hoard of 1690; however, its contents argue against this. There was no sign of a container, although a number of the coins showed signs of a dark deposit which might have been the degraded remains of a leather purse (Shotter 1982).

4.9.10 It appears that, in the 1820s and 1830s, a considerable amount of Roman material was found during the construction of the Gas Works; it was thought that the finds may have related to a cemetery, but the lack of Roman pots makes this less likely. Another report, of 1837 (Shotter 1990, 145), records the discovery of a hoard of the third century, containing radiates of Gallienus, Victorinus, the Tetrici and Probus. This hoard was said to have been associated with stonework.

4.9.11 Thus, the recent excavations, whilst providing important new insights into Roman Wigan, leave many unanswered questions; in particular, the casual coin finds from Wigan and its environs point to the purpose, extent and chronology of Roman Wigan having been far more complex than excavation has so far revealed.

4.10 COPPER ALLOY (*Sean McPhillips*)

4.10.1 In total, 17 small fragments of copper alloy were recovered from the excavations. Most of the objects were heavily encrusted with dense corrosion, with several lumps possibly deriving from copper-working spillage that had become concreted with clay and stones. Many of the fragments (seven) were too small (< 2mm) to identify, and only two objects were identified with confidence, including a spherical-headed pin (probably from upholstery), and a post-medieval door knob.

4.10.2 The small spherical-headed pin, 20mm long, and with a maximum diameter of 5mm, was recovered from the fill of Roman drain ***676***. The possible copper-working spillage comprised five pieces of concave-shaped, heavy

(>2kg) concretions from fill ***155*** within ditch ***151***, which is early post-medieval in date. Copper-alloy-working debris in this quantity is of interest, and almost certainly indicates the production of copper-alloy objects in the close vicinity, the waste debris being dumped into ditch ***151***. There is, however, no clear indication of what might have been manufactured, although bell-founding is a possibility.

4.11 IRON (*Sean McPhillips*)

4.11.1 A small assemblage comprising 31 fragments of iron was recovered from the excavations. The material for the most part was in very poor condition with many of the objects covered in a thick layer of corrosion products. The assemblage mostly derived from stratified deposits from several of the sites, largely Roman in date.

4.11.2 In all, there were 11 fragments of hand-forged nails, all with square shafts and a flat, round head. These are a common Roman type (Type 1b; Manning 1986), but it must be noted that such nails remain in production to the present day, and can only, therefore, be dated by the context from which they derive. The only other identifiable object was a nail or pin with a large, possibly conical head, recovered from fill ***52*** of pit ***41***, which could be dated stratigraphically to the late first- to mid-second century. The remainder of the assemblage is highly fragmentary, and is unidenfiable.

4.12 LEAD (*Chris Howard-Davis)*

4.12.1 In all, 171 fragments of lead were recovered, weighing a total of 1.894kg. All but three items were small solidified drips, presumably originating from molten lead used in the construction of the Period 2 bath-house, or in its subsequent demolition and robbing. Only four contexts (layer ***538***, surface ***540***, posthole ***936***, and stakehole ***941***) produced ten or more fragments, with the largest number of fragments (47) and the heaviest weight of lead (620g) coming from Period 1 deposit ***540*** (Area G7/10).

4.12.2 Two of the remaining fragments were offcuts from thick sheet (from ditch ***198***; fill ***199***, fill ***863*** of hearth ***876***), again likely to have been used in or about the bath-house. A small disc, bearing a superficial resemblance to a seal, came from an evaluation trench in Area G5. The final object, a delicate, but plain, grille fragment (Period 6, linear feature ***17***, fill ***18***) cannot be further identified, but seems most likely to be post-medieval or modern.

4.13 ROMAN GLASS (*Christine Howard-Davis*)

4.13.1 ***Vessel glass:*** although over 200 fragments of Roman glass were recovered, it is unlikely that they represent more than three vessels, many of the fragments being extremely small. One of the three vessels (from ditch fill ***48*** (Period 1) and beamslot fill ***264*** (Period 2)) is reduced to 'sugar crystal' fragments and cannot be further identified. This fragmentation is, however, a characteristic of some colourless Roman glasses (Price and Cottam 1998, 4), but there is

little doubt that it was a small vessel, possibly for cosmetics or bath oil, and probably dating to the second century AD.

4.13.2 The two other vessels, better preserved, are both relatively unusual (*Appendix 9*). Three joining fragments of a colourless indented beaker (Isings form 35; Isings 1957) came from ditch fill ***48***. Indented cups are a relatively common Flavian form, but this example, with out-turned rim and horizontal wheel-cut lines at the rim and neck, seems more likely to be an example of a less common later form. This is not closely dated, but seems to have been in use during the mid- to late second century (Price and Cottam 1998, 94).

4.13.3 The third vessel, part reconstructed from a number of extremely thin-walled blue-green fragments from ditch fills ***32*** and ***48*** (ditch ***43***), appears to be a delicate glass funnel (Isings form 74). The top, which would allow confident identification, is missing, but a large part of the narrow tapering cylindrical spout is substantially complete. It differs from the normal description of this vessel in having a carefully moulded, rather than sheared-off end, but with the exception of even rarer forms, the siphon (Isings form 76) or the *rhyton* (Isings form 73), there is no other likely identification. The form was current from the Claudian period to the latter part of the first century (Cool and Price 1995, 174) and examples are known from, amongst other places, Watercrook, near Kendal, and Castleford, West Yorkshire (*ibid*).

4.13.4 ***Window glass:*** in all, there were 14 fragments of Roman window glass. All were small, with the largest being no more than 65mm in maximum dimension. All were of the natural blue-green matt-glossy type characteristic of the first to third centuries AD (Harden 1961). The appearance of glass in contexts closely associated with a bath-house is not surprising, as it is likely that light would have been admitted into the various rooms through glazed windows. It is notable that, although none exceeds 30mm in its longest dimension, most of the fragments are from Period 2 (beamslot ***891***, fill ***892***), and perhaps coincident with the construction of Building ***1000***, and the remainder of the securely stratified material is from Period 2C (***427***, ***454***, ***461***) and can probably be linked with its demolition. One small fragment of Roman window glass was recovered, without doubt residual, in a Period 4 deposit (the fill (***128***) of pit ***129***).

4.13.5 ***Glass objects:*** a single fragment of glass bangle was recovered from a Period 2C robber trench (***590***, fill ***491***). Translucent cobalt blue, with opaque white marvered trails, it is an uncommon type, falling into Kilbride-Jones type 3I, and probably dated to the first half of the second century AD (Kilbride-Jones 1938).

4.14 POST-MEDIEVAL GLASS *(Jo Dawson)*

4.14.1 In total, 92 fragments of post-medieval glass, weighing approximately 4kg, were recovered during the excavations. The numbers of fragments from each context are shown in Table 19. In total, 76 fragments (83%) were recovered from stratified deposits, whilst the remaining 16 fragments (17%) were unstratified.

Context	Context type	Period	Quantity	Context	Context type	Period	Quantity
18	fill	5	3	***477***	structure	5	2
44	fill	1	1	***2000***	unstrat	0	15
64	fill	3	1	***3031***	fill	7	1
101	surface	6	4	***3035***	fill	5	1
120	structure	4	24	***3053***	fill	6	1
147	fill	5	1	***3095***	layer	5	13
172	fill	5	9	***3098***	fill	5	5
175	fill	4	3	***3114***	fill	6	6
205	structure	5	1	***9991***	unstrat	0	1

Table 19: Post-medieval glass by context

4.14.2 Many of the fragments were poorly preserved, although others are in reasonable condition. The assemblage includes small quantities of diagnostic fragments such as rims and bases, with some refitting. The majority were retrieved from contexts dated to the eighteenth century (Period 5; 35 fragments, or 38% of the total), with significant quantities also from contexts dated to the sixteenth-seventeenth centuries (Period 4; 27 fragments, 29% of the total), and smaller quantities from the nineteenth century (Period 6; 11 fragments, 12%) and twentieth century (Period 7; one fragment, 1%). One fragment (1%) was intrusive in a Roman context (Period 1), whilst the remaining 16 fragments (17%) were either unstratified or from contexts not closely phased.

4.14.3 In total, 11 fragments were derived from window panes, the remainder being from bottles, including four which were heat-affected. All of the window pane fragments were plain, except one, which was relief-moulded or textured. The bottle colours included dark green, brown and very pale turquoise, and their forms comprised shaft and globe/onion/mallet types of the seventeenth/eighteenth centuries and eighteenth/nineteenth-century rectangular cross-sectioned and cylindrical bottles, including one with an internal screw top. Two of the nineteenth-century bottles have embossed text naming the bottle manufacturers and/or the manufacturers of the contents.

4.15 **WORKED STONE** (*Sean McPhillips, Graham Lott and Fred Broadhurst*)

4.15.1 In total, nine stone objects were collected from the excavation, which stratigraphically had a broad date range between the late first and the nineteenth centuries. Amongst the identifiable objects were four whetstones, a millstone fragment, two slate pencils, and an architectural column fragment, possibly reused as a lamp or a mortar.

4.15.2 Two of the whetstones were recovered from demolition deposit ***588***, which dates stratigraphically to the later second century. The other whetstone derived from the fill (***482***) of a robber trench, and was dated to the later Roman period. Two of the stones were local fine-grained sandstone, the other apparently of granite. None of the whetstones were particularly worn, and were likely to have been lost, or perhaps discarded. A small fragment of millstone from an early post-medieval deposit (***202***) is possibly Roman in origin.

4.15.3 The most important and impressive stone object was a large fragment of a moulded stone column, recovered from the backfilled material in the hypocaust below R1 of Building ***1000***. The stone was a hard, siliceous, fine-grained sandstone, which contrasted with the type of stone used in the Roman building. The stone may be identified as ganister, which occurs in the Carboniferous Pennine Lower Coal Measures Group, and is likely to be of local origin (F Broadhurst pers comm). The fragment had a maximum diameter of 0.40m, and is likely originally to have formed part of a colonnade, perhaps at the northern end of the building. Following the demolition of the building, however, it seems that the column fragment may have been reworked for a new purpose, as indicated by the crudely carved hollow at its base. The rationale for this reworking is unclear, although it may have been intended for use as a large oil lamp, or a mortar.

4.15.4 The stone used for the masonry of the bath-house walls was a pale yellow, very fine-grained, laminated, dolomitic sandstone. Analysis of a sample of this stone by Dr Graham Lott of the British Geological Survey concluded that it was of the Carboniferous Pennine Lower Coal Measures Group, and possibly Ravenhead Rock. The fine grain-size, micaceous and laminated nature of these sandstones allowed them to be split, where necessary, into thin slabs which were used widely for paving and roofing slate. The fissile, laminated character of the sandstone would also have been conducive to the production of thin slabs for use as flooring in the bath-house (Lott 2008, 10).

4.15.5 This is exposed along the banks of the River Douglas, which takes a north/south route to the east of Wigan town centre, and past a former quarry at Water Heyes (*ibid*). It is possible that the exposure of this sandstone at outcrop provided the source for the material used in the construction of the bath-house. Given the proximity of the River Douglas to both the outcrop and the bath-house, it is tempting to suggest that the stone was transported via the river.

4.16 WORKED BONE AND IVORY (*Christine Howard-Davis*)

4.16.1 Only two articles of worked bone or ivory were found (*Appendix 10*); a plain bone pin, of typically Roman type, was recovered from an unstratified context, and a roughly carved ivory knife or fork handle was recovered from the fill (***3017***) of gully ***3016*** (Area G3, Period 5).

4.16.2 The latter object was clearly drilled to receive a whittle-tanged blade, and appears to have been carved into a simple pistol-grip style terminal, although the workmanship was sufficiently poor to make this uncertain. 'Pistol-grip' handles were popular in the late seventeenth and eighteenth centuries, being a standard design for cutlery hafts by the early 1720s, but in decline by the 1770s (Moore 1995, 22).

4.17 LEATHER OBJECTS *(Christine Howard-Davis)*

4.17.1 In all, 27 fragments of waterlogged leather were recovered from medieval pits ***3028***, ***3035***, and ***3081*** in Area G3. All were in good condition, and have been conserved. A small group of three irregular, cut fragments came from pit ***3028*** (***3028***/219), and seem most likely to represent the waste from the manufacture of leather goods. The thinness of the leather suggests that it would have been unsuitable for shoes, and it must be assumed that it was used for some finer item.

4.17.2 The remainder of the leather comprised the remains of two shoes. One (***3035***/217) was the sole from a left shoe of turnshoe construction, with flesh-edge stitching suggesting the presence of a rand. The pointed toe and exaggeratedly narrow waist follow the fashion of the later fourteenth century (Grew and de Neergaard 1988, fig 1). The second shoe, recovered from deposit ***3081***, was more complete, being for an adult right foot, with sole, rands, quarters and heel stiffener all present; although the sole was incomplete its original shape could be reconstructed from the surviving fragments of upper. The vamp (front) was less well-preserved, most having been cut away, possibly for recycling. The shoe was again of randed turnsole construction, with low quarters and a relatively rounded toe. The shoe can probably be dated to the early fifteenth century or later, when there was a marked move away from simple one or two-piece construction (*op cit*, 40). As would be expected at this time, there are two symmetrical quarters, joined with a vertical seam up the back, and with an added internal stiffener for strength. It seems to have been cut well below the ankle, clearly indicating that it is a shoe rather than a boot, but nothing survives to indicate how it was closed. Again, the way in which potentially reusable leather has been cut away from this shoe might suggest that it was discarded in the course of cobbling.

4.18 ANIMAL BONE *(Andrew Bates)*

4.18.1 In total, 102 animal bones were recovered from deposits dating from the late first to the nineteenth century. Generally, the material is moderately well preserved, with some degree of the surface eroded, of a generally robust nature, although fragmented, with 49% of the material when identifiable represented by less than 25%, and a further 13% by 25-50% of the original bone. Loose teeth comprise 7% of the total assemblage, indicative of a poorly preserved assemblage.

4.18.2 The material was identified using the reference collection held by the author. All parts of the skeleton were identified where possible. Sheep/goat distinctions were made following Boessneck (1969) and Prummel and Frisch (1986), and red/fallow deer distinctions following Lister (1996). The diagnostic zones used followed those described in Serjeantson (1996). Tooth wear development for cattle mandibular teeth followed Grant (1982). Skull and horn cores were described after Grigson (1976) and Armitage (1982).

4.18.3 The total number of animal bone fragments recovered is low (Table 20), although some interpretative comments can be made. The material is separated into three broad stratigraphic phases, Roman (Periods 1-2), medieval (Period 3), and post-medieval (Periods 4-6).

Species	Roman	Medieval	Post-medieval	Total
Horse			4	**4**
Cattle	6	1	12	**19**
Pig	1		2	**3**
Sheep/Goat	3		6	**9**
Sheep			1	**1**
Goat			1	**1**
Rabbit			1	**1**
Red Deer			1	**1**
Cattle/Red Deer	1		1	**2**
Sheep/Goat/Roe Deer			2	**2**
Medium Mammal			3	**3**
Large Mammal	5		24	**29**
Small Mammal			3	**3**
Unidentified Mammal	17		7	**24**
Total	**33**	**1**	**68**	**102**

Table 20: Number of Individual Specimens (NISP) for each species by broad phase

4.18.4 ***Roman material:*** in total, seven features produced animal bone, much of the identifiable material being excavated from robber trench ***576***. This included a cattle pelvic fragment, four loose teeth, and a pig humerus fragment. Of the loose teeth, two mandibular third molars from an adult animal are counted as one specimen in the tables. Construction cut ***494*** produced three sheep/goat loose teeth fragments, gully ***3107*** a cattle metacarpal fragment, and pit ***27*** a cattle humerus fragment.

4.18.5 ***Medieval material:*** a single cattle metatarsal fragment was recovered from pit ***3028***.

4.18.6 ***Post-medieval material*** in total, 17 features produced animal bone. The majority of the animal bone was recovered from pits (Table 21), although in total only 27 specimens from pits were identified to a species level. None of these features produced significant quantities of animal bone, the largest quantity being nine identifiable fragments from pit ***02***. It is therefore suggested that the bone within them is incidental to the function of the feature (Table 22).

Feature Type	Number of Features	NISP
Ditch	1	4
Drain	1	2
Buried soil horizon	1	1
Layer	3	14
Pit	11	47

Table 21: NISP by species represented in post-medieval feature types

Pit	Horse	Cattle	Sheep /Goat	Sheep	Goat	Pig	Rabbit	Red Deer	Total
02	3	3	1			2			**9**
13		4	1	1	1				**7**
17		1							**1**
69			1						**1**
124			1						**1**
129								1	**1**
171	1		1				1		**3**
220		1	1						**2**
3113		2							**2**
Total	**4**	**11**	**6**	**1**	**1**	**2**	**1**	**1**	**27**

Table 22: NISP by species represented in post-medieval pits

4.18.7 ***Cattle:*** cattle bones were the most frequently recovered species. Three animals were aged from the wear patterns of mandibular teeth. These include the Roman adult animal, as well as two post-medieval cattle, one 8-18 months in age, and the other a senile animal. Butchery marks were recorded on post-medieval cattle bones only, including two instances of filleting, one of the lower forelimb (metacarpal) and one of the hind limb (tibia). A single post-medieval horn core of an ox was recovered from pit ***13***.

4.18.8 ***Sheep and goat:*** most of the sheep/goat category are thought to comprise sheep, although goat is attested at the site by a single post-medieval horn core. No mandibular teeth which could suggest an age of death for these animals were recovered. Three post-medieval bones had been filleted, a humerus and metacarpal of the forelimb and a tibia of the hind limb.

4.18.9 ***Pig:*** pork is considered the third species bred for consumption in significant quantities in British assemblages, but was only recovered in very small numbers from the site. It is likely during the medieval and post-medieval periods that pork consumption was secondary to that of mutton or lamb. No specimens were recovered which could suggest an age at death of the animals, or demonstrate butchery.

4.18.10 ***Other species:*** three post-medieval horse bones were recovered, two tibias and the second phalanx from pit ***02*** and a metacarpal from pit ***172***. Horses in this period in Britain are unlikely to have been consumed by humans, although their meat may have been fed to dogs (Wilson and Edwards 1993). Wild species are represented by an eighteenth- to nineteenth-century rabbit tibia and a seventeenth-century red deer humerus. Rabbit was more commonly consumed than hare in the post-medieval period, and was an important minor element of the English diet (Davis 1995, 194). Venison would have been obtained from deer parks. In the medieval and early post-medieval periods, the hunting of deer, and separation of the carcasses amongst differing social classes, was highly ritualised (Cummins 2001).

4.19 CHARRED AND WATERLOGGED PLANT REMAINS *(Denise Druce)*

4.19.1 Following the assessment of 32 bulk samples taken from a number of features (OA North 2006), additional assessment and analysis of the plant remains from several samples was undertaken. Six contexts were chosen for full analysis of the waterlogged and/or charred plant remains. One, ***1109***, came from a ditch (***1104***), dated to the late first/early second century AD (Period 1), and the remaining five came from medieval/post-medieval pits. Three of the fills, ***22***, ***130*** and ***851***, represent activity in Period 3 (twelfth to fifteenth century), and two, ***127/128*** and ***224***, Period 4 (sixteenth to seventeenth century). Fills ***851*** and ***127/128*** both contained abundant organic material and were interpreted as containing both cess and domestic waste. Period 4 pit ***220*** (fill ***224***) was thought to have served an industrial function, since it contained a large amount of copper-alloy slag and pieces of fired clay.

4.19.2 The recent *North West Regional Research Framework* (Brennand 2006; 2007) has highlighted the sparse environmental record from Roman sites other than forts, and medieval and post-medieval sites in the region, and has reiterated the importance of significantly expanding the existing dataset. The plant record from Roman sites other than forts in the North West is limited, but includes assemblages from Walton-le-Dale, Lancashire (Huntley and Stallibrass 1995), Church Street, Lancaster (Huntley and Huckerby in prep), and Carlisle (Huntley 2000a). In addition, apart from work carried out on plant assemblages from Roman forts near to the study area, including those at Ribchester (Huntley 2000b) and Kirkham (Howard Davis and Buxton 2000), one (very dated) report includes plant remains from several Roman sites in the Greater Manchester area (cited in Hall and Huntley 2007). The number of medieval/post-medieval sites in the region with any recorded archaeobotanical material is also small, and includes work carried out at Old Abbey Farm, Risley (Heawood 2004), the Carlisle Millennium site (Huckerby and Claxton in prep) and Church Street, Lancaster (Huntley and Huckerby in prep). However, no published data are available for the Greater Manchester area. Any archaeobotanical data from the Grand Arcade excavations will therefore not only provide information about the immediate surroundings of the site itself, but will also add significantly to an

understanding of the Roman and medieval/post-medieval economic/agrarian practices of the North West.

4.19.3 ***Methodology:*** in total, 20 litres of each sample were processed by hand flotation and the flots collected onto a 250µm mesh and air-dried. Any charred and waterlogged seeds were identified and quantified using a Leica MZ6 binocular microscope. Identification was aided by comparison with the modern reference collection held at OA North, and nomenclature follows Stace (1997). The results of the analysis are presented in *Appendix 12*, where the charred plant remains are given as actual counts, and the waterlogged and other remains are given as a scale where 1 = less than five items and 5 = more than 100 items.

4.19.4 ***The Charred Plant Remains:*** the single sample taken from Roman fill ***1109*** contained no charred material except for a few charcoal fragments. However, all of the medieval/post-medieval contexts, except pit fill ***127/128***, contained limited charred cereal remains and/or charred weed seeds. Fill ***130***, from medieval pit ***118***, contained the most cereals, which were dominated by *Avena* sp (oat) and *Triticum aestivum* (bread wheat) grains. Fill ***22***, from Period 3 pit ***23***, also contained a few *Avena* sp grains, and although, in both cases, the oats could not be identified as being the wild or cultivated variety, data from other sites in Britain suggest that by this period it was likely to have been cultivated. Fill ***851***, from Period 3 pit ***850***, contained a few charred *Hordeum vulgare* (barley) grains, which still retained remnants of a husk, and therefore represent a hulled variety.

4.19.5 Fill ***224***, from Period 4 pit ***220***, which is believed to have been associated with industrial activity, was dominated by charred weed seeds, and contained a few *Avena* sp awn fragments, which, again, could represent either wild or cultivated oat. In addition, this sample also contained numerous Poaceae (grass) and *Carex* (sedge) seeds, plus a few *Caltha palustris* (marsh-marigold) seeds, which suggests that some of the material originates from plants growing in damp/wet conditions.

4.19.6 ***The Waterlogged Plant Remains from Roman ditch fill 1109:*** fill ***1109***, from a late first/early second-century ditch (***1104***), contained very well-preserved waterlogged seeds, but as the feature appeared to have been disturbed by modern intrusive material, any interpretation based on the waterlogged remains needs to be treated with some degree of caution. Some of the amorphous plant material, especially, which resembled grass stems/nodes, appeared to be very fresh in character, although none of the seeds were sprouting and did not appear obviously modern.

4.19.7 This sample also contained a fairly diverse range of waterlogged plant material, including common to abundant weed seeds of cultivated and/or waste ground, such as *Stellaria media* (common chickweed), *Persicaria lapathifolia/maculosa* (pale persicaria/redshank), and *Brassica* sp (cabbages). Similar, less abundant, flora included *Aphanes* sp (parsley-pierts), *Agrostemma githago* (corncockle) and *Chenopodium album* (fat-hen), the former two, especially, being associated with cultivated land.

4.19.8 A relatively rich grassland component was also well represented, with frequent to abundant *Ranunculus repens*-type (creeping buttercup) and *Prunella vulgaris* (selfheal) seeds. Some element of acidic grassland/cultivated soils are indicated by the common to abundant *Rumex acetosella* (sheep's sorrel) and *Potentilla erecta*-type (tormental) seeds, the latter also being associated with heathland, which may be pertinent given the common remains of *Calluna vulgaris* (heather) leaves/stems, *Sphagnum* moss leaves, and *Pteridium* (fern) leaf fragments.

4.19.9 The abundant *Carex* sp (sedge) and *Juncus* spp (common rush) seeds, and the frequent *Potentilla palustris* (marsh cinquefoil) seeds, indicate damp/wet conditions. The presence of numerous sedge/grass rhizomes in the sample suggests that such plants may have either been growing in and around the ditch, or alternatively, may represent vegetation used as bedding or roofing, which was brought onto the site and subsequently discarded in the feature as waste material.

4.19.10 Fill ***1109*** also contained common to abundant wood, twig and leaf fragments, and buds, and rare Rosaceae (rose family, including brambles, blackthorn and hawthorn) thorn, which may originate from scrub growing adjacent to the ditch during the time it was filling. However, woody seeds, such as *Sambucus nigra* (elderberry), and *Rubus fruticosus* (blackberry), so common in many features of this nature, were conspicuously absent, as were other obvious food plants commonly found on Roman sites.

4.19.11 ***The waterlogged plant remains from the medieval/post-medieval deposits:*** all five of the medieval/post-medieval deposits contained waterlogged seeds from possible food sources, such as *Prunus* sp (cherries/plums/blackthorn etc) stone fragments, *Raphanus* (radishes) pod fragments, *Corylus avellana* (hazel) nut fragments, *Rubus fruticosus*, and *Sambucus nigra* seeds. In addition, all of the samples contained abundant wood fragments, and fill ***127/128***, from one of the possible cess pits, contained Rosaceae thorns, which may indicate the presence of scrub nearby.

4.19.12 The two contexts interpreted as containing cess, ***127/128*** and ***851***, contained a much more diverse range of edible food stuff, in addition to the varieties mentioned above. These samples also contained abundant *Ficus carica* (fig) seeds, *Malus domestica/Pyrus communis* (apple/pear) pips, *Prunus* cf *spinosa* (sloe) stones and *Prunus* cf *domestica* Ssp *insititia* (bullace/damson) stones, the latter representing an early cultivated variety frequently found on medieval sites in Britain (Greig 1991; 1996). In addition, ***127/128*** contained abundant *Papaver somniferum* (opium poppy) seeds, which were, and still are, used for flavouring bread and cakes (Greig 1991; 1996; Moffett 2006), and ***851*** contained *Vaccinium myrtillus* (bilberry) seeds. Although *Linum usitatissimum* (flax) is more typically associated with fibre and oil production, its presence in ***851*** and other medieval cess/latrine deposits in Britain (Greig 1991; Moffett 2006) suggests that it was also consumed whole as linseed, which, like today, may have been used as a flavouring (Greig

1991). In addition, the presence of *Hyoscyamus niger* (henbane) in ***127/128*** could suggest its use as a medicinal plant (Greig 1996).

4.19.13 A suite of typical arable weeds, such as *Agrostemma githago*, *Anthemis cotula* (stinking chamomile), and *Chrysanthemum segetum* (corn-marigold), were especially abundant in the two 'cess' deposits, ***127/128*** and ***851***. *Spergula arvensis* (corn spurry), another common arable weed, was also present in ***851***. Like similar remains from a barrel-latrine from Worcester, (Greig 1981), and from a number of features at The Southern Lanes, Carlisle (Huntley 2000a), the *Agrostemma* seeds were fragmentary. Greig (1981) interpreted the fragments as a sign that they had arrived in the feature along with other, processed/ground food-stuff, such as cereals. Similarly, Huntley (2000a) suggests that, given *Agrostemma* remains are often associated with cereal bran, it is possible it may have been eaten, which is surprising given the fact that, in quantity, corncockle is poisonous to humans.

4.19.14 Most of the medieval/post-medieval samples contained abundant weed seeds of cultivated and/or waste ground, including *Chenopodium album/Atriplex* (fat-hen/oraches), *Rumex acetosella*, and *Stellaria media*. In addition, *Urtica dioica* (common nettle), which prefers nutrient-rich conditions, and therefore is likely to have been thriving at urban sites, such as Wigan, was very abundant. There is evidence that some ubiquitous weeds of cultivated or rough ground, such as fat-hen, may have been tolerated by farmers as a minor food source, especially in times of food shortage (Moffett 2006). However, as Greig (1981; 1991) has pointed out, such weeds were likely to have been so abundant on urban sites in the past that their presence is not surprising.

4.19.15 All of the deposits, except ***22***, contained abundant taxa of wet/damp conditions, including *Eleocharis* sp (common spike-rush) and/or *Juncus* sp (rushes). In addition, *Conium maculatum* (hemlock), which is typical of damp/waste places, was also fairly widespread. Fill ***851***, the medieval cess deposit, contained the most abundant range of wet/damp ground indicators, and as well as those listed above, contained *Ranunculus flammula* (lesser spearwort), *Ranunculus* Subg *Batrachium* (crowfoot) and *Scirpus sylvaticus* (wood-club rush), which are all commonly found in wet/damp conditions. This same context also contained seeds of *Potentilla palustris*, which is common in fens/marshes/bogs.

4.19.16 Most of the medieval/post-medieval deposits contained some charcoal, coal, and clinker/cinder fragments, which may have been dumped in the features or represents general background waste. In addition, ***22***, which produced the least diverse range of seeds, contained some mammal bone and brick fragments, which suggest that this pit was primarily used for the dumping of domestic/industrial waste. Although insect fragments were present in all of the samples, the fact that they were most abundant in ***127/128*** and ***851*** may corroborate the other evidence for their part use as cess depositories (*Section 4.22 below*).

4.19.17 ***Discussion:*** the waterlogged plant remains from the Roman ditch (***1104***) are likely to represent either the remains of vegetation growing adjacent to or

within the ditch during its filling, and/or the remains of plant material, which was utilised at the site and subsequently thrown into the ditch as waste. Although the assemblage contained numerous weed seeds of cultivated land, the lack of any cereal remains suggests that the remains are more likely to represent spent flooring, bedding, or fodder, rather than the remains of crop-processing waste. In addition, the relatively rich grassland and sedge/rush component (including seeds and rhizomes) is just as likely to represent material being brought onto the site alongside hay/thatch, as well as representing vegetation growing adjacent to and within the damp conditions of the ditch itself.

4.19.18 One element of the assemblage that, more than likely, represents material brought on to the site, perhaps as roofing/bedding, is the heathland component, which, in this sample, is represented by heather stems and leaves, alongside *bryophyte* (moss) and *pteridium* (fern) fragments. The abundant tormentil seeds within the assemblage, a plant that commonly grows amongst dwarf shrub, may also have entered the feature along with the heathland components.

4.19.19 Roman ditch fill ***1109*** contained abundant buds, wood and leaf fragments. However, unlike many waterlogged samples of this nature, there were no blackberry or elderberry seeds, which, together with the other woody remains, are usually taken to represent some sort of scrub growing nearby. One (now very dated) report on other Roman waterlogged remains from Manchester (cited by Hall and Huntley 2007) also describes the dominance of woody material and heather, from a pit fill and several 'layers', which Hall and Huntley (2007) suggest may represent the remains of brushwood for construction purposes. Similarly, given that ditch ***1104***, from which this sample came, represents an extension of ditch ***3020***, which contained abundant fragments of wood and worked wood (*Section 4.20 below*) it is possible that that the wood (and heather) remains from ***1109*** are part of this assemblage.

4.19.20 The waterlogged plant remains from all five of the medieval/post-medival contexts are typical of those found at other urban sites of the medieval/post-medieval period in Britain. The limited charred cereal remains, including oat, bread wheat and hulled barley, which is likely to represent food waste that was subsequently burnt and discarded in the features alongside other domestic debris, are also the typical cereal crops grown during the period (Moffett 2006).

4.19.21 The abundance of charred remains in fill ***224*** may be significant in that this sample came from a pit, which was thought to have served an industrial function. It is possible that the charred grasses and sedges, which dominated the assemblage, may have been utilised for some specific purpose such as for tinder.

4.19.22 All of the medieval/post-medieval deposits contained a range of waterlogged seeds from ruderal plants common on waste/rough or cultivated ground and taxa indicative of damp or nitrogen-rich conditions. A number of the deposits

also contained wood fragments and seeds from woody species, such as blackberry and elderberry, which both thrive in nitrogen- and phosphorus-enriched conditions provided by human habitation (Greig 1991). Such taxa often dominate seed assemblages from the medieval period, and the conditions of many urban sites were likely to have been damp and nitrogen-rich, and therefore suitable for many of these taxa to be growing naturally in the vicinity. In addition, given that part of the Grand Arcade site encompasses the former floodplain of the River Douglas, it is highly likely that conditions were wet/damp and therefore home to a range of damp-loving species. As Greig (1991) points out, it is not always easy to interpret the origins of such assemblages as it is often difficult to distinguish between what may have been growing locally and what was brought in as functional material, such as that for flooring or bedding.

4.19.23 The two samples interpreted as containing cess material did indeed contain a wider range of edible seeds than the other features. The varieties found, such as fig, flax, apple/pear, opium poppy, sloe/bullace/damson, and blackberry, are, again, typical of those found on many urban medieval/post-medieval sites in Britain (Greig 1991; 1996), and suggest that a range of collected and cultivated food-stuff was being consumed at the site. In addition, like the plant assemblage from a barrel-latrine from Worcester (Greig 1981), the 'cess' deposits also contained a rich assemblage of arable weeds, which may have entered the features along with straw as 'spent' flooring/bedding, or as cereal-processing waste. As Greig (1991) suggests, such features were often used for the disposal of a variety of products, including faecal material and other domestic rubbish. The similarity of the plant remains from the medieval and early post-medieval phases of settlement at Wigan indicates a continuity in the environs and resources available to and utilised by the occupants of the site during these periods.

4.19.24 ***Conclusion:*** the waterlogged remains from the single analysed Roman deposit from the Grand Arcade excavations are likely to represent either vegetation growing in and adjacent to the ditch (***1104***) during its filling, or represent 'spent' flooring/bedding/fodder being utilised at the site. In either case, the dataset has added significantly to our understanding of the rural Roman environment and the available resources in the area. The data indicate a mosaic of arable/waste land, grassland, heathland and wet/damp ground, which is similar to the range of environments available to the Roman inhabitants at the Roman fort of Ribchester (Huntley 2000b). Similarly, the range of vegetation types at this site was also interpreted as evidence for the widespread dumping of waste hay and bedding in many of the features. The abundant woody material within the Roman assemblage from Wigan may represent the remains of the same construction? feature/dumped assemblage identified in the Roman ditch ***3020***, although this can not be conclusive.

4.19.25 Many medieval/post-medieval urban sites are characterised by signs of their rubbish disposal and the subsequent use of rubbish and latrine pits (Greig 1991). Even though the range of wild and/or cultivated fruit, nuts and seeds found at Wigan is typical of most urban medieval/post-medieval cess/pit

deposits in Britain (Greig 1991; 1996), this dataset has added significantly to the nature of the urban environment and economic/domestic practices in the North West. Material from most of the medieval/post-medieval features probably represents a combination of vegetation growing locally and waste material from a range of different functions/activities, such as clearance waste or spent flooring/bedding. The assemblages from the 'cess' pits also include edible foodstuff, which was gathered from the wild, cultivated locally, and/or imported to the site.

4.20 WATERLOGGED WOOD *(Christine Howard-Davis and Denise Druce*)

4.20.1 ***Introduction:*** varying amounts of waterlogged wood were recovered from a range of contexts of Roman (Period 1: ***1109***, ***3021***, ***3072***; Period 2A-C: ***200***; Period 2C: ***163***), medieval (Period 3: ***851***, ***3029***), early post-medieval date (Period 4: ***127***, ***240***, ***3094***, ***3112***; Period 5: ***3019***, ***3035***, ***3057***), a medieval deposit (***707***) in evaluation Trench 7 (Area G7), as well as being unstratified (***947***). By far the majority, some 73% of the assemblage, come from three contexts in Area G3: ditch fill ***3021*** (Period 1); pit fill ***3029*** (Period 3); and pit fill ***3035*** (Period 5). In all, 143 fragments of waterlogged wood were subject to further analysis. A small representative sample of the best-preserved Roman tent pegs have been selected for conservation. None of the oak timbers were suitable for dendrochronological dating.

4.20.2 ***Wood species:*** in total, 48 pieces of worked wood were analysed for species identification from fill ***3021***, and one piece of wood (a peg) was identified from fill ***3072***, both fills of Roman ditch ***3020***. The analysis involved the brief description, measurement and identification of wood species of each piece, although no attempt was made to calculate the age of the pieces and no woodland management practices were identified.

4.20.3 Initially, a transversal section of each piece of wood was observed using a Leica MZ6 binocular microscope using x40 magnification in order to determine its cellular pattern (*ie* ring, semi-ring, or diffuse porous). Many of the better preserved pieces of *Quercus* (oak), with its wide and distinct auxillary rays, could be identified at this stage; however, if it was unclear, or if the wood proved to be diffuse porous, then radial and tangential sections were mounted on a slide in water, sealed with a cover slip, and observed using a Olympus BH-2 microscope using x200 and x400 magnification. Identification was made by use of standard reference book (Schweingruber 1990) and comparison with reference slides held at OA North.

4.20.4 The results of the analysis, and a summary of the find types and associated species identifications, are presented in *Appendix 11*. The most common species of wood recorded are *Alnus* (alder) and *Quercus*, where *Alnus* forms the widest range of find types, including offcuts (blocks, chunks, chips, and flakes), roundwood/stakes, and a single post, and *Quercus* forms offcuts, planks and the three tent pegs. Other wood species were also recorded, including *Corylus* (hazel), *Betula* (birch), and *Salix* (willow), but each of these contribute only one or two pieces.

4.20.5 ***Structural wood:*** most of the material recovered, from features of all dates, appeared to be scrap structural wood, much of it small diameter roundwood, and riven offcuts, some of the Period 1 material being heavily burnt. Several of the surviving roundwood fragments had been cut to single-facet points, and without doubt much of it derived from coppiced wood brought onto the site and used for a variety of purposes, amongst them to make wattle fences, wall panels, or pit linings. There was little, if any, evidence for wattle structures, and it must be assumed that the origin of much of the Period 1 material, from the upper fill of ditch ***3020***, suggests that it was redeposited during clearance. Larger diameter roundwood (where the species was identified, it was alder) seemed to be confined to medieval pit fill ***3029***, and seems to reflect the use of larger stakes in simple structures, as several have been cut to multi-facet points.

4.20.6 There was little evidence for wood-working on site; one or two large chips from the fill (***851***) of pit ***850*** might point to some timber conversion, although this is not likely to have been the case in general, as under normal circumstances conversion would have taken place at the felling site, in order to reduce the size and weight of the timbers to be transported (Darrah forthcoming). Several of the fragments can be identified as offcuts, probably generated by the conversion or trimming of small timbers, with fragments from Period 1 ditch fill ***3021*** and Period 5 pit fill ***3035*** clearly showing the shallow axe cuts typical of felling at one end, with the other end cut more-or-less square. A plank offcut from Period 4 pit fill ***3094***, clearly saw-cut at each end, as might be expected in the post-medieval period, seems to have been generated by the removal and discard of a particularly poor, knotty fragment.

4.20.7 A substantial offcut from Period 1 ditch fill ***3021*** is of particular interest. Whilst again from the knotty end of a baulk of timber, it appears to have been cut to an L-shaped section, and thus could have been trimmed from a threshold timber, the L-shaped section intended to act as a stop for the door.

4.20.8 There were no large squared structural timbers, with most of the riven fragments in the assemblage coming from planking. Where the preservation was good enough for the method of conversion to be recognised, the majority of the plank fragments were radially converted, and retained the typical triangular cross-section produced by this method. The surviving widths of some of the fragments of plank from Period 1, up to 120mm, suggests some skill in their production. A poorly-preserved fragment of oak planking from Period 4 pit fill ***127*** was over 240mm wide, but as its conversion could not be determined with confidence, it could have been sawn, a method of production which requires considerably less skill from the woodsman. Similarly, an 840mm long and 100mm wide fragment of riven plank from deposit ***707*** in evaluation Trench 7 (Area G7) was little more than 5mm thick. Splitting wood to this thinness again calls for considerable skill. Occasional nails or peg holes attest to their use in carpentry, but no other clues could be gained as to the use of individual timbers.

4.20.9 ***Wooden objects:*** the excavation also produced numerous fragments of Roman tent pegs, many broken, and on occasion so insubstantial that they were discarded without use. Two were recovered from Period 1 ditch fill ***1109***, a single example from primary fill ***3072*** of ditch ***3020***, and ten from the final fill (***3021***) of the same ditch. All those well-preserved enough for identification were made in the same manner, being trimmed from a small baulk of radially split oak. In general, they follow the same pattern as modern wooden tent pegs, with a deep nick approximately 80mm from one end forming a head, and acting as a stop for the guy ropes. Several of these examples, however, whilst carefully made, have no head, and simply taper away, again leading to the possibility that they were discarded rejects. Most of the pegs are around 300mm in length, and around 40mm wide, but one from ***3021*** stands out, being 420mm long. This division in size has been noted elsewhere, for instance the early forts at Ribchester (Howard-Davis and Whitworth 2000, 330) and Kirkham (Howard-Davis and Buxton 2000, 60), where it was suggested that the two lengths served different purposes, short examples pegging the walls of the tent to the ground, the longer ones for securing guy ropes.

4.20.10 A riven plank some 235mm long and 50mm wide came from Period 5 pit fill ***3035***. The large hole (*c* 40mm in diameter) towards one end suggests that this could be part of a barrel stave, an identification perhaps supported by a small peg hole in one edge. It is, however, poorly preserved, and broken at both ends, and thus lacks any of the diagnostic features which might confirm this identification. A small round bung with central perforation was unstratified (***947***), and could be of any date.

4.20.11 ***Discussion:*** although the wood assemblage from the Roman ditch is small by comparison, some similarities can be observed with other Roman assemblages in the region. Oak and alder (plus hazel) wood also dominated the assemblage from Ribchester (where nearly 1000 fragments were identified; Huntley 2000c). As at the Grand Arcade site, the alder was principally found as roundwood, and oak mainly as woodworking offcuts (chips/flakes), which suggests that the selection of species was being practised depending on the type of structure being made. Similarly, although at least seven other wood species were identified at Ribchester (including birch and willow/poplar), the pollen evidence from the region suggests that a much greater variety would have been available at that time, which implies that some form of selection was being carried out from the outset (Huntley 2000b). Although no formal species identification was carried out on the worked wood assemblage from Kirkham (Howard-Davis and Buxton 2000), the numerous tent pegs discovered at this site, like those from the Grand Arcade site, appeared to consist primarily of radially split oak wood.

4.20.12 The nature of the assemblage suggests that the material consists of a combination of both woodworking debris and the remains of a possible fence or roundwood structure. However, given that only one piece was large enough to be considered a 'post', it can be inferred that the original structure was of little substance, and may therefore have been some sort of hurdle or

panel. The planks seem to have been lying recumbent under the stakes, and could represent the remains of a collapsed fence. If this were the case, though, it is difficult to ascertain whether the fence collapsed and fell *in-situ*, or whether the structure came from elsewhere and was subsequently dumped into the ditch alongside the other woodworking debris and wooden pegs. The nature of the waterlogged plant remains from an extension of the same ditch (***1104***; *Section 4.19.6 above*), which contained a relatively diverse range of ecological types and plant material representing possible hay, bedding or fodder, supports the hypothesis that the ditch was indeed used for the dumping of a wide range of settlement debris.

4.20.13 ***Conclusion:*** although the worked wood assemblage from the Roman ditch (***3020***) was small, the data have provided information on not only the nature of the resources available to the Roman occupants of Wigan, but also on the nature of the selection and usage of different species. The results are in accordance with other work carried out in the region, which suggest that oak and alder were the preferred wood used for construction purposes. The assemblage from Wigan appears to consist of, primarily, dumped woodworking debris, with the remains of a possible fence or other type of lightweight structure. However, it is not clear whether this structure collapsed *in-situ* or whether it originated elsewhere in the settlement and was subsequently dumped in the ditch as debris.

4.21 CHARCOAL *(Dana Challinor)*

4.21.1 A selection of charcoal samples from Area G7/10 was submitted for analysis, mostly dating to Periods 1 and 2 (late first to mid-second century AD). Two samples came from timber Structure ***950***, and five came from the Roman bath-house, Building ***1000***. The assemblages from Building ***1000*** offered a rare chance to examine the fuelwood used in hypocaust systems. Few analyses of this type have yet been published in the North of England.

4.21.2 ***Methodology:*** the samples selected for analysis were mostly quite rich in charcoal and were divided to provide a representative sub-sample of *c* 100 fragments. Charcoal that was >2mm in transverse section was identified using standard techniques. The charcoal was fractured and sorted into groups based on the anatomical features observed in transverse section at x7 to x45 magnifications. Representative fragments from each group were then selected for further examination using a Meiji incident-light microscope at up to x400 magnification. Identifications were made with reference to Schweingruber (1990), Hather (2000) and modern reference material. In total, 749 fragments were examined. Classification and nomenclature follow Stace (1997). The results by fragment count are given in *Appendix 13*.

4.21.3 The taxonomic level of identification varied according to the biogeography and anatomy of the taxa, but nine were positively identified: *Ulmus* (elm); *Quercus* (oak); *Betula* (birch); *Alnus* (alder); *Corylus* (hazel); *Populus/Salix* (poplar/willow); *Prunus* (blackthorn, cherry); Maloideae (hawthorn, apple, pear etc); and *Fraxinus* (ash). Most of the *Prunus* fragments could not be

identified to species level with certainty, either because sediment obscured the relevant anatomical characteristics, or because the ray widths/height examined were not conclusive. The preservation of the charcoal was also extremely variable; in most samples it was very soft and heavily infused with sediment, but one sample (from pit fill ***567***) produced some very large, well-preserved pieces. There were a few fragments in all samples categorised as indeterminate, which were not identifiable because of poor preservation or an unusual cellular structure. It is likely that these indeterminate fragments represent additional specimens of taxa positively identified at the site.

4.21.4 ***Flue 201:*** two deposits from flue ***201*** were examined (***567*** and ***568***). The flue was stone-lined, with *in-situ* burning and the charcoal-rich deposits probably represent the remains of the wood used to fuel the hypocaust system in R1. It is interesting that the assemblages differ, insofar as ***567*** is dominated by oak, whereas ***568*** produced a range of taxa, including oak, elm, hazel, cherry/blackthorn and hawthorn-type. This was the only sample to produce elm, which smoulders when burnt as a wood fuel (Edlin 1949), and would not be an ideal choice for bath-house heating, unless the wood were already converted into charcoal.

4.21.5 ***Furnace 460:*** this feature was the *praefurnium* for the hypocaust system and the charcoal represents the rake-out. Oak clearly provided a key fuelwood, but ash and alder were also utilised. Alder does not burn well and must have been either very well seasoned or used as charcoal, for which it makes a very good fuel (Edlin 1949).

4.21.6 ***Flue 571:*** this assemblage is important as it comes from the *in-situ* flue of the hypocaust furnace and is dominated entirely by oak. This suggests that oak was the main fuelwood preferred for the system.

4.21.7 ***Layer 777:*** this was a mixed layer of earth/debris infilling the heating system of R1, and dates to the mid-second century. The charcoal may post-date the disuse of the heating system, but it may also represent the remains from the final use of the structure. It is notable that there is less oak and more alder than in the earlier samples. This may be due to taphonomic mixing or to a slight change in the selection of fuelwood. There may have been few areas suitable for woodland growth close to Wigan, with bogs forming as the trees were cleared and the soils became impoverished and waterlogged. The increase in alder may reflect the limited availability of woodland resources.

4.21.8 ***Hearth 876:*** this was the only feature from Structure ***950*** from which charcoal was analysed. The assemblages were not so different from those in Building ***1000***, and could quite easily represent the fuel remains from a similar heating system. Like flue ***201***, it is notable that the fill (***863***) of hearth ***876*** was dominated by oak, whereas ***869*** produced a range of taxa, including alder and willow/poplar, which would have been better suited to use as charcoal fuels. The *Alnus/Corylus* in this sample is probably alder, but the charcoal was too poorly preserved to check the perforation plates.

4.21.9 ***Discussion:*** it is apparent that oak provided the main fuel for the hypocaust system of the bath-house, Building ***1000***, forming 67% of the whole assemblage. There was little evidence of narrow roundwood being used, such as would have sufficed for a short-lived domestic fire. The other taxa could have entered the archaeological record through various modes: as kindling or supplementary fuel; accidental inclusion; reuse of broken artefacts; or redeposited rubbish. The fuel used to heat hypocausts in bath-houses was normally wood (Rook 1992). However, several of the *in-situ* samples examined from Wigan produced species which suggest the possibility of the use of charcoal as fuel. The detection of charcoal as opposed to wood fuels is not possible anatomically, but clearly a sustained, even, high heat was required to maintain the constant warmth of the bath-house and charcoal would have been suited to this. Charcoal fuel was certainly used in Roman Britain for smelting, and sometimes for braziers and cooking stoves (Gale 1999).

4.21.10 The benefits of charcoal burning would have been offset by the quantity of wood required to produce charcoal, estimated at a ratio of 7:1 (Rackham 2006). The use of wood as fuel in Rome itself was probably related to the timber trade; it is much easier to transport than charcoal, and there is documentary evidence of wood supplies specifically for bath-houses being sent from other cities (Yegül 1992). In Roman Britain, however, there is little evidence for a widespread timber trade, and it is more likely that local resources were utilised, using coppicing to manage the woodland supplies.

4.21.11 The charcoal from Wigan did not provide evidence of management practices, but this is rarely identifiable from archaeological residues. The taxa identified would have been locally available, oak representing the main woodland element, with birch, ash, hazel, alder, elm and willow/poplar, and shrubbier elements of hawthorn-type and blackthorn. The use of alder may suggest that increasing clearance had limited the available woodland resources, creating boggy conditions in which alder thrives. Whether the alder was then used as wood or charcoal cannot be confirmed, but it is reasonable to suggest that at Wigan a combination of wood and charcoal fuel may have been used, and the charcoal could have derived from another activity which necessitated its production.

4.22 THE INSECT REMAINS *(David Smith)*

4.22.1 Only one sample from the medieval layers was waterlogged, from one of a series of pits. Analysis of the insect remains was therefore attempted on a sample of the material. The sample was processed using the standard method of paraffin flotation, as outlined in Kenward *et al* (1980). The weight and volume of the sample processed is described in *Appendix 14*.

4.22.2 ***Methodology:*** the insect remains were sorted from the flots and stored in ethanol. The Coleoptera (beetles) were identified by direct comparison to the Gorham and Girling Collections of British Coleoptera. The various taxa of

insects recovered are presented in *Appendix 14*. The taxonomy for the Coleopera (beetles) follows that of Lucht (1987).

4.22.3 Where applicable, each species of Coleoptera has been assigned to one, or more, ecological grouping(s) and these are indicated in *Appendix 14*. These groupings are derived from the preliminary classifications outlined by Robinson (1981; 1983). The groupings themselves are described in *Appendix 14*. The various proportions of these groups, expressed as percentages of the total Coleoptera present in the faunas, are also discussed in *Appendix 14*. The dung/ foul, tree, grassland and moorland groupings are calculated as a proportion of the terrestrial taxa recovered rather than as a proportion of the minimum number of individuals for the whole fauna (effectively excluding the dominant water beetles from this statistic). None of the insects recovered are listed as rare in the Red Data Book (RDB) classifications of Hyman and Parsons (1994).

4.22.4 The host plants used by the various species of phytophage (plant feeding) beetles recovered are listed in *Appendix 14*. The information included is primarily taken from Koch (1992). The plant taxonomy used is that of Stace (1997).

4.22.5 ***Insect faunas:*** the fauna is dominated by insects that are associated mainly with the dung of herbivores, in essence cow pats. The clearest indication of this are the 17 individuals of the 'dung beetle', *Aphodius sphacelatus* (Panz) or A *prodromus* (Brahm). These two closely related species are almost exclusively associated with cow manure lying in open pasture (Jessop 1986).

4.22.6 The presence of similar material, and again an open grassland environment, is indicated by the four individuals of the *Geotrupes* spp, 'dor beetle', recovered. Many of the other species present, such as the hydrophilids *Cercyon impressus* and *C analis* and the staphylinids *Platystethus arenarius* and the various *Oytelus* species recovered, are associated with a wider range of foul materials, and can occur in cattle dung as well (Hansen 1987; Tottenham 1954).

4.22.7 There is limited evidence that this material either came from pasture or that rather rough grassland was nearby. This is mainly indicated by the single *Sitona* species recovered, which feeds on clover (*Trifolium* spp), and a range of chrysomelid 'leaf beetles' which are commonly associated with a range of Apiaceae 'hog weeds' or crucifers (members of the cabbage family) (Koch 1992). The small number of carabid 'ground beetles', such as the 'violet ground' beetle *Carabus violaceus* and *Nebria salina,* are also common in rough grassland (Lindroth 1974).

4.22.8 There are no indications for the presence of any form of water body, even a temporary one, as water beetles and the range of species normally associated with the margins of still water are absent from this assemblage. In addition, there are no species indicative of trees or dead wood. Lastly, the range of species characterised by Kenward (Hall and Kenward 1990) as common in human settlement and materials is absent from this deposit.

4.22.9 ***Discussion:*** it would seem that this deposit from the site was most likely a fairly pure deposit consisting of animal dung, probably cow pats. It is difficult to establish from the insect remains if this material was washed into the pit or intentionally placed into it. Certainly, the lack of indicators for the wider environment or settlement waste may well suggest that this material became incorporated into the archaeological record fairly quickly. It also seems unlikely that this material represents dumped stabling material, since many of the other species normally associated with this type of material are missing (*ie* Kenward *et al* 2004; Smith and Chandler 2004).

4.22.10 This is the only waterlogged insect deposit of any date from Wigan and the Greater Manchester area from this period. Its apparent nature, especially given that this is a urban deposit, has no obvious comparison in terms of other urban British insect faunas.

4.23 SUMMARY OF ARCHAEOMAGNETIC SAMPLING *(Mark Hounslow and Vassil Karloukovski)* (see *Appendix 15* for full report)

4.23.1 ***Results:*** five of the 11 samples from the northern part of flue ***201*** showed partial thermoremanent magnetisations, indicating two successive heating events with samples in different positions. In spite of extensive thermal demagnetisation of the specimens, these five samples could not contribute to an archaeomagnetic date. The remaining six samples from the southern part of the feature (three shale and three sandstone samples) displayed simpler magnetic behaviour, but showed lithology-specific divergence in the isolated archaeomagnetic inclinations. The mean direction, corrected to Meriden (and corrected for thermoremanent magnetic distortion) has declination = 343.5^{o}, inclination = 66.3^{o}. The large 95% confidence cone of 7.1^{o} is the result of the strong lithology-dependent inclination divergence. The comparison to the UK master curve of Clark *et al* (1988) suggests two possible, though imprecise, dates for the last heating of the feature, either 100 BC to AD 200 or AD 1800 to the present.

4.23.2 Of the eight samples taken from hearth ***876***, six provided useful archaeomagnetic directions. The mean direction (variation corrected) was declination = 354.9^{o}, inclination = 65.2^{o} (α_{95} = 3.5^{o}, N=6, K = 370). This produces a direction corrected to Meriden (and corrected for thermoremanent magnetic distortion) of declination = 355.2^{o}, inclination = 65.5^{o} (α_{95} = 3.5^{o}). This mean direction and its confidence interval, when compared to the UK master curve of Clark *et al* (1988), indicates the most likely last heating date to be about AD 140 (95% confidence date range AD 80–180).

5. CURATION, CONSERVATION AND DISSEMINATION

5.1 RECIPIENT MUSEUM

5.1.1 Wigan Museum Service has been nominated as the ultimate repository for the finds and the integrated project archive:

History Shop,
Wigan Leisure and Cultural Trust Heritage,
Millgate,
Wigan,
Lancashire
WN1 1YN
Tel: 01942 828 128

5.1.2 Arrangements were made with the Museum prior to the commencement of the excavations for the deposition of the complete site archive from the 2005 excavations and the Museum Collections Manager, Yvonne Webb, has acknowledged her willingness to accept the archive.

5.2 STORAGE

5.2.1 The complete project archive, which will include written records, plans, black and white and colour photographs, artefacts, ecofacts and sieved residues, have been prepared for long-term storage following the guidelines set out in *Environmental standards for the permanent storage of excavated material from archaeological sites* (UKIC 1984, Conservation Guidelines 3), and *Guidelines for the preparation of excavation archives for long-term storage* (Walker 1990).

5.2.2 All finds have been packaged according to the Museum's specifications, either in acid-free cardboard boxes or, in the case of less stable materials, in airtight plastic boxes. The metalwork assemblage and the small quantity of medieval glass constitute the only material categories that are potentially unstable; although these materials have been packaged in airtight plastic boxes, they will also need to be stored in controlled conditions.

5.3 DISSEMINATION

5.3.1 The complete results obtained from the archaeological investigation associated with the Grand Arcade Development are incorporated in this final excavation report, which includes the findings from the detailed analysis of each material category. In addition to Modus Properties, copies of this final archive report will be forwarded to Wigan Museum Services, Wigan Metropolitan Borough Council Planning Department and Conservation Officer, the Greater Manchester Historic Environment Record, and Wigan library.

5.3.2 Given the regional, or even national, significance of the results, an agreement has been made to publish the site in order to disseminate the findings to a

national audience. It is anticipated that the results will be published as an A4 monograph report in OA North's *Lancaster Imprints* series. The publication is scheduled to comprise about 100,000 words of text, including bibliography, preliminaries and so on. The text will be supported by approximately 30 line drawings, including artefactual illustrations and interpretative phase drawings, and approximately 30 plates. It must be stressed that these word and figure counts are intended as an approximate guide only.

5.3.3 The publication text will primarily address the revised research objectives for the project, and will present a closely argued stratigraphic narrative detailing the development of the site from the Roman to post-medieval periods. It will also provide an overview and discussion of the finds from the site, both artefactual and environmental, supported by a summary of the specialist reports on all material categories. The site will be placed in its local, regional and national context, and a discussion of the importance of the data in terms of advancing understanding of the history and development of Wigan and of the wider region will be prepared. This will necessarily include evidence obtained from other archaeological investigations carried out in Wigan and the surrounding area. Catalogued information relevant to the research objectives that requires public dissemination may be provided in another medium, perhaps as a CD-ROM.

5.3.4 Throughout the project, a high level of communication will be maintained between all members of the project team. It is anticipated that the specialists, especially those with inter-related study areas, will work closely together in order to facilitate integration between material categories, which will be essential in order to meet the research objectives. This will be achieved through meetings held during the course of the project to discuss progress and research aims. The finished volume will therefore aim to present a high degree of integration between the artefactual, ecofactual, structural and stratigraphic evidence from the site.

5.3.5 The programme of excavations has generated considerable public interest from the local population, in addition to the wider archaeological community. Liaison with several primary and secondary schools during the course of the project, moreover, has demonstrated the considerable educational potential of the excavation results. A popular publication that presents the results of the excavation in simple terms, and places them in the context of the historical development of Wigan, is thus being prepared by Wigan Museum Services.

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APPENDIX 1: SUMMARY CONTEXT LIST

AREA G7/G10 CONTEXT SUMMARY

Context	Area	Description	Period
01	G10	Fill of pit ***02***	4
02	G10	Cut of pit	4
03	G10	Fill of pit ***04***	3
04	G10	Cut of pit	3
05	G10	Fill of drain ***06***	6
06	G10	Cut of drain	6
07	G10	Fill of pit ***08***	6
08	G10	Cut of pit	6
09	G10	Fill of pit/posthole ***10***	6
10	G10	Cut of pit/posthole	6
11	G10	Fill of posthole ***12***	6
12	G10	Cut of posthole	6
13	G10	Cut of pit	4
14	G10	Primary fill of ***13***	4
15	G10	Secondary fill of ***13***	4
16	G10	Upper fill of ***13***	4
17	G10	Cut of linear pit	6
18	G10	Fill of ***17***	6
19	G10	Natural geology (orange/pink clay)	-
20	G10	Natural geology (Yellow sandy-clay)	-
21	G10	Upper fill of pit ***23***	3
22	G10	Lower fill of pit ***23***	3
23	G10	Cut of pit	3
24	G10	Upper fill of pit ***27***	2
25	G10	Tertiary fill of pit ***27***	2
26	G10	Secondary fill of pit ***27***	2
27	G10	Cut of pit	2
28	G10	Primary fill of pit ***27***	2
29	G10	Cut of pit	3
30	G10	Tertiary fill of pit ***29***	3
31	G10	Upper fill of pit ***29***	3
32	G10	Upper fill of ditch ***43***	2
33	G10	Fill of ditch ***34***	2
34	G10	Cut of ditch	2
35	G10	Secondary fill of pit ***29***	3
36	G10	Fill of pit ***37***	3
37	G10	Cut of pit	3
38	G10	Cut of pit	2
39	G10	Fill of pit ***38***	2
40	G10	Upper fill of pit ***41***	2
41	G10	Cut of pit	2
42	G10	Primary fill of pit ***29***	3
43	G10	Cut of ditch	2
44	G10	Fill of ditch ***43***	2
45	G10	Fill of pit ***46***	2
46	G10	Cut of pit	2
47	G10	Fill of ditch ***43***	2
48	G10	Fill of ditch ***43***	2
49	G10	Cut for drain ***50***	6
50	G10	Fill of cut ***49***	6

51	G10	Drain within cut ***49***	6
52	G10	Fill of pit ***41***	2
53	G10	Fill of pit ***41***	2
54	G10	Fill of pit ***41***	2
55	G10	Fill of pit ***41***	2
56	G10	Primary fill of pit ***41***	2
57	G10	Fill of cut ***58***	7
58	G10	Drain within ***59***	5
59	G10	Cut of drain ***58***	6
60	G10	Fill of ditch ***43***	2
61	G10	Primary fill of ditch ***34***	2
62	G10	Fill of ditch ***43***	2
63	G10	Cut of pit	4
64	G10	Fill of pit ***63***	4
65	G10	Fill of ditch ***43***	2
66	G10	Upper fill of pit recut ***69***	6
67	G10	Secondary fill of pit recut ***69***	6
68	G10	Lower fill of pit recut ***69***	6
69	G10	Recut of pit ***70***	6
70	G10	Cut of pit	4
71	G10	Secondary fill of ditch ***43***	2
72	G10	Cut of pit	4
73	G10	Fill of pit ***72***	4
74	G10	Cut of pit	2
75	G10	Primary fill of pit ***74***	2
76	G10	Secondary fill of pit ***74***	2
77	G10	Primary fill of ditch ***43***	2
78	G10	Fill of pit ***70***	4
79	G10	Group context: three cuts of stakeholes in edge of ditch ***43***	2
80	G10	Group context: fills of stakeholes ***79***	2
81	G10	Structure: brick-built; fronts onto ***84***	6
82	G10	Structure: stone surface south of ***84***	6
83	G10	Structure: stone surface north of ***84***	6
84	G10	Structure: brick and cobble surface	6
85	G10	Structure: brick walls along north of ***84***	6
86	G10	Structure: cobble surface north of ***85***	6
87	G10	Structure: brick wall north of ***86***	6
88	G10	Structure: stone walls truncated to west by ***87***	5
89	G10	Structure: brick wall associated with ***95***	6
90	G10	Structure: stone wall associated with ***95***	5
91	G10	Structure: stone surface associated with ***95***	6
92	G10	Structure: brick wall associated with ***93***	6
93	G10	Structure: brick-built	6
94	G10	Structure: brick-built; within ***93***	6
95	G10	Structure: brick and stone-built	6
96	G10	Cut of posthole: truncated pit ***97***	2
97	G10	Cut of pit: truncated by pit ***96***	2
98	G10	Fill of posthole ***96***	2
99	G10	Fill of pit ***97***	2
101	G10	Deposit: unstratified clearance from ***84*** and ***85***	7
102	G10	Structure: brick and stone-built wall running alongside ***84***	6
103	G10	Cut of gully	4
104	G10	Fill of gully ***103***	4
105	G10	Cut of pit	4
106	G10	Fill of pit ***105***	4
107	G10	Possible posthole/small pit	4

108	G10	Fill of posthole/small pit	4
109	G10	Cut of pit: truncated by pit ***111***	4
110	G10	Fill of pit ***109***	4
111	G10	Cut of pit: truncated pit ***109***	4
112	G10	Fill of pit ***111***	4
113	G10	Cut of pit	2C
114	G10	Fill of pit ***113***	2C
115	G10	Cut of ditch	2
116	G10	Secondary fill of ditch ***115***	2C
117	G10	Deposit: rubble layer	2C
118	G10	Cut of pit	3
119	G10	Upper fill of pit ***118***	3
120	G10	Structure: stone-built	5
121	G10	Fill of pit ***118***	3
122	G10	Fill of pit ***118***	3
123	G10	Fill of pit ***124***	6
124	G10	Cut of pit	6
125	G10	Primary fill of ditch ***115***	2C
126	G10	Upper fill of pit ***129***	4
127	G10	Secondary fill of pit ***129***	4
128	G10	Primary fill of pit ***129***	4
129	G10	Cut of pit	4
130	G10	Fill of pit ***118***	3
131	G10	Fill of pit ***118***	3
132	G10	Primary fill of pit ***118***	3
133	G10	Fill of robber cut ***239***	2C
134	G10	Deposit: mortar residue in robber cut ***239***	2C
135	G7	Upper fill of pit ***140***	4
136	G7	Fill of pit ***140***	4
137	G7	Tertiary fill of pit ***140***	4
138	G7	Secondary fill of pit ***140***	4
139	G7	Primary fill of pit ***140***	4
140	G7	Cut of pit	4
141	G7	Cut of pit	4
142	G7	Fill of pit ***141***	4
143	G10	Secondary fill of pit ***118***	3
144	G7	Cut of pit: truncated by pit ***146***	4
145	G7	Fill of pit ***144***	4
146	G7	Cut of pit: truncated pit ***144***	6
147	G7	Fill of pit ***146***	6
148	G7	Upper fill of ditch ***150***	2
149	G7	Primary fill of ditch ***150***	2
150	G7	Cut of ditch = ***43*** = ***178***	2
151	G7	Cut of ditch: truncated cut ***165***	4
152	G7	Upper fill of ditch ***151***	4
153	G7	Fill of ditch ***151***	4
154	G7	Structure: stone-built; within ditch ***151***	4
155	G7	Fill of ditch ***151***	4
156	G7	Upper fill of pit ***158***	4
157	G7	Primary fill of pit ***158***	4
158	G7	Cut of pit	4
159	G10	Cut of pit	3
160	G10	Upper fill of pit ***159***	3
161	G10	Cut of possible drain	3
162	G10	Fill of possible drain ***161***	3
163	G10	Primary fill of robber cut ***576***	2C

164	G10	Upper fill of robber cut ***576***	2C
165	G10	Construction cut: truncated by ***151***, ***201***, ***576,***	2
166	G10	Lower fill of pit ***159***	3
167	G10	Fill of pit ***159***	3
168	G10	Fill of pit ***159***	3
169	G10	Fill of pit ***159***	3
170	G10	Fill of robber cut ***576***	2C
171	G10	Cut of pit	6
172	G10	Fill of pit ***171***	6
173	G10	Cut of pit	4
174	G10	Cut of drain	4
175	G10	Fill of drain ***174***	4
176	G10	Deposit: layer sealing pit ***173***	5
177	G10	Fill of pit ***173***	4
178	G10	Cut of ditch = ***43*** = ***150***	2
179	G10	Fill of ditch ***178***	2
180	G10	Deposit: backfill of structure ***94***	7
181	G10	Structure: stone surface-component of structure ***94***	6
182	G10	Deposit: bedding layer for surface ***181***	6
183	G10	Structure: brick-built; associated with structure ***94***	6
184	G10	Cut of pit	4
185	G10	Fill of pit ***184***	4
186	G10	Structure: brick-built	5
189	G10	Group context: ten stakeholes along edge of ditch ***178***	2
190	G10	Fill of robber cut ***576***	2C
191	G10	Fill of robber cut ***576***	2C
192	G10	Structure: stone surface	4
193	G10	Cut of ditch	2A
194	G10	Fill of ditch ***193***	2A
195	G10	Fill of robber cut ***576***	2C
196	G10	Fill of robber cut ***576***	2C
197	G10	Fill of robber cut ***576***	2C
198	G7	Cut of ditch	2
199	G7	Upper fill of ditch ***198***	2
200	G7	Primary fill of ditch ***198***	2
201	G10	Flue: stone-built, associated with R1	2B
202	G10	Deposit: layer	5
203	G7	Upper fill of ***198***	2
204	G7	Structure: brick-built	6
205	G10	Structure: brick and stone-built; truncated ditch ***115***	6
206	G10	Fill of pit ***173***	4
207	G10	Fill of pit ***220***	4
208	G7	Group context: two stakeholes in edge of ditch ***198***	2
209	G7	Structure: timber in ditch ***198***	2
210	G10	Upper fill of pit ***220***	4
212	G10	Upper fill of ditch ***115*** - north end	2
213	G10	Secondary fill of ditch ***115*** - north end	2
214	G10	Primary fill of ditch ***115*** - north end	2
215	G10	Fill of construction cut ***165***	2C
216	G10	Cut of structures ***879*** and ***571*** – truncated by robber cut ***576***	2A
217	G10	Fill of cut ***216***	2B
218	G10	Fill of pit ***220***	4
219	G10	Fill of pit ***220***	4
220	G10	Cut of pit	4
221	G7	Cut of construction trench	2A
222	G7	Fill of construction trench ***221***	2A

223	G7	Masonry: dressed stone block at north end of ditch ***178***	2A
224	G10	Fill of pit ***220***	4
225	G10	Fill of robber cut ***576***	2C
226	G10	Fill of robber cut ***576***	2C
227	G10	Fill of robber cut ***576***	2C
228	G7	Fill of robber cut ***576***	2C
229	G7	Fill of construction cut ***231***	4
230	G7	Fill of construction cut ***231***	4
231	G7	Construction cut = ***443***	4
232	G10	Fill of ditch ***115***, north corner	2
233	G10	Cut of pit	3
234	G10	Fill of pit ***233***	3
235	G10	Fill of construction cut ***236***	2C
236	G10	Construction cut for walls = ***547***	2C
237	G10	Fill of construction cut ***238***	2C
238	G10	Robber cut	2C
239	G10	Robber cut	2C
240	G10	Primary fill of pit ***220***	4
241	G10	Robber cut ***236***	2C
242	G10	Primary fill of pit ***233***	3
243	G10	Fill/masonry: stone lining of pit ***220***	4
244	G10	Fill of pit ***220***	4
245	G10	Fill of robber cut ***236***	2C
246	G10	Fill of robber cut ***236***	2C
247	G7	Cut of beamslot - immediately north of ***223*** and ***266***	2A
248	G7	Primary fill of beamslot ***247***	2A
249	G7	Secondary fill of beamslot ***247***	2A
250	G10	Deposit/masonry: collapsed stone structure	2C
251	G10	Possible fill of robber cut ***576***	2C
252	G10	Fill of construction cut ***165*** = ***254***	2C
253	G10	Possible fill of robber cut ***576***	2C
254	G10	Fill of construction cut ***165*** = ***254***	2C
255	G10	Fill of robber cut ***576***	2C
256	G10	Fill of robber cut ***576***	2C
257	G10	Fill of robber cut ***576***	2C
258	G10	Fill of robber cut ***576***	2C
259	G10	Fill of robber cut ***576***	2C
260	G10	Possible fill of robber cut ***576***; also fills cut ***216***	2C
261	G10	Fill of robber cut ***576***	2C
262	G10	Fill of robber cut ***576***	2C
263	G7	Fill of beamslot ***268*** within cut ***247***	2A
264	G7	Fill of beamslot ***268*** within cut ***247***	2A
265	G7	Masonry: partially dressed sandstone block	2A
266	G7	Deposit: remnant of sandstone block	2A
267	G7	Cut of beamslot	2A
268	G7	Cut of beamslot	2A
269	G10	Fill of robber cut ***566***	6
270	G10	Fill of beamslot ***271***	2A
271	G10	Cut of beamslot	2A
272	G10	Fill of construction cut ***165***	2C
274	G10	Fill of possible posthole ***275***	2
275	G10	Cut of possible posthole	2
276	G10	Fill of beamslot ***277***	2A
277	G10	Cut of beamslot	2A
278	G10	Fill of beamslot ***279***	2A
279	G10	Cut of beamslot	2A

280	G10	Fill of beamslot ***281***	2
281	G10	Cut of beamslot	2A
282	G10	Fill of beamslot ***283***	2
283	G10	Cut of beamslot	2A
284	G7	Fill of ditch ***285***	2
285	G7	Cut of ditch	2
286	G7	Fill of pit ***287***	7
287	G7	Cut of pit	7
288	G10	Timber in beamslot ***279***	2A
289	G10	Timber in beamslot ***283***	2
290	G10	Fill of stakehole ***291***	2
291	G10	Cut of stakehole within beamslot ***283***	2
292	G10	Fill of stakehole ***293***	2
293	G10	Cut of stakehole within ***283***	2
294	G10	Fill of stakehole ***295***	2
295	G10	Cut of stakehole within beamslot ***277***	2
296	G10	Fill of stakehole ***297***	2
297	G10	Cut of stakehole	2
298	G7	Deposit/fill: possible tipping into beamslot ***268***	2A
299	G10	Primary fill of ditch ***115***	2
410	G10	Cut of pit	4
411	G10	Primary fill of pit ***410***	4
412	G10	Deposit: layer overlying robber cut fill ***228***	2
413	G7	Fill of robber cut ***576***	2C
414	G10	Fill of robber cut ***576***	2C
415	G10	Upper fill of pit ***410***	4
416	G10	Cut of pit	4
417	G10	Fill of pit ***416***	4
418	G10	Cut of pit: truncates robber cut fill ***453*** and pit ***442***	4
419	G10	Fill of pit ***418***	4
420	G10	Fill of robber cut ***576***	2C
421	G10	Fill of posthole ***422***	2
422	G10	Cut of posthole	2
423	G10	Fill of posthole ***424***	2
424	G10	Cut of posthole	2
425	G10	Robber cut = ***542*** and ***566***	2
426	G10	Fill of robber cut ***566***	2C
427	G10	Fill of robber cut ***566***	2C
428	G10	Fill of robber cut ***566***	2C
429	G10	Fill of robber cut ***566***	2C
430	G10	Fill of robber cut ***566***	2C
431	G10	Fill of robber cut ***566***	2C
432	G7	Fill of terrace/construction cut ***433***	2
433	G7	Cut of terrace/construction cut	2A
434	G10	Deposit: surface	2A
435	G7	Terrace cut	2A
436	G7	Cut of posthole	2
437	G7	Fill of posthole ***436***	2
438	G10	Deposit: layer sealing pits ***465*** and ***524***	2C
439	G10	Fill of robber cut ***576***	2C
440	G7	Cut of posthole	2
441	G7	Deposit: layer in vicinity of beamslots ***247, 267*** and ***268***	-
442	G7	Cut of pit	5
443	G7	Construction cut = ***231***	6
444	G7	Fill of construction cut ***231***	2
445	G7	Fill of construction cut ***231***	2

446	G10	Fill of robber cut ***576***	2C
447	G10	Fill of robber cut ***576***	2C
448	G10	Deposit: redeposited clay trample layer	2A
449	G10	Fill of construction cut ***460***	2A
450	G10	Fill of construction cut ***460***	2A
451	G10	Fill of robber cut ***576***	2C
452	G10	Fill of robber cut ***425***	2C
453	G10	Fill of robber cut ***425***	2C
454	G10	Fill of robber cut ***425***	2C
455	G10	Fill of cut/structure ***460***	2A
456	G10	Fill of cut/structure ***460***	2A
457	G10	Fill of cut/structure ***460***	2A
458	G10	Fill of cut/structure ***460***	2A
459	G10	Fill of cut/structure ***460***	2A
460	G10	Cut/structure west of R2	2A
461	G10	Fill of robber cut ***425***	2C
462	G7	Fill of robber cut ***231***	2C
463	G7	Fill of robber cut ***793***	2C
464	G7	Structure: stone footings = ***565***	2A
465	G10	Cut of pit	5
466	G10	Primary fill of pit ***465***	5
467	G10	Secondary fill of pit ***465***	5
468	G10	Fill of robber cut ***576***	2C
469	G10	Fill of robber cut ***576***	2C
470	G10	Fill of robber cut ***425***	2C
471	G10	Fill of pit ***442***	6
472	G10	Fill of cut ***460***	2A
473	G10	Fill of cut ***460***	2A
474	G10	Fill of cut ***460***	2A
475	G10	Fill of flue ***201***	2A
476	G10	Robber cut	2CB
477	G10	Structure: brick and stone drain	6
478	G10	Cut of pit	6
479	G10	Fill of pit ***478***	6
480	G10	North/south robber cut = ***582***	2C
481	G10	Primary fill of robber cut ***480***	2C
482	G10	Secondary fill of robber cut ***480***	2C
483	G10	Fill of robber cut ***576***	2C
484	G10	Fill of robber cut ***576***	2C
485	G10	Fill of robber cut ***576***	2C
486	G10	Fill of robber cut ***576***	2C
487	G7	Cut of posthole east of construction cut ***236***	1
488	G7	Fill of posthole ***487***	1
489	G10	Fill of robber cut ***425***	2C
490	G10	Robber trench cut for walls ***494/592***	2C
491	G10	Fill of robber cut ***590***	2C
492	G10	Fill of robber cut ***590***	2C
493	G10	Fill of robber cut ***590***	2C
494	G10	Structure: partial stone wall in ***490***; truncated by robbercut ***590***	2
495	G10	Fill of robber cut ***590***	2C
496	G10	Fill of robber cut ***590***	2C
497	G10	Fill of robber cut ***590***	2C
498	G10	Primary fill of robber cut ***576***	2C
499	G10	Fill of robber cut ***425***	2C
520	G7	Primary fill of robber cut ***236***	2C
521	G7	Secondary fill of robber cut ***236***	2C

522	W Brief	Civic Centre car park ground reduction	-
523	G10	Fill of robber cut ***425***	2C
524	G10	Cut of pit – cutting fill ***530*** and layer ***531***	2A
525	G10	Primary fill of pit ***524***	2A
526	G10	Secondary fill of pit ***524***	2A
527	G10	Tertiary fill of pit ***524***	2A
528	G10	Fill of robber cut ***236***	4
529	G10	Fill of robber cut ***236***	4
530	G10	Fill of robber cut ***236***	4
531	G10	Make-up layer	2A
532	G10	Make-up layer	2A
533	G10	Fill of cut/structure ***876***	1
534	G10	Fill of cut/structure ***876***	1
535	G10	Make-up layer	2A
536	G10	Deposit: surface	1
537	G10	Deposit: bedding layer for surface ***536***	1
538	G10	Deposit: bedding layer = ***870***	1
539	G10	Deposit: bedding layer = ***872***	1
540	G10	Deposit: surface	1
541	G10	Upper fill of robber cut ***425***	2C
542	G10	Robber cut = ***425*** and ***566***	2C
543	G10	Fill of robber cut ***425***	2C
544	G10	Fill of robber cut ***576***	2C
545	G10	Fill of stone drain ***675***	2C
546	G10	Fill of robber cut ***425***	2C
547	G7	Construction cut for walls = ***236***	2
548	G7	Upper fill of construction cut ***547***	2C
549	G7	Fill of construction cut ***547***	2C
550	G10	Fill of robber cut ***425***	2C
551	G10	Deposit: demolition layer	2C
552	G10	Cut of posthole	5
553	G7	Fill of posthole ***552***	5
554	G10	Deposit: demolition layer, R2	2C
555	G10	Fill of robber cut ***590***	2C
556	G7	Cut of pit - truncated by construction cut ***547***	1
557	G7	Secondary fill of pit ***556***	½
558	G7	Primary fill of pit ***556***	½
559	G7	Structure: partial stone wall foundation of R3	2A
560	G7	Fill of robber cut ***480***	2C
561	G7	East/west robber cut = ***581*** - R2	2C
562	G7	Fill of robber cut ***561***	2C
563	G10	Fill of robber cut ***425***	2C
564	G7	Fill of robber cut ***793***	2C
565	G7	Structure: partial stone wall foundation = ***464***	2A
566	G10	Robber cut = ***425*** and ***542***	2C
567	G10	Fill of flue ***201***	2B
568	G10	Fill of flue ***201***	2B
569	G10	Fill of flue ***201***	2B
571	G10	Structure: associated with construction cut ***591***	2B
572	G10	Deposit: demolition layer within R2	2C
573	G10	Deposit: layer within structure ***460***	2B
574	G10	Deposit: layer within structure ***460***	2A
575	G10	Fill of robber cut ***576***	2C
576	G10	Robber cut for walls ***865, 866*** and ***577***	2C
577	G10	Structure: partial stone wall forming south wall of R1	2A
578	G10	Robber cut: component of ***425***	2C

579	G10	Fill of robber cut ***578***	2C
580	G10	Fill of robber cut ***581***	2C
581	G10	North/south robber cut = ***561***, R2	2C
582	G10	East/west robber cut = ***480***	2C
583	G10	Fill of robber cut ***582*** = ***585*** and ***587***	2C
584	G10	North/south robber cut at east extent of R3	2C
585	G10	Fill of robber cut ***584*** = ***583*** and ***587***	2C
586	G10	Robber cut	2C
587	G10	Fill of robber cut ***586*** = ***583*** and ***585***	2C
588	G10	Deposit: demolition layer within R3	2C
589	G10	Terrace cut	2A
590	G10	Robber cut south-east of ***576***	2C
591	G10	Construction cut for structure ***571***	2B
592	G10	Structure: partial stone wall	2A
593	G10	Structure: pilae, R1	2A
594	G10	Structure: pilae, R1	2A
595	G10	Structure: pilae, R1	2A
596	G10	Structure: pilae, R1	2A
597	G10	Structure: pilae, R1	2A
598	G10	Structure: pilae, R1	2A
599	G10	Structure: pilae, R1	2A
650	G10	Structure: pilae, R1	2A
651	G10	Structure: pilae, R1	2A
652	G10	Structure: pilae, R1	2A
653	G10	Structure: pilae, R1	2A
654	G10	Structure: pilae, R1	2A
655	G10	Structure: pilae, R1	2A
656	G10	Structure: pilae, R1	2A
657	G10	Structure: pilae, R1	2A
658	G10	Structure: pilae, R1	2A
659	G10	Structure: pilae, R1	2A
660	G10	Structure: pilae, R1	2A
661	G10	Structure: pilae, R1	2A
662	G10	Structure: pilae, R1	2A
663	G10	Structure: pilae, R1	2A
664	G10	Structure: pilae, R1	2A
665	G10	Structure: pilae, R1	2A
666	G10	Structure: pilae, R1	2A
667	G10	Structure: pilae, R1	2A
668	G10	Structure: pilae, R1	2A
669	G10	Structure: pilae, R1	2A
670	G10	Structure: pilae, R1	2A
671	G10	Fill of robber cut ***566***	2C
672	G10	Fill of robber cut ***566***	2C
673	G10	Structure: partial stone wall	2A
674	G10	North/south construction cut	2A
675	G10	Cut of drain ***678***	2A
676	G10	Fill of cut ***675***	2C
677	G10	Fill of cut ***675***	2C
678	G10	Structure: stone drain within cut ***675***	2A
679	G10	Fill of drain ***678***	2C
680	G10	Fill of construction cut ***682***; contains structure ***681***	2A
681	G10	Structure: partial stone wall foundation in construction cut ***682***	2A
682	G10	East/west construction cut associated	2A
683	G10	Fill of pit ***684***	2A
684	G10	Cut of pit	2A

685	G10	Fill of drain ***678***	2A
686	G10	Fill of drain ***678***	2A
687	G10	Fill of drain ***678***	2A
688	G10	North/south robber cut internal to R3	2C
689	G10	Fill of robber cut ***688***	2C
690	G10	Structure: pilae within R2	2A
691	G10	Structure: pilae within R2	2A
692	G10	Structure: pilae within R2	2A
693	G10	Structure: pilae within R2	2A
694	G10	Structure: pilae within R2	2A
695	G10	Structure: pilae within R2	2A
696	G10	Structure: pilae within R2	2A
697	G10	Structure: pilae within R2	2A
698	G10	Structure: pilae within R2	2A
699	G10	Structure: pilae within R2	2A
750	G10	Structure: pilae within R2	2A
751	G10	Structure: pilae within R2	2A
752	G10	Structure: pilae within R2	2A
753	G10	Structure: pilae within R2	2A
754	G10	Structure: pilae within R2	2A
755	G10	Structure: pilae within R2	2A
756	G10	Structure: pilae within R2	2A
757	G10	Structure: pilae within R2	2A
758	G10	Structure: pilae within R2	2A
759	G10	Structure: pilae within R2	2A
760	G10	Structure: pilae within R2	2A
761	G10	Structure: pilae within R2	2A
762	G10	Structure: pilae within R2	2A
763	G10	Structure: pilae within R2	2A
764	G10	Structure: pilae within R2	2A
765	G10	Structure: pilae within R2	2A
766	G10	Structure: pilae within R2	2A
767	G10	Structure: pilae within R2	2A
768	G10	Structure: pilae within R2	2A
769	G10	Structure: pilae within R2	2A
770	G10	Structure: pilae within R2	2A
771	G10	Structure: pilae within R2	2A
772	G10	Structure: pilae within R2	2A
773	G10	Structure: pilae within R2	2A
774	G10	Deposit: layer beneath fill ***255***	2A
775	G10	Deposit: layer beneath fill ***253***	2A
776	G10	Structure: pilae within R1	2A
777	G10	Structure: pilae within R1	2A
778	G10	Structure: pilae within R1	2A
779	G10	Structure: pilae within R1	2A
780	G10	Structure: pilae within R1	2A
781	G10	Structure: pilae within R1	2A
782	G10	Structure: pilae within R1	2A
783	G10	Structure: pilae within R1	2A
784	G10	Structure: pilae within R1	2A
785	G10	Structure: pilae within R1	2A
786	G10	Structure: pilae within R1	2A
787	G10	Structure: pilae within R1	2A
788	G10	Structure: pilae within R1	2A
789	G10	Structure: pilae within R1	2A
790	G10	Structure: pilae within R1	2A

791	G10	Structure: pilae within R1	2A
792	G10	Structure: pilae within R1	2A
793	G10	Robber cut	2C
794	G10	Structure: pilae within R1	2A
795	G10	Structure: pilae within R1	2A
796	G10	Structure: pilae within R1	2A
797	G10	Structure: pilae within R1	2A
798	G10	Structure: pilae within R1	2A
799	G10	Structure: pilae within R1	2A
830	G10	Structure: pilae within R1	2A
831	G10	Structure: pilae within R1	2A
832	G10	Structure: pilae within R1	2A
833	G10	Structure: pilae within R1	2A
834	G10	Structure: pilae within R1	2A
835	G10	Structure: pilae within R1	2A
836	G10	Structure: pilae within R1	2A
837	G10	Structure: pilae within R1	2A
838	G10	Structure: pilae within R1	2A
839	G10	Structure: pilae within R1	2A
840	G10	Structure: pilae within R1	2A
841	G10	Structure: pilae within R1	2A
842	G10	Structure: pilae within R1	2A
843	G10	Structure: pilae within R1	2A
844	G10	Structure: pilae within R1	2A
845	G10	Structure: pilae within R1	2A
847	G10	Fill of drain ***678***	2A
848	G10	Fill of structure ***571***	2B
849	G10	Masonry: packing around drain ***678***	2A
850	G7	Cut of pit	3
851	G7	Fill of pit ***850***	3
852	G10	Fill of structure ***571***	2B
853	G10	Cut of posthole	2A
854	G10	Fill of posthole ***853***	2
855	G10	Cut of posthole	2A
856	G10	Fill of posthole ***855***	2
857	G10	Fill of cut/structure ***876***	1
858	G10	Group context: cuts of four stakeholes	2A
859	G10	Group context: fill of stakeholes ***858***	½
860	G10	Structure: stone-built rebuild of structure ***571***	2B
861	G10	Group context: cuts of two stakeholes	2A
862	G10	Group context: fill of stakeholes ***861***	1
863	G10	Primary fill of cut/structure ***876***	1
864	G10	Layer/deposit: heat-affected natural deposit within R3	1/2
865	G10	Structure: stone wall foundation within construction cut ***165***	2A
866	G10	Structure: partial stone wall foundation in construction cut ***165***	2A
867	G10	Construction cut for structure ***868***	2A
868	G10	Structure: partial stone wall within ***867***	2A
869	G10	Fill of cut/structure ***876***	1
870	G10	Deposit: bedding layer for surface ***538***	1
871	G10	Deposit: burnt layer sealed by deposit ***870***	1
872	G10	Deposit: bedding layer for surface ***871*** = ***539***	1
873	G10	Cut of pit	2A
874	G10	Fill of pit ***873***	2A
875	G10	Cut: curving gully	2C
876	G10	Cut/structure: cut surrounded by heat-affected natural deposit	1
877	G10	Cut of posthole	1

878	G10	Fill of structure ***879***	2B
879	G10	Structure: superseded by structure ***571***	2B
880	G10	Deposit: bedding layer	1
881	G10	Structure: pilae within R1	2A
882	G10	Structure: pilae within R1	2A
884	G10	Structure: pilae within R1	2A
885	G10	Cut of ditch	2A
886	G10	Fill of ditch ***885***	2A
887	G10	Group context: cuts of 42 stakeholes	2A
888	G10	Group context: fill of stakeholes ***887***	2
889	G10	Group context: cuts of three stakeholes	2A
890	G10	Group context: fill of stakeholes ***889***	2
891	G10	Cut of beamslot	1
892	G10	Fill of beamslot ***891***	1
893	G10	Cut of pit	2
894	G10	Fill of pit ***893***	2
895	G10	Cut/structure: cut surrounded by heat-affected natural deposit	1
896	G10	Fill of cut/structure ***895***	1
897	G10	Cut/structure: cut surrounded by heat-affected natural deposit	1
898	G10	Fill of cut/structure ***897***	1
899	G10	Cut/structure: cut surrounded by heat-affected natural deposit	1
900	G10	Fill of cut/structure ***899***	1
901	G10	Cut/structure: cut surrounded by heat-affected natural deposit	1
902	G10	Fill of cut/structure ***901***	1
903	G7	Cut of pit beneath sandstone block ***223*** = ***221***	2A
904	G7	Fill of pit ***903***	2A
905	G10	Fill of structure ***879***	2B
906	G10	Fill of structure ***879***	2B
907	G10	Fill of structure ***879***	2B
908	G10	Fill of structure ***879***	2B
909	G10	Fill of structure ***879***	2A
911	G10	Deposit: layer of heat-affected natural deposit adjacent to structure ***460***	2A
912	G10	Cut of beamslot	1
913	G10	Fill of beamslot ***912***	1
914	G10	Cut of beamslot	1
915	G10	Fill of beamslot ***914***	1
916	G10	Cut of posthole below surface ***434***	1
917	G10	Fill of posthole ***916***	1
918	G10	Cut of posthole apparently cut by construction cuts ***165*** and ***236***	1
919	G10	Fill of posthole ***916***	1
920	G7	Cut of structure	1
921	G7	Primary fill of structure ***920***	1
922	G7	Tertiary fill of structure ***920***	1
923	G7	Uppermost fill of structure ***920***	1
924	G7	Secondary fill of structure ***920***	1
925	G7	Deposit: stone pad associated with structure ***920***	1
927	G10	Fill of pit ***928***	3
928	G10	Cut of pit	3
929	G10	Fill of pit ***930***	3
930	G10	Cut of pit	3
931	G10	Cut and fill of posthole; associated with structure ***950***	1
932	G10	Cut and fill of posthole; associated with structure ***950***	1
933	G10	Cut and fill of posthole; associated with structure ***950***	1
934	G10	Cut and fill of posthole; associated with structure ***950***	1
935	G10	Cut and fill of posthole; associated with structure ***950***	1

936	G10	Cut and fill of posthole; associated with structure ***950***	1
937	G10	Cut and fill of posthole; associated with structure ***950***	1
938	G10	Cut and fill of posthole; associated with structure ***950***	1
939	G7	Cut and fill of posthole; associated with structure ***950***	1
940	G7	Cut and fill of posthole; associated with structure ***950***	1
941	G10	Group context; 18 stakeholes; associated with structure ***950***	1
942	G7	Cut and fill of post/stakehole; associated with structure ***950***	1
943	G7	Cut and fill of post/stakehole; associated with structure ***950***	1
944	G7	Cut and fill of posthole; associated with structure ***950***	1
945	G7	Cut of gully at west side of structure ***950***	1
946	G7	Cut and fill of posthole; associated with structure ***950***	1
947	G10/G7	Unstratified	-
950	G7	Structure: post/stake-built	1
951	G7	Structure: post/stake-built	1
10000	G10	Cleaning layer	-

AREA G3 CONTEXT SUMMARY

Context	Area	Description	Period
1100	Yates'	Cut of ditch = ***3069***	1
1101	Yates'	Fill of ditch ***1100***	1
1102	Yates'	Natural geology: pinkish-yellow clay	-
1103	Yates'	Group context: service trenches/drains/pipe trenches - modern	7
1104	Yates'	Cut of ditch = ***3020***	1
1105	Yates'	Upper fill of ditch ***1104***	1
1106	Yates'	Fill of ditch ***1104***	1
1107	Yates'	Fill of ditch ***1104***	1
1108	Yates'	Fill of ditch ***1104***	1
1109	Yates'	Fill of ditch ***1104***	1
1110	Yates'	Primary fill of ditch ***1104***	1
3000	G3	Structure: cobble surface	6
3001	G3	Structure: cobble surface	6
3002	G3	Deposit: bedding layer for surfaces ***3000*** and ***3001***	6
3003	G3	Deposit: concrete wall foundation	7
3004	G3	Structure: brick wall	7
3005	G3	Structure: stone gully within surfaces ***3000*** and ***3001***	6
3006	G3	Structure: cobble surface	6
3007	G3	Cleaning layer	7
3008	G3	Deposit: bedding layer for surfaces ***3009*** and ***3010***	6
3009	G3	Structure: cobble surface	6
3010	G3	Structure: cobble surface	6
3011	G3	Structure: cobble surface	6
3012	G3	Structure: brick wall	7
3013	G3	Structure: brick wall	6
3014	G3	Structure: cobble surface	6
3015	G3	Structure: concrete surface	7
3016	G3	Cut feature	5
3017	G3	Fill of feature ***3016***	5
3018	G3	Cut feature	5
3019	G3	Fill of feature ***3018***	5
3020	G3	Cut of ditch = ***1104***	1
3021	G3	Upper fill of ditch ***3020***	1
3026	G3	Cut of north-east/south-west service trench	7
3027	G3	Fill of service trench ***3026***	7
3028	G3	Cut of pit	3

3029	G3	Fill of pit ***3028*** = ***3068***	3
3030	G3	Cut of east/west service trench	7
3031	G3	Fill of service trench ***3030***	7
3034	G3	Cut of pit	5
3035	G3	Fill of pit ***3034*** = ***3061***	5
3036	G3	Cut of pit = ***3060***	4
3037	G3	Fill of pit ***3036***	4
3040	G3	Cut of pit that truncated ditch ***3064***	5
3041	G3	Fill of pit ***3040***	5
3042	G3	Cut of pit within pit ***3058***	5
3043	G3	Fill of pit ***3042***	5
3044	G3	Cut of northernmost east/west service trench	7
3045	G3	Fill of service trench ***3044***	7
3050	G3	Cut of north/south service trench	7
3051	G3	Fill of service trench ***3050***	7
3052	G3	Cut of wall	6
3053	G3	Fill of cut ***3052***	6
3054	G3	Structure: wall	6
3055	G3	Fill of ditch ***3069***	1
3056	G3	Natural geology: yellow clay	-
3057	G3	Fill of pit ***3058***	5
3058	G3	Cut of pit = ***3042***	5
3059	G3	Fill of pit ***3060*** = ***3037***	3
3060	G3	Cut of pit = ***3036***	4
3061	G3	Fill of pit ***3034*** = ***3035***	5
3064	G3	Recut of ditch ***3069***	4
3065	G3	Fill of recut ***3064***	4
3066	G3	Lower fill of pit ***3028***	3
3068	G3	Fill of pit ***3028*** = ***3029***	3
3069	G3	Cut of ditch	1
3070	G3	Fill of posthole ***3071***	4
3071	G3	Cut of posthole	4
3072	G3	Primary fill of ditch ***3020***	1
3073	G3	Cut of pit	5
3074	G3	Fill of pit ***3073***	5
3077	G3	Cut of pit	3
3078	G3	Fill of pit ***3077***	3
3079	G3	Fill of pit ***3080***	3
3080	G3	Cut of pit	3
3081	G3	Fill of pit ***3082***	5
3082	G3	Cut of pit	5
3083	G3	Structure: concrete slabs on upper part of wall ***3084***	7
3084	G3	Structure: brick wall beneath ***3083***	6
3085	G3	Structure: wall sealed by wall ***3084***	5
3086	G3	Upper fill of ditch ***3105***	1
3090	G3	Cut of pit	4
3091	G3	Fill of pit ***3090***	4
3092	G3	Cut of pit	4
3093	G3	Fill of pit ***3092***	4
3094	G3	Fill of pit ***3092***	4
3095	G3	Deposit: garden soil	5
3096	G3	Cut of service trench truncating ***3090***	7
3097	G3	Structure: stone-lined drain within wall ***3085***	5
3098	G3	Fill of drain ***3097***	5
3099	G3	Cut of pit	3
3100	G3	Fill of pit ***3099***	3

3101	G3	Recut of pit ***3099***	5
3102	G3	Fill of recut ***3101***	5
3103	G3	Structure/deposit: concrete wall footing and associated levelling deposit	7
3105	G3	Cut of ditch: filled by ***3086*** and ***3106***	1
3106	G3	Primary fill of ditch ***3105***	1
3107	G3	Cut of gully	1
3108	G3	Fill of gully ***3107***	1
3109	G3	Structure: possible remains of stone wall	3
3110	G3	Deposit: layer of redeposited natural clay sealed by layer ***3095***	4
3111	G3	Cut of pit	4
3112	G3	Fill of pit ***3111***	4
3113	G3	Cut of pit	5
3114	G3	Fill of pit ***3113***	5
3115	G3	Deposit: soil layer underlying structure ***3085***	5
3116	G3	Structure: remains of stone wall overlying ditch fill ***3086***	3
3117	G3	Pale yellow silty-clay fill of ditch ***3105***	1

APPENDIX 2: CATALOGUE OF ROMAN SAMIAN

The vessels listed below are catalogued by period and in order of context. Note that figure-types as they appear on bowls are frequently smaller than Oswald's illustrated types (see Dannell *et al* 1998, 71 and 87); where this discrepancy occurred here, it is not noted in the catalogue unless considered significant.

Abbreviations: SG – South Gaulish; CG – Central Gaulish; EG – East Gaulish; S & S – Stansfield and Simpson 1958; Oswald – Oswald 1936-7; Rogers – Rogers 1974; 1999; Cala Culip – Nieto and Puig 2001.

PERIOD 1

There were only two sherds of samian ware in this phase:

(***539***/6080) South Gaulish cup form 27; a very small fragment, produced at some point in the wide date range *c* AD 60-100, but most probably Flavian. Weight 1g.

(***870***/6083) South Gaulish cup form 27; a fragment of footring, again not closely datable in the Neronian-Flavian period, but most probably Flavian. Worn from use. Weight 11g.

PERIOD 2A

The samian vessels from Period 2A deposits are summarised by form and fabric in Table 23.

Form	South Gaul	Central Gaul	East Gaul	Total
Curle 11	1			**1**
18	1			**1**
18 or 18R	1			**1**
18/31R	1	1		**2**
27		1		**1**
29	1			**1**
37	5	6		**11**
ind	1	1		**2**

Table 23: Samian vessels from Period 2A contexts, by form and fabric (maximum 20 vessels)

(***222***/643) Central Gaulish moulded bowl of form 37, from Les Martres-de-Veyre. There remains only a battered fragment of an S-shaped motif (Rogers type S72), diagnostic of the potter Cettus, who worked at Les Martres-de-Veyre, *c* AD 135-60. Weight 2g.

(***222***/643) Central Gaulish moulded bowl form 37, from Les Martres-de-Veyre. Fragment of panelled decoration, with wavy-line borders terminating in a six-petalled dot-rosette (Rogers C280) and the lower part of a small column (P10, partially impressed). Both motifs were used in the style of Potter X-9 during the Trajanic-Hadrianic period (cf S & S, pl 31.370), perhaps *c* AD 110-25 at Les Martres, though

Rogers (1999, 326) proposed the range *c* AD 115-35 for his career as a whole. Weight 6g.

(***263***/542) Central Gaulish moulded bowl form 37. Panels with horizontal beadrows (Rogers A2) included, probably, a marine creature in a festoon (F8), used by such potters as Attianus, X-13 and X-14, to the left of ornamentation with vertical wavy lines (A24). Produced most probably at Lezoux in the period *c* AD 125-45. Weight 9g (Fig A2.1).

(***263***/542) Central Gaulish moulded bowl form 37; a small fragment of a cupid (Oswald 378) used by potters working in the Hadrianic-early Antonine period, as well as others later in the second century, such as Caratillus, Censorinus and the Antistii. Not closely datable in the wide range *c* AD 130-60/90. Weight 5g.

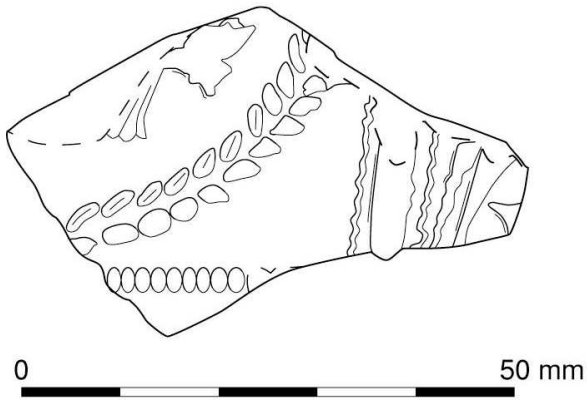


*Figure A2.1: Period 2A Central Gaulish moulded bowl fragment, form 37 (**263**/542)*

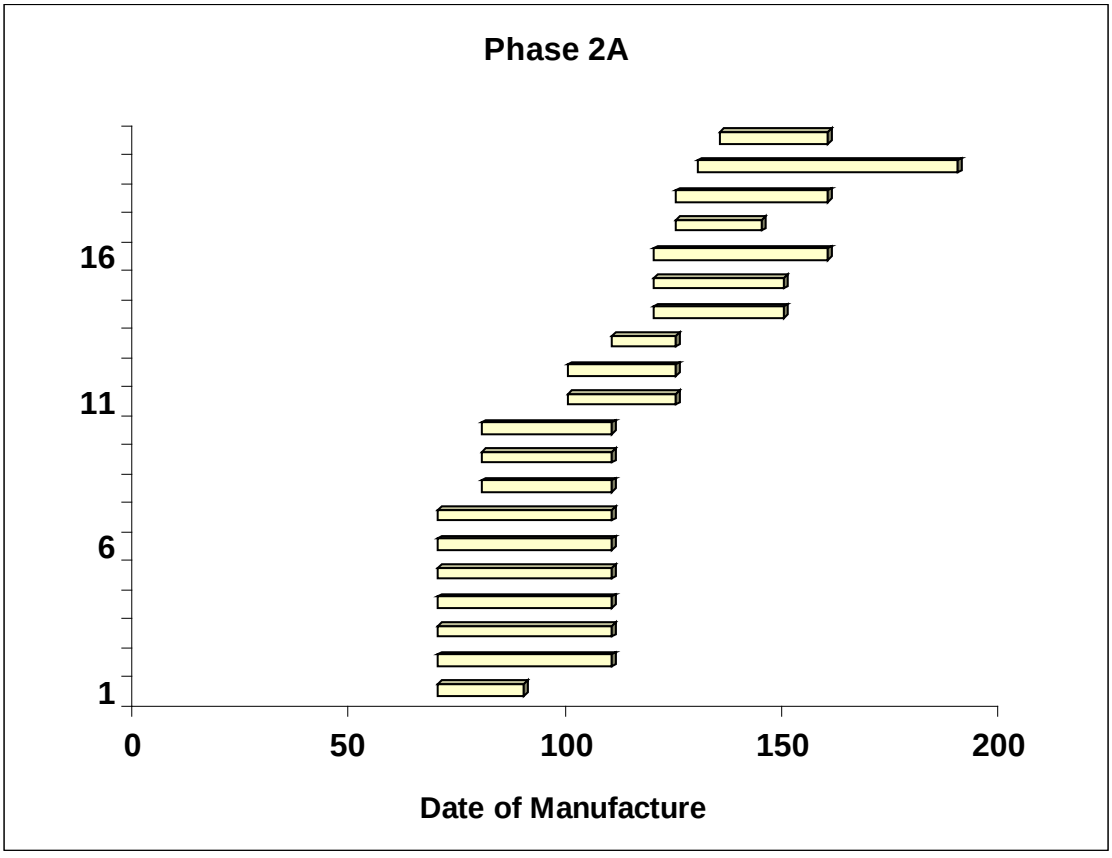


Figure A2.2: Date ranges of samian vessels from Period 2A contexts (maximum 20 vessels)

PERIOD 2B

There were only two sherds of samian ware in this phase:

(***571***/6081) South Gaulish dish form 18. A Flavian product, of which the footring is rather battered, but possibly also worn from use. Weight 13g.

(***905***/676) South Gaulish moulded bowl form 37; a fragment of panelled decoration represented a winged figure-type. *C* AD 80-100/10. Weight 3g.

PERIOD 2C/PHASE 1

There were only two samian sherds in this phase, recovered from the same context:

(***253***/617) South Gaulish cup form 27; a rim fragment of diameter 130mm, produced in the range *c* AD 70-100/10. Weight 2g.

(***253***/617) Central Gaulish cup form 33; wallsherd of a vessel produced in the Hadrianic or early-Antonine period. Weight 5g.

PERIOD 2C/PHASE 2

Form	South Gaul	Central Gaul	East Gaul	Total
18R	2			**2**
27		1		**1**
37	2	3		**5**

Table 24: Samian vessels from Period 2C/Phase 2 contexts, by form and fabric (maximum eight vessels)

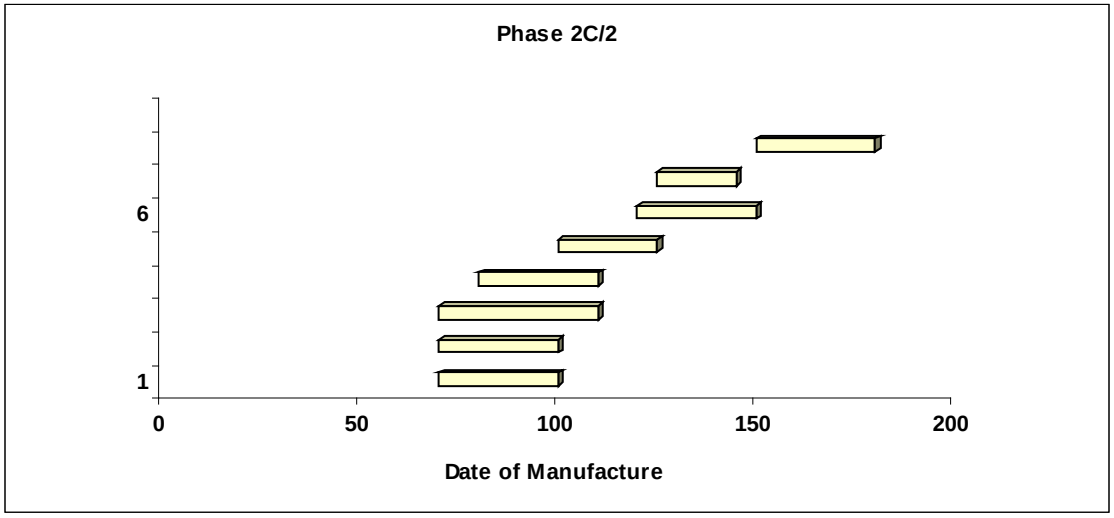


Figure A2.3: Date ranges of samian vessels from Period 2C/Phase 2 contexts (maximum 8 vessels)

(***226***/6087) and (***262***/625) Central Gaulish moulded bowl form 37 in an excellent Lezoux ware (Fig A2.4). The ovolo is Rogers B105, but with a beaded tongue; below, an horizontal astragaloid border (A10) is panelling bordered by beadrows (A2) with rosette ornaments (C194) and indistinct leaves (J162). A leaf-and-bud motif (G93?) lies to the right of a large cupid (Oswald 442); there was also another stocky cupid

(Oswald 508), the front feet of a sea-horse (Oswald 33?) and two dolphins (Oswald 2392 and perhaps 2394A), as well as a spiralling ornament, leafy cross (Rogers L2) and large rosette in a ring (Rogers C6). The individual motifs indicate the work of Mammius, as seen in a very similar composition at Silchester (S & S, pl 103.2). Stanfield and Simpson (1958) gave this potter the same dating as was given to Censorinus (*c* AD 150-180) and Mammius was producing, though rarely, the plain cup form 27 before *c* 160. However, he also made later forms, such as Rogers (1999, 169), suggesting the range *c* 160-80 for his moulded bowls. The lower part of one sherd in ***262*** has concrete adhering. Weight 76g; two further sherds were found in Period 2C/3 (***170***) and one in Period 7 (***152***), weighing 9g and 37g respectively.

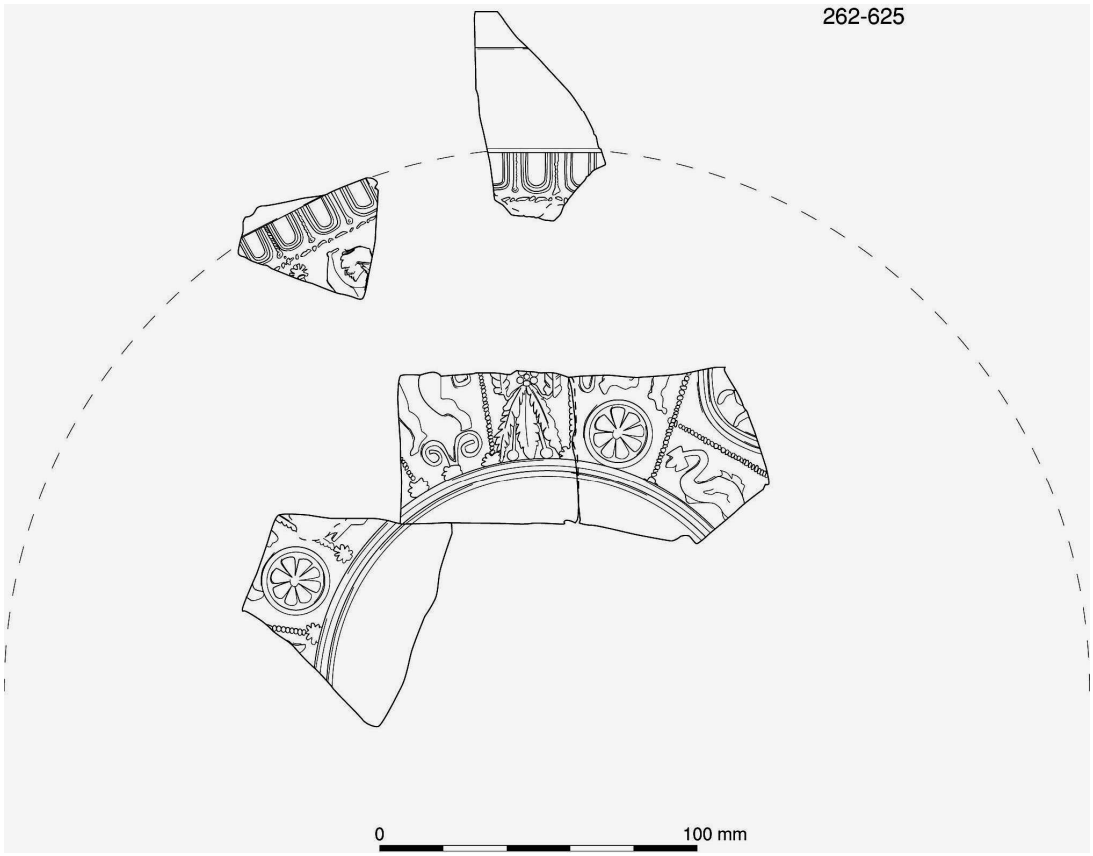


*Figure A2.4: Period 2C Central Gaulish moulded bowl fragment, form 37 (**262**/625)*

(***232***/620) Central Gaulish moulded bowl form 37; a rimsherd with ovolo B28 as used at Lezoux by various Lezoux potters including, in the Hadrianic to early-Antonine period, Drusus ii and Quintilianus, as well as the later potter Censorinus; the general appearance of this sherd suggests the work of Drusus ii, *c* AD 125-45. Weight 7g.

(***482***/553) South Gaulish dish form 18R, most probably a Flavian product. The interior of the wall and base had been scoured away completely, leaving no trace of the slip. Weight 16g.

PERIOD 2C/PHASE 3

Form	South Gaul	Central Gaul	East Gaul	Total
18 or 18/31	1			**1**
33		1		**1**
37		2		**2**
46		1		**1**
Ind		2		**2**

Table 25: Samian vessels from Period 2C/Phase 3 contexts, by form and fabric (maximum seven vessels)

(***170***/535) Two sherds from vessel. Weight 9g.

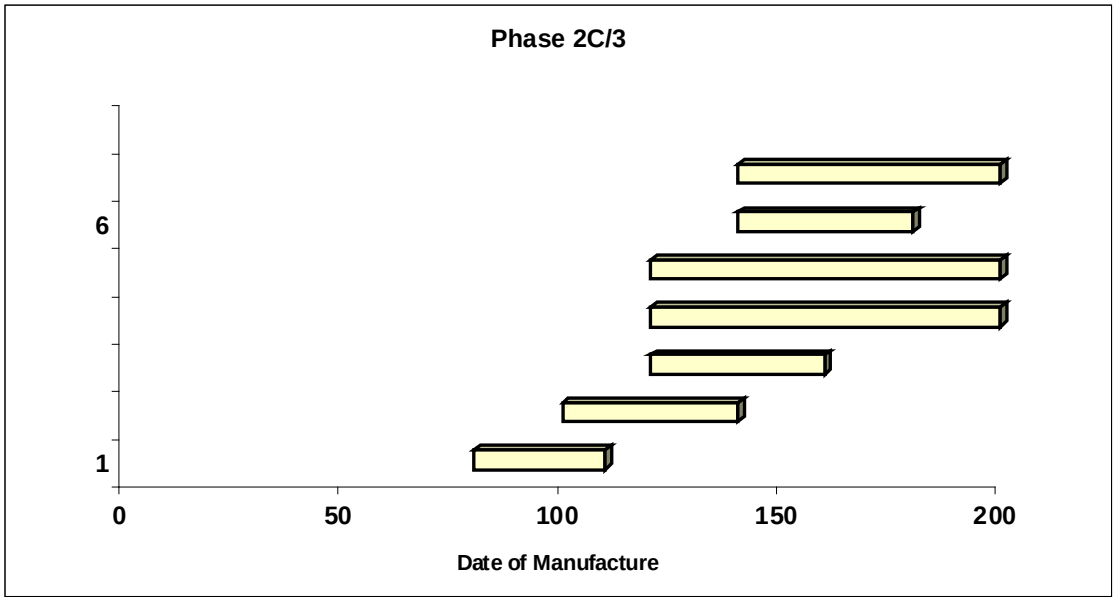


Figure A2.5: Date ranges of samian vessels from Period 2C/Phase 3 contexts (maximum 7 vessels)

PERIOD 2A-C

Form	South Gaul	Central Gaul	East Gaul	Total
18	1			**1**
18/31		4		**4**
18/31or 18/31R		2		**2**
18/31R		2		**2**
27	1	2		**3**
33	2	2		**4**
35	1			**1**
37	11	10		**21**
Ind	2	2		**4**

Table 26: Samian vessels from Period 2A-C contexts, by form and fabric (maximum 42 vessels)

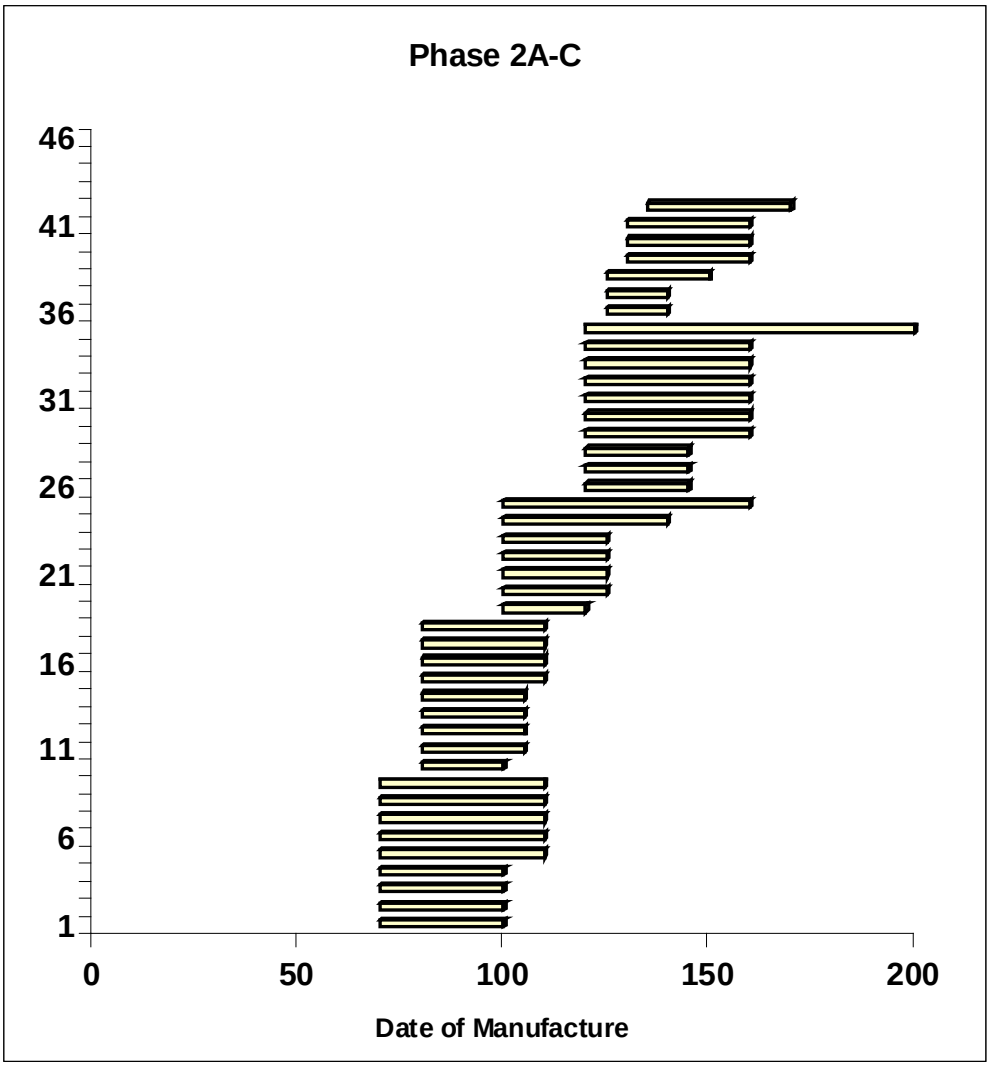


Figure A2.6: Date ranges of samian vessels from Period 2A-C contexts (maximum 42 vessels)

(***32***/391), (***47***/6092), (***48***/6060) South Gaulish moulded bowl form 37, rim diameter 220mm (Fig A2.7). The decoration is very indistinct, but included an ovolo with rosette-tipped tongue, a derivative of the Frontinus ovolo. Below, a large, winding scroll was adorned with wreaths, cranes (Cala Culip typeBf.72) and arrowheads, above a basal wreath of bifid motifs. Geoff Dannell (pers comm) notes a similar bowl from la Graufesenque. Elements of the decoration also occur at Cala Culip on catalogue nos 410 and 606, the latter including a bifid wreath seen on no 396 with one of the large leaves; the other large leaf at Wigan can be seen on Cala Culip no 341. *C* AD 80-100; 15 sherds in this phase weighed 202g, 63g and 17g respectively; three sherds found unstratified (***947***/663) weighed 125g; total weight 407g.

(***32***/391) South Gaulish moulded bowl form 37, rim diameter 220mm (Fig A2.8). Adjoining sherds, displaying an ovolo with a blurred trifid-tipped tongue above saltires with poppy-headed motifs and very indistinct figures, including Diana (Oswald type 104) and Victory (Oswald type 814); the two figures occur in a similar composition on bowls at the Carlisle Millennium site (Ward forthcoming) and in the Bregenz Cellar (Jacobs 1913, taf 3.15 and 19), as well as on form 29 at Rottweil

(Knorr 1919, taf 68 OFPVDENT). The basal wreath was composed of leaf-and-bud motifs. Geoff Dannell (pers comm) notes this bowl as belonging to the Biragillus group, ascribed to the period *c* AD 80-100/5. Four sherds in this phase, weight 145g; two fragments also in a post-Roman context (***30***), weight 30g.

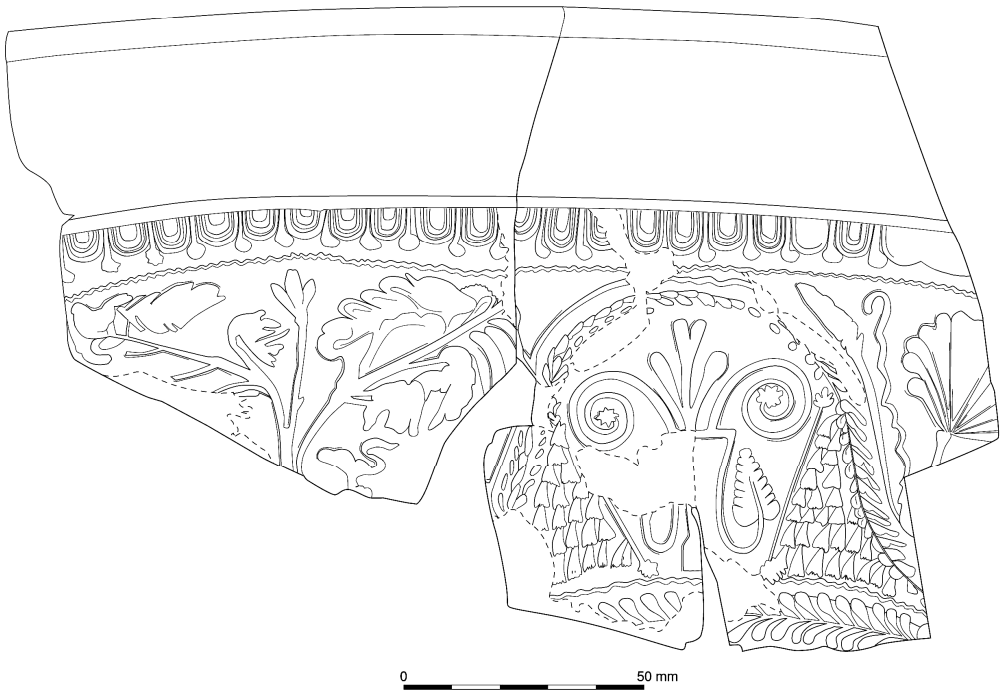


*Figure A2.7: South Gaulish moulded bowl fragment, form 37 (**32**/391)*

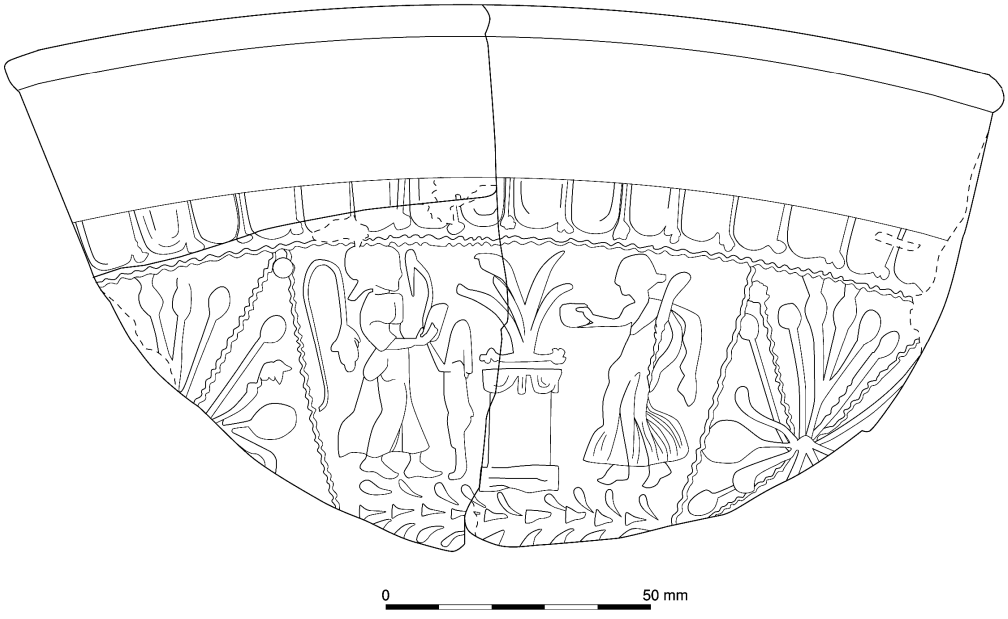


*Figure A2.8: South Gaulish moulded bowl fragment, form 37 (**32**/391)*

(***47***/6092) South Gaulish moulded bowl form 37, rim diameter 220mm (Fig A2.9). Unrecognisably blurred ovolo; freestyle with Germanus-style trees above basal festoons. Geoff Dannell (pers comm) notes a possible connection with the Germanus Ser[group; cf Mees 1995, taf 90.1, perhaps *c* AD 80-100/5. Three sherds, including rim and footring, worn from use. Weight 202g.

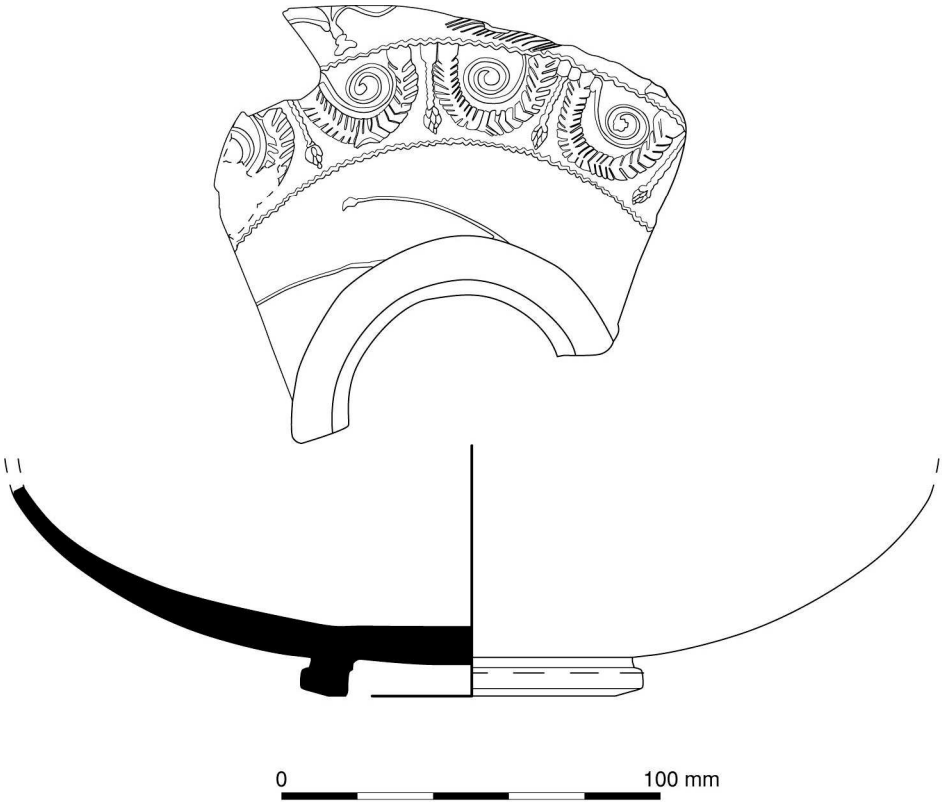


*Figure A2.9: South Gaulish moulded bowl fragment, form 37 (**47**/6092)*

(***47***/6092) East Gaulish, a thin-walled bowl or dish of indeterminate form, considered to be from a Trajanic-Hadrianic workshop (perhaps at Chémery rather than Blickweiler), but the sherd is slightly burnt. Weight 5g.

(***48***/6060) Central Gaulish moulded bowl form 37 from Les Martres-de-Veyre, rim diameter 190mm (Fig A2.10). Ovolo Rogers B28 lay above an indistinct horizontal border (A4?) and scrolling decoration with swags (F21), indistinct dot-rosettes (C280) and two pairs of gladiators (Oswald types 1003 and 1004, 1063 and probably 1027, smudged). All the motifs indicate the work of Drusus i, who worked at Les Martres in the period *c* AD 100-20; cf S & S, pl 11 nos 139, 141. The sherds have broken at a repair hole, probably of the cleat variety and not necessarily successful. Four adjoining sherds, weight 89g.

(***48***/6060) Central Gaulish moulded bowl form 37 from Lezoux, rim diameter 200mm. Indistinct ovolo (Rogers B18 or similar); if B18, this is likely to represent the work of the Sacer-Attianus group, *c* AD 125-45/50. An abraded rimsherd, covered in accretion. Weight 18g.

(***52***/6086) Central Gaulish moulded bowl form 37 (Fig A2.11). A large winding scroll with a bird (Oswald 2239B), leaves (Rogers H13 and H101), ornament G66 and tendrils, bound by an indistinct astragalus. For the general composition with the same bird, see Rogers 1999, pl 30.23 (Cinnamus) and pl 82.2 (Paullus); while leaf H13 was used both by Cinnamus and his early associate, Paullus; H101 and G66 may point to Cinnamus. At any rate, the bowl was produced most probably in the period *c* AD 135/40-60. Weight 31g.

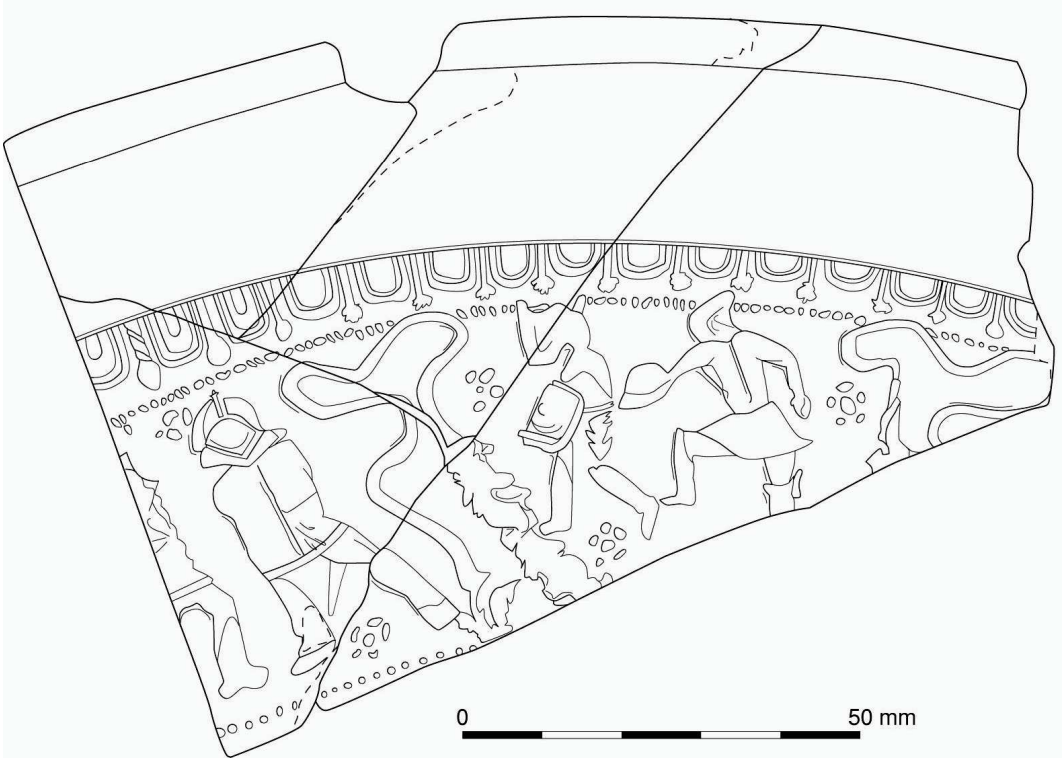


*Figure A2.10: Central Gaulish moulded bowl fragment, form 37 (**48**/6060)*

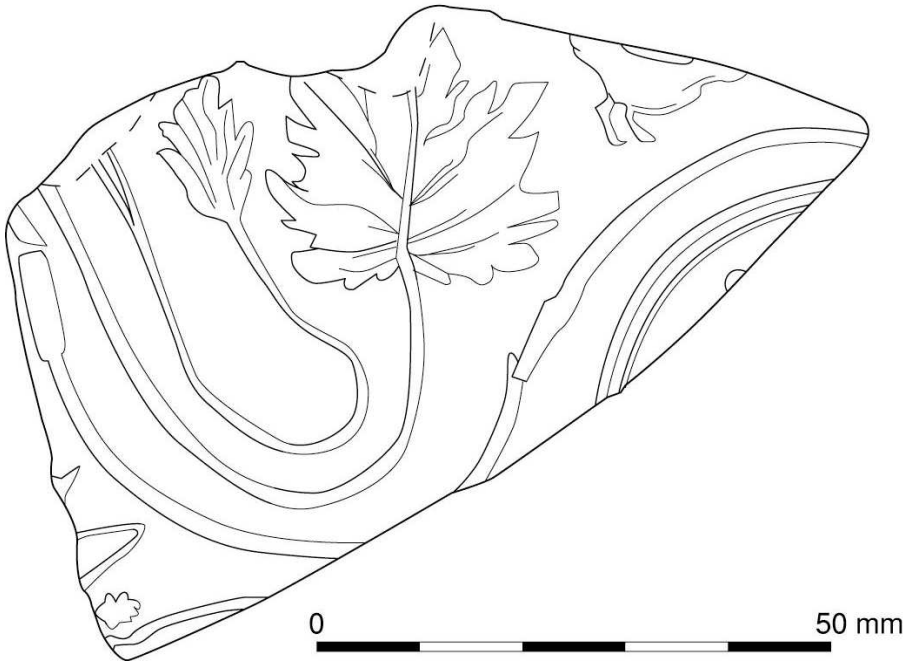


*Figure A2.11: Central Gaulish moulded bowl fragment, form 37 (**52**/6086)*

(***55***/257) Central Gaulish moulded bowl form 37 (Fig A2.12). Fragment of panelling with wavy-line borders (Rogers A24), acanthus tips (Rogers K2) and neat dot-rosettes in high relief (Rogers C280); for the single row of elongated arrowheads (S & S, fig 9.19, larger than U192), see Romeuf 2000, pls 64.1-2, 65.42-43). Apparently the style of Potter X-9, who produced bowls at both Les Martres and Lezoux; the fabric of this

sherd indicates production at Lezoux. Rogers (1999, 326) has suggested a date *c* AD 115-35 for his career. However, his Lezoux products may perhaps be dated *c* AD 125-40. Weight 4g.

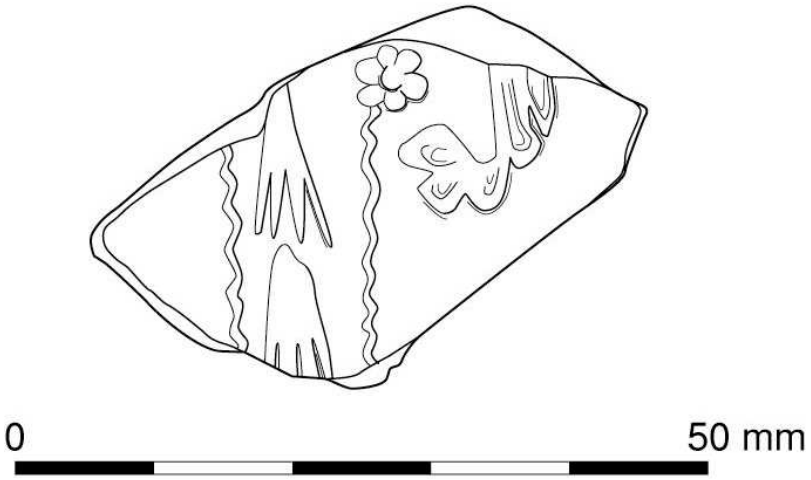


*Figure A2.12: Central Gaulish moulded bowl fragment, form 37 (**55**/257)*

(***56***/6095) Central Gaulish moulded bowl form 37 (Fig A2.13). A fragment of panelling with abraded borders included Diana and hind (Oswald 106) standing over a battered fragment of astragalus (cf Terrisse 1968, pl 27.188), set between two saltires. Comparison with decoration of a bowl from Les Martres-de-Veyre (Terrisse 1968, pl 35.10005) may point to Potter X-13; a Lezoux product, *c* AD 125-40. Weight 24g.

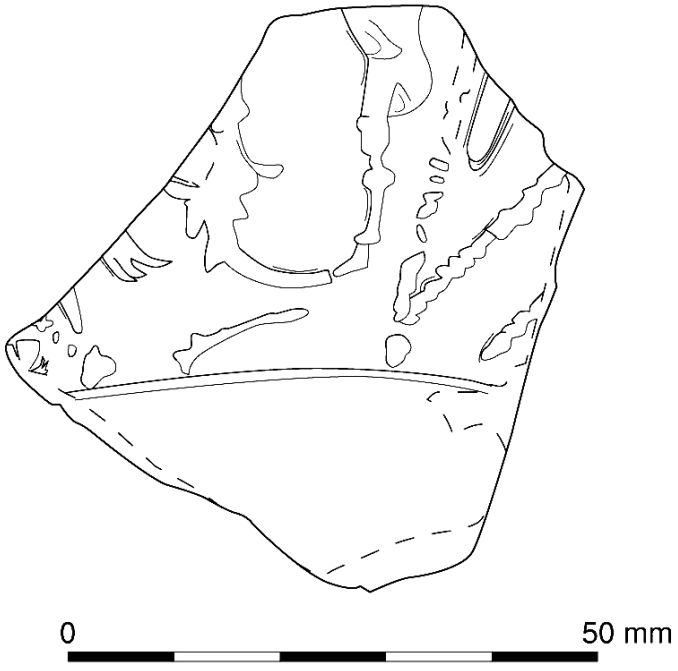


*Figure A2.13: Central Gaulish moulded bowl fragment, form 37 (**56**/6095)*

(***56***/6095) Central Gaulish bowl form 37, Lezoux ware (Fig A2.14). A neat ovolo (Rogers B14) lies above an horizontal beadrow (A1) and a scroll that included a sea-horse (Oswald 49; cf Terrisse 1968, pl 36.363, said to be style of 'IOENALIS') and dot-rosettes (C280) as filling motifs. The composition was similar to that on a bowl

from Les Martres-de-Veyre (Romeuf 2000, pl 57.11) in the style of Potter X-13. The Wigan bowl originated at Lezoux, *c* AD 125-40. Weight 16g.

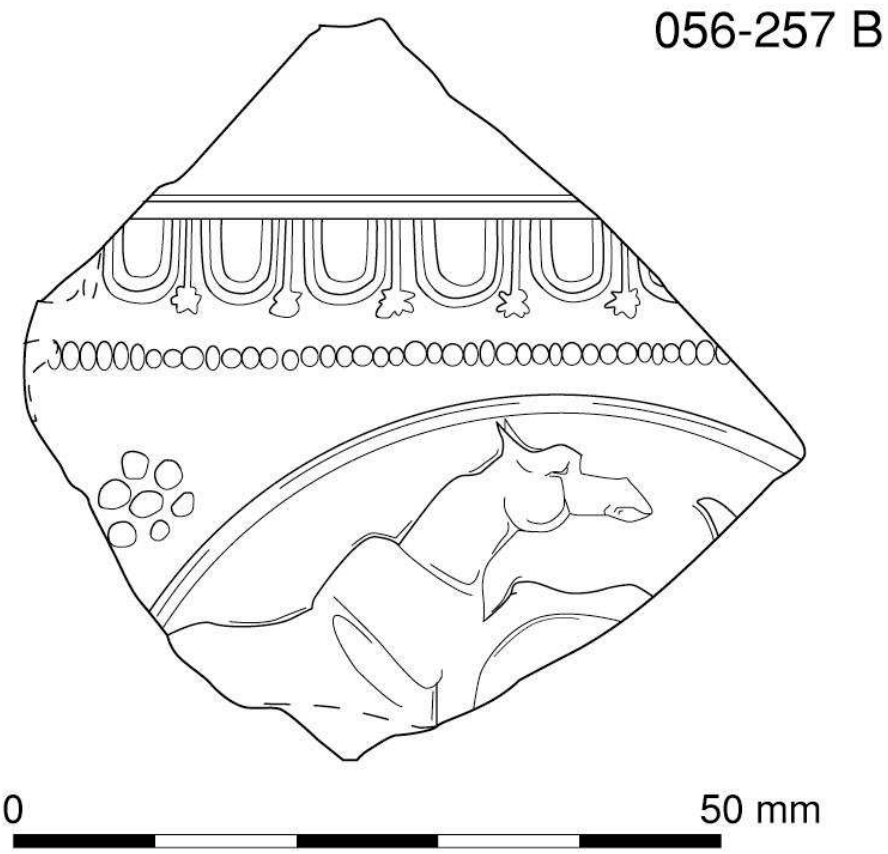


*Figure A2.14: Central Gaulish moulded bowl fragment, form 37 (**56**/6095)*

(***62***/362) South Gaulish cup form 35 (Fig A2.15), a Flavian-Trajanic product. Nine adjoining sherds form the almost complete profile, with leaves *en barbotine* at the rim. The footring is battered, but was also very worn from use. Weight 32g.

(***179***/591) South Gaulish moulded bowl, form 37 (Fig A2.16). The almost complete profile of a small bowl, with a rim diameter of 180mm, lacking the lower part of the decoration. Below, an ovolo with a trident-tipped tongue, as used in the Biragillus group (G Dannell pers comm), lay above divided panelling: a badly blurred, elongated hound and hare lay above a cupid and charioteer respectively (Oswald 501 and 1161), while the main panels included Diana with hind (Oswald type 104B) and Victory (Oswald type 814 or similar). For the ovolo, Diana and Victory on another bowl from the Biragillus group, ascribed to the period *c* AD 80-100/5. The footring was worn in use; broken at vestiges of repairwork of the cleat variety, retaining traces of lead. Weight 154g.

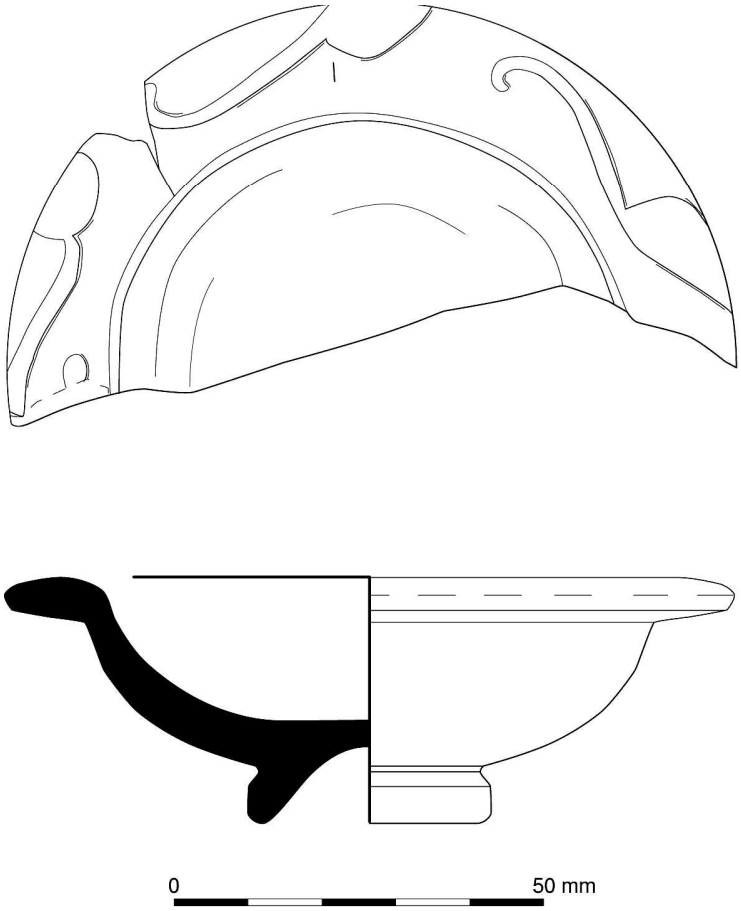


*Figure A2.15: South Gaulish cup fragment, form 35 (**62**/362)*

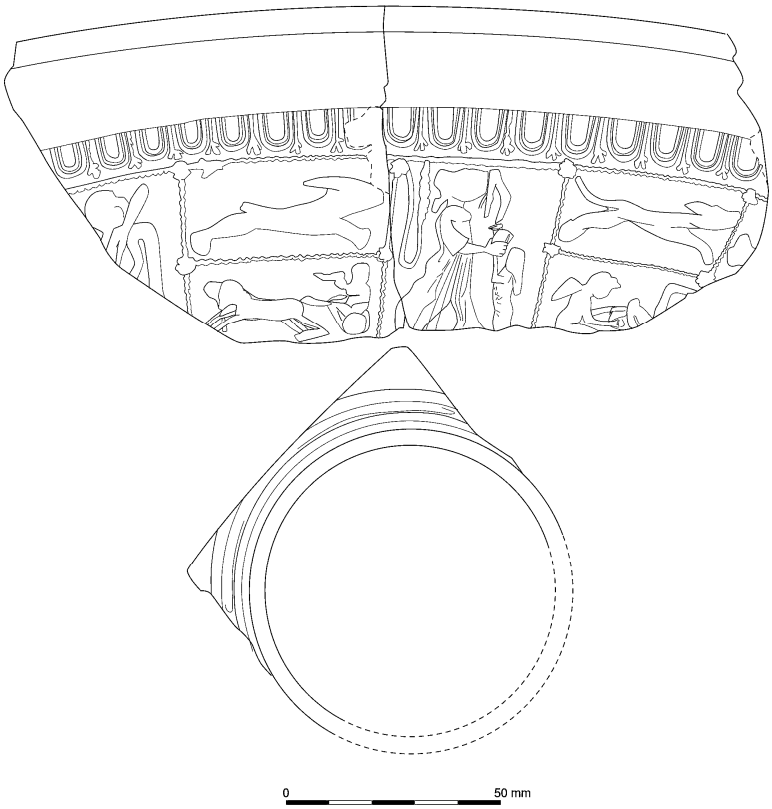


*Figure A2.16: South Gaulish moulded bowl fragment, form 37 (**179**/591)*

POST-ROMAN CONTEXTS

Form	South Gaul	Central Gaul	East Gaul	Total
Curle 11	1			**1**
18/31	1	1		**1**
18/31 or 18/31R		1		**1**
18/31R		4		**4**
18/31 or 31		1		**1**
27	1	1		**2**
27g	1			**1**
29	1			**1**
33		1		**1**
35		1		**1**
37	12	13		**25**
Ind	4	2		**6**

Table 27: Samian vessels from post-Roman contexts, by form and fabric (maximum 45 vessels)

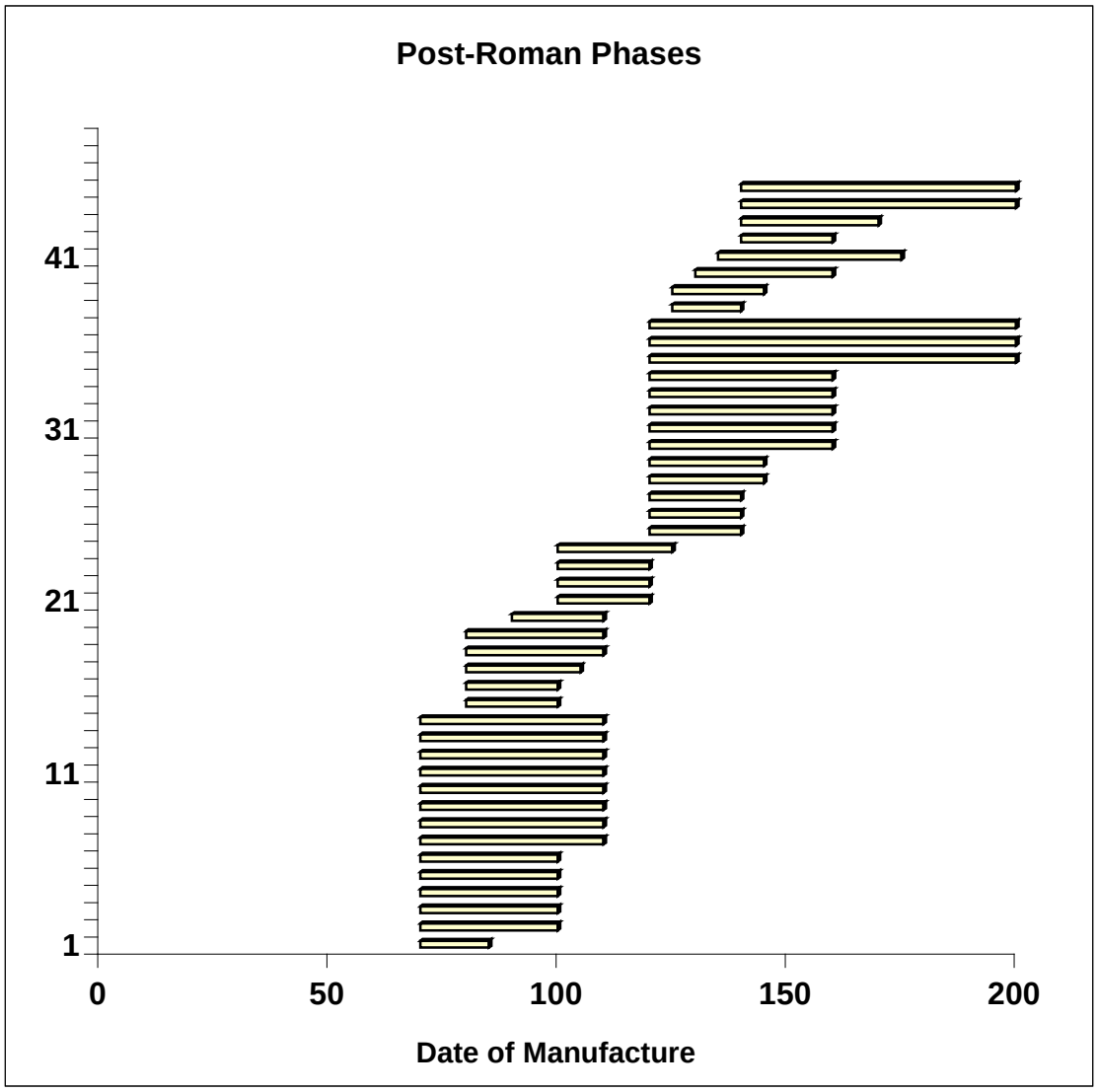


Figure A2.17: Date ranges of samian vessels from post-Roman contexts (maximum 45 vessels)

(***30***/6106) South Gaulish moulded bowl form 37. Rim sherd with a fragment only of a tendril below an ovolo whose long tongue terminated in a large trident, as used by such potters as Albanus iii, Amandus and Coii Bass[probably in the period *c* AD 80-100/5. Weight 10g.

(***30***/6106a) Central Gaulish moulded bowl form 37 (Fig A2.18). This sherd is decorated with a vine-scroll containing small birds (considerably smaller than Oswald 2279) and leaves (H161 and a larger version); style of Potter X-13. Cf S & S, pl 49.577; Terrisse 1968, pl 31.201 etc. This bowl will have been produced at Lezoux *c* AD 125-40. Weight 19g.

(***30***/6106b) Central Gaulish cup form 33 (Fig A2.18). Basal stamp MACR[I]NI·M representing the work of Macrinus ii, whose range of forms also included the dish form 18/31, as well as the later form 31. This vessel was produced most probably in the early-Antonine period at Lezoux. The sherd has broken in such a way that it might perhaps have been reused as a large disc. Weight 7g.

(***35***/6103a) Central Gaulish moulded bowl form 37, from Les Martres-de-Veyre (Fig A2.18). A pigmy (Oswald 692A) stands left of a figure which may be that on a bowl from London (S & S, pl 12.149), which shows the same columns (Rogers P85) and basal wreath of anchor motifs (G395). The style of Drusus i, who worked at Les Martres in the period *c* AD 100-20. Weight 19g.

(***35***/6103b) Central Gaulish moulded bowl form 37 (Fig A2.18). Panelling with blurred figures including a dancer (Oswald 356) and acanthus tips (Rogers K2), as used by potters such as Drusus ii in the period *c* AD 125-45, though this piece is over-fired and may be Les Martres ware and Trajanic. On the broken edge, there appears to be an exploded inclusion (twig or pellet?), although it may be evidence of drilling. Weight 52g.

(***640***/6093) Central Gaulish moulded bowl form 37, rim diameter 180mm, with ring-rosettes in place of an ovolo (Rogers C294) as used in the style of Drusus i (cf S & S, pl 16.195), who worked at Les Martres-de-Veyre in the period *c* AD 100-20; however, this bowl was a Lezoux product, a factor that suggests a Hadrianic origin. Weight 11g.

(***66***/6090) South Gaulish moulded bowl form 37 (Fig A2.18). Two fragments of panelled decoration with large arrowheads and Pan (Oswald 714), a figure that appears on bowls in the Bregenz Cellar (Jacobs 1913, taf 3.15 and 17). Certainly produced in the range *c* 80/5-110 and probably the work of the Biragillus group. Weight 33g.

(***67***/6089) Central Gaulish moulded bowl form 37, from Les Martres-de-Veyre. Wreath of ring rosettes (C294) above an indistinct basal border; probably the style of Drusus i, *c* AD 100-20. Weight 4g.

(***119***/6088) Central Gaulish moulded bowl form 37. A fragment of basal wreath of anchor motifs (G395) as used primarily in the style of Drusus i, though again the fabric of this sherd suggests an origin at Lezoux. Weight 3g.

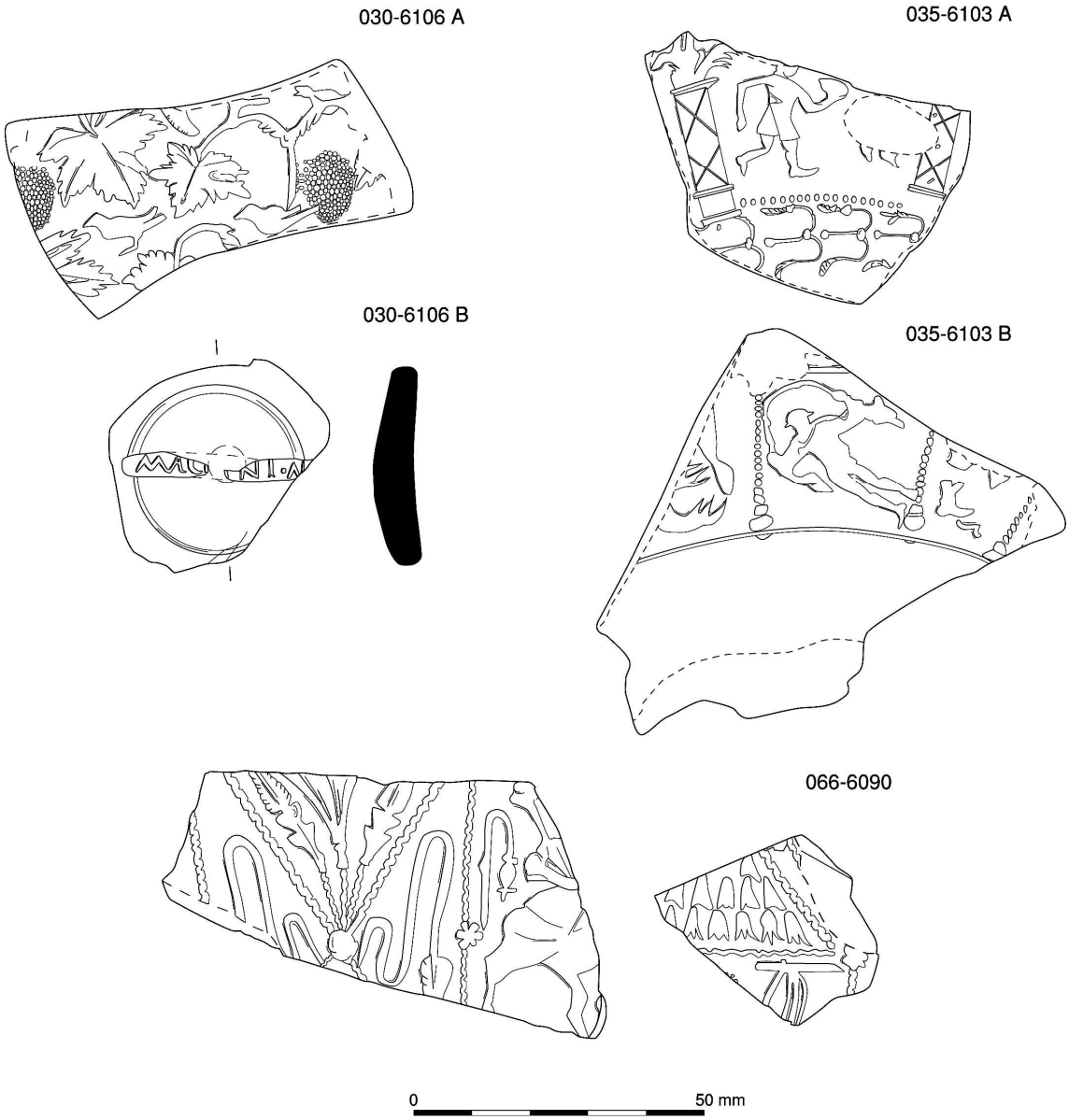


Figure A2.18: Samian fragments from post-Roman contexts

(***128***/6064) Central Gaulish moulded bowl form 37. Repetitive panelling, comprising saltires with bifid ornaments (Rogers G284), small dolphin-motifs and astragali; cf S & S, 13, fig 4 nos 4, 15 and pl 195.16. Apparently the style of Drusus i, rather than Potter X-12 or X-13 (see Ward 1998, 76 no 9). The fabric is burnt or stained, but an origin at Les Martres-de-Veyre in the Trajanic period may be presumed. Weight 11g.

(***138***/6425) South Gaulish moulded bowl form 29, rim diameter 240mm (Fig A2.19). Two rimsherds with festoons in the upper zone; Geoff Dannell (pers comm) draws attention to Cala Culip IV. 192, Secundus and 252, Virthus; the Wigan bowl is not the same, but must have come from a workshop producing bowls of related style. Probably *c* AD 70-85. Weight 55g.

(***153***/6068) South Gaulish moulded bowl form 37 (Fig A2.19). Fragment of bifid basal wreath. Probably *c* AD 80-100. A drilled hole below the decoration retains a lead rivet. Weight 18g.

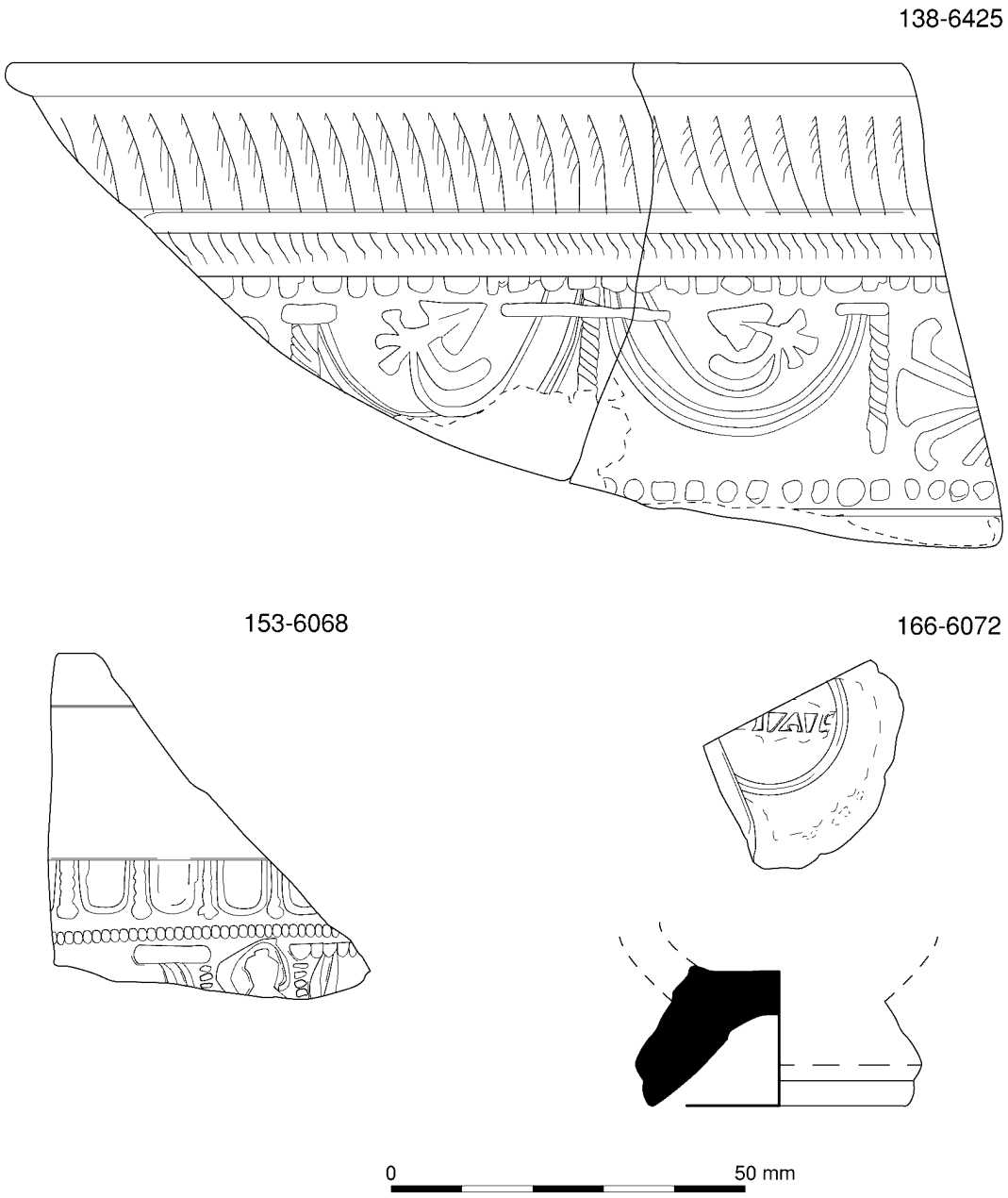


Figure A2.19: Samian fragments from post-Roman contexts

(***153***/6068) Central Gaulish moulded bowl form 37. Small fragment of rim with single-bordered ovolo, probably Rogers B12, above beaded borders (A2). The panels included the upper parts of a small, indistinct caryatid (Oswald 1199 or 1201A) and festoons with blurred, astragaloid terminals. These motifs were used by several potters, primarily Criciro, Cinnamus and Divixtus and the bowl will have been produced at some point in the period *c* AD 135-75. Weight 12g.

(***160***/6070) South Gaulish, indeterminate form. A Flavian-Trajanic product of which this basal sherd could conceivably, but not certainly, have been reworked as a counter of diameter *c* 26mm.Weight 2g.

(***166***/6072) South Gaulish cup form 27 (Fig A2.19). A battered footring with a fragment of basal stamp, reading perhaps]AF or IVI[, and if so, the stamp of an

'illiterate' potter. At any rate, the cup will have been produced at La Graufesenque in the Flavian period. Weight 13g.

UNSTRATIFIED

Form	South Gaul	Central Gaul	East Gaul	Total
Curle 11	1			**1**
15/17 or 15/17R	1			**1**
18 or 18R	1			**1**
18R	1			**1**
18R or 18/31R	1			**1**
18/31R		3		**3**
27		1		**1**
30	1			**1**
36		1		**1**
37	10	2		**12**
Ind	1	3		**4**

Table 28: Unstratified samian vessels, by form and fabric (maximum 27 vessels)

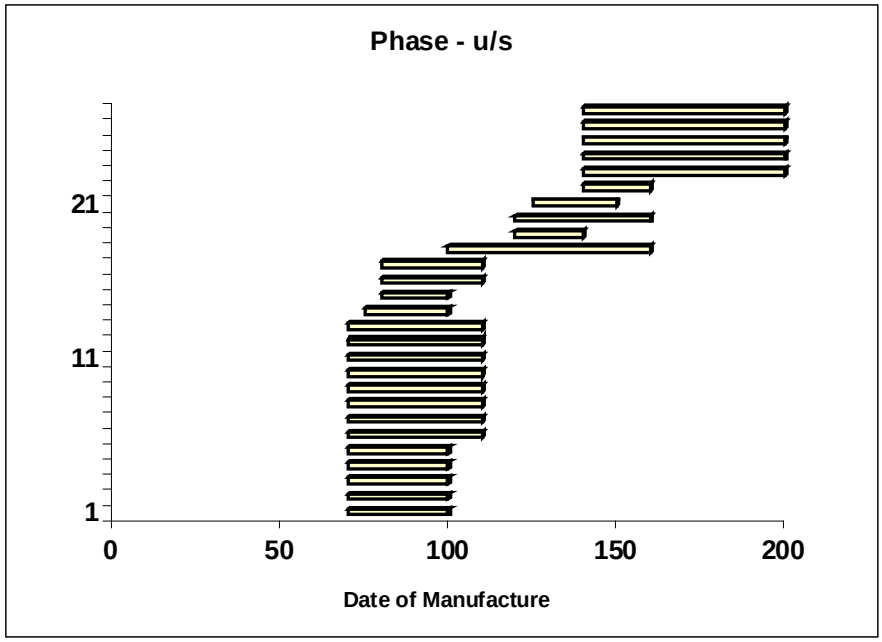


Figure A2.20: Date ranges of unstratified samian vessels (maximum 27)

(***947***/663) Central Gaulish, indeterminate form. Probably an Antonine product, reworked roughly as a large disc of diameter *c* 45mm. Weight 17g.

APPENDIX 3: CATALOGUE OF ROMAN COARSE WARES

The vessels listed below are catalogued by period, and are identified by context number (given in bold and italics) and object refence number. The fabric type is also given, and corresponds to the fabric series detailed in *Section 4.4.3 – 4.4.14*.

AREA G3

3021/6021 OAA2/RSA1 globular beaker with sharply everted rim, of a probable Flavian-Trajanic date (Fig A3.1). The body is covered with rouletting. There are traces of a darker reddish/brown slip or colour coat. The body form is similar to the earlier examples of this type dating to the Flavian period, contrasting with the bag-shaped examples from Wilderspool (Hartley and Webster 1973, nos 35-7) and more like the globular profile of jars from late Flavian sites such as at Inchtuthil (Darling 1985, fig 99) and Castleford (Rush *et al* 2000, fig 46). The globular shape continued into the Trajanic period, however (Gillam 1970, no 68). 44 sherds, 461g. RE 25%.

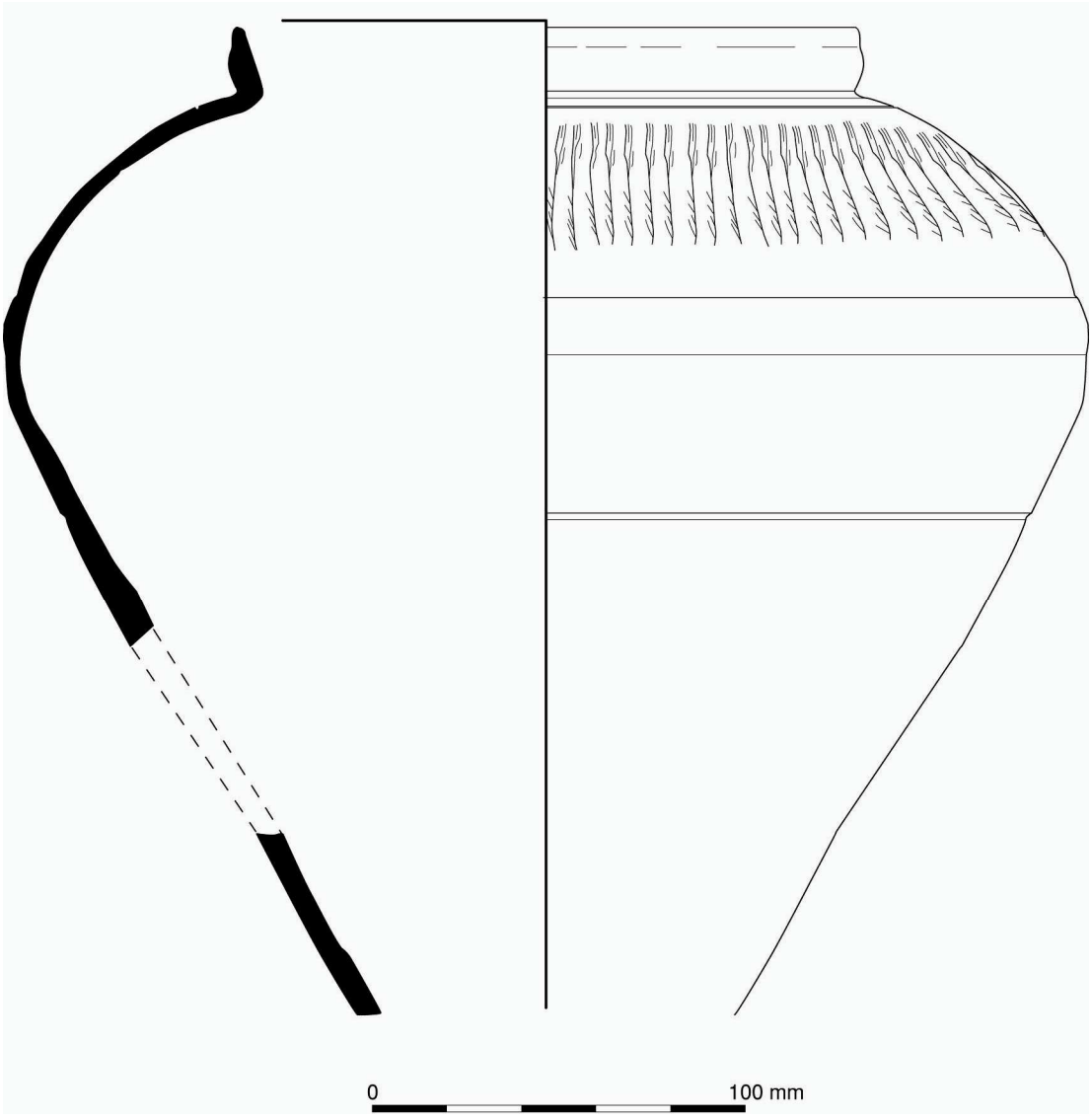


*Figure A3.1: OAA2/RSA1 globular beaker (**3021**/6021)*

3108/6022 OAA2 68 sherds from a flanged bowl with spout formed by two strips applied to the flange (Fig A3.2). A very similar vessel in a coarser fabric was found at Middlewich (Leary forthcoming). Both vessels copy samian form Curle 11 dating from the Trajanic period to *c* AD 145-50 (Curle 1911). A Curle 11 of this type would probably be from Lezoux, and date to 120-45/50 (M Ward pers comm). 672g. RE 85%. This fill also contained scraps of OAB1 and CC1. A Hadrianic-early Antonine date is indicated.

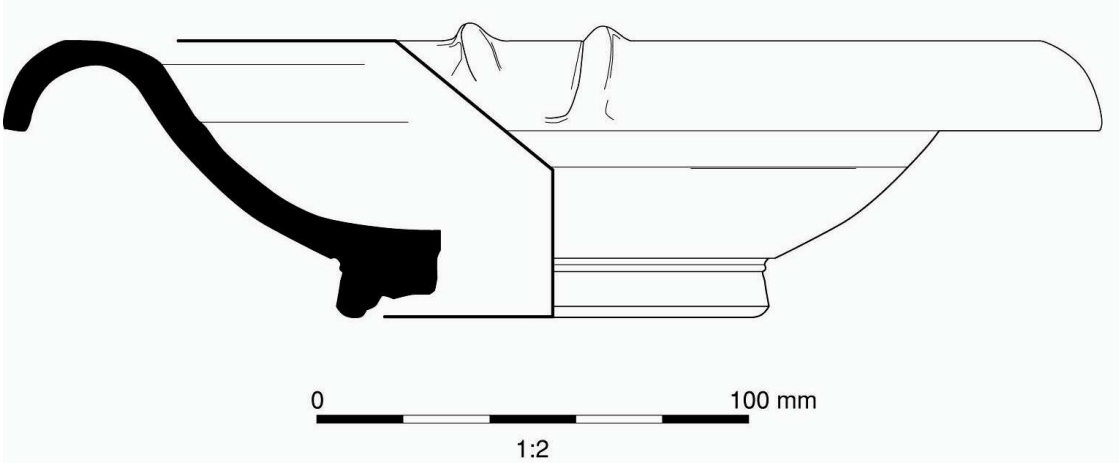


*Figure A3.2: OAA2 68 flanged bowl (**3108**/6022)*

354/537 GRB1 neckless everted rim jar. Late first to early second century (Fig A3.3). Also a GRA2 bodysherd of a jar with combed wavy line decoration between two combed horizontal lines. This feature may also be Flavian-Trajanic in date.

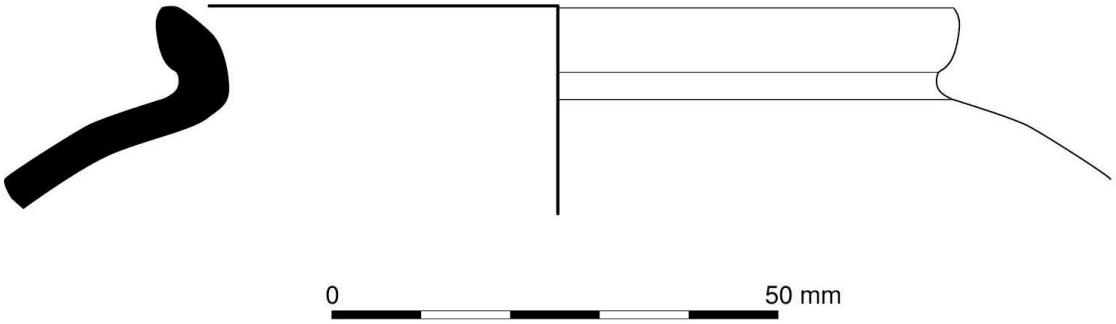


*Figure A3.3: GRB1 everted rim jar (**354**/537)*

719/256 GRB1 everted, internally rebated-rim jar with rebated sloping neck (Fig A3.4). 92g. RE 30%. Also, OAB1 reeded-rim bowl (Fig A3.5). 18g. RE 12%.

The jar was common in Flavian groups at Middlewich and is related to the pre-Flavian Continental jar form represented by Usk no 11 (Greene 1993). It is less numerous than the neckless everted–rim jars of Flavian-Trajanic type at Barton Street, Manchester (Leary 2007), a site with less Flavian samian (Wild 2007), suggesting it was more common in the Flavian period than the Trajanic period. These vessels are of Flavian-Trajanic type.

*Figure A3.4: GRB1 jar (**719**/256)*

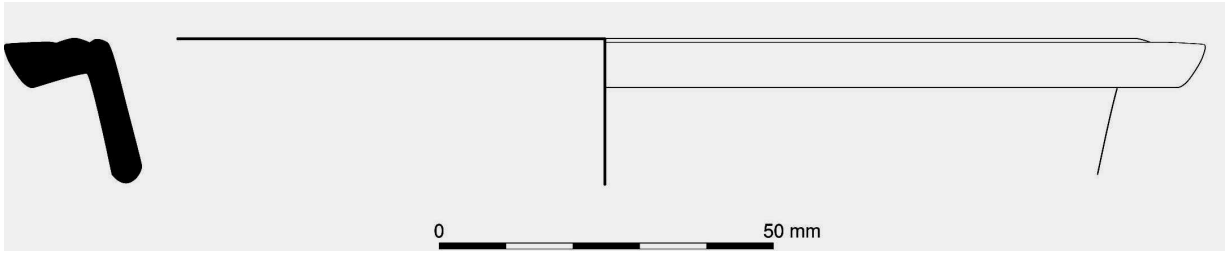


*Figure A3.5: OAB1 reed-rimmed bowl (**719**/256)*

AREA G7/10

Period 2A

*Beamslot **268***

264/6037 Dressel 20 amphora handle; an almost complete handle containing an impressed stamp in *ansa* (Fig A3.6). The reading is slightly difficult due to the faintness of the letters but would appear to be ?Q P P HRY, which is dated at Monte Testaccio to the reign of Hadrian (Callender 1965, no 1492; Carreras and Funari 1998, no 377). 344g.

264/6052 BB1 small everted-rim jar (Fig A3.7). Cf Gillam 1976, no 17, early to mid-second century. 26g. RE 19%.

*Foundation cut **221***

222/6054 GRA2 narrow-necked jar with everted rim and double shoulder groove. The form and fabric suggests a date in the late first to early second century. Cf at Holt, Grimes 1930, no 48 dated late first to early second century. 36g. RE 29%. Also, a GRA2 lid with slightly thickened rim. 10g. RE 5%.

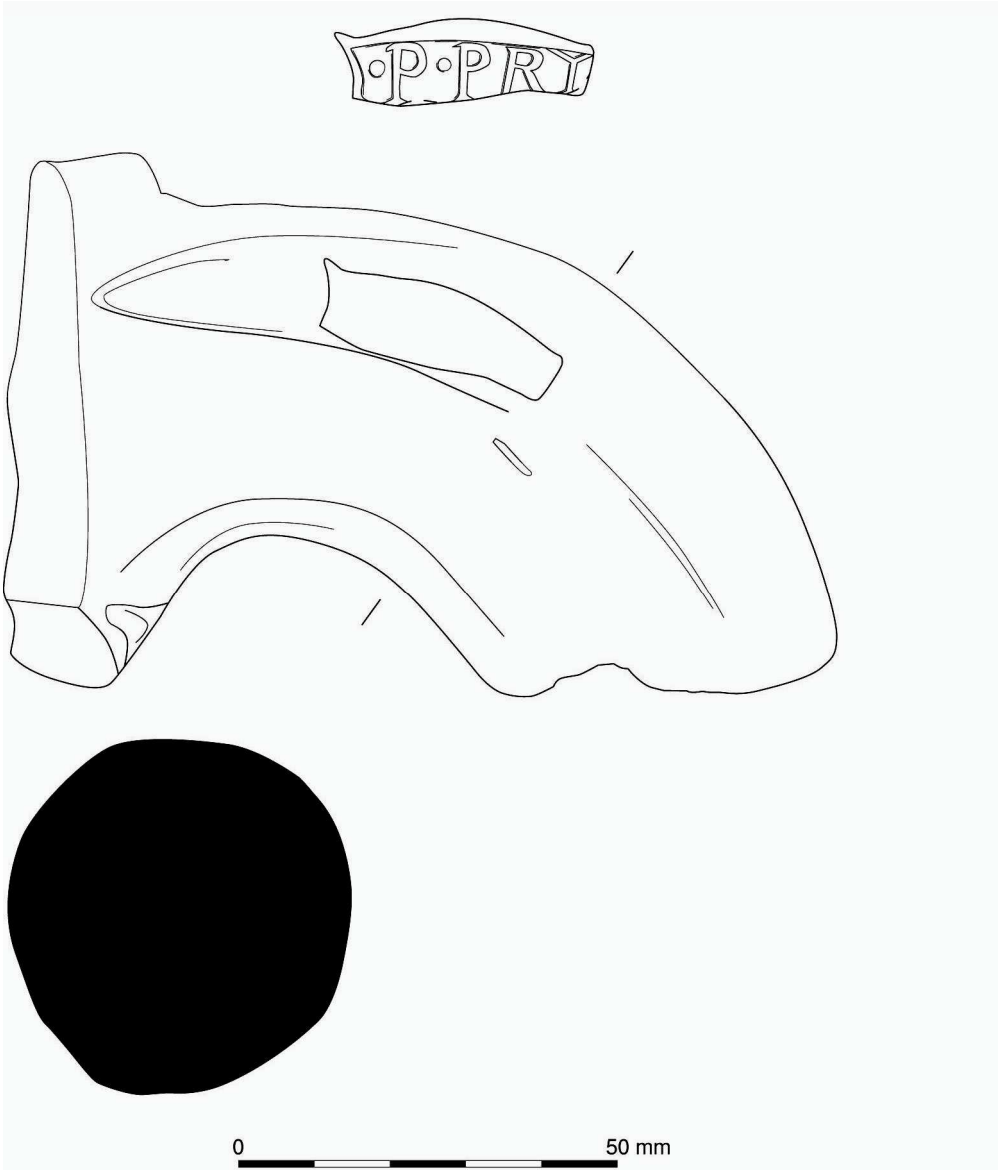


*Figure A3.6: Dressel 20 amphora handle (**264**/6037)*

*Figure A3.7: BB1 small everted-rim jar (**264**/6052)*

Period 2B

*Furnace **216***

905/684 GRA2 rim and body sherds (Fig A3.8). The rim is everted with a blunt tip. The bodysherd, not adjoining, has had a coating of clay applied, which has fired a different colour. This has been rusticated to form a rough surface. This is an unusual pattern of rustication but the technique of applying an extra coating of clay is paralleled at Lincoln (Darling 1984, no 10) in Neronian-early Flavian groups. 34g. RE 30%.

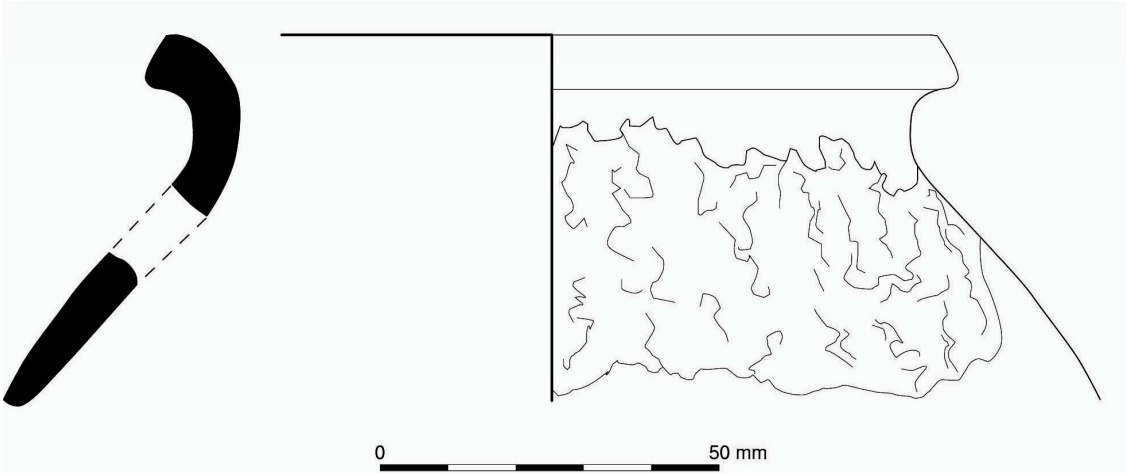


*Figure A3.8: GRA2 vessel (**905**/684)*

Period 2C/Phase 2

*Robber pit **113***

114/432 BB1 jar with slightly splayed neck and beaded rim tip with wavy line neck burnish (Fig A3.9). Early to mid-second century. 57g. RE 10%.

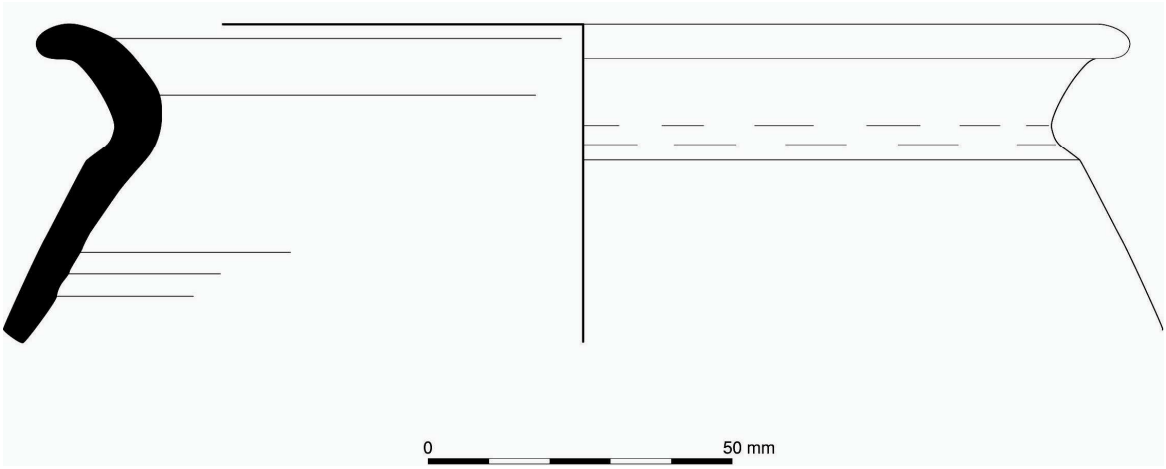


*Figure A3.9: BB1 jar (**114**/432)*

Robber trenches

528/6274 OAB2 narrow-mouthed jar with everted, tapering rim tip (Fig A3.10). The hard firing and grey core compares with a fabric from Middlewich (OAC2), which was used to make large jars, probably narrow-mouthed, with wavy line groove. The Middlewich vessel compared with vessels in the Severn Valley range of second- and third-century date (Leary forthcoming), and the fabric occurred in groups with Hadrianic-early Antonine pottery. 29g. RE 20%.

482/6287 M8 Rhaetian type. A mortarium with well-preserved red slip over the flange, which has a bifid tip (Fig A3.11). Kay Hartley suggested a date in the early second century, probably Trajanic, and a local origin.

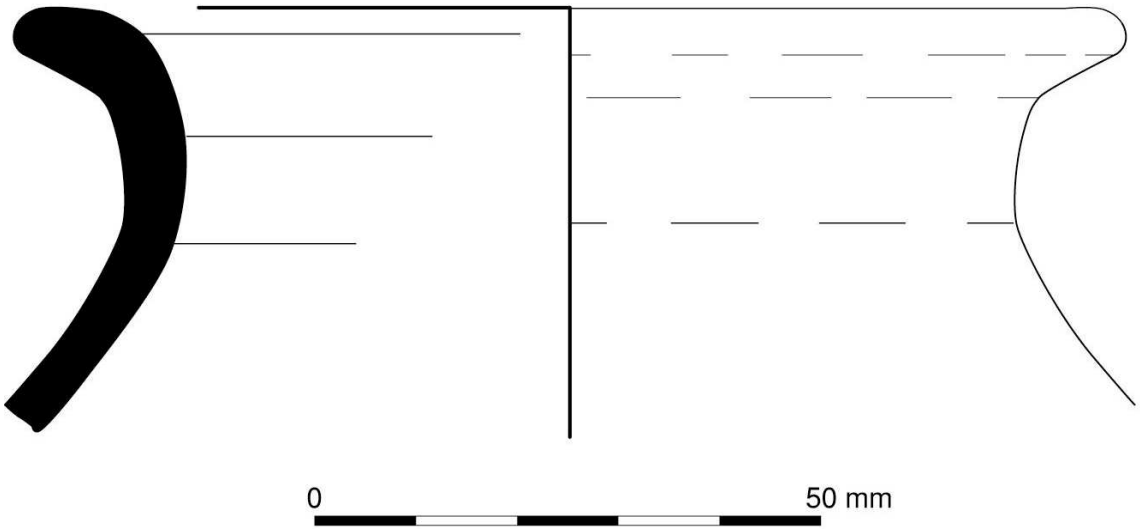


*Figure A3.10: OAB2 narrow-mouthed jar (**528**/6274)*

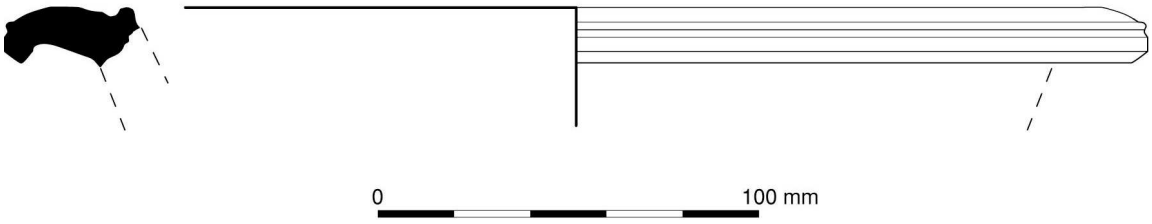


*Figure A3.11: Rhaetian-type motarium (**482**/6287)*

Period 2C/Phase 3

Demolition layer

489/545 GRA2 neck of flagon with traces of applied single handle. This vessel is burnt, or misfired unevenly white and grey. 64g.

Period 2 A-C

*Ditch **34***

33/426 BB1 flat-rim dish or bowl 29g. Mid-second century (Fig A3.12). RE 6%.

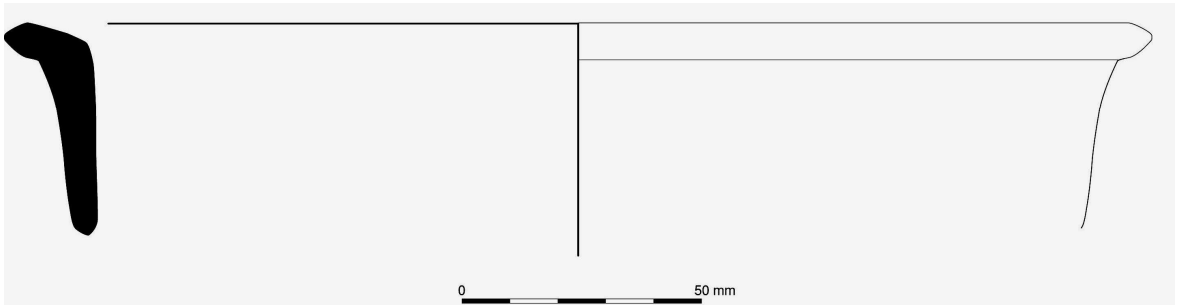


*Figure A3.12: BB1 flat-rim dish (**33**/426)*

*Ditch **43***

77/6033 NOG WH4 mortarium (Fig A3.13). 267g. There are horizontal striations on the flange and inside the body. AD 80-95. RE 15%.

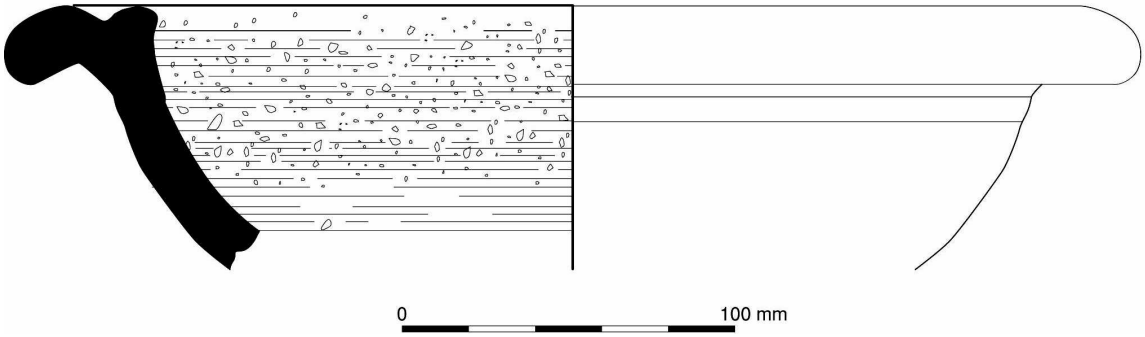


*Figure A3.13: NOG WH4 motarium (**77**/6033)*

71/6371 M10 flanged mortarium (Fig A3.14). Worn. Same as Barton Street fabric 20 (Leary 2007). Early second century, probably Trajanic. 399g. RE 50%.

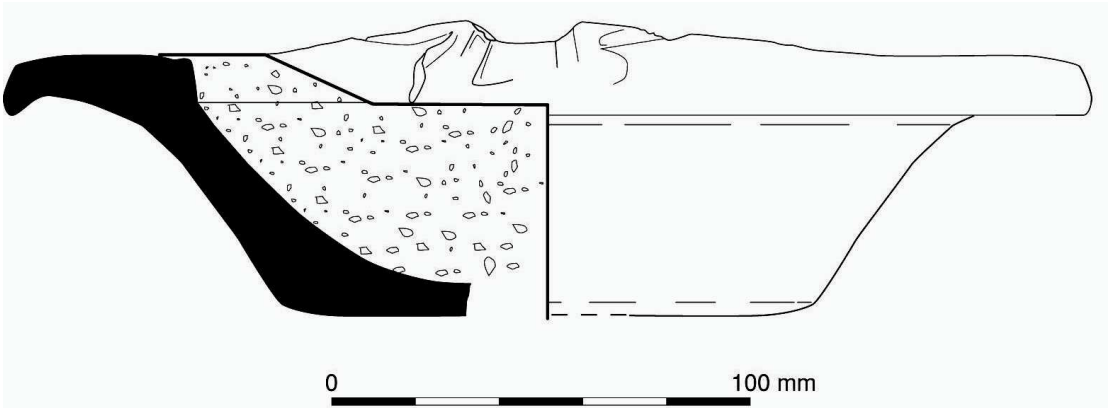


*Figure A3.14: M10 flanged motarium (**71**/6371)*

65/367 GRA2 base of jar with unusual rustication (Fig A3.15). 35g.

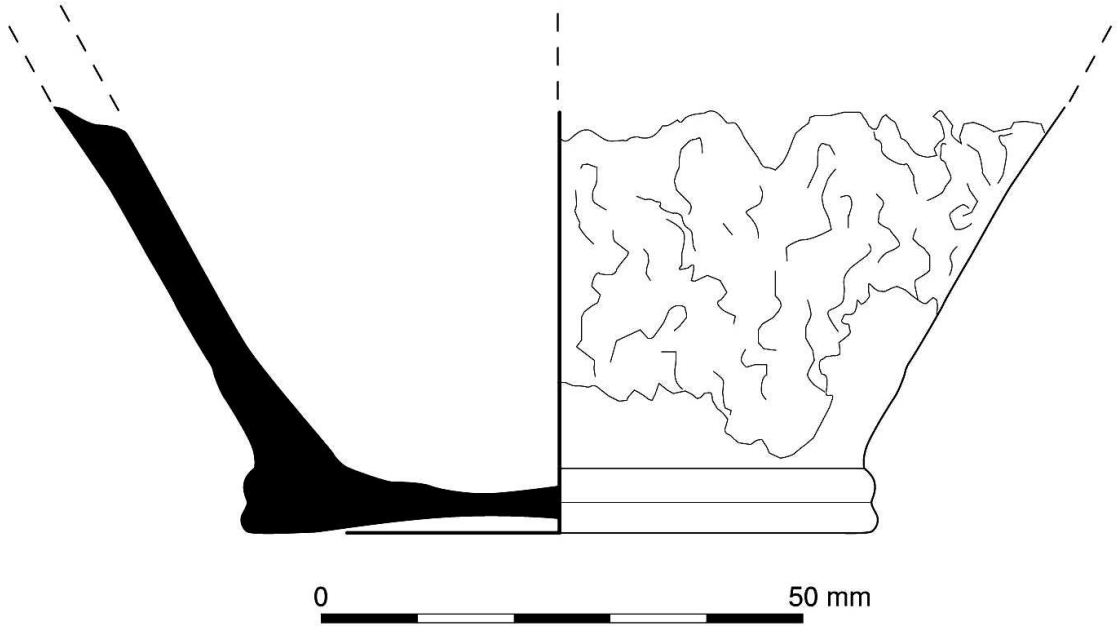


*Figure A3.15: GRA2 jar (**65**/367)*

65/6367 GRA2 body from narrow-mouthed vessel with zone of acute lattice burnish on the shoulder (Fig A3.16). Closely matched at Middlewich by a similar vessel from a pit fill dating to the late first to early second century (Leary forthcoming, no 70). 36g.

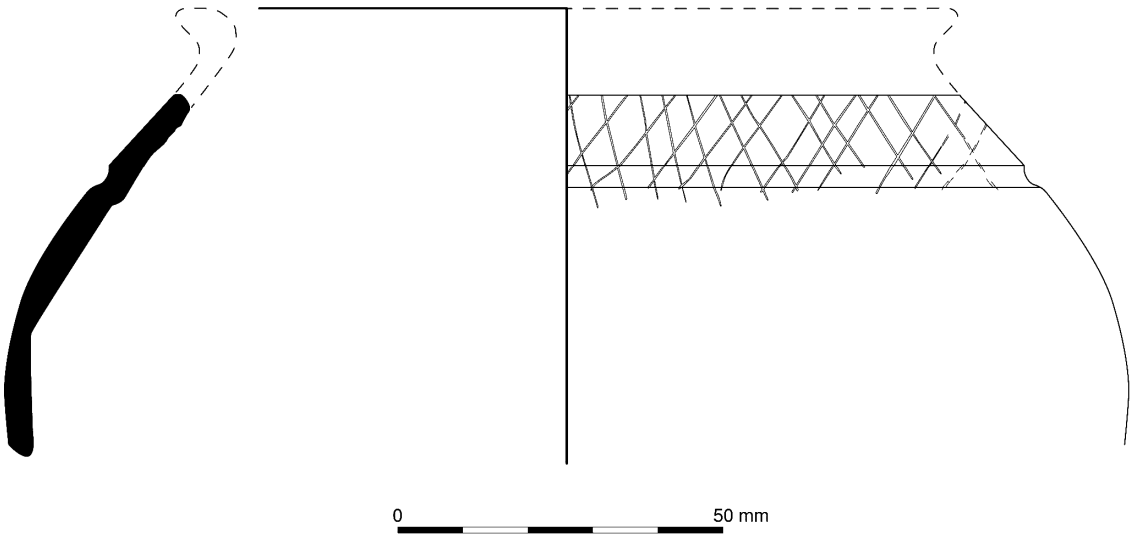


*Figure A3.16: GRA2 narrow-mouthed vessel (**65**/6367)*

48/6366 O unguent pot. This vessel was in a hard, orange fabric tempered with moderate quantities of sub-rounded, medium quartz (Fig A3.17). The vessel had been covered in a deposit during burial and this made detailed identification difficult. Traces of a shiny deposit on the lower inside walls and base may relate to its original contents. 151g.

48/369 BB1 bowl or dish with flat rim and acute lattice burnish (Fig A3.18). Burnt on the rim and indication of surface deterioration likely to be caused by high temperatures. Cf Gillam 1970, nos 59-62, mid-second century. 57g. RE 10%.

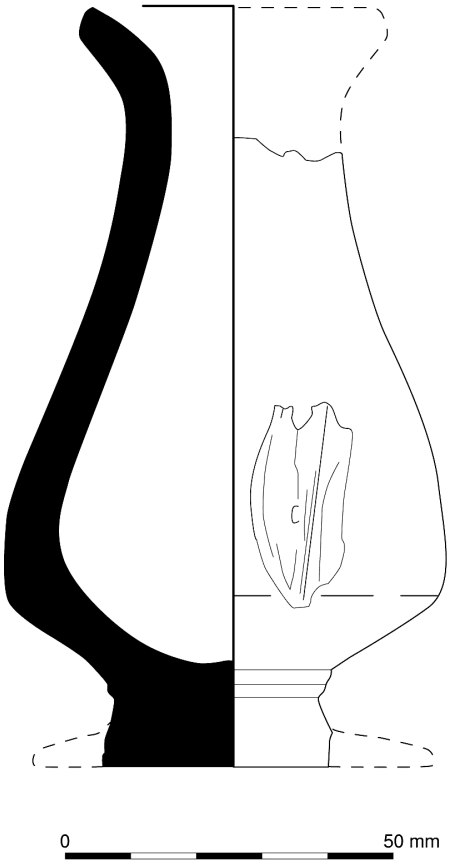


*Figure A3.17: Ungent pot (**48**/6366)*

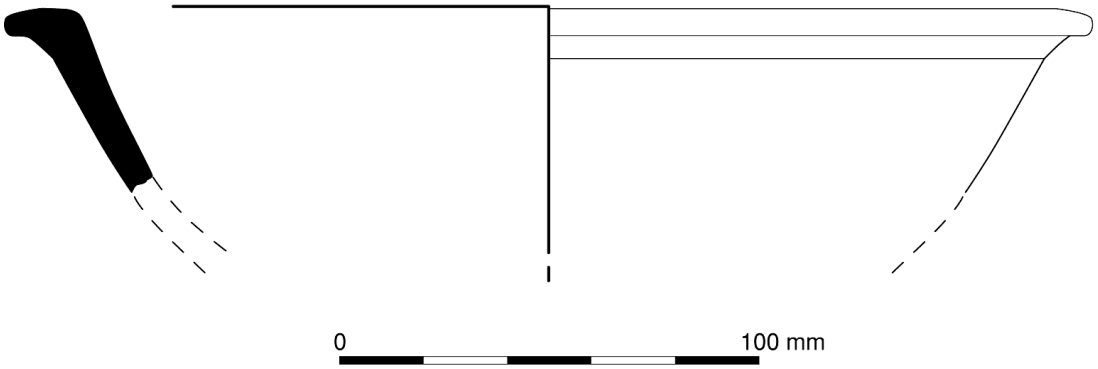


*Figure A3.18: BB1 bowl/dish (**48**/369)*

48/271 GRA4 bodysherd from closed vessel with oblique combed decoration, reminiscent of London ware. 27g. Also, FLA1, 16 sherds from a white ware flagon, two of which bore incised marks. One, a vertical line, may be accidental but the other is a complex graffiti. 425g.

48/271 GRA2 small neckless, everted rim jar/beaker (Fig A3.19). 17g. RE 20%.

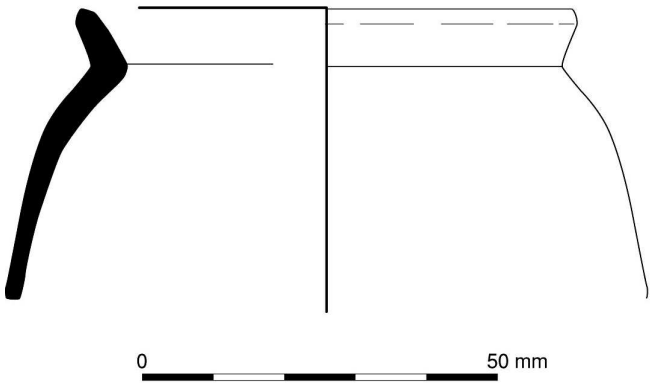


*Figure A3.19: GRA2 jar/beaker (**48**/271)*

48/369 BB1 jar with fairly upright neck and beaded rim tip (Fig A3.20). Hadrianic-early Antonine in or before the mid-second century (Gillam 1976, no 2). 42g. RE 20%.

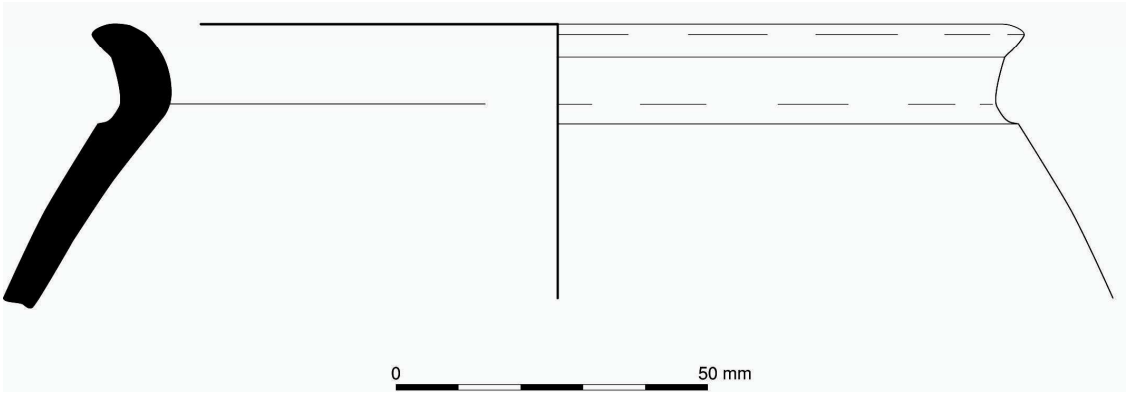


*Figure A3.20: BB1 jar (**48**/369)*

48/271 GRA2 body sherd from jar (Fig A3.21). This sherd has an oval shape and may be deliberately worked. There are three vertical post-firing grooves inside, which may be the result of secondary use.

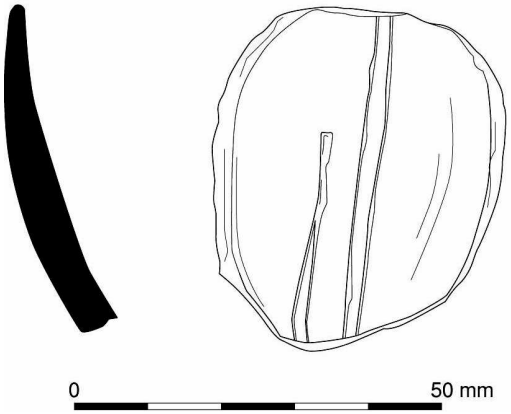


*Figure A3.21: GRA2 body sherd (**48**/271)*

48/271 FLA1, nine sherds from the body and footring base of a flagon(s). One large sherd bore a large and complex graffito which may part of that from OR284. The sherd with the graffiti was large and had a pre-firing dent (Fig A3.22). On the inside of this dent, a surface crack ran towards the edge of the sherd, with hairline lateral cracks also visible.

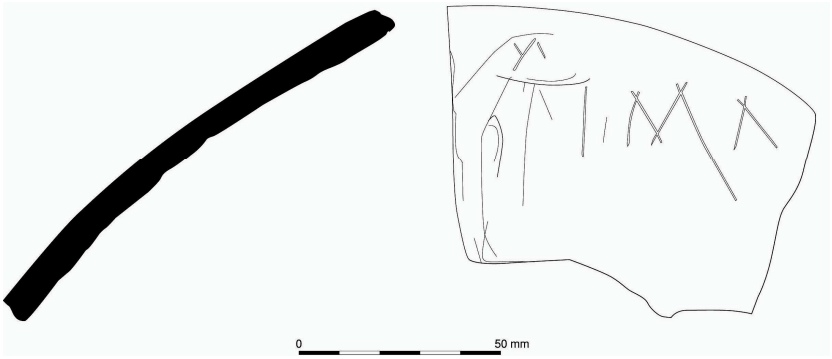


*Figure A3.22: FLA1 body sherd with graffito (**48**/271)*

47/284 BB1, four sherds from a flat-rim bowl with slight groove on the upper surface of the rim and acute lattice burnish on the body (Fig A3.23). The changeover from lattice to intersecting arcs is thought to have taken place in the late second century and very early in the third century (Gillam 1976, 68), so this piece would be placed early in the sequence of grooved flat-rim bowls, perhaps in the late second or at the beginning of the third century. The rim is slightly scorched and there is a notch at the angle of the body and base, which looks like a broken rivet hole. 444.6g. RE 37%.

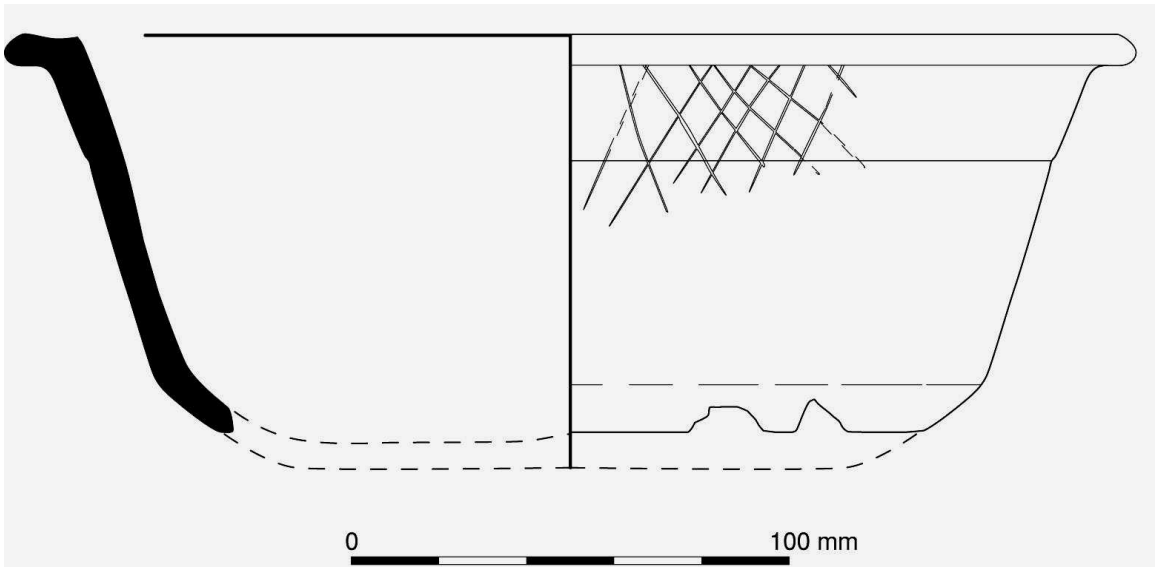


*Figure A3.23: BB1 flat-rim bowl (**47**/284)*

47/284 two sherds from rim and body of a BB1 jar, with simple everted rim and acute lattice burnish around the girth (Fig A3.24). Some burnt material. 72.3g. RE 19%.

47/284 three sherds from a BB1 flat-rim dish with acute lattice burnish (Fig A3.25). Cf Gillam 1970, nos 59-62, mid-second century. 245g. RE 35%. At least one more dish of this type was also present.

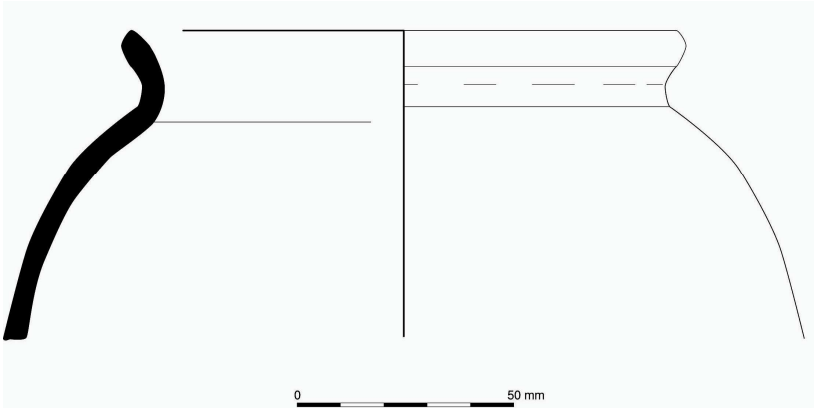


*Figure A3.24: BB1 jar (**47**/284)*

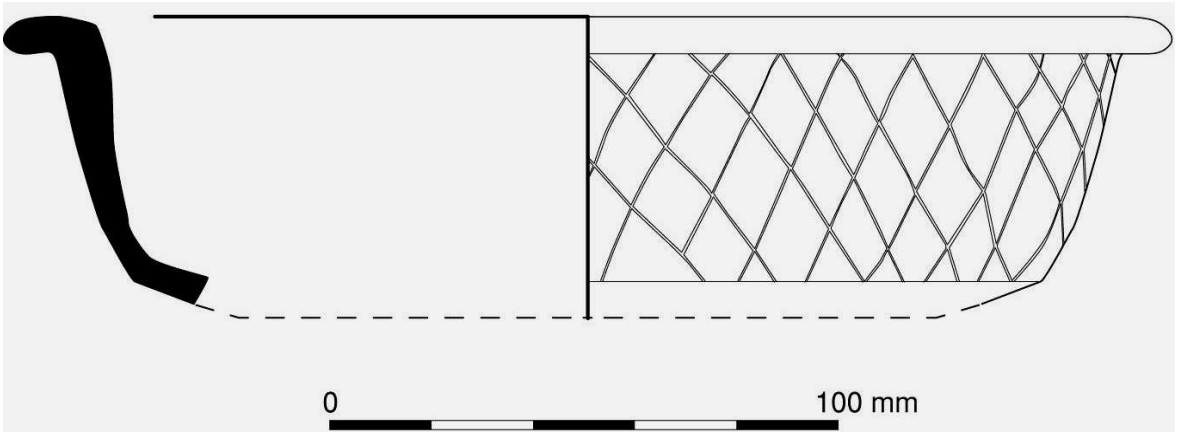


*Figure A3.25: BB1 flat rim dish (**47**/284)*

47/284 GRA1B cordoned bowl (Fig A3.26). Cf Grimes 1930, no 226, for which early second-century parallels are given and at Segontium in a pre-Hadrianic level (Webster 1993a, fig 17.3 no 57). 56g. RE 8%.

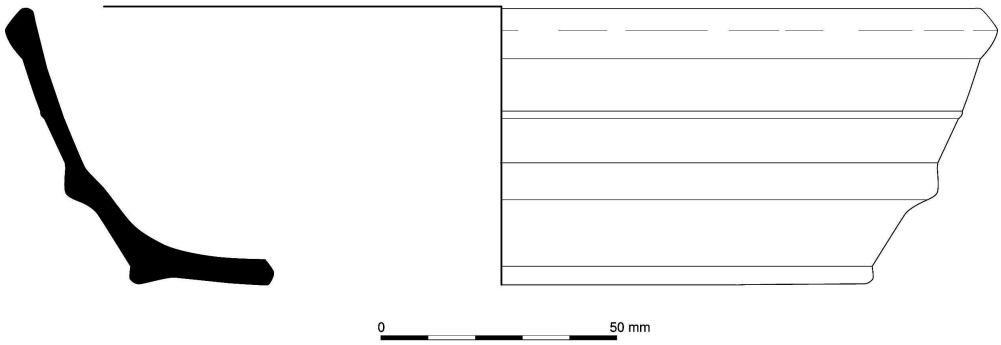


*Figure A3.26: GRA1B cordoned bowl (**47**/284)*

47/284 GRA2 lid with upturned rim (Fig A3.27). 66.8g. RE 37%.

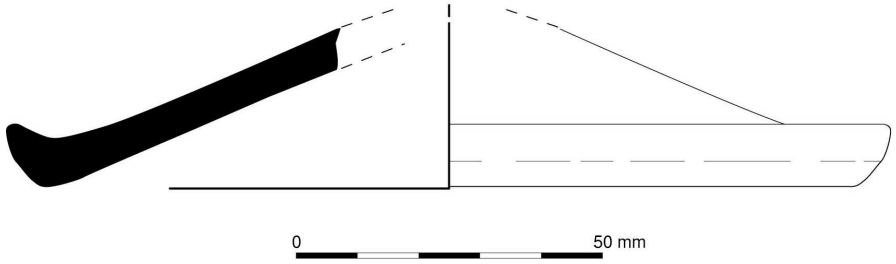


*Figure A3.27: GRA2 lid (**47**/284)*

44/230 BB1 jar with fairly upright neck and beaded rim tip (Fig A3.28). Wavy line burnish is evident on the neck and acute lattice burnish on the girth. Hadrianic-early Antonine in or before the mid-second century (Gillam 1976, no 2). 101g. RE 15%.

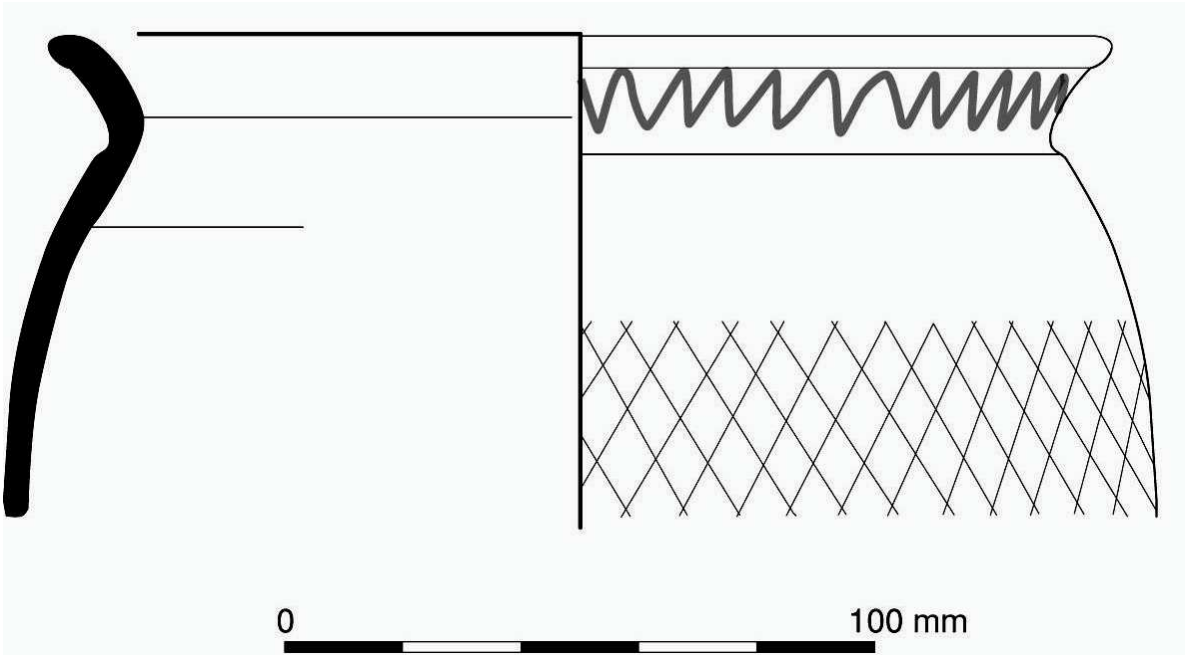


*Figure A3.28: BB1 jar (**44**/230)*

32/289 BB1 flat-rim dish, mid-second century (Fig A3.29). Burnt. 160g. RE 35%.

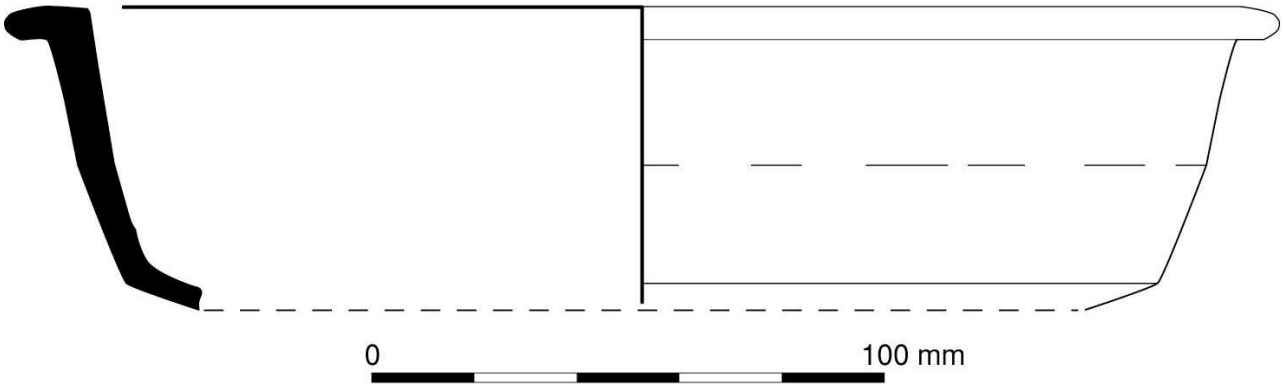


*Figure A3.29: BB1 flat-rim dish (**32**/289)*

32/289 BB1 flat-rim dish with acute lattice burnish (Fig A3.30). Mid-second century. 216g. RE 38%.

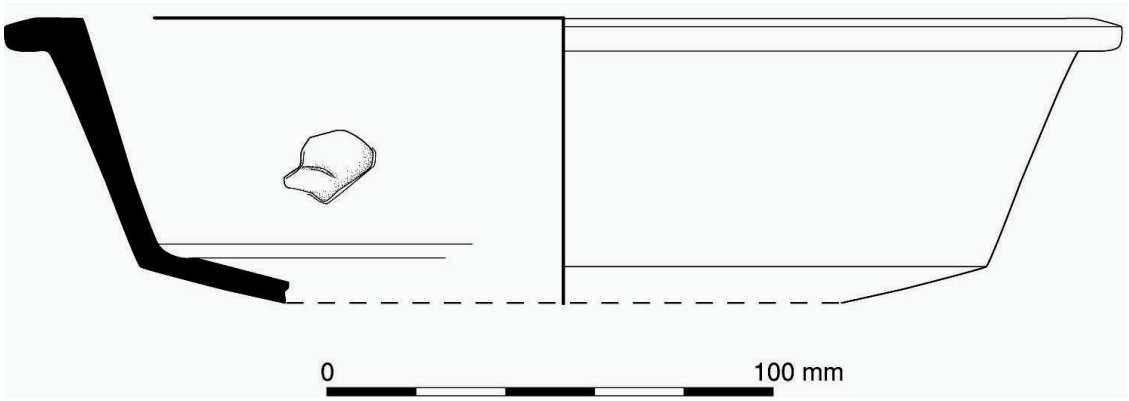


*Figure A3.30: BB1 flat-rim dish (**32**/289)*

32/289 BB1 grooved-rim bowl with acute lattice burnish, burnt (Fig A3.31). Gillam 1976, no 52, mid-late second century, Bidwell 1985, fig 71 no 135, dated *c* AD140 to early third century, thought to come from the Rossington Bridge kilns near Doncaster, South Yorkshire. 103g. RE 44%.

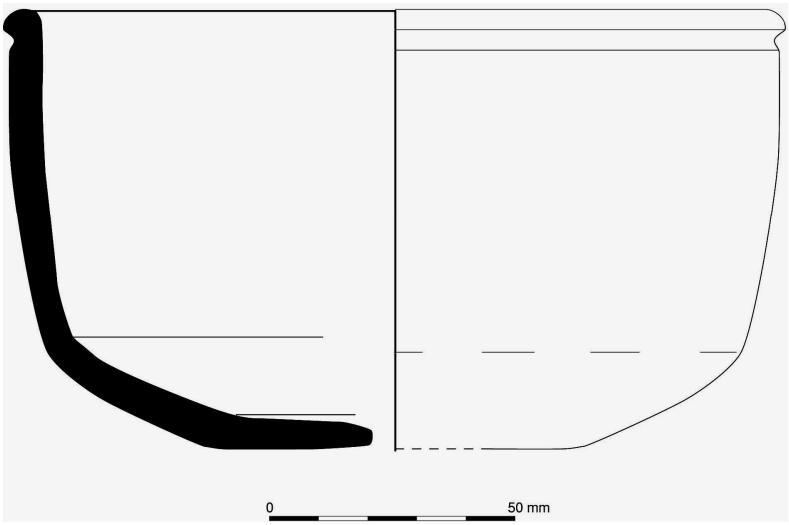


*Figure A3.31: BB1 grooved-rim bowl (**32**/289)*

32/289 FLB1 splayed ring-necked flagon (Fig A3.32). Gillam 1970, no 5, dated AD 110-50. 121g. RE 100%.

32/289 FLB1 splayed ring-necked flagon with slight internal rim rebate (Fig A3.33). 19g. RE 36%.

32/289 FLA1 bodysherds from flagon with two X graffiti.

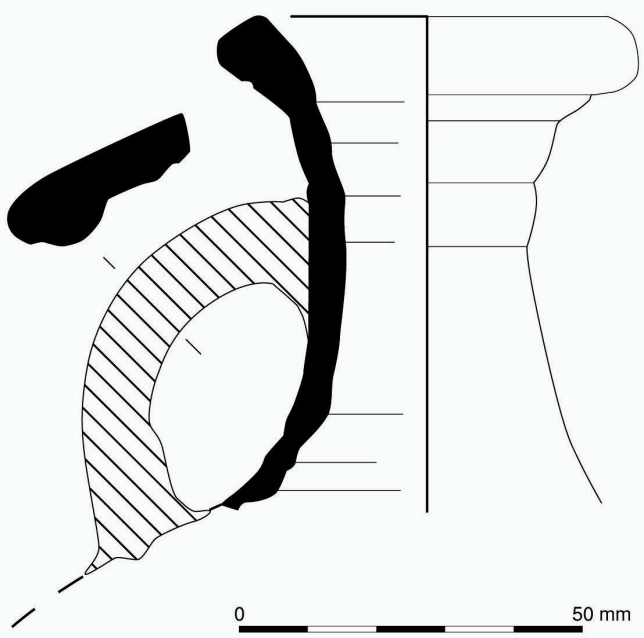


*Figure A3.32: FLB1 flagon (**32**/289)*

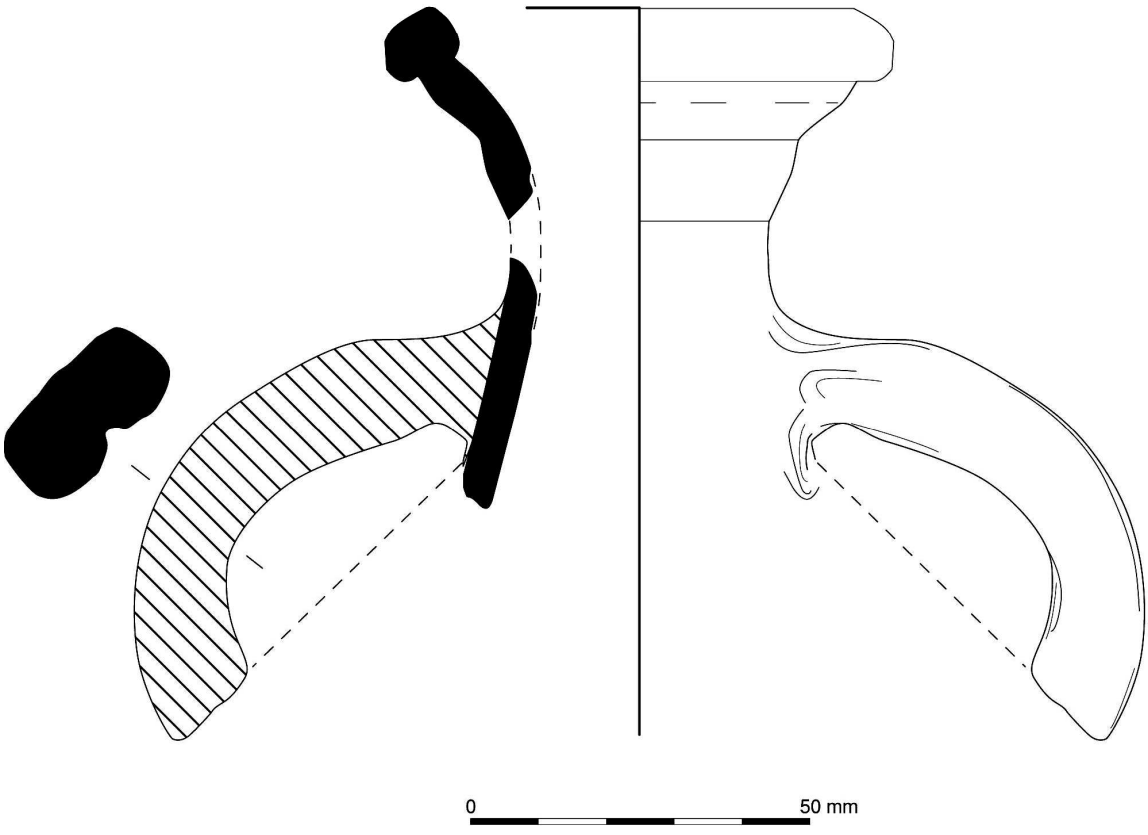


*Figure A3.33: FLB1 flagon (**32**/289)*

48/6412 Dressel 20 amphora rim (Fig A3.34). Cf Martin-Kilcher 1987, beilage 1E, no 81, *c* AD 110-50. 227g. RE 14%.

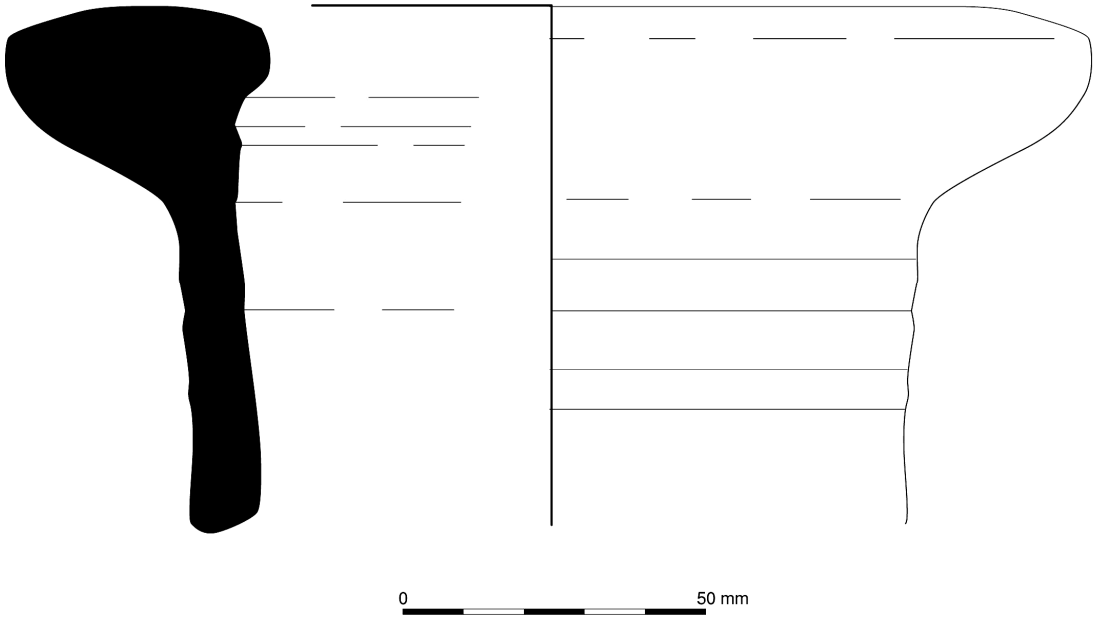


*Figure A3.34: Dressel 20 amphora rim (**48**/6412)*

48/6412 Dressel 20 amphora rim (Fig A3.35). Cf Martin-Kilcher 1987, beilage 1E, no 86, *c* AD 110-50. 121g. RE 19%.

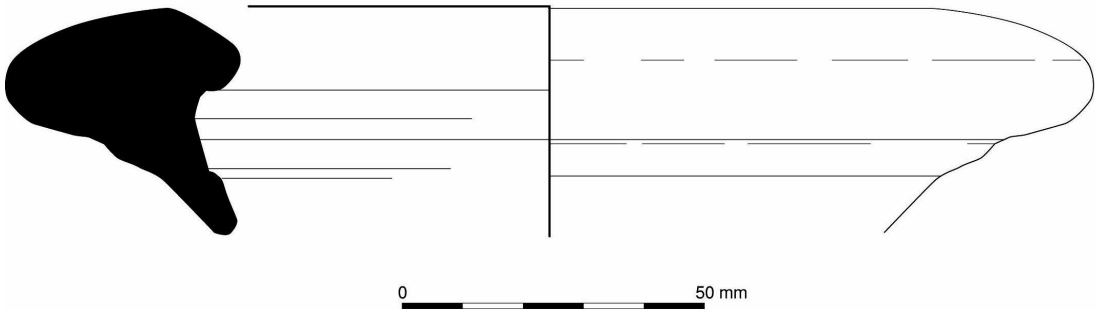


*Figure A3.35: Dressel 20 amphora rim (**48**/6412)*

48/6379 white-ware rim with downturned rim (Fig A3.36). 54g. RE 18%. Amphora undesignated. Difficult to place.

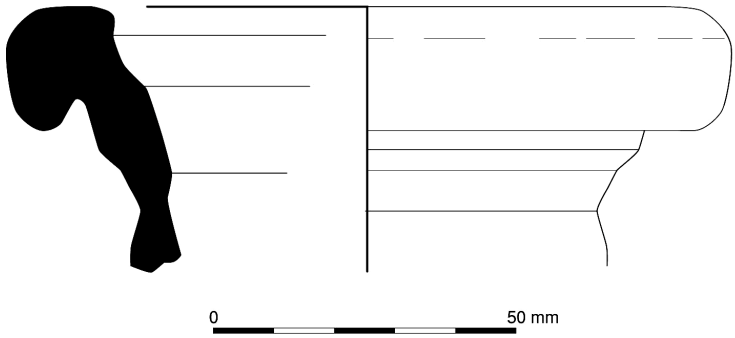


*Figure A3.36: Undesignated amphora rim (**48**/6379)*

*Ditch **178***

179/352 GRB1 neckless everted-rim jar. A second jar of this type in GRA2 was also present.

179/352 FLB2, very abraded sherds from neck, rim and handles of flagon with flat out-turned rim. 225g. RE 100%.

179/352 Fine cream fabric with pink core (Fig A3.37). Large flagon with collared everted rim, slightly rebated. 70g. RE 15%. Cf Hawkes and Hull 1947, no 172.

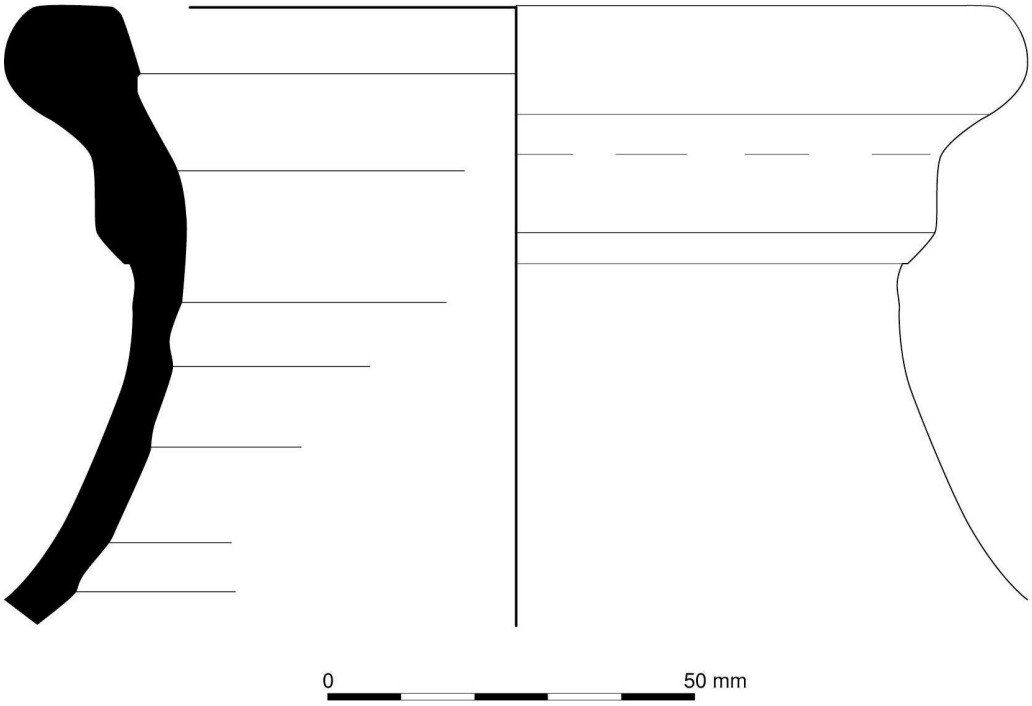


*Figure A3.37: Large flagon with collared rim (**179**/352)*

179/6376 F5 flanged mortarium (Fig A3.38). Early Mancetter-Hartshill. Self-coloured, cream fabric; texture slightly powdery and somewhat friable. Inclusions: fairly frequent, ill-sorted, mostly very small, transparent and pinkish quartz, rare black and orange-brown material. Trituration grit: vari-sized, mixed, mostly transparent quartz, some quartz sandstone and rare orange-brown and black material. The poorly impressed, right-facing stamp survives. Only the first two letters, CO, and the border are reasonably clear, but these are enough to permit its identification as a retrograde stamp of Coertutinus, from the less common of his two dies; the full reading of complete stamps from this die is COIRTVTIN retrograde, the I is standing in for E. Mortaria of Coertutinus are now known from Alcester, Warkwickshire (three); Baginton; Barton-under-Needwood, Staffordshire; Coleshill; Holditch; Leicester (11); *Manduessedum* (two); *Margidunum*; Rocester (four); *Tripontium* (two); Wigan; and Wilderspool (two). The optimum date for his mortaria is AD 90-120 and such site evidence as there is would fit this date. His distribution, with the large number at Leicester and the presence of his mortaria at *Manduessedum*, strongly indicates production in the Mancetter-Hartshill potteries. There is some circumstantial evidence to suggest that Coertutinus, like at least one other contemporary potter at these

potteries, had some, probably minor, activity elsewhere in the Midlands, but the Wigan mortarium can confidently be attributed to the Mancetter-Hartshill potteries.

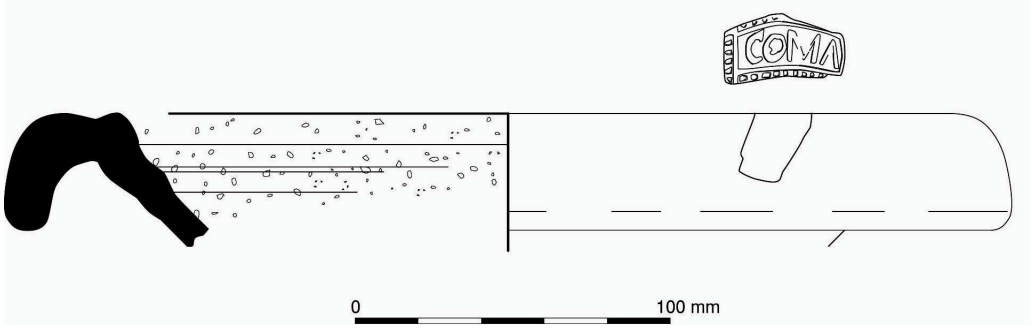


*Figure A3.38: Flanged mortarium (**176**/6376)*

179/673 Dressel 20 amphora handle. Handle is sawn off at both ends. Stamped. Unfortunately stamp is very faint and incomplete. 263g.

179/6406 Dressel 20 rim sherd (Fig A3.39). 135g. RE 24%.

179/6406 Dressel 20 rim sherd (Fig A3.40). 396g. RE 60%.

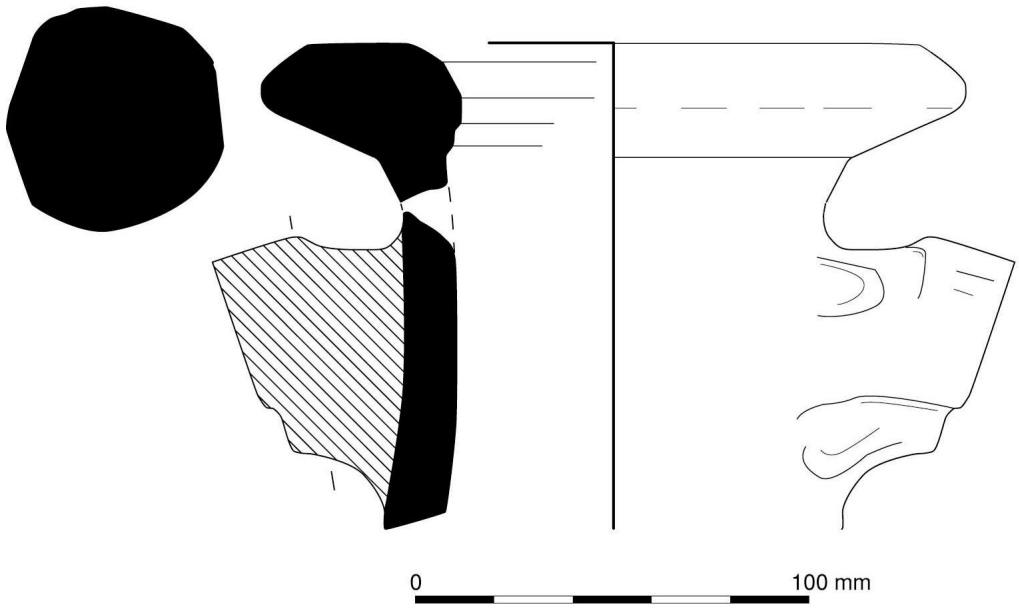


*Figure A3.39: Dressel 20 rim sherd (**179**/6406)*

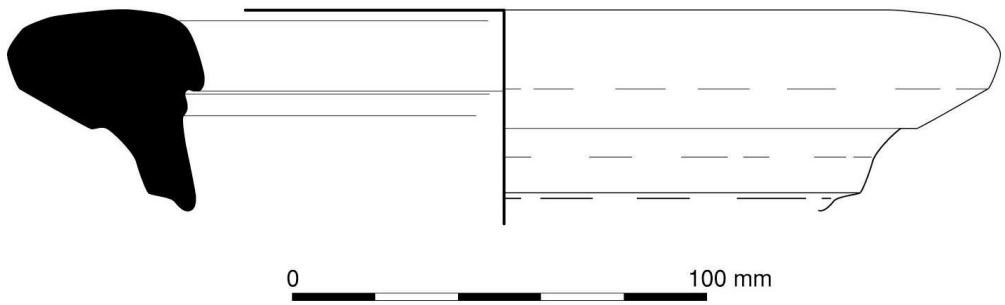


*Figure A3.40: Dressel 20 rim sherd (**179**/6406)*

*Ditch **150***

149/6385 GRA1B neckless, everted-rim jar with barbotine dot decoration (Fig A3.41). Early second-century type. 71g. RE 15%.

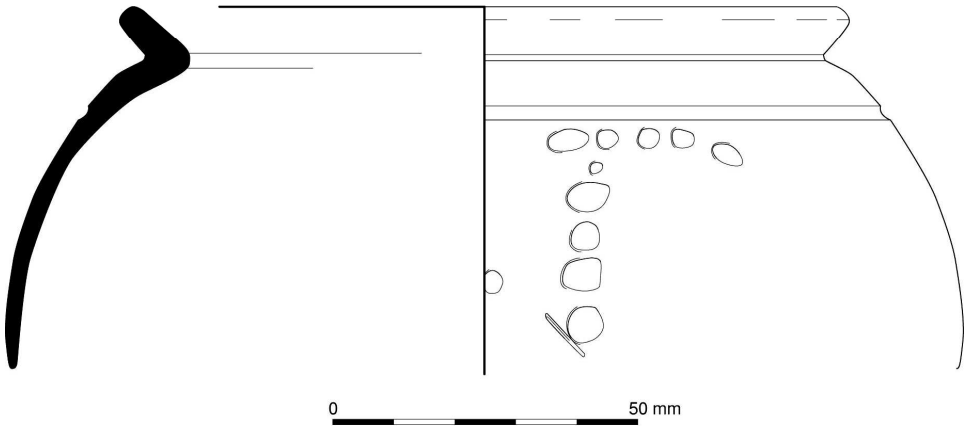


*Figure A3.41: GRA1B (**149**/6385)*

*Ditch **198***

199/409 OAB1 reeded-rim bowl. Late first to early second century (Fig A3.42). Burnt on edge of rim. 15g. RE 5%.

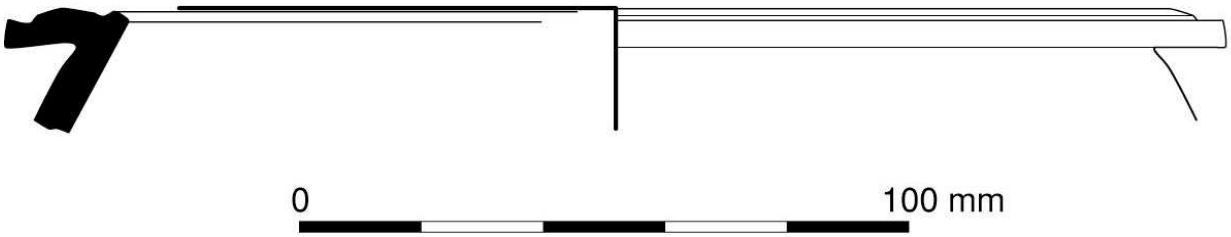


*Figure A3.42: Dressel 20 rim sherd (**199**/409)*

*Pit **41***

56/6372 L1 fragment of small lamp, part of base, wall and discus edge (Fig A3.43). A small section of clay luted onto the outside is perhaps the beginning of the shoulder of the nozzle. The upper edge of the lamp is rounded and the discus is at a lower level and most of it is broken away. There is a thick black deposit all over the inner surface and much of the outer surface is burnt dark grey to black. There are strong concentric ridges on the inside, suggesting the lower half was thrown.

56/523 BB1T flat-rim bowl with deep chamfer (Fig A3.44). Early second century, Hadrianic. 42g. RE 13%.

54/6370 F7 flanged mortarium, Antonine (Fig A3.45). 117g. RE 10%.

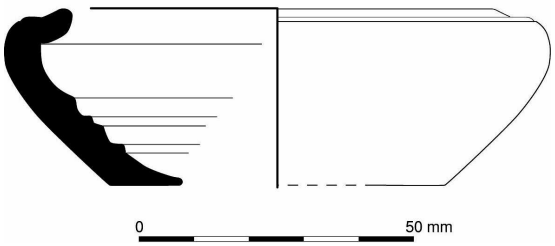


Figure A3.43: Fragment of a small lamp (56/6372)

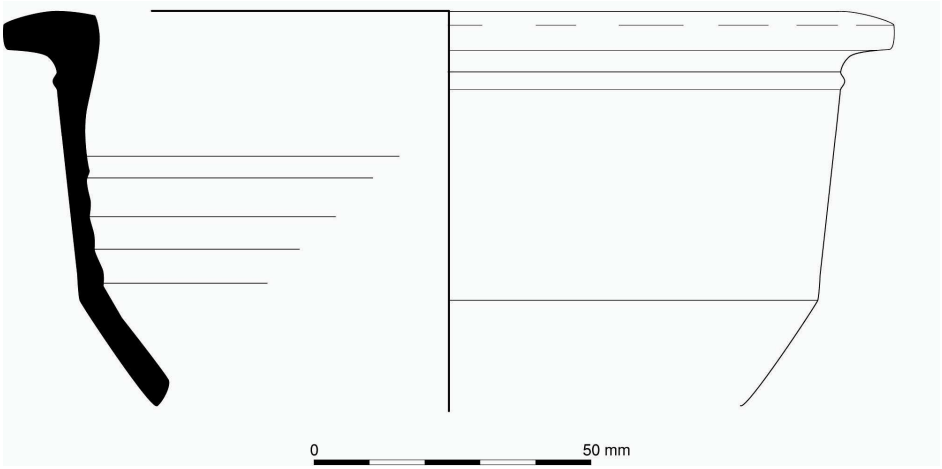


*Figure A3.44: BB1 flat-rimmed bowl (**56**/523)*

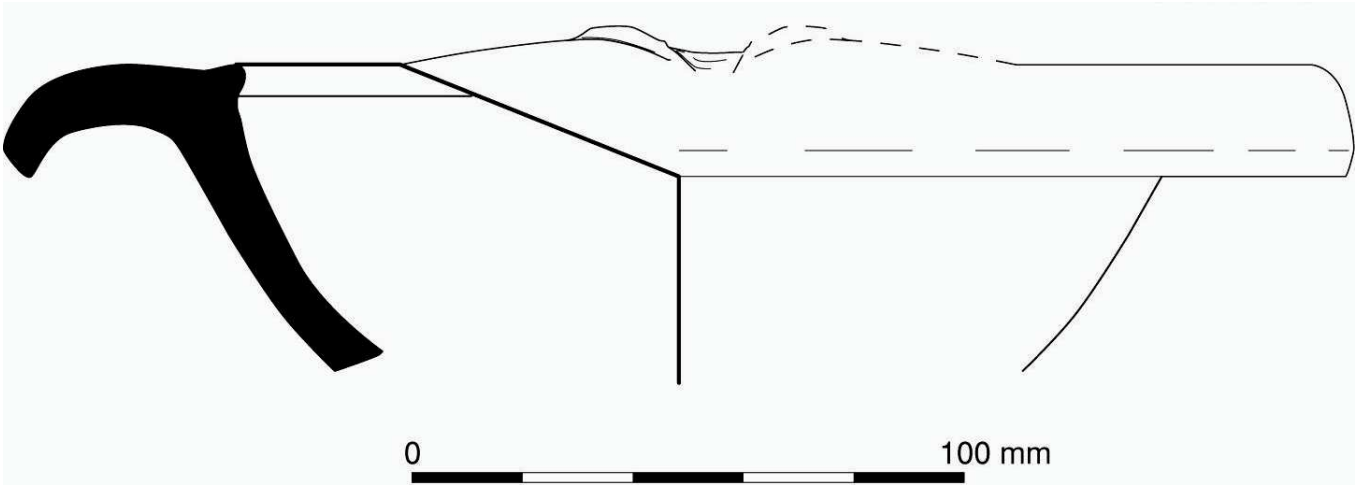


*Figure A3.45: F7 flanged mortarium (**54**/6370)*

Later Phases

33/6282 FLB2 base of closed vessel which has been reworked into a roundel (Fig A3.46).

33/6385 M9 flanged mortarium. Probably local, second century, probably Trajanic. 117g. RE 10%.

316/6024 OAB1 flat-rim bowl (Fig A3.47). This belongs to reeded-rim bowl series of the Flavian-Trajanic period.

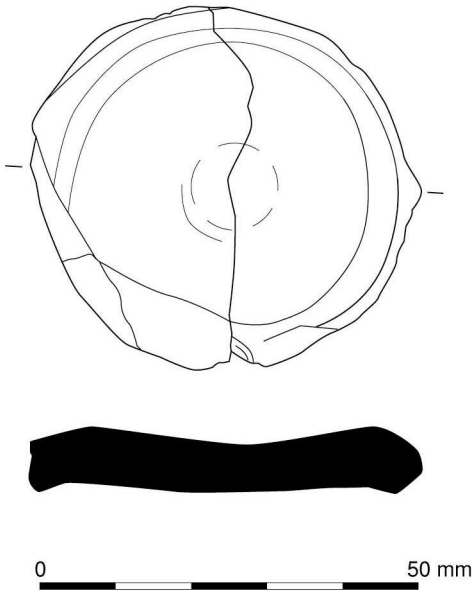


*Figure A3.46: FLB2 roundel (**33**/6282)*

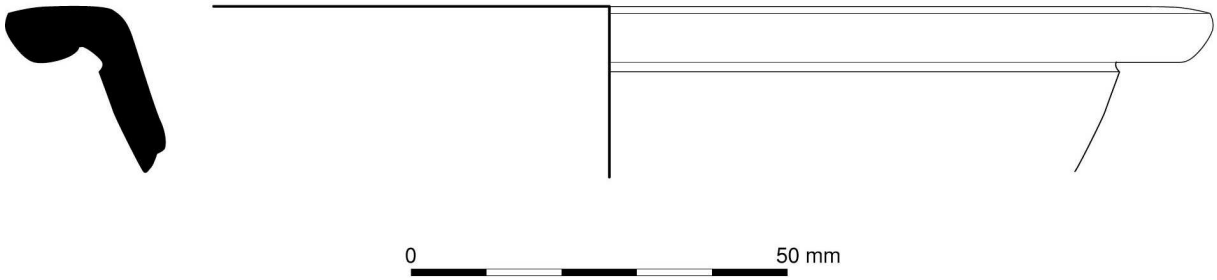


*Figure A3.47: OAB1 flat-rim bowl (**316**/6024)*

947/205 FLB1 rim of honeypot-type jar with blunt everted rim (Fig A3.48). This example is matched at kilns at Holt (Grimes 1930, no 71) and Wilderspool (Hartley and Webster 1973, no 38), and a similar type was present in a group deposited in the late second century, which included much Hadrianic-early Antonine pottery at Barton Street, Manchester (Leary 2007). Similarly, at Middlewich, a 'honeypot' was present in a group containing predominantly early Antonine pottery including samian, although a late second- or early third-century sherd from a BB1 jar was also present (Leary forthcoming). 24g. RE 20%.

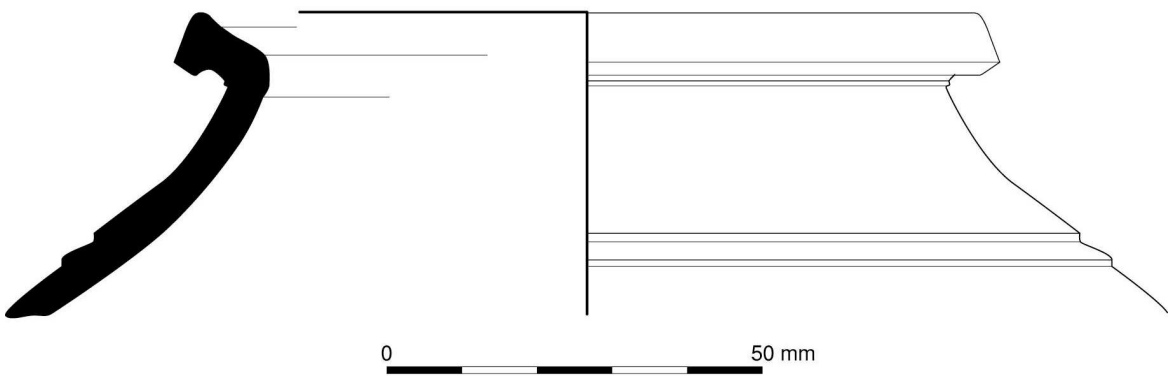


*Figure A3.48: FLB1 honeypot-type jar (**947**/205)*

947/205 OAA1, unusual handle, slightly burnt inside and appears warped. 40g.

947/368 OAB1 wide-mouthed vessel with everted, internally rebated rim (Fig A3.49). A vessel was present at Warrington (Webster 1992, fig 78, no 622) from a ditch with predominantly Hadrianic to mid-Antonine pottery (see also fig 73 no 464 and fig 79).

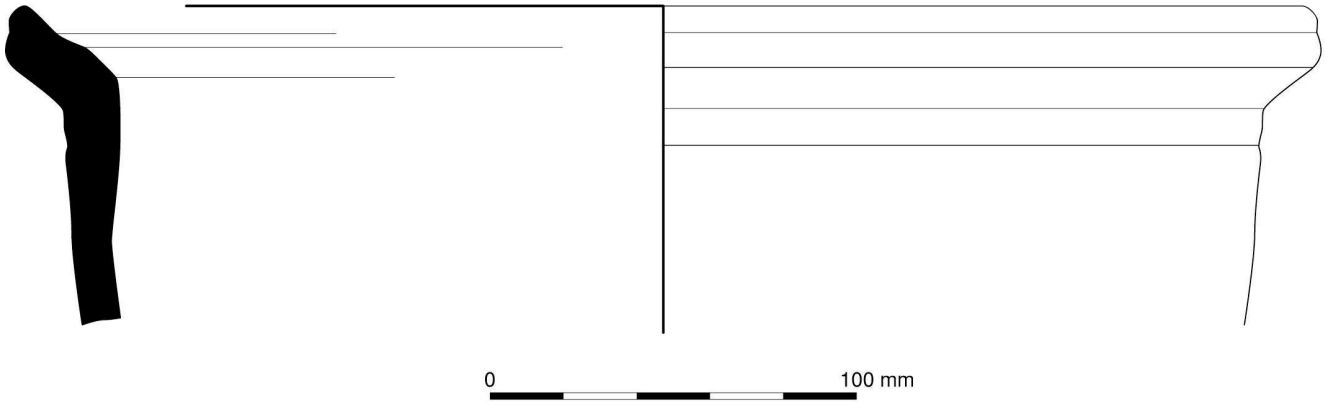


*Figure A3.49: OAB1 wide-mouthed vessel (**947**/368)*

*Pit **159***

160/396 OAB1 reeded-rim bowl with trace of darker surface/slip (Fig A3.50). The rim has two grooves with a wider central part. It is downbent with a blunt tip. 19g. RE 8%.

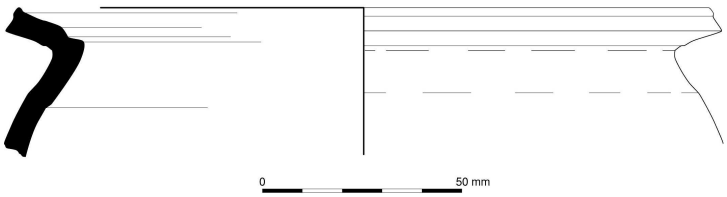


*Figure A3.50: OAB1 reeded-rim bowl (**160**/396)*

*Pit **118***

122/242 OAA2 rim and upper body of bowl with grooved rim (Fig A3.51). The rim is slightly flared above the upright upper body, which is rouletted. There is an internal groove at the junction of the upper body and rim section. This arrangement is a copy of samian form 29, comparing with early-mid Flavian types (Webster 1996, 40 and fig 26 B and C). 11g. RE 7%.

122/242 OAB1 narrow-mouthed vessel with outcurving rim (Fig A3.52). The rim has two grooves on the inside surface, perhaps rebates. 16g. RE 8%.

122/6408 Gauloise 4 amphora rim (Fig A3.53). 103g. RE 24%.

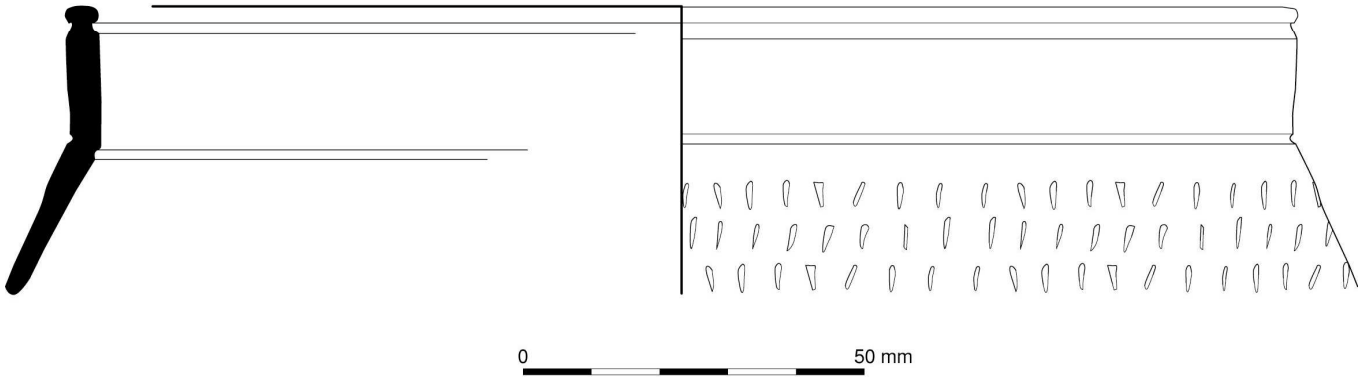


*Figure A3.51: OAA2 bowl (**122**/242)*

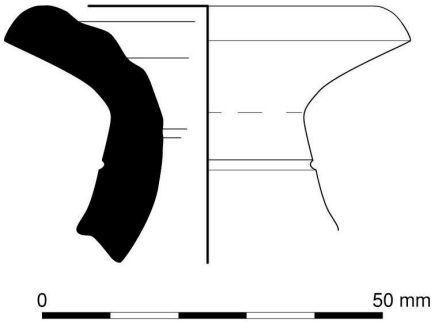


*Figure A3.52: OAB1 narrow-mouthed vessel (**122**/242)*

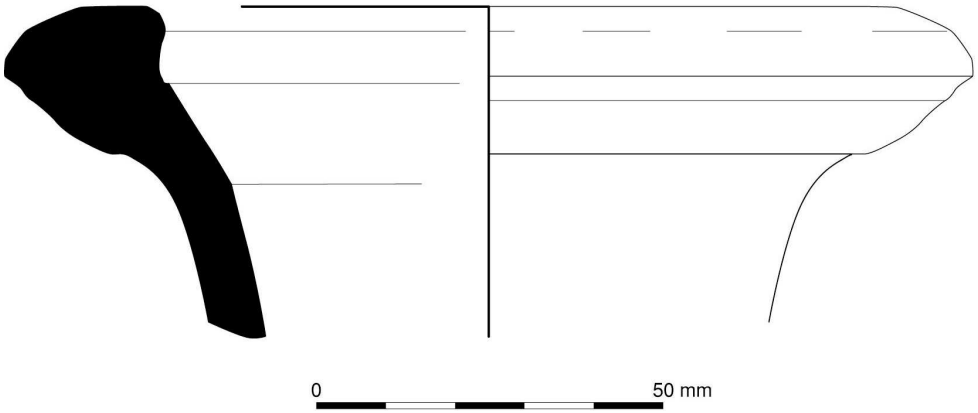


*Figure A3.53: Gauloise 4 amphora rim (**122**/6408)*

*Pit **129***

127/314 OAB1 everted rim of small jar or beaker with cordoned neck (Fig A3.54). 11g. RE 14%.

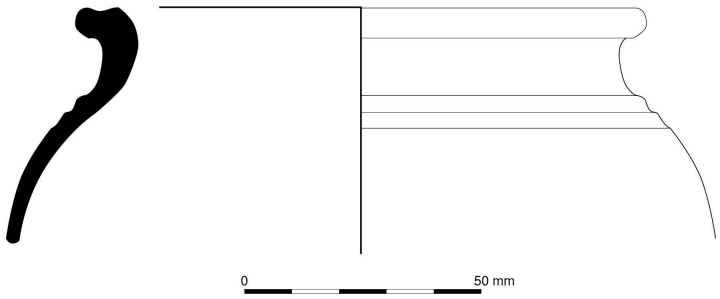


*Figure A3.54: OAB1 jar/beaker (**127**/314)*

*Pit **29***

30/270 OAA2 curved wall platter with plain rim (Fig A3.55). Probably an early second-century form, cf Marsh and Tyers 1978, type 24, at Holt (Grimes 1930, fig 69, nos 129-37), and at Wilderspool (Hartley and Webster 1973, fig 7, no 66). 26g. RE 3%.

31/6368 M9 profile of flanged mortarium (Fig A3.56). Concentric scoring inside upper body. Second century, probably Trajanic. 151g. RE 12%.

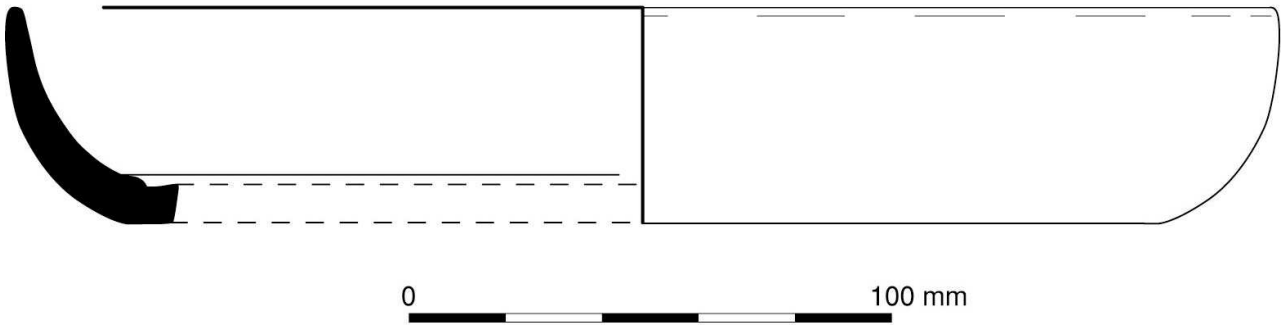


*Figure A3.55: OAA2 platter (**30**/270)*

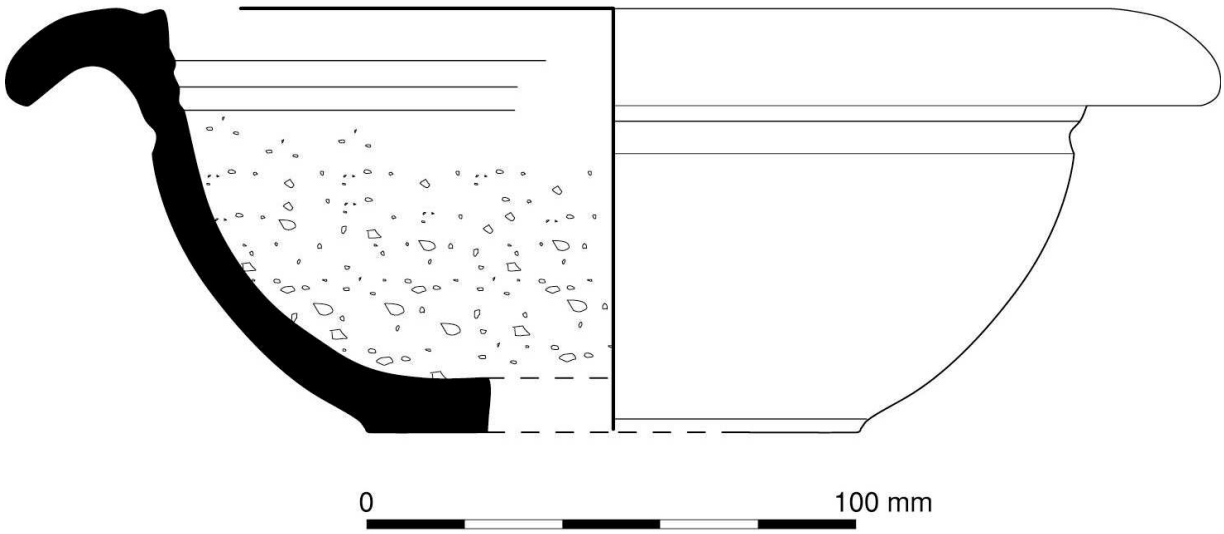


*Figure A3.56: M9 mortarium (**31**/6368)*

*Pit **140***

137/385 GRB2 bead and flange hemispherical bowl (Fig A3.57). Very abraded. 122g. RE 28%.

137/6388 Dressel 20 rim (Fig A3.58). Cf Martin-Kilcher 1987, beilage IE, no 80, *c* AD 110-50. 360g.

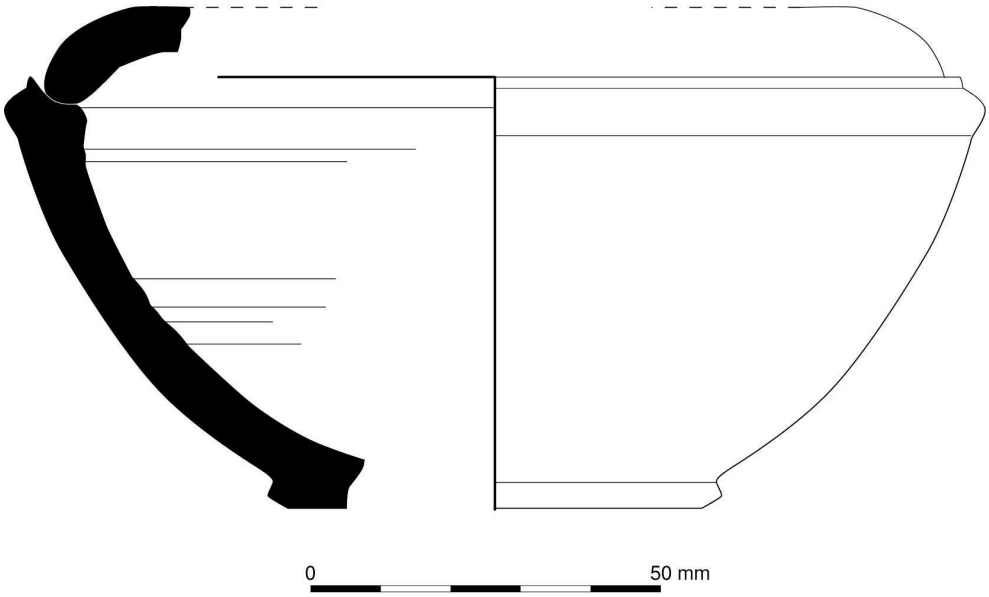


*Figure A3.57: GRB2 bowl (**137**/385)*

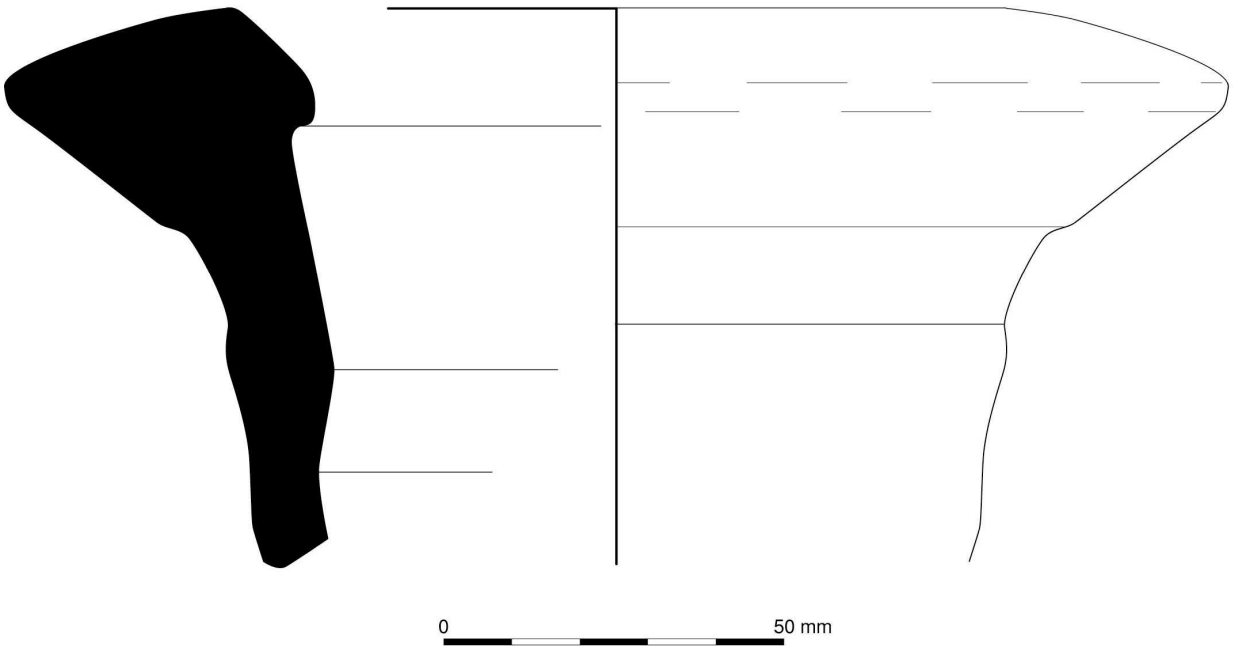


*Figure A3.58: Dressel 20 rim (**137**/6388)*

*Ditch **151***

153/6040 OAA2 narrow-mouthed jar with everted rim (Fig A3.59). This is a long-lived form but the fabric and finish suggest a date in the late first or first half of the second century. 49g. RE 40%.

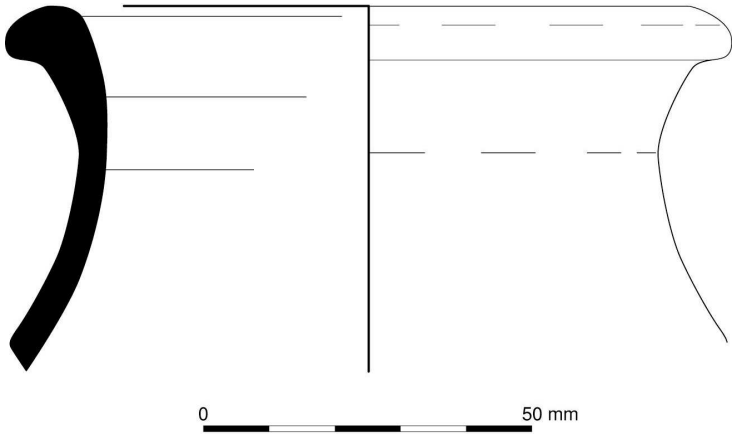


*Figure A3.59: OAA2 narrow-mouthed jar (**153**/6040)*

Evaluation Trench 6

630/270 GRA2 sherds of a necked jug or perhaps honeypot type, with at least one handle (Fig A3.60). The rim has an everted tip. There appears to be a cordon on the shoulder. This vessel compares with the jar with rebated sloping necks of Flavian type and jars from a Trajanic kiln at Derby racecourse (Brassington 1980, fig 11, no 336), dated Trajanic-?early Hadrianic by Swan 1984, microfiche). 126g. RE 30%.

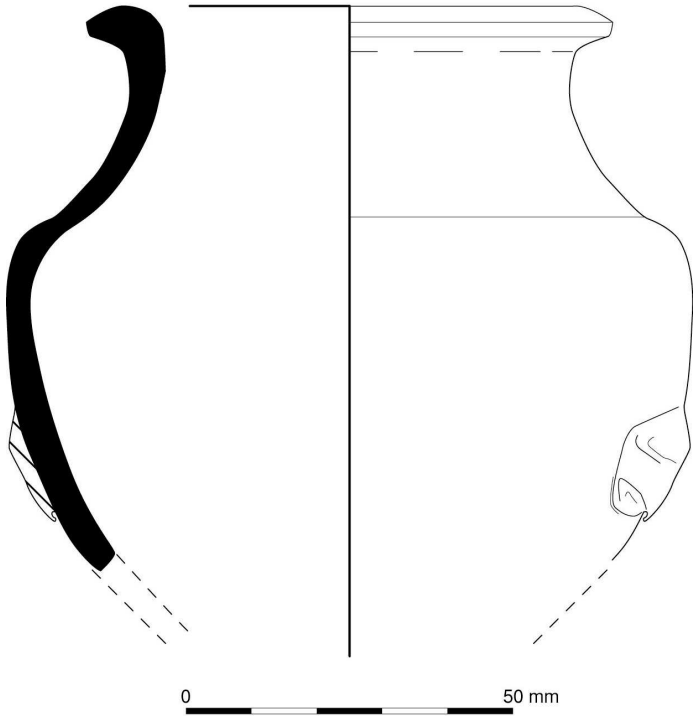


*Figure A3.60: GRA2 jug (**630**/270)*

Ctx	Fabric	Count	Weight (g)	Part	Form
947	DR20	8	39.9	scrap	
30	DR20	2	8.3	scrap	
131	DR20	2	444.4	bodysherd	
32	DR20	4	14.7	scrap	
139	DR20	2	420.9	bodysherd	
159	DR20	2	236.2	bodysherd	
62	DR20	1	2.4	scrap	
77	DR20	9	992.9	bodysherd	
179	DR20	4	32.7	scrap	
65	DR20	2	3	scrap	
25	DR20	1	5.6	bodysherd	
148	DR20	13	1181	bodysherd	
632	DR20	1	36.5	bodysherd	
26	DR20	67	10092	bodysherd	
21	DR20	1	57.1	bodysherd	
21	DR20	1	57.7	bodysherd	
56	DR20	9	10068	bodysherd	
491	DR20	3	113.6	bodysherd	
441	DR20	1	175.7	bodysherd	
253	DR20	2	1606	bodysherd	
179	DR20	1	263.4	handle sherd. Stamped. Sawn off at both ends	Part stamped handle. Unfortunately stamp is very faint and incomplete ? ? AE …
1008	DR20	1	52.4	bodysherd	
47	DR20	2	3534	bodysherd and handle stump	
264	DR20	1	108.5	neck	
264	DR20	1	478.4	handle sherd	
264	DR20	1	343.9	bodysherd+handle sherd	An almost complete handle containing an impressed stamp in ansa. The reading is slightly difficult due to the faintness of the letters but would appear to be ?Q . P. P. HR Y , which is dated at Monte Testaccio to the reign of Hadrian [Callender, 1965, no. 1492; Carreras and Funari, 1998, no. 377
904	DR20	1	106	bodysherd	
904	DR20	2	328.1	bodysherd	
495	Dr20	1	117.7	bodysherd	
421	Dr20	1	19.2	bodysherd	
470	Dr20	1	13.2	Bodysherd. Shaped into roundel	rather circular and ?chipped, possibly used as a stopper?
429	DR20	1	35.3	bodysherd	
77	DR20	1	26.4	bodysherd	
47	DR20	1	72.1	handle flake	
65	DR20	3	280.5	bodysherd	
239	DR20	2	111.1	bodysherd	
137	DR20	1	279.2	handle sherd	
137	DR20	2	360.4	rim	cf. Martin-Kilcher, 1987,

Ctx	Fabric	Count	Weight (g)	Part	Form
					Beilage 1E, no. 80, c.A.D. 110-150
54	DR20	1	37.9	bodysherd	
54	DR20	1	406	bodysherd	
54	DR20	1	73.9	bodysherd	
54	DR20	1	326.3	bodysherd	
31	DR20	2	305.7	bodysherd	
22	DR20	2	189	bodysherd	
30	DR20	1	402.6	bodysherd+handle sherd	
30	DR20	4	131.8	bodysherd	
42	DR20	2	254.6	bodysherd	
44	DR20	3	174	bodysherd	
268	DR20	1	26.2	bodysherd	
427	DR20	1	108.5	bodysherd	
426	DR20	1	129	bodysherd	
32	DR20	1	21.1	bodysherd	
32	DR20	17	1507	bodysherd	
62	DR20	11	604.6	bodysherd	
32	DR20	2	49.8	part of rim	
114	DR20	1	36.5	bodysherd	
441	DR20	1	34.3	bodysherd	
35	DR20	2	762	bodysherd	
179	DR20	1	483.2	handle sherd	
179	DR20	1	228.2	handle stump	
179	DR20	1	45.6	handle sherd	
179	DR20	3	395.5	rim fragments	
179	DR20	1	134.6	rim fragment	
179	DR20	17	412	bodysherd	
33	DR20	1	916.4	large bodysherd with handle stump; the handle has been sawn off	
33	DR20	1	219.7	rim	cf. Martin-Kilcher, 1987, Beilage IE, no. 79, c.AD.110-150
47	DR20	15	3012		1E, no. 79, *c*.A.D. 110-150]
48	DR20	3	545	bodysherd	
71	DR20	1	96.2	bodysherd	
48	DR20	1	226.7	rim and neck sherd	cf. Martin-Kilcher, 1987, Beilage 1E, no. 81, c.A.D. 110-150
48	DR20	10	1145	body+handle sherd Several sherds with incisions and one sherd flaked.	
48	DR20	1	121.1	rim	cf. Martin-Kilcher, 1987, Beilage 1E, no. 86, c.A.D. 110-150
127	DR20	6	868.3	body+handle sherd	
36	DR20	1	264.4	body and handle sherd	
18	DR20	1	71.2	bodysherd	
947	DR20	2	71.7	bodysherd	
9991	DR20	1	516.6	bodysherd	
52	DR20	7	993	bodysherd	
441	DR20	1	312.2	handle sherd	
441	DR20	1	262.8	bodysherd	

Ctx	Fabric	Count	Weight (g)	Part	Form
222	DR20	4	505.8	bodysherd	
719	DR20	1	463.9	bodysherd	
711	DR20	1	220.7	bodysherd	
702	DR20	1	557.6	bodysherd	
9991	DR2-4	1	82.7	rim	bead rim
947	GAL AM	1	4.7	scrap	
166	GAL AM	2	73.3	bodysherd	
30	GAL AM	4	43	scrap	
245	GAL AM	1	4.9	bodysherd	
579	GAL AM	1	15	bodysherd	
268	GAL AM	1	4	bodysherd	
298	GAL AM	2	5.2	bodysherd	
64	GAL AM	1	26	handle sherd	
35	GAL AM	1	41.4	basal sherd	flat base
33	GAL AM	3	290.1	basal sherd	flat base
203	GAL AM	1	143.5	bodysherd	
122	GAL AM	1	102.4	rim	bead rim
122	AMP Undesignated	2	24.9	neck	
698	AMP Undesignated	1	58.4	handle sherd	strap handle
702	AMP Undesignated	1	26.5	rim	thickened bead rim
48	AMP Undesignated	1	53.8	rim	Downward turning rim - hard to place

Table 29: Amphorae catalogue

	Period	**1**	**2A**	**2A-C**	**2B**	**2C/1**	**2C/2**	**2C/3**	**M**	**R**	**UN**	**US**	**All**	**All 2C**
Group	**Ware**													
AMP	AMP		1	1					2			2	6	
AMP	DR20		12	221		2	7	4	48		4	2	300	13
AMP	GAL AMP		3	8			1		11				23	1
AMP Total			16	230		2	8	4	61		4	4	329	14
BB1	BB1		5	183		1	24	3	35			10	261	28
BB1 Total			5	183		1	24	3	35			10	261	28
CC	CC KOL			6					1				7	
CC	CC1			40			1		1	1			43	1
CC	CC4								1				1	
CC Total				46			1		3	1			51	1
FLA	FLA		1										1	
FLA	FLA1	1	4	63	1		2		36		1	2	110	2
FLA	FLA2								1				1	
FLA	FLA3		1						1				2	
FLA	FLA4			20			1					2	23	1
FLA Total		1	6	83	1		3		38		1	4	137	3
FLB	FLB			5									5	
FLB	FLB1		6	151		1	1	2	70			2	233	4
FLB	FLB2	1	1	29			1	1	25			2	60	2
FLB	FLB3			28									28	
FLB Total		1	7	213		1	2	3	95			4	326	6
GMG	GMG				1								1	
GMG Total					1								1	
GR	GRA1B		4	8			3		4				19	3

	Period	**1**	**2A**	**2A-C**	**2B**	**2C/1**	**2C/2**	**2C/3**	**M**	**R**	**UN**	**US**	**All**	**All 2C**
Group	**Ware**													
GR	GRA2		4	49	3		1	6	32		2	1	98	7
GR	GRA4			13									13	
GR	GRB1		5	46	4		9	1	31		15	2	113	10
GR	GRB2								4				4	
GR Total			13	116	7		13	7	71		17	3	247	20
GT	GT						1						1	1
GT Total							1						1	1
Indet	Indet		1										1	
Indet Total			1										1	
L	L			1					1				2	
L Total				1					1				2	
M	F5			14			1		6				21	1
M	M Local white-slip			2					3				5	
M	M local?			5									5	
M	M Midlands								1				1	
M	M Raetian						1						1	1
M	M Verulamium			2					1				3	
M	M Wroxeter			1					1			1	3	
M	M7/M5											1	1	
M	NOG WH4			1									1	

	Period	**1**	**2A**	**2A-C**	**2B**	**2C/1**	**2C/2**	**2C/3**	**M**	**R**	**UN**	**US**	**All**	**All 2C**
Group	**Ware**													
M Total				25			2		12			2	41	2
MG	MG			6					3				9	
MG Total				6					3				9	
O	O		1	1					2				4	
O	OA								1				1	
O	OAA								2				2	
O	OAA1			14			4		5				23	4
O	OAA2	1	2	25			2	1	40	71	4	2	148	3
O	OAB	5	5	26			13	6	62	1	11	6	135	19
O	OAB2						2		6				8	2
O	OAC							1					1	1
O	OB						1	5	6				12	6
O Total		6	8	66			22	13	124	72	15	8	334	35
RSA	RSA			1			4						5	4
RSA	RSA1									44			44	
RSA Total				1			4			44			49	4
SV	SV			2			1	1	2				6	2
SV Total				2			1	1	2				6	2
TS	TS							1					1	1
TS	CG		7	31		1	7	8	38		2		94	16
TS	SG	2	14	55	2	1	4	1	39		5	3	126	6
TS Total		2	21	86	2	2	11	10	77		7	3	221	23
Grand Total		10	77	1058	11	6	92	41	522	117	44	38	2016	139

Table 30: Roman coarse wares: Quantification of fabrics by sherd count

Ware group	Ware	1	2A	2A-C	2B	2C/1	2C/2	2C/3	M	R	UN	US	All	All 2C
AMP	AMP		58	54					25			109	246	
AMP	DR20		1916	38751		1606	379	286	6010		774	1074	50796	2271
AMP	GAL AMP		9	434			5		306				754	5
AMP Total			1984	39238		1606	384	286	6341		774	1183	51796	2275
BB1	BB1		96	4029		26	319	34	538			99	5141	378
BB1 Total			96	4029		26	319	34	538			99	5141	378
CC	CC KOL			15					1				16	
CC	CC1			325			4		3	5			337	4
CC	CC4								1				1	
CC Total				340			4		5	5			354	4
FLA	FLA		34										34	
FLA	FLA1	2	29	1321	12		18		521		3	4	1911	18
FLA	FLA2								13				13	
FLA	FLA3		32						14				46	
FLA	FLA4			393			15					63	472	15
FLA Total		2	96	1714	12		34		548		3	68	2477	34
FLB	FLB			54									54	
FLB	FLB1		107	1536		35	4	25	550			6	2264	65
FLB	FLB2	11	8	347			45	16	294			18	740	61
FLB	FLB3			392									392	
FLB Total		11	115	2330		35	50	41	844			24	3449	126

Ware group	**Ware**	**1**	**2A**	**2A-C**	**2B**	**2C/1**	**2C/2**	**2C/3**	**M**	**R**	**UN**	**US**	**All**	**All 2C**
GMG	GMG				60								60	
GMG Total					60								60	
GR	GRA1 B		115	159			50		54				378	50
GR	GRA2		93	724	34		2	70	262		41	12	1238	72
GR	GRA4			149									149	
GR	GRB1		47	606	53		128	28	476		99	39	1475	156
GR	GRB2								122				122	
GR Total			255	1638	88		180	98	914		140	50	3363	278
GT	GT						20						20	20
GT Total							20						20	20
Indet	Indet		26										26	
Indet Total			26										26	
L	L			26					22				48	
L Total				26					22				48	
M	F5			919			18		426				1363	18
M	M Local white-slip			204					173				377	

Ware group	Ware	1	2A	2A-C	2B	2C/1	2C/2	2C/3	M	R	UN	US	All	All 2C
M	M local?			399									399	
M	M Midlands								68				68	
M	M Raetian						41						41	41
M	M Verulamium			275					51				326	
M	M Wroxeter			37					20			62	120	
M	M7/M5											40	40	
M	NOG WH4			267									267	
M Total				2101			59		738			102	2999	59
MG	MG			72					19				91	
MG Total				72					19				91	
O	O		10	194					57				261	
O	OA								3				3	
O	OAA								22				22	
O	OAA1			115			32		50				197	32

Ware group	**Ware**	**1**	**2A**	**2A-C**	**2B**	**2C/1**	**2C/2**	**2C/3**	**M**	**R**	**UN**	**US**	**All**	**All 2C**
O	OAA2	1	5	360			4	11	317	816	32	13	1560	16
O	OAB	34	35	330			203	88	773	1	83	66	1612	291
O	OAB2						35		42				77	35
O	OAC							9					9	9
O	OB						63	56	41				161	120
O Total		35	50	999			338	165	1306	817	114	79	3903	503
RSA	RSA			10			319						328	319
RSA	RSA1									461			461	
RSA Total				10			319			461			789	319
SV	SV			32			12	10	38				92	22
SV Total				32			12	10	38				92	22
TS	TS							2					2	2
TS	CG		36	407		5	92	93	573		40		1246	190
TS	SG	12	92	1031	16	2	55	6	602		10	20	1846	63
TS Total		12	128	1438	16	7	147	101	1175		50	20	3094	255
Grand Total		60	2750	53967	176	1673	1865	734	####	1283	1081	1625	77701	4273

Table 31: Roman coarse wares: Quantification of fabrics by sherd weight

	1	**2A**	**2A-C**	**2B**	**2C/1**	**2C/2**	**2C/3**	**M**	**R**	**UN**	**US**	**All**
Bowl			132			11		62	85	23	17	330
Decorated samian bowl		25	181			8	8	93			5	320
Bowl/dish			87			4						91
Samian dish		7	31			8	5	51				102
Dish			132					23				155
Beaker	11		55					36	25			127
Samian cup		20	140		5	6		7				178
Flagon			271					51				322
Handled jar			20					20				40
Jug								30				30
Jar			196	30		24		172		36	5	463
Narrow-necked jar		29				60	15	68			8	180
Wide-mouthed jar			9					12				21
Mortarium			133			6		31			7	177
Amphora			160					64			54	278
Lid		5	49								5	59
Lamp			20									20
Small jar		19										19
Indeterminate								10				10
Total	**11**	**105**	**1616**	**30**	**5**	**127**	**28**	**730**	**110**	**59**	**101**	**2922**

Table 32: Roman coarse wares: Quantification of vessel types by period and phase using rim percentage values

APPENDIX 4: CATALOGUE OF ILLUSTRATED MEDIEVAL POTTERY

ILLUSTRATED MATERIAL

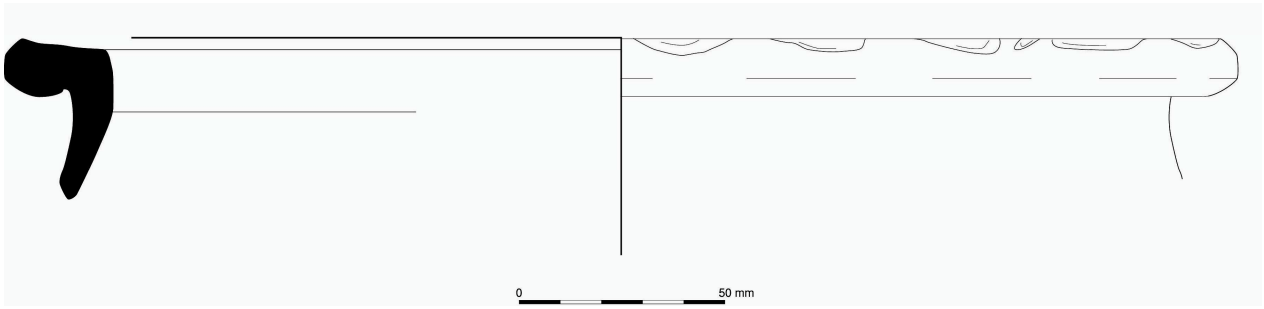


Figure A4.1: Rim fragments of a jar (Fabric 1) from an unstratified context

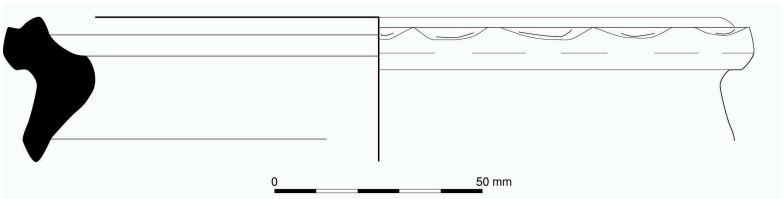


Figure A4.2: Rim fragments of a jar (Fabric 1) from an unstratified context

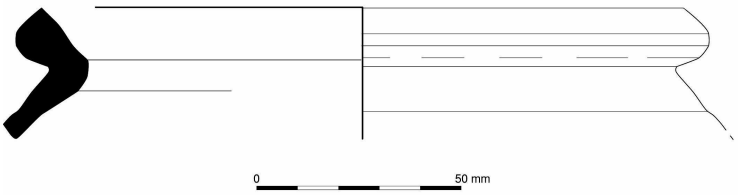


*Figure A4.3: Rim fragments of a jar (Fabric 1) from the fill (**31**) of pit **29**, Area G7/G10*

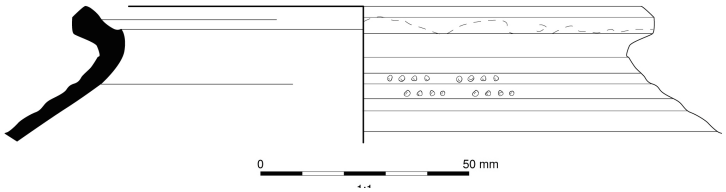


*Figure A4.4: Rim fragments of a jar (Fabric 6) from the fill (**31**) of pit **29**, Area G7/G10*

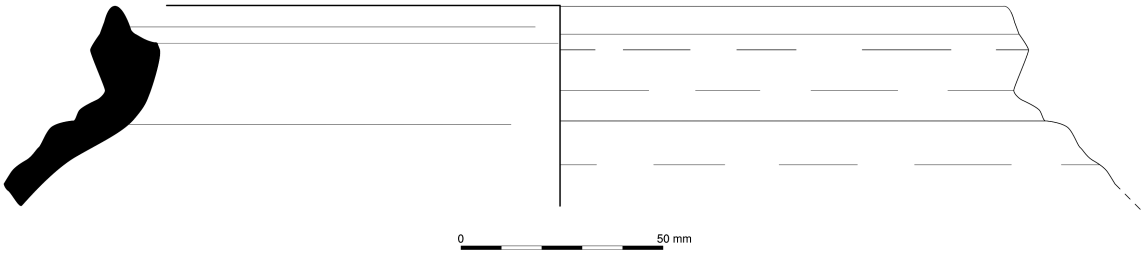


*Figure A4.5: Rim fragments of a jar (Fabric 2) from the fill (**127**) of pit **129**, Area G7/G10*

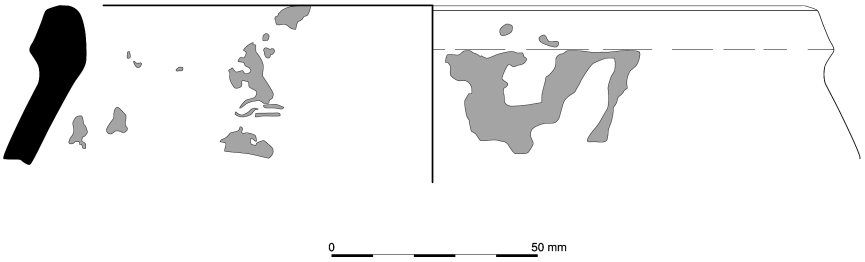


*Figure A4.6: Rim of jar (Fabric 11), from layer (**3110**), Area G3*

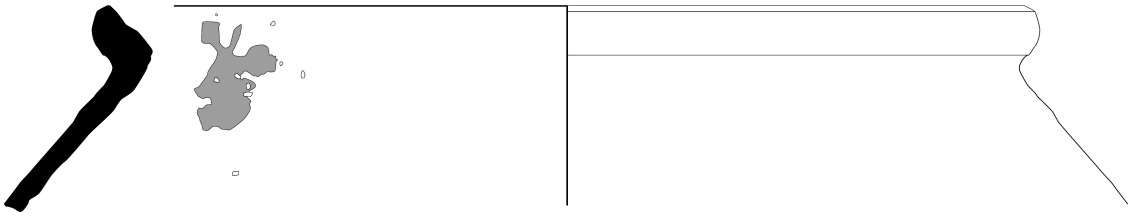


*Figure A4.7: Rim of jar (Fabric 3), from fill(**234**) of pit **233**, Area G7/G10*

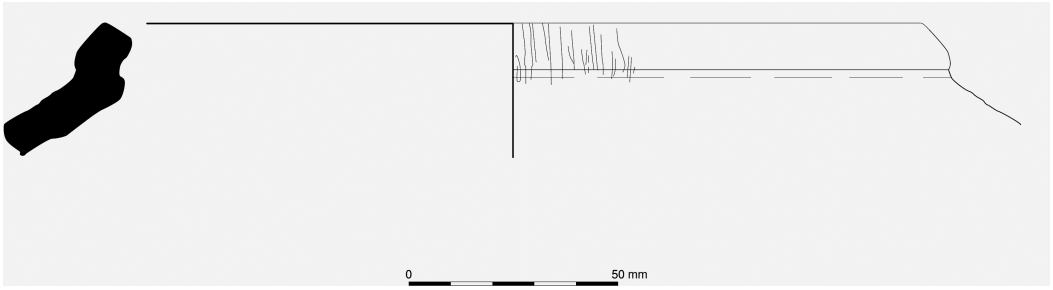


*Figure A4.8: Rim of jar (Fabric 3), from fill(**234**) of pit **233**, Area G7/G10)*

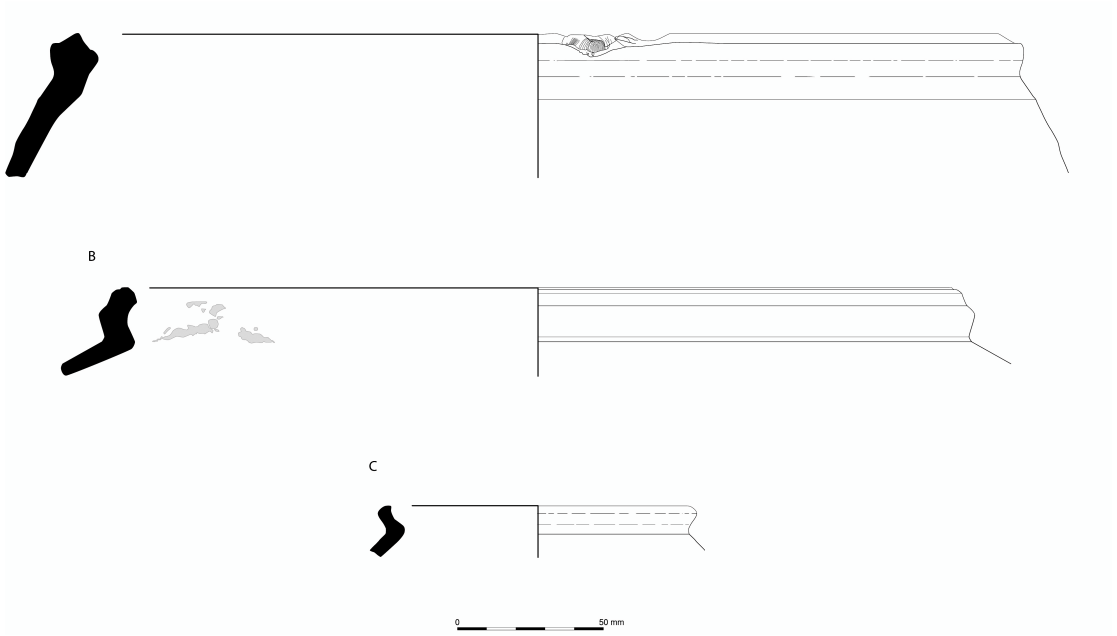


*Figure A4.9: Rims of jars (Fabrics 3 and 6, from fill (**30**) of pit **29**, Area G7/10*

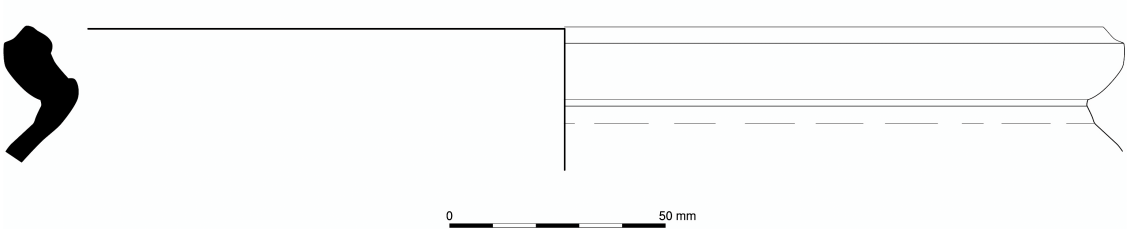


*Figure A4.10: Rim of jar(Fabric 3), from fill(**128**) of pit 129, Area G7/10*

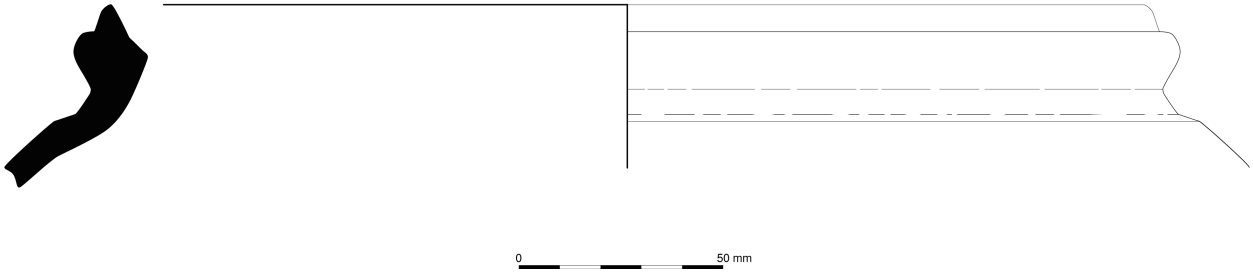


*Figure A4.11: Rim of jar (Fabric 6), from fill (**130**) of pit 118, Area G7/10*

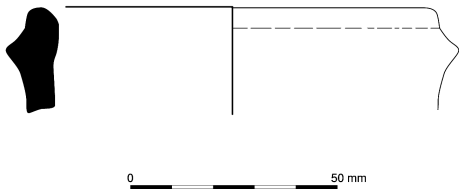


Figure A4.12: Rim of jar(Fabric 6), from unstratified context

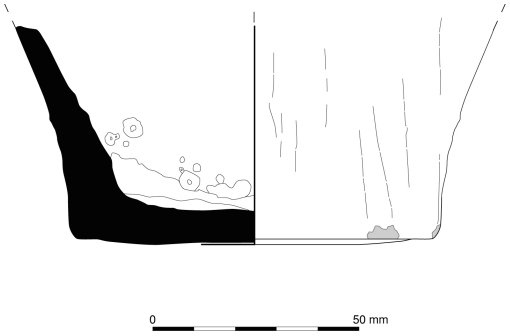


*Figure A4.13: Base of a jar from an evaluation trench in Area G6 (**615**/133)*

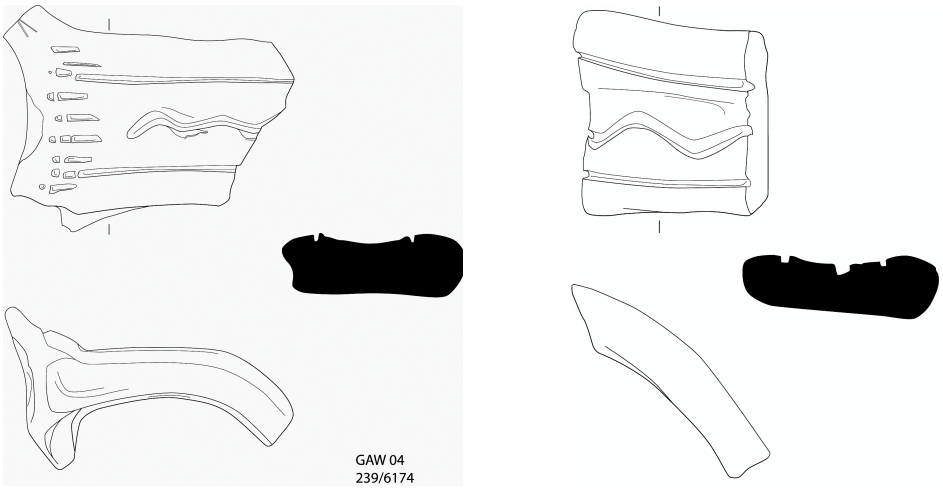


*Figure A4.14: Strap handles (**239**/6174) from Samlesbury-ware jug (Fabric 6)*

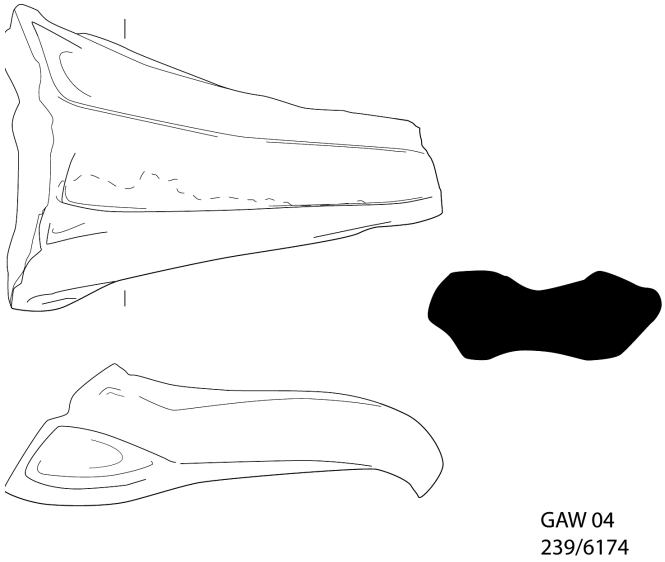


*Figure A4.15: Strap handle (**239**/6174) from a pipkin (Fabric 1)*

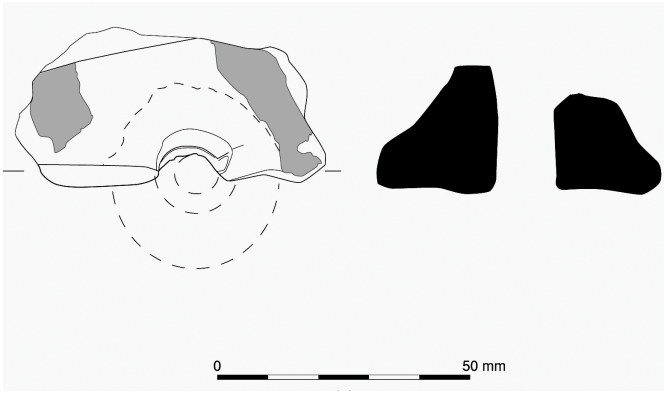


*Figure A4.16: Bung-hole spout (**22**/6175)*

APPENDIX 5: CATALOGUE OF ILLUSTRATED POST-MEDIEVAL POTTERY

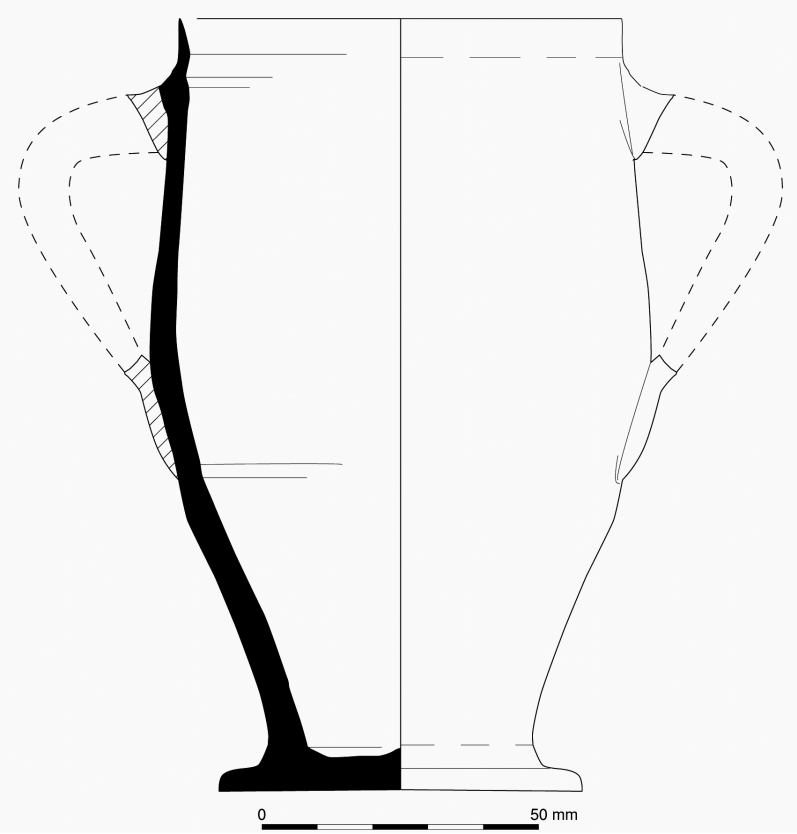


*Figure A5.1: Blackware vessel recovered from evaluation trench in Area G6 (**605**/120)*

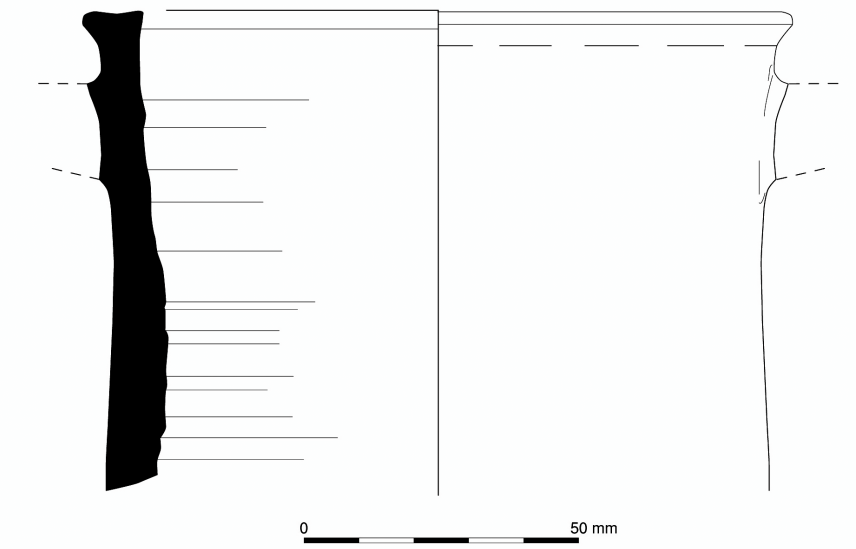


*Figure A5.2: Midland Purple-type ware vessel (**145**/520)*

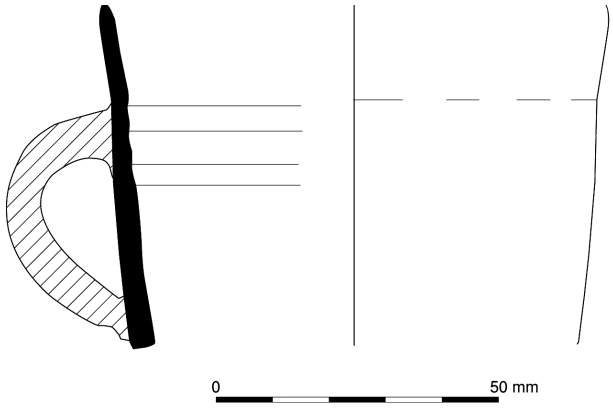


*Figure A5.3: Blackware drinking vessel (**3102**/6214)*

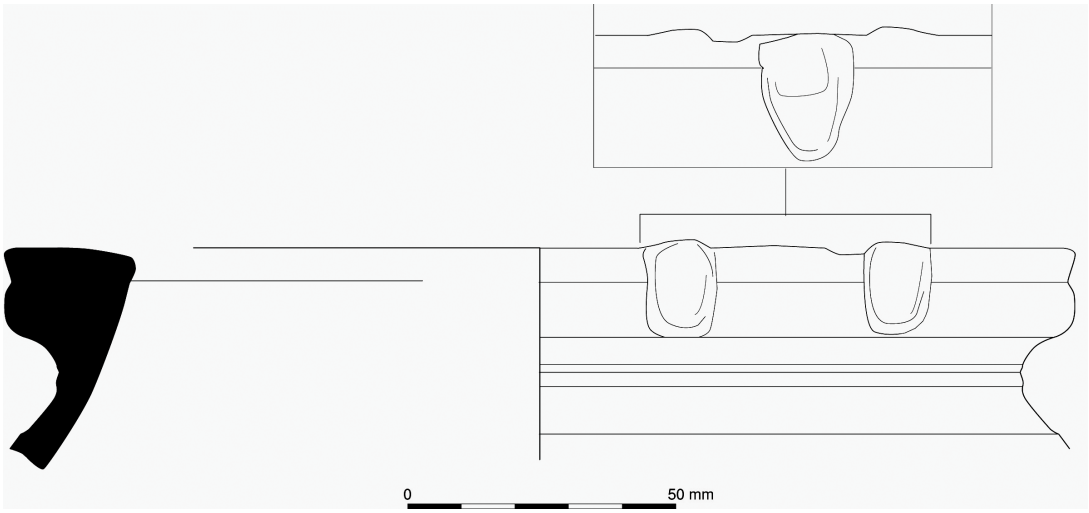


*Figure A5.4: Midland Purple-type ware (**172**/384)*

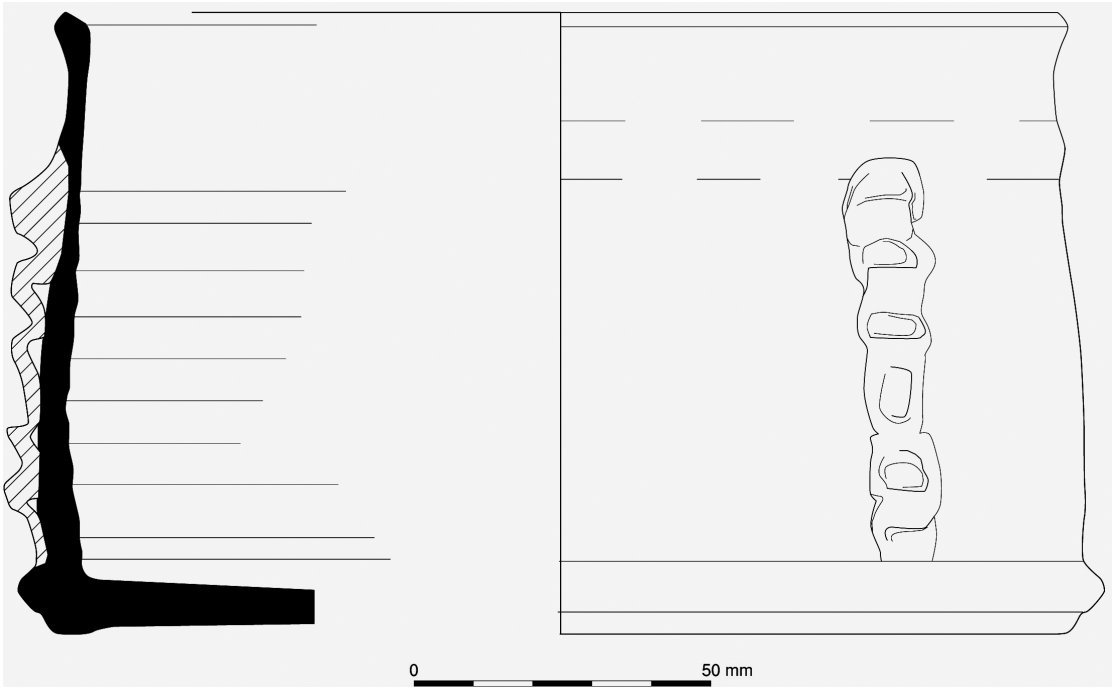


*Figure A5.5: Mottled ware vessel with applied vertical strip decoration (**175**/6138)*

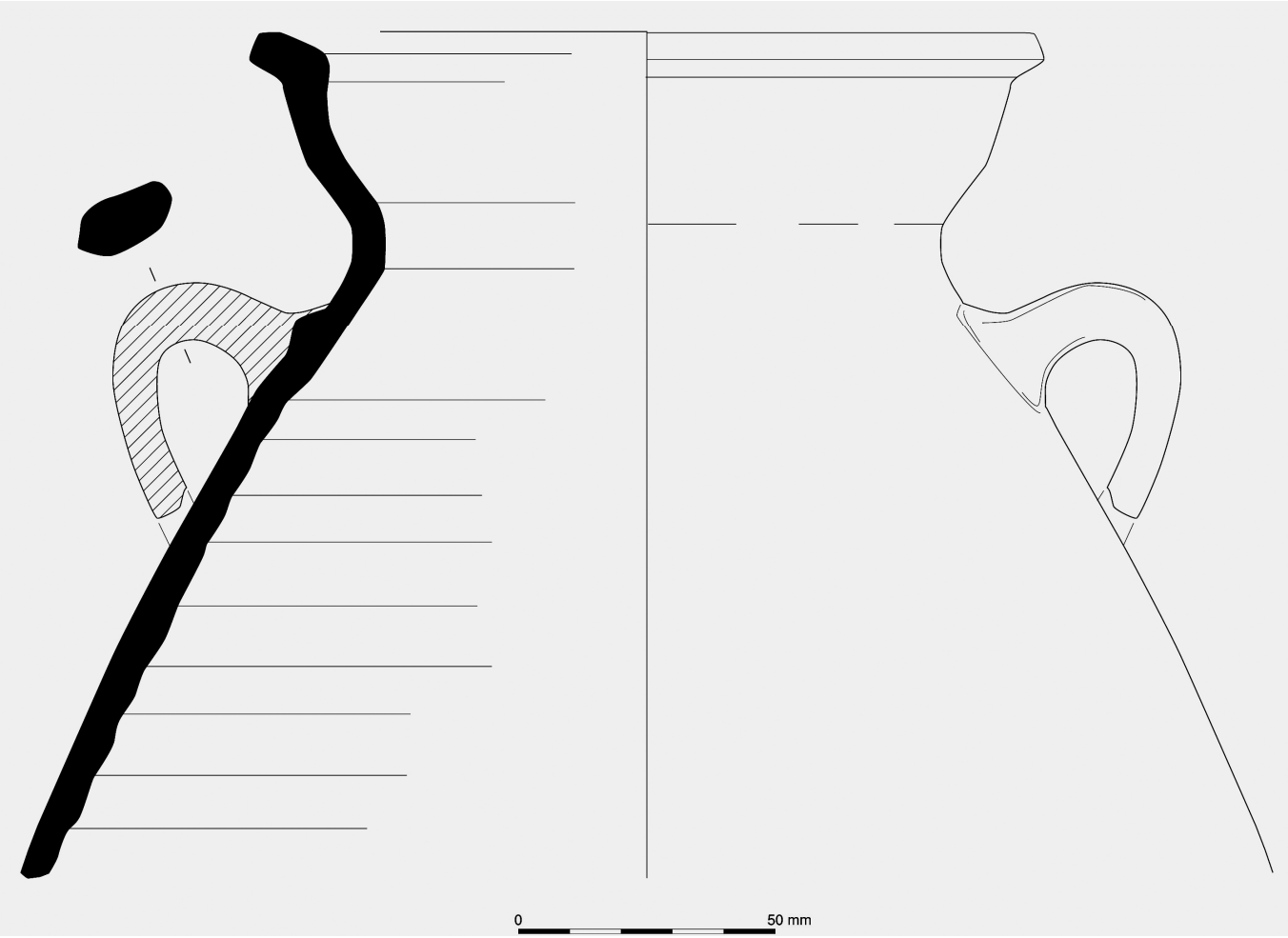


*Figure A5.6: Midland Purple-type ware **175**/6138*

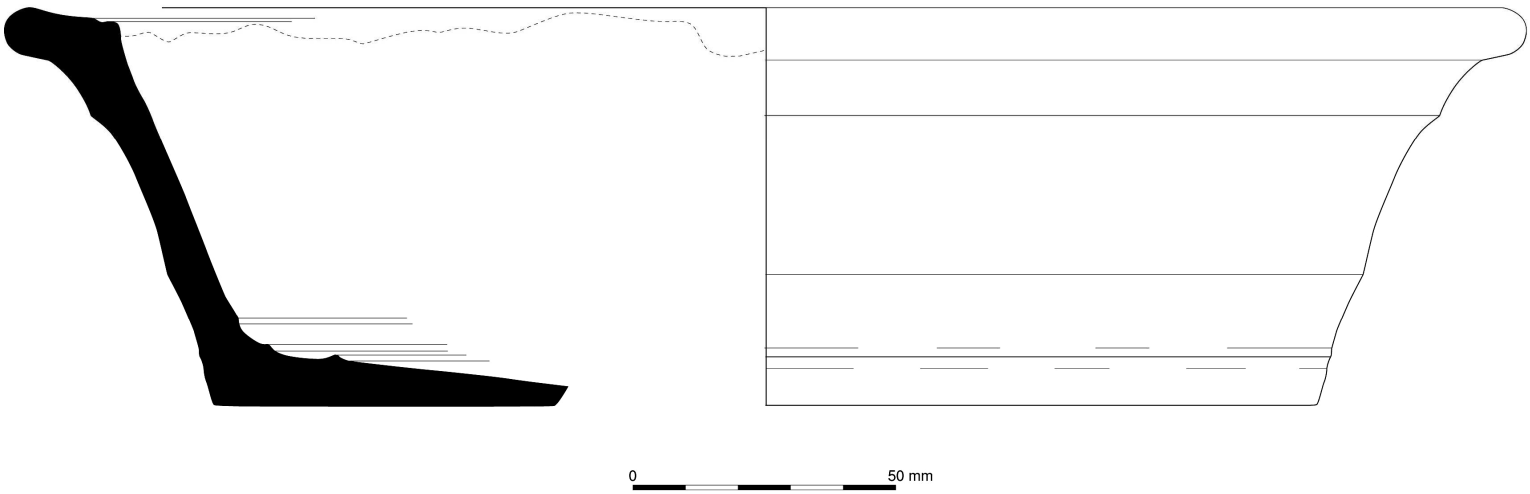


*Figure A5.7: Mottled ware bowl (**64**/333)*

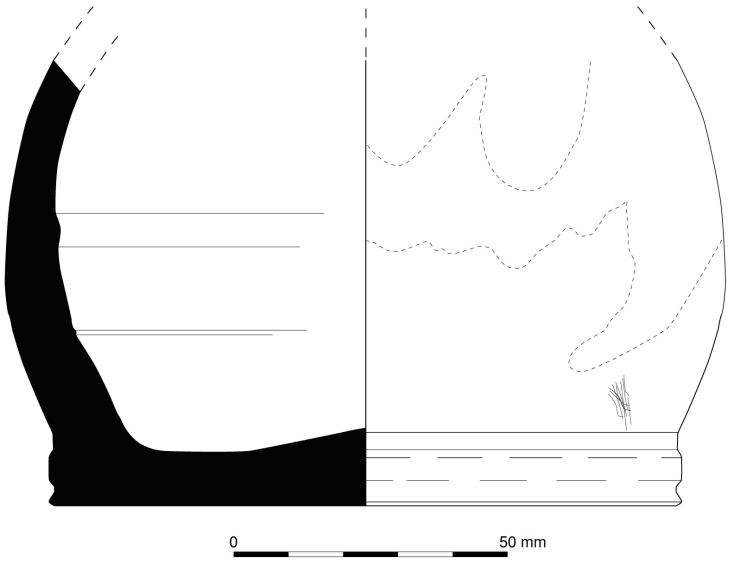


*Figure A5.8: Bellarmine bottle (**202**/6245)*

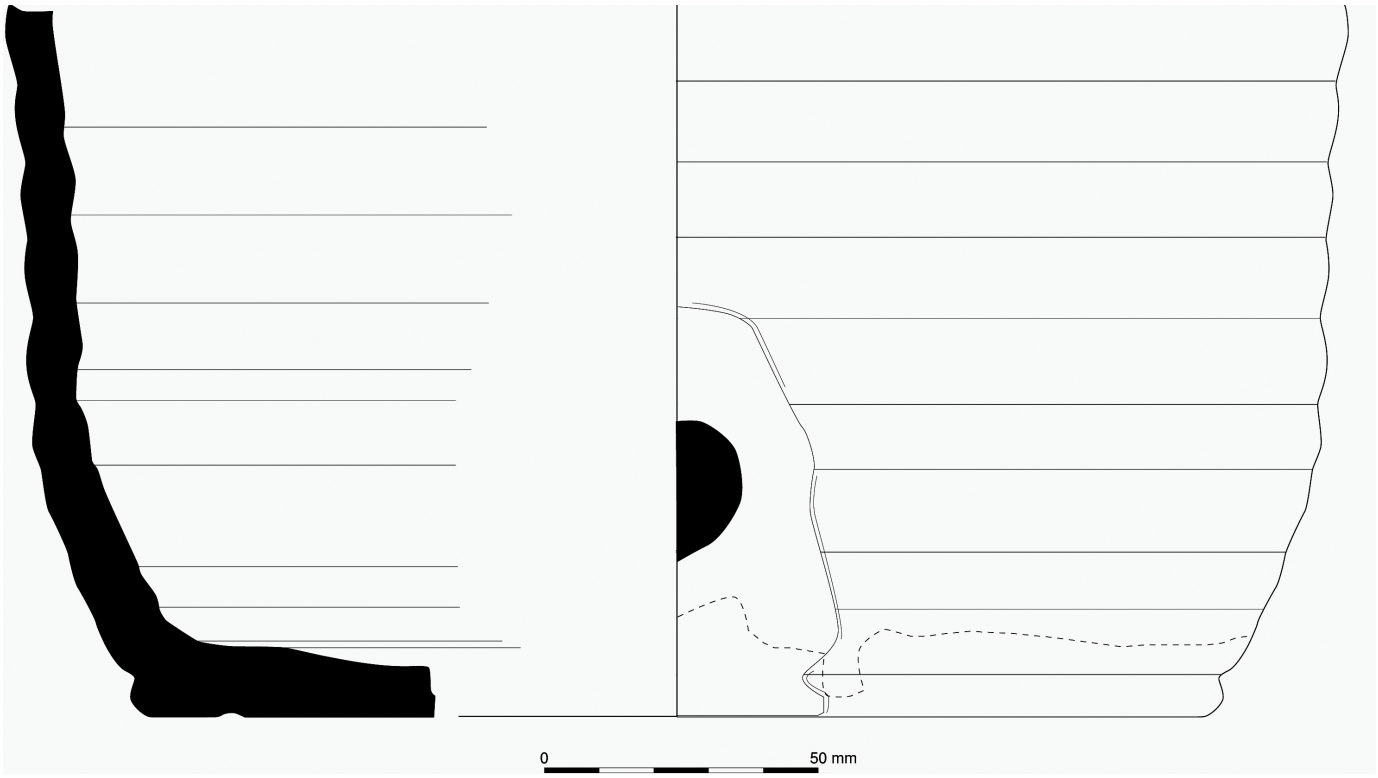


*Figure A5.9: Dark-glazed earthenware cistern (**172**/384)*

APPENDIX 6: CATALOGUE OF ILLUSTRATED CLAY TOBACCO PIPES

ILLUSTRATED MATERIAL

The most diagnostic fragments of clay tobacco pipe recovered from the Grand Arcade Development have been illustrated at 1:1 (Fig A6.1), and Table 33 gives a suggested date for each example, together with details of its appearance and attributes.

1: ***3007***/6233 Heel bowl of local style dating from *c* 1680-1720, made of a local coal-measure clay with coarse inclusions visible to the naked eye, and numerous fine mica flakes visible under a lens. The bowl neatly finished with a bottered but not milled rim and a smooth but not burnished surface. The stem bore is 7/64".

2: ***202***/636 Heel bowl of *c* 1710-50, made of a hard-fired fine fabric. This bowl has three distinctive characteristics. First, the rim (and body of the bowl below it) are markedly oval in plan, with the long axis of the oval aligned with the stem of the pipe. Second, the stem has a markedly oval cross-section, being deeper from top to bottom than across. Third, the heel is particularly flared with a very thin junction where it joins the underside of the bowl. The pipe itself is of a reasonably good form, although the seams are not very well trimmed. The rim is cut but not milled and the stem bore measures 6/64".

3: ***202***/509 Spur fragment of *c* 1700-50 made of a fine fabric, but with a granular fracture. The spur is unusually large and has been trimmed at the base. The stem bore is just over 7/64".

4: ***172***/446 Two joining bowl fragments forming the lower part of a bowl dating from *c* 1740-80 with a stem bore of 5/64". This has been made from a fine fabric finished with a good burnish on the bowl area only. What makes this piece unusual is that the heel or spur was lost during manufacture but the pipe was still finished and fired. This seems particularly odd since the bowl was also burnished – usually taken as a sign of a better quality, and more expensive, pipe. Stem bore 5/64".

5: ***3007***/6231 A nineteenth-century stem fragment, most likely dating from *c* 1820-40, which has been broken and then ground smooth at both ends. The stem has been held at almost 90^0 to its long axis, and both ends ground smooth, and there are also slight facets all around the edges where these have been ground too. The surviving fragment is 44mm in length and has a stem bore of 6/64".

6: ***3007***/6232 An elaborately decorated bowl dating from *c* 1820-40 with a stag's head on the seam facing the smoker. The primary motif on the left-hand side of the bowl is a Liver Bird within a shield surmounted by a wheatsheaf, while on the right-hand side are Masonic emblems comprising a square and compasses surrounding the letter G for God. There are other plant and geometric designs on the bowl and a symbol mark comprising a serrated ring or flower device on the sides of the spur. The range, style and execution of the decoration are all typical of Merseyside area pipes of the period. Cut rim and no internal bowl cross. The stem bore is just over 4/64".

7: ***3007***/6231 A bowl of *c* 1820-40 with leaf-decorated seams. Cut rim; no internal bowl cross; stem bore just over 5/64". This is one of five examples made from the same mould found on this site, which is particularly characterised by the occurrence of a single spike on the mould seam that only occurs between the lowest two leaves on the right-hand side of the bowl facing the smoker. The other examples from this mould are ***3007***/6232 (x3) and ***3007***/6233.

8: ***3007***/6232 A decorated bowl dating from *c* 1820-40 with a very similar scheme of decoration to 6. Several other examples were recovered from this site, whilst others are known from Slackhouse Farm at Ormskirk (Private Collection) as well as from excavations on a site at Adelphi Street in Salford (OA North 2008). Cut rim and no internal bowl cross. The stem bore is 5/64".

9: ***3007***/6232 A plain bowl of *c* 1820-40. Cut rim and no internal bowl cross, with a stem bore of 5/64".

10: ***3007***/6231 A plain bowl fragment of *c* 1820-40. Cut rim and no internal bowl cross. The stem bore is just over 6/64". An identical looking fragment, possibly from the same mould, was recovered from the same context (***3007***/6232).

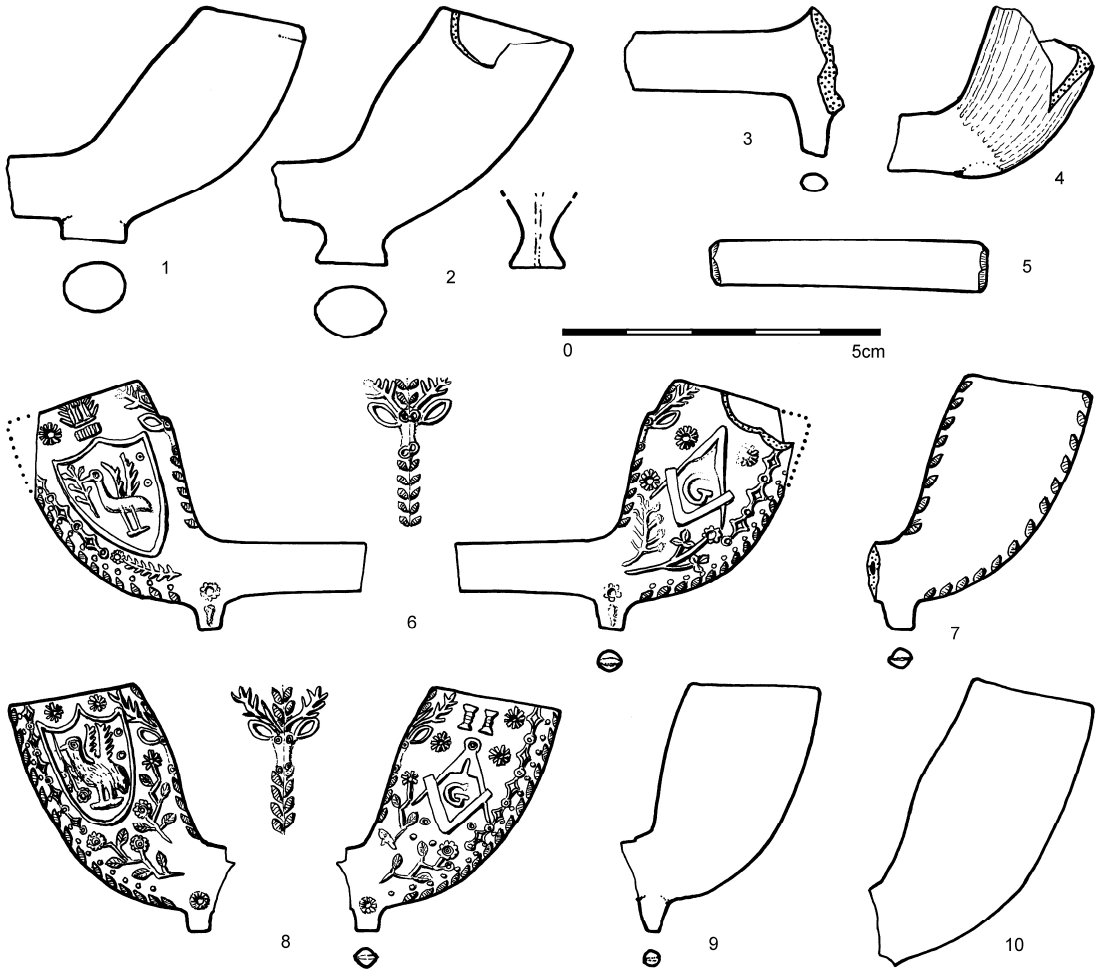


Figure A6.1: The clay tobacco pipes

Cxt	Tot	Range	Deposit	Mark	Dec, etc	Comments
Area G7/10						
07	**2**	1760-1900	1820-1840		Stags head, Liver Bird and Masonic x 1	One stem of general late eighteenth- or nineteenth-century date, and the upper part of a bowl dating from *c* 1820-40 with a stag's head facing the smoker, a shield with Liver Bird on LHS and Masonic devices on RHS. This particular mould type is represented elsewhere on this site, as well as amongst the finds from Salford (OA North 2008).
18	**1**	1860-1920	1860-1920			Rim fragment from a large 'cadger' or 'show' pipe with a plain bowl.
90	**4**	1760-1920	1760-1920			Four plain stems dating from the late eighteenth century.
172	**9**	1740-1900	1740-1780			All of the stems are of late eighteenth- or nineteenth-century types, while the three bowl fragments probably all date from between *c* 1740 and *c* 1800. Two of the bowl fragments join to make the lower part of a burnished bowl with heel or spur missing since manufacture. This piece probably dates from around 1740-80, and provides the most likely date for the group as a whole (all the stems could fit with this dating). The other bowl fragment is just a body sherd from a late eighteenth-century bowl.
175	**2**	1610-1780	1700-1780			One very abraded seventeenth-century residual stem made of a coarse local fabric, and a later piece that probably dates from *c* 1700-80.
202	**6**	1680-1740	1710-1750			A consistent looking group of fragments including five bowl fragments ranging in date from *c* 1680-1750, but with a likely deposition date of *c* 1710-50. This group appears to represent a homogeneous and fairly well-dated layer.
419	**6**	1660-1730	1660-1730			All of these stems would be consistent with a late seventeenth- or early eighteenth-century date (mainly thick stems, several made of coarse local fabrics). Two pieces are burnished. Two plain pieces join (fresh break).
477	**4**	1760-1900	1760-1900			Four stems of later eighteenth- or nineteenth-century date (most likely late eighteenth or first half of the nineteenth century). Two pieces join (freshly broken).
522	**2**	1760-1900	1760-1900			Two plain stems of late eighteenth- or nineteenth-century date

Cxt	Tot	Range	Deposit	Marks	Dec, etc	Comments
2000	**1**	1780-1900	1780-1900			
U/S	**2**	1690-1880	-	Double ring mark x 1	Leaf seams x 1	The lower part of a late seventeenth- or early eighteenth-century spur bowl in local style and the heel (only) of a bowl dating from *c* 1830-80 with a double ring mark on each side of the heel and traces of leaf decoration on the bowl seams.
Area G3						
3007	**98**	1660-1900	1820-1840	Ring marks x 3	Stags head, Liver Bird and Masonic x 6; leaf seams x 6	This is by far the largest group from the site, and one of the most consistent. There are just three or four bits of residual (seventeenth-eighteenth-century) stem and two joining bowl fragments making a complete heel bowl of *c* 1680-1720 (fresh break). All of the rest of the bowls and stems would fit well with a deposit of *c* 1820-40. This deposit appears to have been little disturbed, since many of the bowls are substantially intact and stem fragments of up to 112mm in length survive. There are the remains of six plain bowls, six with just leaf decorated seams (five of which are from the same mould) and six with leaf seams, stag's head, Liver Bird and Masonic motifs. Five of these highly decorated bowls are also from the same mould, in addition to which another was found in pit fill ***07*** (Area G7/10). Further examples have been previously recorded by the author from Slackhouse Farm, Ormskirk (private collection) and Adelphi Street in Salford (OA North 2008). One of the stem fragments in this group has been ground smooth at both ends after having been broken. It is 44mm long and the rounded ends suggest that this was idle doodling.
3019	**1**	1780-1900	1780-1900			Plain stem of late eighteenth- or nineteenth-century type.
3031	**8**	1760-1900	1800-1900			Plain stems of later eighteenth- or nineteenth-century date, with the latest being nineteenth century.
3053	**1**	1760-1900	1760-1900			Single plain stem of later eighteenth- or nineteenth-century date, and most likely late eighteenth- or nineteenth-century.

Cxt	Tot	Range	Deposit	Marks	Dec, etc	Comments
3081	**3**	1660-1740	1660-1740			Three fairly thick stems, probably all made of local fabrics (although two are almost inclusion free), two of which are burnished. These probably all date from the later seventeenth or early eighteenth century, and suggest a consistent deposit of this date.
3091	**1**	1690-1740	1690-1740			Fragment from the lower part of a late seventeenth- or early eighteenth-century bowl.
3094	**1**	1640-1710	1640-1710			Poorly burnished stem fragment made of a coarse local fabric.
3095	**1**	1690-1780	1690-1780			
3098	**1**	1680-1740	1680-1740			Stem fragment with a very deep oval section, probably late seventeenth or early eighteenth century.
3114	**7**	1660-1900	1800-1850			This group includes a residual burnished stem made of a local fabric dating from the later seventeenth century. The rest of the stems are probably all later eighteenth- or nineteenth-century types, and there is one unmarked spur fragment that dates from *c* 1800-50. This is the latest closely datable piece, and provides the likely deposition date for the group as a whole.
U/S	**1**	1800-1900	1800-1900			
Total	**162**			**4**	**13**	

Table 33: Summary of the clay tobacco pipe evidence

APPENDIX 7: CATALOGUE OF CERAMIC BUILDING MATERIAL

ROMAN TILE CATALOGUE

The ceramic building material data was catalogued on an Access 2000 database, with the following attributes recorded: fabric; form type; form code; weight (in g); number of fragments; number of corners; complete width or length measurements (in mm); evidence of burning; reuse or mortar; presence of glaze; and any further comments. Additional calculations have been made for: a 'tile equivalent' (TE); a percentage based on the number of corners present; 'minimum number per context' (MT), derived by dividing the number of corners present by the number of corners for a complete piece; and the mean sherd weight (MSW), calculated by dividing the total weight of a group by the number of fragments.

TILE FABRICS

Fabric T41 (= T15, T16, T24 and T411 in Archive). This is an oxidised tile fabric. It is a red (10R 5/6) hard fabric with a fine fracture and sandy to clean feel. It has inclusions of common poorly sorted sub-rounded translucent quartz at 0.2-0.5mm, moderate rounded black ironstone inclusions to 1mm and occasional white sub-angular quartz at 0.3mm, occasional lime at 0.3mm and sparse silver mica. This fabric is similar to pottery fabrics from Wilderspool and Walton-le-Dale, cf WILD OX (Tomber and Dore 1998). The number of wasters from the site may indicate that this was manufactured in close proximity to the site for the bath-house itself.

T41 I1.1 is a concave-sided tapering imbrex, 438 x 150-172 x12-20mm, weighing *c* 2.2kg, with a straight edge, with a groove along the base of the edge (Fig A7.1). Formed on a sanded mould, with an irregular sandy underside, with wiped, possibly slipped external faces. Occasionally decorated with finger-made grooves formed along the length of the imbrex.

T41 I1.2 is an imbrex with concave sides and an internal flat-end wedge edge. Formed over a sanded mould, with wiped surfaces.

T41 I2.1 is an imbrex with flattened thin sides.

T41 T1.1 is a tegula, dimensions 475 x 350 x 25mm, weighing *c* 9.5kg, with hand-formed concave flanges, with a sloping cutaway formed with a sand mould, cf Warry 2000, class A, no 28, AD 40-120.

T41 T2.1 is a tegula, with straight-edge baton-formed flanges with a straight lower cutaway, cf Warry 2000, class A, no 2, AD 40-120.

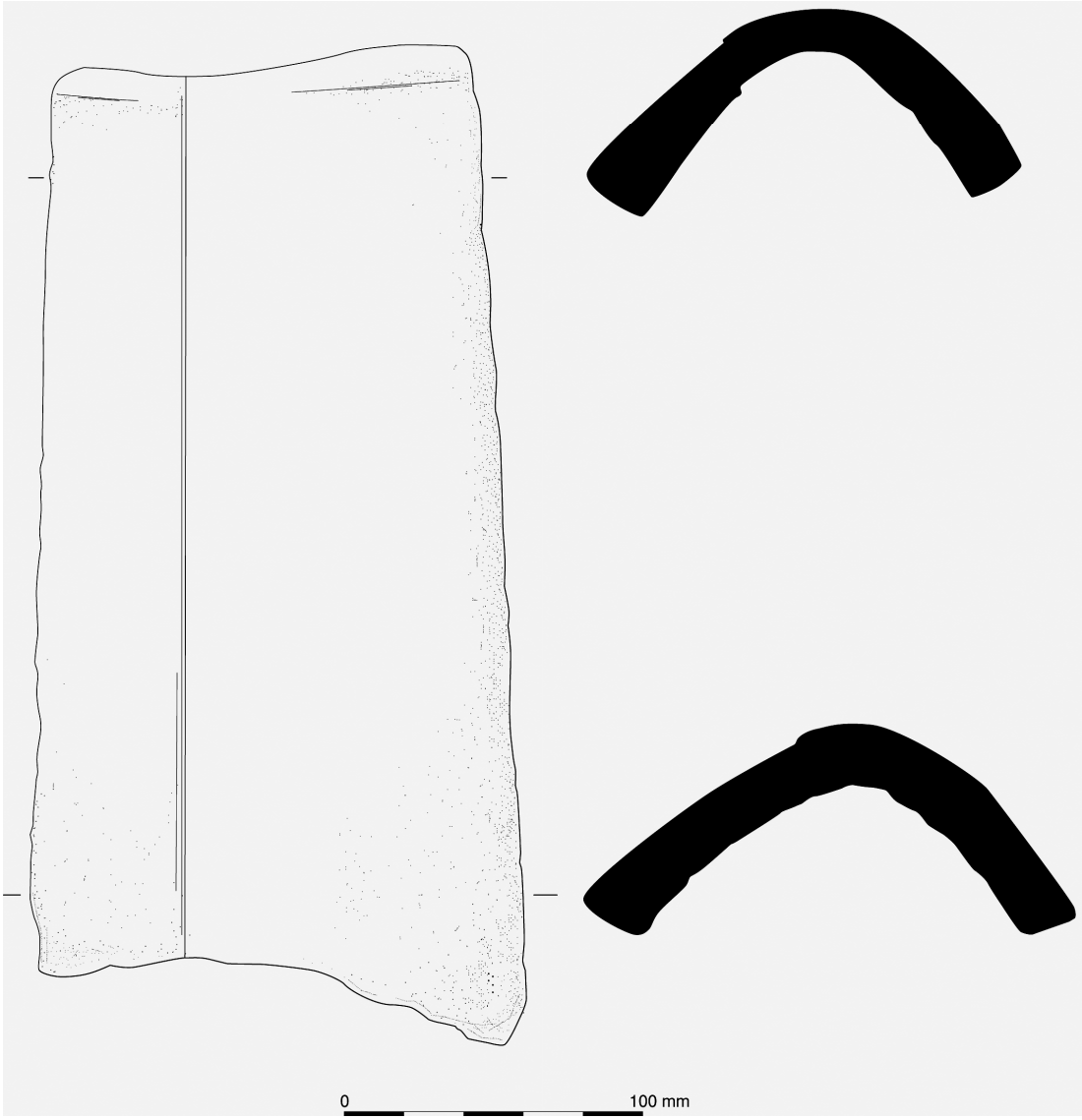


*Figure A7.1: Imbrex recovered from layer **412***

BRICK FABRICS

L41 is is an oxidised Roman brick fabric. It is a hard, red (2.5YR 5/8) fabric with a fine fracture and sandy feel. It has common rounded quartz at 0.5-1mm, moderate black ironstone (possibly grog) at 0.8mm, moderate lime (?) and sparse clay pellets at 1mm and sparse fine silver mica. It is equivalent to tile fabric T41, cf WILD OX (Tomber and Dore 1998).

B4.1 is a Bessales-type brick with dimensions of 135 x135 x *c* 42mm. It was used for the construction of pilae stacks.

B5.1 is a small brick with dimensions of width 125mm by 50mm thick, with no extent length.

B5.2 is a Bessales with dimensions of 175-80 x 175-178 x 50-55mm.

B6.1 is a Bessales with dimensions of 180 x 174 x 58mm.

B6.2 is a pedalis brick, measuring *c* 290 x 290 x 60mm, and would have been used to cap the top of the pilae stack created by the Bessales.

B7/8/9 Bipedalis. No complete examples of this were observed but various examples measuring *c* 70mm, 80mm and 90mm (B7, B8 and B9 respectively) were observed. These would have been placed over four pilae stacks to form the floor. A number of examples had perforations similar to those described by Brodbribb at Beauport Park (1979).

V1.0 are tapered voussoir bricks with dimensions ranging from 15mm to 35mm. Because of the nature of the fragmentation of these forms, these are hard to distinguish from flat tiles, and tend to be under-represented, as well as being easy to confuse for tegula.

FT1.0 is a half box-flue tile with a scored surface, having trapezoid flanges at the rear, cf Brodribb 1987, fig 27 b), late first century AD.

L42 is an oxidised Roman brick fabric. It is a hard, light red (2.5YR 6/8), with an irregular fracture and very sandy feel. It has inclusions of common to abundant rounded quartz at 0.3-0.5mm, with moderate black ironstone and lime.

B4.1 is a bessales with dimensions of 133 x 132 x 40mm.

B5.2 is a bessales with dimensions of 170-182 x 160-178 x 48-52mm.

B5.3 is a pedalis with dimensions of 285 x 285 x 50mm.

B6.1 is a Bessales with dimensions of 175 x 178 x 58mm.

B6.2 is a pedalis with dimensions of 255-275 x 275 x 58-60mm.

B6.3 is sesquipedalis with extant dimensions of 385 x 62mm.

B7/8 Bipedalis. No complete examples were found, but large fragments *c* 70 – 80mm thick (B7 and B8 respectively), some of which were perforated, cf Brodribb 1979.

V1.0. are tapered voussoir or flat tile bricks, with dimensions ranging from 15-35mm.

V2.1 is a fragment of an armchair voussoir, cf Brodribb 1987, fig19, no 1 (Fig A7.2).

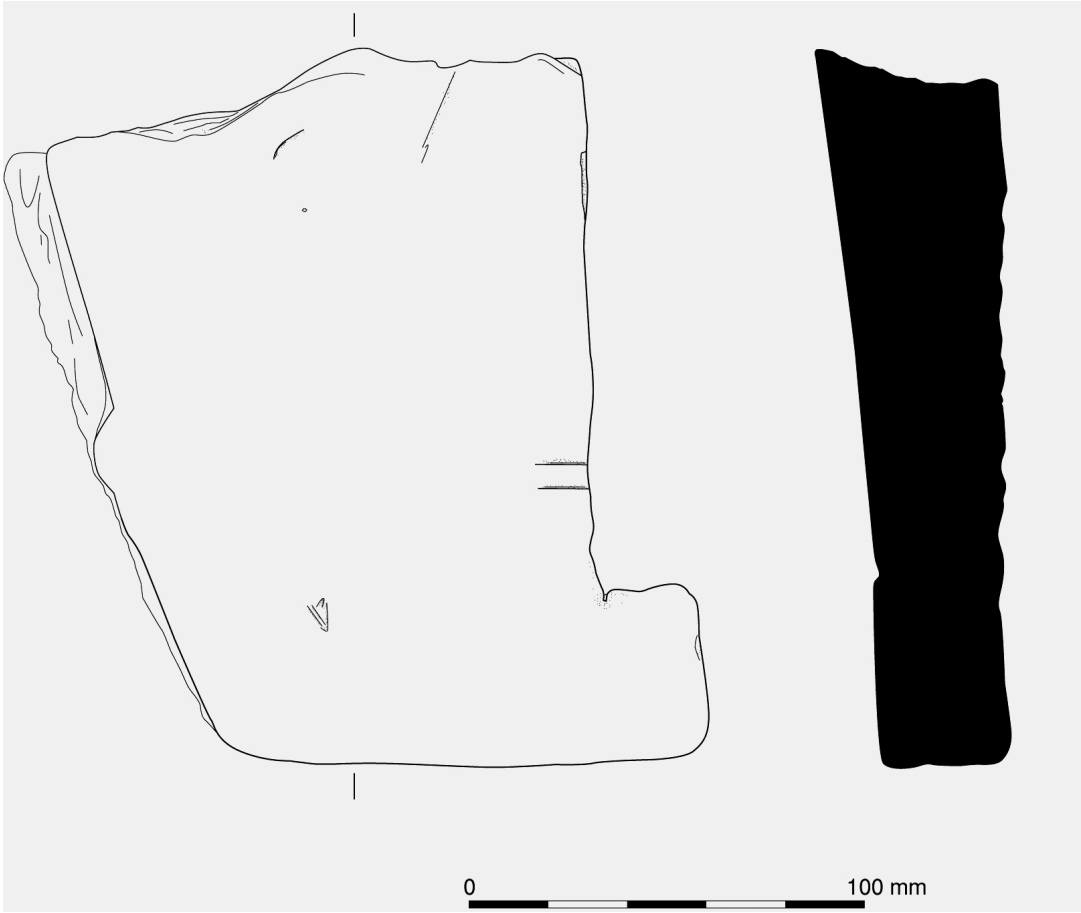


*Figure A7.2: Armchair voussoir V2.1 from demolition layer **572***

FT1.0 is a half box-flue tile with a scored surface and having trapezoid flanges at the rear, cf Brodbribb 1987, fig 27b), late first century AD (Fig A7.3).

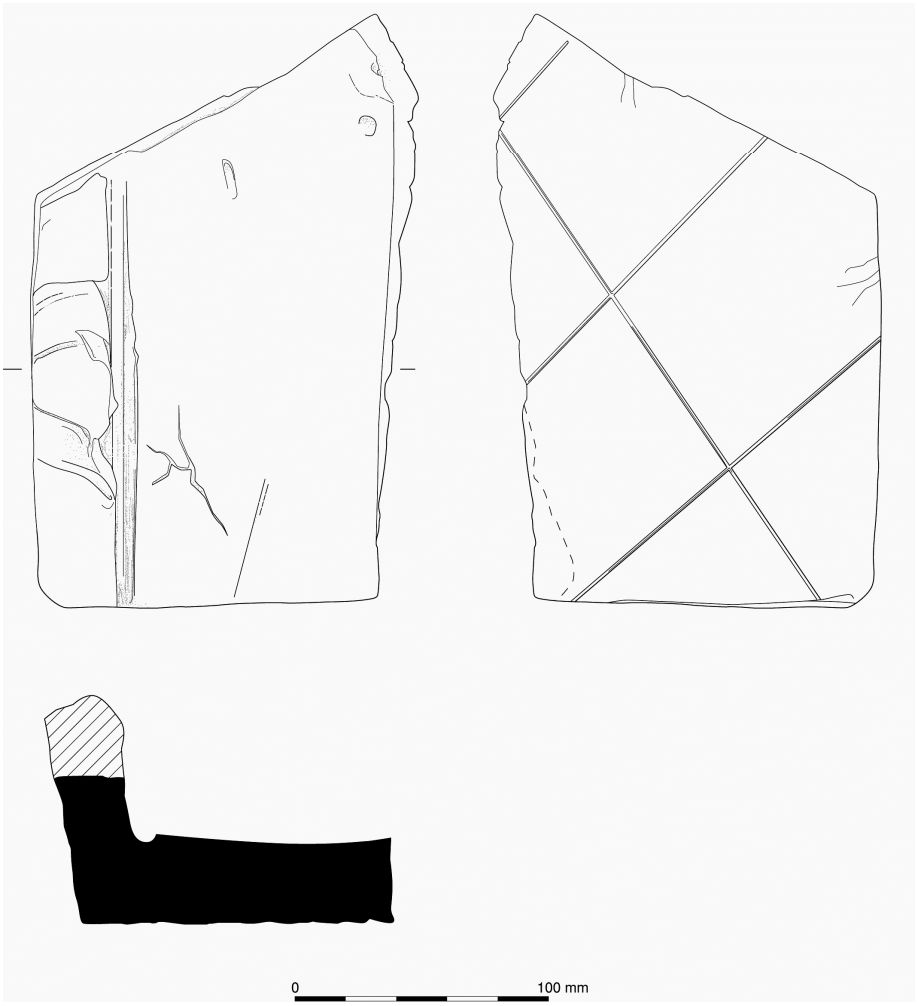


*Figure A7.3: Half box-flue tile fragment fromrobber trench fill **253***

FT2.1 is a medium combed box-flue tile, cf Ward 1999, fig 21, 83, 84; fig 22, nos 86-99. Second century AD+.

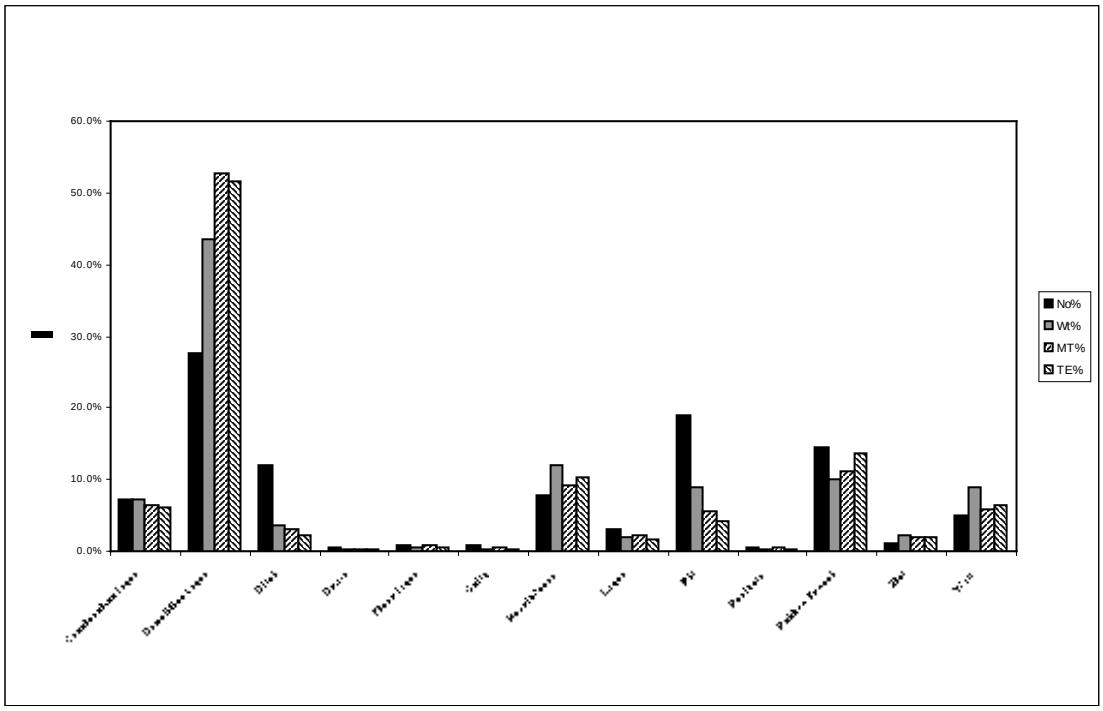


Figure A7.4: Bar chart of ceramic building material quantities by context class

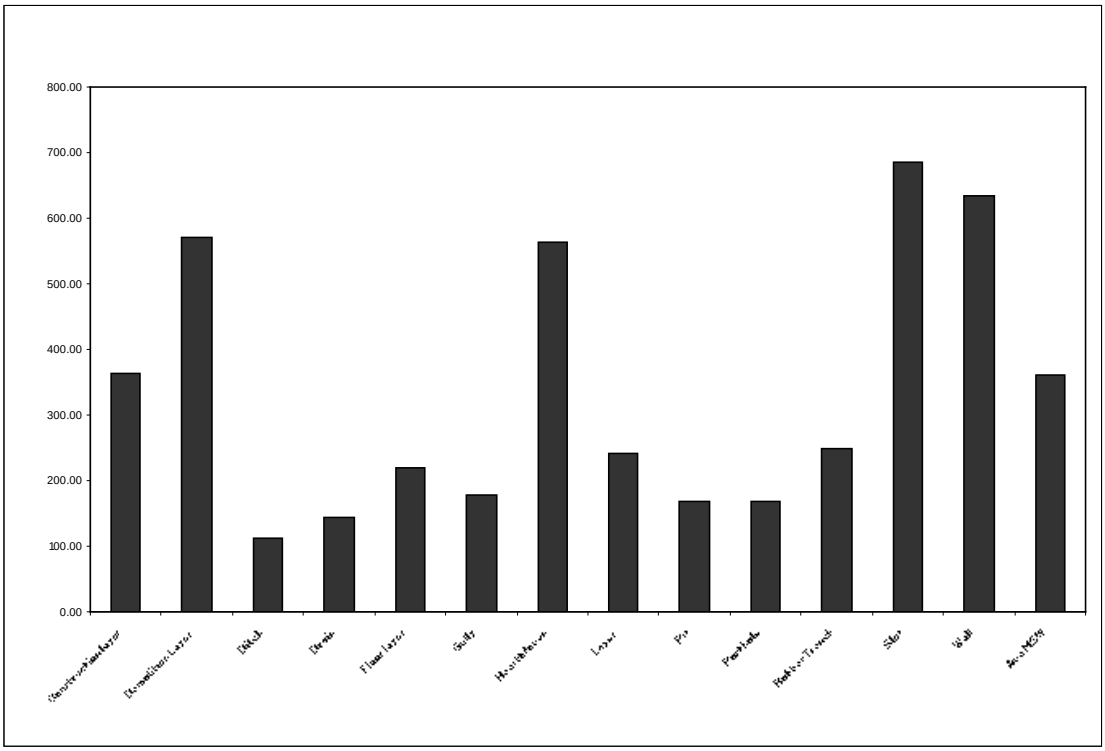


Figure A7.5: Bar chart of MSW by context Class

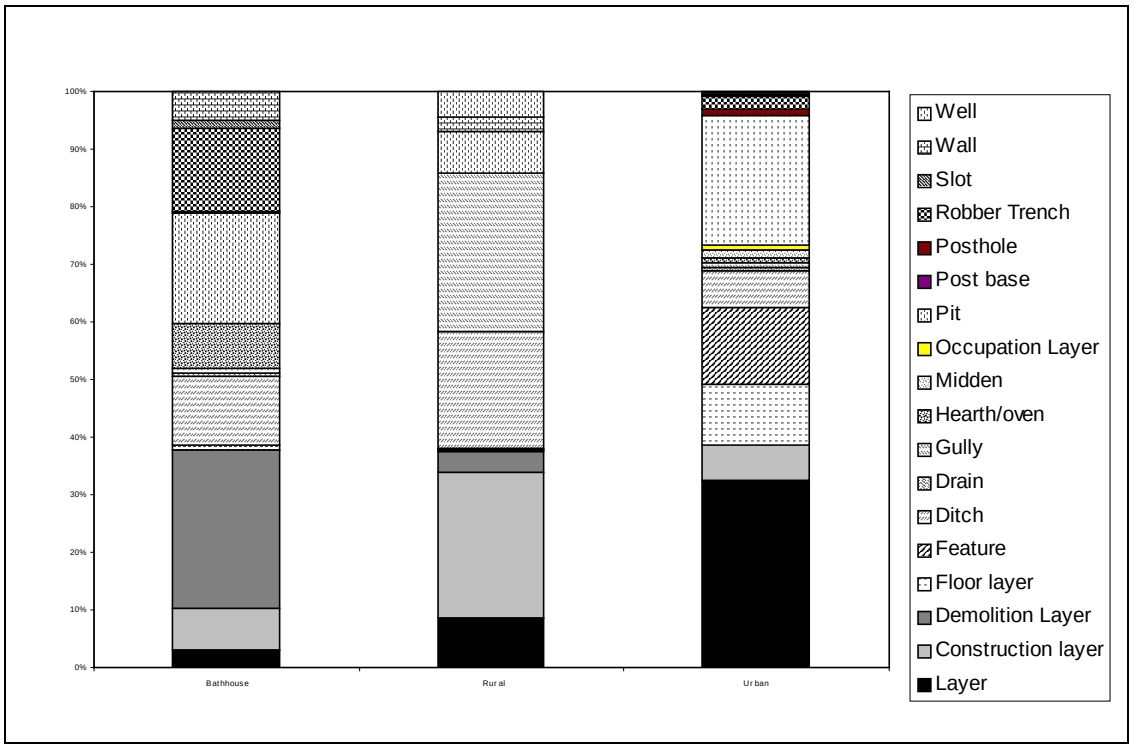


Figure A7.6: Stacked column chart comparing ceramic building material by No% by context class by site type

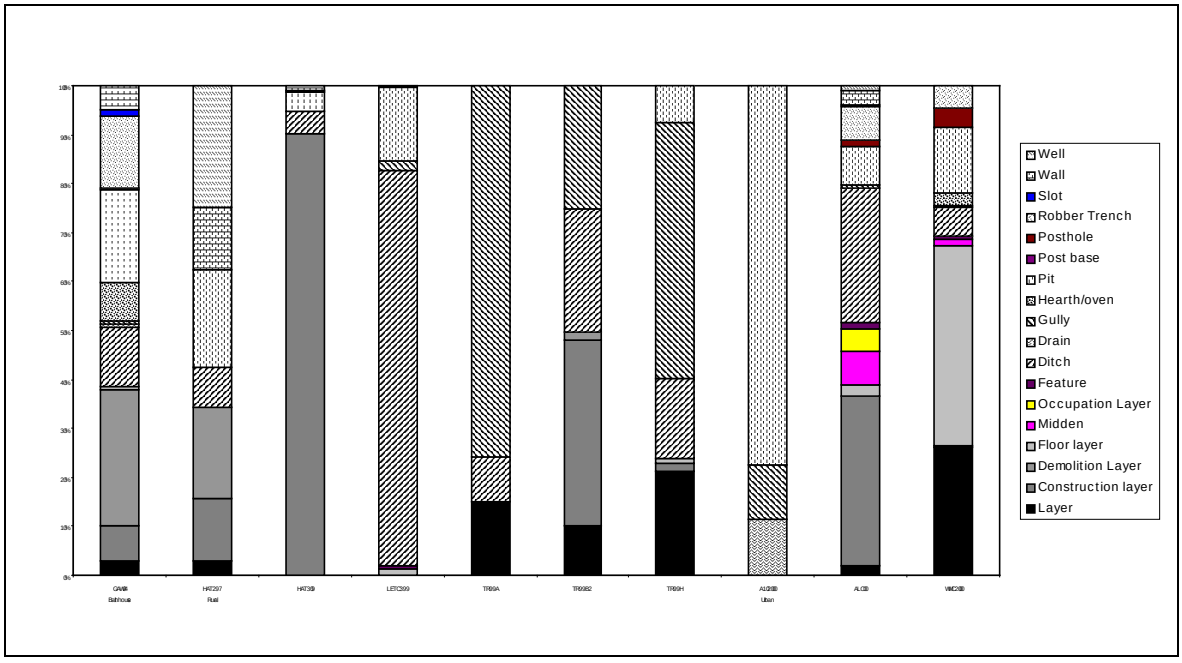


Figure A7.7: Stacked column chart comparing ceramic building material by No% by Context Class for different sites

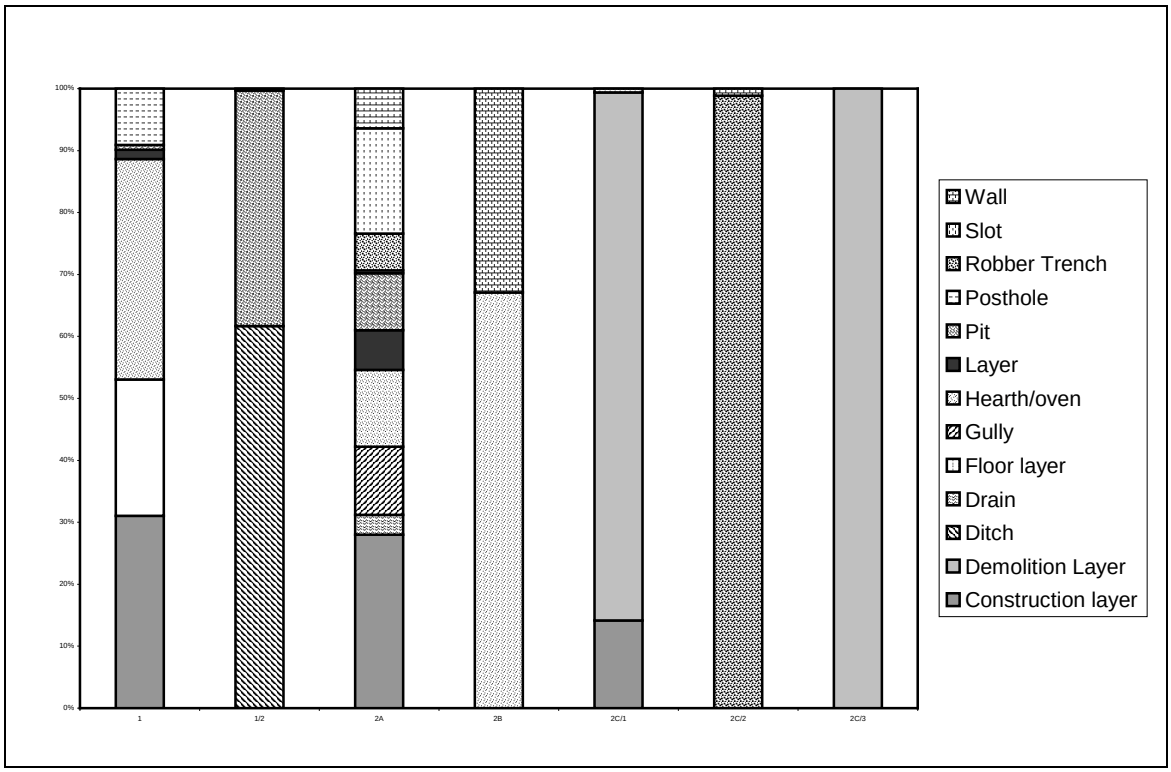


Figure A7.8: Stacked column chart of CBM by Deposit type by no% by phase

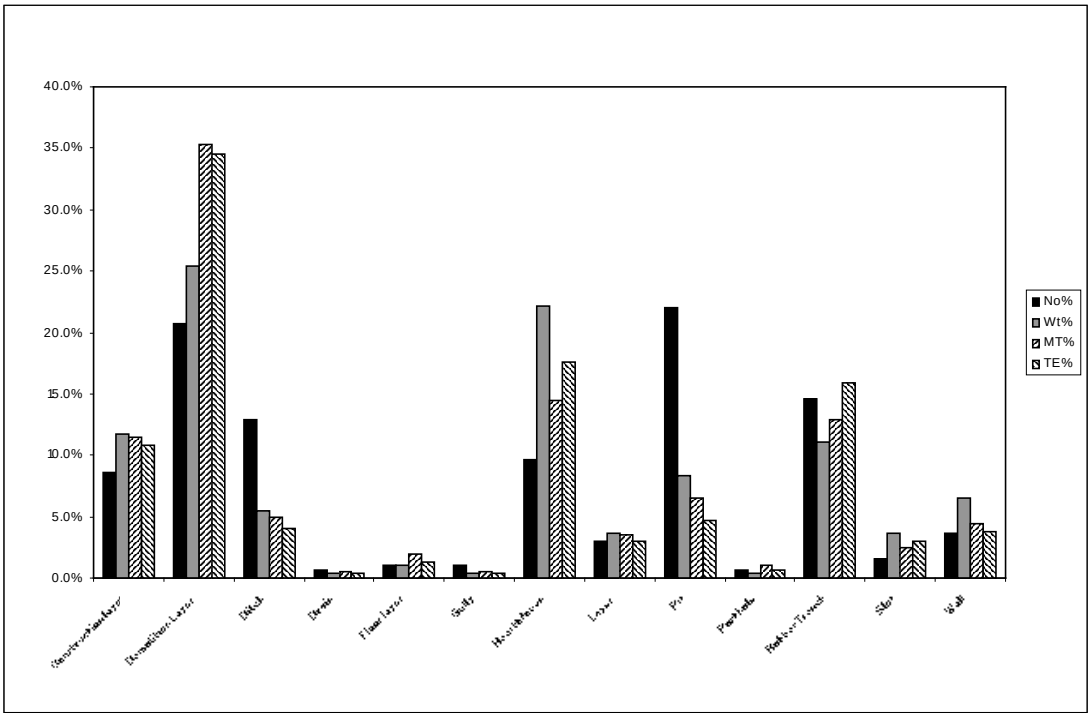


Figure A7.9: The roof tile only by context class

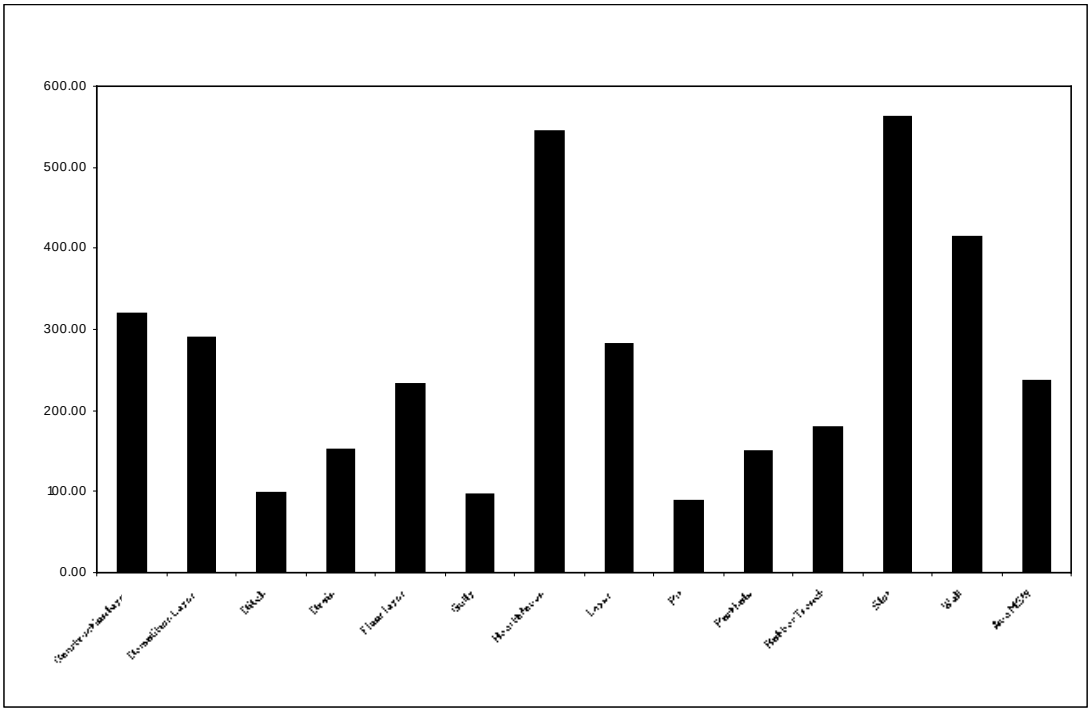


Figure A7.10: Bar chart of MSW by context class for roof tile

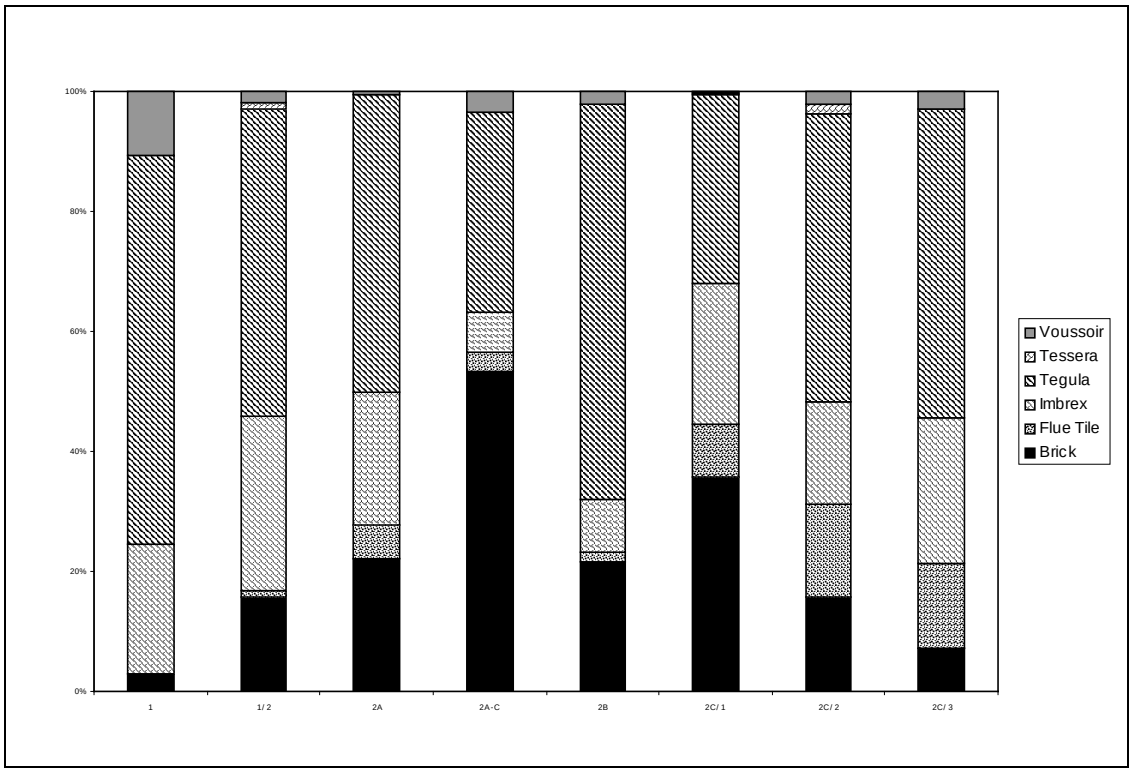


Figure A7.11: Brick type ratios by phase by number of fragments

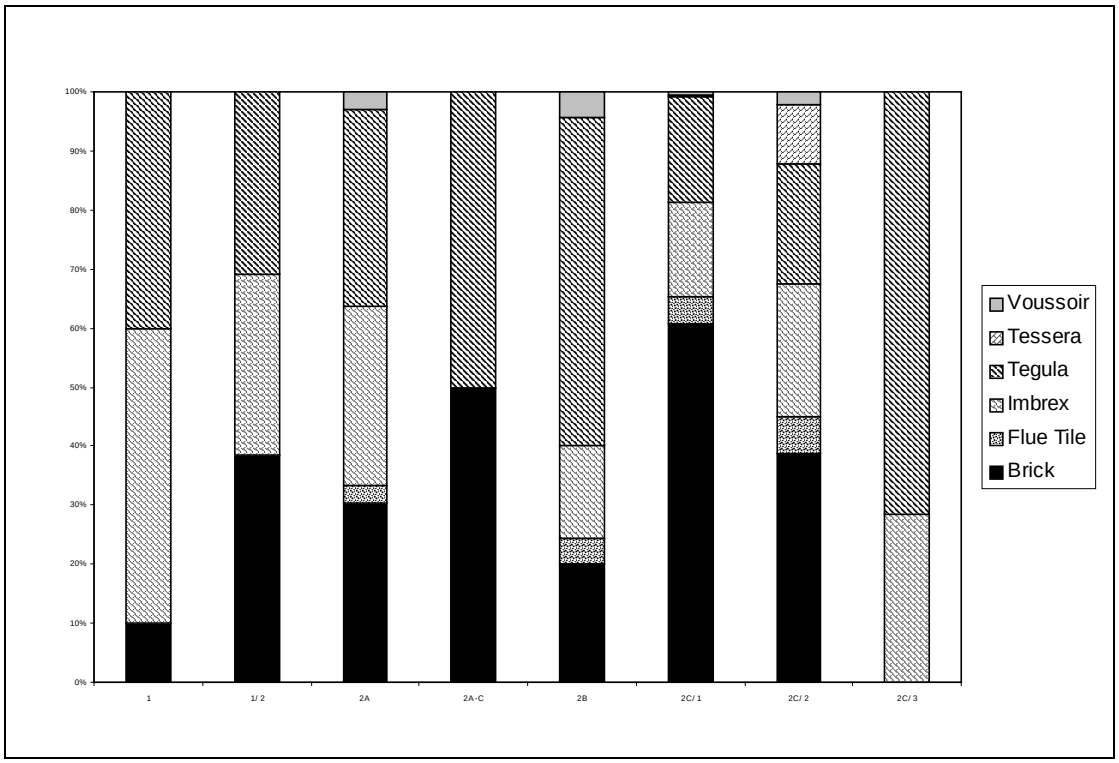


Figure A7.12: Brick type ratios by phase by MT

APPENDIX 8: ROMAN COINS CONSERVATION RECORDS

CONSERVATION RECORD

Lab No. 05/306

Nature / Object Copper alloy coin

Job No. KB 472

Client Oxford Archaeology North

X-Ray No. K05/68

Acc. No. Grand Arcade, Wigan G10X 116 SF4

Instruction Clean, stabilise and protect

Condition Copper alloy coin covered in soil and powdery green corrosion. On cleaning patchy pitted patina remains with some detail of head and standing figure visible.

PHOTO **Before** **After**

Treatment

1. Cleaned using a scalpel and glass bristle brush
2. Degreased using acetone
3. Vacuum impregnated with 3% Benzotriazole corrosion inhibitor in Industrial Methylated Spirits
4. Lacquered with 1:4 Incralac acrylic copolymer in toluene

Advice Handle with care and wear appropriate gloves

Ideal recommended environmental conditions for display / storage
Temperature 18ºC±5ºC in any 24 hour period
Relative humidity 30%±5% in any 24 hour period
Light 300 Lux maximum
Ultra-violet light 75µW/lumen maximum

Treatment 1 **Date** 8/05 **Conservator** KB

Antiquities Conservation Service, Greensfell, Gunnerton, Hexham. Northumberland. NE48 4EF.

CONSERVATION RECORD

Lab No. 05/307

Nature / Object Copper alloy coin

Job No. KB 472

Client Oxford Archaeology North

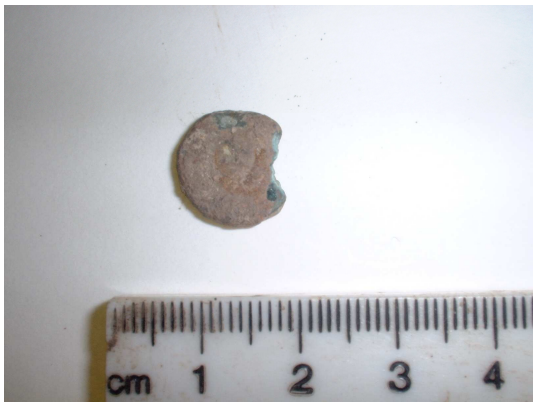
X-Ray No. K05/68

Acc. No. Grand Arcade, Wigan G10X 683 L9460 SF28

Instruction Clean, stabilise and protect

Condition Copper alloy coin covered in soil and powdery pale and waxy green corrosion, 2 deep pits on obverse. On cleaning some detail of head and SC on reverse.

PHOTO **Before** **After**



Treatment

1. Cleaned using a scalpel and glass bristle brush
2. Degreased using acetone
3. Vacuum impregnated with 3% Benzotriazole corrosion inhibitor in Industrial Methylated Spirits
4. Lacquered with 1:4 Incralac acrylic copolymer in toluene

Advice Handle with care and wear appropriate gloves

Ideal recommended environmental conditions for display / storage
Temperature 18ºC±5ºC in any 24 hour period
Relative humidity 30%±5% in any 24 hour period
Light 300 Lux maximum
Ultra-violet light 75µW/lumen maximum

Treatment 1 **Date** 8/05 **Conservator** KB

Antiquities Conservation Service, Greensfell, Gunnerton,
Hexham. Northumberland. NE48 4EF.

CONSERVATION RECORD

Lab No. 05/308

Nature / Object Copper alloy coin

Job No. KB 472

Client Oxford Archaeology North

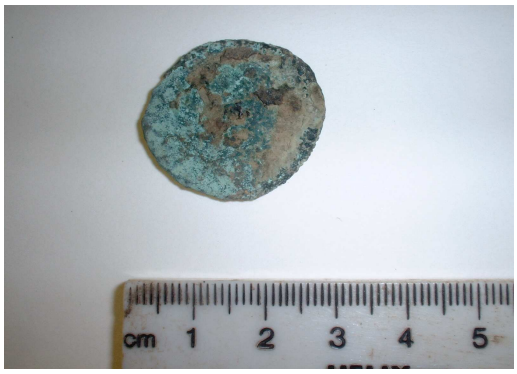
X-Ray No. K05/68

Acc. No. Grand Arcade, Wigan G10X 052 SF6

Instruction Clean, stabilise and protect

Condition Copper alloy coin covered in soil and powdery pale green corrosion, pitted surface. On cleaning some detail of head and standing figure visible.

PHOTO **Before** **After**



Treatment

1. Cleaned using a scalpel and glass bristle brush
2. Degreased using acetone
3. Vacuum impregnated with 3% Benzotriazole corrosion inhibitor in Industrial Methylated Spirits
4. Lacquered with 1:4 Incralac acrylic copolymer in toluene

Advice Handle with care and wear appropriate gloves

Ideal recommended environmental conditions for display / storage
Temperature 18ºC±5ºC in any 24 hour period
Relative humidity 30%±5% in any 24 hour period
Light 300 Lux maximum
Ultra-violet light 75µW/lumen maximum

Treatment 1 **Date** 8/05 **Conservator** KB

Antiquities Conservation Service, Greensfell, Gunnerton,
Hexham. Northumberland. NE48 4EF.

CONSERVATION RECORD

Lab No. 05/309

Nature / Object Copper alloy coin

Job No. KB 472

Client Oxford Archaeology North

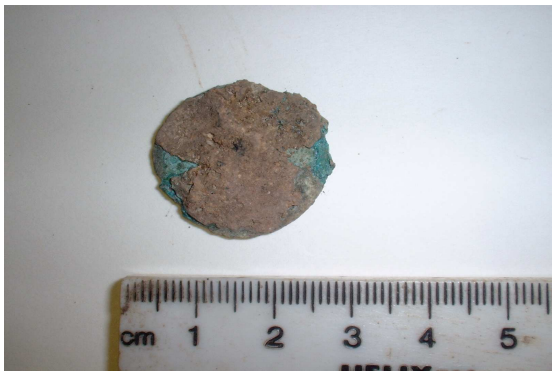
X-Ray No. K05/68

Acc. No. Grand Arcade, Wigan G10X 041 054 SF5

Instruction Clean, stabilise and protect

Condition Copper alloy coin covered in soil and powdery and bulbous hard waxy green corrosion. On cleaning some detail of head and standing figure visible.

PHOTO **Before** **After**



Treatment

1. Cleaned using a scalpel and glass bristle brush
2. Degreased using acetone
3. Vacuum impregnated with 3% Benzotriazole corrosion inhibitor in Industrial Methylated Spirits
4. Lacquered with 1:4 Incralac acrylic copolymer in toluene

Advice Handle with care and wear appropriate gloves

Ideal recommended environmental conditions for display / storage
Temperature 18ºC±5ºC in any 24 hour period
Relative humidity 30%±5% in any 24 hour period
Light 300 Lux maximum
Ultra-violet light 75µW/lumen maximum

Treatment 1 **Date** 8/05 **Conservator** KB

Antiquities Conservation Service, Greensfell, Gunnerton,
Hexham. Northumberland. NE48 4EF.

APPENDIX 9: CATALOGUE OF ROMAN GLASS

48/6145 (Area G7/10) Indented beaker with curved rim (Fig A9.1). Three joining fragments. Colourless. Cracked-off and ground rim, slightly out-turned. Wheel-cut lines immediately below rim and at the shoulder. Period 2A-C, mid- to late second century?

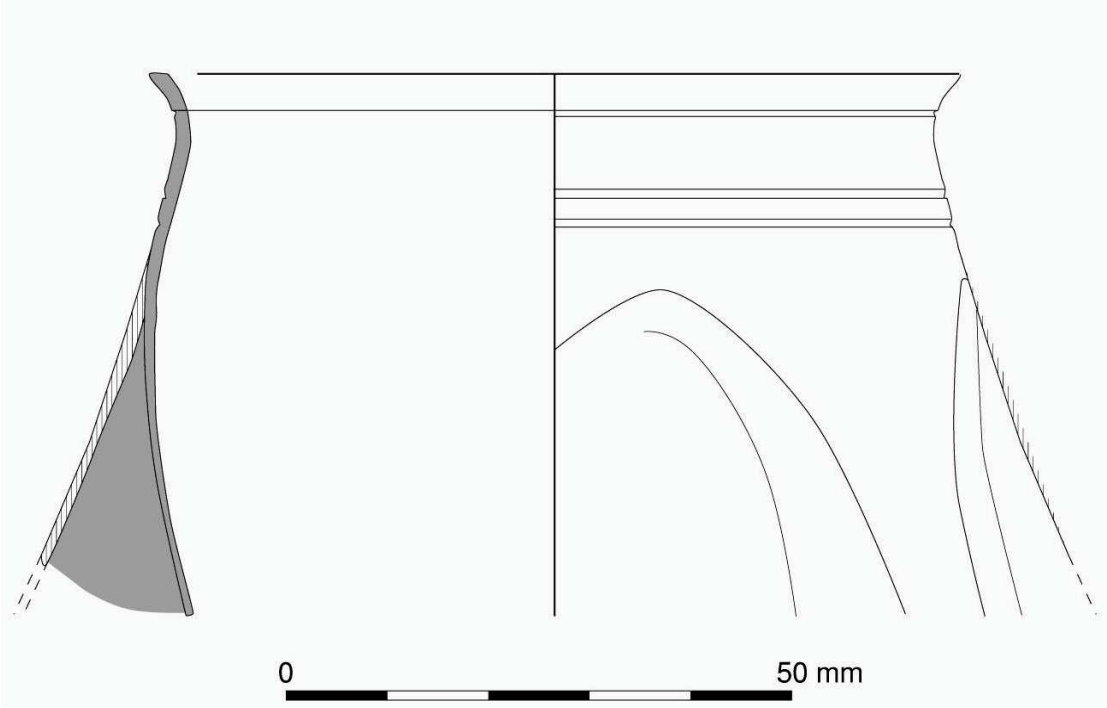


*Figure A9.1: Indented beaker **48**/6145*

32/6142, ***32***/6143 and ***48***/6144 (Area G7/10) Numerous small fragments of a very thin-walled blown vessel. Natural blue-green. The surviving fragments indicate a long narrow tapering tube, with fire-rounded hole at the pointed end. Probably a funnel. Maximum reconstructed length: 145mm; Th: 0.5mm. Period 2A-C, Claudian to late first century

491/6150 (Area G7/10) Translucent dark blue bangle (Fig A9.2). D-shaped section with marvered white trails top and bottom, and white pothooks. Kilbride-Jones (1938) type 3I. Period 2C, second century.

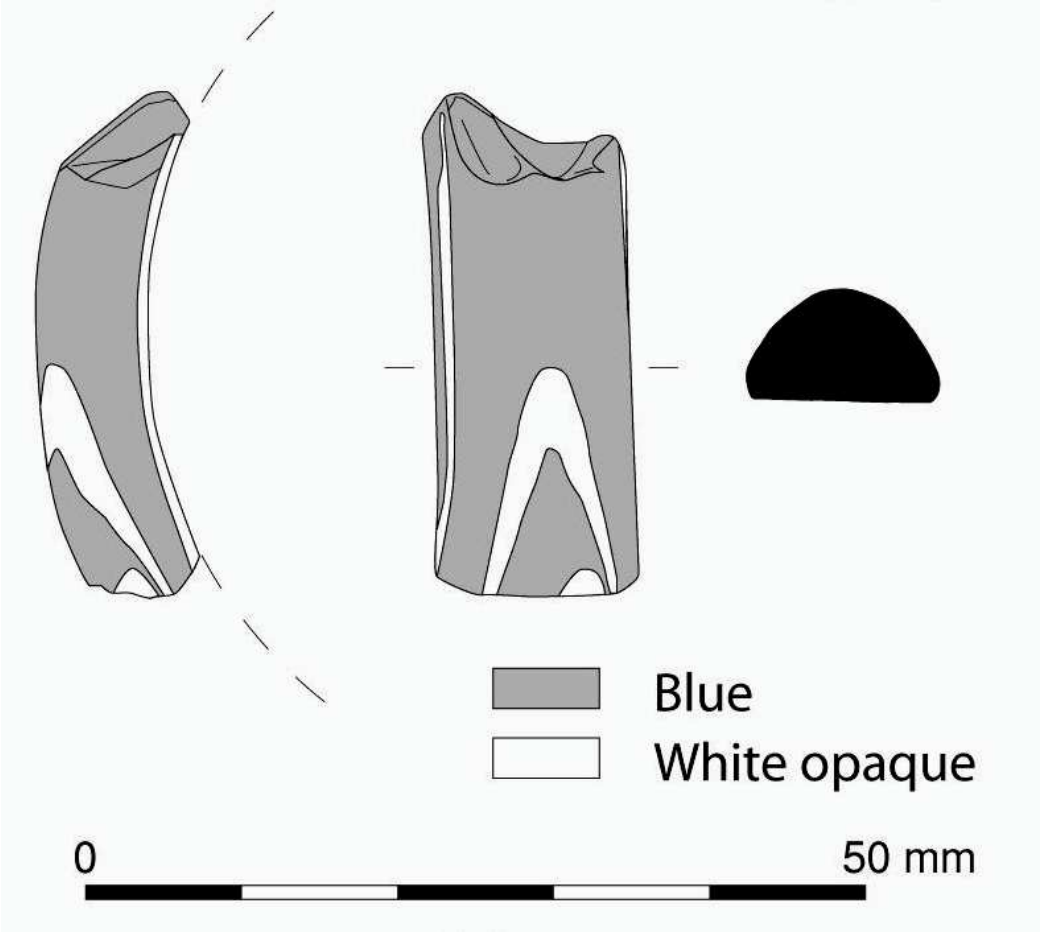


*Figure A9.2: Bangle **491**/6150*

APPENDIX 10: CATALOGUE OF WORKED BONE AND IVORY

947/6325 (Area G7/10, Unstratified) Plain pin, Crummy (1983) type 1. Point only missing. L: 109mm; max diam: 4mm (Fig A10.1). First to fourth century.

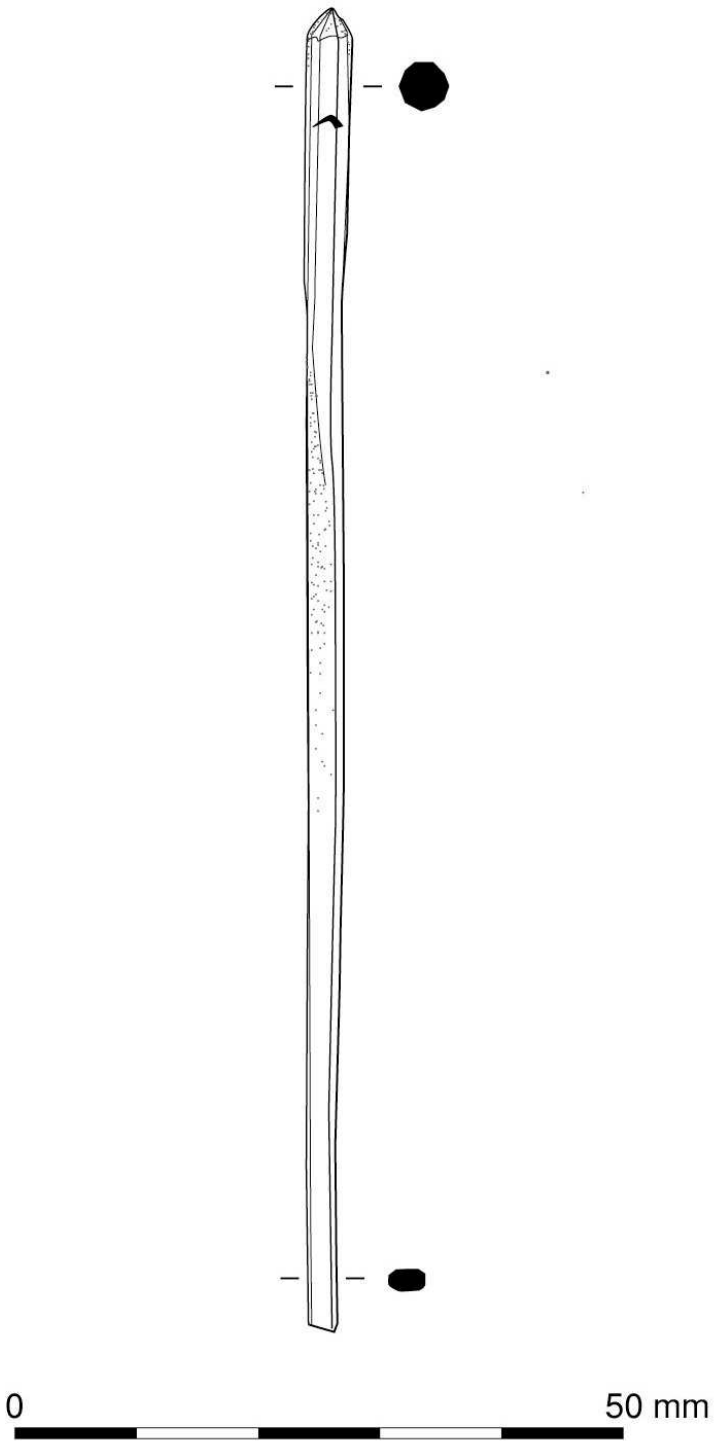


*Figure A10.1: Plain pin **947**/6325*

3017/6324 (Area G3, Period 5) End of roughly-made ivory knife handle, drilled to receive a whittle-tang blade (Fig A10.2). Probably in pistol-grip style. L: 47mm; W: 26mm; Th: 15.5mm. Probably eighteenth century.

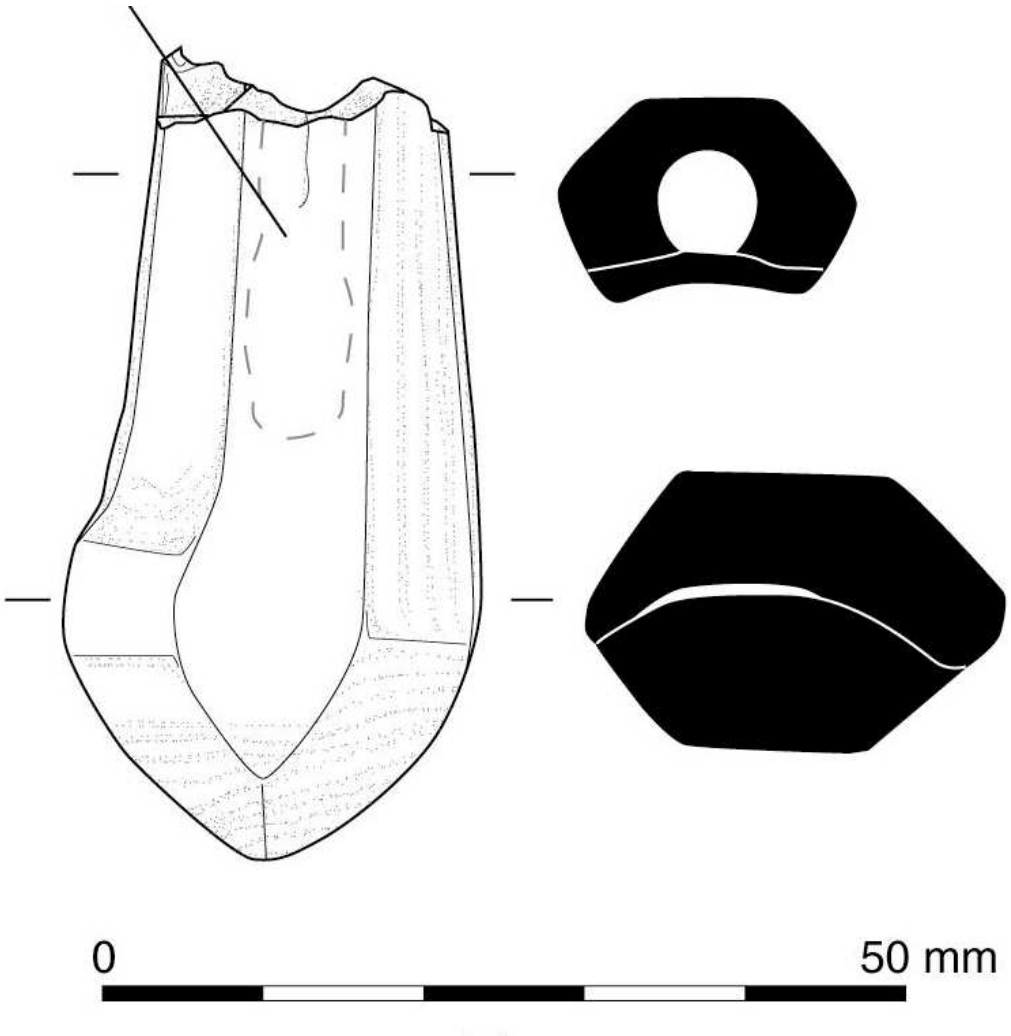


*Figure A10.2: Ivory knife handlen **3017**/6324*

APPENDIX 11: CATALOGUE OF WATERLOGGED WOOD

THE WORKED WOOD ASSEMBLAGE FROM DITCH *3020*, AREA G3

Context / Sample No	Description	Comments	Wood species
3072/222	peg	radially split	*Quercus*
3021/212	peg	radially split	*Quercus*
	small round 'chip' with hole	worked? bark	Indeterminate
	forked roundwood (peg/anchor?)	shows signs of working	*Alnus*
	forked? roundwood (peg/anchor?)		*Alnus*
	stake/post? (missing point)	compressed and showing signs of charring	*Alnus*
	roundwood stake	with cut point	*Alnus*
	roundwood stake (in two pieces)	0.03m diam/0.31m total length, with cut point	cf *Betula*
	roundwood stake	0.02m diam/0.11m length, with cut point	*Alnus/Corylus*
	roundwood stake?	0.04m diam/0.15m length, possibly cut at both ends	*Alnus/Corylus*
	roundwood	0.01m diam, no obvious working	*Alnus*
	roundwood	0.02m diam/0.08m length, no obvious working	*Alnus*
3021/213	peg	radially split	*Quercus*
	offcut/waste chip	triangular, shows signs of working	*Quercus*
	offcut/waste chip	triangular, shows signs of working	*Quercus*
	offcut/waste chip	radially split	*Quercus*
	offcut/waste chip	radially split	*Quercus*
	offcut/waste chip		*Quercus*
	offcut/waste chip		*Quercus*
	offcut/waste chip		*Quercus*
	offcut/waste chip		*Quercus*
	offcut/waste chip		*Salix*
	offcut/waste chip		cf *Salix*
	offcut/waste chip		*Salix*
	offcut/waste chip		*Alnus*
	offcut/waste chip		*Alnus*
	offcut/waste chip		*Alnus*
	offcut/waste chip		*Alnus*
	offcut/waste chip		*Alnus*
	offcut/block		*Alnus*
	offcut/block		*Alnus*
	offcut/block		*Alnus*
	offcut/waste chunk		*Alnus*
	offcut/waste chunk	no signs of working	*Alnus*
	offcut/waste flake	shows signs of working	*Alnus*
	offcut	long and angular with possible working	*Quercus*
	offcut?	radially split, compressed, no obvious working	*Quercus*

Context / Sample No	Description	Comments	Wood species
	thin plank	radially split	*Quercus*
	thin plank	radially split	*Quercus*
	thin plank	radially split	*Quercus*
	thin plank	0.01m thick, radially split	*Quercus*
	thin plank	0.01m thick, radially split	*Quercus*
	thin plank	0.01m thick, radially split	*Quercus*
	thin plank (in several pieces)	0.01m thick, radially split	*Quercus*
	roundwood stake	with cut point	cf *Betula*
	roundwood	0.02m diam/0.14m length, no obvious signs of working	*Corylus*
	roundwood stake	0.03m diam/0.21m length, with cut point	*Alnus*
	roundwood stake	with cut point	*Alnus*
	roundwood stake	0.08m diam with blunt cut point	*Alnus*

SUMMARY OF THE WORKED WOOD AND SPECIES FROM DITCH *3020*, AREA G3

	Alnus	Alnus/Corylus	Corylus	Betula	cf Betula	Quercus	Salix	cf Salix
Block	3							
Chip	5					8	2	1
Chunk	2							
Flake	1							
Offcut						2		
Peg						3		
Plank						7		
Roundw	4		1					
Stake	4	2		1	1			
Post	1							
Total	**20**	**2**	**1**	**1**	**1**	**20**	**2**	**1**

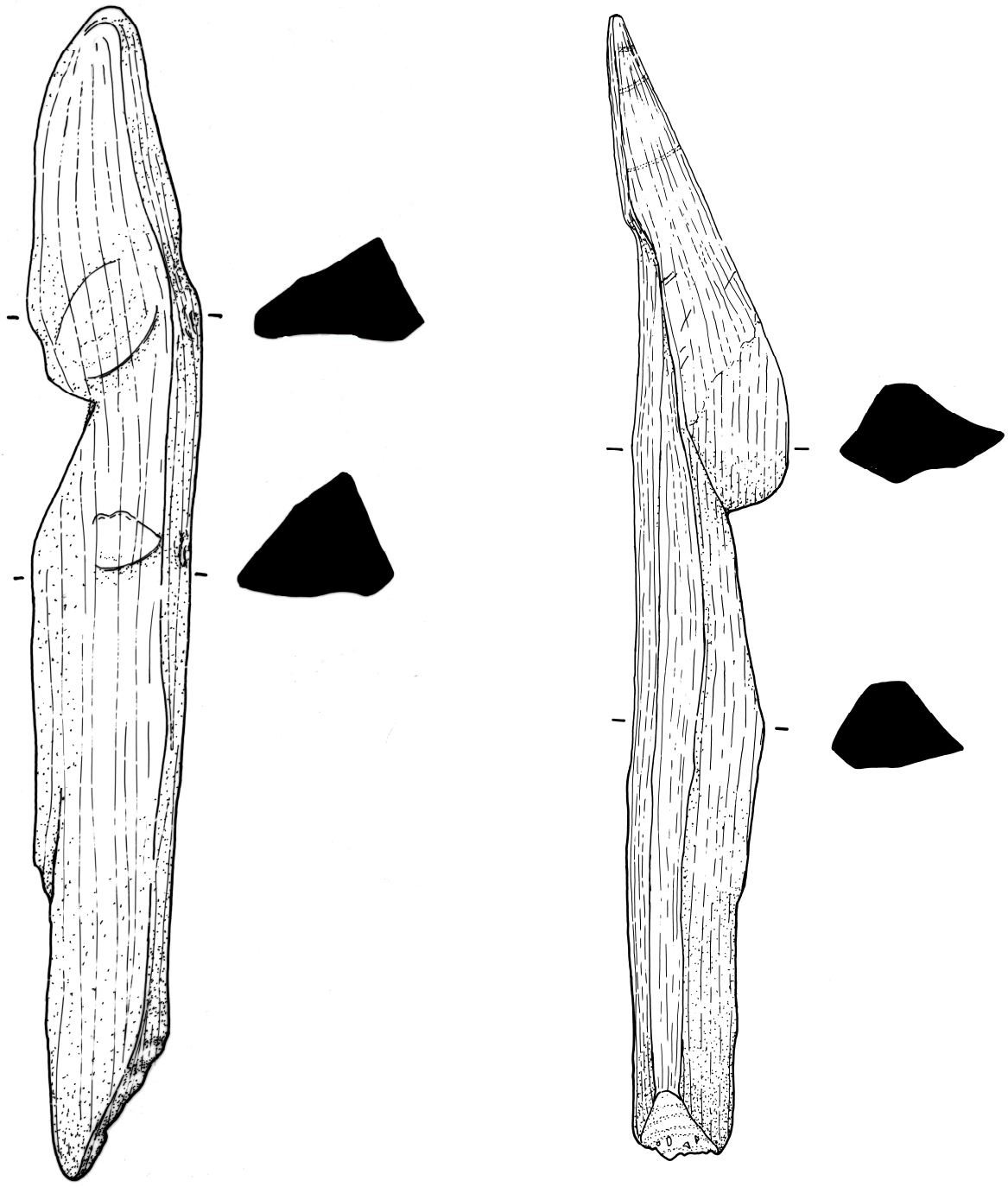


*Figure A11.1: Roman tent pegs **3072**/222 and **3021**/212*

APPENDIX 12: CHARRED AND WATERLOGGED PLANT REMAINS

RESULTS OF THE ANALYSIS OF THE PLANT REMAINS

Context No		***1109***	***022***	***127/128***	***130***	***224***	***851***
Sample No		?	29	31	32	39	52
Feature No		***1104***	***023***	***129***	***118***	***220***	***850***
Feature Type		Ditch	Lower	Pit with waste	Pit	Pit	Pit
Phase		1	6	7	6	7	6
Sample Size in litres		10	20	20	20	20	20
Charred Remains*							
Avena sp	Oat sp		8		20		
Avena sp Awn fragment	Oat sp					6	
Hordeum vulgare	Hulled barley						4
Triticum aestivum	Bread wheat				10		
Brassica sp	Cabbages					1	
Caltha palustris	Marsh-marigold					3	
Carex lenticular	Sedges-two sided					6	
Poaceae <2mm	Grass family					15	
Culm nodes						1	
Unknown charred seeds						3	
Indeterminate charred seeds						3	
Waterlogged Seeds							
Edible/Economic Plants							
Corylus avellana shell fragment	Hazelnut fragment			2	2		1
Ficus carica	Fig			5			5
Linum usitatissimum	Flax						2
Malus domestica/Pyrus communis	Apple/Pear			4			2
Papaver somniferum	Opium Poppy			5			
Prunus cf *spinosa*	Sloe			2			1
Prunus cf *domestica* ssp *insititia*	Bullace/Damson			2		1	2
Prunus spinosa/ domestica ssp *insititia*	Sloe/Bullace/Damson						1
Prunus sp fragment	Cherries			3	3		
Rubus fruticosus	Blackberry		2	4	3	2	5
Sambucus nigra	Elderberry		2	4		1	
Vaccinium myrtillus	Bilberry						2

The charred remains (*) are given as actual counts, whereas the waterlogged and other remains are based on a scale from 1-5 where 1=<five items, 2=5-25, 3=25-50, 4=50-100, and 5=>100 items. Counts are of seeds unless stated otherwise.

Weeds/Ruderals		**Ground Conditions**	***1109***	***022***	***127/12***	***130***	***224***	***851***
Agrostemma githago	Corncockle	Cultivated /wasteland	1					3
Anthemis cotula	Stinking Chamomile	Cultivated /wasteland			3			2
Aphanes sp	Parsley-pierts	Cultivated /wasteland	1					
Barbarea vulgaris	Winter-cress	Waste/damp			4			
Brassica sp	Cabbages	Cultivated /wasteland	4		3	3		
Centaurea sp	Knapweeds	Cultivated /wasteland						2
Chenopodium album	Fat-hen	Cultivated /wasteland	2	2	5	5	2	
Chenopodium/ Atriplex	Fat-hen/Oraches	Cultivated /wasteland						5
Chrysanthemum segetum	Corn Marigold	Cultivated /wasteland						5
Conium maculatum	Hemlock	Damp/ waste		2		3	1	1
Galeopsis tetrahit	Common Hemp-nettle	Cultivated /wasteland/ damp						2
Hyoscyamus niger	Henbane	Waste/nutrient rich			5			
Lamium sp	Dead-nettles	Cultivated /wasteland		2				
Lapsana communis ssp	Nipplewort	Wasteland				2	1	5
Persicaria lapathifolia	Pale Persicaria	Cultivated /wasteland /damp	4		3		2	4
Persicaria maculosa	Redshank	Cultivated /wasteland	3					
Persicaria lapathifolia/ maculosa	Pale Persicaria/Redshank	Cultivated /wasteland/ damp	5					
Plantago ssp *major*	Greater Plantain	Cultivated /wasteland			3			
Potentilla erecta-type	Tormentil	Grass/dwarf shrub (acid)	5		4		2	1
Prunella vulgaris	Selfheal	Grass/waste	2					3
Ranunculus repens-type	Creeping Buttercup	Grassland	4		4		4	2
Raphanus pod fragment	Radishes	Cultivated /wasteland				4	1	4
Rumex acetosella	Sheep's Sorrel	Cultivated/ grass (acid)	3	2	4	2	2	5
Rumex obtusifolius	Broad-leaved Dock	Waste/ cultivated/ grassland				4	1	2
Sonchus asper	Prickly Sow-thistle	Cultivated /wasteland			3	2		2
Spergula arvensis	Corn Spurrey	Cultivated (calcifuge-sandy)						4
Stellaria graminea	Lesser Stitchwort	Grassland	1				1	

		Ground Conditions	***1109***	***022***	***127/12***	***130***	***224***	***851***
Stellaria media	Common Chickweed	Cultivated/ open	5		5	3	2	3
Urtica dioica	Common Nettle	Nutrient rich		5	5		3	4
Broad taxa								
Apiaceae	Carrot family							3
Caryophyllaceae undiff.	Pink family		2					
Cirsium sp	Thistles		4			2	1	
Leontodon sp	Hawkbits				3		1	2
Plantago sp	Plantains				3			
Polygonum aviculare	Knotgrass				4	3	2	5
Rumex acetosa	Common Sorrel					2		
Rumex sp	Docks					3		
Taraxacum sp	Dandelions							1
Plants of wet/damp ground								
Carex lenticular	Sedges-two sided		5		5		4	2
Carex trigonous	Sedges-three sided		3		5	2	3	2
Eleocharis sp	Spike-rushes					4	2	2
Juncus spp	Common rush		5	5	5	5	5	2
Montia sp	Blinks		1					
Potentilla palustris	Marsh Cinquefoil	Fens/ marshes/ bogs	2					2
Ranunculus flammula	Lesser Spearwort							2
Ranunculus sceleratus	Celery-leaved Buttercup						1	
Ranunculus Subg. *Batrachium*	Crowfoot							1
Scirpus sylvaticus	Wood Club-rush							3
Other Plant Remains								
Unknown seeds					5			2
Indeterminate seeds					3	3	2	
Amorphous organic			5		5	5		5
Rush/grass rhizomes			5					
Wood			5		5	5	2	4
Twigs			5					
Small roundwood/roots				5				
Buds			3					
Leaf frags			3					
Rosaceae thorns	Rose family incl. bramples, blackthorn		1		3			
Calluna vulgaris stems/leaves	Heather		3					
Pteridium leaf frags	Fern		3					
Bryophyte frags			3					
Sphagnum moss leaves					3	3		

		Ground Conditions	***1109***	***022***	***127/12***	***130***	***224***	***851***
Culm nodes			1				1	2
Other Remains								
Charcoal			2	5	2	2	5	2
Fungal sclerotia			3	3			2	
Insects			4	1	3	2	2	4
Fly puparia			3					
Mammal bone				2				
Coal				5	5	2	4	2
Clinker/cinder				5	2	5		2
Brick				2				

The charred remains (*) are given as actual counts, whereas the waterlogged and other remains are based on a scale from 1-5 where 1=<five items, 2=5-25, 3=25-50, 4=50-100, and 5=>100 items. Counts are of seeds unless stated otherwise.

APPENDIX 13: CHARCOAL ANALYSIS

RESULTS OF THE CHARCOAL ANALYSIS

Location		Building ***1000***, R1					Structure ***950***	
Phase		1-2				3	1-2	
Feature type		Hearth	Hearth	Furnace	Flue	Layer	Hearth	Hearth
Feature number		***201***	***201***	***460***	***571***	***253***	***876***	***876***
Context number		***568***	***567***	***455***	***848***	***775***	***863***	***869***
Sample number		54	51	45	70	56	60	59
Volume floated (litres)			9	20	10			2
% flot identified		12.5	6.25	12.5	100	50	50	25
Ulmus sp	elm	10r						
Quercus sp	oak	37hsr	104sr	65hs	109hs	40s	103h	18
Betula sp	birch		4					
Alnus glutinosa Gaertn	alder			35		49		10
Corylus avellana L	hazel	25r						
Alnus/Corylus	alder/hazel						1	20r
Populus/Salix	poplar/willow						1	16r
Prunus spinosa L	blackthorn							4
Prunus sp	cherry type	14	1					16
Maloideae	hawthorn, pear, apple	9		2		4		4
Fraxinus excelsior L	ash			18s				
Indeterminate		5	8	4	2	2		9
Total		**100**	**117**	**124**	**111**	**95**	**105**	**97**

(r=roundwood; s=sapwood; h=heartwood)

APPENDIX 14: CATALOGUE OF INSECT REMAINS

THE INSECT REMAINS RECOVERED FROM *850/52*

	Ecology		**Phytophage host plants**
Processed Weight (kg)		11.5	
Processed Volume (l)		10	
COLEOPTERA			
Carabidae			
Carabus violaceus L		3	
Nebria salina Fairm Lab		1	
Bembidion sp		1	
Pterostichus sp		1	
Agonum sp	ws	1	
Hydrophilidae			
Cercyon impressus (Sturm)	df	2	
Cercyon analis (Payk)	df	2	
Staphylinidae			
Eusphalerum sp		1	
Oxytelus rugosus (F)	df	1	
Oxytelus sculpturatus Grav	df	4	
Oxytelus nitidulus Grav	df	1	
Oxytelus complanatus Er	df	2	
Oxytelus tetracarinatus (Block)	df	1	
Platystethus arenarius (Fourcr)	ws	1	
Philonthus spp		1	
Tachinus spp		2	
Aleocharinae genus and species indeterminate		5	
Cryptophagidae			
Cryptophagus spp		1	
Lathrididae			
Corticaria sp		1	
Scarabaeidae			
Geotrupes spp	df	4	
Aphodius sphacelatus or *prodromus*	df	17	
Chrysomelidae			
Phaedon sp		1	
Phyllotreta spp		8	
Chaetocnema concinna (Marsh)		2	
Psylliodes spp		3	
Curculionidae			
Sitona flavescens (Marsh)	g	1	*Trifolium* species (Clover)
Notaris acridulus (L)	ws	1	Mainly on *Glyceria maxima* (Hartm) Holmb (reed sweet-grass)
HYMENOPTERA			
Formicoidea Family Genus and species indeterminate		1	
DIPTERA			
Cyclorrhapha Family Genus and species indeterminate		2	

Ecological groupings

a aquatic species
aff aquatic species normally associated with fast flowing water
ws waterside species either from muddy banksides or from waterside vegetation
m species normally associated with moorland
df species associated with dung and foul matter
g species associated with grassland and pasture
l species either associated with trees or with woodland in general

SAMPLE SATISTICS AND THE RELATIVE PROPORTIONS OF THE ECOLOGICAL GROUPS OF INSECTS RECOVERED FROM *850/52*

Total number of individuals	**69**
Total number of taxa	**27**
% a	0
% aff	0
% ws	4.3
% g	1.5
% df	25.7
% l	0

Ecological groupings
a aquatic species
aff aquatic species normally associated with fast-flowing water
ws waterside species either from muddy banksides or from waterside vegetation
m species normally associated with moorland
df species associated with dung and foul matter
g species associated with grassland and pasture
l species either associated with trees or with woodland in general

APPENDIX 15: ARCHAEOMAGNETIC DATING REPORT

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November 2005

SUMMARY

Two hearths from the Grand Arcade, Wigan (SD 584 055) were sampled for archaeomagnetic dating. Eight samples of burnt shale, clay and sandstone were collected from the walls and the floor of hypocaust hearth ***876***. Six of these samples provided useful archaeomagnetic directions. The mean direction (variation corrected) is declination = 354.9^{o}, inclination = 65.2^{o} (α_{95} = 3.5^{o}, N=6, K = 370). This produces a direction corrected to Meriden (and corrected for thermoremanent magnetic distortion) of declination = 355.2^{o}, inclination = 65.5^{o} (α_{95} = 3.5^{o}). This mean direction and its confidence interval, when compared to the UK master curve of Clark *et al*. (1988), indicates the most-likely last heating date to be about AD 140 (95% confidence date AD 80–180). However, the confidence interval on the mean direction also indicates a second possible 95% confidence dating interval of 80-20 BC.

Eleven samples of burnt shale and sandstones were collected from a 1.3 m long section of a wall with flue ***201***. Five of these samples from the northern part of the feature showed partial thermoremanent magnetisations indicating two successive heating events with samples in different positions. In spite of extensive thermal demagnetisation of specimens, these five samples could not contribute to an archaeomagnetic date. The remaining six samples from the southern part of the feature (three shale and three sandstone samples) display simpler magnetic behaviour, but show lithology-specific divergence in the isolated archaeomagnetic inclinations. The mean direction, corrected to Meriden (and corrected for thermoremanent magnetic distortion) has declination = 343.5^{o}, inclination = 66.3^{o}. The large 95% confidence cone of 7.1^{o} is the result of the strong lithology-dependent inclination divergence. The comparison to the UK master curve of Clark *et al* (1988) suggests two possible imprecise dates for the last heating of hearth ***201***, of either 100 BC to AD 200 or AD 1800 to the present.

1. SAMPLE COLLECTION AND PREPARATION

Hearth ***876*** and flue ***201*** were sampled on 18th May 2005 for the purpose of archaeomagnetic dating, from the Grand Arcade, Wigan (NGR SD 584 055, Latitude 53.545°, Longitude -2.629°). Eight (***876***) and eleven (***201***) oriented samples were collected, of burnt shale, sandstone and clay.

Hypocaust hearth ***876*** was hewn into the bedrock and was approximately 0.5 x 0.6m in dimensions, with the heating chamber, oriented roughly north/south (Fig A15.1). The samples were collected from the nearly vertical northern face (samples GAW3, 6, 7) and from the two sides of its inner channel (samples GAW1, GAW2, GAW4, GAW5, GAW8). All of them were heated shales except for sample GAW8, a heated sandstone. The samples were reddened throughout.

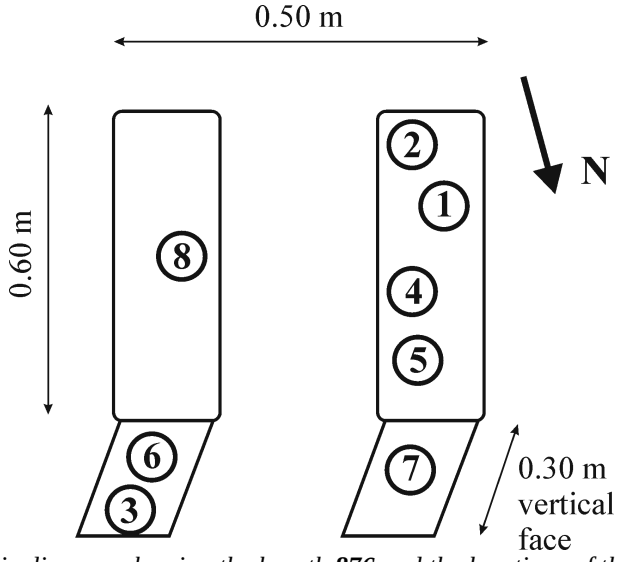


*Fig A15.1: Schematic diagram showing the hearth **876** and the locations of the samples, GAW1 to GAW8, labelled as 1 to 8*

Hearth ***201*** represented a 1.3m long section of a wall, oriented roughly north/south, and built from reddened sandstones (the southernmost one third of the hearth) and shales (Fig A2). Samples GA7, GA8 and GA10 came from red coarse-grained sandstones. The rest of the samples, GA1 to GA6, GA9 and GA11, were from heated shale. Sample GA11 was collected from below samples GA4 and GA5.

All samples were oriented using a flat plaster surface moulded onto the upper part of the hearth material. Onto this plaster surface, a reference direction was determined with respect to magnetic north (using a magnetic compass). The dip direction of this plaster surface was determined to an accuracy of 1^0.

In the laboratory, sodium silicate solution was applied to the sides of the monoliths in order to consolidate them for sub-sampling. Specimens cut from each sample were divided into a 'layer A', close to the former firing surface, and a 'layer B', further inside the wall and away from the fired surface. This is reflected in the numbers assigned to the cut specimens. Nine to fifteen 22 x 22 x 22 mm cubic specimens were cut from each sample in the laboratory using a diamond saw. Between four and six of the best preserved and intact specimens from each sample were used in the laboratory analysis.

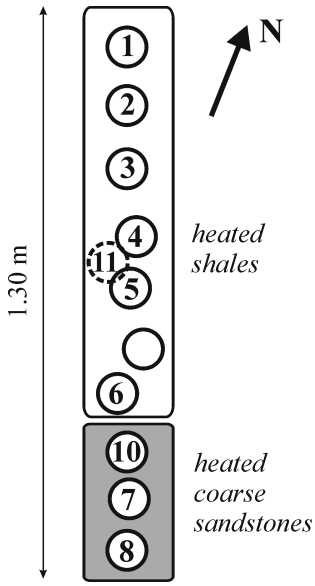


Fig A15.2: Schematic diagram showing the hearth 201 and the locations of the samples, GA1 to GA13, labeled as 1 to 13 on the diagram.

2. ARCHAEOMAGNETIC PROCEDURES AND RESULTS FOR HEARTH *876*

The direction and strength of natural magnetization of the specimens were measured at the CEMP, Lancaster University, using a Minispin spinner magnetometer. The low-field magnetic susceptibility (χ_{LF}), was measured on a Bartington MS2 susceptibility meter. Further details about the methodology, and background can be found in Linford (2004).

Table 34 lists the sample-mean values of the Natural Remanent Magnetisation (NRM), the χ_{LF}, and the Koenigsberger factor (Q_{NRM}). The Koenigsberger factor is the ratio between the NRM and the induced magnetisation in an 0.05mT field (*ie* approximately earth's magnetic field intensity). Values larger than one indicate the net *in-situ* magnetisation is dominated by a permanent remanence. This is normally taken to mean a thermoremanence induced by heating. All samples possess Q_{NRM} larger than one and have been significantly heated in the past.

Sample	N_s	NRM intensity, (mA/m)	χ_{LF}, (x10^{-6} SI)	Q_{NRM}
Shales:				
GAW1	6	19	56	8.1
GAW2	6	107	631	3.9
GAW3	6	211	2801	2.2
GAW4	6	186	733	6.2
GAW5	6	846	1436	10.6
GAW6	6	50	1032	1.7
GAW7	6	80	677	3.0
Sandstones:				
GAW8	7	298	916	4.9

*Table 34: Average volume specific magnetic parameters for hearth **876**, Grand Arcade. N_s = number of specimens used in determining the mean*

The specimen NRM directions have generally uniform inclinations of about 66° but a wider spread of declinations between 330° and 20° (Fig A15.3). The specimen directions from sample GAW8 (the sandstone samples) are clearly anomalous, whilst the specimen directions from sample GAW5 show considerable scatter.

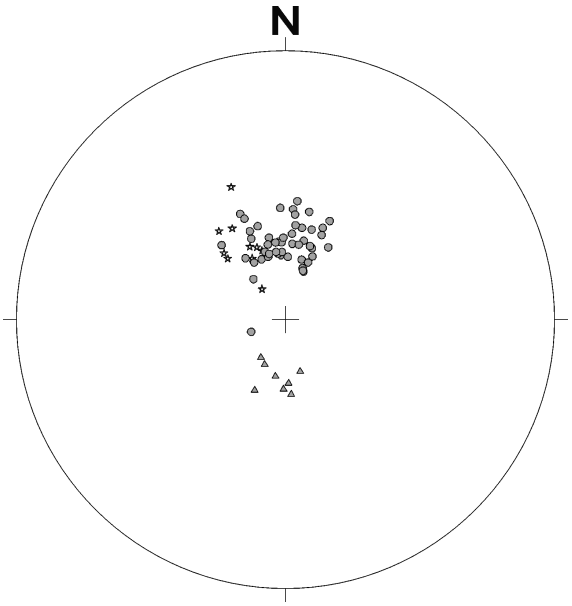


*Fig A15.3: Stereoplot of the specimens' NRM directions from hearth **987**. Circles – specimens from samples GAW1 to GAW4, GAW6 and GAW7. Stars – specimens from sample GAW5, triangles – specimens from sample GAW8.*

One initial specimen per sample was progressively demagnetised with alternating magnetic fields (AF) in six to eleven steps up to 50mT, using a Molspin AF demagnetizer. The NRM of most specimens contained only very minor overprints, which were removed up to demagnetisation fields of 5-10mT (Fig A15.4). These overprints are probably field and laboratory viscous magnetisations.

Demagnetisation in fields higher than 10mT generally revealed a single stable low-medium to medium coercivity magnetisation component. The Characteristic Remanent Magnetization (ChRM) is evident by a straight line on the Zijderveld diagram (Fig A15.4).

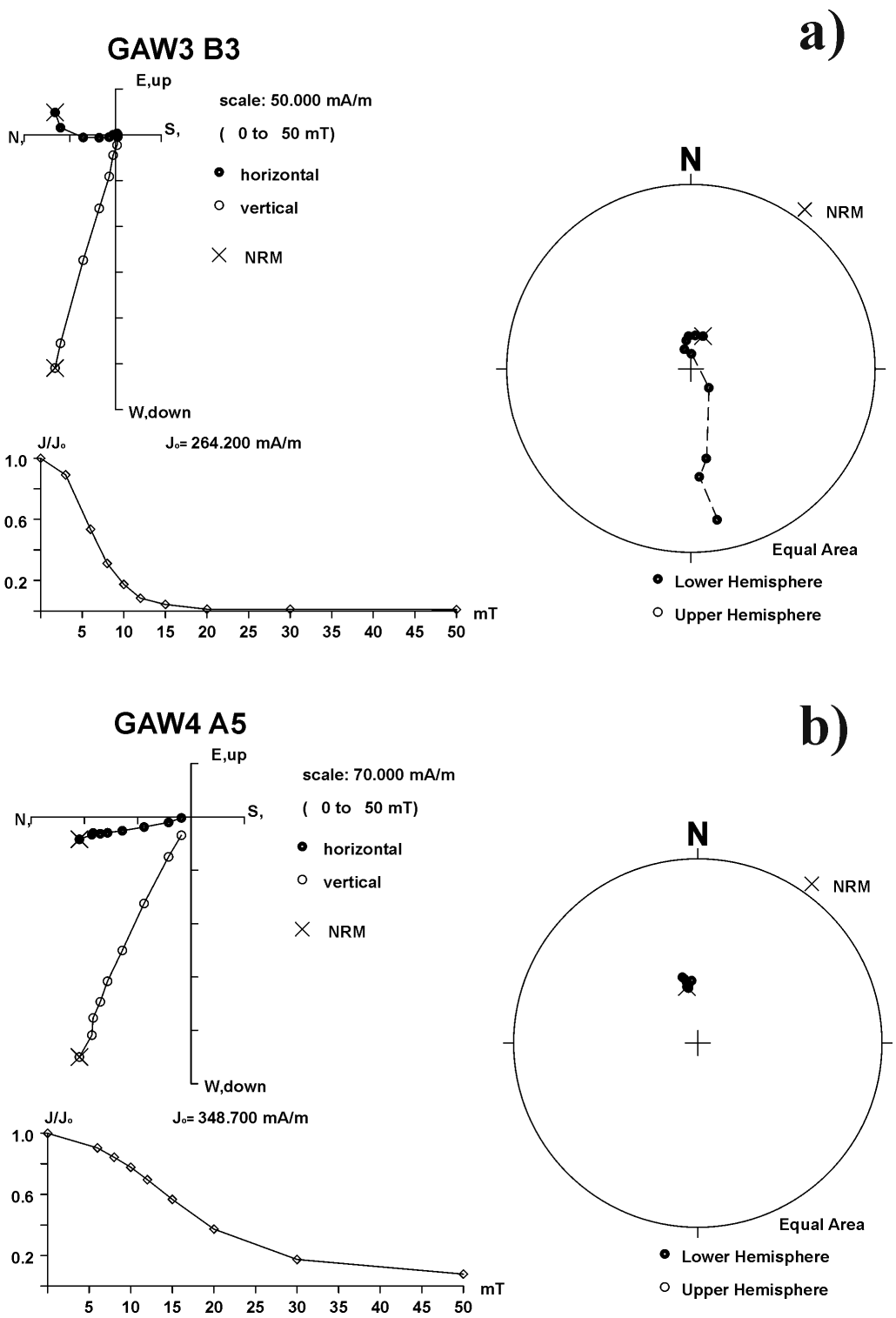


*Fig A15.4: Typical AF-demagnetisation characteristics of specimens from hearth **876**; (a) GAW3 B3 and (b) GAW4 A5.*

The ChRM directions of most specimens were stable, with median destruction fields (MDF) of the NRM between 7mT and 17mT (Fig A4). Between 2% and 10% of the NRM was left after demagnetisation at 50mT, reflecting the secondary contribution (if any) of antiferromagnetic minerals such as haematite. Magnetite appears to be the dominant carrier of the natural remanence.

Forty-one more specimens in total from samples GAW1 to GAW8 were AF demagnetised using four magnetic field steps of 7-12mT or 8-15 mT, depending on an assessment of their MDF. The ChRM direction of each specimen was calculated using principal component analysis based on the least-

squares fitting technique of Kirschvink (1980). The AF demagnetisation did not improve the anomalous directions from the GAW8 specimens, nor did it improve the large scatter and the anomalous western directions from the GAW5 specimens. As a result, samples GAW5 and GAW8 were rejected from the archaeomagnetic dating. A stereoplot of all ChRM directions extracted, from the hearth are shown in Fig A15.5.

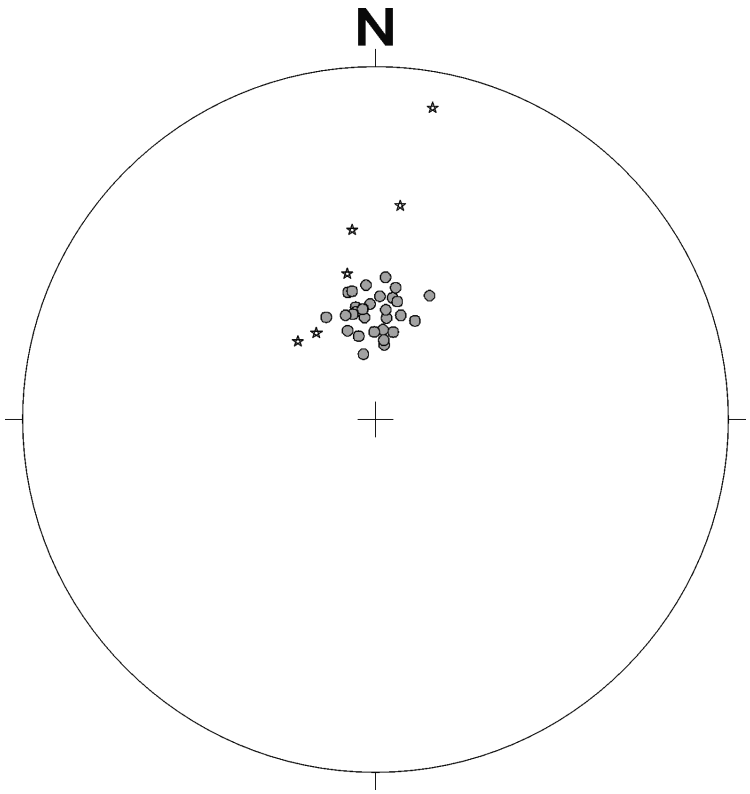


Fig A15.5: Stereoplot of all specimen ChRM directions from hearth 876, samples GAW1 to GAW4, GAW6, GAW7 (36 accepted specimens in total). The stars represent specimen ChRM directions which were not used in calculating the mean archaeomagnetic direction for the hearth.

The extracted ChRM components produced relatively tightly clustered intra-sample directions, with little variation in the declination or inclination (Table 35).

Sample	N_s	D	I	α_{95}
GAW1	4	*13.7*	*63.3*	*7.0*
GAW2	4	*354.6*	*65.0*	*8.3*
GAW3	5	*0.4*	*69.1*	*7.1*
GAW4	6	*355.9*	*65.6*	*3.0*
GAW5	**6**	***327.8***	***68.0***	***4.6***
GAW6	5	*6.4*	*63.4*	*4.8*
GAW7	6	*348.4*	*63.9*	*4.6*

Table 35: Mean directions and intra-sample scatter, α_{95}, for samples GAW1 to GAW7, hearth #876. GAW5 was rejected from the analysis. Ns= number of specimens

Using the intra-sample directional scatter α_{95} as a weighting factor, the overall sample-based mean archaeomagnetic direction is: D = 359.1°, I = 65.2° (α_{95} = 3.5°, K = 370, N = 6). This mean archaeomagnetic directions was corrected for the magnetic declination of the site, which is 4.2° W for Wigan for the year 2005 (NASA 2005). This produced a variation corrected archaeomagnetic direction for hearth ***876*** of:

D = 354.9°, I = 65.2°, α_{95} = 3.5°.

3. ARCHAEOMAGNETIC PROCEDURES AND RESULTS FOR HEARTH *201*

The shales from hearth ***201*** generally have much larger values of NRM, χ_{LF} and Q_{NRM} than hearth ***876***, with typical NRM intensity of ~1.6 to 4 A/m, χ_{LF} ~ 4.4 to 7.8 x 10^{-3} SI and Q_{NRM} ~ 9 to 14 (Table 36). This implies that feature ***201*** has been much more heated in the past than the samples from hearth ***876***. Overall, the sandstones from both hearths are considerably less magnetic (lower NRM intensity and χ_{LF}) than the heated shales, but the values of the Q_{NRM} are sufficiently high, indicating significant heating in the past.

Sample	N_s	NRM intensity, (mA/m)	χ_{LF}, (x10^{-6} SI)	Q_{NRM}
Shales:				
GA1	10	3687	7797	11.8
GA2	8	3783	7561	12.6
GA3	13	1641	4436	9.2
GA4	15	1632	4582	8.8
GA5	4	1807	5249	8.7
GA6	4	2382	5768	10.3
GA9	4	3959	6969	14.3
GA11	10	3367	6447	13.0
Sandstones:				
GA7	4	198	694	6.8
GA8	4	17	43	9.8
GA10	4	13	33	10.0

*Table 36: Average volume specific magnetic parameters for hearth **201***

The specimen NRM directions of the samples from hearth ***201*** were more complicated than those from ***876***. Whilst the specimens from the reddened sandstones (GA7, GA8, GA10) form a tight directional cluster (Fig A15.6a), the specimen directions from the shale samples formed a wide belt of anomalously westerly to easterly shallow NRM directions as well as tendency to more steep westerly directions (Fig A15.6b).

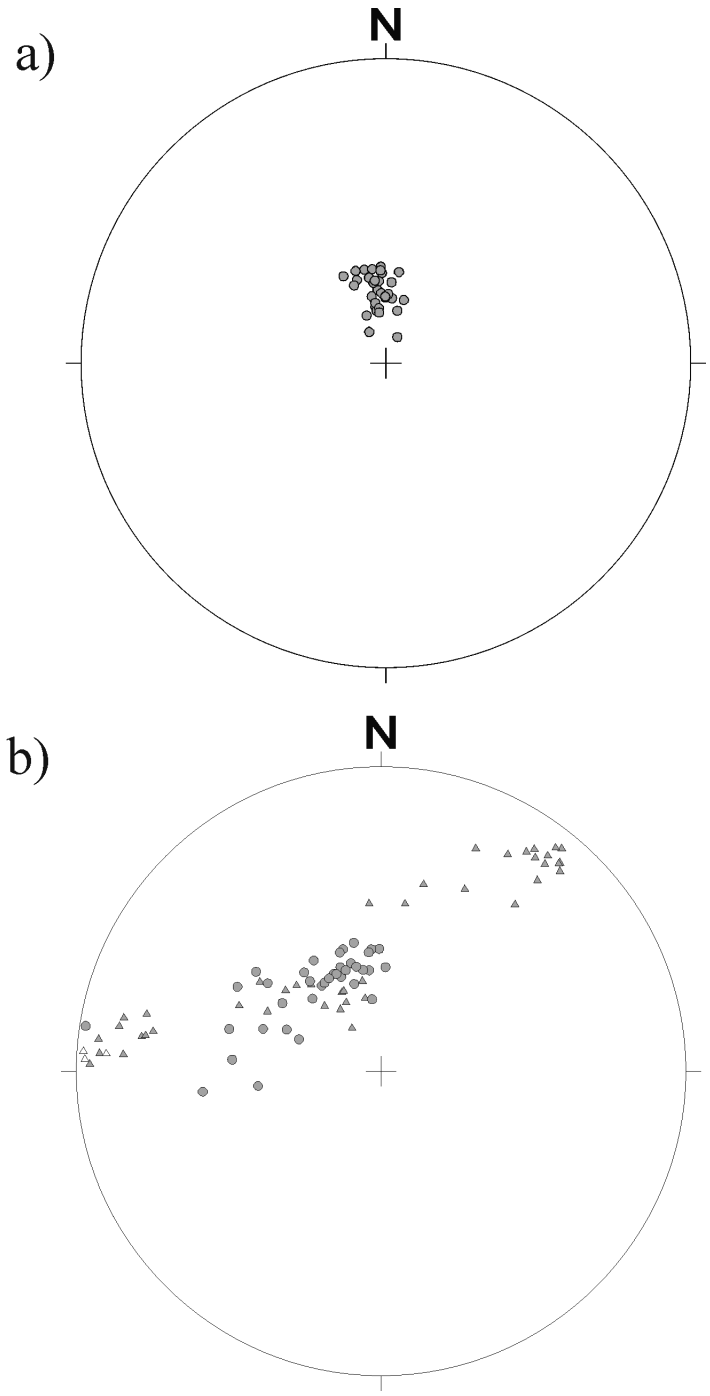


Fig A15.6: Stereoplot of the specimens' NRM directions from: a) the sandstone samples GA7, GA8, and GA10. b) The shales samples – GA1 to GA4 (triangles) and GA5, GA6, GA9, and GA11 (circles)

It was suspected that the NRM of the specimens shown in Figure A6b may contain more than one thermoremanent component. One initial specimen from each sample was thermally demagnetised in 25^{o}C steps up to 575^{o}C (Figs A15.7 and A15.8). The NRM of the specimens from the northernmost shale samples, GA1, GA2, GA3, GA4, and GA11, possesses two components of TRM. Above ~350-425^{o}C there is a strong component, intersecting the origin of the Zijderveld plot, comprising around 50% of the NRM signal (Fig A15.7a). We here term this the B-component of the specimens. At lower demagnetisation temperatures, there is a second component (the A-component) with a different direction. The changing temperature of the switch-over from the A to the B component directions indicates a heating temperature gradient within the hearth. The northernmost samples, GA1 and GA2, posses an A-component with an apparent maximum heating up to 325-350^{o}C (Fig A15.7a); GA3 and GA4 have an A-component present up to 350-375^{o}C, whilst GA11, the most southerly of this northern group of shales, has an A-component up to 425^{o}C (Fig A15.7b). This indicates heating in the past to

two temperatures, an initial (earlier) high temperature >500°C?, producing the B-component, and a later lower temperature heating to about 350°C producing the A component (Table 36). The difference in direction of the A and B components indicates the hearth samples had been re-positioned prior to the later heating episode (Tables 37 and 38).

The high-temperature B-component directions are anomalous in direction and inconsistent with each other. This indicates samples GA1 to GA4 and GA11 have not remained in the same position since this initial high temperature heating. In addition, the B-component directions from sample pairs GA1 and GA2, and GA3 and GA4, are very close to each other, indicating that samples GA1 and GA2, and GA3 and GA4, probably came from two originally co-joined shale blocks (*ie* not four). The inclinations of the B-components are also too shallow, since in Britain for the last 3000 years inclination has always been between 55° and 75° (Clarke *et al*, 1988). Hence these samples were heated initially to high temperatures (>500°C) in a position roughly perpendicular to their present one - *ie* on their sides. This indicates they were reused from a previous hearth (or other heated feature) with a different functional arrangement of hearth stones. This perhaps indicates some difference in cultural behaviour?

The A components below about 325-425°C are not so well defined magnetically as the B-components. We generally observe curved demagnetisation trajectories, in which it has not been possible to extract precise or apparently useful magnetisation data, either because of contamination from after-sampling (laboratory or other) viscous remanence, or a residual part of the B-component being present at lower demagnetisation temperatures (Table 39). Hence, the A-components are not good enough for archaeomagnetic dating and the northern-group of samples (GA1 to GA4 and GA11) were excluded from the dating analysis.

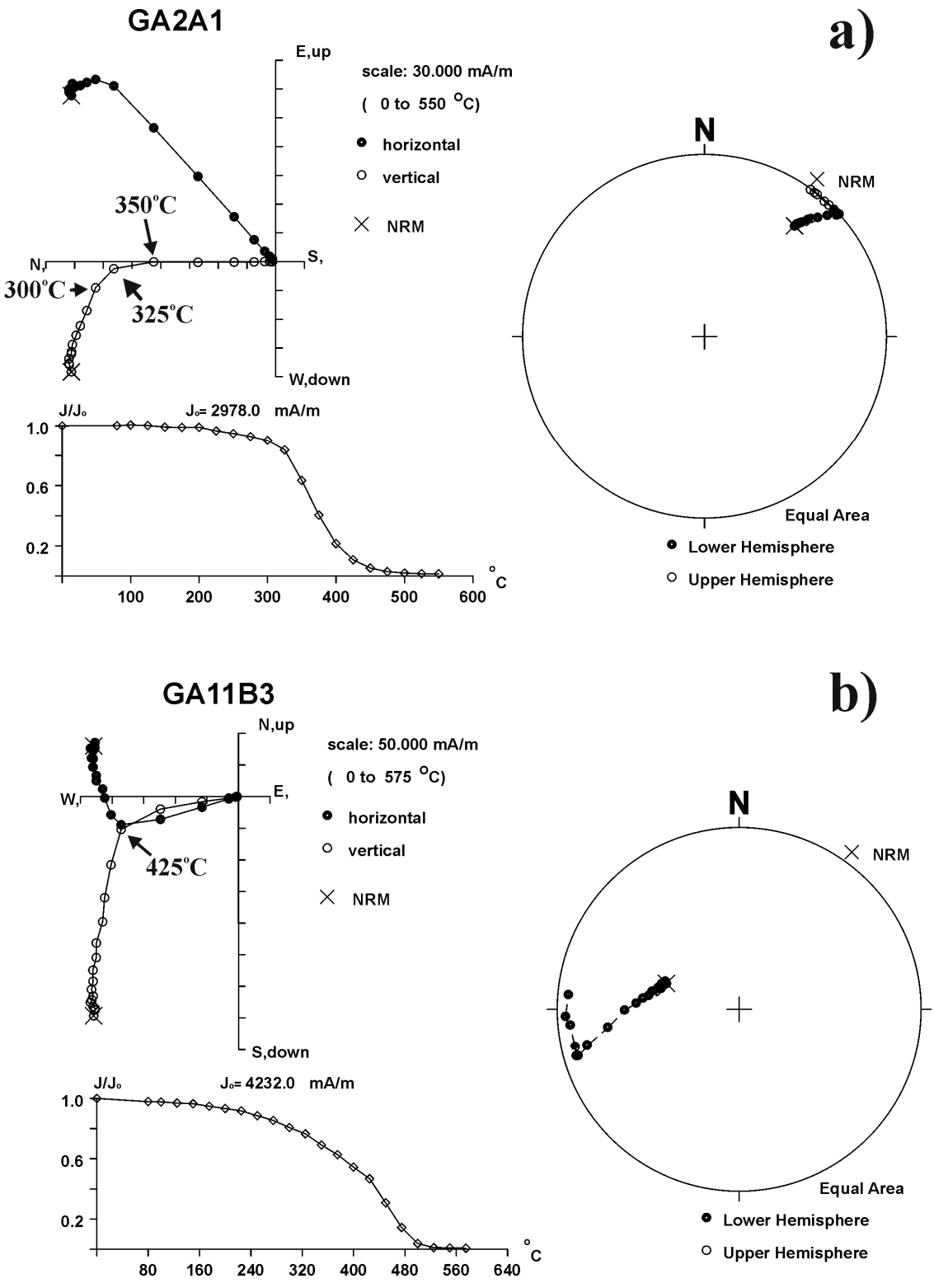


*Fig A15.7. Typical thermal demagnetisation characteristics of shale specimens from the north end of hearth **201**; (a) specimen GA3 A1 shows the A component up to 325-350°C and (b) specimen GA11 B3 shows the A component present up to 425°C*

Specimen	Declination (^{o})	Inclination (^{o})	Range (^{o}C)
GA1 B2	45.0	-2.2	400-550^{o}C
GA2 A1	48.4	0.2	350-550^{o}C
GA3 B2	261.2	-24.8	400-550^{o}C
GA4 B2	265.5	-19.8	400-550^{o}C
GA11 B3	253.0	8.5	450-575^{o}C

*Table 37: High-temperature (earlier heating), B-component directions in the northern group of samples, hearth **201**. Range is the demagnetisation temperature range over which the B-component was fitted.*

Specimen	Declination (^{o})	Inclination (^{o})	Range, ^{o}C
GA1 B2	353.1	55.4	150-300^{o}C
GA2 A1	340.1	68.7	125-275^{o}C
GA3 B2	355.4	69.5	100-300^{o}C
GA4 B2	350.7	66.1	100-225^{o}C
GA11 B3	338.3	64.8	275-400^{o}C

*Table 38: Low-temperature(and later) A-component directions in the northern group of samples, hearth **201***

The more southerly group of shales and sandstones displayed only one TRM component of NRM up to the maximum unblocking temperatures (Figs A15.8a, A15,8b), indicating that samples GA5 to GA10 have been heated to at least 500-550^{o}C, with no magnetic evidence of a substantial earlier heating episode. The AF demagnetisation up to 50mT of pilot specimens also revealed only one component after removal of a small viscous overprint at 5mT (Figs A15.8b, A15.9b).

The unblocking temperatures of all shale specimens vary between 450 ^{o}C and 500^{o}C (Figs A15.7, A15.8a). The MDFs vary between 8mT and 12mT, and less than 5-10% of their NRM remains after 50mT AF demagnetisation. This indicates that the specimen magnetic mineralogy is dominated by ferrimagnetic minerals (magnetite, maghemite), with only minor contributions from antiferromagnetic minerals like haematite. The reddened sandstone samples, on the other hand, preserve a portion of their NRM even after heating to 575^{o}C (Fig A15.9a). The MDFs of these are between 30mT and 40mT and around 40% of the NRM remains after 50mT AF demagnetisation (Fig A15.9b), indicating that haematite may contribute more to the remanence.

Apart from the six thermally demagnetised specimens, 18 more specimens from samples GA5 to GA10 were AF demagnetised using four magnetic field steps between 5mT and 50mT, depending on their MDF. A stereoplot of all ChRM directions extracted from the southern group of samples are shown in Figure A15.10.

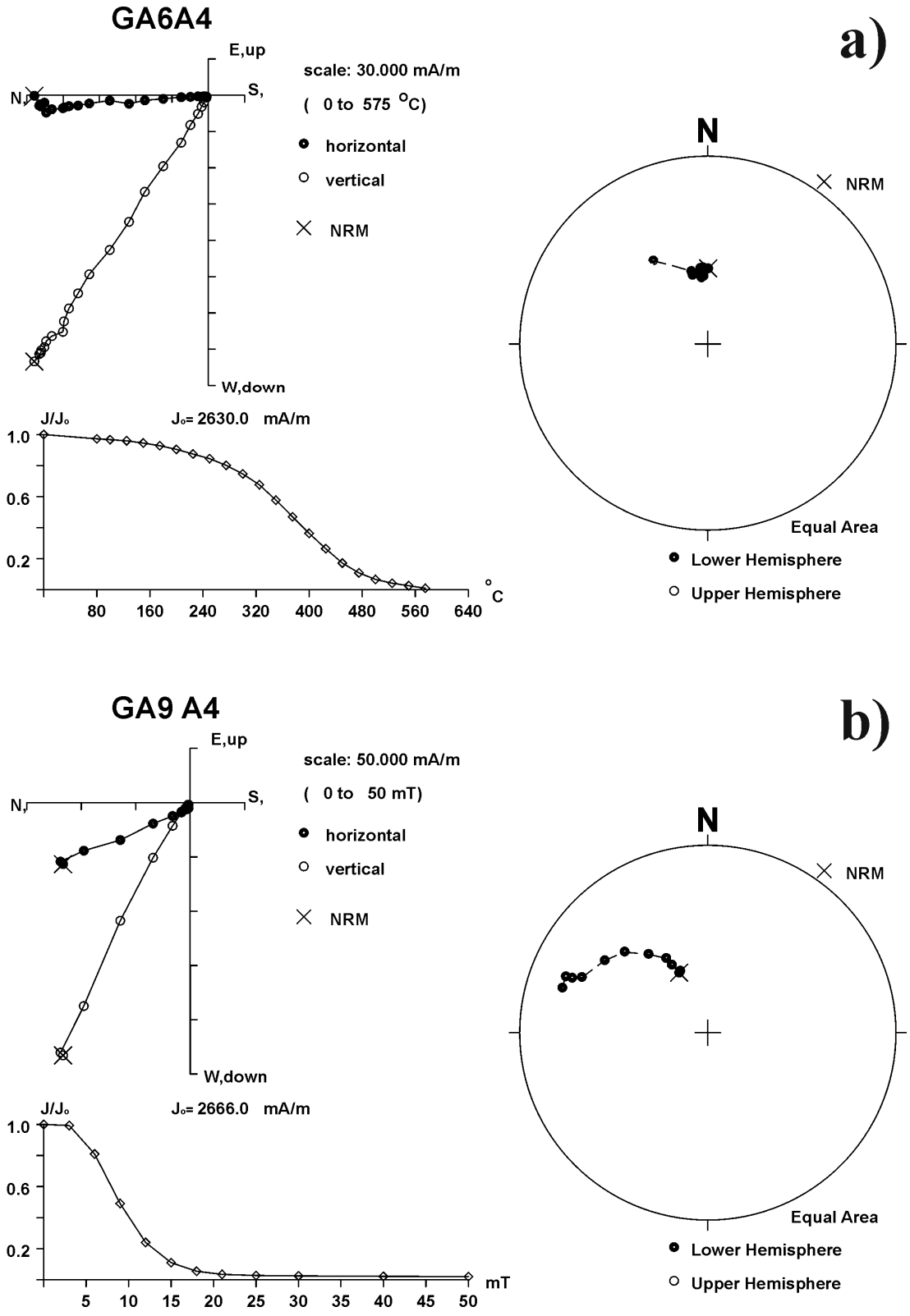


*Fig A15.8. Typical thermal and AF demagnetisation characteristics of shale specimens from the southern end of hearth **201**; (a) Specimen GA6 A4 has been heated to >560°C; (b) Specimen GA9 A4*

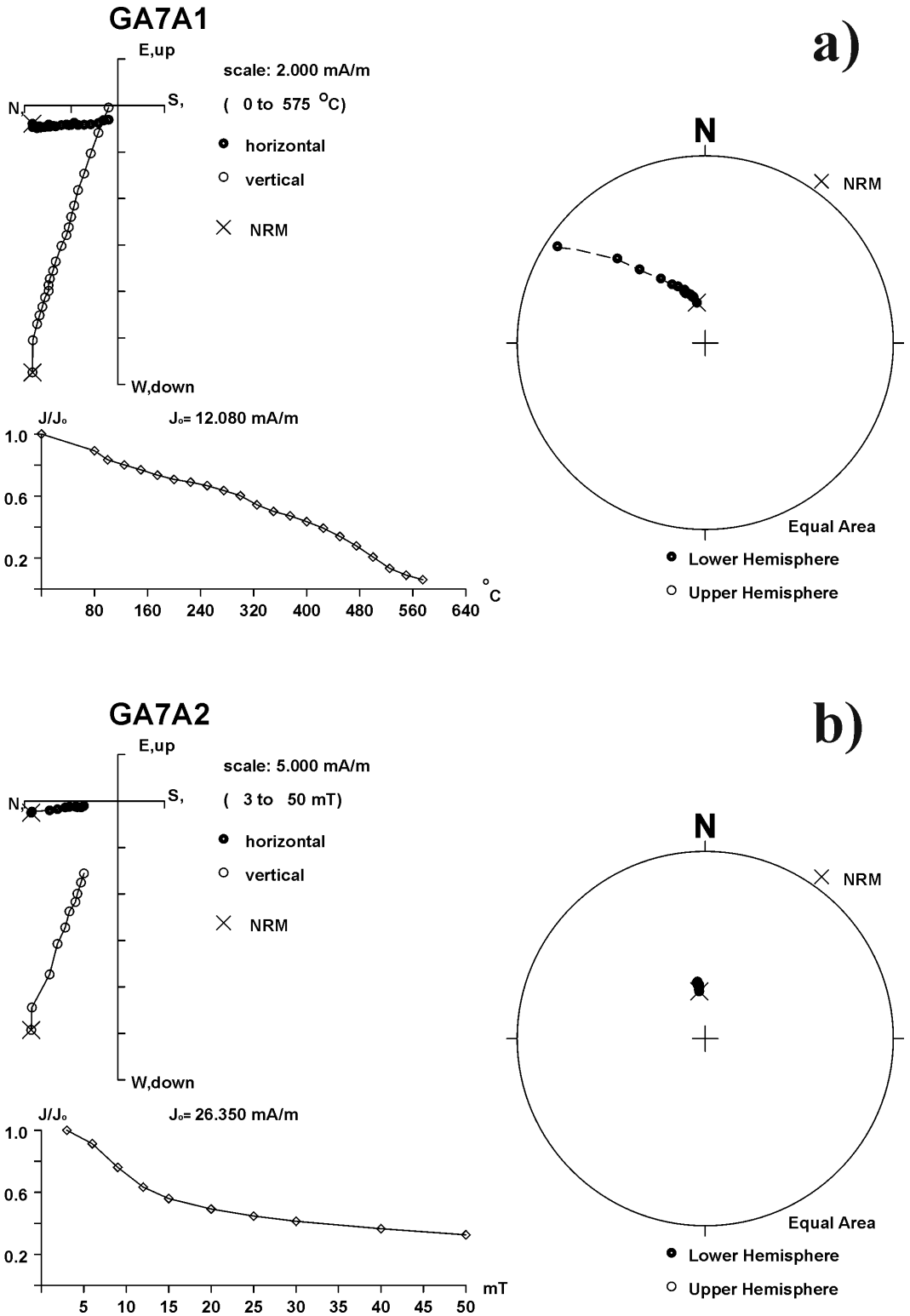


*Fig A15.9: Typical thermal and AF demagnetisation characteristics of sandstone specimens from the south end of hearth **201**; (a) specimen GA7 A1; (b) specimen GA7 A2*

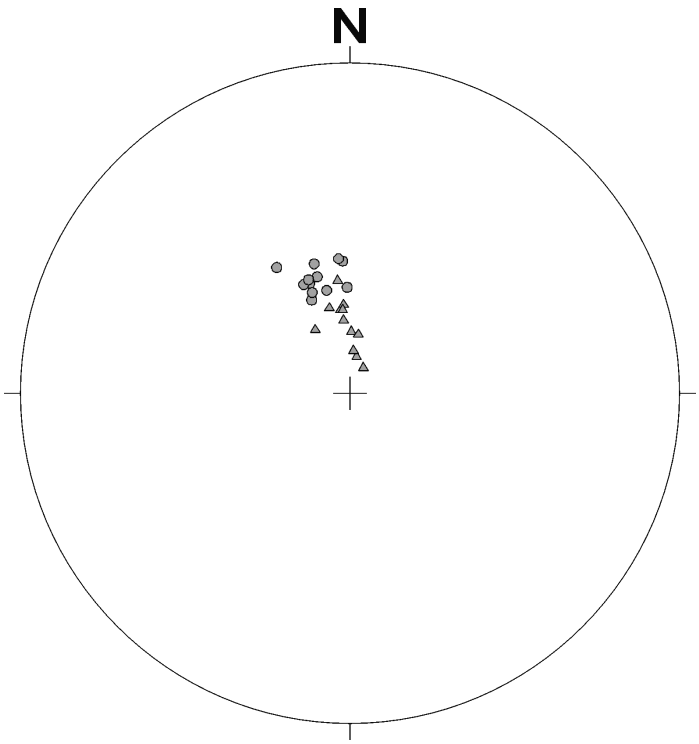


*Fig A15.10: Stereoplot of all specimen ChRM directions from the southern group of hearth **201**, samples GA5 to 10 (24 specimens in total). The circles represent the shale specimens (samples GA5, GA6, GA9), the triangles – the sandstone specimens (samples GA7, GA8, GA10)*

The extracted ChRM components produced relatively tightly clustered intra-sample directions with respect to their declinations, but the inclinations vary considerably. The inclinations from the sandstones are consistently steeper that those from the shales. Such discrepancy could be due to several factors:

- some ~10^{o} movement/tilting of the individual blocks, since their last heating;
- the demagnetisation data suggests that in some specimens there is a residual high stability component, which is not well defined (*ie* Figs A15.9a, A15.8b), but is not consistent with having been produced by heating in the samples present position. This may represent a residual part of the B-component, like that seen in specimens from the northern part of hearth ***201***. This residual part of the B-component appears to be more prevalent in the shales, and hence may contribute to a skewing of directions away from the generally steeper directions shown by the less magnetic sandstone samples.

Sample	**N_s**	**D**	**I**	**α_{95}**
shales				
GA5	4	337.7	59.2	3.3
GA6	4	354.6	60.4	2.6
GA9	4	340.1	61.1	1.2
sandstones				
GA7	4	354.5	67.8	2.3
GA8	4	348.2	73.1	3.9
GA10	4	8.0	78.3	2.5

*Table 39: Hearth **201**, mean directions and intra-sample scatter, α_{95}, for the shale (GA5, GA6, GA9) and sandstone (GA7, GA8, GA10) samples. Ns= number of specimens*

Using the intra-sample directional scatter α_{95} as a weighting factor (Table 39), the overall sample-based mean archaeomagnetic direction is: D = 347.2^{o}, I = 66.0^{o} (α_{95} = 7.1^{o}, K = 91.3, N = 6). The variation corrected archaeomagnetic direction for hearth ***201*** is:

D = 343.0^{o}, I = 66.0^{o}, α_{95} = 7.1^{o}.

4. ARCHAEOMAGNETIC DATING OF THE HEARTHS

The mean directional results from hearths ***876*** and ***201*** were converted via the pole method of Noel and Batt (1990) in order to compare them to the revised British master curve of Clark *et al* (1988). This corrects the direction to Meriden ($\varphi = 52.43^o$ N, $\lambda = 1.62^o$ W).

Converted to Meriden data

D = 355.2°, I = 64.3°, α_{95} = 3.5°. (hearth ***876***)
D = 343.5°, I = 65.1°, α_{95} = 7.1°. (hearth ***201***)

In order to compensate for magnetic shallowing according to the methodology of Clark *et al* (1988), the mean inclination was increased by 1.2°, which is the case for samples from a mix of hearth wall and floor. The resulting final mean archaeomagnetic directions corrected to Meriden are:

D = 355.2°, I = 65.5°, α_{95} = 3.5°. (hearth #876)
D = 343.5°, I = 66.3°, α_{95} = 7.1°. (hearth #201)

When plotted on the UK master curve of Clark *et al* (1988), the mean directions of the hearth ***876*** give a best estimate age of last heating of AD 140, with a 95% confidence interval on this date of AD 80-180 (Fig A15.11).

When plotted on the UK master curve of Clark *et al* (1988) for 1000 BC-AD 600, the mean direction of hearth #201 with its confidence interval gives a very imprecise 95% confidence interval date between 100 BC and AD ~200 (Fig A15.12), which does not significantly help in improving the chronology for this feature. There is also a second possible solution, in the twentieth century centered at ~ AD 1900 according to the directional information (Fig A15.13).

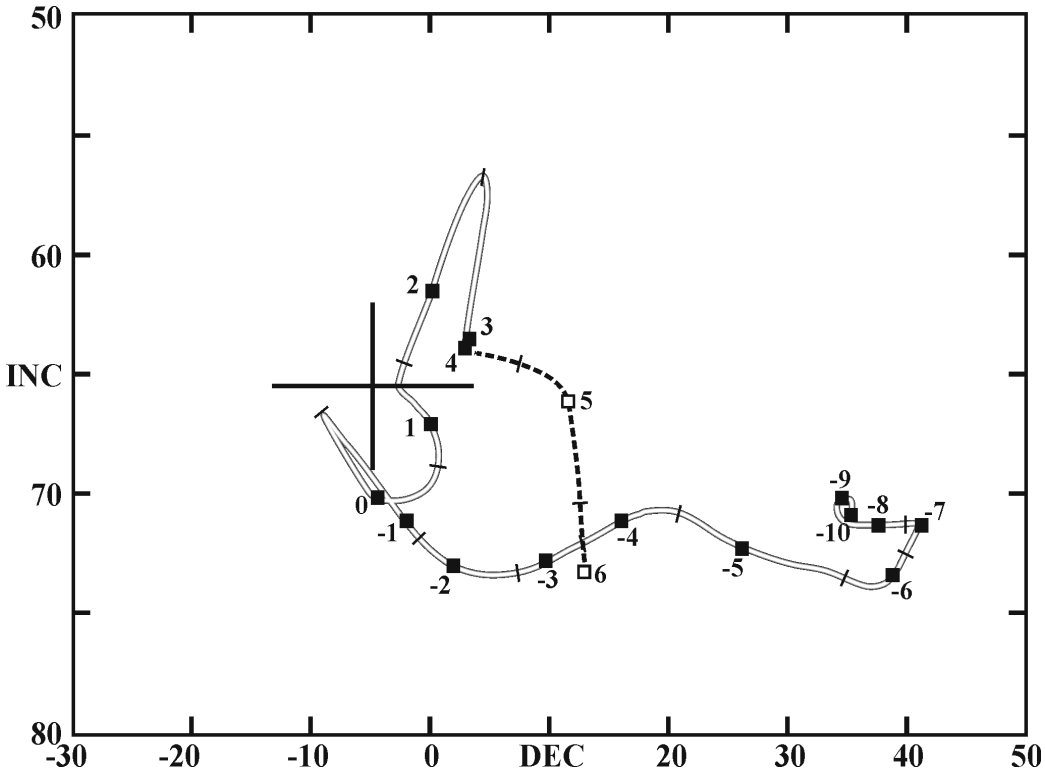


*Fig A15.13: Comparison between the UK master curve for 1000 BC – AD 600 of Clark et al (1988) and the converted to Meriden sample-based mean ChRM direction of hearth **876**, with its error interval (black cross) based on the Fisher 95% confidence cone*

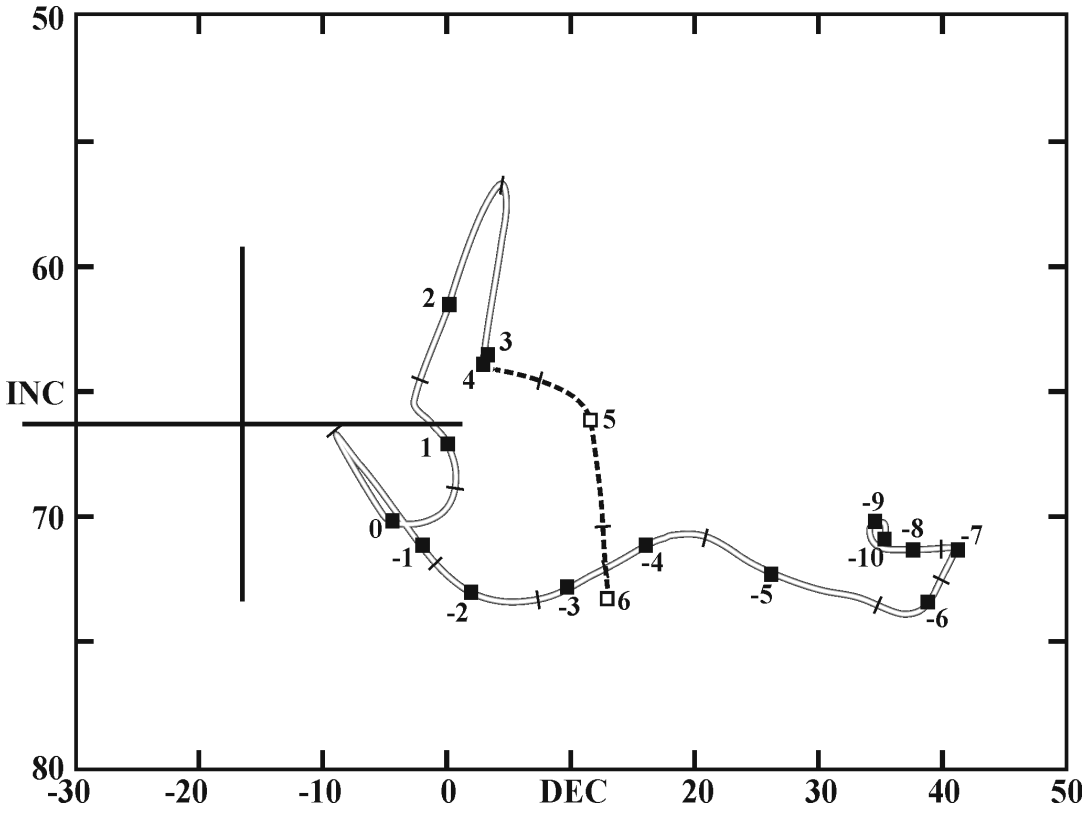


*Fig A15.12: Comparison between the UK master curve for 1000 BC – AD 600 of Clark et al. (1988) and the converted to Meriden sample-based mean ChRM direction of the Grand Arcade, Wigan, hearth **201**, with its error interval based on the Fisher 95% confidence cone*

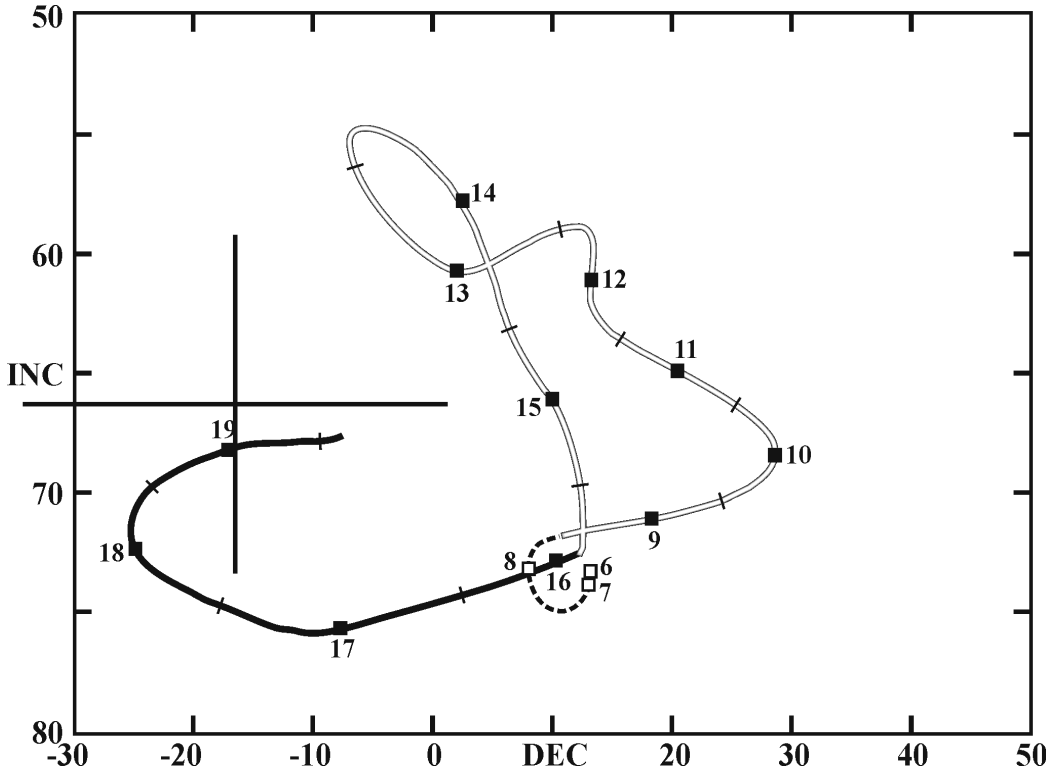


*Fig A15.13: Comparison between the UK master curve for AD 600–1975 of Clark et al (1988) and the converted to Meriden sample-based mean ChRM direction of the Grand Arcade, Wigan, hearth **201** with its error interval based on the Fisher 95% confidence cone*

5. SUMMARY

The archaeomagnetic directional data for hearth ***201*** is too scattered to add to any significant improvement in the dating for this feature. This appears to be both a result of possible structural tilting, and the hearth-builder's reuse of materials from an earlier hearth, which had experienced a more substantial heating episode.

The archaeomagnetic directional data for hearth ***876*** is good and has allowed a clear date to be determined for the last heating of this feature, which is shown below using the English Heritage guidelines on archaeomagnetic dating:

Archaeomagnetic ID:	**GAW**
Feature:	**hypocaust hearth, context 876**
Location:	**Longitude 357.371°E, Latitude 53.545°N**
Number of Samples (taken/used in mean)/specimens:	**(8/6)/30**
AF Demagnetisation Applied:	**7-15mT**
Distortion Correction Applied:	**+1.2°**
Declination (at Meriden):	**355.2°**
Inclination (at Meriden):	**65.5°**
Alpha-95:	**3.5°**
k:	**370**
Date range (63% confidence):	**AD 120 to AD 160**
Date range (95% confidence):	**80 BC to 20 BC, AD 80 to AD 180**
Archaeological date range:	***Roman***

FIGURES

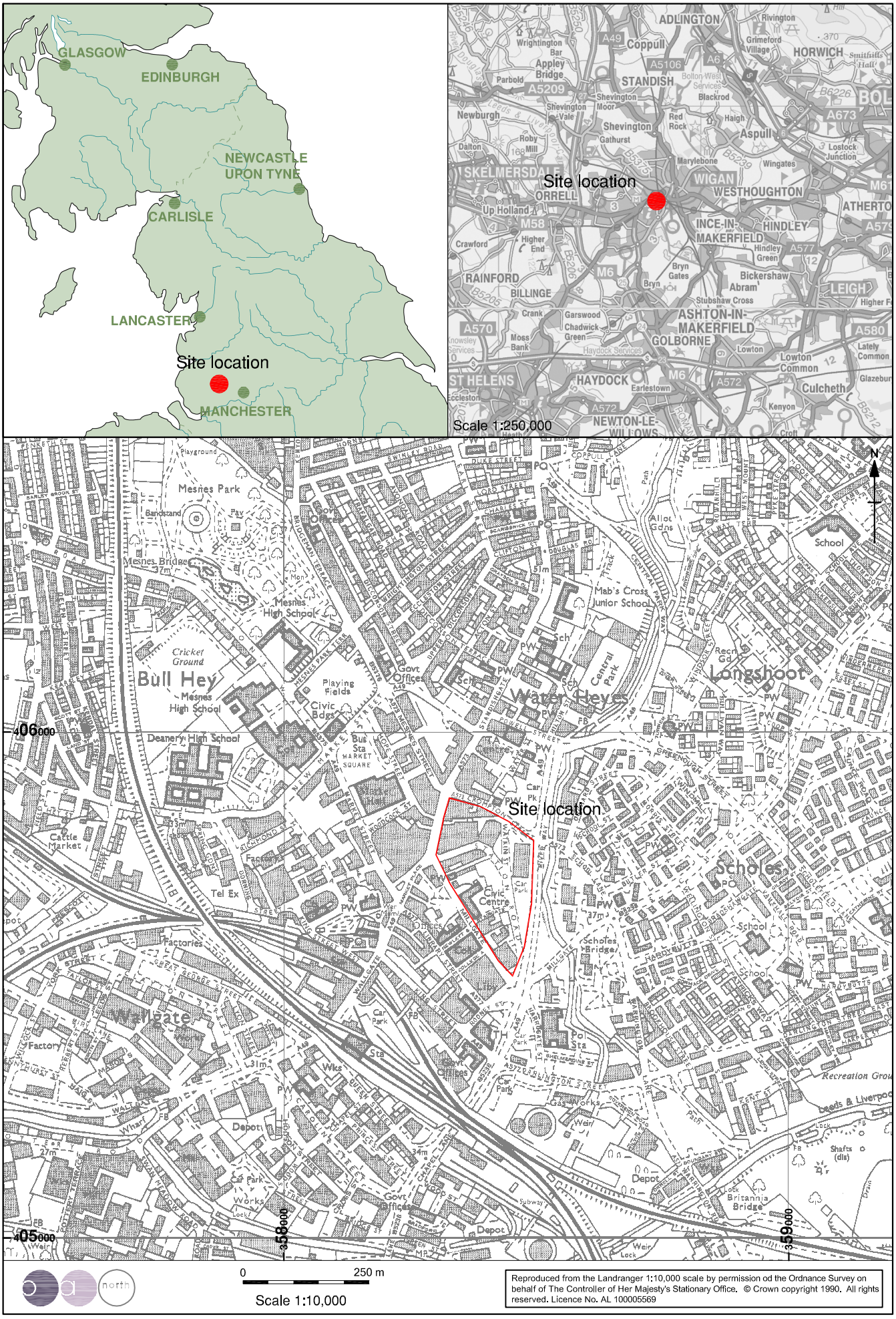


Figure 1: Site Location

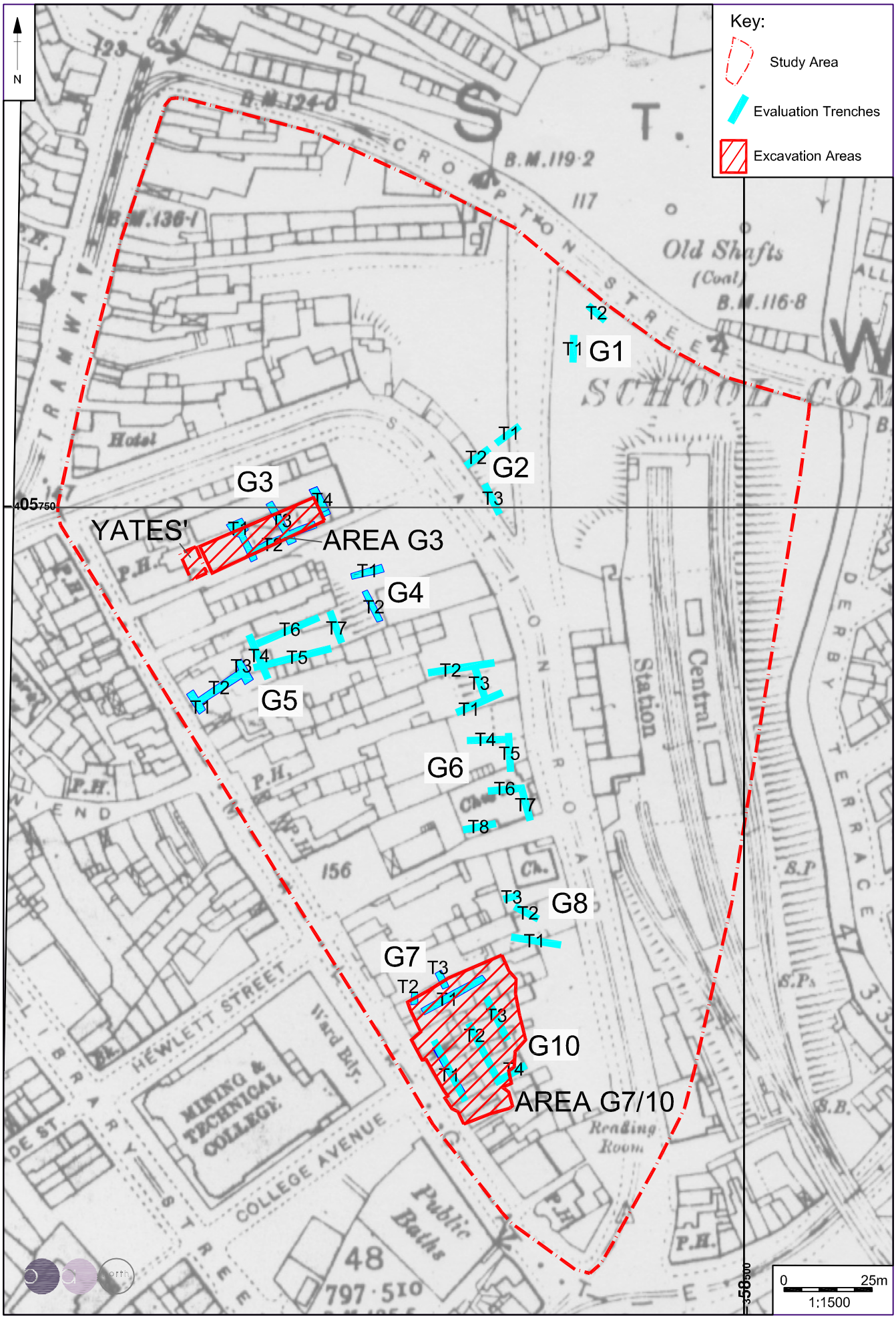
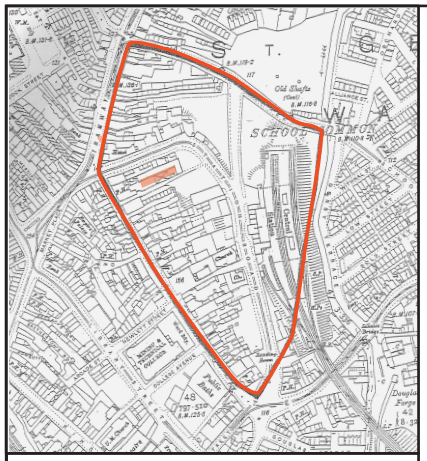


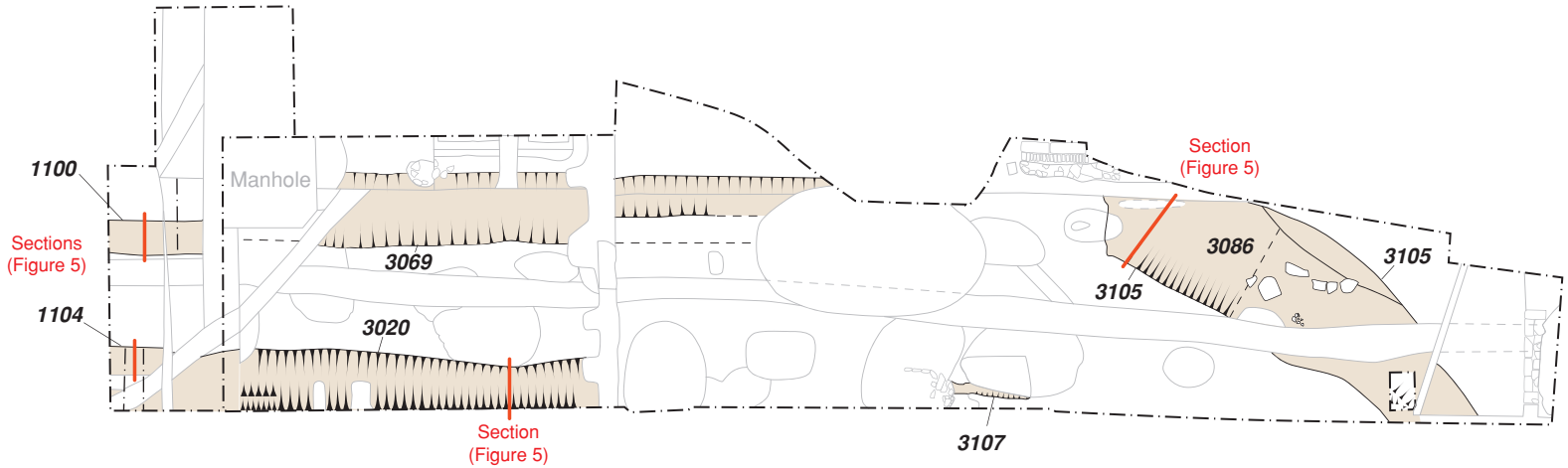
Figure 2: Location of excavated trenches superimposed upon the Ordnance Survey map of 1908

Figure 3: Detail of Area G10, showing distribution of Period 1 features



0 250 m

1:7500

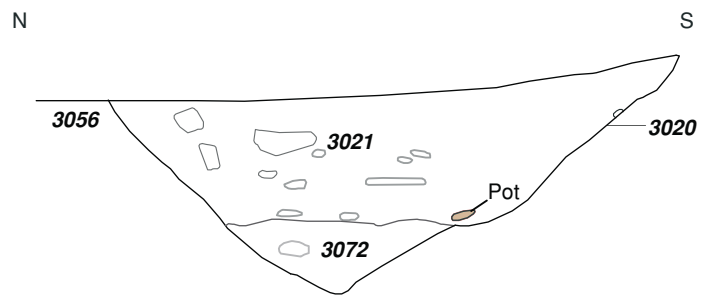


Line of excavation
Uncertain edge
Period 1 feature
Features from other phases

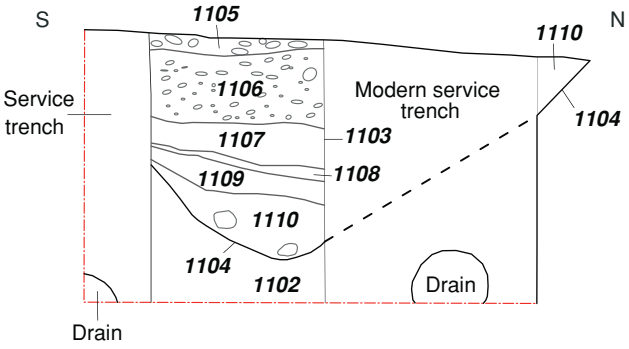
Figure 4: Area G3, showing distribution of Period 1 features

0 10 m

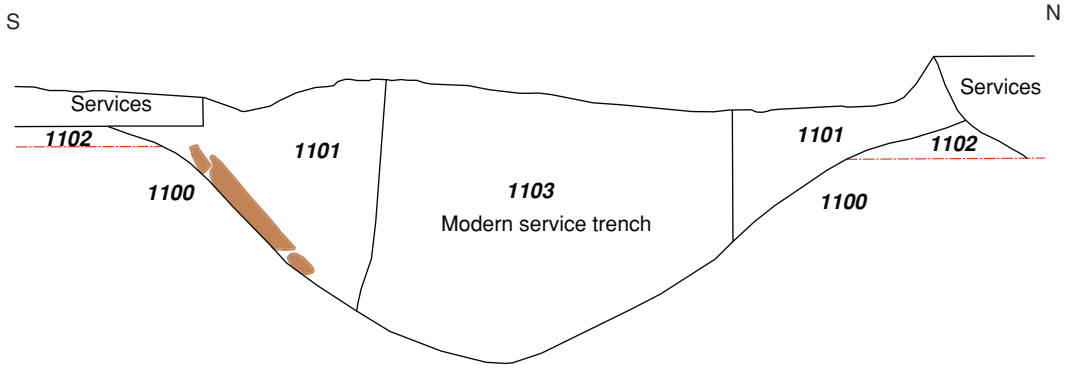
1:200



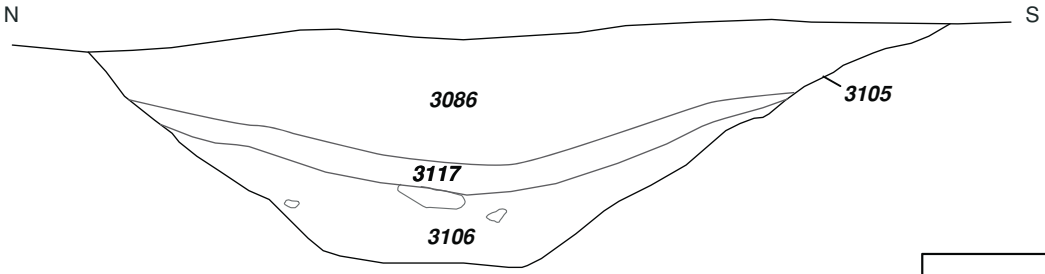
West-facing section of ditch ***3020***



East-facing section of ditch ***1104***



East-facing section of ditch ***1100***



West-facing section of ditch ***3105***

Figure 5: Sections of ditches ***3020***, ***1104***, ***3105***, ***and 1100***

0 1 m

1:20

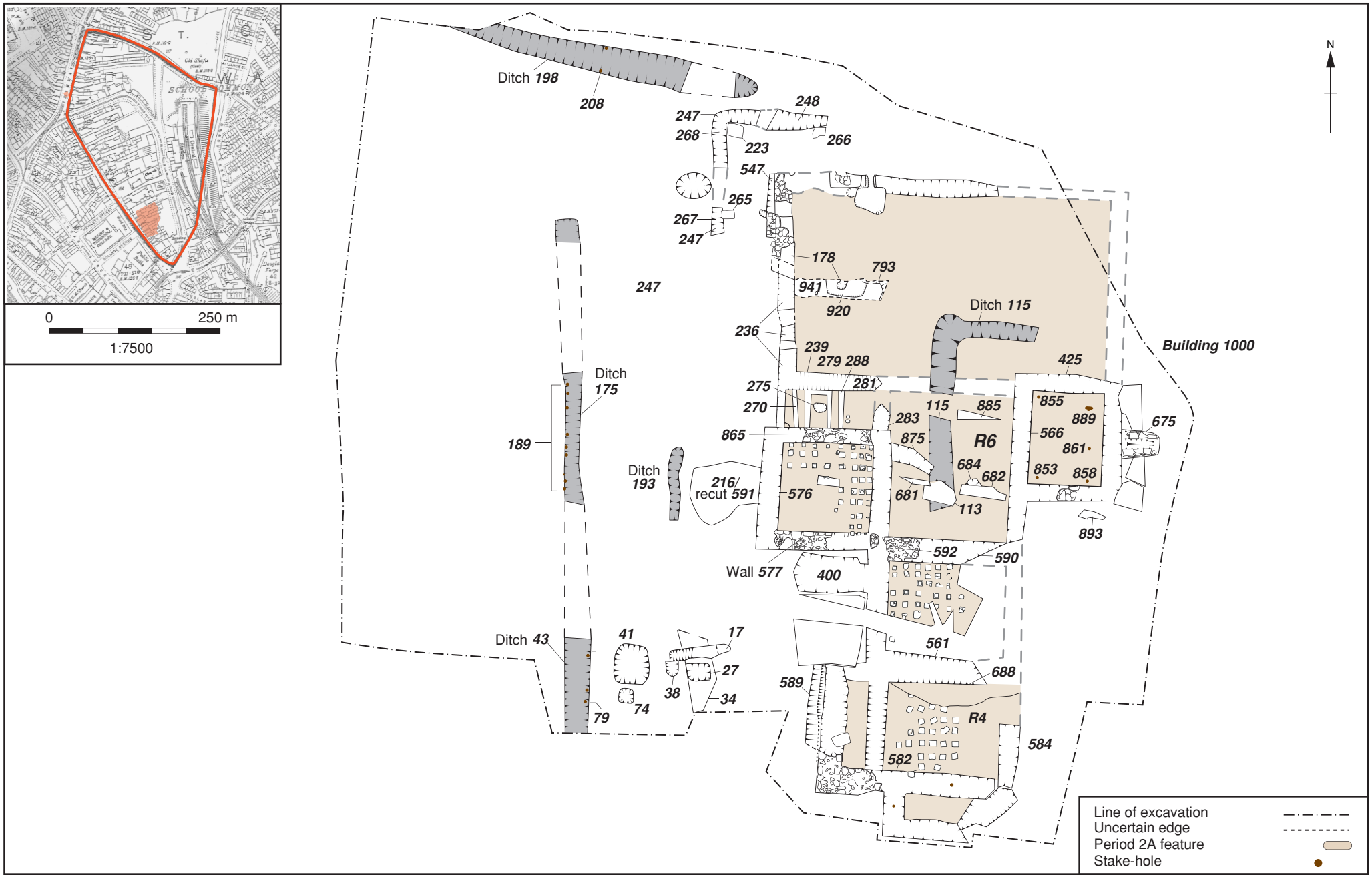


Figure 6: Area G7/G10, showing distribution of Period 2 features

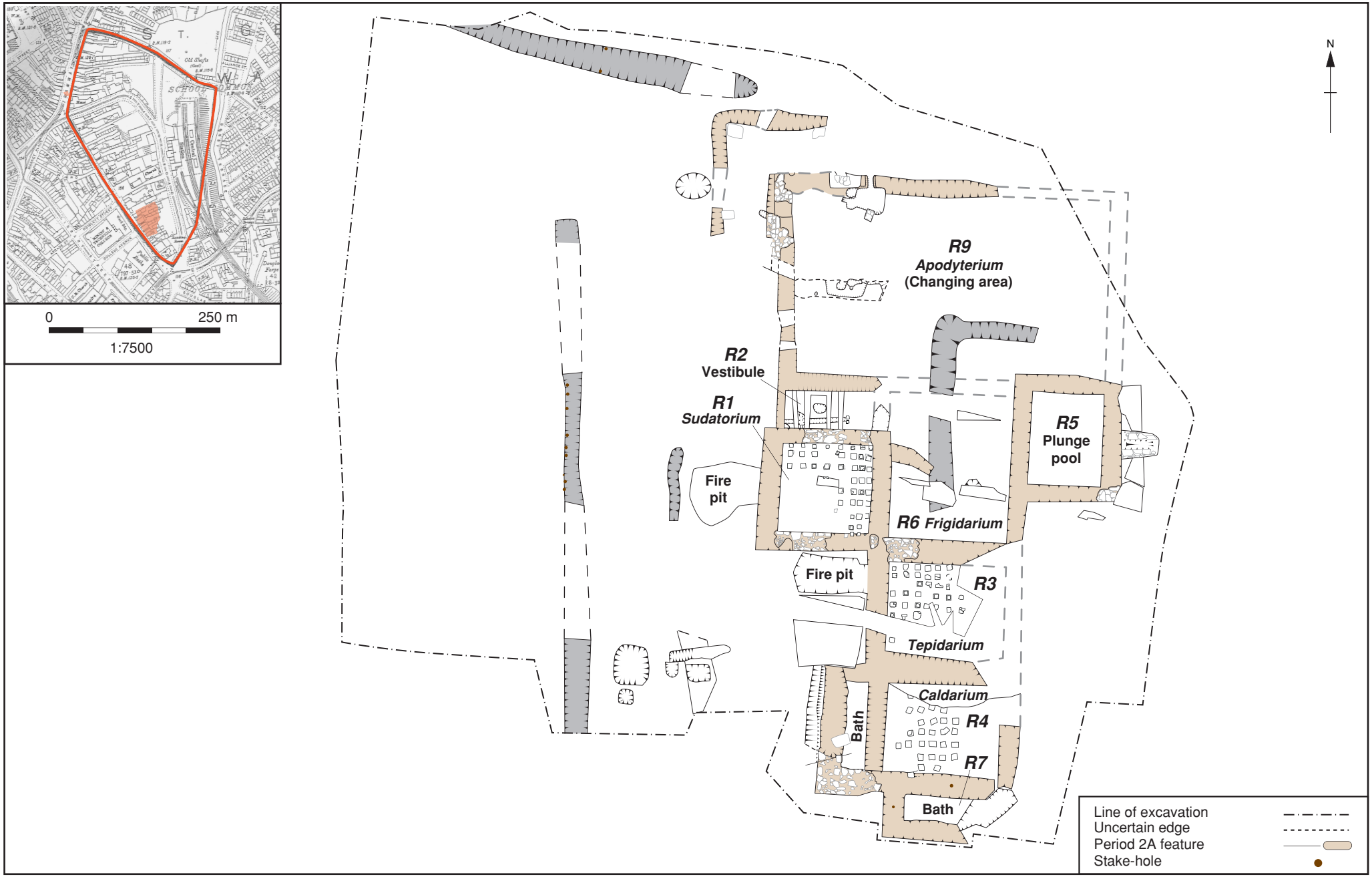


Figure 7: Excavation plan of the Roman bath-house (Building ***1000***)

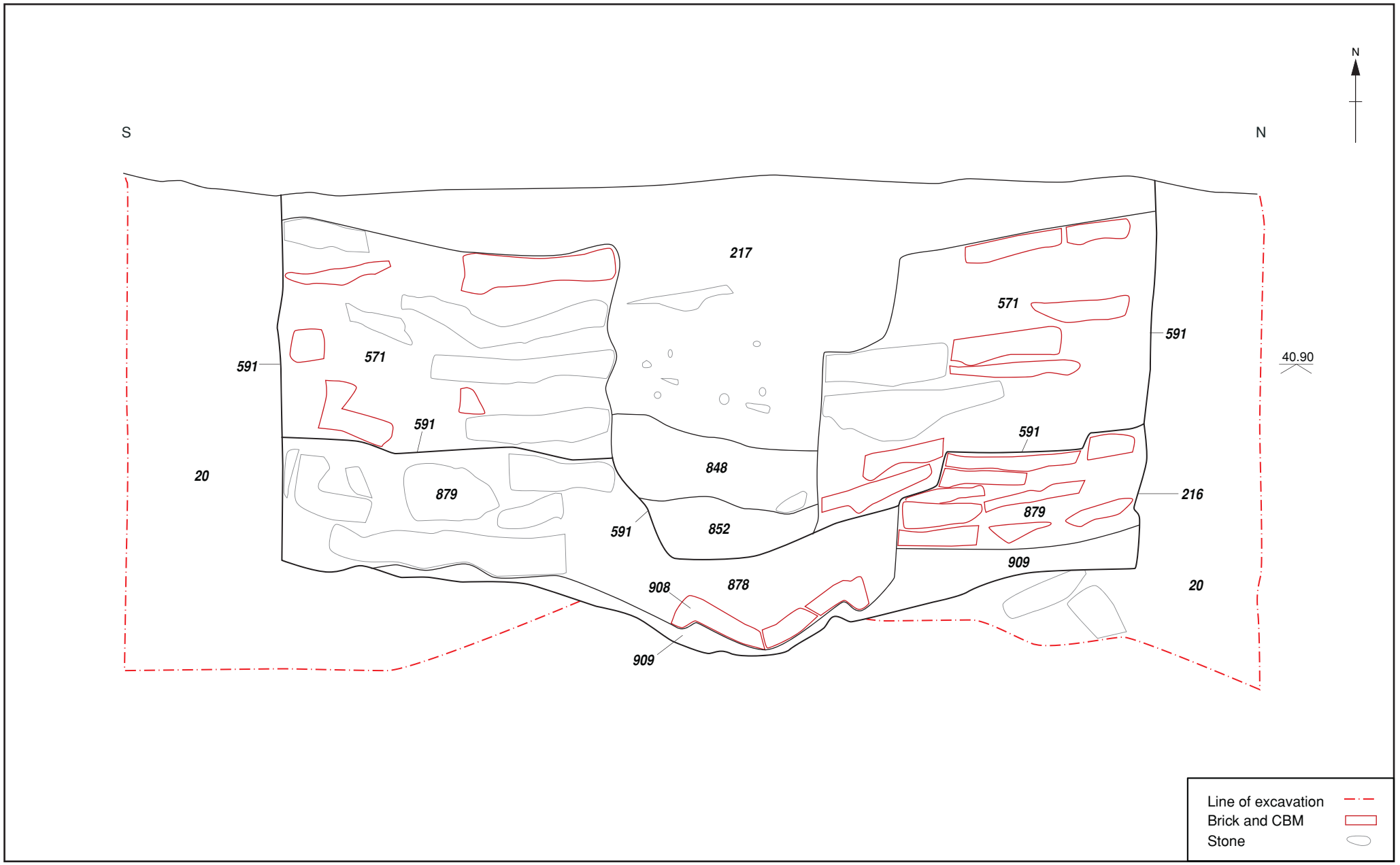


Figure 8: East-facing section through *praefurnium* ***216***, showing three phases of the fire pit

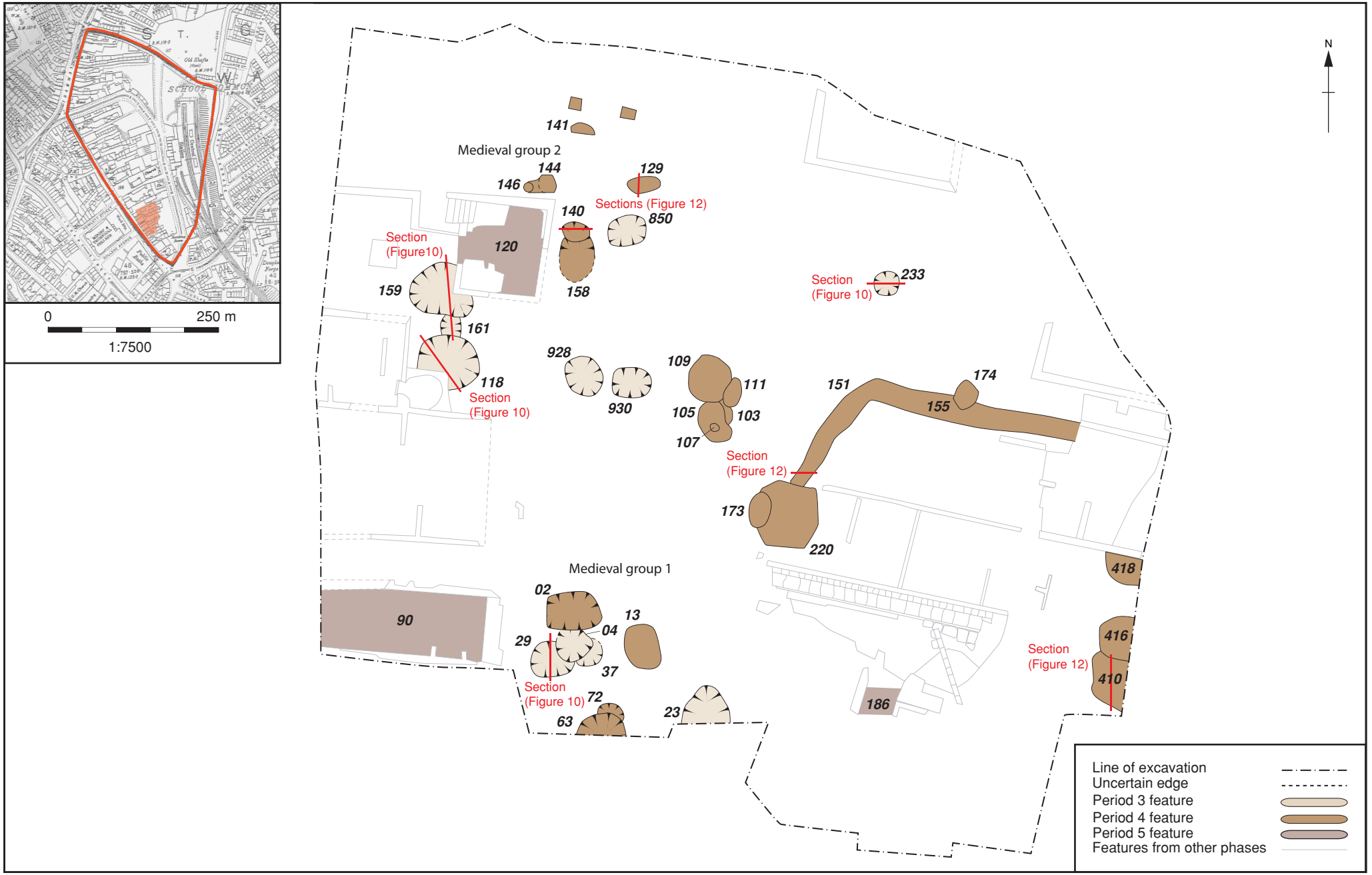


Figure 9: Area G7/10, showing distribution of medieval and early post-medieval (Periods 3-5) features

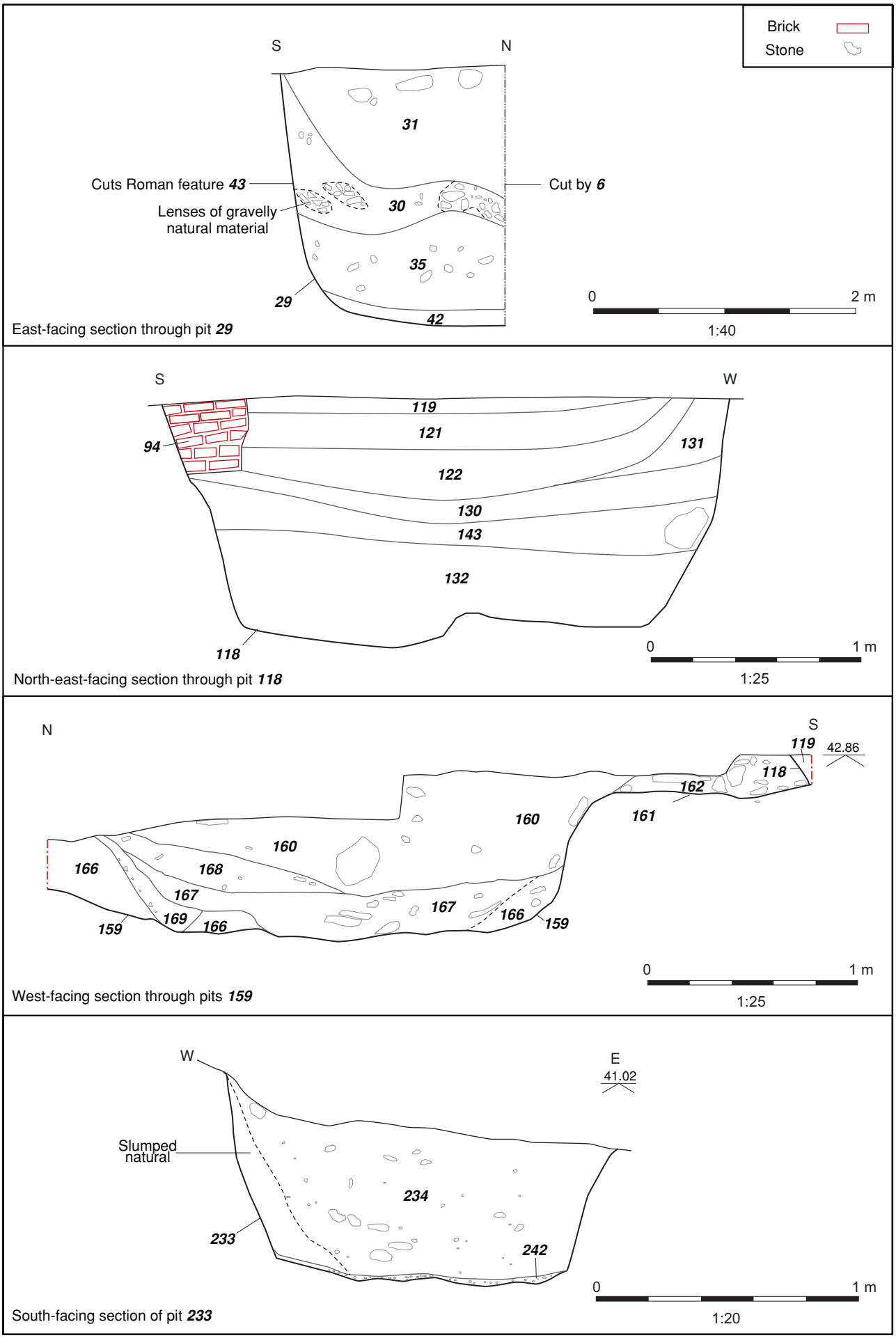
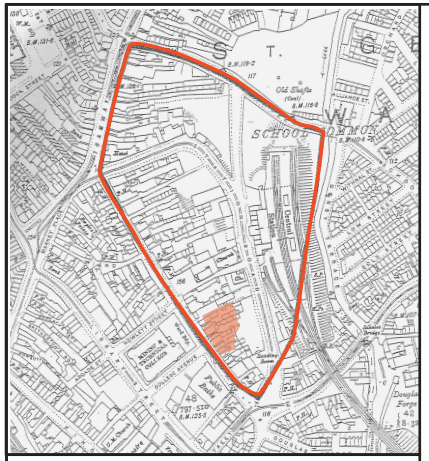
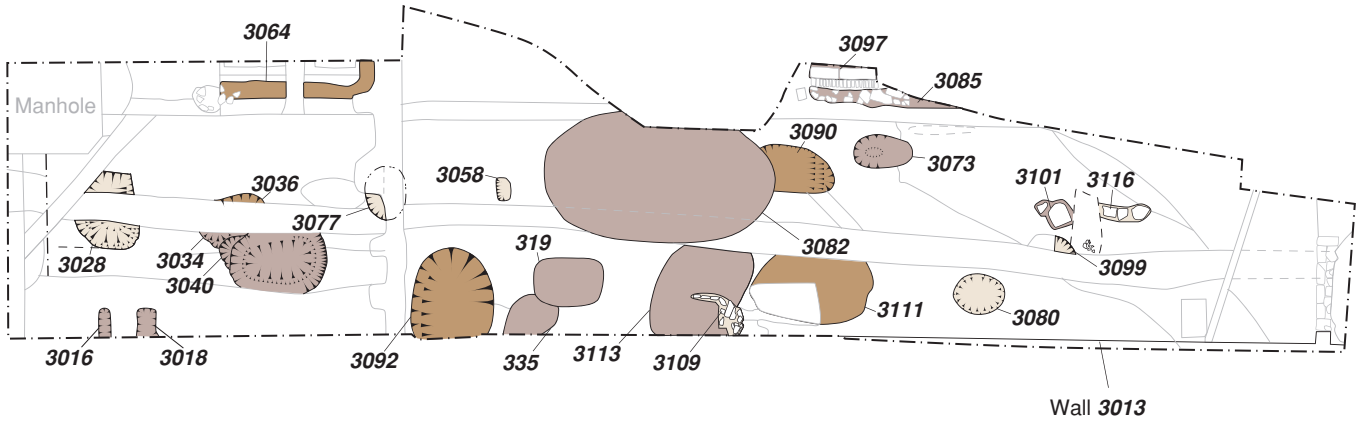


Figure 10: Sections of medieval pits ***29***, ***118***, ***159***, and ***233***



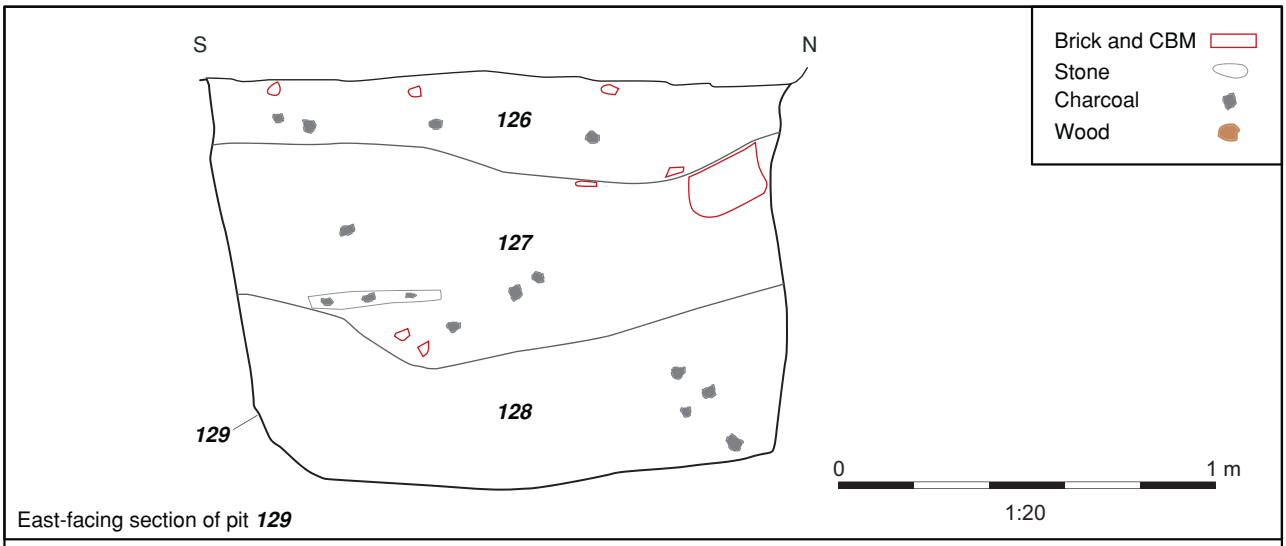


N

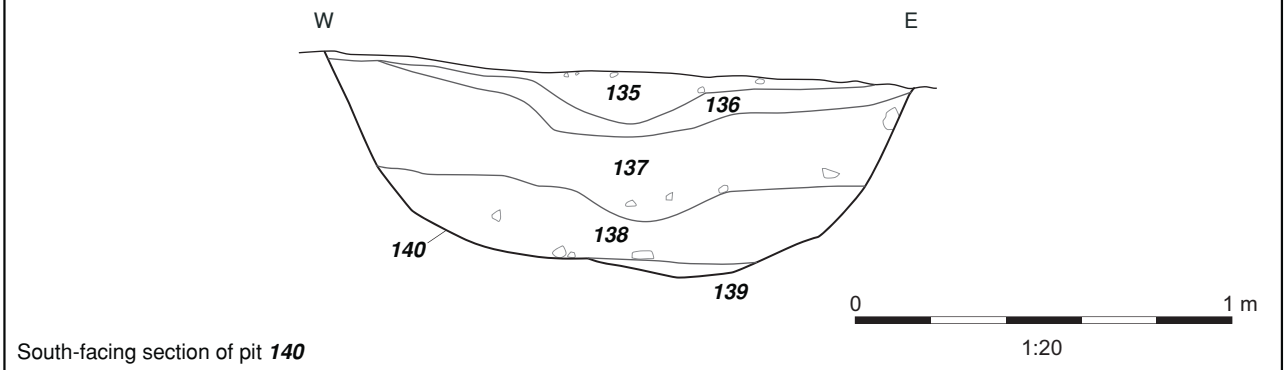
Line of excavation
Uncertain edge
Period 3 feature
Period 4 feature
Period 5 feature
Features from other phases

0
10 m
1:200

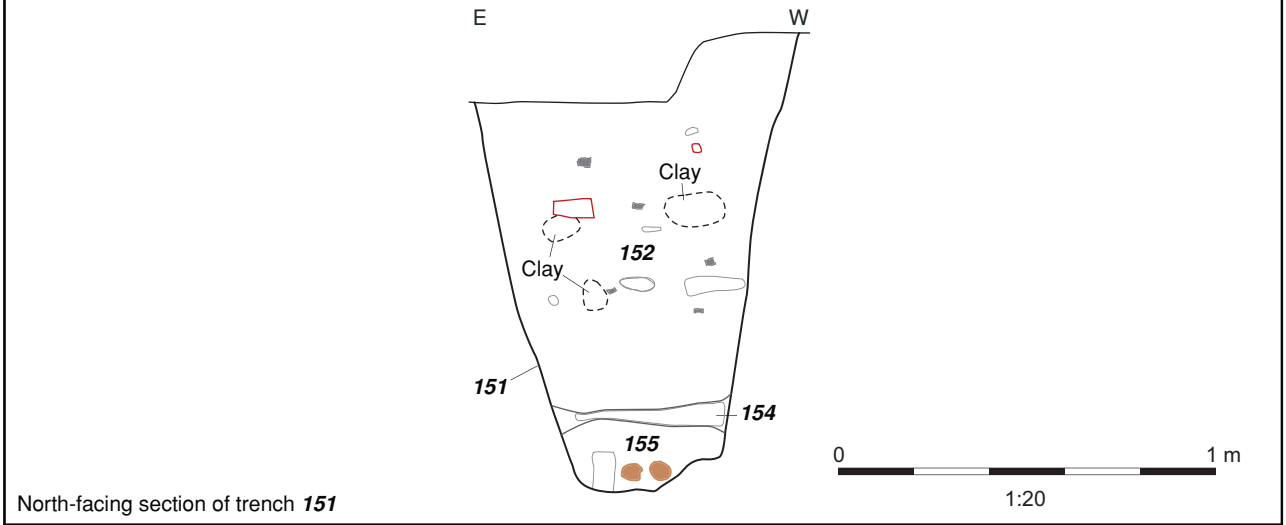
Figure 11: Area G3, showing distribution of medieval and post-medieval (Periods 3-5) features



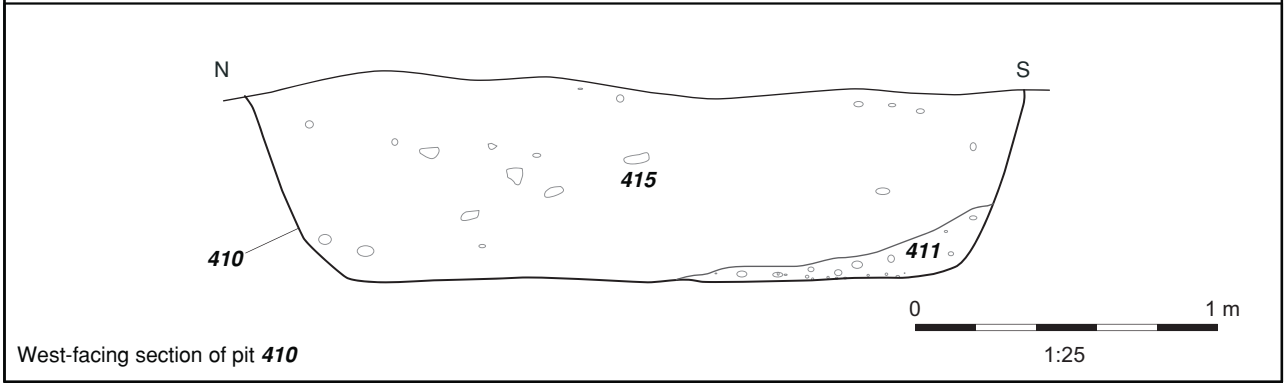
East-facing section of pit ***129***



South-facing section of pit ***140***



North-facing section of trench ***151***

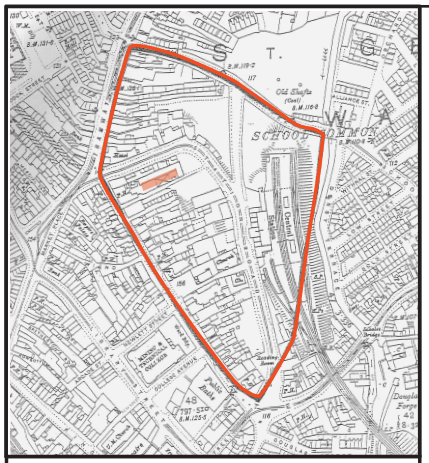


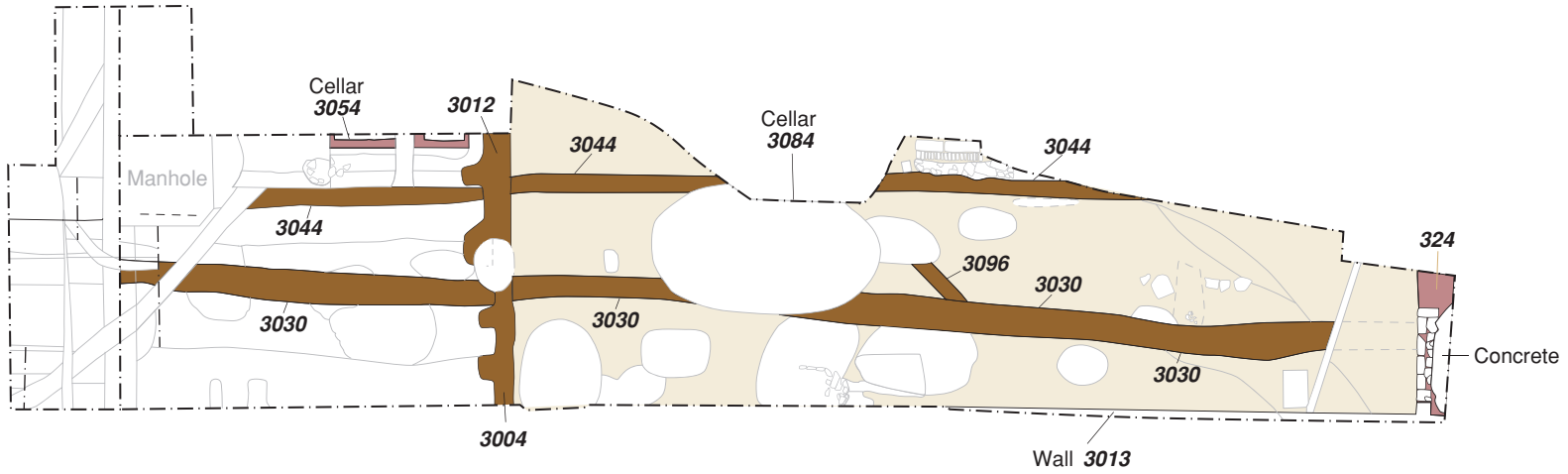
West-facing section of pit ***410***

Figure 12: Sections of Period 4 pits ***129***, ***140***, and ***410***, and trench ***151***

Figure 13: Area G7/G10, showing distribution of post-medieval (Period 6-7) features

0 10 m
1:250





Line of excavation
Uncertain edge
Period 6 feature
Period 7 feature
Period 7 setts
Features from other phases

Figure 14: Area G3, showing distribution of post-medieval (Periods 6-7) features

0 10 m
1:200

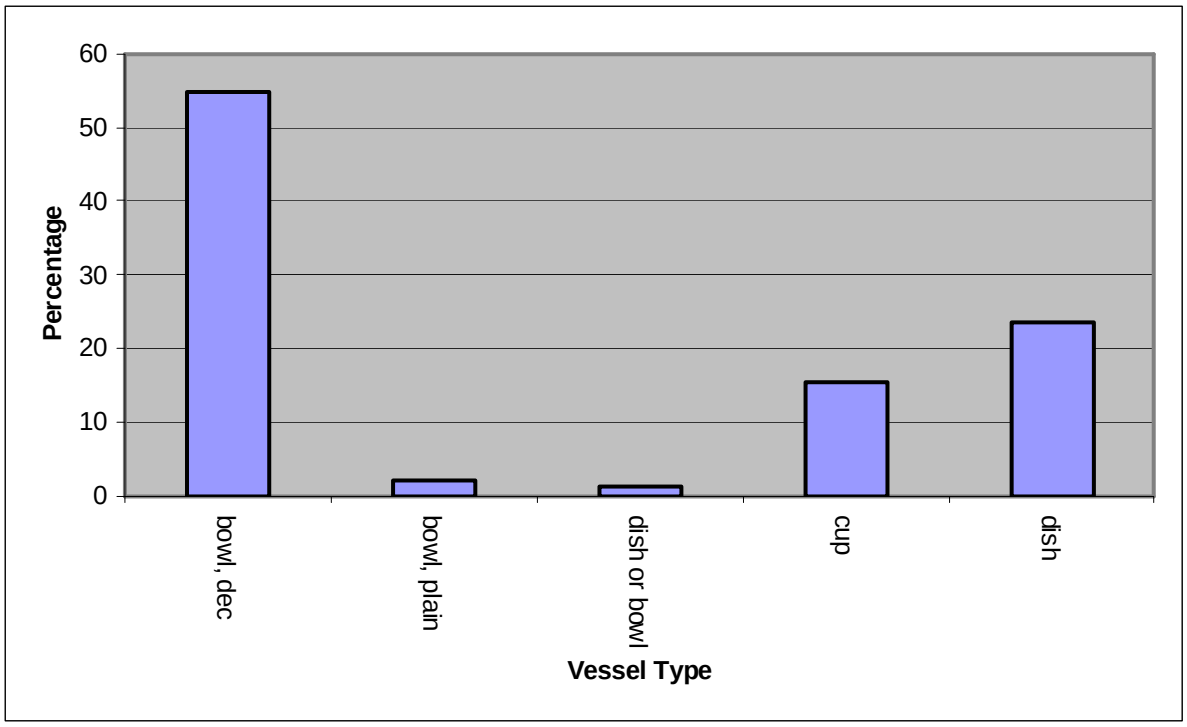


Figure 15: South Gaulish and Central Gaulish moulded bowls with decoration attributable to specific potters or groups (maximum nos)

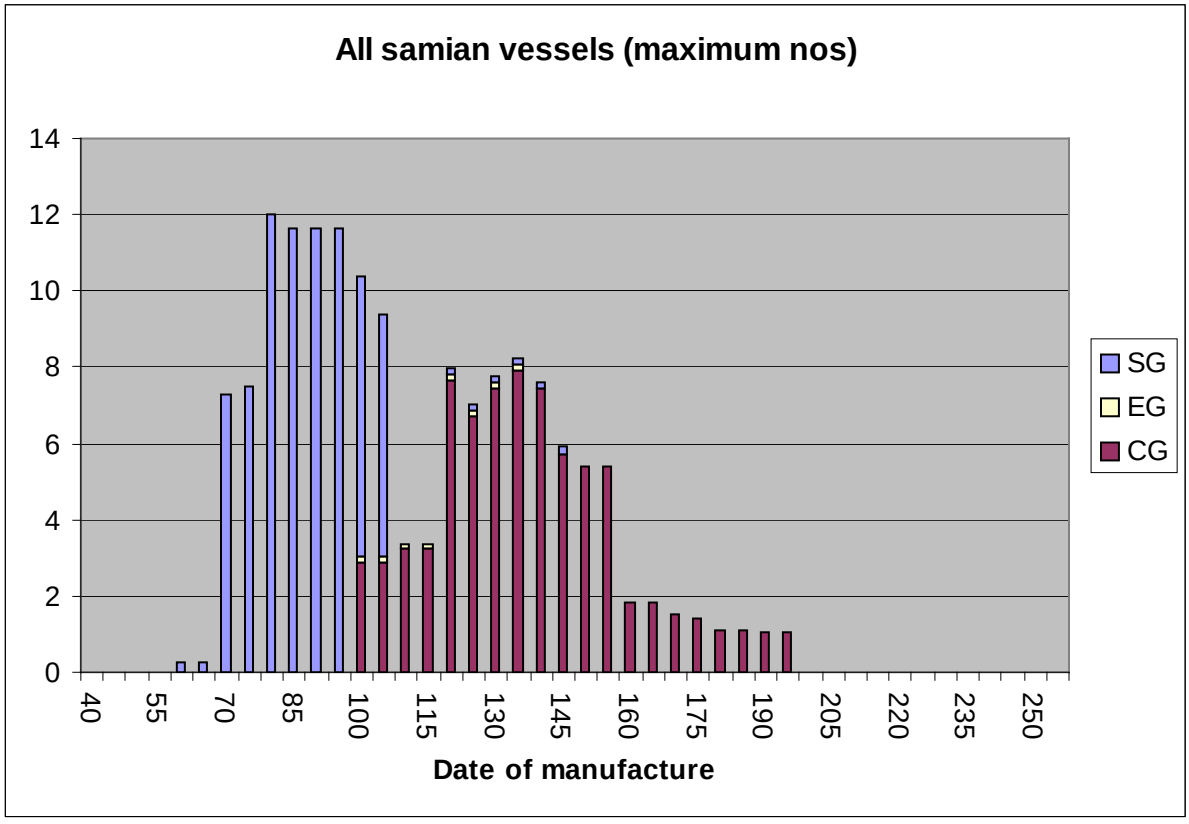


Figure 16: Date ranges of all samian vessels, by fabric (maximum 155 vessels)