

Excavations at Half Moon Yard, Bigg Market, Newcastle upon Tyne

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SUMMARY

The excavations at Half Moon Yard revealed evidence of activity on site during the Iron Age, with the main phase of occupation on the site being from the 12th to 14th centuries when it was used for light industrial activities and rubbish disposal. The pottery indicates a hiatus in activity on the site in the late medieval period until it again becomes the focus of industrial activity and rubbish disposal from the 17th century onwards. Intriguingly this included possible evidence for dog butchery from a pit dated to the 17th century.

INTRODUCTION

ARCHAEOLOGICAL INVESTIGATIONS were conducted during April and May 2013 on land to the rear of Bigg Market and the street called High Bridge (fig. 1) known as Half Moon Yard (NGR NZ 2484 6418). This was undertaken as part of planning conditions in advance of development for hotel and leisure facilities. The site was located in the centre of Newcastle within the town walls, 550 m north-west of the River Tyne.

At the time of the excavation the site was divided into two areas, both in use as car parks. The southern half of the site was accessed from Bigg Market, the north part of the site from High Bridge. The north end of the site was at a height of approximately 37 m OD, with the south end at 40 m OD.

HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

Evidence for prehistoric activity is generally sparse throughout the city, but this evidence has increased in recent years through a number of excavations. In 2001 excavations on High Bridge, 190 m north-east of Half Moon Yard, uncovered the remains of a roundhouse radiocarbon dated to the late Bronze Age (Brogan 2010). Evidence of Bronze or Iron Age farming and plot boundaries were recorded below the Roman activity at the Castle Garth 350 m south-east of Half Moon Yard (Snape and Bidwell 2002). Recent excavations at Clavering Place, west of the Castle Garth and 370 m south of Half Moon Yard, have revealed evidence for an Iron Age roundhouse (Archaeological Services 2015b). There is therefore a growing body of evidence for a wider prehistoric landscape beneath the medieval city.

Within the medieval townscape the site lies on the south side of the Lort Burn, which bisected the medieval town from north to south. The steep-sided dene would have been a barrier for movement between Bigg Market and the other major north/south route of Pilgrim

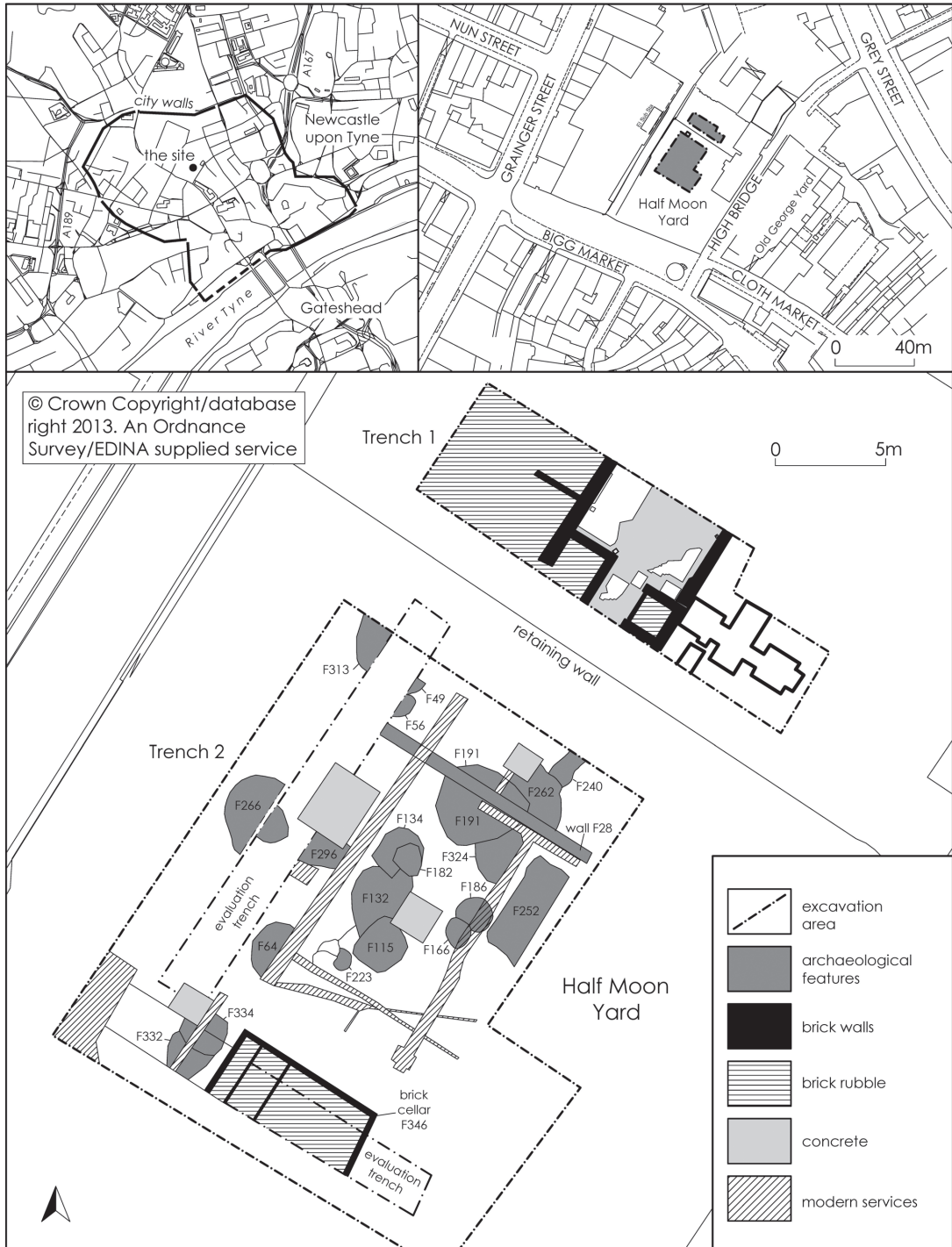


Fig. 1 Location of the site.

Street until the Burn was bridged. Movement of small boats along the burn was said to be possible (Guthrie 1880, 22), but this is doubtful because of the gradient involved. The bridge over the burn was in existence by 1334, when it was known as Le Denebrigg, and was in use into the late 16th century. By 1580 part of the Lort Dene was being infilled and by 1646 the lowest section was being culverted, by the time of Richard Grainger's development in the 1830's the Lort Burn was fully covered.

The site lies at the centre of the area enclosed by the town walls, completed in the late 14th century, and north of the main north/south route through the town. This route was recorded as a market street from as early as 1235 (Graves and Heslop 2013, 126). The markets originated at New Gate, north-west of the site, before extending out until the whole space from New Gate to the Cathedral was filled with specialist markets. The Market Street was subdivided according to what was being sold. Barley was sold in the Beremarket, which occupied the space from Nuns' Lane to Pudding Chare, immediately south of the site. From 1525 it was known as Bigg Market and is named as such on Corbridge's map of 1723. By the time the markets had spread the streets, including Bigg Market, would have been divided into burgage plots (Harbottle and Clack 1976, 119) consisting of a building on the street frontage with a long strip of land behind. Part of the layout of the medieval burgage plots can be seen on Wood's map of 1827 (fig. 2).

Several religious orders were founded in Newcastle during the medieval period. The Nunnery of St Bartholomew, founded as early as 1086, was located immediately west of the site. The entrance to the nunnery precinct lay at the north end of Nuns Lane. The full extent of the nunnery precinct is not known; Corbridge's map of 1723 and Thompson's map of 1746 show it filling a large area between Newgate Street, the town wall and the Lort Burn, and it may have extended as far as High Bridge. Excavations beneath the former Binn's department store, approximately 20m west of the site, aimed to investigate remains associated with the Nunnery (NAA 1998). The boundary wall of the nunnery precinct was not located but medieval occupancy layers and refuse pits were recorded. Graves and Heslop (2013, 150) interpret these features as lying within the nunnery precinct whilst others have interpreted them as domestic backland usage associated with burgage plots running back from the Bigg Market (PCA 2004, 19).

St Bartholomew's Nunnery was demolished in the late 16th century following the period of the Dissolution of the Monasteries 1536–41. It is around this time that Half Moon Inn, which gives the site its name, is said to have been built (Carey 2008a). The inn forms the south boundary of the site; an inscription placed over the doorway in the early 20th century states that the inn had been built in 1550. No further evidence has been found to support this but it is likely that the inn was in existence from the late medieval period and was certainly trading by 1805, as the Atholl Lodge Masons are recorded as holding meetings there from December of that year (*ibid.*, 9–11).

Further information on the historic development of the site can be gained by studying old maps and trade directories of Newcastle. Speed's map of 1611 shows that the Bigg Market is fully developed with buildings on both sides of the road; the Lort Burn can be seen north of the site culverted below buildings on High Bridge. Corbridge's map of 1723 clearly shows buildings along Bigg Market with burgage plots running back from the buildings to the Lort Burn, across the excavation site. Thompson's map of 1746 shows that there has been some development within the burgage plots to the rear of Bigg Market. By the time of Hutton's map of 1770, buildings have been constructed around the site, with a courtyard at the centre.



Fig. 2 Location of site on Wood's map of 1827.

The Half Moon Inn is noted in a trade directory dating 1838, but no detail of the rear yard is given; by the time of the 1st edition Ordnance Survey Map of 1861 the building in the south-west part of the site which fronts on to Bigg Market is listed as Half Moon Inn Public House, and a building in the north-west is labelled as a smithy. In Kelly's directory of 1886 the Half Moon Yard is listed as being occupied by a joiner, a brewer, and a horse dealer. The Goad Insurance plans of 1887 list the buildings around the site as Clephans & Wiencke Provisions Warehouse, a Paper Warehouse and Newcastle Daily. Two buildings at the south end of the site are listed as Fodder and Cattle Medicine. Between the 1887 Goad plan and the modern day the buildings are occupied by a variety of businesses including Colman J. & J., mustard manufacturers, Langdales & North Fertilisers Ltd, a tea and coffee warehouse, a confectionery factory, typewriter suppliers, printers, drapers and woollen merchants (Carey 2008a). At the time of the excavation the Half Moon Inn building was occupied by a bar and takeaway and the buildings fronting High Bridge were unoccupied.

THE EXCAVATION

In 2008 three evaluation trenches were excavated across the site (Carey 2008b). Following the discovery of archaeological remains two larger areas were excavated, Trench 1 in the north half of the site and Trench 2 in the south half (fig. 1). Most of the archaeological features recorded were in Trench 2. Below the archaeological deposits within Trench 2 the glacial subsoil, an orange clay [348], was identified at a depth ranging from 0.3 m to 0.7 m below the current ground level (39.7 m OD to 39.3 m OD).

During the project five phases of activity were identified:

- Phase 1: Prehistoric activity,
- Phase 2: 11th or 12th centuries,
- Phase 3: 13th and 14th centuries,
- Phase 4: post-medieval activity,
- Phase 5: modern use of the site.

Phase 1 (Prehistoric period, fig. 3)

One of the earliest features was a large pit in the west part of the site [F64]. The pit was heavily disturbed by modern drainage but the surviving part measured 2.5 m in diameter and 0.8 m deep. The primary fill of the pit was a redeposited glacial clay. Two postholes were cut into the clay layer that contained plant remains typical of the late prehistoric period; radiocarbon dating of a charred spelt wheat grain from one of the postholes dated it to the Iron Age, between 389 and 206 cal BC (SUERC-58748 GU36927, 95.4% probability).

North-east of the pit four intercutting features, a posthole and three pits [F196, F186, F166, F168], were excavated. The primary fills of all these features contained plant material typical of the late prehistoric period including spelt wheat (*Triticum spelta*), barley, hazel nutshells and weed seeds.

A series of post holes and stake holes were recorded across the south half of the trench [F136, F138, F140, F327, F69, F112, F71, F233]; the presence of late prehistoric plant material within the fills of these features and their stratigraphic position suggests that they are the

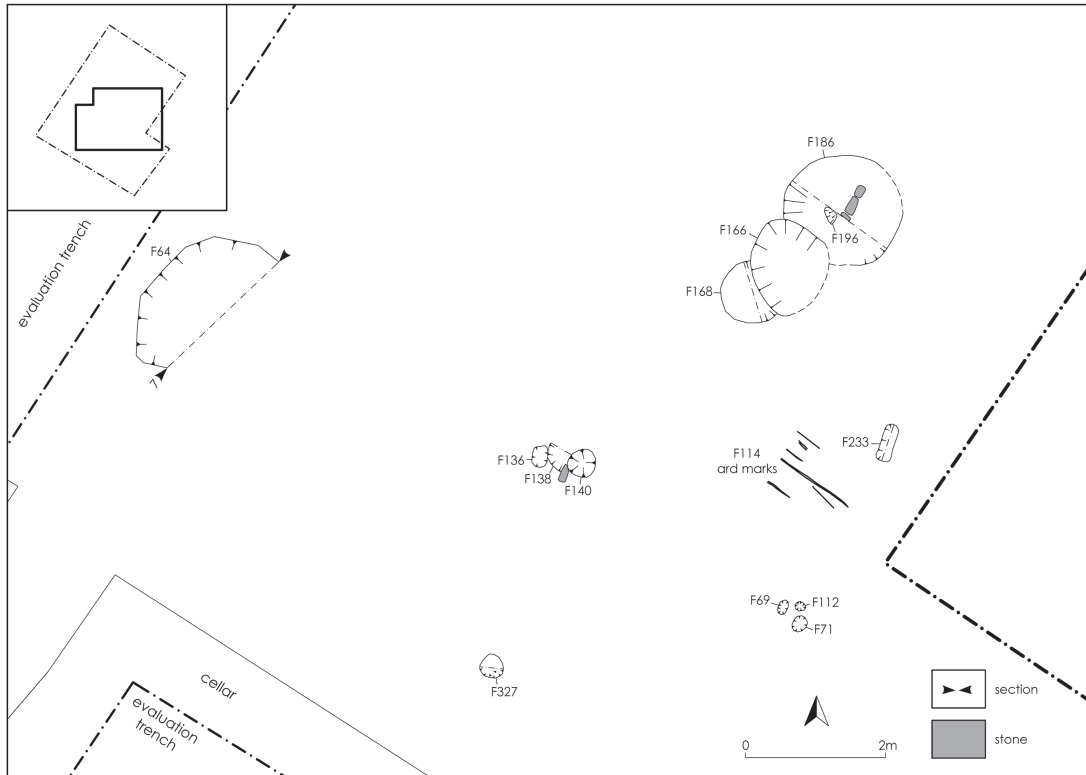


Fig. 3 Trench 2, Phase 1 features.

remains of a structure or structures that stood on the site prior to the medieval period. The palaeoenvironmental evidence found in association with the postholes indicates the presence of turves, possibly utilised as a construction material, suggesting that these features could be part of a roundhouse or similar structure. On the east edge of the trench traces of prehistoric ploughing, ard marks, were recorded cutting the glacial clay [F114].

Phase 2 (11th to 12th centuries, fig. 4)

The main features in this phase are large intercutting pits. Towards the centre of the trench a large oval pit [F134] measuring 2 m by 1.5 m cut the glacial clay. The feature was excavated to a depth of 1.5 m before it became unsafe to continue. This pit was cut by a larger, though shallower, pit [F132] measuring 2.6 m by 2 m and 1.2 m deep. Hazel charcoal from the secondary fill of this later feature was radiocarbon dated to between 1013 and 1155 cal AD (SUERC-57134 GU35936, 95.4% probability). Both pits were waterlogged and a diverse assemblage of plant remains was recovered from the palaeoenvironmental samples, including fruit stones of bramble, elderberry and raspberry, hazel nutshells, nettle, weld seeds and flax seeds. The original purpose of these pits is unclear. It is possible that they were clay extraction pits; the depth and waterlogged nature of the fills may suggest that these features were wells, though they could in fact have performed both functions. A clay extraction pit was excavated at High

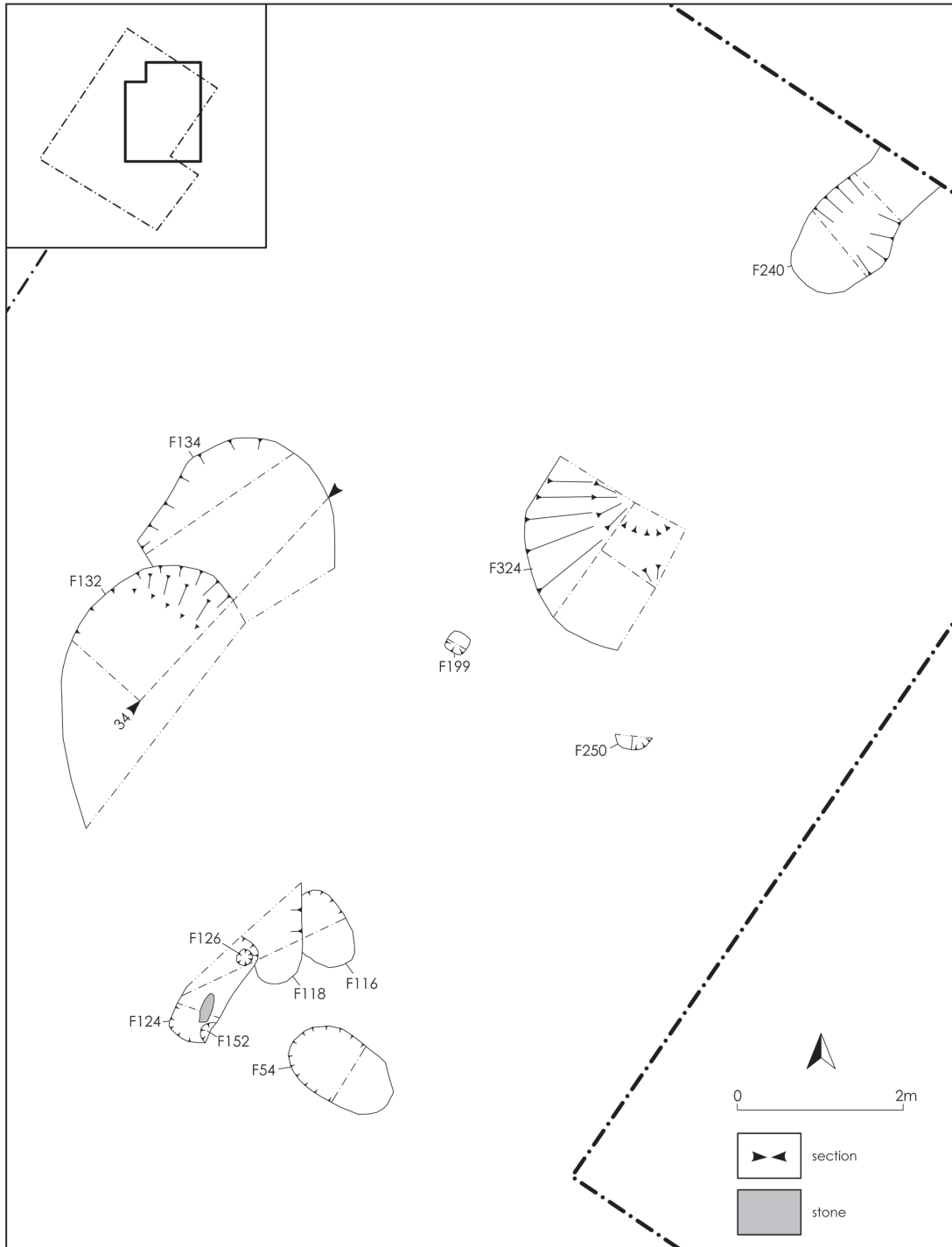


Fig. 4 Trench 2, Phase 2 features.

Bridge (Brogan 2010, 336). There is no evidence of their use for industrial activities such as tanning or for their use as cess pits, unless they were regularly cleared out and the cess material disposed of elsewhere. There was a paucity of animal bone recovered from these features suggesting that domestic refuse disposal was not their primary function or that material was being regularly cleared out of the pits.

Further south-east smaller intercutting pits were recorded [F116, F118, F124] (fig. 5). Maloideae charcoal from the primary fill one of these pits [F116] was radiocarbon dated to between 1024 and 1155 cal AD (SUERC-57131 GU35933, 95.4% probability).

South-east of these features was an oval pit [F54], the nature of the fills within which suggest it could have been a cess pit. Fragments of wood that may be part of a wattle weave were recovered from the fill. North-east of these features another large pit measuring 1.5 m wide and 1.2 m deep was excavated [F324]; this feature was heavily truncated by later activity but contained 12th century pottery. Towards the north-east corner of the trench the terminal of a V-shaped linear gully [F240] was identified aligned north-east/south-west which extended beyond the edge of excavation. This gully may be the remains of a burgage boundary. Two postholes [F199, F250] were also assigned to this phase of activity due to an absence of prehistoric plant remains in their fills.



Fig. 5 Pits (from left to right) F116, F118, F124 with pit F54 in the background (looking south).

Phase 3 (13th and 14th centuries, fig. 6)

These features are separated from Phase 2 by the presence of predominantly 13th-/14th-century pottery, radiocarbon dates and their stratigraphic position. There is also a general trend in the palaeoenvironmental samples for these features to contain a predominance of coal and clinker/cinder compared to a predominance of charcoal in the Phase 2 features. This may reflect a change in the main fuel used or indicate a larger input of waste from industrial rather than domestic activities.

Further pits were recorded throughout this phase; Phase 2 pits F124 and F118 were cut by a large waterlogged sub-rectangular feature 2 m wide and 1.2 m deep [F115]. Hazel charcoal from this pit was radiocarbon dated to between 1168 and 1269 (SUERC-57130 GU35932, 95.4% probability). The pit contained a group of cattle horn cores and a large quantity of clinker, cinder, hammerscale and smithing waste indicative of industrial activity such as a blacksmiths nearby, though small charcoal fragments and charred food remains suggest the presence of some domestic hearth waste in the pit backfill. Phase 2 pits F134 and F132 were cut by a shallow pit [F182] which also contained horn cores of sheep, goat and cattle.

Horn cores were also found in two more pits [F207, F56], the latter being fragmented. A sheep and two goat horn cores were found in pit [F182], with an immature cattle horn core. Foot fragments were also recovered with the horn cores though the larger more robust bones are notably absent. The presence of horn cores within the fills of all of these pits suggests that horn working was taking place nearby.

Large pit F115 cut through pit F309, together with other features. An uncharred plum fruit stone from F309 was radiocarbon dated to between 1058 and 1263 cal AD (SUERC-57136 GU35938, 95.4% probability). Pit F309 was cut by another circular pit [F307] that had a thin layer of burnt wood over its edges and base, possibly the remains of a wood lining.

Several further intercutting pits were excavated across the site [F190, F211, F221 F223, F219, F252, F332, F334], the fills of which suggest a mix of background industrial and domestic activity with clinker, coal and cinder recovered from the palaeoenvironmental samples, together with uncharred and occasional charred plant remains. The primary fill of F252 was waterlogged and a large wooden plank of unknown purpose was recovered from the fill; four wooden stakes deposited as refuse were recovered from F223.

A very large pit [F266] was recorded towards the west edge of the excavated area (fig. 7), first noted in the evaluation of the site (Carey 2008b). The pit measured 3.8 m in diameter and 1.7 m deep. A charred large oat grain from a layer of dark brown clay silt towards the base of the pit was radiocarbon dated to between 1154 and 1264 cal AD (SUERC-57132 GU35934, 93.3% probability). The pit contained animal bone, 13th- to 14th-century pottery, organic remains and was recut twice. Its original function is unknown.

Further pits [F313, F258, F56, F49] and a posthole [F66] were recorded at the north end of the site. A charred barley grain from pit F313 was radiocarbon dated to between 1277 and 1394 cal AD (SUERC-57140 GU35939, 95.4% probability). The remains of a gully [F85] aligned north-west/south-east with a posthole cut into its base was also recorded. This feature may reflect a land division but it was too heavily truncated by a modern manhole and services to be sure.

In the north-east part of the trench was a 2.2 m wide circular pit [F262]; this was cut by a second pit [F194] that contained 12th- to 14th-century pottery; west of these features further pits were identified [F205, F202]. In the north-east corner of the trench a pit [F246] was cut by

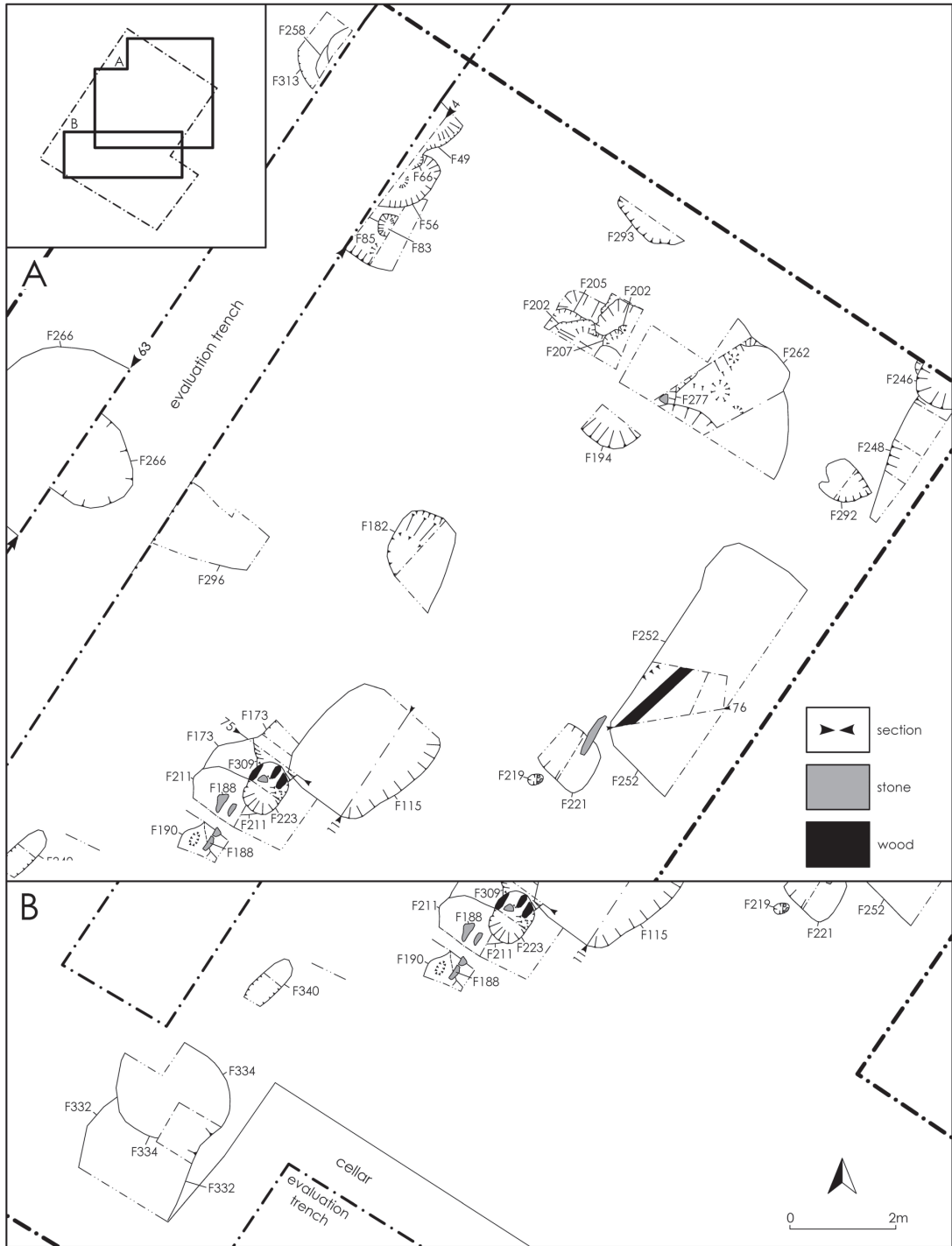


Fig. 6 Trench 2 (A: north and B: south), Phase 3 features.



Fig. 7 Pit 266, looking north-west.

a shallow gully [F248] which ran north-east/south-west along the edge of the trench, possibly the remnant of a burgage plot boundary; a fragment of residual Roman pottery was recovered from the gully. West of the gully a shallow depression was excavated which may have been the remains of a heavily truncated pit [F292] containing 13th- to 14th-century pottery. Along the north edge of the trench a further pit was recorded [F293]. The medieval features were sealed by a thin layer of green-brown soil possibly suggesting the site went out of use for some time.

Phase 4 (Post-medieval period, fig. 8)

The pottery assemblage suggests that there was little activity on the site through the 15th and 16th centuries before further pits were recorded dating to the post-medieval period. Cutting the earlier pits and the medieval soil layer towards the north-east part of the trench was a large pit 2.5 m wide [F191]. Low Countries Redware pottery recovered from this feature span the 14th to 17th centuries, and a tile recovered dates to the 17th to 18th centuries suggesting this feature is likely to be 17th century in date. The upper fills of this pit contained the remains of several dog skeletons. A shallow pit [F148] was cut into the top of pit F191; this pit contained bones from two dog skeletons, possibly disturbed from pit F191.

Dogs of several sizes are represented in these pits ranging from cat-size upwards. One dog acetabulum has clearly been chopped, suggesting use of the carcass. The abundance of dog bones may relate to activity in the vicinity, or the function of the pits. A seventeenth century

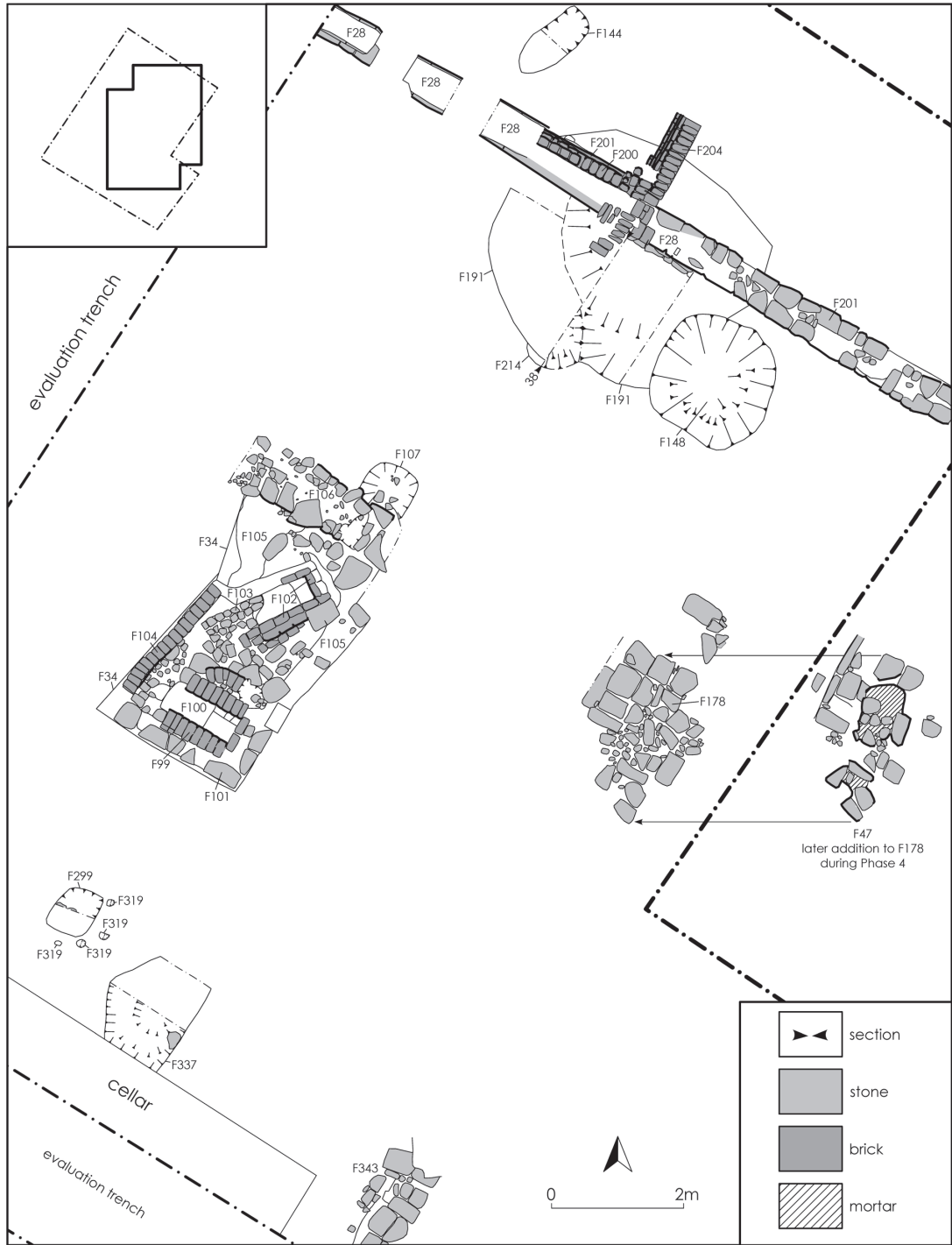


Fig. 8 Trench 2, Phase 4 features.

recipe for a pomatum for the hair was proposed as a possibility for post-medieval dog bones with cut marks from Newcastle (Gidney 1996). Smith (1998) discusses the evidence for the exploitation of dogs in Scottish towns and notes the export of dog skins to England and France in the 17th century and the use of dog skins for fishing floats on the east coast.

Further pits were recorded across the excavation area [F214, F144, F337, F299]. Pit F299 had four stakeholes surrounding its east side, all of a similar size and depth [F319] suggesting a timber structure around the pit.

Lying directly over the medieval soil layer, on the east edge of the trench, was a paved surface [F178] of large, flat, sandstone blocks. Overlying the paving was a thin layer of green-brown sandy silt which was overlain by the remains of a robbed-out sandstone wall [F47] aligned north-east/south-west along the east edge of the trench. The alignment of this wall suggests it follows the line of the burgage boundaries. The wall consisted of a single course of roughly hewn blocks bonded with a lime mortar. Cutting large pit F191 and the other features towards the north-end of the trench was a wall [F201] aligned north-west/south-east, constructed from four courses of roughly hewn sandstone blocks bonded with lime mortar. The west half of the wall was only a single course of sandstone, patched in places with bricks [F28], perhaps reflecting a later extension. A short brick wall [F204] was also recorded running at right angles to wall F201.

A second sandstone wall [F106], a single course of unworked blocks, was recorded south of F28 on the same alignment. Butting the north face of wall F28 was a small pit [F107] containing post-medieval pottery, brick, glass and the skeleton of an adult cat. In the south-east corner of the trench the remains of a sandstone and brick culvert [F343] were recorded.

At the centre of the trench two paved surfaces of large flagstones and small flat cobbles [F100, F103] were recorded. The flagstones had brick walls two courses high bonded to them with concrete forming two open-ended rectangular structures, one aligned north-west/south-east [F99] and the other roughly north-east/south-west [F102].

The two rectangular structures were bounded by sandstone and brick walls forming a rectangular feature [F34] (fig. 9). [F101, F105, F104]. The paving slabs and rectangular brick features had been heat affected, possibly suggesting they are the remains of flues or ovens.

Overlying the post-medieval features on the eastern half of the trench was a thin layer of grey-brown silty clay that contained a mix of residual medieval and post-medieval pottery [31]. A gold posy ring was recovered from this layer which may date to the late 17th century.

Phase 5 (figs. 10–11)

Cutting the post-medieval soil layer and truncating many of the earlier features were a series of services and brick drains [F24, F89, F73, F92, F110, F73, F217]. The services in the south-east part of the site were covered by a spread of sandstone building rubble that consisted of unworked and roughly hewn blocks of sandstone mixed with lumps of concrete and fragment of ceramic drain which may reflect demolition of buildings on site. The rubble produced a George III copper half penny dating to 1799. In the north-west of the trench the post-medieval soil was covered by paving surfaces made up of sub-angular and sub-rounded blocks of sandstone and bricks [F24, F36, F40, F44]. Modern foundations [F127, F349, F347, F128], a brick cellar [F346] and service trenches [F42, F350] disturbed all the excavated areas. These features were covered by a mixed layer of demolition debris, a levelling deposit of dolomite, and modern surfaces.



Fig. 9 Brick structure F34, looking north-east.

All the features in Trench 1 in the north of the site date to this phase. Three brick cellars and concrete and wooden block flooring were recorded, all backfilled with brick rubble from the demolition of buildings that stood on the site.

POTTERY

Jenny Vaughan

Introduction

An assemblage of 866 sherds weighing just over 12000g was recovered from the site. Over 90% of the sherds were medieval; there were a small number of sherds which could span the late-medieval/early-post-medieval period (i.e. 15th/16th century). One or possibly two sherds were Roman, and the remainder were post-medieval, ranging in date from 17th to 19th century (or later).

Pottery types present

The composition of the assemblage is summarised in fig. 12. A fragment of Roman mortaria was recovered from pit F132; otherwise the earliest pottery present was a small quantity of 12th-century coarse-gritted Dog-Bank-type ware Fabric Group (FG) 2 (Edwards 1966) including two everted rim sherds.

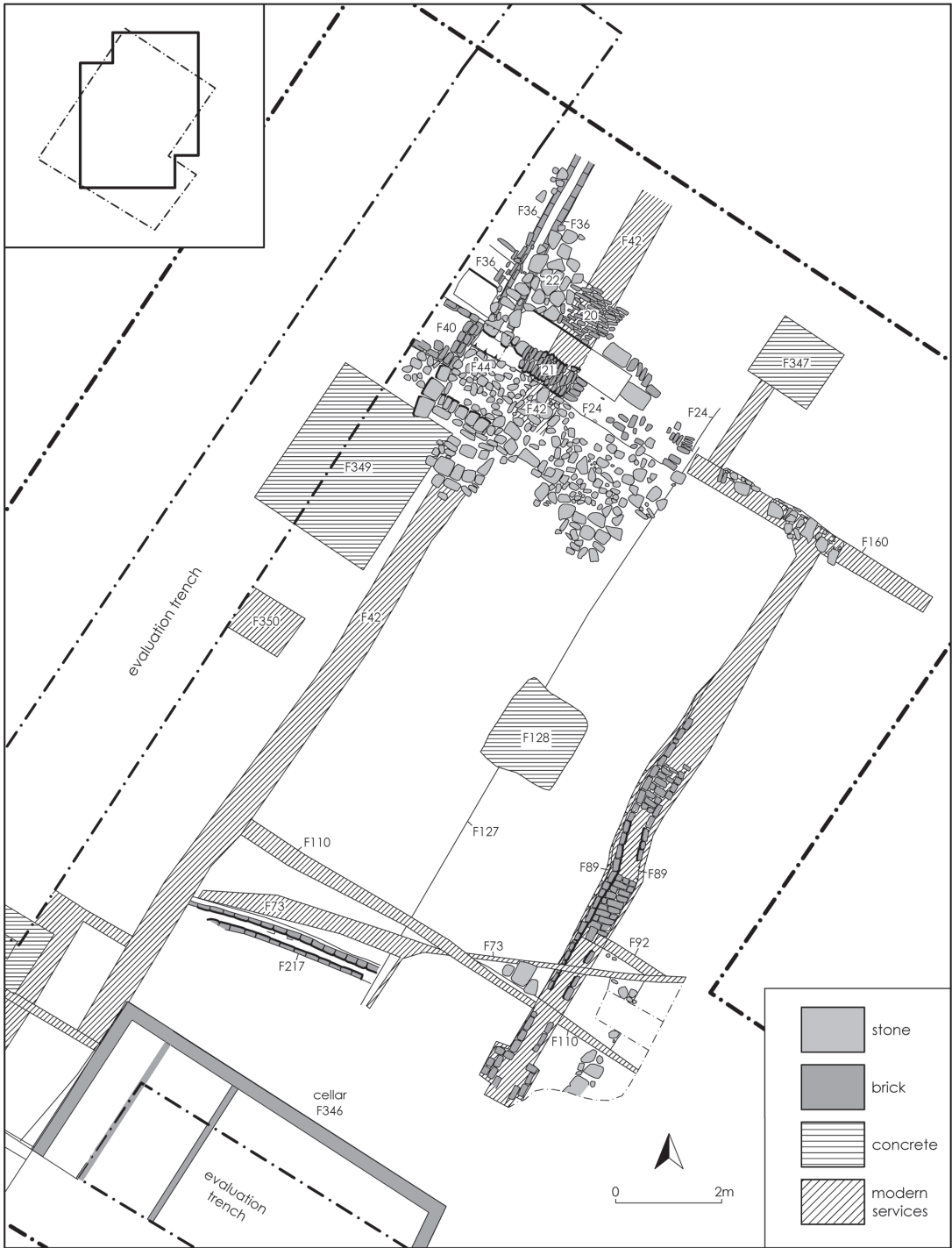


Fig. 10 Trench 2, Phase 5 features.

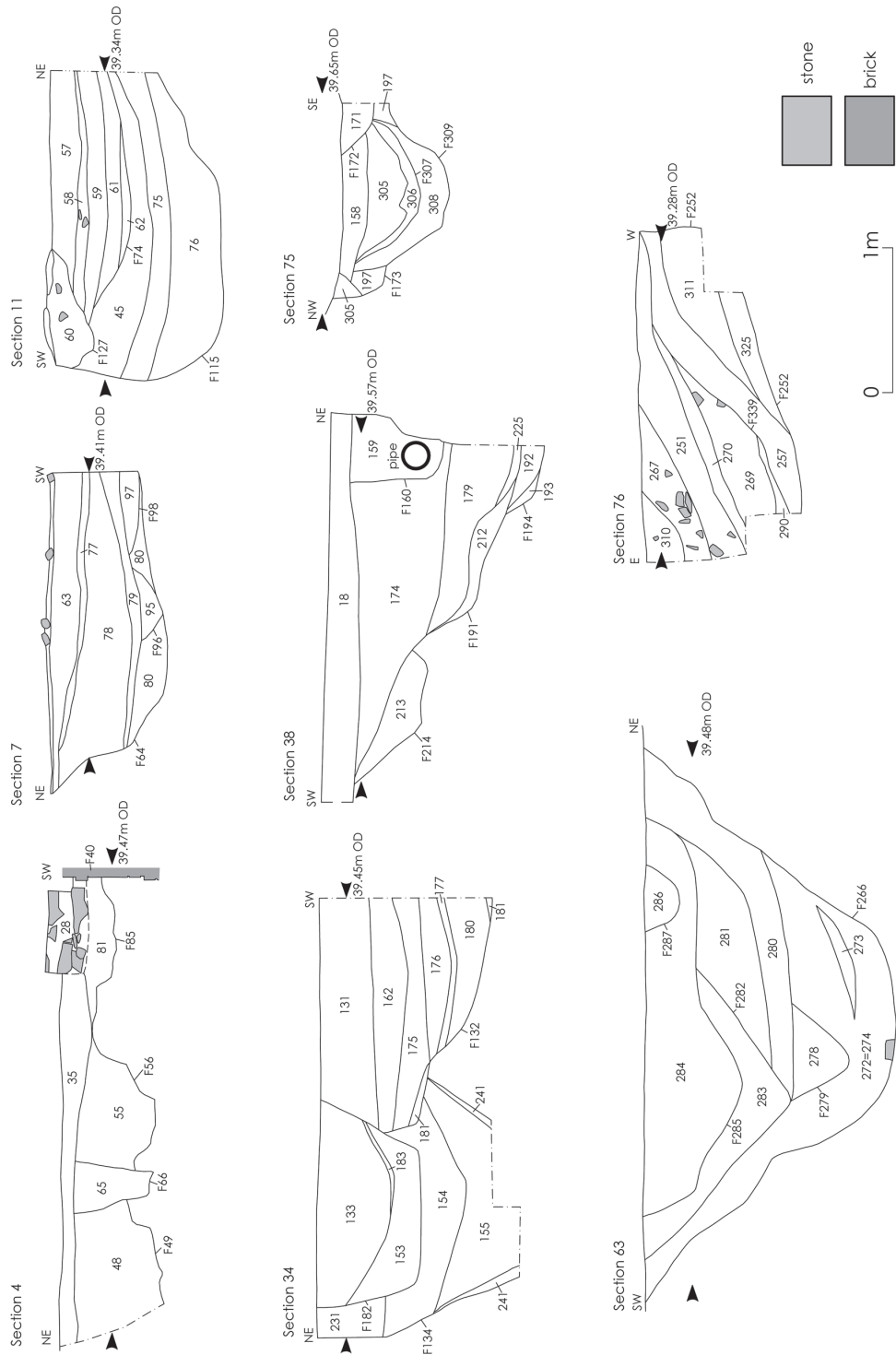


Fig. 11 Trench 2 sections.

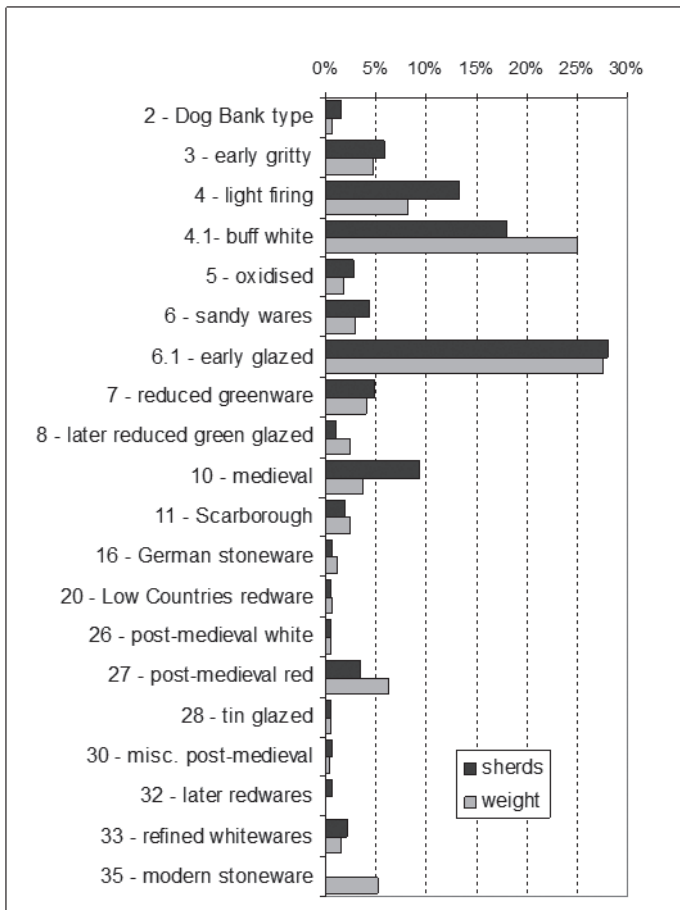


Fig. 12 Summary of pottery fabric groups present.

Discussion

The medieval pottery ranged in date from the 12th to the 15th century, but most were broadly mid-13th to mid-14th century. The pottery indicates activity throughout the 13th and into the early 14th century but very little in the late medieval period, although this may be related to changes in rubbish disposal rather than a hiatus in activity. There is then clearly 17th century, and later, activity. Most contexts produced fairly small quantities and amongst the medieval material there were relatively few form elements present. Although in two cases links between contexts were noted, it therefore seemed unlikely that a more exhaustive search for crossfits would produce much in the way of significant information on the medieval vessels present. Thus, although there are one or two items of interest, there was no potential for in-depth analysis of the medieval assemblage. This is unfortunate as pit groups, related to properties, have great potential for refining chronologies and providing data on what types and vessels were in use together.

The quantity of 17th-century material is too small to have any potential for further work and the later post-medieval is of no particular interest.

ANIMAL BONE

*Louisa Gidney**Introduction*

Preservation of the bones from Half Moon Yard was variable. The medieval finds from some waterlogged contexts had been in good condition when found but, on drying out, are now flaking and crumbling. Vivianite seen at the assessment stage has now disintegrated from bone surfaces. For some fragments, the assessment record was used to establish the identification. The waterlogging appears to be associated with cess in some pits, with the bones still covered in the typical green encrustation. This burial environment has also contributed to the disintegration of bone fragments on drying out. The post-medieval finds were in good condition.

Phase 2

Pits F116 and F124 are the earliest group of deposits with animal bone, associated with 12th- to 13th-century pottery. Only one identifiable fragment was recovered from pit F124. This has the characteristic greenish encrustation associated with cess. The paucity of such finds suggests refuse disposal was not a primary function of these features.

Phase 3

Pit F115 and the associated pit F74 contained bones in several fills. A group of horn cores had been deposited in pit [F115], together with ash and cinders indicating hearth waste, suggesting that the refuse might be integral to the function of these features. Examples of large and robust male horn cores were found in [F207] and [F56], the latter being fragmented. A group of one sheep and two goat horn cores were found in pit [F182], with an immature cattle horn core. A number of foot fragments were also recovered with the horn cores though larger more robust bones are notably absent. This suggests some human selection in the bones deposited, with the possibility of small scale horn and hide working.

Over twenty features produced faunal remains only in the uppermost fills. Such fragments may represent backfill when the pits went out of use, rather than being related to the function of the pit. The species present in these features indicates general consumption and waste disposal patterns in the locality.

Hand-recovered finds of the principal domestic species are dominated by cattle, with sheep/goat bones less numerous and those of pig scarce; such a pattern may be influenced by preservation and recovery favouring the larger and more robust cattle bones. Butchery marks are all chop marks and there is evidence that carcasses were split into two sides and long bones were broken to extract the marrow. Examples of both cattle and sheep metapodials were split longitudinally; it is not clear whether this was to facilitate serving marrow bones at table or for the extraction of the marrow for leather dressing.

The small accumulation of faunal remains in features spanning a long period of use suggests that mechanisms were in place to remove such bulky debris from the site, rather than dumping it in cess pit fills. The metapodial bones from these species could indicate some hide working or production of neat's foot oil leather dressing from the marrow, while the presence of hornworking is also suggest (discussed further below). The fragments found on

site may be scraps that were missed when clearing out refuse for disposal elsewhere. The medieval market place in Ripon, for example, was used for dumping such commercial refuse from hide processing (Archaeological Services 2011). Sites such as Half Moon Yard provide a valuable balance to large deposits like that found at Ripon, as demonstrating long term urban strategies for waste disposal off the tenements and burgage plots.

The impression gained from this assemblage is of long-established good housekeeping practices limiting the deposition of faunal refuse on site. The horn worker actively selected large and robust horn cores from adult male animals where possible and acquired this raw material already severed from the skull. The unusual disparity between fore and hind limb elements of sheep suggests that butchered joints were procured, rather than whole sides or carcasses. There is very tentative evidence for possible breeding stock on site, from the few bones of infant calf and piglet. Considerably more evidence for such backyard stock rearing has been found at medieval Hartlepool (Rackham 2010). Veal, sucking pig and fowl appear to have been very occasional festive fare, with beef and mutton more commonly available.

Phase 4

For the domestic meat animals in this phase, the proportions of bones deposited in the pits and the other feature types are comparable and in contrast to the medieval pattern, with a reversal of the proportions of cattle to sheep/goat bones. The latter are most abundant, while pig remains are less frequent than in the medieval pits. This cannot be due to recovery or preservational bias given the high proportion of similar sized sheep/goat fragments. For cattle and sheep/goat, the body part representation also contrasts with the medieval pits. There are far fewer fragments from the head for both species whilst axial and hindlimb fragments are most common for cattle. Hindlimb is well represented for sheep and the broadly comparable proportions of fore and hindlimb bones with metapodials may indicate that the feet were left on the joint, rather than being removed in the skin. Hogarth's 18th-century depiction of 'An Election Entertainment' clearly shows the foot left on the joint, for example. Chop mark butchery was standard on the bones in the pit fills; one proximal cattle humerus from pit [F191] had been severed with one mighty blow through the head. Both cattle and sheep carcasses had been split into sides and saw mark butchery, characteristic of the later 18th and 19th centuries, was observed in the fill of culvert F89 and fill of brick drain F217.

In contrast to the earlier medieval occupation dog bones are abundant during this phase; conversely, bones gnawed by dogs were infrequent. Animals of a variety of sizes are represented, the smallest indicated by an ulna in rubble context 33 which is of similar size to a cat. The acetabulum from a much larger animal in context 29 had been clearly chopped through the ilial shaft, suggesting that the dog remains are not all necessarily from household pets. The majority of the dog bones had been deposited in pit fills; an articulating humerus and ulna were found in pit F262, at least two animals are represented in pit F148 and two fills in pit F191 contained concentrations of dog bones indicating several animals.

The abundance of dog bones may relate to activity in the vicinity, or the function of the pits. There is an apparent absence of bones from the paws, which might suggest that these had been removed in the skins. Dog faeces were integral to the production of certain leathers and dog skins too were cured (Thomson 1981), but this would not require carcass dismemberment. Dog carcasses could be butchered for feeding back to dogs (Wilson and Edwards 1993), but there is no evidence of canid gnawing on the dog bones. A 17th-century recipe for a

pomatum for the hair was proposed as a possibility for other post-medieval dog bones with cut marks from Newcastle (Gidney 1996). Smith (1998) discusses the evidence for the exploitation of dogs in Scottish towns and notes the export of dog skins to England and France in the 17th century and the use of dog skins for fishing floats on the east coast. Smith also found marks suggestive of butchery, rather than skinning, and postulated this might be a response to a period of dearth or food shortage. However, this seems unlikely on this site given the paucity of dog bones in the medieval deposits, which encompass the famine period of the early 14th century (Kershaw 1973). Certainly the deposition of disarticulated dog body parts at Half Moon Yard is part of a broader post-medieval trend within both Newcastle upon Tyne and towns in Scotland, even if the exact purpose for dismembering dog bodies remains unclear.

Despite the post-medieval pits appearing similar to the medieval features during excavation, the faunal contents reveal strikingly different patterns of consumption and disposal. Consumption of meat is indicated, with the sheep carcass being favoured and larger animals than the medieval finds are represented. The choice of viand appears to have been almost solely between beef, veal, mutton and lamb, with scant representation of pig and fowl and no festive dining species such as goose. The light industrial use of the site, seen in the medieval phase, appears to have continued but exploiting an entirely different species: the dog. Quite what the dog bodies were being used for remains unclear, but this site has provided a substantial addition to a growing body of data for such post-medieval deposits.

FISH BONES

Jennifer Harland

A small assemblage of fish remains was recovered from the excavations. The assemblage was in moderate condition and displayed a considerable amount of burnt bone, particularly in the later phase of activity at the site. From a total of over 1400 fragments, 161 could be identified to species or broader taxonomic grouping. All of the fish remains were derived from sieving, barring 2 specimens: one was a large ling caudal vertebra from a fish of over 1m total length, found in a medieval pit fill. The other hand-collected bone was a large cod cleithrum from a 17th century pit fill. This was exceptionally well preserved compared to the rest of the assemblage, and it might be evidence for the import and consumption of preserved cod (see below).

Phases 2 and 3

A wide range of fish species was found at Half Moon Yard, despite the small size of the assemblage. The medieval deposits contained remains from rays, eel, herring, salmon and trout family, cod family, cod, haddock, ling, whiting, a putative perch, and a few flatfish. No one fish taxa dominated the assemblage. Herring was the most commonly identified fish, accounting for about a third of the fragments in the medieval period. Cod family fish included cod, haddock, ling, whiting and those that could only be identified to family level; combined together, the cod family accounted for just over half the identified remains from the medieval deposits. Eel was present, but at low levels accounting for only 6% of the medieval assemblage, and the other taxa were present only at trace levels but they undoubtedly added diversity to the diet. Although herring appeared more numerous than any other single

species, the cod family fish probably provided much of the food: a single herring can contain a lot of bones relative to its contribution to the diet, whereas a large ling can provide many kilos of food without leaving too many bones for us to find.

Phase 4

The post-medieval remains were much less numerous but they still managed to include fragments from rays, eel, herring, cod family and cod. The post-medieval fragments follow the same general trends as the medieval material: no one taxa dominates, but cod family and herring were the primary fish along with the odd other species present to add diversity.

The emphasis on cod family and herring is completely typical of the time period, given that Newcastle is on a major river only a few miles from the sea (Barrett et al. 2004; Harland et al. 2008). The inhabitants had access to marine fish, most likely supplied fresh from the sea. They sampled the odd freshwater or migratory fish, including the eel and salmon or trout family fish found here (although the latter was tiny and probably wasn't intended for human consumption; see below). The putative perch would have been a freshwater catch. The small proportion of freshwater fish would suggest either limited access to the River Tyne, or a real preference towards marine fish.

A diverse range of sizes was exploited for all taxa, suggesting that a range of fishing grounds and fishing methods were used, from inshore to deeper water. The smallest of the fish remains were probably stomach contents from larger fish or from sea birds; this would include the single salmon and trout family identification and the single herring family identification, as well as the smallest of the cod family fish. This would imply that freshly caught fish were being gutted at Half Moon Yard. A range of sizes was recorded for cod, haddock, ling and whiting. Some of these were substantial fish, like the ling of over 1m in length and the various cod of 0.5–0.8 m and 0.8–1 m total length. Each of these fish could have produced a lot of food to feed several families, whereas the smaller herring and eels would barely have provided a single serving.

Some of the largest cod, haddock and ling may have been imported as preserved, prepared foods. In larger sites, element patterning and butchery marks can help establish the presence of imports (as can isotopic analysis to trace fish from producer and consumer). Here, no butchery marks were noted and there were both cranial and appendicular elements present for most of the target sizes of fish, so it is likely most of the fish were eaten when freshly caught in Phases 2 and 3. The few bones from the phase 4 were all from the vertebrae, but the small size of this phase makes the evidence equivocal. However, the single hand-collected large cod cleithrum from this later phase could well have been imported as a preserved foodstuff from the North Sea, Scandinavia, Iceland, or even, given the time period, from Newfoundland (Barrett et al. 2011).

OYSTER SHELL

John Carrott

The hand-collected shell assemblage was small and primarily recovered from pit fill deposits from Phase 3. Most of the remains were of rather poorly preserved oyster valves (although there were occasional remains which exhibited better preservation), together with traces of another edible shellfish, common cockle, and most likely derived from human food waste.

Both of these marine shellfish are indigenous (and often common) to British coasts but, overall, the assemblage was too small and lacking a detailed chronological framework for any investigation of patterns of distribution (spatial or temporal).

If the oysters were supplied from a cultivated source (or sources) then current evidence suggests that the closest beds would be those of the Firth of Clyde, followed by others along the Kent, Essex and Suffolk coasts (Winder 1992 and pers. comm.). However, Kenward (2009) has speculated that exploitation of local (but as yet unlocated) oyster beds may well have been more widespread along the east coast of England and the small quantities recovered here are far too little to imply any large-scale importation; the assemblage of oyster shells was also too small and too poorly preserved (in general) to form any impression of consistency in size, or otherwise, which might suggest a cultivated source or more casual collection, respectively. Certain organisms (e.g. *Polydora* spp. polychaete worms) which infest oysters have known preferred habitats, and this can help to identify the source of the oysters, but unfortunately such evidence was lacking — keelworms, probable tubes of which were recorded on a left oyster valve from drain F160; and perhaps also as remnants on occasional valves from pits F148, F191 and F262, are abundant on all rocky British shores (Hayward and Ryland 1995, 258).

CLAY PIPE

Jennifer Jones

Three clay pipe bowls and 30 stem fragments came from 12 contexts. None have stamps, decoration or maker's marks. The shape of the bowls from pits F107 and F191 are 17th century in date, while the bowl fragment from pit F166 suggests an 18th century date.

GLASS

Jennifer Jones

A total of 25 pieces were found, six of them window glass. Small thin (1mm) post-medieval window fragments came from Phase 3 pits F207 and F252 and Phase 4 pit F214. Post-medieval bottle sherds in mid-green and blue-green glass came from Phase 4 soil layer 39 and rubble 33. An unweathered green rim sherd from a jar or large bottle came from Phase 4 pit F148, a highly weathered, possibly medieval vessel fragment and part of a thin tube (5mm diameter) of weathered, curved glass 42mm long also came from this pit. A similarly weathered piece 19mm long × 8mm diameter came from Phase 4 pit F191; these may be fragments of applied vessel decoration.

BUILDING MATERIALS

Jennifer Jones

One fragment of medieval glazed roof tile was recovered from a pit, and several complete or part bricks with measurable dimensions were retained. Of these, one of these was of Tyneside Type 1 and one of Tyneside Type 7 of the Tyneside brick series (Fraser 1995, 183), though the other examples could not be matched to type.

TIN-GLAZED EARTHENWARE TILES

Jennifer Jones

Nine fragments (470g weight) of Dutch/English tin-glazed earthenware tiles were recovered, six of which had traces of glaze. Both polychrome and blue and white examples were found. The pieces are small, but some decorative motifs are identifiable: *fleur de lys* corner motif with central bear from pit F191; ox head corner motif from pit F148; central deer motif from pit F262. Only the polychrome fragment from pit F262 retains any traces of mortar. The tiles can be dated to Phase 4, the 17th to 18th centuries.

SILVER AND GOLD OBJECTS

Jennifer Jones, Alejandra Gutiérrez

A gold band was recovered from a layer of subsoil in Phase 5 that sealed the medieval features, context 31. The band is almost flat and narrow with a D-section. It is inscribed on the flat, interior surface, with the motto 'A true freinds remembran' in italic script (fig. 13a, b). It has a smooth terminal at one end and a broader, irregular and flatter terminal at the other. The band is 2.5 mm wide and the surviving length is 49mm. Once closed, the band would have produced a hoop 16mm in diameter.

The object was examined using Scanning Electron Microscopy with Energy Disperse X-ray Spectroscopy. The results show that the gold content is between 82.5 and 83.4%, with some silver (around 3%), copper (1.1–1.5%) and aluminium (0.6–1.3%). The gold content corresponds with a 20 carat standard. Microscopic examination of the object revealed a partial seam running lengthwise (fig. 13c) which seems to be evidence of the manufacturing process as a result of 'strip-drawing' the gold wire (Oddy 1977). The marks at the wider terminal are impossible to identify with any certainty (fig. 13d and 13e) but they seem more likely to be tool marks from pliers used during the manufacture of the band rather than being remnants of a now lost shoulder/gem setting/decoration, as they are neither regular nor symmetrical.

This is a posy finger-ring, numerous parallels for this type of inscribed finger-ring exist between the late 16th and 18th centuries; the posies (from the French *poésie*) or verses usually have an amatory, ethical or religious character of the kind seen here. In contrast to earlier models, post-medieval posy rings are usually plain bands, engraved in English, and bear the inscription on the inside. They were worn by all social classes as betrothal rings (Dalton 1907, 177–178). The italic script seen here is typical of the period and quite distinct from earlier examples on which a solid, regular black lettering is used. The writing here has the same calligraphy and serifs as rings in the collections of the British Museum, especially examples marked with the initials TS, an unknown goldsmith active around 1650–1670 according to dated mourning rings which bear identical marks (Dalton 1912, no. 1187, 1459 and 1463, for example; British Museum 1961, 1202.269 and 1202.471, AF.1268, AF. 1530, AF. 1534).

It seems likely that this find from Newcastle was in the process of being made into a ring but it was never finished. Its finding in this part of Newcastle is intriguing. Goldsmiths are known in the city from the 12th century and they received their company charter in 1536, combined with pewterers, plumbers, glaziers and painters. By the end of the 17th century there were thirteen goldsmiths but by 1702 a total of 287 different marks were punched on a copper plate to record as many makers whose plate was assayed in the city when the Newcastle Goldsmiths became an independent company (Boyle 1894). This area of the city

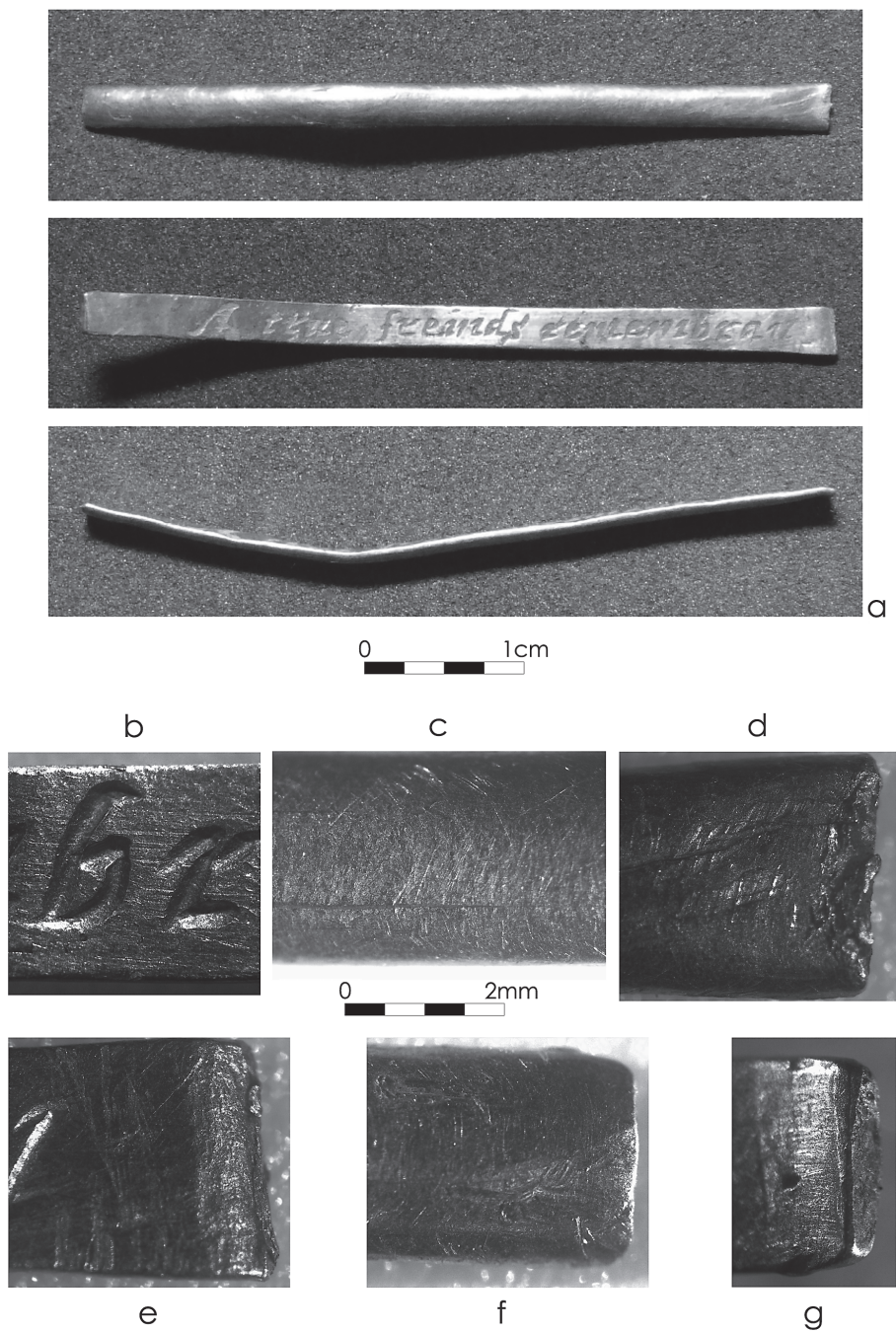


Fig. 13 The gold band as found during excavation (a), detail of the engraving (b), detail view showing the seam (c), detail showing the marks at the wider terminal of SF1 (d=exterior, e=interior), detail of smooth terminal of SF1 (f=exterior, g=interior).

was well known for its shops and markets: whether or not any of these included a goldsmith is unknown. Although their trade is well documented in Newcastle so far no goldsmiths have been traced in this part of town, either in the written or archaeological record (Jackson 1905, 329; Carey 2008a; Archaeological Services 2013).

A silver alloy object with a lobulated edge was recovered from Phase 3 pit F258. The object is incomplete and badly corroded, but could be heart-shaped originally. It is impossible to identify its function with certainty but, given the material it is made from and its shape, this artefact may be a brooch or perhaps a mount.

METAL OBJECTS

Jennifer Jones

A complete coin was found in Phase 5 stone rubble 33, a George III halfpenny dating to 1799. A damaged small oval maker's badge (50 × 40 mm) with two nail holes also came from context 33. It is made from tinned copper alloy or a tin alloy and bears a partial inscription arranged in three lines, stamped into the thin metal from the back. This reads:

C SNOWBA*L
 ***DLER
 NEWCAST**

This may refer to Cuthbert Snowball, a 19th-century Newcastle resident, who was married in St Nicholas Cathedral in 1839 and whose occupation is listed as 'saddler' in the 1881 census.

Eight highly corroded iron object fragments were recovered, six of them revealed as nails by X-radiography. A fragment from an iron shaft, undiagnostic, but perhaps from a hinge pivot or a large, whittle-tang knife or tool came from Phase 2 pit F324; parallels for medieval examples are numerous (for example, Goodall 1993a, 149; 1993b; Goodall 2000, 144). Two small fragments of waste lead came from Phase 3 pit F258 and a short length (44 mm) of probable lead window came was found in service trench F107.

BONE OBJECT

Jennifer Jones

Part of a bone handle in poor condition came from Phase 4 pit F191. It is 82 mm long by 14–20 mm diameter and has been made from a single long bone drilled with a 7 mm perforation along c. 60% of its length. Drill marks can be clearly seen inside where the surface is lost. The handle retains part of a decorative incised line just below its top edge and the shaped terminal has a slight central knop. The outside surface is now distorted, but was probably originally faceted. The handle is most likely post-medieval, supported by pottery finds from the context which are dominated by 17th-/18th-century wares.

CLAY OBJECT

Jennifer Jones

A clay marble 20 mm diameter came from soil layer 150 beneath wall F47; it is made from white clay slightly marbled with red. It is probably a toy and is post-medieval.

WOOD OBJECTS

Jennifer Jones

Six fragmentary examples of wooden floor blocks were examined from Phase 5 [F5] in Trench 1, none complete. Pieces from five planks/stakes were recovered from waterlogged contexts, along with wooden floor blocks and a few other fragmentary objects. Most pieces were wholly or partly degraded. Many of the well-preserved parts are heavily contaminated with sulphur and iron salts, and most pieces are of unknown function. The results are summarised in Table 1.

Table 1 Summary of wooden objects recovered

Context	Phase	Wood type	Function
F5	5	oak	Wooden floor blocks
F54	2	unknown	Wattle weave
F115	3	unknown	Wattle weave
F116	1	oak	Unknown, fragment
F223	3	oak	4 × Plank/stake
F252	3	oak	Plank/stake
F266	3	hazel	Unknown
F279	3	oak	Unknown

A wooden object was recovered from the evaluation of the site (Carey, 2008b). It came from large pit [F266] in Phase 3. The object was broken into two closely-joining pieces with a worn 'dog leg' break, which probably occurred during burial at a point of previous weakness. Both ends are intact and both show evidence of wear and battering. The slightly larger end has a short, cut or 'polished' angled surface. The object appears to be complete, but has no detectable nails, nail holes or joints to suggest it was once part of a larger piece. In contrast to the battered ends, the surfaces are relatively unworn with a fairly rough finish and some axe/adze marks visible. Microscopic examination identified the wood as hazel (*Corylus* sp.). It was hoped that conservation and examination of the piece might yield clues as to its function in order to further interpret its context. Although this piece has no joints or nails, the condition of the ends suggests it has been extensively used. If there were joints or nails, an interpretation as part of a piece of furniture would be most likely. Though it is perhaps most likely that wear at the break between the two fragments has obscured a small mortise joint, a definite identification of the piece must remain obscure.

LEATHER

Jennifer Jones

A very small assemblage of leather was recovered that probably reflects casual disposal and loss. There is no evidence for the systematic disposal of waste from leather working or cobbling activity. Four small offcuts with no nail or stitch holes were recovered from brick flue F102. Pit F132 produced one small offcut with no nail or stitch holes and two upper fragments, some edges cut with no nail or stitch holes and one offcut with no nail or stitch

holes. Two offcuts with no nail or stitch holes were recovered from pit F223. Pit F266 produced 24 very small fragmentary and degraded pieces with no nail or stitch holes.

INDUSTRIAL RESIDUE

Jennifer Jones

The site produced small quantities (202g weight) of cinder and fuel ash slag from pits F115, F56, F258, F246 and F313. This small quantity of material represents fuel waste, probably from domestic use; 362g weight of ironworking residue and hammerscale was also found. Small quantities of probable smithing residue came unstratified and from pit F115. Most of the material (240g) came from pit F258, and consisted of three pieces of dark, dense smithing residue with a slightly vesicular interior and evidence of drip accumulation on the surfaces. This small quantity of residue probably represents casual disposal. Very small quantities (<10g) of hammerscale and other magnetic material were found in three samples from pits F166 and F252 and posthole F199.

PLANT MACROFOSSILS

Charlotte O'Brien, Lorne Elliott

Palaeoenvironmental analysis has been carried out on 103 bulk samples taken during the evaluation and excavation phases of work. The majority of the samples were from large inter-cutting pits dating to the medieval period, many of which were waterlogged. Iron Age and post-medieval features were also sampled.

Phase 1: Iron Age activity

The primary fills of a series of pits and postholes were found to contain plant remains typical of the late prehistoric period including spelt wheat (*Triticum spelta*), barley, hazel nutshells and weed seeds comprising brome, heath-grass, ribwort plantain, sedges, grasses, buttercups, vetches and docks. The small flots contained charcoal, cinder, coal/coal shale, indeterminate tuber/rhizomes and heather twigs. The combination of these charred remains is characteristic of burnt turves (Hall 2003), which may have been used as fuel or construction purposes such as roofing or earth ovens. Some of the remains may also derive from gathered hay for fodder or bedding. Radiocarbon dating of a spelt-type wheat grain from posthole F96 indicated an Iron Age date. The later fills of some of these features contained a mixture of prehistoric remains and macrofossils more typical of the historic period (for example bread wheat and large oats). This is assumed to have resulted from disturbance by later activity on the site.

Phase 1: Palaeoenvironment

The weed flora recorded in the samples can provide information about the palaeoenvironment of the site and the surrounding area. The small assemblages of charred plant remains from the Iron Age features comprise plants characteristic of lowland heathland such as heath-grass, ribwort plantain, sedges, heather and grasses. This habitat generally occurs below 300m and is associated with bogs, scrub, scattered trees and acid grassland and would have been typical of the coal measures of south-east Northumberland and County Durham during

the Iron Age. Similar macrofossil assemblages have been recorded at other Iron Age sites including 370m south-west at Clavering Place (Archaeological Services 2016) and further afield at East Wide Open, Tyne and Wear (Archaeological Services 2014), Haswell in County Durham (Archaeological Services 2012) and Brenkley, Blagdon Hall and Shotton in Northumberland (Archaeological Services 2010a; 2010b; 2010c).

Phases 2–4: Cereal crops

Small assemblages of cereal remains were recorded across the site and throughout the main phases of activity. While spelt wheat and barley were in use during the Iron Age, the medieval cereal assemblages were dominated by oats. The large size of some of the oat grains suggests that the common cultivated oat, *Avena sativa*, was represented. However the majority of the oat grains from the site were small and slender, and many of these probably derive from bristle oats, *Avena strigosa*. A few chaff fragments from both species were recovered. The results suggest that either both oat species were being cultivated, or that *Avena strigosa* was a significant arable weed.

Barley was the second most frequently recorded cereal crop from the medieval features. Most of the barley grains could not be determined to species or variety due to their poor condition, but some of the better preserved grains were identified as hulled barley. A few were noted to have a twisted shape, which is characteristic of a proportion of grains from 6-row barley (*Hordeum vulgare*), although twisting can also result from distortion during charring. A single rachis fragment was identified as 6-row barley, but the few others were too damaged to be differentiated between the 6-row and 2-row (*Hordeum distichum*) species. Half Moon Yard is located in the Bigg Market (formerly Beremarket), the terms 'bere' (English) and 'bigg' (Scandinavian) refer to barley and this market was where barley, oats and other cereals were sold. Bigg/bere refers specifically to 4-row barley, however the archaeobotanical remains were generally too undiagnostic and too few in number to confirm if this was the main species of barley in use at the site.

Wheat grains were recorded occasionally and in low numbers, the majority of the grains having the characteristic shape of bread wheat (*Triticum aestivum*). Remains of rye were rare, with single grains noted in pits F115 and F252, and a grain and rachis fragment present in pit F313. The small size of the cereal assemblages on the site prevents a detailed analysis of changes in crop use over the medieval and post-medieval use of the site. While oats, and to a lesser extent barley, dominate the assemblages, by the 13/14th century the full range of crops (oats, barley, bread wheat, rye and legumes) are in use which is typical of medieval sites throughout Britain (Hall and Huntley 2007; Greig 1991).

Phases 2–4: other edible and economic plants

There is evidence for the use of peas and beans, which commonly formed part of the human and/or animal diet at medieval sites. Although they were present in low numbers, legumes are thought to often be under-represented in charred plant macrofossil assemblages, as their preparation does not involve exposure to fire. Vetches, an additional member of the pea family, were occasionally recorded.

Waterlogged (and occasionally charred) flax remains were present in several of the pits from Phases 2 and 3, and were abundant in the fills of pits F132 and F309. Flax is a versatile

crop, which in addition to producing fibre for clothing, ropes or sacking, may have been used to make linseed oil for food, preservative or medicinal uses. The by-products of oil and fibre production could have been used as fodder or fuel (Bond and Hunter 1987). Hemp was also an important fibre crop in Britain, particularly for the ship-building industry. Although fibre can be extracted from nettles (Catling and Grayson 1982), the abundant remains of common nettle in the pits may be a reflection of nutrient-enriched soils rather than the deliberate use of nettles as a fibre plant.

The charred and waterlogged remains indicate that a range of wild fruits and nuts was available, including hazelnuts, elderberries, blackberries, raspberries, hawthorn, plums, bullace/damson and sloes demonstrating exploitation of the wild food resources. A similar range of wild foods has been recorded from waterlogged pits at other urban sites in the region including Darlington Town Hall (Archaeological Services 2015) and Ripon Market Place (Archaeological Services 2011). Fig seeds were also recorded in Phase 2 and 3 contexts reflecting the use of introduced 'luxury' foods within the town from the 12th century onwards. Although figs can be grown in the warmest parts of England now (Roach 1985), Greig (1996) suggests that most archaeological finds of fig seeds derive from imported dried fruits. Unlike many of the excavations on the quayside (cf. Archaeological Services 2007; Hall and Nicholson 1986; Huntley 1989), grapes were not recorded at Half Moon Yard.

Some of the weed seeds noted in the features may reflect plants collected for the medicinal properties associated with them, such as henbane, which has narcotic, analgesic and sedative constituents (Stuart 1989). Remains of sea club-rush were found in the fills of pit F115 but not elsewhere on the site. Traditional uses of sea club-rush (and related members of the sedge family) include floor litter, bedding, matting, basketry, packing, rush lighting material and caulking for barrels (Gale and Cutler 2000). It is not clear whether the occurrence of these remains in pit F115 relates in some way to the smithing waste and horncores deposited in this feature.

Phases 2–4: palaeoenvironment

Many of the charred seeds recorded from the medieval features probably derive from weeds growing with the cereal crops, and this is particularly true of the arable weeds fat-hen, stinking chamomile and corn marigold. The ruderal species may also have grown in the fields, or on areas of waste, disturbed ground. Some wet ground species were recorded charred (sedges and ragged robin), which may reflect cultivation of damp, heavy soils and/or the burning of peat, dung or hay for fuel or kindling. The charred heather twigs may reflect burnt remains of bedding, roofing or winter fodder. Uncharred weed remains were abundant in the large waterlogged pits, with the assemblages dominated by a diverse range of arable and ruderal species, with sun spurge, fool's parsley, fat-hen, stinking chamomile, corn marigold, wild radish, small nettle and docks frequently recorded. Many of these may have been brought in with the arable crops and input of material from cultivated land is reflected in the beetle fauna. There is also a suggestion from the beetle remains for the presence of dung, stable manure and hay in some of the pits, which is echoed by the remains of grasses, docks and other ruderal weeds in the plant macrofossil assemblages. Nutrient-enriched soils, possibly as a result of the presence of manure, are indicated by the abundant remains of common nettle in many of the pits. Damp ground herbs including sedges, hemlock, bogbean, pale persicaria, marsh cinquefoil, lesser spearwort and hairy buttercup may reflect the collection

of peat for fuel, or input of material from wet pasture and damp meadow vegetation. Such habitats may have existed in the vicinity of Lort Burn, which flows behind the site.

Conclusions

The palaeoenvironmental evidence suggests both domestic rubbish and waste from industrial and craftwork activities was being disposed of in the pits. The relatively small quantities of food plant remains and hearth waste may reflect periodic clearing out of the pits and/or disposal elsewhere. Although there is evidence of fibre crops (flax and hemp), the pits themselves are unlikely to have been used for retting, as this polluting process was usually undertaken away from the areas of settlement (Gearey *et al.* 2005). There is also no indication that tanning was undertaken in the pits, although some waste from possible hide working is suggested by the faunal remains. The pits analysed for intestinal parasites were found not to have had a primary function as cesspits, although cess material may have been a component of some of the pits, particularly of F309, which comprised a large quantity of fruitstones and fig seeds, which are characteristic of cess deposits (Murphy and Scaife 1991). Cess-type concretions were also noted in some pits (e.g. F54 and F124). Phase 3 pit F115 comprised quantities of smithing waste, accompanied by large amounts of coal and clinker/cinder, suggesting that coal was the main fuel used for this metalworking activity. There is a general trend for a predominance of charcoal in the flot matrices of the Phase 2 fills, compared to coal and clinker/cinder in the Phase 3–5 fills. This may reflect a change from the use of charcoal to coal as the main fuel used in the later medieval and post-medieval periods, or that the Phase 3–5 features comprise a larger input of waste from industrial rather than domestic activities compared to the Phase 2 fills.

CHARCOAL

Lorne Elliott

Radiocarbon dating, pottery and plant macrofossil evidence indicate five broad phases of activity at the site. The largest accumulations of charcoal were associated with deposits from the medieval and post-medieval periods (Phases 2–4). Eleven pit fills representing these three phases of activity were selected for charcoal analysis. Charcoal deposits of Iron Age origin (Phase 1) are also discussed. Detailed results and methodology are included in the site archive (Archaeological Services 2015c).

Phase 1: Iron Age

Deposits from pits and postholes associated with this phase of activity generally produced relatively small flots comprising rare to occasional quantities of charcoal. The later fills of some of these features contained a mixture of charred remains typical of both prehistoric and medieval deposits due to disturbance, resulting in uncertainty as to whether or not the charcoal fragments were intrusive material. In some instances, increased mineralisation was noted compared to charcoal fragments recovered from known medieval deposits, which may reflect an earlier origin. Where there is more certainty of a prehistoric origin, the primary fills of these features predominantly comprised the remains of oak stemwood and small calibre hazel branchwood, with fewer occurrences of cherries, birch, willow/poplar and hawthorn/

apple identified. Unfortunately the low quantities of charcoal and small fragment size provide little interpretative value for this earlier phase of activity. Clinker/cinder and coal remains from these deposits were negligible.

Phase 2: 11th–12th century

Charcoal remains are a common component of the pit deposits associated with this phase of activity, whereas coal and clinker/cinder generally occur in small quantities. The comminuted nature of this material is typical of fuel debris from domestic hearths and is probably the result of exposure to repeated burnings. The presence of burnt food waste (animal bone, nutshell and cereal remains) provides additional evidence for the disposal of domestic hearth waste.

A minimum of thirteen woody taxa were identified from the two pit deposits radiocarbon dated to this phase of activity. Initial assessment of the charcoal from these contexts indicated a predominance of oak, hazel and willow/poplar. Other species identified included ash, alder, birch, cherries, holly, rowan, heather, yew, apple/hawthorn and blackthorn/plum. The diversity of tree and shrub species within these charcoal assemblages reflects the long-term deposition of firewood remains and the random exploitation of the woodland resources, consequently providing an indication of landscape clearance for this period. This palaeo-environmental evidence is given added importance considering the absence of pollen studies for the surrounding area during this time.

Evidence of three and seven year growth in hazel branchwood from pit F54 is of interest, as these are typical cycles for short rotation coppice in order to maximise yield (Agate 2002). This supports documentary evidence for the formal management of woodlands for timber and roundwood during the medieval period (Huntley 2010). However, the low number of fragments with evidence of coppicing suggests this resource was too valuable a commodity to be used as firewood.

Phase 3: 13th–14th century

Generally, there was a noticeable increase in the quantity of charcoal recorded for Phase 3 features compared to Phase 2, with most deposits comprising moderate to abundant amounts. Quantities of coal and clinker/cinder increased sharply too, possibly as a result of an increase in industrial activity at the site. Eight charcoal samples were analysed from this phase. As with Phase 2 there is a diverse range of taxa with oak and hazel predominant. Species identified included alder, birch, willow/poplar, hawthorn/apple, holly, heather, elm, ash, gorse/broom, pine and guelder-rose. Overall, the fragments were relatively small in size, often with moderate to strong ring curvature and anatomical properties of stemwood and branchwood.

The quantity of charcoal in the fills of pit F115 decreases from common in the primary fill 76 to rare in the upper fill 45. In contrast, the amount of coal and clinker/cinder in these deposits increases from occasional to abundant. Analysed charcoal indicated oak and hazel were predominant, with evidence of stemwood and heartwood recorded. This charcoal was very dark in appearance (not reflective) with few mineral inclusions. The large fragment size of some of the oak charcoal (>10 mm) and the identification of heartwood may indicate some of the charcoal is fuel waste from small-scale industrial practices, as oak produces the

required high temperatures. The large quantity of coal and clinker/cinder recovered from the upper fills of pit F115 also probably represents the remains of fuel for industrial purposes. The common occurrence of hammerscale (ball/flake) provides credible evidence for metal-working waste. Documentary evidence states that in 1305 merchants such as smiths and brewers in Newcastle were using coal because wood and charcoal were already scarce and costly (Taylor 1858).

The charcoal deposits from pit F307 were very similar in composition, predominantly comprising oak fragments containing radial cracks, comparable preservation and anatomical properties typical of structural timber. The large fragment size of this material is not typical of domestic hearth waste and probably indicates an ephemeral nature for these deposits. These remains may represent the deposition of a burnt structure or reflect some form of industrial purpose. The presence of burnt clay supports either of these possibilities, although the inclusion of charred cereal remains may suggest otherwise.

Phase 4 and 5: post-medieval

Bulk samples taken from features associated with these later phases predominantly comprised fragments of coal and clinker/cinder with only rare occurrences of oak, ash and hazel charcoal. The exception was pit deposit [336] which comprised a large quantity of charcoal, although fragments of clinker/cinder and coal were abundant. The charcoal from [336] was unusual in its nature, being predominantly comprised of gorse branchwood, with smaller quantities of blackthorn/plum and hawthorn/apple. Radial cracks and low levels of vitrification occurred in the majority of fragments. Additional species were represented by a few fragments of oak, alder and pine. The composition of the charcoal assemblage from 336 differs remarkably from the rest of the samples from the site. Whether this reflects changing economic, social or environmental factors during later activity at the site or whether it relates to a specific use is uncertain. Gorse has been of economic importance throughout history as it makes good kindling and is often widespread and abundant on heathland commons. This shrub was often used as an alternative fuel when wood and peat were in short supply before the development of the coal trade, with known uses including fuelling baking ovens, firing brick and tile kilns and smoking food, particularly fish (Humphries and Shaughnessy 1987). The considerable proportion of burnt fish bone recorded in the analysis of deposit 336 may be more than just a coincidence. The additional presence of twigs and small branchwood from fruit trees (blackthorn/plum and hawthorn/apple) may be significant, as these particular species are also considered favourable for smoking food as a way of flavouring or preserving. Radial cracks and vitrification noted in many of the fragments are thought to be the result of either rapid combustion at high temperatures (Schweingruber 1990) or the burning of damp and green wood (Marguerie and Hunot 2007), the latter would be fitting for the smoking process.

INSECT ANALYSIS

Stephen Davis

Insect remains were extracted from a total of three samples using a standard paraffin flotation technique as described by Kenward *et al.* (1980). The samples represented the primary fills of three pits; Phase 2 pit F132 and Phase 3 pits F252 and F266. Each sample follows the same

general trend: large numbers of refuse-dwelling taxa, implying compost, grass heaps or well-rotted manure type material, mould taxa characteristic of similar environments, structural pests (woodworm), stored product pests at low frequency, some arable elements, small numbers of aquatic taxa and numerous phytophagous taxa, particularly of floodplain taxa.

As an assemblage this is strongly indicative of stable manure (cf. Kenward and Hall's (1997) — the dung and refuse of large herbivores kept in stalls, from the dung of the animals themselves which may incorporate for example taxa consumed from collected hay or silage, including often low numbers of stored product pests. There is no evidence within these samples of, for instance, industrial activities such as tanning. The presence of a small, dryland component within each assemblage may actually relate to the primary digging of the pits themselves, effectively acting as pitfall traps.

INTESTINAL PARASITE ANALYSIS

John Carrott

Five small sediment samples were assessed for the eggs of intestinal parasites using the 'squash' technique of Dainton (1992). Only two of the samples analysed produced parasite eggs. Phase 2 pit F132 and the primary fill of Phase 3 pit F339, gave a single poorly preserved *Trichuris* egg and the latter also a possible infertile *Ascaris* egg. Measurements of the eggs from pit F339 (that from pit F132 could not be measured) fell within the range to be from the parasitic nematodes of either humans or pigs but a determination between the two was not possible. These occasional records represent no more than a 'background level' of faecal contamination of the deposits.

A possible coprolite was also examined from the primary fill of Phase 3 pit F115. Analysis revealed it to be composed largely of heavily comminuted bone. No parasite eggs were seen in a 'squash' subsample taken but the material was almost certainly dog faeces.

DISCUSSION

The archaeological investigations at Half Moon Yard have shown that there was activity in this area from as early as the Iron Age. Pits and postholes across the site contained plant remains typical of the late prehistoric period, and a spelt wheat grain from one of the pits has been radiocarbon dated to between 389 and 206 BC. It is possible that these features are the remains of roundhouses or other structures from Iron Age settlement on the site. Prehistoric activity, in particular remains of an Iron Age round house recorded 370m south-west at Clavering Place (Archaeological Services 2016) and a Bronze Age roundhouse recorded 190m north-east of the site on High Bridge (Brogan 2010), has been recorded nearby and it is possible these sites form part of a larger multi-phase prehistoric settlement or settlements beneath the better-known medieval town. This may have implications for further research in the centre of the city, particularly the importance of obtaining radiocarbon dates. Arid marks from probable Iron Age ploughing were also identified; similar features were recorded beneath the Roman fort of *Pons Aelius* 350m to the south-east (Snape and Bidwell 2002). Other features across the site, though medieval in date, contain residual prehistoric plant remains suggesting that prehistoric features in this area have been removed by the medieval activity.

Across the site intercutting pits were recorded. Some of these pits could date from as early as the middle of the 11th century, with radiocarbon dates from three features dating to between 1013 and 1156 and therefore predating the construction of the medieval walls and the earliest known record of the medieval Bigg Market. The dates for the pits are however contemporary with known dates for the foundation of St Bartholomew's Nunnery which was founded by 1135 (Graves and Heslop 2013). The full extent of the nunnery precinct is not known; Corbridge's map of 1723 shows it fills in a large area between Newgate Street, the town wall and the Lort Burn and may extended as far as High Bridge. According to Bourne (1736, 48) the nunnery may have owned all the property on the Newgate Street frontage. The community leased properties in Market Street to tradesmen in 1292 and 1332. It is possible that they also owned property on the street front along Bigg Market.

An excavation immediately west of Half Moon Yard at the former Binn's Store revealed similar pits (NAA 1998). It has been conjectured that this land lay within the grounds of St Bartholomew's Nunnery as no boundary wall to the nunnery has been recorded. It is possible that the land within Half Moon Yard also belonged to the Nunnery; it is interesting to note that the pits at Half Moon Yard predate the Binn's store excavation by up to a century and features excavated 70m south-east at the Cloth Market by up to two centuries, the earliest medieval pottery from the Cloth Market dating to the mid-14th century (Tullett and McCombie 1979, 134).

The majority of the pits on the site were in use from between the 12th and 14th centuries, which coincides with the first known record of the Bigg market, established around the 13th century. There is no evidence that the pits were related to market activity, for example the storage of grain or industrial processes such as retting or tanning.

The pottery indicates a hiatus in activity on the site around the 16th century; a build-up of soil over the medieval features indicates that the site went out of use around this time. This timescale would fit with the dissolution of the monasteries in 1536, and the demolition of St Bartholomew's in the late 16th century, perhaps indicating that if this land was part of the nunnery complex it was abandoned during the period of demolition before coming back into use in the 17th century.

The animal bone assemblage indicates that good housekeeping practices limited the deposition of faunal refuse on site. Episodes of refuse disposal from small-scale industrial use may suggest that hornworking, indicated by the deposition of cattle, sheep and goat horn cores, was taking place. The working of horn handles for metal tools may also be indicated, and evidence of metalworking taking place nearby may be taken to support this theory.

Fish were also being exploited during this period, mainly inshore and open water marine taxa, although some freshwater species were also present. The charcoal evidence also suggests that fish may have been smoked on site.

Evidence from the palaeoenvironmental results is comparable to other medieval urban studies undertaken in the region, including the nearby High Bridge site (Brogan 2010, 369), in terms of the cereal crops cultivated, the use of legumes, the exploitation of locally-grown fruits and nuts, and the cultivation of fibre crops such as flax and hemp, and indicates a varied diet of meat, fish, shellfish, cereals, pulses, fruits and nuts. The site has provided evidence for the combined use of bristle oats and common oats, in addition to the other cereals including barley, bread wheat and rye. In contrast to High Bridge however the import of dried fruits such as figs from as early as the 12th century is indicated, reflecting distant trade and a possible higher economic and social status compared to the site of High Bridge.

Charcoal analysis of features from Half Moon Yard has highlighted the economic and environmental changes taking place around Newcastle during the transition from the medieval to the post-medieval periods. Diverse charcoal assemblages radiocarbon dated to the medieval period indicate the exploitation of woodland resources and landscape clearance with a minimum of sixteen different tree and shrub species identified. This included rarely occurring taxa such as pine, yew, rowan and guelder-rose. The use of charcoal for domestic and industrial purposes is noted, although by the 14th century the use of coal becomes more evident.

During the post-medieval period further pits are excavated. The animal bone assemblage indicates the consumption of meat, with the sheep carcass being favoured and larger animals than the medieval finds being represented. A similar variety of fish continued to be consumed. The light industrial use of the site seen in the medieval phase appears to have continued but exploiting an entirely different species: the dog. Quite what the dog bones were being used for remains unclear, but this site has provided a substantial addition to a growing body of data for such post-medieval deposits.

The Half Moon Inn which gives the yard its name was founded in the later medieval or post-medieval period and it is likely that a lot of the activity seen on the site is a result of the Inn. From this we can infer that beef, veal, mutton and fish, dominant in the edible animal bone assemblage and brought to site as prepared joints, were the main meats of choice at the Inn. Palaeoenvironmental evidence for plants used for smoking of food, including gorse and fruit trees, may suggest the brick structures recorded in Phase 4 were smokers for fish and meat. The palaeoenvironmental and insect evidence points to the presence of animal bedding and stable manure suggesting horses were stabled at the Inn. A saddler's tag and evidence for some small scale metal working may also indicate that horses were being stabled here.

After the post-medieval pits were backfilled, the first boundary divisions are recorded, comprising the remains of two walls aligned north-east/south-west running at right angles to High Bridge, not Bigg Market. A similar event was recorded at 44–48 High Bridge (Brogan 2010) where the plots were laid out at right angles to High Bridge in the 17th century rather than to the medieval boundaries that ran from Pilgrim Street.

BIBLIOGRAPHY

- AGATE, E. 2002 *Woodlands: a practical handbook*, Doncaster.
- ARCHAEOLOGICAL SERVICES 2007 *Tuthill Stairs, Newcastle upon Tyne: palaeoenvironmental analysis*, unpublished report 1646, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2010a *Shotton Medieval Site, Northumberland: plant macrofossil analysis*, unpublished report 2460, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2010b *Brenkley Lane, Northumberland: plant macrofossil analysis*, unpublished report 2371, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2010c *Blagdon Hall, Delhi Extension Opencast, Northumberland: plant macrofossil analysis*, unpublished report 2504, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2011 *The market place, Ripon, North Yorkshire: post-excavation analysis*, unpublished report 2711, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2012 *Haswell Wind Farm, Haswell, County Durham: post-excavation full analysis*, unpublished report 2819, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2013 *Half Moon Yard, Newcastle upon Tyne, Tyne and Wear: archaeological excavation and building recording*, unpublished report 3148, Archaeological Services Durham University.

- ARCHAEOLOGICAL SERVICES 2014 *East Wideopen, North Tyneside, Tyne and Wear: post-excavation full analysis*, unpublished report 3331, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2015 *Darlington Town Hall, Darlington: post-excavation full analysis*, unpublished report 3604, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2015b *Half Moon Yard, Newcastle upon Tyne, Tyne and Wear: post-excavation full analysis*, unpublished report 3763, Archaeological Services Durham University.
- ARCHAEOLOGICAL SERVICES 2016 *Former BEMCO site, Clavering Place Newcastle; post-excavation assessment*, unpublished report 3712, Archaeological Services Durham University.
- BARRETT, J. H., LOCKER, A. M. and ROBERTS, C. M. 2004 'Dark Age Economics revisited: The English fish bone evidence AD 600–1600', *Antiquity* 78, 618–636.
- BARRETT, J. H., ORTON, D., JOHNSTONE, C. and HARLAND, J. 2011 'Interpreting the expansion of sea fishing in medieval Europe using stable isotope analysis of archaeological cod bones', *Journal of Archaeological Science* 38, 1516–1524.
- BOND, J. M. and HUNTER, J. R. 1987 'Flax-growing in Orkney from the Norse period to the 18th Century', *PSAS* 117, 175–181.
- BOURNE, H. 1736 *The History of Newcastle upon Tyne, Newcastle upon Tyne*.
- BOYLE, J. R. 1894 'The goldsmiths of Newcastle', *AA*², 16, 397–440.
- BROGAN, G. 2010 'Excavations and building recording at 44 to 48 High Bridge, Newcastle upon Tyne', *AA*⁵, 39, 329–74.
- CAMPBELL, M. 1991 'Gold, silver and precious stones', in Blair, J. and Ramsay, N (eds), *English medieval industries*, The Hambledon Press, London, 107–166.
- CAREY, C. 2008a *An Archaeological Desk-Based Assessment at the Half Moon Yard, Bigg Market*, unpublished report 2008/42, Archaeological Research Services.
- CAREY, C. 2008b *An Archaeological Evaluation at Half Moon Yard, Bigg Market, Newcastle upon Tyne*, unpublished report 2008/49, Archaeological Research Services.
- CATLING, D. and GRAYSON, J. 1982 *Identification of vegetable fibers*, London.
- DAINTON, M. 1992 'A quick, semi-quantitative method for recording nematode gut parasite eggs from archaeological deposits', *Circaea* 9, 58–63.
- DALTON, O. M. 1912 *Franks Bequest. Catalogue of the finger rings, early Christian, Byzantine, Teutonic, mediaeval and later*, London.
- DALTON, O. M. 1907 *A guide to the medieval room and to the specimens of mediaeval and later times in the gold ornament room*, Oxford.
- EDWARDS, B. J. N. 1966 'The Pottery', in Harbottle, B. 'Excavations at the South Curtain Wall of the Castle, Newcastle upon Tyne, 1960–61', *AA*⁴, 44, 79–145.
- FRASER, R., JAMFREY, C. and VAUGHAN, J. 1995 'Excavation on the site of the Mansion House, Newcastle 1990', *AA*⁴, 23, 145–214.
- GALE, R. and CUTLER, D. 2000 *Plants in archaeology: identification manual of artefacts of plant origin from Europe and the Mediterranean*, Otley.
- GARRARD, I. and STREETER, D. 1983 *The wild flowers of the British Isles*, London.
- GEAREY, B. R., HALL, A. R., KENWOOD, H., BUNTING, M. J., LILLIE, M. C. and CARROTT, J. 2005 'Recent palaeoenvironmental evidence for the processing of hemp (*Cannabis sativa* L.) in eastern England during the medieval period', *Medieval Archaeology* 49, 317–22.
- GIDNEY, L. J. 1996 'The Cosmetic and Quasi-Medicinal Use of Dog Fat', *Organ* 11, 8–9.
- GOODALL, I. 1993a 'Iron door, window and furniture fittings', in Margeson, S. 'Norwich households: the medieval and post-medieval finds from Norwich survey excavations 1971–1978', *East Anglian Archaeology* 58, 148–155.
- GOODALL, I. 1993b 'Iron knives', in Margeson, S. 'Norwich households: the medieval and post-medieval finds from Norwich survey excavations 1971–1978', *East Anglian Archaeology* 58, 124–133.
- GOODALL, H. I. 2000 'Iron objects', in Ellis, P. (ed.) *Ludgershall Castle, Wiltshire: a report on the excavations by Peter Addyman, 1964–1972*, 143–156, Newton Abbot.

- GRAVES, C. P. and HESLOP, D. H. 2013 *Newcastle upon Tyne, the eye of the North: an archaeological assessment*, Oxford.
- GRAVES, G. 1996 *Medicinal plants: an illustrated guide to more than 180 herbal plants*, London.
- GRAY, W. 1649 *Chorographia, or a survey of Newcastle upon Tyne*, Newcastle.
- GREIG, J. 1996 'Archaeobotanical and historical records compared — a new look at the taphonomy of edible and other useful plants from the 11th to the 18th centuries A.D.', *Circaea* 12 (2), 211–247.
- GREIG, J. R. A. 1991 'The British Isles', in Van Zeist, W., Wasylikowa, K. and Behre, K. E. (eds) *Progress in Old World Palaeoethnobotany*, Rotterdam.
- GUTHRIE, J. 1880 *The River Tyne: its history and resources*, Newcastle upon Tyne.
- HALL, A. 2003 *Recognition and characterisation of turves in archaeological occupation deposits by means of macrofossil plant remains*, Centre for Archaeology Report 16/2003.
- HALL, A. R. and HUNTLEY, J. P. 2007 *A review of the evidence for macrofossil plant remains from archaeological deposits in northern England*, English Heritage Research Department Report Series 87, London.
- HALL, A. R. and NICHOLSON, R. 1986 'The plant remains from excavations at Queen Street, Newcastle upon Tyne, 1984–85', *AML Report New Series* 45/86.
- HALL, A. R., TOMLINSON, P. R., HALL, R. A., TAYLOR, G. W. and WALTON, P. 1984 'Dyeplants from Viking York'. *Antiquity* 58, 58–60.
- HARCOURT, R. A. 1974 'The Dog in Prehistoric and Early Historic Britain', *Journal of Archaeological Science* 1, 151–175.
- HARLAND, J. F., JOHNSTONE, C. and JONES, A. K. G. 2008 'A case study from the Medieval Origins of Commercial Sea Fishing project: Zooarchaeological results from York (UK)', in Béarez, P., Grouard, S. and Clavel, B. (eds) *Archéologie du poisson. 30 ans d'archéo-ichtyologie au CNRS*, 15–26, Antibes.
- HAYWARD, P. J. and RYLAND, J. S. (eds) 1995 *Handbook of the marine fauna of north-west Europe*, Oxford.
- HUMPHRIES, C. J. and SHAUGHNESSY, E. 1987 *Gorse*, Aylesbury.
- HUNTLEY, J. P. 1989 'The plant remains', in O'Brien, C. *et al.*, 'Excavations at Newcastle Quayside: the Crown Court site', *AA*⁵, 17, 141–205.
- HUNTLEY, J. P. 2010 *A review of wood and charcoal recovered from archaeological excavations in Northern England*, English Heritage Research Department Report Series 68.
- JACKSON, C. J. 1905 *English goldsmiths and their marks*, London.
- KENWARD, H. 2009 *Northern regional review of environmental archaeology: Invertebrates in archaeology in the north of England*, English Heritage Research Department Report Series 12/2009.
- KENWARD, H. K., HALL, A. R. and JONES, A. K. G. 1980 'A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits', *Scientific Archaeology* 22, 3–15.
- KENWARD, H. K. and HALL, A. R. 1997 'Enhancing Bioarchaeological Interpretation using Indicator Groups: Stable Manure as a Paradigm', *Journal of Archaeological Science* 24, 663–673.
- KERSHAW, I. 1973 'The Great Famine and Agrarian Crisis in England' 1315–1322, *Past and Present* 5, 1–50.
- MACKENZIE, E. 1827 *Historical Account of the Borough of Newcastle upon Tyne including the borough of Gateshead*, Newcastle upon Tyne.
- MARGUERIE, D. and HUNOT, J.-Y. 2007 'Charcoal analysis and dendrology: data from archaeological sites in north-western France', *Journal of Archaeological Science* 34, 1417–1433.
- MCKENNA, W. J. B. 1992 'The environmental evidence', in Evans, D. H. and Tomlinson D. G. (eds), *Excavations at 33–35 Eastgate, Beverley 1983–86*, 227–35, Sheffield.
- MURPHY, P. and SCAIFE, R. G. 1991 'The environmental archaeology of gardens', in Brown, A. E. (ed.), *Garden Archaeology*, CBA Research Report 78, 83–99.
- NORTHERN ARCHAEOLOGICAL ASSOCIATES 1998 *Archaeological excavation at the former Binn's Store, Newcastle upon Tyne*, unpublished report, Barnard Castle.
- ODDY, A. 1977 'The production of gold wire in Antiquity', *Gold Bulletin* 10 (3), 19–27.

- PRE-CONSTRUCT ARCHAEOLOGY 2004 *An archaeological desk-based assessment: 31–39 High Bridge, Newcastle upon Tyne*, Unpublished report, Durham.
- PRESTON, C. D., PEARMAN, D. A. and DINES, T. D. 2002 *New Atlas of the British and Irish Flora*, Oxford.
- RACKHAM, D. J. 2010 'Meat supply and the pastoral economy', in Daniels, R. (ed.) 'Hartlepool: An archaeology of the medieval town', *Tees Archaeology Monograph Series 4*, 186–194.
- ROACH, F. A. 1985 *Cultivated fruits of Britain; their origin and history*, Oxford.
- SCHWEINGRUBER, F. H. 1990 *Microscopic Wood Anatomy*, Birmensdorf.
- SMITH, C. 1998 'Dogs, cats and horses in the Scottish medieval town', *PSAS* 128, 859–885.
- SNAPE, M. and BIDWELL, P. 2002 'The Roman fort at Newcastle upon Tyne', *AA⁵*, 31, 139–72.
- STUART, M. 1989 *The encyclopaedia of herbs and herbalism*, Novara.
- SWANN, N. 2013 'Excavations within the grounds of Newcastle University, Percy Street, Newcastle upon Tyne', *AA⁵*, 42, 207–34.
- TAYLOR, G. and SCARISBRICK, D. 1978 *Finger rings from ancient Egypt to the present day*, Lund Humphries, London.
- TAYLOR, T. J. 1858 'The Archaeology of the Coal Trade', in Hartshorne, C. H. (ed.) *Memoirs chiefly illustrative of the history and antiquities of Northumberland*, London.
- THOMSON, R. 1981 'Leather manufacture in the post-medieval period with special reference to Northamptonshire', *Post-Medieval Archaeology* 15, 161–175.
- TULLETT, E. and MCCOMBIE, G. 1980 'An Excavation in the Cloth Market, Newcastle upon Tyne, 1979', *AA⁵*, 8, 127–41.
- VAUGHAN, J. and SAGE, A. 2006 *Draft report on the Medieval Pottery from Newcastle Castle*, Unpublished report.
- WILSON, B. and EDWARDS, P. 1993 'Butchery of horse and dog at Witney Palace, Oxfordshire, and the knacker and feeding of meat to hounds during the post-medieval period', *Post-Medieval Archaeology* 27, 43–56.
- WINDER, J. M. 1992 *A study of the variation in oyster shells from archaeological sites and a discussion of oyster exploitation*, Unpublished PhD Thesis, University of Southampton.

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