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Excavation on the Site of the Mansion House, Newcastle, 1990

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SUMMARY

THE excavation of the former Mansion House site, between the Close and the river, was undertaken to examine the development of a section of the medieval waterfront of Newcastle upon Tyne (NZ 249 636). This confirmed that a broad artificial platform over 50 metres wide had been created at the base of a steep river cliff through reclamation behind a sequence of successive stone waterfronts. Although there was evidence of waterfront construction and limited use of the platform in the 13th century, large scale development of the platform began in the 14th century. A large, L-shaped building was constructed abutting the river which was subsequently enlarged through the addition of an east range following the partial infilling of a "dock" in that position. With the construction of a new waterfront in the 15th century, the whole complex was extended further south. In the early 17th century the site was completely redeveloped; a large courtyard plan domestic building was erected behind a new waterfront wall. This building was demolished in 1691/2 and a large, Italianate, brick building was constructed as the Mansion House of the Corporation of Newcastle. This building was the residence of the Mayor of Newcastle until 1835 after which it became a timber warehouse and was burnt down in 1895.

INTRODUCTION

The excavation formed a second stage of investigation of archaeological deposits on the south side of the Close prior to redevelopment. A desktop appraisal of the area, west of Dove's warehouse, was carried out as part of an Envi-

ronmental Assessment of the area for Tyne and Wear Development Corporation (TWDC) in 1988. In accordance with the recommendations of the report a section of the town wall to the south of Close Gate was excavated in 1988-89 prior to construction of a hotel on that site. Trial trenching took place in 1989 to confirm the nature and extent of deposits beneath the proposed office development to the east of the hotel and a further excavation was then undertaken in order to fulfill a planning condition imposed on the developers by TWDC. This excavation, which encompassed one complete property (the Mansion House site—property 2) and part of a second to the west (property 1), took place between January and May 1990. The primary objectives were to map the extent of the town wall within the site; to establish the reclamation sequence of the area and to determine the nature and extent of development associated with that reclamation.

HISTORICAL BACKGROUND (FIG. 1)

The Close lies in the south-west corner of the medieval town. The street appears to have been laid out parallel to the river in the mid-13th century (Harbottle and Clack 1976, p. 121). The eastern end was certainly in existence by c.1260 when it was mentioned as the southern boundary of a property lying on the bankside below the Castle (Oliver 1924, p. 76 108). The street appears to have developed gradually westwards, since a roadway at the west end is not mentioned until c.1272 (*ibid*, p. 94 140). In this document the street forms the northern boundary to the property which lies on the river edge, while in a document relating to an adjacent property dated c.1268-9 (*ibid*, p. 21 18), it is the "hoga" or bankside which forms the northern boundary. Both

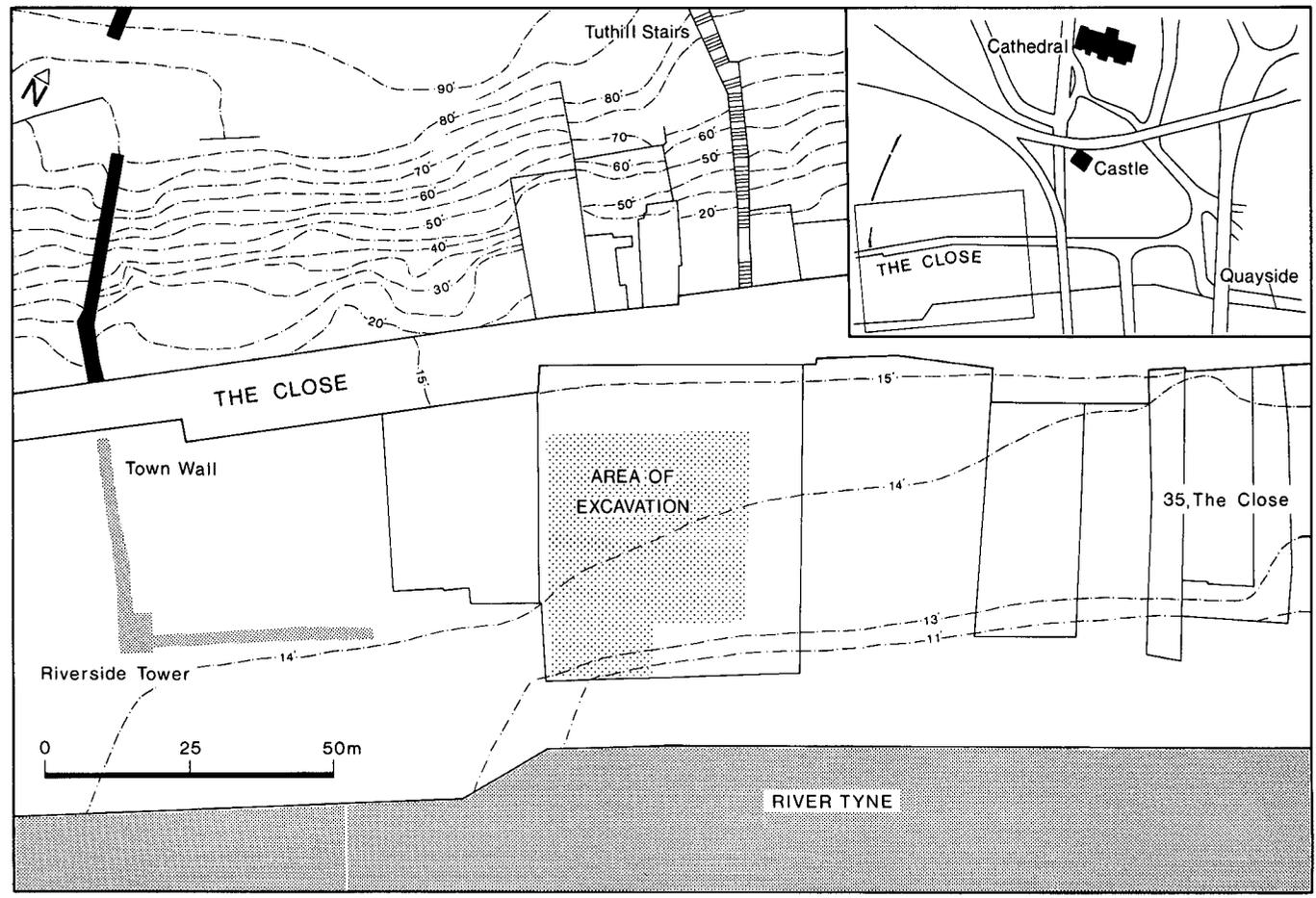


Fig. 1 Site location (contours in feet).

properties lie in the vicinity of and possibly outside the Close Gate.

The Close may have been partially enclosed behind a defensive ditch between 1311 and 1316 (Nolan et al. 1989, p. 29), but it was not until the mid-14th century that the first phase of town wall was constructed in this sector (ibid, p. 39). In this period, the wall was constructed on the bankside, south of the Carmelite Friary, and across a section of reclaimed foreshore and into the river. The Close Gate is also likely to date to this period and like the towers may have been constructed first. In the 15th century a square tower was added at the south end of the wall where it met the river and a further section of curtain was added to the east of it along the water's edge (Fraser et al. 1994). Cartographic representations of the area in the late 16th-century (fig. 2) and mid 17th-century (fig. 3) reflect this but show that most of the waterfront in the Close was not enclosed in this way.

No early deeds can be related directly to the excavated properties. Many of the properties mentioned in surviving medieval records belonged to either the Hospital of the Blessed Virgin Mary in Westgate or the Chapel of St. Thomas on Tyne Bridge. Between the 13th and 17th centuries a significant proportion of the tenants of these properties and the owners of others in the Close were important merchants and aldermen of the town. As late as the 18th century, the area was recorded as containing the houses of many of the town's most notable inhabitants (Bourne 1736, p. 126), although thereafter it declined due to the concentration of industrial processes (potteries, iron works, glass works and a soap manufactory) on the banks of the Tyne.

No documentary evidence exists which can be related to the property immediately to the west of the Mansion House. The earliest document relating to the Mansion House site records the sale of the property in 1683. This property was purchased by the Corporation from Ralph Carr for £700 (Twas 544/75 Enrolment Book 1682–85). It was then given as an endowment to the recently founded Holy Jesus Hospital in the town. The site is described as:

“All that Messuage Burgage or Tenement Key and Garden with their and every of their app(urtenances) scituait standing and being within the said Town and County of Newcastle upon Tine in a certaine street or place there called the Close now in the possession or occupacon of Nicholas Fenwicke Esq Mayor of the said Towne of Newcastle upon Tine Boundering upon a certaine place chair or common vennel upon or towards the east a messuage late in the possession of William Bonnor and now in the possession of the Lady Blackett on the west the said street called the Close on the north and the River of Tine on the south by its rights mettes and bounds Together with all and singular outhouses edifices Buildings Rooms Chambers Lofts Gardaines Courtaines Yards Backsides Keyes Wharfes Wayes passages Lightes Entries Easiaments . . .”

In 1691–2 this property was redeveloped as the Mansion House, which was constructed by the Corporation for £6000 (Mackenzie 1827, p. 232). Contemporary plans, illustrations and a single photograph show that the building was a large four storey structure of seven bays. The building had a flat roof with cupolas placed centrally at either end and a top balustrade. The corners of the building were picked out in rusticated sandstone quoins. The main entrance was detailed in a similar fashion and surmounted by a broken pediment. The main entrance lay at first floor level on the north side of the building. A double flight of steps led to it across a balustraded terrace which lay over the cellar. The cellar is shown as being lit by six square and round half lights. On the north side of the building, towards the Close, there was a courtyard with an ornamental entranceway; and towards the river, on the southside, a paved terrace.

The building was used as the Mayor's residence until 1835 when it was decided that it was too costly to maintain. In January 1837 its contents were sold by auction and the catalogue for the sale itemized the contents of the building room by room. Although not listed in the sale a number of fixtures from the Mansion House appear subsequently to have been removed (Charleton 1885, p. 269). Mantelpieces and a staircase were taken to Clervaux

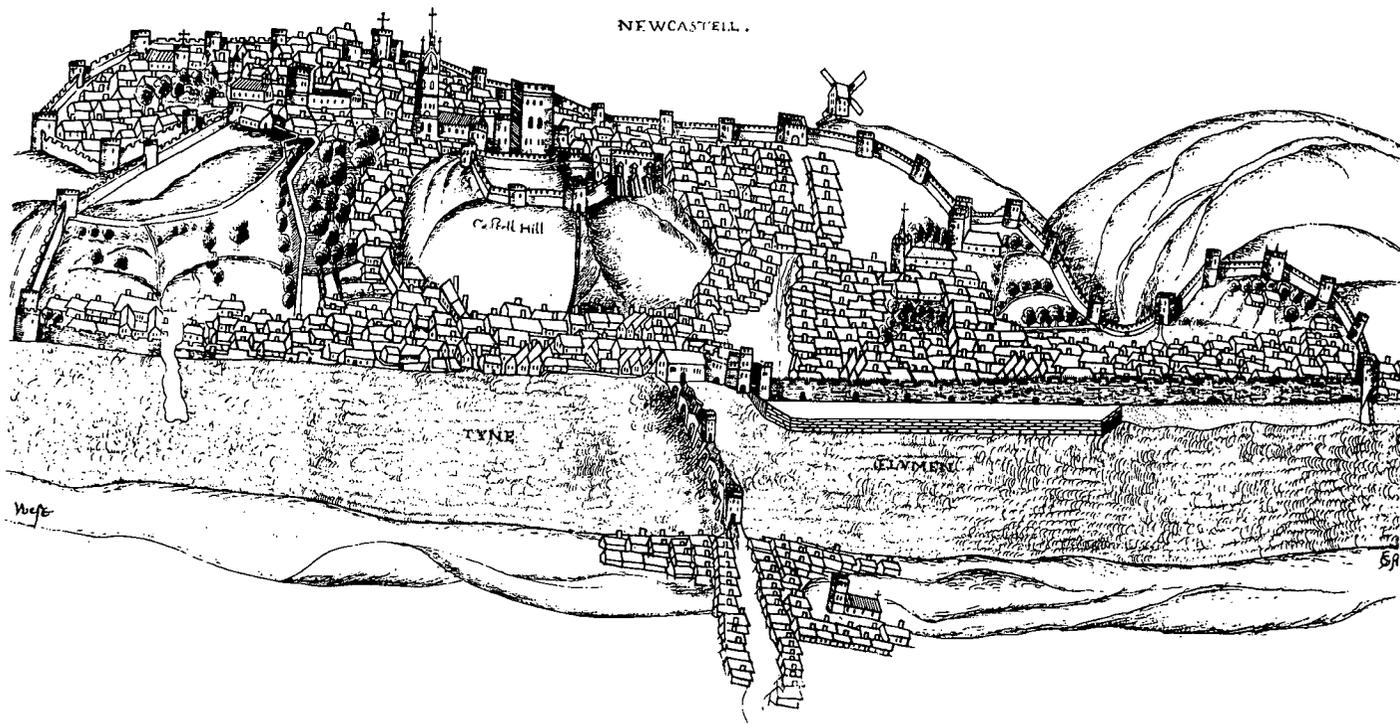


Fig. 2 Newcastle c.1590 (Cotton MSS).



Fig. 4 *Ornate mantelpiece from the Mansion House (© Bowes Museum).*

Castle, Croft, N. Yorkshire, which was demolished in 1950 (Waterson and Meadows 1990, p. 36) and a mantelpiece now at the Bowes Museum (fig. 4) may also have been removed from the Mansion House (pers. comm. S. Medlam), although this cannot be verified.

The Mansion House itself was subsequently sold in c.1838 and the building formed part of a timber warehouse until it burnt down in 1895. A number of engravings of the riverside in this period depict the building surrounded by stacked wood deals but only a single photograph of it survives today (fig. 5). The site continued until the Second World War as a timber store but was not redeveloped until the 1950s when a light steel framed warehouse was erected on the site. This was pulled down in 1989.

THE EXCAVATION

The initial phase of the excavation concentrated on locating the extent of the medieval town wall within the development site. Once this was achieved the remainder of the site was then excavated having been cleared mechanically of between 0.8–1.9 m of industrial ash.

Occupation deposits on the site lay in a zone between 3.4 m OD and 1.85 m OD, although they were concentrated mainly in the top 0.30 m of this band, (present day ground level is c.4.4 m OD). Structures and deposits relating to the reclamation of the area from the river lay between 3.10 m and –1.1 m OD. The presence of an infilled “dock” meant that waterlogged midden type material was encountered as low as 0.45 m OD.

The site straddled two earlier properties (fig. 6). Property 1, on the west side, lay only partially within the site. Property 2 on the east side lay, with the exception of the road frontage, completely within the site. Although both properties are described separately below, their respective phases were broadly inter-related and as a result a unified phasing sequence has been applied to the site as a whole.

Phasing Summary

Period	Date	Property 1	Property 2
1	13c	*	
2	13c	*	*
3	14c		*
3.1	14c		*
4	14c		*
5	14c	*	*
5.1	14c	*	*
6	15c		*
7	15–16c	*	*
8	17c	*	*
8.1	17c	*	*
9	17–19c	*	*
10	19c	*	*

* indicates presence of period contexts on property

PROPERTY 1

Heavy truncation of the western side of the site by 17th and 19th century redevelopments, meant very little evidence of medieval occupation survived above the reclamation dump deposits. No trace of medieval buildings on the property survived, while evidence for the late 17th–18th century buildings was concentrated only at the south end of the property. Consequently, the excavation of this property concentrated on establishing the sequence of waterfront advances and the structures related to this process. This was achieved by the excavation of a north to south section through the property (fig. 7).

PERIOD 1: 13TH CENTURY

A substantial sandstone revetment wall (350), capped by an earth bank retained a sequence of landfill deposits to the north. The revetment consisted of an unevenly coursed, clay bonded sandstone wall, faced on the south side, with a rubble core to the north. Only the top of the wall was excavated, but a height of 3 m may be inferred from the depth of the landfill deposits behind it to the north. These landfill deposits consisted of large sub-angular flint and limestone boulders and cobbles in a clay silt matrix.

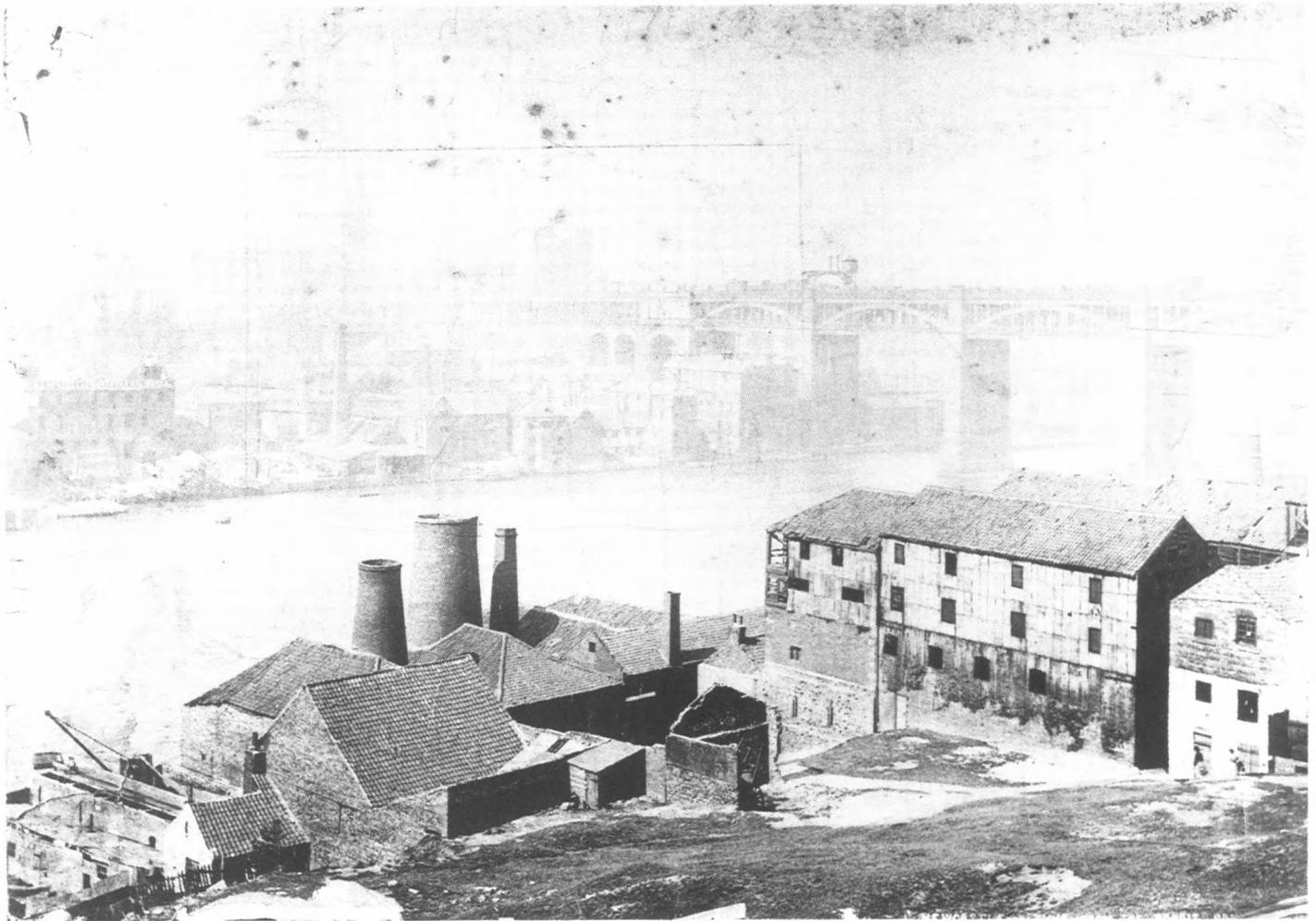


Fig. 5 Late 19th century photograph of the Close from Gateshead with the Mansion House centre left (© TWAS).

The upper layer (270) partially overlapped the top of the revetment wall, forming a bank into which a series of four sandstone steps (352) had been inserted. No surface was identified above the landfill in this phase.

These contexts appeared to indicate a waterfront advance of a minimum of 11.5 m south of the The Close, creating a platform some 25 m broad on the north shore of the river. The scale of the stone dump and the presence within it of flint and limestone, (neither of which naturally occur in the North-East), would suggest that these deposits represent ballast tipping.

PERIOD 2: 13TH CENTURY

This period was marked by the construction of a new waterfront 5.4 m to the south of the earlier retaining wall (350). Both the waterfront wall (525) and the landfill material behind it were similar in composition to that seen in period 1. The wall was constructed on the natural surface of the river foreshore. This too was a retaining wall, faced only on the south side, and constructed from roughly dressed sandstone slabs bonded with a silty clay. The rear of the wall consisted of flat irregular slabs

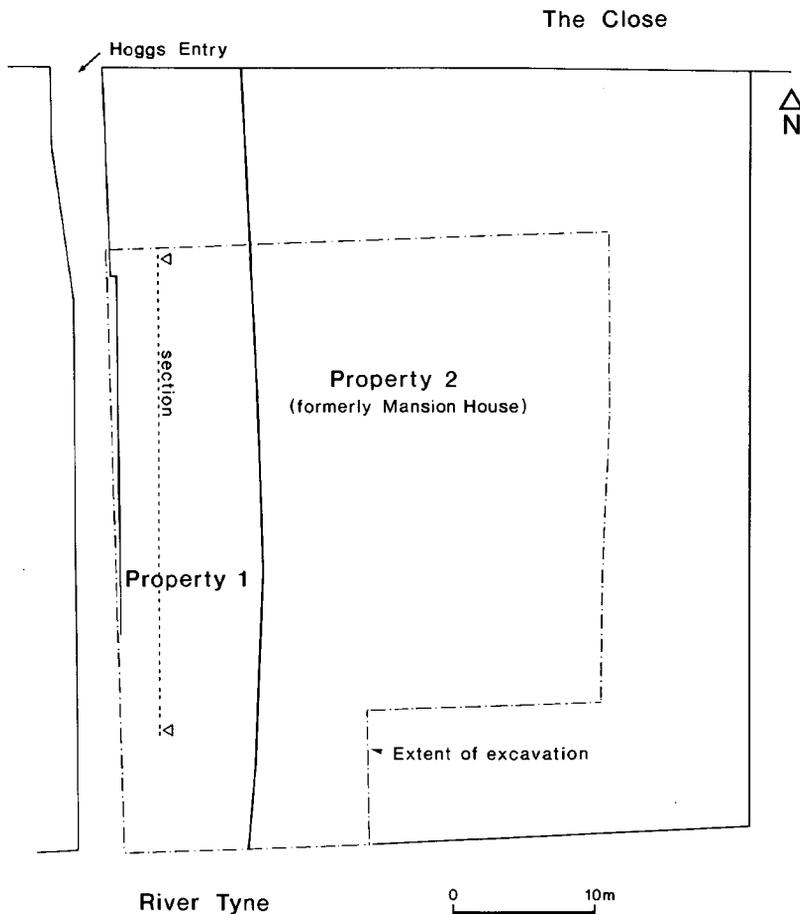


Fig. 6 Area of excavation and location of principal section.

which merged into the landfill layer behind. The wall measured 1.4 m high, however, the upper section had been truncated at a later date, (and would originally have been c.3.95 m high in order to have retained the landfill behind). The principal landfill layer (526) consisted of large rounded cobbles in a fine silt sand matrix. This was sealed by a number of predominantly clay layers which buried the earlier waterfront to the north. The uppermost layer (188) was a developed or plaggen type soil (soil formed through the artificial build-up of manure and other occupation debris—Evans, 1978, p. 67) and this layer formed a ground surface above the landfill.

To the south of the waterfront, two thick, banded layers, one of gravel (547) and a second of sand and gravel (546) were evidence that such structures were affecting the river regime and that as a result significant silting was taking place.

PERIOD 5: 14TH CENTURY

The construction of another new waterfront (290) 4.5 m to the south of the period 2 structure, occurred after property 2 to the east had advanced to the new line. A steeply angled cut (543) in the previous sequence of landfill deposits to the rear of wall 525 was associated with the removal of approximately 2.6 m of the upper part of the period 2 waterfront wall. A large revetment wall (290) was then constructed in uneven courses of roughly dressed sandstone blocks bonded with clay. The wall measured 3.9 m high and 1.6 m wide and like the period 2 wall was constructed on the river foreshore.

To the north of wall 290, the landfill sequence was dominated by a series of deposits which appeared to have been strongly influenced by the effects of water-action. Layer 526a overlapped the top of the earlier waterfront wall (525) and consisted of large stone cobbles in a fine silt sand matrix. It was similar in composition to landfill layer 526, but botanical analysis indicated it to be species rich and the presence of rat-tailed maggots indicated rotting matter. The layer appeared to have

formed as a result of layer 526 slumping and eroding out after the retaining wall 525 had been robbed away. Above this, the landfill consisted of a layer of chalk fragments (545)—derived from southern England. These were sealed by a sequence of fine sandy-clay layers, interspersed with dark brown organic lenses (541/2). The coarse organic component of layer 541 comprised around 50% of the soil sample and has been interpreted as floor or bedding material (made up of bracken, cereal/grass and sedge fragments). Chemical analysis of these layers showed that phosphorus was massively enhanced and that most of it was organic. Interestingly, the values were greater than those of most animal manures and were consistent with chicken faeces or certain types of bacteria associated with the guts of domestic animals.

The upper part of the landfill sequence was dominated by sand layers including one layer (252) of white sand. The landfill layers were sealed by a sequence of two developed soils (248 and 247) which were also retained by wall 290. No evidence for the use of the platform was identified in this period. The dominance of sand within the landfill suggests that there had been a change in the type of material used for ballast at this time. Once again, the presence of chalk is indicative of ballast material being used for landfill.

PERIOD 7: 15TH–16TH CENTURY

Following the advance of the waterfront in property 2 to a new line 11.5 m to the south of wall 290 in period 6 (see below p. 162), a new waterfront was established on property 1 with the construction of the town wall along the river edge from the riverside tower eastwards. The town wall represented an advance of 11.75 m south from wall 290.

The town wall (62) consisted of a coursed sandstone wall 2 m thick and between 3 m to 4 m in height. At least two external chamfers were visible towards the base of the wall on the south face, while on the north face three distinct horizontal building breaks could be identified. The south face of the wall was

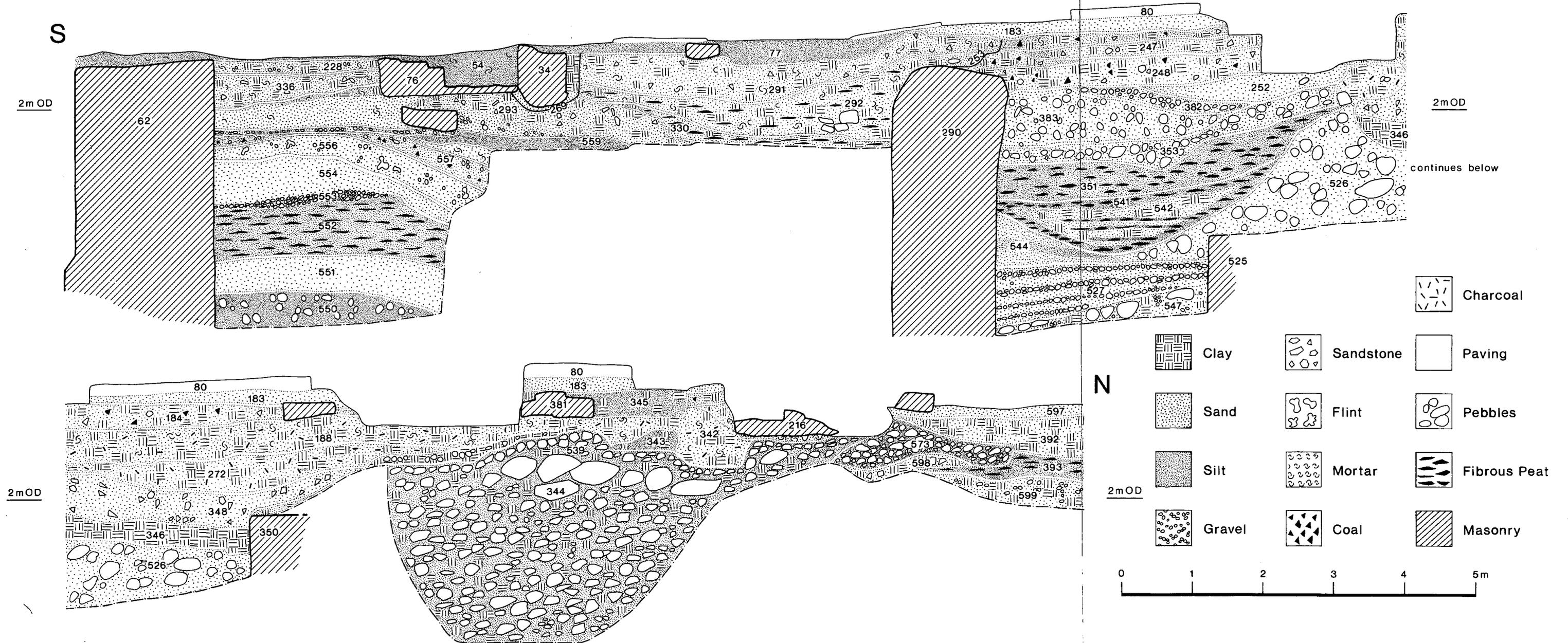
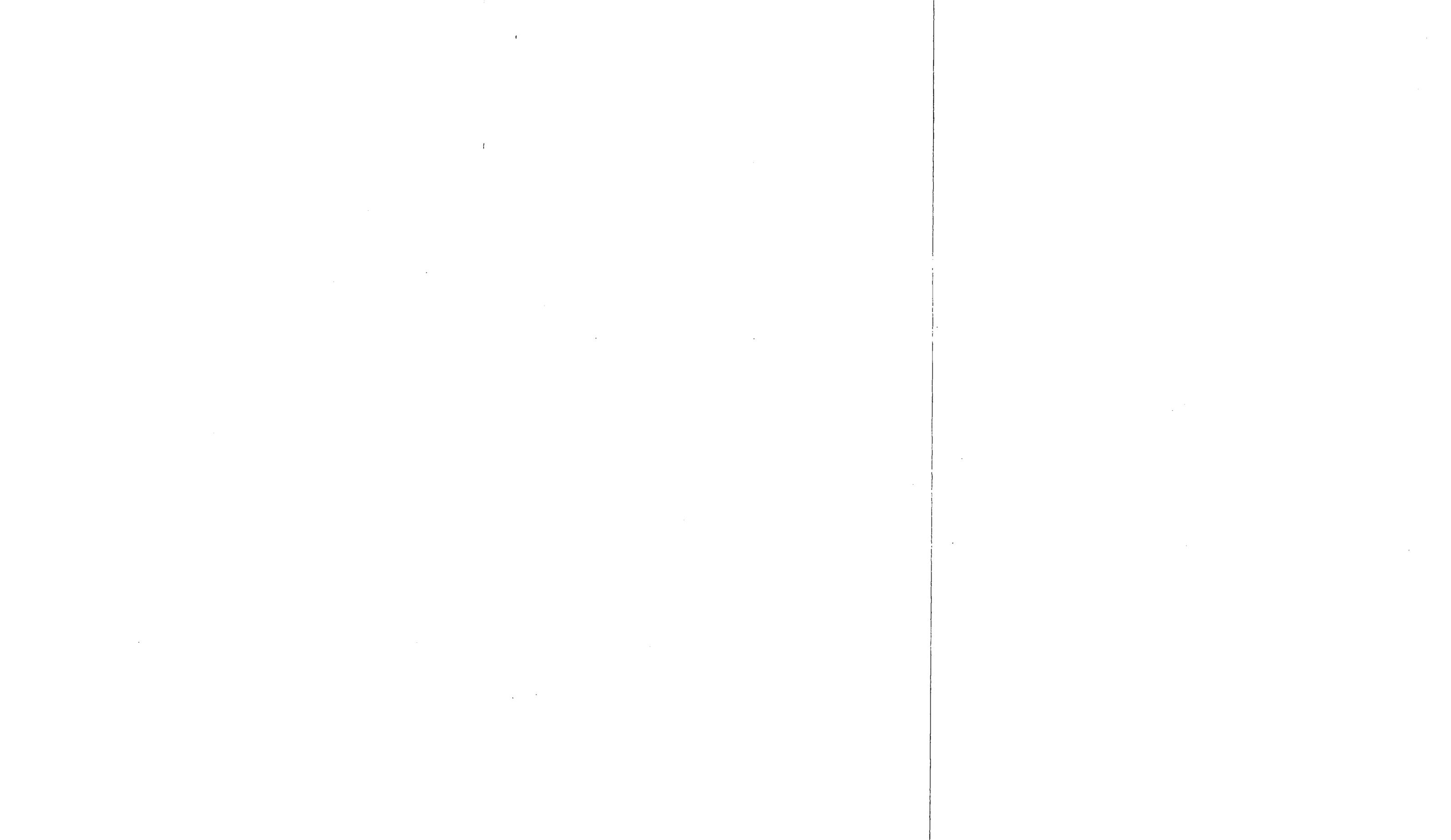


Fig. 7 North-South section through reclamation deposits in property 1.



constructed in finely dressed sandstone ashlar, while the north face was finished in roughly cut rectangular blocks below the level of the finished ground surface. The wall had a rubble core and was clay bonded towards the bottom while the upper half was mortar bonded.

The wall incorporated a postern gate or watergate at the east end with a culvert set 0.5 m below it. The watergate closely resembled the postern visible in the Bath Lane section of the Town Wall (Nolan et al. 1989 p. 55). The aperture was closed by a doorway which shut against chamfered stops on the riverward side. The postern was splayed towards the landward side. The eastern end terminated in a chamfered corner, the wall being bonded into the angle with walls 98 and 99 (fig. 12).

To the north of the town wall and to the west of wall 99, layers 550–559 represented large-scale tipping of landfill material, deposited as the wall itself was being constructed. The layers all dipped northwards indicating that they had been dumped from the south side. They consisted of mostly clean sands and gravels interspersed with a peaty sandy silt and sandstone and mortar lenses. A thin lense of crushed brick (295) sealed these landfill layers forming a level temporary surface above them.

Above these layers and associated with a cut (253), which removed the top of the earlier waterfront wall 290, were a series of layers of sandy loam mixed with sandstone rubble, mortar and gypsum. These layers effectively buried the top of wall 290 and formed the final ground surface north of the town wall. Running north from the culvert beneath the watergate and cut through layers abutting wall 99 to the east was a large sandstone lined drain (504) 1.25 m high and 0.4 m wide. This formed the principal north–south drain through the property.

To the east of the drain an area of cobbles (97) may have formed part of the surface of an alleyway leading between the watergate and the Close. The surface was overlain by a layer of sandy loam (92) which contained 16th century pottery. No other evidences of surfaces or structures relating to this period was found.

PERIOD 8: 17TH CENTURY

The postern appeared to have been substantially remodelled in this phase. It was first blocked up with mortared sandstone rubble (324) and dressed stones. It was then reopened, but with a raised floor and sill (230) and a reduced splay on the west side (321). The gate was then largely destroyed when the town wall was subsequently dismantled to ground level later in this period, although its position was perpetuated by a doorway in the later building which occupied the site.

PERIOD 9: 18TH–19TH CENTURY

Building 604

Following the demolition of the town wall, a building (604) was erected over the town wall at the south end of the property (fig. 8). This structure measured 7 m wide and over 10 m long. It was truncated on the west by a later wall foundation and it abutted building 39 to the east. The south wall (605) was constructed on the southern edge of the town wall and as a result the building directly abutted the river. The building was divided into two rooms on the ground floor by a passage which ran north–south. Its elevation is recorded in the 1745 Buck engraving.

Room 614 was located on the west side of the passageway (60) and measured 6 m long and over 5.4 m wide. It was truncated on the west side by a later wall foundation, and the remainder of the walls survived only at floor level. The north and south walls (34 and 605 respectively) were constructed of sandstone, while the east wall (38) consisted of a thin brick partition two bricks wide. The room had a flagged floor which survived partially intact and which extended over the top of the demolished town wall. Part of the floor sealed a cesspit which had a wattle lining and contained early 18th century bottles, clay-pipe and pottery. To the east of the cesspit the floor was cut by a later brick-lined pit which abutted the south face of wall 34.

The passage (60) measured 6.5 m long and

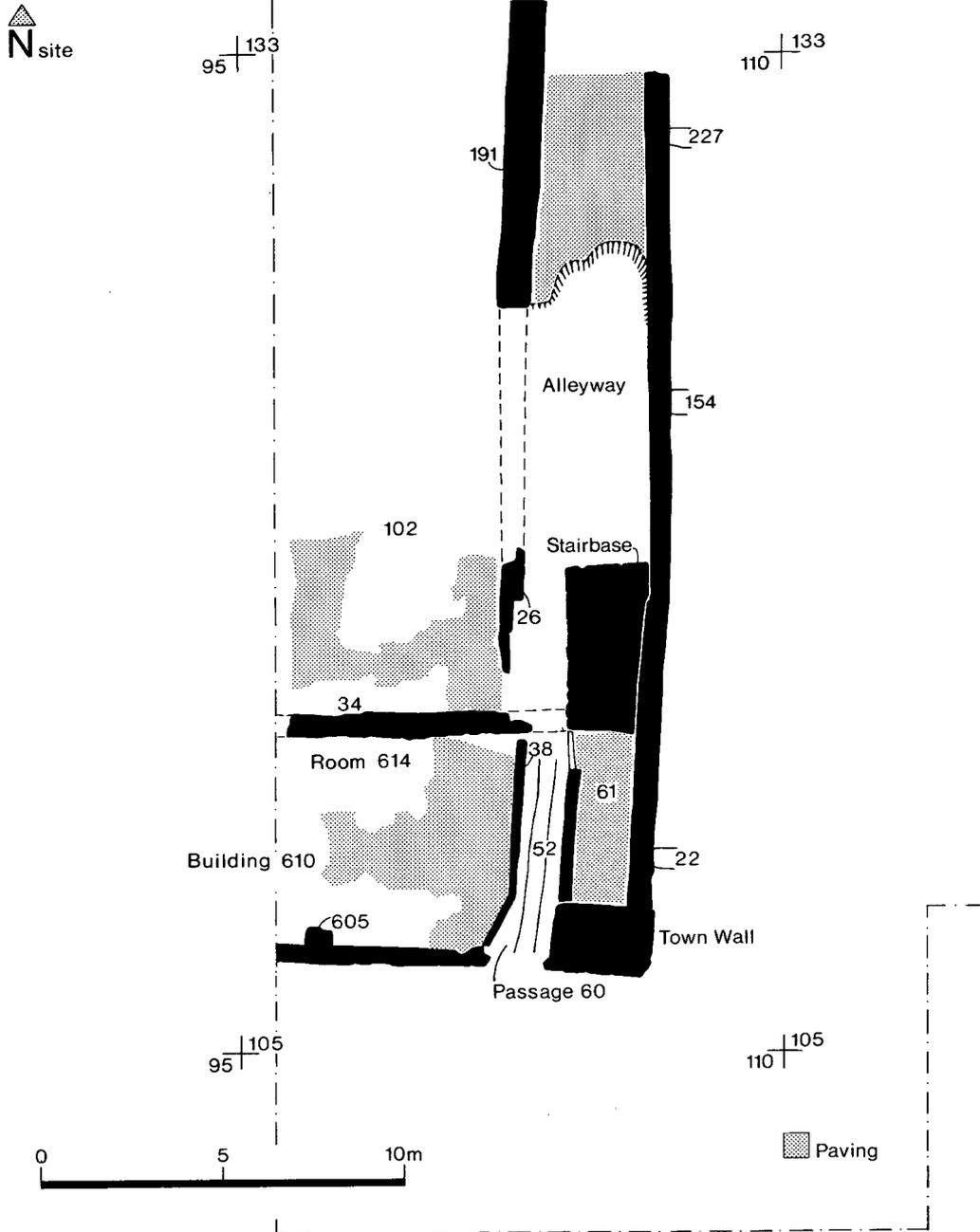


Fig. 8 Structures on property 1 in period 9.

1.25 m wide. It may have been an open passage through the building, linked to the alleyway to the north, but insufficient evidence survived to be certain of this. The passage had a cobbled surface with a sandstone gutter set into its eastern side. At a later date a sandstone capped, brick-lined drain (52) was inserted through the middle of this surface and the floor level raised with a thin silty loam.

To the east of the passageway was a room (61) with a stone flagged floor which measured 5.86 m long and 1.56 m wide. At the south end it incorporated the only upstanding section of the town wall to survive the demolition. The east wall was constructed of sandstone and had been largely built as part of building 39 to the east. The west wall had a stone foundation and a brick superstructure which incorporated a blocked doorway at the north end. The north wall of the room was constructed in sandstone and had been remodelled to incorporate an adjoining stairbase on the north side.

Abutting the north-east corner of building 604 was a stone stairbase measuring 4.1 m long and 2.3 m wide. It was faced in large rectangular sandstone blocks with a rubble core. The treads rose eastwards from the northwest corner for three steps before turning to the south. It appeared to have been an external structure.

Room 102 lay north of building 604 at the southern end of a large north-south range in excess of 19 m in length. The remains of sections of floor surfaces indicated that it measured over 5.4 m long and over 5 m wide. Unlike the flagged floor to the south, this floor was made up of numerous patches of brick and sandstone. The floor sealed a stone lined pit which may have pre-dated the building, however, the finds associated with the fill material were not conclusive. There was evidence for a possible doorway in the south-east corner of the room in the form of a brick sill.

The alleyway appears to have extended the length of the property, between the Close and building 604, delineated by wall 47 to the east and wall 191 to the west. Like passage 60 to the south it had a cobbled surface and a sandstone edge gully set in its eastern side.

A three-storied building, fronting the river is shown on this property in the Buck view of 1745. This building appears to have been demolished sometime before 1830 as the area is shown as open ground on Oliver's map of Newcastle. From c.1840 to 1930 the site formed part of the Mansion House Saw Mill.

PERIOD 10: LATE 19TH CENTURY

Much of the northern half of the site was redeveloped in the 19th century when a series of deep trenches were dug for machine bases of wood and concrete. At this time the southern end of the alleyway was lowered and truncated to form access to a sunken chamber at the south end of this complex. These features appear to be associated with the use of the area as part of the Mansion House Saw Mill and evidence of intense heat reddening suggested that structures in this area were burnt down together with the Mansion House to the east in 1895.

PROPERTY 2

This property occupied the site of the former Mansion House. It measured approximately 25 m wide and 36 m long and with the exception of the original street frontage the whole of the property was accessible. A half cellar on the north side of the Mansion House had destroyed evidence for earlier surfaces and structures in that area, but to the south these survived below the remains of the late 17th century building.

PERIOD 2: 13TH CENTURY

Both the eastern and western walls of the property appeared to have been constructed in a series of stages southwards towards the river (fig. 9). These different builds appeared to reflect a number of phases in the reclamation of the property from the river. The northern end of the later "dock" wall, comprising elements 366 and 399, appeared to be part of an early arrangement of the property where the

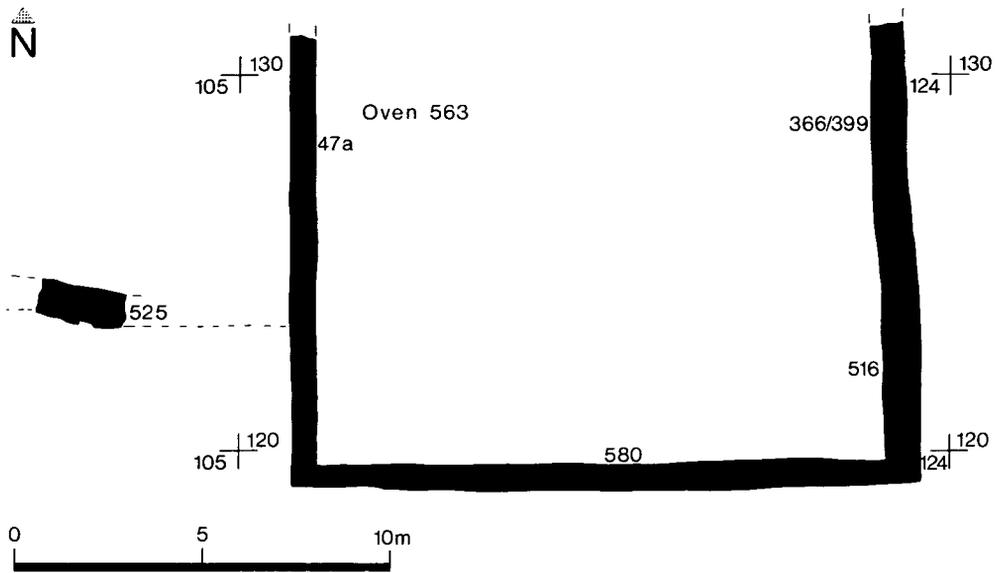


Fig. 9 Extent of property 2 in periods 2 and 3.

river frontage was aligned broadly with wall 525 in property 1 to the west. Unfortunately no surfaces or occupation layers could be identified with this phase.

PERIOD 3: 14TH CENTURY

In this phase property 2 was extended 4.5 m further south into the river than property 1. On the east side the line of the revetment wall forming the side of the "dock" was extended with a new wall (516), while on the west side a similar wall extended the alignment of the property boundary to a similar point (47a). These side walls were linked by a new waterfront wall (580), orientated east-west and measuring 16.9 m in length. All three walls were faced with finely dressed ashlar blocks on the riverward side with large irregular blocks forming the core of the wall. The landward sides of the walls were not faced. The walls retained a sequence of dump deposits which consisted predominantly of sands and gravels interspersed with lenses of ashy sandy loam. A low stepped platform (575), built in sandstone with a rubble core, was constructed on the

foreshore, south of and abutting the waterfront wall (580). An analysis of the upper soil profile of the dump deposits was undertaken which indicated contrasting usage of the area with garden activity being superseded by residential/industrial activity. Pottery associated with upper levels of landfill material was predominantly buff white ware, in proportions indicative of the first half of the 14th century.

On the western side of the property an oven (563) was constructed on a raised platform bounded on three sides by low sandstone walls (fig. 10). The platform on which the oven stood measured 0.47 m high, 3.7 m wide and over 5.5 m long. The oven was aligned north-south and measured 2.7 m long, 0.25 m high and a maximum of 1.9 m wide. It was constructed from rough sandstone blocks and slabs, laid in uneven courses, and bonded with clay. The stokehole was situated at the north end of a long straight flue, and at the south end there was a circular oven. The southern part of the oven contained fragmentary evidence for a stone floor. A small sandstone wall linked the structure to the east wall of the platform. The superstructure had been largely demolished

and was truncated at the north end, however an area of intense heat-reddening indicated that the structure had originally measured 3.6 m long. A number of samples were taken for thermo-luminescence dating, however, the sherds were found to have unsatisfactory properties and they could not be dated (pers. comm. Dr. I. Bailiff).

A large subrectangular pit (180) was subsequently cut through the east wall (204) of the oven platform. The feature was subsequently infilled with a mixed sandy loam.

PERIOD 4: EARLY 14TH CENTURY

In this period the property was substantially redeveloped, with the earlier structures being cleared from the site (fig. 11). A large south range was constructed abutting the river frontage, with a west range and a courtyard to the north. Initially the south range would have been surrounded by water on three sides as the waterfront to the west had not advanced as far

into the river, while to the east there was a "dock" or inlet. This location would seem to argue very strongly for a commercial function to at least part of these buildings.

The South Range (Building 200)

This building measured 16.8 m long and 7.2 m wide and was divided into two rooms, 384 and 613, by a central wall (209). Its southern, eastern and western walls were all founded on river edge retaining walls. The north wall was completely new work although it took in part of an earlier wall (204) at its west end. There was evidence of a possible north-south passage to the west of wall 209 leading to the river.

Room 384, at the west end of the building, measured 5.9 m long and 7.2 m wide. It was partitioned on the east side by a passageway 5.9 m long and 1.7 m wide, which linked a door through the north wall (207) with a possible exterior door through the south wall (165). The north doorway had a chamfered exterior sur-

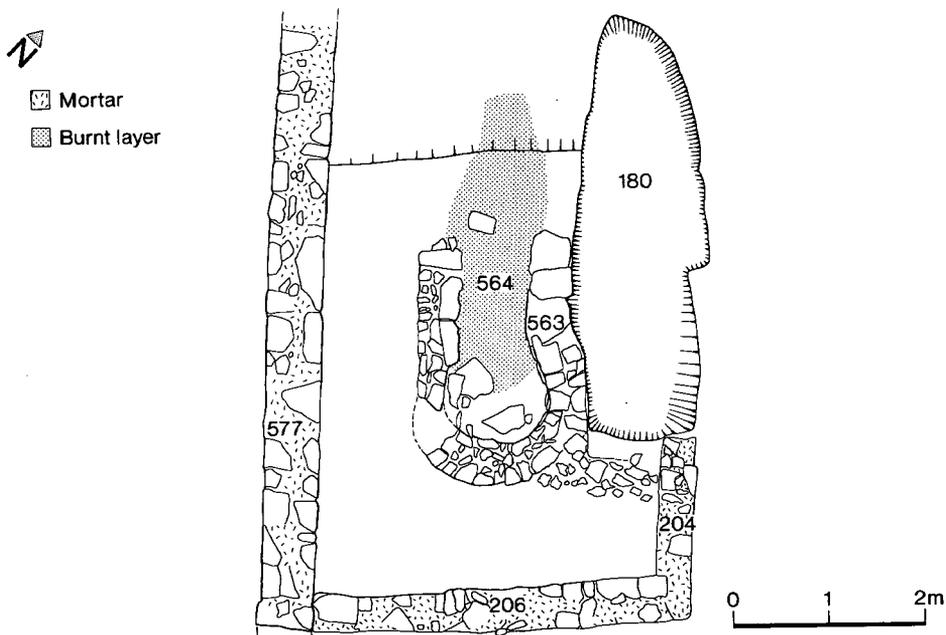


Fig. 10 Detail of oven 563 on property 2 in period 2.

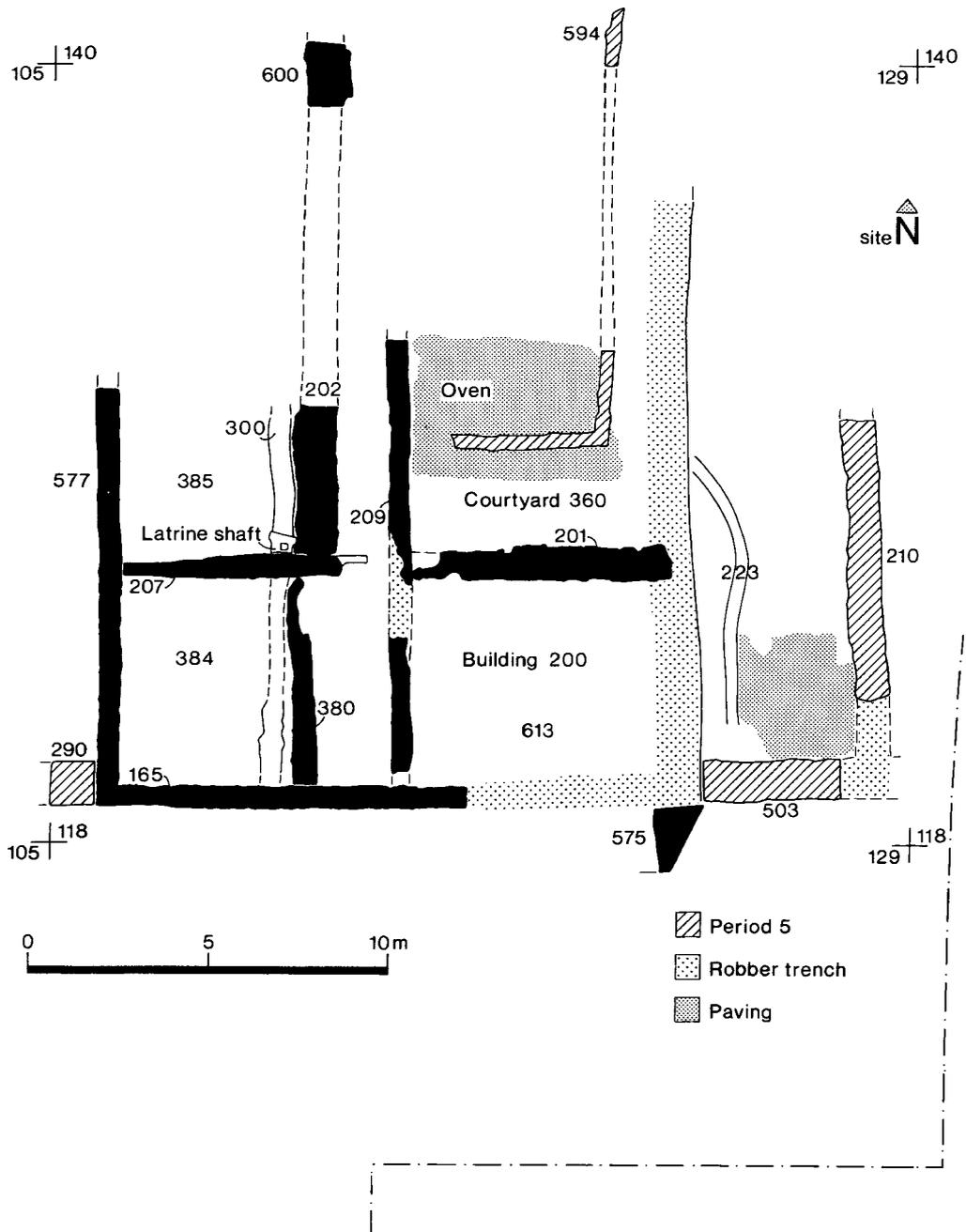


Fig. 11 Structures on property 2 in periods 4 and 5.

round, the splay behind opening into the room. The sill of the doorway was at 3.19 m OD, 0.13–0.36 m higher than any of the surviving interior levels. The possible opposing doorway survived only as a rough stonework blocking against a vertical joint through the thickness of wall 165 to the south. The partition wall survived as an ephemeral cobble foundation (380) and no doorways were discernible through it. A large number of thin lenses of make-up material were encountered which filled the area between the main walls. None of these layers were thought to be floor surfaces, but rather they seemed to represent the tipping of very varied material as part of a single operation. They were sealed by a layer which consisted predominantly of crushed brick with pockets of sand, mortar and clay. This layer formed an extensive spread throughout the room and may have been a floor surface. Above this was a thin lens of clay, itself sealed by a hard, thin mortar spread, both related to later floors in the room.

Although much of the south and east walls of room 613 had been robbed away, it was possible to reconstruct their alignments and therefore the extent of the room, which measured 5.9 m long and 7.3 m wide. Only the west wall survived to any height and then only in part, while the north wall had been robbed down to its basal course. Consequently there was no evidence for any external doorways. Internally only reclamation deposits were identified, with no evidence for a floor surface above.

The West Range

A west range over 14.5 m long appeared to extend northwards from the south range. The northern half of the building had been partially truncated by the later cellar of the Mansion House, but part of a room (385) survived at the southern end together with a section of wall foundation delineating a passage on the east side of the room. The same wall foundation was also traced a further 8.5 m to the north.

Room 385 measured 7.4 m wide and over 6.1 m long. A large foundation wall (202) defined a passageway on the east side of the room, leading north from the doorway through

wall 207. The passage measured 1.4 m wide and over 6.1 m long. No floor surfaces survived anywhere within the room. Mixed clay layers had been deposited to seal and level up over earlier walls e.g. above oven 563 etc., but no surfaces survived above these. Abutting the north face of wall 207, the remains of a stone lined shaft gave into a large sandstone drain (300), orientated north–south. The drain was traced over the full length of the property. At the south end it debouched into the river through wall 580. The vertical shaft suggested the existence of a first floor latrine and therefore the possibility of domestic accommodation.

Courtyard 360

Situated in the angle between the south and west ranges, the courtyard measured 7.2 m wide and over 14 m long. It originally had a uniform cobble surface. This was superseded (in period 5) by a raised clay surface within which two walls at right angles defined an area where flagging and some associated burnt ash and clay indicated the position of a large hearth or oven (362). The eastern wall (594) was also traced to the north of the later cellar.

PERIOD 5: EARLY-MID 14TH CENTURY

Reclamation of the "dock"

A large retaining wall, (503), was built across the front of the "dock" or inlet and behind this a series of large sand and ash deposits were dumped to create a level surface (fig. 11). The blocking wall was a very substantial construction and the riverward face was built in finely dressed ashlar, very similar to those used in the retaining walls to the west (580, 516 and 47a). A second wall (210), orientated north–south, and bonded to 503 at the south end, was constructed within the "dock" itself. It may be that this wall partitioned the space between two properties created by the infilled "dock". The infill material behind the wall was predominantly an ashy silty sand which contained large quantities of early–mid 14th century pottery. Unlike the reclamation material used else-

where within the site, it was very similar to the material used to reclaim ground immediately east of the town wall south of Close Gate in the mid-14th century (Fraser, 1994). Samples from the infill material were found to be particularly species rich botanically suggesting the disposal of organic rubbish.

The infill deposits (211) to east of wall 210 were similar in composition to those excavated to the west but they contained significant quantities of reduced greenware suggesting that the "dock" area to the east may have been infilled somewhat later.

East Range

The "dock" infill was sealed by a large dump of heavy cobbles over which a paved surface was laid. The surface was bedded in a yellow-brown sand and consisted of large rough irregular sandstone slabs. Only the southern half of the surface survived, the northern half having been truncated by later features. Above this surface a thin brick wall (225), aligned north-south, was evidence for a narrow partition. To the west a drain (223) ran north-south through the floor.

These features would seem to indicate an east range of buildings, orientated north-south and abutting the east side of building 200. The range would have measured 5.3 m wide externally and over 12.2 m long.

PERIOD 6: 15TH CENTURY

A new riverfront wall (98) was built 11.5 m to the south of the period 3 waterfront (fig. 12). Although largely robbed out in phase 8, enough survived of this structure at its junction with the town wall, to suggest that it predated the town wall. The wall (98) was traced in a separate trench some 30 m to the east, which would suggest that several properties had extended out to a similar line. The waterfront associated with property 1 to the west only reached this line with the construction of the town wall, and it may be that the position of this eastern waterfront determined the alignment and the final extent of the town wall.

The western side of the new waterfront was

formed by wall 99 which ran southwards from the eastern end of waterfront wall 290. The area bounded by walls 98 and 99 was infilled with a very varied sequence of landfill deposits. On the eastern side the sequence was dominated by layer 574 a thick homogeneous deposit comprising rounded cobbles in a silt matrix, 2.25 m deep. On the western side the lower part of the sequence resembled layer 574. Above this layer there were numerous layers of rubble and demolition material interspersed with ash, sand, silt and clay.

Above the infill material there were the remains of several walls and surfaces, which indicated that the southern side of building 200 had been substantially remodelled and extended further south following the advance of the waterfront. Room 384 appeared to have been extended 3 m further south with the addition of walls 46 and 208, while to the east walls 579 and 173 extended room 613 5 m further south. As part of this extension drain 300 was continued southwards through wall 208, through the landfill and presumably as far as the new waterfront (98). Two other sandstone-lined drains (302 and 172) ran outside room 613.

Although somewhat truncated both extensions had floor surfaces associated with them. Layer 576 formed a cobble surface in the angle between walls 46 and 208 and was continued to the east as a thin layer of crushed coal. Further east, layer 538 formed a cobble surface south of wall 165, although it did not survive as far south as walls 579 and 173.

PERIOD 8: EARLY-MID 17TH CENTURY

At this time the waterfront wall appears to have been re-aligned possibly to create a more uniform frontage with properties further to the east. The earlier waterfront wall (98), set slightly to the north was partially dismantled in the process. This event coincided with a redevelopment of the property with two or possibly three new ranges of buildings being constructed (fig. 13). These were located broadly in the same position as the buildings of period 4, however the west range extended some 10 m further south.

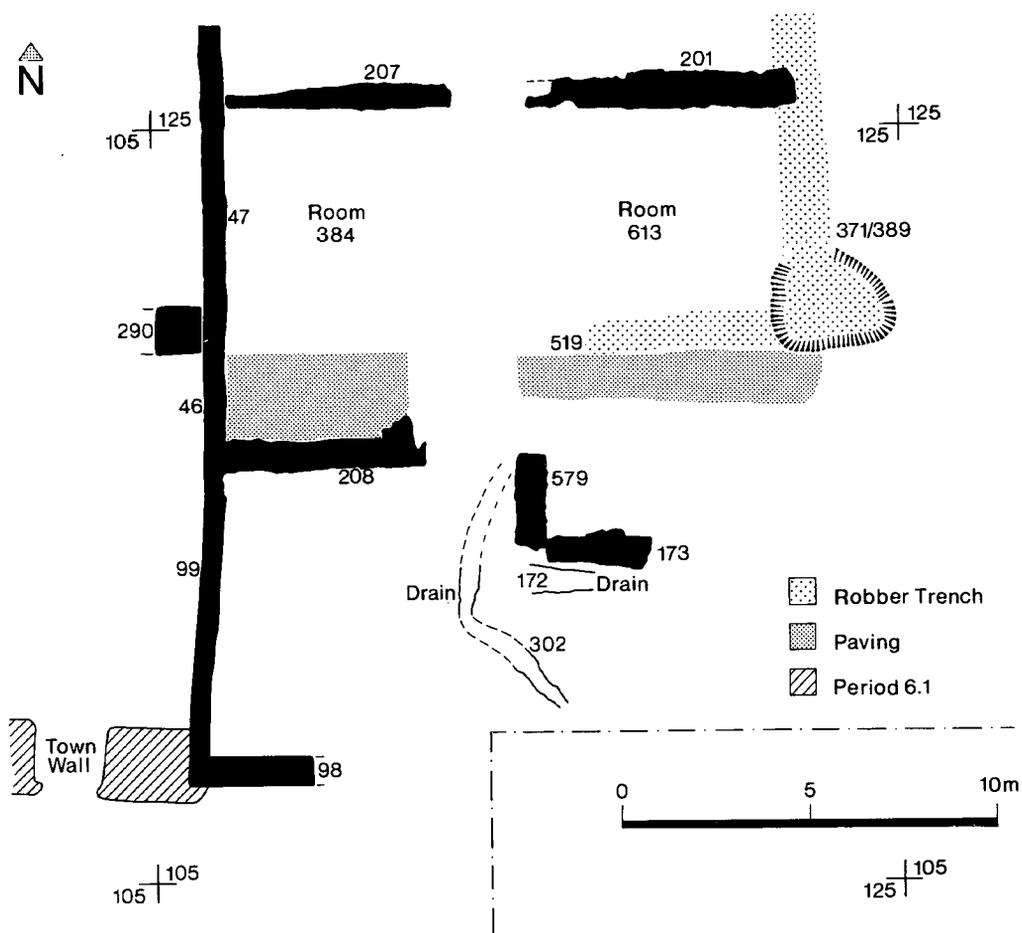


Fig. 12 Structures on property 2 in period 6.

Waterfront wall 45

A large sandstone revetment wall (45) was constructed 2.2 m to the south of the earlier waterfront wall (98). At its west end it turned a right-angle to abut the south-east corner of the town wall. The new waterfront wall was traced south-eastwards for 12 m. The wall was faced in fine ashlar sandstone blocks on the south side with a vertical north face executed in roughly dressed stonework. It measured 1.0 m wide and 2.62 m high and was mortar bonded. The top of the wall was truncated at the contemporary ground surface, but it may have

stood higher as a narrower structure demarcating the river edge.

To the north, waterfront wall 98 was largely dismantled in the process of constructing wall 45. The trench created by this process was backfilled with relatively clean yellow brown sands and gravel lenses. The area within the west range was levelled up following the construction of the principal external walls.

Building 39

This structure formed the west range of the building complex on the southern half of the

property. The east and west walls followed existing wall alignments for much of their length, while the south wall, which incorporated an angled bay lay 7 m further south than the most southern wall of the preceding phase. Its southern end lay 3.2 m north of the waterfront, separated from it by a small area of level ground.

The building was divided into three rooms, (610, 611 and 612), which were interconnected by an internal passageway (250) along the eastern side. There was evidence of an external doorway in the south-east corner of the passage, but there was no evidence of a connecting door at ground floor level between building 39 and building 160, or of a stair to first floor levels.

The building measured 7.4 m wide internally and over 23.5 m long. All of the external walls were rebuilt from ground level, although a number of earlier walls were used as foundations. The foundations to the walls were in sandstone, however, there was some evidence to suggest that the internal partition walls (e.g. 227) were of brick. A number of walls had mortar surfaces suggesting that most of the rooms had been plastered. Plaster recovered from the demolition horizon above the building also suggested that some of the rooms had moulded plaster ceilings. Apart from some evidence for a succession of floor surfaces and one door blocking, there were no significant structural changes during the relatively short life of the building.

Room 610, at the south end, measured 12 m long and 5.2 m wide. The room was entered from the passageway to the east through a doorway set 4.6 m from the southern end of the room. It was not possible to determine whether there had been a more northerly entrance, either from the passage or through the western side of wall 154, as these elements had been destroyed by later features. In the latest phase, the room had a flagstone floor, and although this floor survived reasonably well in the southern half of the room, it had largely been robbed out in the northern half. There was evidence within the bands of floor make-up for at least one earlier floor, although no surface survived

to be identified. Within the southern half of the room, where the floor survived, there was no trace of a fireplace.

Room 611, in the centre of the range, measured 7 m long and 7.4 m wide. It was entered via doorways in the south-east and north-east corners. Only against the north face of wall 154 were floor surfaces preserved within the room. Here, there was evidence of several phases of flooring, the latest of which consisted of sandstone flagstones and the earliest rounded sandstone cobbles.

Room 612, at the north end of the range, measured 7.4 m wide, but its full length could not be established as it was truncated by the Mansion House cellar to the north. The room was entered through a doorway in the south-east corner, but no evidence of floor surfaces survived.

The passageway (250) measured 12 m long and 1.5 m wide. Its western side was defined by a partition wall whose southern end survived well (23), but the northern end (255) survived as a very ephemeral feature and the centre was largely missing. The passage had an external door in the south-east corner, through wall 25. To the north it opened into room 611 through wall 154. Here there was evidence of an earlier phase of flooring comprising rounded cobbles (254) which was then succeeded by a stone door blocking (256), which was then removed and replaced with a second phase of flooring, this time in sandstone pavers (24). There was also a door through partition wall 23 into room 610, although the full extent of this could not be established as the northern half of the doorway had been truncated. The paved surface (24) did not run through as it was interrupted by a slot which was presumably for a wooden threshold/doorcase. Along the eastern edge of the passage a sandstone gully drained water from a stone trough in wall 25 towards the door in the south-east corner.

Building 160

This structure formed the south range of the building complex, abutting the east side of building 39. Although it overlay an earlier

building, it did not re-use the wall foundations as did building 39, but was offset slightly to the north and followed a different alignment to the walls of the earlier building below. It lay parallel to and 14.5 m north of waterfront wall 45.

The building contained a single ground floor room, which measured 7.4 m wide and over 8.1 m long. It was truncated at the east end by a later pit (175) and its full extent could not therefore be established. Within the building, no floor surface survived although within a layer of floor make-up (159) there was evidence for the position of a rectangular brick hearth (319) against the south wall (161). There was no evidence of any doorways into the room and it may be that they were located in the missing east end of the building as all the other walls survived well above floor level.

Courtyard

A courtyard was located on the north side of building 160 and measured 7.75 m wide and over 4.0 m long. Very little of its original surface survived but in the south-east corner there was a small remnant of sandstone paving (363) with a shallow edge gully set into it along two sides. That the edge gully ran north-south suggested the existence of another building to the east. The courtyard was truncated to the north by the later Mansion House cellar.

East Range?

Only a single wall (364) survived to indicate the presence of a possible range to the east of building 160. This structure formed the east side of the courtyard and had slumped into the earlier infill deposits within the "dock". Insufficient of the wall survived to indicate a possible width for the range.

PERIOD 8.1: MID-LATE 17TH CENTURY

There was no substantial structural change to the west range in this period, however, the south range suffered partial dismantling while the "east range" appears to have been totally demolished. A large pit or midden (175) then occupied the site of at least the southern half of the "east range".

In this period the east end of the south range was robbed out together with the putative east range. Both main walls of the south range (161 and 162) were truncated at their eastern ends and no trace was found of the precise location of the east wall. To the north wall 364, orientated east-west, within the east range was partially robbed out and had also been subject to severe settlement along its length. The footings of the wall had settled into layers associated with the infilling of the "dock" in period 5 and it is possible that this may have caused the buildings in this area to collapse.

A large pit (175) was cut into the remains of these ranges removing all trace of them in those areas. It occupied an area 13.5 m long and 7.5 m wide, although its full northern and eastern extents could not be defined as they lay beyond the area of excavation. The pit varied in depth between 0.3 m at the south end and 1.0 m in the northern half. It was filled with a clayey sandy loam heavily mixed with coal, sandstone, mortar and ash. The pit was excavated by machine and therefore only sample finds were retrieved. From these, it would appear that it was a refuse deposit containing material of the late 17th century.

The area to the south of both the south and east ranges was delineated at this time by a large sandstone wall which ran the width of the site and abutted building 39 on its western side. The wall (135) was orientated east-west, and measured 13.7 m long and 1.22 m wide. It lay 14.3 m to the north of the waterfront (45) and some 2 m to the south of the position of the south range. It is interpreted as being a boundary wall.

PERIOD 9: LATE 17TH-LATE 19TH CENTURY

The Mansion House

The remainder of the standing buildings constructed in period 8 were demolished and the site levelled immediately prior to the construction of the Mansion House in 1692. The new building had a slightly irregular rectangular ground plan, which was the result of fitting the building into existing property boundaries. The

building measured 20.5 m north-south and between 23.5-25.25 m east-west.

The ground plan (fig. 14) divided into three bays, with the northernmost lying beneath a terrace to the north of the building proper. The main building was divided in two by a large central wall, aligned east-west. A total of six rooms were identified within this part of the ground plan (C-H), while the cellar was partitioned into three bays. The floor levels were consistent throughout the floor plan, with the exception of the cellar, where the floor was 0.48 m lower. There appear to have been two north-south passages through the ground floor either side of room D leading from the cellar to the south frontage; and one east-west passage along the north side of the southern bay.

The building was constructed in brick set on sandstone foundation walls. The external walls were built in English bond while the internal partition walls were built in English garden wall bond. A brick plaque recording the building's construction in 1692 was found *in-situ* in the west wall. Most of the interior wall surfaces appeared to have been plastered and the floors were predominantly sandstone flagstones.

Excavation confirmed contemporary accounts that the building had burnt down (in 1895). Some areas exhibited intense heat reddening of the stone and brickwork, while in other areas charred timbers, including parts of *in-situ* floors and doors, survived. Following the fire, the building was demolished and the site was levelled. As a result both external walls and internal partitions survived standing to heights of between 0.5-1.5 metres.

The cellar, which measured 4.2 m wide and 23.5 m long, extended across the full width of the Mansion House. It was divided into three equal sections by a sequence of partition walls. Although the lower parts of the walls were constructed in stone the upper walls and the arched vault were constructed in brick. Prints and contemporary descriptions show that it lay on the north side of the main building beneath a raised terrace.

Traces of the positions of five lights were identified in the south face of wall 106, where the arch of the vault was interrupted by a

recessed vertical brick panel. The cellar was entered through two doorways situated at the end of passageways which ran the width of the building. Both doors were located in room D, and the cellar was reached via a series of steps in the thickness of wall 108.

The floor of the cellar appeared to have been raised 0.43 m at some point in the early 18th century, probably to avoid flooding. A thick layer of industrial ash, clinker and pottery was used to make-up levels presumably because of its free-draining properties. Within the later flagstone floor were two shallow drain channels and a series of small settings which were evidence for the location of timber racking.

Room C measured 7.15 m long and 6.72 m wide and was subdivided by a thin brick partition. The northern half had a plank floor laid on timber joists, with evidence of a fireplace in the west wall and a doorway through sub-partition 111 in the south-east corner. The southern half had a flagstone floor and a doorway on the east side, through wall 110, connected it with room D.

Room D interconnected with every other room on the ground floor via six doorways. It measured 10 m long and 6.73 m wide. It had a flagstone floor and evidence of a two-phase fireplace with a cupboard to the east against the south wall.

Room E measured 6.28 m long and 6.87 m wide. The floor was predominantly of flagstones but in the centre of the room they were missing or removed and replaced with timber joists, although there was no evidence for planking surviving above. There was evidence for a possible fireplace against the east wall and of a blocked doorway at the west end of the south wall.

Room F was the largest on the ground floor. It measured 11.3 m long and 7.0 m wide and had a flagstone floor. It was connected through a doorway in its north wall to room D and in its east wall to room G. There was evidence of a fireplace in the north-west corner of the room against wall 4, with some indication of the position of the grate and the dog-irons preserved in the floor. Against the south wall 5, a small rectangular area was unflagged and this

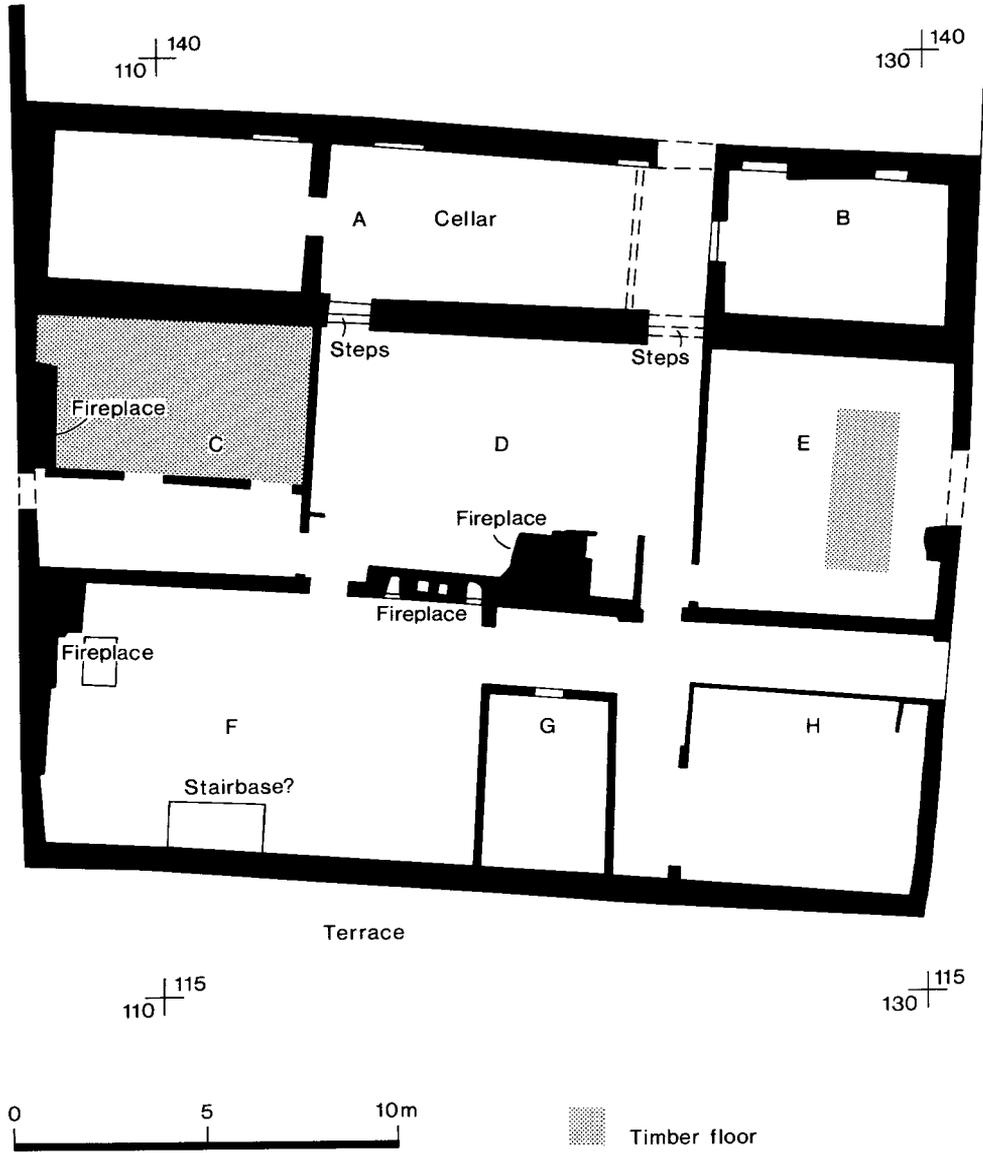


Fig. 14 The Mansion House, period 9.

may have been a stairbase. In the northeast corner, set in the south face of wall 109, were a series of grates and stokeholes, which were presumably for heating water.

A passageway ran to the north and east of room G which was defined by a narrow brick partition. The room measured 5.05 m long and 3.64 m wide. The passage areas had flagstone floors, but within the partitioned area the centre of the floor was missing. A threshold stone in the northern element of the partition wall indicated that access was from the north side only. This room may indicate the position for a rear stair.

Room H was surrounded by passages on both the north and west sides and was delineated by a very thin brick partition. The room measured 6.2 m long and 5.2 m wide and was entered through a large doorway in the western side.

Evidence of external surfaces was found to survive only on the south side of the building. Here a large paved area sloping down towards the river was surrounded on the north and west sides by a garden border. Immediately south of the building a substantial stone and brick drain led water away from the building eastwards.

THE POTTERY

Introduction

The pottery sequence from the Mansion House excavation spanned a period from the late 13th century to the 18th century. The 13th century material derived from landfill deposits and that in the first two periods, (Table 1a & 1b), was the most fragmented. The bulk of the assemblage was from the 14th century periods and was better preserved. The material in these periods derived from both landfill and occupation deposits as the two properties were developed. Only relatively small quantities of pottery were recovered from the late medieval and post-medieval periods (6 to 9) and a large proportion of this was in fact medieval. The total assemblage of c.3900 sherds was not large compared to other assemblages from New-

castle, but it has nevertheless contributed to an understanding of the relationship between the main medieval pottery types in Newcastle, as well as producing some new and more complete vessel forms.

Methodology

Basic quantification was by both weight and sherd count. A detailed description of the methods of recording and terminology used is in the archive. Tables 1a and 1b show the pottery recovered from each period as a percentage of the total assemblage by weight and sherd count. This is intended to give a general picture of the relative fragmentation of the material and to put in perspective the vessel statistics represented in Tables 1c and 2. Table 2 shows number of vessels in each fabric type by period. The pottery from period 10 was omitted although the types and quantities present are recorded in the archive.

Discussion

The local medieval wares in Newcastle fall into two main fabric groups, as first noted in the report on the Castle Ditch (Ellison, 1981). These are i) wares made in a buff or white firing clay, and ii) wares made in an iron rich clay which fires red or dark grey, of which the largest subgroup is the "reduced greenwares".

The dominance of buff white ware throughout the first five periods on this site (from the (late) 13th to the 14th centuries) parallels phases 3 and 4 in the Castle Ditch assemblage (Ellison, 1981, fig. 6). The majority of the buff white wares from the Close Gate excavation (Vaughan, 1994), where the earliest deposits were probably early 14th century, were a fairly hard light grey fabric with buff exterior margin and red brown surface. This type was noticeably absent from the first two periods at the Mansion House where the fabrics were lighter, often white or buff (with undifferentiated margins) and less hard fired. This general development towards harder fired darker products was also noted amongst the Castle Ditch material.

The group called here "later reduced green-

Table 1a

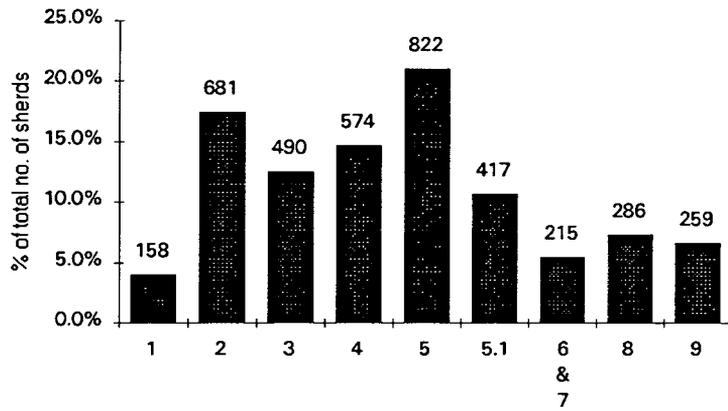


Table 1b

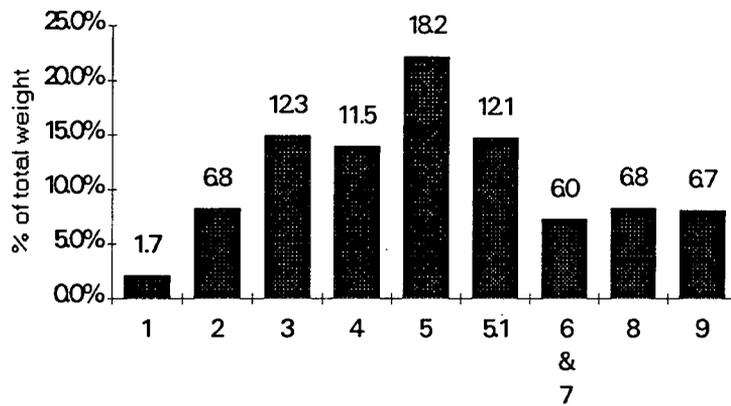
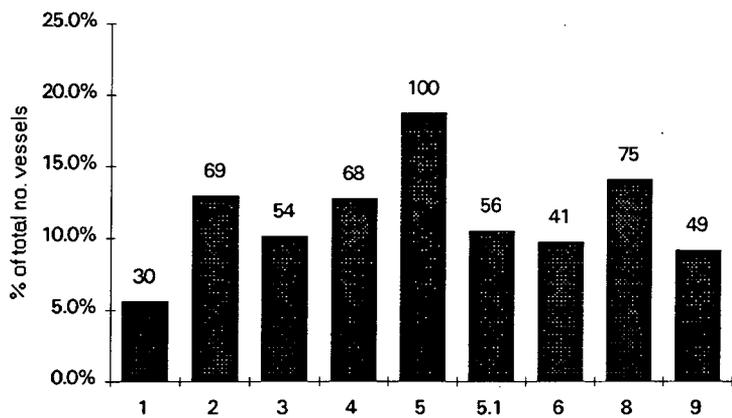


Table 1c



wares" was dominant in the 15th century (period 6). This pattern is also paralleled in the Castle Ditch, although the material from Mansion House period 5.1 shows a more gradual transition from buff white to reduced greenware than was evident in that assemblage. Reduced greenware type 4, first occurring in Period 4, only made up about 30% of the "later reduced greenware" in these phases. The major part of the group were generally lighter in fabric colour with some quartz grit, although otherwise with the same forms and type of glaze as RG4. This type has since been noted during work on the medieval assemblage at Black Friars (Ellison *in prep.*). It may be a "transitional" type (it does occur earlier than type 4, in Period 3, at the Mansion House) or merely from a different production centre. Both types include the oxidized or partly oxidized variety.

These established trends would appear at variance with those identified in the material from the Queen Street excavations (Bown, 1989, p. 76). At Queen Street quartz gritted wares, dominated by oxidized gritty ware, characterize the 13th century assemblage, while the

buff white wares were thought to be predominant in both the 14th and 15th century horizons. Unusually no chronological developments in the buff white assemblage were apparent.

Fabric groups represented in table 2

This number series is not specific to this site, having been used in the processing of several sites in Newcastle. Some minor groups and queries have been omitted.

4	Buff white wares
5	Orange buff wares
6.1	Oxidized gritty wares
6.2	Reduced gritty wares (including early reduced greenware)
7	Later reduced/oxidized greenwares
10	Other medieval wares
11	Scarborough ware
12	French wares—Saintonge, Beauvais
16	Rhenish stonewares (except Westerwald)
19	Weser (German slipware)
20	Low Countries wares—red, white, grey
26	English whiteware
27	English Redwares

Table 2 Number of vessels by fabric and period.

Fabric Group	Periods									Totals
	1	2	3	4	5	5.1	6&7	8	9	
4	21	34	41	51	23	3	3	5	227	
5		2	5	6	11	6				30
6.1		3	4	2	6	1	1		18	
6.2	5	10	5	8	6	3	2			31
7		2	3	8	14	18	23	13	3	84
10			1	2	6	2		1		12
11	3	6		2		1	1		1	15
12			1		2		2	1		6
16				3	2		2	5	5	17
19								5		5
20				3		2	6	14	2	27
26			1					3		4
27							1	8	10	19
28							1	13	9	23
32								3	1	4
33								2	5	7
35								1	8	9
Totals	29	69	54	67	99	56	41	74	49	

- 28 Tin-glazed earthenwares—"Delft"—17th/18th centuries
 32 Later 18th/19th century local red earthenwares, or "brownwares"
 33 Other 18th/19th century wares—pearlware, creamware, "china"
 35 White salt-glazed stoneware—18th century.

NB: Some small groups only appear in the table and are not commented upon in any detail later in the text. It was not thought necessary here to repeat descriptions and information which can be found more appropriately in other reports.

The high proportion of group 27 in period 9 reflects the assemblage in Pit 96 (see below). This is possibly misleading because the group also covers the 17th century "metropolitan" type redwares, as distinct from the "brownwares" of group 32. Although the pit assemblage is an interesting closed group, it is too small, and too narrow in scope, to do much to clarify the local type series during the late 17th and 18th centuries and it was not thought appropriate to introduce another type of post medieval redware at this stage.

In presenting the pottery for this published report the illustrated vessels are broadly grouped by fabric type, with context information following the catalogue entry thus:-(period/[context]). However, when dealing with a vessel which did not easily fall into a discrete fabric group it was placed with the forms it seemed most closely related to rather than impose an artificial segregation. Thus the first two groups of cooking pot/jars include two vessels in oxidized iron rich fabrics although the others are buff white wares. The main distinction in "jars" was between this group and those in the gritty, iron-rich fabric of the early reduced greenwares.

Reference to material from other Newcastle excavations is given in an abbreviated form with site name and illustration number thus: *Ditch 6*. The key to these excavations is given at the beginning of the bibliography.

BUFF WHITE WARES

This includes the orange buff fabrics which were noted in the Closegate assemblage, Vessels: 227 buff white, 30 orange buff.

About a third of the buff white vessels were divided into the two main vessel types catalogued here i.e. cooking pot/jars and jugs.

The rest included:-

29 represented by only a handle or handle fragment/handle attachment—16 rod, 5 strap, 3 oval sectioned

38 represented by a base which could be measured. 12 large bases 28–30 cm. 5 at 24–26 cm. 10 at 20–22 cm. 4 at 16–18 cm. 4 at 13–14 cm. 3 at 10 cm.

Cooking pots/jars

34 vessels (plus 9 oxidized gritty)

Small vessels

1. Buff fabric with darker brown surfaces. Has large quartz grits in a fine matrix like the wares from the Dog Bank kiln (Bown, 1989). Flecks of glaze on exterior with small patches of sooting. Cf. *Queen St.* 20. (1/[270])
2. Brown buff fabric with ill sorted inclusions. Darker surfaces. (1/[270])
3. Buff white gritty with green glaze. Cf. *Queen St.* 147 (2/[349])
4. Buff white, heavily sooted. (3/[182])
5. Short lid seated neck similar to the Low Countries cooking pots. Light orange/brown with a zone of external glaze. There was another example of this form. (4/[391])
6. Buff white gritty. Simple everted rim. (2/[188])
7. Light brown with darker surfaces. (2/[188])

Large vessels

8. Light brown to pinkish brown fabric with grey core where thicker. Matrix of abundant fine quartz and occasional fine red iron oxide with ill sorted sparse to moderate large quartz and occasional large red

iron oxides with grits visible on surface. Blackened below neck externally and round neck internally. Grass impressions on internal surface. Fabric and form are as *Orchard Street 2*, from a pre-Town Wall context. There was a similar, though thicker, rim in the same context and one from (2/[349]). (1/[270])

- 9 Buff white thinly thrown, fine grits on surface. Patches and some thin runs glaze inside. Discoloured by burning. Two examples of this form in Oxidized Gritty fabric and another in buff white. (1/[270])
- 10 Gritty buff white fabric with darker red brown surfaces. A few small specks of glaze. (2/[349])
- 11 Red brown oxidized gritty fabric. Fairly

heavy out turned clubbed rim. (3/[592])

- 12 Pinkish gritty buff white, unglazed. Fragment of sooted strap handle, broken lengthwise, could be same vessel. The more rounded form is similar to *Ditch 6*. There were two orange buff examples. See also under no. 17 below. (3.1/[182])
- 13 Orange buff fabric with orange glaze on body. Large diameter vessel, possibly a dairy pan although those at Queen Street (Bown, 1989 nos. 151–153 and 164) had more elaborate rims. This form a heavier version of no. 9 above. (4/[289])
- 14 Buff white gritty fabric. (4/[403])
- 15 Buff with darker surfaces. Similar to no. 13 above but plain. (2/[188])
- 16 More upright rim. (2/[188])

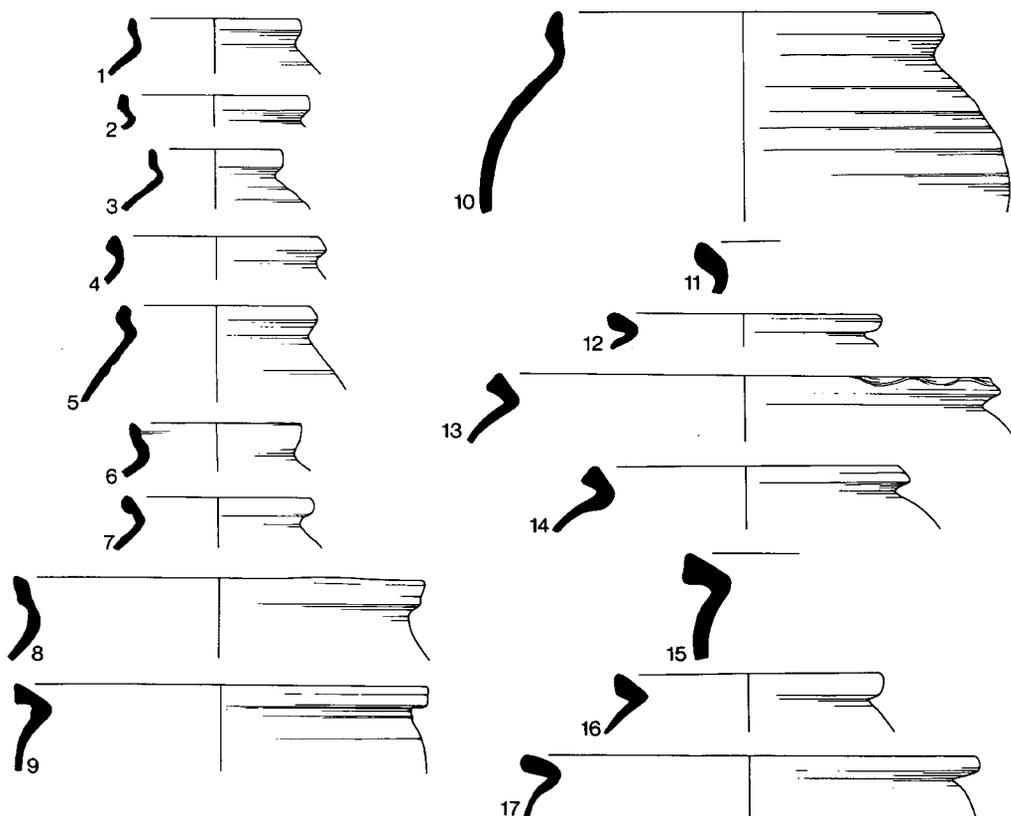


Fig. 15 Pottery: Buff White Ware cooking pots/jars, nos 1–17 ($\frac{1}{4}$ scale).

17 Oxidized gritty fabric, one other oxidized gritty of this form, which is similar to *Ditch* 6. The other example had a handle scar. (2/[188])

Other cooking pot forms occurring were:

Square sectioned rims as *Closegate* 1: 5 examples.

Similar, thinner thrown form as *Ditch* 5: 4 examples in buff white, one in orange buff, one in oxidized gritty.

Similar but with groove round outer face of rim as *Closegate* no. 5: one in orange buff.

Wavy rim as *Closegate* 26: one in oxidized gritty.

Possible "dairy pan" as *Queen St.* 164: one in oxidized gritty.

As *Queen St.* 144 (plain everted rim): 2 buff white.

Jugs

60 vessels

This broad term covers all vessels presumed to be for holding or storing liquids.

Apart from the illustrated vessels, forms occurring were:-

Common jug form with slightly lid seated rim cf. *Ditch* no. 9: 14 vessels

Simple expanded rims: 8 vessels

There were 11 rod handles, 4 oval sectioned, 4 small loops.

18 Hardish light grey with light orange/buff exterior margin in parts. Glazed zones but glaze is flakey and devitrified. Slightly ridged lower body. (3/[530])

19 Small crudely made jug found almost complete. Coarse and fairly hard orange buff fabric with ill sorted inclusions with orange to red brown external surface. There were fragments of four other similar jugs, indicated by handle and body fragments, in orange buff fabric, and one in a hard fired buff white fabric. (3/[531])

20 Almost complete fat jug. Off-white fabric with zones on upper body of green glaze. Handle of small cross section. (4/[355])

21 Two joining sherds only are illustrated, other sherds indicate a large cistern type vessel. The illustrated sherds have an unglazed rough red/brown surface

although other body sherds which seem to be from same vessel indicate zones of glaze on upper body. The surface colour derives from a slip which fades out towards the bottom of the vessel where the surface is also smoother. Hard light to mid-grey fabric with streaking/mixing of the clay. Inner surface light yellowy brown with occasional black iron oxides staining. (4/[355])

22 Hard, compact light red fabric with dark red/brown external surface. Sparse medium sized quartz and red iron oxide inclusions in a very fine matrix of the same. Base (not illustrated) 22 cm. (4/[355])

23 Hard mid-grey fabric with black blibs. Red brown to dull brown exterior surface where unglazed. Spots, splashes and zones of uneven greenish speckled glaze. (5/[398])

24 Fairly coarse buff white fabric with light pinky brown external surface, some large red and grey inclusions. (5/[396])

25 Hard fired fabric, pale pinky brown (light grey in parts where reduced) with occasional large red and grey (iron oxide) and very occasional large opaque white inclusions in a matrix of moderate, medium quartz grits. External surface grey and greyish brown with runs of brown glaze. Some parts of the body have roughened brown glaze. (5/[511])

26 Buff fabric with slightly darker surfaces, rather abraded. Lid seated rim similar to *Ditch* 9, but thicker. (5/[502])

27 Orange buff hard fired coarse fabric with a fine matrix of quartz and red (iron oxide) flecks. Surfaces are darker brown, splash brown glaze externally. (5/[502])

28 Orange buff fairly fine fabric with light grey internal margin, unglazed except for a spot and two thin runs. Fabric similar to oxidized greenware but form fits into this group. (5/[512])

GREYWARES/"REDUCED GREENWARES"

This group covers the iron rich fabrics. The reduced greenware types as identified in the

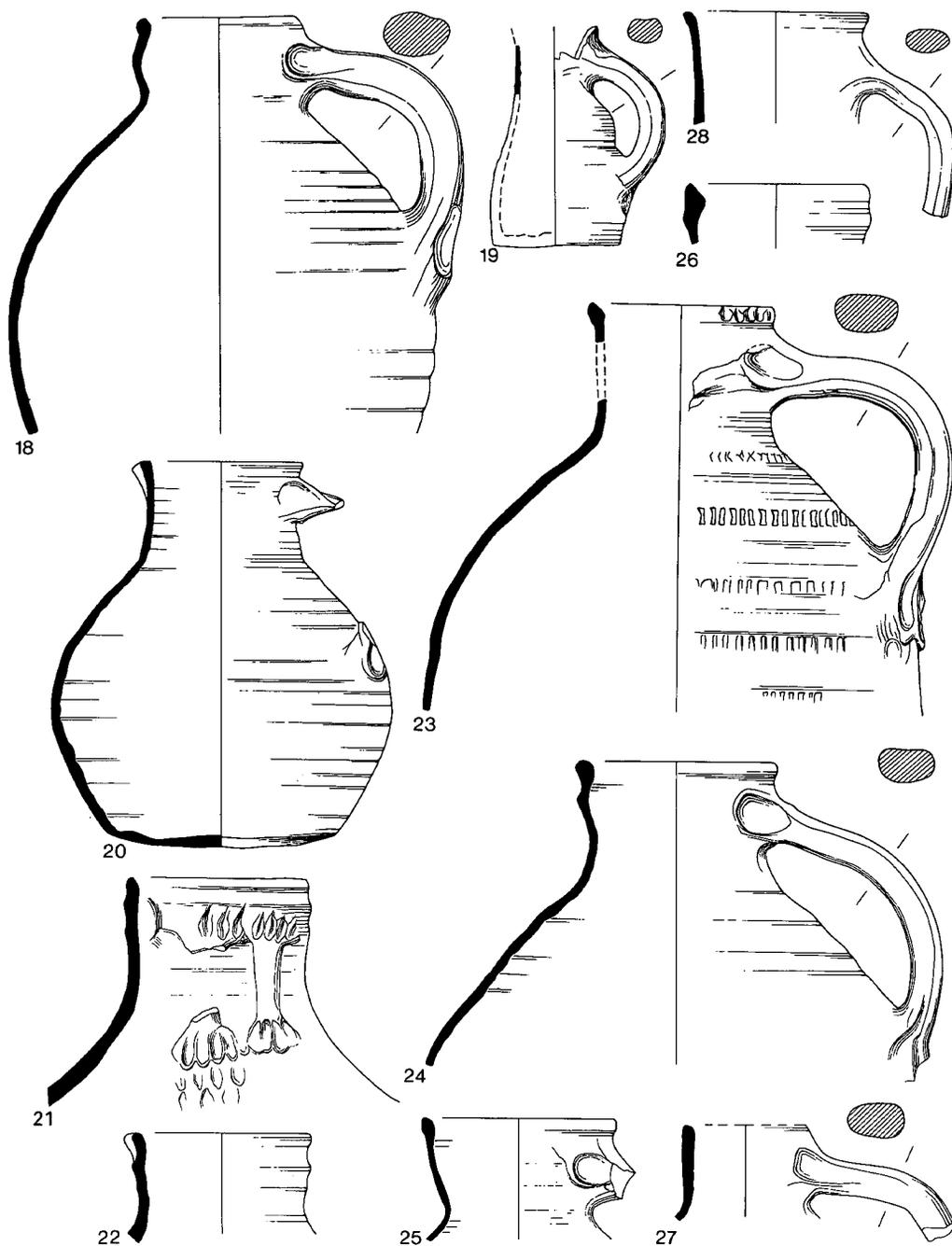


Fig. 16 Pottery: Buff White Ware jugs, nos 18-27 (1/4 scale).

Ditch report are referred to by an abbreviation—thus RG3, RG5 etc.

Jars/cooking pots

These vessels are in the dark grey gritty fabric of the early reduced greenwares but they are unglazed for the most part with off-white surfaces.

- 29 Rim diameter seems rather big so perhaps vessel not circular. Trace of blackening ?sooting. (1/[270])
- 30 Similar to above. (2/[349])
- 31 Thin whitish margins, brownish surface with a spot and traces of pale green glaze (5/[501])
- 32 Everted rim. (2/[188])
- 33 Thick clubbed rim. Unglazed. (1/[528])
- 34 Gritty grey fabric with orange surface. (5/[511])
- 35 Two joining sherds. One is dark grey with greenish glaze similar to the early RGs but part of the other sherd is oxidized light red. Cf. *Closegate* 8. (5/[502])
- 36 Moderately gritted grey fabric with orange/red margins, red brown surfaces. Patch of glaze on top of rim, a base fragment had rough splashes glaze internally. (5/[211])
- 37 Globular body on short neck. Mid grey slightly gritty fabric oxidized in parts. Green brown crackled glaze. (5.1/[249])

Other Vessels

- 38 Lid seated jug rim. Grey gritty fabric with oxidized exterior patch and green glaze. (2/[349])
- 39 Cf. the common cistern form *Ditch* 45–47, though rather heavier. Medium grey gritty fabric with whitish and buff exterior margin (RG3). Light green slightly speckled glaze, unglazed patches, oxidized light red brown, under handle and near rim. (5/[501])
- 40 Jug rim similar to no. 38 above but in a completely oxidized orange fabric with fairly abundant fine and moderate medi-

um quartz and fairly abundant black iron oxide inclusions. (5/[510])

- 41 ?Lug in RG5. Fully glazed lightish greeny/brown. (7/[176])
- 42 Chipped ?pedestal base in RG5. Fully glazed. (7/[518])
- 43 Embossed decoration formed by pressing out from within (finger marks can be seen). The lower pattern element, made in the same way, also occurred at *Orchard Street*. Light grey gritty fabric with light olive green glaze. (5/[502])

OTHER MEDIEVAL FABRICS

- 44 White fabric with fairly compact matrix of sparse fine quartz with very occasional fine red and black iron oxides and large opaque white inclusions similar to the later English whitewares. Traces of yellowish glaze. Impressed patterns. (4/[391])
- 45 Small fragment of shallow dish with divider. Light red fabric with ill sorted inclusions: sparse medium quartz, occasional large quartz and iron oxides. (5/[502])
- 46 Saintonge jug rim with mask. White fabric fully glazed green, lighter inside. Base probably same vessel is 12 cm diameter with only runs of glaze externally. Paralleled at Southampton (Platt and Coleman-Smith, 1975, p. 142 nos. 1029 and 1030). Dated 1300–1350. (5/[512])

POST MEDIEVAL WARES

WHITEWARES

Low Countries

There were only a few sherds.

- 47 Frying pan in sandy white fabric with internal copper green glaze. Scar where spout chipped off. Similar rim form to *Orchard Street* 45. (7/[133])

English Whitewares

- 48 Jar or jug with abrupt change in body angle and notched decoration on ridge.

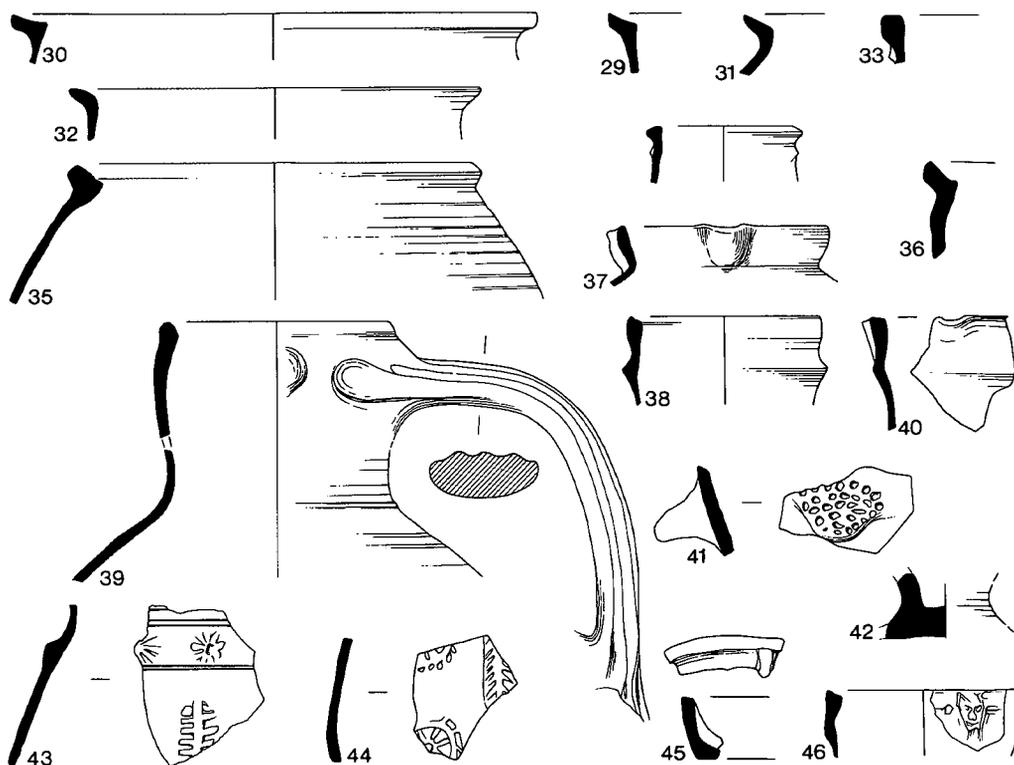


Fig. 17 Pottery: Reduced Greenwares and other medieval fabrics, nos 29–46 ($\frac{1}{4}$ scale).

Hard buff fabric with moderate fine sand and fine black iron oxides. Bright copper green glaze externally. Unglazed internally. (7/[153])

- 49 Chamber pot with yellow internal glaze and green external. (8/[170])

REDWARES

- 50 Low Countries. Bowl in sandy orange fabric. (6/[292])
 51 Low Countries. ?Bowl. (8/[314])
 52 English redware. Vessel similar to *Bastion* 14, which also has handle. (8/[156])
 53 English redware bowl. Not a Metropolitan form but from same context as flatware no. 54 below. (8/[151])
 54 English Metropolitan type redware. Flatware with no marked flange, though slip trailed pattern respects the border cf.

Blackfriars 56. Small flecks of iron in glaze. (8/[151])

ASSEMBLAGE FROM PIT 96: PERIOD 9—EARLY EIGHTEENTH CENTURY

This cess pit was sealed beneath the paved floor of a waterfront building on the western property. The pottery forms a group falling between the 17th century assemblages, dominated by metropolitan type wares (see *Blackfriars* and *Bastion* reports) and the “modern” assemblages (late 18th and 19th centuries) which are dominated by the later red or “brown”wares of Tyneside and Sunderland manufacture (see Nolan, 1990). The three illustrated redware vessels (55–57) are each in a different fabric. Also in the pit were the fragments of several large unglazed redware vessels with simple thickened rims (such that the

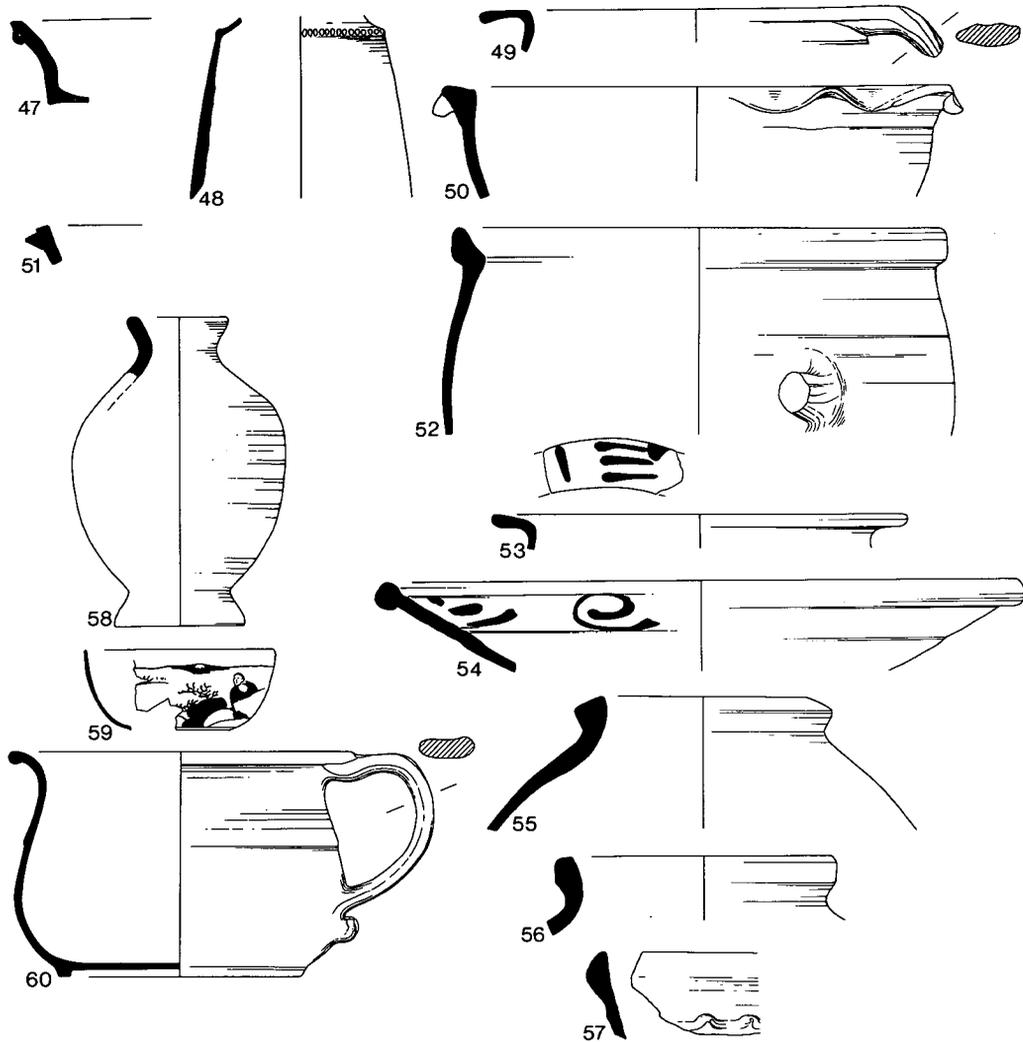


Fig. 18 Pottery: Post medieval wares, nos 47-60 ($\frac{1}{4}$ scale).

wall of vessel varied from e.g. 6 mm to 22 mm at thickest part of rim). The diameter of these vessels was 340 mm. There were fragments of three other tin-glazed vessels: a plain plate as one from Norwich (Jennings, 1981, no. 1519) late 17th/early 18th c.; a ?bowl with a slightly hooked rim (cf. *Blackfriars* 113); a chipped base fragment of a drug jar with a bit of mauve painting. There was also a base fragment of a Cologne/Frechen stoneware vessel.

- 55 Jar, splashes of glaze. Light red fabric with some fine sand.
- 56 Jar with zone brown glaze along top and inside rim. Red brown fabric with reduced core.
- 57 Jar, fully glazed (orange/yellow) in orange brown very sandy fabric. There were four unglazed sherds of the same fabric.
- 58 Complete unbroken vessel, unglazed in light orange fabric.

- 59 Tin-glazed earthenware small cream or sugar bowl? Chinese type painting, blue paint on a pale blue background.
- 60 Tin-glazed earthenware, almost complete chamber pot. Plain white glaze with a very faint pinkish tinge in parts, especially under base where cover not total. Early 18th c. see no. 1524 from Norwich (Jennings 1981).

Industrial Vessel

- 61 The illustration is a reconstruction from non-joining pieces. A thick layer almost entirely composed of red earthenware fragments of vessels like this was found beneath the cellar floor of the Mansion House ([142/147]). The fragments were covered in a red powder. A few very coarse fragments of saggar type vessels were found in the same context together with some sherds of a dipped white salt glazed stoneware tankard with a band of iron slip at the rim. This stoneware type was introduced in the 1720s and continued into the 1770s (Noel-Hume, 1980, pp. 16–23).

The powder was analysed by J. and H. S. Pattinson (Public Analysts) as containing:

Iron Oxide (Fe ₂ O ₃)	20.5%
Silica (SiO ₂)	47.9%
Lead Oxide (PbO)	LT 0.05%
Arsenous Oxide (As ₂ O ₃)	LT 15 milligrms/kilo
Antimony Oxide (Sb ₂ O ₃)	LT 15 milligrms/kilo

The vessel and its contents can be paralleled by finds from Legge's Mount, Tower of London (16th/17th century) and from Tower Hill, London from a 17th/18th century context (Heyworth 1988). Like the Newcastle examples, they had red powdery deposits on them. They were used for distilling mineral acids and the iron oxide is the insoluble residue from the process (J. Bayley pers. comm.).

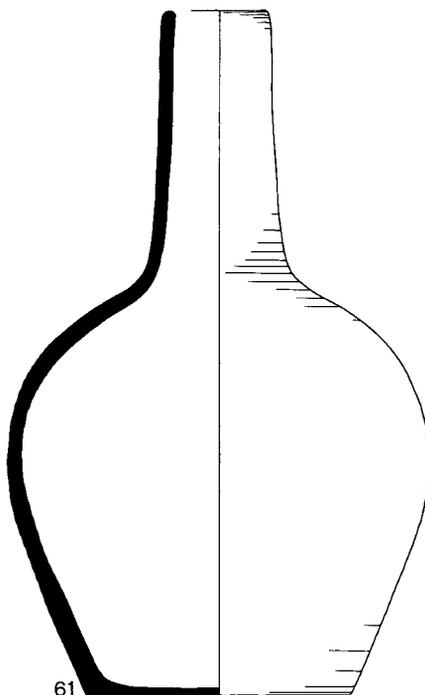


Fig. 19 Pottery: Industrial vessel, no. 61 (¼ scale).

CLAY PIPES

A total of 152 fragments were recovered. The two largest, and perhaps most interesting, groups occurred in Period 8: 29 fragments from the large pit [175] and 34 from demolition rubble. Both these groups predate the Mansion House. The makers stamps in these groups are summarized below. Unless otherwise stated the dates for makers are those quoted by Lloyd Edwards (BAR 192, 1988).

Pit [175]

Henry Walker (1674–1699): 3 lozenge stamps (type C1), 1 oval (type D)
 John Rodchester (1688–1718): 1 type D
 George Parke (1695–1706): 1 type D
 John ?Thompson (1683–1690): 1 type D
 ?C G: lozenge stamp, see below no. 64.
 The presence of a George Parke stamp in this

group allows the dates for this maker to be put back to at least 1691.

Demolition Rubble

Henry Walker: 1 type C

John Rodchester: 1 type D

Leonard Holmes (1671–1707): 4 type D

Arthur Hastings (1680–1722): 1 type D

Michael Parke (1692–1737): 1 type D

?C G: lozenge stamp, see below no. 63.

Michael Parke's dates can also be put back slightly on this evidence.

Only pipes with marks which have not previously been published are illustrated.

62 Michael Parke type D stamp on type 8 bowl. Demolition [146].

63 Type 6 bowl with lozenge stamp. From Demolition [20].

64 Type 9 bowl with lozenge stamp. From Pit [175]. 63 and 64 are not the usual type C stamp—quartered with fleur de lis top and bottom and initials either side—but have a cannon down the middle. The initials are rather obscured but the same stamp was found at Blackfriars complete and the initials appear to read C and G (Edwards,

forthcoming). It is possible that the initials are those of George Carter (1667–1677) reversed. His only other known stamp is the usual type C. Alternatively the pipes may not be of local manufacture.

Period 9

65 John Rodchester type D. From Mansion House construction [226].

66 Circular stamp on base of heel. A similar mark from Blackfriars was identified as "Uncertain Dutch" (Edwards, forthcoming). From Pit [96].

67 Decorated stem, similar stems at Blackfriars also identified as Dutch (ibid). From floor make-up, property 1 [183].

68 Type E stamp on a plain bowl similar in shape to the decorated bowls of the late 18th–early 19th century. This simple form of maker's mark, introduced about 1680, was still in use in the first half of the 19th century (see also Closegate report). Initials possibly J P, perhaps another member of the Parke family. Also [183].

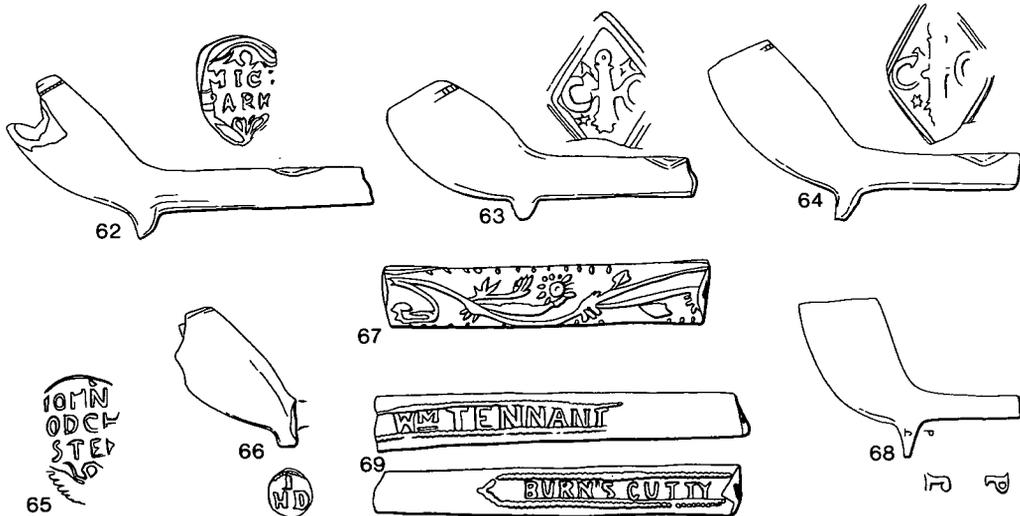


Fig. 20 Clay pipes: nos 62–69 ($\frac{1}{2}$ scale).

Period 10

- 69 Stem stamp called by Parsons type "d" and dated 1840—(1964, p. 246–7). William Tennant pipes have a wide distribution. Parsons lists two makers of that name. One from Berwick with a single date, 1855. One from Newcastle 1875–1925. Both are noted as using this stamp.

DECORATIVE PLASTERWORK

A large quantity of moulded plaster was recovered from four contexts associated with the demolition of building 39 sealed below the Mansion House, (i.e. before 1691). A 17th century date is consistent with the suggested dates for similar plaster ceilings in Newcastle. Stylistically the plaster can be attributed to the early 17th century (Beard, 1934).

The plaster has been catalogued in detail although only the recognisable and more identifiable pieces are published here. The border mouldings were all broken and there was nothing to link them in a cogent way with the rest of the plaster. Only the mouldings still attached to decorative elements are published. The presence and orientation of lath marks has also been recorded in the archive catalogue; but there was not enough plaster for them to contribute materially to a clearer understanding of the arrangement of the ceiling. In total there were 39 decorative types, 8 mouldings and 6 uncertain types. On stylistic grounds it would appear that more than one ceiling is represented.

There are three other ceilings in Newcastle likely to be of similar date: 28–30 The Close; the Mayor's Parlour in the Guildhall and Alderman Fenwicke's, Pilgrim St. In addition six pieces of plaster from this site have identical or very similar designs to those on the ceiling in Bessie Surtees House. This ceiling was believed to be a copy of one that existed in Cosyn's House on the Quayside, which was demolished to make way for the piers of the Tyne Bridge.

There was not enough plasterwork to surmise anything about the size of the original

ceilings or to suggest possible reconstructions in any detail. However narrow decorative bands arranged in a geometric pattern with devices in the centre of the space between (like the ceilings in Bessie Surtees House, Alderman Fenwicke's and the Guildhall) are common at this time and also consistent with most of the plasterwork from this site.

Catalogue nos. 75 and 76 do not seem to fit into this type of ceiling. No. 75 is identical to an element of a complicated frieze in a recess between the beam soffits of the plaster ceiling in 28–30 The Close. This ceiling is different in concept from the other Newcastle ceilings of similar date. The beams and recesses are completely covered in repeating friezes; there are no blank areas or free-standing elements, the whole design is more intricate and detailed, and not a single flower motif appears.

Motif no. 85 appears in both the ceilings of the Guildhall and Alderman Fenwicke's but used differently within a palmette rather than a decorative band while no. 88 is similar to elements in all of these ceilings. No close parallels are known for these particular designs outside Newcastle.

It seems likely that all four ceilings, and the one that existed in Cosyn's House, are the work of the same group of plasterers, possibly even using some of the same moulds. The Guildhall and Alderman Fenwicke's ceilings appear almost identical in design elements though not in overall size. The Tudor rose no. 70 appears almost identical to that used in the Guildhall. However it has been suggested that the moulded plaster itself could have been brought in by ship from London and applied by local plasterers. (David Bostwick, pers. comm.)

- 70 Large Tudor rose, 6 inner petals, 8 outer petals. Very similar to a rose set in the centre of 4 palmettes within the ceiling of the Mayor's Parlour in the Guildhall. Similar to rose used in spaces between rib-work infill, Bessie Surtees. The Bessie Surtees example lacks the outer "leaves". 8 fragments.
- 71 Tudor rose, 8 inner petals, 8 outer petals.
- 72 Mask, simple moulding on left side.



Fig. 21 Moulded plaster: nos 70-77 (1/4 scale).

- 73 Base of palmette shaped? decorative panel. Flowers and foliage around central stem. 11 fragments.
- 74 Exotic? fruit.
- 75 Bird head between 2 tendrils with foliage strand in its beak. This motif appears in full as part of a bird and foliage frieze in the recesses between the beam soffits of a ceiling in 28–30 The Close.
- 76 Thistle? with tendril above. Remains of moulding on right side.
- 77 Part of decorative foliage band, with remains of moulding on both sides. 6 fragments.
- 78 Part of foliage/flower decorative band with small five- and six-petalled flowers, large stylized flower and tendrils. Remains of moulding on both sides. 7 fragments.
- 79 Corner piece of flower/foliage decorative band. Large rose-type flower and small five-petalled flower. The tendrils are gathered into the corner by a fleur-de-lys. Remains of moulding which continues at a right-angle. This has very similar elements to no. 11: the five-petalled flower, the fleur-de-lys and the tendril but no joining pieces exist. 6 fragments.
- 80 Part of flower/foliage decorative band with eleven-petalled large flower and five-petalled small one, the tendrils are gathered into a fleur-de-lys. Remains of moulding on both sides. See no. 79.
- 81 Part of flower/foliage decorative band with eleven-petalled large flower with elaborate centre. Leaves and tendrils. Remains of moulding on both sides. 5 fragments.
- 82 Large piece of flower/foliage/fruit decorative band with Tudor rose, honeysuckle, and fruit within a tendril scroll. Small ivy-type leaves. The central fruit and Tudor rose appear identical to ones in decorative bands at Bessie Surtees house. See also 83 and 85. Remains of moulding on both sides. 5 fragments.
- 83 Part of flower/foliage decorative band. Simple Tudor rose, thistle and unidentifiable flower within tendril scroll. Remains of moulding on both sides. This piece seems to be curved, perhaps part of large circular band? Similar to elements in the Bessie Surtees decorative bands, see also 82 and 85. 4 fragments.
- 84 Part of foliage/flower decorative band with fairly simple Tudor rose, tendrils and small bud. Remains of moulding on both sides. Moulding indicates this is part of the junction between 2 bands meeting at approx. 60°.
- 85 Part of flower/fruit/foliage decorative band. Exotic fruit within tendril scroll. Remains of moulding on both sides. A fruit of this type appears within a palmette in both the ceilings of the Mayor's Parlour, Guildhall and Alderman Fenwicke's, Pilgrim St. Also is used as part of decorative band in the Bessie Surtees ceiling, see also 82 and 83. 2 fragments.
- 86 Part of flower/fruit/foliage decorative band. Vine scroll. Remains of moulding on both sides. 39 fragments.
- 87* A small part of the ends of two adjoining petals. Seems similar to petals in a 15 petalled flower which appears as the centre of four palmettes in the ceilings of the Mayor's Parlour, Guildhall and Alderman Fenwicke's Pilgrim St.
- 88* A small piece with part of a tendril? surrounded by dots. Similar motifs appear in the ceilings of the Mayor's Parlour, Guildhall; Alderman Fenwicke's, Pilgrim St. and 28–30 The Close.

BRICK

A total of 174 fragments of brick were recovered from medieval and post-medieval contexts during excavation. Of these 78% were from medieval contexts and 22% from post-medieval contexts. A total of 13 distinct types could be identified. Of these the majority were isolated fragments. With the exception of the Mansion House, brick was recovered from only four structural contexts, 225, 301, 227, and 162. With the exception of context 225, which was constructed from type 1 bricks the other contexts were all type 13 bricks.



Fig. 22 Moulded plaster: nos 78-82 ($\frac{1}{4}$ scale).

The quantity of brick examined from this and other recent sites has allowed the earlier type series published in the *Ditch and Bastion* reports to be remodelled and a more comprehensive series formulated, although almost every site produces at least one type which is unseen on any of the others. The numbers have been changed from Roman to Arabic as this was thought to be less confusing, but otherwise they relate, or add to those previously published. The principal medieval bricks are nos. 1, 2, 5 and 11. Types 3, 4 and 12 would appear to be late medieval to early post-medieval; while 9, 14 and 15 are the principal post-medieval types.

Type 1

Large brick with cream-yellow fabric, generally soft firing, with occasional blue-green ash glaze covering part of brick. A number of examples have a border on the upperface between 5–20 mm wide. The sides and lower face are sand covered and the latter often has traces of grass or straw impressions. The weight of whole bricks varies between 1.19–1.96 kg. Measurements are generally in the range 194–234 mm × 100–120 mm × 47–60 mm. Bricks in similar fabric, but generally thinner and harder fired are types 3/5 and 5. Formerly type i. First occurrence, period 3, [182].

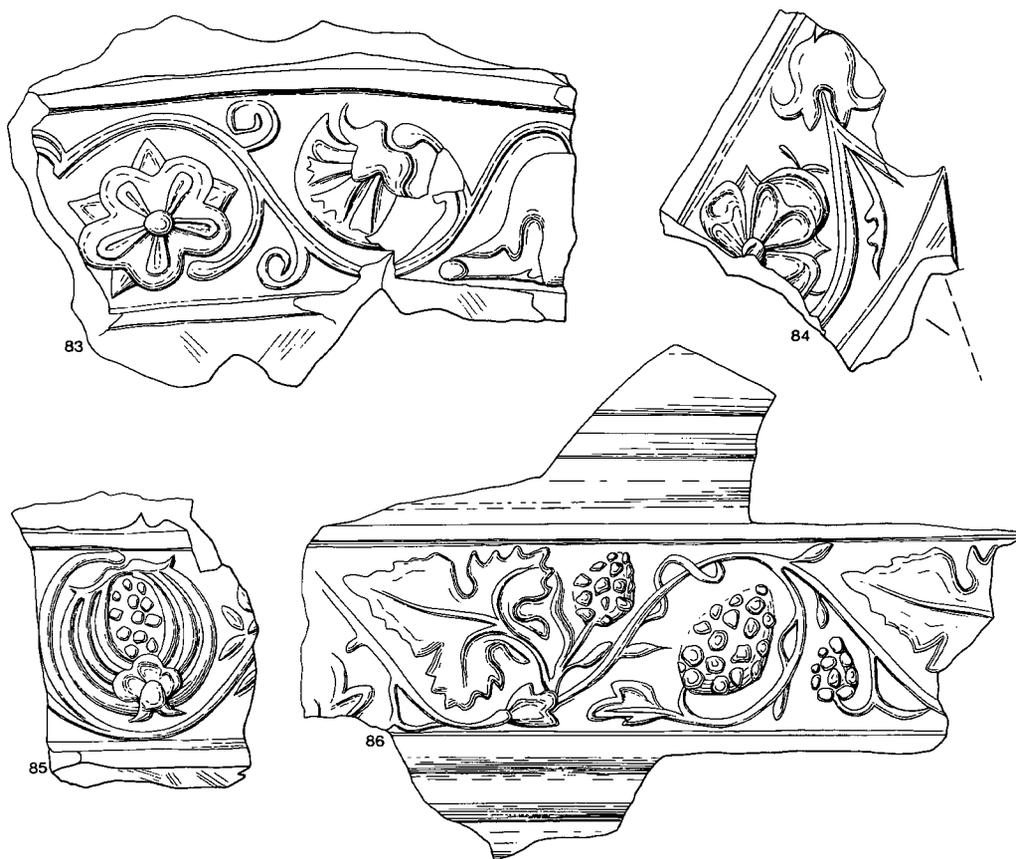


Fig. 23 Moulded plaster: nos 83–86 ($\frac{1}{4}$ scale).

Type 2

Large brick with orange to purple-brown fabric, generally relatively hard, quite sandy with occasional large stone inclusions. Smoothed upper face, but sides and lower face sand covered. Lower face often has grass or straw impressions. No complete examples have so far been found and measurements vary between 127–144 mm × 50–62 mm. Formerly type ii. First occurrence, period 4, [277].

Type 3

Small brick with light brown to orange-brown fabric, generally soft firing and quite sandy. A large number have a border on the upper face. The sides and lower face are generally rough and sand covered. Measurements are generally in the range 173–190 mm × 78–93 mm × 35–50 mm, with whole examples weighing between 0.53–0.95 kg. Formerly types iii, iv, v and vii. First occurrence, period 6, [292].

Type 4

Small brick with light brown to orange-brown fabric, generally hard fired, quite sandy with no other inclusions. The upper face has no border and is normally smoothed flat. The sides and the lower face are rough and sanded. Measurements vary between 164–177 mm × 74–85 mm × 37–45 mm with whole examples weighing 0.62–0.88 kg. First occurrence, period 4, [283].

Type 5

Large, sandy, yellow-brown to pink-brown brick, generally hard fired. The upper face normally has a border and a smoothed surface. The sides and lower face are rough and sanded. Measurements vary between 216–222 mm × 95–110 mm × 41–53 mm with whole examples weighing 0.83–1.34 kg. Formerly type v. First occurrence, period 3, [530].

A group of intermediate sized bricks, with fabric and surfaces similar to types 3 and 5 was also identified on this site. Measurements vary between 190–212 mm × 91–103 mm × 42–54 mm with whole examples weighing 0.97–1.14 kg. It is uncertain as yet whether

these bricks are in fact a discrete type and they are included here with type 5.

Type 6

Not identified here.

Type 7

Large brick with light yellow-brown to pink-brown fabric, generally soft firing with red iron oxide inclusions. Smoothed upper face, sometimes with a border, sides and lower face generally rough and sand covered. Measurements lie in the range 210 mm × 92–100 mm × 44–54 mm with whole examples weighing 1.76 kg. Appears to be similar to type vii. First occurrence, period 3, [182].

Type 8

Not identified here.

Type 9

Large light orange to purple red brick, generally hard fired with occasional sandstone inclusions. The upper face is generally smoothed, with evidence of a border. The sides are also usually smoothed while the lower face is rough and sanded with a diagonal impressed groove set in it. Measurements vary between 225–246 mm × 105–120 mm × 40–53 mm and weight of whole examples varies between 1.85–1.99 kg. Formerly types ix/x. First occurrence, period 8, [150].

Type 10

Not used.

Type 11

Large, sandy, orange-red to purple-red brick, generally soft firing, with occasional red iron oxide inclusions and yellow "sand". The upper face is smoothed, generally with a border. The sides and lower face are rough and sand covered. Measurements vary between 224 mm × 103–127 mm × 42–55 mm, however, no whole examples have been found to record weight. Formerly type xi. First occurrence, period 3, [182].

Type 12

Formerly xii—not identified here.

Type 13—New type description

Large brick, dark red to purple-red sandy fabric, generally hard fired. The upper face and sides are smoothed, while the lower face is rough and sanded. Measurements vary between 241–245 mm × 111–120 mm × 53–66 mm and the weight of complete examples varies between 2.54–2.58 kg. First occurrence, period 7, [304].

Type 14

Large orange-red to red-brown brick, generally hard fired, with small angular black ferric oxide inclusions and quartz grains. The upper face is smoothed, sometimes with evidence of a border; the sides are smoothed while the lower face is rough with a central impressed groove set in it. Measurements range between 237–250 mm × 117–120 mm × 50–62 mm and weight of whole examples varies between 2.86–3.15 kg. Formerly type xiv (see *Blackfriars* p. 121). First occurrence, period 7, [153].

Type 15—New type description

Large brick, orange-red to purple-brown fabric, generally hard fired, often overfired and sometimes containing large stone inclusions. The upper face is smoothed, sometimes with evidence of a border; the sides are smoothed but the lower face is rough with traces of grass or straw marks and has an impressed diagonal groove set in it. Measurements range between 215–233 mm × 108–125 mm × 50–67 mm and

weight of whole examples varies between 2.39–2.57 kg. Formerly type xv, also identified first at Blackfriars. First occurrence, period 8, [146].

A brick plaque was found still in situ in the centre of the west wall of the Mansion House, evidently commemorating its construction. It consisted of two bricks set on edge bearing the legend in relief 16O*M92.

FLOOR TILE

A total of only eleven fragments from nine contexts were produced from the site. Of these, six of the contexts were medieval. The earliest tiles found were in [282]—three unglazed red-brown sanded fragments ranging from 31–37 mm thick. This context (the infill above drain 300) was contemporary with building 200 and the occurrence of these tiles is therefore quite early. A fragment of tile from 518, the backfill of the robber trench for wall 165, could represent the type of flooring in building 200—glazed, orange sandy fabric, 28 mm thick. The remaining four contexts 263, 235, 336 and 293 were all later landfill or make-up deposits.

STONE OBJECTS

Fragment of a chalk gaming board, 173 mm wide and 38 mm thick, with three lines of semi-spherical indentations 20 mm in diameter, 8 mm deep. Four set squarely around the edge 75–80 mm apart and two in the centre, see sketch below, (9/[8]Property 2)

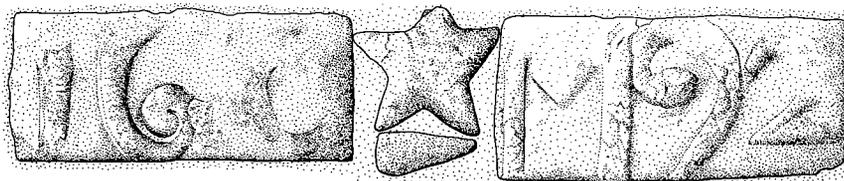


Fig. 24 Moulded brick plaque.



Base fragment (220 mm diam.) of cylindrical limestone bowl. Side wall varies in thickness between 16 mm at angle with base to 24 mm 45 mm above the base. [151] period 8.1, property 2.

Fragment of large sandstone whetstone, rectangular in section (53 mm × 37 mm) and broken at both ends. [176] period 7, property 2.

Fragment of a sandstone trough, with walls 17 mm thick. [395] period 5.1, property 1.

Fragment of stone disc 40 mm diameter with central perforation 9 mm and groove along edge of circumference. [564] period 3.1, property 2.

Lower part of a heavily worn whetstone, micaceous schist, rectangular in section (36 mm by 11 mm), with a rounded end. Probably worn suspended from a strap or belt. [569] period 3.1, property 2.

COINS

by R. J. Brickstock

- 89* Copper alloy jetton; Anglo-Gallic. Obv: king's head full faced. Rev: long cross moline cantoned by cinque foils. Late 13th–early 14th century. Berry type 1 (2/[188])
- 90* Silver penny; long cross issue. Obv: king's head full faced, illeg. Rev: long cross cantoned by pellets. Possibly Edward I, (1279–1307), very worn. (5/[511])

COPPER ALLOY OBJECTS

Twenty eight copper alloy objects were recovered from the site. There were no significant groups of objects so the catalogue of illustrated

finds has been arranged in period (chronological) order.

- 91 Mount from a knife sheath with incised decoration. (3/[529])
- 92 Decorative stud fitting rivetted to traces of leather. Originally a symmetrical arrangement but the other decorated side has been folded over and broken off, though part of it still adheres to the back. (4/[318])
- 93 Ring with setting filled with opaque blue glass. It was forbidden to use precious stones in base metal jewellery (Goodall, 1981 p. 64, citing Saltzman). Very thin traces of gold plate, probably applied as a mercury amalgam. The longer side of the hoop seems to be finished to a point, so may never have been a complete circle. This probably also explains why it has broken in the way it has. (4/[390])
- 94 An identical object to this from excavations in London has recently been published. It is dated there to the second half of the 14th century and classified as an “arched pendent mount”, possibly used as a purse hanger. The Mansion House example is broken in the same place as that from London, and also apparently one found in Winchester. (Egan and Pritchard, 1991, p. 219–224, fig. 140 no. 1197) (4/[530])
- 95* Sub-rectangular buckle frame made from bent strip (5 mm wide) found shiny and uncorroded. Only the two ends of the iron pin bar, which should form the fourth side, remain. (5/[502])
- 96 Decorative belt fitting. (5/[511])
- 97 Strap end with a common form of decoration probably made by rocking a chisel from side to side as it is pushed over the surface (Goodall 1981, p. 63). (F.6:5/[211])
- 98 Stud or boss. Dated to the 16th century at Battle Abbey (see Geddes, 1985, p. 160 fig. 51). (6/[504])
- 99 Stud on bent shank possibly for decorative use in upholstery or other furnishing. (7/[159])
- 100 Double loop buckle probably shoe. 17th

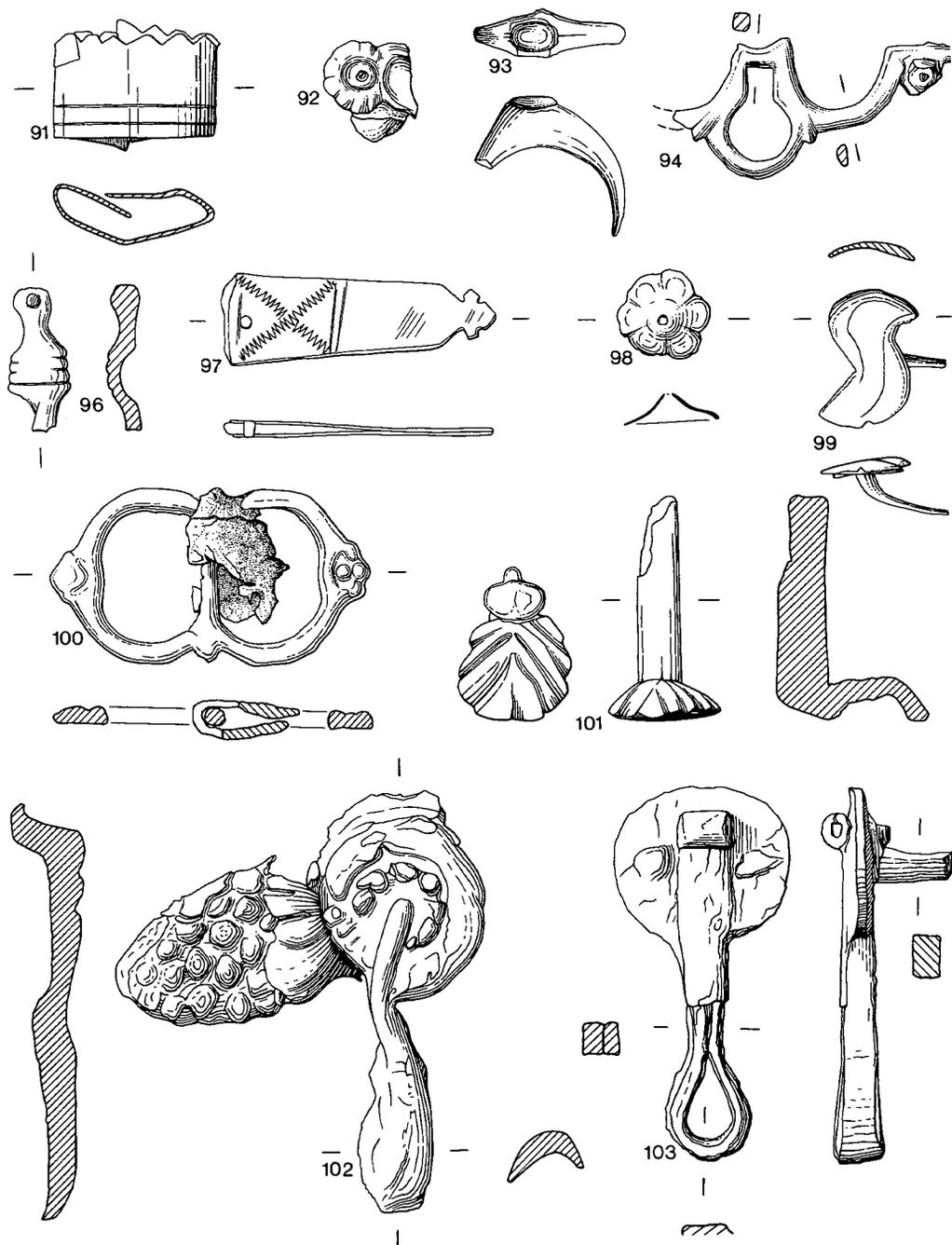


Fig. 25 Copper alloy objects (nos 91–100), lead objects (nos 101–2) and iron object (no. 103) ($\frac{1}{2}$ scale).

century. Similar found at Basing House (Moorhouse, 1971, fig. 25, no. 169 and 170). (9/[11])

In summary the other finds were:-

Period 3: a small fitting similar to no. 96 above.

Period 4: two pins (shank fragment and twisted wire head); a ring, 17 mm diam. with lozenge-shaped cross section.

Period 5: some corroded sheet fragments and a buckle pin.

Period 5.1: a broken strap end; a small bar (40 × 3.5 × c.1); a small fragment.

Period 6: a fragment with traces of gilding; a headless pin.

Period 7: two pins, one with globular head and short length of shank, one c.40 mm with single twist head.

Period 8: small pin, 26 mm, with twisted wire head; a stud in form of a short shank with a flat disc/washer on one end and a dome on the other.

Period 10 ("modern"): button inscribed "MURPHY and CURTIS WATERFORD".

LEAD AND PEWTER

101 ?Pewter. Part of stand. (5/[501])

102 Decorative moulding possibly for rain-head. There is a certain similarity with one of the exotic fruits on the plaster-work and it is to be expected that various contemporary decorative arts would share design elements (see Sutton-Gould 1990, p. 22). (F.I.9/[91])

IRON

68 nails or fragments of nails, in summary:

Period 2: 3, from landfill.

Period 3: 3, including large square headed nail, from pit fill.

Period 4: 25; 17 are from floor surface/make-up in Building 200 and include 5 with domed heads; 6 are from the trench cut for Drain 300 and include 1 domed head; 1 flat headed nail came from courtyard make-up.

Period 5: 10, 1 with an oval flat head from

landfill, the rest from Dock infill mainly fragments but two sprigs.

Period 5.1: 4—including 3 probable sprigs.

Period 6: 3; 1 dome headed from pitfill, 2 large squarish headed from landfill.

Period 7: 3; 1 wedge shaped nail with a rectangular head from floor surface/bedding; another wedge shaped nail but with slightly domed head from [313].

Period 8: 7 from demolition layers; 4 quite large square headed and 1 narrow headed.

Period 9: 9.

Period 10: 1.

There were very few other iron objects recovered with any identifiable shape:-

Period 4: a clench bolt from floor make-up.

Period 5.1: fragment of the moulded stem of a key with broken bit, from property 1.

Period 8: an "eye" from demolition rubble in Pit 175/314, a large "T" shaped piece (270 mm long, 163 mm the cross piece) from another demolition layer.

Period 9: 2 fragments, probably bits of hinges from pit fills; a staple from a rubble (demolition) layer.

103 (Probably) the plate end from a barrel padlock. There were traces of copper alloy plating over the entire surface. (3/[182])

MISCELLANEOUS

Some 35 fragments of leather were recovered from the dock infill. These included an almost complete turnshoe sole and four fragments of others; a few torn, tattered or cut bits of upper and other unidentifiable items and one or two offcuts. There was also part of a strap, c.13 mm wide, with the impression of a stud. Another small fragment of turnshoe sole came from [353]—Phase 5 landfill.

A bone needle, possibly net maker's, came from period 8, the large pit [175]. It was rather decayed but at least 127 mm long and 10 mm across the hole end.

THE ANIMAL AND FISH BONES

Simon J. M. Davis, Ancient Monuments
Laboratory and
Andrea Bullock, Southampton University
(fish bones)

Introduction

This report is a summary of the results of the study of the faunal remains from the Close Gate and Mansion House excavations—in the tables referred to as CG1/Close Gate 1 and CG2/Mansion House respectively. The sites were studied together because of the small size of each assemblage. A full archive report with details of methods and measurements is available through Newcastle City Council or the AML (Davis, 1991).

Most of the animal remains come from the 15th–16th century deposits with some from 13th–14th centuries and 17th–18th centuries. A particular interest of the bones is that they were recovered by sieving and comprise a reasonably well-dated sequence from a period which is probably not long before, or coincident with, the beginnings of selective animal husbandry, farmyard improvements, and all else that the “agricultural revolution” implies. According to historical sources dealing with agricultural developments in England (Orwin, 1949) it was the end of the 18th and beginning of the 19th century that saw work on the improvement of the nation’s breeds of cattle and sheep. However it has been suggested that new breeds of sheep had been created earlier and only perfected in the 18th century.

The bulk of the bone had been recovered by wet-sieving through a 5 mm mesh with a small volume (30 litres) sieved through a Siraf tank with a 1 mm mesh. Some bones were abraded (a few were probably water-rolled) and poorly preserved, while others in deeper and probably waterlogged deposits were very well preserved.

For a full description of methods of quantification see Davis 1992 (b). In brief, all mandibular teeth and a restricted suite of “regions of identification” of girdle, limb and foot bones were recorded and used in counts. It was noted

that despite the sieving operations some smaller elements, such as sheep carpals, incisors, premolars and phalanges, were conspicuously rare. Some of these scarce elements were recovered in the Siraf tank. Species retrieved in the Siraf tank are recorded in table 3. The small volume processed in this way, and the fact that the total volume excavated is not known, have made it impossible to estimate the original proportion of smaller skeletal elements and smaller species such as mice and small birds.

Species present and their frequencies. (Tables 3 and 4).

Most of the 1353 recorded remains from the 5 mm sieve collection belonged to sheep, cattle and pig. Of the 776 sheep/goat bones and teeth, 182 were identified as sheep and only 2 as goat (both from 13th–14th century contexts). Of the four cervid bones found, one is definitely roe deer, one is definitely fallow deer, and one is probably red deer. Several equid bones and teeth are probably horse. It is quite likely that all the galliform bones belonged to chickens rather than pheasants. Although many of the bones could belong to either of these two species, which are difficult to distinguish, the exceptions could all be identified as chickens.

Of the sea shells found, the large numbers of periwinkles, oysters and cockles undoubtedly represent food waste. Some of the other less common species (some appear beach-rolled) may have come from beach sand/gravel used as landfill deposit.

Sheep bones far outnumber those of cattle, but given the larger size of a cow, beef rather than mutton was probably a more important element in the diet. Comparison of the assemblages from the three main periods (table 3) does, however, reveal that sheep increase slightly in relation to cattle through time. Comparison of the species frequencies here with those from other sites in Newcastle is difficult since most published bone assemblages had been hand-collected, hence sheep/goat and other smaller species are under-represented. Nonetheless the results from excavations at Crown Court (Gidney, 1989), Castle Ditch

Table 3 Summary of mammal and bird remains (5 mm sieve).

Century:	13-14		15-16		17-18	
	n	%	n	%	n	%
Horse	2	2	7	1	1	1
Pig	13	10	65.5	7	8	5
Red deer	?1		-		-	
Red/Fallow deer	-		1		1	
Fallow deer	-		1		-	
Roe deer	1		-		-	
Cattle	39	31	298.5	30	44	25
Sheep/Goat	71	56	584.5	60	120.5	68
(Sheep)	(8)		(156.5)		(19)	
(Goat)	(2)		(-)		(-)	
Hare	1B		1 + 2B + 1?		1?M	
Rabbit	2		3		4	
Subtotal:	130		964.5		179.5	
Fox	-		1		-	
Dog	2		24		3	
Cat	2		4		2	
Rat	-		2		5	
Thrush	1		-		-	
Jackdaw	2		-		-	
Corvid	1		-		-	
Teal	-		-		?1	
Duck	2		-		-	
Red-breasted Goose	-		-		1	
Goose	1		7		-	
Chicken	2		2		-	
Galliform	6		20 + ?1		2	
Woodcock	1		-		?1	
Total	150		1025.5		194.5	

Key:

B = Brown hare

M = Mountain hare

Galliform = probable chicken or pheasant

(Rackham, 1981), Blackfriars (Rackham, 1987), Queen Street (Rackham, 1989) and Bastion (Rackham, 1983) do show this same trend, particularly between the 13th and 15th centuries. The sheep counts at Queen Street were relatively lower but this probably reflects poor recovery.

A similar increase of sheep remains has been observed elsewhere. For example in 12th century Lincoln, O'Connor (1982) correlates a fall in the percentage of cattle bones with the gradual change from the use of oxen to horses

for ploughing. By this time the rigid breast harness which enabled horses to be used for ploughing had reached England from the continent (Lefebvre des Noettes, 1931: 122). In addition, the increase of sheep coming into towns may well reflect the growth of the wool industry. At Close Gate the tooth-wear data show that a substantial proportion of the sheep belonged to the older age groups (circa 4-6 years) which had undoubtedly been shorn of several fleeces (and ewes may have been milked too) prior to slaughter.

Table 4 Summary of fish remains from Close Gate and Mansion House.

		5 millimetre mesh			1 millimetre mesh		
		CGI + II 13-14th	CGI 15-16th	CGI 17-18th	CGI 13-14th	CGI 15-16th	CGI 17-18th
<i>Scyliorhinus</i>	dogfish etc.	1				1	
<i>Galeorhinus</i>	tope					18	3
<i>Rajidae</i>	skates and rays	3	8		2	21	1
<i>Anguilla anguilla</i>	eel						
<i>Conger conger</i>	conger	2					
<i>Clupeidae</i>	herrings					1	
<i>Clupea harengus</i>	herring	2			52	116	9
<i>Salmonidae</i>	salmon family		2	1		2	
<i>Gadidae</i>	cod fishes	25	17	2	30	307	10
<i>Gadus morhua</i>	cod	20	2		2	1	
<i>Melanogrammus aeglefinus</i>	haddock	24	60	2	22	120	5
<i>Merlangius merlangus</i>	whiting					8	
<i>Pollachius virens</i>	saithe				11	11	
<i>Molva molva</i>	ling	7				2	
<i>Merluccius merluccius</i>	hake	2					
<i>Sebastes viviparus</i>	Norway haddock				1		
<i>Triglidae</i>	gurnards	2				2	
<i>Serranidae</i>	sea perches				1		
<i>Trachurus trachurus</i>	scad	1					
<i>Ammodytidae</i>	sandeels					10	
<i>Bothidae</i>	scaldfishes					2	
<i>Pleuronectidae</i>	right-eyed flatfishes	4			8	12	
<i>Pleuronectes platessa</i>	plaice	1				1	
<i>Limanda limanda</i>	dab					3	
Undetermined		58	5	1	79	486	19

The small number of equid remains is worth noting and contrasts with animal-bone assemblages from contemporary rural sites such as at Raunds in Northamptonshire (Davis, 1992a). An equid pelvis bearing chop-marks (from a 13th–14th century context) is of some interest as it is unusual to find any signs of butchery on horse bones from British sites. It could derive from a horse carcass which was processed for glue.

A large number of fish bones were recovered and the species are shown in table 4. The use of the 1 m mesh for sieving has enlarged the spectrum of species found and greatly increased the recovery of herring bones. These 1 mm sieved samples derived from 30 litre soil samples. Comparison of the weight of large mammal bones recovered by this means with weight of fishbones (table 5), gives some indication of the probable actual ratio of mammal to fish, and suggests that fish were an important part of the diet—certainly more important than is suggested by the 5 mm sieved sample alone. However, the ratio “skeleton weight” to “body weight” increases with animal size—a 10-fold body weight increase results in approximately a 13-fold increase in skeleton weight (Anderson, et al. 1979). Therefore the importance of fish in the diet of the inhabitants of The Close was probably even greater than table 4 indicates. It may in fact represent as much as 10–20% of the total meat eaten.

Body part frequency (Table 6).

Examination of the relative abundance of different parts of the skeleton shows that, allowing for differential preservation and recovery, most parts of the skeleton including teeth are well represented. This is not typical of either primary/butchery waste (with an abundance of limb extremities) or kitchen/domestic refuse (with a predominance of meat-bearing elements). The impression is that either the animal bones are derived from both butcher's and household waste or whole carcasses were being discarded. Many of the meat-bearing bones had cut marks and many of the cattle bones had been extensively chopped as one might expect.

Table 5 Weights in grams of mammal and fish bone retrieved by use of a 5 mm sieve and a 1 mm sieve. The use of a 1 mm sieve increases the proportion of fish:mammal (NB all sieved samples were “whole earth samples”.)

Closegate I

Mesh aperture	Mammal		Fish	
	g	%	g	%
5 mm	60915	99.97	18	0.03
1 mm	589	92.2	50	7.8

Closegate II

Mesh aperture	Mammal		Fish	
	g	%	g	%
5 mm	19548	99.63	72	0.37
1 mm	370	86.9	48	13.1

One individual context (CG1 [201], Phase 5) produced a large and interesting collection of bones which does not reflect this pattern. It included 24 sheep foot bones though only one leg bone and one shoulder blade. Sheep feet have little flesh attached to them but may be sold to the poor or for a special dish. It is possible that this deposit derives from a poor household. Other possibilities are that it is simply waste from a butcher's stall or, as foot bones are favoured by bone workers for handles and tools, an accumulation of raw material for the manufacture of bone-tools.

Size

The 13th–16th century sheep bones in the assemblage are rather small, and similar in size to the modern “primitive” breed, the Soay. This accords with Armitage's (1983) survey of sheep remains in England. While there is little evidence for any size difference between the 13th–14th centuries and the 15th–16th centuries, sheep bones from the 17th–18th centuries are somewhat larger.

Measurements of sheep bones from two other contemporary post-Medieval archaeological sites have also provided evidence for a size

Table 6 Body-part frequencies. Counts of the different parts of the skeleton of Sheep/Goat and Cattle in the 15th–16th century and Sheep/Goat in the 17th–18th century. The MN columns provide an approximate guide to the relative occurrences of different elements taking into account their anatomical frequency i.e. 2 “Humeri”, 8 “i + I”, 6 “Molars”, 2 “Radii”, 8 “Phalanx 1” etc. (These MN numbers would therefore be equal if whole carcasses had originally been buried and if recovery and preservational biases had had an equal effect on all parts of the skeleton.) Fractions have been rounded up. For example 16 radii must have come from at least 8 (=16/2) individuals, 59 molar teeth must have come from at least 10 (=59/6) individuals, and 19 third phalanges must have come from at least 3 (=19/8) individuals. Distal metapodials whose anatomical identity (metacarpal or metatarsal) could not be ascertained have been divided equally between the counts for distal metacarpals and distal metatarsals.

	Sh/G 15–16 cent		Sh/G 17–18 cent		Cattle 15–16 cent	
		MN		MN		MN
Mandible	30	15	7	4	14	7
i + I	11	2	2	1	36	4
dp+P	48	8	14	3	50	9
Molars	116	20	41	7	59	10
Scapula	17	9	7	4	9	5
Humerus—dist	62	31	9	5	9	5
Radius—dist	16	8	5	3	6	3
Radiale	1	1	1	1	3	2
C2 + 3	0	0	0	0	6	3
Metacarpal—dist	74 + 7	41	9 + 1	5	9 + 3	6
Ischium	21	11	7	4	8	4
Femur—dist	8	4	3	2	7	4
Tibia—dist	26	13	8	4	4	2
Astragalus	18	9	6	3	18	9
Calcaneum	17	9	9	5	13	7
Metatarsal—dist	59 + 7	33	6 + 1	4	18 + 3	11
Phalanx 1—prox	91	12	9	2	31	4
Phalanx 3	14	2	2	1	19	3

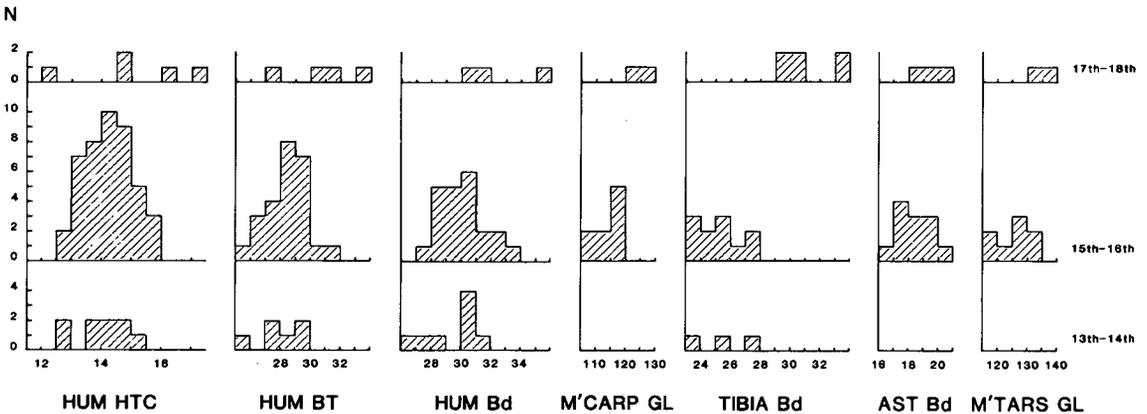
increase. They are Aldgate in the City of London (Armitage, 1984), and St. Frideswide's Priory in Oxford (Stallibrass, 1988). At Aldgate several very long (and slender) sheep metatarsals (even longer than those from Closegate) were found in late 17th to early 18th century contexts. At St. Frideswide's large sheep/goat bones were found in 17th century contexts and “massive cattle bones” were found even in 16th, as well as 17th, century contexts.

It is possible that castration could result in some of the size differences being recorded (Hatting, 1983) but alternatively we could be seeing a real size difference between sheep of 15th–16th and those of the 17th–18th centuries in the Newcastle area. With a contemporary increase of sheep size in both the north of

England and in London and Oxford the more probable explanation, as Stallibrass (1988) has suggested, is that the late 17th–early 18th century marks the beginnings of sheep-breed improvement and that history does not record the early stage of this part of the Agricultural Revolution. This would seem to corroborate Kerridges's suggestion that the Agricultural Revolution took place earlier than the history books would have us believe.

Bones of cattle (and of other species) from Close Gate are too few to enable a proper study of their size variation but there are no indications of changes. The chicken bones are small and little different from present-day bantams.

Table 7 Variation in size of the sheep. Plots of distal humerus *minimum diameter of trochlea*, distal humerus *width of trochlea*, distal humerus *width*, metacarpal *length*, distal tibia *width*, astragalus *width*, and metatarsal *length*. The measurements are in millimetres. Each square represents a single specimen.



Ageing

The tooth-wear data for this assemblage show that although a substantial proportion of the sheep belonged to the older age groups (circa 4–6 years) in the 15th–16th centuries, for example, about 30% appear to be lambs. Newcastle was evidently being supplied with both lamb and prime-mutton animals from which one or several fleeces would have been shorn (and ewes may have been milked too).

The cattle tooth-wear data for the 15th–16th centuries suggests little veal was imported into Newcastle, which in turn may mean that cattle were not kept primarily for dairy products in the area. Cattle were probably kept as multi-purpose beasts and occasionally slaughtered for meat.

The pig tooth-wear data show that most of the pigs were slaughtered fairly young—from a few weeks to around three years—hardly surprising for an animal usually only reared for its meat and fat.

Environmental considerations

The finds of black rat presumably reflect fairly squalid and warm conditions prevailing in the buildings on the Close. The amphibian bones

may evidence the presence of semi-permanent bodies of water in the vicinity. So too the finds of woodmouse/yellow-necked mouse and bank and field voles probably all signify the closeness of rough grass and bushes.

Pathology

Few bones exhibited signs of disease or injury. Of the cattle incisors, however, eight exhibited small “v” shaped notches on the lateral sides at the base of their crowns. This abnormal pattern of wear is said to be due to long grass, perhaps associated with abrasive soil, being drawn between the teeth in grazing (Miles and Grigson, 1990: 494–5).

Conclusions and summary

While a wide range of sources of animal protein was exploited, beef and mutton were undoubtedly the most common meats consumed by the people of Newcastle during the 13th–18th centuries. Mutton assumed greater importance with time—possibly an indirect result of the growing importance of wool and the increased use of horses as work animals. The abundant fish bones (mainly herring, cod and haddock) recovered by 1 mm sieving sug-

gests that fish made up an important element in the diet. Some pork, rabbit, hare, chicken, goose and molluscs (mainly oysters and winkles) were also eaten.

The abundance of low meat-bearing bones and the scarcity of wild game such as deer indicates that the bones are derived from the dwellings of the lower classes, although written records indicate that the Close contained the houses of many of the town's most notable inhabitants. Perhaps the landfill deposits were composed of municipal garbage originating from poorer neighbourhoods, or perhaps rich people had a "poor" diet too.

The bones are of particular interest in that they were recovered by sieving and include a reasonably well-dated group from a period which is probably not long before, or coincident with, the beginnings of selective animal husbandry, farmyard improvements, and all else that the "agricultural revolution" implies. The sheep bones from Close Gate increased in size towards the end of the 17th century. A contemporary size-increase of this animal has been found in London and Oxford some 100 years before the time when, according to historical sources (Orwin, 1949), farmers began to apply modern methods to the breeding of livestock—an endeavour associated with the Agricultural Revolution. This Revolution may have had its beginnings earlier than had been supposed.

Acknowledgements

I am grateful to Richard Fraser of the Newcastle City Archaeology Unit for inviting me to study the Close Gate bones, to Sebastian Payne, Sue Stallibrass, and Caroline Grigson who offered much useful advice and to Miguel Angel Martinez Paz for helping to identify the leporid bones, to Andrea Bullock who identified the fish remains, to Terry O'Connor who identified some of the bird bones and to Barbara Noddle for drawing my attention to the work of Kerridge.

THE PLANT REMAINS

Jacqueline P. Huntley

A third of the 63 samples examined were of no interest botanically being taken from landfill deposits from all phases of the site with a high proportion of clinker and industrial waste. Of the samples with plant material present some have very few, and resistant to decay, seeds (elderberry and blackberry) and probably indicate differential preservation. The lower levels of the site were regularly inundated by the tide. This has, no doubt, aided preservation in some cases but probably hindered it in others with alternate wet and dry periods enhancing degradation.

13th century

Five samples from phases 1 and 2 contained plant remains. In four these consisted only of elderberry and hazelnut, this was thought to be due to differential preservation. Context [526] contained many weeds of cultivation (annual nettle—*Urtica urens* and chickweed—*Stellaria media*) suggesting gardens nearby. Maggots were recorded during the sorting process which indicated the presence of rotting matter and, therefore, that some rubbish was being used in the reclamation process at this time.

14th century

Contexts representing the extension of property 2 gave no indication of organic build-up. Samples from the subsequent redevelopment of the property were very species poor, except for one context [300] where numbers of stinging nettle (*Urtica dioica*) and hemlock (*Conium maculatum*) seeds were present, both of which require high levels of nutrients in the soil and indicate patches of waste ground. Elderberry seeds were more or less the only items present in the remaining samples.

Samples associated with the advancement of the western property in phase 5 varied considerably. Thousands of elderberry seeds were recovered from one, while another contained a wide variety of grassland taxa and also numbers of wheat glume bases, both possibly repre-

Table 8 Summary phasing data

Period	Date	Total samples	with seeds
1	13th century	3	2
2	13th century	5	3
3	14th century	5	3
4	14th century	7	5
5	14th century	22	16
6	15th century	14	8
7	15th–16th century	4	2
8	17th century	1	1
Unphased		2	

senting waste from animal bedding or fodder. This idea is reinforced by the presence of insect fragments and fly puparia.

The material from the infilled dock is particularly species rich and clearly demonstrates the disposal of organic rubbish. From the variety of food species present some of this rubbish was probably domestic although not faecal—there was neither the vast quantity of seeds from such taxa nor the cereal bran matrix which is characteristic of cess pits. No context is dominated by elderberry seeds and this could indicate that preservation here was more even, perhaps reflecting the protection gained from the massive stone revetment on the river side.

15th century

Most numerous in phase 6 were the remains of walnut but other samples did not add to the interpretation of activity on the site.

16th century

None of the four contexts sampled contained any quantity of seeds. Their rather sterile nature supports the hypothesis that the landfill was predominantly of ballast from incoming ships.

As with many urban sites the most abundant ecological groups of plants represented were the ruderals (plants of waste ground) and weeds of cultivation although the overall quantity of botanical material was never great at this site.

The data in the tables are expressed as counts of seeds per original volume of material taken (approx. 30 l.). All the samples were scanned and only those with any quantity of material were fully analysed. Whole numbers refer to counts from these samples while *** ** * and + indicate decreasing proportions of material from the others.

The economic taxa

Both carbonized and waterlogged material was recovered, the former in very low amounts. Material preserved by carbonization often relates to human activities and is therefore often from economically important crops. On the other hand, waterlogging preserves material from locally growing vegetation as well.

Although the numbers of seeds from economic taxa are always low (Table 9) they clearly demonstrate that wheat, some at least bread wheat (*Triticum aestivum*), hulled barley (*Hordeum* sp.), rye (*Secale cereale*) and probably oats (*Avena*) were used, the oats may have been wild oats present as a weed amongst other crops. Other evidence for a crop plant was one pea (*Pisum sativum*).

It is interesting that no carbonized seeds from arable weeds were recovered although cereal chaff (straw and ear fragments) was. Thorough cleaning should result in the absence of the chaff as well. The sample is probably too small for any serious interpretation of this phenomenon to be attempted.

Of particular importance is the occurrence of a tetraploid, free threshing wheat—probably *Triticum durum* or *T. turgidum*. It has been recorded at sites from the south and Midlands (e.g. at Stafford, Moffat 1987) although this is the first occurrence from the north. Its presence, as well as that of a brittle rachis wheat, such as spelt, reinforces the hypothesis that bread wheat was not the only wheat in use during this period.

Seeds from waterlogged, exotic taxa occur scattered throughout but are never abundant and are therefore unlikely to reflect faecal material. They include imported species such as grape (*Vitis vinifera*), walnut (*Juglans regia*), olive (*Olea europea*), fig (*Ficus carica*), and dill

Table 9 Summary by phase of economic taxa

Phase	1	2	3	4	5	6	7	8
Total samples	3	5	5	7	22	14	4	1
# economic	1	2	4	0	9	3	1	1
<i>carbonised:</i>								
Avena	10	.	.	.
Hordeum indet.	.	.	1	.	1	..	.	.
Hordeum hulled	.	.	6	.	5	.	1	.
Triticum sp.	1	.	.	.
Triticum aestivum	8	.	.	.
Triticum (hexaploid)	.	.	2	.	1	.	.	.
Triticum spelta	1	.	.	.
Secale cereale	.	1	.	.	.	.	.	.
Cerealia indet.	1	.	.	.
Pisum sativum	1	.	.	.
Vitis vinifera	7	1	.	.
Corylus avellana	1	2	10	.	11	.	.	.
Trit. aest. internode	4	.	.	.
Trit. tetraploid internode	2	.	.	.
<i>waterlogged:</i>								
Ficus carica	.	1	.	.	9	.	.	.
Linum usitatissimum	10	.	.	.
Anethum graveolens	.	1	.	.	.	.	.	.
Olea europaea	1	.	.	.
Prunus s.l.	3	.	.	.
Malus/Pyrus	2	.	.	.
Juglans	3	18	.	.
Corylus	.	15	.	.	300	2	.	.
Sambucus + Rubus	**	2	.	***	***	**	.	.

(*Anethum graveolens*). Grapes could have been grown in the area during the medieval period when the climate was somewhat warmer than today (Lamb, 1977). Walnuts could also have been grown locally. To my knowledge these are the first records for this area for walnut although Roman-aged shells have been found in Carlisle (Huntley 1990b). The olive demonstrates the importance of sieving large volumes of sediment since its pits are only likely to occur rarely. Like the walnut it is the first occurrence, of which I know, for medieval Newcastle. Flax (*Linum usitatissimum*) seeds occasionally occur and could have derived from material imported for the manufacture of either ropes or fibres.

No doubt the native plants represented, hazelnuts (*Corylus avellana*), apple or pear (*Malus/Pyrus*) and blackberry (*Rubus fruticosus*), as well as the elderberry, were eaten.

Many other species have had uses (e.g. medicinal) in the past, e.g. henbane (*Hyoscyamus niger*) whose seeds are scattered throughout the samples. However many of these plants grow naturally in ruderal or disturbed ground conditions.

The natural/semi-natural vegetation

Ruderals are the most commonly represented species. Nettles (*Urtica dioica*) are abundant and indicate high levels of nitrogen and phosphorus as does hemlock (*Conium maculatum*). An interesting taxon in this group is weld (*Reseda luteola*). This plant produces a green dye and thousands of its seeds were recovered from the excavations at Crown Court (Huntley, 1989) only a few hundred metres to the

east of the Mansion House. There it was considered as a possible indication of waste from a local dyeing industry. Here the evidence is more tenuous.

There are moderate numbers of weeds of cultivation present. Species such as chickweed (*Stellaria media*) and annual nettle (*Urtica urens*) which demand high nutrient levels may have been growing in nearby gardens. Others, such as corn marigold (*Chrysanthemum segetum*), are perhaps more likely to have been brought in with straw or cereal waste although there is little other evidence for this.

Wet ground plants are present but are not as abundant as they often are on urban archaeological sites. Although a variety of unidentifiable sedge nutlets were present they are not dominant and are not considered to represent the dumping of flooring material. The identifiable species include taxa such as water crow-foot (*Ranunculus flammula* and *R. sceleratus*) which may well have been growing on the edge of the Tyne or have been brought in with dredged material. Some, at least, are indicative of brackish water (e.g. Spikerush—*Eleocharis* species) although none are characteristic of salt water.

Grassland plants are sparsely represented with taxa characteristic of species-rich communities on calcareous soils as well as more acidic communities. They probably reflect a few grassy patches in the vicinity although they could represent a dump of animal dung. Remains of bracken are present in a few contexts and in small quantities, not indicative of actual use on site.

Woodland and scrub taxa are moderately well represented. Elderberry and blackberry could be either growing nearby, as they were till very recently, or being eaten on site. Other remains include alder and birch catkins—which could have been blown onto the site—and seeds of the hawthorn (*Crataegus monogyna*). Although not very abundant they do suggest that there were some limited areas of scrub quite close by; this is reinforced by the presence of rose thorns and gorse needles from Close Gate (Huntley 1990c).

Overall the botanical evidence from this site

indicates a well-used area with some plots of cultivated land and a certain amount of ruderal and scrub vegetation. There were no dumps of faecal material nor regular disposal of domestic organic rubbish. The material used for levelling and reclamation seems to have been either botanically sterile, industrial waste or soil.

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GARDEN SOILS, MIDDEN DEPOSITS,
LANDFILL AND BALLAST MATERIAL
Dr. Robert Shiel, Dr. Maureen McHugh &
Mr. Mervyn Jones

Summary

The physical, chemical and micromorphological characteristics of a number of postulated garden soils were examined in order to ascertain their origins, relationships to underlying materials and the use to which they were put. It has been concluded that the 15th–17th century profiles had developed in dumped terrestrial soil rather than river sediment and had been biologically active for some considerable time, while the 14th century soil had accumulated (through dumping and subsequent additions) on charcoal and coal detritus. Each soil had clearly supported plant growth and soil fauna, though the duration of soil development and thus implied garden usage, was much greater in the 15th–17th century profiles. Plants had evidently been established for some time in the 14th century soil, though garden usage was probably short-lived. Each soil was also rich in anthropogenic debris, while the 14th century soil had also been contaminated by workshop associated activities. There was though, no evidence for midden usage other than from one organic landfill context. Here very high levels of phosphorus could only be attributed to animal wastes, either in the form of manures or carcass refuse.

The 13th–15th century landfills comprised

Table 10 Summary of numbers of seeds by period. (selected taxa only, no single occurrences) taxa in alphabetical order within ecological groups.

	Period	1	2	3	4	5	6	7	8
	# samples with seeds	2	3	3	5	16	8	2	1
a	<i>Agrostemma githago</i>	.	1	.	.	16	.	.	.
a	<i>Anthemis cotula</i>	.	.	.	.	24	.	.	.
a	<i>Centaurea cyanus</i>	.	2	.	.	8	.	.	.
a	<i>Chenopodium album</i>	.	1	.	.	7	.	.	.
a	<i>Chrysanthemum segetum</i>	.	1	.	.	28	.	.	.
a	<i>Euphorbia exigua</i>	.	.	.	.	.	.	+	.
a	<i>Galeopsis tetrahit</i>	.	.	.	.	5	.	.	.
a	<i>Stellaria media</i>	.	10	.	.	14	.	.	.
a	<i>Thlaspi arvense</i>	.	.	.	.	1	.	.	.
a	<i>Urtica urens</i>	.	18	.	.	4	.	.	.
g	<i>Achillea millefolium</i>	.	.	.	.	3	.	.	.
g	<i>Leontodon taraxacoides</i>	.	1	.	.	1	.	.	.
g	<i>Linum catharticum</i>	.	.	.	.	.	+	.	.
g	<i>Plantago lanceolata</i>	.	.	.	.	3	.	.	.
g	<i>Rhinanthus minor agg.</i>	.	.	.	.	4	.	.	.
g	<i>Rumex acetosa</i>	.	.	.	.	2	.	.	.
h	<i>Pteridium aquilinum</i>	.	.	.	.	**	.	.	r
	<i>Brassica sp(p).</i>	.	4	.	.	31	.	.	.
r	<i>Conium maculatum</i>	.	.	.	2	1	.	.	.
r	<i>Fallopia convolvulus</i>	.	.	.	.	15	.	.	.
r	<i>Hyoscyamus niger</i>	.	.	.	.	2	.	.	.
r	<i>Lapsana communis</i>	.	3	.	.	15	.	.	.
r	<i>Polygonum aviculare</i>	.	2	.	.	16	.	.	.
r	<i>Polygonum lapathifolium</i>	.	1	.	.	14	.	.	.
r	<i>Polygonum persicaria</i>	.	.	.	.	3	.	.	.
r	<i>Potentilla anserina</i>	.	.	.	.	.	+	.	.
r	<i>Raphanus raphanistrum pod.</i>	.	.	.	2	1	.	.	.
r	<i>Reseda luteola</i>	.	.	.	.	4	.	.	.
r	<i>Rumex acetosella</i>	.	2	.	.	16	.	.	.
r	<i>Rumex obtusifolius-type</i>	.	1	.	.	25	.	.	.
r	<i>Sonchus asper</i>	.	.	.	.	2	.	.	.
r	<i>Tripleuro. inodorum</i>	.	.	.	1	7	.	.	.
r	<i>Urtica dioica</i>	.	.	.	2	.	1	.	.
s	<i>Triticum glume base</i>	.	.	.	.	36	.	.	.
t	<i>Alnus glutinosa</i>	.	.	.	.	*	.	.	*
t	<i>Betula catkin scale</i>	.	.	.	.	*	.	.	*
t	<i>Crataegus monogyna</i>	.	.	.	.	1	.	.	.
t	<i>Juglans regia</i>	.	.	.	.	3	17	.	.
t	<i>Malus/Pyrus</i>	.	.	.	.	2	.	.	1
t	<i>Prunella vulgaris</i>	.	.	.	.	6	.	.	.
t	<i>Rubus fruticosus</i>	.	2	.	.	17	.	.	.
t	<i>Sambucus nigra</i>	**	1	.	**	***	**	.	.
w	<i>Caltha palustris</i>	.	.	.	.	4	.	.	.
w	<i>Carex (lenticular)</i>	.	3	.	2	51	.	.	.
w	<i>Carex (trigonous)</i>	.	3	.	.	48	*	*	*
w	<i>Carex hostiana-type</i>	.	2	.	.	3	.	.	.
w	<i>Eleocharis palustris</i>	.	.	.	1	23	.	.	.
w	<i>Eleocharis sp(p).</i>	.	.	.	.	6	.	.	.
w	<i>Ranunculus flammula</i>	.	1	.	.	4	.	.	.
w	<i>Ranunculus sceleratus</i>	.	.	.	2	1	*	.	.
w	<i>Scirpus lacustris</i>	.	.	.	.	7	.	.	.
w	<i>Sphagnum sp(p)</i>	.	*	.	.	*	.	.	*
x	<i>Chenopodiaceae undiff.</i>	.	.	.	.	16	.	.	.
x	<i>Cirsium sp(p).</i>	.	1	.	.	3	.	.	.
x	<i>Gramineae undiff.</i>	.	.	.	.	5	.	.	.
x	<i>Labiatae undiff.</i>	.	.	.	.	*	.	.	*
x	<i>Lamium undiff.</i>	.	.	.	5	2	**	.	.
x	<i>Luzula sp(p).</i>	.	.	.	.	2	.	.	.
x	<i>Medicago sp(p).</i>	.	.	.	.	2	.	.	.
x	<i>Potentilla sp(p).</i>	.	.	.	.	5	.	.	.
x	<i>Ranunculus repens-type</i>	.	5	.	.	81	*	.	.
x	<i>Rumex sp(p). perianth</i>	.	1	.	.	1	.	.	.
x	<i>Silene sp(p).</i>	.	.	.	1	20	.	.	.
x	<i>Stachys sp(p).</i>	.	.	.	5	1	.	.	.

a - arable weeds, g - grassland, h - heath, r - ruderals, t - trees/shrubs, w - wet ground, x - unclassified

Note: phase 3 samples contained only carbonised or economic taxa.

some "ballast" stones which appear to be far travelled. They suggest some shipping returning empty from southern England as well as local transport from Yorkshire or the Tyne Valley. The material incorporated into the 14th–15th century landfills also comprised mineral soils of a varied composition, although occasionally midden wastes were also utilized.

Introduction and methodologies

A number of soil and landfill samples were taken for further investigation in the course of the excavation on the Mansion House site. The investigation consisted of 1) thin section examination of rocks believed to be ship ballast so as to determine the provenance of the samples; and hence, the shipping routes involved. 2) Chemical, physical and thin section analysis of postulated garden soils to ascertain their origins, relationship to underlying materials and the use to which they were put.

The particle size distribution and pH of selected horizons were determined using standard procedures (Avery and Bascomb, 1974). Total and inorganic phosphates were determined using a sequential extraction/acid digestion procedure (Page et al. 1982) and organic P estimated as the difference between the two. Thin sections were prepared using standard procedures (Avery and Bascomb, *ibid*, modified by M. D. Jones) and described using the terminology of Bullock et al. (1985).

Landfill characteristics

The material included rounded stone cobbles (chalk and other rock types, contexts listed below) and organic/mineral materials which were apparently used to raise the ground level.

2.1 Rock contexts:-

13th century (Period 1)

539a **Nodular flint** This originated in the Middle or Upper Chalk. It has a slightly weathered surface stained by iron oxides indicating that it has not come directly from the Chalk but via a later deposit. It is typical of those found in

some glacial tills of East Anglia and Yorkshire and some superficial deposits of the southeast.

539b **Crystalline Limestone** A completely recrystallized limestone with no recognizable fossil remains. It is probably of lower Carboniferous age but it is not possible to suggest a provenance.

14th century (Period 5)

545 **Chalk** Typical Middle or Upper Chalk from southern England. It is soft and friable with none of the secondary calcite formation, which is a feature normally found in the Chalk from N.E. England and Scotland.

15th century (Period 6)

547a **Shelly Limestone** This consists of abundant coarse shell fragments in a recrystallized calcite matrix. It is almost certainly of lower Carboniferous age. The surface shows the effects of differential solution and iron staining but there is little evidence of physical erosion, suggesting weathering *in-situ* and/or transport in glacial till.

547b **Chalk** The same comments as for sample 545.

547c **Oolitic Limestone** A typical oolite of middle or upper Jurassic age. The recrystallized matrix contains abundant sub-angular quartz grains. It could well be from Durham or Yorkshire.

Period 5, 14th century landfill

A sequence of layers of organic matter (541) interspersed with layers of light grey clay (542) were identified behind the period 5 waterfront in property 1. These layers were sub-sampled for detailed analysis as they appeared to be waterlain and were atypical of the bulk of the landfill material used in this and other periods.

Context 542 was a complex mineralogenic material. It comprised two main fabrics which were intimately mixed 50:50. One was sandy with a substantial porosity, the other was more compact with a higher fines content. These

occasionally had a vertical to inclined orientation. Large (2.5 cm) sedimentary clast or sand-rich inclusions comprised 15% of total, both coarse and fine fabrics were oriented around this. A range of other fabric types occurred but were considered to be subsidiary. These were a complex distribution, and while some may have been coprolites, other areas of iron/organic matter enrichment may have been pedological. Shells were also present but there were few other anthropogenic indicators. This material comprised predominantly locally derived clay landfill.

Context 541 was a complex mix of loose soil, organic (plant and animal) and animal residues with carbon distributed throughout the silt fraction (2 to 63 μm). It was more silty than 542 and had more varied clasts including micaceous and feldspathic sandstones, fine calcareous cherts, limestones and a few fine igneous or metamorphic erratics. The coarse mineral component comprised randomly distributed quartz with subsidiary coal and iron oxides. Within mineralogenic areas the fine material comprised around 80% and consisted of fine quartz, micas and some clays and organic and/or Fe rich gels. The coarse organic component comprised around 50% of the total soil and included residues ranging from carbonized woody vessel to fragmented lignified tissues and yellow distorted non-lignified tissue remains to recognizable parenchymatic/schlerenchymatic tissues containing cellulose. These remains had a horizontal to inclined orientation, individual tissue types having a random distribution. These physical attributes are consistent with compost/midden type dump materials. Unburnt well preserved bone fragments was abundant throughout, fine shells were also common, Fe/organic enriched areas may have been coprolitic.

The pH was consistent with the presence of well preserved bone and shell residues, though marginally lower than the soils described above. Phosphate was massively enhanced with two fold more total P than the A horizon described in profile 1 below. Most of the P was organic, the latter comprising more than half the total. Bone and shell residues were the

most probable source of inorganic P whereas soil minerals and fine clasts probably all provided sources in the A horizon (profile 1). Organic P is most important and must be attributed to plant residues and human or animal wastes. The values recorded here are greater than those documented for most animal manures though they are consistent with levels reported in carcass remains (Hammond, 1983), chicken faeces and some resistant bacterial residues associated with the guts of domestic animals (Harrison, 1987).

Soil Profiles

1. Period 3, 14th century

The profile examined included contexts 139, 140 and 578, and these have been designated as A, A2 and B/C horizons respectively. The profile occurred at the interface between landfill and occupation surfaces adjacent to a small structure incorporating an oven/kiln on the west side of property 2. Samples were taken for thin section from the A horizon (21–29 cm), the A–A2 boundary (31–39 cm) and the A2 horizon (44–52 cm). A and A2 horizon samples were included in the pH and phosphate determinations. This profile comprised a deep, loosely structured, detrital (charcoal and coal) deposit lying unconformably over a relatively debris free fine sandy soil, which in turn overlies a deposit comprised of charcoal and coal debris but with interstitial soil inclusions. The abundance of charcoal and coal within the A and B/C, and their relative absence in the A2 suggests contrasting usage (perhaps residential/industrial and garden respectively). The intimate mixing of the charcoal/coal/soil within the A indicate either biotic mixing or that accumulation processes have been gradual. The loose spongy structure of the A and the absence of horizontal laminae, even in thin section, suggest that this material was not regularly trampled, although the overall proportion of coal/charcoal is enhanced close to the A/A2 boundary. Other than charcoal and coal, the only other anthropogenic debris observed were rare shell fragments within the A. The presence of voids of presumed biotic origin and

plant debris throughout the fine matrix of all horizons suggests that each has supported plant growth at some time.

Although the A horizon was rich in debris, clay/Fe/organic matter coated voids occurred throughout, while plant debris occurred both within the matrix and voids i.e. it has true soil characteristics. The dominant minerals were multi-source (probably not fluvial) while charcoal fragments were mostly dicotyledon. Unidentified residues associated with charcoal debris in the A and B/C may have been resins associated with high temperatures. The source of fine discrete soil inclusions within the A is unknown; these were finer, more dense and reddened. Low levels of debris (possibly some birch charcoal) throughout the A2 suggests a different usage although the presence of clay/Fe/organic matter coated voids and plant debris as above suggests normal plant/soil processes. The A2 though comparable mineralogically with the A, was mostly much sandier and there were denser areas of fine sand/silt often cemented by Fe oxides.

The abundance of reduction/oxidation features within the A2 are indicative of a fluctuating moisture regime and in the case of those occurring adjacent to root channels, an actively respiring biota. The continuity of some root/bio channels (non-coated therefore possibly recent) across the A/A2 boundary suggests normal soil profile processes at some time, however the sharpness of that boundary indicates minimal biotic mixing which may be attributed to the rapid initial accumulation of the lower A perhaps through dumping. The inclusion of some A material within the upper A2 suggests disturbance during the initial stages of accumulation. There are also highly oriented fine micaceous and discrete clay soil inclusions of unknown origin. The presence of coated voids within the fine dense interstitial soil of the B/C, suggest that it has at some time supported plant growth, although possibly not in situ. This horizon, however, comprised 50–60% open/loose charcoal/coal debris i.e. refuse or landfill. pH values were consistent with those observed in anthropogenic soils/deposits elsewhere (e.g. Pettry and Bense, 1989).

P levels in both the A and A2 were relatively enhanced in terms of average values documented for topsoil total P (Wild, 1988) and organic P content (Harrison, 1987) but lie within the range recorded for archaeological soils (Eidt, 1977; Pettry and Bense, 1989). Levels of total and inorganic P within the A were more than 5 to 10 times greater than those associated with intensive garden usage/shortlived settlement or anthropogenic soils (Eidt, 1977; Pettry and Bense, 1989), they were, however, comparable with those associated with intensive occupation or prolonged settlement (Eidt, *ibid*). Inorganic and total P within the A2 were much lower and indicative of intensive garden usage/short-lived occupation. There was no relative enhancement in terms of organic P. Levels were slightly higher than those reported in most agricultural topsoils (Harrison, 1987) but were lower than those recorded in most manures and some calcareous soils (e.g. rendzinas, Harrison, *ibid*). Assuming that P levels within the A2 reflect simple garden usage and a relatively normal distribution of inorganic/organic P, it may tentatively be suggested that the relatively low level of organic P within the A can be attributed to i) massive non organic P amendments in the A, ii) limited microbial activity and therefore slow incorporation into organic P cycle and/or iii) low levels of native organic matter.

The absence of bone within the A, the abundance of charcoal/coal and the close proximity of the kiln (and the absence of bone and building rubble) combine to suggest that enhanced P within the A may be attributed to deposition of burnt wastes (wood-ash etc.) and not to midden type usage. P levels within the A2 were enhanced but consistent with intensive garden usage. Enhancement within the A2 following the solution of Fe-bound P on reduction of the A is possible but seems unlikely in view of the true soil characteristics noted above and the relatively enhanced organic P levels within the A2.

2. Periods 4–8, 14th century–early 17th century

Contexts 401 to 404 occurred towards the

northern edge of property 2 below the courtyard to the north of the Mansion House. The sequence of deposits were sealed by rubble resulting from the construction of the Mansion House and can be dated therefore to pre-1691. Layer 401 is a period 8 context, while the rest are earlier and represent the development of a soil profile over landfill (404).

Contexts 401, 402 and 403 were morphologically closely comparable. They were loose (silty to fine sandy), weakly structured, freely draining porous materials rich in anthropogenic debris. They resembled the matrix of 542 being somewhat silty with fine charcoal intimately mixed throughout. The presence of biopores, plant residues (non charcoal) and fine organic material confirmed that these deposits were true soils having been at some time biologically active. Although quartz predominated in the coarse mineral fraction, charcoal and coal fragments comprised up to 30%. Some of the former may be elm or oak but most is fragmented or lacking vessel structures. These residues were randomly distributed throughout, suggesting either slow accumulation or mixing via soil biota or digging cultivations. Context 403 changes at its base becoming sandier and more structured.

These soils are particularly rich in building refuse (calcareous plaster/daub or cement), burnt/unburnt bone (well preserved therefore indicative of high pH) and fine shells, all distributed randomly throughout. The former might imply adjacent demolition though rubble may have been added to the gardens. Additional calcareous materials include chalk, siliceous limestone and apatite which combined with the above suggest a highly calcareous soil environment. Some coarse quartz and feldspars are rounded and possibly fluvial in origin.

Context 404 is very different from the soils discussed above; although rubble was not observed, fine charcoal was distributed throughout. It was very compact and was a complex mix of fabrics though all were penetrated by coarse (4 by 2 mm) vertically oriented channels. It also had large chamber like voids (2–3 mm) of unknown pedological origin and had not been subject to mixing via soil

biota or man and was poorly sorted in terms of fabric. There were few true soil attributes or anthropogenic or biotic indicators. Orientations may be attributed to water action or possibly the movement of material in the fluid state. This sample yielded little in terms of interpretive information.

3. Periods 6–8, 15th–mid 17th century

This profile occurred south of wall 135 in Property 2 and incorporated contexts 133, 582 and 609. These have been designated A and A/B, B(g) and B/C horizons respectively. Samples for thin section were taken from the A horizon (10–18 cm), A–A/B boundary (26–34 cm), the B(g) horizon (46–54 cm) and the B/C (60–68 cm). Bulk samples were taken from the A, A/B, B(g) and B/C horizons for particle size analyses and in the case of the A and A/B horizons, for pH and phosphate determinations.

The A horizon comprised loose material consisting of rounded aggregates of quartz in a silty matrix. There are numerous clasts of limestone, sandstone and rubble, plus frequent charcoal and coal. The aggregates were enriched in Fe/clay/organic matter at the edges and there were small areas of denser aggregates. There were several shell and fine bone fragments. The A/B horizon was similar but contained more charcoal and had a larger amount (20%) of dense fabric some of which included horizontally oriented channels. The aggregates had well developed cracks and there were vertical voids which represented worm channels. In the B(g) horizon there was less coal and charcoal and the sand grains were somewhat smaller. Commonly the matrix was insufficient to fill the voids between grains leaving many small unconnected spaces. Some areas were more like the A/B with continuous pores and more staining of the smooth void walls. The B/C horizon varied from a dense matrix similar to the dense areas at the base of previous profile (404), but the remainder consisted of open quartz grains with very little matrix. There was very little charcoal but many bright reddish fragments of fine material. Some of the voids were coated and were continuous. There

was brown staining in the upper part of the slide on the surface of sand grains.

Inorganic and organic P were enhanced in terms of average topsoils but also in terms of levels associated with intensively used garden or anthropogenic soils (Eidt, 1977; Pettry and Bense, 1989). This presumably reflects the bone, shell and rubble (contributing to Ca) content of this soil and its high pH (calcareous soils tending to retain high levels of P). The similarity between the phosphate data in the A and A/B reflect a reduced heterogeneity compared with the soil described in profile 1. Organic P levels were twice those expected in normal soils but consistent with some calcareous soils and manures (Harrison, 1987).

The profile consisted of a mixture of material within which substantial biological activity had occurred. Apart from the charcoal, the material was natural soil taken from several locations and mixed roughly in layers. The material does appear to have functioned as a garden soil for some period after its emplacement, and would have reasonable properties in terms of providing an environment for plant growth.

Conclusion

The three soil profiles are all artificial or anthropogenic in the sense that they have developed in dumped materials, although this varies in composition and form. The first profile (1) has a basal layer dominated by carbon (coal and charcoal) with subsidiary inclusions of mineral soil, while the other two profiles (2 and 3) have a basal layer comprising over 95% mineral soil. Carbon is, however, distributed throughout every horizon of all three profiles indicating that the dumped material was already contaminated by human activity rather than being transported natural soil, and came from more than one source. This original carbon is invariably in small fragments (<1 mm) and is distributed at random through the matrix suggesting substantial mixing.

Subsequent to the emplacement of the "soil" on each of the three sites there have been substantial additions of loose sandy soil, charcoal and coal, and in some cases building

rubble and bone. Enrichment in building rubble is particularly marked in the second profile and may reflect its situation within the courtyard area in each phase of the property preceding the Mansion House, though its random distribution suggests subsequent bioturbation or cultivation. The gradual decline in carbon with depth in the third profile also suggests mixing via bioturbation and therefore biological activity of considerable duration, though not long enough to eliminate matrix heterogeneity completely. In contrast, the sharp boundary between the upper carbon rich material and intermediate low carbon soil in the first (14th century) profile suggests either minimal bioturbation, incorporation of the carbon prior to addition or a markedly contrasting usage, although horizons both possess true soil characteristics. Clearly plants were established for some time though this profile was probably never as biologically active as the soils in the other two profiles. It may be that garden usage of the topsoil, though not the underlying sandy soil, was short-lived.

The soil matrix in each profile consists of at least two separate sandy materials which remain distinct under thin section examination. One is poor in fine particles and has a very high porosity, the other is much richer in fine sand and silt and a much lower porosity. The composition of the three soils suggest that the profiles on the Mansion House site comprise terrestrial soil which has been moved onto the site, rather than river sediments. The only pedological indicators (other than biotic) are soil reduction features within the intermediate horizon of the first profile (1). These indicate microbial activity in a periodically wet environment, the later profiles were presumably more freely drained. It may be concluded that the later profiles (2 and 3) have developed in dumped material while earlier profile (1) has accumulated (through dumping and subsequent additions) on charcoal and coal detritus.

With the exception of the A2 of the first soil profile (1), levels of phosphorus within two of the profiles examined (1 and 3) are higher than would be expected as a result of intensive garden usage. In the second profile (2),

enhancement throughout the topsoil can be related to the high phosphate retention capacity of calcareous soils (the pH being maintained by the addition of building refuse/cement, limestone, chalk etc. additions) and the addition of bone and manures to garden soils, though not midden usage. Very high levels of phosphate within the topsoil of the first soil profile (1) may be related to kiln/oven associated activities since inorganic phosphate predominates, although this soil also possesses true soil characteristics. There is no evidence for midden usage other than from the landfill, context 541, unless middens were subsequently completely removed. Very high levels of phosphate within this organic material can only be attributed to animal wastes, either in the form of manures or carcass refuse.

The morphological and chemical characteristics of these soils are thought to reflect primarily domestic usage; the presence of builders waste is not unusual on a modern housing estate. Whether these profiles functioned solely as gardens is subject to debate given their high carbon and phosphate contents and high pH, although each has supported plant growth and soil fauna. It is thought that each profile has functioned as a true soil at some time though durations may differ, particularly between the first soil profile (1) and the other two (2 and 3). There is no clinker or coke in any of the profiles such as was found throughout the upper contexts at the Close Gate site suggesting strongly contrasting site use between these adjacent sites. The Close Gate material appears to have been associated with industry while the samples from the Mansion House site are associated with garden and domestic workshop activities.

DISCUSSION

The waterfront

The reclamation and development of the riverside waterfront at Newcastle follows a pattern previously recognized at many other medieval coastal and riverside towns in Europe (O'Brien 1988, p. 156). Above Tyne Bridge the water-

front was consolidated in front of The Close, which now lies some 50 m behind the frontage, in an arrangement paralleled at Hull, King's Lynn and London. The waterfront appears to have developed in a series of stages with individual properties being enlarged at different rates. At any one time a common alignment appears to have been rapidly established on adjacent properties, although the only evidence for a cohesive strategy for the waterfront in the medieval period occurs with the construction of the section of town wall between the Riverside Tower and property 2 (Ralph Carr's property, subsequently the site of the Mansion House).

The earliest phase of reclamation on The Close lies beneath and to the north of the existing road (fig. 26) and appears to have begun some time in the 13th century (Nolan 1989, p. 38). During this century the frontage appears to have advanced rapidly southwards and at least two further waterfronts have been recorded (periods 1 and 2) creating a platform approximately 30 m deep (from the foot of the cliff to the river edge). During the 14th century only one waterfront advance of 4.5 m was recorded in each of the excavated properties. In the early 15th century both properties advanced 11.5 m creating a platform 46 m deep, which appears to have remained until the waterfront was remodelled in the 19th century.

With the exception of a single wooden structure at the Close Gate site (Fraser, 1994), all the excavated waterfronts in The Close were constructed of local sandstone. These stone revetment walls retained various types of landfill material which consisted predominantly of large dumps of stone cobbles and sand. Petrological analysis of samples from various phases appears to show that much of the stone was derived from non-local sources, ranging between Durham and Southern England. Large dumps of ballast sand have also been identified as landfill elsewhere along the waterfront, both inside and outside Sandgate, and in particular on a warehouse site between the Crown Court and Milk Market, immediately inside the town wall. On this evidence it is

suggested that from the 13th century ballast from shipping engaged in trade along the eastern and Southern English coast was being used as landfill.

Documentary evidence of the discharging of ballast commences in the early 16th century (C. Fraser 1984, p. 169), but the practice could significantly predate these records. Ships carrying cargoes of coal from Newcastle are recorded from the 13th century (C. Fraser 1962, p. 210) and coal exports are thought to have been up to 7000 tons per year during the 14th century (Ibid 209). Certainly by the later 14th century the coal trade was an established source of local revenue following the imposition of tolls on coal shipments. When in 1362 an ordinance prohibited the export of coal, the burgesses complained that unless it was revoked they would be ruined and unable to pay the annual town farm of £100 due to the Exchequer. Since in 1524 similar tolls were used to pay not only the annual town farm but also to maintain the town wall, pavements, haven and ballast shores (C. Fraser 1984, p. 171), the inference must be that the earlier tolls may also have been used for the same purposes.

The waterfront between the Riverside Tower and property 1 was consolidated into a uniform frontage by the construction of a new section of town wall in the early 15th century. By this time properties further to the east had already attained this line and the wall appears never to have been built over the section of waterfront between property 2 and Tyne Bridge. The excavated evidence is supported by illustrations of this area on the Cotton MSS (c.1590), by Speed (c.1610) and a survey of the town defences in 1638. In these the town wall is depicted as a tall crenellated structure pierced by at least one watergate. Unlike the other waterfront walls the town wall created a physical barrier to the movement of people and goods between the river and the properties behind. Viewed from the riverward side the excavated section of wall stood 3.5 m to the sill of the watergate and must have stood in excess of 7 m high to the top of the parapet.

There was no evidence of rubbish pits or cess

pits on either property in the medieval period. Refuse was not disposed of in the normal manner seen on most urban sites, but was tipped either into the river or into areas which were being reclaimed. There is evidence from both properties that domestic refuse, including animal bedding but not faecal material, was used only in limited circumstances as landfill. The presence of large volumes of organic material made the ground unsuitable for building. Where such material was used to infill the dock, parts of the building constructed upon it appear to have suffered extreme subsidence and may possibly have collapsed.

Development of the platform

The sequence of buildings on property 2 began in the late 13th century (fig. 27A) with a small oven set on a low raised platform against the western side of the property. This structure was cleared away in the 14th century and an L-shaped range of buildings erected (B). To the south they fronted directly onto the river, with a dock or inlet on the eastern side. Prior to the end of the century the inlet was subdivided and the western side filled in. An east range was then erected above it. Evidence survived to show that both the east and west ranges had been subdivided into a series of rooms, with a passage on the eastern side of the west range. Two stone-lined drains ran beneath the ranges and a vertical shaft let into the western drain from ground or first floor level. No other internal details survived. The three ranges surrounded a courtyard to the north. It had a cobbled surface which was subsequently raised and repaved with flagstones. These were delineated to the south and east by a slight wall which may have defined an external passage.

Following a further 11.5 m advance of the waterfront in the early 15th century the western and southern ranges were extended further south, although they no longer abutted the river (C). There is also circumstantial evidence that at this time the east range either collapsed or was demolished. These buildings then remained intact until the site was redeveloped in the early 17th century (D).

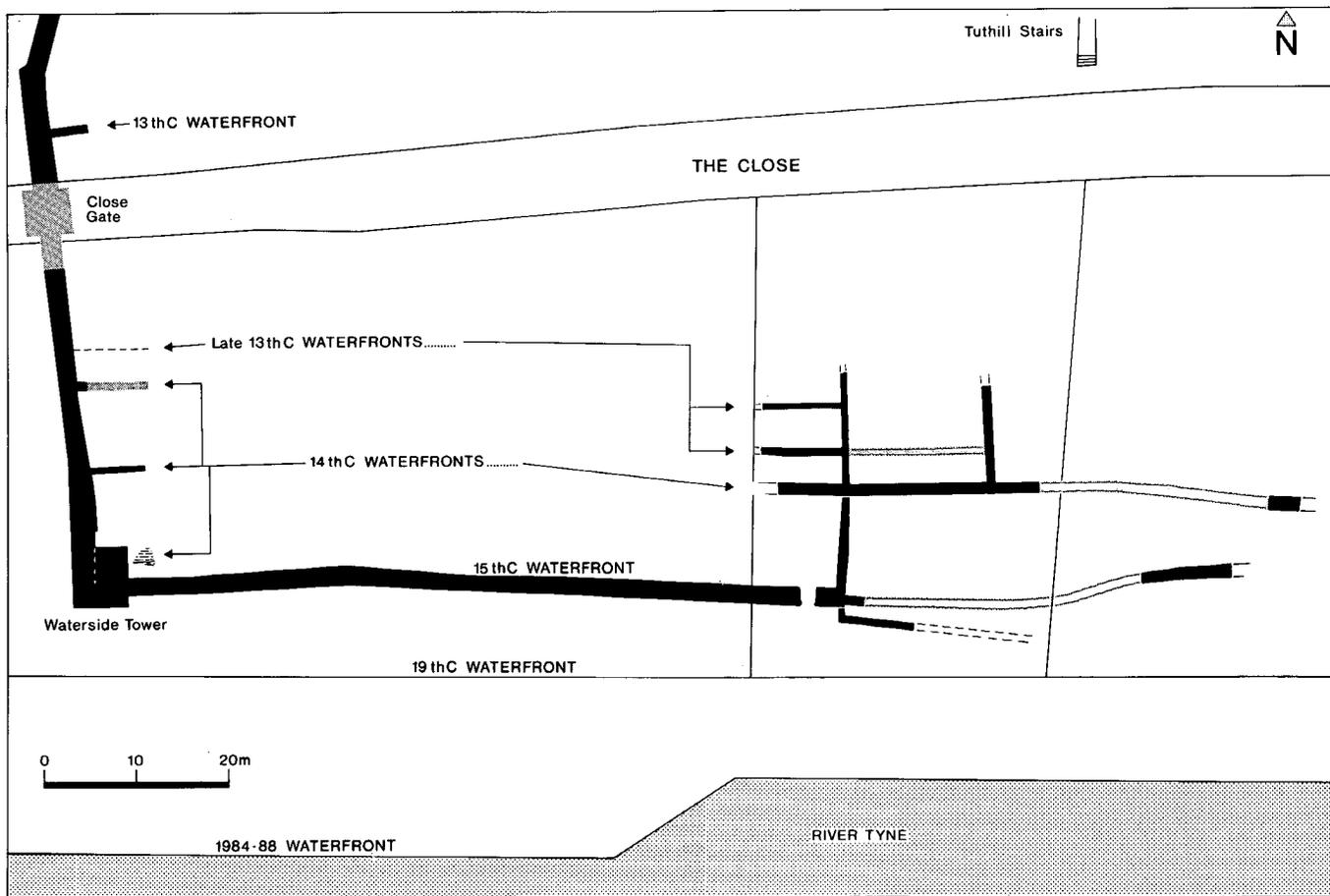
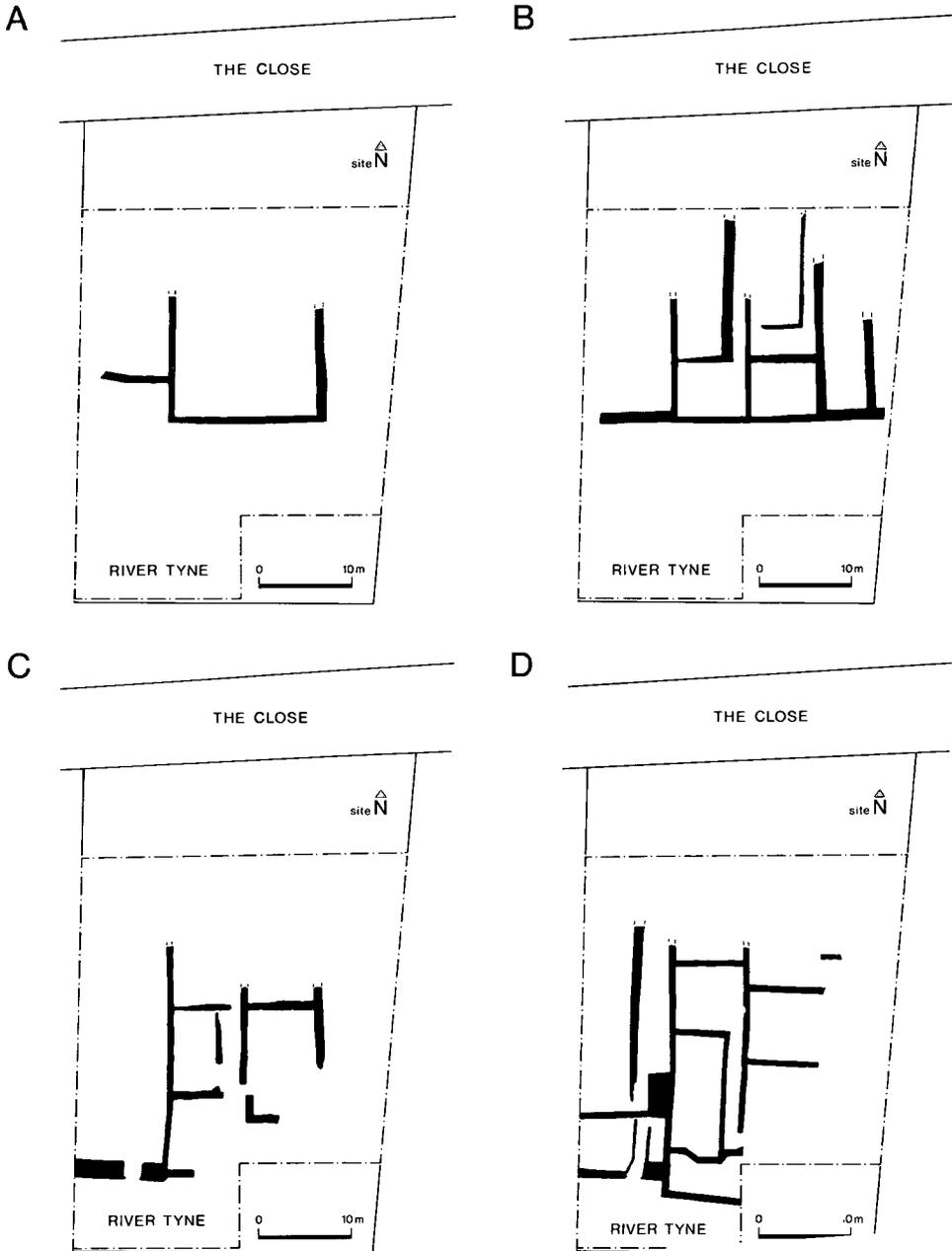


Fig. 26 Waterfronts identified during excavation on The Close.



*Fig. 27 Building development on property 2.
(A—13th century; B—14th century; C—15th century; D—17th century).*

The redevelopment of the buildings on property 2 in the early 17th century appears again to be linked to a revision of the waterfront. The buildings consisted of an eastern, southern and western range set back from the waterfront, although only the west range utilized foundations from buildings in the earlier period. This latter range was bay-fronted and evidence from the demolition of the site suggests that both this building and the south range may have been used for domestic occupation since large quantities of decorative moulded plaster were recovered.

In form and dimensions the buildings recorded on the site are very similar to the structure on 35 The Close, known today as Dove's warehouse. This building consists of three ranges, the eastern and western ranges are stone built, while the southern range is partly timber framed. The western range projects south of the other ranges and fronted directly onto the river until the waterfront was extended in 1984. The west range has been re-roofed in the 20th century, but recent dendrochronological studies of eight samples has shown that the roof of the east range dates to c.1486 and that of the south range to c.1514. Study of the building by RCHM (York) in 1990 showed that the existing south range had been rebuilt, and was formerly constructed in stone.

Examination of both the 1745 Buck view of The Close and Oliver's 1830 plan of Newcastle indicates that a significant proportion of the buildings on properties between the river and The Close were similar in form to Dove's warehouse and those excavated on property 2. They consisted of one or two long ranges which ran the length of the property between the road and the river, with a smaller south range set back from the waterfront, and a narrow courtyard behind.

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BIBLIOGRAPHY

- Newcastle Excavations*: see bibliography for full reference
- Bastion*: Ellison, 1983
- Blackfriars*: Vaughan, 1987
- Closegate*: Vaughan, 1994
- Ditch*: Ellison, 1981
- Orchard St.*: Vaughan 1993
- Queen Street*: Bown, 1989
- ANDERSON, J. F., RAHN, H. and PRANGE, H. D., (1979). Scaling of supportive tissue mass. *The Quarterly Review of Biology* 54.
- ARMITAGE, P. L. (1982). Studies on the remains of domestic livestock from Roman, medieval, and early modern London: objectives and methods. pp. 94–106. In Hall, A. R. and Kenward, H. K. (eds.), *Environmental archaeology in urban context*. London, CBA Research Report 43.
- ARMITAGE, P. L. (1983). The early history of English longwool sheep. *The Ark* 10, 90–97.
- ARMITAGE, P. L. (1984). The faunal remains. pp. 131–144. In: Thompson, A. et al. Excavations at Aldgate, 1974. *Post-Medieval Archaeology* 18, 1–148.
- AVERY, B. W. and BASCOMB, C. L. (1974). Soil Survey Laboratory Methods. Soil Survey Technical Monograph No. 65 Harpenden.
- BEARD, G. (1934). *Decorative plasterwork in Great Britain*.

- BOURNE, H. (1736) *History of Newcastle*.
- BOWN, L. (1989). The Pottery in O'Brien C., et al. 1989.
- BULLOCK, P., FEDOROFF, N., JONGUERIUS, A., STOOPS, G., TURSINA, T. and BABEL, U. (1985). *Handbook for soil thin section descriptions*. Waine Research Publications.
- CHARD, *in prep.* The medieval pottery from the Blackfriars, Newcastle upon Tyne.
- CHARLETON, R. J. (1885) *History of Newcastle*.
- DAVIS, S. J. M. (1991). Faunal remains from Closegate I & II, Newcastle, Tyne and Wear, 1988 & 1990 excavations. *Ancient Monuments Laboratory Report* 81/91.
- DAVIS, S. J. M. (1992a). Saxon and Medieval animal bones from Burystead and Langham Road, Northants; 1984–1987 excavations. *Ancient Monuments Laboratory Report* 71/92.
- DAVIS, S. J. M. (1992b). A rapid method for recording information about mammal bones from archaeological sites. *Ancient Monuments Laboratory Report* 19/92.
- EDWARDS, L. (1988). Seventeenth and Eighteenth Century Tyneside Tobacco Pipe Makers and Tobacconists, No. XI in *The Archaeology of the Clay Tobacco Pipe*, Peter Davey (ed.). BAR British Series 192.
- EDWARDS, *in prep.* Clay tobacco pipes from the Blackfriars, Newcastle upon Tyne.
- EGAN, G. and PRITCHARD, F. et al. (1991). *Dress Accessories—Medieval Finds from Excavations in London: 3*, Museum of London/HMSO.
- EIDT, R. C. (1977). Detection and examination of anthrosols by phosphate analysis. *Science* 97 117–128.
- ELLISON, M. (1981). The Pottery in Harbottle, B. and Ellison, M. 1981.
- ELLISON, M. and HARBOTTLE, B. (1983). The Excavation of a Seventeenth Century Bastion in the Castle of Newcastle upon Tyne, *Archaeologia Aeliana*, 5th series, Vol. XI.
- EVANS, J. G. (1978). *An Introduction to Environmental Archaeology*.
- FRASER, C. (1962). The North-east Coal Trade until 1421, *Transactions of the Architectural and Archaeological Society of Durham and North-umberland*, Vol. XI, Parts III & IV.
- FRASER, C. (1984). The Early Hostmen of Newcastle upon Tyne, *Archaeologia Aeliana*, 5th Series, Vol. XII.
- FRASER, R., et al. (1994). Excavation adjacent to Close Gate, Newcastle, 1988–9, *Archaeologia Aeliana*, 5th series, Vol. XXII.
- GEDDES, J. (1985). The Small Finds in Hare, J. N. *Battle Abbey. The eastern range and excavations of 1978–80* HBMCA Archaeological Report No. 2.
- GIDNEY, L. J. (1989). The mammal and bird bone. pp. 182–188. In O'Brien, C., et al. 1988.
- GOODALL, A. R. (1981). The medieval bronzesmith and his products in *Medieval Industry* (Ed Crossley, D. W.) pp. 63–71.
- HAMMOND, F. W. (1983). Phosphate analysis of archaeological sediments. In: *Landscape Archaeology in Ireland*. Eds. T. Reeves-Smyth and F. W. Hammond. *British Arch. Report* 116 47–80.
- HARBOTTLE, B. and CLACK, P. (1976). Newcastle upon Tyne: Archaeology and Development in Harding, D. W. ed. *Archaeology in the North*.
- HARBOTTLE, B. and ELLISON, M. (1981). An Excavation in the Castle Ditch, Newcastle upon Tyne, 1974–76, *Archaeologia Aeliana*, 5th series, Vol. IX.
- HARBOTTLE, B. and FRASER, R. (1987). Black Friars, Newcastle upon Tyne, after the dissolution of the monasteries, *Archaeologia Aeliana*, 5th series, Vol. XV, 23–149.
- HARRISON, A. F. (1987). Soil Organic Phosphorus: a review of world literature. *C.A.B. International*. Wallingford.
- HATTING, T. (1983). Osteological investigations on *Ovis aries L.*, *Dansk naturhistorisk Forening*.
- HEYWORTH, M. (1988). Analysis of medieval distillation vessels from Tower Hill, London. *Ancient Monuments Laboratory Report* 168/88.
- HODGSON, J. M. (1976). Soil Survey Field Handbook. *Soil Survey Technical Monograph* no. 5. Harpenden.
- HUNTLEY, J. P. (1989). The Plant Remains pp. 180–182. In O'Brien, C. et al 1989.
- HUNTLEY, J. P. (1990a). Further plant remains from the Medieval Quayside at Closegate, Newcastle upon Tyne: CG90. *Ancient Monuments Laboratory Report* 125/90.
- HUNTLEY, J. P. (1990b). An environmental synthesis of material from the Annetwell Street Roman Fort, Carlisle. (submitted to the excavator in publication-ready state).
- HUNTLEY, J. P. (1990c). Plant remains from the Medieval Quayside at Closegate, Newcastle upon Tyne: CG88. *Ancient Monuments Laboratory Report* 124/90.
- JENNINGS, S. (1981). Eighteen Centuries of Pottery from Norwich, *East Anglian Archaeology Report* 13.
- LAMB, H. H. (1977). *Climate Past and Present*. Methuen and Co., London.
- LEFEBVRE DES NOETTES, R. J. E. C. (1931). *L'Attelage. Le cheval de selle a travers les ages. Contribution a*

- l'histoire de l'esclavage*. Paris, Picard.
- MACKENZIE, E. (1827). *History of Newcastle*, Vol. 1.
- MILES, A. E. W. and GRIGSON, C. (1990). *Colyer's variations and diseases of the teeth of animals*. Cambridge, University Press.
- MOFFATT, L. C. (1987). The macrobotanical evidence from late-Saxon and early Medieval Stafford. *Ancient Monuments Laboratory Report*, 169/87.
- MOORHOUSE, S. (1971). Finds from Basinghouse, Hampshire *Post Medieval Archaeology*, 5 (1971)
- NOEL-HUME, I. (1980). The Rise and Fall of English White Salt-Glazed Stoneware, in *English Pottery and Porcelain—An Historical Survey* (Ed. Paul Atterbury) pp. 16–29.
- NOLAN, J. et al. (1989). The Medieval Town Defences of Newcastle upon Tyne: Excavation and Survey 1986–87, AA, 5th series, Vol. XVII.
- NOLAN, J. (1990). The Castle of Newcastle upon Tyne after c.1600, *Archaeologia Aeliana*, 5th series, Vol. XVIII.
- NOLAN, J. (1993). The Town Wall Newcastle upon Tyne, Excavations at Orchard Street and Croft Street, 1987–89, *Archaeologia Aeliana*, 5th series, Vol. XXI.
- O'BRIEN, C., et al. (1989). Excavations at Newcastle Quayside: The Crown Court Site, *Archaeologia Aeliana*, 5th series, Vol. XVII.
- O'BRIEN, C., BOWN, L., DIXON, S. and NICHOLSON, R. (1988). *The Origins of Newcastle Quayside, Excavations at and Queen Street and Dog Bank*. (The Society of Antiquaries of Newcastle upon Tyne Monograph Series 3).
- O'CONNOR, T. (1982). Animal bones from Flaxengate, Lincoln c.870–1500. *The Archaeology of Lincoln* 18(1). London, Council for British Archaeology.
- OLIVER, A. M. (1924). "Early deeds relating to Newcastle upon Tyne" *Surtees Society* Vol. CXXXVII.
- ORWIN, C. S. (1949). *A history of English farming*. London, Nelson.
- PAGE, A. L., MILLER, D. R. and KEENEY, D. R. (1982). Methods of soil analysis, Part 2. Chemical and microbial properties. *Agronomy* 9. American Soc. of Agron. Inc.
- PETTRY, D. E. and BENSE, J. A. (1989) Anthropoc epipedons in the Tombigbee Valley of Mississippi. *Soil Science Society of America Proceedings* 53 505–511.
- PLATT, C. and COLEMAN-SMITH, R. (1975). *Excavations in Medieval Southampton, 1953–1969*.
- RACKHAM, D. J. (1981). The animal remains. pp. 229–250. In Harbottle, B. and Ellison, M. 1981.
- RACKHAM, D. J. (1983). The animal remains. pp. 240–256. In Ellison, M. and Harbottle, B. 1983.
- RACKHAM, D. J. (1987). The animal remains. pp. 130–142. In Harbottle, B. and Fraser, R. 1987.
- RACKHAM, D. J. (1989). The mammal bones from medieval and post-medieval levels at Queen Street. In O'Brien, C. et al. 1989.
- STALLIBRASS, S. (1988). The animal bones. pp. 56–60. In Scull, C. Excavations in the Cloister of St. Frideswide's Priory, 1985. *Oxoniensia* 53, 21–75.
- SUTTON-GOULD, P. M. (1990). *Decorative Leadwork* Shire Album 249.
- VAUGHAN, J. E. (1987). The Redwares in Harbottle, B. and Fraser, R. 1987.
- VAUGHAN, J. E. (1993). The Pottery in Nolan, J. 1993.
- VAUGHAN, J. E. (1994). The Pottery in Fraser, R. 1994.
- WATERSON, E. and MEADOWS, P. (1990). *Lost Houses of York and the North Riding*.
- WILD, A. (1988). (Ed). *Russell's Soil Conditions and Plant Growth*, 11th Edition. Longman Scientific and Technical.

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