

The medieval development of South Leith and the creation of Rotten Row

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ABSTRACT

An excavation was undertaken in advance of development at 40–43 Water Street, Leith, which was documented as Rotten Row in the 14th century. The earliest remains encountered were the bases of turf banks used to define properties in the 13th century. These divided the area in an unexpected arrangement, with several plots extending beneath Water Street/Rotten Row. The midden deposits that accumulated in the plots suggested that fish and shellfish processing had been undertaken, as recorded in earlier excavations on the opposite, western side of Water Street/Rotten Row. It is suggested that the street was a later insertion and that the two excavations uncovered parts of the same properties. The backs of several abutting plots were revealed and these contained remains such as hearths and surfaces. All the excavated properties showed evidence of a hiatus during the 14th century. Re-occupation saw the construction of a workshop with access to the west, and this must reflect the creation of Rotten Row/Water Street. The construction of a 19th-century warehouse had truncated most later remains, although a well-preserved 17th-century structure survived in the north-west corner of the site. According to documents this was initially a dwelling, but later became a cooperage.

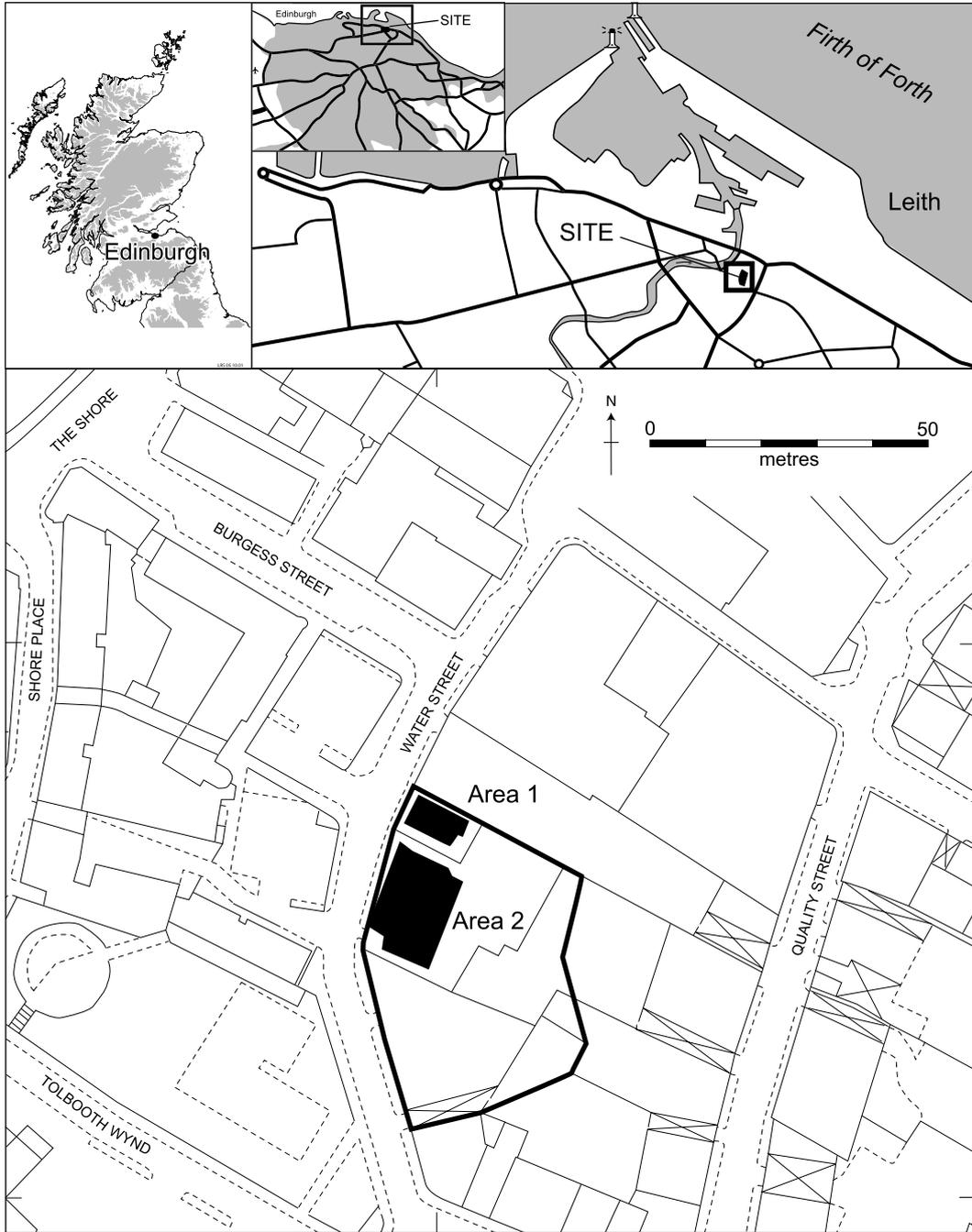
INTRODUCTION

The site lies within the core of the Port of Leith on the eastern side of Water Street around 100m south-east of The Shore (illus 1, site centred NGR: NT 2710 7636, formerly Midlothian County, now City of Edinburgh Council). Nineteenth-century warehouses dominate the area but many have been converted to residential flats. As a result of redevelopment large areas of medieval archaeology have been excavated on the opposite side of the road, to the south of Burgess Street, and on the opposing bank of the river at

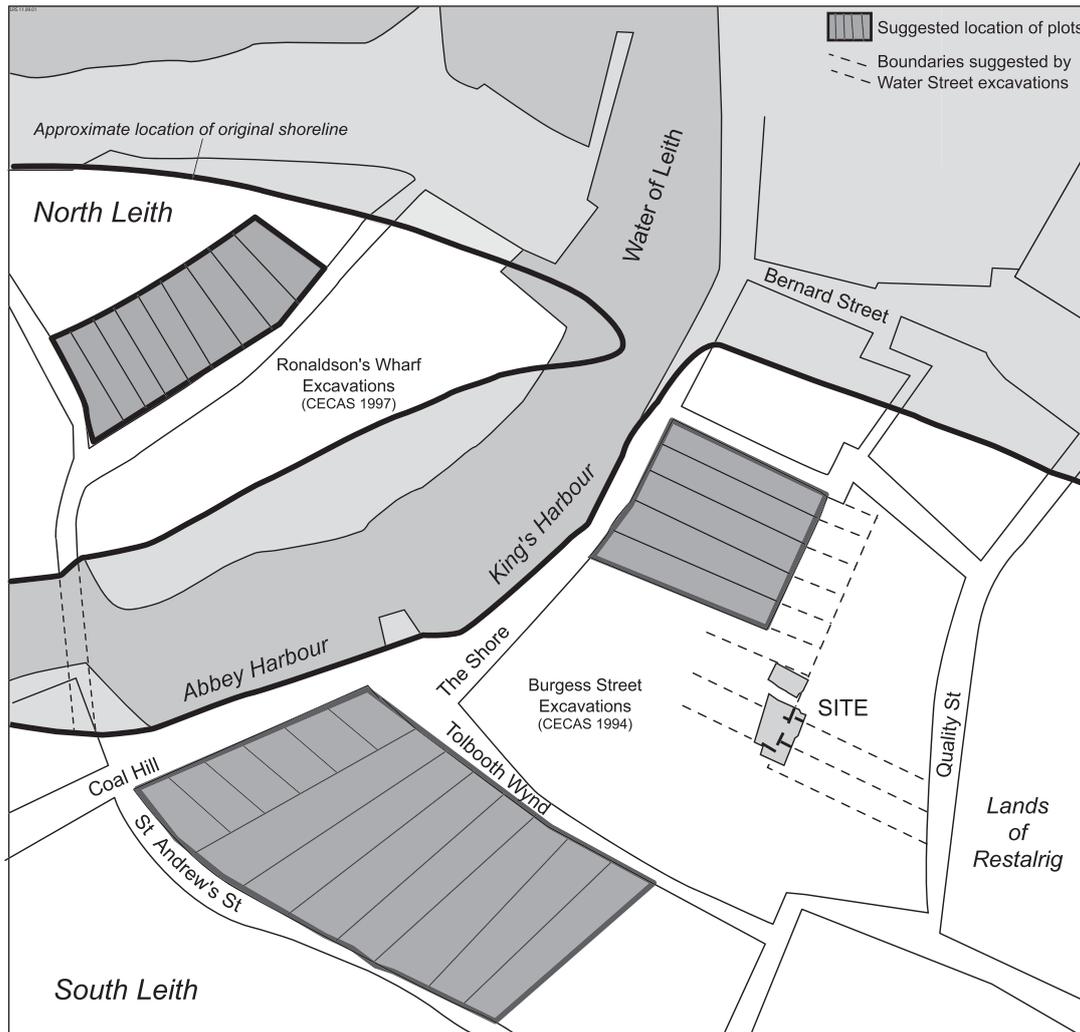
Ronaldson's Wharf (illus 2; Collard & Reed 1994; Reed & Lawson 1999). These await full publication; however, the author is aware of the phasing and nature of the sites (D Reed & J Lawson, pers comm).

The coastline has altered dramatically as a result of reclamation from the later medieval period onwards, as shown by excavations beside Bernard Street in 1980, which established that this was part of the medieval foreshore (illus 2; Holmes 1985). More recent excavations at The Shore and Ronaldson's Wharf (Lawson 1999; Reed & Lawson 1999) also encountered the medieval beach, possibly

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ILLUS 1 Site Location. (Based on the Ordnance Survey map © Crown copyright)



ILLUS 2 Speculative recreation of 12/13th-century Leith. The dashed lines reflect the results of the Rotten Row excavation and are discussed at the end of the report.

defined by a large sea wall, and it is possible to estimate the position of the original shoreline (illus 2). The unchannelled Water of Leith formed a tidal estuary accessible to seagoing ships at high tide (Mowat 1994). The site would have straddled a marginal area between sandy shore and grassland.

Two evaluations (Collard 1996; Lawson 1996; Moloney 1999) undertaken in response to proposed residential developments established the survival of medieval deposits

beneath the basement of a standing warehouse at 42–3 Water Street and an open yard to the north. As part of a resulting planning condition a specification designed to preserve the deposits by record was agreed with the City of Edinburgh Council Archaeology Service, who monitored the project. An excavation was undertaken in two stages, the first beneath the open yard in August 1999 (illus 1, Area 1) and the second following demolition of the standing warehouse in February 2000 (illus 1,

Area 2). The façade of the warehouse has been retained in the new development, and the rear and side of the structure were subject to a program of recording prior to demolition (Holden & Speed 1999). The developers, Kier Scotland Ltd and Castle Rock Housing Association, have wholly funded the works and this publication. All descriptive elements of this report are summaries of more detailed archives and catalogues deposited with the project archive at the National Monuments Record for Scotland.

HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

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Leith lay around 3km north of medieval Edinburgh at the mouth of the Water of Leith on the Firth of Forth. By the later medieval period Leith's harbour had grown into Scotland's busiest port with particular dominance of the wine trade (Mowat 1999). The first documentary evidence for a settlement at Leith occurs in the foundation charter of Holyrood Abbey, issued by David I in 1128 (Mowat 1999, 1). It is referred to as two entities separated by the Water of Leith, and prefixed North and South (illus 2). The King endowed the Abbey with lands in North Leith and a harbour in the South. When the settlements first developed remains the subject of speculation, but preliminary reports of the Ronaldson's Wharf excavations suggest an 11th-century origin (Reed & Lawson 1999). The Water was traversed by ford or ferry until the Abbey built a bridge in the early 15th century (Mowat 1994, 35).

Having ceded a source of revenue to the Church, the King promptly founded another harbour downstream (illus 2) although this does not necessarily imply the construction of any stone or wooden wharves. At this time it is likely that trading ships were capable of being beached, or that small boats serviced larger vessels anchored in the middle of the channel (Mowat 1999). Although excavation

has not confirmed it, it is thought that the Abbey harbour was associated with a row of short properties at right angles to it and several longer ones running between Tolbooth Wynd and St Andrew's Street (illus 2; Mowat 1999, 1). The King's Harbour is thought to have been associated with its own row of properties, probably fronting onto The Shore (illus 2). Excavation in the area between them has established that midden deposits began accumulating from the 12th century, possibly with earlier cultivation (Collard & Reed 1994; Lawson 1995). The foundations of medieval buildings were discovered on the Shore Place frontage (illus 1), but the area adjacent to Water Street seems to have been used sporadically for open-air activities such as fish processing (D Henderson, pers comm). It was also noted that the earliest midden deposits extended below Water Street (Lawson 1995). The excavations carried out within North Leith recorded evidence for extensive industrial activity such as smithing along the north shore (Reed & Lawson 1999). Nevertheless, the results from both excavations suggest that during its early history Leith functioned as a fishing village for much of the time, with trade restricted to certain seasons (Reed & Lawson 1999).

The earliest, 14th-century, references to Water Street designate it Ratoun or Rotten Row. 'Rattin' refers to undressed timber and Row was used to denote a street with properties occupying one side. The name implies that the street contained simple, wooden buildings. In 1398 a charter confirmed the existence of a road on the line of Quality Street, which at that time marked the boundary with the rabbit warrens of Restalrig (illus 2; Mowat 1999, 3).

The amount of trade passing through Leith is thought to have increased during the 13th century, but Berwick-upon-Tweed dominated commerce to and from wealthy Border estates (McNeill & MacQueen 1996, 238–42). It was eliminated as a rival by the second Wars of Independence beginning in 1333 and Leith was the main beneficiary. The quantity of goods

passing through the port increased substantially through the second half of the 14th century, even though it decreased in Scotland as a whole. Wool and skins formed the vast bulk of exports at this time, with cloth becoming increasingly important during the next two centuries (McNeill & MacQueen 1996, 238–42). Imports came mainly from England, when possible, France, the Low Countries and the Baltic. These consisted of luxury items such as wine, spices and silk, as well as staples like timber. A large amount of Scottish produce was also redistributed through the port (Mowat 1994).

Medieval Leith was not granted burgh status and technically all imported goods should have been hauled up to Edinburgh to be taxed and sold on (Mowat 1994, 1–2). Like all burghs Edinburgh guarded her rights jealously but frequent edicts concerning the sale of imports in Leith seem likely to reflect the existence of a robust black market. As well as skippers, mates and fishermen the maritime economy would have supported coopers, smiths, boat-builders, bakers, brewers and porters.

Edinburgh's status as capital undoubtedly enhanced Leith's trading position but also caused it to become embroiled in hostilities, although occupation by foreign troops was not an economic disaster as their garrisons still needed supplies. Of greater impact were trade embargoes, particularly by the English during the 14th century. The town also suffered direct attack on a number of occasions, including twice in quick succession by the Earl of Hertford during the 1540s (Mowat 1994, 107–14).

Documents from the 17th century suggest the site was occupied by one property, which extended from Water Street/Rotten Row to Quality Street. It consisted of 'Seton's Land' in the north-west and a large surrounding L-shaped garden (Mowat 1999, 8–9). Seton's land contained a dwelling fronting onto Water Street, a yard and two cellars (warehouses) behind. The garden and Seton's Land were

sold as two properties before the end of the century, and as pressure on land increased during the next 200 years a succession of tenements, stores, workshops, stables and yards were constructed, mostly within cooperages (Mowat 1999). A single warehouse replaced the resulting crowded jumble of buildings in 1878.

THE EXCAVATION

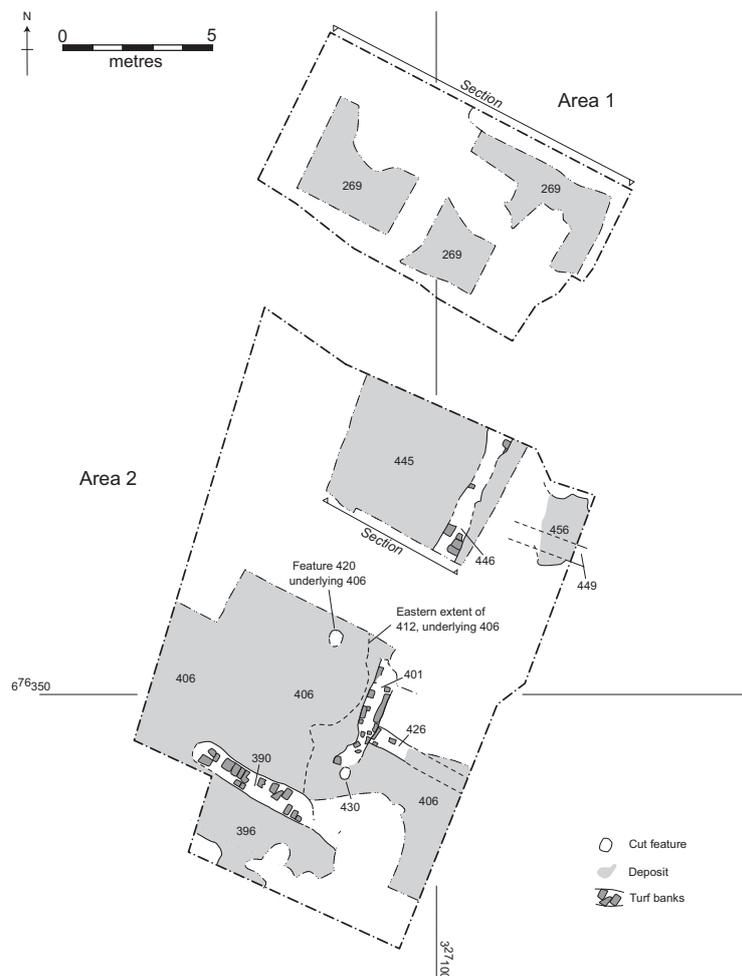
Simon Stronach

METHOD

The excavations were primarily a response to development, with the aim of preserving all threatened archaeological remains by record. Given previous work in the surrounding area it was thought that they would provide information on the date and scale of the medieval expansion of South Leith. Modern overburden was removed by machine and overlay around 1m of archaeological deposits in both areas; all subsequent excavation was by hand. Modern truncation had removed later deposits across both areas and also included deep foundation cuts that extended into subsoil, particularly beneath the warehouse in Area 2. In contrast, Area 1 had previously lain within an open yard, and had suffered much less disturbance. All primary features and deposits were sampled and the vast majority were sandy and freely draining. Consequently there was very little preservation by waterlogging. In what follows, '12/14th-century pottery' means pottery where a date can be tied down no closer than to the 12th to 14th centuries. The two areas have been combined within one phase sequence.

PHASE 1: SAND DUNES AND AN UNDATED FEATURE (NOT ILLUSTRATED)

The subsoil was clean beach sand with an undulating surface. The lowest point was in the north of Area 2 (4.41m OD), with a gentle slope rising to the south and a more pronounced one towards Area 1 (5.11m OD). A single undated feature had been cut into the beach. It was irregularly shaped, with steep sides reaching a flat base at a depth of 0.1m. It was filled with stratified silty sands suggestive of gradual accumulation and sterile apart from a single oat grain, which is possibly intrusive (Hastie, below).



ILLUS 3 Phase 2: 13th-century turf banks

PHASE 2: 13TH-CENTURY BOUNDARIES AND FISH PROCESSING (ILLUS 3)

Several turf banks, around 1m wide at base, were constructed (illus 4) and a trample layer containing 12/14th-century pottery formed. The presence of imported Yorkshire ware within one bank suggests that the area was not divided until the 13th century, but the recovery of 12th-century pottery within midden accumulations around the banks implies that settlement existed nearby in the previous century.

The banks divided the area into properties. It is likely that Area 2 contained the rear of three plots with widths of around 7m extending east towards

Quality Street, and at least one running below Water Street to the west. There was no surviving boundary or identifiable frontage along the roadway. The plots were not used for structural development within the excavated area, and accumulations of midden mixed with windblown sand collected within them. Truncation had removed the tops of the banks and any associated features, but in North Leith boundary banks were mounted by stake fences (Reed & Lawson 1999), and with these they could have been used to hold stock. A post-hole within a gap between two banks may have been the only surviving evidence of a similar arrangement. Alternatively the banks could have supported hedges; however, a lack of root disturbance makes

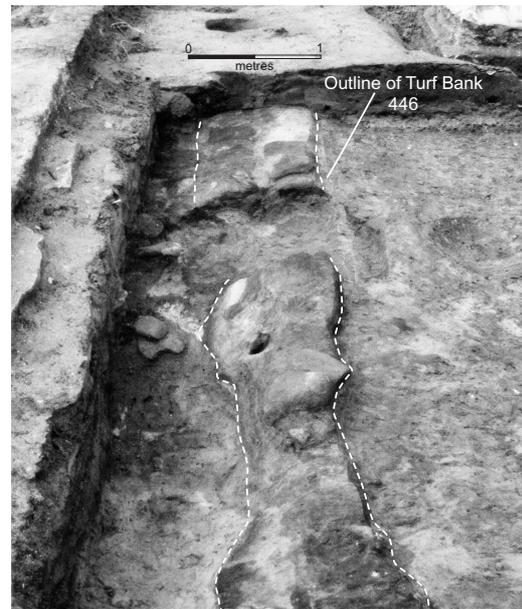
this a less likely interpretation. The analysis of fish bone from the accumulated sands implied that the area was used sporadically for processing catches, especially of cod and ling, and had a striking similarity with the early remains discovered during the Burgess Street excavations on the opposite side of Water Street (Henderson below; Collard & Reed 1994). During the trading season open areas may also have functioned as storage areas, especially for bulky goods such as timber (Mowat 1999).

Turf banks

In Area 2 a trampled surface overlay the subsoil sand and contained occasional coal fragments, rare bone and 12/14th-century pottery (Franklin, below). This had formed during the construction of several turf banks. Two sections of bank (401 & 446) were divided by a later wall but are likely to represent a single bank running for 12m. A further three banks were identified running at right angles to this axis. That numbered 390 had been truncated by later activity and ran for just over 4m. A truncated stretch (426: illus 3) abutted the eastern face of bank 401 and contained two fragments of imported Yorkshire ware, suggesting that this bank was not created until the 13th century (Franklin, below). Bank 449 was identified only in section because of truncation by a pit. All the banks had been reduced in size by modern disturbance and survived to a maximum height of three courses or 0.3m. They were constructed from two parallel lines of turves, decayed to dark purple sand and separated by a core of re-deposited clean sand. The turves had been placed upside down and were separated vertically by clean sand, indicating that they had originated in sandy grassland (Carter, pers comm). They varied in size from sub-rectangular examples measuring 0.2m by 0.4m, to sub-squares measuring 0.2m across. The banks were sampled and found to contain only low quantities of charred cereal grains, as did all contexts on the excavation (Hastie, below). Weathering was evident on the sides and was most pronounced at the southern end of bank 401. Here slumping had covered a small sub-circular cut (430) interpreted as a robbed post-hole.

Windblown sand and midden

Following construction, windblown sand and material reflecting surrounding activities accumulated between and against the banks. To the south of



ILLUS 4 Turf bank

bank 390 this consisted of up to 0.1m of coarse sand (396) with infrequent inclusions of coal, fish bone, pottery and shell. To the north of bank 390 and west of bank 401, dark grey sand (412) accumulated with midden including roof tile fragments (Franklin, below). This was cut by a small disposal pit (420) and sealed by sandy accumulation 406, which contained a fragment from a rare 12th-century mortar (Franklin, below). The fish bone from this deposit is likely to derive from the processing of a single deep-sea catch of cod and ling (Henderson, below). To the east of bank 446 and around bank 449 up to 0.3m of laminated sands (456 = 453), with occasional lenses of ash developed. To the west of bank 446 sand with frequent midden material accumulated (445). Both of these deposits contained 12/14th-century pottery, but fish bone and coal fragments were more abundant.

The earliest deposit (269) in Area 1 was also an accumulation of sand with midden. It reached depths of up to 0.26m and contained frequent laminations of coal, cinders and fish bone. Analysis of the bone suggests it derived from the processing of one deep-sea vessel's catch, as with deposit 406 (Henderson, below). Finds recovered from the layer were varied and included: 12/14th-century pottery; roof tile fragments; a fragment of furnace lining;

and a Neolithic thumbnail scraper (Franklin, below). The anthropogenic content lessened markedly from west to east and the deposit was characterized by clean bands of windblown sand alternating with purple turf lenses in the eastern section of the area. Initially these were interpreted as temporary ground surfaces; however, given the orientation of bank 446 in Area 2 they were more likely to represent a longitudinal section through the continuation of this feature.

PHASE 3: 13TH/14TH-CENTURY BACKLANDS ACTIVITY (ILLUS 5)

At this stage truncation caused by modern construction began to impact on deposits in Area 2. The effect was greatest in the south due to a rise in underlying ground level. The divisions established in Phase 2 were maintained and the rear of the Quality Street plots contained small groups of features. The area adjacent to Water Street did not contain any features although its boundaries were redefined by bank 441 on the line of 446. Clean beach sand 444 was dumped to the west and a new bank (442) created (illus 5 & 6). This seems most likely to have redefined a property boundary previously just outside the excavated area to the south, rather than to be sub-dividing a very large plot. Within Area 1 windblown sand mixed with occasional midden material (269) continued to accumulate.

Light industry in the rear of backlands

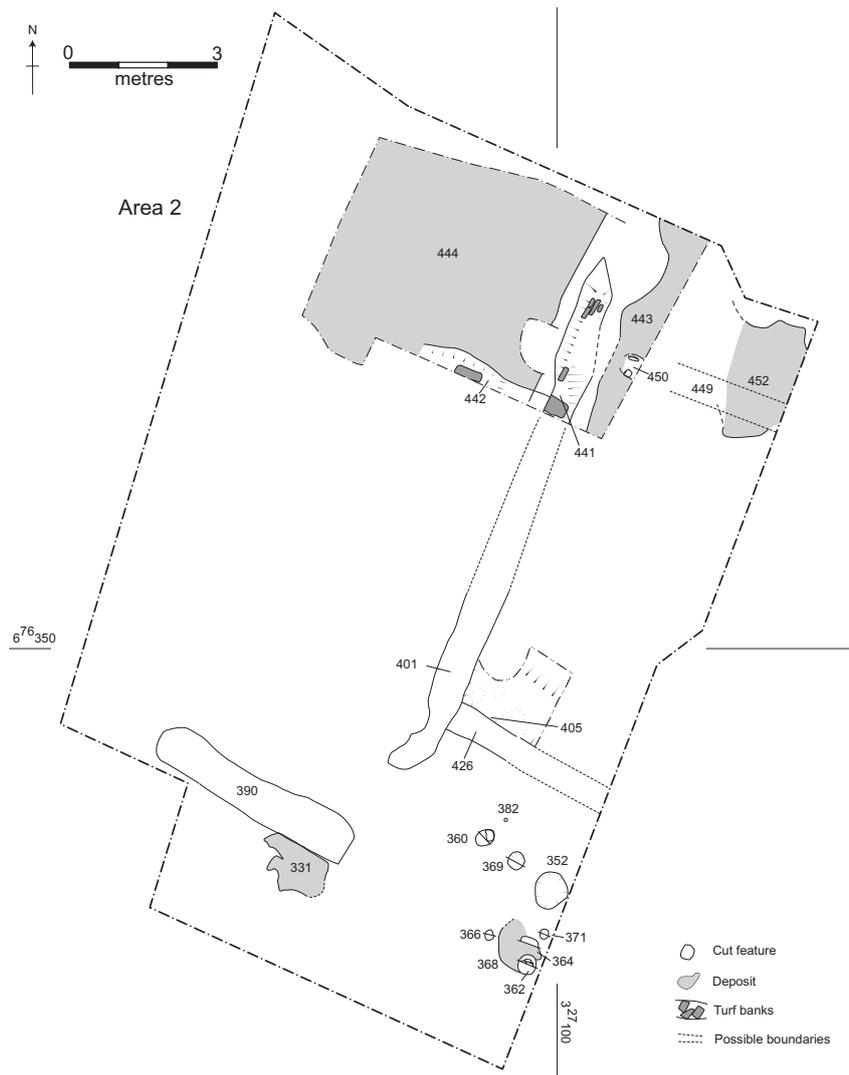
A small round hearth (450) defined by cobbles was set into underlying sand. Despite having a diameter of only 0.5m it generated a substantial spread of coal, ash and cinder (443/452). The most abundant finds from these deposits continued to be 12/14th-century pottery and fish bone. To the south, feature 405 consisted of a large sub-rectangular cut with sloping sides, it was truncated to the north and east; two existing banks formed its south-western corner. Its base sloped down from south to north, where it had a maximum depth of 0.6m and traces of in situ burning. A primary fill of coal, ash and rubble associated with clay sealed three irregular scoops in the base. This contained fish bone, animal bone and hammerscale, although none was sufficiently abundant to aid interpretation of the feature. The secondary fill was dark clayey sand with coal lenses and rubble. A later cut truncated a sandy upper fill,

which contained frequent rubble, clean sand lenses and purple turf laminations. The fills suggest that the cut originally held a structure formed from rubble with clay bonding. The abundance of coal and in situ burning indicate that it also shielded a small fire.

A small group of post-holes with no obvious pattern (360, 362, 364, 366, 369, 371 & 382) was confined to a small area to the east of the terminus of bank 390. Two contained packing stones (360 & 362) and all were filled with clean sand. The fills contained a couple of sherds of 12/14th-century pottery (Franklin, below). Two post-holes were cut into a small compact ashy spread (368) with fish bone and coal. To the south a truncated accumulation of sand (331) contained ash, coal and burnt stone.

PHASE 4: 14TH-CENTURY ABANDONMENT AND A WORKSHOP (ILLUS 7)

Initially the remains indicated a period of very little or no activity on site. Sandy accumulations containing sparse midden material developed and covered the turf banks. Tree roots penetrated abandoned feature 405. Eventually a building was constructed using a frame of substantial posts set into a foundation cut. Impressions preserved in packing material suggested horizontal plank walls had been used to cover the frame. However, on the north side interior accumulations directly abutted the construction cut and this wall may have consisted of a wattle panel for ventilation. Several corroded lumps of iron were recovered from the interior but there was no hammerscale and the building is not likely to have been used for metalworking. Given the large amounts of coal and ash within the structure it can be presumed that it held a fire or hearth outside the excavated area. A ceramic vessel had been set into the floor (352: illus 8) and could have been used for a number of things (see Franklin, below). The workshop entrance indicated access from Water Street/Rotten Row and it is suggested that the road had been created within an area previously occupied by the rear of Shore Place plots. The excavated area is interpreted as being incorporated into at least two, probably three, plots extending from Rotten Row/Water Street to Quality Street. A thick dump of marine shell in Area 1 is likely to be waste from food



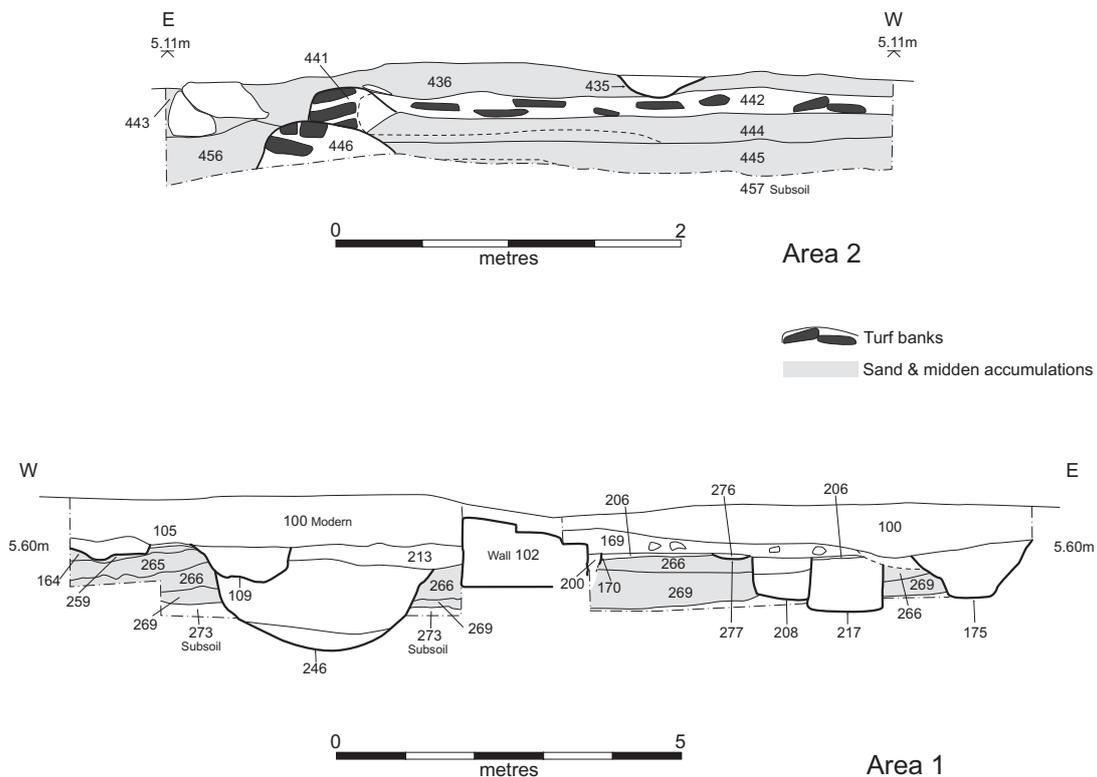
ILLUS 5 Phase 3: 13/14th-century backlands

processing, and has strong parallels with the Burgess Street excavations (Collard & Reed 1994).

In the north of Area 2 up to 0.3m of laminated silty sands (436: illus 6, upper) with occasional coal, shell, fish bone, 12/14th-century pottery and wind-blown lenses overwhelmed the banks. To the south this deposit or its equivalent had been removed by truncation. Here tree roots 409 grew through the Phase 3 cut 405. In Area 1 up to 0.3m of laminated sands (266: illus 6, lower) contained a temporary ground surface, fish bone, 12/14th-century pottery, coal and marine shell.

Workshop

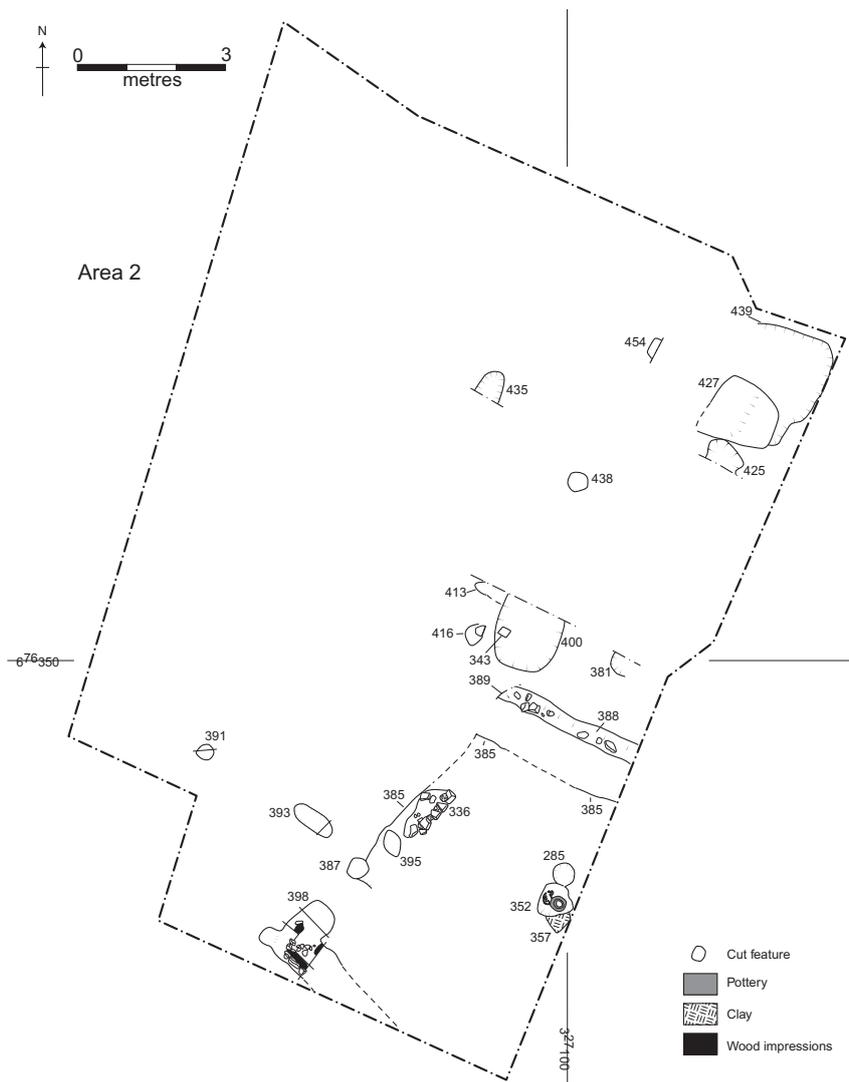
The most substantial remains of Phase 4 were associated with a timber building in Area 2. The south-western corner was represented by a foundation trench (398) with a depth of around 0.35m, although this reached 0.8m within post settings. The backfill comprised a mixture of sand, rubble and clay, in which impressions of planks could be identified. The impressions showed that planks had been set parallel to the trench edge, at an angle of roughly 45 degrees and sloping toward its lip. The



ILLUS 6 Selected sections (see illus 3 for locations)

small area defined in the middle of the trench must then have been used as a secure foundation for the base of a wall with packing material placed around it. Small, unidentifiable scraps of timber were retrieved from the bottom of post-pipes and large sherds of 12/14th-century pottery from packing material (Franklin, below). To the north, beyond a gap between 398 and 397, interpreted as an entrance, the structure continued in a different form. Here the interior was at the same level as the base of the construction cut (385), effectively forming a large rectangular cut. It extended outside the excavation to the east, giving a western side of 6m and a northern of at least 3m. The depth of the cut remained around 0.35m, though with deeper post settings (387 & 395) around the entrance. Clay and rubble packing material 336 survived against the western edge and within post settings. The primary fill in the structure was compact dark silty sand with clay patches, coal fragments, ash and an assemblage of 12/14th-century pottery. This had been used as a

rough surface over which an accumulation of crushed coal, with several small lumps of corroded iron and lenses of cleaner silty sand, built up. This directly abutted the construction cut to the north, but not west, suggesting a difference between the forms of the walls. Within the interior several original features were preserved. A sub-circular cut (352) contained a large upright White Gritty vessel (illus 8), which was sooty from use as a cooking pot and dated to the 13/14th century (Franklin, below). A surrounding fill of sand with ash, coal and the remains of another 13/14th-century cooking pot held it in position. The mouth of the upright vessel emerged from the top of the cut, and was surrounded by clay. The use of clay is mentioned in sealing the connection between pots used for the collection of oil (see McCarthy & Brooks 1988, 119, for a detailed description). However, the lack of any residue within the pot weakens this interpretation; for a full discussion of possible uses see Franklin (below). There was also a bowl-shaped



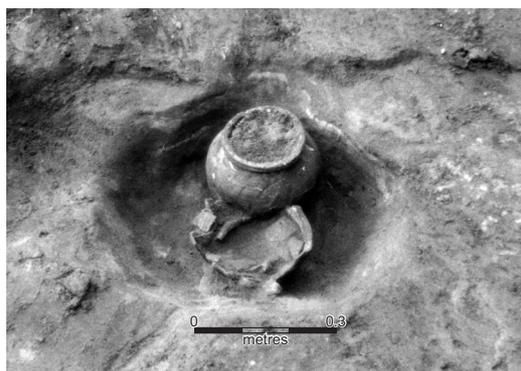
ILLUS 7 Phase 4: 14th-century workshop

cut (285) with a fill of carbonized rope, straw and wood sealed by clay containing 14 sherds from the same 12/14th-century vessel. This may originally have been another pot buried in the floor.

Boundary features

A number of truncated pit bases filled with sand and midden material (381, 413, 400, 438, 454, 425,

427, 439), and two post-holes (343, 416) were concentrated in the east of Area 2. The pits were probably for waste disposal and are likely to have been concentrated at the boundary of plots. This division was also represented by a more formal example of a property boundary (389). This was located around 1m to the north of the workshop, with the same orientation, and only a thin strip of fill (388) survived later truncation. It contained



ILLUS 8 Pot set into floor of workshop

large boulders set along the edge of the cut, several corroded iron objects and sherds of 12/14th-century pottery (Franklin, below). It may be the south side of a revetted ditch, slightly to the north of the line first established by bank 426.

Shellfish processing and midden accumulation

Within Area 1 a thick deposit of marine shell (265: illus 6, lower) was dumped. It consisted mainly of oyster but also included a proportion of winkle (Dawson, below). As there were no lenses of windblown sand within the shell deposit it seems to represent a single processing event. There was an overseas trade in pickled oysters harvested from the Forth, and the deposit may be related to this rather than domestic consumption (Dawson, below). The deposit contained 12/14th-century pottery and a lump of flint, possibly a core (Franklin, below). It lay below a deposit of dark brown sand (259: illus 6, lower) with frequent coal, charcoal, fragments of animal or fish bone, patches of oyster shell and 12/14th-century pottery.

PHASE 5: 15/16TH-CENTURY DISPOSAL PITS (ILLUS 9)

By this stage in the sequence truncation was severe across Area 2 and remains were largely confined to the bases of negative features. These do not seem to be concentrated along any NW/SE boundaries and the plots may have been amalgamated into the single property first documented in the 17th century. Area 1 contained several large pits used to dispose of shell and fish waste. The presence of clay and rubble suggested that a stone structure existed nearby. One pit contained iron smelting slag and

hammerscale, which probably reflects smithing in the environs.

Truncated accumulations and disposal pits

Four irregular remnants of larger accumulations were identified in Area 2. These included a small spread of clean sand (335). To the north two darker sand accumulations (339, 384) contained 13/15th-century pottery (Franklin, below). A compact spread (338) with coal, clay patches, shell and mortar may have been part of a yard surface.

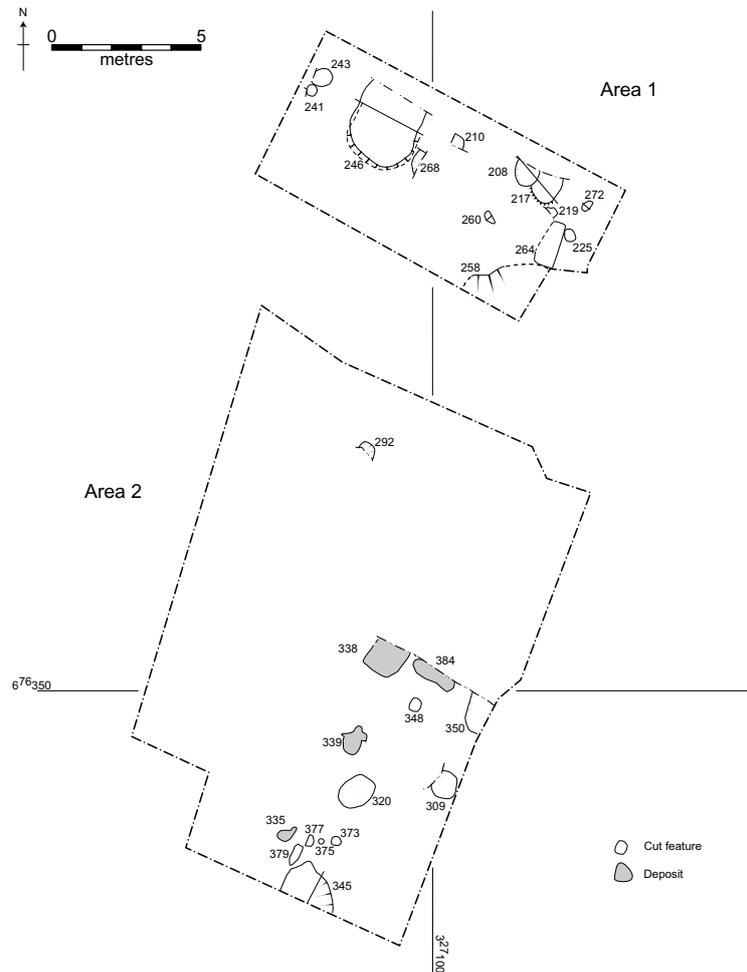
Elsewhere the bases of pits and post-holes were all that survived (292, 309, 320, 345, 348, 350, 373, 375, 377 & 379). All the pits were filled with sand mixed with a varying amount of midden material. This was dominated by fish bone, marine shell, 13/15th-century pottery and ash. Some pits also contained structural debris, namely clay and rubble, which was often heat-affected.

Within Area 1 large disposal pits dominate this Phase. Pit 246 (illus 6) had a depth of over 1m and a backfill containing frequent shell, bone, 15/16th-century pottery, and a late 15/16th-century coin (Franklin, below). This feature also contained the largest concentration of iron slag and hammerscale found on the excavation. Immediately to the east was pit 268, which contained much oyster shell and fish bone. Two pits (208, 217: illus 6) had relatively clean sandy fills. To the south was a series of three related pits. The earliest (258) extended outside the area and beyond a depth of 1.35m, which was the limit of safe excavation. It had been filled with seven dark fills dominated by fish bone and marine shell and sealed by two layers of clay, presumably to seal off the accompanying smell. Pottery from the fills suggested a 15/16th-century date (Franklin, below). Two pits (225 & 264) post-dated this feature, the former used for the disposal of midden and rubble, the latter gradually filled with windblown sand.

Several features were interpreted as the truncated bases of post-holes (210, 219, 241, 243, 260, 272). Only one contained disturbed clay and stone packing while the others contained sterile sand, suggesting the posts had been removed.

PHASE 6: 16TH-CENTURY DEVELOPMENT (ILLUS 10)

The remains from Area 1 included a yard surface, hearth, un-lined drain, latrine and possible storage pit. It seems likely to have been occupied by a



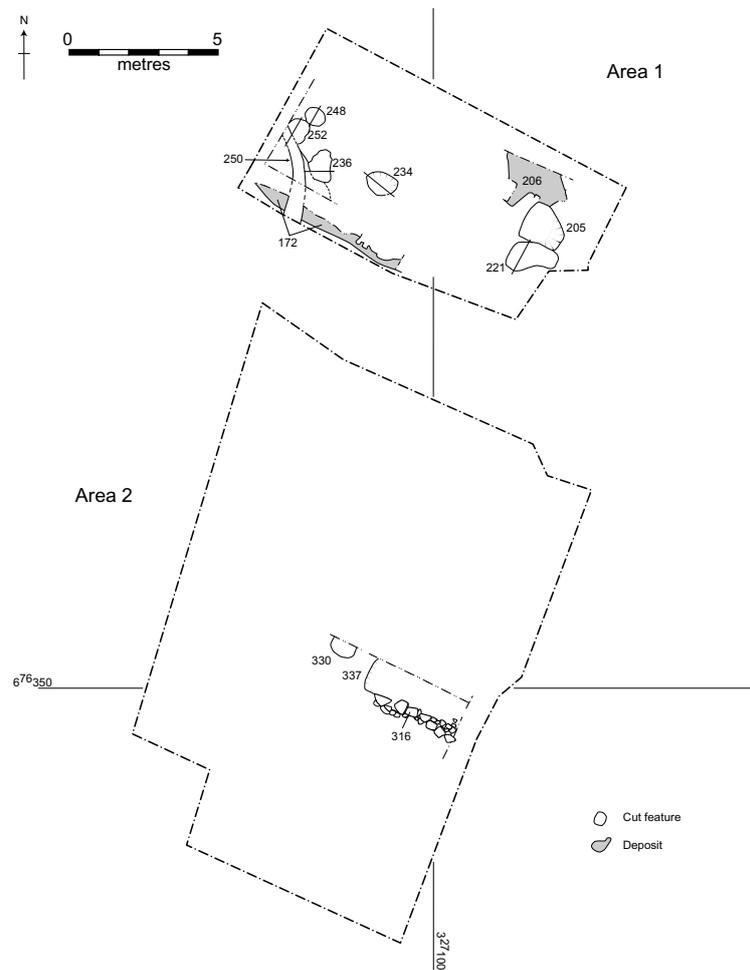
ILLUS 9 Phase 5: 15/16th-century pits

structure by this time, probably connected with ironworking.

Yard surface, industrial features and disposal pits

In Area 1 a thin band of sandy midden (172) survived to the south of later truncation. It contained imported 15/16th-century pottery (Franklin, below), iron smelting slag and hammer scale, coal, fish and animal bone (Henderson, below). A small patch of compact black sand (206) with coal, mortar and hammer scale was interpreted as part of an external yard surface. It was post-dated

by a large oval pit (205) containing two near-complete 15/16th-century green-glazed jugs decorated with a rosette (Franklin, below). The retrieval of grape and fig seeds (Hastie, below) from the laminated fill suggests the pit had been used as a latrine. To the south it truncated a rectangular pit (221) containing a copper button and 15/16th-century pottery. To the west a shallow scoop 236 was interpreted as a hearth because of its fill of coal and burnt sand. A very regular sub-circular pit (248) contained coal, ash and heat-affected rubble. An un-lined curvilinear channel (250) emerged from the western baulk and within a short distance curved to run beneath the southern trench edge. It had filled with clayey silt (249) containing coal,



ILLUS 10 Phase 6: 16th-century development

shell, 16/17th-century pottery (Franklin, below) and hammerscale. This is likely to have functioned as a crude drain and post-dated a circular pit (252). This contained a large round slab of grey sandstone with two drilled holes around 0.1m apart. It was broken but originally had a diameter of 0.45m, matching that of the pit. It would have worked well as a cover, perhaps with a rope handle tied between the two holes, and the pit could have been used for storage.

In Area 2 an insubstantial structure was identified extending into the eastern baulk and truncated

to the north. It comprised a shallow sub-rectangular cut (337) with a rough wall (316) constructed from sandstone boulders bonded with clay against its southern edge. There was no wall on the west, suggesting the feature may have been accessed from that side. An accumulation of coal, ash and soot, containing 16th-century pottery, and a concentration of cultivation weeds collected in the base. For a discussion of how these could have been brought into an urban area see Hastie (below). To the west, a pit (330) contained 14/16th-century floor tile (Franklin, below).

PHASE 7: 16/17TH-CENTURY
CONSTRUCTION/DEMOLITION (NOT
ILLUSTRATED)

The remains from this phase related to demolition and/or subsequent rebuilding. The presence of clay, rubble and mortar in these contexts is suggestive of a transition from clay-bonded to lime-mortared structures.

Disposal pits and construction

A large construction or demolition related pit (189) with a depth of 1m was located centrally in Area 1. The fills comprised clean basal clay overlain by sand with midden, and upper fills of clay, rubble and mortar. These contained pottery with a date range from the 14th to 17th century and several pieces of glazed floor or roof tile (Franklin, below). Immediately to the west was a smaller pit (229) filled with clay, mortar and rubble. Two small pits (274 & 277) filled with sand and mortar were identified only in section. A disposal pit a short distance away (234) was filled with burnt rubble and a concentration of black mustard seeds, which were used in the manufacture of soap (Hastie, below). The property immediately to the south of the excavation was home to Scotland's first soap works by 1621 (Mowat 1999, 4–5) and it seems likely that the seeds derived from this.

In Area 2 rubble dominated the fills of two pits (291 & 298), one of which also contained brick, tile and 16th-century pottery (Franklin, below), while oyster shell, used as pinning in lime-mortared walls, and mortar dominated the fill of another (422).

PHASE 8: 17/18TH-CENTURY SETON'S LAND
AND WILKIE'S HOUSE

Records from the first half of the 17th century allow the first correlation between archaeological structures and documented buildings. They describe the site as part of a single large property split into two parts; the north-west occupied by a dwelling-house fronting onto Water Street with a yard to the rear and the rest within a L-shaped garden stretching to Quality Street (Mowat 1999). Area 1 contained the dwelling house and part of the yard, Area 2 the garden. A skipper called James Seton bought the property in 1657, while the house was being leased to a Captain in the English Parliamentary army then occupying Leith. By 1690 the L-shaped garden

had been sold to a Patrick Wilkie and contained a dwelling on the Water Street frontage. In 1721 Seton's son defaulted on debts and an Edinburgh writer seized Seton's Land. In 1742 a cooper called James Rannie bought it and the building may have become a cooperage smithy.

Seton's Land (illus 11)

A small building was constructed on the frontage in Area 1. It was rectangular with the north side beyond the trench. The walls (102) were constructed from randomly coursed sandstone rubble bonded firmly with lime mortar, and surviving to a height of three courses (0.5m). The east or rear wall was noticeably thicker than the south, while the west was not fully exposed. The east wall contained a threshold stone some 2m from the south-eastern corner, and interior alcoves or presses on either side. It was constructed within a trench, with backfill that contained pottery dated to the 17th or early 18th century (Franklin, below). The interior of the building was surfaced with compact mortar (105), similar to that used in the wall and likely to be original. The surface was used for a prolonged period and required repair using fragmented schist (213: illus 6, lower). This contained a worn George II coin dated to 1729–54 (Franklin, below). Many small post- or stake-holes filled with a mixture of sand, ash, coal and fragments of pot, metal objects and glass, were located within the building. These were concentrated in the south-west with a grouping forming an intercutting curving line (132–40, 152–4) with four posts (144, 146, 148, 161) offset from the southern end and one (130) from the northern. The remainder were scattered around the floor (111–28, 157, 160, 165–7) and the fill of one contained a musket shot. An irregular scoop (107) in the south-east contained fragments of clay pipe, slate and green bottle glass. Three pits (109, 164, 215) may originally have been internal features but were eventually used for disposal and contained coal, ash, fragments of pot and bone, and hammer-scale.

Wilkie's House

In Area 2 the earliest structure (326, shown as part of illus 12) was cellared and orientated along the Water Street frontage. It was constructed from sandstone rubble, randomly-coursed and bonded



ILLUS 11 Phase 8: Seton's Land building

with lime mortar. Several truncated disposal pits were also dated to this phase (not illustrated).

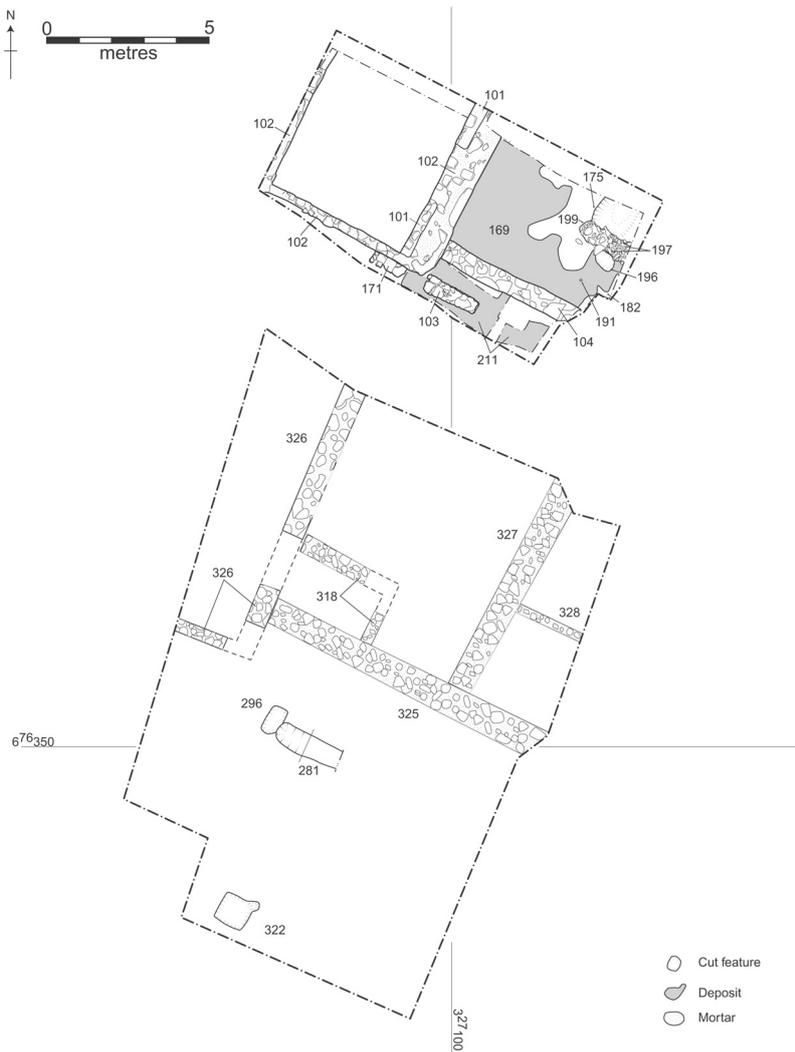
PHASE 9: 18/19TH-CENTURY COOPERS (ILLUS 12)

In 1760 the former garden was sold to another cooper called John Graham. He developed the area with stables, storehouses and cellars. In 1780 a large part of the property was sold to a baker, who developed a bakehouse and granary. In 1785 James Rannie, who had purchased Seton's Land in 1742, embarked on a series of improvements, converting the house into a tenement and constructing more cellars and lean-to structures in the yard (Mowat 1999). Remnants of these buildings, namely stores and warehouses within the Area 2 cooperage and the Area 1 tenement, had been preserved in some parts of the later warehouse walls and were recorded

during a pre-demolition survey (not illustrated; Holden & Speed 1999).

Rannie's Development

After the Area 1 structure had been in use for some time the presses in the rear wall were filled with sandstone rubble (101) bonded with a hard mortar. This may have been intended to strengthen the wall. A stretch of east/west sandstone rubble wall (103) with five surviving courses was constructed against the south-eastern corner. It was constructed within a trench that also contained drystone cobbling to support the exposed corner of the original building. Running south from the same corner a stretch of sandstone walling (171) survived as a single course, and an east/west wall (104) abutted the western face. This survived to a height of three courses and ran out of the trench to the east. Outside the trench



ILLUS 12 Phase 9: 18/19th-century coopers

it was seen to form the foundation of tenement walls. The associated construction deposit served as make-up for a mortar surface (182) and contained a large corroded iron spike, possibly a mason's wedge (Franklin, below).

Several features were associated with this phase. In the north a sub-oval pit (199) was connected to a shallow channel that ran outside the area to the east. The upper fill comprised conglomerate cobbles, set level with the surface and with signs of in situ burning. It was post-dated to the south by an irregular shallow scoop (196), probably formed

through shovelling from a coal store. To the south was a stake rotted in situ (191). Extending beneath the north-eastern corner of the trench was a regular rectangular pit (175) with a centrally placed setting. It had been filled with burnt sand, coal, clay pipe, nails, an iron cannon ball, brick and roof tile fragments (Franklin, below). Deposits of coal, mortar, clay and some rubble (169, 211) accumulated on either side of wall 104. This contained a variety of finds including slate, nails, glass, a fragment of copper pot and pottery dated to the 15/17th century (Franklin, below). This may be a

re-deposited levelling material relating to Rannie's development.

Cooperage and bakery

In Area 2 the foundations of several buildings post-dating the frontage structure were identified. Foundation 325 abutted it and extended outside the area of excavation to the east. A small cellar was added to the rear of the frontage structure by the addition of a new wall (318) at the junction with wall 325. Wall 327 ran at right angles to and abutted wall 325, and was associated with a small cellar (328) to the east. Additionally several cuts thought to have a structural function were identified (281, 296, 322). One of these contained the only fish-hook recovered on the excavation, probably because of the poor preservation of metal on site (Franklin, below).

PHASE 10: 19TH-CENTURY WAREHOUSE (NOT ILLUSTRATED)

Large sandstone plinths that had supported the warehouse built by James Watt in 1878, and demolished prior to the excavation, were cut through earlier deposits in Area 2. In a Leith Fire Insurance Map created in 1892 the warehouse is part of a yard owned by J A Bertram & Co, Wine and Spirit Merchant (Mowat 1999). The tenement in Area 1 was being used as a grocery with dwellings above.

FINDS

Julie Franklin

(Finds not illustrated unless otherwise noted.) For a small site Water Street produced an exceptional assemblage of pottery, both in terms of imports and completeness of vessels. In contrast there was not a large amount of metalwork, probably due to the freely draining sandy conditions, which promote oxidization. Ronaldson's Wharf in North Leith and the neighbouring South Leith sites of Burgess and Bernard Streets (Holmes 1985) have provided a useful body of comparative material. Unfortunately the two former, excavated by the City of Edinburgh Council Archaeology Service, are not yet published. However, finds reports have been written for most of the Burgess Street assemblage (Franklin, forthcoming a; Will, forthcoming) and the author is familiar with the pottery and small finds from Ronaldson's Wharf.

POTTERY

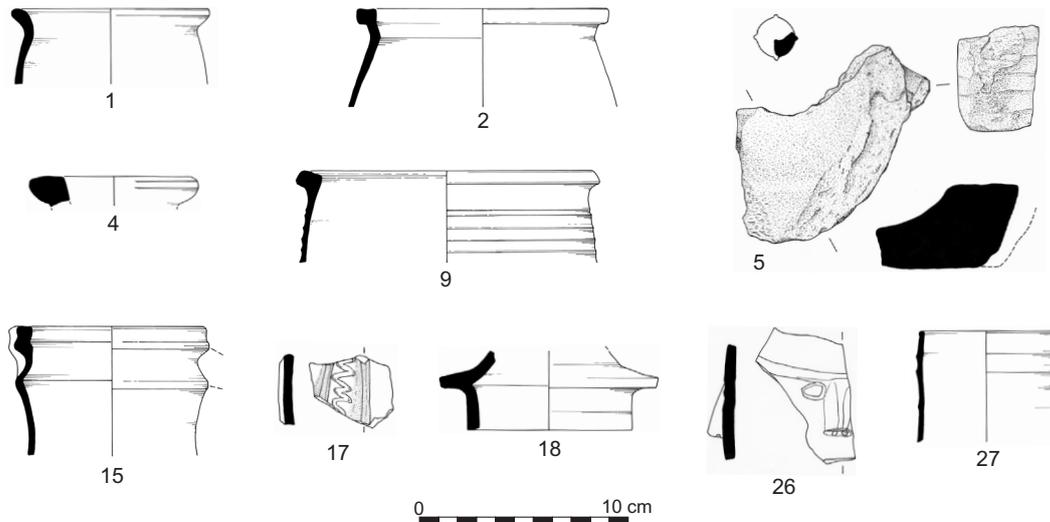
The assemblage numbered 2466 sherds sorted by visual analysis. This was mainly from the medieval period with a little 17th-century material and a negligible amount of later wares. It included 158 sherds from imported vessels, mainly Yorkshire Type Wares, Low Countries Redware and Rhenish Stoneware. The local industry is represented by a large collection of Scottish White Gritty Ware, including three complete jar (cooking pot) profiles. Several later complete or near-complete vessel profiles were reconstructed.

Scottish Wares

Medieval Redware 86 sherds. Typically this is an orange sandy fabric, occasionally coarse and gritty, and the majority covered with a white or pale pink slip, often on both sides. The glaze can be olive green, yellow or brownish orange. It is analogous to Perth Local Ware, the predominant fabric found in Perth between the 13th and 15th centuries (MacAskill 1987a; Hall 1997). Unlike in Perth, the Redware from Water Street is limited to the earlier medieval period. It is most numerous in Phase 2 and thereafter declines, probably ceasing to be current following Phase 4. Early medieval Redwares were found at Jedburgh Abbey where they predated the White Gritty industry (Haggarty & Will 1995). Crucially these were not white slipped, which implies the copying of an existing White Ware industry. Thus, we may suggest that Leith Redwares do not predate the inception of Scottish White Gritty Ware. This is reinforced by the observation that within phases and individual contexts it is never more common than White Gritty.

The Water Street assemblage is probably local and possibly a continuation of an earlier Redware tradition. However after a short period of competing with and copying the more popular White Wares, it was eventually superseded. Most of the forms represented appear to be 13th-century, although a few rim sherds (illus 13: 1–2) probably date to the second half of the 12th century (G Haggarty, pers comm). Two straight-sided jars of identical fabric were found at Ronaldson's Wharf where they were associated with Stamford Ware and other 12th-century pottery.

Included in this group, though the fabric is more akin to brick or tile than pottery, is part of the base of a large mortar (illus 13: 5) found within a Phase



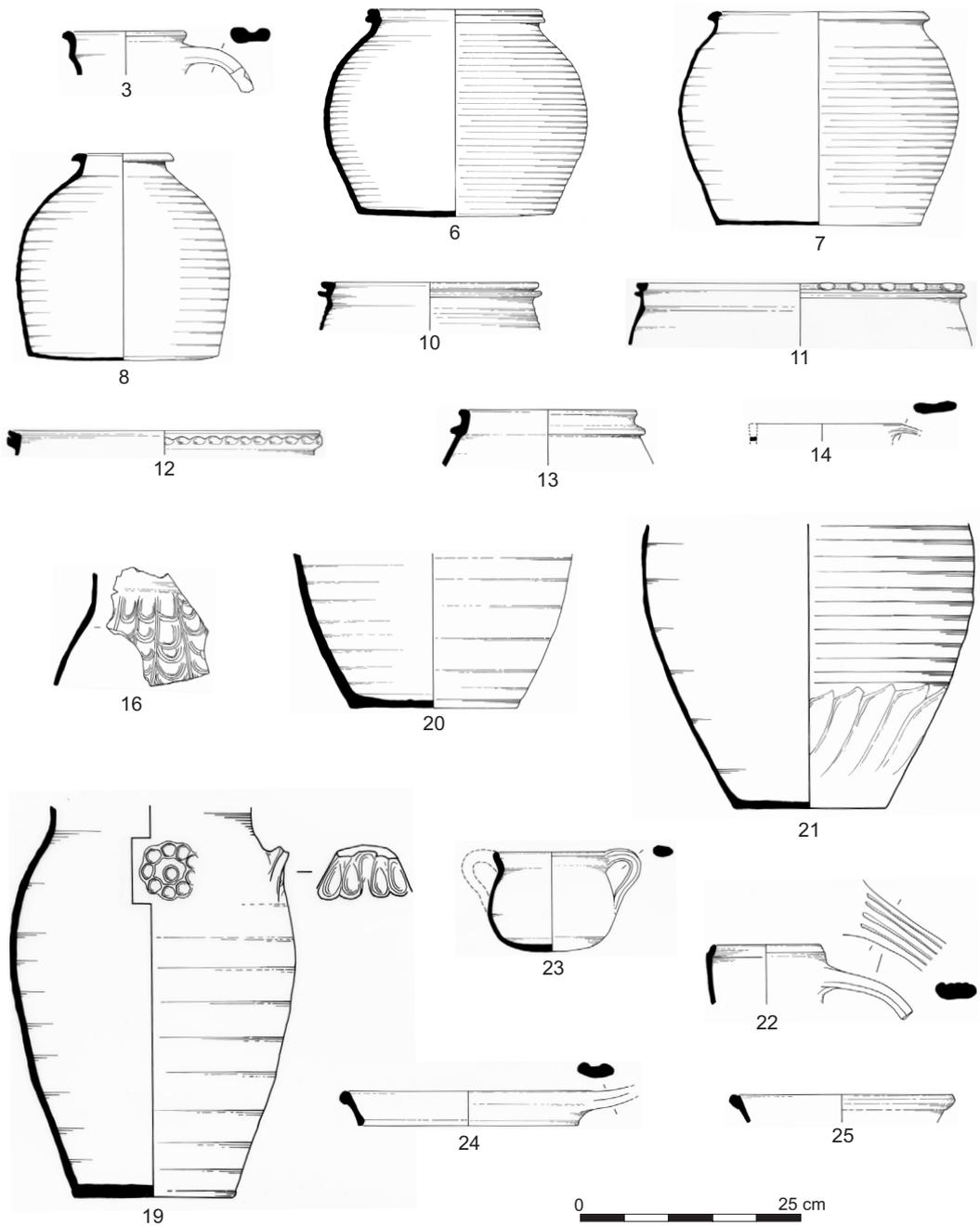
ILLUS 13 Selected Pottery. *Medieval Redware*: 1 Jar rim, Phase 4; 2 Jar rim, Phase 4; 4 Vessel rim (possible flask), Phase 2; 5 Mortar base, Phase 2. *Scottish White Gritty Ware*: 9 Jar rim, Phase 4; 15 Jug rim & neck, Phase 4; 17 Jug body sherd, Phase 4; 18 Lid, Phase 5. *Other English*: 26 Applied face mask, Phase 5. *Rhenish Stoneware*: 27 Jug rim, Phase 6

2 deposit. Stone and metal mortars are more common but ceramic examples are sometimes found, offering a cheaper but less hardy alternative. The nearest parallel comes from the kiln site of Colstoun in East Lothian (Brooks 1980, 383). It could have had several culinary or industrial uses, for example the grinding of spices or ingredients for pottery glazes, and it is not likely to have been used for processing grain.

Scottish White Gritty Ware 1894 sherds. Over 75% of the assemblage is accounted for by White Gritty sherds. This ware is present from the earliest Phase 2 deposits and begins to decline numerically from Phase 5, corresponding to the traditional date range of 12/15th century. The assemblage included three near-complete jars. All were similar in form: globular with sagging bases and pronounced wheel rilling. The most complete (illus 14: 6) was found set into the floor of a Phase 4 wooden structure, with the rim flush with the floor level. The surrounding backfill contained most of a similar but broken pot (illus 14: 7), one side of which was missing, presumably removed when it was replaced. A White Gritty jar was found in a similar structure at the neighbouring site of Burgess Street. The function of this pot is unclear, although it was

evidently used for several years and was important enough to be replaced. It seems unlikely that it was used for everyday storage, due to the difficulty of extracting the contents. Also, any foodstuffs stored would be prone to attacks from vermin. There were no deposits on the interior surface to indicate its use, while heavy sooting on the exterior was from primary use as a cooking pot. It could have been used for storing embers, although this would probably leave signs of interior burning. Other possibilities are: a trap for vermin or for collecting oil from heating wood (see McCarthy & Brooks 1988, 119), although again the latter would be expected to leave some traces on the inside of the pot. Perhaps the correct interpretation is the most simple and the pot was hidden beneath some debris to act as a safe repository for valuable items.

On the evidence of rim forms, the majority of the assemblage is composed of jars. The proportion of jugs rises over time, but only in Phase 5 are there more jugs than jars. The most distinctive of the jar rims has a broad flange below the horizontal rim (illus 14: 10). This appears to be an early type found mainly in Phase 2. Examples were also found at Ronaldson's Wharf, but not at other sites, even as close as Edinburgh (Thoms 1976). This may therefore be a form distinctive to Leith, or possibly an



ILLUS 14 Selected Pottery. *Medieval Redware*: 3 Jug rim & handle, Phase 2; *Scottish White Gritty Ware*: 6 Complete jar, Phase 4; 7 Near complete jar, Phase 4; 8 Near complete jar, Phase 2; 10 Jar rim, Phase 8; 11 Jar rim, Phase 3; 12 Jar rim, Phase 6; 13 Jar rim, Phase 4; 14 Jar rim with handle, Phase 5; 16 Jug neck and shoulder, Phase 4. *Late White Gritty Ware*: 20 Jug base and belly, Phase 7. *Late Medieval Greyware*: 21 Jug base and belly, Phase 6; 22 Jug rim and grooved handle, Phase 5. *Late Medieval Oxidized*: 23 Handled jar, Phase 8. *Post-Medieval Oxidized*: 24 Skillet rim and part of handle, Phase 7; 25 Bowl/skillet rim, Phase 7

indication of how little contemporary material from this early period has been excavated. That thumbled variations of this rim were found at both Leith (eg illus 14: 11) and at the kiln site of Colstoun, East Lothian (Brooks 1980, 380, 199–202), suggests the latter.

There are several base and rim sherds from early straight-sided cooking pots, found from the third quarter of the 12th century (Tabraham 1984; Haggarty & Will 1995). These were associated with early Redwares and other late 12th-century pottery.

Decorated sherds do not appear until Phase 4, also the first phase with significant quantities of jug fragments. Among the more unusual are two sherds, probably from the same jug, decorated with applied red strips and incised zig-zags (illus 13: 17). The yellow glaze appears brownish red over the decoration, and the bright colours are reminiscent of French Rouen jugs or 13/14th-century London copies. Also notable were a jug shoulder covered in an incised pattern of lines and arcs (illus 14: 16) and an impressed wheat-ear design.

Late medieval White Gritty Ware 113 sherds. This is a heterogeneous group of fabrics but distinct from the White Gritty, Grey and Redwares associated with it. The name is a temporary term until a standard classification is established for Scottish pottery. Generally it is pale in colour, varying from grey to pink and buff. It is thick-walled, badly made, fired and glazed, with spalling surfaces and is rarely decorated. The fabric is generally smoother than White Gritty containing sparse but large inclusions. It is represented mainly by jugs, with forms similar to late medieval Greywares. It first appears in Phase 5 and is most common in Phase 6. It represents the final decline of the White Gritty industry during the 15th and 16th centuries and the transition to smooth grey post-medieval Greywares.

The most complete vessel is a large jug (illus 14: 19), recovered from a rubbish pit and whole but for neck, handle and some of the shoulder. It is decorated with an applied thumbled rosette. A similar rosette was found on a sherd from an apparently 15th-century midden at Bernard Street (MacAskill 1985, 414 no 33).

Three sherds (all Phase 5) have the remains of a purple-coloured glaze and may represent an attempt to copy Langerwehe Stoneware, a popular import at this time.

Late medieval Reduced 109 sherds. There were probably many kiln sites producing this type of pottery although only one is known, at Hamilton (Franklin & Hall, forthcoming a), with a possible reference to a potter at Bothwell Castle (Cruden 1952). Similar pottery is common on the west coast, for example at Ayr (Franklin & Hall, forthcoming b). Production is also likely in the east as significant amounts are commonly found here. It is spread over Phases 6–9, dating from the 15th to the 17th century. As is typical, most sherds represent olive glazed jugs. Much of a large jug (illus 14: 21) was found in the same rubbish pit as the above rosette decorated jug. Few sherds are decorated but one base sherd is thumbled in imitation of 15/16th-century Rhenish stoneware bases.

Late medieval Oxidized 70 sherds. This is essentially the Redware version of the above fabric. It is generally represented by handled jars and skillets with an internal olive glaze. It dates to around the 16th century, being most common in Phases 8 and 9. A complete profile of a handled jar (illus 14: 23) was recovered from the backfill of a wall cut. A whole series of these jars was found at Eyemouth Fort, Berwickshire, a site dated historically to the mid-16th century (Franklin 1997).

Post-medieval Reduced & Oxidized 22 sherds. This smooth, thick walled fabric is the most common type found on Scottish sites of the 17th and early 18th centuries. The only known kiln site is at Throsk, Stirlingshire (Caldwell & Dean 1992), but there may have been a kiln serving every town. Its relative scarcity on this site compared to Burgess Street and Ronaldson's Wharf is indicative of a general lack of 17th-century and later material. The bright orange glaze found on the interior of some of the Leith sherds seems to be imitating Low Countries Redware, popular at the time.

English Wares

Stamford Ware 1 sherd. A fragment of strap handle of Developed Stamford Ware, with a clear glaze heavily speckled with green, was found in a Phase 2 deposit. A fold is visible across the break of the handle, consistent with a common method of handle formation at Stamford, that of flattening and pulling a narrow cylinder of clay (Kilmurry

1980, 81). It dates to the late 12th or early 13th century.

Yorkshire Type Wares 76 sherds. Yorkshire Wares, especially Scarborough Type Wares, were generally the most common imported pottery to the east coast of Scotland in the 13th and 14th centuries. Excepting one residual sherd of 13th-century York Glazed Ware (Phase 9) all the sherds here are of Scarborough Fabrics I (50 sherds) and II (25 sherds). The dating of these has been the subject of much debate and evidence from recent excavations points towards them being more contemporaneous than previously thought, with Fabric II beginning a little later than Fabric I (Haggarty & Will 1996, 653). At Leith, however, Fabric II is concentrated in Phases 2–3, while Fabric I is most numerous in Phases 4–5.

Unidentified English Wares 2 sherds. One fragment of a slipware was found (Phase 6). It is of an orange sandy fabric, decorated with a white slip trailed or applied strip appearing yellow on brown under the glaze. A green speck in the glaze implies the complete vessel was tri-coloured. It may be a London copy of wares from Rouen (G Haggarty, pers comm; Pearce et al 1985). The second sherd is decorated with an unusually well modelled face mask (illus 13: 26). It is of a fine fabric, sparsely gritted, and glazed on the exterior. However burning post-breakage has altered the colours of both fabric and glaze.

European Wares

Rhenish Stoneware 31 sherds. The largest group of stoneware is of the early types, Langerwehe (18 sherds) and Seigburg (two sherds). Both of these are commonly found on 14/15th-century sites in Britain, although Langerwehe tends to be more common (Hurst et al 1986, 186). Excavations in Edinburgh, for example, produced a very large group of 313 Langerwehe sherds representing a minimum of 131 vessels (Clarke 1976, 206). Several of the Water Street sherds are coarsely made and underfired to hard reddish buff earthenware. All, however, have the characteristic purple iron wash. Seven sherds from the same vessel are salt glazed brown and grey, giving them the appearance of

later Raeren-type wares. Later stoneware is represented by Raeren/Aachen or possibly Frechen-type sherds (8 sherds). These vessels with their characteristic tiger glaze, mottled grey and brown were popular in the late 16th and 17th century.

Low Countries Greyware 1 sherd. Greyware was produced in the Netherlands from the mid-12th century but begins to be supplanted by Redwares from the 14th century (Hurst et al 1986, 130). It was traded along the east coast of Britain, though is far more common in Scotland than England (Watkins 1987, 145). In the assemblage from High Street, Perth (Hall 1997, 735) it is by far the single largest group of imports, mainly from the mid-12th to the mid-14th century. At Water Street it was associated with 13/14th-century pottery. The sherd was burnt from use as a cooking pot.

Low Countries Redware 37 sherds. Redware tripod cooking pots were imported into Britain in increasing quantities from the 14th to the 17th century, replacing Low Countries Greyware by the 15th century (Hurst et al, 1986, 130). Despite 13 sherds coming from the same context, none joined and the lack of vessel profiles makes it hard to narrow this broad date range. All the sherds bear a clear lead glaze, appearing orange to brownish orange and most have a thick external layer of soot. Also of probable Dutch origin (A Vince, pers comm) are three sherds of typical Redware fabric but slipped white on both surfaces and glazed a deep green on the exterior. They are from a small thick-walled vessel, and are all from the same 16th-century Phase 7 pit.

Northern French Wares 3 sherds. The first of these is a very thin-walled sherd of fine white fabric, decorated with a cluster of applied scales and glazed speckled green inside and out. It was recovered from a 14/15th-century context (Phase 5) and is likely to be residual (G Haggarty, pers comm). There were two sherds of Beauvais white earthenware. A fragment with a bright green glaze, and a small flat base thinly glazed green on the interior and patchily on the exterior. The latter is possibly from a drug jar. This earthenware was in production from the late 15th to the 16th century (Hurst et al 1986, 106).

Saintonge Plain 8 sherds. These sherds were recovered from modern overburden but were associated with pottery and finds mainly dating to the 16th or 17th century. They are unglazed, of a fine buff fabric, with occasional mica and red haematite inclusions. Surface colour varies from buff to pale reddish brown. Vessels have been identified from 16th-century deposits at Southampton (Platt & Coleman-Smith 1975, 145). They are most commonly found in deposits dating to the later 15th or earlier 16th century (Hurst et al 1986, 77).

Merida Type Ware 1 sherd. This unglazed sherd of a coarse gritty orange fabric with a redder external surface and a high mica content was found in a 16th-century pit (Phase 7). Produced mainly in Portugal, in the form of bowls and narrow necked costrels, most examples found in Britain tend to date from the 16th or 17th century, for example it is common on Armada wrecks (Hurst et al 1986, 69). The largest find in Scotland was at Threave Castle, Galloway, where seven sherds from a storage jar were dated to the 17th century (Hurst & Haggarty 1981).

COPPER ALLOY

Coins

(identifications by N M McQ Holmes)

- 1 Scottish copper farthing, 'ecclesiastical' type II–III (c 1450–82); die axis uncertain; highly corroded, with only a small part of the trefoil design visible on the obverse. Context 218, Phase 5.
- 2 Unidentifiable, possibly part of a jeton of late 15th- to 16th-century type. Context 244, Phase 5.
- 3 James I–II silver groat of Edinburgh, fleur-de-lis issue, uncertain type (1424–51); die axis uncertain; much corrosion and pitting. Context 283, Phase 8.
- 4 Unidentifiable copper, possibly a Scottish farthing of the later 15th century; die axis uncertain; highly corroded. Context 178, Phase 9.
- 5 George II copper halfpenny (1729–54); extremely worn. Context 213, Phase 8.
- 6 James III–IV billon plack, uncertain type (c 1465–1513); much corroded. Context 100, Phase 10.

Other finds

- 7 Strap loop. Trapezoidal frame with pair of internal projections. Context 007, evaluation. Strap loops were fitted along a strap to hold down the free end of a buckled belt, a function generally today served by a loop of the same material as the belt. This type was the earliest type found amongst examples from London (Egan & Pritchard 1991, 231), in deposits dating to between the late 12th and 14th century.
- 8 Lace end. Incomplete lace end, simple edge to edge seam. Context 244, Phase 5.
- 9 Pin. Incomplete wire pin with coiled wire head soldered to shaft. Context 214, Phase 8. Wire pins and lace ends are most commonly found between the late medieval and early post-medieval periods. A number were found at Burgess Street, lace ends being concentrated in 15th/16th-century deposits and pins in 16th/19th-century ones (Franklin, forthcoming a).
- 10 Vessel rim. Thick piece of sheet metal, curved at one edge, broken at the other, with slight carination visible at rim. Twisted and impossible to tell original diameter and angle. Context 169, Phase 9.

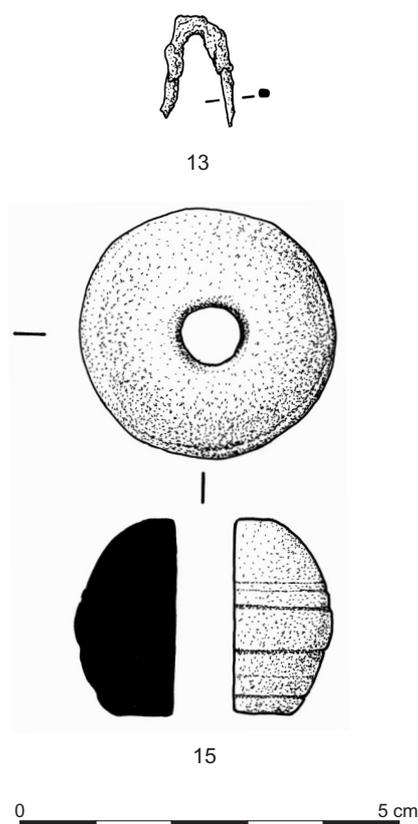
IRON

A large spike was found in the construction backfill for a wall and was possibly a builder's tool. A small cannonball was recovered from a pit filled with 17th-century industrial waste. It may be related to Cromwell's siege and occupation of the burgh in 1650.

- 11 Cannonball. Slightly damaged, possibly fired. Diam 38mm (1½ inch), wt 180g (probably originally ½lb). Context 173, Phase 9.
- 12 Large spike or wedge, possibly square sectioned. Context 178, Phase 9.
- 13 Fish hook. Small U-shaped hook, pointed at one end, possibly a small staple. Context 300, Phase 9 (illus 15: 13).

LEAD

- 14 Shot. Pistol ball. Diam 13mm (½ inch). Context 156, Phase 8. These were extremely common in the 18th century. A nearly identical ball was found at Burgess Street (Franklin, forthcoming a).



ILLUS 15 Selected Finds: 13 Fish hook; 15 Spindle whorl

CERAMIC

15 Spindle whorl. Large globular whorl, decorated with a central circumferal raised band and several incised circumferal lines. Context 380, Phase 5 (illus 15: 15). The spindle whorl is simply decorated but has a number of parallels, most notably from late 14th/15th-century deposits at Burgess Street, Leith (Franklin, forthcoming a). Similar stone examples dating to the late medieval period have been found in St Andrews (Caldwell 1996, 644) and Perth (Cox 1996, 784).

STONE

16 Flint thumbnail scraper. Residual Neolithic (D Murray, pers comm). Context 269, Phase 2.

17 Whetstone. Broken at both ends, worked into a rough trapezoidal shape in section, smoothed from use only on the broad side. Pattern of wear indicates it was in use after it was broken. Blue-grey

schist. Context 007, evaluation. The nearest source for this kind of stone is either Shetland or Scandinavia. Sites in England have revealed a thriving trade in whetstones from Scandinavia, between at least the 10th and 15th centuries (Moore & Oakley 1979, 280; Margeson 1993, 197). In Scotland raw materials tend to be more local, whether due to different trading links, or perhaps more likely, the quality of locally available stone. However, two pieces of blue schist whetstones were found at Burgess Street, dating to the late medieval period.

BUILDING MATERIALS

Floor tiles

Three pieces of plain glazed floor tile were found, one glazed green, the others yellow over a white slip. Tiles such as these were imported in large numbers from the Netherlands into Britain from the late 14/16th century (Norton 1994, 152). Cargoes of tile were sometimes used as ballast by Dutch trading vessels (Eames 1976, 213). Several stray tiles were found in a 1460–70s midden at Bernard Street, Leith (Eames 1985, 423), and several were found at Burgess Street. The glaze is flaked rather than worn, and with no mortar adhering there is no evidence they were ever part of a floor. The same is true of the Bernard Street tiles, where Eames suggested they represented broken or surplus tiles from a consignment, dumped near the port.

18 Floor tile. Thick coarse tile, sandy orange fabric, slightly bevelled edge. Unevenly white slipped and glazed yellow. Context 307, Phase 8.

19 Floor tile. Edge piece of fine orange sandy fabric, bevelled edge, slightly domed in centre. Remains of thick bright green glaze. Context 329, Phase 6.

20 Floor tile. Fragment of tile, fine pale orange sandy fabric. Remains of white slip and yellow glaze. Context 329, Phase 6.

Roof tiles, slates & bricks

Roof tiles are present on site from the earliest deposits. Most medieval buildings, even as late as the 16th century, would have been thatched but of the 23 pieces of tile found at Water Street over half came from Phase 2. Other Scottish urban sites in Perth and St Andrews have produced roof tiles from as early as the 13th century (MacAskill 1987b, 156; Maxwell 1997, 91). The finding of more in

Leith is notable, and may indicate there was a high status building or buildings in the vicinity. Fabrics vary, but are generally coarse, gritty and fired orange-red. The pieces were too small to estimate form or size. One 16th-century piece (181, Phase 7) was covered in a glossy olive glaze, appearing greenish black. Glazed roof tiles have been found in Edinburgh in 15/16th-century deposits (Franklin, forthcoming b). Roof slates, by contrast, are few and limited to Phase 8 deposits (17th century). Only a small number of medieval brick fragments were recovered. These first appear on site in Phase 5 (14/15th century).

21 Roof slate. Near-complete one edge neatly finished, the others roughly bevelled. One hole, pecked out from the back. Context 169, Phase 9.

GLASS AND CLAY PIPES

Glass and clay pipe fragments were rare, in keeping with the general paucity of post-medieval finds. A quantity of glass fragments and glass waste was found in one context (141, Phase 10). This appears to be waste from a glassworks, though being recyclable it is unusual to find it disassociated from a factory. The only identifiable pieces of glass are an 18th-century bottleneck and base, and a later bottle-stop marble. The only clay pipe bowl was 19th-century though a few stem fragments were earlier.

DISCUSSION

The assemblage as a whole, though small, provides a clear insight into the trade, economy and development of Leith from the 12th to the 17th century. The first phases of the site have been dated by pottery alone, suggesting an origin in the second half of the 12th century. Up to the end of the 14th century (Phase 4) the assemblage is characterized by local red and white wares, the former in decline, and imports from the east coast of England.

A distinct change is discernible after Phase 5 (see Table 1). The finds increase in quantity and, generally speaking, quality. There is an increase in the amount of European pottery coinciding with the start of the decline of the local White Gritty industry and the beginning of the late medieval Red and Greyware industries. The imported pottery is indicative of a 15th-century date for this change and evidence from coins refines this towards the second half of the century. This is contemporary with the midden and coin hoard found at Bernard Street (Holmes 1985). Leith in the 15th century is busier and more cosmopolitan than in earlier times. The pattern of European imports is centred on the North Sea, originating from The Low Countries, Rhineland and Northern France. Not until the 16th century are ceramics from Spain and south-west France encountered. This is a pattern of imports typical of the east coast Scottish Burghs. West coast

TABLE 1
Pottery by fabric & phase

Fabric Phase	2	3	4	5	6	7	8	9	10	U/S	Total
Medieval Redware	44	7	23		4	1	6			1	86
White Gritty	361	126	609	315	95	80	160	34	95	19	1894
LM White Gritty				27	31	27	20	2	3	3	113
LM Oxidized			1	14	2	13	21	18	1		70
LM Reduced			2	13	26	9	17	36	5		109
PM Red & Oxidized					1	7	1	11	2		22
Stamford	1										1
Scarborough I	3	1	31	8		3		1	3		50
Scarborough II	13	5	3	2				2			25
York Glazed								1			1
Other English				1	1						2
Rhenish SW				11	3		7	2	6	2	31
LC Greyware			1								1
LC Redware				3	3	22	5	1		3	37
N French				2				1			3
Saint. Plain							1		7		8
Iberian						1					1
Tin-Glzd Earthenware							1				1
U/I Red Earthenware				1	2	1					4
Modern							3	1	1	2	7
Total	422	139	670	397	168	164	242	110	123	30	2466

ports such as Ayr have a stronger affiliation to Western France (Franklin & Hall, forthcoming b).

Although the percentage of imports increases slightly in the later medieval period it is still only around 8%. This compares with 18% in Perth (MacAskill 1987a) and 25% in Aberdeen (Murray 1982). Even if the deposits reflect the material culture of poorer dwellings it still seems likely that with so many foreign cargoes being unloaded on the Shore more goods would have found their way into Leith homes. This might be explained by the relative strength and quality of the local industry. Though pottery was often imported more for its contents than as a commodity itself this might explain the lack of imported kitchen wares such as Low Countries Greyware cooking pots, common in Aberdeen. Holmes (1985, 426) notes this dearth of imports in Leith and suggests it may be due to the relationship between the port and the city. Edinburgh placed restrictions on Leithers, forbidding them to trade, possess shops or warehouses (Mowat 1994). Goods unloaded at Leith should have been sent straight to Edinburgh.

The jugs found in Phase 7 (illus 14: 19 & 21) are unusually complete. Vessels were rarely thrown out while still functional but several similar near-complete jugs were found at Ronaldson's Wharf (Franklin, pers comm). There may be an underlying reason behind this similarity, although perhaps merely a change in taste.

FAUNAL REMAINS

David Henderson.

INTRODUCTION

In total 5040 individual elements of mammal and bird bone were recovered from the site, of which 1609 elements were identified to species. Because of the relative paucity of material deriving from earlier deposits, 13/14th-century contexts (Phases 2 to 4) were analysed together. Phases 8 and 9 were also analysed together as the small amount of material found in the foundation trenches of Phase 9 structures was considered likely to be residual from Phase 8. Both sieved and hand-recovered material were analysed together. Throughout the report, comparisons will be made between the data from the present site, and data from the author's analysis of the faunal remains from the larger site of Burgess Street.

SPECIES PRESENT

Sixteen species were identified from the material, as well as unidentified small rodent, cetacean and bird bones. Of these, 86% of the individual items of bone derived from cattle (677 items) and sheep (707 items). Over the site as a whole, these items represent a minimum of 24 cattle and 29 sheep (the most common skeletal elements in both cases were mandibles). The next most commonly occurring species are pig (123 bones, minimum number of individuals [MNI] 12) and domestic chicken (34 bones, MNI 10). In all cases the MNI for each of the phases is summed to give the site MNI. A full species list is given in Table 2 (NISP = number of individual specimens of bone) and Table 3 (MNI = Minimum Number of Individuals). As the proportion of goat bones was very low (two of 32 distal metapodials, 6.25%) and all four bones securely determined as deriving from goat came from Phases 5 and 6, all bones in this category will be referred to as 'sheep'.

The distribution of species recovered from the current site is essentially similar to that observed from the neighbouring site at Burgess Street, with cattle and sheep being by far the most common species represented. Significantly more pig bones were recovered from Water Street, however, even when the partial skeleton from Context 203 (Phase 8) is counted as one item instead of 20. There is also a relative lack of bird bones from Water Street compared to Burgess Street. Although in both sites the most common species are domestic fowl and geese, most phases of activity in Burgess Street produced some wild sea-bird species, often bearing butchery marks. With the exception of a (?wild) mallard duck from Phase 6, Water Street shows no evidence of wildfowling. A very small number of red deer bones is common to both sites, as are cetacean bones. While the former must represent hunting (or poaching) the latter may derive from occasional stranding on the shores of the Forth; the killer whale from Phase 8 was represented by a single tooth, the crown almost worn away, which must have come from a very elderly animal. The two probable wood-mouse bones suggest that some wooded areas, or at least shrub-like cover, must have been available close to the site. The mice may have been victims of the cats, which are present at low frequencies throughout the deposits. The fox bone was a fragment of very degraded mandible.

TABLE 2
Mammal and bird remains, number of individual specimens (NISP) of bone present per phase

Species	Phases 2–4	Phase 5	Phase 6	Phase 7	Phases 8–9	Total
Cattle	197	147	138	80	115	677
Sheep/goat	109	141	161	108	188	707
Pig	16	8	13	15	71	123
Horse	1	3	2	4	1	11
Red deer		1				1
Dog	2		9			11
Cat	1	4	11		5	21
Fox	1					1
Cetacean spp					1	1
Killer whale					1	1
Rat		2	1		3	6
?Wood-mouse			1		1	2
Rabbit					2	2
Small rodent			3			3
Domestic fowl	10	2	8	1	13	34
Goose			2	1		3
Duck			5			5
Total identified	337	308	354	209	391	1609
Mammal not identified	490	553	1076	288	1024	3431
Bird not identified	5				5	10

TABLE 3
Mammal and bird remains, minimum number of individuals (MNI) per phase

Species	Phases 2–4	Phase 5	Phase 6	Phase 7	Phases 8–9	Total
Cattle	9	4	4	3	4	24
Sheep/goat	7	6	5	3	8	29
Pig	3	3	1	2	3	12
Horse	1	1	1	1	1	5
Red deer		1				1
Dog	2		1			3
Cat	1	1	1		1	4
Fox	1					1
Cetacean spp					1	1
Killer whale					1	1
Rat		1	1		2	4
?Wood-mouse			1		1	2
Rabbit					1	1
Domestic fowl	3	1	2	1	3	10
Goose			2	1		3
Duck			1			1

One of the dog bones was a tibia from a small dog of 'bow-legged' appearance, possibly resembling the bulldog type seen today, although no conclusions about breed can be made on the basis of the skeleton alone. Similar dogs were seen from the Burgess Street site.

CULL PATTERN

The state of fusion of the epiphyses of long bones and the state of eruption and wear of the mandibular teeth of the three main domestic animals were analysed to determine the pattern of culling practised on the populations from which the animals

derived. The results of this analysis were related to the possible husbandry practices in force at various periods of the site's use. Ages of fusion of the epiphyses were taken from data for unimproved breeds in Silver (1969). Mandibular wear stages were assigned to age categories following O'Connor (1988) and following Payne (1973) for sheep. Because of the relatively small amount of material recovered from the site, the data on age at death of the main domestic species were analysed in three broad periods, namely: medieval (Phases 2–4); late medieval/early post-medieval (Phases 5–7); and 17th century (Phase 8).

Cattle

In the medieval period, very few cattle bones and teeth were recovered. No evidence of young beasts (aged under 18 months) was found, and both tooth-wear and epiphyseal fusion data suggest that over half of the cattle survived beyond the age of 3.5 years, with some not being slaughtered until they were over eight years old. This pattern continues in the later medieval phases, where both tooth-wear and fusion evidence again suggest that over half of the animals represented on site were elderly when slaughtered. No mandibles from younger animals were recovered, perhaps reflecting poorer preservation of juvenile mandibles, or a difference in the treatment of the carcasses of younger beasts; the evidence from the post-cranial skeleton, however, suggests that a quarter of the herd was culled before the age of 2.5 years, with nearly a third of those (ie 7% of the herd) slaughtered as calves. Only two mandibles from Phase 8 (17th century) were suitable for establishing age (one over three years old at slaughter, one over eight years old). The evidence from epiphyseal fusion suggests once again that over half of the cattle were slaughtered after reaching full skeletal maturity (over 3.5 years). A further full third had been slaughtered between the ages of 2.5 years and 3.5 years, and 10% of the herd was killed when young. Apart from the single mandible, there is no evidence of very elderly animals in this phase.

In terms of husbandry practice, there appears to be a shift in the 17th century away from keeping cattle until very elderly. This might reflect a decline in the need to keep oxen for traction, with milk and meat production becoming more important. The larger numbers of younger animals in Phase 8 may be surplus male beasts not required for a dairy herd, and milk cattle would be slaughtered before old age made their declining fertility and milk production less valuable than their carcass. The gradual increase in the proportion of younger animals slaughtered from the medieval period to the 17th century is reflected in the material from Burgess Street. On that site, the larger sample available from the 17th century shows a very distinct peak of slaughter between 1.5 and 2.5 years old, a cull-pattern suggested by McCormick (Hamilton-Dyer et al 1993) as indicative of a dairy economy where sufficient grazing allowed the overwintering of

'surplus' calves to increase their value in terms of carcass and hides.

Sheep

Amongst the bones dated to the medieval period around 40% of sheep represented were slaughtered before the age of two years, most of these being killed before the age of ten months. This figure is typical of urban medieval Scottish sites; in Perth (Smith & Hodgson 1987; Smith 1995) the figures ranged from 31.6% to 80%, and at Burgess Street between 36% and 40% of sheep were culled before the age of two years. It is likely that this cull represents young male sheep being slaughtered for meat, possibly allowing some to survive one winter in order to provide the economic bonus of one fleece or wool-fell (a hide with the fleece attached). In the medieval period (Phases 2–4), 20% of the flock was not slaughtered until about six to eight years of age. It is likely that some of these older animals were ewes kept for dairying purposes, especially as dairy cattle appear to have been less important during this period (see above). In later periods around 10% of sheep survived to old age. In the 17th century, there is no evidence of any sheep being slaughtered before a year old, and 45% of animals survive until their third year and beyond. This may reflect an increase in the importance of wool production.

Pig

Because of the very low numbers of pig bones recovered, any conclusions must be treated as tentative at best. There is no evidence of young piglets being slaughtered in the medieval phases, all available evidence points to pigs being culled at between two and three years. This practice would allow the animal to reach its full size before slaughter, maximizing the economic return. In the later phases it appears that between 67% and 75% of pigs were killed before the age of 1.5 years. It may be that this reflects an increase in the affluence of the area, with more piglets killed for their delicate flesh and a few animals remaining as breeding stock.

SKELETAL ELEMENT FREQUENCY

The parts of carcasses of the two main species present were analysed in order to ascertain whether the site had received only the detritus from consumption of meat, or from the initial butchery and dressing of carcasses.

Cattle

In the case of the cattle bone from the medieval phases there was a slight tendency for them to derive from the 'waste' parts of the animal. In the other periods the opposite was true, although the correlation was again weak. The results from Phases 5–7 showed a significant over-representation of meaty parts of the carcass, also suggesting that these phases contained the products of cattle consumption, with a lesser admixture of butchery waste. Because of the low numbers of skeletal elements recovered, no spatial analysis or comparison of bone derived from negative features and layers was possible.

Sheep

Sheep skeletal elements showed a similar pattern, with a weak negative correlation with meat in Phases 2–4, and positive, though not significant, correlations in the later periods. Both the late medieval and the 17th-century sheep bone showed a significantly lower proportion of 'waste' bones than might be expected if whole carcasses were deposited; again this suggests that the source of the bone was more likely to have been domestic consumption.

Pig

No analysis of the pig bone was possible, but the presence of jaws and skulls, and a substantial proportion of the skeleton of a young piglet from Phase 8 suggests that whole carcasses were cooked, either purchased or slaughtered by the household. At Burgess Street, this general pattern is repeated; cattle bone from the medieval period shows a significant negative correlation with meat production, indicating that this area of Leith was an area where butchery of carcasses was carried out. Again the deposits show a more domestic character in the later phases.

TAPHONOMY

All bones were assigned to a weathering stage (after Behrensmeyer *in* Lyman 1994, 354–360) and cattle and sheep bones were analysed for density mediated attrition (*ibid*, 234–58). In both cases the analysis suggests that there is very little residuality in the assemblage, except in Phase 9 where there was a

significantly higher proportion of bone weathered to stage 2 than stage 1 compared to the rest of the site. Survival of sheep (but not cattle) bone was significantly positively correlated with bone density in the medieval phases, although this may be an artefact caused by denser bones being correlated with 'waste' butchery material (see below).

BUTCHERY

All butchery marks were recorded as the bones were examined. The pattern of butchery common in Scottish medieval sites was observed; bisected vertebrae show that carcasses of both sheep and cattle were split into sides, apparently either when hanging up or laid on their backs. The beast was then decapitated. It is apparent that fairly heavy use was made of the meat from the head; most hyoid bones had paring and cut marks, showing consumption of the tongue, and many of the cattle zygomatic bones (from the lower border of the eye socket) had been chopped across just in front of the eye. This finding was also common in the Burgess Street material and it has been suggested (Mr Crombie, Master Butcher, *pers comm*) that this cut would be the most effective way of entering the cranial vault in order to remove the brains; if an attempt was made to remove the brain from the upper side of the skull, even with the horns removed, the large sinuses in the frontal bone and the thickness of the posterior bones of the skull would provide a greater barrier than chopping off the snout. The sides of beef or mutton would then be disjointed. The sheep bones have fewer butchery marks evident, as a whole, probably because the smaller size of the animal meant that less butchery was necessary to reduce the carcass to manageable portions.

Cattle bones are most commonly chopped apart between the shoulder blade and the humerus, and across the elbow to separate the humerus from the radius and ulna. The femur is also commonly chopped through where it joins the hip bone. Many of the cattle bones were broken up to a high degree, probably in pursuit of the marrow within. When the broken surfaces of the bones from some contexts were analysed it was apparent from the forms of the fractures that the bones had been broken while still fresh, rather than suffering breakage after deposition.

As mentioned above, the partial skeleton of a piglet was recovered from Phase 8. Although no

butchery marks were recorded, it is likely that the animal was cooked whole, the flesh of young animals falls away from the bone without the need for cutting. In other pig bones, evidence was seen of splitting the carcass into sides and of chopping the lower parts of the leg away from the hams.

One horse bone, a humerus from Phase 6, appeared to have been broken open to obtain the marrow. It is possible that horse meat was only used to feed dogs, rather than for human consumption, although horses may have been consumed during the 16th-century sieges of Leith.

SIZE OF STOCK

Because of the very broken nature of most of the cattle bone, very few measurements could be taken. The measurements of sheep bones were slightly more numerous, but again there were not enough of any single measurement to make analysis worthwhile. In general it may be stated that the measurements obtained were all in the normal range for contemporary Scottish sites. Average live weights of sheep, calculated using the distal radius breadth (Bond & O'Connor 1999, 407) were calculated at 34.7kg in the medieval period and 36kg in the post-medieval. A radius from the medieval period gave an estimated withers height of 577mm. There was a small increase in size of sheep seen in the post-medieval period and a small decrease in the breadth of cattle phalanges at the same time, possibly reflecting a move away from oxen as draught animals.

Insufficient data were recovered to ascertain if the changes in the conformation of the cattle and sheep were due to the introduction of new strains of breeding stock. Genetically controlled traits recorded on the bones were too few to analyse. It is perhaps worth noting that two sheep crania from the medieval phases were both polled (ie hornless). In Rattray Castle, Aberdeen (Hamilton-Dyer et al 1993) and other Scottish medieval sites, no evidence of polled sheep is often reported until the post-medieval period.

CONCLUSIONS

The small amount of material derived from the Water Street site, although too broken for a very full analysis, does allow some comparisons with the broadly contemporary neighbouring site of Burgess Street. The two taken together indicate that this

area of Leith received some refuse from the slaughter and primary butchery of animals in the medieval period, later becoming more domestic in character. Husbandry practices appear to have moved away from the medieval system of production of meat for sheep and traction for cattle towards the production of dairy products and wool.

FISH REMAINS

David Henderson

Fish bone was recovered from 127 contexts (Phases 2–9). Of this material, the majority was recovered from the retents of the sieved samples; only 18 contexts contained fish bones collected by hand at the time of excavation. This fact appears to reflect the relative paucity of bones from large fish in the assemblage, rather than excavation technique. In general, the fish bone was in a poor state of preservation. In only two cases (269 & 406, Phase 2) was there sufficient material to justify an analysis at context level. In all other cases only a broad overview of the species and genres present will be given in this report, with comments on the inferences that can be drawn from these data relating to the economy of the site.

HERRING AND SMALL GADOIDS

The most commonly occurring species in the assemblage were herring (*Clupea harengus*, present in 84.4% of the sieved samples) and various smaller representatives of the gadoid family (relatives of the cod, in 74% of the sieved samples). The herring occur throughout the site, and appear from their ubiquity to have been something of a staple in the diet at all periods. Herring formerly appeared off Scotland in vast numbers, and are readily preserved by salting, making them a reliable source of protein in the traditional Scottish diet. The smaller gadoids include whiting, saithe and pollack (*Merlangius merlangus*, *Pollachius virens* & *Pollachius pollachius*). The younger age groups of all these gadoids (almost all the vertebrae represented in the assemblage are small and appear to derive from fish of under 30cm in length) are readily caught in the inshore waters off the coasts of Lothian and Fife. It would appear that these fish were caught locally, probably in a small-scale operation to provide for very local consumption. One saithe caudal vertebra was recovered bearing the mark of a sharp knife,

which had cut into the side of the backbone from the tail end of the fish. It is suggested that this represents evidence that some of these fish were filleted before cooking (Wheeler & Jones 1989, 66).

HADDOCK

The remains of haddock (*Melanogrammus aeglefinus*) are almost as abundant as the small gadoids. While it is possible that these fish are over-represented in the assemblage due to their massive and well-preserving cleithrum bones, it is clear that they were an important element in the piscine economy of the site. As with the gadoids they are abundant within a short distance of the shore and were probably also fished for locally.

OTHER SPECIES

Of the less well-represented species (with the exception of cod and ling, discussed below) the various flatfish species are present in all phases, especially the plaice (*Pleuronectes platessa*). Once again, this fish is easily obtained locally. Gurnards of various kinds (*Triglidae* family) are found exclusively in the medieval phases, although their relative importance may be overstated as the flat bones of the cranium of these fish are patterned with a rough surface, and are therefore more recognizable than those of other fish, even when fragmentary. Equally, the presence of the thornback ray (*Raja clavata*) is attested throughout the assemblage, but almost exclusively through its 'thorns' and 'bucklers'. These are defensive denticles in the skin of the fish, which are very hard and dense and so preserve extremely well. In contrast, the bones of salmon (*Salmo salar*) are poorly ossified and mackerel's (*Scomber scombrus*) oily flesh causes greater degradation of the bones, (Wheeler & Jones 1989, 62–63); the low frequency of these species may therefore not reflect the full extent of their contribution to the diet.

Cod and ling processing

Both the cod (*Gadus morhua*) and to a lesser extent the ling (*Molva molva*) are present throughout the assemblage, particularly in Phases 2–5, but in most contexts only as one or two bones. In context 269, Phase 2, the bulk of the recovered material was cod bone, both vertebrae and the denser parts of the skeleton of the head. The minimum number of cod represented was 28 (from the parasphenoid bone)

and although preservation was too poor for any measurements to be taken, it is estimated that no cod was under around 0.7m in length. Ling were represented in smaller numbers (minimum 10, also from the parasphenoid), but again with a mixture of vertebrae and head-bones from large fish. Both species of fish, when they have attained this size, tend to be found further out to sea than the smaller species discussed above.

The vertebrae of the two species were categorized as deriving from the abdominal portion of the backbone, or from the caudal portion. In the case of the cod, 175 abdominal and 25 caudal vertebrae were recovered; in the ling the figures were 127 and 16 respectively. Also of note was the presence of many head bones from the two species, but with an absence of any of the relatively large cleithrum bones. If whole backbones had been deposited (say from filleted fish, or the remains of meals of whole cooked fish) it would be expected that the numbers of caudal and abdominal vertebrae would be much more nearly equal (even allowing for the smaller size of the caudal vertebrae). It has been suggested (Henderson 1986) that this distribution of skeletal elements is derived from the processing of large cod and ling into 'stockfish'. In this process, the catch is gutted and beheaded, and part of the backbone removed, leaving the caudal vertebrae in place surrounded by the flesh of the 'tail' of the fish. The cleithra (which form part of the support of the pectoral fins) are left attached to the flesh, however, probably for ease of handling as the anterior of the fish is splayed open and the fish is attached to a rack to dry in the wind. It is known that the production of stockfish was a common and economically important method of preserving large fish in medieval times. It would appear that the remains from context 269 derive from this method of fish processing, and from the numbers of fish, it seems reasonable to suggest that this represents the treatment of one boat's catch. Context 406, also Phase 2, although smaller, may represent a similar event. Cod is present as a minimum of only two fish (from left dentary) and there are 81 abdominal vertebrae to three caudal.

CONCLUSIONS

For the most part, the fish remains from Water Street derive from the domestic refuse of the hinterland of the site. In most contexts the remains

appear to be a steady accumulation of small fish, especially herring and the smaller gadoids, caught and consumed locally. In two contexts, both from the earlier medieval phases, there is some evidence of the catching and processing of larger species on a more 'industrial' scale, perhaps reflecting the putative origins of Leith as a small fishing village before its development into the most important trading port of medieval Scotland.

MARINE SHELL

Jo Dawson

Marine shell was recovered from 99 contexts. The shells of each genus, or species where identification was possible, were counted for each context. The number of apices was used to produce a minimum number of individuals (MNI). These were then summed to give MNIs for each phase as shown in Table 4.

The main types of shell present are oyster and winkle. No attempt was made to identify the oysters to a species level. Winkles here mean Edible Periwinkles (*Littorina littoralis*) and where abundant were measured by volume. All the other types of shell are present in very small numbers. They are all shells that would have been common in the Forth at the time. The large numbers of oysters and winkles in Phase 4 are from a single dump of marine shell (265). A quantity of c 70 litres was taken from this context for sieving. This represented about 10% of the entire context. In Phase 5, the large numbers of oysters and winkles came from two contexts (239 & 254), waste backfills within the same pit (268). Therefore, the numbers of oysters and winkles in Phases 4 and 5 probably represent single events, and no general conclusions can be drawn about changes from phase to phase.

There are no longer any oyster beds in the Forth (Smith 2000); however documents show a plentiful supply was exploited for export in the late 17th century (Mowat 1994, 219). The dump of oyster shells in Phase 4 could be a result of processing and pickling before export rather than domestic consumption. Documents show that pickled oysters were exported as far as Danzig in modern Poland (Mowat 1994, 219).

PLANT REMAINS

Mhairi Hastie

For assessment of environmental remains 178 samples were subjected to a system of flotation and wet-sieving in a Siraf style flotation tank. The floating debris was collected in a 250µm sieve, and once dry, scanned using a binocular microscope. Most of the samples contained small amounts of carbonized material including cereal grains, weed seeds and wood charcoal (Hastie 2000a). Preservation of most organic remains on site was by charring although two samples (204, Phase 6 & 233, Phase 7) did contain waterlogged remains. Identifications were made with reference to the modern comparative collection of Headland Archaeology and seed atlases (Berggren 1969; 1981). Botanical nomenclature generally follows that of the *Flora Europaea* (Tutin et al 1964–80). The results are presented in Tables 5 and 6.

CEREALS

The most common component was cereal grain with barley, oat, wheat and rye all present. Oat was the most frequently encountered cereal but most grains could only be identified to the level of *Avena* sp. A small number, however, remained enclosed

TABLE 4
Marine shell by phase

Phase	oyster	winkle	limpet	scallop	mussel	tower shell	cockle	whelk	periwinkle	barnacle	crustacean
2	34	109	10	2	1	1	8	3	7	1	0
3	8	13	6	1	1	0	2	1	3	1	0
4	418	2437	16	9	4	3	13	14	7	1	0
5	200	1947	9	4	12	2	9	12	8	1	1
6	57	95	3	4	6	1	5	5	1	1	1
7	73	62	1	2	2	1	3	1	5	1	0
8	51	68	1	4	1	3	1	3	4	0	0
9	12	10	0	1	1	0	0	0	0	0	0

within their florets. This made it possible to identify both *Avena strigosa* L (small/black/bristle oat) and *Avena sativa* L (white oat) with certainty. Preservation of the barley grain was good and most were the hulled variety (*Hordeum vulgare* L). Both straight and twisted barley grains were present and a ratio of one straight to one twisted grain was recorded. This potentially indicates that both two-row and six-row barley were present. Barley rachis fragments were recovered from a small number of samples. Lower numbers of wheat and rye grains were also recovered. The morphology of the wheat was typical of *Triticum aestivo-compactum* (bread/club wheat). Rare fragments of wheat chaff (rachis) were identified and a concentration of rye rachis fragments was recovered from contexts 284 and 288.

WILD TAXA

A variety of wild or weedy taxa was present in low concentrations. These comprised common weeds of cultivation and waste places, grassland and rare examples of wild taxa associated with damper/marshy areas and heathland (see Table 5). The majority of the wild taxa present were common components of disturbed soils, agricultural fields and waste places. They are frequently found around settlement sites and are brought into dwellings adhering to boots and tools. The concentration present in some samples, for example contexts 263 and 317, does suggest that some of the seeds could also have been brought to the site along with harvested cereal grains. Species such as corn cockle, corn marigold and corn spurrey were troublesome weeds of arable fields before the introduction of herbicides. Other species present represent grassland/pasture, heathland and damper areas. There are many reasons for deliberate collection of these plant resources and it is possible that many were brought to the site with turf collected for building

material and fuel. Other uses include thatching, flooring, bedding and packing material.

OTHER POTENTIAL ECONOMIC SPECIES

Low numbers of flax seeds (*Linum usitatissimum*) were present in two samples and three flax capsules with adherent seeds were recovered from context 428. The presence of carbonized flax seeds potentially indicates the use of flax for domestic or small-scale industrial purposes in, for instance, the production of linseed oil or linen. Alternatively the flax seeds could derive from residual plants grown as part of a crop rotation sequence.

One or two fragments of hazel nutshell (*Corylus avellana*) were recovered from context 445. The low quantities recovered from Water Street probably suggest that they were either an infrequently used food or that they were brought onto the site along with firewood.

A small number of contexts, from the 14th century on, contained fragments of garden/field pea (*Pisum sativum*) and common vetch (*Vicia sativum*) (average diameter 5.5mm). Recovery of legume remains is rare on archaeological sites, probably a consequence of methods used to process the crops. However, documentary evidence suggests that peas and beans were imported in the 13th and 14th centuries and were probably being grown on a small scale in the local area. In the late 15th century Parliament decreed that plough teams should sow wheat, peas and beans (Dickson & Dickson 2000).

WATERLOGGED REMAINS

One sample from Phase 6 and one from Phase 7 contained organic remains preserved in waterlogged conditions.

TABLE 5
Plant remains from wild taxa

Weeds of cultivation	<i>Agrostemma githago</i> (corn cockle) <i>Raphanus rapanistrum</i> (charlock) <i>Vicia/Lathyrus</i> sp (vetch/pea) <i>Polygonum</i> spp. (knotgrass) Chenopodiaceae indet. (fat hen family) <i>Spergula arvensis</i> (corn spurrey) <i>Anthemis arvensis</i> (corn chamomile) <i>Chrysanthemum segetum</i> (corn marigold)
Waste places	<i>Urtica dioica</i> (stinging nettle) <i>Polygonum</i> sp (knotgrass) <i>Rumex</i> sp (dock) Chenopodiaceae indet. (fat hen family) <i>Lapsana communis</i> (nipplewort) <i>Crepis</i> sp (hawk's-beard)
Grassland or Pasture	Gramineae indet. (grass family) <i>Plantago lanceolata</i> (ribwort) <i>Centaria nigra</i> (lesser knapweed) <i>Ranunculus</i> sp (buttercup) <i>Viola</i> sp (violet)
Damp marshy areas	<i>Carex</i> spp. (sedge) <i>Eleocharis</i> sp (spike-rush) <i>Ranunculus</i> spp (buttercup)
Heath	<i>Calluna vulgaris</i> (heather/ling) <i>Sieglingia decumbens</i> (heath grass)

TABLE 6
Summary of plant data by phase

Phase	Century	Phase description	Composition	Distribution
1	–	Sand dunes and an undated feature.	One oat grain was recovered from this Phase	Mixing of later sediments with earlier contexts probably accounts for the presence of this grain.
2	13th	Boundaries and food processing	Oat was most common. Lesser quantities of barley, wheat and rye	Low to medium concentration of cereal grain with higher concentrations in pit and midden fills. The pit fills consisted mainly of fish processing debris and indicate that the site was used primarily for this activity.
3	13/14th	Backland industry	Similar to Phase 2. Oat was most common element. Lesser quantities of barley, wheat and rye	Low concentrations of charred plant remains associated with features and trampled surfaces. There is no evidence for food processing taking place on site.
4	14th	Abandonment and a workshop	Oat dominates with lesser quantities of barley, wheat and rye	Most plant remains were recovered from midden deposits. A concentration of cereal rachis fragments was recovered from a pit (Context 285) and probably represents burnt straw. Following a period of disuse a workshop was constructed in the area.
5	15/16th	Disposal pits	Oat is dominant with lesser quantities of barley, wheat and rye	Most cereal grain was recovered from a series of large pits. These contained domestic rubbish.
6	16th	Development	Change in plant composition. Both barley and oat predominate with lesser quantities of wheat and rye	Most cereal grains were recovered from midden and pit fills. Archaeological evidence suggests that the area was associated with industrial activities in the ground floor of a tenement building.
7	16/17th	Construction/Demolition.	Almost equal quantities of oat and barley with lesser quantities of wheat and rye	Low concentration of grain mainly from demolition pit fills. The charred material probably derives from reworked earlier material.
8	17/18th	Seton's Land and Wilkie's House	Similar to Phase 8. Barley and oat with lesser quantities of wheat and rye	Low concentrations of material in most samples. The charred material probably derives from reworked earlier material.
9	18/19th	Coopers	Only barley and oat were present	Low quantities of grain associated with rubble and back fill material. The charred material probably derives from reworked earlier material.

Context 204 (fill of pit 205: illus 10)

This contained a variety of weed seeds, including sedges, dock, fat hen, henbane and knotgrass. Significantly the samples also contained the remains of fig seeds (*Ficus carica*) and a grape pip (*Vitis vinifera*). The presence of small quantities of these within the waterlogged sample is probably indicative of low levels of cess/faecal material. The other weed seeds present are more commonly associated with waste places and probably representative of the flora growing around the site during Phase 6.

Context 233 (fill of pit 234)

This contained a very high concentration of black mustard (*Brassica nigra*) and occasional turnip seeds (*Brassica rapa*), fat hen (*Chenopodium album*) and hemp nettle (*Galeopsis* sp). Black mustard was formerly cultivated as a condiment but also used as oil for medicinal purposes and in the production of soap. The high concentration of black mustard probably indicates the storage of this on or near the site. The other wild taxa present, including turnip seed, fat hen and hemp nettle, probably represent the contaminants of the cultivated crop of black mustard.

COMPOSITION AND DISTRIBUTION OF MATERIAL BY PHASE

Cereal grains were recovered from many different features in all parts of the site and from all periods. Most grain-bearing samples contained a mix of the four main cereal crops cultivated in Scotland during the medieval period: oat (*Avena sativa* & *A strigosa*), barley (*Hordeum vulgare*), wheat (*Triticum aestivo-compactum*) and rye (*Secale cereale*). Barley and oat dominate most samples.

Few samples contained significant concentrations of grain and none of the botanical remains would appear to have been charred in situ. They are generally not associated with the features from which they were recovered and any context-related variation in plant species is difficult to interpret. The discussion therefore concentrates on broad differences in composition at the level of phase (see Table 6).

DISCUSSION

Like many other Scottish urban medieval sites the samples from Water Street contain limited plant

remains with most samples containing no more than ten identifiable cereal grains. A small number of other economic species was identified, yet these were also present in extremely small quantities, those being flax seeds, hazelnut shell and remains of cultivated bean/peas. The concentration of cereals was broadly uniform across the site with only small numbers of cereal grain and weed seeds present in each sample. Slightly higher concentrations were uncovered from pits and midden deposits but there is no evidence for them having been burnt in situ. Evidence for the cultivation of legumes (such as field pea) was recovered from the later phases only. This could reflect changing use of the site but the concentrations offer little basis for any more specific comment. The concentration of wood charcoal across all phases of the site is low as opposed to the high concentrations of coal. This trend has been noted on many other urban medieval sites excavated in the Edinburgh area (for example, Hastie 2000b; Holden & Hastie 2000) and is clearly an indication that coal was the primary fuel source throughout this period.

The plant remains recovered from Water Street indicate that quantities of whole, clean, cereal grains were being brought into Leith. The major question, however, is the origin of the burnt material. At many urban medieval sites, such as Edinburgh (Holden & Hastie 2000) and Dundee (Holden 1998; Hastie & Holden 2000) direct evidence for the source of charring is lacking. It is often unclear whether the charred remains represent the remnants of regular, small-scale events such as food preparation or reworked material from larger but less frequent events such as a fire at a kiln or cereal store.

It is true that Leith acted as a major centre for the import of cereal grain throughout the post-medieval period (Sinclair 1793; McNeil & MacQueen 1996) and that granaries must have been common. However, the evidence from the excavation suggests that during the earliest phases much of the site was sporadically used for fish processing. Recorded evidence for the post-medieval period indicates that the environs were used principally for industrial processes and storage of bulky goods such as timber (Mowat 1999). This (together with the fact that the largest concentrations of cereal grain were recovered primarily from middens and pit fills containing such things as fish bone and pottery fragments) does tend to suggest,

in this case, a domestic or small-scale industrial origin. Some of the cereal grain may have come from baking and brewing, which could be carried out domestically or commercially. Corn drying was a prerequisite of milling grain for baking, and malt for brewing, and may have been a source of some of the grain. Unfortunately, the evidence for such activities on site is poor even though excavations at Burgess Street (Collard & Reed 1994), which uncovered three bread ovens dating to the early medieval period, and documentary evidence for a bakery at the end of Water Street during the 15th century (Mowat 1999), indicate that it is a possibility. On balance, however, the evidence on the present site is for low levels of domestic cereal processing or food preparation probably undertaken by workers associated with other non-cereal-based industries.

DISCUSSION

12TH/13TH-CENTURY EXPANSION

Pottery from the earliest contexts suggests that 12th-century settlement was located close to the excavated area, although it was probably not divided until the 13th century. The use of turf banks is unusual among published Scottish sites but they were recorded at Ronaldson's Wharf in North Leith (Reed & Lawson 1999). As discussed in the stratigraphic report, the material used to make the banks originated in sandy grassland, readily available in this coastal area. Unlike ditches, they would have formed a barrier to windblown sand, and would probably have remained visible longer, especially if topped with a wooden fence. Although the excavated area did not cross all the relevant boundaries it seems likely that the banks delineated the rear of three plots extending east. The boundary of the Lands of Restalrig would have constrained the properties, and they are likely to have fronted onto a road that was the forerunner of Quality Street. The first historical record of this is probably 'the road leading from Leith to the sea' in 1398 (Mowat 1999, 3). The area to the west of these plots contained evidence for fish processing and some butchery, as on the other side of Water Street/Rotten Row (Collard & Reed

1994). Given the lack of a Water Street/Rotten Row frontage or roadway, and the observation made during the Burgess Street excavations that early middens extended beneath Water Street (Lawson 1995), it is suggested that the two excavations uncovered parts of the same properties. This would imply that Water Street/Rotten Row was a later insertion and that the rear of plots extending back from Shore Place directly abutted the rear of Quality Street properties. The results allow a reassessment of the speculative recreation of 13th century Leith (illus 2).

The lack of a back lane between the properties is unusual in a medieval town, and must have led to the eventual insertion of Water Street/Rotten Row. The rather irregular layout of South Leith is perhaps best explained as a result of piecemeal development, not instigated by a single feudal superior but several. During this period several owners of property in South Leith are recorded. These are notable personages or institutions, including a Royal Chamberlain and two Normans (Mowat 1994), and it would seem acquiring a property in South Leith was a popular investment for the wealthy.

It is likely that in the first half of the 12th century the King created his new harbour and a series of plots stretching back from it. It would seem that by the 13th century the settlement extended along Shore Place and the land further east was developed with a row of tofts fronting the Lands of Restalrig. The area exposed during the excavations was open and used for activities such as fish processing, and perhaps others that leave no archaeological trace such as holding stock or storing bulky goods. Although seasonal trade seems likely to have been the impetus behind Leith's development the remains confirm that the settlement operated as a fishing village for much of the time.

EARLY TO MID-14TH-CENTURY DECLINE

Recession in the early to mid-14th century has been noted in other Scottish burghs, especially

Perth (Bowler et al 1995; Moloney & Coleman 1997; Roy & Falconer 2000) but also Aberdeen (Murray 1984). In Inverness a surge in local pottery production was detected in the middle of the 14th century, but this was not accompanied by any noticeable abandonment or decline (Wordsworth 1982). At Water Street imported pottery became common again in the 15th century. During the 14th century bubonic plague swept across Europe, reaching Scotland in 1349, and generally this century is seen as a period of European economic decline. The situation may have been exacerbated in Scotland by the Wars of Independence in the first half of the century, and an accompanying disruption of trade. As a relatively densely occupied seaport, Leith would have been vulnerable to the plague and may have exceeded national mortality rates of around 1 in 3 (Ziegler 1969). As more archaeological work is carried out in Scottish burghs variations between them may allow more detailed analyses of the troubled 14th century. Of the work done so far, Perth, Aberdeen and Leith seem to have been badly affected, with properties subsequently lying vacant or derelict. In Inverness imports seem to have stopped for a time, but the excavated site there was developed rather than abandoned (Wordsworth 1982). Recent work in Dundee (Brown & Roy 2000) also encountered uninterrupted development through the 14th century.

LATE 14TH-CENTURY WORKSHOP AND REDEVELOPMENT

By the end of the 14th century a rectangular wooden building had been built at the rear of a Quality Street plot with access to the west, and this suggests that Water Street/Rotten Row had been created. The insertion of a lane through the backlands of Shore Place properties implies the need for direct access to these, and therefore development. Plots that extended from Water Street/Rotten Row to Quality Street now occupied the excavated areas. The workshop building was constructed

using foundation trenches with deep post settings to support the roof. The walls were likely to have been formed by horizontal planking, although one side may have had wattle panelling, perhaps for ventilation. The building contrasts with most published examples, although most comparanda have been excavated in Aberdeen and Perth (Murray 1980). The Water Street building is unusual in its use of deep foundation trenches instead of sill-beams. The freely draining sandy subsoil would have led to greater longevity for earth-fast timbers and less need for a sill-beam to preserve wooden foundations. However, maintaining the stability of the structure in loose subsoil may have been a problem, and certainly the foundation trenches needed to contain clay and stone packing material. The building is not unusual in comparison to 12th-century timber buildings recorded during the Burgess Street and Ronaldson's Wharf excavations, which also used foundation trenches (Lawson, pers comm). The lack of a complete ground plan hinders the interpretation of this structure, although large amounts of unburnt coal in the interior suggest that it was not domestic. The use of planks instead of wattle for most of the walls is surprising given that this seems to have been a workshop. It perhaps reflects the ready availability of timber at the Port rather than enhanced status; frontage buildings recorded elsewhere in Leith had stone foundations by this time (Reed & Lawson 1999). The mixture of plank and wattle walling in a single structure is not unique and was noted in a building in Perth (Bowler et al 1995, 937).

15/16TH-CENTURY WASTE DISPOSAL

The interpretation of the site possible for the later medieval period was extremely limited as most of the remains were pit bases. These had been used to dispose of large quantities of refuse, mainly from fish and shellfish processing, especially in Area 1. The artefacts contained within the pits indicated an increase

in wealth and trade through the 15/16th century, despite Leith being besieged several times. The percentage of imported pots in the assemblage is not high in comparison with other ports and reflects Leith's lack of burgh status. The use of Area 1 for digging refuse pits suggests that it was still open and the Water Street/Rotten Row frontage remained largely undeveloped. The position of the pits and the lack of any other property divisions suggest that the plots that had previously occupied the site had been amalgamated into a single large one that occupied the entire excavated area.

17TH-CENTURY STRUCTURE

For the 17th century a fuller interpretation is possible due to the survival of post-medieval remains in Area 1, combined with detailed historical records. These confirm that the site was contained in a single property extending from Rotten Row/Water Street to Quality Street. This was largely undeveloped except for a corner in the north-west. The rest of the site was within a garden, including the Water Street frontage. The building was originally used as a dwelling house and then as part of a cooperage. It contained a musket ball within an internal post-hole and a cannon ball in the yard. Cromwell's army occupied the town and the tenancy of an English Roundhead in 1657 provides a tangible connection.

CONCLUSIONS

This part of Leith was divided into properties before the end of the 13th century. These extended west towards the shore and east towards Quality Street with no lane in between. Early remains, including structures, may survive beneath later development along the Quality Street frontage, although it is equally likely that these plots were left open and used as yards. The early development of South Leith, stimulated by foreign trade, appears to have been more widespread than

previously assumed, and perhaps less organized than usually seen in Scotland's medieval towns.

It is suggested that Water Street/Rotten Row was inserted in the 14th century, as a result of development in the backlands belonging to Shore Place properties. The dearth of development within the properties that stretched from Water Street/Rotten Row to Quality Street perhaps strengthens the argument that these were primarily open areas or yards. The publication of results from larger areas of excavation to the west will undoubtedly increase our knowledge of medieval Leith further.

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