

Excavations in Kirkwall, 1978

the late N A McGavin

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SUMMARY

Five sites were excavated on the W side of Albert Street, Broad Street and Victoria Street, Kirkwall. The excavations showed that during and after the medieval period the S part of the town had expanded W into the area of the Peerie Sea. The new land was reclaimed by the dumping of material stripped from the existing area of the town, and finds from the dumps suggest a range of sources for goods traded to Orkney.

HISTORY

The first reference to Kirkwall is in 1085 in the *Orkneyinga Saga*: reference for the year 1117 in the same source describes it as a market town, although one with few houses (Taylor 1938, 221). However the growth of the town must have been given a new impetus when Earl Rognvald chose it as the site of the Cathedral to St Magnus, work on which started in 1137 and was not completed for nearly 300 years. During these centuries Kirkwall flourished as a Scandinavian town, the seat of the earls of Orkney as well as of the ecclesiastical authorities and of a merchant community.

From the second half of the 13th century Kirkwall had been colonized by Scots. Clouston notes that from the beginning of the 14th century there were Scottish householders in Kirkwall, even if they made little impression on the ranks of the land-owning classes in Orkney generally (1914, LVII, XLIX). In 1468 Orkney was ceded to Scotland under a marriage treaty made between Christian I and James III and in 1486 King James raised Kirkwall to the status of a Scottish royal burgh. This is the earliest evidence of incorporation or municipal status that has survived, although there are indications that Kirkwall may have had similar privileges in the Norwegian period. James Wallace, a 17th-century writer, comments

this town has been erected into a Royal Burrow in the time of the Danes, and Anno 1486 King James the third gave them a charter confirming their old erection and privileges, specifying their antiquity . . . (*in* Mooney 1950, 97).

There is some support for this in references in charters and other legal documents to 'burgesses' of Kirkwall (such as Robert of Gerring in 1425 (*ibid*, 43) although references to *ballivi* or *baliffs* probably represent officials of the Norwegian earldom rather than purely town officials.

In the post-medieval period Kirkwall continued to expand, but as a Scottish burgh and under Scots law.

TOWN DEVELOPMENT (fig 1)

Kirkwall's pattern of development reflects the various elements of the medieval community. The earliest settlement is traditionally thought to have been in the N part of the town, known as the *Burgh* (Hossack 1900, 5), an area stretching from the modern harbour to the site of St Olaf's Church (fig 1), and subsequently the centre of the merchant community. The Cathedral was started on the shore outside the 12th-century town and 300 m to the S of it; and the ecclesiastical community grew up round the Cathedral in an area known as the *Laverock*. The Old Castle of the Sinclairs was built in 1369 between the two, at the head of what is now Castle Street. The King James charter of 1486 mentioned only the two areas of Burgh and Laverock, but documents of the 16th century and later refer to the land between them as the *Midtown*, a stretch of shore corresponding roughly to Albert Street.

TOPOGRAPHY

The town lies along the E side of Kirkwall Bay where the bay is almost blocked by a sandspit, the *Aire* (fig 1). Sandspits are ephemeral features, but the Aire has remained stable for several centuries sheltering the S tip of the bay which is known as the *Oyce* or *Peerie Sea*. In consequence the town has two waterfronts. The Burgh lies NE of the base of the Aire, and looks N over the modern harbour into Kirkwall Bay. The Laverock and Midtown however lie to the S of the Aire and are closely related to the waterfront formed by the E shore of the Peerie Sea. The presence of two waterfronts is reflected in the presence of two different street patterns. In the N, the principal axis is along the shore of the bay, with a major thoroughfare, Bridge Street, running back at right angles to the waterfront. After approximately 100 m Bridge Street crosses the course of the Pabdale burn, now culverted but formerly the S boundary of the Burgh. On the S side of the Pabdale burn is Albert Street which then becomes successively Broad Street and Victoria Street, forming a line parallel to the W waterfront and following the pattern of settlement in the S part of the town.

The S street-line from Albert Street to Victoria Street follows the line of the 5 m contour and lies just to the W of it at approximately 4 m OD. The street line marks the division between low-lying flat land to the W which has been reclaimed from the Peerie Sea and a ridge of boulder clay which rises to the E. In the N, however, Bridge Street follows no such division as it runs NW across flat land to the harbour; the margin of the exposed natural clay slope diverges to the E.

It is the S part of the town with which this report is concerned, and unless otherwise stated all references are to the S main street-line and the W waterfront.

THE EXCAVATIONS

In 1978 five sites were investigated in the area to the W of the main street. Two of the sites, *Gunn's Close* and the *Gasworks*, were threatened by development, and the opportunity was taken to complete an excavation at *Tankerness House*, which had been lying open for some years. At the same time a further two trial trenches, *Mounthoolie Lane* and *57 Albert Street*, were excavated to help to assess the survival of deposits in the town generally. The distribution of the sites was intended to reflect the historical three-fold division of the town; no trench, however,

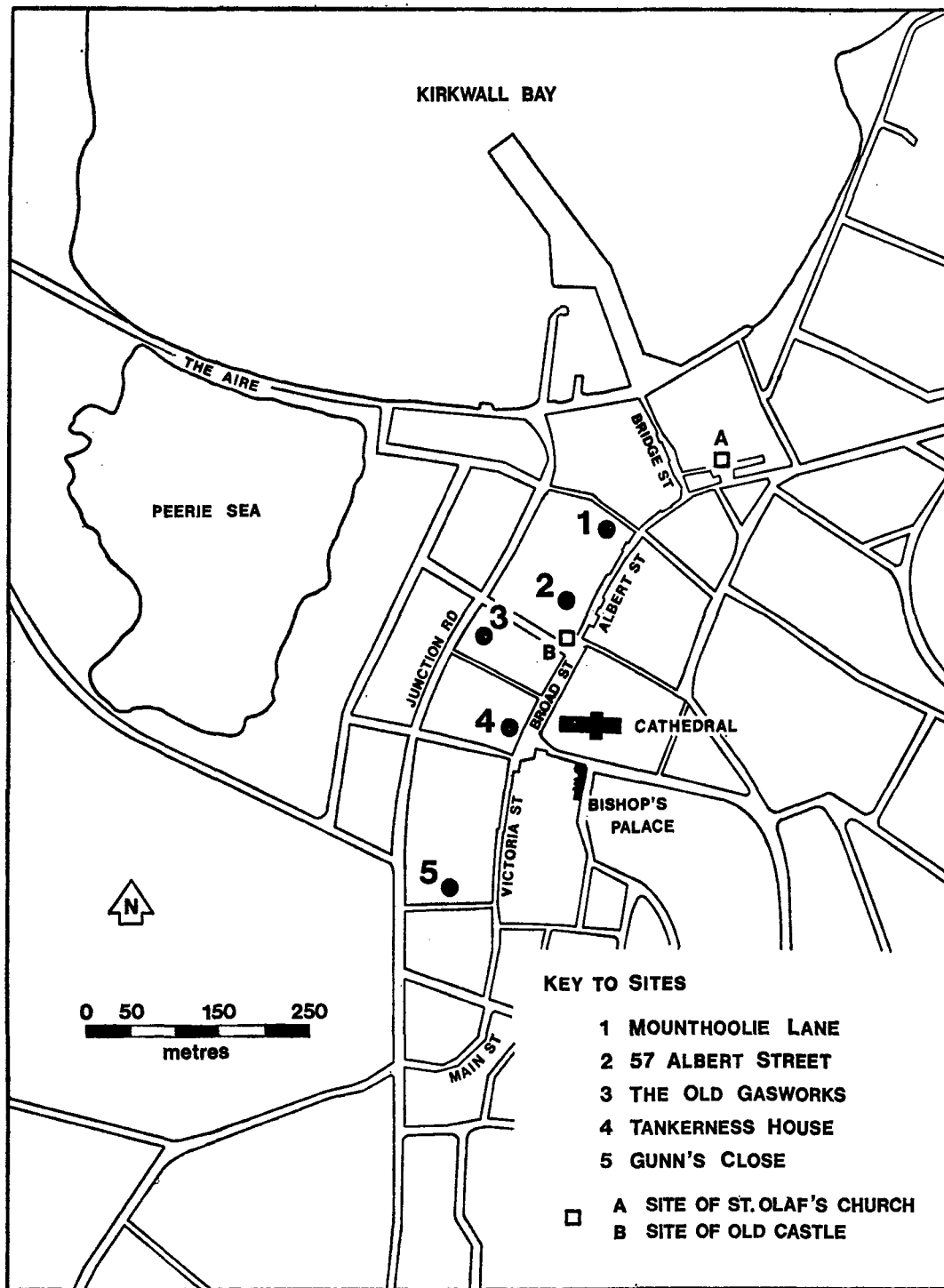


FIG 1 Kirkwall: town plan showing the location of the sites (based on OS map, Crown Copyright reserved)

could be placed within the 'Burgh' and this area remains an unknown quantity. The five sites posed different problems of excavation and were treated separately.

The site codes were KIM78 (Mounthoolie Lane), KIB78 (57 Albert Street), KIW78 (the Old Gasworks), KIT78 (Tankerness House) and KIG78 (Gunn's Close). Features and layers were numbered in a series running from 100 for each site. The exception is Gunn's Close where separate blocks of three digits were given to the various trenches. Finds were given a four digit number which followed a letter code referring to the material of which the object was made; the finds numbers, like the feature numbers, were separate for each site. To aid the identification of the finds discussed in this report, the relevant feature numbers are referred to in the text; however, it should be noted that not all the features referred to appear in the illustrations.

The excavation records together with a full account of the sites from which this version has been extracted will be deposited with the National Monuments Record of Scotland, 54 Melville Street, Edinburgh. It has not proved possible to include all the detailed tables relating to specialist reports: complete copies of the Animal Bone, Insect, Plant Remains, Wood and Leather reports will be stored along with the excavation records.

MOUNTHOOLIE LANE (fig 2)

This site lay in the garden of the Council Architects' Offices on the S side of Mounthoolie Lane. The trench originally measured 5 m E-W by 3.5 m N-S, but was reduced to 2.7 m N-S; fig 2 shows the N main section.

The lowest level of the site consisted of a shingle beach sloping towards the Peerie Sea with a dip of 1:17 and at a height of approximately 1.28 m OD. The beach was trenched to a depth of 1 m and found to consist of layers of grey flagstone chippings and flakes up to 0.3 m across, 125-7, 129-30, and a layer of midden, 128. The midden produced wood, leather and stone artefacts and medieval pottery showing varying degrees of abrasion. Small fragments of Rhineland stoneware were recovered from the midden and beach; from the dating supplied by these, the beach appears to have been open until the early 16th century.

The beach was overlain by layers of water-washed midden interspersed with lenses of silt and shingle, 121-4, which produced finds similar to those of the beach but richer in organic materials. The surface of these layers sloped more sharply than the beach and it had been levelled up by the dumping of further layers of mixed debris at the W end, 111, 118 and 120, raising the level of the ground by up to 0.5 m. At the E end of the cutting, the dumped layers had been cut away to expose the firmer, water-compacted material below, and a clay bank was laid down, 108 and 114. The bank crossed the cutting N to S and parallel with the waterfront. From the care taken to base it on firm material and to consolidate the successive layers of evenly laid clay of which it was made up, it is clear that the bank was intended as a foundation, probably for a wall. No trace of wall remained *in situ* and the bank had fallen into disrepair, leaving a band of washed-out clay, 109 (not shown in section), to the E, and a scatter of grey sandstone fragments, 112, to the W. There was no indication of the purpose that a wall on this foundation might have served. It would not however have been a sea defence: the dumped layers, 111, 118 and 120, to the seaward showed no sign of water action, so that the base of the bank must have been clear of the tidal range. A fragment of clay pipe-stem from the upper dumped layer, 111, suggests a date not earlier than the 17th century for the foundation of the wall. The destruction of the wall was sealed by a further dump of material, 105, 106, 107, 110 and 116, which contained a sherd from a Westerwald chamber pot of the mid-18th century.

Above these dumped layers were two layers of topsoil, 104 and 101, which produced modern pottery and glass.

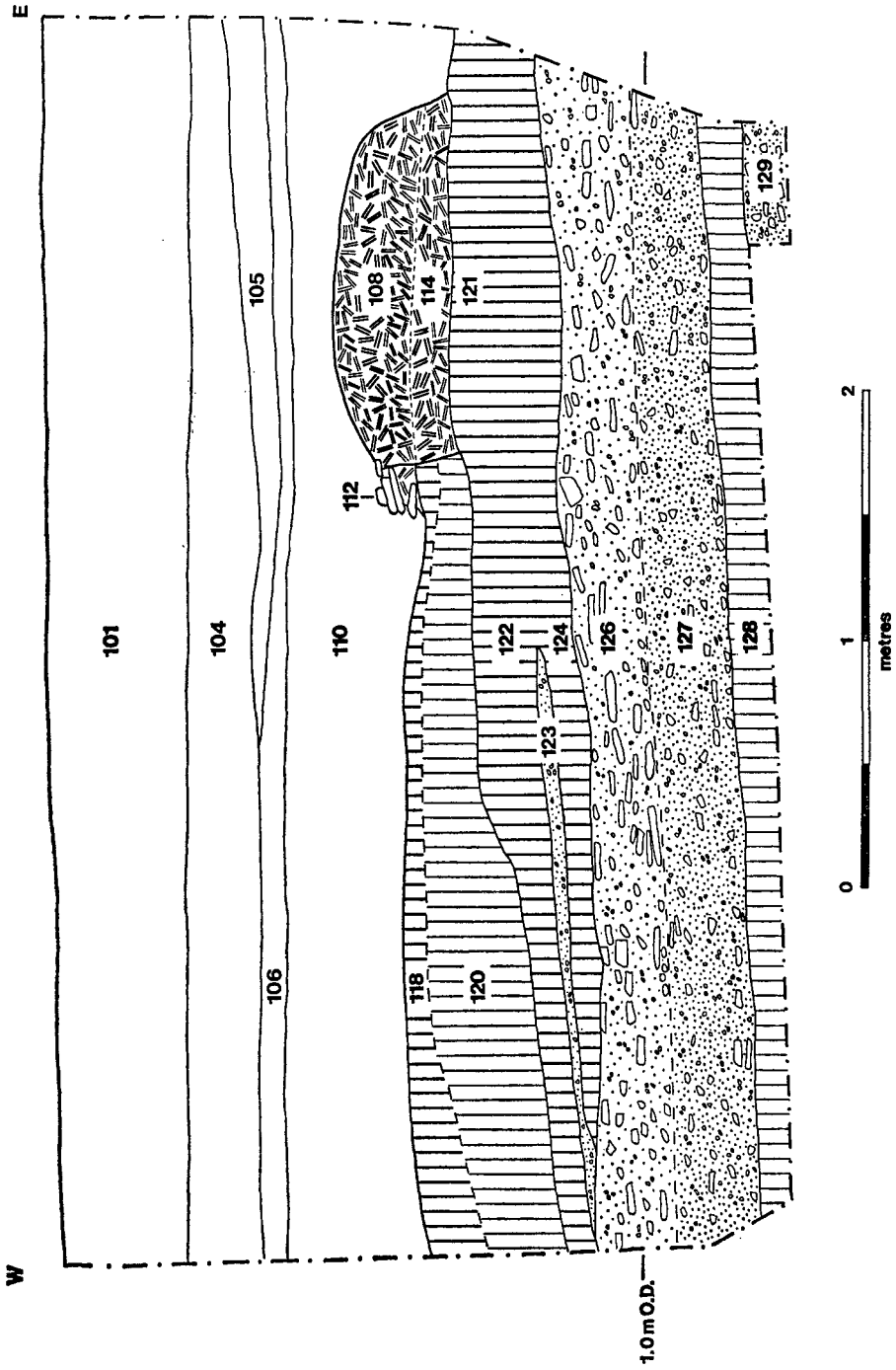


FIG 2 Mounthoolie Lane: N main section

57 ALBERT STREET (fig 3)

This cutting was located in derelict ground 30 m back from the street frontage behind a bakery at 57 Albert Street. The trench measured 4 m by 4 m.

The lowest level reached in the excavation was a beach of loose grey sand with some gravel and shell, 152, which lay at a height of c 0.55 m OD. The beach sloped towards the W with a gradient of approximately 1:20, although the slope flattened out towards the E. At this level, the seepage of tidal water into the trench was rapid enough to turn the sand to slurry, so that attempts to trench the beach to any depth were unsuccessful. Shallow trenching to a depth of 0.15 m produced animal bone but no pottery or dating material.

A sea wall, 142, had been built across the beach parallel with the modern water front. The wall, 1.2 m wide and surviving to a height of 0.95 m, consisted of a rubble core between two regular faces of coursed undressed grey flagstone, all bonded with light brown clay. This wall produced no dating material. Peat and midden layers, 136, 139, 148–51, had accumulated on the landward side to a depth of 0.8 m. Patches of trampled surface occurred at various levels within the midden layers, and one surface was covered with a thin layer of wood shavings. The surfaces probably represent use of the area as a yard, but as these levels lay within the tidal range the ground would have been marshy and poorly drained. In estimating ground levels, however, some allowance must be made for compaction of the midden *in situ* after it had been dumped; the successive levels of trampled surface may represent successive dumps of midden designed to keep the ground surface above the high-tide level. The midden layers contained the base of a 15th- to 16th-century Langerwehe jug (fig 9, no 42). They also produced a rimsherd of unglazed N European Earthenware of an atypical fabric, possibly dating to the 16th century. Wood and leather objects were preserved in the midden and a toy quernstone (fig 11, no 1) also comes from this context. A sample of the midden was analysed for insect and plant remains and the report (p 426) describes the process of deposition and decay during the build-up of these layers. Further shingle, 147, was washed up against the seaward side of the wall forming a secondary beach at a height of 0.91 m OD. The beach was overlain by a thin layer of midden, so that by the time of its deposition further sea defences had probably been built to the W, protecting it from scouring on an open shore.

Dating for the construction and life-span of the sea wall is indirect. The primary beach, 152, below it produced no dating evidence. The midden layers behind the wall date to the 15th to 16th centuries, and the secondary beach, 147, produced a sherd of Bellarmine of the 16th to 17th centuries. The wall was therefore probably constructed in the 15th to 16th centuries and stood until the 18th century when it was demolished and sealed by the next phase. It had ceased to be the outer sea wall some time previously.

The next phase of activity in the area involved demolition of the wall, and the construction of a drain, 145, which ran across it from E to W. Layers of clay and rubble, 120–3, 125, 127, 129, 130, 134–5, 137–8, 140–1, 143–4, were then dumped in the area, sealing the stub of the wall and raising the level of the ground by up to 0.65 m. The drain proved inadequate and the continuing marshiness of the land was shown by silting in a linear depression, 131, running E–W, parallel with drain 145. The dumped material produced a sherd of dark tin-glazed earthenware of the 18th century or later.

The tips were overlain by loams and topsoil, 101–3, 116, which produced modern pottery. The soils had been heavily cultivated and the bases of vegetable rows of 19th century date showed as corrugations in the interface between two of the layers, 102 and 103. Three coins were recovered from the topsoil: a Doit, a Charles I Turner and a Mary Lion or hardhead (Scottish 1½d) billon.

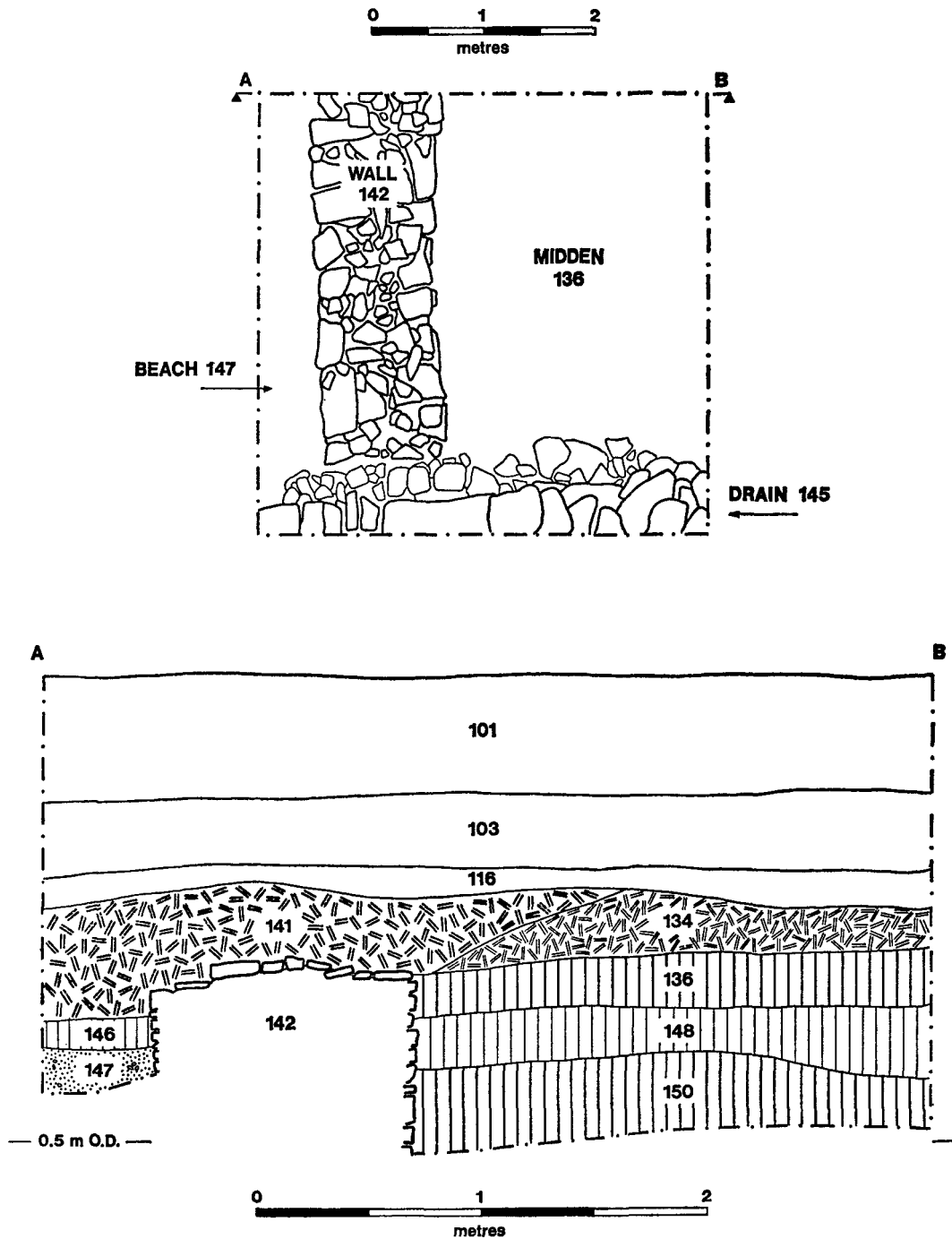


FIG 3 57 Albert Street: plan and N main section

THE OLD GASWORKS (not illustrated)

The site of the Old Gasworks was 80 m W of the Broad Street frontage and was bounded on the N by Castle Street, on the S by St Magnus Lane and on the W by Junction Road.

Land which lay so far W of the main street line was unlikely to have been reclaimed from the sea during the medieval period. On the other hand the site of the Old Castle lay 50 m to the NE and must itself have projected from the contemporary shoreline and its proximity suggested that machine trenching might be worthwhile. However, the machine trenches revealed modern disturbance but no features of archaeological interest. In the few areas where natural sand was undisturbed it lay at a high level, 1.6 m OD, and was directly overlain by the topsoil.

TANKERNESS HOUSE MUSEUM (figs 4 and 5)

Tankerness House lies on Broad Street opposite the foot of Palace Road and close to both the Cathedral and the Bishop's Palace. It is a listed building on a site known to have been occupied at least since the 16th century and probably considerably earlier (Hossack 1900, 227). The 1978 excavation took place in the basement of the middle part of the N wing. In 1973 Mr E McGillivray then the Honorary Curator of the Museum, dug into the floor of the basement in search of a well which he believed to lie underneath (E McGillivray, pers comm). He found no well but he cut through archaeological deposits which produced medieval and later pottery. The trench that he dug measured roughly 2 m by 1.6 m, and remained open until it was enlarged and recorded in the 1978 excavations. Pottery from Mr McGillivray's excavation is published in this report, and is treated as unstratified; it is identified by its site code, KITND.

The cutting excavated in 1978 measured 2 m by 4 m; an extension to the S was excavated to link the S wall of the building to the archaeological layers (fig 5). Excavation of the site was not completed, and was abandoned when the volume of water extracted from the lower levels of the trench became a potential hazard to the stability of the building.

The earliest level reached was a deposit of red freestone fragments in a silty matrix, 128 and 131. The freestone was from the Eday beds of the Old Red Sandstone rather than the grey Rousay and Stromness flagstone which underlies Kirkwall Bay and was found in the beaches of the other excavations. The freestone was probably imported from nearby on the island and it was similar to the stone in which the Cathedral had been built, as well as some of the stone used in the Bishop's Palace. Fragments examined had been worked but not finished and the layer had the general appearance of debris from a mason's working floor although it was a homogeneous deposit without scatters or layering and was therefore probably not *in situ*. The surface lay at a height of 2.1 m OD; it was relatively even, apart from a small group of blocks which projected above the surface by 0.15–0.2 m, and it sloped to the W with a gradient of 1:20, similar to the gradients of the natural beaches found at Mounthoolie Lane and 57 Albert Street. However the fragments were angular and had retained sharp edges in spite of the softness of the stone, so that they had probably not been rolled in the water. The freestone debris appeared to have been dumped on to the shore and graded to give a platform sloping seaward, possibly as a beach landing or 'hard'. There is a local tradition that ships were sailed 'up to the steps of the Cathedral'. This is by itself improbable as the Cathedral stands at a height of more than 5 m OD, well above both the modern tidal range and the modern spring tide of 2.5 m (Mather *et al* 1974, 8–9); the medieval range is unlikely to have been significantly different. However, the W end of the Cathedral lies only 50 m from the excavation, and the area now occupied by Tankerness House would have been the most likely point for the landing of construction materials. The freestone deposit was trenched to a depth of 0.4 m; it was sterile and produced no dating material. However, it is significant that the chippings came from a fairly large building project. The Cathedral was started in 1137 and the

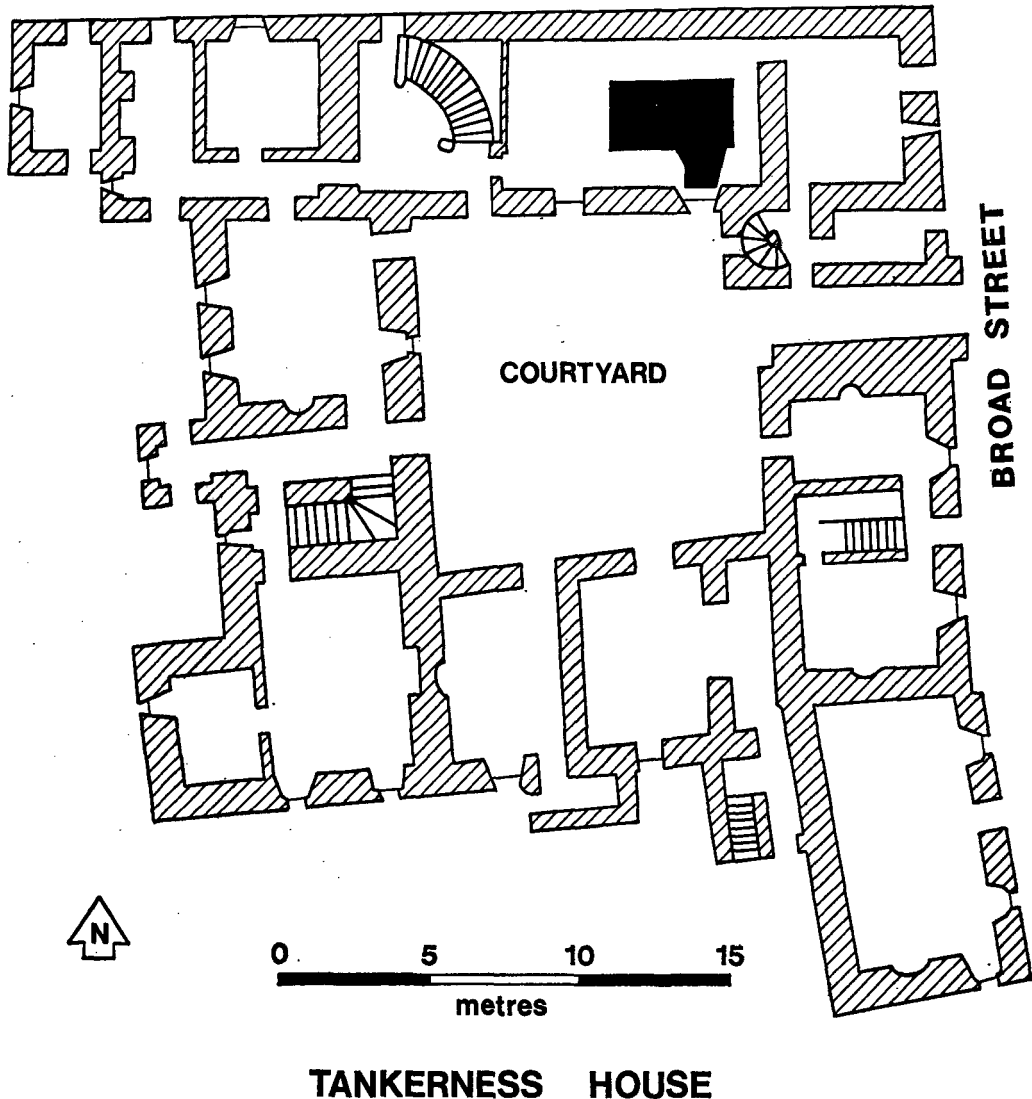


FIG 4 Ground plan of Tankerness House, showing the location of the excavation (based on a figure by RCAMS; Crown Copyright)

Bishop's Palace in the second half of the 12th century. If the beach deposit is connected with either of these projects it would have been laid down at some time after 1137, and it remained open until it was sealed by dumped layers of 13th to 14th century date.

The same date range applies to a structure, 129, which was found resting on the surface of the beach. The structure ran E-W and lay under the main section so that only the S face was visible. It was built of grey flagstone fragments; at the face these were up to 0.5 m long, undressed but aligned, with a core of smaller fragments behind. There was no bonding material and sea shells had been washed into crevices between the stones. The fragments were laid in crude courses which dipped seaward. Where it entered the W main section three courses survived, although

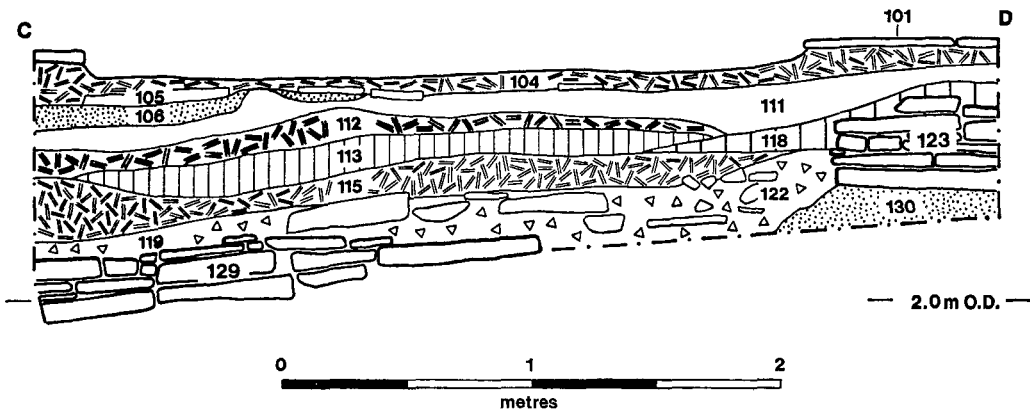
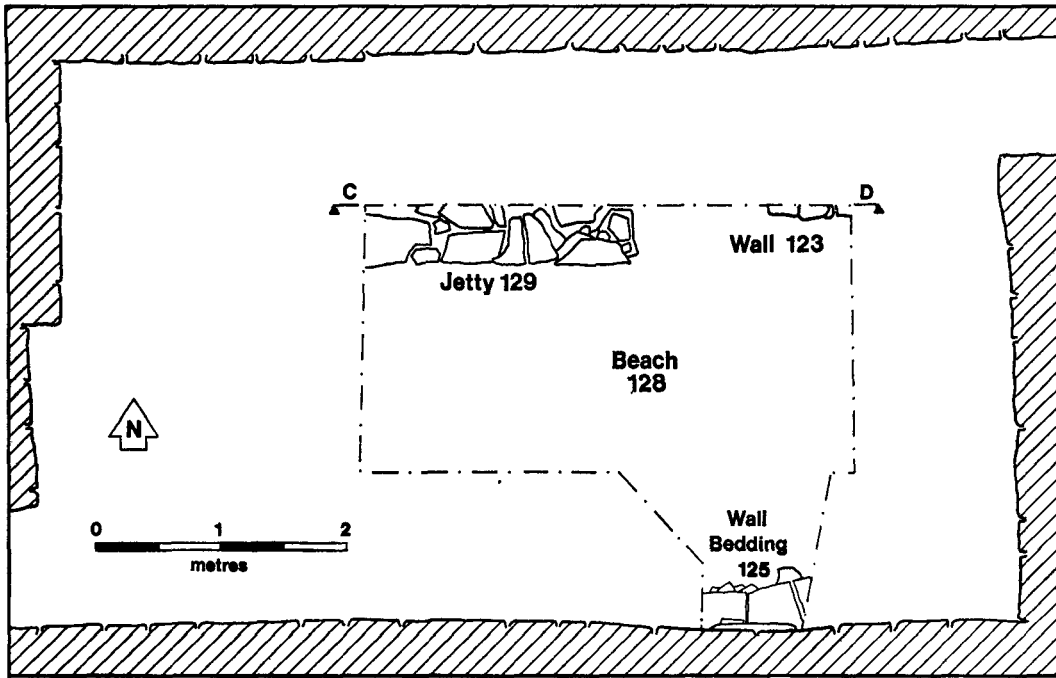


FIG 5 Tankerness House: the excavation. Plan and N main section

there was only one course where it petered out 2 m to the E. The top was rough and irregular and suggested that further courses might have been robbed out, but the seaward tilt of the courses and the casual way in which the stones were laid without regard for bond or stability made it unlikely that this was a foundation for a structure of any height. It appears to have been a waterside structure, possibly a jetty.

During the next phase of activity, the area was reclaimed by the dumping of domestic rubbish, earth and demolition materials, 115, 119-22 and 126. At the same time a wall, 123, was

built at the E end of the cutting. Like the jetty the wall lay mainly under the N main section. It was built of flagstone blocks in courses, with five courses surviving. At the W there was either a butt end or a return under the main section towards the N. The blocks were up to 0.65 m long and 0.1 m thick; the N-S dimension was hidden under the section. They were not dressed, but had been matched to form the courses and aligned to give a regular face. It was evident that care had been taken in the construction and that the foundation could have carried a considerable structural load. The wall rested on a bedding of fine yellow sand, 130, up to 0.1 m thick and spreading over approximately 1 m² of the excavated area. The sand was clean and appeared to have been deliberately laid to level up the slope of the beach. The sand was overlain and revetted by the dumped layers already described, which suggests that the wall and its bedding material were exactly contemporary with the dumped layers, since the sand bedding of the wall could not have survived exposure on the shore. The dumped layers and the wall are dated to the late 13th to early 14th centuries by Scottish pottery and Scarborough ware, including sherds from an aquamanile.

The wall, 123, was subsequently demolished, and there is a gap in the sequence before the next phase of dumping, 112-4 and 118, which sealed the stub of the wall and formed a layer 0.05-0.5 m thick over the site. The tips of this phase were predominantly of refuse and rotted organic material; they produced no pottery but contained a fragment of clay pipe stem probably of 17th-century date.

During the 16th century, Tankerness House had passed into the ownership of Master Gilbert Foulzie, who carried out extensive works, including the N front and the arched gateway with its date of 1574 (Hossack 1900, 227). There was however no trace of his work within the excavated area.

Above the 17th-century layers the site was levelled up to receive a slabbed floor, 110, which survived in the NW corner of the cutting but elsewhere was traceable only as a series of impressions in the bedding layer. The bedding layer, 111, sealed and partly filled the construction trench to the foundation, 125, of the S wall of the N wing of Tankerness House. Although 111 contained a pipe bowl of mid-17th century type, the presence of a group of pieces of bottle glass makes a date in the 18th century more likely.

In the 19th century two further floors were laid. The first of these, 105 and 107, on bedding layer, 106, 108-9, was decorative and consisted of irregular flagstone slabs, with the interstices filled with smaller flagstone fragments laid on edge. The second floor, made up of slabs, 101, was laid on bedding layers, 102 and 104, and formed the current basement floor.

GUNN'S CLOSE (figs 6 and 7)

The site consisted of two adjacent burgage plots running from Victoria Street to Junction Road at the N side of Gunn's Close. The frontage buildings were to be preserved and the backlands were to be turned into a car park. The total area available for excavation, 100 m by 20 m, was substantial but it was obstructed by telephone cables and by a live electricity substation and cables, which discouraged vigorous machine trenching. The site was sampled by excavating three trial squares in the S plot (Trenches 1-3) and cutting a machine trench down as much of the N plot as the cables permitted. The machine trench (Trenches 6 and 7) replaced an earlier attempt to sample the N plot by hand (Trench 4) and Trench 5 was excavated by hand to recover dating evidence for a structure that had appeared in the machine-trench section.

The earliest levels found on the site were in Trench 1 at the head of the S plot: the lowest layer group, 103-6, overlay a sand and flagstone beach, and consisted of midden with wood chippings and stems. It produced Weser Slipware and N European Earthenware suggesting a

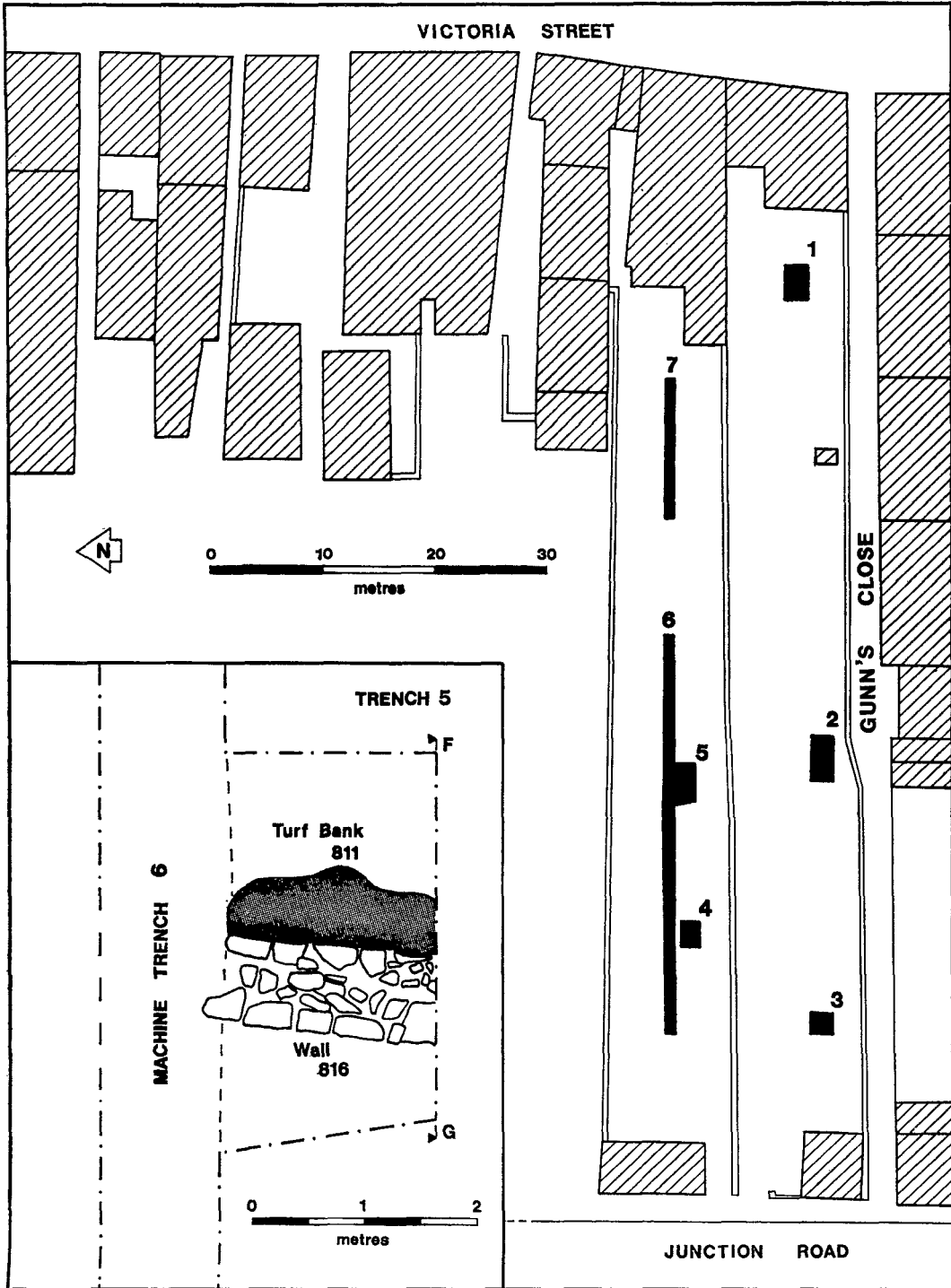


FIG 6 Gunn's Close: location of trenches. Inset Trench 5, plan of sea wall

date in the late 16th to early 17th centuries. The layer contained leather working debris, including a sole of welted construction.

In Trench 2, clay pipe fragments were found in the layers directly overlying the beach (304-7); reclamation in this trench took place later than in Trench 1, and started probably in the 17th to 18th centuries. The lower tips of reclamation material had been dumped from the W, implying that a bank or waterfront had by then been established further to the W. This waterfront is almost certainly the projection of the sea wall of Trench 5 as at this stage the properties still formed a single frontage and had not been divided down their length. Excavation in Trench 3 was abandoned when it became apparent that a deep modern disturbance occupied almost the whole area.

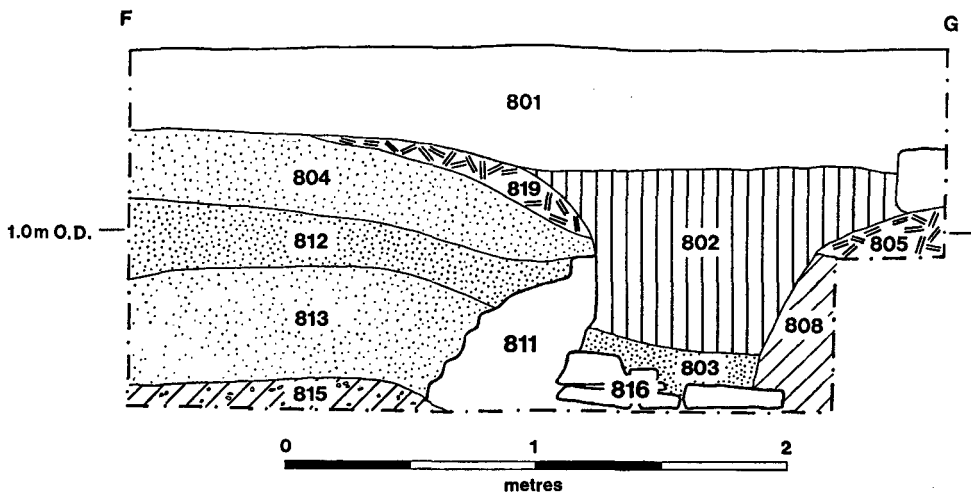


FIG 7 Gunn's Close: Trench 5, main section

In the N plot, the machine trench (Trenches 6 and 7) cut through two sea walls, and Trench 5 was dug by hand across the eastern most of these. The wall, 816, was resting on the beach, 814 and 815, without foundations. It was built of grey flagstone fragments which had survived only to a single course and it had been packed on its landward side with a bank of turves, laid mainly grass-upwards, 811. These were overlain by a series of sandy tipped-deposits, 804, 812 and 813, which contained a sherd of delftware and date probably from the 18th century. Rubbish, 808, had washed up against the seaward face of the wall, and was then covered with tipped material and clay, 805 and 819, before the wall was robbed, and the area covered with tilled soil, 801. The sea wall had gone out of use in the 18th or early 19th century. A map drawn in 1827 during a law suit (SRO RHP 759) shows a waterfront established 15 m W of Trench 5 and 80 m W of the street frontage. The line of the frontage shown on the map corresponds with the western of the two sea walls cut by Trench 6.

THE EXCAVATED MATERIAL

THE POTTERY N MacAskill

Introduction

Many varieties of wares were recovered from these sites, most, or all, of which were imported. There is no evidence of a local medieval or post-medieval industry, although some wares identified as imports from the Scottish mainland might have been locally produced. Handmade grass-tempered ware, which was present in many contexts, is more likely to be local and is perhaps the earliest material recorded although similar material was being produced elsewhere as late as the 19th century. As well as Scottish White Gritty and red sandy wares other imports include small amounts of Scarborough ware, substantial quantities of North European Earthenware – probably Dutch or German and mostly pipkins – and fragments of Weser slipware, Beauvais Sgraffito and various other French wares and German stone-wares.

The quantity of pottery was not large, 679 sherds, and the layers from which it came were largely redeposited, so no pottery sequence could be built up. For this reason the pottery from all periods of the four sites is treated here as a single group. However, from the dating of known pottery types, some attempt has been made in the conclusions to describe the pottery in use in the various periods and to identify the sources and the patterns of trade. The sherds have been divided into groups (I–VII) according to date and provenance and these groups have, where necessary, been subdivided by fabric type.

Group I – Grass-tempered wares (fig 8, nos 1–6)

There were 151 sherds in this fabric type, 140 of them came from Mounthoolie Lane where they were present throughout, with a preponderance in the higher dumped levels. All the sherds were redeposited. The estimated minimum number of vessels is 10, but the actual number is probably considerably higher.

The fabric is usually pink-brown in colour with the cores and/or internal surfaces reduced to grey. It is medium hard, sandy and micaceous with moderate to abundant quartz grits ranging from less than 0.1 mm to more than 1.0 mm across. Occasional red-brown earthen inclusions of various sizes are also present as well as occasional fragments of unidentifiable grey rock. Nearly all of the sherds have been tempered with grass, the marks of which are usually visible on the surfaces. The quantities of grass vary considerably but these variations do not seem to bear any obvious relationships to the contexts in which the sherds were found. The sherds vary in thickness from c 5 to 10 mm and most have a layer of sooting on their internal and external surfaces, usually thicker on the latter. Apart from a group of six jug sherds, all the material seems to be from cooking pots. These were handmade, with a possible exception represented by three sherds from Mounthoolie Lane, beach layer 126, which have some fine internal and external rilling and may have been wheel-thrown or possibly finished on a turntable. All of the 19 rimsherds recovered are simple and upright or slightly everted (nos 1 and 2), with slight squaring at the top in four cases (nos 3 and 4). Eight basal angles were recovered, all simple in form and from flat-bottomed vessels. Two of the Mounthoolie Lane sherds are decorated with roughly incised grooves. On one from 110 the grooves are horizontal and spaced, with a single vertical groove (no 2); the other, from 124, has only horizontal grooves which run into each other (no 4).

Six sherds from Mounthoolie Lane, 107, are in an orange variation of the standard fabric. Five are bodysherds and one is part of a strap handle which is c 30 mm wide and 6 mm thick and has a central ridge running down its outer surface and smaller, parallel ridges at each edge. The sherds all appear to have been part of the same vessel, probably a jug. They are the only sherds which give any indication of date of manufacture as the strap handle looks like a copy of a common form of medieval jug handle.

Grass-tempering in itself does not appear to be culturally or chronologically diagnostic but there seems to be a medieval tradition of using 'heavy' grass tempering in N and W Scotland (A Lane, pers comm) evidenced by wares recovered from such sites as Jarlishof, Freswick and Buchollie Castle, as well as material from survey work carried out on the N coast. Handmade pottery very similar to this, known as cragganware, was being made as late as the 19th century in the Hebrides and W Highlands (Quail 1979, 39). Its prevalence in these areas is attributed in part to the shortage of trees with which to make wooden vessels, a situation which would be paralleled in Orkney. The lack of modern forms such as cups or bowls in the Kirkwall material suggests that it is medieval or earlier in date but this dating is by no means secure.

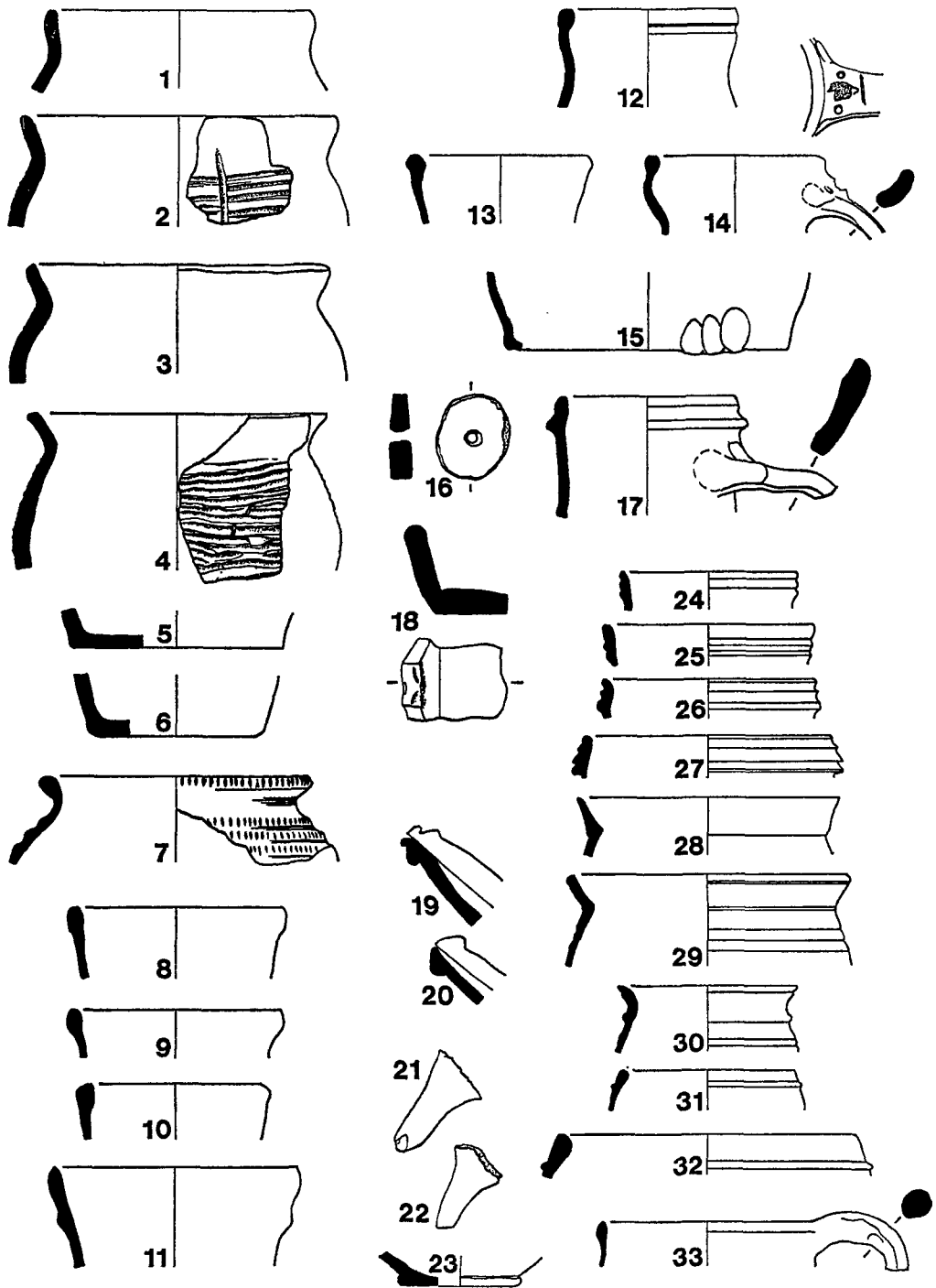


FIG 8

Group II – Scottish medieval wares

IIA – White Gritty (fig 8, nos 8–11). Forty-three sherds in medieval white fabrics, probably Scottish, were recovered, all from Mounthoolie Lane and 57 Albert Street. Thirty-two of these are standard White Gritty wares of the type which is common on medieval sites throughout Scotland, particularly on the E coast of the mainland. The standard fabric is normally off-white in colour and sometimes partly reduced to grey, with a moderate spread of medium to large subangular grits, occasional black specks and occasional to moderate brown ferruginous inclusions, and lenses. The sherds in this fabric type all appear to be from jugs with external green-glaze. Four rimsherds are present, all from Mounthoolie Lane. One, from 108, is simple and upright with a pulled spout; two, from 126 and 129, are upright and externally thickened (nos 8 and 9), and the other, from 126, is upright with internal thickening (no 10). Parts of three strap handles are present. One of these fragments, from 57 Albert Street, 136, is in a badly abraded coarse variation of the standard fabric, with large grits of sandstone and of an unidentified grey slate-like material as well as the usual inclusions. From Mounthoolie Lane, one 70 mm wide strap handle with a broad groove came from 110. This form is typical of material found in the coastal areas of Fife and Angus. A smaller, thicker, strap handle, 45 mm wide, came from the same site, 128.

The only decorated bodysherds in this fabric type came from Mounthoolie Lane, 110, and has faint horizontal linear rouletting on the external surface. A basal-angle sherd from the same context is from a thick-walled jug with a heavy foot-ring. This has a near black reduced core and green glaze on the external basal and body surfaces. The only basal angle came from Mounthoolie Lane 106, and is unglazed and simple in form, with wiped surfaces.

Eight sherds from Mounthoolie Lane are in a variant of the White Gritty fabric type which has an abundance of small subangular to rounded quartz grits. The only rimsherd is from 127 and is upright with a pulled spout and an applied external ridge on the upper neck (no 11). Its core is reduced to grey and most of its external surface is covered with a thick dark green glaze. The only handle present, from 107, is a grooved strap form 40 mm wide with pale green glaze on its outer surfaces. Two of the five bodysherds are unglazed, two are partly glazed externally and one has yellow-green, brown flecked internal and external glaze. Three other jug bodysherds are in a fabric variation which is white to light grey in colour with dark grey interiors and dark green overfired glaze, and contains, as well as moderate medium quartz gritting, moderate mica flakes and large grey unidentified rock fragments.

On Scottish mainland sites the White Gritty fabric is used both for jugs and for cooking pots, but all the identifiable sherds in the Kirkwall group appeared to be from jugs.

IIB – ‘Red Sandy’ wares (fig 8, nos 12–17). Nearly 300 sherds of this type of ware are present.

FIG 8 Kirkwall: pottery nos 1–33 (scale 1:4). The fabric code and common name are given for each sherd, followed by site and context number. Fuller descriptions of most of the sherds are given in the pottery report. 1, Group I – grass-tempered ware, Mounthoolie Lane, 110. 2, Group I – grass-tempered ware, Mounthoolie Lane, 110. 3, Group I – grass-tempered ware, Mounthoolie Lane, 111. 4, Group I – grass-tempered ware, Mounthoolie Lane 124. 5, Group I – grass-tempered ware, 57 Albert Street, 103. 6, Group I – grass-tempered ware, Mounthoolie Lane, 113. 7, Group VC, Mounthoolie Lane, 126. 8, Group IIA – White Gritty ware, Mounthoolie Lane, 129. 9, Group IIA – White Gritty ware, Mounthoolie Lane, 126. 10, Group IIA – White Gritty ware, Mounthoolie Lane, 126. 11, Group IIA variant, Mounthoolie Lane, 127. 12, Group IIB1 – ‘Red Sandy’ ware, Tankerness House, ND. 13, Group IIB1 – ‘Red Sandy’ ware, Mounthoolie Lane, 126. 14, Group IIB1 – ‘Red Sandy’ ware, Tankerness House, 121. 15, Group IIB2 – ‘Red Sandy’ ware, Tankerness House, 121. 16, Group IIB1 – ‘Red Sandy’ ware, Tankerness House, 115. 17, Group IIB1 – ‘Red Sandy’ ware, Mounthoolie Lane, 111. 18, Group IV – reduced post-medieval ware, Mounthoolie Lane, 110. 19, Group VA – N European Earthenware, Gunn’s Close, 902. 20, Group VA – N European Earthenware, Gunn’s Close, 300. 21, Group VA – N European Earthenware, Gunn’s Close, 103. 22, Group VA – N European Earthenware, Gunn’s Close, 904. 23, Group VA – N European Earthenware, Gunn’s Close, 102. 24, Group VA – N European Earthenware, Gunn’s Close, 302. 25, Group VA – N European Earthenware, 57 Albert Street, 103. 26, Group VA – N European Earthenware, 57 Albert Street, 103. 27, Group VA – N European Earthenware, Gunn’s Close, 103. 28, Group VA – N European Earthenware, Gunn’s Close 103. 29, Group VA – N European Earthenware, Gunn’s Close, 808. 30, Group VA – N European Earthenware, Gunn’s Close, 302. 31, Group VA – N European Earthenware, Mounthoolie Lane, 106. 32, Group VA – N European Earthenware, Mounthoolie Lane, 106. 33, Group VA – N European earthenware, Mounthoolie Lane, 116.

Most of these came from Mounthoolie Lane and Tankerness House, with four from 57 Albert Street and none from Gunn's Close. All the sherds are a reddish or buff colour, sometimes partly reduced to grey or grey-brown, and are sandy and medium hard to hard. The majority of the sherds are in a single fabric type which has been subcategorized as IIB1.

Fabric type IIB1 contains moderate quantities of medium to large subangular quartz grits, occasional to moderate mica flakes and occasional small to medium brown ferruginous inclusions, all in a matrix containing abundant tiny quartz grains. Unidentified rock fragments are present in some of the sherds as well as occasional striated voids where grass or other fibrous vegetable matter has been present, although never in sufficient quantities to be seen as deliberate tempering. The fabric is very similar to medieval wares found, and presumed to be locally produced, in Inverness, Perth and Aberdeen. It may have originated in one or more of these burghs but this could not be established without petrological analysis.

No complete profile is present in this fabric type but most or all of the sherds appear to be from upright jugs with green, brown-green or yellow-green external glaze on the upper body, shoulder and neck surfaces. The rims are upright, with internal thickening, and slight internal concavity (nos 12–14) or, in the case of two fragments from Mounthoolie Lane, simple and slightly everted (not illustrated). One of the internally thickened rims, from Gunn's Close 121 (no 14), has part of a strap handle attached, the upper surface of which has been fashioned into a rudimentary face-mask with incised mouth, applied nose – most of which is now broken off – and circular impressed eyes. This resembles Scottish attempts to copy the more elaborate decorative face-masks which are common on medieval wares from various parts of England.

Parts of two other strap handles were recovered, one simple in form, 32 mm wide and 10 mm thick, and the other 40 mm wide and 20 mm thick with a 14 mm wide vertical groove flanked by two narrower parallel grooves. Both are from Mounthoolie Lane beach levels and are badly abraded. One other handle fragment in the B1 fabric type is present, from Tankerness House, 115. It is a small rod handle, 15 mm thick, with a fingered lower junction. This may be from an unusually small jug, but it is more likely to have been an additional decorative handle from a larger vessel. A large rod-handled jug from Castle Street, Inverness (Wordsworth, this volume p 367), has four decorative handles very like this, one running between its rim and lower neck.

All the basal angles recovered are fragmentary apart from one large sherd from a convex sagging base. Wiping marks are apparent on the external surfaces of the basal-angle sherds whose original surfaces have not been obliterated by abrasion. Several decorated bodysherds are present from Mounthoolie Lane and Tankerness House, the decoration consisting in the main of linear horizontal rouletting incised lines or, in one case, a ring and dot stamp and horizontal groove.

One rim and strap handle sherd which appears to be in this fabric type is untypical in form and surface treatment. The rim is simple and slightly inverted and has an applied external ridge. The handle is unusually wide with a broad shallow groove. The surfaces of the sherd are unglazed except for a few small spots of green on the lower surface of the handle junction and appear to have been finished with a wash or slip and smoothed by wiping. It came from Mounthoolie Lane, 121. A spindle whorl (no 16) from Tankerness House, 115, is in this fabric type as is an unglazed body fragment from 121 which appears to be a failed attempt at making a spindle whorl, having broken when the hole was bored in it. An unglazed fragment from Mounthoolie Lane, 124, has a rounded edge and appears to have been part of a circular object, possibly another spindle whorl or a gaming piece.

Fabric type IIB2 is very similar to IIB1 but with a finer grained, smoother matrix, and only medium-sized angular to subangular grits and occasional mica flakes. The sherds are most commonly medium hard and entirely oxidized but some are hard and partly reduced to dark grey. Forty-four sherds are present 41 of which are from Mounthoolie Lane. No rims are present and only one handle, an oval-sectioned form from 57 Albert Street, 113. Most of the bodysherds are externally glazed light green or brown-green. Fifteen other sherds are in similar fabric types which do not fall completely into either of the above categories. These include, from Tankerness House, 121, a ridged oval-sectioned handle with thumbled upper and lower attachments. The fabric of this is heavily gritted with abundant medium and large angular quartz grits and moderate medium-sized mica flakes. This is similar to one variation of the material classed as Aberdeen Local (C Murray, pers comm).

Group III – English medieval ware: Scarborough ware (not illustrated)

Two different types of material identified as Scarborough wares were recovered from Tankerness House, one represented by 10 sherds and the other by a single body fragment.

Group IIIA consisted of an upright jug rimsherd from an unstratified context and nine bodysherds

from 115, 120 and 121. The fabric is medium hard and pink with abundant small subangular quartz grits and occasional mica flakes in a fine sandy matrix. They are externally glazed yellow with, except for the rimsherd, irregularly spaced spots of iron. The glaze on all the sherds is flaking. Streaking from the spots on the external surfaces of these bodysherds runs roughly parallel to the wheel-marks. This suggests that the vessel of which they were a part was fired on its side and thus was probably an aquamanile rather than a jug. This is supported by the curious shape of the vessel which seems to have consisted of a ceramic tube or cylinder 90 mm in external diameter.

Group IIIB consists of a single body fragment in a slightly different fabric, recovered from 119. It has narrow horizontal rilling and dark green external glaze.

Group IV – Scottish post-medieval wares (fig 8, no 18)

This group contains 18 sherds in smooth, sandy, largely reduced fabrics, usually grey in colour, which are typical of material from Scottish post-medieval green-glazed jugs or internally glazed bowls. All but three of these are from the upper layers of Mounthoolie Lane, the others being from 57 Albert Street. The sherds have been divided into four subgroups on the basis of differences in the inclusions which they contained.

Fabric type IVA is hard and quite smooth and varies from medium grey to orange-grey in colour. It contains occasional small to medium subangular quartz grits and small mica flakes in a fine grained sandy matrix. From Mounthoolie Lane, 110, are two unstratified jug rimsherds and three bodysherds. One rim is upright and externally thickened with lustrous light green internal and external glaze, flaking in places. The other is slightly inverted and has light green internal glaze. Two of the bodysherds are glazed green externally. From 58 Albert Street, 103 and 108, there are three bodysherds, two externally and one internally glazed green.

Fabric type IVB is very similar but contains an abundance of small quartz grits. All the sherds are from Mounthoolie Lane, one basal angle and four bodysherds from 106 and a bodysherd each from 107 and 111.

The basal angle is from a small vessel, with a foot ring approximately 70 mm in diameter and is largely reduced grey with green glazed orange-buff external surfaces. Five of the bodysherds are externally glazed green and are probably from jugs; the other is internally glazed and probably from a bowl. Three bodysherds from Mounthoolie Lane, 110, are in a coarsely made variation of this fabric which has medium to large grey-brown earthen inclusions along with the quartz and mica. They are externally glazed green and are probably from jugs.

Another similar variation from Mounthoolie Lane, 110, is represented by a rim and basal angle sherd from a shallow flat-bottomed dish with vertical sides. Its fabric is hard and grey with an overall green glaze, and some sooting on the external surfaces. Inclusions are abundant small to medium subangular quartz grits, moderate small to medium dark brown ferruginous inclusions and occasional large dark grey-brown mineral grits (up to 5 mm across).

Group V – European wares

VA – N European Earthenware (fig 8, nos 19–33). A total of 106 sherds in this ware were recovered from the four sites. Examples have previously been found in other places, particularly during excavations in Scalloway (Hall and Lindsay pers comm), and they will be discussed in the report on that site.

No complete profiles could be reconstructed but from the separate rims, handles and legs recovered it seems that most of the sherds are from well-made pipkins with round bottoms and tubular handles. The rim diameters vary from 100 to 170 mm. The only definite exception to this was a basal angle from a flat-based bowl. The pipkin form was common throughout NW Europe and England from the 16th century onwards but is not thought to have been produced in Scotland. It is not known from which country these vessels originated but the most probable candidates are the Netherlands or Germany.

The sherds are thin and their fabric is hard, sandy and orange-red in colour, sometimes partly reduced to a brown-grey. Inclusions consist of abundant small to medium subangular quartz grits, occasional small mica flakes and occasional small to medium, brown to grey-brown, ferruginous grains, all in a fine-grained sandy matrix. Variations exist from sherd to sherd: the sand particles of the matrix are sometimes larger and the quartz grits fewer and larger. The vessels are normally internally glazed pale green or brown-green, often with dark brown speckling. One body fragment has both internal and external glaze and one has only external glaze. The glaze on several sherds has been overfired to a very dark brown, almost black colour, and most of the sherds are blackened and sooted on their external surfaces.

A variety of rim forms is present, most of which can be classified according to the typology suggested by Lindsay (pers comm). There are five examples of the type 1 rim, upright with two or three external grooves (nos 24–27). In Scalloway these were thought not to come into use until the 18th century. The examples from Kirkwall are from 57 Albert Street, 103, and Gunn's Close, 103, 302 and 901. Nine examples of the type 2 rim form are present. These are simple and everted with what appears to be vestigial internal lid seating and in some cases a single external groove (nos 28 and 29). These came from Mounthoolie Lane, 106 and 107; 57 Albert Street, 103 and 111, and Gunn's Close, 102, 103 and 104. The rim from Mounthoolie Lane, 107, has paler than usual internal glaze and part of a strap handle attached directly to the top of the rim (not illustrated). The type 2 rims from Scalloway are thought to date to the 17th century or earlier.

Two type 3 rimsherds were recovered, both slightly everted and one with a single groove and a cordon at the neck (no 30). This type was thought to date to the 17th century or earlier in Scalloway; the two Kirkwall examples came from Gunn's Close, 302 and 901. Two type 5 rims came from Mounthoolie Lane, 106. These are inverted with a single external cordon (nos 31 and 32) but, unlike the Scalloway standard form, they do not have any external grooves. An untypical rim form from Mounthoolie Lane, 116, is upright with slight external thickening and has a rod handle attached directly to the upper surface with pinching close to the junction (no 33). This type of pinched handle is often associated with Dutch pipkins and has also been found in Germany.

Apart from the above mentioned strap handle and rod handle, there are four examples of tubular pipkin handles. Part of one from Gunn's Close, 129, is attached to an internally green glazed bodysherd with external rilling and a single thumb impression on each side of the top of the junction. One unglazed, featureless fragment came from Mounthoolie Lane, 107, and two examples from Gunn's Close have decorative terminals which give a distinctly phallic appearance. One is from 902 (no 19) and the other is unstratified (no 20). Four complete and two partial pipkin legs are present, all from Gunn's Close. The complete examples can be divided into two similar types, both pulled and conical in form with trimmed ends. The first type (no 21) has had its foot trimmed by three cuts to a wedge shape and appears to have rested on the angle between cut faces rather than one of the faces themselves. These came from 103 and 804. The second type (no 22) has had its foot trimmed with a single cut and the slightly curved leg has rested on the flat surface thus produced. These types came from Gunn's Close, 904 and 308. The type 1 legs have broken off at the point of attachment whereas the type 2 are ones still attached to internally green-glazed bodysherds. One of the two fragmentary sherds is unusually large, with a diameter at the junction of c 40 mm.

The only sherd which is definitely not from a pipkin-type vessel is a basal-angle sherd from Gunn's Close, 102, which appears to be from a small open bowl with a foot ring (no 23). This has brown-green glaze with dark brown speckling on the interior and basal surfaces.

A rim and upper bodysherd from 57 Albert Street, 103, is in a slightly reduced grey-brown sandy fabric and appears to be from a pipkin or similar vessel with a form similar to the type 5 rim. The upper body is inturned with slight eversion at the rim and a substantial (6 mm wide) horizontal ridge c 20 mm down from the top. It has crazed pale green internal glaze and external sooting. This may be related to the other material in this group or may be only a similar type with different provenance.

It is apparent from the external blackening on most of the sherds that the pipkins in this group were used as cooking pots, probably as well as functioning as tableware.

VB – Beauvais Sgraffito (fig 9, no 35). A dish rimsherd from Mounthoolie Lane, 106, has been identified as Beauvais Sgraffito probably dating from the 16th or early 17th century. Its fabric is fine, medium hard and white with moderate to abundant small subangular quartz grits some of which are clear and some of which are red in colour. The internal surface is covered with a red then a white slip. The sgraffito decoration is cut through to the body fabric in the case of the two circumference lines, or to the red slip in the case of the inner decorative lines. A clear glaze with some greenish staining covers the whole internal surface. The external surface appears to have been wiped and has some traces of glaze.

Two body fragments from the same context are in a white fabric which is similar but contains occasional large mica flakes. Both have green internal glaze and one has the same glaze on its exterior.

VC (fig 8, no 7). A rim and shoulder sherd from a large jar was sent for identification by Dr Richard Hodges; it has not been possible to identify the source but it may be Danish or N German, dating to the 13th century or later. The sherd came from 57 Albert Street, 126. The fabric is grey-pink, medium hard and sandy with abundant small to medium subangular quartz grits and moderate to abundant mica flakes.

External linear notched decoration is present round the rim and on ridges on the shoulder. The external surface is partly blackened by burning.

VD – Valencian lustreware (not illustrated). An abraded basal-angle sherd from Gunn's Close, 808, has been tentatively identified as Valencian lustreware. It has a foot ring and is covered with lustrous grey-white glaze, dark on the interior and light on the exterior. The fabric is off-white and contains a moderate quantity of medium subangular quartz grits, occasional black and brown ferruginous grains and very occasional small mica flakes, all in a sandy matrix. A spindle whorl from Gunn's Close, 802, appears to have been made from a sherd in the same fabric with badly flaking glaze.

VE – French (fig 9, no 36). A grooved strap handle attached to part of the rim of a narrow mouthed jug came from Gunn's Close, 306. The form is a Loire type probably dating from the 16th or 17th century but this particular sherd has not been definitely identified as originating from that area. The fabric is pale buff-grey coloured with traces of yellow-brown glaze. Inclusions present are abundant to medium subangular and occasional large rounded quartz grits and occasional to moderate small to medium ferruginous lumps, all in a fine grained sandy matrix (cf Gaskell Brown 1979, 73).

VF – Weser slipware. Four sherds from Gunn's Close, 103, have been identified as Weser slipware. Two are fragments of 'hammer-headed' plate rims with a thin white slip and, in one case, two lines of brown trailed slip decoration covered with clear glaze, giving a yellow ground. The other two are fragments of reshaped sherds, both of which have rounded edges and one of which has a hole in the middle. The trailed slip decoration over the white slip on one side is brown and green under a clear glaze and the other side is unglazed. The fabric is smooth and sandy with abundant small quartz grits and occasional to moderate small red earthen inclusions. Three fragments in similar fabrics came from the same context. Two are bodysherds and one is a basal angle sherd, either from a tiny vessel (24 mm in diameter) or the top of a tubular handle, or part of a leg from an unidentified vessel. It has internal and external yellow-brown glaze.

Weser slipware was manufactured from the late 16th century to the middle of the 17th century with some continuation to the middle of the 18th century. For a time it seems to have been one of the most important German ceramics for export (G Stephan, quoted by Clark in Gaskell Brown 1979, 40) and has been found on sites in England as well as at Scalloway (Hall & Lindsay pers comm).

Group VI – Miscellaneous (fig 9, no 34)

As well those which have been categorized, a number of apparently medieval and post-medieval sherds of unknown date and provenance were recovered. Most of these are fragmentary, abraded and, in several cases, burnt so identification is not possible.

One sherd from a thick delftware dish came from Gunn's Close, 809. This has white glaze which is scorched to brown on the undersurface and blue painted decoration on its upper surface. The fabric is white and sandy and contains large pieces of red-brown grog (up to 10 mm across) which in turn contain large sandstone grits. This probably dates to the 17th or 18th centuries and could be British in origin although no precise parallels have been found.

A rimsherd from another sort of dish came from Gunn's Close, 802. It is an orange-pink hard fabric with an orange slip and trailed yellow slip decoration on the upper rim surface with a clear glaze over all. This is probably an 18th- or 19th-century piece and it has been suggested that it may be Dutch. A thin body fragment with oval-sectioned handle attached, from 57 Albert Street, 129, is from a small jug or cup with brown internal and external glaze and external trailed slip decoration. The fabric is hard, red and sandy. A similar bodysherd, also with external trailed slip but in a finer fabric, came from 57 Albert Street, 127.

Group VII – Stonewares (fig 9, nos 37–44)

Thirty-nine sherds of stoneware were recovered, most of them German in origin. All were examined by John Hurst and his identification and dating are summarized below.

Four sherds of Siegburg ware came from the washed dump and beach levels of Mounthoolie Lane. Three of these are bodysherds and one is a carinated body and rimsherd from a drinking bowl (no 37). All date to the 15th and 16th centuries.

Eight sherds of Raeren ware are present. Five undecorated bodysherds from Mounthoolie Lane, 126, one from 57 Albert Street, 124, and one from Gunn's Close, 902, all date to the early 16th century. A bodysherd from a fine decorated panel jug with brown-orange external glaze came from Tankerness House, 111, and dates to the late 16th century (no 40).

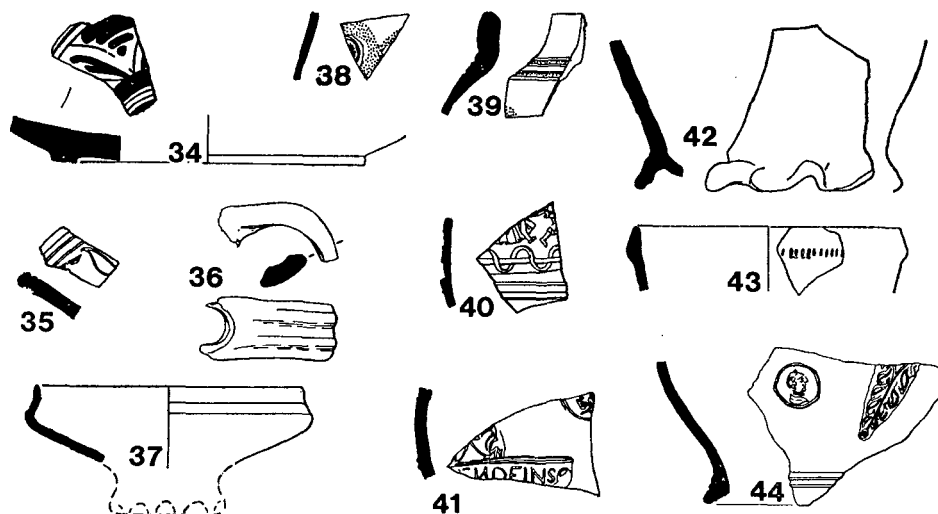


FIG 9 Kirkwall: pottery nos 34-44 (scale 1:4). 34, Group VI - Delftware, Gunn's Close, 809. 35, Group VB - Beauvais, Gunn's Close 106. 36, Group VE - Loire type, Gunn's Close, 306. 37, Group VII - Siegburg Stoneware, Mounthoolie Lane, 124. 38, Group VII - Westerwald stoneware, Mounthoolie Lane, 107. 39, Group VII - Westerwald stoneware, Gunn's Close, 805. 40, Group VII - Raeren stoneware, Tankerness House, 111. 41, Group VII - Frechen stoneware, Tankerness House, 111. 42, Group VII - Langerwehe stoneware, 57 Albert Street, 150. 43, Group VII - Langerwehe stoneware, Mounthoolie Lane, 120. 44, Group VII - Frechen stoneware, Tankerness House, 111.

There are 15 sherds of Langerwehe stoneware present, all but one from Mounthoolie Lane. These are 15th- to 16th-century in date with the exception of a rimsherd from Mounthoolie Lane, 120 (no 43), which dates from the 14th or 15th century. A frilled basal angle sherd from 57 Albert Street, 150, also dates from the 15th or 16th century (no 42).

Two sherds of Westerwald chamber pots were recovered, a rim fragment from Gunn's Close, 805 (no 39), and a bodysherd (no 38) from Mounthoolie Lane, 107. The rim dates from the early to middle 18th century and the bodysherd from the middle of the 18th century.

Four sherds of Frechen Bellarmine are present. One, from Mounthoolie Lane, 104, dates to the 17th century; one from Gunn's Close, 804, dates to the late 16th or 17th century; and two from 57 Albert Street, 103 and 147, date to the 16th or 17th century. Two decorated coarse Frechen bodysherds (nos 41 and 44) came from Tankerness House, 111, and date to the late 16th century.

A bodysherd from Gunn's Close, 809, was identified as type II Martincamp Flask dating from the 16th century and half of an ink bottle from Gunn's Close, 102, is English and 18th- or 19th-century in date.

Group VIII - Modern wares

Substantial quantities of modern ceramic material were found in the upper layers of the sites. Most of this dated from the late 19th or early 20th century. Notable types which were present include Scottish tin-glazed and salt-glazed wares, the latter possibly dating as early as the 17th century, Staffordshire type slipwares dating from the 18th or 19th century, and fragments of bone china and Chinese porcelain.

Conclusions

The earliest material present, judging by form and method of manufacture, is probably the grass-tempered ware. This could have been made locally or may have been imported from N Scotland. From the quantities recovered it is possible that it was in use before the 12th or 13th century but the complete lack of accurate dating means that it could equally have started much later, like craggan ware, and continued well into the post-medieval period.

In the 13th and 14th centuries the pottery seems to have consisted of imports from Scotland, with some English material also present, giving a picture of ceramic use similar to that in medieval Scottish burghs such as Perth, Inverness and Aberdeen. A small number of 13th- or 14th-century Scarborough ware sherds, including some from an aquamanile, is the main dating for a group of well-stratified material from Tankerness House. This is the only group which is reasonably securely dated to the medieval period. Scottish wares appear to have continued to be imported throughout the medieval and post-medieval periods.

From the 14th or 15th century to the 17th century, Rhineland stonewares were imported in some quantity: Langerwehe, Siegburg, Raeren, and Frechen Bellarmine. These were joined from the 16th century, at the latest, by French wares – Beauvais Sgraffito, a type II Martincamp flask and a Loire-type jug – and German Weser slipware.

However, the dominant pottery of this period, both in tableware and kitchenware, appears to have been the North European Earthenware, of Dutch inspiration or manufacture, which is largely present in the form of handled tripod pipkins. This was probably introduced into Kirkwall in the 16th century, as it was not found in the beaches of Mounthoolie Lane or, apart from one undated sherd in a variant fabric, in the midden of 57 Albert Street but thereafter was present in most contexts. Very little German stoneware of post-16th century date was present so it is possible that not much was imported after this date.

From the 18th century onwards, imports from a large number of different sources are present including Scottish tin- and salt-glazed wares, slipwares of probable English origin, delftware and Chinese porcelain, reflecting a general expansion of production and trade in ceramics.

THE LEATHER (fig 10)

Clare Thomas

The leather consisted of shoes, a knife sheath, a few straps and waste material. The shoes were very worn; only a few of the soles were complete enough to show their shape, and only part of one upper could be reconstructed. Thread survived on five fragments from Gunn's Close; this has been identified as linen by Mrs Helen Bennett of the National Museum of Antiquities of Scotland. The full catalogue of leather fragments has been deposited in the National Monuments Record.

Shoes

Two types of shoe construction, turnshoe and welted, appear to be present, although the evidence for turnshoes is not definite as the fragments are so worn. Turnshoes are so called because they are made inside out, usually with the flesh, or inner surface, of the leather facing outwards, and the grain side, or outer surface, facing inwards. They consist of an upper, and a single sole which acts as both outer sole and insole. The lasting margin or lower edge of the upper is pierced with oval grain to flesh holes, usually c 1.5 mm by 3 mm, and from 4 to 7 mm apart; the thread passes through these holes, then into the edge of the sole and out on the flesh side. The holes thus made on the sole are called an edge-flesh stitching channel. The stitch length, or distance between the centres of stitch holes, is usually 4–7 mm. Fragments of upper are joined to each other with a butted edge-flesh seam, invisible on the grain or outer side of the leather. The shoe is then turned inside out; the sole now has the grain surface outwards, or downwards, and the flesh side inwards, or upwards (Thornton 1973, 44–8).

Some turnshoes also include a rand, a strip of leather, usually wedge-shaped but sometimes flat, with a grain to flesh stitching channel; the rand was placed between sole and upper, to strengthen the seam and make it more watertight. One authority on shoe construction suggested that rands were a 14th-century innovation (Thornton 1973, 9–11) but at Perth they date from the 12th century (Thomas, forthcoming). A rand could also have an extra sole added to it, either for repair or to provide a more substantial shoe. At some stage, probably towards the beginning of the 16th century, it was discovered that if the rand was stitched to the outside of the upper and insole, and not placed between them, the finished shoe did not have to be turned, which made manufacture much simpler. The rand was then called a welt (Thornton 1973, 11 and 48).

Welted shoe construction takes place in three stages. Firstly, the upper is shaped to the last, stitched together and held in position with nails or bracing thread. Then the lasted margin is sewn, together with the welt, to the insole. In early welted shoes the insole was pierced with an edge-flesh stitching channel; later ones used a slight rib set in a short distance from the edge, on the underside of the insole. Thirdly,

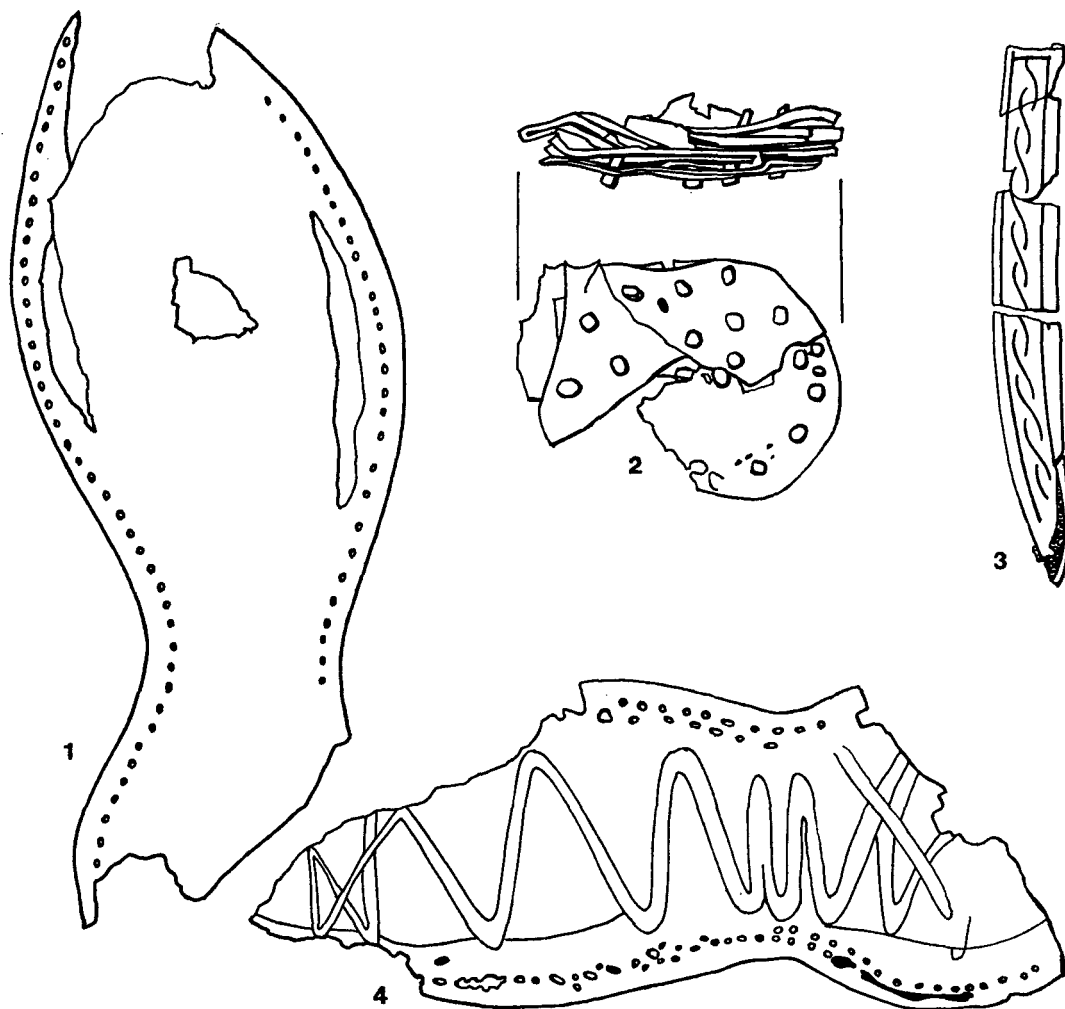


FIG 10 Kirkwall leather (scale 1:2). 1, Weltped right outer sole; D1012, Gunn's Close, 104. 2, Heel or top-piece of weltped sole; D1123, Gunn's Close, 814. 3, Knife sheath; D1027, Mounthoolie Lane, 120. 4, Weltped outer sole fragment; D1083, Gunn's Close, 306.

the outer sole was attached to the outer part of the welt, with the thread passing through grain to flesh holes in both sole and welt (Thornton 1973, 48).

The two methods of shoe construction thus produce three different soles. Weltped outer soles are quite distinct, as they have grain to flesh stitching channels. Turnshoe soles and early weltped insoles, on the other hand, are fairly similar, as both have an edge-flesh stitching channel. However, there are usually two important differences. Turnshoe soles have a tight stitch length of 4-7 mm, weltped insoles a coarser one of 7-10 mm. A turnshoe sole has the flesh side up, with impressions from the foot on that side, and with wear on the grain side from contact with the ground. A weltped insole has the grain side up, with marks from the foot; the flesh side does not usually show signs of wear comparable to those on the grain side of turnshoe soles, as it has an outer sole between it and the ground (Thornton 1973, 8-12). Despite these differences it is not always easy to decide whether the Kirkwall fragments are turnshoe soles or weltped insoles. Some examples are so worn that it is now impossible to decide which side was originally uppermost. Others appear to have the flesh side up, but have long stitch lengths. In the dis-

cussion which follows these soles are considered and compared with the other artefacts from the same context.

The child's shoe from 57 Albert Street, 136, is extremely worn; fragments of sole and upper survive but there is no evidence for welts or for a welted outer sole. None of the other leather from this site suggests the use of welted construction. Accordingly, it is most probably a turnshoe. This is consistent with a 15th- to 16th-century date.

One fragment of a sole from Mounthoolie Lane, 124, is almost certainly a turnshoe; it has an edge-flesh stitching channel with a short stitch length of 6 mm, and it has the flesh side up. A second piece from 129 also has an edge-flesh stitching channel with a stitch length of 6 mm but it is delaminated, and it is not possible to determine whether the flesh side was uppermost or not. A third fragment from 124 with edge-flesh stitching channel, however, has a much larger stitch length, 11 mm, which would be very unusual in a turnshoe. It could be a welted insole. This fragment came from material dumped on the beach at Mounthoolie Lane during the 16th century. Thornton suggests that welted shoes were an early 16th-century innovation in England (Thornton 1973, 11). The only other published Scottish welted shoe, from Skirling Castle, Peeblesshire, dates to the mid-16th century (Dunbar 1963, 244). There is no other evidence for welted construction at Mounthoolie Lane. The large fragment of upper of boot with side lacing is broadly similar to a type from Perth found in 13th- and 14th-century layers (Thomas, forthcoming). This does not exclude the possibility of later examples of this type, as the stratified layers at Perth High Street do not extend beyond the mid-14th century (Bogdan, forthcoming).

Most of the shoes from Gunn's Close were definitely of welted construction. Several fragments of welts survive, with two parallel stitching channels of grain to flesh holes; a few also have a row of tunnel stitching on the flesh side, between the other two channels. The purpose of this third row is not clear. The outer soles have stitching channels of grain to flesh holes, stitch length c 6–10 mm. Some of these soles have two parallel stitching channels; the function of the second channel is not evident. Most of these soles have holes for nails, and, in some cases, wooden pegs or nails survive. Separate heels or top pieces were attached to the soles by such pegs. Soles with wooden pegs are a later innovation; they first occur in Trench 5, in layers dating to the 17th, 18th and early 19th centuries.

Four fragments (Trench 2, 306; Trench 5, 814, 813 and 808) might possibly be turnshoe soles. All have edge-flesh stitching channels and the flesh side up. The three examples from Trench 5 have stitch lengths of 6, 7 and 8 mm which are slightly long for turnshoes; the fragment from 306 (fig 10, no 4) has a stitch length of 11 mm, which is exceptionally long. The presence of many fragments of welted shoes in the same layers (of 17th- to 19th-century date) suggests that these are either residual – rubbish from earlier periods – or else welted insoles. The latter usually have the grain side uppermost but a local idiosyncrasy is quite possible. The long stitch lengths are more in keeping with welted construction. Furthermore, there is no suggestion of turnshoes in Trench 1, which is earlier (later 16th to early 17th centuries).

Straps, sheath and waste material

The leather from Mounthoolie Lane also included a strap, a knife sheath and nine offcuts. The strap, from 123, formed of a strip of leather folded once, could have been a top band for a shoe or a binding for clothing. Similar straps are common among medieval leather assemblages, as, for instance, at Perth (Thomas, forthcoming). Four other fragments from 124, with oversewn edges, may also have been straps. The knife sheath from 120 (fig 10, no 3) is broadly similar in construction and decoration to others of 13th- to 15th-century date from Perth (*ibid*) or, for example, York (Richardson 1959, 105–6).

Two straps were found at 57 Albert Street, 150, as well as five offcuts from other layers. One strap had been folded once, and was probably also a binding. The second strap had been folded twice and stitched up the middle of the reverse; parallels exist elsewhere, for instance, at Perth (*ibid*).

The leather from Gunn's Close included many offcuts and two thongs knotted together, but no straps. Trench 1 contained 31 offcuts, Trench 2, 32 and Trench 5, 135; many more than were found at either Mounthoolie Lane or 57 Albert Street, although the quantities of offcuts are negligible compared, for instance with those found in individual features at Perth High Street (*ibid*).

Conclusion

The leather from the three sites provides a reflection of leatherworking in Kirkwall from the 15th century to the early 19th century. The range of items; shoes, straps, sheaths, waste material and miscellaneous fragments, can be paralleled at many sites in Scotland and England, for example at Perth (Thomas,

forthcoming) and King's Lynn (Carter & Clarke 1977, 349–66). The methods of shoe construction – turnshoe and welted – are the same as on the mainland, with welted construction being introduced at approximately the same time, in the 16th century. The introduction of wooden pegs appears in the 17th or 18th century, either as a method of construction or for the purposes of repair.

The material is extremely worn, possibly more so than comparable material from the mainland, for example, Perth (Thomas, forthcoming). This suggests that leather was scarce and that it was used and re-used for as long as possible. The leather is so worn that it is difficult to judge the degree of skill of the craftsmen. The relatively early introduction of welted constructions does suggest that they were not very conservative.

Catalogue of illustrated material (fig 10)

- 1 Worn and cracked fragment of welted right outer sole with stitching channel of grain to flesh holes, stitch length 5 mm. Forepart gently curved, with narrow rounded toe. Surviving length 235 mm, maximum width 103 mm, width of waist 50 mm. Thickness 3–5 mm. (D1012, Gunn's Close, 104).
- 2 Delaminated fragment of heel or top-piece of welted sole, composed of several layers of leather, and with wooden pegs for attachment to sole (D1123, Gunn's Close, 814).
- 3 Four fragments of exceedingly narrow decorated knife sheath formed by folding one piece of leather twice; edges stitched together up centre of reverse with butted grain to edge seam, stitch length not measurable. Decorated on front with simple curvilinear design. Very worn and fragile. Maximum width c 20 mm (D1027, Mounthoolie Lane, 120).
- 4 Fragment of welted outer sole with two parallel stitching channels of grain to flesh holes, stitch length 5 mm. Grain surface marked by criss-cross lines, caused by bracing to last. Linen thread survives in some holes. Very worn. Thickness 4.5 mm (D1083, Gunn's Close, 306).

THE WOOD

R McCullagh

Wood was preserved by waterlogging in the lower levels at Mounthoolie Lane, 57 Albert Street and Gunn's Close. This report describes the wood from the best preserved of these deposits, the 15th- to 16th-century midden layers (136, 140, 148–50) behind the sea wall at 57 Albert Street. A detailed catalogue of the wood debris has been deposited in the National Monuments Record.

The sample consisted of 137 fragments which were examined by thin-sectioning, identified as to species and described and found to consist mainly of worked fragments within which types of working are clearly defined. There was a clear demarcation between debris from general wood working and that produced by structural timbers or components of structures. Vessel components are listed separately as their function and form are related unambiguously. 'Primary' debris covers those offcuts produced in the initial stages of carpentry. It would include falling and squaring waste distinguished by retaining bark or waney edge (the curved outermost circumference of the timber). There is a correlation between kerfs (blade scars on the wood) produced by an axe and primary offcuts. The removal of the offcut has been by incision split and tear of wood tissue by a broad blade. Small shallow kerfs with no sign of tearing occur on 'secondary offcuts' and denote more advanced or refined carpentry.

Species

Pinus silvestris (Scots pine) and *Quercus* sp (oak) are the most abundant, accounting for 68% of the sample; *Salix* sp (willow), *Betula* sp (birch) and *Corylus avellana* (hazel) together account for a further 25%. From the pollen record (Keatinge & Dixon 1979) and modern tree cover, it is clear that a birch-hazel to willow-scrub is indigenous to Orkney. The finds of these species on site are either offcuts or section of round wood of small diameter (c 50 mm) which will occur regularly in such scrub-forest. Oak is not well represented in the unprocessed form and it seems likely that most represent imports on to site. The high frequency of primary debris of pine does suggest some local felling, although it may merely represent the initial work on imported logs. The remaining species (*Cretagus* sp (hawthorn), *Picea abies* (common spruce), *Alnus* sp (alder) and *Fraxinus excelsior* (ash)) occur as a minor component, all the pieces are worked and represent imported products.

Artefacts

Because of the small nature of the sample, it is wrong to seek significance in the differing frequency from layer to layer. There is however clear correlation between the type of wood of each species and its usage.

Within the wood-working debris the five main species are all represented by primary offcuts. Whereas pine and oak display high frequencies of secondary offcuts, indicating more refined carpentry, willow, birch and hazel are represented by simple adaptations of their natural form. Whether coppiced or unmanaged these species produce straight lengths of round wood. On site they occur as rods, pegs and wood nails of small diameter (average c 50 mm). It appears that oak was less abundant in the raw state and was frequently re-used; the offcuts were mostly from already dressed timber, and in such timber the finishing was taken to an advanced state. In general pine shows a more generalized use with only rare examples of refinement.

Of the pieces where shape has been governed by function, structural timbers comprise the largest group. The number of board and slating fragments was low (13) and this group covers a variety of forms from fragments of small plank to panels and small beam fragments. No massive timbers such as ship or house components were found. Four pieces have peg holes, two of which retained pegs (two of *Corylus* and one of *Betula*) in the holes. In none of these pieces could a definite function be attributed, but all except one had holes of similar diameter (15 mm). The holes were probably produced by auger but no clear tool marks were seen. One piece had split along an alignment of four small holes: each was discoloured by rust and was, presumably, a nail hole. Other pieces include: a possible fragment of panel, fragments of slating and battens which displayed both crude and fine, possible planed, finishes. Most were damaged and all were incomplete and while in some cases damage must have occurred in use, others had clearly been recut and broken deliberately.

The most abundant types of artefact were pegs and wood nails, pegs being parallel-sided and used as elements of joints or structures, whereas wood nails are tapered and include wedge-forms and pins. Both pegs and wood nails occur with round and square sections. The pegs almost all have a diameter of 15 mm: the holes in some structural timbers match this dimension. Three pegs were found within such timbers. The wood nails were made from all the main species except *Betula* and, except for the wedge forms, were mostly produced from round wood. Several of the wood-nails were fine slender pins. The pegs were all damaged and probably owe their deposition to the dismantling or decay of the structures they pegged together. Many of the wood nails were scorched at the ends but appeared unused. It is unlikely that this was deliberate as the main attribute of a pegged joint is its flexibility, which could, perhaps, be reduced if the pegs were made brittle by burning.

The most clearly defined functional group, vessel components, contained only five pieces. Of these one was an oak lid, two were staves of oak and two were fragments of the same wooden bowl. The bowl was made from hawthorn (*Cretagus* sp) and the two fragments were from the rim and body of the bowl. It would have been about 80 mm in diameter, and was decorated on the interior by a turned groove. The rim was very badly worn.

Of the pieces classed as miscellaneous, most were unidentifiable lumps of woody tissue, but three deserve mention. One is a crudely fashioned and perforated disc, perforated near its centre and used perhaps as a washer or float. The second is a rod of pine tapered at both ends which closely resembles a 'tip-cat' used in a children's street game and common from dynastic Egypt to the present day. The third is a bound bundle (or bavin OED) of stems. Both the stems and the twisted binding were of willow (*Salix* sp) and were cut at one year old. The stems were in bud so cutting occurred in late winter or early spring (J Barber, pers comm).

Technology

The evidence for the tool kit is slight. The drilled holes in the laths and staves must have been made with an auger. The primary offcuts showed evidence of high-powered impact producing a convex face to the chip, and probably caused by an axe. Other surfaces of timber show no signs of splitting or tearing the tissues being cut only. This is reflected by the shallow convex faces of secondary chips, and results from the application of a controlled blade such as block knife, chisel or shaver. A knife blade is suggested by the whittled wood-nails and pins. The use of a plane or saw is suggested by the flat, level, facets with no individual cutting scars visible.

Conclusions

The assemblage is a product of wood working but does not record a single process nor a regular phase in any process: it is an amalgam of all processes and must therefore be seen as the wood component

of a waste or litter dump. The archaeological layers have accumulated the debris of carpentry, the waste of building and products of decay of such structures.

THE STONE OBJECTS (figs 11 and 12)

Lindsay Ross

The majority of the stone objects recovered are residual finds: most obviously residual are finds which are closely paralleled on Viking sites such as Jarlshof. J1037, from 57 Albert Street, resembles toy quernstones from Jarlshof (Curle 1934, 320, fig 57), while J1129 from Mounthoolie Lane may be a baking plate (cf Curle 1934, 318, fig 55). In each case the materials used (steatite and schist) are the same as at Jarlshof. Stone discs (cf J1010 from Mounthoolie Lane, 106) are also common finds at Viking period sites (Curle 1938; Hamilton 1957). However, as they occur in Kirkwall in redeposited contexts they can only suggest that some Viking occupation had been present in the general area.

The architectural fragments are common forms of moulding, and the freestone in which they were carved, the sandstone of the nearby Eday beds, was used locally in the medieval period, at St Magnus cathedral and elsewhere. Two hones were recovered. One, J1024, from Tankerness House, 106, has been tentatively identified as being of Norwegian ragstone. This was a popular material for hones during the medieval period and earlier (Moore & Oakley 1979, 280-3); ragstone was exported widely in Europe and it is not surprising to find it on Orkney.

57 Albert Street

- 1 Broken hemispherical disc with six concentric grooves on its upper surface and two on its lower. Small pointed hole on base; central hole vertically sided; no obvious wear. Too large and heavy to be a spindle whorl; this may be a toy quernstone. Steatite of unknown origin. 68 mm in diameter; 21 mm thick; pierced hole 15 mm in diameter in centre (J1037, 136) (fig 11, no 1).

Tankerness House

- 1 Hone of rectangular cross-section; hone struck as rod and roughly shaped. Point-sharpening grooves on all four faces; one face also bears three small shallow holes. Quartz mica ore schist of uncertain origin. 107 mm by 17 mm by 12 mm (J1024, 106) (fig 11, no 3).
- 2 Architectural fragment of triangular cross-section, broken across base. Top sides flattened and scored with grooves parallel to apex of triangle. Red sandstone of local Eday type. 128 mm by 70 mm by 33 mm (J1051, 122) (fig 12, no 7).
- 3 Irregular block with one chisel mark and other peck marks; unused roughout block. Red sandstone of local Eday type. 185 mm by 140 mm by 90 mm (J1052, 131).

Gunn's Close

- 1 Long tapering circular stone with sharpened point; probably used as pencil on slate. Slate of unknown origin. 54 mm long; 4 mm diameter (J1092, 300).
- 2 Broken irregular stone pierced by hole 12 mm in diameter near one end; probably piece of roofing slate. Micaceous grey siltstone of unknown origin. 160 mm by 85 mm by 15 mm (J1136, 808).

Mounthoolie Lane

- 1 Flat ovoid disc; red sandstone of local Eday type. 55 mm by 50 mm by 133 mm (J1010, 106) (fig 11, no 5).
- 2 Fragment of roofing slate; grey micaceous sandstone, local origin. Triangle: edges 142, 157 and 162 mm. 11 mm thick. Pierced hole 14 mm in diameter in centre (J1012, 106).
- 3 Ovoid disc with rounded edges and flaked at one end; flaking may be natural or caused by use as a small pounder; cream feldspathic sandstone? local origin. 62 mm by 58 mm by 18 mm (J1061, 118).
- 4 Hone of tapering rectangular cross-section; worn mainly on base, this forming a depressed curve caused by transverse honing. Grey micaceous siltstone of local origin. 106 mm by 22 mm by 15 mm (J1064, 111) (fig 11, no 4).
- 5 Hemispherical section with flat base; sides smoothed; stone has been fired before being broken;

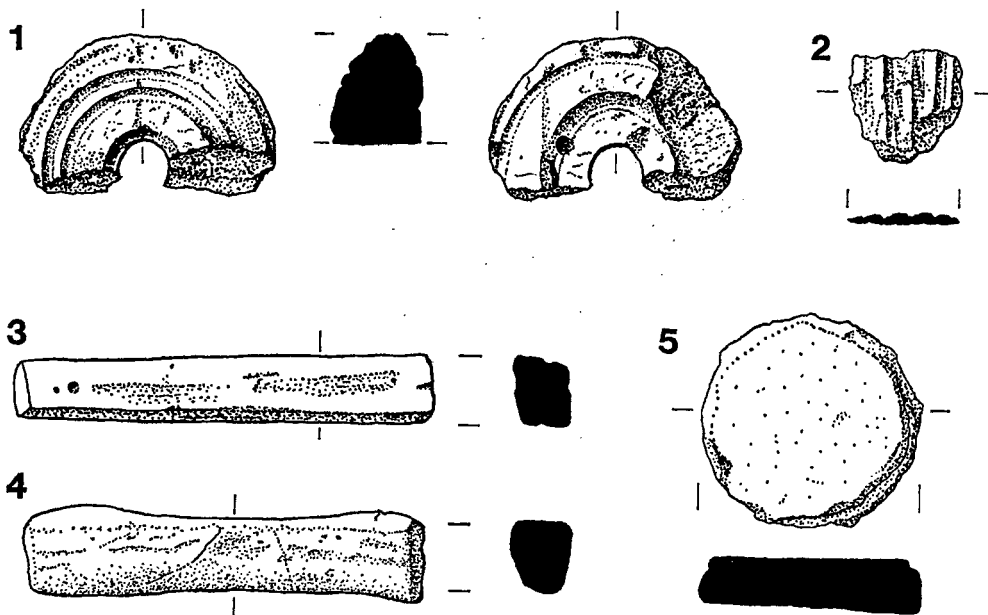


FIG 11 Kirkwall: stone objects (scale 1:2)

shape may be natural; function uncertain. Grey sandstone of local origin. 65 mm by 32 mm by 50 mm (J1084, 124).

- 6 Architectural fragment, sheared on one side; flat top smoothed roughly and scored by shallow grooves. Marking point for arc in centre; part of projecting semi-circular freestone moulding. Red sandstone of local Eday type. Radius 35 mm; 14 mm thick (J1090, 126) (fig 12, no 8).
- 7 Small irregular fragment bearing shallow grooves scored in its surface, all aligned similarly; may be a fragment of a larger slab used as a 'baking plate'. Calc-chlorite-mica schist; origin unknown. 30 mm by 27 mm by 10 mm (J1129, 129) (fig 11, no 2).
- 8 Architectural fragment, probably a column head or base; stone has been burnt. Red sandstone of local Eday type. 182 mm by 85 mm by 60 mm; central depression 70 mm in diameter at base, 23 mm deep (J1117, 126) (fig 12, no 6).

METAL OBJECTS (not illustrated)

Metal was generally poorly preserved on all the sites, and was rare in the well-stratified contexts.

- 1 Button broken at the shank. Five-pointed star within outer ring. Lead, cast as openwork. 30 mm in diameter, 3-4 mm thick. 15th- to early 16th-century (E1074, Mounthoolie Lane, 126).
- 2 Metal strip consisting of three fine layers of pewter. Possibly an industrial offcut. 40 mm by 58 mm by 1-2 mm thick. 15th- to 16th-century (E1033, 57 Albert Street, 148).

THE COINS (not illustrated)

David Caldwell, National Museum of Antiquities of Scotland

Three coins were found, all at 57 Albert Street. Two are common Scottish coins, while Doits are believed to have come into Scotland in quite large quantities in the 17th and early 18th centuries and to have been used unofficially to a limited extent as currency.

All are residual in context, their present poor state is due to corrosion and bad striking rather than excessive wear.

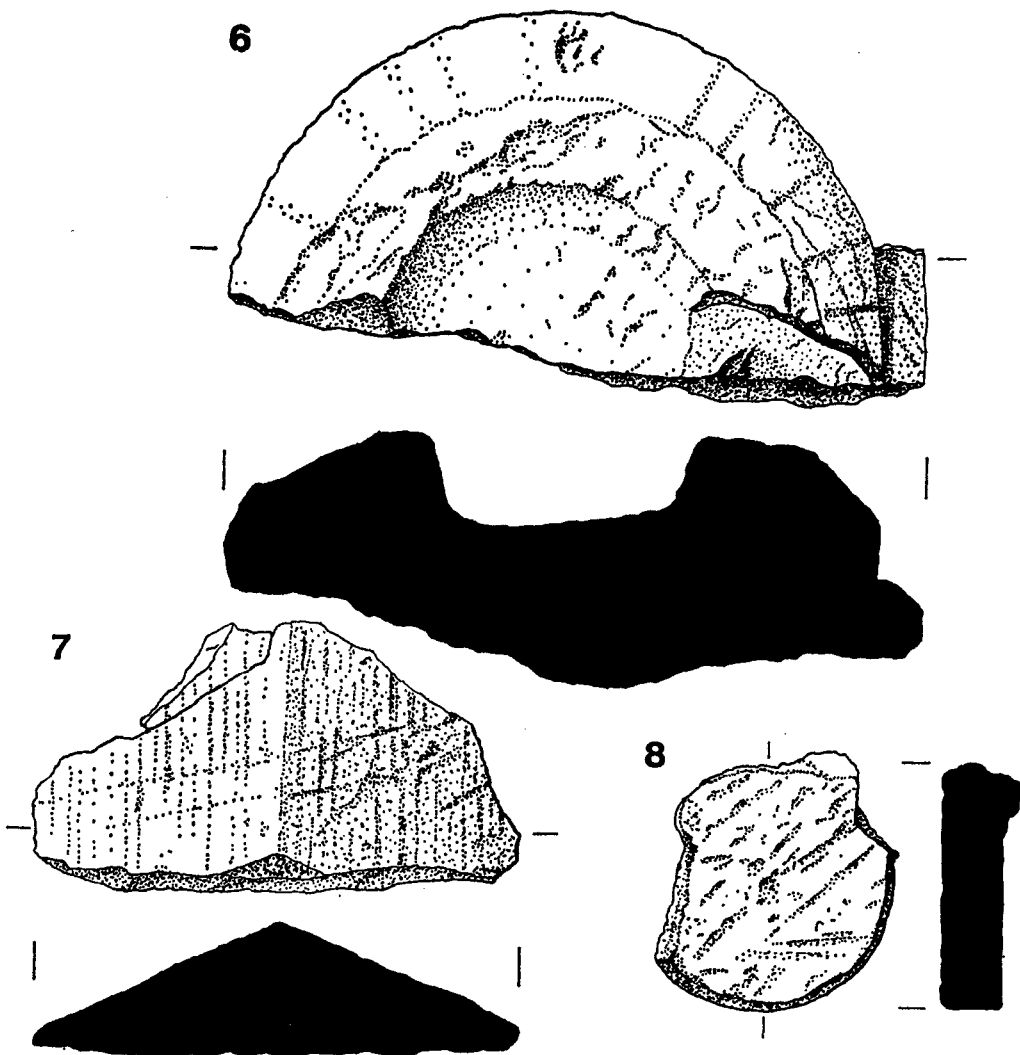


FIG 12 Kirkwall: stone objects (scale 1:2)

- 1 Doit, copper of Batenburg (obv BAT/ENBVR/GVM within wreath; rev crowned shield within wreath) (cf Verkade 1848, 103, no 198, pl 35, fig 5) (E1151, 100).
- 2 Charles I Turner (Scottish 2d), copper, 2nd issue; later type with three lozenges on obverse (E1000, 103).
- 3 Mary Lion or hardhead (Scottish 1½d) billon 1558, countermarked on obverse with heart containing star (in 1572 it was ordered to be used to determine true coins from false). Arched crown on reverse (E1026, 103).

THE GEMSTONES (not illustrated)

David Caldwell

S1031, Mounthoolie Lane, 120

- 1 Polished oval rock crystal cut *en cabochon*, the underside slightly convex. Base 22 mm by 78 mm. Height 11.5 mm.

- 2 Polished elongated oval rock crystal with ridged back. The underside is slightly convex. Base 23 mm by 12 mm. Height 10 mm.

The two gems were found together in a layer deposited in the 16th century.

Although comparatively small these stones are clearly related to the larger crystal balls and gems that have survived in Scotland, set in reliquaries and brooches or kept as charms, especially in the Highlands and Islands. It is not possible to date any of these stones themselves by their cut but some of them may be of great age. The ridged-back crystal set on the crozier head of St Fillan (Stuart 1878, pl V) in the National Museum of Antiquities, Edinburgh (KC 1-2) is presumably at least 14th century in date, when the crozier head was remodelled in its present form. The ridged-back crystal known as the Breadalbane Charmstone (also in the National Museum) is presently incorporated in a silver mounting which dates to the 16th century but family tradition takes it back until at least the 15th century (Taymouth BK, iii), and there are other ridge-back and round crystals in West Highland brooches of the late 15th to 17th centuries (eg NMAS 1958, figs 18 and 19) or incorporated into 16th- to 17th-century silver mountings (eg Galbraith 1929). Possibly many of them originally decorated church furnishings, books or reliquaries. The mountings for these crystals, whether on reliquaries, brooches or pendants, are normally denticulated and four gilt bronze mountings with denticulated sockets for stones were found last century in St Magnus Cathedral, Kirkwall, and are now preserved in the National Museum of Antiquities (KJ 11-14).

BONE OBJECTS

- 1 Vertebra, possibly from a bottle-nosed dolphin or a young pilot whale (identified by M C Sheldrick, British Museum (Natural History)); abraded and pierced with a hole 18 mm in diameter, 180 mm by 180 mm by 25-30 mm thick. Pierced cetacean vertebrae of this sort are said to have been used as household ornaments in Orkney until this century. 15th- to early 16th-century (K1082, Mounthoolie Lane, 124) (fig 13, no 1).
- 2 Two bone strips. 80 mm by 12 mm by 5 mm with saw marks; originally a single strip 160 mm long before being cut. Bevel on the edge of one long side. Blanks or offcuts? 15th- to 16th-century (K1095, 57 Albert Street, 150).

MEDIEVAL PAINTED WINDOW GLASS (fig 13, no 1)

Jill Kerr

N1001, Tankerness House, 102

Fragment of a Jewel Border design 32 mm by 25 mm by 3 mm thick. Originally clear and uncoloured glass. Burial has caused discoloration to yellow opacity. As the surface is unconsolidated, microscopic examination of areas where the surface corrosion has flaked off reveals the centre core of the base glass to be clear. The fragment is now broken into two pieces. All the broken edges show definite evidence of having been broken before burial, a condition compatible with destruction for the removal of the lead. Judging from the depth of the patina these breakages are unlikely to have been as recent as the 19th century. There are no signs of fire crazing. Two of the edges are grozed. The slight remains of a few millimetres of the grozed edges on the other two sides indicate the original shape to have been a rectangle of c 34 mm by 25 mm. The grozing line of the shorter grozed edge to survive has been indicated by a paint line which would have been obscured by the lead when *in situ*. Microscopic examination revealed no discernible lead shadows.

The exterior surface shows no signs of pitting, corrosion or weathering, and indicates that the glass was in good condition before burial. There are no traces of yellow stain or backpainting.

Apart from slight losses, possibly the result of underfiring, the paint is intact and retains the original characteristic brown hue. The paint was applied in a single line 1.9 mm wide, and then the design was picked out of the matt wash before firing. The articulation of the geometric forms is clumsy and inaccurate. The design of a strip alternating squares and oblongs with two circles in between placed within side lines is a common convention to indicate jewels. The original function may have been as a decorative border to drapery or even the jewelled base of a crown. The scale is not comparable with a function as a panel border.

The fragment probably dates from the 15th century. It was recovered as a residual find from a 19th century layer.

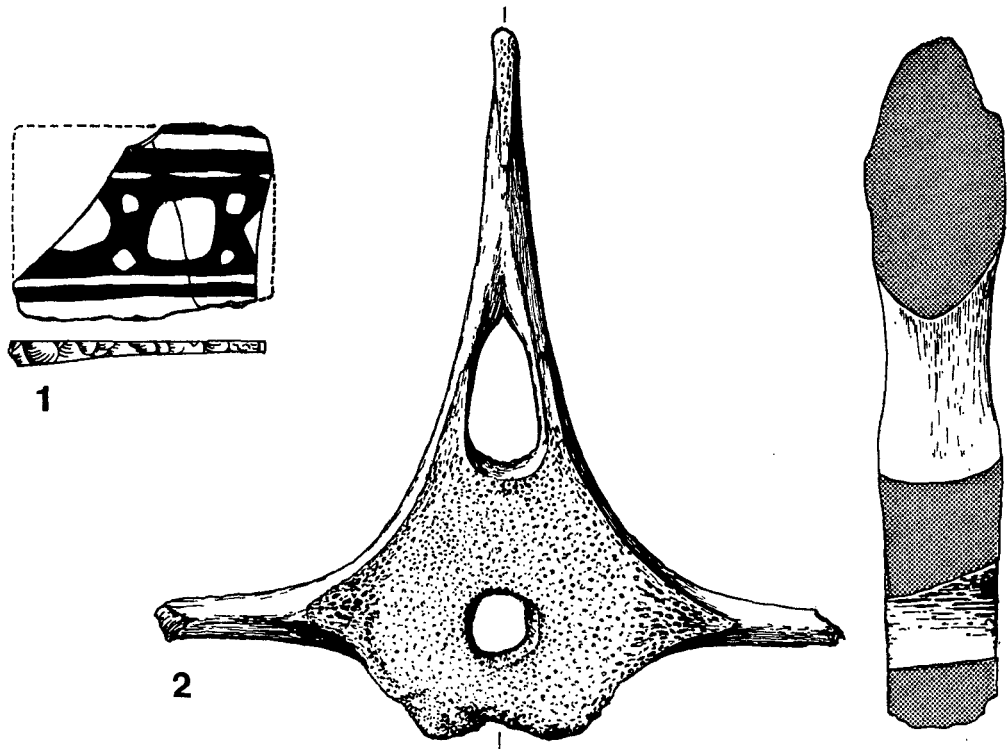


FIG 13 Kirkwall: stained glass (scale 1:1); bone object (scale 1:2)

CLAY PIPES

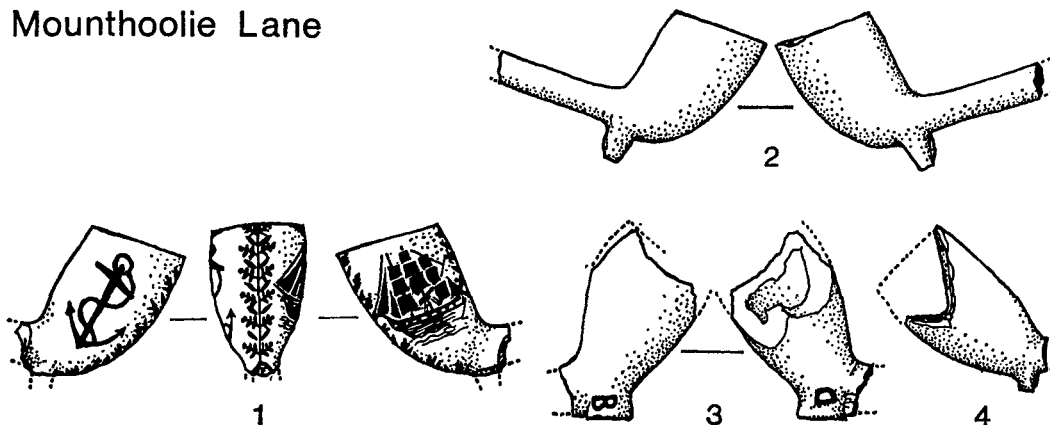
David Caldwell

Over 100 fragments of clay pipes from the excavations were examined, including 28 complete or substantial pieces of bowl. All are residual in topsoil deposits or unstratified, apart from bowl 23 from 809 in Trench 5 at Gunn's Close, dated on other grounds to the 17th to 18th century. The fabric of all the pieces was inspected under a microscope at $\times 10$ magnification and some attempt made to distinguish different types. The descriptions given here, however, must be considered provisional until much more work is done on Scottish material.

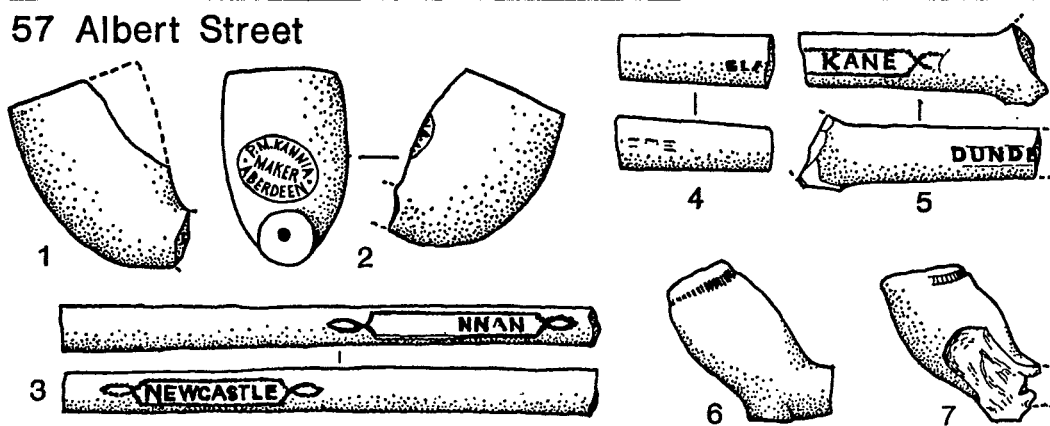
There are two main groups of 17th-century bowls. First, five (57 Albert Street, no 6, and Gunn's Close, nos 13, 22, 25 and 28) which are thought to be Dutch, and with them can be associated a further seven pieces of stem with bores from 2.5 to 3.2 mm. Their fabric (for convenience called here fabric A – cf Davey 1980, 47) is soft white and inclusion free, normally reduced grey inside and sometimes fire blackened on the surface. Two of the bowls (Gunn's Close, nos 13 and 22) have typical debased rose designs. The most complete is similar to one from Stirling Castle (Davey 1980, no 2) and probably dates to the second quarter of the 17th century. It is thus one of the earliest pipes in the group.

Secondly, there is a group of five bowls (Gunn's Close, nos 11, 15, 16, 24 and 27) datable to the mid-17th century, one of which has a mark, PC, for an Edinburgh maker. Their shape seems to be typically Scottish. About half the stem fragments, with bores from 2.5 to 3 mm, have a similar fabric which is hard with sparse inclusions of quartz, voids and/or haematite concentrations. It will no doubt be possible once further work is done to subdivide this group but at present they have all been called fabric C (cf Davey 1980, 47). Other supposed Scottish pipes have similar fabrics, but two late 17th or early 18th-century bowls marked DB, apparently an Edinburgh maker, have soft fabrics, one with numerous quartz inclusions. Two other 17th-century bowls appear to be English. One, Gunn's Close, no 21, unlike all 17th-century Scottish bowls recognized to date, has a spur.

Mounthoolie Lane



57 Albert Street



Tankerness House



Gunn's Close

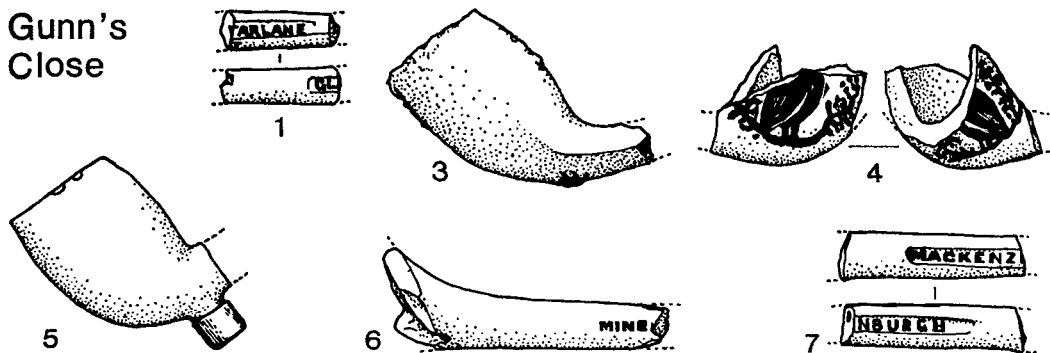


FIG 14 Kirkwall: clay pipes (scale 2:3)

There is an almost total absence of pipes which can be assigned to the 18th and early 19th century, and although the sample is not nearly large enough to make far-reaching conclusions on this, it should be borne in mind that this situation may reflect the known preference by the Scots for taking snuff at that time. The lack of pipes of similar date from recent excavations in Edinburgh (Lawson 1976, 1980) tends to add weight to this supposition.

Amongst the 19th-century fragments are bowls and stems marked by makers in the main Scottish towns, Glasgow, Edinburgh, Aberdeen and Dundee, but only one which appears to be of the work of an unknown Orcadian from Kirkwall. There is at least one English pipe of this period, by a Newcastle maker.

Mounthoolie Lane

- 1 Mottled brown-yellow and red fabric, mould-impressed with anchor on one side, sailing ship on the other, and a tulip at the front of the bowl. Bore 1·8 mm. 19th century (A1004, 100).
- 2 Piece of bowl stamped T.W & . . . / . . . DINB . . . Probably for T Whyte Co, Edinburgh 1832–64 (Directory). Bore 1·8 mm (A1004, 100).
- 3 Thick-walled bowl, soft fabric with numerous quartz inclusions. Initials DB on sides of bowl, with faint stamp on base probably the same as Gunn's Close, no 26, below. Bore 2·8 mm. Edinburgh (?). Late 17th to early 18th century (A1005, 104).
Several pipes from Edinburgh are marked TB and WB and there are pipes stamped RS from Edinburgh Castle (now in Huntly House Museum) apparently with a similar basal stamp.
- 4 Thin-walled well-polished hard grey fabric. There is an asterisk mark on the side of the spur. Bore 2·3 mm. English (?). 18th century (A1004, 105).

57 Albert Street

- 1 Bore 1·8 mm. 19th century (A1014, 101).
- 2 Stamped P.M.KANNA/.MAKER./ABERDEEN. Bore 2–3 mm. Late 19th to early 20th century (A1014, 101).
- 3 Stem, impressed . . . M . . . NNANT/NEWCASTLE, for William Tennant, Newcastle, active 1875–1925 (Parsons 1964, 254). Bore 1·8 mm (A1014, 101).
- 4 Stem, impressed . . . E/GLA . . . (Glasgow?). Bore 2 mm (A1014, 101).
- 5 Stem, impressed . . . KANE/DUNDE . . . for Andrew Kane, Dundee, 1874–93 (Directory). Bore 2·2 mm (A1014, 101).
- 6 Fabric A, bore 2·8 mm, Dutch, c 1630–50. Compare one from Stirling Castle (Davey 1980, no 3) (A1017, 103).
- 7 Softish fabric with sparse inclusions of quartz and voids. Bore 2·8 mm. Scottish mid-17th century (A1017, 103).

Tankerness House

- 1 Hard inclusion-free fabric with reduced grey core. Bore 2·8 mm. Scottish, third quarter of 17th century. Compare the shape to a bowl from Kirkwall with a basal mark NW in the National Museum of Antiquities in Edinburgh (Oswald 1975, fig 5N, no 7) (A1027, 111).

Gunn's Close

- 1 Stem, stamped . . . FARLANE/GLA . . . for MacFarlane & Co, Glasgow, 1829–30(?) (Directory). Bore 1·9 mm (A1153, 100).
- 2 Broken wig curler, 18th century (A1153, 100) (not illustrated).
- 3 Covered in deposit of slag. Bore 1·8 mm. Late 18th century (A1154, 102).
- 4 Moulded decoration of bird sitting on branch on both sides of bowl. Bore 2 mm. 19th century (A1154, 102).
- 5 With open ended spur covered with copper cap c 1850–70. This pipe was probably intended to have a small oil reservoir at the base of the bowl with a filter of some sort above (P Davey, pers comm). Bore 1·8 mm (A1154, 102).
- 6 Stem, impressed . . . MINE . . . Compare two 19th-century pipes in Tankerness House Museum, Kirkwall (Accession nos 1977, 25 and 26), impressed 15 MINERS PIPE (A1154, 102).
- 7 Stem, impressed MACKENZ . . . / . . . NBURGH for J McKenzie, Edinburgh, 1864–83 (Directory). Bore 1·8 mm (A1154, 102).

Gunn's Close

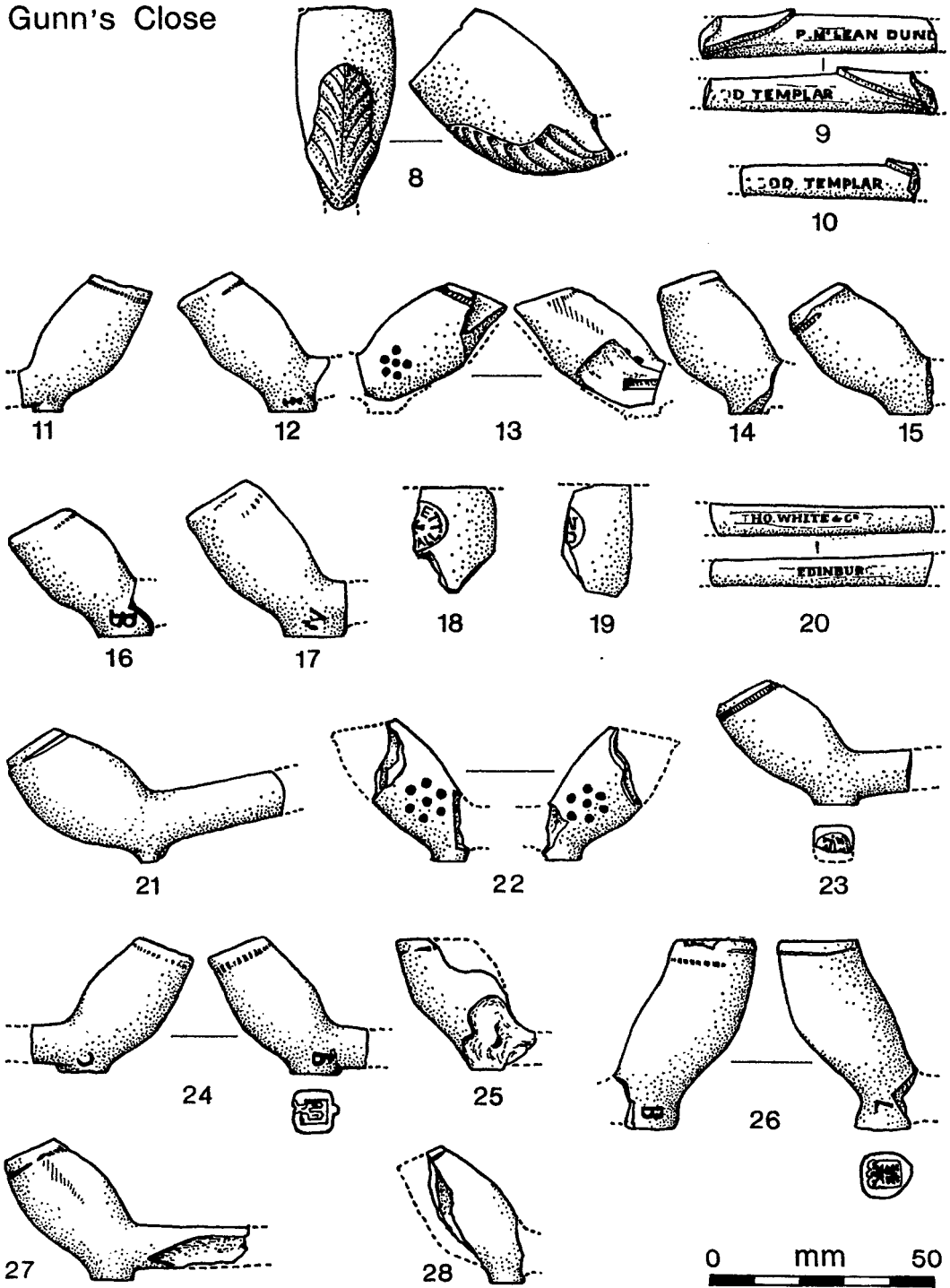


FIG 15 Kirkwall: clay pipes (scale 2:3)

- 8 Moulded leaf decoration on front of bowl. Bore 2 mm. 19th century (A1155, 300).
- 9 Stem from pipe similar to no 8, OLD TEMPLAR/PMCCLEAN DUND . . . (stamped upside down) either for P McLean, Dundee, 1858-61, or P McLean, Dundee, 1861 (Directory). Bore 2 mm (A1155, 300).
- 10 Another similar stem, OLD TEMPLAR (stamped upside down). Bore 1.8 mm (A1155, 300).
- 11 Fabric C, marked on one side of bowl with an I. Bore 2.5 mm. Scottish, mid-17th century (A1156, 302).
- 12 Fabric C (with concretions of haematite). Bore 2.8 mm. Scottish, mid-17th century (A1156, 302).
- 13 Fabric A with 'Tudor rose' designs. Dutch, 17th century (A1157, 303).
- 14 Fabric C (with inclusions of haematite). Bore 2.8 mm. Compare a similar shaped bowl from Stirling Castle (Davey 1980, no 6) (A1157, 303).
- 15 Fabric C. Bore 2.8 mm. Scottish mid-17th century (A1157, 303).
- 16 Fabric C. The bowl is marked on one side with a B. Bore 1.5 mm. Scottish mid-17th century (A1158, 304).
- 17 Fabric C, grey, with sparse haematite concretions. The bowl is marked on its sides WB as several bowls from Edinburgh, some with Edinburgh Castle basal stamps (eg Lawson 1978, nos 9, 22, 34). Bore 3.3 mm. Second half of 17th century (A1160, 306).
- 18 Piece of bowl stamped . . . ETT/ . . . WALL (Kirkwall?) (A1161, 400).
- 19 Piece of bowl marked . . . N/ . . . D (A1161, 400).
- 20 Stem, stamped D WHITE & CO/EDINBURGH. Bore 1.8 mm (A1161, 400).
- 21 Soft fabric with quartz inclusions and fire-blackened exterior. Bore 2.5 mm. English(?), mid- to late-17th century. Compare a pipe from Linlithgow (Laing 1968, no 8) (A1137, 801).
- 22 Fabric A with 'Tudor rose' designs. Bore 3 mm. Dutch, second quarter, 17th century (A1164, 808).
- 23 Soft white fabric with sparse inclusions of quartz. It has a basal stamp of a crown with initials below - (?) S. Bore 2.5 mm. English, second quarter 17th century (A1162, 809).
- 24 Fabric C, grey. The bowl has PC on its sites and a basal stamp with a three-towered castle. Bore 2.5 mm. Edinburgh, mid-17th century. For another published pipe by this maker see Lawson (1978, no 27) (A1165, 814).
- 25 Fabric A. Bore 2.5 mm. Dutch, 17th century (A1169, 901).
- 26 Soft yellowish fabric with sparse inclusions of haematite and with regularly ribbed surface. The bowl is marked on the sides D(?) B and there is a basal stamp. Bore 3 mm. Edinburgh late 17th to early 18th century. Compare Mounthoolie Lane, no 2 (A1169, 901).
- 27 Fabric C, greyish with sparse inclusions of haematite. Bore 3 mm. Scottish, mid-17th century (A1169, 901).
- 28 Fabric A. Bore 3 mm. Dutch, 17th century (A1168, 904).

BEETLE ASSEMBLAGES AT 57 ALBERT STREET AND MOUNTHOOLIE LANE

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Insect remains from the above sites were examined in order to throw some light on the depositional process by which the organic layers were formed, and to gain some impression of environmental conditions prevailing in Kirkwall at that time.

Sampling rationale

Column samples through the organic layers were taken by the excavators. These columns were split into layers using the section drawings supplied by the excavator. Larger layers were subdivided where clear-cut differences could be observed within them, to see if there was any variation within them. Thus layer 128 from Mounthoolie Lane was split in two parts, and layer 148 from 57 Albert Street into three parts. Some layers were too small to justify further examination, the criterion being a minimum weight of 1 kg. Layers meeting this condition were paraffin-floated and washed down through sieves (Kenward *et al* 1980) by Allan Hall. The floats were then sorted by the author, and all beetle fragments collected. The insects were identified using the reference collection at Doncaster Museum.

The samples examined were as follows: 57 Albert Street: 148A, 148C, 150; Mounthoolie Lane: 120, 124, 128A. The assemblages from the six samples are so similar that they can be considered together. The complete report, including species lists, has been deposited in the National Monuments Record.

Mode of deposition

There are several possible ways in which these layers may have been laid down.

- 1 Natural – *in situ* deposition of plant material.
- 2 Tidal – deposition of sea-washed material above high water level.
- 3 Human – dumping of rubbish, be it industrial or domestic origin.

1 Natural peat formation. The large number of hygrophilous carabid species such as *Pterostichus anthracinus*, *P nigrita*, *Agonum fuliginosum* and *Dyschirius globosus* indicate that these layers were deposited under very moist conditions. This is further supported by the comparative abundance of *Stenid* spp and *Carpelimus* spp which are generally associated with banks of ponds. Conditions favouring peat formation are suggested by the presence of many species of moss-inhabiting insects such as *Olophrum piceum*, *Lesteva* spp, *Cthius* spp and *Acidota* spp. There are also a number of phytophagous taxa represented, indicating that the area supported some vegetation. For the most part these are Ceuthorhynchines: it was impracticable to identify them further, as to do so would have required disarticulating museum specimens; but others include a *Donacia* sp (feeding on water plants such as *Carex*), *Meligethes* sp and *Phyllodreana floralis* (both found on flowers) and *Sitona* sp, which feeds on clover. The relatively small number of aquatic and semi-aquatic insects is a strong indication that these layers were not formed under standing or slow-moving water in the way that many Quaternary peat deposits are laid down. The only genera represented in this category are *Hydroporus* and *Aqabus*. Aquatic beetles fly readily in search of new bodies of water to colonize – thus they consistently form c 5% of the background fauna in most archaeological deposits.

The strongest indication that these layers are not the result of natural peat formation is that the fauna from each layer is dominated by species associated with accumulations of decomposing vegetation. These include *Micropeplus staphylinoides* and *M fulvus*. *Xylodromus concinnus*, *Megarthus sinuaticollis* and *Acritus nigricornis*. The presence of large quantities of rotting vegetable matter is further confirmed by the presence of numerous species normally associated with rotting seaweed such as *Omalium Laeviusculum*, *Cercyon depressus*, *C littoralis* and *C marinus*.

2 Tidal deposition. The possibility that these layers comprise sea-washed material is very difficult to argue against. The close proximity of the sea during the period of deposition and the large littoral component within the insect fauna provides strong support for this hypothesis. *Trechus fulvus* is a species that lives on beaches above the high tide-mark, and those species associated with rotting seaweed have been mentioned above.

The littoral component does not, however, dominate the assemblage. Other species such as *Omalium caesum*, *O rivulare* and *Megarthus depressus* are present in addition to those listed earlier. The littoral component can be seen as opportunist, taking advantage of an eminently suitable habitat close to the beach.

3 Dumping. Included among the non-littoral detritivores is a group of mycetophagous beetles which have known associations with human activities. These include the genera *Atomaria*, *Corticaria*, and *Cryptophagus*. These are frequently found in dry compost or haystack refuse. The genera *Lathridius*, *Enicmus* and *Thes* are frequently found in buildings; *Enicmus* spp being the 'plaster beetles'. *Thes bergrothi* has been frequently recorded as a pest in granaries (O'Farrell & Butler 1948). Although these species are present and have known associations with man, in order to demonstrate satisfactorily that the layers were produced by deliberate dumping requires the presence of strongly synanthropic species.

There are three species represented in the fauna whose presence can only be adequately explained in terms of human activities. These are the spider beetle, *Tipnus unicolor* (present in all the sampled layers), the weevil, *Micrelus ericae* (present in Mounthoolie Lane, 124) and the grain beetle, *Oryzaephilus surinamensis*. *Micrelus ericae* is not a natural synanthrope; it is found on heather and ling. Thus its presence within the town must be seen as the result of the importation of these plants into the town. *Tipnus unicolor* has far stronger associations with man, being recorded from granaries, warehouses, bakeries, stables and houses (Hinton 1941). It appears to have been much more common in medieval times, being superseded by foreign ptinids such as *Ptinus tectus*. *Oryzaephilus surinamensis*, the 'saw-toothed grain beetle' is a major pest, feeding on damaged grain and flour. It is not a native British species, but probably Mediterranean in origin: it has been recorded from numerous Roman sites such as Alcester (Osborne 1971a), York (Kenward & Williams 1980) and Old Kilpatrick, Bearsden (Locke, forthcoming). Although it can survive the British winter by sheltering in buildings, to breed successfully it requires warm indoor conditions: it is thus, unavoidably, a synanthrope (Howe 1956). In addition to these beetles several flea sclerites were found in Mounthoolie Lane, 124. These included a head of the human

fly *Pulex irritans* and it is probable that the two flea thoraces belong to the same species. These four insect species provide very strong evidence for the postulate that these layers comprise deliberately dumped vegetable matter, and that together they constitute a midden.

Conclusions

The evidence of the beetle assemblages suggests the following sequence of events.

- 1 Domestic rubbish containing *Micrelus ericae*, *Tipnus unicolor* and *Oryzaephilus surinamensis* was dumped on to a wet marshy area supporting a diverse population of hygrophilous carabid species.
- 2 The rotting plant matter provided an ideal habitat for detritivorous species to colonize. Both littoral and non-littoral detritivorous species took advantage of the new food supply.
- 3 As the material rotted mycetophagous species appeared as did the predatory carabids and staphylinids who would have fed on the other insects.

This sequence of events explains the presence of the different components of the insect fauna.

These 15th- and 16th-century insect assemblages contain many species in common with middens in Perth (Locke, forthcoming) and York. They also differ markedly in that they contain a very strong littoral component as a result of their proximity to the sea. The only other archaeological insect assemblage with a comparable location comes from the Roman deep-water channel at Fishbourne (Osborne 1971b) but the assemblage itself is not comparable, either in terms of mode of deposition or of the fauna. It might be thought that the presence of large quantities of rotting material would constitute a nuisance, if not a health hazard. This would explain why it had been dumped next to the sea wall. However, the indications from the insect fauna are that the rotting material does not contain foul matter such as cess or stable manure. Although coprophilous species (*Aphodius* spp, *Cercyon melanocephalus*, *Megasternum obscurum*) are present, this is because, like the aquatic species, these fly readily in search of new habitats to colonize. The presence of such middens is known from Perth, York and Oslo, among others (Kenward 1979). In Perth and York their development may have been actively encouraged, in order to raise the ground level to counteract the frequent flooding.

THE PLANT REMAINS

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Subsamples for plant macrofossil remains were taken from Mounthoolie Lane, 120, 124 and 128, and from 57 Albert Street, 148 (two samples from different layers) and 150. In each case 1 kg was used, except for the sample of 960 g from Mounthoolie Lane, 128, all of which was used.

The deposits comprised blackish, crumbly, amorphous (and highly humified) peats with a variable admixture of sand and small stones (mainly from flaggy, micaceous sandstones), silt, clay and a little charcoal, with marine shells (eg *Littorina* sp) and occasional fragments of wood and bone. Earthworm egg capsules were often frequent, perhaps indicating that a living soil developed on these deposits or that such soil somehow became incorporated into them. Mites and fly puparia were also observed during sorting for plant macrofossils. Of particular interest were frequent irregular lumps of hardened amorphous peat which proved to digest almost completely on addition of strong (oxidizing) nitric acid; this appears to have been highly humified peat secondarily deposited into the crumbly matrix forming the remainder of the sample material. It yielded abundant pollen of *Ericales* (heather or ling, heaths and their relatives), as well as leaves of cross-leaved heath (*Erica tetralix*), and it may be that it is peat from an old ground surface, either forming locally or cut for some purpose such as fuel and imported to Kirkwall. Its very hard nature suggests that it had dried out completely at some stage, perhaps through being baked.

All samples were disaggregated in hot water and passed through a tower of sieves of mesh sizes 2 mm, 1 mm, 500 μm and 300 μm . In general, only part of the two smallest fractions was sorted for seeds and other plant remains. Nearly all the samples yielded high concentrations of remains, usually in good condition. With the exception of a few charred cereal grains and a little charred heather, all the fossils had been preserved by waterlogging. The assemblages were rather similar in each case, and it has been thought suitable to consider them as a unit for the purposes of interpretation. Certainly there were insufficient differences to warrant their separate discussion. Full details are deposited in the National Monuments Record.

It is clear that plants of two major habitat types predominate, those of acid peatland, whether moorland, heathland or bog (eg *Calluna*, *Erica*, *Empetrum* and many of the mosses), and those of ruderal or segetal habitats (the weeds of arable fields and/or waste ground, especially *Stellaria media*, *Cheno-*

podium album, *Polygonum aviculare*, *Spergula arvensis* and *Lamium purpureum*). With these are small numbers of seeds of plants such as *Atriplex* sp(p) that might represent either ruderal/arable or coastal habitats. It is interesting that both subspecies of the scentless mayweed, *Tripleurospermum maritimum*, are recorded. These subspecies characteristically favour ruderal/arable (ssp *inodorum*) and maritime (ssp *maritimum*) habitats, and appear to have evolved as ecotypes that have become distinct taxa at the subspecific level through genetic isolation. The small numbers of aquatic, waterside, and damp ground plants (eg *Menyanthes*, *Potentilla palustris* and *Pedicularis palustris*) are probably not sufficiently abundant to be more than chance introductions from such habitats at some distance from the site of deposition. Plants from damp habitats are often abundant in urban archaeological deposits but their interpretation is problematic at present.

Such assemblages of plant remains suggest a mixed origin for the deposits, and there seems little doubt that they accumulated as the result of dumping, perhaps on to land supporting vegetation characteristic of one of those habitats mentioned. It is possible that some of the material within the deposits derived from cultivated land. It should be borne in mind, however, that weeds such as *Stellaria media* are favoured by habitats naturally rich in nitrogen and where disturbance maintains open ground for colonization. Sea-bird colonies – which might not be unexpected in the present setting – provide the conditions for such habitats to develop.

Evidence for human activity, other than that afforded by the weeds, may be interpreted from the regular occurrence of seeds and capsule fragments of flax, *Linum usitatissimum*, and the few charred cereals. Seeds of fig, *Ficus*, clearly indicate foreign trade at this time, though the nature of the archaeological context means that detailed evidence for trade in foodstuffs is unlikely to be more than fortuitous.

THE ANIMAL BONE

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The mammalian remains are mainly from domestic animals with which man interacted. The species represented by the samples are, cattle, sheep/goat, pig, horse, dog, cat, a baleen whale, bird and fish. Perhaps surprisingly in an Orcadian context, the remains of marine mammals are absent except for two fragments of a whale's jawbone.

Cattle bones predominate in most contexts at each of the four sites. At Mounthoolie Lane, Albert Street and Tankerness House, sheep/goat remains are the second most numerous species in most contexts with those of pig being third. The frequency of species is different at Gunn's Close, where bird bones consistently outnumber pig and in some contexts also outnumber sheep and goat.

Evidence suggests that calf and young cattle were killed but there is none to suggest that lambs and piglets were exploited. All three species were apparently overwintered for several years to become mature animals. Some of the samples may represent domestic refuse but there is evidence of commercial debris from an animal-based industry at Gunn's Close. Table 1 shows sample sizes and species identified for a selected list of contexts which appeared to be made up of relatively unmixed material.

TABLE 1
Numbers of bones, species represented and estimate of minimum number of animals, by site and context

Site	Context	No of bones	Species present, incl min nos
Mounthoolie Lane	121-4	135	Cattle 4, sheep/goat 5, pig 1, bird 4, dog 1
	125-30	37	Cattle 2, sheep/goat 2, pig 1, bird 1, dog 1
57 Albert Street	136, 139	147	Cattle 4, sheep/goat 4, pig 1, bird 2, hare 1, dog 1
	148-51		
	152	74	Cattle 2, sheep/goat 4, pig 2, horse 1, bird 1
Tankerness House	-		
Gunn's Close	103-6	124	Cattle 3, sheep/goat 3, pig 2, bird 4, dog 1, cat 1, hare 1
	303-7	36	Cattle 3, sheep/goat 1, pig 1, bird 1, cat 1

Other contexts in which the material is more heavily mixed need particular care in interpretation and are not published here. The full report can be found in the archive.

COAL SAMPLES

Six samples from the excavation were examined at the laboratories of the National Coal Board for petrological and palynological evidence which might establish the coal fields of origin. The results showed a wide range of possible sources for the various samples. One sample, however, from the 15th- to 16th-century midden behind the sea wall at 57 Albert Street was identified as coming from Scottish (W Fife) or Northumberland coals and suggests an East Coast trade for this period.

DISCUSSION

Although the Old Gasworks site produced no material of archaeological significance, the other four sites each produced at least one layer of interest. These were the lowest layers, and they were overlain by mixed deposits dumped in the post-medieval period and containing a high proportion of residual material.

The earliest of the well-stratified deposits occurred at Tankerness House. The earliest phase, the beach of sandstone chippings and the jetty, dated to the 12th to 13th centuries; the second phase, in which the site was reclaimed, dated to the 13th to 14th centuries. This later phase was overlain by post-medieval dumped soils. At Mounthoolie Lane, the lower beach and its associated midden layer dated probably to the 15th century, and the upper layer of the beach was open until the first quarter of the 16th century. The first layers dumped to reclaim the area also dated to the 16th century. These dates are approximately equivalent to those at 57 Albert Street, where the sea wall was built and the midden behind it accumulated in the 15th to 16th centuries. At Gunn's Close, the lowest layer of Trench 1 dated to the second half of the 16th or the first half of the 17th century. The lower levels of Trenches 2 and 5 dated to the 17th to 18th and early 19th centuries. Comparing the dates of deposits across the sites, there is no continuity, and it is not useful to compare sequences from individual sites, but the dated deposits roughly span the period from the 15th to the early 19th centuries, with two isolated deposits from the medieval period.

All the sites had been reclaimed from the Peerie Sea, demonstrating that the waterfront had moved considerably to the W; at Gunn's Close, with its E-W scatter of trenches, the advance of the shoreline could be followed in the ground for the period from the late 17th century to the 19th century.

This expansion of the town started from Albert Street, Broad Street and Victoria Street (fig 1), whose line marks the division between the rising ground to the E and the flat reclaimed land of the Peerie Sea basin to the W. It is unlikely that the line of the street has changed; the street probably grew from the passage of the traffic along the head of the beach and has remained static, dividing the tenements on the E side of the street initially from the open beach and later from the new tenements which grew up or were reclaimed to the W.

Reclamation started in the medieval period, but the W expansion developed more slowly in its initial phases than has been thought (Gourlay and Turner 1978, fig 2). At Tankerness House, reclamation 7 m from the street frontage took place only in the 13th to 14th centuries. Tankerness House is at the centre of the Laverock area, a nucleus for early settlement and therefore a likely point for the early development of the reclamation process, although it is possible that a beach was kept open at this point for handling ships or cargo. At Mounthoolie Lane reclamation had not reached 30 m from the street frontage by the 16th century, and at 57 Albert Street, reclamation was brought forward to a line 33 m from the street frontage when the sea

wall was constructed there in the 15th to 16th centuries. Both these sites lay in the Midtown which was an area of late development. Gunn's Close was also unlikely to have been built up at an early date. Here reclamation reached 16 m from the street frontage in the late 16th or early 17th centuries; it extended to the sea wall of Trench 5, 65 m W of the frontage, probably in the 18th century and to the outer sea wall of Trench 6, 80 m W of the frontage, by 1827. Junction Road was laid out in 1861 c 100 m to the W of the main street, and regularized and fossilized the contemporary line of the waterfront. The modern shore of the Peerie Sea is now c 250 m to the W of the main street line and the Peerie Sea itself is no more than a fraction of its original size.

The location of the shore line can also be compared with the distribution, in the medieval and early modern periods, of contemporary buildings. All but one of the major buildings constructed in Kirkwall in the medieval period S of the Aire lie to the E of the main street line (fig 1). These include the Cathedral and the Bishop's Palace, both started in the 12th century and St Olaf's Church, constructed in the 11th century. The exception is the Old Castle of the Sinclairs, which was built in the late 14th century to the W of the main street at the intersection of the modern Castle Street, Albert Street and Broad Street. Judging by the evidence of the shore line at the 57 Albert Street site 50 m to the N, the Old Castle must have projected from the shore for more than two centuries after it was built.

At Tankerness House, wall 123 at the E end of the cutting probably represents the foundation for a building, in which case the seaward side of the street was being built-on in the 13th or 14th centuries during its reclamation. This stretch of shore was opposite the Cathedral and was probably within a nucleus of ecclesiastical settlement grouped round the Cathedral. The earliest recorded use of Tankerness House is as ecclesiastical lodgings: Gilbert Foulzie was the first to unite the building of Tankerness House in a single lodging, when he acquired them at the Reformation. Before then the N and S wings had been Subchantry and Archdeanery, respectively.

Two houses in the S part of the town may be attributable to the medieval period. Both can be traced back to the 16th century by historical means, but may be earlier on the evidence of structural analysis and comparison of their ground plans with those of medieval Norwegian and excavated Viking houses (Clouston 1923a). Both houses are in Victoria Street, one incorporated in 'Bishop Reid's House' at 48-52 Victoria Street (Clouston 1923b, 41), the other incorporated in 72 Victoria Street (Clouston 1927, 9-14). The N end of Victoria Street was known as the Laverock, and probably formed part of the ecclesiastical settlement. However the remainder of the street appears to have been built up late, as part of a post-medieval ribbon development straggling S along the shore road. If it is correct to assign the two buildings to the medieval period, they were probably built in what was still open country. In each case, they were built on the shore road, looking W over the road and beach to the Peerie Sea, and with the slope behind them. This is a pattern common to nearly all the houses on the E side of the street line, and explains why 72 and 48-52 appear to have aligned with the later houses when Victoria Street was eventually built up in the 17th to 18th centuries.

Two further sites known to have had medieval or pre-Reformation associations should be mentioned. One is a house 'pertaining to the Chapel of the Virgin Mary' (Hossack 1900, 205) and the other was a house dedicated to the altar of St Barbara in the Cathedral (*ibid*, 198). Both sites were in the Midtown to the W of Albert Street and must represent reclamation. However, while noting the presence of occasional buildings on the beach before the end of the medieval period, it seems unlikely that the beach would have been reclaimed on any large scale before the E side of the main street was taken up, even if many of the E plots had not yet been built up. The settlement pattern of the medieval town probably consisted of a straggling row of houses facing the Peerie across the shore road and the beach; an arrangement dictated more by local

geography than by conformity with an urban tenement pattern: there was probably a nucleus of settlement around the Cathedral and a further nucleus in the area of the Burgh to the N. In the post-medieval period much of the development can be traced through the property documents which survive in substantial numbers from the 17th century onwards. The W side of Albert Street was developed during this period. Although the two pre-Reformation sites have already been referred to, there were only six houses on that side of Albert Street between Mounthoolie Lane and the Old Castle by 1677 (*ibid*, 197). The tenement plot where the 1978 excavation took place, at the S side of Mounthoolie Lane, was built on for the first time in 1714 by David Traill, merchant, of Kirkwall (*ibid*, 197). Traill bought the plot from James Baikie of Burness who owned the house on the opposite side of the road. Until Baikie sold the seaward plot as a separate tenement, it was open and acted as a yard for the house opposite to whose frontage it corresponded. The same pattern is found at 57 Albert Street. The various plots running seaward off the S end of Albert Street had until 1665-76 formed parts of a single yard, known as 'Buchanan's Great Yard'. The seaward limit of the yard was probably the contemporary sea wall of the 57 Albert Street site. On the landward side Buchanan's yard ran up to the main street, and on the other side of the road at the foot of the slope was Buchanan's Lodging (*ibid*, 206). As in Victoria Street, the older houses were on the E side of the street, but it is also worth noting that in the Midtown cases, the seaward plots appear to have been owned, and possibly reclaimed, by property owners nearby on the opposite side of the street.

In the 17th and 18th centuries the seaward expansion accelerated, with further sea walls being laid down at 57 Albert Street and Gunn's Close and a further dumping on the reclaimed areas to raise them above the tidal levels. There was also an intensification of urban in-filling by building on vacant frontage plots on both sides of the street: many of these buildings survive to the present day. It was at this period that the building on the frontages to the seaward of the main street first gave Kirkwall its superficial resemblance to a medieval High Street town, with its main street symmetrically flanked to the E and W by narrow tenement plots broken by closes and wynds.

The waterfront was pushed W by the building of sea walls and the dumping of material behind them. At 57 Albert Street the lowest material dumped was almost pure midden which partly rotted (p 397) *in situ*. The invertebrate report, notes the absence of dung-eating insects, and the most offensive material may have been tipped straight into the Peerie Sea: the beaches at Gunn's Close, Mounthoolie Lane and 57 Albert Street contained much domestic refuse. James Feo of Clestrain noted in 1875 that the town was

situated . . . in a very low and marshy ground in which the inhabitants would have but uncomfortable habitation were it not that the tide comes up very near the back of the town and effectively carries away all the filth, which in such a situation behoved to be very noxious (quoted in Hossack 1900, 189).

Fragments of wood and leather at 57 Albert Street suggested that the dumped material derived in part from the waste from a yard; elsewhere demolition and building debris formed a large part of the deposits.

At 57 Albert Street and at Gunn's Close the foundations of the successive sea walls were found resting on sand without protection from tidal scouring; in each case shingle and sand had washed up against the seaward side to protect the base of the new wall. The process of deposition on the W shore of the Peerie sea was therefore partly natural, and at the Gasworks site, natural beach deposits had built up almost to the height of the modern ground surface. This process of accumulation would have made it difficult to maintain an adequate depth of water at a quay,

and the view of Kirkwall in the 1766 *Plan of Grain* by William of Aberdeen shows the W waterfront as a series of gardens with occasional piers for light craft projecting beyond the frontage.

There is no evidence of the types of ships which were used in Orkney during the medieval period. The jetty and the platform of sandstone chippings at Tankerness House suggest that during the 12th and 13th centuries ships may have used the W waterfront, and may perhaps have been beached there, either for landing goods or for ship-hauling and repair, as at Bergen. Ships of a type adapted for beaching are known to have taken part in the trade round the North Sea (Herteig 1975, 86–7).

The sites were excavated in land which had been reclaimed from the Peerie Sea. In this zone, deposits were found to be up to 3 m deep; the lower levels were waterlogged and preserved organic materials. However, the soils were largely redeposited, and it is unlikely that further excavation in this area would add much to our knowledge of the town. Elsewhere on the E side of the street line, observations of building and drainage operations suggested that deposits on the slope were thin. The frontage sites on the E side of the main street have in many cases been terraced into the natural clay of the slope, with consequent destruction of any underlying deposits.

In the N part of the town the original area of the 'Burgh' has not been tested and raises questions of considerable interest. However, the very large volume of deposits which has been stripped from the area of the town in order to fill in the Peerie Sea basin suggests that prospects for archaeological survival in the town generally are poor. For this reason the finds from the excavations represent a body of material which is not likely to be added to in the foreseeable future. Interpretation of the material needs to be carefully qualified, as the material is a small sample, of which a proportion is poorly stratified. However, the material is of particular interest, not merely because of Kirkwall's Norwegian background, but also because, being sited on an island, most of the materials for urban existence had to be imported, and there is here an opportunity to examine the trading contacts which were established during and after the medieval period. The finds have therefore been described in some detail, and discussion of the environmental samples from the lower sites of the levels has also been published here.

The finds suggest trading contacts around the North Sea. Some of the stone objects – a steatite toy quern, stone discs and a fragment of a 'baking plate' – are paralleled at Jarlishof and suggest Viking affinities. The presence of grass-tempered pottery, of uncertain date, reflects a tradition local to N Scotland and the northern and western isles which may be related to craggan ware. However, the identifiable medieval pottery is similar to that of Scottish E coast towns with White Gritty and Red Sandy wares, and with the Scarborough and Yorkshire pottery which was traded up the E coast in the 13th and 14th centuries. The group includes sherds from a vessel identified as a Scarborough aquamanile.

In the 15th and 16th centuries, Rhenish stonewares were imported and seem to have made up a considerable proportion of the finer pottery attributable to this period. From the 16th century, some French pottery appears, eg a Loire-type jug, a Martincamp flask and Beauvais Sgraffito ware. By the end of the 16th century, Dutch or German imports seem to have become established, and to be dominated by a type of pottery referred to in this report as 'N European Earthenware', which occurs in a variety of forms but characteristically in tripod pipkins. Pottery of this type occurs widely in Europe and is known for example to have been made in London in the 15th century (C Orton, pers comm); in Kirkwall it may have been traded directly from the continent. In the 17th century Dutch imports, eg clay pipes, continued although some English and much Scottish material is also present. Apart from the material with obvious Norse affinities, many of the items imported have been found in Scottish E coast contexts, and it could be that either the same trade was reaching the Scottish burghs or that trade was passed on through them.

The stained glass was found in a 19th-century floor level at Tankerness House. It appears to date to the 15th century and probably comes from the Cathedral. The two gemstones were found on a 16th century beach at Mounthoolie Lane and may also come from the Cathedral; empty mounts from which precious stones had been taken were found at the Cathedral in the last century. They serve as a reminder of the wealth that must have accumulated in the Cathedral during the middle ages which was broken up and released into circulation at the Reformation.

Leather was preserved in the lower layers of Mounthoolie Lane, 57 Albert Street and Gunn's Close. The deposits range in date from the 15th and 16th centuries up to the early 19th, and cover the period when the welted shoe was replacing the medieval turnshoe; welted shoes are well represented in the Kirkwall sample and appear to date from the 16th century. Medieval turnshoes are less clearly represented, but are thought to have been present.

Wood was preserved in the same deposits as the leather, but study of the wood was concentrated on the material from the midden at 57 Albert Street to give a representative cross-section of wood use in Kirkwall in the 15th to 16th centuries. Structural timber, particularly oak, appears to have been extensively reused. The principle species used in structural timbers were oak and pine; oak would have been imported, and probably pine also, although there is some controversy over this. The debris at 57 Albert Street suggests that primary trimming was being carried out on site, whether of local logs or of timber imported in its bark. Smaller items such as pegs and wood nails were not so heavily used; they could presumably be made from scrap, or from Orkney's indigenous scrub. Wooden vessels were either imported or made from imported timber; they include staved vessels, an oak lid and a small wooden bowl.

One impression gained from the wood and leather is that craftsmen were not unenterprising or conservative, but were forced to continue using products until they were beyond further use or repair. This is not necessarily a sign of material poverty; it may be a reflection of the scarcity of materials in an island community.

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The excavation records together with a full account of the sites from which this version has been extracted will be deposited in the National Monuments Record of Scotland, Melville Street, Edinburgh.

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