e-ISSN: 2056-7421

Excavations by Gogar Church, Nether Gogar, Edinburgh

How to cite:
Will, B & James H F 2018 'Excavations by Gogar Church, Nether Gogar, Edinburgh', *Scottish Archaeological Internet Reports* 79. https://doi.org/10.9750/issn.2056-7421.2018.79

Visit http://journals.socantscot.org/index.php/sair to see the journal homepage

Excavations by Gogar Church, Nether Gogar, Edinburgh

Bob Will with Heather F James

with contributions by
Torben Ballin, Beverley Ballin Smith, Donal Bateson, Dennis Gallagher, Richard Jones, Susan Ramsay and Catherine Smith

Address
GUARD Archaeology Ltd, 52 Elderpark Workspace, 100 Elderpark Street, Glasgow G51 3TR

Author contact
bob.will@guard-archaeology.co.uk

Funding
Edinburgh Tram Project for Edinburgh City Council

e-ISSN: 2056-7421
https://doi.org/10.9750/issn.2056-7421.2018.79
Published by the Society of Antiquaries of Scotland with the Archaeology Data Service archaeologydataservice.ac.uk.

Society of Antiquaries of Scotland
National Museums Scotland
Chambers Street
Edinburgh EH1 1JF
United Kingdom

Managing editor: Catherine Aitken
Copy-editor: Susan Milligan
Production: Raspberry Creative Type, Edinburgh

www.socantscot.org
Registered Scottish charity no SC010440

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

1. ABSTRACT

This report records the results of an excavation of a medieval settlement next to Gogar Church that was discovered within the construction corridor of the Edinburgh Tram line. The remains relate to the medieval village of Nether Gogar and date from the 11th to the 15th century, although later material was also recovered. The results of this work complement previous work on the site of Nether Gogar (Morrison et al 2009) and add to the growing evidence of medieval rural settlement in the Edinburgh area. The excavation was carried out by Glasgow University Archaeological Research Division (GUARD), while the post-excavation phase was undertaken by GUARD Archaeology Ltd on behalf of Edinburgh Tram Project for The City of Edinburgh Council.

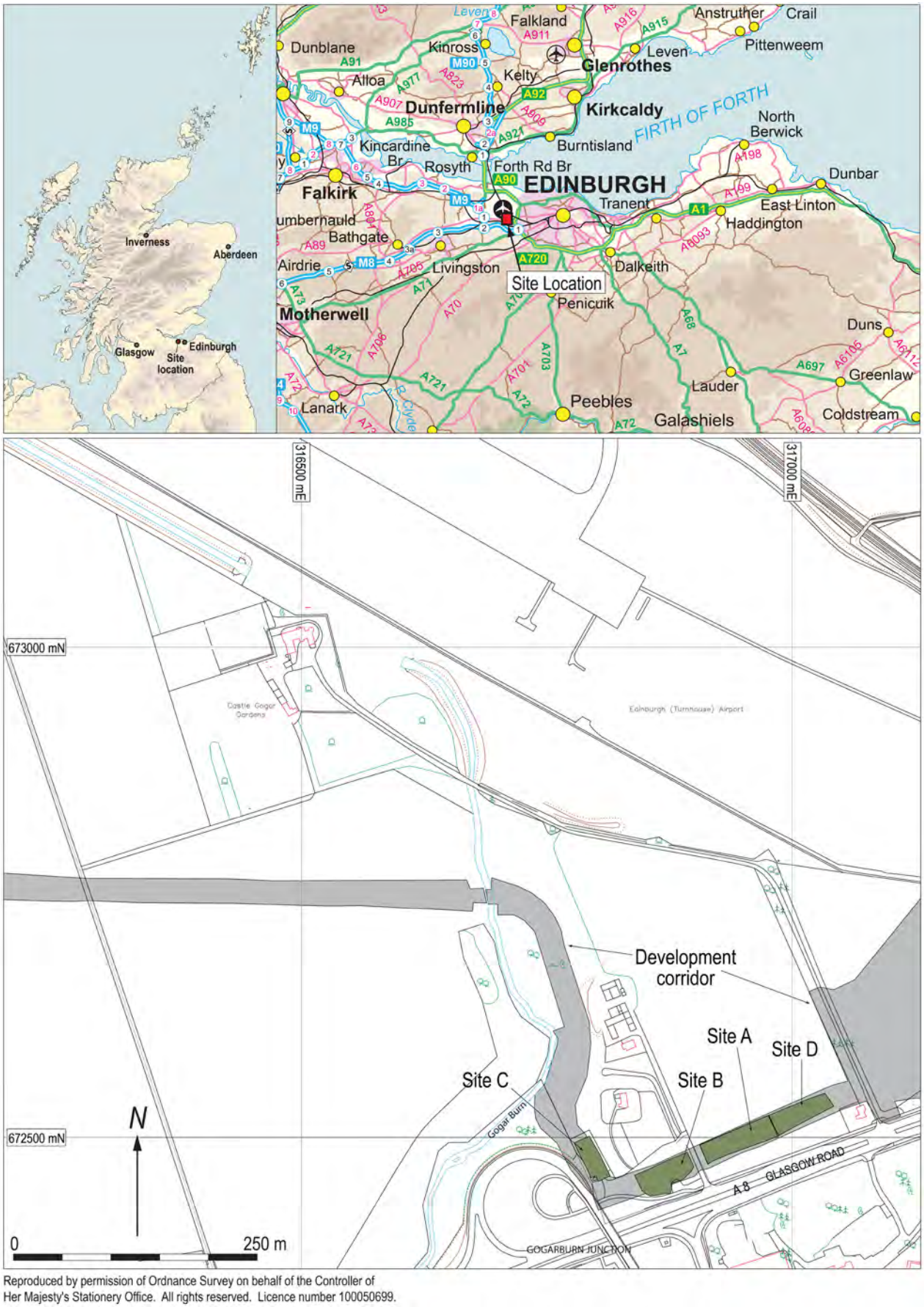
2. INTRODUCTION

The archaeological investigations in the vicinity of Gogar Church, Edinburgh were conducted in advance of construction of the Edinburgh Tram Scheme that extends to Edinburgh Airport. The fieldwork was commissioned by Transport Initiative Edinburgh (TIE) and The City of Edinburgh Council, and was carried out between 21 April and 14 July 2008 by Glasgow University Archaeological Research Division (GUARD). The post-excavation programme was undertaken by GUARD Archaeology Ltd. The site had been initially identified during an archaeological evaluation carried out in 2006 (Sneddon & Will 2006). The specification for further archaeological works was established in a method statement prepared by GUARD in collaboration with TIE and John Lawson from the City of Edinburgh Council Archaeology Service, who also monitored the project. The area investigated was initially divided into four areas (A–D) and reflects the sequence in which the areas were excavated. Area A was the field to the east of the church, Area B to the south of the church, Area C to the west, and Area D was an eastern extension to Area A (see Illus 1).

3. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The history of Gogar has been extensively researched and has recently been published alongside the results of archaeological excavation located immediately to the west of the present site (Morrison et al 2009) and what follows is a brief summary of that work. The first reference to the lands of Gogar is in a charter dated between 1165 and 1174. It was issued by King William I and confirms an earlier gift of land to Ralph de Graham, a knight whose family had moved from England to Scotland during the reign of David I (1124–53). The land at Gogar was part of an estate that also consisted of Cousland and Pentland, with Cousland being the main centre. As a consequence there was no house or castle associated with the land of Gogar at this time and it was in effect managed by an absentee landlord. The land was divided into two fermtouns: the more prosperous Over Gogar was due to the presence of a mill, which was located to the south of the present A8, with Nether Gogar to the north. The current excavations relate to the land of Nether Gogar. The lands were subdivided and changed hands several times, including a portion of land that belonged to the Knights of the Hospital of St John, which is first mentioned in a charter of 1409.

The parish of Gogar is mentioned in 1247, when the church was re-consecrated by Bishop David de Bernham of St Andrews, indicating that the parish was already established at that time. The income for the church came from its landholding and rents (tiends) and there are records of these revenues as well as lands changing hands often in a quite complex manner until 1599 when the parish was amalgamated with Corstorphine. After this the church was no longer used for services, although the burial ground probably remained in use, and the church may have been used as a family mausoleum. The history of the lands the Nether Gogar fermtoun and the parish are quite complicated but by the early 17th century much of the land had been acquired by the Logans of Restalrig who built Castle Gogar to the north of the church. This was probably a tower house, which was later expanded and modified by the Couper family around 1625. It was then acquired by Andrew Myreton in 1701, and his son



Illus 1 Site location showing different areas of investigation. © Crown copyright 2018, OS 100050699

Sir Robert Myreton initiated a series of agricultural improvements and re-organised the farm lands (Illus 2).

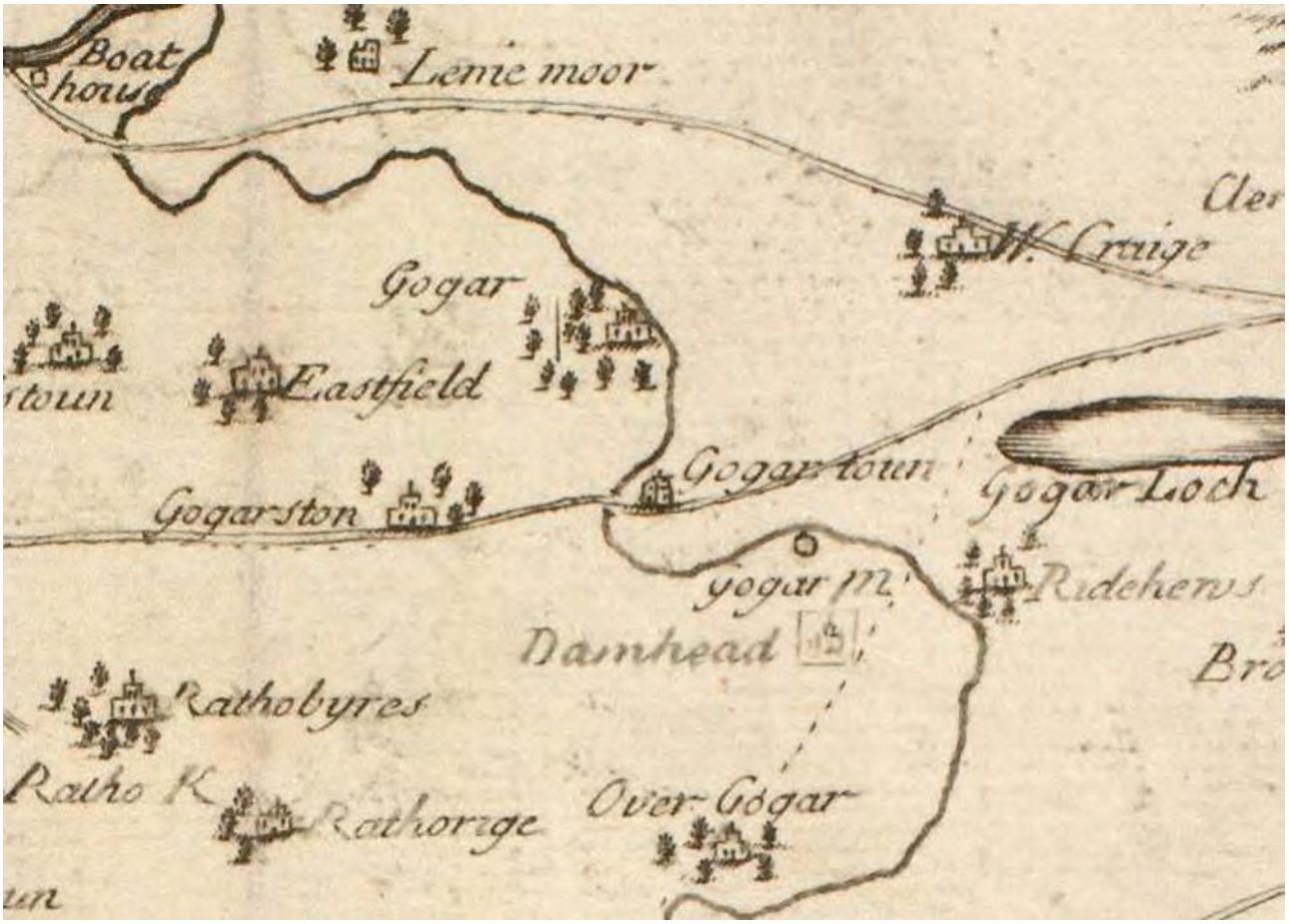
3.1 Civil war

An important incident in the history of Gogar occurred on 27 August 1650, when there was a skirmish between English Parliamentarian forces under Cromwell and Scottish Royalist forces under Leslie. The Scots camp was located in the vicinity of Gogar parish church and may have numbered some 20,000–25,000 men (based on figures cited for the battle of Dunbar) and would therefore have required a considerable expanse of ground. The skirmish followed a series of moves and countermoves, which saw the Scots move from their entrenched positions in Leith. Cromwell's army tried to outflank the Scots, who were camped close to the church (Grainger 1997: 34) and positioned itself on high ground to the south. Fighting seemed inevitable but then scouts reported that the land between the two armies was marshy and not suitable for battle. The result was a prolonged exchange of artillery fire between the two armies across the marshy expanse. It is reported that several hundred rounds were fired by each side (ibid), with both reporting casualties. Low on supplies, Cromwell's army eventually marched away with Leslie shadowing his movements, the result being the battle at Dunbar on 2–3 September at which Cromwell delivered a crushing defeat to the Scots. Dunbar was Oliver Cromwell's greatest victory and the final major encounter of the British Civil Wars.

A metal-detecting survey along the tram construction corridor in the field to the east of Gogar Church (Areas A and D) did not recover any metal artefacts that could be related to the skirmish (Dalland 2006).

3.2 The church

The surviving rectangular church building (currently a cabinet maker's workshop) is located within a sub-



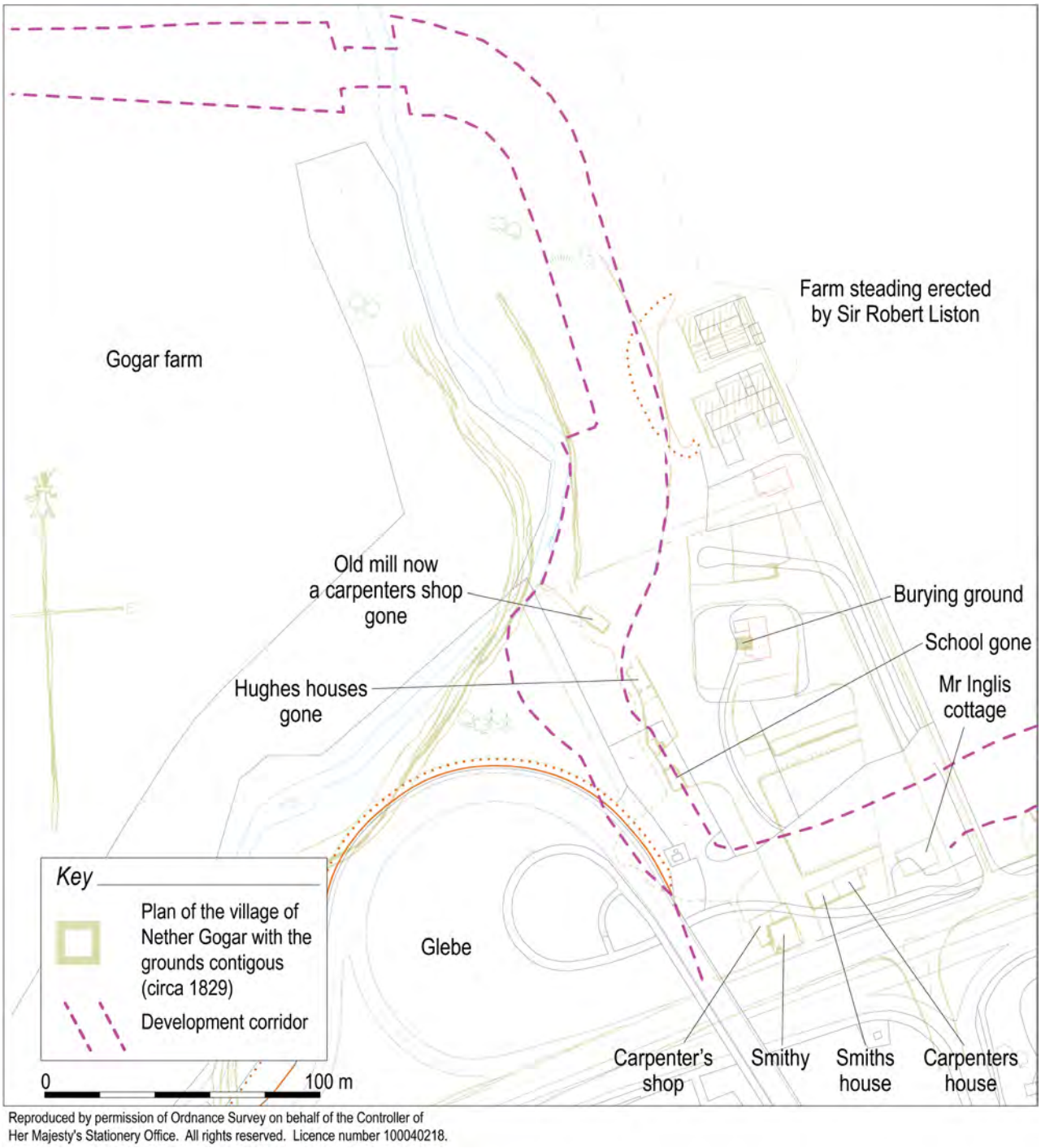
Illus 2 Cooper's map of 1735

Illus 3 The present church from the west

rectangular graveyard with a stone boundary wall and mature trees round the outside (Illus 3). The ground level within the graveyard is considerably higher than that outside, particularly on the west side. After 1599 the church was no longer used for regular services, although the graveyard seems to have remained in use. The B-listed church was extensively rebuilt in the 1890s, possibly utilising surviving 17th-century walls, and a tower was added in 1905. The church was again used for services but only for a short period of time. The RCAHMS record of 1920 (RCAHMS 1929) refers to a 15th-century font inside the church, which was moved to Corstorphine church in 1955 and remains there today in the south transept.

3.3 Nether Gogar in the post-medieval to modern period

A plan of the village of Nether Gogar dated to about 1829 (Illus 4) shows the church and graveyard with buildings along the main road frontage: these are identified as a 'Smithy', 'Carpenters shop', 'Smiths house', 'Carpenters house' and 'Mr Inglis cottage', as well as a 'farm steading erected by Sir Robert Liston' to the north of the church. More interestingly, the plan also marks where earlier buildings were located along the west side of the church. These consist of 'Old Mill now a carpenters shop gone', 'Hughes houses gone' and 'School gone', although the 'new steading' of 1829 still survives as a derelict complex of farm buildings. Sir Robert Liston, a British diplomat, bought the old village of Gogar in 1830/31: he already owned Milburn Tower. As well as the new steading, he made other improvements to the village and farms, and he is buried in the churchyard. The census records show that a school along with a smithy and carpenter's workshop remained operational at Gogar into the 20th century, until they were demolished in 1927 when the main road was widened. Workshops and houses were then built further to the north away from the road (Illus 5). These were presumably the buildings that were demolished when the Gogarburn Headquarters development took place.



Illus 4 Sketch plan from 1829 estate map of Nether Gogar settlement with modern map and construction corridor. © Crown copyright 2018 OS 100040218

Illus 5 Aerial photograph of Gogar Church and its environs in 1947

3.4 Archaeological background

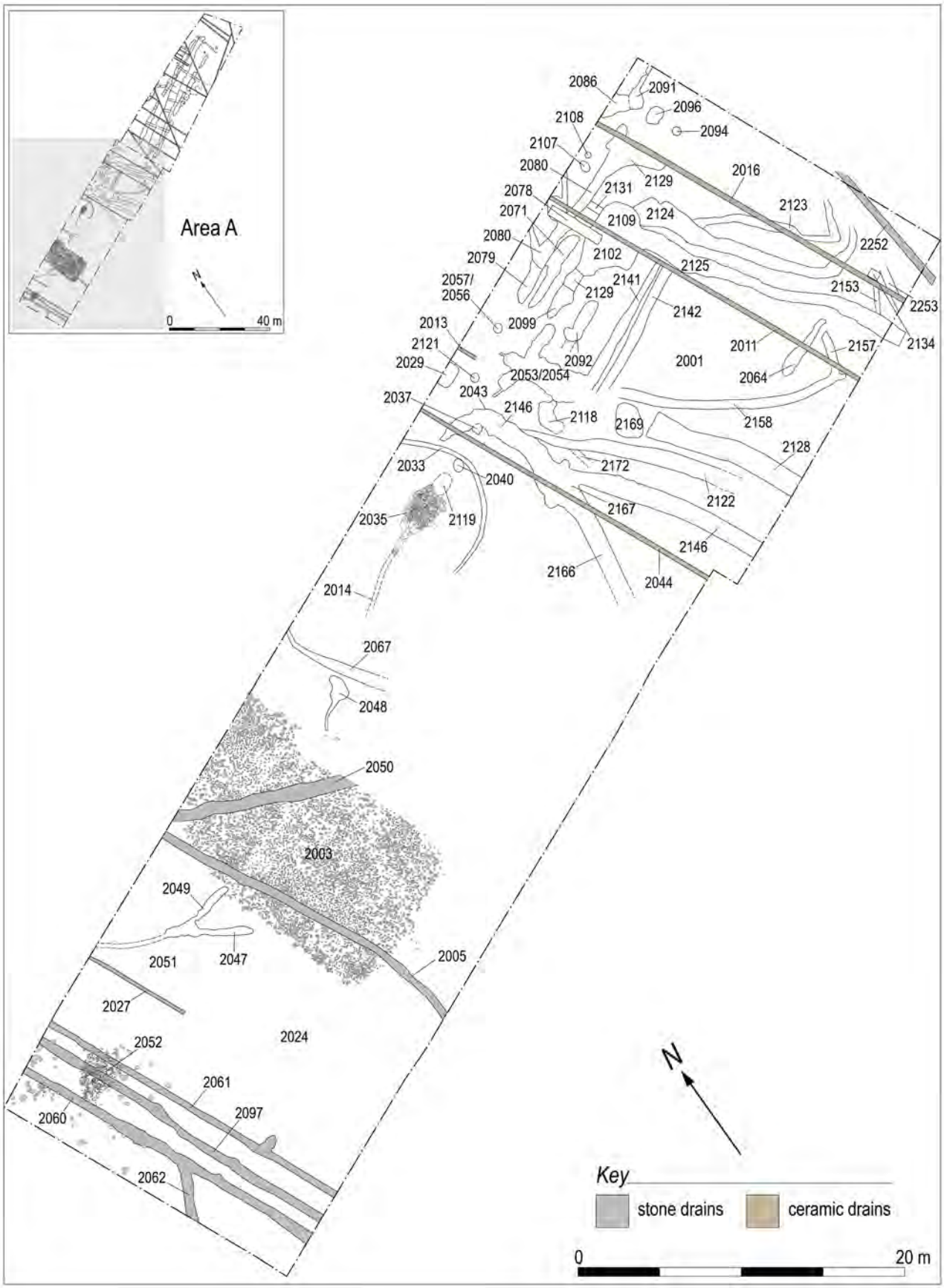
Recent archaeological works prior to the construction of a bridge for the Royal Bank of Scotland Headquarters at Gogarburn revealed remains associated with the settlement of Nether Gogar (Morrison et al 2009). These comprised a number of ditches and pits that were thought to represent the remains of domestic and agricultural activities. Part of a ditch or lade associated with the post-medieval mill was also investigated. This work was located to the west of the church immediately adjacent to the construction corridor for the tram line, and would therefore represent the western periphery of the settlement.

4. RESULTS

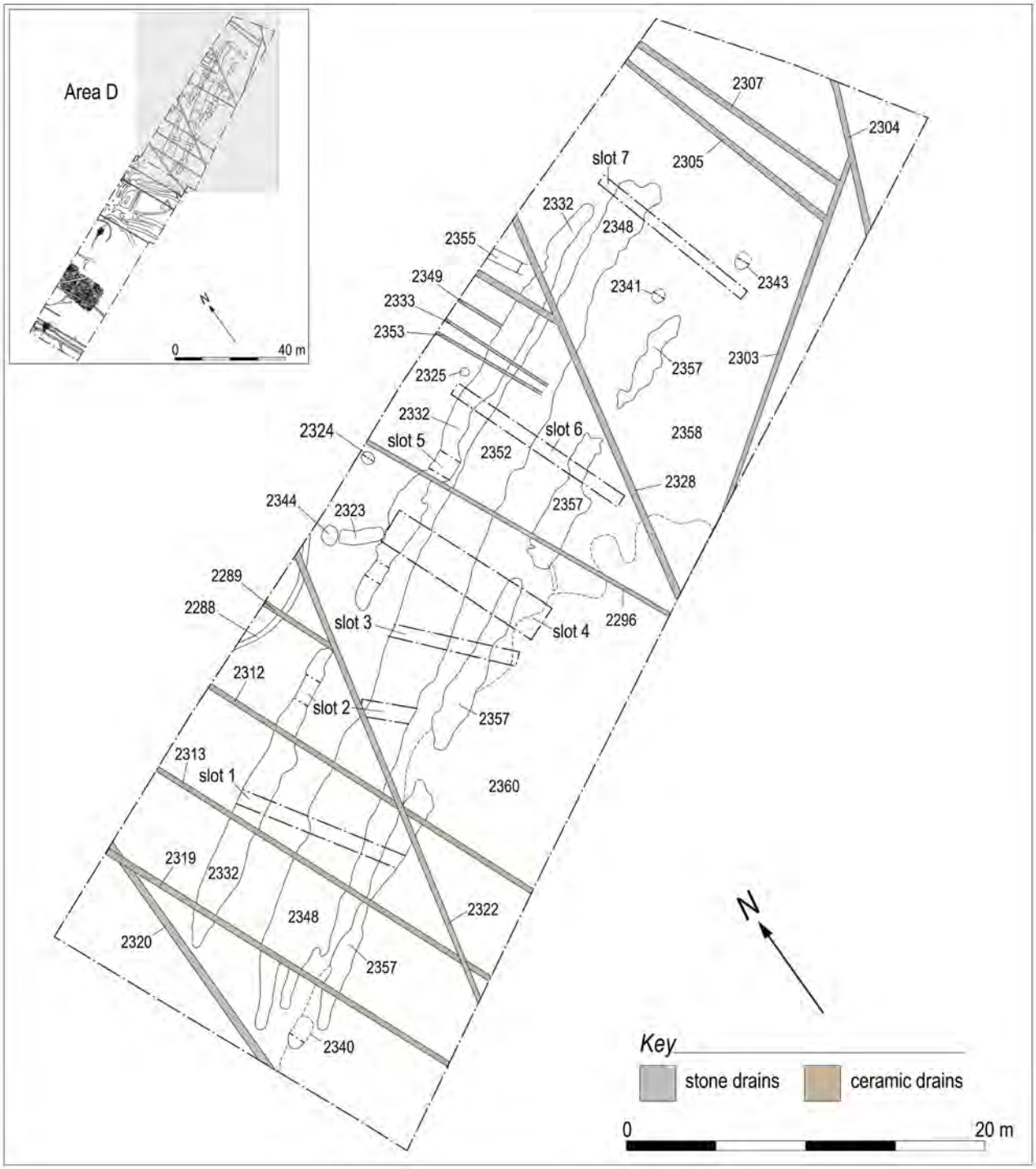
4.1 Area A/D main area (Illus 6 & 10)

As the evaluation trenches had established that archaeological remains survived in two locations in the field within the construction corridor, an area 75m by 20m was initially stripped of topsoil to investigate and define the extent of the archaeological deposits (Illus 7 & 8). The topsoil was stripped by machine under archaeological supervision and it became apparent that the deposits were more extensive than previously thought. As a result, the whole construction corridor was stripped across this field, an area 138m by 23m (Illus 1, 7 & 8).

Illus 6 Aerial photograph of Area A from the west



Illus 7 Trench plan of Area A



Illus 8 Trench plan of Area D

Illus 9 Cobbled surface aerial view working shot from the west

Illus 10 Area A showing location of detailed plans

The plough soil varied in depth between 0.25m and 0.5m, resulting in some truncation, but, once stripped, a number of features were visible in the underlying subsoil. Several ceramic and rubble-filled field drains were uncovered running north/south across the field, as well as possible pits, post holes, ditches and an extensive cobbled surface.

4.2 Cobbled surface

One of the features revealed in the evaluation trenches was a cobbled surface (Context 2003, Illus 9, 11 & 12). It was exposed revealing a surface 10m east/west and at least 16m north/south but it appeared to extend beyond the limits of the construction corridor to the north. The surface consisted of a mixture of angular stones and rounded cobbles of differing sizes and a few bare patches where cobbles were absent. Although there were several larger stones up to 0.4m by 0.3m by 0.25m in size, they did not appear to form wall lines for a structure. No additional features, foundations or post holes were associated with these larger stones. The cobbled surface sloped down towards the south-west corner of the trench and had been laid directly onto the subsoil. The subsoil varied across the site from mid-grey boulder clay (C2042) to orange-brown sand (C2098). The cobbles were largely confined to the clayey area, which could be the result of repeated flooding causing silting and puddling. Two later, large rubble-filled drains cut through the cobbled surface and appeared to continue to the north, and another three smaller drains ran parallel to the access road along the west field boundary.

Illus 11 Detail of cobbled area

The layer covering the cobbles consisted of mid-grey-brown silty clay (C2002) up to 0.07m thick which tapered away to the east as the ground level rose (Illus 13). This deposit contained a number of sherds of medieval pottery and animal bone. Carbonised plant remains were also recovered, consisting of small quantities of birch, hazel, heather type and oak charcoal, together with a moderate number of cereal grains. In addition, several seeds from corn marigold and docks, regarded as weeds, were identified, and these may have been growing alongside the main cereal crop. This material may represent waste from cereal processing and ash from the corn-drying kiln located to the east. The cobbled area may represent a threshing floor or stack yard where cereal crops were stored and processed prior to the grain being dried in the kiln. The covering deposits also contained small amounts of post-medieval and modern pottery, presumably intrusions from ploughing and drainage work.

4.3 Corn-drying kiln (Illus 14, 15 & 16)

The foundations for the kiln were built into the subsoil and were orientated east/west to make use of the natural slope of the ground and presumably the prevailing wind. The pit for the kiln was 3.5m long by 1m wide and 0.8m deep (maximum dimensions). At the east end, up-slope, the pit was stepped, while to the west its floor gradually rose as the sides tapered in. The main section of the kiln consisted of a sub-rectangular hollow with a flat base (C2117) with steeply sloping sides. A channel extended beyond the kiln for approximately 2.5m to the west and presumably acted as a flue. This channel was 0.3m wide and 0.2m deep, and filled with loose mid-grey sandy silt (C2063). Lining the sub-rectangular

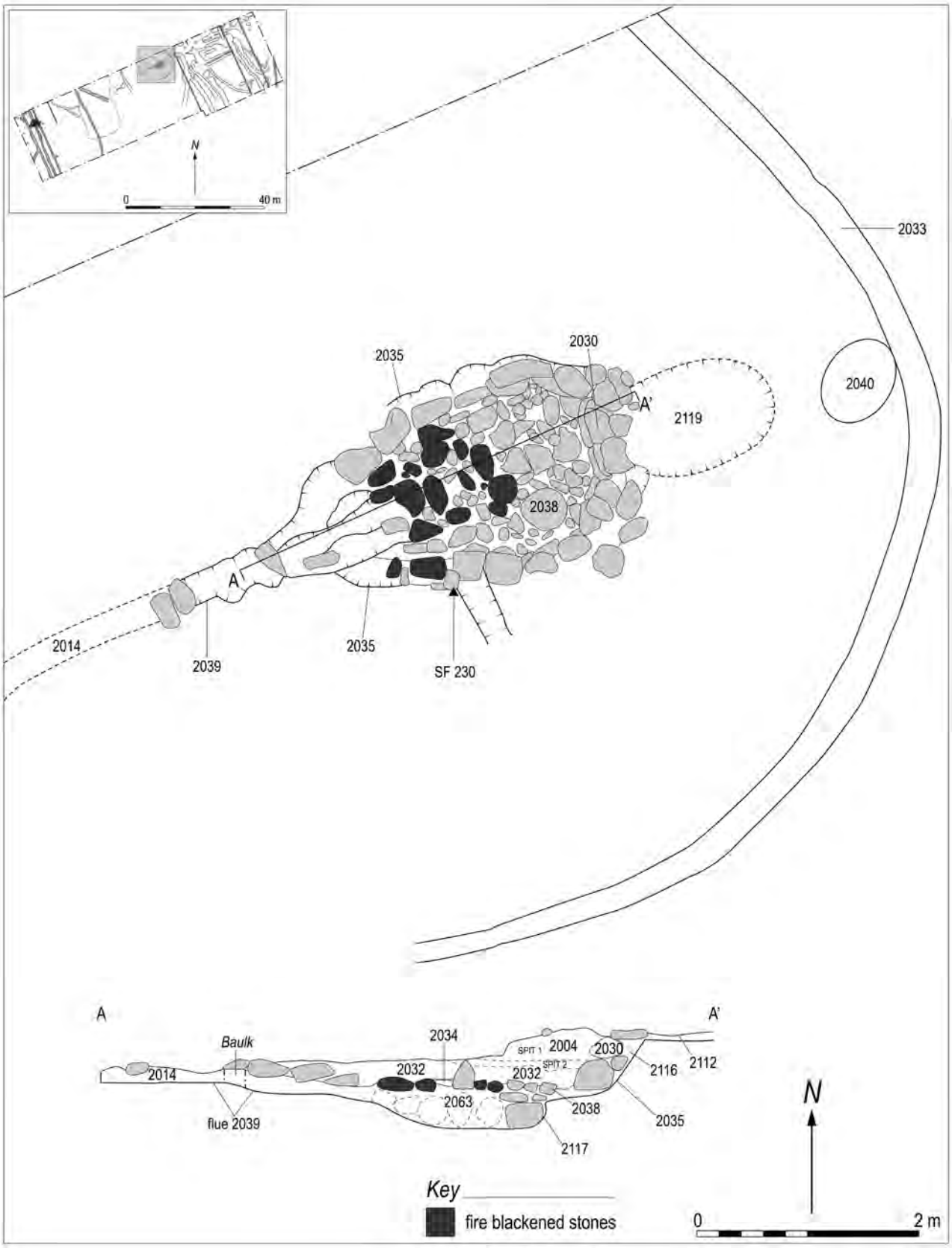
Illus 12 Plan of detail of cobbled area with drains

Illus 13 Aerial view of cobbled surface from the west

hollow was a course of large stones (C2065), which may have supported the floor above. Above the flue and built over the stones C2065 was the flat floor of the kiln. This was constructed from stones up to 0.3m by 0.2m by 0.1m in size (C2038). In the centre of the floor, and towards its western end, a number of stones showed signs of burning: they were blackened and the stone had decayed, possibly the result of repeated firings in the kiln. Lying over and interspersed between the stones forming the floor was a thin deposit of black ash or soot (C2034).

The kiln walls were constructed of stones up to 0.5m by 0.4m by 0.3m in size (C2030), with the largest towards the base. They were bedded into a loose, mid to dark brown clay-silt (C2116) similar to the subsoil that the kiln was built into. The walls survived three courses high (0.6m) in the east but gradually sloped down to a height of 0.2m in the west where the walls joined the flue (C2039). The east wall of the kiln sloped steeply to the east, while the northern and southern walls were straight-sided. At approximately the mid-point in the south wall, a space within the stones seemed to form an opening with a flat stone at the base and two upright stones on either side. On the outside of the kiln these stones were adjacent to a slight linear scoop that extended beyond the kiln. This scoop appears to have been part of the original construction pit for the kiln (C2035). The scoop and the gap in the kiln wall may have formed an opening for ventilation or adding fuel or removing waste from the kiln floor.

The channel or flue that extended away from the kiln to the west gradually became V-shaped. Its fill (C2014) comprised mid-grey-brown silty clay. This section of the flue would have been covered with flat capping stones (C2173), but only three remained in place. Others had fallen into the flue or had been displaced. The length of the flue suggests that it may also have acted as a drain to keep water from accumulating in and around the kiln when not in use. A kiln with a similar drain has recently been excavated at Birnie near Elgin (F Hunter pers comm) although it is likely to be earlier in date. Only a limited range of carbonised plant remains were recovered from the flue and, not surprisingly, these were very similar to the fill of the kiln, which



Illus 14 Corn-drying kiln: trench plan and section

Illus 15 Corn-drying kiln during excavation

Illus 16 Corn-drying kiln excavated

suggests that the flue was probably cleaned out on a regular basis.

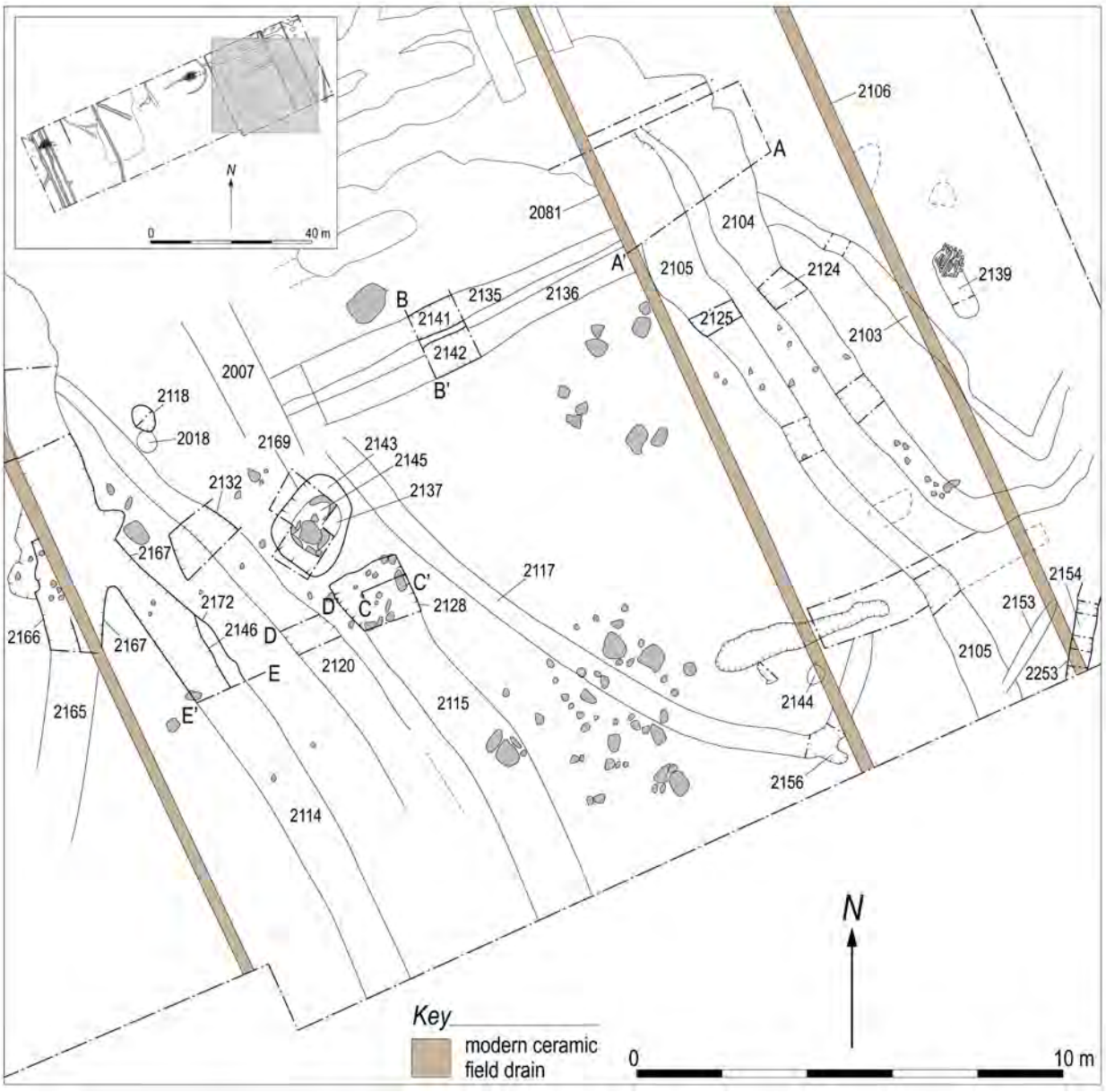
The main fill of the kiln (C2004) consisted of a dark brown, organic-rich sandy silt with occasional inclusions of charcoal. Four sherds of Scottish White Gritty Ware medieval pottery and fragments of animal bone (including a bovine jaw) were also recovered from this layer. This sealed deposits (C2032 and C2034) that were both very similar to C2004, but included concentrations of red staining, possibly ash. Analysis of soil samples from within the kiln, including the flue, recovered over 500 cereal grains, of which 80% could not be identified due to repeated heating or burning. The identified grains included oats, barley and wheat. Radiocarbon dates from the fill of the kiln produced two dates between AD 1380 and 1450 (Table 1, SUERC-35918 & SUERC-35919). These dates confirm that the settlement was still in use in the 15th century and provide a date for the last use or abandonment of the corn-drying kiln.

The kiln cut a shallow scoop or pit 0.8m by 0.5m and 0.1m deep that contained 16 sherds of Scottish White Gritty Ware pottery from two vessels (C2119, Fill 2112).

A curvilinear, U-shaped ditch (C2033, Fill 2008) 0.3m wide and 0.08m deep extended round the kiln from the northern baulk. The ditch may have formed a foundation trench for a wattle wall, as a rare fragment of roundwood charcoal of willow was recovered from it. A radiocarbon date from the ditch provided a date of 1205–85 (Table 1, SUERC-35915), much earlier than the dates from within the kiln, which could indicate that the kiln or the site of the kiln was in use for a long period of time. In addition to this, a post hole (C2041, Fill 2040) was located immediately to the west of the ditch and east of the kiln. It was packed with large stones and contained two medieval pottery sherds and fragments of burnt daub that may have originated from the superstructure for the kiln.

4.4 Ditches and gullies (Illus 17 & 18)

To the east of the corn-drying kiln the site was crossed by a complex series of ditches and gullies, possibly field boundaries or truncated cultivation plots or furrows. Several of the ditches were up to 0.5m deep while others were very shallow and ephemeral at 0.12m deep. The shallow nature of the ditches and gullies meant that many of them had become completely ploughed out, particularly to the south of the site. What was apparent is that the



Illus 17 Area A: detail plan of ditch complex

ditches seem to form two systems, one orientated north/south and the other east/west.

Two of the larger north/south ditches, C2146 (Illus 19) and C2166, each 1m wide and 0.3m deep, converged and, at the point where they met, the ditch measured 2m wide and 0.3m deep. The ditch then continued to the north, where it became deeper and narrower and reached a maximum depth of 0.5m. At the point where the ditches met it appeared to have been recut, as there was evidence for an earlier cutting (C2167). Its fill was the same throughout and consisted of dark brown sandy silt with frequent small stones. Artefacts recovered from the fill include 154 sherds of medieval pottery and a fragment of a copper-alloy finger ring. The botanical remains consisted of small quantities of charcoal and cereal grains, which could have derived from either domestic hearth waste or waste from the nearby corn-drying kiln. Radiocarbon dates from the fills (C2006 and C2114) date the deposit to AD 1030–1220 (Table 1, SUERC-35910 & SUERC-35916). The presence of large quantities of pottery within the fill would suggest domestic waste or midden material that has been used to fill the ditch, and it may be that the charcoal for the radiocarbon date is residual.

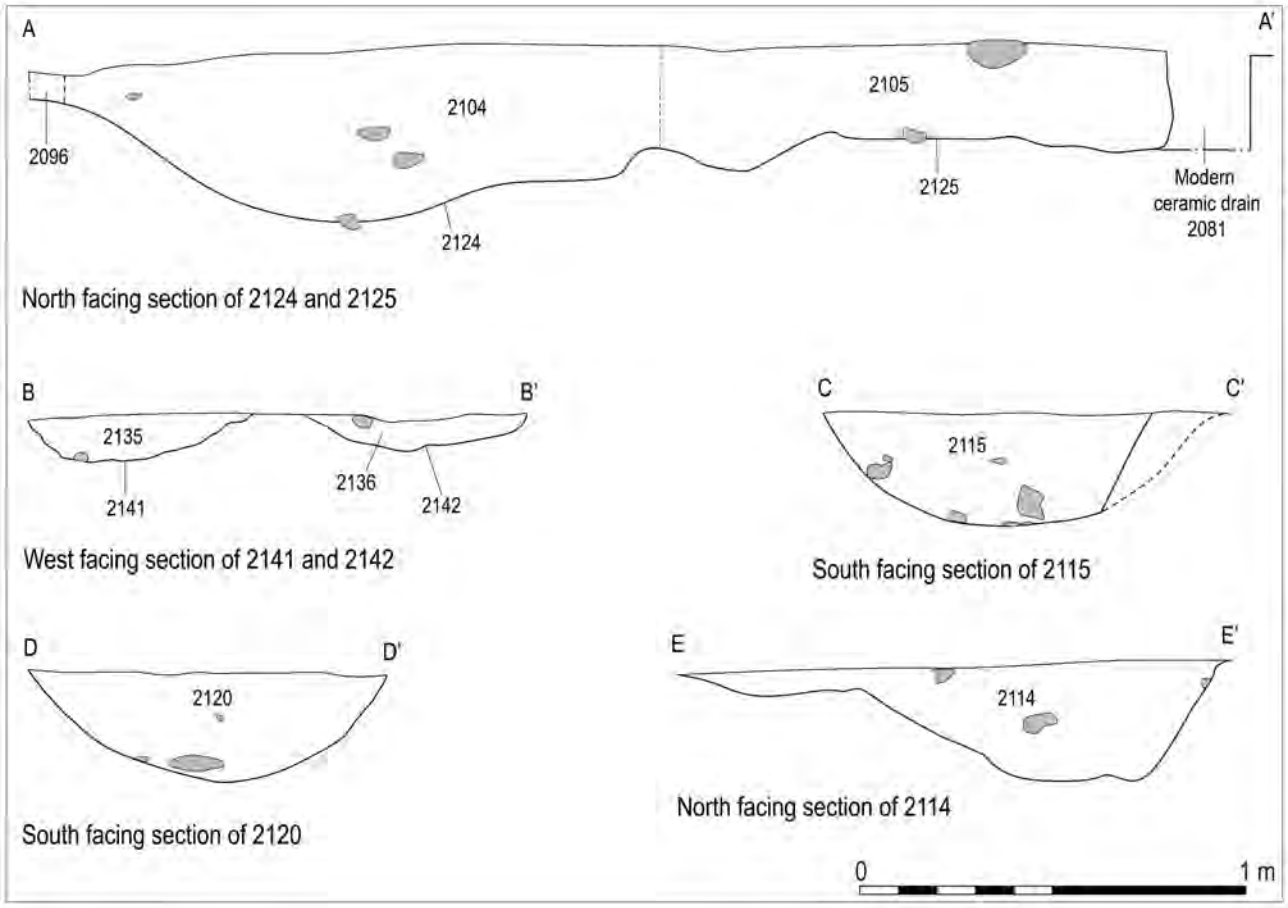
A smaller ditch (C2122, Fill 2120), 0.85m wide and 0.3m deep, ran roughly parallel to the drain (C2146) before joining it where it curved slightly to the east. The ditch was filled with brown sandy silt with occasional large stones up to 0.15m in size. Two sherds of medieval pottery were recovered along with slight traces of birch charcoal and cereal grains.

Immediately to the east of the ditches (C2146/2166) was another (C2128, Fill 2115), which was 1.4m wide and 0.3m deep but it did not extend through the whole width of the trench. Ten sherds of pottery including three modern sherds were recovered from its fill. The botanical remains consisted of small quantities of charcoal, including heather type and cereal grains consistent with waste from the corn-drying kiln.

Illus 18 Area A ditches pre-excavation from the east

Illus 19 Half section across Drain 2146 from the north

Illus 20 Half section across Drains 2124 and 2125 from the south



Illus 21 Sections through drainage channels

North of the terminal of Ditch 2128 was a small circular pit, C2138. Excavation revealed that this shallow feature had been dug into the fill of a larger pit C2169 (below). The lower pit had steeply sloping sides with a rounded base and contained the remains of a tree trunk and root system (C2145). The lack of organic deposits or artefacts would suggest that this is a natural feature that had silted up, although its regular sides could suggest that it may have been a tree-throw pit.

Adjacent was another linear feature (C2053, Fill 2007) similar to C2146/2166 immediately to the west. Here the ditch widened to 1.8m with a maximum depth of 0.3m and had an irregular, uneven base and sides. It was cut by an east/west linear feature (C2054), which may be part of feature C2099 further to the east. Its fill consisted of dark brown sandy silt with occasional stones and flecks of charcoal, and 11 sherds of white gritty pottery. A limited range of plant remains and charcoal was recovered, including cereal grains.

Further west there were two more north/south ditches, C2124 which was 1m wide and 0.12m deep and C2125 which was 1.2m wide and 0.15m deep (Illus 20 & 21). They were roughly parallel but converged into a wide shallow area, C2109, to the north at approximately the same level as C2146 and C2053 to the west.

The area to the north of these features was crossed by several shallow and truncated east/west linear features of similar size and depth (C2071, C2080, C2099, C2054 that may link C2053 and C2109, C2092, C2141 and C2142). All these linear features were a maximum of 1m wide and 0.3m deep. There was very little in the way of artefacts, animal bone or botanical remains from any of these features, which appeared to mark the outline of a rectangle, possibly indicating that buildings or structures had occupied the site utilising sill beam foundations rather than post holes.

Further to the south was an irregular linear feature, C2064, which survived with the maximum

dimensions of 5m by 0.85m by 0.45m and which tapered and become shallower to the east. Unlike many of the linear features, this one contained artefacts: 15 sherds of medieval pottery of probable 13th-century date along with a large amount of cereal grains and charcoal suggestive of domestic activity. Adjacent to this was another linear feature, C2157 (0.6m wide and 0.12m deep), which formed a right angle with Ditch 2158 (0.5m wide and 0.1m deep) that ran NW/SE; neither of these features contained artefacts or botanical remains.

In addition, there were a number of features, pits and possible post holes that did not form a pattern and could not be linked to structures. These were often very ephemeral and may be the remains of fence lines or plot boundaries. No artefacts or botanical remains were recovered from them.

4.5 Area D (Illus 22)

Area D consists of the remaining eastern half of the field to the east of Site A. In this area the archaeological remains were quite different in character and few artefacts were recovered. Three extensive linear features ran east/west across most of the site and were in excess of 50m long. The northern feature (C2332, Fill 2278) was approximately 1m wide and 0.09m deep, while the central feature (C2350, Fill 2348) was 3.5m wide and up to 0.25m deep, and the southern feature (C2357, Fill 2351) was 1m wide and up to 0.1m deep. Feature C2357 was severely truncated and survived as several segments. These features ran parallel for some distance before feature C2332 merged with C2350.

These linear features were investigated by means of seven slot trenches (Illus 23) excavated across them and the results were very similar. They had shallow sloping sides with no definitive cut and an uneven base. The fill of all three features consisted of light-brown sandy silt with occasional small stones along with a small amount of Scottish White Gritty Ware pottery. An iron nail was recovered from C2350. In the base of the central linear feature (C2350, Illus 24) and observed in each of the six slots excavated across it were several parallel grooves cut into the subsoil. These were up to 0.3m wide and 0.1m deep and between 2.2m and 2.4m apart, indicative of wheel ruts and cart tracks. These

Illus 22 Area D from the west

Illus 23 Slot through linear feature C2350

Illus 24 Possible wheel ruts in base of trackway C2350

suggest that the central feature may have been a road or trackway and that the flanking features may have been drainage ditches or even hedgerows. Despite the trackway being clearly visible for over 50m, it was not identified in Area A immediately to the west, although the track may have turned to the south and followed the line of the present road.

4.5.1 Other features

At the northern trench edge was a shallow curving ditch (C2288, Fill 2279, Illus 25), 0.28m wide with a maximum depth of 0.08m. Although no finds were recovered from it, a large number of cereal grains along with slight charcoal remains, including heather, were retrieved from bulk soil samples, enough to obtain a radiocarbon date of AD 1010–1160 (Table 1, SUERC-35920). The cereal grains and heather indicate that this is waste from a corn-drying kiln and the trench dimensions are similar to the ditch surrounding the corn-drying kiln in Area A to the west with a similar date, although this one is slightly earlier. It suggests there may be another corn-drying kiln beyond the limits of the excavation trench to the north.

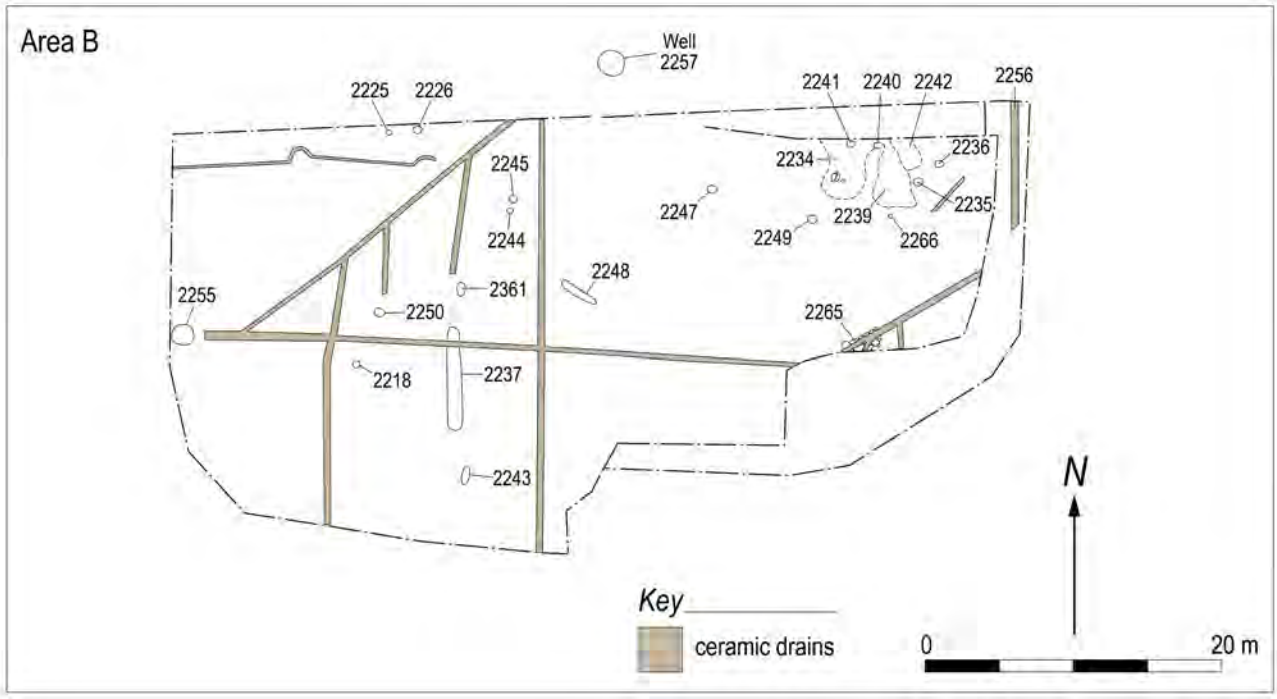
The ephemeral remains of a second linear feature were observed to the east of the curving ditch, consisting of a possible post hole (C2344, Fill 2334), and a linear feature (C2323/2326, Fill 2280). The possible post hole (C2344) contained stones and charcoal. Neither of these features contained artefacts.

The fact that there were very few structural features and very few artefacts from this area, only 12 sherds of medieval pottery and traces of charred botanical remains, suggests that this area was peripheral to the main settlement.

4.5.2 Areas B and C (adjacent to Gogar Church)

Areas B and C had until recently been occupied by cottages and workshops, and later a carpark and construction compound before being landscaped.

Illus 25 Curving ditch from the west



Illus 26 Area B trench plan

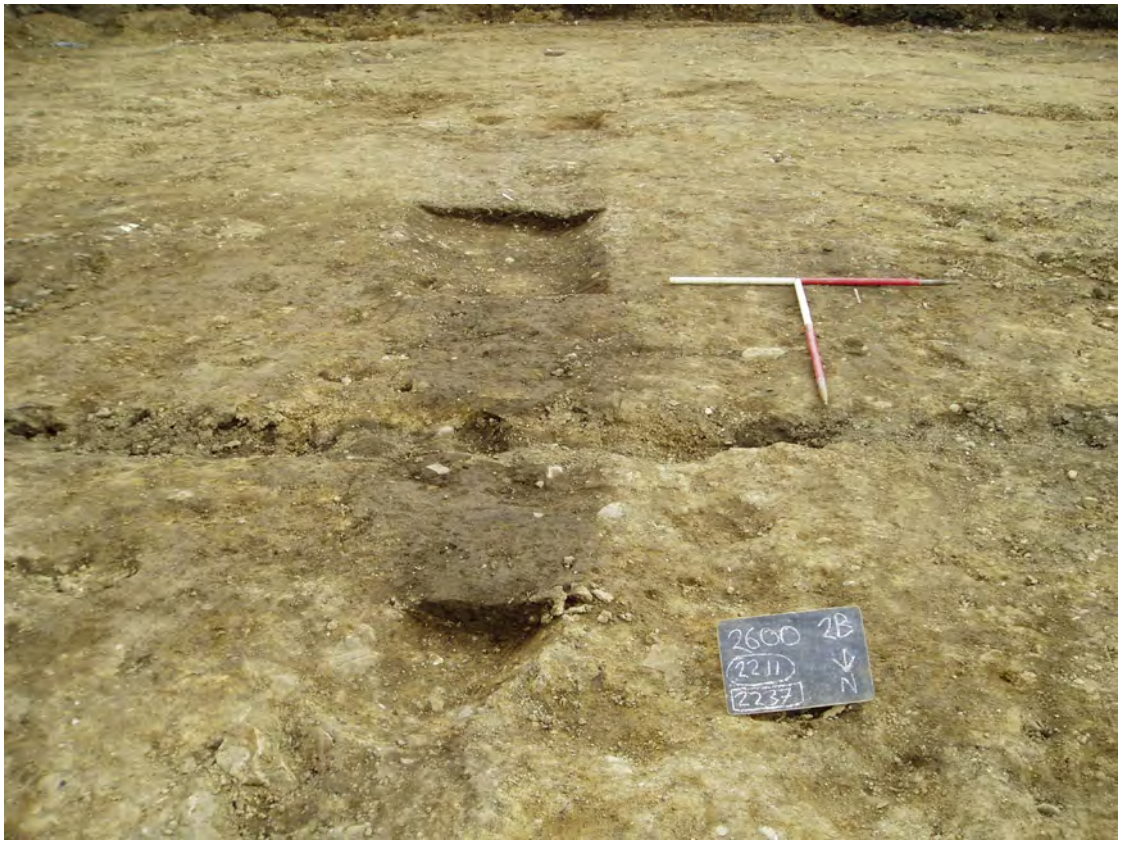
In these areas, as the ground level was to be built up with minimum disturbance to lower deposits, it was agreed that any archaeological deposits that were uncovered were to be recorded, sampled and where possible preserved in situ rather than fully excavated.

4.5.3 Area B (Illus 26)

The modern overburden was removed to reveal several layers of grey-brown silty clay up to 0.5m deep that contained modern pottery and clay tobacco pipe fragments. Below this deposit was a linear feature that ran north/south across the site, and a tobacco pipe bowl of post-1800 date was recovered from its fill (Illus 27). Beneath these deposits in the north-east corner was another deep deposit, up to 0.4m deep, which contained a clay pipe bowl dating to 1650–70. These deposits sealed an irregular surface of rough cobbles (C2234/2239/2242, Illus 28). Post-medieval pottery and a clay tobacco pipe bowl were recovered from the surface. Associated with this were several small pits and post holes, again with a mixture of medieval and modern pottery, along with tobacco pipe fragments that were recovered from the surface. These features were not excavated but protected and left in situ.

Illus 27 Area B ditch

Illus 28 Area B cobbles



Illus 29 Area B Ditch 2211

Illus 30 Area B Ditch 2211: north-facing section

On the west side of Site B below the modern overburden several features had been cut into the subsoil. One was a linear feature (C2211, Illus 29 & 30) that was 8m long by 1m wide and 0.12m deep. Twelve sherds of Scottish White Gritty Ware pottery from cooking pots were recovered from its fill along with carbonised cereal grains. A radiocarbon date obtained from this pit produced a date of AD 1040–1230 (Table 1, SUERC-35917) and a late 12th-century date would fit with the date for the pottery. The alignment of this feature, at right angles to the main road, could suggest that it was a medieval field or property boundary. The remaining pits and post holes in this area contained modern artefacts, mainly pottery, and one large pit contained the skeleton of a large mammal. As modern pottery was also recovered from the upper fill of this pit, it was not fully excavated. In addition to the medieval pottery from the ditch feature, a number of post-medieval and modern sherds were also recovered.

4.5.4 Well

About 3m to the north of the tram corridor adjacent to the access road was a stone-lined well (C2257, Illus 31) capped with a millstone. Heavy machinery crossing this area had broken the millstone, which had fallen into the well cavity. The well was drained of water and found to be at least 2.2m deep with an internal diameter of 1.4m. It was of drystone construction of around 14 courses of rough, angular stones. Four fragments of the broken millstone were recovered, and although not complete there was enough to establish that its diameter was approximately 1.5m. Once recorded, the interior of the well was protected with geo-textile and backfilled with gravel. The location of the well corresponds to

Illus 31 Area B stone-built well that was capped with a millstone

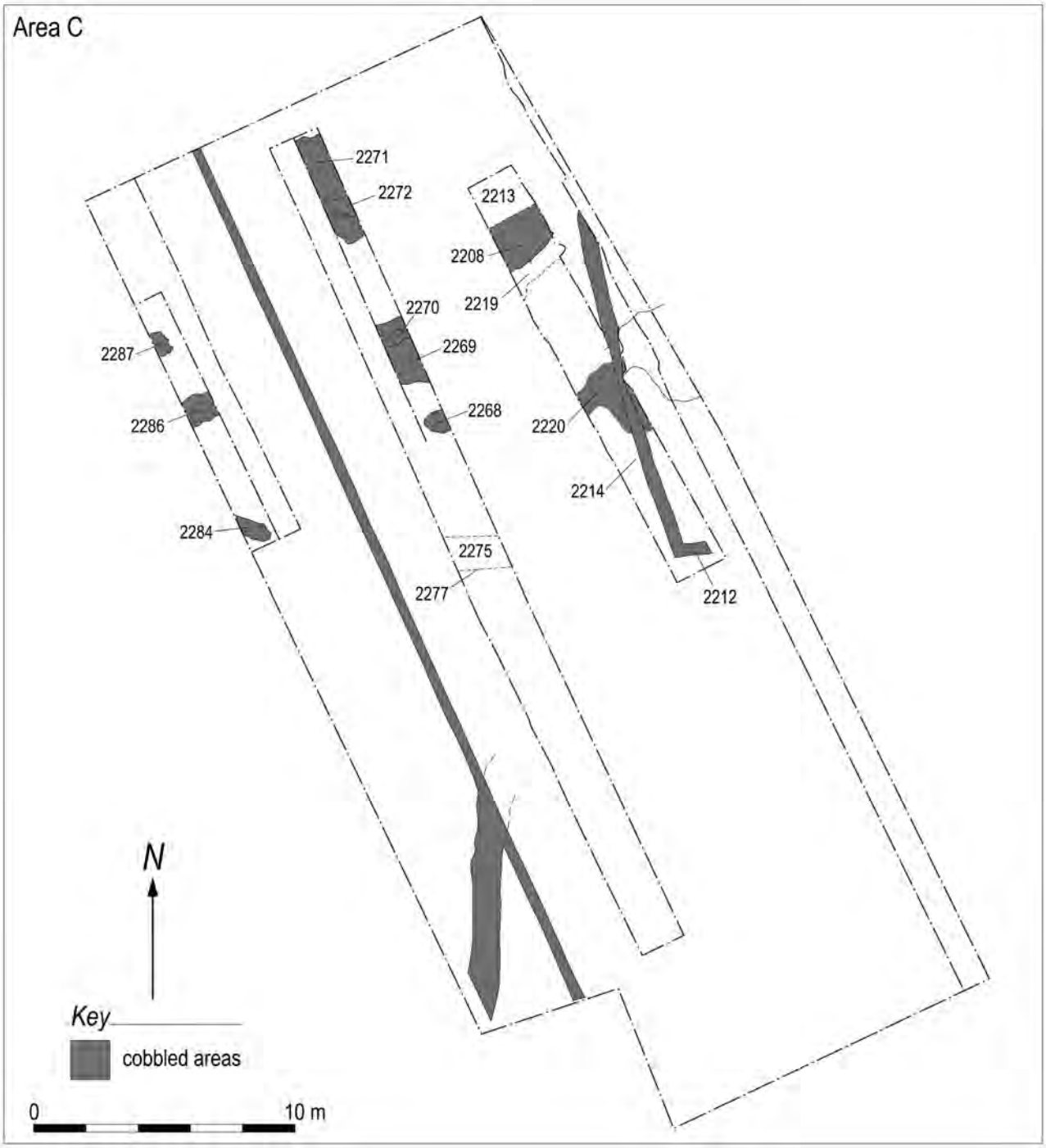
a 'Pump' shown on an estate plan dating to the early 19th century.

4.5.5 Site C (Illus 32)

This was the area to the west of the church, and the modern overburden was removed to reveal an extensive deep deposit of homogeneous brown silty clay (C2207) that covered the whole trench. As this layer was at the depth required for the construction work, any archaeological remains below this layer were not excavated. Instead three slot trenches (A, B and C) were excavated to assess any archaeological deposits that may survive below.

Similar deposits were uncovered in each of the three trenches. Layer C2207 was 0.6m deep and contained a mixture of medieval and modern pottery sherds along with fragments of clay tobacco pipe. It sealed several patches of rough cobbles (C2208, C2220, C2271, C2269 and C2268, Illus 33) at a depth of about 1.2m below the present ground surface. In two of these areas the cobbles had remnants of stone walls (C2272 and C2270) associated with them. Mainly pottery of post-medieval date was retrieved from the surface of the cobbles, suggesting that these surfaces relate to the post-medieval use of the site. In Slot C there was only a small patch of cobbles (C2286) with a possible wall to the north (C2287, Illus 34) and another to the south (C2284). Modern pottery was recovered from between the foundation stones. All these structures were cut into subsoil. In Slot A, the foundations of a stone-built wall (C2210) had been cut through an existing cobbled surface (C2208). These wall foundations formed a corner and may possibly be one of the buildings shown on the estate plan of Nether Gogar dated to around 1829.

A coin of Charles I dating to the 1630s (Scots turner, SF460) was recovered from a modern pipe trench in this area.



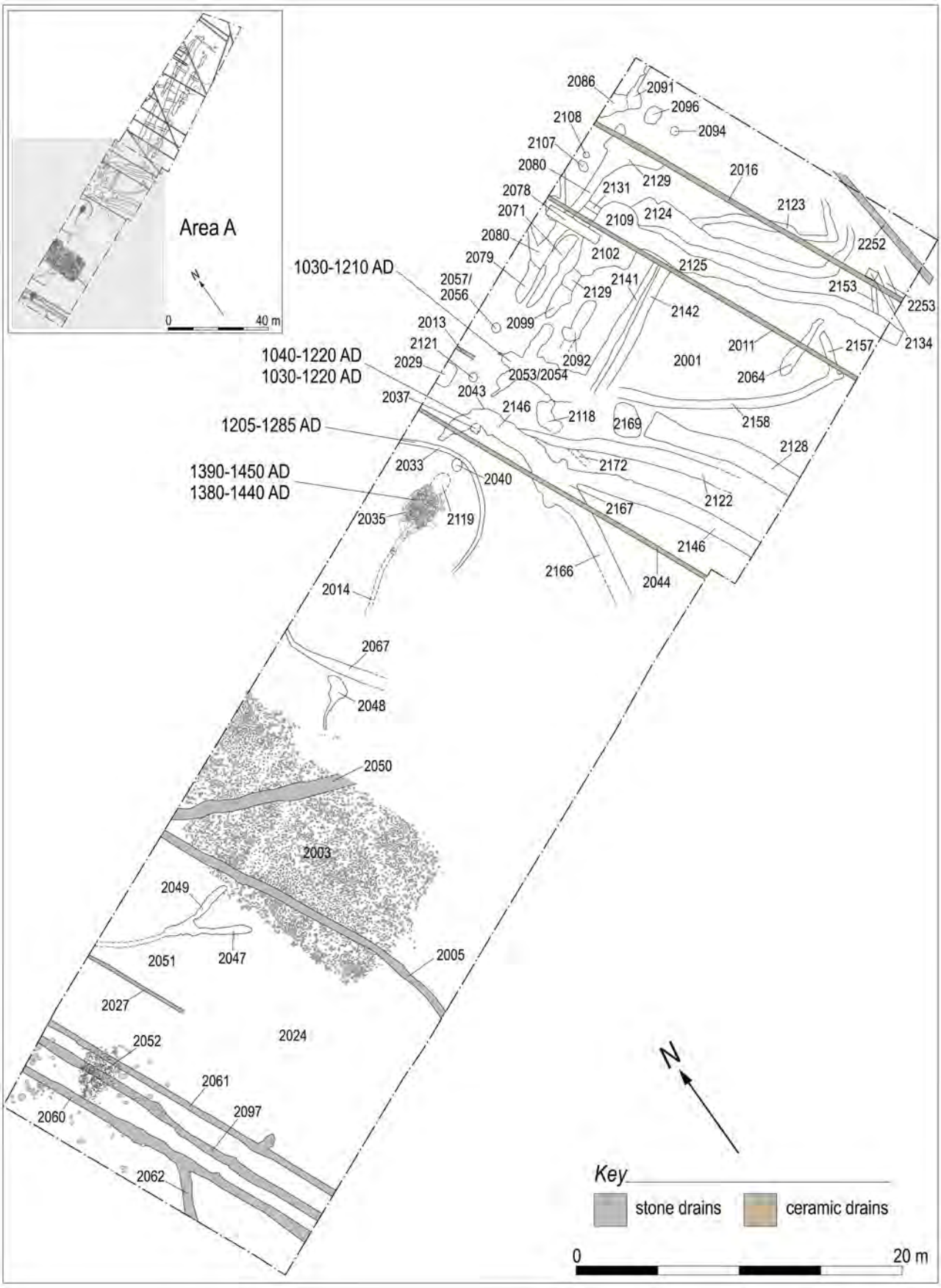
Illus 32 Area C trench plan

Illus 33 Area C cobbled surfaces from the north

Illus 34 Area C possible stone wall in north-west corner

4.6 Radiocarbon dates (Table 1, Illus 35)

Due to the large amount of medieval pottery recovered from the excavations, a limited radiocarbon dating programme was undertaken that concentrated on key features or structures. Eight dates were submitted for AMS dating to the Scottish Universities Environmental Research Centre (SUERC). These dates were derived mainly from carbonised cereal grains, although one date was obtained from willow (*Salix*); these were obtained from bulk soil samples recovered during the excavation. Analysis of the carbonised plant remains suggest that it was largely derived from hearth waste, either from corn-drying or the domestic hearth, rather than structural elements or timbers. Interestingly, there is a break in the radiocarbon dating sequence for the 14th century, which would coincide with the arrival of the 'Black Death' in Scotland in 1350 and may represent a period when the settlement contracted.



Illus 35 Area A trench plan showing features dated by C14

Table 1 Radiocarbon dates from the site

Lab code	Structures	Feature/Context	Sample	Radiocarbon age BP	$\delta^{13}C$ rel	Calibrated date 95.4% probability
SUERC-35910	Ditch	2006 fill of 2146	Charred grain: cereal indet	890±30	-21.90%	AD 1040–1220
SUERC-35914	Ditch	2007 fill of 2053	Charred grain: cereal indet	910±30	-23.60%	AD 1030–1210
SUERC-35915	Ditch round corn-drying kiln	2008 fill of 2033	Charcoal: *Salix*	785±30	-27.00%	AD 1205–1285
SUERC-35916	Ditch	2114 = 2006 fill of 2146	Charred grain: *Avena*	895±30	-26.50%	AD 1030–1220
SUERC-35917	Area B ditch	2211 fill of 2237	Charred grain: *Avena*	880±30	-23.60%	AD 1040–1230
SUERC-35918	Corn-drying kiln	2032 lower fill of 2035	Charred grain: *Hordeum vulgare* sl	510±30	-23.70%	AD 1390–1450
SUERC-35919	Corn-drying kiln	2034 basal fill of 2035	Charred grain: *Hordeum vulgare* sl	550±30	-24.10%	AD 1380–1440
SUERC-35920	Area D ring ditch?	2279 fill of 2288	Charred grain: cereal indet	975±30	-23.30%	AD 1010–1160

5. ARTEFACTS

5.1 Medieval and later pottery

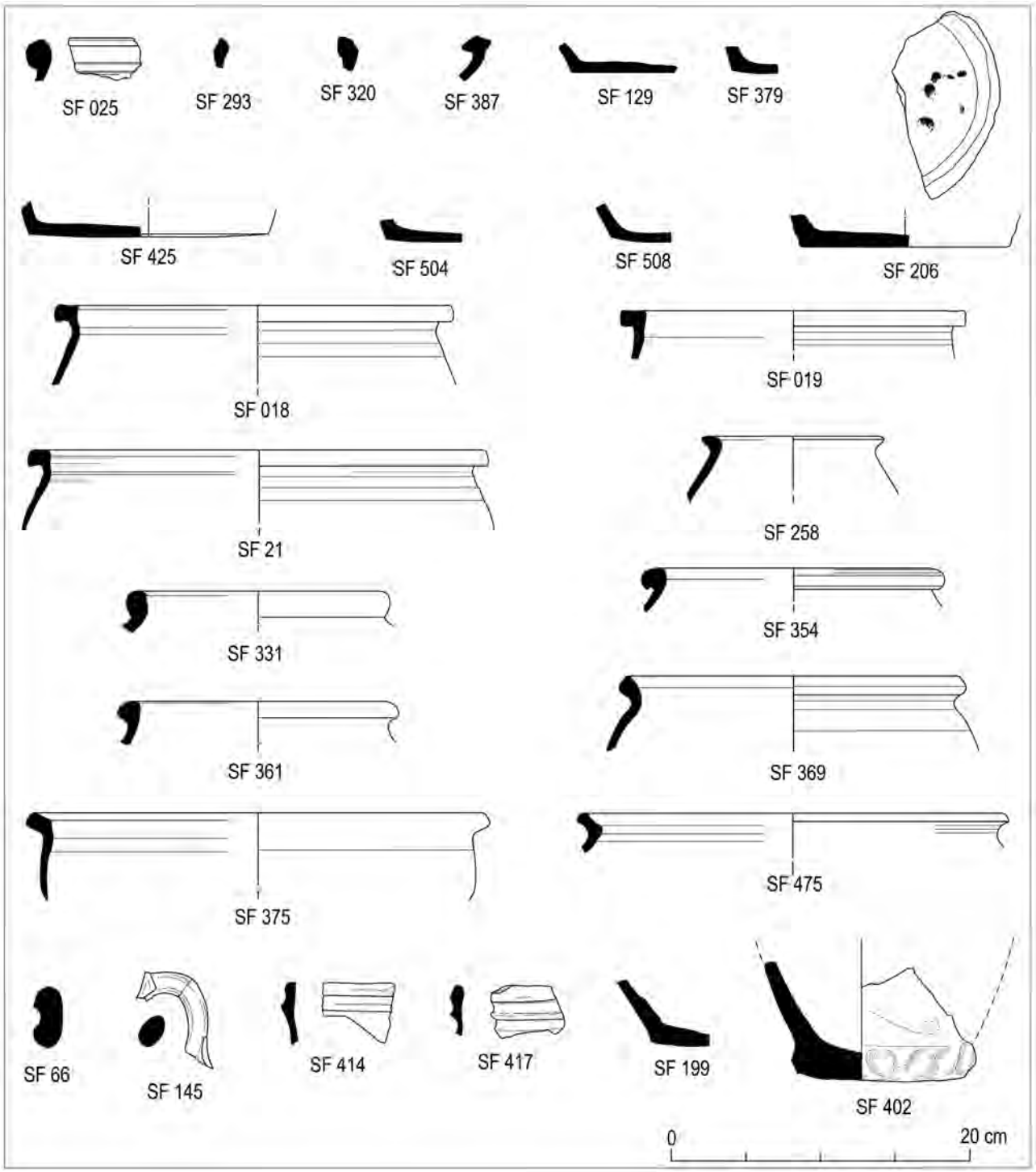
Bob Will

5.1.1 Introduction (Illus 36)

In total, 650 sherds (7.389kg) of pottery were recovered from the investigations. The sherds from the main excavation form a tight group dating to the 12th/13th century, although there is also a small group of post-medieval and modern pottery that was recovered mainly from topsoil or modern deposits. Scientific analysis consisting of ICPES/MS and petrographic analysis was carried out on 20 medieval Scottish White Gritty Ware sherds and the report on this is included below (see Appendix). All the sherds retrieved from the excavation were individually examined and weighed, with diagnostic features such as rims, handles and bases, and differences in fabric and decoration, recorded. The breakdown of all sherd numbers and fabrics present are summarised in Table 2, with sherds from Areas A and D (Table 3), and Areas B and C (Table 4). The pottery was catalogued according to guidelines and standards produced by the Medieval Pottery Research Group (MPRG 1998 and 2001).

5.1.2 Scottish White Gritty Ware

A total of 406 sherds of Scottish White Gritty Ware (SWGW) were recovered from the excavations and form the largest fabric group of the project. White gritty wares occur in large quantities especially in the east of Scotland (mainly St Andrews, Edinburgh and Aberdeen), but increasingly throughout the country. At present only one kiln site has been identified, at Colstoun near Haddington (Brooks 1980; Hall 2004), but recent analysis of white gritty fabrics suggest that there were a number of different kilns throughout the country producing a range of similar vessels in visually similar fabrics (Jones et al 2003). One of the earliest assemblages of White Gritty Wares were recovered from the excavations at Kelso Abbey (Tabraham 1984), where a pit group was dated to the late 12th century, but similar fabrics carry through into the late 15th and early 16th centuries. The earlier vessels from Kelso are thin-walled, straight-sided cooking pots with flat bases, while the later material is much thicker and heavier



Illus 36 Medieval and post-medieval pottery

Table 2 Total sherds and their types from all sites

Total pottery recovered from all areas (including evaluation trenches)	Total sherds	Rim	Base	Handle	Sherd	Weight (g)
Medieval Scottish White Gritty Ware (SWGW)	406	27	40	2	337	3410
Scottish Medieval Redware (SMR)	23	4	3	1	15	454
Low Countries Redware type	2	0	0	0	2	7
Scottish Post-Medieval Oxidised Ware (SPMOW)	20	4	1	1	14	329
Scottish Post-Medieval Reduced Ware (SPMRW)	32	4	3	1	24	838
Modern white earthenware	130	29	6	1	94	1715
Modern red earthenware	22	3	2	2	15	326
Tin-glazed white earthenware	9	1	1	0	7	76
Modern industrial stoneware	2	1	0	0	1	44
Tile	4	2	0	0	2	190
Total	*650*	*75*	*56*	*8*	*511*	*7389*

Table 3 Total sherds and their types from the main excavation, Areas A and D

Pottery recovered from Areas A and D (including evaluation trenches)	Total sherds	Rim	Base	Handle	Sherd	Weight (g)
Medieval Scottish White Gritty Ware (SWGW)	375	26	37	2	310	3204
Scottish Medieval Redware (SMR)	13	1	2	1	9	258
Scottish Post-Medieval Oxidised Ware (SPMOW)	6	2	1	1	2	223
Scottish Post-Medieval Reduced Ware (SPMRW)	15	1	0	1	13	220
Modern white earthenware	98	9	3	0	86	190
Modern red earthenware	18	2	1	1	14	155
Tin-glazed white earthenware	9	1	1	0	7	76
Modern industrial stoneware	1	0	0	0	1	12
Tile	4	2	0	0	2	190
Total	539	44	45	6	444	4528

Table 4 Total sherds and their types from Areas B and C (closer to the church)

Pottery recovered from Areas B and C	Total sherds	Rim	Base	Handle	Sherd	Weight (g)
Medieval Scottish White Gritty Ware (SWGW)	31	1	3	0	27	206
Scottish Medieval Redware (SMR)	10	3	1	0	6	196
Low Countries Redware type	2	0	0	0	2	7
Scottish Post-Medieval Oxidised Ware (SPMOW)	14	2	0	0	12	106
Scottish Post-Medieval Reduced Ware (SPMRW)	17	3	3	0	11	618
Modern white earthenware	32	20	3	1	8	1525
Modern red earthenware	4	1	1	1	1	171
Modern industrial stoneware	1	1	0	0	0	32
Total	*111*	*31*	*11*	*2*	*67*	*2861*

with a wider range of vessel types, particularly jugs.

The Gogar material consists of predominantly undecorated thin-walled cooking pots and storage jars with flat bases and both straight-sided and globular bodies. While the fabric of the bodies was generally between 3mm and 4mm thick, several sherds were between 2mm and 3mm, which demonstrates a high level of skill by the potter. Taken as a whole, these characteristics would suggest a 12th- or early 13th-century date for the assemblage. Only a handful of sherds were decorated: these were from jugs and were decorated with applied horizontal strips with incised decoration, and a few had spots of glaze that had presumably dripped or splashed onto the vessels.

A large group of Scottish White Gritty sherds (156 sherds) were recovered from one of the larger ditches in Area A (C2146/2166, Fills 2006 and 2114). Again, these were mainly from cooking pots, identified by the presence of sooting and burning on their bases and bodies. Both straight-sided and slightly rounded vessel forms were present. Radiocarbon dates of AD 1040–1220 and AD 1030–1220 (Table 1, SUERC-35910 & SUERC-35916) were recovered from charcoal within the fills of one of the ditches, which indicates an early date for the assemblage. Only one Scottish redware sherd was recovered from this group and it was from a cooking pot with a white slip.

5.1.3 Scottish Medieval Redwares

Twenty-three sherds of Scottish Medieval Redware (SMR) were recovered from the excavations. The term 'Scottish Medieval Redware' is a general name to describe a group of similar fabrics found throughout Scotland (Haggarty, Hall & Chenery 2011). The largest assemblages of Scottish Medieval Redwares have been recovered from excavations in Aberdeen, Perth, Stirling and other east coast burghs, which along with kiln sites at Rattray near Peterhead and Stenhouse near Falkirk have led to the use of the fabric name East Coast Redware (Hall 1998). Generally these fabrics date from the 13th to the 15th century, although the recent publication of the Perth High Street excavations has identified Scottish redware fabrics from the mid-12th century (Hall et al 2012). Scottish Medieval Redwares do occur in the Edinburgh area and other parts of Scotland where Scottish White Gritty Wares are the dominant fabric, but, as at Gogar, in very small numbers. The occurrence of redware sherds does

indicate that pottery vessels were available from the wider area and that pots were being traded between towns.

As mentioned previously, one of the sherds from Ditch 2146/2166 plus another sherd had a white slip covering its red fabric, presumably to compete with the more common Scottish White Gritty Ware vessels. Similar sherds have been found at Stirling and Perth, where the use of a white slip especially on cooking pots seems to be more common in the 13th and 14th centuries (MacAskill 1987). The radiocarbon dates of AD 1040–1220 and AD 1030–1220 (Table 1, SUERC-35910 & SUERC-35916) from the ditch would suggest that the use of white slip may be earlier than previously thought. In addition to the sherds from cooking pots or storage jars, there was a grooved strap handle from a jug and several sherds decorated with green glaze that also probably derive from jugs.

5.1.4 Imported wares: Low Countries Redware type

Two small sherds recovered from Areas B and C may be imported. They are in an orange-red fabric with a clear glaze which gives a brown appearance. When recovered, both sherds had soot on the exterior, suggesting they are likely to be from small globular cooking pots. Similar vessels were imported from the Low Countries in the 16th and 17th centuries and have been recovered from several sites within Edinburgh.

5.1.5 Scottish Post-Medieval Reduced Wares and Oxidised Wares

A total of 52 sherds of both Scottish Post-Medieval Reduced and Oxidised Wares (SPMRW & SPMOW) were recovered. They represent mainly jugs, although an everted rim from a vessel shaped like a chamber pot but probably a cooking vessel or bowl was recovered in an oxidised fabric. These fabric types were first classified at Stirling Castle (Haggarty 1980), where the pottery dates from the late 15th to early 18th centuries. The only published kiln site for these wares in Scotland is at Throsk on the banks of the Forth near Stirling (Caldwell & Dean 1992). Scottish Post-Medieval Reduced Wares are thick-walled and the fabric is usually heavily reduced to grey or black with few inclusions and tends to be covered with a thick, dark green glaze. The oxidised wares are very similar, except that they are reddish/orange or more commonly partially oxidised or partially reduced. These variations are the result of firing conditions in the kiln. One near complete frilled and thumbed base similar to 15th-century Rhenish stonewares was recovered. Examples of similar frilled bases copying these imports have been found in local Scottish fabrics at a number of sites including the High Street, Edinburgh.

5.1.6 Late 18th- to 20th-century industrial wares

The modern industrial ceramics consist of white earthenware (130 sherds), red earthenware (22 sherds), tin-glazed white earthenware (9 sherds) and industrial stoneware (2 sherds) that date from the late 18th through to the early 20th centuries, and most were recovered from topsoil. These vessels were made in large quantities at a number of factories throughout Britain, and without maker's stamps or recognisable decoration or patterns it is difficult to identify the manufacturers or refine the dating. Nine sherds of white earthenware with a flaking pale blue tin glaze were recovered from the fill of a modern field drain (C2332). The sherds are all from the same small vessel with a pedestal base, possibly a large eggcup or goblet. Tin glaze became common in Europe from the 16th century, with potteries in the Netherlands and England, but these sherds are more likely to originate from the Delftfield pottery in Glasgow that operated from 1748 until 1823 (Kinghorn & Quail 1986) or later factories that copied this style. Four fragments of orange-red earthenware were recovered and are the remains of ceramic field drains and probably date from the 19th century.

5.1.7 Conclusion

This medieval assemblage recovered from Gogar is a tightly dated group supported by radiocarbon dates that dates to the late 12th/early 13th century but mainly consists of material recovered from possible domestic waste within ditches. The early material comprises Scottish White Gritty Ware cooking pots identified by smoke marks and soot on their external surfaces. A large group of sherds was recovered from a ditch fill which was radiocarbon-dated to the

11th to early 13th century, providing independent dating for the assemblage, although the charcoal for the dates could be residual. There is also a small assemblage of post-medieval sherds, mainly from the area nearest the church, which was the centre of the post-medieval to modern settlement. The medieval assemblage is very similar to that recovered from the excavations to the west of the present site, where sherds of Scottish White Gritty Ware cooking pots and Scottish Medieval Redwares with a white slip were recovered, suggesting contact and trade beyond the immediate local area. A similar set of radiocarbon dates were obtained in association with these sherds. There were no imported sherds from England or mainland Europe in the medieval assemblage and this may reflect the economic circumstances of the villagers, as a wide range of imported wares were available in Edinburgh and Leith.

5.2 Burnt clay

Beverley Ballin Smith

Fragments of burnt clay were recovered from a post hole forming part of the ditch surrounding the corn-drying kiln and from three of the ditches to the east of the corn-drying kiln. The fragments were all small, irregularly shaped pieces of burnt clay weighing 131g. Several were grey in colour, possibly the result of burning.

The occurrence of small pieces of burnt clay in a post hole forming a curving ditch round the corn-drying kiln, along with the recovery of willow charcoal from the ditch, may indicate that there was possibly a wattle and daub screen or windbreak round the kiln.

5.3 Tobacco pipes

Dennis Gallagher

A total of 22 fragments of clay tobacco pipe were recovered and date from the mid-17th century to the late 19th and early 20th. Notable fragments included a bowl of *c* 1650–70 marked B three times, probably a member of the Banks family, possibly William Banks (No 1, see 5.4 Catalogue of diagnostic fragments below). The letter B, denoting the maker's surname, had been recut twice, an indication of the longevity of the mould. Another bowl, from the end of the 17th century and with an Edinburgh/Leith-style mark, is from an unidentified maker (No 2). There are also a number of 19th-century fragments. Several have decoration typical of early 19th-century forms with fine relief decoration such as fluting (Nos 4 and 5). Later 19th-century examples include a fragment of a TW pipe (No 7), a very common form, and a Dutch import with a milkmaid stamp (No 6). This form of stamp was used in Gouda from the 17th century to *c* 1940 but the present pipe is of probably 19th-century date.

5.4 Catalogue of diagnostic fragments

5.4.1 17th century

▸ 1. Bowl, rim, bottered and milled. A mould-imparted letter B recut twice, no initial visible on the other side of the base. Probably a member of the Banks family, Edinburgh/Leith, *c* 1650–70. Area 2b, Context 2204.

▸ 2. Bowl, base damaged, rim bottered but not milled, mould-imparted T or I/I and the upper part of an Edinburgh/Leith 'portcullis' style basal stamp; maker unidentified, *c* 1690–1720. Area 2b, Context 2234.

▸ 3. Thick-walled bowl, base missing, rim bottered; *c* 1680–1720. Area 2c, Context 2207.

5.4.2 Post-1800

▸ 4. Bowl body sherd with relief fluting and horizontal band of rope twist, in a very fine clay; early 19th century. Area 2b, Context 2203.

▸ 5. Adjoining basal and bowl wall fragment of a spurred bowl with relief ribbing, possible garland around square-cut rim; early 19th century. Area 2a, Context 2027 and Area 2a, Context 2060 field drains.

▸ 6. Bowl body sherd with circular stamp with milkmaid; Dutch, probably Gouda, 19th century. Area 2b, Context 3601.

▸ 7. Two adjoining bowl sherds with a part of a stamp having a T with frame. This is probably a TW pipe, post-1850. Area 2a, Context 2081.

5.5 Carbonised plant remains

Susan Ramsay

A total of 39 samples, representing 24 contexts, were processed by flotation or wet sieving for the recovery of carbonised remains, which were then examined using a binocular microscope at variable magnifications of ×4 – ×45. The testa characteristics of small seeds and the internal anatomical features of all charcoal fragments were further identified at ×200 magnification using the reflected light of a metallurgical microscope. Reference was made to Schweingruber (1990) and Cappers et al (2006) to aid identifications, and vascular plant nomenclature follows Stace (1997).

The carbonised assemblage is consistent with a medieval or later agricultural site. A corn-drying kiln contained evidence for multiple episodes of use, with oats, barley and wheat grain present, although there is no evidence for chaff. Arable weed seeds were present in small quantities, indicating that the crop was more or less fully processed prior to drying. The fuel for the kiln would have been collected from local woodlands and heather type stems may be the remains of a 'mat' on which the grain was dried. There is tentative evidence for a willow wattle fence or screen on one side of the corn-drying kiln. An extensive ditch system and a cobbled courtyard produced carbonised assemblages that were similar to those recovered from the corn-drying kiln and it is considered likely that much of the carbonised material present on this site originated from activities associated with the corn-drying kiln.

The botanical analyses of the samples provided little in the way of evidence for structural material, either in the form of posts burnt in situ or for evidence of roofing or flooring material. The only potential structural material came from the trench surrounding the corn-drying kiln, in which a single fragment of small roundwood willow charcoal was recorded, as well as a piece of burnt clay. Although this is not sufficient evidence to say that a wattle screen or fence definitely existed within this trench, willow was not commonly found on the site and did not appear to have been used for fuel on a regular basis.

The most notable feature on the site was the stone-built corn-drying kiln. A large proportion of the cereal grain recovered from this feature was not identifiable to type, probably as a result of having been burned multiple times or at a very high temperature. However, evidence for oats, six-row barley and wheat (including possible bread wheat) was recovered from it as well as from the surrounding ditch systems and cobbled surface. It appears that the majority of the carbonised remains from the site originated from the use of the corn-drying kiln. The fuel used within the kiln appears to have been collected from the local woodlands, with no evidence for particular wood types being preferred. Birch charcoal was slightly more common than other types but this may just have been a result of birch trees being one of the commonest tree types growing in the vicinity of the site. Of note is the presence of significant quantities of heather type charcoal within the waste material from the corn-drying kiln. The heather twigs could have originated from turves cut from areas of heathland, since Fenton (1999) indicates that turf was a preferred fuel for corn-drying kilns as it burned with a slow, even heat and was less likely to create sparks that could set the grain alight. However, there was no additional evidence for burnt turf within the kiln waste and it may be that the heather was being used as a 'mat' on which to dry the grain, with wood being the kiln fuel.

Crop processing is the name given to the series of events that result in the removal of chaff and arable weed seeds from the grain. The successive stages progressively remove more and more contaminants, thereby leaving a 'fully cleaned' crop that has few, if any, weed seeds remaining (Hillman 1981). The almost total absence of chaff and only limited numbers of small weed seeds indicates that the crops being dried in the kiln at Gogar Church had already undergone much of the processing required prior to grinding.

The commonest weed seeds present within the assemblages were corn marigold and fat hen. These species were both common weeds within arable crops in the past, although corn marigold is now a relative rarity as a result of the increased use of chemical herbicides. Corn marigold was particularly prevalent on light sandy or loamy acidic soils, while fat hen has a much less specific habitat requirement. Nevertheless, both species prefer fertile, nitrogen-rich soils such as those found associated with arable land (Williams 1963; Howarth & Williams 1972).

The cereal assemblage consists of oats (13%),

barley (8%) and wheat (3%). However, the majority of the grain (76%) recovered was indeterminate in nature and so care must be taken in extrapolating the dominant cereal type from the small quantity of identifiable grain available. The mixture of grain types within the assemblages could represent the processing of a maslin (mixed) crop but is more likely to be the result of multiple uses of the kiln, with different crops being processed separately. Multiple uses of the kiln would explain the high percentage of indeterminate grain, as repeated burning causes the deterioration of the exterior of any carbonised cereal grains present.

The identification as to species of oats is problematic, and is based on the grain size and shape of the abscission scar if no chaff is present. In this study the grains were not confidently identifiable as to species, although many were sufficiently large to have cultivated origins, implying that common oat (*A. sativa*) or black oat (*A. strigosa*) was present. Oats were generally the most common cereal type grown from the medieval period onwards in Scotland (Bishop et al 2009), although the assemblages from Gogar Church suggest that six-row barley and wheat were also grown in significant amounts. Wheat has been recognised since antiquity as being a higher-status crop than either barley or oats in Scotland, making it a more expensive commodity, either to buy or trade. Part of the reason for this is the fact that the wheats need a longer growing period, requiring winter sowing. In Scotland the weather at this time of year is often not conducive to winter sowing in many parts. Wheat also needs a longer ripening period than barley or oats, with warm summers more of a requirement. Summer warmth is not guaranteed in Scotland to the same extent as it can be in England, although certain parts of Scotland can grow wheat well. Nevertheless, wheat cannot be grown in Scotland as ubiquitously as barley or oats, and consequently it would have been a more valuable commodity.

The botanical assemblage is consistent with those that would be expected from medieval or later agricultural activity in central Scotland. It is also broadly similar to the botanical remains recovered from the earlier excavations to the west, where they recovered more charcoal from willow in similar quantities to birch, and rye grains were found among the cereal grains but in very small quantities.

5.6 Animal bone

Catherine Smith

Approximately 111 bones or bone fragments were examined but their preservation was generally poor. Teeth were possibly over-represented in the collection since they are hard and durable and tend to resist decay in unfavourable soil conditions rather better than the rest of the skeleton. However, a small number of the cattle bones were well-preserved but because of their large size and the presence of saw cuts may be considered to have a more modern origin than the bulk of the assemblage (SF136, SF202 and SF229). Bones of cattle, sheep/goat, horse, pig (represented by one tooth SF81) were present. Most of the surviving bones came from adult rather than juvenile animals, which is unsurprising given that bones from younger animals tend to decay faster than those of adults, because they are less well mineralised. The presence of a high proportion of horse bones may represent the burial of casualties, although it is interesting to compare another medieval assemblage from East Lothian, at Hallhill Farm, Dunbar. Here, relatively high numbers of horse bones were noted, some of them butchered, scattered throughout the site (Smith 2000). At the multi-period site of Castle Park, Dunbar, there was also strong evidence to show that horses were not simply buried on death, but were utilised as a food source throughout the life of the site, from the Iron Age to the post-medieval period (Smith 2000: 231–3). One of the horse bones from Gogar, a distal metapodial, bore marks which may well be abraded knife cuts (SF150), indicating that the carcass was put to some use after the animal had died, either for its meat or the hide. This use of horses is not at all unusual in a rural, or indeed an urban, medieval context (Smith 1998).

The bones, although in poor condition, tell a story of the exploitation of large domestic mammals, mainly cattle and horses, although sheep/goat and pig bones were also present. It is not possible to estimate the relative importance of these species, however, since it is clear that not all of the bones which were originally deposited have survived. This is indicated by the high fragmentation rate and the high incidence of fragments which could only be described as 'indeterminate mammal'. There was evidence of limited butchery of cattle and horses.

Those cattle bones which were sawn may be of a more recent date than those which were butchered using axes or cleavers, since saws were not generally used for everyday butchery during the medieval period.

5.7 Shell

A number of fragments of oyster shell (74g in total) were recovered from features across the site and suggest that oysters had been eaten. The recovery of oyster shells from medieval sites is quite common, especially in Edinburgh, and the oysters most likely came from the River Forth.

5.8 Coin

Donal Bateson

One coin was recovered from the excavations; although badly abraded it is most likely to be a Charles I Scottish copper turner (two pence piece) of the 1630s (SF460, Context 2207). The coin was recovered from a modern service trench to the west of Gogar Church.

5.9 Metal finds

Bob Will

Only one metal object recovered from the excavations has been identified as medieval. The remaining metal objects (bolts, nails and unidentifiable fragments of iron corrosion and concretions) tended to come from plough soil and are probably relatively modern.

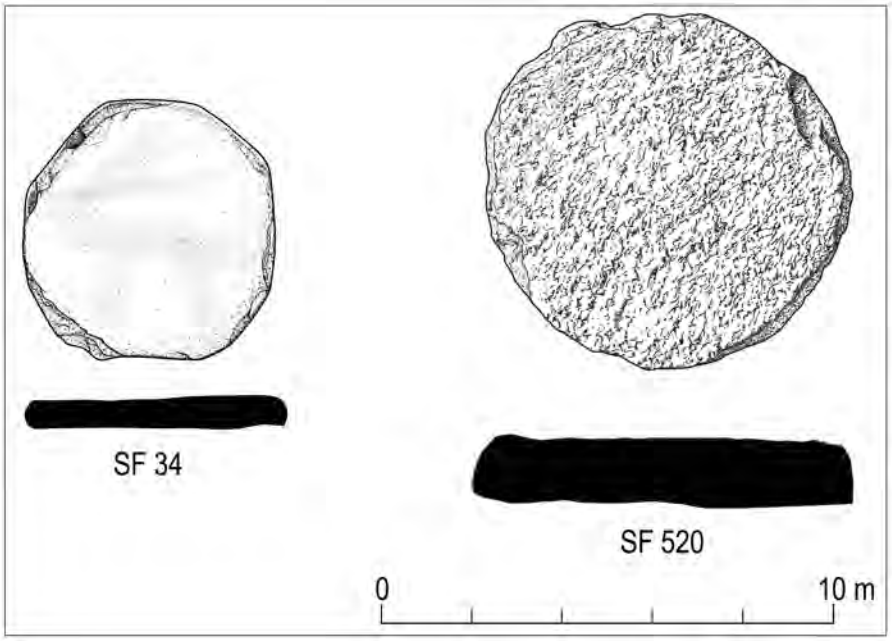
5.9.1 Finger ring (No 377, Context 2114, not illustrated)

A fragment of a plain circular ring, possibly a finger ring made from copper-alloy, was recovered from ditch 2146/2166. The fragment consists of approximately two-thirds of a ring with a diameter of 21mm. The ring is 2mm thick and is ovoid in section. A radiocarbon date from the ditch dates the deposit in which the ring was found to the period AD 1030–1220 (Table 1, SUERC-35916).

5.10 Stone artefacts

Beverley Ballin Smith

1. Possible shale rough-out (Area A, SF350, Context 2089)
This is a semi-circular piece of highly laminated shale (141mm by 56mm by 17mm weighing 100g), which may have been deliberately shaped by chipping the curved edge from one surface only. A roughly shaped piece may have broken before it could have been used to make a bracelet or other form of ornament. Cannel coal or shale was often used from prehistoric times to make bracelets.



Illus 37 Stone discs

Initially a circular disc was formed by chipping or cutting and the bracelet carved out of the piece. However, this piece is in poor condition and could equally be a naturally shaped stone.

2. Stone disc (Area 2D, SF520, unstratified, Illus 37)
This is a roughly circular disc of grey/yellow sandstone (80mm in diameter, 15mm thick and 178g in weight). It is a slice from a larger stone that has been split: its surfaces are natural and unworked, and its side and edges have been mostly chipped to form a circular piece. It is a roundel rough-out.

3. Stone sliver (Area A, SF357, context 2114)
This irregular circular-shaped disc of micaceous sandstone (115mm by 90mm by 18mm and 287g in weight) is a sliver from a large cobble. Fresh grooves on one surface are probably from machinery such as a plough or mechanical excavator. Fine grooves on the upper edge are probably natural. There is little evidence of the stone having been worked.

4. Polished stone cobble (Area A, SF306, Context 2082)
This natural cobble of quartz, coloured pink and pale brown, is very smooth with a high polish on its surfaces. It measures 102mm to 113mm in diameter, and is *c* 46mm thick at its centre. It weighs 849g. Although there are no signs of highly polished areas on the surface of the stone, this hand-sized stone could have functioned as a polisher.

5. Stone with a groove (Area A, SF200, Context 2002, from soil sample 200)
This irregular-shaped stone of blond/yellow sandstone (60mm by 35mm by 30mm and 129g in weight) is part of a cobble or other larger piece. Its sides and edges appear to have been chipped, flaked or cut. One surface is naturally convex and the other is flat but angled with a linear groove running from one end of the stone to the other. The groove is *c* 4mm wide and 3mm deep. This stone may have functioned as an improvised whetstone.

6. Worked stone (Area A, SF2006, from soil sample 190)
This irregular-shaped piece of possible mudstone measures 37mm by 15mm by 7mm and is 5g in weight. It has been chipped along its two long edges and is probably broken at either end.

7. Roundel (Area A, SF34, Context 2002, Illus 37)
This roughly rounded stone of mudstone measures 68mm by 9mm and weighs 47.9g. The piece is split from a larger stone as both surfaces are unworked. Its sides have evidence of some knife trimming, with some limited areas of smoothing. This is probably a rough-out for a spindle whorl.

8. Millstone
Four fragments of a blond sandstone millstone were recovered from inside a stone-built well to the south of Gogar Church. The stone appears to have been used to cover the well and an estate map of 1829 has a water pump marked at this location. The same map also shows the location of a mill next to the Gogar Burn at the western edge of the settlement. The fragments would suggest a diameter of 1.4m with a central pivot-hole 300mm in diameter. The stone is 120mm thick. One surface has been pecked to roughen it, while the other surface is smooth with damaged areas. Presumably this was the side that was uppermost when the stone was used to cover over the well. The edges of the pivot-hole are rounded and smooth through use. There are remains of a check on the inner edges of three of the stones for the metal brackets or rhynds that would have held the stone in place when in use. In addition, there is also evidence of a small rectangular recess at the broken edge on the underside of one of the stones (90mm by 40mm by 30mm).

5.11 Lithic artefacts

Torben Ballin

A small number of lithic artefacts were recovered from the excavations and are predominantly quartz (six pieces), but some of these pieces may be natural. In addition to the quartz, there were two flints and one piece of chert. While most of the lithics represent debitage, there are two interesting pieces, a core (CAT 1) and one tool (CAT 12).

▸ CAT 1 (29mm by 22mm by 23mm) is a small sub-conical core in chert. It may be the exhausted remains of a microblade core, but only flake scars survive. It has been reduced along half of its circumference, and it has a plain, trimmed platform. This core probably dates to the Mesolithic or early Neolithic.

▸ CAT 12 (33mm by 21mm by 21mm) is in reddish-orange, somewhat impure, local flint. Despite some

similarities with prehistoric cores, this is probably a crudely shaped fire-flint, used with a steel strike-a-light. All edges are heavily battered or crushed, in some cases developing notable concavities. A large collection of similar fire-flints was recovered from Townparks in Antrim town, Northern Ireland (Ballin 2005). It is impossible to typologically date the fire-flint, precisely as they were in use from the Iron Age to the post-medieval period. However, the fact that it was recovered along with artefacts suggests a late date within this period.

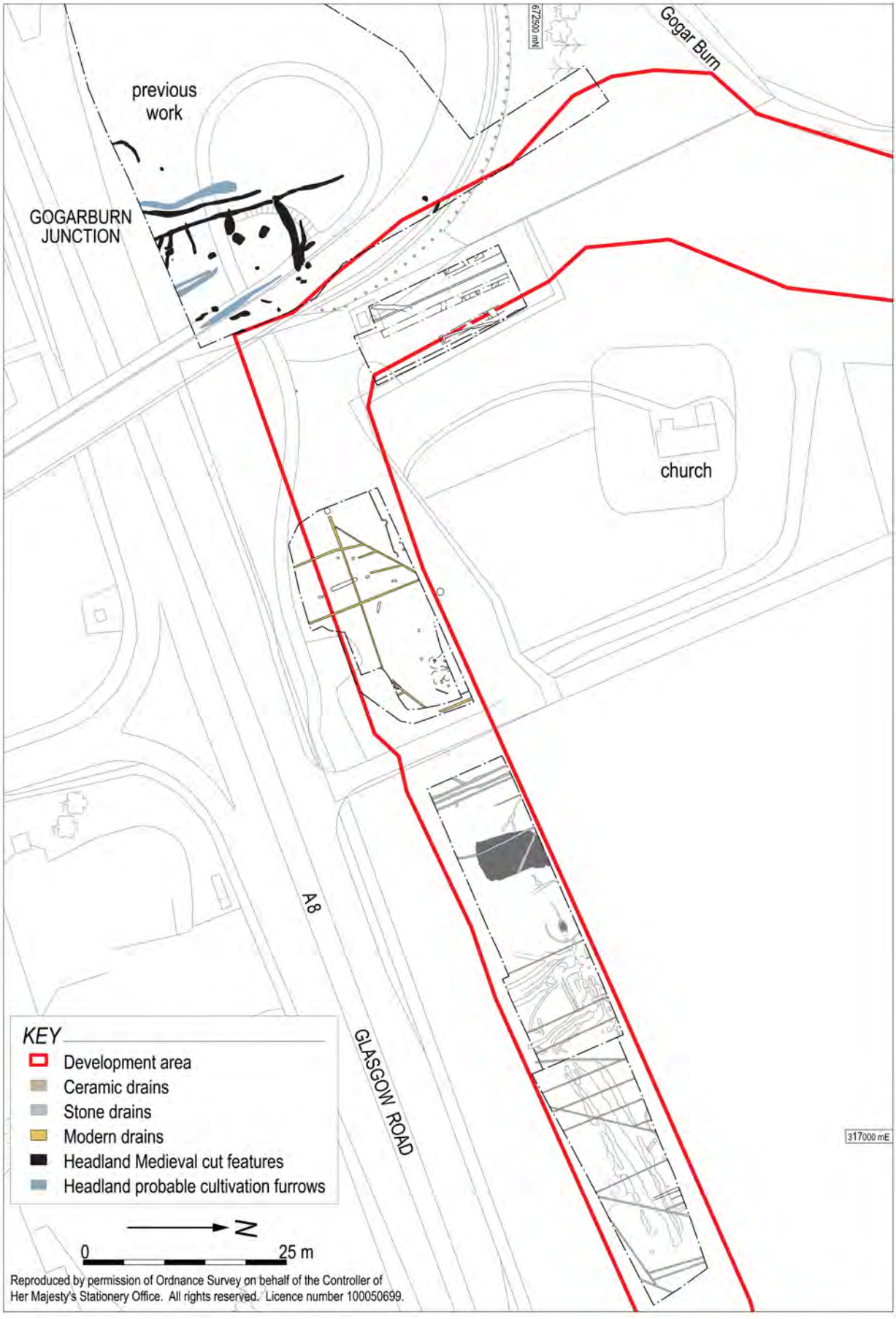
6. DISCUSSION (ILLUS 38 & 39)

The excavations to the south and east of Gogar Church revealed significant archaeological remains related to agricultural activities connected to the medieval settlement of Nether Gogar. They included a cobbled surface, a corn-drying kiln, a trackway, and ditches that probably relate to field systems. In many ways the results are very similar to those from the excavation to the west of the site and radiocarbon dates obtained from the ditches there produced almost identical dates. Although stone-built structures were discovered in Area A with the corn-drying kiln and cobbled surface, possibly a yard used for crop processing, no houses or buildings or their foundations have been found. Domestic midden material was recovered, especially from the larger ditches. Apart from the pottery assemblage, the range of artefacts was quite limited, although a copper-alloy finger ring was recovered as well as quern fragments and other coarse stone objects. The carbonised plant remains appear to relate to crop processing and consist of burnt cereal grains and charcoal from fuel used in the corn-drying kiln, although fuel waste from domestic use would be similar and cannot be ruled out. In Areas B and C cobbled surfaces and wall foundations were discovered but the artefacts associated with them are post-medieval and modern. Therefore, both excavations have uncovered evidence for agricultural activities including the processing of cereal crops but the actual settlement remains are missing. The evidence points to agricultural activities taking place on the periphery of the settlement. In Areas B and C there was only one feature with medieval deposits – a section of ditch that contained white gritty pottery, suggesting domestic use to the south of the site near the modern road. Records show that in 1927 the road was widened and re-aligned and this involved demolishing existing buildings. Therefore the main settlement could have been situated to the south, now under the present road. Work on the south side of the road did not uncover substantial archaeological remains (Morrison et al 2009).

Two other medieval settlement sites have recently been investigated in the immediate vicinity of Gogar, at Norton House Hotel (Swan & Caruthers 2006) to the south-west and at Newbridge (Engl & Hunter-Blair 2008) further to the west. These sites seem to be small agricultural settlements or hamlets consisting of mainly cobbled surfaces, stone-wall foundations possibly from buildings, and at Newbridge stone-built corn-drying kilns and ditch systems. These three sites have also produced similar assemblages of White Gritty Ware pottery that may have originated from different sources or kiln sites within the local area. The petrographic and chemical analysis of the white gritty pottery (see Appendix) has demonstrated similarities as well as differences between the three sites, along with a chemical signature for the local area that can distinguish sherds from local production sites from pottery made outside of the local area. There is little evidence for houses or buildings, unlike the recent excavations at Eldbotle in East Lothian, where the stone foundations and walls of rectangular buildings were investigated (Morrison et al 2009). Another site, at Hallhill near Dunbar, also in East Lothian, has some interesting structures – shallow oval and sub-rectangular features that have been interpreted as the sunken floors of buildings due to clearly defined edges along with pits and post holes (Mitchell & Anderson 2011). It may be that some of the more ephemeral shallow features at Gogar are the truncated remains of similar structures, although there were no structural elements suggested by post holes.

6.1 Corn-drying kiln

A number of kilns have been excavated, and those at Gogar are smaller than the other stone-built examples but they do share similar traits. They are built into a natural rise with several courses of stones lining the pit, often with a platform or ledge to carry a floor, and a flue leading out of the kiln to allow fuel to be added to the fire and to allow air



Illus 38 Plan showing all four areas excavated and previous work. © Crown copyright OS 100050699

Illus 39 Reconstruction drawing of the medieval settlement around Gogar Church

in. The flue at Gogar is quite long and it may have also served as a drain to keep the kiln dry. Similar flues have also been observed at the medieval corn-drying kilns at Birnie near Elgin (Hunter 2004) and Dreghorn in North Ayrshire (Addyman 2004). Another similarity is that at Dreghorn millstones had been used for the floor of the kiln, while at Gogar a fragment of a quern had been built into the wall of the kiln. Other published kilns at Capo in Angus (Gibson 1989) and Scotstarvit in Fife (MacGregor 1998) have produced broadly similar radiocarbon dates between the 11th and 13th century. Two corn-drying kilns have recently been excavated at Newbridge close to Gogar (Engl & Hunter-Blair 2008; now published as Dunbar & Engl 2016).

Although no archaeological features could be dated to the post-medieval period, several artefacts were recovered and include a Charles I turner from about 1630, a clay tobacco pipe from Edinburgh or Leith from 1650–70, and post-medieval pottery including two sherds of possible imported Low Countries Redware.

The material recovered from the excavations along with the radiocarbon dates suggest a long period of occupation of the site from the early medieval period through to the post-medieval to modern period. The medieval settlement is marked by a break in the radiocarbon sequence in the 14th century, which could indicate the devastating effect that the 'Black Death' had on the population, particularly in rural areas when it reached Scotland in 1350. This break in the dating sequence does not appear to have occurred in the dates from the previous work to the west of the site and could indicate that the settlement had contracted at this time, with the core of the settlement further to the west. Overall the evidence suggests that the settlement pattern changed over time and that the settlement grew and contracted while the church remained at the centre of the settlement.

The Scottish Archaeology Research Framework paper that assessed current research in medieval Scotland including rural settlement (ScARF 2012) was conscious that a relatively limited amount of excavation has been undertaken across Scotland. The report also suggested that a more 'holistic' approach

Illus 40 The tram stop at Gogar

should be taken in future research. The current work at Nether Gogar and the previous research on the site have taken a 'holistic' approach, combining excavation with historical research, and artefact, faunal and environmental studies. The results of this work have added detail to the excavation and historical narrative. While the historical research refers to rents, farming and agricultural produce, the environmental studies revealed that oats, barley and wheat were being grown and processed on site and in the local area. Similarly, chemical analysis of the pottery has revealed a local pattern of production and distribution that is different to the nearby main urban centres of Edinburgh and Leith. These results suggest that rural settlement, especially in areas close to urban centres, is more complicated than previously thought. Therefore these excavations build on and add to the current dataset for rural settlement not only for the local area but across the whole of Scotland.

A.1. APPENDIX: CHEMICAL AND PETROGRAPHIC ANALYSES OF MEDIEVAL SCOTTISH WHITE GRITTY WARE POTTERY

Richard Jones

A.1.1 Summary

As the medieval pottery assemblage was a potentially early and tightly dated group that consisted mainly of cooking pots and storage jars in Scottish White Gritty Ware fabrics (SWGW), the opportunity was taken to analyse the clay fabric by both chemical and petrographic means. The aim was to assess whether this pottery represented local or regional production. Since 1998 a project with a key element of science-based analysis has examined more than 600 Scottish White Gritty Ware sherds from over 40 sites throughout Scotland, including a large number from Edinburgh (Jones et al 2003; Haggarty & Hughes 2012). Since the initial study was published in 2003, further assemblages and sites have been analysed, including material from Norton House Hotel (Jones 2008) and Kirkliston Road, Newbridge (Jones 2011); both these sites are in located within 5km of Gogar Church.

A.1.2 Material

Twenty sherds were selected for chemical and petrographic analysis. The selected sherds consisted of 12 cooking pot rims, four cooking pot flat bases, two jug bases and two body sherds. The sherds, which are mostly from cooking pots, are illustrated in Illus 36 and 41 and described in Table 5 (although sherd 320 is represented, its small size precluded analysis). One of the rims (21) and a body sherd (363) were actually in a red fabric with a full white slip on the interior and exterior surfaces. The use of white slip on red fabrics is usually associated with material found in Perth and Stirling. Therefore these sherds were selected to determine whether they originated in the local Gogar area or from further afield.

A.1.2.1 Petrographic description

The thin sections were examined with a Leica Wild M240 polarising microscope. Maximum objective was ×32. Selected photomicrographs (taken in plane polarised light) appear in Illus 42; the horizontal field of view is *c* 8mm. Summary descriptions of all sherds subject to petrographic analysis are given below.

▸ SF18

Fabric: cream, uniformly fired.

Matrix: coarse, moderately sorted.

Voids: almost none.

- Inclusions:
- Very frequent scatter of very small and lath-like quartz, mostly *c* 0.06mm but going up to 0.12mm
- Occasional large sub-angular quartz typically 1mm, usually mono-crystalline but occasionally polycrystalline
- Five fragments of sandstone, ranging from 0.3mm to 1.7mm. Some of the smaller sandstone is disintegrating.
- No apparent igneous inclusions

Resembles 206.

▸ SF19

Fabric: light grey with prominent dark core.

Matrix: fine, moderately to poorly sorted.

Voids: few elongate.

Inclusions:

- Frequent small monocrystalline quartz, *c* 0.06mm
- Frequent large sub-angular quartz typically 0.6mm; one very large quartz grain 2.2mm
- Very distinctive are the long fibrous, laminated brown inclusions (Illus 42, arrow) up to 1.4mm
- No apparent igneous inclusions

▸ SF21

Fabric: light pale brown with dark grey core.

Matrix: coarse, moderately sorted.

Voids: almost none.

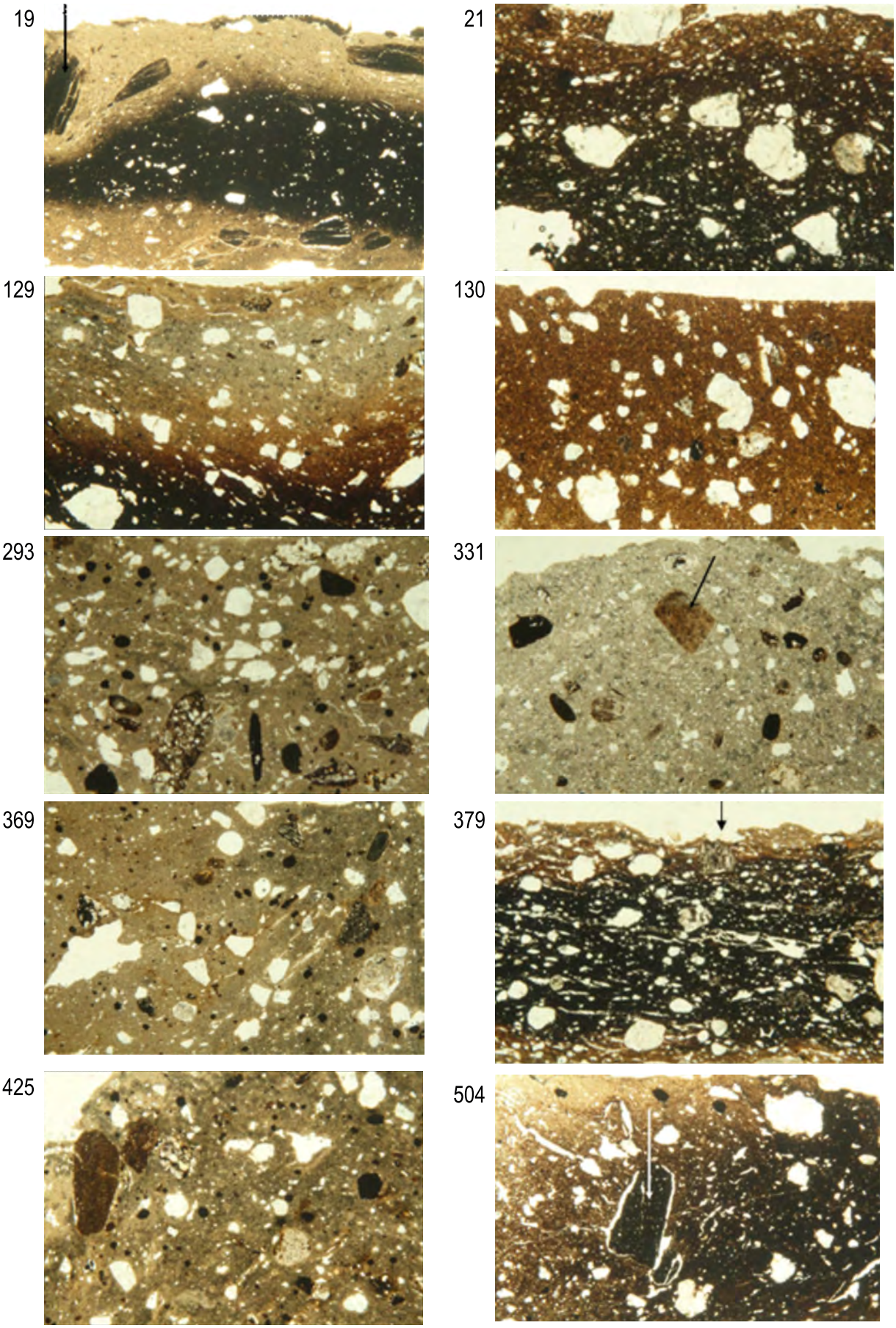
Inclusions:

- Very frequent small quartz up to 0.12mm
- Frequent quartz up to 0.25mm
- Less frequent or occasional angular quartz in 0.5–1.25mm range
- No apparent igneous inclusions

Table 5 Illustrated sherds and sherds used for scientific analysis (see Illus 36)

Sherd SF	Context	Description (* denotes scientific analysis)
		Medieval
25	2136	SWGW undecorated cooking pot rim, profile *
293	2009	SWGW undecorated cooking pot rim, profile *
320	2000	SWGW undecorated cooking pot rim, profile
387	2165	SWGW undecorated cooking pot rim, profile *
129	2006	SWGW cooking pot base with soot on underside *
379	2114	SWGW undecorated base *
425	2211	SWGW cooking pot base *
504	2278	SWGW undecorated base *
508	2348	SWGW cooking pot base with soot on underside *
206	2002	SWGW base with spots of green glaze and impressions of fingerprints on the inside *
18	2002	SWGW cooking pot rim *
19	2002	SWGW cooking pot rim *
21	2002	SMR cooking pot rim with white slip *
258	2064	SWGW cooking pot rim *
331	2114	SWGW cooking pot rim *
354	2114	SWGW cooking pot rim *
361	2133	SWGW cooking pot rim *
369	2114	SWGW cooking pot rim *
375	2114	SWGW cooking pot rim
475	2002	SWGW cooking pot rim *
130	2006	SMR body sherd with white slip – not illustrated *
363	2133	SWGW cooking pot body sherd – not illustrated *
		Post-medieval
66	2002	SPMRW profile of a grooved strap handle from a small jug
145	2028	SPMOW oval-shaped rod handle and rim from a small jug
414	2207	SPMRW green glazed jug rim
417	2207	SPMRW green/brown glazed jug rim with ridged cordon below the rim with part of a pulled spout
199	2002	SPMOW jug base with green glaze
402	2207	SPMRW jug base with thumbing round base copying Rhenish stonewares

Illus 41 Photograph of medieval pottery sherds selected for scientific analysis



Illus 42 Photomicrograph of Scottish White Gritty Ware fabric of sampled sherds

The distinctive feature is the frequency of quartz and its size ranges (Illus 42).

▸ SF25

Fabric: Cream brown with dark core extending all way to inner surface of rim.

Matrix: coarse, moderately sorted.

Voids: several small, elongate which may not be natural.

Inclusions:

- Frequent small quartz up to 0.12mm
- Frequent to very frequent angular to sub-angular quartz up to 1.2mm but more typically 0.6–0.7mm
- One distinctive brown inclusion – burnt clast?
- No apparent igneous fragments

Resembles 354 with respect to quartz size and frequency.

▸ SF129

Fabric: cream interior to grey-brown extending to exterior surface (Illus 42). Black base has a layer of heavy carbon residue, surprisingly unfriable and stable.

Matrix: fine, moderately sorted. Orientation of matrix clearly aligned with exterior surface in the grey-brown exterior, much less evident in interior.

Voids: very few natural voids; some may be due to plucking of quartz grains.

Inclusions:

- Frequent small inclusions up to 0.12mm
- Frequent larger quartz, some if polycrystalline typically 1mm, but one large quartz at 1.7mm
- Occasional sub-rounded ?igneous fragments up to 0.7mm
- Few opaques, some burnt clasts
- No mudstone/textural concentration feature

Generally similar to 508.

▸ SF130

Fabric: uniform red.

Matrix: fine, poorly sorted.

Voids: rare.

Inclusions:

- Few small quartz up to 0.12mm
- Frequent intermediate quartz in 0.5mm size range
- Frequent large quartz up to 1.2mm
- Few opaques
- Few burnt clasts
- Rare igneous

The red fabric and large quartz grains are distinctive (Illus 42).

▸ SF206

Fabric: cream, uniformly fired.

Matrix: fine.

Voids: few and small.

Inclusions:

- Very frequent, small quartz mostly 0.06mm but going up to 0.1mm
- Rare larger quartz up to 0.5mm
- Three sub-rounded igneous fragments, 1mm
- Rare burnt clasts, one of them 2mm
- Common fine mica laths

The fine texture fabric is the main feature.

▸ SF293

Fabric: cream, evenly fired.

Matrix: fine, poorly sorted.

Voids: few.

Inclusions:

- Few small quartz up to 0.12mm
- Frequent larger quartz up to 0.5mm
- Some large quartz at 2.5mm
- Occasional sandstone up to 1.1mm
- Few igneous inclusions, including basalt, sub-rounded variable size up to 2.5mm
- Some opaques typically 0.2mm, rounded but sometimes very elongate

The igneous fragments and the relatively low frequency of small quartz are distinctive in this sample (Illus 42).

▸ SF331

Fabric: cream, evenly fired.

Matrix: coarse, moderately sorted.

Voids: almost none.

Inclusions:

- Frequent small quartz up to 0.12mm
- Frequent large quartz up to 0.7mm
- Rare sandstone
- Igneous fragments of possibly three types, one of which is basalt, in the size range 0.2–1.2mm
- Occasional opaques and burnt clasts
- One nearly square-shaped brown-veined inclusion, probably mudstone (Illus 42 arrow), opaque on XPL

Similar to 387 in terms of the matrix.

▸ SF354

Fabric: cream to dark grey interior core.

Matrix: fine, poorly sorted.

Voids: few.

Inclusions:

- Quite frequent small quartz typically 0.06mm
- Frequent large quartz angular to sub-angular typically 0.6mm but going up to 1.5mm
- 1 large sandstone 2.5mm
- Rare opaques
- No apparent igneous

The large quartz grains are the distinctive feature.

▸ SF361

Fabric: dark grey core with narrow cream band interior and exterior.

Matrix: fine, moderately sorted.

Voids: several but probably all or most due to plucking of quartz grains.

Inclusions:

- Very frequent small quartz 0.06mm
- Frequent large sub-angular quartz 0.04–1.3mm
- Rare opaques; no burnt clasts
- No apparent igneous fragments

▸ SF369

Fabric: pale light brown, uniform.

Matrix: fine, poorly sorted.

Voids: few.

Inclusions:

- Frequent small quartz up to 0.12mm
- Frequent large angular quartz, typically 0.6mm but occasionally 1.2mm
- Frequent rounded opaques *c* 0.2mm
- Occasional igneous fragments of possibly three types but not including basalt

The diversity of inclusions is noteworthy (Illus 42).

▸ SF379

Fabric: thick grey brown core, very narrow cream exterior and interior. Oriented parallel to surface of vessel.

Matrix: coarse, poorly sorted.

Voids: many elongated probably due to plucking.

Inclusions:

- Frequent small quartz all monocrystalline up to 0.12mm
- Frequent larger quartz typically 0.5mm but sub-angular (1.2mm) to sub-rounded (0.7mm)
- Rare sandstone of size 0.7mm rising to 1.3mm
- Occasional sub-angular to sub-rounded igneous of at least two types in 0.8–1.0mm range; one may be basalt (Illus 42, arrow)

▸ SF387

Fabric: cream, uniform.

Matrix: fine moderately sorted.

Voids: rare.

Inclusions:

- Very frequent small rounded quartz up to 0.12mm
- Frequent larger sub-angular quartz, 0.4–1.3mm
- Rare igneous, probably basalt, 0.05mm
- No sandstone

▸ SF425

Fabric: cream uniform base. Finger impressions on interior of base.

Matrix: fine poorly sorted.

Voids: rare.

Inclusions:

- Occasional small quartz grains up to 0.12mm
- Occasional larger sub-angular quartz grains up to 0.4mm
- Occasional large angular, sub-angular and sub-rounded quartz in the range 0.7–1.3mm
- One large sandstone of size 1.5mm
- Frequent small rounded opaques, 0.12mm
- Rare fibrous elongate brown inclusions up to 2.5mm (Illus 42) – burnt clast?
- Several igneous inclusions of at least two types; most are 0.6–0.75mm but one is 1.5mm

Similar to 18 but rather coarser.

▸ SF504

Fabric: cream brown interior surface but thick dark grey core.

Matrix: Fine, poorly sorted.

Voids: few.

Inclusions:

- Very frequent small quartz. 0.05mm
- Frequent large sub-angular quartz, 0.4–1.3mm
- Few large brown angular fibrous laminated inclusions of ?siltstone/mudstone (Illus 42 arrow) as in 19
- Quite frequent opaques
- No apparent igneous fragments

The laminated angular inclusions are distinctive.

▸ SF508

Fabric: cream but darkish exterior core. Slight finger impressions on interior of base.

Matrix: fine poorly sorted. Darker (reduced) layer is notably more oriented to the surface of pot, like 379.

Voids: none.

Inclusions:

- Frequent small quartz up to 0.12mm
- Frequent larger quartz, some if polycrystalline *c* 0.5mm, but one large quartz grain at 1.75mm
- Common black opaques in two sizes: 0.12mm and 0.3–0.6mm
- Two large sub-rounded ?mudstone or textural concentration features, 1.0mm and 1.85mm
- One large sub-rounded quartz-rich igneous fragment, 1.2mm

A.1.2.2 Discussion

The first point to make about the compositions at Gogar is that they display the general material characteristics of SWGW, as for example Jones et al (2003) found among examples throughout Scotland: very frequent quartz grains occurring in a wide range of sizes (ibid: fig 42). With few exceptions, such as SF19 and SF331, the presence of larger-size quartz grains is indicative of deliberate tempering.

Some of the compositions share certain other features which include the presence of burnt clasts, siltstone and igneous rock fragments, but treated as a whole these compositions are not uniform and furthermore they defy ready classification into sub-groups. The immediate issue then is whether the level of variation observed is consistent with production at more than one centre.

Turning to the geological background, Gogar lies in a sedimentary environment of glacio-fluvial sands, gravels, till and sandstone – GFIC in Illus 43b – which also encompasses the till material making up the Cramond River valley (TillD in Illus 43b). In addition, there are outcrops of igneous rocks (1) ENE of Gogar at West Craigs (MVSC), (2) south of Ratho (MVSC), (3) to the north of the Cramond at West Craigie Farm and (4) at Corstophine (CRST). In the vicinity of Gogar clays would probably have been available along or near Gogar Burn and Gogar Loch to the east (where South Gyle is today; see Morrison et al 2009: illus 2). Small though the igneous presence at West Craigs is, its relative proximity to Gogar – *c* 1km – could in principle explain the finding of occasional igneous fragments in SF21, SF25, SF129, SF130, SF354, SF361, SF379 and SF508. In practice, however, it will be necessary to compare these fragments, which it is important to note are *not* all of the same type, with those principally making up the Midland Valley Sill complex (which will include basalt) – this has yet to be done.

Nevertheless the findings as they presently stand can make a case for *local* production of these eight samples but *not* at the same workshop. Since the general appearance and composition of these eight samples is not uniform, we could propose that they are products of neighbouring, local workshops (or, of course, of local workshops that operated at different time periods) and the same remark applies to the remaining samples from Gogar.

One alternative option is that they were products of workshop(s) to the west that were using clays close to the River Cramond. On geological grounds this is feasible and furthermore can be considered in the light of the results from Newbridge and Norton House Hotel. At the former site Jones (2011) found significant variation among the admittedly few (six) specimens examined, two of which contained igneous fragments. Their re-examination reveals that that lack of uniformity is shared at Gogar and furthermore some fabrics seem to appear at both sites. For instance, SF354 is similar to NB1 and NB5; SF369 is similar to NB2. On the other hand, there is somewhat greater uniformity among the samples from Norton House Hotel; the light-coloured oxidised fabric is quartz-rich but little or none of it is of large size, and igneous fragments seem to be absent.

A third option takes the source closer to the coast at Cramond. The intrusive rock outcrop at West Craigie Farm (Illus 43a, b) to the north of the river, which is of different geological character to the Midland Valley sill complex, is responsible for the igneous fragments in the fluvial deposits.

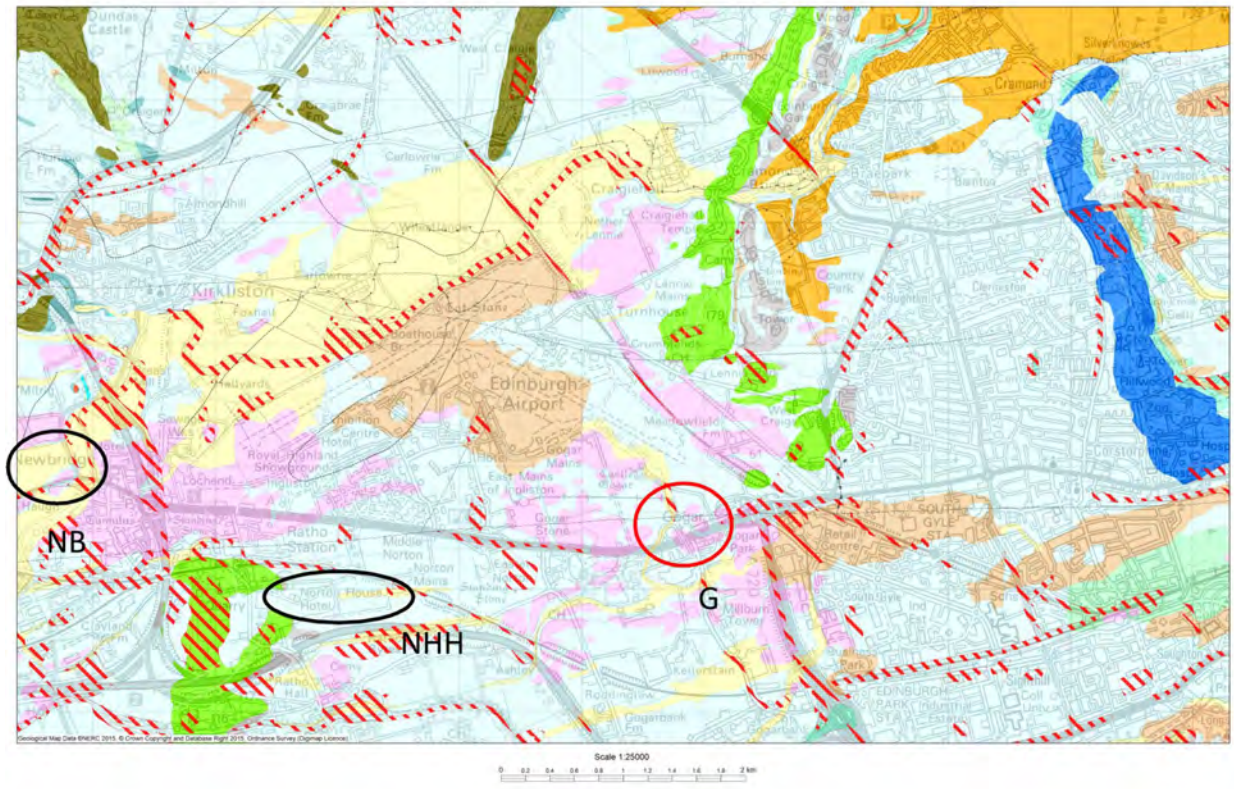
In summary, the petrographic data is pointing to multiple local production places for the SWGW at Gogar; possible candidates are (a) the immediate vicinity of Gogar, (b) several kilometres to the west near the River Cramond, and/or (c) to the north-west near Carlowrie Farm. These same places account for some or most of the SWGW found at Newbridge, but not at Norton House Hotel.

A.1.2.3 Chemical analysis

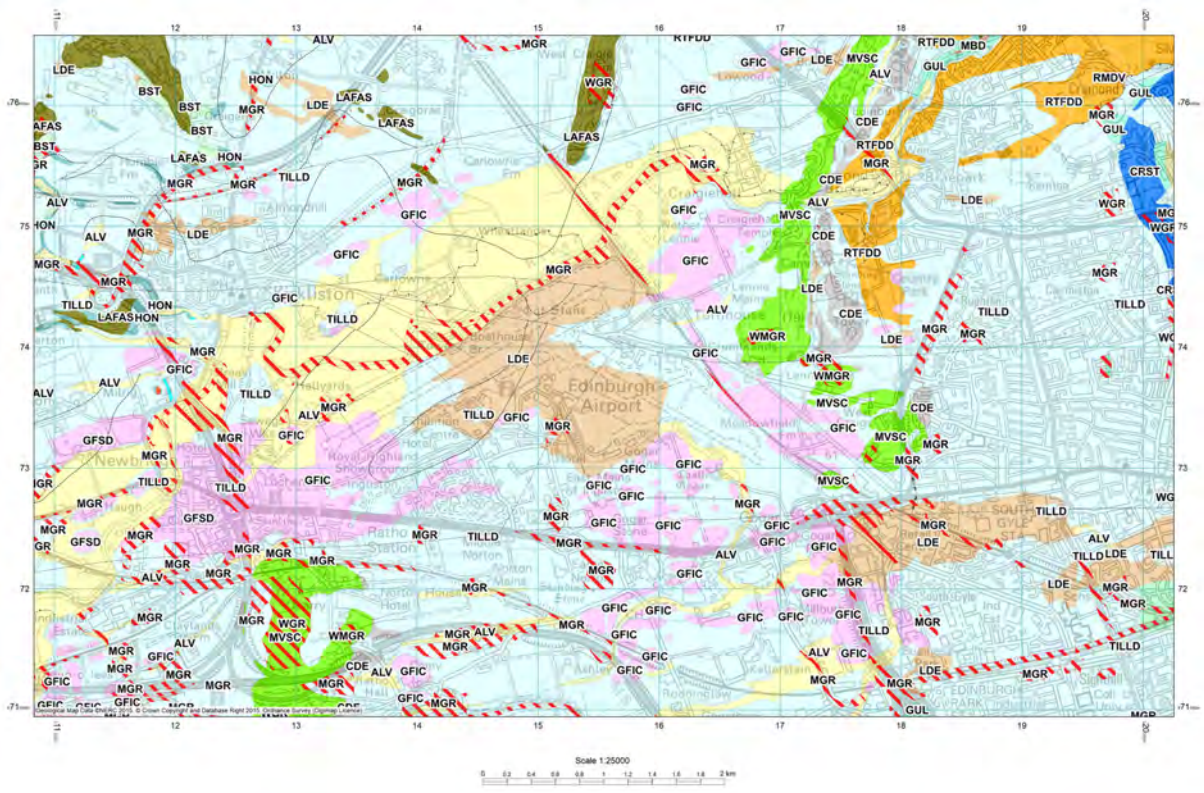
Chemical analysis of all samples, apart from SF129 and SF320, was carried out by inductively-coupled plasma emission (ICP-ES) and inductively-coupled plasma mass spectrometry (ICP-MS) in September 2011, using the same technique (for ICP-ES) and methodology as that described by Jones et al (2003). The samples together with standards were analysed at the Earth Sciences Department, Royal Holloway College, University of London, Egham. The composition data consisting of the concentrations of 19 elements (ICP-ES: Table 2 Al to Zr) and 13 elements (ICP-MS: Table 2 Cr to Pb) elements were treated using principal components analysis (PCA) and discriminant analysis (DA) in the SPSS PC package (v.22).

The compositions are typical of SWGW having high, variable Al and low Ca, Mg, Na and Mn contents. The iron (Fe) contents are also variable, as is clear in Illus 44. In keeping with the petrographic data, the compositions do not form a single compact group. The feature of high iron and low aluminium contents in SF130 together with its red fabric suggest that this sherd is better classified as a redware. SF379 has anomalously high lanthanide element and several high trace element contents; whether this can be explained by the higher than average igneous fragment content is uncertain, to say the least. Jugs 206 and 425 are no different in composition from the cooking pots, yet it is interesting to note that 425 together with 293, both containing igneous inclusions, form a pair chemically owing to their high iron content.

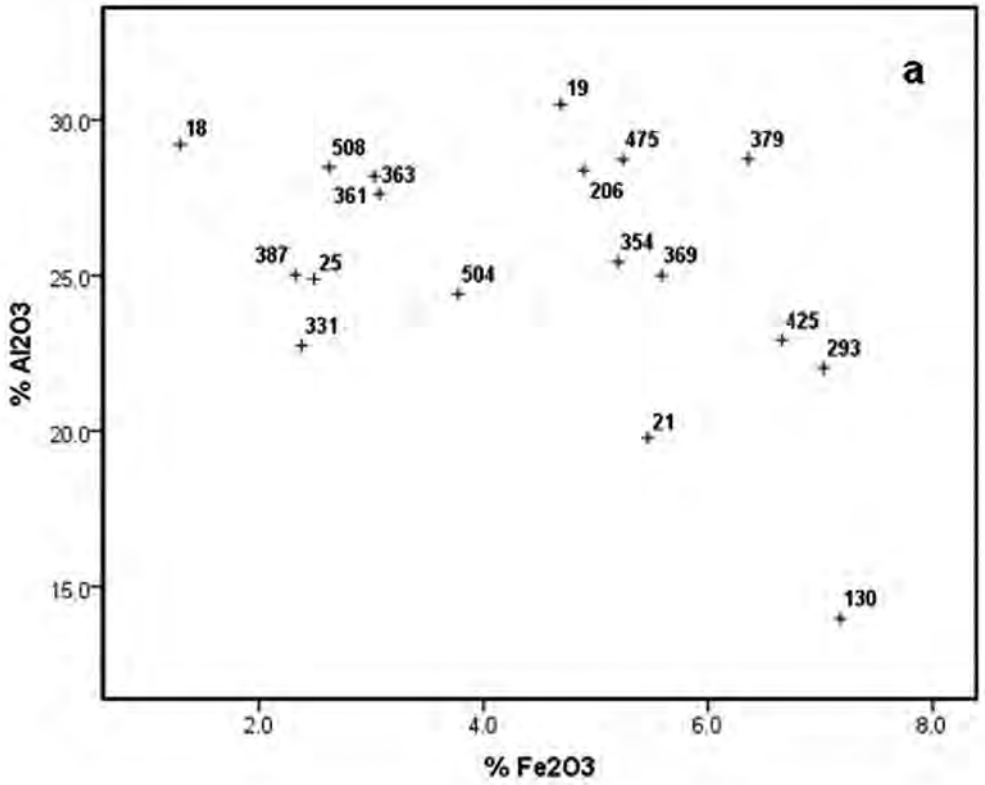
The hypothesis proposed in the previous section, of production at more than one location in the area, can be tested by comparing the compositions (excluding SF130 and SF379) with those at Newbridge and Norton House Hotel, bearing in mind that the compositions from those two locations are not numerous. The results of PCA in Illus 45 show that the SWGW at the Hotel site (apart from NHH8) separates from Newbridge and Gogar along PC2, but there is considerable overlap between the latter two sites. This situation is reflected more starkly in the output of DA (Illus 46), which treats the SWGW data as three separate groups: Gogar and Newbridge are again very close; although the two sites retain their separate identity, the distinction between them is very subtle, based as it is on the scores on the (weak) second discriminant function. Indeed, a more critical view of Illus 46 would argue that these two groups are chemically indistinguishable. The Hotel site, on the other hand, is well discriminated as is shown in Illus 46 & 47, where the Hotel site separates away from the other two.



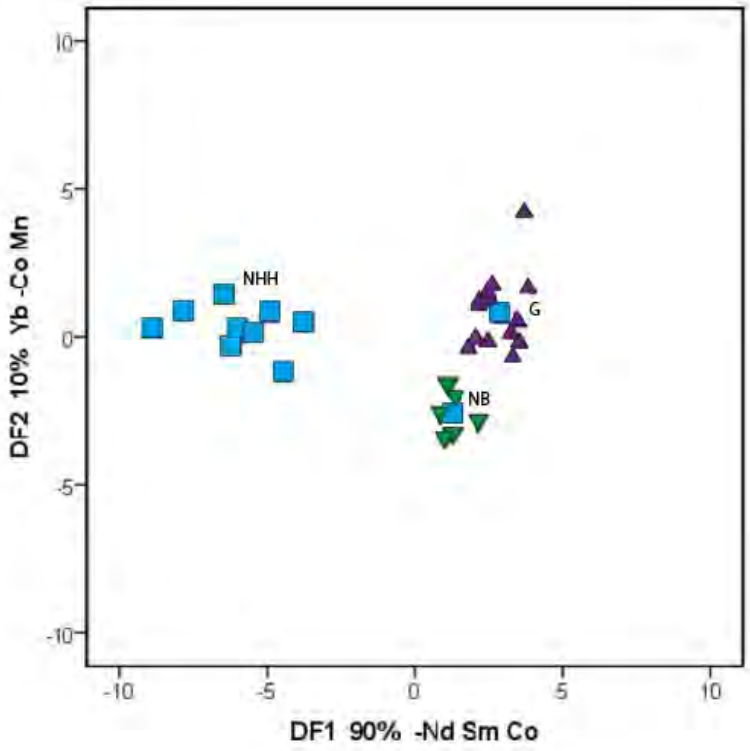
Illus 43a Geological map of the area west of Edinburgh showing Gogar (G), Norton House Hotel (NHH) and Newbridge (NB)



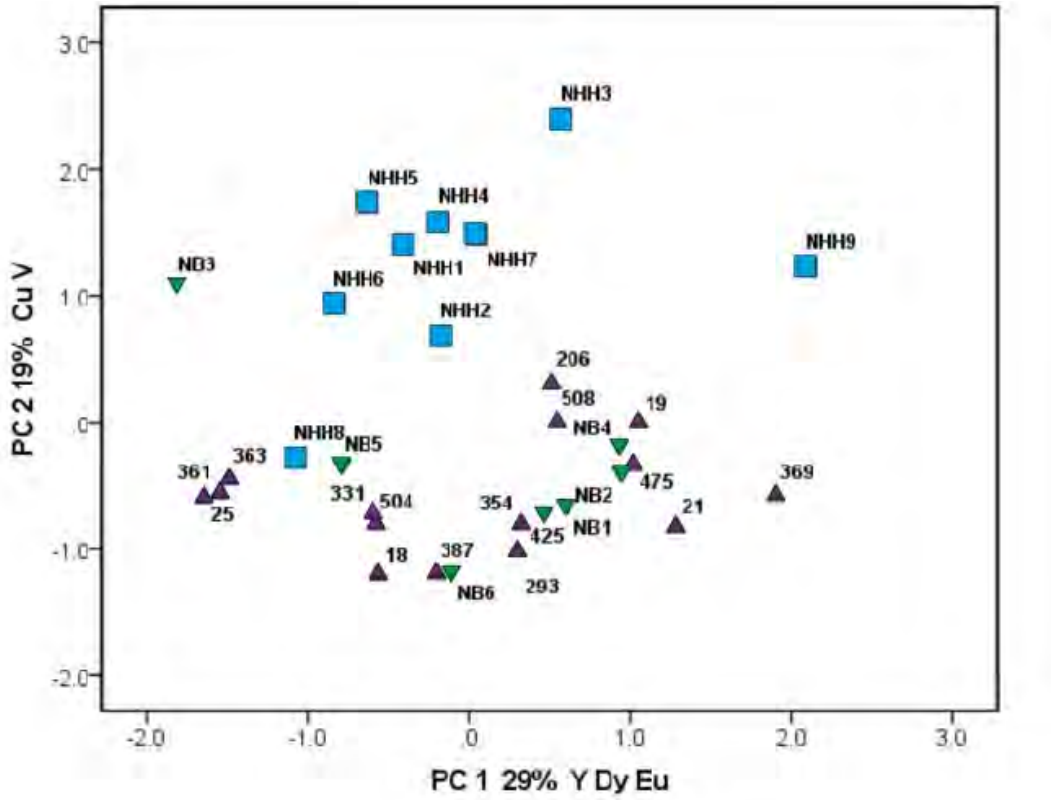
Illus 43b The geological map with annotation: LDE Lacustrine deposit; TillD Till Devensian; CRST Corstophine sill; WGR Worked ground; MGR Made ground; MVSC Midland Valley sill complex; GFIC Glaciofluvial ice contact deposit; LAFAS Dinantian to Westphalian sills of Lothians and Fife



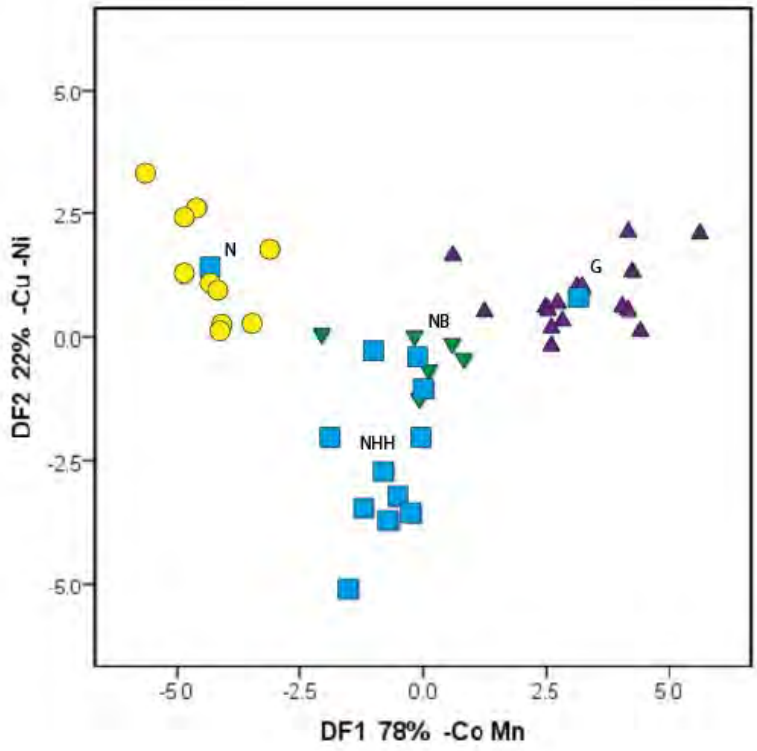
Illus 44 Plot of the aluminium and iron oxide contents



Illus 45 Principal component analysis: Gogar (excluding SF130 and SF379; purple triangle), Newbridge (NB, green inverted triangle) and Norton House Hotel (NHH, blue square) compositions (all elements, except P, Ba, Cd and As; raw form)



Illus 46 DA plot of the SWGW groups at Gogar (G, purple triangle), Newbridge (NB, green inverted triangle) and Norton House Hotel (NHH, blue square)



Illus 47 DA plot of the SWGW groups at Gogar, Newbridge, Norton House Hotel and Niddrie (N, yellow circles)

At this point the combined petrographic and chemical datasets suggest:

- The SWGW at Gogar is the product of more than one workshop in the local area.
- Gogar SF130 is probably a redware.
- Some of the SWGW at Gogar and Newbridge has a common source.
- The SWGW at the Norton House Hotel has a different but probably local source.

Looking further afield (Illus 47), these three sites can be discriminated from the SWGW found at Niddrie near Edinburgh, which has recently been analysed by the same technique (Haggarty & Hughes 2012); wherever the Niddrie material was made, it was not to the immediate west of Edinburgh.

A.1.2.4 Conclusion

Using the combined analytical techniques of petrographic and chemical analysis supplemented by an existing dataset from two other sites in the immediate area has produced similar and interesting results. Both techniques have identified common traits in the SWGW sherds which suggest that there were several local production centres in the area. In addition, there appears to be a local chemical signature for this area that can distinguish sherds from the different local production sites from pottery from the wider area in and around Edinburgh. Therefore the combined approach using the two techniques has demonstrated that it is possible to distinguish between sherds recovered in a small local area as well as over a large geographical area.

7. ACKNOWLEDGEMENTS

The authors would like to thank Sheen Smith and John Lawson from the City of Edinburgh Council and the fieldwork team whose efforts in often difficult conditions were appreciated. In addition we would like to thank Gert Petersen for preparing the petrographic thin sections. The illustrations were provided by Gillian McSwan, Fiona Jackson and Sarah Bailie.

8. REFERENCES

Addyman, T 2004 'Station Brae, Dreghorn (Dreghorn parish), Neolithic settlement with ?ritualistic component; medieval village', *Discovery and Excavation in Scotland* 5: 87–90.

Ballin, T B 2005 'Lithic artefacts and pottery from Townparks, Antrim Town', *Ulster Archaeological Journal* 64: 12–25.

Bishop, R R, Church, M J & Rowley-Conwy, P A 2009 'Cereals, fruits and nuts in the Scottish Neolithic', *Proc Soc Antiq Scot* 139: 47–103.

Brooks, C M 1980 'Medieval pottery from the kiln site at Colstoun, E Lothian', *Proc Soc Antiq Scot*, 110: 364–403.

Caldwell, D H & Dean, V E 1992 'The pottery industry at Throsk, Stirlingshire in the 17th and 18th century', *Post-Medieval Archaeology* 26: 1–47.

Cappers, R T J, Bekker, R M & Jans, J E A 2006 *Digital Seed Atlas of the Netherlands*, Groningen Archaeological Studies 4. Eelde: Barkhuis Publishing.

Dalland, M 2006 'Report on the Earthwork and Metal Detector Survey of Sections of the Proposed Route of the Edinburgh Tram Network between Gogar and Ingliston', Headland Internal report ETW05.

Dunbar, L & Engl, R 2016, 'A Roman Road Runs Through It: Excavations at Newbridge, Edinburgh', *Scottish Archaeological Internet Reports* 59 https://doi.org/10.9750/issn.1473-3803.2016.59

Engl, R & Hunter-Blair, A 2008 '2A Kirkliston Road, Newbridge, City of Edinburgh (Kirkliston parish), excavation', *Discovery and Excavation in Scotland* 9: 82.

Fenton, A 1999 *Scottish Country Life*. East Linton: Tuckwell Press.

Gibson, A 1989 'Medieval corn-drying kilns at Capo, Kincardineshire and Abercairny, Perthshire', *Proc Soc Antiq Scot* 118: 219–29.

Grainger, J D 1997 *Cromwell Against the Scots: The Last Anglo-Scottish War, 1650–1652*. East Linton: Tuckwell Press.

Haggarty, G 1980 'The pottery' *in* Ewart, G 'Excavations at Stirling Castle 1977–78', *Post-Medieval Archaeology* 14: 23–51 (36–46).

Haggarty, G & Hughes, M J 2012, 'The medieval and later pottery from Niddrie near Edinburgh', *Medieval Ceramics* 33: 53–71.

Haggarty, G, Hall, D & Chenery, S 2011 'Sourcing Scottish Redwares', Medieval Pottery Research Group Occasional Paper 5.

Hall, D W 1998 'The Scottish medieval pottery industry: a pilot study', *Tayside and Fife Archaeological Journal* 4: 170–8.

Hall, D 2004 'Excavations at the pottery production centre of Colstoun, East Lothian 1939, 1969, 1971, 1977 and 1999/2000', *Medieval Ceramics* 28: 35–74.

Hall, D W, Haggarty, G & Vince, A 2012 'The medieval pottery' *in Perth High Street Archaeological Excavations 1975–1977: The Ceramics, the Metalwork and the Wood, Fascicule 2*, Tayside and Fife Archaeological Committee Monograph Series 8: 3–73.

Hillman, G C 1981 'Reconstructing crop husbandry practices from charred remains of crops', *in* Mercer, R (ed.) *Farming Practice in British Prehistory*, 123–62. Edinburgh: Edinburgh University Press.

Howarth, S E and Williams, J T 1972 'Chrysanthemum segetum L.', *Journal of Ecology* 60: 573–84.

Hunter, F (2004) 'Birnie (Birnie parish), Iron Age and medieval settlement', *Discovery and Excavation in Scotland* 5: 84–5.

Jones, R E 2008 'A chemical and petrographic study of White Gritty pottery from Norton House Hotel and Blackfriars, Edinburgh: a preliminary report', unpublished report for GUARD.

Jones, R E 2011 'Chemical and petrographic analysis of White Gritty ware pottery at Kirkliston Road, Newbridge', unpublished report for AOC.

Jones, R E, Will, B, Haggarty, G & Hall, D 2003 'Sourcing Scottish White Gritty ware', *Medieval Ceramics* 26 & 27 (2002–3): 45–84.

Kinghorn, J & Quail, J 1986 *Delftfield: A Glasgow Pottery 1848–1823*. Glasgow: Glasgow Museums and Art Galleries.

MacAskill, N 1987 'The pottery' *in* Holdsworth, P (ed.) *Excavations in the Medieval Burgh of Perth 1979–1981*, 89–120. Edinburgh: Society of Antiquaries of Scotland Monograph Series 5.

MacGregor, G 1998 'Archaeological work on the Fife Water pipelines, 1995: The excavation of Bronze Age, Roman and medieval sites', *Tayside*

and Fife Archaeological Journal 4: 67–98.

Mitchell, S & Anderson, S 2011 'A rural medieval settlement and Early Iron Age funerary remains at Hallhill, Dunbar, East Lothian, Edinburgh', *Scottish Archaeological Internet Reports* 50. http://archaeologydataservice.ac.uk/archives/view/sair/contents.cfm?vol=50. Accessed 15 April 2015.

Morrison J, Oram, R & Ross, A 2009 'Gogar: archaeological and historical evidence for a lost medieval parish near Edinburgh', *Proc Soc Antiq Scot* 139: 229–55.

MPRG 1998 'A guide to the classification of medieval ceramic forms', Medieval Pottery Research Group Occasional Paper 1.

MPRG 2001 'Minimum standards for the processing, recording, analysis and publication of post-Roman ceramics', Medieval Pottery Research Group Occasional Paper 2.

RCAHMS 1929 *The Royal Commission on the Ancient and Historical Monuments and Constructions of Scotland. Tenth report with inventory of monuments and constructions in the counties of Midlothian and West Lothian*. Vol 27. Edinburgh: RCAHMS.

ScARF 2012 Hall, M & Price, N (eds) *Medieval Scotland: A Future for its Past*, Scottish Archaeological Research Framework: Society of Antiquaries of Scotland. Available online at http://www.scottishheritagehub.com/content/medieval. Accessed 4 July 2017.

Schweingruber, F H 1990 *Anatomy of European Woods.* Berne & Stuttgart: Haupt.

Smith, C 1998 'Dogs, cats and horses in the Scottish medieval town', *Proc Soc Antiq Scot* 128: 859–85.

Smith, C 2000 'The animal bone' *in* Perry, D R *Castle Park Dunbar: Two Thousand Years on a Fortified Headland*, 194–279. Edinburgh: Society of Antiquaries of Scotland Monograph Series 16.

Sneddon, D & Will, R 2006 'Edinburgh Tram Scheme Work Strands 3 and 4 Archaeological Evaluation. Data Structure Report', unpublished report for GUARD, Report 2235.

Stace, C 1997 *New Flora of the British Isles*, 2nd edn. Cambridge: Cambridge University Press.

Swan, D & Caruthers, M 2006 'Norton House Hotel, City of Edinburgh (Ratho parish): evaluation, excavation and watching brief'. *Discovery and Excavation in Scotland* 7: 77.

Tabraham, C 1984 'Excavations at Kelso Abbey', *Proc Soc Antiq Scot* 114: 365–404.

Williams, J T 1963 'Chenopodium album L.', *Journal of Ecology* 51: 711–25.