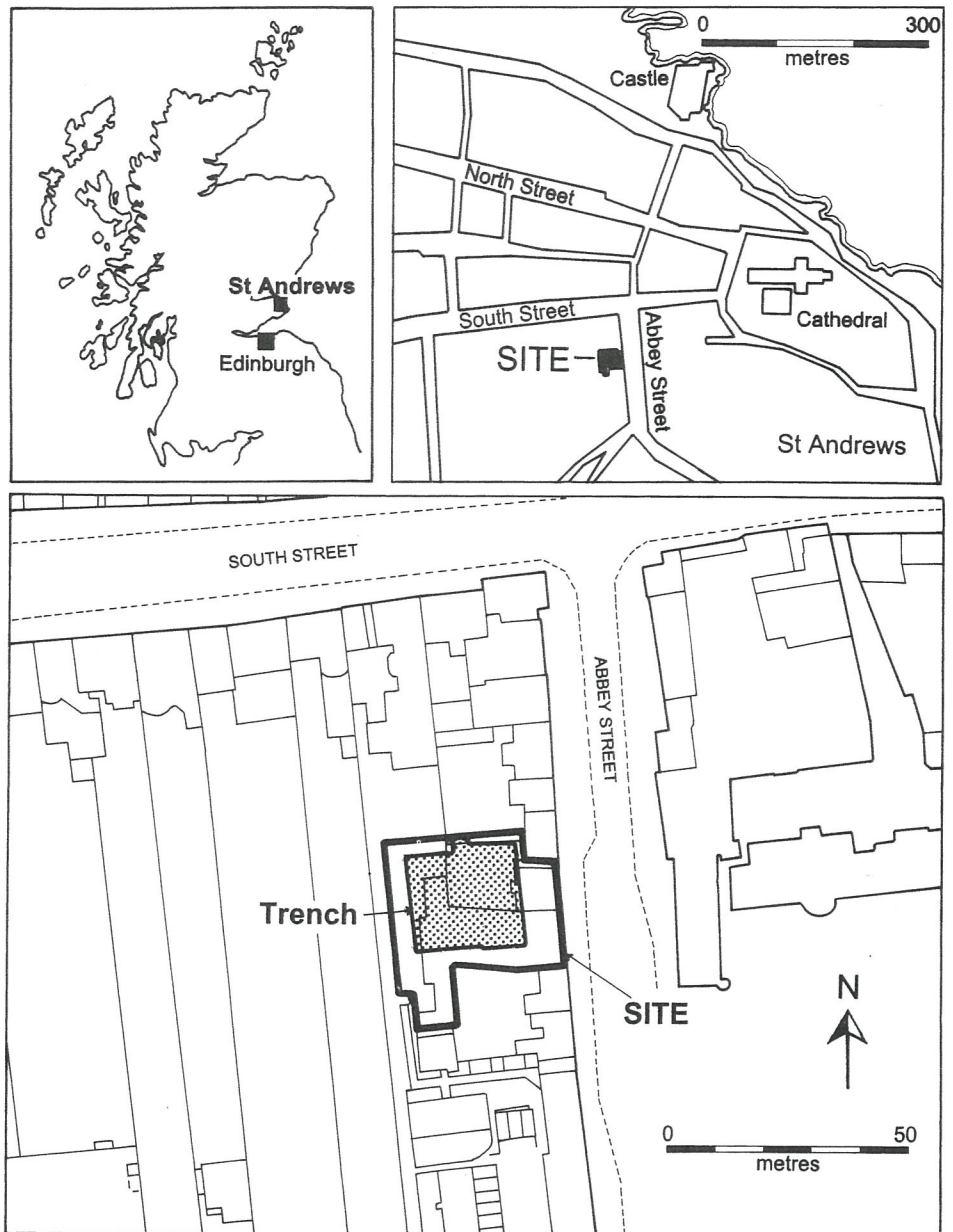




Illus 1
Site and trench location.



Illus 2
The excavation area.

Evidence for the form and nature of a medieval burgage plot in St Andrews: an archaeological excavation of the site of the Byre Theatre, Abbey Street, St Andrews

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illustrations by F Moran, L Speed and D Munro

Introduction

An archaeological investigation was undertaken at the site of the Byre Theatre, St Andrews in January and February 1998 by Headland Archaeology Ltd in advance of its redevelopment as a new theatre (Illus 1 & 2). The project arose as a formal condition of the planning consent. A preliminary evaluation, and an excavation, resulted from a brief provided by Fife Council Planning Service Archaeology Unit. The work was commissioned and funded by the Byre Theatre and instructed by their agents Nicoll Russell Studios. Post-excavation analysis was funded by Historic Scotland and the Byre Theatre. The archaeological investigation was intended to record all threatened archaeological deposits and structures in advance of redevelopment.

Historical background

Archaeological evidence for the development of St Andrews is summarised in Turner-Simpson and Stevenson (1981), with findings since 1981 reported in annual editions of *Discovery and Excavation in Scotland*. More recently seven excavations undertaken between 1980 and 1989 in the Burgh have been published in *Excavations in St Andrews 1980–89* (Rains and Hall 1997). Numerous small excavations have taken place in St Andrews during this period, at least four of which took place on South Street near to the Byre Theatre. An excavation undertaken on the E side of Abbey Street by Professor Nicholas Brooks sadly remains unpublished. Here a timber building was identified possibly dating to the 12th century (Fife SMR). However the difficult conditions under which that investigation was undertaken did not allow for any degree of certainty to be assigned to the results. In general the unpublished excavations from St Andrews present numerous problems when attempting to understand the development of the medieval burgh. A total of 12 important excavations predating 1980 remain unpublished (Rains and Hall 1997, 5). These

are generally not in a satisfactory state to allow analysis and may never be published. Unfortunately the basis for our understanding of the burgh's early development is based on the shaky foundations that were laid by these pioneering investigations and it is difficult to separate fact from speculation when assessing the archaeological background of the burgh. From the published data the picture that emerges is of a variable level of medieval activity, represented by pits, gullies and truncated deposits, often overlain by deep homogenous deposits of soil. This 'garden soil' is assumed to reflect horticultural use of the town backlands in the later medieval and post medieval periods.

Sources held by the National Monuments Record of Scotland, Scottish Record Office, National Map Library and the library of the Society of Antiquaries of Scotland were investigated. No documentary evidence pertaining to this site could be identified from the available sources, although there is information about the general development of St Andrews and an excellent series of historic maps and plans for the city. The whole of the excavation area stretches over parts of two properties whose boundaries are medieval in origin. The western part lies within a rig running south from South Street, while the eastern part forms the backland of one or more properties fronting onto Abbey Street. In a plan of c. 1580 (Geddy) the rigs to the S of South Street are shown with cross-divisions and scattered buildings. On Abbey Street the frontage is built up and there are additional buildings in the backlands. The precise position of the Byre Theatre site on this plan cannot be determined. James Gordon's plan (1642) is lacking in detail but shows no buildings behind the Abbey Street frontage. A similar level of development is shown by John Ainslie (1775) and John Wood (1820). On Wood's plan, present day Abbey Street is named *Eastburn Wynd*. The first Ordnance Survey map for this area dates from 1854 (published 1855). This shows a formal garden layout in the South Street rig behind buildings that are still

standing today. On Abbey Street, the present day property divisions are shown, but the buildings illustrated on the frontage are considerably smaller in ground plan. The present day layout of the properties on Abbey Street is first mapped in 1893 (OS 1:500 map, 1895) when the now demolished houses and garden layouts were recorded. There have been no other significant changes in the excavation area since this date other than the development of the Byre Theatre.

The archaeological sequence

The relationship between archaeological features and soils

The archaeological sequence has been divided into six stratigraphic phases and these are described below. The majority of the site was covered with up to 1m of soil that was divided into two main horizons: an upper very dark brown layer (001) and a lower brown layer of similar thickness (002). The stratigraphic relationship between these soil layers and the archaeological features is complex and is dealt with in a separate paper in this journal. The conclusions of that paper are summarised here.

The lower soil (002) is interpreted as the disturbed remains of the natural topsoil, contaminated with medieval artefacts. It is likely that the original (pre-12th century) ground surface was close to the top of 002, perhaps 0.4 to 0.5m above the natural sand and gravel. All features (pits, wells, ditches, wall foundations) assigned to Phases 1 to 4 were cut through this soil but continuing biological mixing has removed any evidence for these cuts, except where stone structures were involved (the corn kiln and the Abbey Street building for example). Evidence for any feature not built from stone and less than c. 0.5m deep has not been preserved so the record for Phases 1 to 4 comprises only stone features and the larger, deeper cuts. It is worth noting that these surviving cuts would have been at least 0.5m deeper than their recorded depths indicate.

The upper soil (001) is the modern topsoil. It is assumed that most of the sediment that forms the upper soil was deposited as a result of occupation in the medieval period. Limited sediment deposition probably occurred after this date and may be represented by the coal ash and lime mortar residues in 001 that account for 5 to 10% of the upper soil. Stability of ground surface has resulted in the top 0.5m of medieval deposits developing into a topsoil which has continued to receive artefacts through biological mixing and probably also through cultivation. Archaeological features detected at the base of the upper soil (001) and cut into the lower soil (002) have been assigned to Phases 5 and 6. As in the case of Phases 1 to 4, these features would have been cut from the top of the overlying soil layer but continuing soil mixing has erased the evidence for any cut feature less than 0.5m deep.

Stratigraphic analysis

Six phases of activity have been defined through analysis of stratigraphy and a chronological framework generated through typological analysis of the artefactual material. In reality the archaeology is the result of several centuries of continuous human occupation of the site and the six phases represent an interpretation of the interrelation of groups of features, their stratigraphic position within the site matrix and datable artefacts contained within them. This is not a definite chronology and is heavily weighted by interpretation of fragmentary evidence.

Phase 1 *Evidence for activity pre-dating the issue of a burghal charter by David I* (Illus 3)

The earliest phase of activity identified at the Byre Theatre site consisted of truncated negative features related only by their stratigraphic position. These are likely to represent a 'pre-burghal' phase of activity as they pre-date the formal division of the site into burgrave plots, an action likely to have occurred during the 12th century with the planning of the burgh (Rains and Hall 1997, 3). Producing an exact chronology for this phase of activity is impossible as no datable artefacts were recovered.

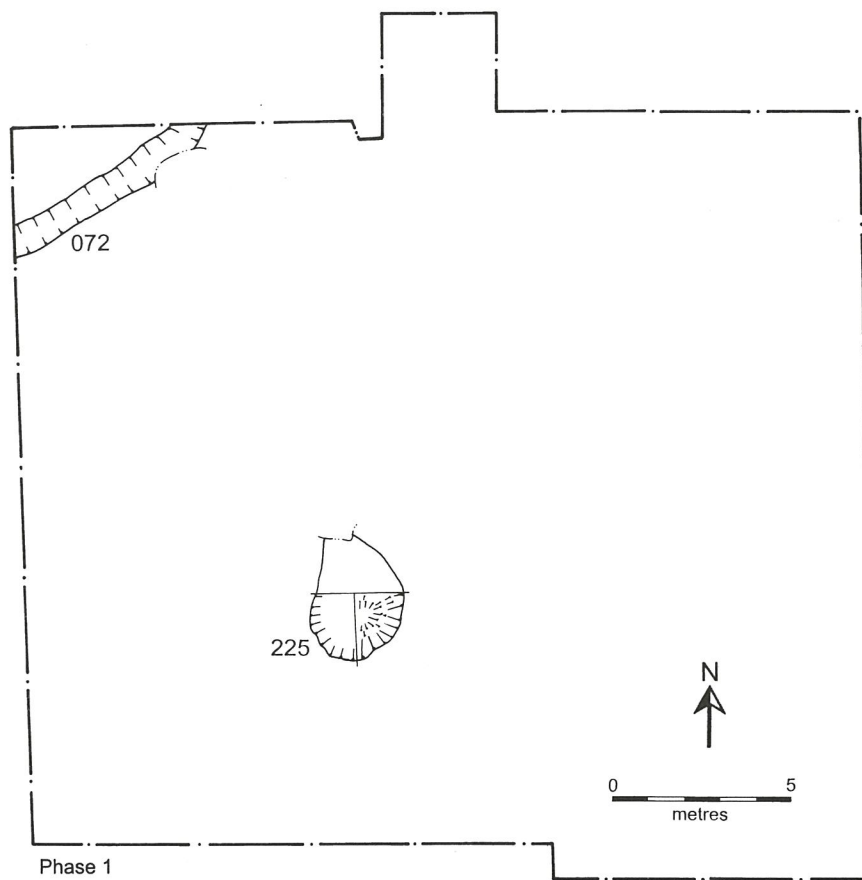
A curvi-linear ditch (072) was identified at the NW corner of the site curving around from W to N. This feature appeared to be curving out of the site and is likely to have defined, or possibly enclosed, an area to the NW of the excavation trench. The later axis of development imposed on the site was completely different to the orientation of this feature.

A large pit (225) was identified stratified beneath the later boundary ditches. This was irregular in plan with sharply sloping sides and a flat base. One sherd of unidentified pottery was recovered from the basal fill of the feature.

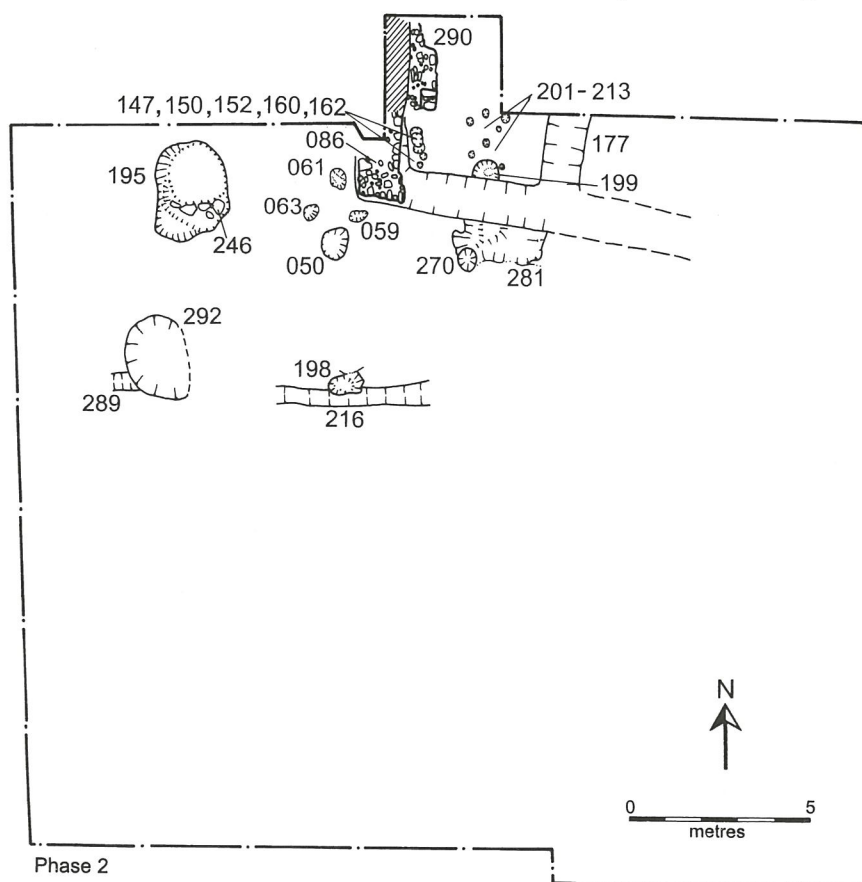
Phase 2 *An early property* (Illus 3)

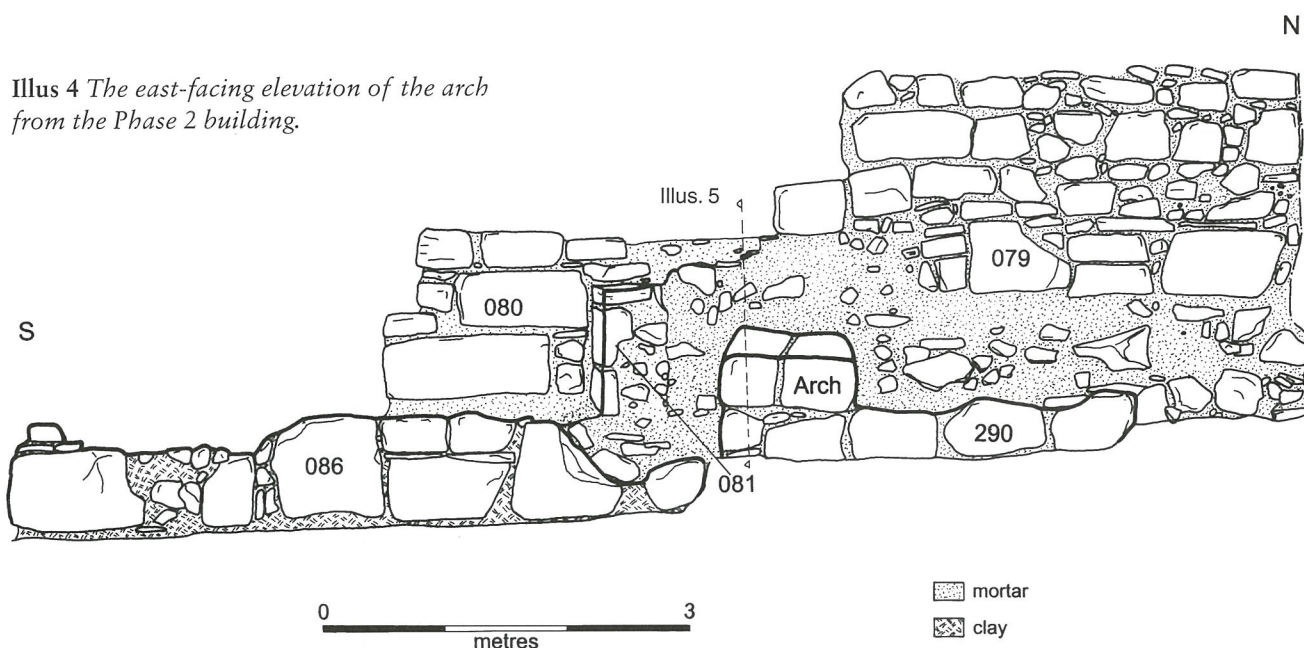
The most substantial structure identified on the site was a stone building which forms the core of the second phase of activity. Unfortunately this was only partially contained within the excavation trench. The property in which the building was contained was aligned E/W and fronted onto Abbey Street.

A number of features surrounding and cut by the foundation trench for this structure could not be understood but may relate to the construction of the building. A pit that may have served an industrial function lay to the S and was cut by the construction trench. This consisted of a sub rectangular cut (281) with vertical sides and a flat base. At the W end the cut became funnel shaped. At the SW corner of this feature was a posthole (270). Two groups of stakeholes/postholes were also identified. The E group (147, 150, 152, 160 & 162) was in a linear arrangement aligned N/S.

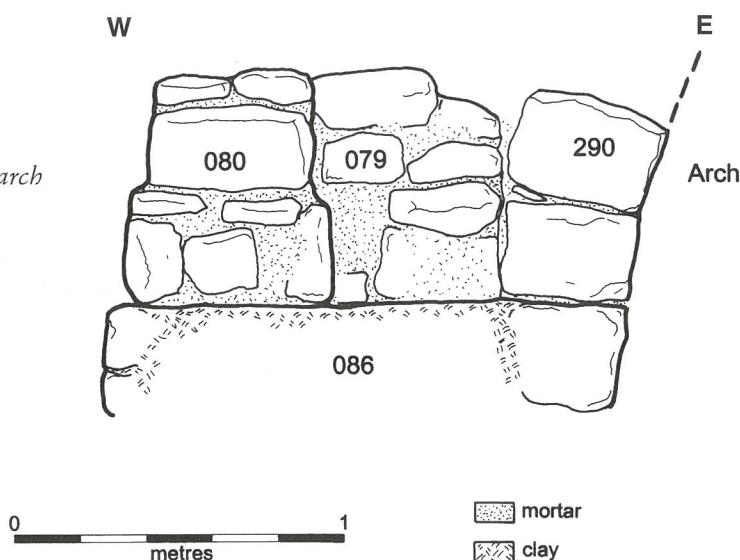


Illus 3 Phase 1 showing pre-burghal features and Phase 2 showing an early Abbey Street property and the remains of a stone building.





Illus 5 The south-facing elevation of the arch from the Phase 2 building.



The W group of three stakeholes/postholes (059, 061 & 063) may have been related to an associated pit (050). This was a small, shallow oval shaped pit of unknown function. The fill of the pit contained one sherd of Scottish White Gritty ware and had no qualities diagnostic of function.

These features lay around the building which appears to have been rectangular in plan although it was badly disturbed by later robber trenches. In particular an E/W aligned robber trench (008) had largely removed the S wall of the building but did indicate the original position of the wall. The W wall (086) had been incorporated into a later South Street boundary (079) and was very well preserved (Illus 3, 4 & 5). This measured approximately 1.2m in width, with 3 surviving courses, and contained the first course of the spring of a relieving arch (290) constructed of sandstone blocks bonded with mortar. The internal width of the arch was

1.4m. The arch was integral with the W wall of the building, the foundation of which consisted of sandstone and limestone blocks and occasional rounded cobbles bonded by clay (086). The S wall was completely robbed out to the E although the construction cut (177) was still identifiable beneath the robber trench. A smaller N/S aligned wall, again robbed out, subdivided the building forming a small room at the W. A clay surface was laid as a floor within this room. A post-hole (199) and a group of associated stakeholes (201–213) may have formed a structure of unknown function within the stone building. The E end of the building had been completely destroyed by later development. Assigning a function to the building is problematic as only a small portion of the structure was within the excavation trench and that had been heavily robbed. Furthermore no diagnostic material was recovered from the floor surface.

A well was identified to the rear of the building. This comprised a sub-rectangular cut (195) which had vertical sides for a depth of 0.75m where a paved ledge constructed of sandstone flags was set on the S side (246). Below the ledge the cut was circular and was excavated for a further 0.6m at which point excavation of the feature was abandoned on safety grounds. The feature was augured without obstruction for a further 2m, suggesting the depth of the well was in excess of 3.35m. The feature had been deliberately backfilled in a single event.

A number of pits were associated with this phase. The first had a circular cut (292) with a shallow u-shaped profile filled with a greyish brown silty clay. To the E of this was a second pit which consisted of a sub-rectangular cut (198) with near vertical sides and a flat base filled with a dark grey brown sandy loam deposit. The Phase 1 pit was re-cut by another pit (256) which was sub-circular in plan with steep sides curving to a rounded base. Three fills were contained within the pit, the upper one of which (230) contained a single sherd of Scottish White Gritty ware. It is assumed that these pits were excavated to extract clay.

One possible property boundary was identified which was represented by two E/W aligned ditches. The E ditch measured 4.8m in length and was truncated at either end by later pits. The cut (216) had vertical sides and a concave base and was filled by a brown sandy clay loam deposit. Another shorter section of ditch was located to the W of this. Its cut (289) and fill were the same as those of the E section.

Phase 3 *The South Street property (12th/13th century)*

The site was formally divided into properties fronting onto South Street during Phase 3 (Illus 6). This represented a realignment of the established E/W properties evident in Phase 2. Presumably smaller properties continued to be occupied fronting Abbey Street although no evidence was identified for this within the Byre site. The features within the properties represent a typical variety of low density backland activity, largely consisting of isolated pits. Presumably all structures dating to this period were either located at the South Street frontage or did not survive due to the soil processes discussed above.

A property which was 9.6m wide (31 foot 6 inches) and fronted onto South Street was defined by ditches aligned N/S (013, 294, 171 and 296) and a pit (112). Both boundaries were heavily truncated by later features.

The stone building identified in Phase 2 went out of use. A layer of rubble (076) resulted from the collapse/demolition of the building and a robber trench (117) was evidence of the recycling of the substantial squared stones used to construct the structure. The site of the Phase 2 building was cut by the Phase 3 property boundary (013) suggesting the entire property system changed between Phases 2 and 3.

Evidence for activity within the property was restricted to a number of pits. One pit was identified to

the west of the central property. This consisted of a sub-rectangular cut (273) which was quite shallow and irregular. The remaining pits were within the central property. There was a central group of four sub-rectangular pits that are likely to have been related (220, 222, 192 and 218). No primary function could be attributed to this group.

A large quarry pit which may have formed part of the west property boundary was identified to the SW of this group of pits. This comprised a sub-rectangular cut (112) filled by a pink and dark grey green clay and a dark brown clay silt. This was sunk into the underlying pink clay subsoil which was presumably the material being quarried. In addition to a quantity of bone resulting from domestic animals, such as cattle, sheep/goat and domestic fowl, a large proportion of cat bone was recovered from pit 112. This may be evidence of the skinning of cats, an activity well documented for medieval Scotland (Smith 1998a).

A number of interesting objects were recovered from the features identified during this phase. These included a fragment of iron which may have been part of the handle of a pair of shears or tongs. This was recovered from the eastern property boundary which also contained a fragment of Scottish White Gritty ware.

Phase 4 *Redevelopment of South Street during the 13th/14th century* (Illus 6)

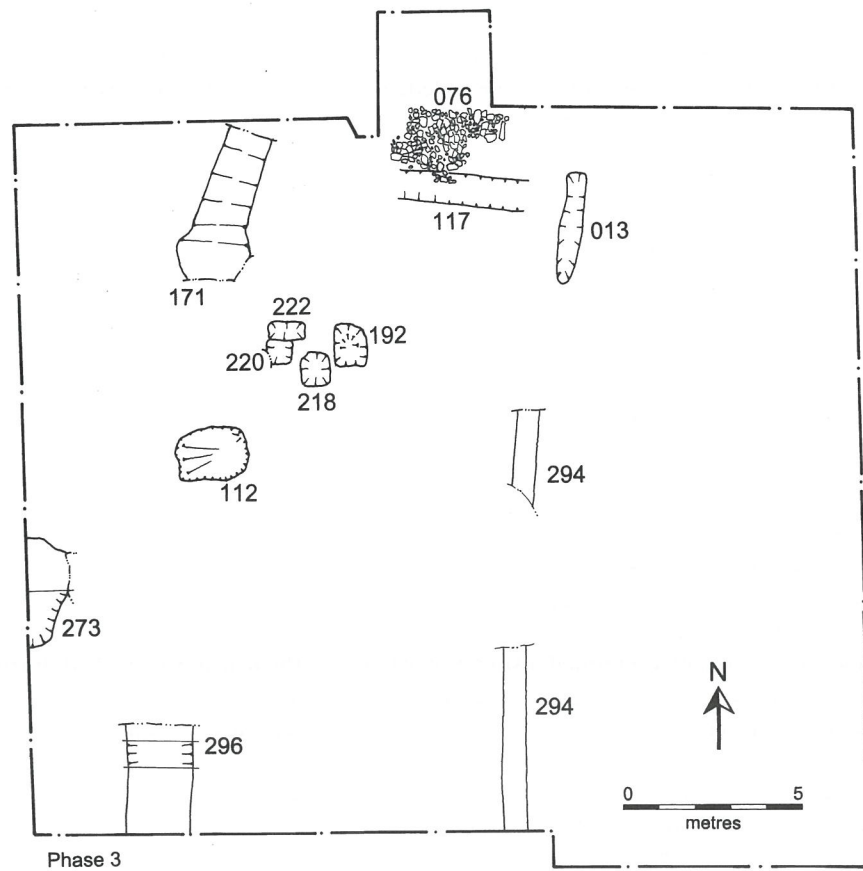
Of the 6 phases of activity identified, Phase 4 represents the most intensive use of the site. The property boundaries were realigned and a combination of clay extraction, industrial processing and waste disposal were undertaken. Further robbing out of the building which was in use in Phase 2 and fronting onto Abbey Street was evident in the form of a robber trench (008). A date of the 13th/14th century is attributed to this phase due to the presence of the remains of several vessels of Yorkshire type ware and a number of native copies of Yorkshire vessels.

The South Street property

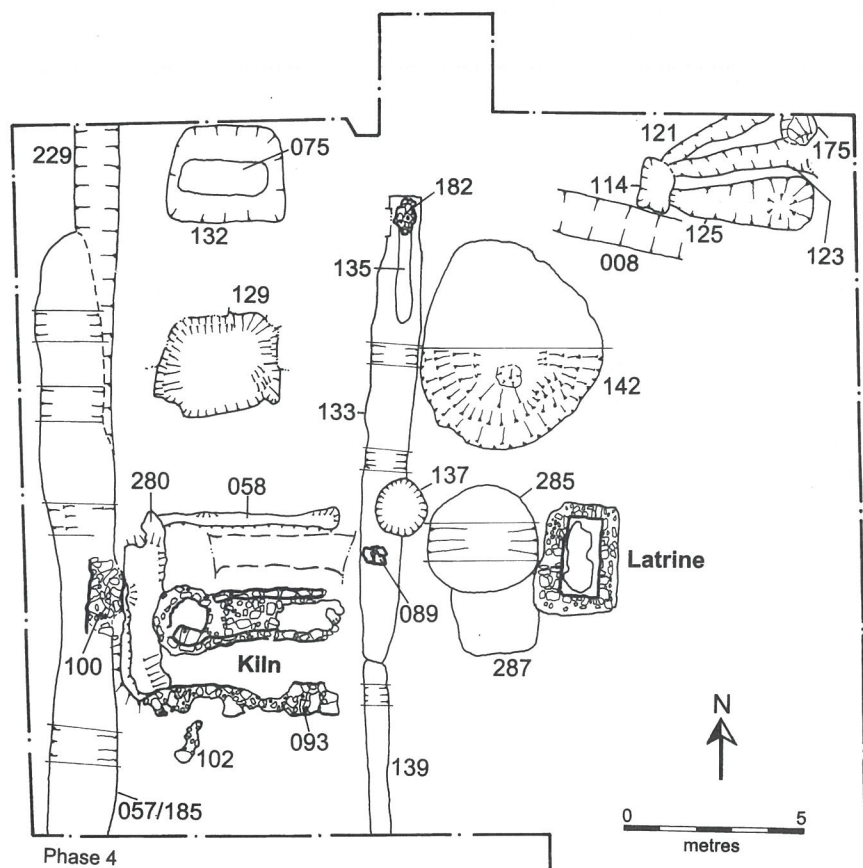
Property boundaries

The property orientation and size identified in Phase 3 was maintained in Phase 4 although the boundaries moved to the W. There were considerable differences in the form of the new boundary ditches. The W ditch comprised a single cut (229) which was recut and widened at the S end (057/185). The E ditch (133 & 139) appears to have been dug in a number of inter-cutting segments.

The earlier part of the W ditch was 1.3m wide with steeply sloping sides and a rounded base at 0.4m depth. The recut S section was approximately 2m wide and filled by two deposits of brown sandy silt (056/184 & 183) which contained charcoal flecks, lumps of pink clay, bone, shell, pottery and iron. The iron object consisted of a spike or implement tooth (see The artefacts).



Illus 6 Phase 3 showing the earliest South Street property and Phase 4 showing the redefined South Street property and intensive occupation.



The E boundary consisted of a segmented linear cut (133, 139) aligned N/S with a sharp break of slope from the surface, slightly concave sides and a concave base. The fill comprised a dark brown charcoal rich ashy loam and a mid brown sandy clay. The remnants of a badly disturbed wall (182) were identified at the N end of this ditch possibly indicating that the boundary had been more substantially redefined during its use. The remains of the wall suggest a structure of sub-angular and sub-rounded limestone and sandstone fragments bonded by loose white mortar. The wall had been largely destroyed by a robber trench (135).

Rubbish/cess pit

Between the property boundaries two distinct areas of activity could be identified. The first of these was represented by a rubbish/cess pit which produced the majority of the high status pottery retrieved from the excavation. This consisted of a sub-rectangular cut (129) that sloped gradually to a depth of 1m where it dropped vertically to a slightly concave base. The cut contained 16 distinct fills which contained a wealth of environmental and artefactual material. The primary fill was a grey brown silty clay which was overlain by two further silty or clayey deposits. Overlying these was a series of deposits which contained building materials such as masonry, tile and mortar. These are indicative of episodes of construction in the surrounding area. This dump of building material was sealed by a deposit of green silt which had the appearance of cess. The composition of further deposits within this pit varied and they contained materials such as pink clay, cess, burnt material, silty loam, stone and mortar.

An interesting aspect of the contents of the pit was the large and varied assemblage of building materials including roof tiles, squared stone, nails and lime mortar. This material appears to have been dumped in the pit either as the result of demolition or more likely as the waste products of a construction site, as the lime mortar was dumped while wet and had moulded over the stones and the lip of the pit. This material provides an excellent image of the building fronting South Street during the 13/14th century. It would appear to have been constructed of squared sandstone blocks bonded with mortar and roofed with tile including decorative pieces. This structure may have been similar to a building on the N side of South Street, the foundations of which were identified at Logies Lane in 1991 (MacKenzie and Moloney 1997). The Logies Lane building pre-dated the foundation of the Church of the Holy Trinity which is dated to 1410 and was constructed of similar kinds and size of materials as that found in the pit. The nails found associated with the building materials in the fill of the pit are of a type that could have been used to secure tiles. A total of 327 fragments of tile were recovered from the pit.

The pit was also notable for the large assemblage of animal bone contained within its various fills. This accounted for 35% of the total assemblage from the site and would appear to have resulted from the

disposal of domestic waste. The majority of the assemblage derived from cattle or large ungulate, with sheep/goat, pig, horse, domestic fowl, dog and cat represented in smaller numbers (see the Animal Bone below). Fish bones were also present in large numbers with 20% of the total assemblage retrieved, the second largest concentration identified at the site. Of the identifiable bones (35%) in the sample the largest number were identified as plaice (39%) with herring (24%) and saithe (13%) also well represented. Other species present included cod, haddock, pollack, eel, salmon/trout, bib and dab.

Evidence was also retrieved for the plant content of the diet with the second largest concentration of cereals identified on the site. These were predominantly oat with barley, rye and wheat represented in lesser quantities. A single cultivated pea was also present.

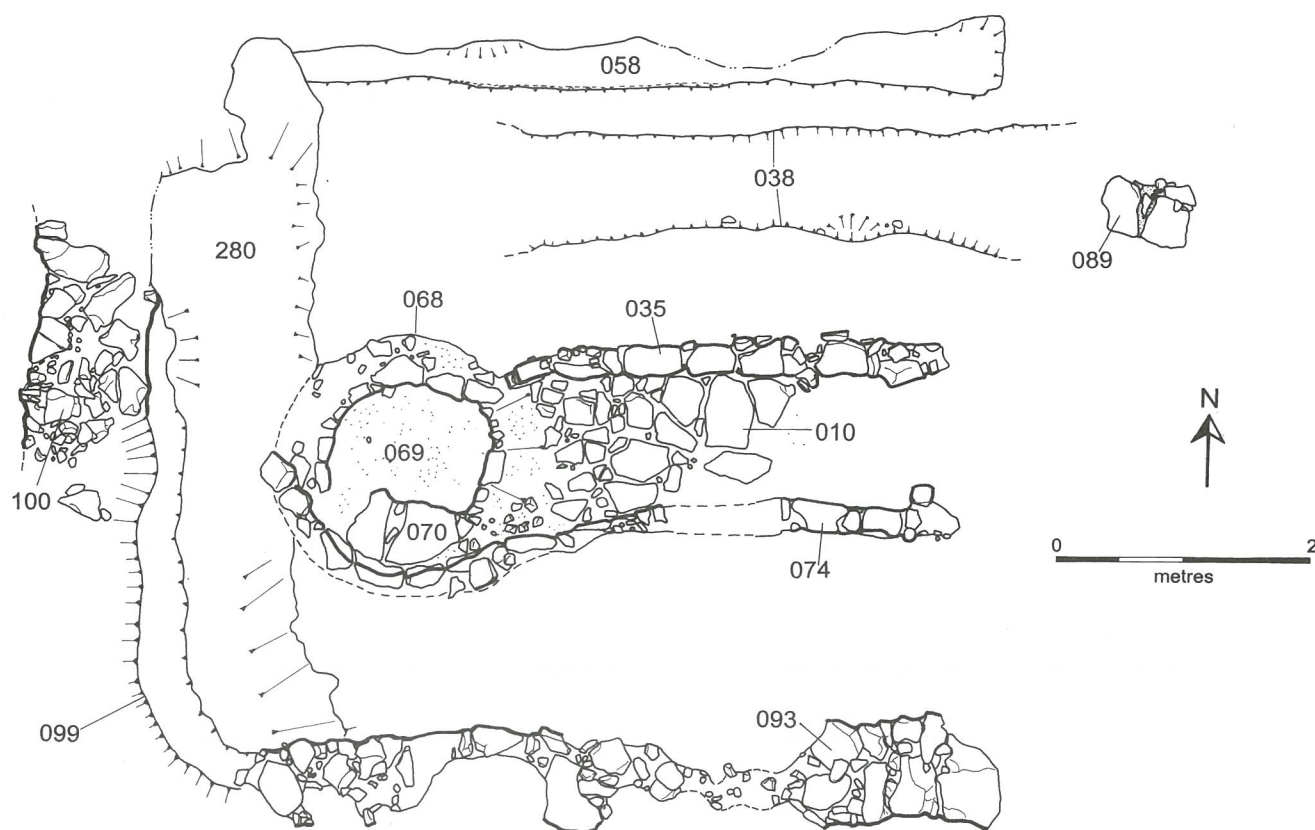
A substantial assemblage of large fragments of pottery was recovered from the fills of the pit including Yorkshire Type Wares and Scottish White Gritty ware. This suggests an affluent property owner with the majority of the assemblage coming from glazed jugs rather than cooking pots. A large fragment of an aquamanile in Yorkshire ware was also recovered (see The Pottery). A horseshoe was also recovered from the pit which was of a type generally dated to the 14th century (see The artefacts).

Kiln and kiln house (Illus 7, 8 & 9)

The second area of activity was a corn drying kiln and an associated shelter or kiln house. The kiln was keyhole shaped in plan with the bowl to the west and the flue opening to the E. The bowl floor was paved with the remains of a large circular red sandstone quern stone (070, Illus 9). This was surrounded by a curving wall (068) constructed of flat sandstone blocks bonded by pink clay. The flue was 3.5m long and curved slightly. This was flanked by two low parallel walls (035 & 074) constructed of sandstone bonded by pink mortar. The structure sat within a shallow keyhole shaped cut. A bedding layer (069) of crushed shell and sand was laid within the flue and bowl. The original floor of the flue was a simple clay surface. This was heat affected and covered by a thin layer of charcoal and ash. Above this material was a dump of brown silty sand and a deposit of ash which contained a large quantity of crushed shell. A charcoal rich deposit had accumulated within the bowl of the kiln and the west half of the flue was resurfaced with a layer of flagstones (010).

The area containing the kiln appears to have been initially defined by clay banks which were superseded by the later kiln house. Two banks were identified. A bank aligned N/S and constructed of pink clay (280) which contained Yorkshire Type Ware, 13/14th century, and a bank aligned E/W constructed of pink clay (058) with lenses of brown silty sand. These banks may represent the collapsed remnants of a wattle and daub structure which surrounded the kiln.

The kiln was later flanked on three sides (N, S and W) by sandstone walls (093, 100). The N wall of the



Illus 7 Kiln and kiln house.

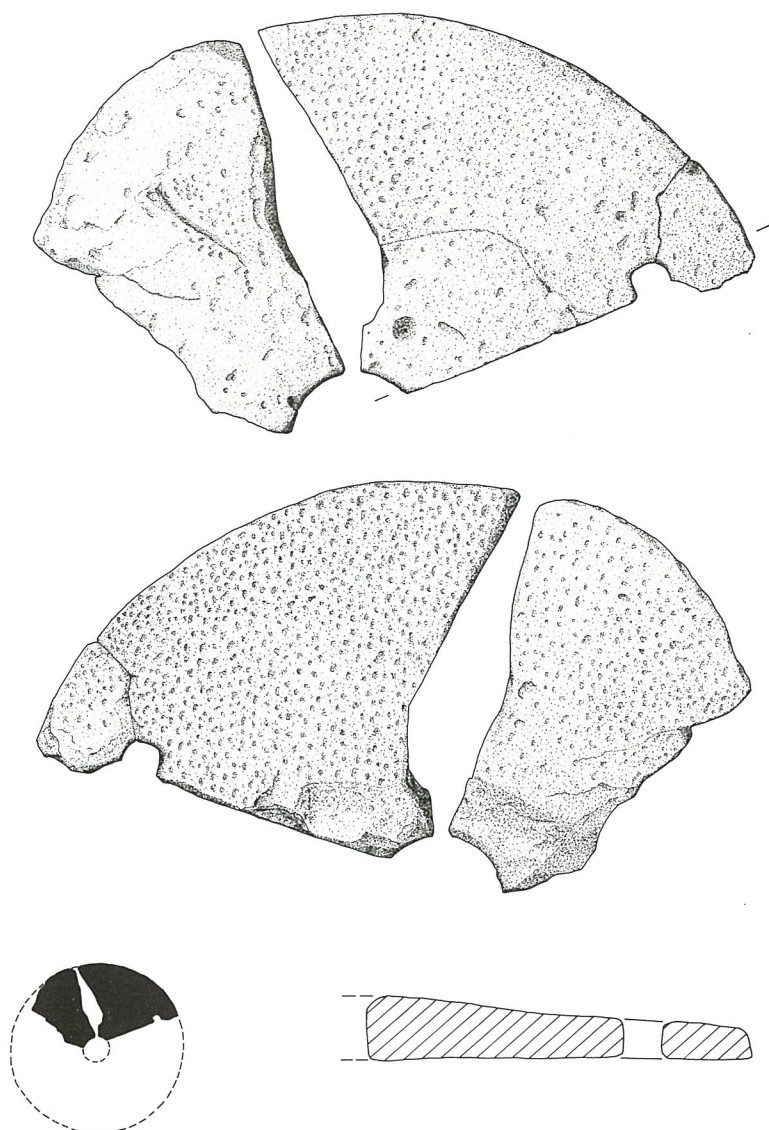


Illus 8 The excavated kiln.

structure was removed by a later robber trench (038). It is not clear whether these represent the foundations of a kiln house or a simple shelter which assisted with the working of the structure. The walls were badly disturbed by later robbing but where remnants survived, they were constructed of large sandstone blocks bonded by a mixture of clay and lime mortar. A stone setting (089) of similar construction appeared to form a stone plinth and is also likely to be associated with the kiln. A further fragment of masonry (102) was identified to the S of the structure and again may have been associated to the kiln house.

The largest concentration of cereal was recovered from the kiln. This was predominantly oat and barley with rye and wheat also represented. This would seem to suggest that the kiln was used in processing numerous crops for different purposes. The low proportion of weed seeds and the lack of chaff indicate that the samples represent the charred remains of cleaned crops. The basic processing of the crop ie threshing, winnowing and sieving was, in all likelihood, undertaken at the point of production so reducing the transport requirements. The absence of evidence for germination in the grain would also seem to indicate that it was being kilned prior to milling.

The remaining deposits in this phase relate to material which appears to have been dumped into the depression caused by settling of the backfill of the Phase 2 well. This was evident as a rectangular depression (132) which was levelled up by a dark brown sandy



Illus 9 Quern stone. Scale 1:4.

silt deposit, and a deposit of black ash (075) containing frequent charcoal fragments and fragments of Yorkshire ware.

Abbey Street property (Illus 6)

Latrine

The area to the E of the South Street properties contained a number of interesting features, the most notable being a well built and waterlogged latrine. The upper levels of the latrine had been badly truncated by the construction of the Byre Theatre. The primary fill of the feature was, however, well preserved and contained an impressive environmental assemblage. The structure consisted of a rectangular pit cut into the natural pink clay. The cut was lined on all sides by walls constructed of well faced limestone blocks bonded with clay which produced a watertight tank. The insect remains from the latrine suggests that the structure was covered while in use (see Warsop below) although no in-situ evidence for the upper part of the structure was identified due to modern truncation. A well preserved 13th/14th century latrine superstructure, constructed of

wood, was found preserved at Kirk Close in Perth (Blanchard 1987 and Yeoman 1995). This may be similar to the original seating arrangement at the Byre latrine. The presence of woodworm in the waterlogged fill of the latrine may suggest that timber was used in the construction of the structure.

The primary fill of the latrine comprised a layer of very dark brown organic silt (274) which was very moist and odorous and almost certainly contained a high quantity of human excrement. A drier silty fill (111) sealed the primary fill and this deposit was in turn sealed by loose limestone rubble which presumably represents the partially demolished walls of the structure. The upper fill of the latrine appears to have been dumped deliberately to seal the structure. This consisted of black sandy gravel with a high charcoal content.

The single largest deposit of fish bones was retrieved from the fill of the latrine with 954 individual bones or 60% of the entire site assemblage (see the Fish Remains below). Of the identifiable bones in the sample (47%) the majority derived from herring (48%) with saithe (21%), haddock (17%) and eel (8%) also well repre-

sented. Other species present included salmon/trout, gurnard, sandeel, pollack, dab, cod and flatfish.

The anaerobic conditions within the latrine were ideal for the preservation of plant and insect remains and the result is the best preserved assemblage from any medieval site in St Andrews. In contrast to the other features on site only small amounts of cereal were recovered. The largest concentrations of plant remains were fruits and berries. Fig seeds were the predominant species recovered with over 2000 seeds identified from the processed samples. Grape, cherry, plum, sloe, black mustard, strawberry, bilberry/cowberry and plum/bullace/greengage were also represented in significant numbers. Also present were wild cherry, opium poppy, chickweed, hazel nut, blackberry, pea, hemlock and ling/heather. It is possible that the ling/heather may have been brought to the site as a roofing/thatching material. The insect remains are dominated by fly and beetle species associated with rotting environments as would be expected in the bottom of a latrine.

Clay extraction

A group of pits adjacent to the latrine are likely to have represented clay extraction. Two extremely deep intercutting pits (285 & 287) were located adjacent to the latrine. These extended below the water table and their excavation was abandoned due to safety restrictions.

A smaller, sub-circular pit (137) was excavated to a depth of 2m where it appeared to be undermined forming a bell pit. The primary fill of the feature consisted of brownish grey sandy clay which contained charcoal, pottery and bone. Subsequent fills were pink gravely clay, yellow sandy silt with a high shell content, small pieces of coal and charcoal in a matrix of grey sand and finally mid dark greyish brown sandy clay loam which contained a copper plate with rivets. This pit also contained a large quantity of animal bone representing 28% of the total assemblage. This assemblage contrasted with pit 129 in the South Street property in that it showed an overwhelming predominance of sheep and goat over cattle. Whether this demonstrates a difference in taste between the residents of the neighbouring properties or evidence of a variation in affluence is uncertain. However a more exotic, and presumably expensive, pottery assemblage was recovered from pit 129, a possible indication that beef was the favoured meat amongst the more affluent citizens of St Andrews.

To the N of this group of pits was by far the largest pit excavated on the site, again presumably cut for clay extraction. The cut (142) measured a maximum of 5.84m in diameter with steep sides sloping to meet a rounded base. A large socket stone was identified at the centre of the base for which no function could be assigned. The basal fill comprised mottled pale pink clay and pale yellow sand which is likely to have derived from collapse of the sides of the pit. Subsequent fills relate to the re-use of the feature as a rubbish pit as indicated by the inclusion of domestic waste including animal bone (7% of the total assemblage) and fragments of pottery.

The nature of the environment within the pit did not allow for good preservation of materials within these fills.

Industrial activity

An unusual complex of features at the NE corner of the site appears to be the result of an industrial process. Little by way of artefacts was recovered to assist with an interpretation of the nature of the process undertaken.

An oval cut (114) with vertical sides and a flat base formed the focus of the complex. Three features of similar form were connected to this pit. Two of these were not fully contained within the excavation trench. The third comprised a linear cut with a bowl shaped E end (125), the primary fill of which comprised a deposit of pink clay. The secondary fill comprised mid brown sandy silt. The other two features (121 and 123) appeared to be of a similar shape and nature. The depth of the features increased towards the bowl shaped end from 0.45m to 1m. An associated rectangular cut (175) with vertical sides and a flat bottom was filled by mid brown silty loam and contained a large boulder set upright which had a number of lumps of slag adhering to its surface. This may possibly represent a rudimentary anvil. A thin spread of dark sandy loam containing rubble and slag was also related to this complex.

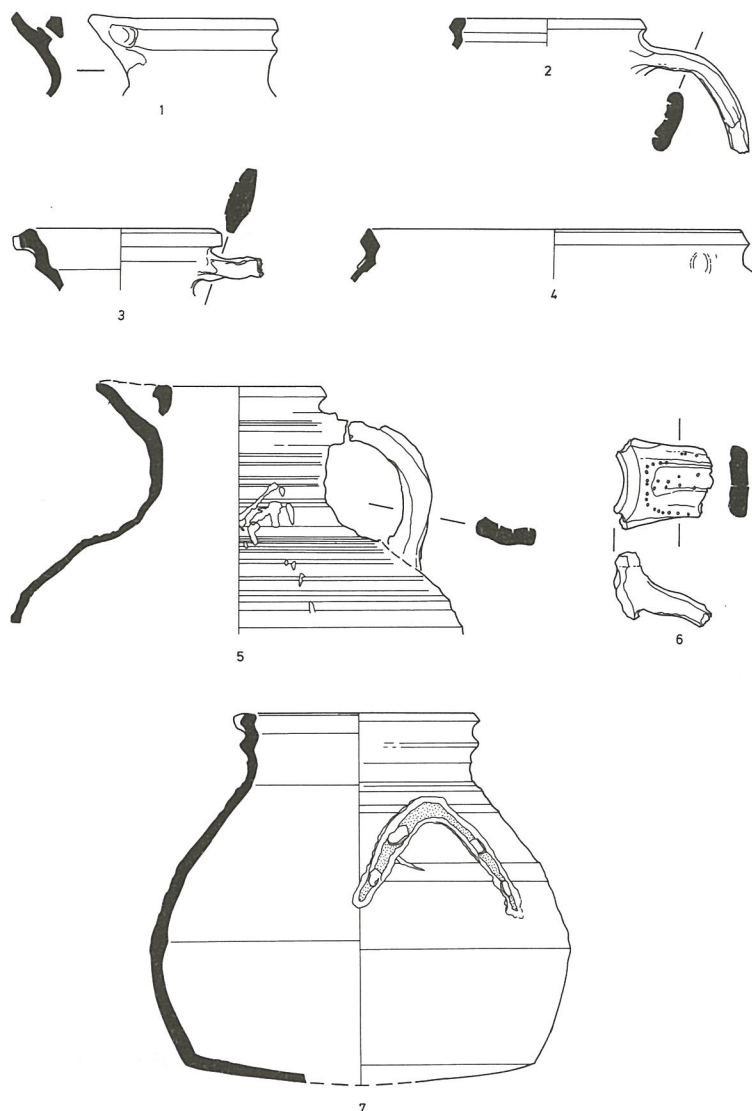
Unfortunately insufficient evidence was retrieved to determine the function of these features. The available evidence is contradictory. The presence of slag in the vicinity of the features together with the slag adhering to the possible anvil stone and the kiln shaped appearance of the features would seem to indicate metal working. However the lack of burning or scorching to the edges of the kiln like features does not suggest that intense heat was part of the process.

Phase 5 Late-medieval features (16th century)

At the surface of the homogenous lower soil deposit discussed above (002) a small number of features were identified. These consisted of a small dump of sand, a tumble of rubble and a robber trench all relating to the demolition of the kiln house. In addition a small rubbish pit (039) which had been heavily truncated during demolition of the byre theatre was excavated and a fragment of a sundial retrieved from the fill (036).

Phase 6 Post-medieval features (post-16th-century activity)

During the post-medieval period the eastern South Street boundary was consolidated and defined by a large stone wall. This boundary was retained until the demolition of the Byre Theatre in 1998. The remainder of the site appears to have been used as gardens as indicated by extant map evidence. The majority of features relating to this period relate to modern rubbish pits and features relating to the Byre Theatre.



Illus 10 Pottery catalogue nos 1–7. Scale 1:2.

The pottery

D W Hall

The excavation produced 699 sherds of pottery, 687 sherds of which are of medieval date (Illus 10–13). All the fabrics have been examined by eye and where possible given a known provenance.

Scottish White Gritty ware

Cooking pots and glazed jugs are the most common vessel forms in this fabric although this assemblage contains fragments of skillets (cat 19), curfews (cat 20) and a piece from a smoker (cat 21) similar to one previously excavated from Market Street, St Andrews (Hall 1997, cat 196).

East Coast Redware

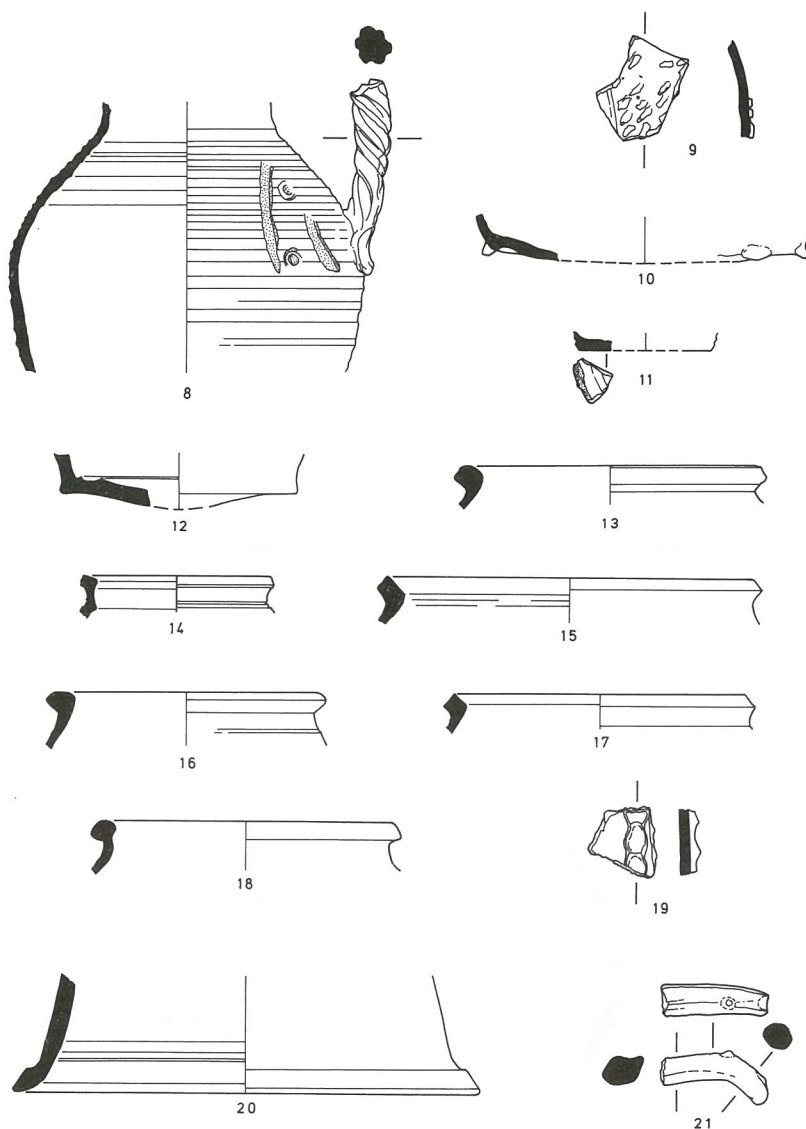
Glazed jugs are the most common vessel form although one of the pieces in this group is from a chamber pot with a looped handle (cat 25).

Yorkshire Type Ware

This is the most common imported fabric from this site (39 sherds) and high status vessels such as highly decorated figure jugs (cat 27), a seal jug (cat 32) and an aquamanile (cat 35) are present.

Grimston Ware

This reduced grey sandy fabric was produced in East Anglia from the late 12th to 16th centuries (McCarthy and Brooks 1988, 266). The single sherd in this assemblage is from a highly decorated jug with an applied notched strip (cat 26). The highly decorated wares from this production centre are typologically dated to the mid 13th–mid 14th centuries (Ibid, 266).



Illus 11 Pottery catalogue nos 8–21. Scale 1:2.

London Type Ware

This pottery industry has been dated from *c* 1140 to *c* 1350, however all the evidence would suggest that it only travelled in the 12th and early 13th centuries (Pearce, Vince and Jenner 1985, 7). It is sherds from the highly decorated jugs, often Rouen copies, that are found in Scotland. The 6 sherds in this assemblage would seem to be from these types of vessels (cat 36).

Low Countries Redware

This fabric begins to replace the earlier Low Countries greywares from the mid-14th century onwards (Verhaege 1983, 25). There is a single sherd from context 012.

Rhenish Stoneware

These distinctive very hard fired imported fabrics begin to be imported into Scotland in the 14th and 15th

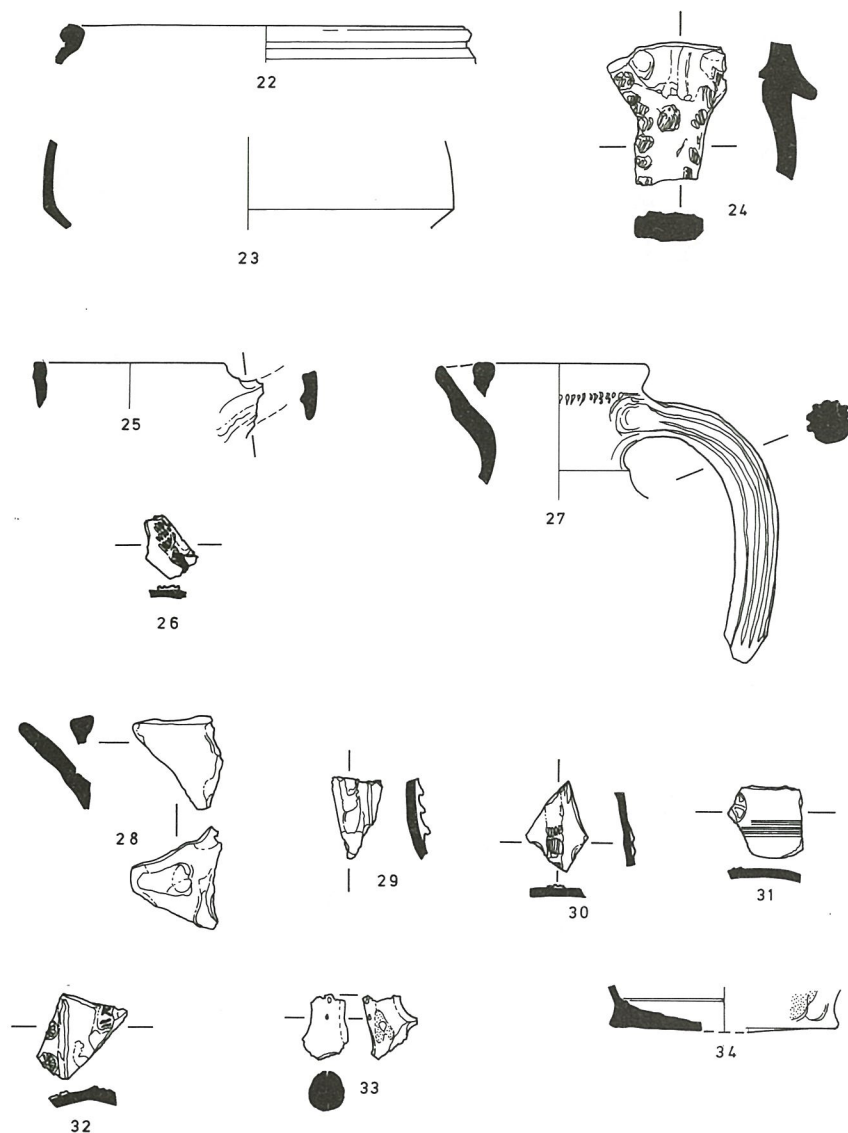
centuries (Hurst et al 1986). The 2 sherds from 032 and 178 are of Langewehe type and the sherds from 002 are from a small Siegburg jug with a frilled base (cat 37).

Unidentified

This material is made up of unprovenanced material of medieval date apart from a single rimsherd from 244 which could be of an earlier date (cat 38).

Discussion

The Scottish White Gritty wares from this site are largely from glazed jugs rather than cooking pots and seem to be copying Yorkshire Type Ware vessel forms. This is most obvious in the style of the bridge spouted jugs (cats 1 and 5) and the jug with a twisted rod handle (cat 8). High status Yorkshire Type Ware vessels are also present in this group, such as the aquamanile which is one of the best Scottish examples of this form (cat 35). Such influence on the local wares would



Illus 12 Pottery catalogue nos 22–34. Scale 1:2.

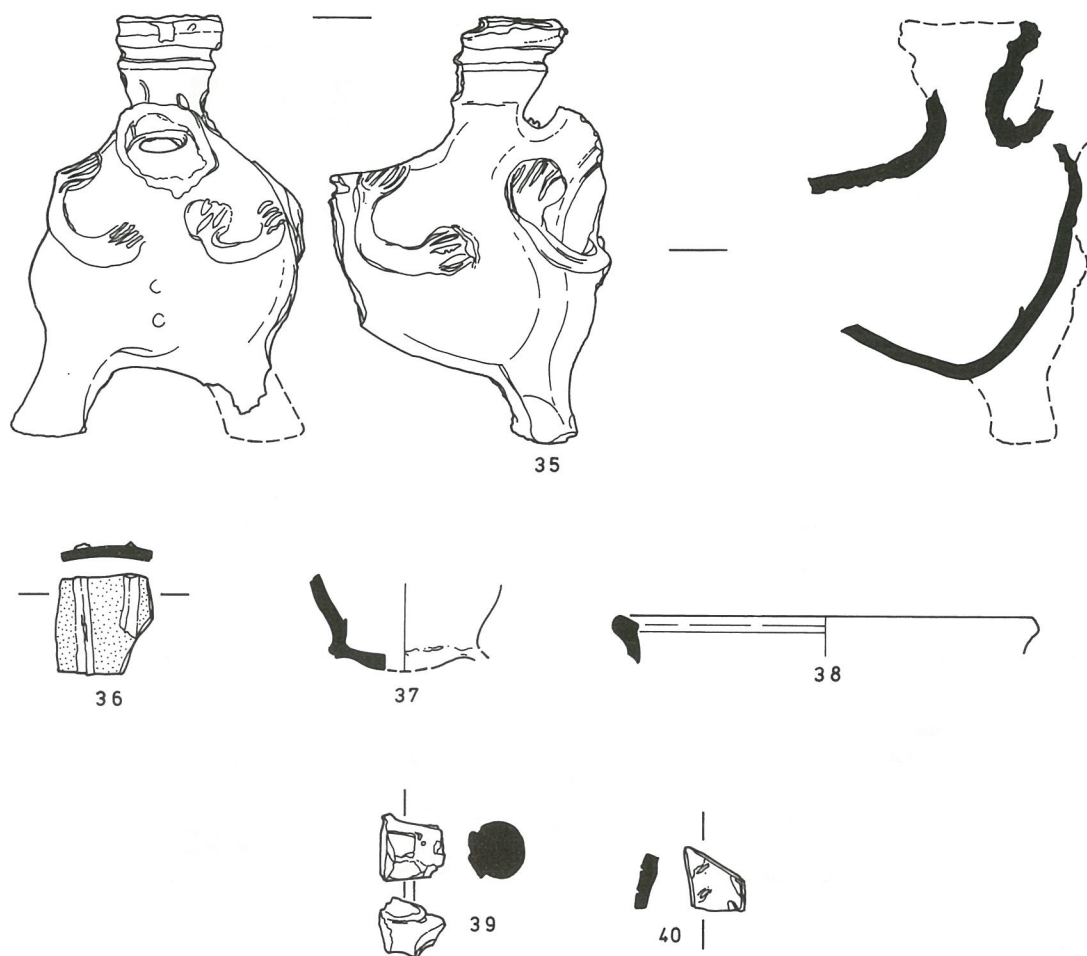
suggest that the bulk of this assemblage dates to the 13th and 14th centuries; there is nothing present to suggest an earlier date. At this point it is worth stating again the problem of dating assemblages that only contain local fabrics (Hall 1996).

Of most interest in this assemblage are the many large parts of vessels which have survived. This would appear to be because these fragments come from pit fills. Pit 129 contained both the Scottish White Gritty ware copies of Yorkshire Type Ware vessels and the fragment of an aquamanile (cat 35). When considered with the large ceramic tile assemblage (Cox this report) it would appear that a medieval building or buildings of high status stood in the near vicinity. The new Scottish White Gritty ware vessel forms will provide useful extra information for integration into the ongoing development of a vessel typology for the Fife pottery industry.

Illustration catalogue (Illus 10–13)

Scottish White Gritty ware

- 1 Jug rim with bridge spout with splashed green glaze (context 020)
- 2 Complete jug rim with pulled spout and stabbed strap handle junction with traces of splashed green glaze (context 067)
- 3 Jug rim and stabbed strap handle with patches of green glaze (context 067)
- 4 Jug rim with single thumb pad and traces of a white slip (context 067)
- 5 Jug rim with bridge spout, strap handle junction and upper part of body decorated with brown glazed pads on splashed green glaze (context 110)
- 6 Rim and stabbed strap handle from jug with spots of green glaze and traces of a white slip (context 138)
- 7 Rim to base profile from jug glazed green and decorated with applied 'horseshoe' shaped strips (context 110)
- 8 Upper part of jug body glazed brown with twisted rod handle decorated with brown glazed strip and ring and dot decoration (context 110)



Illus 13 Pottery catalogue nos 35–40. Scale 1:2.

- 9 Bodysherd from jug decorated with applied pads and glazed green (context 067)
- 10 Thumbbed basesherd from jug with traces of white slip and spots of brown glaze (context 040)
- 11 Jug basesherd with glaze over broken edge, kiln waster ? (context 143)
- 12 Basesherd from unglazed jug (context 166)
- 13 Cooking pot rim with traces of white slip (context 002)
- 14 Cooking pot rim with internal and external smoke blackening (context 056)
- 15 Cooking pot rim (context 067)
- 16 Cooking pot rim (context 131)
- 17 Cooking pot rim (context 143)
- 18 Cooking pot rim (context 219)
- 19 Bodysherd from smoker with applied thumbbed strip and external smoke blackening (context 002)
- 20 Basesherd from curfew with internal smoke blackening (context 002)
- 21 Skillet handle with splashed green glaze (context 009)
- 22 Rimsherd from storage vessel (context 002)
- 23 Basesherd from open vessel form? with external smoke blackening and internal green glaze (context 143)

East Coast Redware

- 24 Strap handle from jug decorated with facemask and incised scalloped decoration glazed green (context 002)

- 25 Rimsherd and loop handle junction from chamber pot glazed green on a purple wash (context 031)

Grimston Ware

- 26 Bodysherd from jug decorated with applied strip with incised decoration glazed olive green with brown patches (context 067)

Yorkshire Type Ware

- 27 Complete rim from figure jug with bridge spout and ribbed rod handle and traces of scars from decorative handle junctions (context 067)
- 28 Rim and bridge spout from jug glazed lustrous green (Context 075)
- 29 Bodysherd from jug decorated with applied scales and lines glazed lustrous green (context 040)
- 30 Bodysherd from jug decorated with applied combed strip glazed lustrous green (context 143)
- 31 Bodysherd from jug with stamped pad and incised lines glazed lustrous green (context 280)
- 32 Bodysherd from a seal jug decorated with applied stamped pads, an applied vertical line and a small fragment of circular seal containing two letters (context 143)
- 33 Rod handle fragment glazed yellow brown with stabbed holes (context 040)
- 34 Thumbbed basesherd from jug glazed lustrous green (context 183)

35 Front end of zoomorphic aquamanile glazed lustrous green (context 110)

London Type Ware

36 Bodysherd from jug glazed lustrous green with applied vertical white slip lines glazed yellow green (context 002)

Rhenish Stoneware

37 Filled basesherd from small jug in Siegburg stoneware (context 002)

Unidentified

38 Rimsherd from cooking pot with traces of external smoke blackening (context 244)

39 Rod handle from jug glazed green with applied pads (context 002)

40 Bodysherd from jug decorated with stabbed marks and traces of green glaze (context 166).

The artefacts

Adrian Cox

A small but varied assemblage of artefacts was recovered, including significant groups of iron and bone objects and an important assemblage of ceramic roof tile fragments. Part of a sundial represents a particularly rare find from an archaeological context. A select catalogue is presented here.

Copper alloy objects (Illus 14)

Two artefacts of copper alloy are worthy of note. Number 1 is a plain buckle plate, recovered from a garden soil deposit in Phase 5. Examples of similar form, with incised and punched decoration, are known from medieval contexts in London (Egan and Pritchard 1991, 110–1).

1 Buckle plate Length 50 mm; width 16 mm; thickness (excluding rivets) 0.8 mm

Plain, rectangular buckle plate with five rivet holes, one at each corner and another on the central axis. Three of the corner holes are occupied by rivets, with ends expanded by hammering. Parts of the recesses for the buckle frame and pin survive, but the object has broken across this end. Context 002; Find No 10; Phase 5.

Found in the fill of a quarry pit in Phase 4, No 2 is a repair or reinforcement plate. Its corners appear to have been deliberately folded inward, indicating that the plate was possibly attached to an object with rectangular sides and rounded corners. It may have been used as a reinforcement patch for a wooden item, to repair, reinforce and protect it.

A probable repaired vessel rim of 14th- or 15th-century date was found at Cinema House, St Andrews (Maxwell 1997a, 74, Illus 37, No 74), and a probable vessel repair patch of 14th- or 15th-century date came from St Nicholas Farm (Cox 1995, 63–4, Illus 11, No 2).

Other vessel repair patches are known, for example from Rattray, Aberdeenshire (Goodall 1993, 192, Fig 42, No 237).

2 Repair or reinforcement plate Length 50 mm; width 78 mm; thickness 0.3 mm.

Fragment of a thin plate, originally with right-angled corners, which are folded over. Irregular rivet holes have been punched through the plate along its edges. One of these is occupied by a rivet. The object is roughly broken on one side and is heavily corroded. Context 138; Phase 4.

Lead alloy objects (Illus 14)

A discoid object (No 3) found in a Phase 5 garden soil deposit probably represents a weight. The possibility that it represents a spindle whorl can probably be discounted, as the central aperture has a slight burr on its inner face, indicating that a spindle had not been inserted. Additionally, the uneven shape of the object, with one face exhibiting irregularities formed during the casting process, indicates that it would have been ineffective in spinning. It may have functioned as a loomweight or a net weight.

3 Weight? Diameter 31 mm; max thickness 5 mm

Plain, discoid, cast object of slightly uneven thickness, with a central, circular hole (diameter 8 mm).

Context 002; Find No 36; Phase 5.

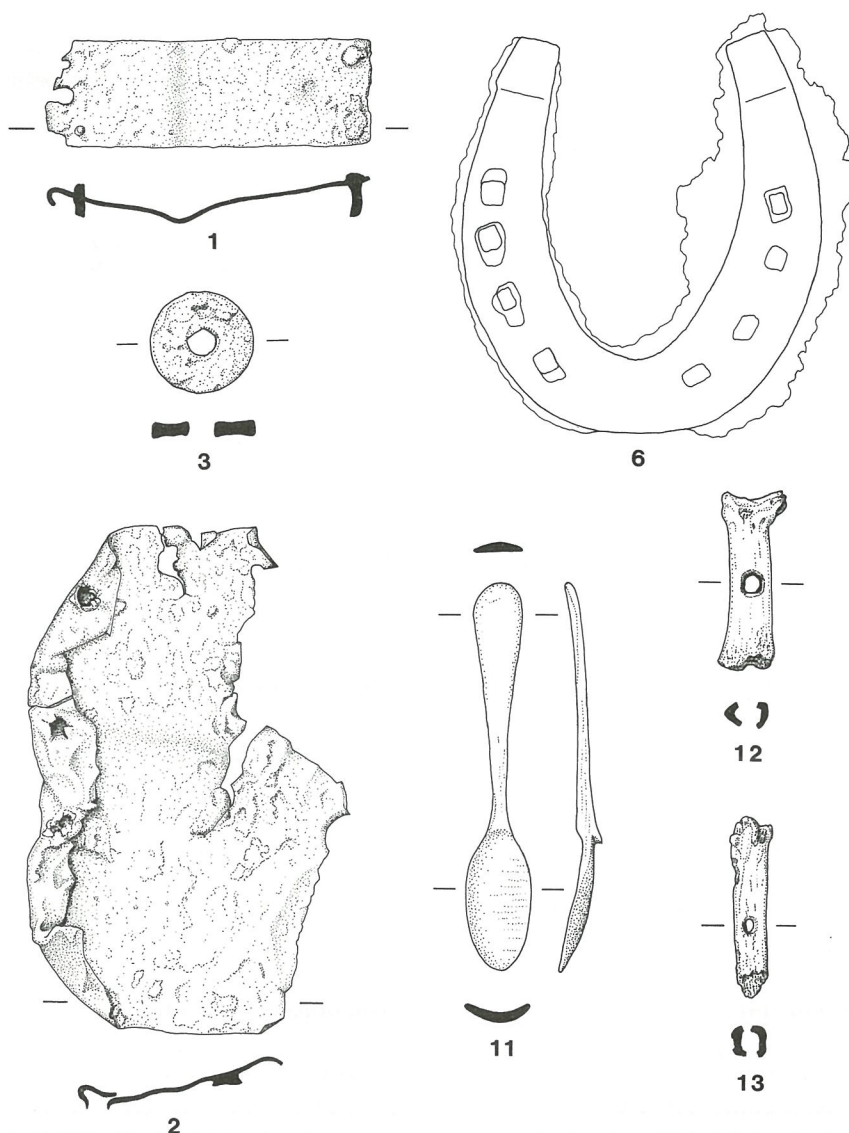
Iron objects (Illus 14)

In general, damp conditions on the site resulted in fairly poor preservation of iron artefacts. Selected artefacts were subjected to x-ray examination, which has helped to reveal original dimensions and additional constructional detail.

Found in a soil deposit in Phase 5, No 4 is probably a chisel. Number 5, from the fill of a boundary ditch in Phase 3, is a curved fragment of rectangular cross-section. One possibility is that this could represent part of a handle from a pair of tongs or shears. The single horseshoe (No 6) from the excavation came from a pit fill in Phase 4. Although the shoe is largely obscured by corrosion products, X-radiography reveals that its nail holes are of countersunk, sub-rectangular form, indicating a possible 14th-century date.

Part of a scale-tang knife (No 7), with remnants of its bone scales surviving, came from a garden soil deposit in Phase 5. Evidence from London indicates that scale-tang knives rapidly increased in popularity from the mid-14th century onwards (Cowgill *et al* 1987, 26). This example is of post-medieval date, although the manner of its construction bears some similarities to that of its medieval predecessors.

Number 8, an intrusive fragment found in the uppermost fill of the latrine in Phase 4, is probably from a vessel or a water pipe of recent date. Recent pottery was found in association with this object. Recovered from a soil deposit in Phase 6, No 9 is



Illus 14 Finds catalogue nos 1–3, 6 & 11–13. Scale 1:2.

probably a fragment of a pot stand, made from cast iron. It is unlikely to pre-date the 18th century. Originally, the pot stand would have been of circular plan, with three or four projecting lugs, incorporating feet. Only one lug now survives.

Number 10 may represent a tooth from a horticultural implement such as a fork or rake, with short, tapering, rectangular cross-sectioned teeth. It was recovered from the fill of a boundary ditch in Phase 4.

4 Chisel? Length 166 mm; max width 15 mm; max thickness 7 mm

Probable chisel, of slender form, with a narrow, irregular head and a tapering, rectangular cross-sectioned shaft. Measurements are taken from an x-ray image and exclude corrosion products. (Not illustrated).

Context 002; Phase 5.

5 Curved fragment Length 33 mm; width 11 mm; thickness c 4 mm

Fragment of rectangular cross-section, even width and a

smooth curvature, broken at both ends. Measurements are taken from an x-ray image and exclude corrosion products. (Not illustrated).

Context 012; Phase 3.

6 Horseshoe Length 118 mm; max width c 110 mm; thickness c 8 mm

Complete shoe with eight countersunk, sub-rectangular nail holes arranged in two sets of four, and heavy calkins. The detail is heavily obscured by corrosion products, and an x-ray image has been used to assist illustration. Measurements are also taken from the x-ray image.

Context 110; Find No 32; Phase 4.

7 Knife Length 114 mm; max width of handle 18 mm; max surviving width of blade c 27 mm; thickness (excluding corrosion products) 7 mm

The handle and part of the blade of a scale-tang knife, found in conjoining fragments. Fragments of bone scales, each derived from a large ungulate long bone shaft, survive at either side of the handle, and were secured by three surviving iron rivets. The blade appears to have been broad.

Only a small section remains, and this is very heavily corroded. A further fragment of iron-stained bone scale (length 13 mm) does not conjoin but is also from this object. (Not illustrated). Context 002; Conjoining Find Nos 43 and 44; Phase 5.

8 Plate fragment Length 79 mm; max width 35 mm; thickness 3 mm

Fragment of curved, cast iron plate. All edges are broken. (Not illustrated).

Context 032; Phase 4.

9 Pot stand fragment? Length 169 mm; max width 94 mm; max thickness 19 mm

Fragment, probably from a cast iron pot stand. A projecting lug incorporates a small, circular cross-sectioned 'foot'.

Heavily corroded. (Not illustrated). Context 001; Phase 6.

10 Spike or tooth Length 92 mm; max width 9 mm; max thickness 7 mm

Spike or implement tooth of steadily tapering rectangular cross-section. It is broken at the broader end and heavily corroded. Measurements are taken from an x-ray image and exclude corrosion products. (Not illustrated). Context 183; Phase 4.

Nails

A total of 23 nails were recovered. There were two small concentrations, in the upper fill of a large cess pit in Phase 4 and in a late medieval soil deposit in Phase 5. Of the examples on which both the head and at least part of the shaft survive, the predominant type (14 examples) is a wrought nail with a round head and a square or rectangular cross-sectioned shaft. Nails of this type appear to have had a range of uses in wood-working, for example in securing timbers, in roof construction, in coffins, and as components of clench bolts. This type predominates among other excavated nail assemblages from St Andrews (eg Cox 1995, 64; Walsh and Maxwell 1997, 79–82). The seven examples found in the cess pit fill at this site were associated with a large group of roof tile fragments (see below) and may have been used to secure them to roof timbers.

Only a single nail, from the rubble infill of a latrine, is of an identifiably different type. This example, which is the longest nail recovered (128 mm) has a narrow, rectangular head and a rectangular cross-sectioned shaft.

Bone objects (Illus 14)

A bone spoon of slender form (No 11) was recovered from a modern soil deposit. This example is probably of 19th-century date and its form reflects that of metal spoons of this date, although the shape of the bowl is particularly narrow. Bone spoons with slender bowls were preferred to their metal counterparts for use as egg spoons, until recent times. Another bone spoon of similar size from South Castle Street, St Andrews (Cox 1997, 102, Illus 48, No 16) exhibits a slight variation on the form of the handle.

Numbers 12 and 13 are pig metapodials, modified by a single perforation cut through the middle of the shaft. These objects, not uncommonly found on medieval sites, have been variously interpreted as bobbins, clothes fastening devices and musical toys. The latter interpretation gives rise to the term *buzzbone* (Lund 1981, 256–7) and Fenton (1978, 503–4) describes the custom in the Northern Isles for children to claim pig metapodials for making a toy called a *snorie bane*, so called because of the snoring sound it made when rotated quickly by means of a twisted cord fastened around it. Other examples have been excavated previously in St Andrews at Cinema House (Maxwell 1997b, 89, Illus 42, No 267), St Nicholas Farm (Cox 1995, 64, Illus 11, No 20) and Castlecliffe (Caldwell 1996, 644, Illus 33, No 87).

11 Spoon Length 119 mm; max width of bowl 20 mm; max width of handle 14 mm; max thickness 6 mm. Complete spoon derived from a large ungulate long bone shaft. Context 001; Find No 22.

12 Toggle or buzzbone Length 55 mm; max width 19 mm; max thickness 15 mm

Toggle or buzzbone, derived from a pig metacarpal III (left).

The distal end is unfused. A roughly circular hole (width c 7 mm) has been cut through the midshaft in an antero-posterior direction. The proximal surface is abraded.

Context 002; Find No 1; Phase 5.

13 Toggle or buzzbone Length 54 mm; max width 13 mm; max thickness 11 mm

Toggle or buzzbone, derived from a pig metapodial (III or IV).

A roughly oval hole (width c 4 mm) has been cut or drilled through the midshaft in an antero-posterior direction. The object is heavily eroded and both epiphyses are missing.

Context 075; Phase 4.

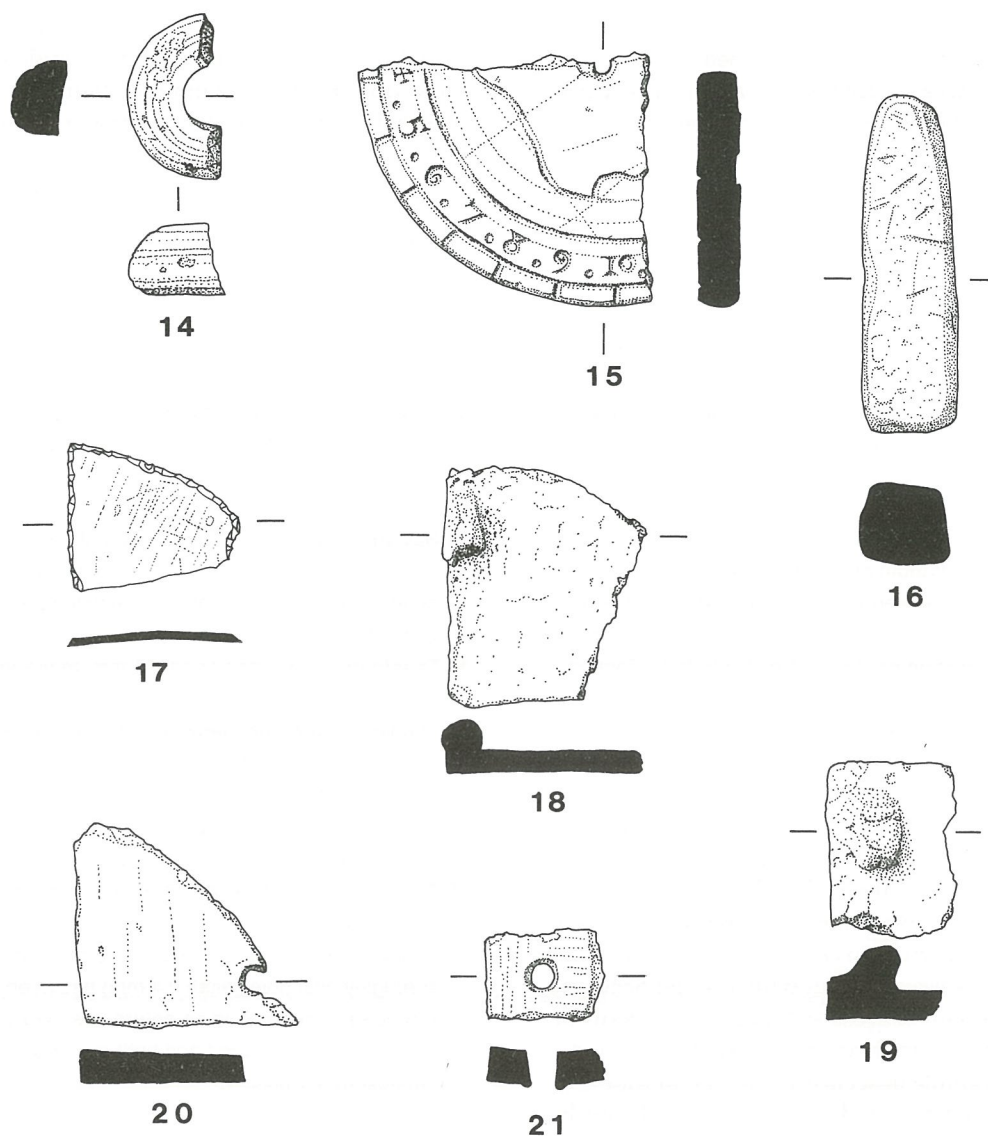
Stone objects (Illus 15)

A fragment of a spindle whorl (No 14) was recovered from a soil deposit which also contained 15th to 16th century pottery. Slight abrasion indicates that the whorl may be a residual find of earlier date. Rounded conical forms such as this are well known among medieval assemblages.

Fragments of sundials such as No 15 are, conversely, rare finds in archaeological contexts. This example, which appears to represent approximately one quarter of a circular dial, was found in a rubbish pit, in association with Scottish White Gritty ware of medieval date.

A sundial marks the time by the shadow of its gnomon or style (missing in this example), which falls on the face of the dial when exposed to the rays of the sun. Sundials can be engraved so as to show the time upon surfaces facing in any direction, although only a horizontal sundial will show the time all year round throughout the period during which the sun is above the horizon (Ward 1963, 9).

This sundial appears to be of the wall-mounted variety, formerly affixed by means of an iron nail or bolt, which has left a residue of corrosion products around the edge of the central hole, across which the



Illus 15 *Finds catalogue nos 14–21. Scale 1:2.*

dial has broken. An original diameter of 122 mm can be extrapolated from the surviving radius of 61 mm. The hour lines on the dial are marked by short, incised radial grooves near its edge, and each is accompanied by an Arabic numeral. The hour lines and numerals would have been arranged only around the lower half of the dial. Numerals from 4 to 10 survive on this fragment.

The incised design on the face of the dial is finely executed, and considerable care has been taken to ensure the accuracy of measurements. Numerals marking hour lines are more usually depicted in the Latin form rather than the Arabic form, as here. Indeed, numerals accompanying hour lines are uncommon on surviving sundials. Most of the large group of dials on churchyard walls analysed by Green (1926), for example, do not appear to include numerals at the ends of their hour lines. However, as Drinkwater (1987, 61) points out, a common practice was for only the hour lines themselves to be incised, while other work was

carried out in paint. Many 18th-century dialstones now appear completely blank since all their markings were executed in paint. A more crudely executed sundial of unknown date, found in Newburgh, Fife, also appears to be marked with Arabic numerals (M King, pers comm).

Although the Byre Theatre sundial is fragmentary, it is remarkably unabraded, and the very finely incised guide-lines used to lay out its face are still visible. Some of these take the form of concentric circles. Two such lines define the band within which the numerals have been more heavily incised. Another line runs radially from the centre of the dial to the number '6', and further examples run across the dial at 90° to this one. It is also notable that the object has fractured almost exactly along the hour line marked '4'. There are slight linear traces of iron staining along several of the hour lines, most notably along the '6' line. These may be attributable to the positioning of the gnomon.

The construction of sundials flourished in Europe between the 16th and 18th centuries in particular, although many earlier examples are also known. In the 17th century, symbolic gardens were laid out, with plants and rocks selected for their magical associations with the heavenly body whose influence it was hoped to attract. Such gardens may have persisted longer in Scotland than in England, many English Renaissance gardens having disappeared during the 18th-century revolution in landscape gardening (Somerville 1987, 249). A Venetian traveller quoted by Strong (1979, 115) remarks on the sundial as one of the standard features of English gardens. Larger types of sundials, of a grander scale than the Byre Theatre example, could be accurate to within a few minutes and were commonly used to regulate the erratic mechanical clocks of the 17th and 18th centuries (Somerville 1987, 251).

Hones such as No 16, recovered from a recent garden soil deposit, were used to sharpen knives and other bladed implements. The possible surviving traces of tool sharpening activity on this example are very slight, although there are a number of fine, parallel striations on one face of the object, obscured by later scratches and general abrasion. Hones have been excavated previously in St Andrews, at Cinema House, 120–4 Market Street and 134 Market Street (Maxwell 1997c, 87–8, Illus 41).

14 Spindle whorl Diameter 41 mm; max thickness 17 mm

Fragment representing approximately half of a spindle whorl of rounded, conical form, with a circular central hole which tapers in diameter from 17 mm at the base to 15 mm at the top. Shallow, concentric grooves are spaced unevenly over the surface of the whorl. It is slightly abraded. Context 002; Find No 48; Phase 5.

15 Sundial fragment Surviving length 92mm; surviving width 67 mm; max thickness 10 mm

Fragment representing part of the lower portion of a probably circular sundial. The dial is broken radially across its central nail or bolt hole (diameter 4 mm), around which are slight traces of iron staining. Incised decoration appears on the face of the object, including the Arabic numerals 4 to 10, marking the positions of the hour lines, and separated by dots, within a band bordering the edge. Short, radial hour lines run from the lower edge of this band to the edge of the dial, opposite each numeral. A series of more finely-incised guide-lines also appears on the object's face, and there are traces of radial iron staining. The rear surface of the object is mainly flat, but bears three broad, parallel tool marks (width 13 mm), possibly made by a chisel, although a curved cutting edge appears to have been used. The object is slightly thicker at its centre than at its outer edge. Context 036; Find No 14; Phase 5.

16 Hone Length 84 mm; max width 21 mm; max thickness 19 mm

Probable hone of tapering, rectangular cross-section. A number of very fine striations may have resulted from tool-sharpening. The object is moderately abraded. Context 001.

Glass

A small number of glass fragments were recovered. Among the vessel fragments are two small, weathered bottle fragments, probably of 17th- or 18th-century date, from Contexts 002 and 004. Notable among the window glass fragments is a roughly triangular piece (No 17), which was found in the fill of a robber trench. Triangular panes of glass were used at the edges of windows in the late medieval and early post-medieval periods, with individual panes held together by a lattice of lead alloy cames. Panes were cut to size by scoring their surfaces and then breaking the glass, the edges sometimes being finished by paring with grozing tongs. This process resulted in a series of tiny conchoidal fractures along the edges of the panes, evident on this example.

17 Window glass Length 43 mm; width 36 mm; thickness 2 mm

A roughly triangular fragment with a slight curvature, broken at one corner. It is translucent and pale green, with occasional surface imperfections, and has grozed edges. Context 106; Find No 27; Phase 3.

Ceramic roof furniture (Illus 15 & 16)

Four hundred and eight fragments of ceramic roof tile and a possible finial support were recovered from the excavation. Of the tile fragments, 314 (77% of the total) came from a single context, the upper fill of a backfilled quarry pit in Phase 4. Smaller, but significant, groups came from a lower fill of the same pit (13 fragments), the fill of another Phase 4 quarry pit (26 fragments), a soil in Phase 5 (20 fragments) and the fill of a post-hole in Phase 2 (10 fragments). The probable finial support (No 22) was found in the same context as the majority of the tile fragments. Detached finial supports were among the most common type of roof ornamentation recovered from the excavations at Sandal Castle, where large quantities of roofing material dated from the mid-13th to 15th centuries (Moorhouse 1983, 312). Finial supports were used to hold separately made ceramic roof finials, employed at or near the gable ends of tiled roofs. At Sandal Castle, the recovered finial supports all surmounted the second tile crest from the gable end (*ibid*). This find indicates the likely presence of a substantial building, possibly a high status structure, in the vicinity.

Only a single fragment among the tile assemblage appears to be from a curved tile, in a hard, fine, lightly sanded fabric (Context 143; Phase 4). All the other fragments are from flat tiles. Projecting nibs survive on a small number of fragments (eg Nos 18 and 19), while others, from the same context, are perforated to accommodate a peg or nail (eg Nos 20 and 21). No surviving fragment has two nibs, and it would appear that at least some of the nibbed tiles may have hung by only a single, central nib. Where a corner of the tile and a nib survive (eg in No 18), the width of the tile can be extrapolated as c 170–190 mm. This assumes only a

single nib, however. If two nibs were present, the tiles would have been considerably broader. Only small fragments of the peg tiles survive, hence estimation of the dimensions of the original tiles is not possible. Once again, no surviving fragment has more than a single peg hole.

The earliest ceramic roof tiles from British towns, for example those from London from contexts dating from the late 12th century onwards, are large, nibbed forms. A large group, dating from the early 13th century, was excavated at Bordesley Abbey (Rahtz and Hirst 1976, 172–5). Peg tiles are thought to have become widely preferred by the beginning of the 14th century, and were predominant in the mid-13th century construction levels at Sandal Castle (Moorhouse 1983, 308). The co-existence of nibbed and pegged tiles within a single pit fill in Phase 4 at the Byre Theatre site is of interest, therefore, and may indicate a likely 13th- or early 14th-century date for this assemblage. This dating roughly corresponds with the earliest appearance of peg tiles in Perth (MacAskill 1987, 156).

There are variations in the fabric of the tiles, even among the large group from the upper fill of the cess pit. Some differences, for example in fabric colour, can probably be accounted for in terms of variations in firing conditions; however there also appear to be significant differences in fabric content and surface finish.

A majority of the fragments are of a moderately coarse fabric, with a streaky and occasionally laminated appearance due to the presence of differently-coloured clays. This streakiness may be due to incomplete mixing of different clays or to the natural state of the weathered clay from which the tiles were made. Most fragments have orange surfaces and buff to orange cores, although 10–15% of fragments have reduced, grey cores. Inclusions in the fabric include grog (crushed, previously fired tile fragments), angular and sub-angular quartz and possibly orthoclase fragments, and occasional, small iron mineral fragments. The abundance of angular quartz inclusions varies quite widely. Tiles with abundant grog inclusions generally contain less quartz, and vice-versa. Both grog and angular quartz would have been deliberate additions to the fabric, serving as opening materials to reduce shrinking and breakage during the drying and firing processes.

Differences in surface texture evident throughout the assemblage are a reflection of slightly different manufacturing methods. The raw materials for making tiles included clay, sand, and, if applicable, lead for the preparation of glazes. The clay was normally dug in the autumn or winter months and then had to be allowed to weather for a few months afterwards. When prepared, the clay was thrown into a mould, which in turn was placed onto a moulding board or stock table. Both the mould and moulding board could be covered with sand to prevent adherence of the clay, and this produced tiles with sanded surfaces. Many of the Byre Theatre

tiles have numerous shallow, linear impressions running in random directions on their lower surfaces, indicating that straw or chaff may have been used rather than sand in at least some cases. Once the shape of the tile had been formed by the mould, surplus clay would have been removed from the upper surface and this surface would then have been smoothed, offering a degree of protection from the elements when the tile was eventually fixed to a roof. Evidence of smoothing, in the form of shallow, parallel striations on the tiles' upper surfaces, is also present among this assemblage.

Pottery and tiles were sometimes manufactured together by a single workshop. Steane and Bryant (1975, 33, Fig 12) reported on such a tiliary at Lyveden, Northamptonshire, which incorporated a kiln, clay and fuel stores and a workshop. Tile-making would also have been carried out by itinerant craftsmen, probably enlisting the assistance of local labour, on or near the site where the tiles were required. Updraught kilns, such as that at Nuneaton (Platt 1978, 119) appear to have been used to fire tiles, although they could also be fired in clamps. The presence of a possible pottery waster at the Byre Theatre site (see Pottery Report) is a possible indication of a kiln nearby.

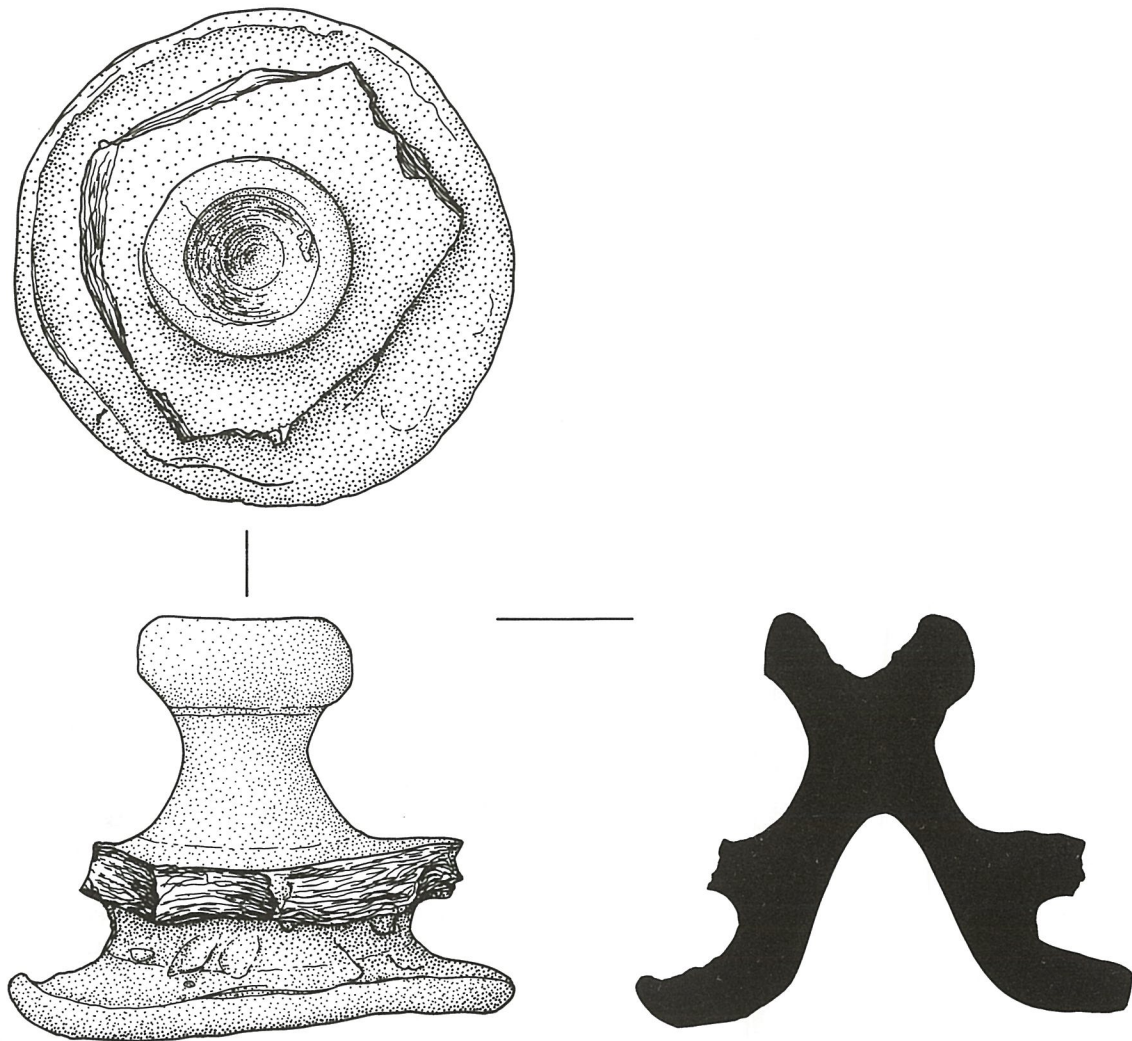
A green to brown glaze is present on only 18 tile fragments from the site (less than 5% of the total). Where present, it covers only a small fraction of the tile and often appears on the edges or as splashes over the surfaces. On one fragment, the glaze appears to form a border around a rectangular object stacked on top of it during firing. The pattern of very occasional and patchy glaze may indicate that the glazing of these tiles is accidental rather than deliberate, and may suggest that the tiles were indeed fired alongside glazed pottery.

Since several of the tile fragments (eg No 20) have traces of mortar adhering to them, they must represent tiles from demolished buildings rather than waste associated with construction activity. The large group from the cess pit fill may have been dumped along with associated laths or timber fragments, as they were accompanied by a number of iron nails.

18 Roof tile Surviving length 97 mm; surviving width 122 mm; thickness excluding nib 13 mm; thickness at nib 26 mm
Fragment from the upper edge of a flat tile, including a nib and one of the corners. The fabric is coarse, moderately hard and orange, with angular and sub-angular inclusions (max length 19 mm).
Context 040; Phase 4.

19 Roof tile Surviving length 65 mm; surviving width 87 mm; thickness excluding nib 15 mm; thickness at nib 34 mm
Fragment from the upper edge of a flat tile, including a nib. The fabric is coarse, moderately hard and buff to orange, with angular and sub-angular inclusions, including abundant quartz/orthoclase (max length 3 mm).
Context 040; Phase 4.

20 Roof tile Surviving length 98 mm; surviving width 108 mm; thickness 15 mm
Fragment from the upper edge of a flat tile, broken across a



Illus 16 Roof finial support. Scale 1:2.

roughly circular nail or peg hole, the diameter of which tapers from 15 mm (upper surface) to 11 mm (lower surface). The edge of the hole is 12 mm below the top of the tile. The fabric is moderately coarse and moderately hard. The core of the tile is heavily reduced and dark grey in colour, while the surfaces are orange. Angular and sub-angular inclusions are present (max length 2 mm). Traces of mortar survive on the lower surface.

Context 040; Phase 4.

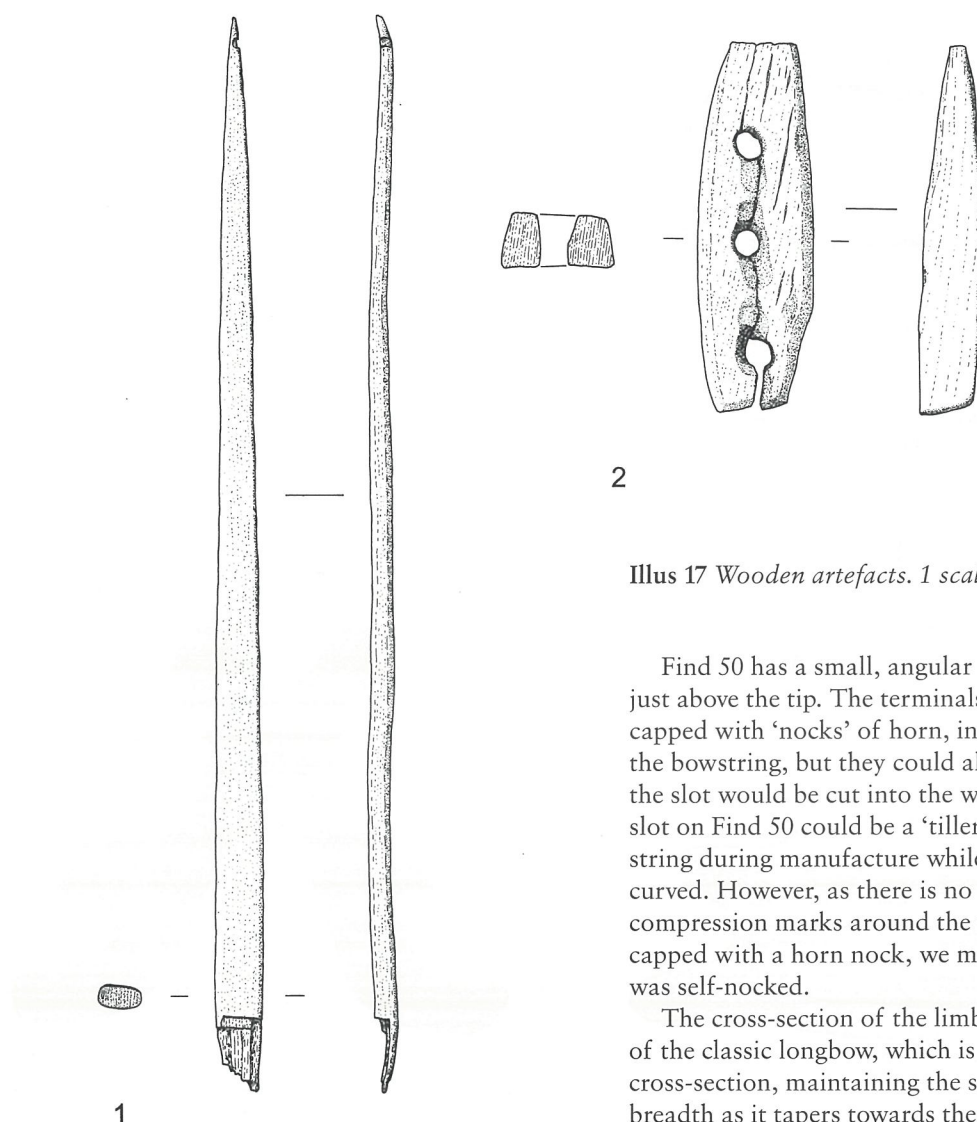
21 Roof tile Surviving length 55 mm; surviving width 44 mm; thickness 16 mm

Fragment from the upper edge of a flat tile, including a circular nail or peg hole, the diameter of which tapers from 16 mm (upper surface) to 14 mm (lower surface). The edge of the hole is 17 mm below the top of the tile. The fabric is coarse and moderately hard, buff to orange, with angular and sub-angular inclusions, including abundant quartz/orthoclase (max length 14 mm). There are traces of brown glaze on the upper edge of the fragment. Context 040; Phase 4.

22 Roof finial support (Illus 16) Height 84 mm; diameter at

narrower end 41 mm; diameter at broader end 104 mm.

Probable roof finial support, of hollow, approximately conical form, with a splayed terminal, adjacent to which is a projecting flange with broken edges. The fabric is moderately coarse, predominantly buff to orange, with angular and sub-angular inclusions (max length 2 mm). There are patches of dull green glaze, mainly on the upper parts of the object. Context 020; Find No 11; Phase 4.



Illus 17 Wooden artefacts. 1 scale 1:4, 2 scale 1:2.

Wooden objects

Anne Crone

Two wooden objects were recovered from the latrine.

Find 50 (Illus 17–1)

Find 50 is the limb of a bow, some 54.3cm long from the tip to the damaged end. The limb has been carved from a stave of yew (*Taxus baccata*) in such a way that the sapwood lies along the back, or outside of the bow, and the heartwood lies along the belly, or inside of the bow. This was, and still is, the classic means of making a bow, exploiting the natural qualities of the yew by placing the tensile sapwood on the outer curve and the compression-resistant heartwood on the inner curve (Hardy 1986, 30).

At the damaged, splintered end the cross-section of the bow is a flattened ellipse with slightly parallel sides, 22mm wide and 12mm deep. The limb tapers regularly along its length from this elliptical cross-section to a rounded terminal 2mm in diameter and its surface has been finished so smoothly that there is no evidence of grain.

Find 50 has a small, angular slot cut into one edge just above the tip. The terminals of a bow were usually capped with 'nocks' of horn, incised with a slot to take the bowstring, but they could also be 'self-nocked', ie the slot would be cut into the wood around the tip. The slot on Find 50 could be a 'tillering nock', to hold the string during manufacture while the bow is being curved. However, as there is no evidence, in the form of compression marks around the tip, that the bow was capped with a horn nock, we must assume that the bow was self-nocked.

The cross-section of the limb fragment is unlike that of the classic longbow, which is a deep 'D'-shape in cross-section, maintaining the same ratio of width to breadth as it tapers towards the nocks. However, most surviving longbows are 16th century or later in date (for example, the *Mary Rose* bows; Rule 1983) and it is possible that earlier bows were flatter in section than later weapons (Hardy 1986, 169). An assemblage of bows from the 13th century and possibly earlier contexts in the town of Waterford, Ireland tends to support this idea (Halpin and O'Sullivan 1997). Only one bow was complete and this was 'D'-shaped in profile at the mid-point but a flattened trapezoid towards the terminals. The other limb fragments displayed a similar flattened cross-section towards the terminals.

The St Andrews bow must have been at least 1.086m long (twice the length of the surviving limb) but there is little evidence on which to reconstruct its full size. However, it was probably smaller than the classic longbow which at *circa* 1.80m usually stood taller than the archer. The Waterford bows, which are the only extant bows of comparable date, were much smaller. The complete bow was 1.26m long and the dimensions of the incomplete bows indicate that they were comparable in size. Furthermore, arrowshafts found on the same site also indicate the use of a small bow (*ibid* 549). Although later in date, an engraving by Albrecht Dürer does imply that the shorter bow was commonly attributed to the Irish (Steer and Bannerman 1977, Plate 40).

The engraving, dated 1521, depicts a group of Irish mercenaries one of whom is carrying a bow that when gripped upright would have spanned shoulder to mid-calf, a length of between 1.3m and 1.5m depending on the height of the archer. As the costume and equipment of the Irish of the period is thought to closely resemble those of the West Highland Scots (*ibid* 171) it seems reasonable to assume that the smaller bow may also have been a Scottish weapon. Smaller size may well be the reason why Scottish bows were nearly half the price of English bows at that time. In the *Accounts of the Lord High Treasurer of Scotland* an entry for 1539 records that Scottish bows were priced at 9/- each while English bows were 16/- each (Balfour Paul 1907, 194).

Despite the plentiful imagery from the medieval period depicting bows in use, mainly in war, but also in hunting and target practice, few actual examples of that period appear to have survived, possibly because they had a short lifespan and, once broken they were useful only as firewood. The only surviving bow with Scottish connections is the 'Flodden' bow, housed in the headquarters of the Royal Company of Archers, Edinburgh. Found in a house near Flodden field in the late 18th century it was, therefore, thought to be associated with the eponymous battle of 1513. Not only is it not securely provenanced and could, therefore be of any date (Cledland 1981, 14), but it is also a longbow, standing 1.81m high and, given the arguments rehearsed above, could, therefore be of English origin, dropped by an English archer.

The St Andrews bow would thus appear to be the first example of a medieval bow in Scotland and is an important addition to a small assemblage throughout the British Isles.

Find 51 (Illus 17–2)

Find 51 is damaged and incomplete and the wood is degraded and very spongy, making species identification difficult. It is provisionally identified as cf *Acer campestre*, or common maple. The surviving length of the object is 93mm; it is damaged at one end. In plan the object is boat-shaped, 13mm wide at the undamaged end, expanding to 23mm at the broadest point. In cross-section the sides slope out slightly so that, at the broadest point, it expands to 29mm in width. The object is now only 15mm thick but the 'base' is not original; the wood has sheared off across the grain. The object is pierced by three holes, all of which are 8.5mm in diameter and which lie along the median line of the object. The central hole has shallow indentations on either side which slope into the hole and are aligned towards the two outer holes. The two outer holes have a single indentation each on the side nearest the central hole. It is not clear whether these indentations have been deliberately made or are the results of wear. Whatever the means of manufacture, the position of the indentations suggests that narrow cords of some sort, be it leather or rope, were threaded up through the two outer holes and fed down into the

central hole. This type of arrangement, where two ropes are fed in and a single rope emerges, is known as a 'dead-eye' and is a common nautical device. However, it could have been employed in a multitude of other activities.

There is no directly comparable object in the archaeological literature. Objects of very similar shape and size have been found in 10th–15th-century contexts in medieval Novgorod (Kolchin 1989, 129 & Plate 128) and 11th-century Lund (Morris 1984, 114) where they were identified as swivels, mechanical items with wide range of domestic and technological applications. A perforated peg, inserted into the central hole, would allow the mechanism to swivel while ropes through the outer holes would take the pull. However, the indentations on Find 51 are not compatible with a peg in the central hole.

The animal bone

Catherine Smith

The excavation yielded a well-preserved animal bone assemblage. The contexts selected for full study of their faunal contents consisted mainly of fills of pits. The total number of bones from each species is shown in Table 1.

Species found at the site

The main component of the faunal assemblage was bone from domesticated mammals, mainly cattle and sheep/goat. Only two bones were positively identified as goat: these were both horn cores which are readily distinguishable from those of sheep. Bones of pig, horse, dog and cat were also present. Wild mammals were represented by the bones of rabbit (*Oryctolagus cuniculus*), rat (*Rattus sp.*), small Cetacean and one bone of dog/fox (cf *Vulpes vulpes*). The last noted may, however, have come from a gracile domestic dog. The small size of the Cetacean bone, a vertebra, indicated that it came from a species such as porpoise, dolphin or pilot whale.

Relative frequency of species

Since the number of animal bones recorded was not large (some 779 bones in total), a degree of bias may exist in the sample (see Table 1). In total, 101 bones came from cattle, as compared with 121 from sheep/goat and two from goat. Minimum numbers of individuals represented were 4 cattle (based on the left distal tibia) and 7 sheep/goats (based on the right distal and entire tibia), over the whole sample. This is an unusual result for a north-eastern Scottish medieval urban site, where cattle are generally found to predominate over sheep (see, for example, Hodgson 1983 and Smith 1995a for data for sites in Perth, Aberdeen and Elgin). Other sites in St Andrews which yielded animal bone also conform to the pattern of dominance of

cattle. The percentages of main food-forming large mammals (cattle, sheep/goat, pig, horse and deer species) for the sites at Cinema House, 134 Market Street and St Nicholas Farm (Smith 1997; Smith 1995b) are shown alongside those for Byre Theatre in Table 2. It should be noted that at all of these sites the sample numbers were not great, particularly in the medieval phases of St Nicholas Farm. It is at this last site, a leper hospital which lies outwith the medieval town, that the low ratio of cattle to sheep/goats is most similar to that at the Byre Theatre.

As regards the proportion of other species at the Byre Theatre, the relatively low frequency of pigs and horses is typical of a Scottish urban assemblage. Pigs were never as important to the urban economy as were cattle and sheep, whose meat was in effect a by-product of the hide, wool and woollend industries. While cattle and sheep were of prime importance to the medieval Scottish export economy, pigs were raised primarily as a domestic meat source. Although important to the local subsistence economy of the townsfolk, they were not part of the export market.

Horse bones were found at the Byre Theatre in similar proportions to those at other medieval sites in Scotland and indeed the town of St Andrews. Horse meat was eaten in Scotland at this period, as numerous examples of butchered bones, for example from sites in Perth and Aberdeen indicate (Smith 1998a). Evidence of butchery on the horse bones from the Byre Theatre was inconclusive, but marks of gnawing indicated that some of the meat had been consumed by dogs.

Dog and cat bones were plentiful at the Byre Theatre, mainly representing the burial or disposal of individual animals; hence for example, the high numbers of cat bones in Phase 3, which contained a minimum number of three adult cats and one very young kitten. A substantial part of a dog skeleton, from an arthritic individual, was found in the demolition of the Phase 2 building.

Although bones of a few wild mammal species such as fox (Phase 4) and Cetacean (Phase 3) were found at the Byre Theatre, both red and roe deer were absent. This is not altogether surprising, given the relatively small sample size, since deer bones have not been found in high numbers in any other urban medieval assemblage in Scotland. The meat protein requirements of town dwellers were apparently adequately met by the domestic livestock brought to be sold in the burgh markets. High consumption of wild deer species in the medieval period is a feature of rural, rather than urban, sites, as has been noted in bone assemblages from Ladyhill in Elgin and Urquhart Castle on Loch Ness (Smith 1998b).

Marine resources, (other than fish, for which see Fish Report), do not appear to have been greatly utilised. Only one marine mammal bone was found, while seabirds were represented only by one bone of guillemot (*Uria aalge*) and one of gannet (*Sula bassana*), all from Phase 3. There was a similarly low uptake of seabirds as food at the other medieval sites excavated in

St Andrews. The site at Cinema House also produced only a single gannet bone (Smith 1997, 109). The low incidence of seabirds at the St Andrews sites is probably related to the relative lack of cliff breeding sites in the immediate vicinity. By contrast, at the early medieval and post-medieval site on the Isle of May, situated to the south of St Andrews in the mouth of the Firth of Forth, where seabirds bred freely, the inhabitants relied heavily on species such as guillemot, razorbill, cormorant, shag and gannet (Smith, unpublished).

Size of the animals

Anatomical measurements were made on the long bones wherever possible. The size ranges for domestic livestock recorded for Byre Theatre compared well with those from medieval sites elsewhere in Scotland. Only a single bone (a sheep/goat proximal femur from Phase 4) exceeded the size range recorded on the large assemblage recovered from 75–77 High Street, Perth (PHSE: Hodgson *et al*, unpublished; Hodgson 1983). One complete sheep/goat radius was recovered which allowed a calculation of the animal's stature to be made, based on Teichert (1975). This animal, from Phase 4, stood approximately 56.3cm high at the withers (shoulders), and thus fell well within the PHSE range of 46.8–65.8cm.

The length of the cattle horn cores indicates that they came from animals of the short-horn type, typical of the medieval period in Scotland. Only one of the horn cores was at all likely to have come from a bull; the remainder came from females or castrates.

As regards the horses, one complete humerus from Phase 4 came from an animal standing about 142.2cm (or 13:3 hands height) and a metacarpal, also from Phase 4, from an animal of about 138.5cm (13:2 hands height) calculated using the method of Kieswalter (quoted in Ambros and Muller 1980). Both of these animals were typical of the sturdy-legged ponies found in the medieval period in Scotland.

Most of the dog long bones were incomplete and could not be used to estimate the heights of the animals. However a system devised by Clark (1995) which uses the greatest length of the metapodials, was applied to two large metatarsals which probably came from a single individual, recovered from a cess pit in Phase 4 (Context 067). This animal was estimated to have stood between 69.8cm to 70.1cm high at the shoulders, and was thus above the upper end of the range for medieval dogs, the tallest previously recorded having come from Meal Vennel in Perth (Smith, 1998a).

Evidence of butchering implements used

Many of the bones bore evidence of having been butchered by axes or cleavers. The axe was the typical tool of the fleshing trade in both the medieval and post-medieval periods. Saws were reserved for removing parts of the carcass which were intended for some

particular use, such as the production of artefacts. Thus, the sole instance of sawing at the site was noted on a cattle horn core (Context 040, Phase 4). The core was sawn about half way up its length; the intention was probably to remove the core from the skull in order to use the outer horn sheath in artefact manufacture. No other horn cores from the site were sawn across, although knife cuts, probably also associated with horn-working, were noted on a cattle frontal (skull) bone in the region of the base of the horn core, where the horny tissue was likely to have arisen (Context 067, Phase 4).

One cat bone, a proximal femur, bore two knife cuts in the midshaft region (Context 040, Phase 4). These cuts were probably made in the course of removing the animal's pelt; skinning of both cats and dogs appears to have been a common practice in the medieval period, and has been noted at several sites in Perth and Aberdeen (Smith, 1998a). No dog bones from the Byre Theatre showed evidence of cut marks, but this does not preclude the possibility that the animals were also skinned. Some were, however, gnawed by other dogs; three bones, a humerus, ulna and tibia, from the large animal in Context 067, Phase 4 were extensively chewed.

Conclusions

The assemblage from the Byre Theatre was in a relatively better state of preservation than others previously recovered from St Andrews and has thus added significantly to the data available for the medieval town. There were, however, some differences between this assemblage and those from the medieval sites at Cinema House and 134 Market Street, particularly with regard to the low proportion of cattle bones with respect to sheep/goats. Generally, such a pattern is more typical of the post-medieval period in Scotland, as has been observed, for example, in the later phases of sites such as Meal Vennel in Perth, and may be related to the fluctuating importance of wool to the Scots economy (Smith 1996, 792–3). The presence of both rabbit and rat bones in Phases 3 and 4 at the Byre Theatre is also problematic, since although rabbits were introduced into Scotland in the Norman period, the species was at first difficult to establish. Evidence of rabbits is therefore scarce in the medieval period, and no butchered bones, which would provide secure evidence of their use as a meat source, have yet been identified from Scotland. The rabbit bones from the Byre Theatre therefore possibly originated from an intrusive, burrowing animal. Similarly, the single rat bone (Context 106, Phase 3) may also be intrusive. Identification of small mammal bone further than genus level is difficult if no dental elements are found: in this case the bone was a femur, and could therefore have come from either the black rat (*Rattus rattus*), or the brown rat (*R. norvegicus*). The black rat was introduced to the south of Britain, albeit briefly, in the Roman period, with a more extensive re-introduction in

Norman times (Armitage *et al* 1984) while the brown rat was introduced only in the early 18th century (Davis 1987, 177). On the basis of size alone, the bone is more likely to have come from the latter species, and may therefore be intrusive.

The fish remains

Ruby Cerón-Carrasco

Most of the samples with fish remains derive from soils, latrine and pit fills, hearth material and industrial soil accumulations. The summary of species present by phase is given in Table 3.

Taxonomic analysis

The assemblage is dominated by fish of the cod family (Gadidae) and by herring (Clupeidae family). Haddock (*Melanogrammus aeglefinus*), cod (*Gadus morhua*), saithe (*Pollachius virens*) and pollack (*Pollachius pollachius*) are the most significant species of the Gadidae group present in the assemblage.

Other marine species include herring (*Clupea harengus*) which was present in most contexts. Flatfish included dab (*Limanda limanda*), sole (*Solea solea*) and plaice (*Pleuronectes platessa*). Gurnard (Eutriglidae family) and some smaller species of Gadidae such as poor cod (*Trisopterus minutus*) and bib (*Trisopterus luscus*), which are found in inshore waters, are also present as well as sandeels (Ammoditae family). Cartilaginous fish were also present in the assemblage but could not be assigned to any family because the remains consisted of fragments of mineralised vertebra which could have belonged to shark, skate or rays.

Non marine species include salmonidae (salmon/trout) and eel (*Anguilla anguilla*).

Discussion by phase

Phases 1 to 3

Few fish remains were recovered from the first three phases. During Phase 1 the main species identified were immature pollack and saithe representing small-scale inshore fishing. Herring was also represented. During Phase 2 the most important species present were cod, saithe and herring. This denotes fishing from the shore for immature saithe and deeper water fishing for large cod using lines from boats and net fishing from boats for herring. Phase 3 was dominated by herring.

Phase 4

Most of the fish remains from the Byre were recovered in this phase. The main species represented in this phase was herring. Cod and saithe were also quite abundant. All these species represent a similar exploitation of fishing resources as those identified in Phase 2, inshore fishing for immature saithe and deeper offshore

fishing from boats using lines for cod and nets for herring.

A larger species representation was also apparent in this phase, flatfishes are quite important with plaice as the main species of this group present. Gurnard was also recovered and remains of elasmobranchs, cartilaginous fish, were also present. Freshwater species were represented in this phase with eel as the main freshwater fish and salmon also present.

Phase 5

The main species present in this phase were pollack, haddock and cod. Herring was also present.

Phase 6

Few fish remains were recovered in this phase with haddock, herring, gurnard, cod, saithe, salmon, eel and plaice present.

General discussion

Anson (1971, 106) describes how in 1728 it was reported that St Andrews Bay 'abounds not only in cod and other white fish, but in herring also in their season'. Based on the species found in this assemblage, this seemed to have been also the case during medieval and post-medieval times at St. Andrews.

The most common taxon recovered in the Byre Theatre fish bone assemblage was herring which has been one of the most important species in the history of fishing in Scotland. The fishing of herring can be traced over centuries with documents showing an early export trade (Lockhart 1997). The main source in which herring is recorded is the Exchequer Rolls, where they are prominent from 13th century onwards. Herring from Crail, for instance, is mentioned as early as 1266 (Coull 1996). The price of herring is mentioned in the Parliamentary records of Scotland in 1240; these are referred to as dried, as opposed to smoked, or salted; no packings or barrels are mentioned, and no tax was levied on them (Samuel 1918, 71).

It is important to note that the migratory habits of the herring are unusual. Scotland is particularly fortunate in relation to the movement of herring, which is found in the W Coast over winter moving towards Shetland in the spring and early summer. A different stock moves towards the east coast from overwintering grounds near Norway. During July and August fishing for herring was traditionally done in the E Coast of Scotland (Samuel 1918). Around the St. Andrews Bay herring used to spawn during February (Laverack and Blackler 1974), so these would also have been easily available then.

As a food resource, herring is more nourishing and contains more essential vitamins and minerals than any other fish, land mammals or fowl. Being a fatty

fish, herring cannot be cured by simple salting and drying or it would soon become rancid. Heavy salting and smoking over a wood fire is needed if it is to be transported over long distances.

Species from the Gadidae group were the second most common taxa in the assemblage. The species identified of this group were haddock (*Melanogrammus aeglefinus*), cod (*Gadus morhua*) as well as saithe (*Pollachius virens*), pollack (*Pollachius pollachius*) and ling (*Molva molva*). These species are known in the fisheries trade as 'white fish', also included in this category are the flatfish species found in this assemblage; dab (*Limanda limanda*), plaice (*Pleuronectes platessa*) and sole (*Solea solea*).

Haddock, cod and saithe were the main species among the white fish represented in this assemblage. Haddock is found near the sea-bed in depths of 40–300m but large shoals are occasionally found in mid-water (Wheeler 1978). The haddock size and quality vary with location, the best fish coming in the main from deep water and the east coast (Lockhart 1997). It does not take salt as well as cod and for this reason, is mainly cured by drying and smoking (ibid.).

Cod is a demersal fish, a bottom feeder and prefers a rocky seabed although it is widely distributed and found in a variety of habitats from the shoreline to well down the continental shelf. The younger fish, however, usually live close inshore (Wheeler 1978).

Saithe is a common fish occurring in northern inshore waters. It spawns from January to April and by midsummer the young fish are found close inshore among weed-covered rocks and open bays. This immature phase lasts for at least three years. Mature fish are found slightly offshore, mainly in mid-water (Wheeler 1978).

The white fisheries industry can be traced as far back as the Norse period in Scotland. During the late 12th century these fisheries were controlled by the Law of the Four Burghs, and were strictly burghal monopolies. Each burgh passed regulations to control the white fishing industry, relating to the price, quality and selling of fish as well as building of boats and harbours, provision of salt and of wood for barrels (Anson 1950). Although these practices can be traced back to medieval times, they continued unchanged during the post-medieval period, and so are relevant to the discussion of the Byre Theatre material.

In the Exchequer Rolls from the 13th century onwards there appear references to 'mullones', generally accepted to be dried cod in various east coast burghs, as well as references to 'hard fish' which most probably means the same (Coull 1996).

Haddock and cod may have been consumed either as fresh or salted, dried or smoked products. The industry of salting and/or drying fish had been in practice in Scotland from at least Norse times and expanded during post-medieval times to cater for Christian dietary norms. The Western world was a largely Catholic place with meat forbidden by Papal Decree on

more than a quarter of the days of the year (Lockhart 1997). Fish was an obvious alternative dish. From 1490 there had been fishing treaties, and disputes with Denmark and Iceland over cod fishing grounds can be traced back over many centuries (*ibid.*).

Most of the haddock was sold fresh in Fife and in the southern districts while further N this species was mainly cured by smoking (Gray 1978). In the Fife area, fishing for small specimens such as immature haddock, saithe and pollack, was done in inshore waters. This activity was in practice for most of the year but particularly in autumn and winter (Gray 1978). The fishermen of the east coast would also engage, for a great part of the year but especially during spring, in the pursuit of cod and ling which were taken offshore from boats using hooked lines (*ibid.*).

The flatfish recovered in the assemblage included dab, plaice and sole which are quite abundant in inshore grounds.

Gurnards (Triglidae family) are caught by line and are most frequently fished during the months of July to February, these can be found in inshore waters.

The other marine species found in the assemblage are of no real economic or nutritional value since these are too small for human food, and it assumed that they were used as fishing bait. These include the sandeels, poor cod and bib.

The non-marine species include freshwater eel, which used to be abundant in streams and occasionally between tidemarks (Laverack and Blackler 1974). Salmonidae species, which were also present in the assemblage, may be remains of either salmon or trout. This group was represented by vertebra, which is unidentifiable to species. Both species are common around St Andrews Bay; nets were used in the recent past to catch them (*ibid.*).

The fish remains from the Byre Theatre, St Andrews derived from mainly garden soils, industrial waste soil, infills from cesspits and latrines. These must have contained mixed materials of which the fish remains form an important part. The elements recovered showed no signs of digestion or chewing by scavengers, and it is therefore assumed that they could have entered the deposits as domestic rubbish discarded into the fills and garden soils. For example rubbish and food wastes were often used for covering the contents of cesspits and latrines (Greig 1982).

Conclusion

The fish remains from the excavation give an outstanding example of the importance of fishing in the economy of medieval and post-medieval periods. Haddock and herring are the most common species represented in the assemblage, outlining their importance in the economy and the diet of most of the Scottish population during the periods represented, and this is particularly evident in Phase 4.

The insect remains

Clive L M Warsop

Two samples were provided for insect analysis from contexts 274 (sample 72) and 111 (sample 42). Both contexts were *in situ* and sealed by subsequent deposits and appeared to have accumulated incrementally in the Phase 4 latrine (C Moloney, pers comm).

Results

The contexts are rich in insect remains and in some cases preservation is exceptional. Coleoptera (beetle)—see Table 4, and Dipteral (fly) remains are present in both samples, but particularly context 274 for the former and context 111 for the latter.

The presence of Dipteral (fly) puparia both hatched and unhatched suggests that inclusion of insects in the pit is not accidental. The fact that a breeding population is recorded indicates a food source specific to these species is also present within the latrine, (Skidmore this volume). In addition other Orders of insect such as Hymenoptera-Hymenoptera parasitica are present, with preservation of even the membranous flight wings evident in some cases.

Interpretation

Much of the fauna from context 274 is associated with decomposing plant material of some sort with a suggestion of sourness. The most abundant species present *Coprophilus striatulus* has been recovered from vegetable refuse, manure (Tottenham, 1954) and compost, (Harde, 1984). The group of *Anotylus* species are also found in such an environment as are certain species of *Quedius*. These Staphylinids are present as they are predatory on a number of other insects. The records of Clambids, *Omalium excavatum*, *Lesteva*, *Gyrophypnus augustatus*, *Aphodius fimetarius* and *Hister* all reinforce this interpretation.

Tachinus subterraneus has been noted in a badger latrine pit, (Hancox, 1991) and badger faeces, (Luff and Sheppard, 1980). The beetle fauna suggests that faecal material is most likely present and this is confirmed by the Dipterous fauna

(cf. Skidmore). The flightless spider beetle *Tipnus unicolor*, which is mostly synanthropic *ie.* survives in association with man, in the northern part of its range (Buckland 1994), has been frequently recorded in barns, in straw and hay waste (Koch 1970), as well as cereal debris (Howe 1955). This may reflect its association with small mammals as it is thought that it may feed on the faeces of rodents and small birds, (Zacher, 1933). However, Osborne (1983) has suggested that in archaeological contexts, *T. unicolor* has more frequently been found in features interpreted as cess pits. Warsop (1998) and Buckland (1994) recorded it in considerable numbers in just such a context. The structure which is the subject of this analysis has been interpreted as a

latrine (Holden pers. comm.), so the presence *T. unicolor* on previous evidence could be expected.

The abundance of Cryptophagids and Lathridiids in context 274 also indicates the inclusion of a drier, sweeter composting material. They are common in a range of mouldy plant debris rather than human waste (Buckland 1994). That mould is present is supported by the occurrence of *Anotylus rugosus*, *Hister*, *Catops fuliginosus*, the abundance of *Mycetaea hirta* and the two records of *Aglenus brunneus*. The presence of *A. brunneus* is an interesting one as this species has been noted as a highly characteristic component of the mediaeval urban fauna (Kenward 1976). Although apparently common at this time, in towns at least, it is certainly not so now, apart from locally in old grain residues (Woodroffe 1967). It has been recorded indoors in a flour mill in northern Scotland, but it is mainly regarded as a southern species: it needs temperatures above those experienced in natural habitats in Britain today and would probably not overwinter outdoors in the northern part of its range. *A. brunneus* is blind, flightless and cryptic in behaviour, so it is unlikely to be found away from its breeding places (Kenward 1975). It has been recorded in habitats such as manure, rotting straw, sacks of old bones, tanneries, mill refuse and commercial mushroom beds (Hinton 1945). There are repeated references to mould in the literature and it may be adapted to buried mouldering wood (Kenward 1975). It reinforces the argument for the presence of mould in the context in question.

Some of the ground beetles including *Carabus problematicus* are considered as possible accidental inclusions to the fauna, but this species does favour slugs as part of its diet, which may well be present in this type of environment. *Laemostenus terricola* has been recovered from cereal debris and is a known synanthrope (Hinton, 1945).

The four species of *Meligethes* noted are pollen feeders and probably originated in gathered plants. Probably of similar origin are *Apion* and *Ceutorhynchus contractus* which are found on a variety of Cruciferae. *Anobium punctatum* (woodworm) most likely emerged from a constructional timber.

Although there are relatively fewer species of beetle recorded from context 111 they indicate a similar environment to context 274 of decomposing plant material and faecal material. *Cercyon analis* has been taken from dung and compost as has *Micropeplus porcatus* (Harde, 1984). That drier mouldy material is also present in this context (111) is supported by the relatively large number of Cryptophagids identified.

Conclusion

The beetle fauna from the latrine is dominated by species which favour or require a pabulum or environment of decomposing plant matter or of drier mould. The overall impression provided by this assemblage is one of decay. The presence of faecal material is indicated by the fauna as is a quantity of decomposing

plant material, but the environment within the latrine is sufficiently dry and mouldy in places to provide a food source suitable for a number of mould feeders.

The top of this feature was obviously sufficiently open to allow access to the pit, but little if any adventitious species appear to be present: this feature was not acting as a pit-fall trap and was probably fairly dark which suggests it may have been at least partially covered.

Diptera from the latrine

Peter Skidmore

Two small tubes of dipterous material were analysed. The specimens showed moderate to very good preservation and consisted of the following taxa:

Context 111

Thoracochaeta zosterae, 5 empty puparia.
Fannia scalaris, 1 incomplete puparium.

Context 274

Caddis, fragment of wing.
Scatopse notata, 4 empty pupal exuviae.
Thoracochaeta zosterae, 2 empty puparia.
Telomerina flavipes, 5 puparia, 1 containing female adult in perfect condition.
Limosiniinae, two wings, one probably *Telomerina flavipes*, second possibly *Minilimosina vitripennis*.
Fannia scalaris, 2 incomplete puparia, one containing part of female adult in poor condition.
Coenosia ?pumila fore-leg of adult in perfect condition.
Ichneumonid sp. wing fragment.

Interpretation

The taxa identifiable to species strongly suggested that this was a latrine as had been suggested by the excavators. Today in Britain the fly *Thoracochaeta zosterae* only occurs in masses of decaying seaweed, but it was an ubiquitous inhabitant of medieval cess pits and latrines where it presumably bred in algal concentrations in urine-rich situations. In much of mainland Europe it still breeds in such situations, often far from the coast. Whilst in a coastal archaeological situation like St. Andrews it could be indicative of the presence of seaweed, in the Byre Theatre site its being associated with *Scatopse notata*, the Latrine-fly *Fannia scalaris* and the sphaerocerid *Telomerina flavipes* very strongly infer a faecal habitat, compounded by the fact that these four species made up 80% of the 24 individual insects present in the sample sent for analysis. *Coenosia* was most likely a casual immigrant from adjacent grass swards where the adults are abundant predators on small soft-bodied insects. The ichneumon may have been parasitic on one of the coprophagous flies, whilst the caddis evidently entered the site from an adjacent water course.

The plant remains

Mhairi Hastie and Tim Holden

Environmental samples were taken primarily from ditch, pit, kiln and latrine deposits. Large quantities of imported pottery, glazed floor and roof tiles were recovered from the samples in addition to significant animal bone and well-preserved macroplant assemblages (Holden 1998). The majority of samples contained substantial amounts of carbonised material while four samples also contained un-charred plant remains preserved by waterlogging.

A more detailed analysis of the grain containing assemblages and waterlogged samples was recommended, and it is this analysis that forms the basis of this report. Full results are available in the site archive.

Results

Most botanical material recovered was preserved by charring with wood charcoal, cereal grains and weed seeds being present. Four samples also contained substantial amounts of well-preserved waterlogged material.

Cereals

Grains of oat were by far the most frequently encountered element. Most grains could only be identified to the level of *Avena* sp; however, a small number were still enclosed within the lemma and palea (florets). This made it possible to distinguish between the two main cultivated British species *Avena strigosa* (small/bristle/black oat) and *Avena sativa* (common oat). One possible grain of *Avena sativa* was identified from Context 055, but, the majority were identified as *Avena strigosa*—black oat. This implies that the bulk of the grains were also of this species.

Barley grains were present in the majority of samples. Preservation of the grains was generally poor and only a small number could be identified as the hulled variety. Straight (symmetrical) and twisted (asymmetrical) grains were identified where preservation allowed. A ratio of approximately 3:1 straight to twisted grain was recorded potentially indicating the presence of the two-row as well as the six-row varieties.

Wheat and rye were also recovered though not in the same numbers as the oat and barley. Overall morphology of the wheat was typical of *Triticum aestivo-compactum* (bread/club wheat). It is, however, impossible to distinguish between *T. aestivum* (bread wheat) and *T. compactum* (club wheat) purely on the morphology of the grains. Separation of the varieties relies on the chaff being present and none was recovered. Small quantities of rye grains were identified and one rye rachis internode was recovered from Context 240.

In addition, a small quantity of highly fragmented cereal bran (pericarp and testa) identified as wheat/rye was recovered from two waterlogged samples—Contexts 111 and 274.

Wild species

Generally the weed ‘seeds’ were very sparse with only one or two in most samples. A number did, however, contain a larger percentage of wild species notably those from the kiln (Context 227 and 073/066) and from the latrine fill (Context 111 and 274). Most of these were common weeds of arable land suggesting that the majority of the wild taxa were field weeds introduced into the towns inadvertently with the cultivated crops.

Other potential economic species

One possible seed of *Pisum sativum* (cultivated pea) was identified from Context 271. Documentary evidence indicates that the pea was cultivated throughout Britain in the medieval period (Greig, 1996) and a small number have been recovered from other archaeological sites. As only a single seed was recovered from the Byre it is impossible to offer any further detailed interpretation.

Two carbonised flax seeds, identified as the cultivated species *Linum usitatissimum*, were recovered from context 271. This plant resource is very versatile and can be eaten or used to produce linseed oil or fibres for spinning. It has been recovered from a number of archaeological sites dating back to the Neolithic (Fairweather and Ralston, 1993) and it is commonly found in medieval deposits. Its presence at this site indicates that the resource was being utilised within the area, though the quantity recovered gives little scope for further analysis.

The other oil-rich species present are *Brassica nigra* (black mustard) and *Papaver somniferum* (opium poppy). Both are commonly encountered on medieval sites and were likely to have been grown for their medicinal and culinary properties. *P. somniferum* is unlikely to have been native.

From two of the waterlogged contexts (Contexts 111 and 274) the most conspicuous elements were fruit stones and pips. Three distinct *Prunus* species were present: *Prunus domestica* (large cultivated plum or bullace), *Prunus spinosa* (sloe), and *Prunus avium* (wild cherry), the majority being identified as the cultivated plum/bullace. Other fruits were represented by their pips and stones—*Ficus carica* (figs), *Malus* sp. (apple), *Vitis vinifera* (grape), *Fragaria vesca* (strawberry), *Vaccinium myrtillus* (bilberry) and *Rubus fruticosus* agg. (blackberry). In addition, the outer parts of the kernel and the shell of *Corylus avellana* (hazel) were also recovered.

Discussion: carbonised remains

The samples analysed were all basically similar in composition although concentrations of the remains were variable with generally lower concentrations of grain in the earliest phases ie Phase 1–3. All four of the primary medieval cereal crops are present, oat, bread/compact wheat, hulled barley and rye with oat being by

far the most abundant. This site therefore fits into a well-established pattern for the east coast of Scotland (Boyd, 1988). The weed seed component is small and dominated by species consistent with arable land. They were therefore, in all probability, brought to the site with the cereal crops. Indeed, corncockle (*Agrostemma githago*) is found almost exclusively on agricultural fields and it is because of this and the heavy use of herbicides in modern agriculture, that it is presently very rare in Britain. Some species are, however, more catholic in their habitat preferences and could as easily have been growing on the disturbed, nitrogen rich soils of the site itself. Some, such as hemlock (*Conium maculatum*), might indicate the presence of wetter, overgrown areas of the site.

Also present were traces of *Calluna vulgaris* (ling/heather), *Carex* sp. (sedges) and *Menyanthes trifoliata* (buckbean/bogbean). These do not generally grow as weeds of cultivation and their presence indicates the exploitation of more acidic heaths and marshy land. Their arrival on site can only be guessed at but heather and sedge were typically used for bedding, packing, thatching, flooring and general building material.

The majority of the charred cereal grains were found to be associated with a structure identified as a corn drier (Contexts 073/066, 189, 193, 227 and 231). In these both oat and barley grain is common with smaller quantities of wheat and rye. The low proportion of weed seeds and chaff in these samples indicate a threshed and cleaned crop. The basic processing of the crop ie threshing, winnowing and sieving was, in all likelihood, undertaken at the point of production so reducing the transport requirements.

In temperate climates kilning of corn can be undertaken for a number of reasons. In wetter areas it can be used to aid threshing and the removal of the awns (bristles/barbs) by making the lighter chaff brittle and easier to remove although this appears not to be the case on this site. In such an urban context kilning is most likely to be undertaken for the following reasons:

- a To harden the grain to make grinding easier
- b To kill the germinating grain during the production of malt.

In the absence of evidence for the germination of the grain, which can be seen microscopically, it would be most likely that the grain was being kilned prior to milling. Certainly in the more remote parts of Scotland where the use of such kilns continued until relatively recently, such structures were built, used and maintained communally, with each household possessing a hand quern for piecemeal grinding of cereals (Scott 1951). Less is known about their use in an urban environment but it is possible that such structures were also associated with communal mills. The exact nature of the relationship between these small urban kilns and the consumer remains unclear.

The ethnohistorical accounts available indicate that accidents in kilns like this occurred regularly (Fenton 1978) and at places such as Hoddum (Holden forth-

coming a) the same kilns were known to have burnt down several times. Accidents such as this together with less catastrophic burnings at the kiln are assumed to be the source of the majority of charred grain on many medieval sites. For example, three other samples that are physically unrelated to the kiln but from the same phase (Phase 4) stand out with respect to concentration of cereal grains (Context 055 (a cess pit), Context 149 (a ditch) and Context 284 (a rubbish pit). The sample composition is almost identical to that recovered from the kiln. The hypothesis is therefore, that this grain too, originated from the excavated kiln, or a nearby one, as a result of the direct dumping of charred kiln debris into them. The lower concentrations in many of the other contexts could also represent reworked material from this same source.

Discussion: waterlogged remains

Two waterlogged samples (Contexts 111 and 274) were recovered from a feature identified as a latrine. The anaerobic environment in this feature had led to exceptional preservation of organic remains. The taphonomy is, however, complex comprising a mixture of digestive degradation of foods and post-depositional decay. There was no evidence of surviving 'soft' tissues but cereal bran was frequently recovered. As with most archaeological plant assemblages the most readily identifiable remains were the small thick-coated seeds and fruits thus creating an obvious bias towards these.

The botanical remains can be divided into three major categories

- a Food remains
- b Non-food plants deliberately dumped into the latrine
- c Incidental inclusions.

Food remains

Staple plant food resources are represented by the remnants of degraded and highly fragmented cereal bran. This is very characteristic of human faecal material (Hall *et al.* 1983) and together with a small amount of mineralised cereal grain, certainly supports the field interpretation that this feature was a latrine/cess pit. Large volumes of fruit pips and stones are also typical of medieval latrines their diversity having been discussed by, for example, Greig (1982 and 1996). The latrine from the Byre is therefore no exception.

The source of the fruits is varied. Fruits such as the sloe, bilberry, strawberry, cherry, blackberry and hazelnuts could all have been collected locally, from heath, copices, hedgerows and wasteground. Others such as the bullace or plum are more likely to have been locally cultivated fruits and may have been tended in the orchards and kitchen gardens of the backlands of the burgrave plots. The apples and cherries could also have been cultivated but it is difficult to distinguish between the pips and stones of the wild and domesticated varieties. A proportion, at least, are

therefore likely to have been collected. The grapes and figs were, however, clearly imported and would have been brought to St Andrews as dried fruits from further south, probably from Southern Europe. Although evidently a luxury item figs, for example, are commonly found on urban or religious medieval sites throughout Britain (Dickson 1996) and played an important role in both culinary and medicinal recipes of the time. Some of the *Prunus* species also could have been imported dry.

While much of the contents of the latrine had passed through the human gut many of the fruit stones must have derived from kitchen waste which was also dumped into the latrine pit. This is somewhat confirmed by the insect assemblage (Warsop this paper) in which was identified the presence of decomposing meat.

From historical evidence it is known that a variety of plants were used as herbs and spices throughout the medieval period. Numerous seeds such as coriander, fennel and parsley have been recovered from archaeological sites, however, there is no evidence for these plant types at the Byre. A concentration of *Brassica nigra* (black mustard) was recovered from Context 274. This was frequently used as food flavouring during the medieval period and the large quantity recovered from the latrine suggests that it was being collected specifically for this purpose. Additionally, three seeds of *Papaver somniferum* (opium poppy) were also recovered. Like black mustard these seeds can be used as food flavouring, especially sprinkled on bread, or used to provide oil. These two species are readily grown in the Scottish climate although the opium poppy is not native. It would, however, seem likely that both were locally grown specifically for their culinary and medicinal properties.

Non-food plants deliberately dumped into the latrine

A large proportion of Contexts 111 and 274 consisted of highly fragmented moss stems. This could have entered the latrine though a number of routes but perhaps the most likely is that it was used as the Medieval equivalent of 'toilet paper'.

Incidental inclusions

The waterlogged samples contained a small component of seeds from plants that commonly grow on waste ground and cultivated land. These species may have been included in the latrine because:

- i they were growing close by
- ii they were a part of the general soil burden of seeds and may therefore have entered the pit during backfilling or via slumping at the edges. Soil may also have been added to the latrine to reduce bad odours
- iii they were eaten as contaminants of poorly cleaned grain.

The presence of these seeds is not in any way unusual and add little to the interpretation of the site.

Conclusions

The plant remains comprise both waterlogged and charred elements. The charred assemblages are very similar to others investigated by the authors from several medieval Scottish towns such as St Andrews, Perth, Dundee, Dumbarton and Edinburgh. The picture is one in which oats tend to predominate with significant quantities of barley and lesser amounts of wheat and rye. Chaff is rare, as are weed seeds, with samples differing from each other on the basis of concentration of grain rather than by composition. At the Byre the corn dryer contained some of the highest quantities of grain found on site and it would seem likely that much of the grain from other features was also originally from this source. This is likely to represent dumped and reworked materials. Could kiln debris of this type be the source of much of the charred grain on Scottish urban medieval sites?

The presence of waterlogged deposits from the latrine is very important. This has provided excellent data on some elements of the local diet and indicates a relatively affluent community. Fruit stones are abundant, including locally grown species, species collected from the wild and imported dried fruits in the form of fig and raisin. Also present are condiments such as black mustard and poppy seeds.

General discussion

The results of the Byre Theatre investigation have greatly increased the wealth of archaeological knowledge for St Andrews. The very limited nature of previous excavations, excepting the excavations at Castlecliff (Lewis 1996) has not allowed for conclusive results to be reached regarding the origins and early development of St Andrews.

The origins of the town, which possibly date back to the eighth century, are quite confusing and poorly understood. As with many Scottish towns it appears that St Andrews owes its origins to an early ecclesiastical foundation. The nature of the early secular settlement associated with the religious centre has been a topic of much debate which has been summarised by Derek Hall (Rains and Hall 1997, 3). Certainly the Byre Theatre site, together with the majority of previous excavations in the town, has demonstrated an early phase of truncated features which predated the formal division of the site into burgh plots. This may indicate a very sporadic and informal settlement spread across most of the eastern half of modern St Andrews. In effect, this may have represented a small secular settlement associated with a relatively large ecclesiastical foundation.

Dating of the Phase 1 features found at the Byre Theatre site is problematic, as the phase is aceramic, with the exception of a single unidentified sherd. However the stratigraphic position of features beneath the earliest property boundaries would suggest a date

prior to the second half of the 12th century and possibly as early as the eighth century. If compared with other excavated sites in St Andrews a very similar picture emerges (Rains and Hall, 1997). The majority of excavated sites in the city have identified an enigmatic spread of heavily truncated, but undated, features as the earliest phase of activity. This has been identified at Kirkhill (Wordsworth and Clark, 1997), Auction Hall (Wordsworth and Clark, 1997b), Cinema House (Ross and Clark, 1997), South Castle Street (Cox, 1997) and North Street (Clark 1997). These features consistently comprise pits, gullies, spreads of postholes and beam slots.

Early activity in St Andrews is attested in the historic record, and archaeological remains have been identified in the form of burials and ecclesiastical buildings (Rains and Hall, 1997, 2). However, evidence of early settlement is rare. A settlement is documented from the eighth century and archaeological evidence for human occupation in St Andrews dating to the 12th century has been identified at North Street (Turner Simpson and Stevenson 1981). Whether this phase of early activity represents occupation in the hinterland of the ecclesiastical centre or a more structured, extramural, 'proto-urban' settlement is unclear.

The archaeological remains dated to Phase 2 are curious for two reasons. Firstly the building identified exhibits elements of architectural advancement not normally present in the domestic buildings of early medieval Scottish burghs. One possibility is that the structure relates to an ecclesiastical foundation – possibly an outer building associated with the early site of St Leonards. Unfortunately too little of the building was available for investigation to allow a more conclusive interpretation. A timber building identified during the unpublished excavations on the east side of Abbey Street has tentatively been dated to the 12th century again suggesting an early date for development on the street. Stone buildings have generally been assigned a later medieval date in Scottish towns. Blanchard (1987b, 86–7) argues for a late date for stone buildings in Perth and goes so far as to suggest that "expectations of Scottish houses are too high and grand houses were rare before the 16th century". In Aberdeen it appears that the transition from simple timber structures to stone also happened in the 16th century (Murray 1982, 227–8). Stell argues that all stone construction is likely to have been the exception rather than the rule in Scottish urban centres up until the Reformation (Stell 1988, 73). St Andrews does, however, appear to be different. The Logies Lane structure is likely to date to the 14th century (MacKenzie and Moloney 1997) and the recently excavated structure from 106–110 South Street may date to the 13th century (Cachart 2000). However the likely 12th century date for the Byre structure is very early and implies the structure was of a very high status. A further interesting similarity between the Byre structure, the South Street structure and a third building recently excavated in Argyle Street (R Coleman pers com) is that all three were set back from the frontage.

Secondly the apparent alignment of the property is E/W as opposed to the later dominance of the South Street properties which were aligned N/S. This may suggest that Abbey Street had at least a partially developed frontage before South Street was formally laid out by Bishop Robert and Mainard the Fleming in the 12th century (Brooks and Whittington 1977, 291). If this were the case the earliest axis of the town would have been on the present line of Abbey Street and North and South Castle Street. South Street and North Street may have been later, planned streets. The Phase 1 E/W aligned gullies identified at Auction Hall (Wordsworth and Clark 1997, 18–21) may support this hypothesis. Here it would appear that a property fronting onto Castle Street predated the laying out of the South Street and North Street property system.

A small triangular fragment of window glass was retrieved from the fill of a robber trench which removed the south wall of the building. This is of a type that would generally be assigned a later medieval date and may in fact be intrusive. However it is possible that the glass derived from the buildings windows and if so again confirms the high status of the structure.

Phase 3 represents the earliest division of the Byre site into properties fronting on South Street. The previous alignment based on Abbey Street was cleared away to make way for the new axis of development. This process ties in well with the historical reference to the planned approach to the expansion of the burgh. This appears to have been undertaken by Bishop Robert who enlisted the aid of Mainard the Fleming of Berwick on Tweed to assist him with laying out the town, presumably on a European model (Brooks and Whittington 1977, 291). The width of this early property measured just over two poles (ie pole = 16½ feet). The pole was an important measurement in medieval property division and two poles would appear to be the standard width of early properties in St Andrews. Recent excavations in South Street identified an early property measuring 29½ feet again approaching two poles (Cachart 2000, 131–3).

During Phase 4 the same property alignment was maintained but the property moved slightly to the west. This phase sees a period of prosperity and intensive backland activity suggesting pressure on space. The majority of imported pottery was retrieved from this period of activity and suggests a well developed trading network and affluent community. The exact nature of commercial contact with foreign countries, commodities traded, means of transport and lines of communications are poorly understood although the presence of pottery from England, the Low Countries and Germany suggests that trade links were well established by the 13th or 14th centuries. The evidence for the presence of figs and raisins within the latrine sediments are also suggestive of international trade. This extended period of prosperity may be further evidence that St Andrews avoided involvement in the second phase of the Wars of Independence (Turner Simpson and Stevenson 1981, 2).

The kiln is of a type that is commonly found on medieval sites (See Holden forthcoming a and b for a summary of the available evidence). It is broadly key-hole shaped in plan, stone-lined with clay bonding. The flue to the east is approximately 3m long and the bowl to the west approximately 1.5m in diameter (Illus 7, 8 & 9). The floor of the bowl has been lined with a broken millstone and the flue with flags although the original floor was of clay. The evidence for the fire hole is scant but this would have been at the east end of the flue and may have been outside the building.

The kiln in its present form has been severely truncated. Originally the flue would probably have been covered with either timber or flags and floored over. This would have given access round the sides to the bowl which would typically have been 1m or so above the surrounding floor. The clay floor and the kiln house walls erected later would have provided a good working environment allowing for ease of loading/unloading and regular turning of the grain. The clay floor surrounding the kiln would have allowed inevitable spillages to be swept up and the clay-lined bowl would enable recovery of grain that would have regularly fallen through the straw or sacking onto which the grain would be spread for drying (eg. Headrick 1807, 314, Sutherland 1889, 61). This grain might accumulate over the course of several kilnings before being cleaned out so the presence of wheat, rye, oat and barley is probably indicative of different crops being kilned as separate events.

Scott (1951) indicates that the length of the kiln flue is generally determined by the fuel used. Where peat is used, for example, the fire can be almost directly under the drying grain, the risk of sparks and therefore conflagration being minimal. Where cereal chaff or furze were used the risk of fire would be much greater and the length of the flue lengthened accordingly. In the case of the Byre kiln this is of medium length and perhaps indicates that wood may have been the preferred fuel.

Kilns such as this might have been associated with a nearby mill and the presence of a broken millstone might support this. However, individual burgesses were allowed to have their own kilns for domestic use. Kilns such as this were commonly used,

- i* to dry grain wither as a prelude to shelling or hummeling of black oats and barley respectively (ie. removal of the husks and barbs),
- ii* to harden grain to make milling more efficient and
- iii* to make malt for brewing.

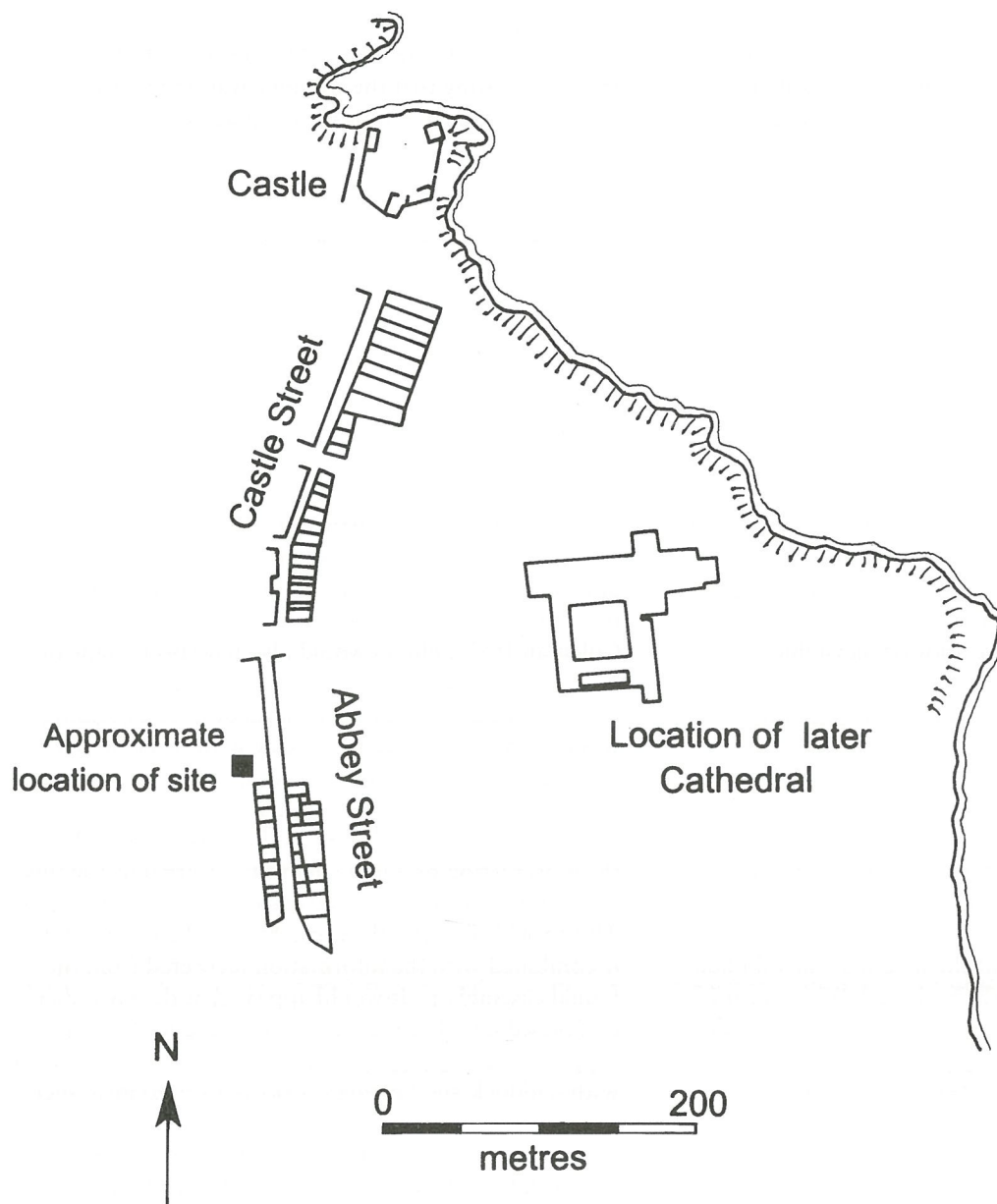
There is certainly no evidence for malted grain, which can be identified morphologically, but there are traces of light chaff of the sort that would be produced by process *i*) above. It would however, seem likely that all three processes would, from time to time have been undertaken in this kiln.

The presence of the waste products of a building site including squared stone, mortar, roof tiles and nails suggest an impressive structure stood at the frontage. The foundations of a large medieval stone building

have previously been identified on the north side of South Street at Logies Lane (Mackenzie and Moloney 1997) suggesting that the frontage was lined with substantial stone buildings from quite early times. In comparison, buildings fronting the High Streets of both Perth and Aberdeen at this time were much less substantial structures constructed largely of timber and with thatched roofs. The Abbey Street structure may have been thatched as indicated by the presence of heather/ling in the fill of the latrine.

Further indirect evidence for building construction may be found in the numerous clay extraction pits identified at the Byre site. The clay may have been used for the construction of clay walled buildings or possibly as clay mortar for bonding stone in more substantial structures. The remains of clay banks associated with the kiln may be the remnants of such a clay walled building. Certainly clay was a major ingredient of the daub adhering to the wattle walls of the buildings fronting Perth High Street at this time (Moloney and Coleman 1997). Floors would also have been made of beaten clay as was seen in the Phase 2 building at the Byre site. In general most medieval domestic buildings would have been floored with clay with stone flags used for areas of specialist use or intensive ware such as around hearths and in thresholds.

The anaerobic conditions in the latrine allowed for the preservation of a large quantity of organic remains not normally recovered from excavations in St Andrews. This provides an excellent insight into the medieval diet if combined with the information recovered from the faunal assemblage. It would appear that the meat diet comprised mainly sheep, goat and cattle which was supplemented by pig and domestic fowl. This combined with haddock and herring provided a varied meat diet for the medieval population. The plant element of the diet was just as varied. Oat and barley were the most significant cereals identified although wheat and rye were also present. Other evidence for cultivated crops came in the form of cultivated peas. Fruits and nuts also appear to have been plentiful with plum, sloe, wild cherry, fig, apple, grape, strawberry, bilberry, blackberry and hazelnut all present. Black mustard and opium poppy may have been grown as a condiment or served a medicinal function. The picture that emerges from this is a well balanced and varied diet produced both locally and imported. The low proportion of cattle bones to sheep/goat is unusual if compared to other medieval assemblages from the east coast. This may however be explained by the sampling strategy employed at the site where homogenous fills were sieved on site and an intensive environmental sampling strategy was applied. The Byre assemblage may therefore be a more accurate reflection of the actual situation, a hypothesis that can only be tested by applying a similar sampling strategy on future sites. The large fish bone assemblage may also be explained by the same sampling strategy. Where smaller bones may have been lost in the past, they were retrieved through both on-site and post-excavation sieving. In effect what has been described in The Fish



Illus 18 Plan of early Abbey Street and Castle Street properties, based on Brooks and Whittington 1977, showing Castle and Cathedral for reference.

Remains above as 'an outstanding example' may in fact be a very ordinary assemblage that will be retrieved from any urban medieval site applying a rigorous sampling regime.

The anaerobic conditions also allowed for the preservation of the bow. This is a significant addition to a small assemblage of bows recovered from Britain and Ireland and is unique to Scotland.

The homogenous soil deposit (002) is a phenomenon that has been identified on the majority of archaeological investigations in the core of the medieval burgh, the so called 'garden soil' phenomenon. Work by Dr Stephen Carter during the course of the post-excavation analysis of the Byre Theatre has presented an interesting hypothesis on the formation of this deposit

which is presented in a separate paper in this journal. It is suggested that the soil was not imported for cultivation as previously believed (Cox 1997, 33; Hall 1997b, 28–30; Ross and Clark 1997, 25; Cachart 2000, 118). The alternative suggestion is that the upper archaeological deposits have been heavily mixed through animal, plant and human agency thus producing the appearance of a homogenous deposit rather than a cultivation horizon. The great depth of material is likely to be the result of the accumulation of the collapsed remains of buildings incorporating earthen building materials such as clay and turf. The occurrence of low levels of artefactual material within this deposit would result from the mixing of midden deposits resulting from the domestic occupation of the site. The

net result of this would seem to indicate that instead of the assumption that the pressure for space reduced at the end of the medieval period with urban land passing over to cultivation, there was in fact much more intensive use of the land.

The sundial is an exceptional object and hints at a fashionable community in St Andrews during the 16th/17th century, a time when the construction of sundials flourished in Europe.

Conclusion

The results of the investigation, together with the information gleaned from previous work and historical records, allow us to postulate a model for the early development of St Andrews.

The first phase of secular development at the town would appear to have been a small settlement which presumably grew up around the fringes of the ecclesiastical centre it served. This would appear to have been organic rather than planned as no property alignments or streets have been identified.

The second phase of development was represented by a more structured and 'planned' settlement based on a 'main street' formed by the modern streets of Abbey Street, South Castle Street and North Castle Street (Illus 18).

The N/S layout was maintained until the middle of the 12th century when the great planned development of St Andrews by Bishop Robert and Mainard the Fleming based on the two great thoroughfares of North and South Street was set in place. The development of the town from this point forward has been well established by Brooks and Whittington (1977, 288–92).

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Abstract

Archaeological excavation at the Byre Theatre, Abbey Street, St Andrews identified a well stratified sequence of medieval structures and deposits relating to the town's early development. An early, well constructed stone building, of uncertain function, containing the base of a large relieving arch was identified within a property fronting onto Abbey Street. This building predated the planned layout of South Street which was evident in the form of a series of parallel property boundaries. Evidence of economic development during the 13th and 14th centuries was gained through the examination of the fills of a number of large rubbish pits identified in the backlands of the South Street property. Large quantities of imported pottery and glazed floor and roof tile were recovered. In addition to a significant animal bone assemblage, a well-preserved macroplant assemblage was recovered providing a further glimpse of the diet of the medieval residents of St Andrews. A corn drying kiln was also identified in the backlands of the South Street property. The first example of a Scottish medieval bow was also retrieved during the excavation.

Keywords

early burgh development
environmental remains
medieval bow
roof furniture

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