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ARO30: Uncovering the history and archaeology of the house of the Blackfriars, at Goosecroft Road, Stirling

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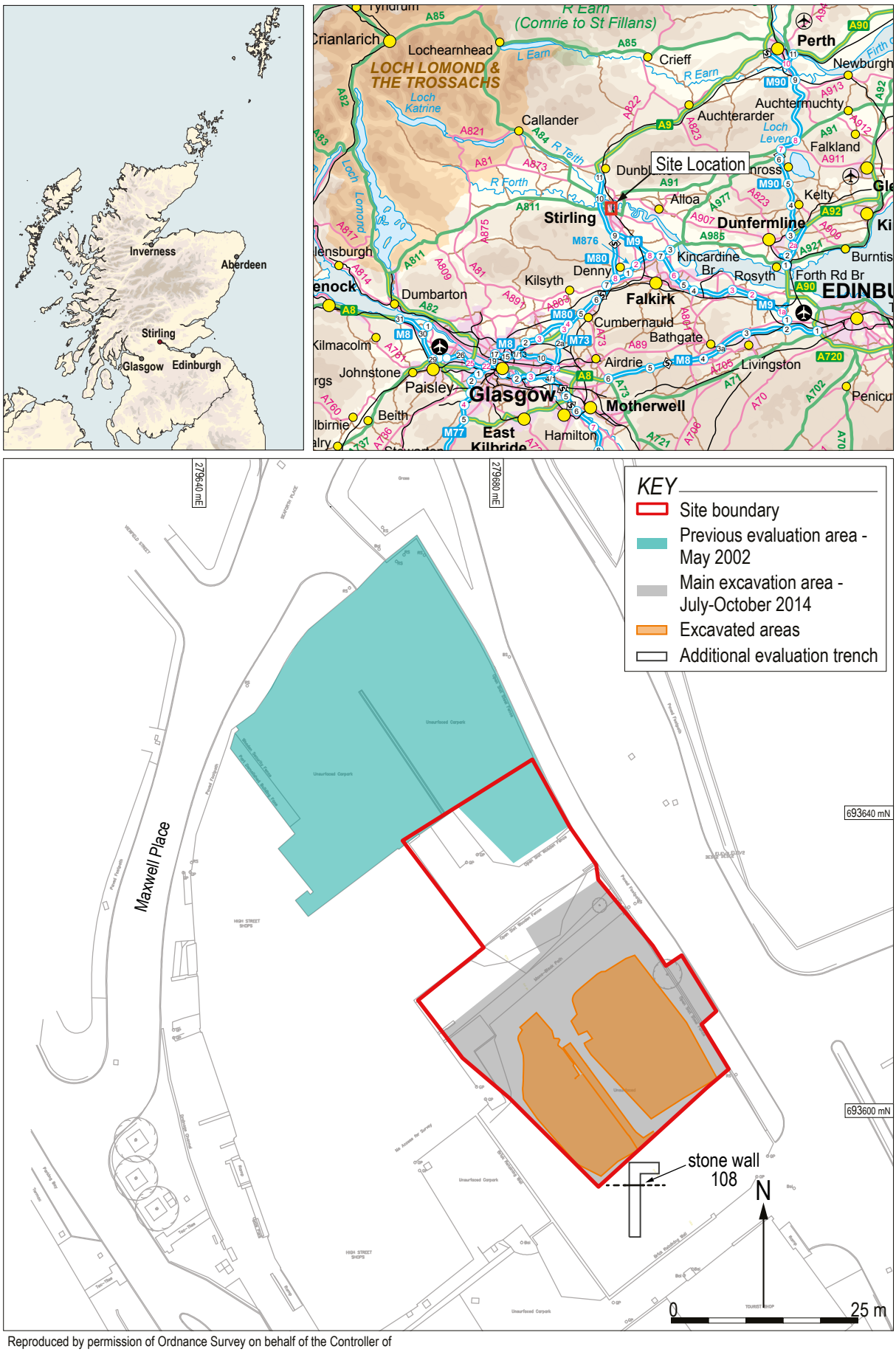

Figure 1: Site location with outline of the excavated trenches.

Summary

An archaeological excavation was carried out across an area proposed for re-development at Goosecroft Road, Stirling. The investigations uncovered the foundations of a substantial stone wall in the south-west corner of the site, and another wall further to the south, that probably relate to the nearby location of a medieval Dominican friary. Historical research provides additional background information (see Appendix 1). In addition, a burial was uncovered closely associated with the friary. Medieval midden deposits and possible boundary divisions were also discovered. The recovery of artefacts as well as radiocarbon dating evidence suggests these deposits and features are from the twelfth to the sixteenth centuries. In addition, an environmental sampling programme revealed that deep organic rich deposits originated in the early Neolithic, provided an insight into the changing environment around Stirling through to the medieval period (See Appendix 2).

Introduction and location

The archaeological investigations were undertaken by GUARD Archaeology Ltd on behalf of the Stirling Development Agency on a development site at Goosecroft Road, Stirling (Figure 1). The main excavation was carried out between 28 July and 6 October 2014, while a watching brief on the northern part of the area was conducted between 26 November and 5 December 2014.

The site, at NGR: NS 7968 9364 and at a height of c.14 m OD, covered c. 873 m^2 is enclosed by the B8052, Goosecroft Road and Stirling Railway Station to the east, the rear gardens and car parks of retail and office buildings on Murray Place leading to Maxwell Place to the west, Station Road to the south, and a car park to the north. It comprised a flat but rectangular-shaped piece of waste ground, which had been used as a car parking area after the demolition of a number of buildings that occupied the site in the late nineteenth and twentieth century.

The site is located between the edge of the volcanic spur where the castle and core of the medieval burgh of Stirling is located and the River Forth, which is still tidal at this point. The bedrock consists of midland valley sill-complex quartz-micrograbbro while the superficial (subsoil) deposits consist of reclaimed intertidal deposits of silt and clay (British Geological Survey 2018).

Short historical and archaeological background to the site

This short account highlights the main events affecting the excavation area, but a full account of the history of the site and the history and archaeology of the surrounding area can be found in Appendix 1.

The development site is situated in the immediate vicinity of a medieval friary. The Dominicans, also known as the Friars Preachers or Blackfriars, established their house in Stirling in 1233, their charter being granted by Alexander II (Cowan and Easson 1976, 121). As was usual, it was located on the edge of the then burgh, and the extant documentary records have been well-summarised by Page and Page (1996b). Following defeat at the battle of Falkirk in 1298, Wallace burned the town of Stirling but Edward I stayed at the friary to recover from injuries after being trampled by his horse. This would suggest that the friary buildings survived the fire and may have already been built of stone at the time. Edward I is thought to have stayed there again in 1304 when he besieged Stirling Castle, which suggests that the buildings might have been quite substantial. The friary buildings were allegedly destroyed in June 1559 (Cowan and Easson 1976, 121; Page and Page 1997, 120) but in 1560 Prior McNeill granted all the residual communal property to Alexander Erksine of Cangoir, later 'of Gogar', uncle of the Earl of Mar (Page and Page 1996b, 887). This grant was confirmed by a precept from Mary, Queen of Scots, then in France (*Stirling Chrs* No XLIV). This precept was a warrant, or order, dated 10 May 1560, commanding a charter to be drawn up in Edinburgh under the Great Seal, which would re-state the transfer of assets (ibid.). Whether or not this second charter was composed is not stated, and the matter was further confused when on 15 April 1567, Mary granted the Provost, Bailies and community of Stirling *'the church property and revenues within the burgh'*, for the maintenance of the poor (*Stirling Chrs* No XLV). These confiscations included '*tenements, buildings, orchards, yards, annual rents, anniversaries, fruits, profits and emoluments … which formerly belonged to the*

Dominican or Preaching Friars' (*Stirling Chrs* No XLV, 94). The inclusion of the '*rents, alms, obits … chapels, places of friars, yards, with their pertinents … as they lie … in buildings, walls, timber, wood, stone and lime' (Stirling Chrs* No XLV 95; Fleming 1897, 121). These charters, while not identifying the exact location of friary buildings, provide an insight into the type of property that belonged to the Dominican, the range of material used in their construction, and that the buildings were still in use at the time of the Scottish Reformation.

The location of the friary is shown on the Ordnance Survey first edition map of 1860 as situated to the rear of 84 Murray Place. Recent limited excavation has confirmed that the remains of a church survived within the rear garden of 60-68 Murray Place along with burials and a large number of disarticulated human remains (Page and Page 1997). An extensive graveyard associated with the friary was suggested by the discovery of mainly disarticulated human skeletal remains and graves to the south of the church in 1846 and 1856 and at several locations close to the friary site. Human remains were also found in the garden of 74 Murray Place to the north of the church in 1882 and there are also historical references to burials within the church (see Appendix 1). Further archaeological remains were identified at 3 Station Road, bordering the garden of 60-68 Murray Place. These consisted of a large stone-built drain and a sump, with associated cobbled surfaces thought to be medieval in date and relating to the activities of the Blackfriars. The western boundary of the present site is thought to be the location of the 'Stank', a late medieval drainage/ sewage ditch which acted as the City's northern defences and which was expanded and reinforced in 1651 ahead of the Cromwellian invasion.

In June 2000 the modern buildings occupying the northern part of the site were demolished under an archaeological watching brief and a limited standing building survey was undertaken on a possible mill in the middle of the site at the eastern edge (Will et al. 2000). Nothing of archaeological significance was identified at this time. Further work in 2002 (Johnstone 2002) consisted of six evaluation trenches in the northern half of the site. While no significant archaeological remains were encountered, two sherds of medieval pottery were recovered and some cobbled surfaces of probable post-medieval date were encountered. The present excavation followed on from an evaluation in May 2014 of the southern half of the site that revealed organic-rich waterlogged deposits that had not been encountered from any recent excavation in medieval Stirling along with medieval artefacts (Kilpatrick 2014; Will 2014; 2015).

Methodology

Excavation at the site focussed on the medieval deposits that survived in pockets across the development area. Following the initial evaluation, the site was stripped of all modern overburden, demolition debris and levelling material under a watching brief. The main area of investigation initially measured c. 20 m by 25 m and was located in the southern part of the development area, although this was later expanded to the north. A strategy for the excavation had been agreed in consultation with the client and the Stirling Council archaeologist and this was further developed and revised during the course of the fieldwork, as the nature and complexity of the archaeological deposits were revealed. The presence of large concrete foundations that ran north/south through the site divided it into three areas - west, middle and east.

As the new building was not going to occupy the whole of the site there was the opportunity for the preservation in situ of archaeological deposits located outside of its footprint, especially along the western and southern portion of the development area (Figure 2) and provision was made to ensure any deposits that remained in situ would not be disturbed by ground-works associated with the construction. In all areas where preservation was feasible, a layer of geotextile was laid over the archaeological deposits followed by a 100 mm layer of sand and a 150 mm layer of pea gravel up to the formation level required for the new building.

An integral part of the excavation strategy was the targeted environmental sampling programme that was prepared in consultation with archaeobotanist Dr Susan Ramsay, with the aim of recovering information on the past environment of the site through time. This

included soil micromorphology samples and bulk soil sampling of contexts that indicated the survival of organic remains including charcoal, or which appeared to be waterlogged. Monolith tins were also used to take samples from the deeper deposits to provide a full environmental record of the site (see Appendix 2).

Results

Modern deposits and features

The modern overburden (context 001) was removed to reveal a series of large concrete foundations (011/012/013/014), stone and brick walls (004) as well as modern services.

Figure 2: Survey of trench layout overlain with areas of archaeology preserved in situ.

A modern brick built manhole (015) was still connected to an active NW/SE aligned drain that was left undisturbed in a baulk (Plate 1). Cast iron drainage pipes (005) were also uncovered aligned SW/NE across the site that connected with the main north/south drain. Due to the size of the concrete foundations these were left in place and the deposits excavated between them, while the brick and stone walls were removed. Removal of the overburden and demolition material (002) between the concrete foundations on the east side of the site exposed a layer of garden-type soil (003) (Plate 1). While on the west a compact silty-clay was present that contained medieval pottery and animal bone (006).

Plate 1: Preliminary cleaning of the site prior to the excavation.

In the central area and east side, once the modern overburden was removed and the modern walls and foundations exposed, a number of small trial trenches were excavated by hand to determine the date and depth of the exposed deposits. These trenches demonstrated that the upper material was 0.4 m thick and contained both modern artefacts as well as residual medieval and post-medieval finds. As no burials or structural features were uncovered, a mechanical excavator was used to remove this material from the east side and the southern half of the central area of the trench under archaeological supervision. The trial trenches also provided information on the sequence of deposits in the middle of the site. Beneath dark silty-clay layer (006) and part of 003 was a layer of dark grey clay (018) that was 0.4 m thick and contained medieval pottery. Beneath this was an organic-rich layer (019), 0.2 m thick that overlay the clay subsoil (022). The test pits and evaluation trenches demonstrated that the sequence of deposits varied somewhat across the site.

The friary wall and a burial in the south-west corner

As the overburden was removed in the south-west corner next to one of the evaluation trenches a substantial stone wall (017) was discovered and once fully exposed was over 12 m long (Plate 2, Figures 3 and 4). While cleaning the wall a sherd of glass was recovered that would date to the late fifteenth or sixteenth century when the friary went out of use. On the north side of the wall an incomplete skeleton in poor condition (010) was uncovered within a shallow grave (008) filled with dark silt (009). In the grave with the skeleton were an annular brooch or buckle (SF 9) that would date to the thirteenth or fourteenth century and a possible iron coffin nail (SF 10). A radiocarbon date obtained from the skeleton produced a date of 1271 – 1320 cal AD which corresponds with the foundation and use of the friary. Once fully exposed, it was noticed that the right arm and leg bones were missing from the skeleton. Further investigation of wall (017) uncovered a cast iron drainage pipe with a concrete foundation (007) that had cut through the wall and had possibly disturbed the burial.

Plate 2: The friary wall being cleaned and recorded.

The wall (017) was 1.4 m wide and it survived four courses from ground level (Figure 5) while its foundations were exposed in an evaluation trench and were up to a further 0.9 m deep. When the material used to backfill the adjacent evaluation trench was removed an architectural stone fragment identified as tracery from a church window (SF 77, see below) was recovered and presumably originated from the nearby friary church. It has been dated to the late thirteenth century on stylistic grounds.

Figure 3: Overall plan of the medieval features across the site.

The wall was constructed of regularly squared facing-stones with an infill of irregularly shaped smaller stones. The large foundation stones that were revealed in the evaluation trench were initially interpreted as a 'soak-away' drain, due to the amount of water flooding into the trench. These stones were in fact part of a buttress (072) supporting the north side of the main wall (Figure 4, Plate 3). The buttress (072) was 1.7 m long by 1 m wide and survived to a height of 0.9 m where it was exposed, and consisted of approximately five courses of stonework. There were no facing stones visible for either the buttress or the wall at this point but this may suggest that they were not intended to be visible at ground level. The buttress and the wall were constructed together as part of the same construction phase.

As the excavation continued the foundation trench (062) for wall (017) was exposed along the northern edge along with the badly disturbed foundations of another buttress (071) (Figures

Figure 4: Details of the main medieval features excavated.

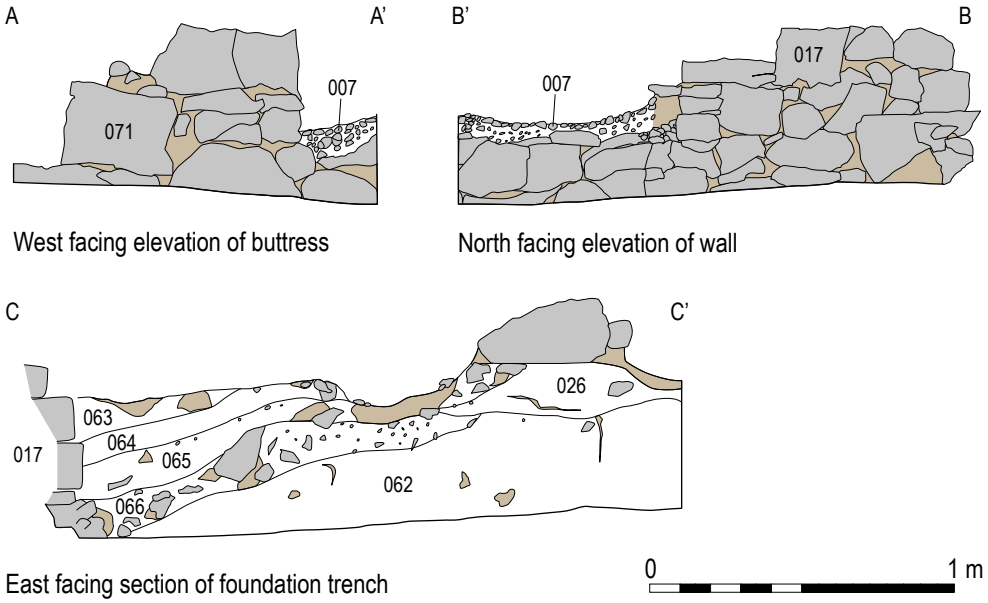

Figure 5: Elevations of the friary wall and its foundation trench.

4 and 5). The foundation trench extended 1.3 m from the wall and was 0.5 m deep with a sloping side. It was filled with silty-clay (063), 0.15 m thick, which contained local medieval pottery and overlay a shallow deposit (064) that contained fragments of medieval pottery, animal bone, charcoal and mortar. Below this was a 0.15 m thick construction layer (065), containing small angular stones as well as pockets of pale grey/ cream-coloured mortar and occasional oyster shells. Artefacts recovered from this deposit included local medieval pottery and a pottery sherd from Yorkshire that would date to the thirteenth century. Below this was a 0.13 m thick primary fill (066) containing building debris, but also flat stones that had been laid next to the wall. In addition, there were also pockets of organic silt from the underlying organic-rich layer that the foundation trench had been cut into as well as local medieval pottery.

Plate 3: Friary wall-buttress, wall face and foundation trench.

The buttress (071) and wall (017) had been truncated to the south by the insertion of a modern cast-iron drain pipe that was laid partly over the wall on a concrete base (007) and to the east by a recent ceramic drain (015). The drain was not exposed where it cut the buttress and wall, as a deep deposit of clean light grey clay (074) some 0.3 m thick had been used to seal it. To east of the clay, a section of wall (076) was exposed next to the south baulk and interpreted as a continuation of wall 017. The west face of the buttress and the north face of the wall (017) survived to a height of 0.55 m and four courses of stonework. The buttress was 1.2 m long but its full width could not be determined due to the insertion of the later service pipe. Again, this buttress and the wall were contemporary. The full depth of their foundations was not uncovered but the top of what may be the foundation course was identified as it protruded out from the wall by 50 mm. At the northern extent of the buttress, its foundation course and the stonework above were built at a slight upward angle.

At the southern edge of wall 017 facing stones formed the side of what appeared to be an open drain or culvert (060), 0.45 m wide. A separate wall (068) formed the southern side of this drain but both were cut through by the later cast iron drainage pipe (007). The west end of the drain (060) was filled with clean light-grey clay (067), which may have been used to seal it or to make it watertight, while the rest of its course was filled with light-brown sandy-silt (061) up to 0.25 m thick. The fill of the drain was sampled for environmental remains and charcoal from the clay fill (067) produced a radiocarbon date of 1441 – 1528 cal AD, which would suggest that the drain was still in use at the time that the friary was no longer in use.

Wall 068 was of similar construction to wall 017 and it was exposed for approximately 10 m before it ran under the southern trench edge. It was 1.2 m wide and survived to three courses (0.35 m) in height. The two walls 017 and 068 were slightly misaligned and it was not possible to pursue their convergence beneath the concrete for the iron drainage pipe. The walls were different widths and it is suggested that the drain or culvert (060) is later than wall 017, and is actually part of wall 068. This stonework was not fully investigated but it was preserved in situ and protected during construction.

Linear stones and a ditch on the western side

Once the grave (008/010) was excavated, the area to the north of wall 017 (006/026) was investigated to establish if there were additional burials associated with it, but only a number of sherds of medieval pottery and fragments of animal bone were recovered. Nine metres to the north of wall 017 was a linear feature (029) which extended east/west across the site. It comprised an irregular band of stones up to 0.8 m wide that could be traced for 6 m from the former evaluation trench to the concrete foundation (014) (Figure 3). The feature was only one layer of stones thick and with no apparent foundation but a number of animal bone fragments and

sherds of medieval pottery were recovered from between its stones including a sherd of possible Yorkshire ware.

A similar band of stones (031) up to 1 m wide was visible to the west of the evaluation trench but it did not align with feature 029. The area between these two bands of stone contained some modern disturbance (032) that included bricks and concrete, and presumably relates to the demolition and clearance of the site in recent decades.

Once linear feature 029 had been removed, excavation continued with the removal of the medieval midden-type deposit (026/048) which overlay an organic deposit (049) that contained wood fragments adjacent to 029. Slightly to the south of feature 029 was another linear feature, which on excavation was found to be a ditch (055) that extended westwards to the concrete foundation (Plate 4, Figure 4). Part of the ditch was visible beneath the concrete but it did not continue to the east of the concrete foundation. The ditch was 0.45 m wide at the top but its sides sloped steeply to 0.35m at its flat base. Its upper fill (053), 0.1 m thick consisted of dark silty-clay with frequent oyster shell, fragments of bone, charcoal and medieval pottery as well as three sherds from a Martincamp flask dating to the late fifteenth or early sixteenth century which would suggest that the ditch may have been filled in when the friary went out of use. It sealed a similar silty deposit (054) that was 0.15 m thick with oyster shell and bone. Layer (054) contained charcoal which produced a date of 1167 – 1267 cal AD, which is similar to the dating of a pottery handle in a Low Countries grey ware fabric which was traded between the twelfth and fourteenth centuries. Below this, the primary fill (056) consisted of a 0.1 m thick layer of reddish/brown silty-clay with some bone and oyster shell, surrounding several large angular stones positioned in the base of the ditch. The western end of the ditch was partially sealed by a 0.2 m deposit of dark silty-clay (057) containing oyster shell, medieval pottery and a fragment of a glazed medieval floor tile. It was partly sealed by linear feature 029 (Figure 4). Analysis of botanical and insect remains from the ditch deposits suggests that material indicative of sewage was within the ditch and that it might have been draining into a cess pit or similar possibly from friary or burgage settlements nearby (see below).

Once the ditch (055) had been excavated a mechanical excavator was used to remove the remains of the surrounding deposit (048) in

Plate 4: Feature 055 boundary ditch.

shallow spits. Part of the baulk around drain 015 was also removed to reveal the full extent of the organic deposit (019/049) that covered the north-western part of the site. It consisted of reddish-brown sandy-silt with clay, which contained many small fragments of wood with bark that did not appear to be worked. Pottery recovered from this deposit was mixed with both medieval and late medieval fabrics recovered including sherds from a Martincamp flask, suggesting that there had been some later disturbance to the upper surface of this extensive deposit. Small twigs and branch fragments were also observed. The deposit was c. 0.7 m thick and overlay the undisturbed blue-grey clay subsoil (022).

A mechanical excavator was also used to remove the remaining overburden material in the north-west corner of the site to the north of the concrete foundations. There was a steady flow of water into this area from the trench edges which made work in this area difficult. It had also been disturbed by later developments, and the demolition and levelling layers 001 and 002 overlay a deep deposit of dark mixed silty-clay (075) up to 0.45 m thick. This in turn overlay the clay subsoil (022).

Central area walls and drains

Beneath deposit 003 in the middle of the trench was a large concentration of stones and silty-clay (025) which contained medieval pottery, a sherd of possible fifteenth century coloured window glass and animal bone but very few modern artefacts. The stones were part of a wide linear feature (027) that ran roughly north/south through the area that had been cut across by a later drain (033) to the south (Figures 3 and 4). The rubble drains that survived in the eastern part of the trench, all roughly aligned NE/SW seemed to be part of the same drainage system (Plate 5). Deposits of decayed lime mortar (035) were found around the stones of 027 and appeared to overlay drains 027 and 033.

Plate 5: Rubble drains on the east side of the site.

The northernmost extent of feature 027 appeared to be crossed by a similar east/west stone alignment (038) that appeared to be part of the linear stone feature (029) uncovered in the western part of the site. During the excavation of feature 027, its smaller stones and patches of pale coloured mortar would suggest that it represented a robbed wall (Plate 6). The useable building stone would have been removed leaving deposits of mortar and small stones.

Plate 6: Feature 027, part of a possible stone building, from the south.

A clay tobacco pipe bowl recovered from 027 was decorated with a star that identifies it as being made in Stirling during the late seventeenth century. The excavated deposits on the east side of 027 were given the context number 034 and the deposits to the south were numbered 036. The latter was much more mixed and contained modern material. Further excavation of it uncovered another ceramic field drain (059) parallel to the southern trench edge.

When fully exposed, the features 027 and 038 formed two walls and a corner of a possible structure that was 9 m long and up to 1.2 m wide but the full extent of the building did not survive and there was no evidence for a foundation trench (Figure 4). However, the stones and mortar appeared to sit within a 0.4 m thick uniform deposit (025). Artefacts recovered from this deposit included medieval and post-medieval pottery, glass, clay tobacco pipe fragments that would date to the seventeenth century along with animal bones, Deposit 025 overlay the natural subsoil (052 and 022), and the organic layer 019/049 to towards the north-west. Medieval pottery including sherds from imported vessels from the Low Countries that would date to the thirteenth or fourteenth centuries lay on the subsoil surface.

The excavation area was extended to the north c. 5 m and uncovered further concrete foundations that appear to be part of those already exposed along with modern disturbances related to the cast iron drain pipe 005. The garden-type soil (003) included old wooden railway sleepers and telegraph poles but became shallower towards the north where it was truncated by modern debris (073) including brick, rubble and coal, which directly overlay the subsoil. Beneath dark silty-clay (003/006) was a dark grey clay layer (018) that was 0.4 m thick, medieval pottery was recovered from this layer. A radiocarbon date obtained from charcoal from layer 018 produced a date of 1272–1320 cal AD. Beneath this was an organic-rich layer (019), 0.2 m thick that overlay the clay subsoil (022).

East side features and a pit

Further removal of garden-type soil (003/023) was required on the east side of the excavation as only modern ceramic and glass shards were recovered. Beneath it was a main rubble field drain (037) measuring 0.4 m wide and up to 0.2

m deep with a flat base extending almost the full length of the trench from north to south (Plate 5). Towards the north end of the site within another field drain (042), a large base sherd of medieval Redware pottery was found. In the middle of the east side of the area, an east/west aligned rubble drain (040) ran from the main drain (037) to the east baulk (Figure 3). It was 3.2 m long, 0.5 m wide and 0.22 m deep and again filled with angular stones. At the southern end of the site another east/west rubble drain (033) continued through from the central area and joined drain 037 but could not be traced further. A mixed deposit of small stones (039, Figure 4) overlay the remains of the drain (037) and probably derived from the original evaluation trench.

Investigation of the deep soil (023) across this side of the area demonstrated that it overlay a light coloured silty-clay (045), 0.2 m thick that contained residual medieval and post-medieval pottery as well as late eighteenth or nineteenth century pottery and glass. This deposit overlay the natural clay subsoil (022) and had been cut into by the rubble drains. A loose deposit of sandstone rubble and brick fragments (046) was uncovered beside field drain (042) and alongside the possible remains of a wall (047) that was visible in the trench side built from sandstone blocks (Figure 3).

The eastern side of the trench was extended by 2 m next to the site boundary for a length of 6.5 m. Excavation confirmed the sequence of deposits as previously revealed in the rest of this area. At the base of them where the subsoil was revealed, was the edge of a large ditch (069) (Figure 3) that could be traced for 6 m to the north baulk, and which attained a maximum width of 1.3 m. It was irregular in plan but with several stones, up to 0.25 m in size, along its inside edge. Further investigation revealed it was 0.4 m deep filled with light sandy-silt and an occasional large stone (070), possibly suggesting an area of disturbed or contaminated subsoil. No artefacts were recovered from its fill but a radiocarbon date of 1119–1247 cal AD was obtained from charcoal recovered from its fill. The date could suggest that the feature was in fact part of the medieval town or burgh boundary ditch or 'stank'

Southern evaluation trench

An additional evaluation trench was excavated in the southern portion of the development site next to the stone boundary wall to determine if archaeological deposits survived in this area (Figure 1). The irregular shaped trench was 10 m long and 1.5 m wide but the northern half was extended to a maximum width of 4 m due to the presence of modern services. The overburden and demolition material was removed to reveal part of the core of a stone wall (108) that was built within a foundation trench (107) (Plate 7). Although not fully exposed, the wall measured 0.6 m across, was at least three stones wide and survived to five courses or 0.7 m in height. The wall was built on top of the natural clay subsoil at a depth of 2 m below the present ground surface. Given the size and depth of the wall it is likely that this relates to the friary and could be part of the church building (Plans 1, 2 and 3?)

Plate 7: Wall 108 in the southern evaluation trench.

Watching brief results

After then main excavation was completed an archaeological watching brief was carried out to the north of the excavation in an area that was not accessible at the time of the initial investigations (Figure 2). Modern surfaces and overburden, including recent demolition material was removed to reveal a cobbled surface (1011) and three sandstone walls (1006, 1008 and 1010) (Figure 6). Two of the walls (1010 and 1006) to the east and south respectively, cut through the cobbled surface while the third wall (1008) was contemporary with it and enclosed its western limit. The cobbles (1011) covered an area measuring 7 m by 6 m, and may have belonged to a grain store that occupied the area in the late nineteenth and twentieth century and which was recorded during an earlier phase of work on the development site (Johnstone 2002). A later concrete floor was laid to cover the cobbled surface.

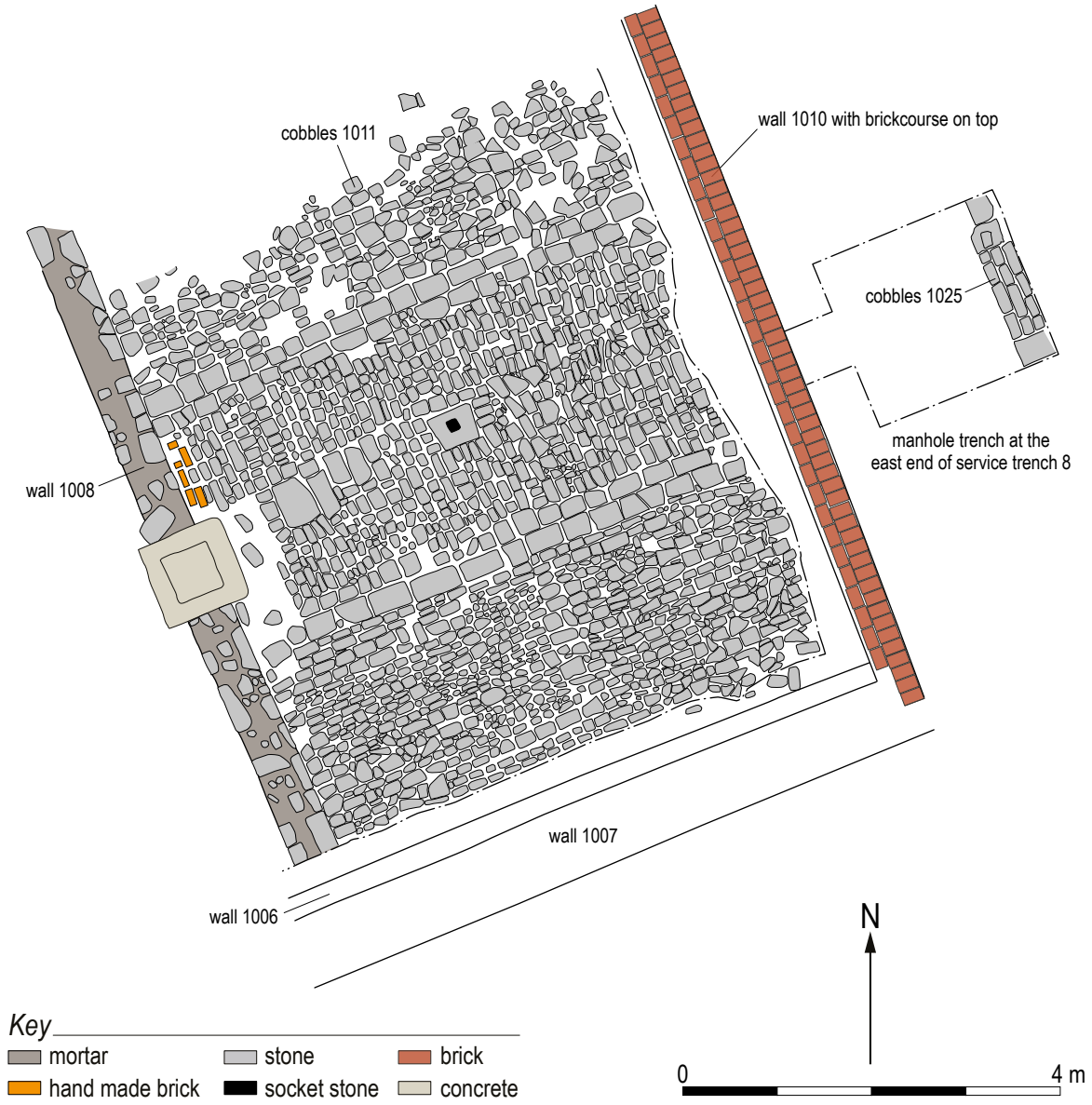

Figure 6: Plan of area of cobbling uncovered during the Fubar Access Watching Brief.

Results of the post-excavation analysis

Human Remains

By Maureen C. Kilpatrick

A small assemblage of articulated human bone from a grave was analysed and the fragmentary remains of at least one adult individual of possible male sex was identified. A single human burial (skeleton 1) was located to the immediate north of wall 017, orientated east/west with the head at the west end. Unfortunately, the remains were very fragmentary, with most of the right side missing due to later building work which had truncated the skeleton. The burial was articulated, supine and fully extended with the left arm placed across the body with the hand (which was absent) probably resting in the pelvic area. A buckle (SF 9) was located in front of the pelvic bones.

Methodology

The macroscopic analysis was conducted using standards outlined by Buikstra and Ubelaker (1994) and Brickley and McKinlay (2004) and recorded on GUARD proforma skeletal recording sheets. Skeletal completeness was calculated on the percentage of the skeletal material present for analysis and on the surface erosion of the cortical bone in accordance with McKinley (in Brickley and McKinley 2004).

The minimum number of individuals (MNI) present was calculated using the most commonly

repeatable skeletal elements and those of differing skeletal age. The biological sex for adult individuals was calculated using standards outlined by Buikstra and Ubelaker (1994) and was based on the analysis of the sexually diamorphic features exhibited in the skull and pelvis where they survived.

The age at death of the individual present was calculated using methods outlined by Buikstra and Ubelaker (1994) and included epiphyseal fusion and bone degeneration where observable. Unfortunately dental development could not be estimated due to the post mortem absence of the upper and lower dental plates. Calculating the age at death for adult remains is in general problematic due to the completion of skeletal and dental maturity. The main method of assessment is the observation of age related changes such as skeletal degeneration in areas including the pubic symphyses and auricular surface of the pelvis. Unfortunately, these degenerative changes can occur at different times with factors such as physical activity and genetic predisposition influencing bone deterioration. Table 1 outlines the age categories used during the analysis.

Category	Age
Foetal	< birth
Infants	b – 3 years
Children	3 – 12 years
Adolescents	12 – 20 years
Young Adult (YAd)	20 – 35 years
Middle Adults (MAd)	35 – 50 years
Old Adults (OAd)	50+ years

Table 1: Age categories from Buikstra and Ubelaker (1994).

The stature (metric traits) of the individual present in the burial assemblage was not possible to calculate using complete long bone length (Trotter 1970), due to their partial and fragmentary state. There were no non-metric traits which are generally regarded as either genetic or environmental in origin.

In the absence of documentary records human bone can provide evidence of disease although the information it provides can be limited and, at times, ambiguous. Each bone of the skeleton was observed for evidence of pathology and then it was recorded according to possible cause. Unfortunately, due to the fragmentary nature of many of the bones present, predominantly due to post mortem damage, it was difficult to diagnose disease with overall certainty as most diagnosis usually requires a complete skeleton, which can then be examined for overall distribution patterns of observable lesions.

Results of the analysis

A summary of the results of analysis of Skeleton 1 is displayed in Table 2.

Skeleton No/ Context	Sex	Age	Preservation	*Pathology	Associated Material
Sk 1	? Male	>16 years YAd	30%, grade 0-2	-	Brooch/ Buckle

Table 2: Summary of data obtained from Skeleton 1.

Completeness and preservation

Preservation of this skeleton was poor with only 30% available for study. Most of the right side of the individual was absent probably due to later disturbance in the area, with only a fragment of right tibial shaft surviving and four rib fragments. The skull was very fragmentary with only small pieces of parietal and frontal bone present and one sphenoid fragment. Unfortunately, no facial or mandible bones survived. The thoracic cavity was mostly absent except for one small fragment of sternal body and very fragmentary left and right rib fragments. Only two incomplete thoracic vertebrae survived with several small fragments of cervical and lumbar vertebrae also present. The pelvis was represented by the left innominate only, although this had since fractured. The bones of both the left arm and legs were present although all were incomplete. All bones had cortical surface erosion estimated at grade 0-1, except the vertebral bodies which had more marked surface erosion graded at 2 (McKinley in Brickley and McKinley 2004).

MNI and biological sex

A minimum number of one individual was present and was deemed to be of possible male sex based on pelvic morphology. This was based on the observation of the sciatic notch which was graded at 4-5 and the pre-auricular surface which was absent (0) (Buikstra and Ubelaker 1994). Measurement of the vertical diameter of the left femoral head also suggested that the individual was of possible male sex (45 mm) (Bass 1992, 230).

Age at death

Those bones which had at least one relatively

undamaged epipyseal end, such as the humerus, ulna, radius, femur and fibula were completely fused, suggesting that a combined minimum age of >16 years had been attained by this individual prior to death (Scheuer and Black 2004). The articular surfaces, which were present, appeared relatively youthful with no age related changes observable. This was also the case for the few surviving vertebrae articular facets which also had no observable age related changes. The annular rings of the three surviving vertebral bodies were also present and fused.

The auricular surface of the left innominate (pelvic bone) was partially observable and suggested an age of 30-39 years (grades 3-4) based on its appearance which had patches of granularity along with coarsening and striae (Lovejoy et al. 1985). On the present evidence it is suggested that the individual had obtained adulthood at death but, based on the youthful and fresh appearance of the observable articular surfaces, was probably within the younger adult age category (20-35 years YAd). This probable age category was also strengthened by the surviving fragment of pubic symphysis, which had obvious billowing with slight porosity on its surface (Brooks and Suchey 1990), again suggesting that a younger individual was present.

Stature

Unfortunately height could not be obtained due to the incomplete state of the surviving long bones. The left femur looked relatively robust with fairly rugose muscle attachments.

Non-metric traits and skeletal pathology

No non-metric traits and no skeletal pathology were observable.

Discussion

The human remains from the excavation represent the articulated remains of one individual who appears to have been formally buried within the precincts of the Dominican friary. The individual was placed on their back in an extended position and orientated east/west, with the head at the west end and the lower arms placed towards the pelvis. Artefacts with the individual included a brooch/buckle which was positioned in front of the pelvic area. The individual appeared to be of male sex although this was based on only two sexually dimorphic traits of the pelvis, therefore is tentative only. They had also reached adulthood prior to death although was probably fairly young, between 20-35 years of age (young adulthood). No skeletal pathology was noted on the skeleton, although the remains were very fragmentary and any trace of disease may have been lost.

The burial is consistent with other known medieval burials with regards to burial orientation and the positioning of the lower arms towards the pelvis, such as those found at other friary sites in Scotland in Aberdeen, Linlithgow and Perth (Stones et al. 1989). The arms placed across the body, whether across the chest or pelvis has been interpreted as evidence of a body being firmly wrapped in a shroud (ibid., 114) and with the absence of any evidence for a coffin is more than likely the mode of burial of the present individual. The location of the burial within the foundation trench of a wall is more unusual, although at the Carmelite friary in Linlithgow a similar burial of a young adult male buried within the south foundation wall of the nave was also discovered (Stones et al. 1989, 1/C7). Interestingly, both individuals appear to have been formally buried, with orientation respecting the east/west tradition of the time, although this can also be explained by the fact that the burials were aligned along walls which were orientated in that particular direction. At present it is unknown what the Stirling wall relates to, whether it was the church or an ancillary building of the friary. Excavation at the Carmelite friary sites of Linlithgow, Perth and Aberdeen has revealed that burials were found in the churches of all three sites and in the cloister and two areas to the north and east of the church at Linlithgow.

All three sites have evidence of the burial of male and female individuals, with children also found at Linlithgow and Aberdeen suggesting the local populace was also interred in friary grounds. The difficulty is finding evidence of the friars themselves, although it has been suggested that they would have been buried in their habits. At the Austin friary in Leicester, buckles found near the pelvis were used as evidence of those individuals being friars, as their rule required them to wear a belt with a buckle, rather than a rope cincture worn by other clergy such as the Franciscan (grey) Friars (Stones et al. 1989, 114). The Dominican Friars also wore a belt cincture with a buckle and the finding of a possible buckle

close to the pelvis of the present individual could suggest that he was a friar rather than a local individual.

Conclusion

A single individual was recovered from the burial site at Goosecroft Road in Stirling and probably represents the remains of a male person who had reached adulthood prior to death. The cause of death is unknown.

Radiocarbon dates

Deep deposits of organic-rich material accumulated in some parts of the site below what appeared to be the main medieval deposits and a radiocarbon dating programme was undertaken that concentrated on key medieval features and included the burial, and the organic rich deposits. Eleven dates were submitted for AMS dating to the Scottish Universities Environmental Research Centre (SUERC). Apart from the burial, the dates (Table 3) were from charcoal (hazel, cherry, willow and alder) that was obtained from bulk soil samples, two monoliths and kubiana samples recovered during the excavation. The three dates from each of the two monoliths provided a controlled sample through the organic deposits from the medieval deposits at 400 mm depth to the natural subsoil between 760 to 800 mm depth.

The results of the radiocarbon dates confirmed medieval dates for the main structural elements and burial, but more surprisingly, the dates revealed a long sequence of environmental change dating back to the early Neolithic.

The material culture

The excavations produced a wide variety of artefacts in different materials including stone, pottery, glass and metal, and covered a long period of time suggested by unstratified prehistoric flint artefacts to modern pottery and glass.

Sample	Material	Context	Description	Uncalibrated	Calibrated 2σ	Delta 13C %
SUERC- 59195 (GU37040)	Charcoal: Corylus cf avellana	18	layer	672+/- 31	1272 – 1320 cal AD	-25.00%
SUERC- 59196 (GU37041)	Charcoal: Corylus cf avellana	54	Fill of ditch	815+/- 31	1167 – 1267 AD	-25.90%
SUERC- 59197 (GU37042)	Charcoal: Prunoideae	67	Fill of drain	383+/- 35	1441 – 1528 cal AD	-24.90%
SUERC- 59198 (GU37043)	Charcoal: Corylus cf avellana	70	Fill of ditch/pit	871+/- 30	1119 – 1247 AD	-25.00%
SUERC- 59199 (GU37044)	Charcoal: Alnus cf glutinosa	M1	Monolith 1 top	962+/- 31	1020 – 1155 cal AD	-27.50%
SUERC- 59200 (GU37045)	Charcoal: Corylus cf avellana	M1	Monolith 1 middle	860+/- 31	1150 – 1257 calAD	-28.30%
SUERC- 59204 (GU37046)	Charcoal: Corylus cf avellana	M1	Monolith1 bottom	3628+/- 31	2044 – 1901 cal BC	-26.90%
SUERC- 59205 (GU37047)	Charcoal: Salix sp	M2	Monolith 2 top	944+/- 31	1025 – 1158 cal AD	-26.00%
SUERC- 59206 (GU37048)	Charcoal: Alnus cf glutinosa	M2	Monolith 2 middle	2248+/- 31	321 – 206 cal BC	-27.50%
SUERC- 59207 (GU37049)	Charcoal: Alnus cf glutinosa	M2	Monolith2 bottom	4679+/- 31	3523 – 3369 calBC	-23.80%
SUERC- 59208 (GU37050)	Human bone: fibula shaft L	Skeleton 1	burial	675+/- 31	1271 – 1320 cal AD	-21.10%

Table 3: Radiocarbon dates.

The lithic assemblage

By Torben Bjarke Ballin

The purpose of this analysis is to characterize, date and discuss the lithic artefacts in detail, with special reference to raw-materials and typo-technological attributes. The evaluation of the lithic material is based upon a detailed catalogue of the lithic artefacts from Goosecroft Road, which are referred to by their number CAT no.

As so-called fire-flints form an important element of this collection, special attention is paid to this group of artefacts.

Fire-flint terminology

In dealing with fire-flints from Townparks at Antrim Town in Northern Ireland, the following terminology relating to fire-flints was suggested (Ballin 2005, 18). The purpose of the fire-flint terminology is to allow distinction between flints involved in prehistoric (e.g. Stapert and Johansen 1999) and historic fire-making (e.g. Koch 1990). Two different techniques were applied to produce fire: prehistoric fire-making involved a flint and a piece of pyrite, whereas historic fire-making involved a flint and a mostly bullhorn-shaped steel implement. It is suggested that the use of the term 'strike-a-light' be limited to the implements doing the actual striking (subject), and not the material which is being struck (object). This means that, in prehistoric fire-making, the flint is the strike-a-light (as it *strikes* the pyrite), whereas, in historic fire-making, it is not, as it is being *struck* by the steel strike-a-light. The author suggests referring to the struck historic lithics as 'fire-flints'. The fact that the prehistoric and historic fire-making flints are subjects and objects, respectively, results in notably different wear-patterns, with the former developing smooth abraded points, whereas the latter develop chipped and crushed edges, like the pieces collected from the present site.

A typology was devised in order to present the observed morphological variations. Three main categories were defined: 1) fire-flints based on raw nodules, 2) 'shaped' fire-flints, and 3) fire-flints based on flakes, thermal flakes and fragments. Fragmented fire-flints and fragments of fire-flints were counted independently (Figure 7), as were naturally rolled fire-flints. Categories 1 and 3 are self-explanatory, whereas Category 2 is not. The term 'shaped' is meant to describe pieces which, as a consequence of use, have had their morphologies modified substantially by chipping, crushing and the detachment of smaller and larger flakes.

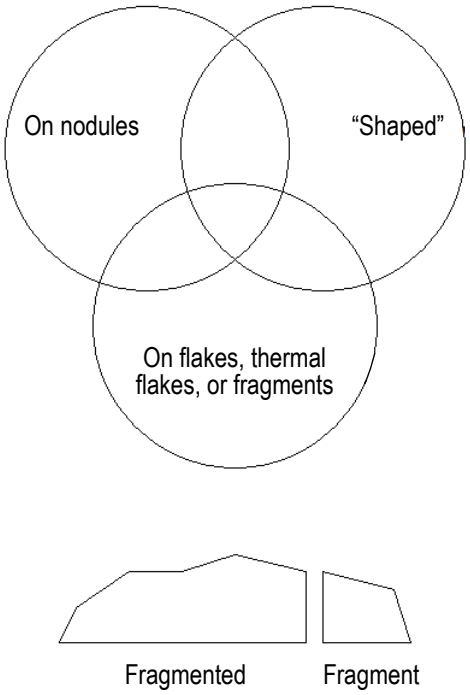

Figure 7: The main categories of fire-flints, fragmented fire-flints and fragments of fire-flints.

However, during the classification process it became clear that there is a substantial overlap between the three main categories, as illustrated in Figure 7. The difference between Categories 1 and 2 is mainly a question of degree of use, with 'shaped' pieces simply being more extensively used specimens. Between Categories 1 and 3 the main problem is that a thermal flake may, over time, become naturally abraded or rolled, making it difficult to characterise the blank as a nodule or a thermal flake. Below, this classification system has been retained, as it provides an overview of the formal variation, whatever its cause, and it supports the author's impression that the spectrum of fire-flints forms a continuum.

Catalogue (by context) *(see Figure 8)*

Context 003

CAT 1 (SF 003) A proximal fragment of a *piercer*, based on a bipolar flake (21 by 18 by 9 mm); tertiary, fine-grained, orange flint; probably a local raw material. A piercer tip was formed at the proximal end by retouching two merging lateral sides.

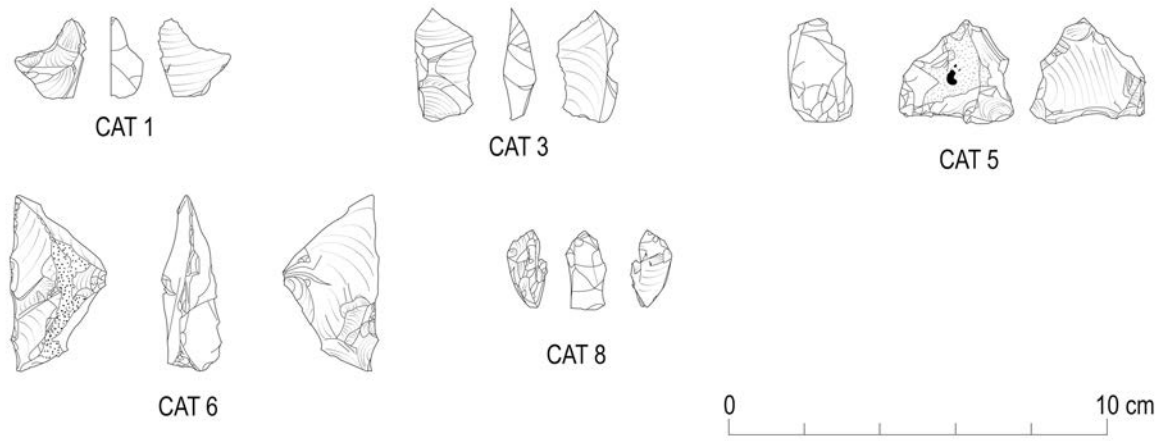

Figure 8: Lithic artefacts: CAT 1 a proximal fragment of a piercer, CAT 3, 6 and 8 are fire-flints, CAT 5 a 'shaped' fire-flint.

Context 025

CAT 2 (SF 125) Possible *fire-flint*, based on bipolar flake (23 by 14 by 5 mm); tertiary, fine-grained mottled grey flint; probably exotic. Use-wear along the right lateral side may be from being struck with a steel strike-a-light.

CAT 7 (SF 263) Proximal fragment of *bipolar flake* (27 by 22 by 8 mm), tertiary, fine-grained mottled grey flint; probably exotic. The piece has a light yellow patina.

Context 026

CAT 3 (SF 127) *Fire-flint*, based on hard percussion flake (29 by 16 by 8 mm); tertiary, fine-grained mottled grey flint; probably exotic. A notable concavity was formed in the dorsal arris, probably by being struck with a steel strike-a-light.

CAT 4 (SF 127) Hard percussion *flake with fine distal retouch* (12 by 15 by 2 mm); tertiary, fine-grained grey flint; probably exotic. Probably retouched to strengthen the edge for fire-making, although no obvious use-wear.

CAT 5 (SF 127) *'Shaped' fire-flint* (30 by 30 by 17 mm); secondary, fine-grained mottled grey flint; probably exotic. Cubic piece reduced from all directions. Numerous battered edges, in several cases developing concavities.

Context 036

CAT 19 (From Sample 36) *Chip* (10 mm); corticated, fine-grained flint; provenance uncertain.

Context 053

CAT 8 (From Sample 015) *Fire-flint*, based on hard percussion flake (21 by 11 by 9 mm); secondary, fine-grained mottled grey flint; probably exotic. Mainly struck along one edge, which displays notable concavities. Possibly the fragment of an originally larger fire-flint.

Context 054

CAT 6 (SF 251) *Fire-flint*, based on hard percussion flake (47 by 24 by 13 mm); secondary, fine-grained mottled grey flint; probably exotic. The left lateral side is fully blunted, probably to strengthen the edge for fire-making. The retouched edge appears abraded. Also wear at the distal end and along the right lateral side.

Context 065 West

CAT 20-21 (From Sample 39) Two *chips* (10 mm); fine-grained, grey flint; probably exotic.

Context 1019

CAT 9 (From Sample 005) *Chip* (10 mm); white milky-quartz.

Monolith 1, Level 200-300 mm

CAT 10 (From Sample 007) *Chip* (10 mm); white milky-quartz.

Monolith 2, Level 100-200 mm

CAT 11-12 (From Sample 019) Two *chips* (10 mm); white milky-quartz.

Monolith 2, Level 300-400 mm

CAT 13 (From Sample 021) *Chip* (10 mm); white milky-quartz.

Monolith 2, Level 400-500 mm

CAT 14-17 (From Sample 022) Four *chips* (10mm); white milky-quartz.

Monolith 2, Level 500-600 mm

CAT 18 (From Sample 023) *Chip* (10mm); fine-grained, grey flint; probably exotic.

Discussion

From the excavations at Goosecroft Road, 21 lithic artefacts were recovered (see Table 4). The assemblage is generally based on the exploitation of flint, and it is thought that the nine sharp-edged quartz chips *may* be natural pieces, not least given the fact that the site yielded no larger examples of worked quartz. The piercer (CAT 1) is in orange flint, which is thought to represent a local resource (see the description of local and exotic flint from Overhowden, Scottish Borders; Ballin 2011, 7); 19 pieces are in various forms of grey and mottled grey flint, which definitely represents exotic raw material; and the provenance of one small flint chip could not be assessed as new cortex has developed (cf. Shepherd 1972). As the site's exotic flint was predominantly used for the production of later prehistoric or historic fire-flints, this flint may represent scavenged deposits of north-west European ballast flint (cf. the recovery of similar forms of flint from other medieval and post medieval Scottish ports, such as Aberdeen, Perth and Edinburgh; Ballin 2007; 2010; forthcoming).

	Flint	Quartz	Total
Chips	4	9	13
Flakes	1		1
Piercers	1		1
Fire-flints	5		5
Pieces with edge-retouch	1		1
TOTAL	12	9	21

Table 4: General flint artefact list.

The piercer (CAT 1, Figure 8) is an expedient piece based on the fragment of a bipolar flake, and it has a simple proximal tip. The implement's general execution and type of flint would be consistent with a prehistoric date, and this piece may be residual in relation to the site's dominant later contexts, structures and finds.

The five fire-flints (CAT 2, 3, 5, 6 and 8, Figure 8) form a highly heterogeneous category, with some being 'shaped' cubic (i.e. 'core-like') pieces, whereas the remainder are based on bipolar or hard percussion flakes or fragments of such blanks. The 'shaped' fire-flint (CAT 5) was formed by detaching small flakes from all directions. It displays heavy wear of edges and ridges, and in some cases concavities were formed where the edges/ridges were struck repeatedly by a steel strike-a-light. Two flake-based pieces (CAT 3 and 8) have no secondary retouch. Both display notable concave wear patterns from use as fire-flints. CAT 6 is a relatively large hard-hammer flake, which has robust retouch along one lateral edge, probably to strengthen the edge and make it suitable for fire-making. This edge appears somewhat abraded, and in addition, CAT 6 has light use-wear along other edges from being struck by a steel strike-a-light. CAT 2 is a bipolar flake with light wear along one lateral edge. CAT 4 is a small, hard-hammer flake with fine retouch along one edge. Although it is highly likely that this piece is also a fire-flint, and that the retouch represents an attempt at strengthening the edge for fire-making (as in the case of CAT 6), it has no obvious wear. It was therefore defined as a piece with edge-retouch, not least taking into account that expedient implements with simple retouch (piercers, knives, etc.) have been identified in other historic (ballast?) flint assemblages, such as the ones from Aberdeen and Dun Eistean, Isle of Lewis (Ballin 2012a; forthcoming).

The unmodified flake CAT 7 may be a blank for a fire-flint, and the chips in exotic flint (CAT 18, 20 and 21) probably represent either the production or use of fire-flints

The various fire-flints and flakes and chips in exotic flint (fire-flint related pieces?) were recovered from Contexts 003, 025-6, 053-4, and 065. It is generally difficult to link this group of artefacts to any specific levels or activities on the site. However, CAT 6 was recovered from Context 054 (the fill of a linear feature in the site's western part) which it has been possible to radiocarbon date to the medieval period (SUERC-59196: 1167–1267 cal AD). In recent years, fire-flints have been recovered from several Scottish sites, such as Allt Iain near Fort William (Ballin 2014); Dun Eistean, Isle of Lewis (Ballin 2012a); Balliscate Chapel, Isle of Mull (Ballin 2017); the Glebe, Iona

(Ballin 2015); Trusty's Hill, Dumfries & Galloway (Ballin 2016); and Knowe of Skea on Orkney (Ballin 2012b). Some of these sites (or contexts/ structures on these sites) have been dated to the Iron Age (e.g. Knowe of Skea), whereas others have been dated to the Pictish period (Trusty's Hill), or the medieval/post medieval period (e.g. Allt Iain). Apart from fire-flints based on datable recycled pieces like gunflints (Skertchley 1879), it is presently impossible to distinguish between early and late fire-flints.

Small stone artefacts

By Beverley Ballin Smith

Only two stone artefacts (Figure 9) were recovered from the archaeological interventions and both are everyday objects, commonly found on urban and rural excavation of the medieval and/or later periods.

The smallest, SF 181 a stone button is from a machine dug context (048) in the north-eastern part of the main area. Its measurements are: diameter 26.8-27.3 mm, thickness 4.4 mm, and diameter of the central perforation is 4-4.5 mm. It is made on slate, chipped to shape on one side, with knife-trimmed edges. The central perforation was drilled but was later damaged when the surfaces of the piece became chipped around it. Subsequently, the chipped marks have been worn smooth. The hole is worn to a slight hour glass shape, becoming elliptical in shape on the surfaces. The piece is too small, thin and light to be a spindle whorl and too large to be a bead but it may possibly be a button. Similar items identified as buttons have been found at Paisley Abbey and also at Melrose Abbey (Bob Will pers. comm.). The piece would have been secured on a garment by a thread or thong tied in a knot to stop it falling off.

The other stone artefact SF 62 is a fragmentary hone for sharping iron/steel blades, found in context 003, the first soil layer beneath the overburden and demolition deposits. Its maximum length is 92 mm, its maximum width 30 mm, and maximum thickness 13 mm. It has a central perforation of 6−7 mm diameter.

The tool is made on a very fine-grained mudstone bar with a perforation at its surviving end, but has clearly broken across its width. The end by the perforation has been cut by a machine as regular cutting marks are still clearly visible. Both sides are double chamfered and are quite sharp and unworn but the face of the stone by the perforation has been lost through flaking. The perforation is slightly worn and elliptical indicating it was hung on string or similar. The piece is post-medieval or later in date, but given its largely unworked state, it may have broken and been discarded before the tool was put to use.

Moulded stone fragments

By Richard Fawcett

SF 77 Window tracery fragment: springer at the junction of two arches (Plate 8, Figure 10)

This finely worked stone embodies the springer of a pair of window arches at their point of bifurcation; its lowest part has broken away, and one of the arches is more badly damaged than the other. The upper beds of both arches, which

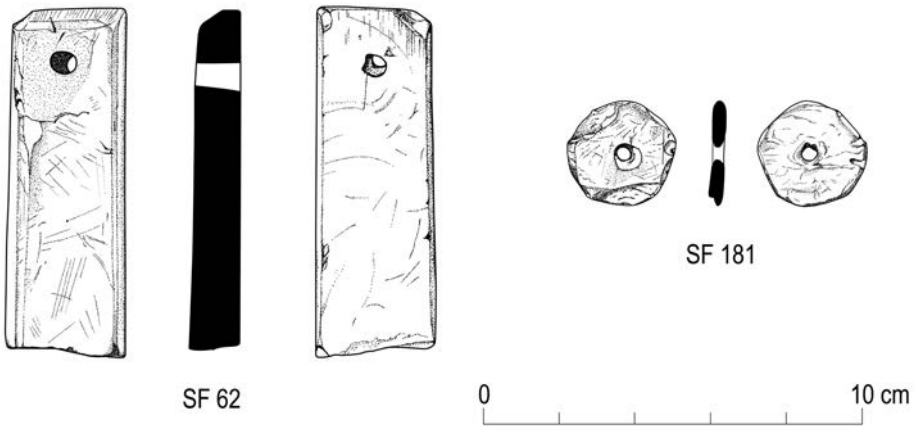

Figure 9: Small stone artefacts SF 62 a hone and SF 181 a possible button.

are more roughly tooled than the surfaces that were intended to be visible, have survived to varying extents, and on the more complete of the two beds is a lightly incised axial line that would presumably have served to ensure that the template was correctly aligned when the stone was being cut.

This worked piece, of moderately finely-grained buff-coloured sandstone, is dated to approximately the fourth quarter of the thirteenth-century. Its maximum measurements are 290 mm wide by 200 mm deep by 410 mm high.

The profile of the arches is likely to have reflected that of the supporting mullion. If that is the case, to one side of the glazing plane the mullion was given the form of a filleted leading roll flanked by cavettos; on the other side of the glazing plane it evidently had the simpler profile of a wedge shape with angled flanks terminating in a narrow leading face. In the arches themselves, however, the profile on one side of the glazing plane is asymmetrical, with no more than half of the filleted roll and a single cavetto to the intrados, and with the corresponding part of the extrados treated as a plain angled face. The glazing was evidently held in a metal or timber frame located within a right-angled rebate, though nothing survives of any fixings there may have been.

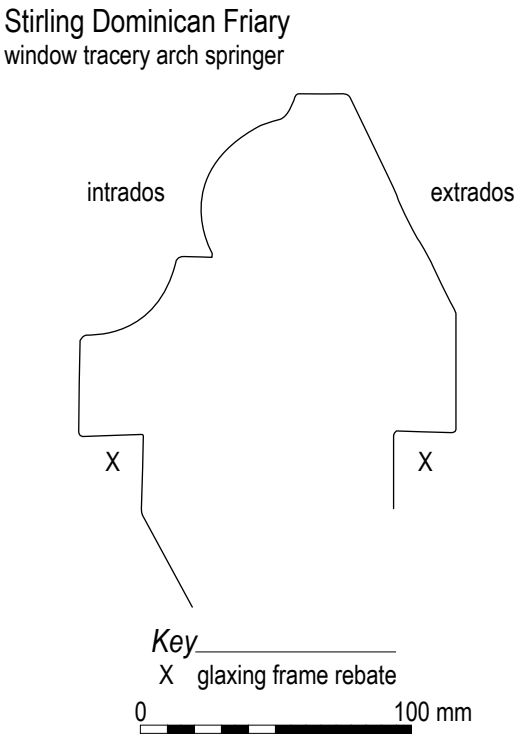

Figure 10: SF 77 window tracery fragment.

a)

b)

c)

d)

Plate 8: SF 77 window tracery fragment (a-d): springer at the junction of two arches.

At the lowest part of the salient cheeks of the intrados of each sub-arch there is a small area of broken stone. Three possible explanations for this might be worth considering:

1) Were the broken areas the stumps of the springer points of lower arches that were the heads of lesser lights within the arches?

2) Do they survive from vertical springer blocks that rose up into the intrados of the arches, and eased the transition between the vertical of the mullion and the curve of the arches, such as may be seen in the single-light windows of the north transept at Dryburgh Premonstratensian Abbey?

3) Did they form part of the upper junction of cusps with the intrados?

There is, however, insufficient evidence to be able to advance any of these possibilities with confidence, particularly since the broken area is limited to the salient cheeks outside the glazing plane.

In attempting to assess the date of this fragment it must be accepted that there can be no certainty on the limited diagnostic evidence provided by what survives. In particular, it must be borne in mind that mullions and form pieces with the profile of a filleted roll flanked by cavettos have a long history, and were in continued favour for much of the later Middle Ages. However, three particular details might arguably point to a date around the last decades of the thirteenth century, when bar tracery appears to have been first introduced into Scotland:

1) It is clear that the glazing was held by timber frames or ferramenta set within rebates, whereas by the fourteenth and fifteenth centuries it was more usual, though not invariable, for the glazing in major ecclesiastical buildings to be set into chases cut into the cheeks of the form-pieces and mullions.

2) Asymmetrical treatment of tracery form-pieces of the kind seen in the arches of this fragment is more common in first-generation bar-traceried tracery, as seen for example in some of the presbytery windows at Sweetheart Cistercian Abbey, or in the one bar-traceried window of the south choir aisle of Glasgow Cathedral. In later windows, while there might be a hierarchy of scale within the form-pieces of a single window, the form-pieces themselves were generally symmetrical, with the same profile to both the intrados and extrados.

3) The likely absence of cusping would also be consistent with a date in the later thirteenth century. Nevertheless, it must be stressed that none of this could be regarded as firmly conclusive evidence for the date of the fragment.

It is not clear which part of the sub-arches was internal and which external, and thus whether the rebate for the glazing frame was set into the external or internal part of the tracery. In general, it can be said that in twelfth-century windows it was common for the glazing frame to be set towards the exterior, as is seen in the late twelfth-century fenestration of Arbroath Tironensian Abbey, for example. By the thirteenth century, however, it had become more common for the glazing frame to be set towards the interior, where it was presumably better protected and more secure, as seen at Restenneth Augustinian Priory.

There are, however, exceptions to this, including a number of windows in the presbytery of Sweetheart Abbey, which must date from around the time of the endowment of the abbey in 1273 (Anderson 1899). These windows show some similarities with the Stirling fragment in having a filleted roll on one side of the form-pieces (and mullions), and simply angled faces to the other. In the case of some of those Sweetheart windows the more complex treatment is towards the interior and the simpler treatment and glazing rebate towards the exterior. On the basis of such comparisons there can be no certainty which part of the sub-arches at Stirling was internal, and whether the glazing frame was towards the interior or the exterior.

The measured drawing of one of the Sweetheart windows (Figure 11) indicates where the Stirling fragment may have been located in such a window, at the springing point of two arches. The detail of the window tracery fragment is portrayed in Figure 12.

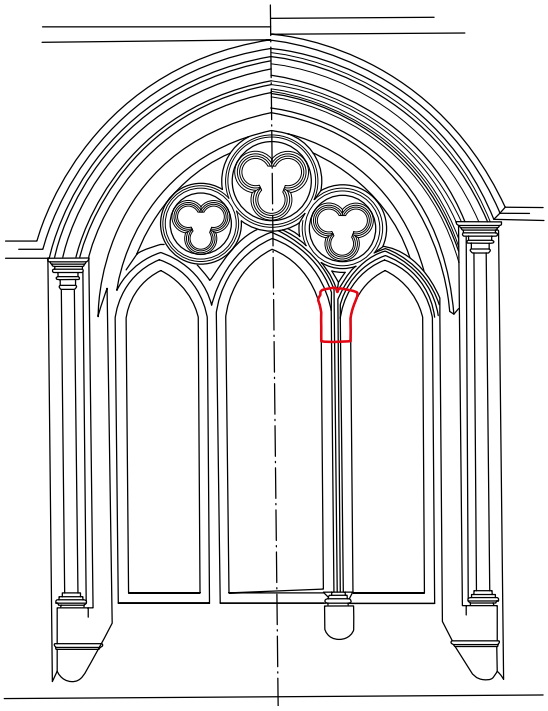

Figure 11: Example of Sweetheart Abbey, presbytery window (MacGibbon and Ross 1899, Five Great Churches of Galloway).

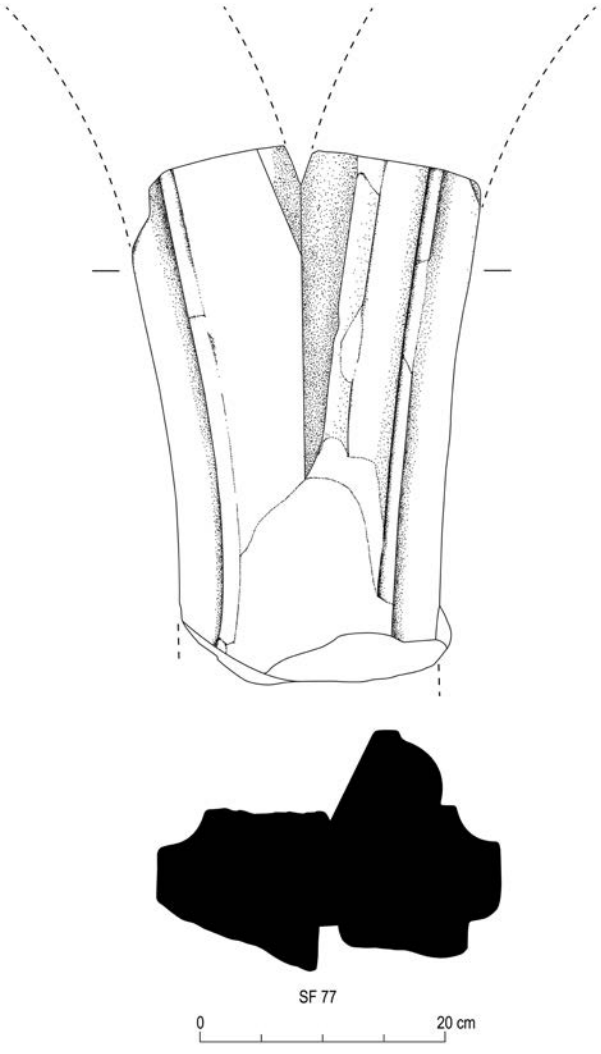

Figure 12: Detail of SF 77, window tracery fragment and its section.

Window tracery fragment: form-piece *(Figure 13, Plate 9)*

This piece moderately finely-grained buff-coloured sandstone is dated to approximately the fourth quarter of the thirteenth-century. Its maximum measurements are 115 mm wide by 170 mm deep by 200 mm high.

This curved form-piece is likely to have originated in the tracery field of a window of some scale and complexity. To one side of the glazing rebate it is of asymmetrical profile, with a simply angled face to the extrados, and a pair of cavettos terminating in a roll to the intrados; that roll is so damaged that it is now impossible to determine if it was filleted in any way. On the other side of the glazing rebate is what appears to have been a wedge-shaped tail with angled flanks terminating in a narrow leading face.

The asymmetrical profile to one side of the glazing rebate, together with the wedge-shaped profile to the other side, shows kinship with SF 77, and it appears likely that it came from a window of similar date. However, the lesser scale by comparison with the other piece suggests that it was from a part of its window that was at a subordinate level in the hierarchy of forms.

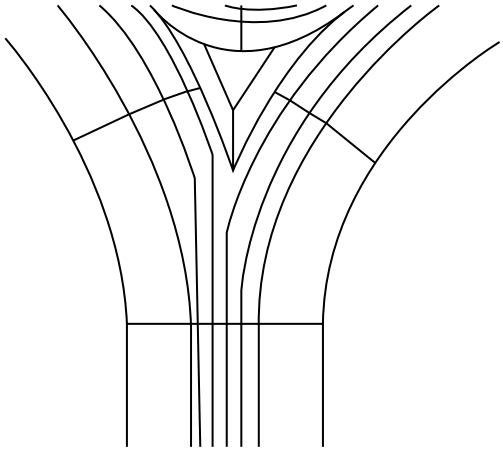

Figure 13: SF 76 window tracery fragment, form piece.

One possible interpretation of the combined evidence of these two stones, with their indications of major arches and subordinate form pieces, is that they could have formed parts of windows like that in the second bay from the west of the south choir aisle at Glasgow Cathedral (Figure 14), where work had been started around 1242 (Innes 1843). That window was probably inserted in the final stages of completing the eastern limb, perhaps around the time that timber was

provided for a bell tower and treasury in 1277, works that probably formed part of a subsequent stage of operations. Windows of this type, with their permutations on combinations of paired lights with a circlet at their head, were one of the standard types of first-generation bar tracery across Europe. It must be stressed, nevertheless, that there is insufficient evidence to suggest this as more than one possibility amongst others.

a)

b)

c)

Plate 9: Window tracery fragment (a-c): form-piece.

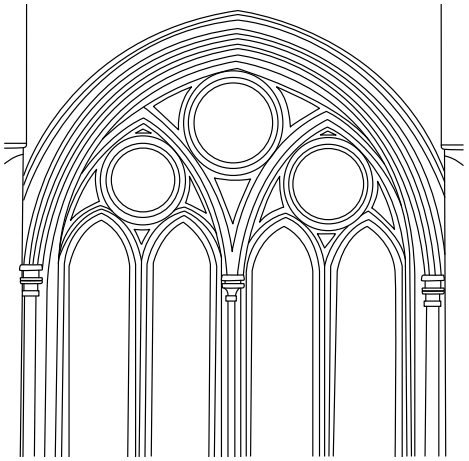

Figure 14: Glasgow Cathedral, south choir aisle window (Collie 1835 Plans...of the Cathedral of Glasgow).

The wheel-thrown pottery

By Bob Will

The analysis of the assemblage of wheel-thrown pottery (excluding brick and tile) recovered from the excavations includes material recovered from an earlier evaluation. In total, 1489 sherds amounting to almost 21 kg of pottery were recovered from the investigations. Scientific investigation by ICPES/AES and petrographic analysis was carried out on a group of Scottish Medieval Redwares and Scottish White gritty ware sherds (see below). All the sherds retrieved from the excavation were individually examined and weighed, with diagnostic features such as rims, handles and bases, and differences in fabric and decoration recorded. The sherd numbers and different fabrics present are summarised in Table 5. The pottery was catalogued according to guidelines and standards produced by the Medieval Pottery Research Group (MPRG 1998 and 2001).

The medieval assemblage

Scottish Medieval Redwares

A total of 759 sherds (51% by sherd count and 51% by weight) of Scottish Medieval Redwares was recovered from the excavation. This name is a general name to describe a group of similar oxidised orange or red coloured fabrics that are found throughout Scotland (Haggarty, Hall and Chenery 2011). These wares form the second largest group of sherds at Goosecroft Road and comprise mainly cooking pots or storage jars, jugs and bowls. The largest assemblages of Scottish Medieval Redwares have been recovered from excavations in Aberdeen, Perth and other

Fabric	Total sherds	Rims	Bases	Handles	Body sherds	Weight (g)
Scottish Medieval Redwares	759	62	71	36	598	10595
Scottish White gritty ware (medieval)	270	35	13	11	227	2477.5
Yorkshire	54	3	2	2	47	475.3
Stamford?	1	0	0	0	1	18
English	1	0	0	0	1	16
Martincamp	9	0	0	0	9	84
Beauvais	2	0	0	0	2	34.3
Low Countries Greyware	1	0	0	1		82
Low Countries Highly Decorated Wares	2	1	0	0	1	29.1
Scottish post-medieval oxidised wares	60	11	8	5	36	2413.6
Scottish post-medieval reduced wares	134	6	1	6	121	1903.7
Import?	3	0	0	0	3	23
Raeren-type	4	0	0	0	4	52.9
Siegburg	1	1	0	0	0	6
Tin-glazed earthenware	16	7	1	0	8	87.9
Modern white earthenware	123	29	11	0	83	609
Modern red earthenware	42	8	6	2	28	507.1
Modern industrial stoneware	6	0	3	0	3	1391.1
Totals	1489	163	116	62	1170	2087.7

Table 5: The numbers of the different pottery fabric types.

east coast burghs, which along with kiln sites at Rattray near Peterhead and Stenhouse near Falkirk have led to the use of the fabric name East Coast Redware (Hall 1998).

Generally, these fabrics are thought to date from the thirteenth to fifteenth century although the recent publication of the Perth High Street excavations has identified Scottish redware fabrics from the mid to late twelfth century (Hall, Haggarty and Vince 2012). The kiln site at Stenhouse (Hall and Hunter 2001) is the closest and only excavated kiln site to date for the medieval period in the area, although there are historical references to a late medieval pottery site at Goose Croft in Stirling. Goose Croft was located immediately south of the present site in the vicinity of the Thistle Shopping centre and the name survives as Goosecroft Road (Harrison 2012). Some of the local sherds could have been made there, although as the site has probably been destroyed, this suggestion cannot be definitely proven, although the chemical analysis of the clay indicates a nearby source (see Jones below). There was traditionally a wide variation in redware fabric, from quite crude and rough pots to well-sorted thin-walled and well-made vessels. The firing conditions also varied from oxidised to reduced or partly reduced. These variations may reflect different kilns or manufacturing sites, or even chronological differences.

Several sherds with sooting and fuming on the exterior may be from cooking pots. These sherds are generally well made with thin walls and could be late twelfth or early thirteenth century in date. Redware cooking pots are not common even in Perth where redware is the main local medieval fabric. Sherds from late medieval 'chamber pot' style handled cooking pots were also recovered from Goosecroft Road, along with straight handles from skillets and a crude rim that might be from a dripping dish.

The jugs generally have simple pulled spouts, an upright rim and a grooved strap handle (Plate 10). The upper portion of a jug, SF 303, was recovered that had a dark green/brown coloured glaze on its shoulders and body but not on the neck or rim (Figure 15). Jugs tend to have a clear glaze, which on the red clay body produces a brown or dark green colouring. Two glazed tubular bridge spouts (SF 203, Plate 11) were recovered and would reflect the influence of the decorated Yorkshire jugs that came into Scotland in the late twelfth and thirteenth centuries. A variety of handles were recovered including grooved and ridged strap handles and a twisted ribbed rod handle with a white slip under the light green glaze (Plate 10). There were also two barley sugar' style twisted rod handles (SF 361; Plate 12). All the jugs have flat bases, some with thumbed decoration, either in groups or continuously round the base. Apart from glaze, the jugs were generally not decorated although one sherd (SF 361) has a wave pattern consisting

Plate 10: Pottery handles (left to right), SF 259 strap handle with thumbed decoration, SF 361 a ribbed rod handle and SF 58 a spiral rod handle.

Plate 11: Pottery (clockwise from top left) SF 111 Beauvais ware, SF 216 rim of Seigburg stoneware, SF 262 (2 sherds) of decorated Scottish White Gritty ware, SF 203 tubular bridge spout, and SF 214 crudely decorated sherd of Scottish Medieval Redware.

Plate 12: Pottery (left to right) all SF 361 Scottish Medieval Redware barley twist handle fragment, English piece with ear of wheat, Scottish Medieval Redware decorated sherd, and Scottish Post medieval reduced ware with simple design.

of pinched clay raised up in a repeating horizontal pattern (Plate 12). In addition, another sherd had vertical applied strips. Another sherd, SF 214, was crudely decorated (Plate 11). The complete rim of a large storage jar, SF 225, was recovered with a diameter of 120 mm, with an upright rounded rim with dark green glaze on the exterior but not on the rim (Figure 15). The vessel was thought to be a jar as the rim did not have a spout and there was no evidence for a handle. Other vessels within the assemblage include bowls with glaze on the interior and two possible 'dripping dishes' (Figure 15; SF 138). These are usually rectangular in shape with a flat base and low side walls that were used in cooking or serving food.

Sixty sherds had a white slip presumably to mask the red colour of the fabric and this has also been noted on sherds from Perth where the locally made pots tend to be in an orange/red fabric but were slipped to compete with white gritty wares. In Perth, these wares are more common in the thirteenth and fourteenth centuries and appear to fall out of use in the fifteenth century (MacAskill et al. 1987). The sherds from Goosecroft Road include five cooking pots rims, two barley sugar jug handles, three jug rims and two bases. Therefore the use of white slip may be more extensive than previously thought, especially its use on jugs. A white slip was used on jugs to highlight the colour of the glaze to produce a lighter colour. It is a common feature of the Low Countries Highly Decorated wares which have a red fabric, white slip and then a full green glaze.

Scottish White gritty ware

A total of 272 sherds (18% by sherd count and 12% by weight) of Scottish White gritty ware were recovered. This type of fabric occurs in large quantities, mainly in the east of Scotland but increasingly throughout Scotland (Jones et al. 2006). At present only one kiln site has been excavated at Colstoun near Haddington in East Lothian (Brooks 1980, 364-403; Hall 2007), although additional kiln sites have recently been discovered at Ceres and Coaltown of Wemyss in Fife (Will and Haggarty 2008, 136-149). White gritty wares date from the late twelfth century (Haggarty 1984, 396-7) through into the late fifteenth and early sixteenth centuries (MacAskill 1983). The earlier vessels tend to be thin-walled, straight-sided cooking pots with flat bases while

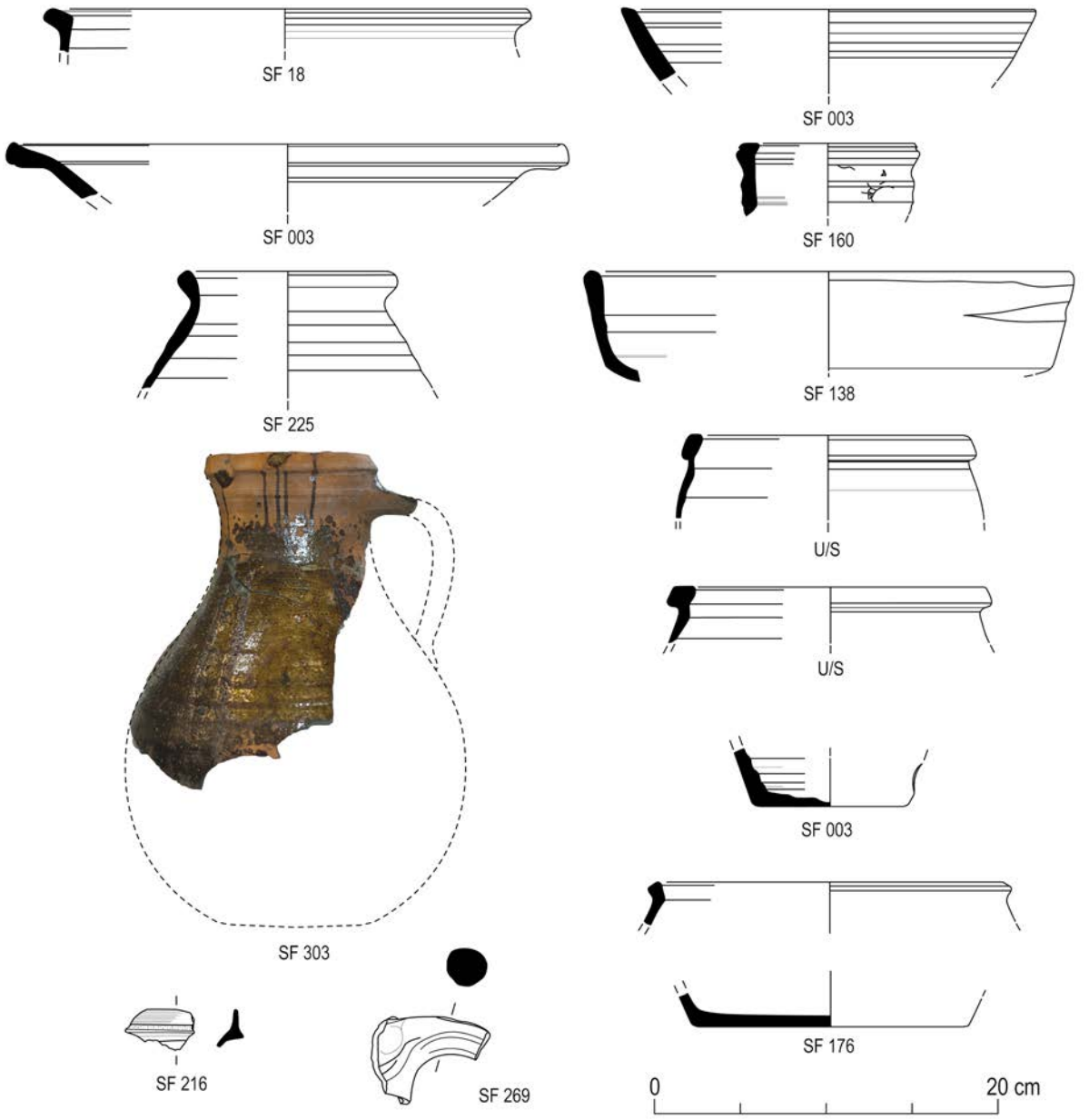

Figure 15: Examples of the pottery. Scottish Medieval Redware SF 18, 225, 269 and 303, Scottish White Gritty ware SF 003 (2 rims), 2 unstratified rims and SF 176, Scottish Post-Medieval Reduced wares SF 138, 160, Siegburg rim SF 216, and a base of industrial stoneware SF 003.

the later material is much thicker and heavier with a wider range of vessels, particularly jugs and bowls.

The material from Goosecroft Road consists of a mixture of similar fabrics and includes thin-walled storage jars/cooking pots and later thick-walled jugs. Cooking pots are present and are identified by the presence of sooting and fuming marks on their outer surfaces. Several rim sherds were recovered but unfortunately it was not possible to reconstruct profiles or forms. Many of the cooking pot sherds were thin-walled with pronounced rilling or throwing marks indicative of a late twelfth or early thirteenth century date.

The jugs tend to have upright rims with simple pulled spouts and strap handles that are attached just below the rim. Both grooved strap handles and ridged strap handles were recovered along with one bridge spout. The range of decoration includes applied vertical impressed strips (SF 262; Plate 11) and applied pellets and another sherd, SF 262, was decorated using four prongs to give a repeating impressed design (Plate 11). The glaze was mainly shades of green with some brown and yellow. The bases were flat and one had thumbed decoration round the base edge.

Yorkshire type Wares

In total, 54 sherds (4% by sherd count and 2% by weight) in Yorkshire-type fabrics were recovered. There were several potteries operating in Yorkshire in the thirteenth and fourteenth century and these tend to be the most common imported pots coming into Scotland, with large numbers of sherds recovered from excavations in Leith, St Andrews, Perth and Aberdeen. In Aberdeen, trade in these vessels appears to stop around c. 1400 (Cameron et al. 2001). The Yorkshire fabrics tend to be white to buff coloured and well made with few inclusions and usually have a bright green coloured glaze. The vessels tend to be highly decorated jugs with various applied decorations and motifs. The sherds from Goosecroft Road include applied vertical strips and scale decoration. One of the sherds from may be from a rounded lid for a jug. Two ridged rod handles were recovered along with one grooved strap handle. The two base sherds both had thumbed decoration. One body sherd, SF 58, was decorated with an impressed 'raspberry' motif that had been pushed out from inside the pot. The use of this motif is quite common on vessels from the kiln sites at Scarborough and Brandsby. Both kilns produced very similar vessels in terms of shape, decoration and glaze and seem to have used the same clay source. Brandsby wares seem to have replaced Scarborough wares in York during the early and middle decades of the thirteenth century (Mainman and Jenner 2013, 1230).

Stamford

One sherd was recovered from a jug in a distinctive white to cream-coloured, smooth fabric with a bright green copper glaze. These vessels from Stamford date to the period 1150-1250 (Kilmurray 1980) and have been recovered from a number of excavations in Scotland including Edinburgh, Leith, St Andrews, Aberdeen and the Isle of May.

English

One sherd that probably originates in England was recovered with distinctive decoration in the form of an ear of wheat (SF 361; Plate 12). This type of decoration was quite common and the sherd probably dates to the fourteenth century.

Continental Imported Wares

A number of imported sherds from mainland Europe were recovered and these include the major wares traded across Europe in the medieval period (see Table 5).

Beauvais

Two sherds were recovered in a white fabric with a bright yellow glaze and are probably from the kilns at Beauvais in Northern France (SF 111; Plate 11). There was a well-established pottery industry in the Beauvais region from the fourteenth century. These distinctive yellow glazes were introduced in the later fifteenth and early sixteenth century and are often found on bowls or chaffing dishes. However, these vessels are also found with a green or brown glaze (Hurst et al. 1986). Similar vessels have been found at a number of sites in Scotland including Aberdeen and Edinburgh.

Martincamp

Nine sherds (84 g) were recovered in a thin off-white fabric. Three of them are from the neck of a flask where there is a slightly rough overlapping lip on the inside of the pot where the neck has been joined to the body. This distinctive type of flask or costrel with a long neck and slightly flattened body was made at Martincamp in North France in different fabrics including stoneware. The sherds from Stirling are in the Type 1 which has been closely dated in England to the period 1475 to 1550 (Hurst et al. 1986). These vessels have been found on a number of sites in Scotland.

Low Countries Greyware

One handle with rim, possibly from a ladle was recovered in a Low Countries Greyware fabric. Greywares were made at a number of sites in the Low Countries and date from the twelfth to the fourteenth century, after which time they were replaced by Low Countries Redwares in the fifteenth century. These two groups of vessels share the same clay sources and often the same shape and style of vessel, the only difference being the firing conditions in the kiln.

Low Countries Highly Decorated Ware

Two sherds including a rim sherd probably from a highly decorated jug were recovered in a red/brown fabric with a white slip under a thick green glaze. These vessels were made at a number of sites particularly near Brugge and date to 1250-1350. Other examples have been found from St Andrews, Aberdeen and the Isle of May.

Siegburg stoneware

One rim sherd from a drinking bowl was recovered. The fabric is thin and fine off-white to light grey stoneware with an orange-brown ash glaze on the rim edge (SF 216; Figure 15; Plate 11). The height of production for Siegburg was in the fifteenth century (Hurst et al. 1986). Similar sherds have been recovered from a number of sites including Aberdeen (Cameron et al 2001).

Raeren-type stoneware

Four sherds of Raeren-type stoneware were recovered. The fabric is usually dark grey with a bright grey salt-glaze, sometimes with an iron wash. The fabric is almost identical to that from Aachen, Frechen and Cologne. Although Raeren was in production in the fifteenth century it is during the sixteenth century that they become common (Hurst et al. 1986, 194).

The post-medieval to modern assemblage

Scottish post-medieval reduced wares and oxidised wares

A total of 194 sherds of both Scottish post-medieval reduced (134 sherds) and oxidised (60 sherds) wares were recovered (Table 5). These fabric types were first classified at Stirling Castle (Haggarty 1980) and the pottery dates from the late fifteenth to eighteenth centuries. The only published kiln site for these wares in Scotland is at Throsk on the banks of the River Forth just outside Stirling (Caldwell and Dean 1992) but other kiln sites making similar vessels are likely to have been in operation across Scotland. Historical research at Throsk has uncovered details about the potters and their families and links to other parts of Scotland (Harrison 2002). It has been suggested that it was the draining of the carse that lead to the development of pottery production as the carse clays became more easily accessible (Haggarty and Lawson 2013). The best range of vessels so far recovered comes from Throsk and Stirling Castle where platters, bowls, skillets, fish dishes and money boxes or *pirlie pigs* as well as the more common jugs have been recovered.

Scottish post-medieval reduced wares tend to be thick-walled and the fabric is usually heavily reduced to grey or black with few inclusions and a thick, dark-green glaze. The oxidised wares are very similar except they tend to be thinner-walled and better made and tend to be found in a wider range of vessels. For the oxidised wares the fabric is reddish/orange or more commonly partially oxidised or partially reduced, these variations are the result of firing conditions in the kiln.

The reduced wares recovered from Goosecroft Road are quite typical and consist of mainly jugs with grooved strap handles, thick walls and a short neck with a cordon below the rim. The jugs have a full green glaze and sherds were recovered with an incised wave decoration or other simple decoration (e.g. SF 361, Plate 12). Some of the base sherds have evidence for knife trimming, but other vessel types were present including the complete profiles of two dripping dishes and a straight handle from a skillet. A reduced strap handle with thumbed decoration along the centre was also recovered and may date to the late medieval period, and could have been accidently over-fired in the kiln.

The oxidised wares include small jugs and bowls identified from the rims and the use of an internal glaze. The handles consisted of both grooved strap handles and rod handles but one small handle had an oval profile. A thick 'lug' handle was also recovered possibly from a large storage jar or cooking pot. More unusual was a rim from a shallow plate or platter with a diameter of 170 mm. The upper surface was reduced grey with a light brown/green glaze that had flaked off in places.

Late Eighteenth, Nineteenth and Twentieth Century Industrial Wares

The modern industrial ceramics consist of white earthenware (127 sherds), red earthenware (47 sherds) and industrial stonewares (six sherds) that date from the late eighteenth century through to the early twentieth centuries. White earthenwares tend to be table wares while the red earthenwares are usually more utilitarian wares consisting of large bowls and storage vessels.

Tin-glazed white earthenware

A small number of sherds (16) of white earthenware with pale blue tin glaze were also recovered. Tin glaze became common in Europe from the sixteenth century with potteries in the Netherlands and England before taking off in the seventeenth and eighteenth centuries. Most

of the sherds from Goosecroft Road are likely to date from the late eighteenth century and may have been made at the Delftfield factory in Glasgow which operated from 1748 to 1823. Unfortunately, the glaze has flaked off most of the sherds so there is little in the way of decoration which would help in identification. One sherd, a rim from a small plate, was decorated with a hand painted design with blue bands with green wave design in between. This could be an imported vessel and slightly earlier in date.

White earthenware

The main assemblage of white earthenwares (123 sherds) represent a variety of forms, including plates, bowls, teapots and teacups that have been decorated by a number of methods including hand painting, sponge printing and transfer printing. Unfortunately, most of the decorated sherds are too small to be able to identify the pattern. The use of sponge printing as a decorative technique is thought to have been introduced from the 1830s or 1840s.

Many of the remaining sherds were from bowls and planters and were decorated with horizontal painted bands that ran round the rim and sides of the vessels, the more open bowls often had bands on the inside rather than the outside. Sponge printed designs were also often used on these vessels where the sponged designs would fill the space between the horizontal bands.

Red earthenwares

The red earthenwares (42 sherds) represent a range of more utilitarian vessels than the white earthenwares. These vessels are usually larger with thicker walls and are often made from coarser fabrics. The vessels include large slip-lined dairy bowls and storage vessels. The dairy bowls are large bowls with a white or cream coloured slip on the interior that has then been covered by a clear lead glaze, while the exterior remained unglazed. On some examples there are also spots or swirls of brown or green glaze on the interior. These vessels tend to have a wide rim and a narrow base.

Of the remaining red earthenware sherds, most are covered in a brown lead glaze or a dark brown/black manganese glaze, and several sherds have white or cream coloured slip-trailed decoration.

The red earthenware industry was widespread throughout Scotland and many of the white earthenware factories also produced red earthenwares. In addition, there were many small potteries that produced red earthenwares for local markets.

Industrial stoneware

Six sherds of Industrial stoneware were recovered including two complete bottles or storage jars probably for ink and a base sherd from an ink bottle with lettering. These types of vessels were made in vast quantities at factories in Glasgow, Newcastle and Portobello, as well as many other locations in the nineteenth and early twentieth centuries.

Building materials

Medieval tile *(Table 6)*

Three fragments of medieval floor tile were recovered from the excavations. They are in a similar orange/red fabric with few inclusions and are approximately 27 mm thick. The two larger fragments (SF 183) have a patchy pale yellow glaze over a white slip that appears to have been applied with a brush. The remaining fragment (SF 224) has a thick dark green glaze (both Plate 13). Floor tiles in Scotland are often found in early monasteries or friaries and tend to date to the thirteenth century.

Material	Number of pieces	Weight
Medieval tile	3	1278
Modern tile	7	324
Brick	4	2508
Brick/tile	46	270
Tile	16	2296
Daub	3	11.4
Kiln waste?	1	44
Total	80	6731

Table 6: The number of pieces and weight of items identified as building materials.

Other building materials

A total of 73 fragments of recognised building materials, such as hand-made bricks, roofing tiles and ceramic drain pipes, were recovered in an orange/red fabric. Several of the brick/tile fragments are probably from chimney pots as they are curved with sooting on the surface. These presumably date from the post-medieval to modern period.

Plate 13: Medieval tile fragments, SF 183 (two fragments) with pale yellow glaze over a white slip, and SF 224, with dark green glaze.

Conclusion

This assemblage of pottery recovered from Goosecroft Road covers a wide date range from the late thirteenth or early fourteenth centuries through to the early twentieth century although the main assemblage would date to the fourteenth century. The medieval and early post-medieval material is mainly of local origin but does include material from France, Germany and the Low Countries. The imported sherds from England and mainland Europe represent 5% of the assemblage by sherd count and 3% by weight, which is comparable with other urban sites in Scotland. The largest group of imported pottery is from Yorkshire (4% by sherd count and 2% by weight) which would date to the late thirteenth or early fourteenth century. The local redwares and white gritty wares would be broadly of the same date, and would be contemporary with the use of the friary. The small assemblage of late medieval and post-medieval imported vessels would date to the period when the friary fell out of use in the sixteenth century.

Chemical analysis of Redwares and other medieval pottery from the site

By Richard Jones

The excavation produced a medieval pottery assemblage dominated by Scottish Redware but with some examples of White Gritty ware as well. Following the study of this pottery, the opportunity was taken to use chemical analysis to assess whether it was produced locally or further afield at one or more workshops. Such an assessment would be carried out with reference to the large Red and White Gritty Ware chemical databases (Haggarty et al. 2011 and Jones et al. 2002-03 respectively).

The only known pottery production centre of medieval date in the Forth Valley is at Stenhouse (Figure 16) where eleven kilns and much associated Redware pottery were recovered (Hall and Hunter 2001). By the post-medieval period, the demand for pottery and other ceramics coupled with the abundance of suitable clays in the carseland south of the River Forth and east of Stirling stimulated an industry of some size and importance (Harrison 2002); Throsk (Caldwell and Dean 1992) was the principal centre, but there were smaller ones as well including Cockspow, Drypow and Bandeath (Figure 16).

The material

The samples are listed and described in Table 7, and are illustrated in Plates 14 and 15. They include the plentiful dark clay found on the site and some 'typical' specimens of Redware from the kiln at Stenhouse (Plate 16) (Hall and Hunter 2001).

Methods

Chemical analysis of all samples was carried out by ICP-ES and MS in February 2012, using the same technique (for ICP-ES) and methodology as that described by Jones et al. (2002-3). The samples together with standards were analysed at the Earth Sciences Department, Royal Holloway College, University of London, Egham. The composition data consisting of the concentrations of nineteen elements (ICP-ES: Table 2 Al to Zr) and thirteen trace elements (ICP-MS: Table 2 Cr-Pb) elements were treated using the IBM-SPSS PC statistical package (v. 22).

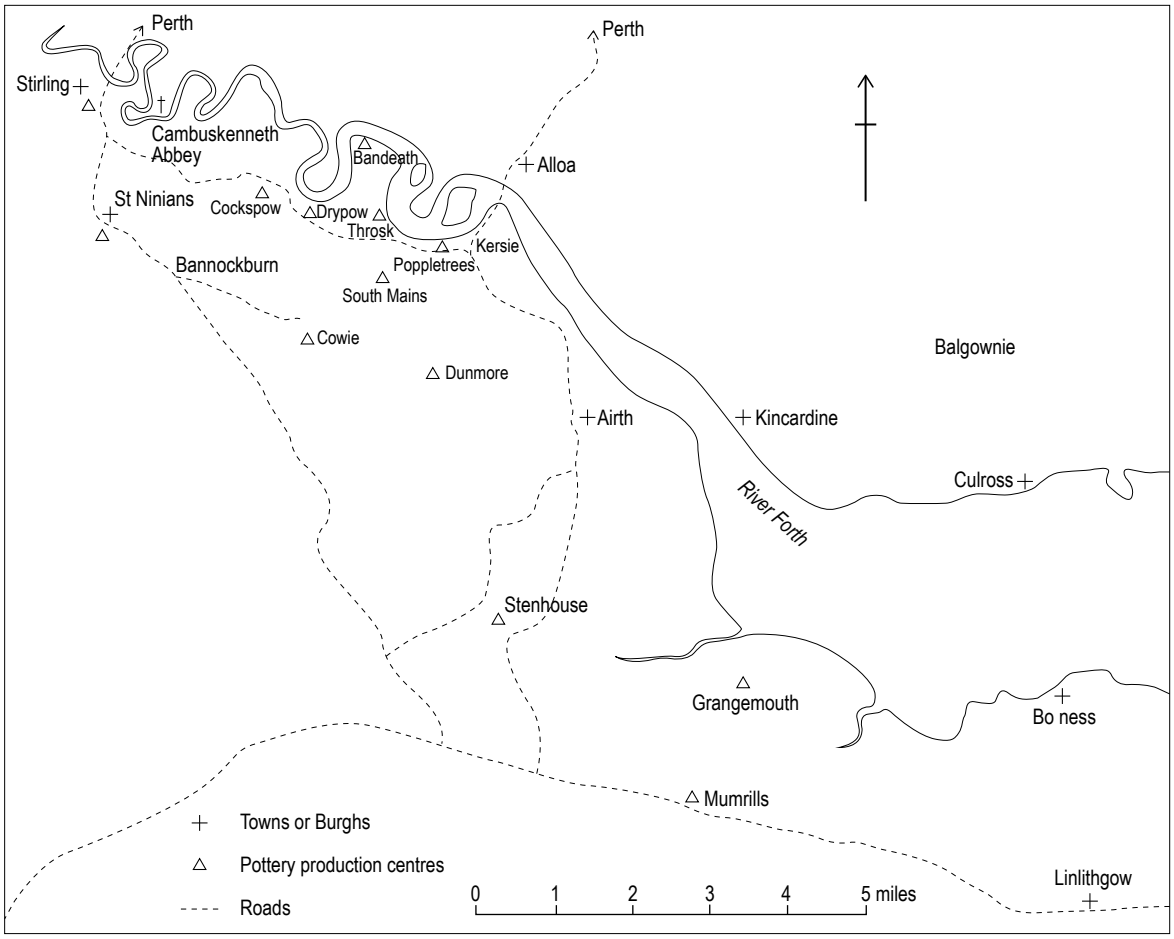

Figure 16: Sixteenth and seventeenth century pottery production centres in the Forth Valley (Caldwell and Dean 1992, Fig. 1). Stenhouse and Throsk are highlighted; Stirling lies at the NW corner of the map.

Plate 14: Analysed sherds SF 363, 364, 365, 367, 368 (top); 369, 370, 371, 373, 375 (bottom).

Plate 15: Analysed sherds SF 366, 372, 374, 376, 377, 378 (top); 379, 380, 381, 382, 383 (middle); 384, 385, 386 (bottom).

Plate 16: Stenhouse kilns SF 2, 11, 12 (top); 13, 14 and 16 (bottom).

SF	Context	Description
363	26	Redware jug handle
364	26	Redware base
365	26	Redware cooking pot rim
366	252	Redware rim
367	25	Redware storage jar rim
368	25	Redware storage jar rim
369	48	Redware Jug base
370	26	White Gritty ware cooking pot rim
371	6	White Gritty? body sherd
372	Unstrat	White Gritty cooking pot rim
373	26	Redware large crock base
374	26	White Gritty ware rim
375	26	White Gritty ware rim
376	26	Redware base
377	67	Redware jug base
378	67	Jug rim and handle
379	26	Redware bridge spout
380	25	Redware handle
381	20	Redware jug rim
382	20	Redware large crock base
383	20	Redware strap handle
384	26	Redware storage jar rim
385	26	Redware jug rim spout
386	18	Redware jug rim (grooved) and strap handle
Brick		Clay from excavation site, Stirling
STEN 2	Box SP07.5	Rim and double handle of (glazed) jug
STEN 11	Box SP07.5	Rim and handle of jug
STEN 12	Box SP07.5	Rim and handle of plain jug
STEN 13	Box SP07.5	Jug base
STEN 14	Box SP07.5	Shallow dish base
STEN 16	Box SP07.5	Unfired clay fragment showing grass impressions

Table 7: The pottery and other samples from Goosecroft Road, Stirling and Stenhouse kiln site.

Since this study makes use of published reference data for redwares from Stirling and neighbouring localities obtained by the same techniques, ICP-MS, but in a different laboratory, the issue of inter-laboratory comparability is critical. To this end, the data from Stenhouse obtained as part of this study and of Haggarty et al.'s large Redware project was selected as a suitable point of comparison. Examination of their Table 3 indicates that the latter dataset shows greater variability in element concentrations which may be a reflection of the two types represented – sherds with face masks and plain body sherds – as opposed to the more uniform group of sherds analysed in the present study. Nevertheless, the level of agreement is good, and it is gratifying to find that the respective ranges for each element overlap in all cases except for Cu and Zr. Those two exceptions are not serious, and it is already known that measurement of the latter element is not entirely straightforward. In sum, the level of comparability appears sufficiently good to proceed, albeit with some caution, although the need for a fuller, statistically-based comparative exercise is recognised.

Results

The clay was plastic, dark reddish grey in colour (Munsell 2.5YR 3/1) and had good potting properties; on firing a small brick made from this clay at 700°C for 5 hours its colour was light red (2.5YR 7/6). The colour of much of the Redware at Stirling was not greatly different, ranging from 2.5YR to 10R 7/8 (light red). A few Redware examples, for example SF 366 and SF 371, had sparse, dark surface inclusions resulting from burial conditions.

The first treatment of the data made use of two elements that Haggarty et al. (2011) found to be informative in discriminating different regions of Redware production in Scotland, namely Mg and K. Figure 17 shows most of the Stirling samples forming a tight cluster together with the Stenhouse kiln samples. Three Redwares stand apart, SFs 376, 377 and 379, and as expected, White Gritty SFs 370, 372 and 375. The Stirling clay (called Brick in Figure 17) is close, and it is equally gratifying to find the Stenhouse unfired clay (STEN 16) in close proximity to the Stenhouse pottery. There appears to be no chemical differentiation between the shapes represented among the Stirling Redware samples, nor would it be expected.

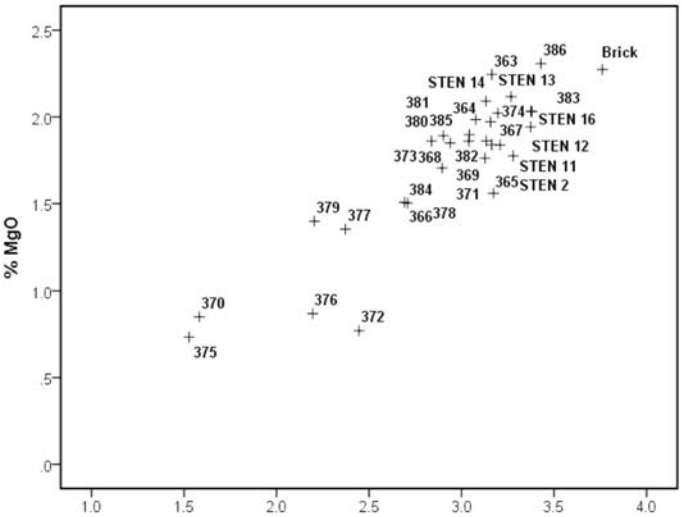

Figure 17: MgO-K2O plot of the Stirling (numbered) and Stenhouse kiln (STEN) samples.

Behaving like Redwares are SF 371, which has the unusual characteristic of a white slip on the interior (Plate 14), and, unexpectedly, SF 374 which macroscopically resembles White Gritty with some 1 mm size white quartz inclusions.

Multivariate treatment (by principal components analysis) of the same data set yields a similar picture to Figure 17, but now SF 384 falls outside the main cluster as do to a lesser extent SF 365 and SF 366 (Figure 18). These two samples may form a group as they have more frequent, and in the case of SF 366 much more frequent, white inclusions than is common in Redware, which have had a dilution effect on their element compositions.

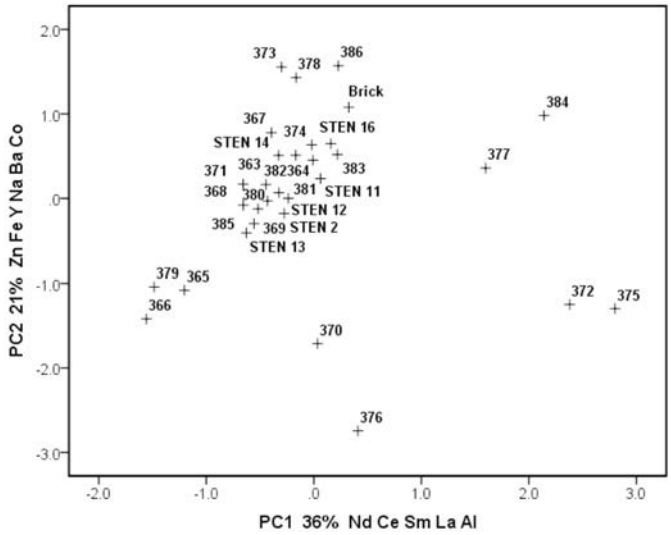

Figure 18: PC plot of the same data set as in Figure 17.

Restricting attention to the Redwares, other data sets can be added to the picture using the same two elements as in Figure 17: Haggarty et al.'s Stenhouse Redware kilns, Stirling Castle Redware and Throsk Scottish Post-medieval Oxidised and Reduced ware kilns (Figure 19). The Stirling Goosecroft Road samples lie close to the Stirling Castle (SC) data, slightly less so to Stenhouse SFs 2, 11, 12, 13, 14 and 16 and separate, albeit imperfectly, from Throsk (T). It is interesting to find the outlier SF 376 lying adjacent to two SC samples, both of them tiles. As mentioned above, Haggarty et al.'s Stenhouse samples (SK) are more widely distributed in MgO and K_2O than are the ST samples. The relative uniformity of the Throsk compositions accords with the results of NAA of similar material from that site (Tate et al. 1992, Fig. 15).

From Figure 19 it seems reasonable to say that the bulk of the Stirling Goosecroft Road samples have a single origin, similar to that of the Stirling Castle Redwares, which may lie in or close to Stirling itself; according to the classification of the compositions given in Figure 20, the origin is probably Stenhouse or nearby.

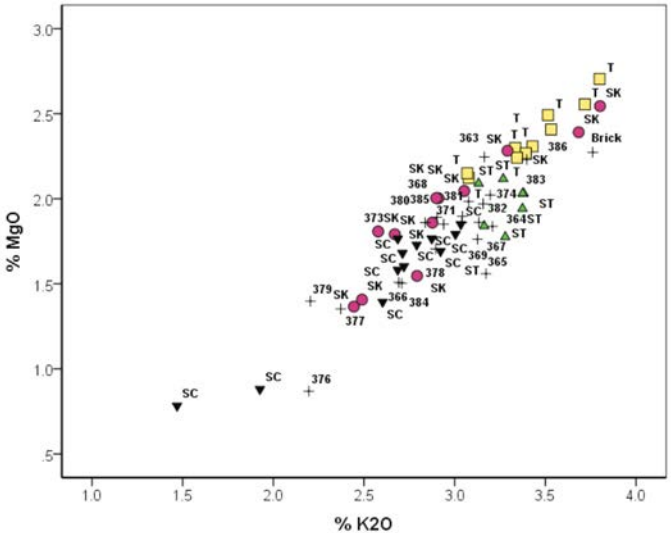

Figure 19: MgO-K2O plot of the Redwares (numbered +), Stirling Castle Redwares (SC black inverted triangle), Stenhouse kiln (ST green Δ this study; SK purple o, Haggarty et al. 2011) and Throsk kiln (T yellow □).

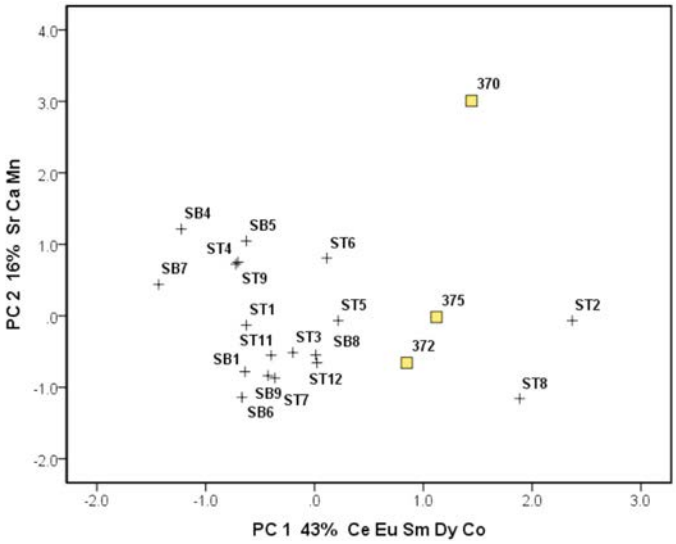

Figure 20: PC plot of the compositions of 370, 372, 375 (shown as yellow squares) and WG from Stirling Tolbooth (ST) and Baker Street (SB). All elements except P, Zn and Zr, normalised to the Al content.

Turning now to the remaining samples, SFs 370, 372 and 375 have White Gritty (WG) type compositions. The first point of comparison is with the WG found at two locations at Stirling, Tolbooth and Baker Street, whose compositions were considered by Jones et al. (2002-03). Using Al-normalised data to offset the effects of variable dilution effects due to the quartz-rich grits, Figure 18 shows that SFs 372 and 375 are close to the Tolbooth and Baker Street WG samples, while SF

370 stands well apart. The point of comparison is then extended to Leith (Burgess Street) representing the lower Forth Valley among the sites treated by Jones et al. (2002-03, 73-74). A bivariate plot of the Al-normalised Sr and Cr contents indicates that Stirling and Leith can be partially discriminated from each other and that SF 372 is attributable more to Leith than to Stirling. However, a multivariate treatment of the same data set using principal components analysis (Figure 21) makes plain that the separation of Stirling from Leith is weak, and there is more of a case for assigning SFs 372 and 375 to Stirling. On balance this interpretation placing these two samples as probable 'local' products is preferred. Regarding SF 370, all that can be said is that it is atypical but it need not have been made far from Stirling.

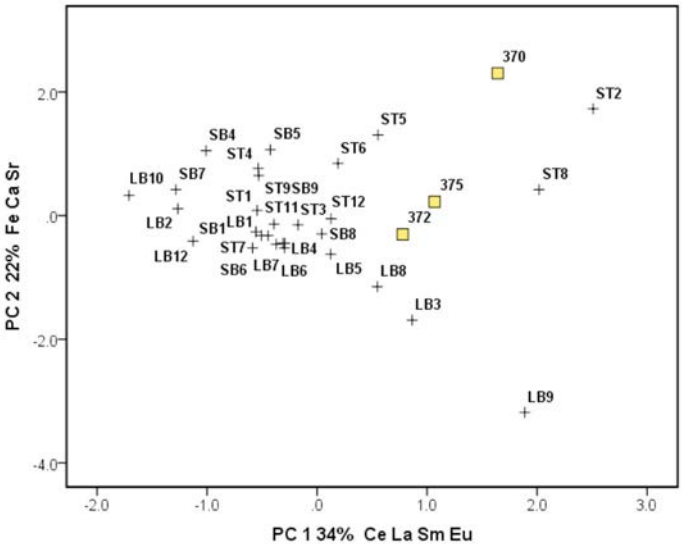

Figure 21: PC plot of the compositions of 370, 372 and 375 (yellow squares) and WG from Stirling Tolbooth (ST) and Baker Street (SB) and from Leith Burgess Street (LB). All elements except P, Zn and Zr, normalised to the Al content.

Discussion

It is proposed above that the source of most of the Redware at Stirling Goosecroft Road (and at the Castle) is *probably Stenhouse or nearby*. That statement needs to be expanded in the following scenarios:

- The pottery is from Stenhouse but the lack of a 'perfect match' is due to *either* a chronological difference between the Stirling Goosecroft Road samples and those selected from Stenhouse, implying that the exploited clay source perhaps changed over time, *or* the respective burial environments at Stirling and Stenhouse may have introduced (very) small subtle differences in composition.
- The pottery is not from Stenhouse but from an as yet unknown centre in or near the city itself.

These two scenarios are very relevant to the graphic in Figure 19 showing the relationship between the Stirling Goosecroft Road and Castle Redware, and the products of the kilns at Stenhouse and the chronologically later one at Throsk. Both kilns were most likely exploiting the same kind of clay found in the alluvium of the Forth Valley; separated by little more than 8 km, the products of these kilns nevertheless appear to be differentiated chemically. The comparability check (described briefly in *Methods*) between Redware data sets generated by the same analytical technique but in different laboratories established a good degree of comparability, while accepting there is a low level of 'noise' in the data. It is therefore reasonable to propose that the difference in chemical signature between Stenhouse and Throsk, while small, is real. As such, this represents an impressive example of fine-grained chemical discrimination between centres that are spatially close to each other, an implication of which is that *other* production centres in the Stirling area might also have identifiable chemical signatures. Thus, in terms of the two scenarios outlined above, the second – production at an unknown centre – is as plausible on chemical grounds as the first. In this connection the finding that one Redware, SF 376, matches two tiles found at the Castle is surely relevant. The presence of an interior white slip on SF 371 is interesting but its significance is uncertain.

As has been found in previous studies, the White Gritty ware is less amenable to precision sourcing. The statements made above about their origins require no further comment.

Clay tobacco pipes

By Dennis Gallagher

A total of 15 clay tobacco pipe fragments from this site were examined, comprising of one bowl and 14 stem fragments. Six of the fragments were dateable to the seventeenth/early eighteenth century on stylistic grounds, in the case of the bowl, and on approximate stem bore diameter in the case of the stems. None of the stems had maker's marks or decoration.

The bowl, SF 352, (Figure 22; Plate 17a) is a large forward-leaning form with a 'chinned' base. The rim is bottered and has a small section of milling, and the body is burnished. There is a basal stamp of a star in relief within a circular field (Plate 17b). The star identifies this as the product of a Stirling pipemaker, 1680-1710 (Gallagher and Harrison 1995).

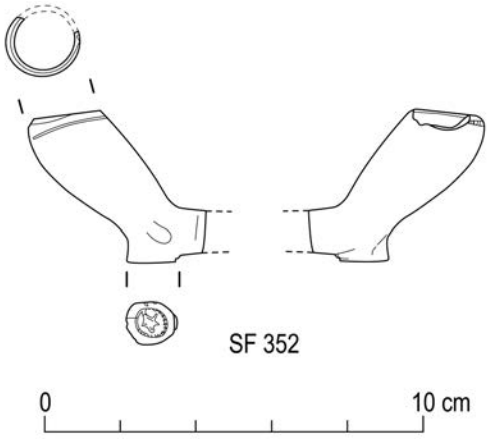

Figure 22: Clay tobacco pipe bowl SF 352, with a basal stamp.

Plate 17: SF 352 a) bowl, b) basal stamp detail.

Glass bead

By Ewan Campbell

Description of the bead found in Monolith 1

The small decorated glass bead is annular, with flattened shiny surfaces around the hole. The bead is wound, of opaque black glass, decorated with a series of at least 10 randomly placed round spots. The spots are decayed, but originally probably of opaque white, and are deeply embedded in the body of the bead. There is spalling around several of the spots, and a substantial spall on one side of the bead. Its measurements are: diameter 6 mm; height 3-4 mm; diameter of perforation 2 mm.

This piece was found in Monolith I (location on Figure 3) is an unusual early medieval spotted bead (Plate 18), though there are a few other examples from Scotland. The type is also uncommon in Anglo-Saxon England and Scandinavia, so their origin and precise date are problematic. The Stirling bead is formed from a true opaque black metal, rather than the usual very dark translucent green, blue, brown or purple. The white spots are fully embedded in the bead, as seen in the broken area, and apparently have been incorporated in the glass before winding, rather than being added later. The small size and annular form relate it to some rare examples found in pagan Anglo-Saxon graves (Guido 1999, 27, Class 2x; Brugman 2004, 'Regular Dot', figs 57, 150), but spotted black beads are also found in early Viking period sites in Scandinavia (Callmer 1977, 86, type B079), though these have a different shape and arrangement of spots. Close parallels are seen in two beads which are stray finds from Coulter, Lanarkshire in the National Museum (NMS FJ29 & 35) (Christie 2014). None of the examples from outside of Scotland seem to agree in every respect with the Stirling bead, and it may be a local product, or even a modern loss. The small size and true black colour might suggest it is possibly a modern intrusion, but a growing number of early medieval beads, both imported and locally produced, are being recognised from sites throughout Scotland, so it is more likely to be a residual early medieval find in a medieval context.

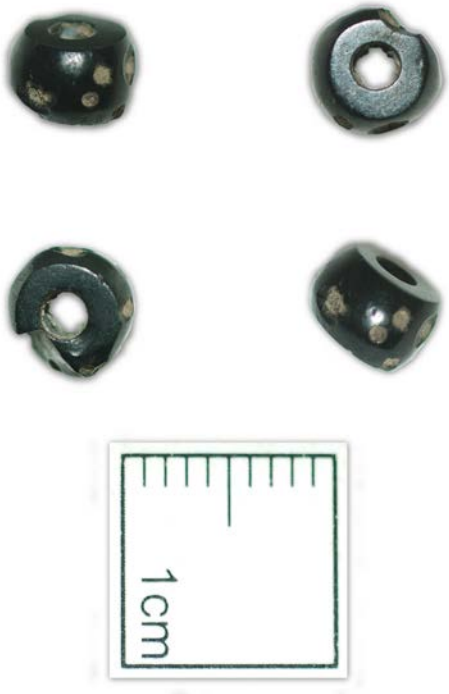

Plate 18: Glass bead found in Monolith 1.

Bottle and window glass assemblages

By Robin Murdoch

Description

The glass assemblage from Goosecroft Road comprises a total of 108 shards of which ten were window glass. Of the remaining 98 shards, 76 (77.5%) were identifiable as late seventeenth to early nineteenth century wine/ale bottles (Dumbrell 1992). This is a situation repeated across Scottish sites both urban and rural.

In reality very little vessel/bottle glass appears to have been in use in Scotland until the late seventeenth century when wine/ale bottles began to appear. The two were so similar in profile it is almost impossible to differentiate between them and therefore they are all normally described as wine bottles for simplicity. Fine tableware is also relatively rare until the eighteenth century and it would be the nineteenth century before glass containers were adopted for a wide range of contents. Care must be taken therefore not to assume a lack of glass means a lack of occupation before the late seventeenth century. Before that there was very little glass around and then generally only on prestigious sites. The one exception is window glass, which was in regular use in high profile ecclesiastical buildings from the later twelfth century onwards.

Bottle glass

Thirteen shards at Goosecroft Road were identified as mid-nineteenth to twentieth century bottles of indeterminate use. SFs 26 and 60 contained small bags of corrosion products and they may also have been present in SF 108. In alkaline surroundings, potash fluxed glass will corrode readily, and in medieval material this can result in the complete disintegration of the shard. Likewise, late seventeenth/eighteenth century wine bottles (cheap potash fluxed glass) often have heavy unstable corrosion layers and these deposits may have derived from that source.

Other shards of specific interest are:

SF 18 contained a shard from a hexagonal or octagonal bottle made from typical green wine bottle glass and may have been from a decanter. This moulded body shape first appears in the early eighteenth century and such vessels sometimes had strap handles attached to the neck for use as decanters.

SF 60 yielded a wine bottle shard with glassgall which gives the normally clear green glass a semi opaque bluish-green tinge. This is caused by too much sodium nitrate in the melt but is seen regularly in what have been completed eighteenth century bottles. It seems therefore that this condition was not enough to see the bottle rejected at manufacture, indeed the colouration may have been attractive.

Another item made from typical green wine bottle glass is the body shard from SF 350 which has come from a large capacity vessel, possibly a wine bottle but more likely a carboy (storage vessel). Its colour and corrosion level would again indicate an eighteenth century useage.

The base of a small medicine phial came from SF 108 and again had a characteristic eighteenth century profile.

Only three shards of finer tableware in clear untinted glass were recovered. That from SF 60 had external facet cutting, which generally starts in the late eighteenth century and was very popular in the nineteenth.

SF 139 was originally thought to be window glass (sample B) but is in fact a vessel rim. Its composition would indicate it is probably no later than the seventeenth century. The shard from SF 123 also seemed to be a rim shard but there was simply not enough to postulate a vessel type. Although not analysed, its condition would again suggest a date no later than seventeenth century.

A full catalogue of the identified shards can be found in the site archive.

Window glass

pXRF analysis results *(Table 8)*

The window glass from Goosecroft Road numbered only ten shards. Originally 11 had been identified but sample B turned out to be a vessel shard. Portable X-ray fluorescence (pXRF) analysis was carried out on samples A-I and approximate dates were assigned based on the dating model in Dungworth and Girbal (2011, Table 1).

Type	Thickness (mm)	Description	SF No	Composition	Date
A	0.6	Very thin, secondary surfaces, mid blue tint	123	HLLA1	<1600
B	1.3	Thin with rim? Probable vessel shard	139	FG?	15th/16th c.
C	1.8	Moderate to heavy corrosion, very pale green tint	26	FG	16th c. possibly earlier
D	2.1	Firebright, no tint	18	SS1	c.1835-1870
E	2.8	Firebright, very pale aqua tint	60	SS3	c.1930-1960
F	1.4	Light iridescent corrosion, tint?	14	H/K	c.1600-1700
G	1.4	Slightly dulled, greyish tint	166	Kelp	c.1700-1835
H	1.6	Slightly dulled, greyish tint	166	Kelp	c.1700-1835
I	3.6	Light to moderate corrosion, pale green tint, crown edge?	166	Kelp	c.1700-1835

Note: With the exception of sample A all the other samples where tint is mentioned this is due to contaminants in the raw materials or to iron oxide in the clay of the founding crucibles.

Sample A is the only one where the tint is deliberate.

Table 8: Window glass samples.

Sample A (SF 123) is interesting, it is the only deliberately coloured shard present (most early, i.e. pre 1800 window glass has some sort of tint, occasionally this can be quite strong from unwanted raw materials in the mix. The composition of sample A is high lime low alkali (HLLA1) and there are small amounts of cobalt and copper oxides present, which would give the blue colour. It is not possible to estimate the original thickness of the shard since unstable corrosion layers have become detached leaving a rough secondary surface. The thinness of the remaining glass and the rough surface can both affect the pXRF results. In the case of sample A the silica content read much higher than would be expected for this composition. According to Dungworth (ibid.) this HLLA composition was made in England between c. 1567 and 1600. However, in Scotland it could easily have been imported from the continent since there is, as yet, no evidence of an indigenous glass industry (manufacture from raw materials) in Scotland prior to 1610 (Turnbull 2001, 1). HLLA glass was first made in Germany in the fourteenth century and had spread to France by the fifteenth. Because of the deliberate colouring, sample A may derive from a decorative window, possibly ecclesiastical.

Sample C (SF 26) is also early, possibly a forest glass import from England dating to the mid-sixteenth century or possibly earlier.

Sample F (SF 14) is of a composition that is found regularly on Scottish sites. It is basically an HLLA glass but with elevated strontium levels, but not as high as the later kelp fluxed glass given in (Dungworth 2011, Table 1). At the moment it is reasonable to assign this glass a mid to late seventeenth century date and to suggest that it was made using a mix of land based plant alkalis and kelp.

Samples G, H and I (all SF 166) are standard kelp fluxed glasses dating to the period c. 1700-1835. The greyish tint in G and H may indicate they are later in the period and I has the characteristic edge seen on crown glass tables (discs). Samples D (SF 18) and E (SF 60) are synthetic soda glasses, D being nineteenth century and E the twentieth.

From their appearance the window glass shards from SF 26 and SF 31 are probably modern and were not analysed.

Conclusion

The expressed intention behind these excavations was to investigate the medieval remains in Stirling. Glass finds are unlikely to add very much to the corpus of knowledge from that period simply because of its rarity. As already noted, vessel and bottle glass are rare finds in Scottish medieval excavations simply because there appears to have been little in currency. Not only that, but some medieval compositions were very prone to corrosion and some glass from the period will have effectively disappeared or become unrecognisable as glass. Only two of the window glass shards, samples A and C are probably medieval, the former could be as early as fourteenth century. Likewise the vessel shards from SF 123 and SF 139 might fall into the late medieval period but not enough survives to be sure.

The metalwork

By Gemma Cruickshanks

Excavations at Goosecroft Road produced 107 metal artefacts, comprising 12 non-ferrous and 95 iron objects (Table 9). The most significant find was a copper-alloy medieval annular buckle or brooch from a burial. The iron assemblage is dominated by nails (81%) but also includes a folding knife, a file fragment and structural fittings such as a hook and hinge. Aside from clearly modern items, only the annular buckle/brooch and a belt mount are diagnostic of a particular period, both being medieval in date. The rest of the assemblage is in keeping with a date in either the medieval or post-medieval periods.

The assemblage is summarised below and a full catalogue is in the archive.

Material	Object	Quantity	Total
Copper-alloy	Personal (buckle/ brooch, pin and button)	3	11
	Coins	2	
	Mounts/ collars	4	
	Watch-winder	1	
	Sheet fragment	1	
Lead	Worked strip	1	1
Iron	Nails	78	95
	Tools (knife and file)	2	
	Bar fragments	6	
	Fittings	3	
	Wire	3	
	Horseshoe	1	
	Mount	1	
	Sheet fragment	1	
Total		107	

Table 9: Summary of the metalwork assemblage.

Copper-alloy artefacts

Eleven copper-alloy artefacts were recovered, several of which are clearly recent, such as the 1956 halfpenny (SF 1), watch-winder (SF 32.4), thin tube (SF 280.5) and collar (SF 219.2). A possible coin (SF 187) is in very poor condition but is probably a 'Turner' two pence of uncertain date. Sheet-mount (SF 333) and a small sheet fragment (Sample 036) are clearly parts of larger composite objects though they are not chronologically distinct. SF 15 is a well-made bar mount with two fine rivets through it. Bar mounts would have ornamented leather or possibly textile belts, straps and harnesses and date to around the twelfth and thirteenth centuries AD (Egan and Pritchard 2002, 26 and 211). Three items of personal ornament were recovered: a post-medieval plain disc button (SF 71), an undiagnostic pin shank missing its head (SF 112.7) and an annular buckle or brooch (SF 9) which merits further discussion.

The annular brooch or buckle (Plate 19) was recovered from a burial alongside the Dominican friary wall. Grave goods are rare in the medieval period but where present they are most often metal dress accessories (Gilchrist and Sloane 2005, 84). This object (SF 9) is a plain annular ring 37.5 mm in diameter with diamond section and rebated, slightly humped pin. The difference between plain annular brooches and annular buckles is not always clear: while the rebated pin suggests it is an annular brooch (Egan and Pritchard 2002, 64), the item was found around the pelvic area. This is more in keeping with it being a buckle as brooches are more likely to be positioned around the shoulders or chest. Large annular buckles (c. 40 mm in diameter) were used in pairs to fasten breeches or hose (e.g. Gilchrist and Sloane 2005, fig 45), though as only one was found here it is more likely to be a belt buckle. Similar annular buckles are commonly found around the waist, hips or upper thighs in cemetery contexts (ibid. 85). Whether a brooch or buckle, a date in the thirteenth/fourteenth centuries AD is most likely (Stuart Campbell pers. comm.) which places the burial within the use of the Blackfriars friary, whose wall it was found alongside.

Plate 19: Copper-alloy annular brooch or buckle SF 9.

Buckles are more common than brooches in Scottish medieval burials. A medieval grave at Auldhame, East Lothian, contained a buckle which was found by the upper thigh, suggesting it was from a belt (McLaren and Hunter 2016) and buckles were more numerous than brooches in medieval graves at Whithorn (Nicholson and Hill 1997, 370-1).

The traces of mineralised textile on the inner edge indicate it was fastened or lay against clothes or a shroud when deposited. Recent research suggests shrouds were more likely to have been fastened by a pin than a buckle or brooch, suggesting this burial was clothed (Gilchrist and Sloane 2005, 110). The position of the skeleton however, with arms over the chest, is thought to be due to having been firmly wrapped in a shroud (see Kilpatrick above). This may suggest the body was both clothed then wrapped in a shroud for burial. Aside from a single broken iron nail in the grave fill, which is probably residual, there was no evidence of coffin fittings, e.g. handles or clench bolts.

Interestingly, buckles in the pelvic area have been linked to burials of friars, who were buried in their habit which included a buckled belt or cincture (Mellor and Pierce 1981, 22). However, it was not just members of the religious order but a wide range of people from the local community who could be buried around friaries (Stones 1989, 112-3) and so the interpretation of this individual as a friar remains a cautious one.

Catalogue of medieval copper-alloy artefacts

SF 9 An intact annular buckle or brooch. The frame is plain with a diamond section while the pin is slightly humped and tapers to a rounded tip. There are file-marks on the back from manufacturing; fragments of textiles and traces of textile imprints indicate the brooch was touching clothes or a shroud when deposited. External diameter 37.5mm, internal diameter 27 mm, thickness 4 m; pin length 36.5 mm, width 4-2 mm, thickness 1-2 mm. Recovered from the fill of grave (008).

SF 15 Belt bar-mount. A small, thin, intact, curved strip with a rivet at each end (tips broken). This type of mount was often found along ridges on leather belts in the thirteenth/fourteenth centuries AD. Length 10.5 mm, width 4.5 mm, thickness 0.4 mm; rivets length 3 mm, diameter 1 mm. Recovered from the top fill of linear feature (053).

Lead

A single lead artefact (SF 134.12) was recovered with roughly crescentric shape. Its function is unclear but knife-cut facets down the edges indicate it may have been a partly finished object. Lead was frequently used from the medieval period for artefacts such as weights, or for repairs or seals.

Iron

95 wrought iron artefacts were recovered, dominated by a large quantity of nails, as is typical of medieval and later periods.

Nails

The 78 nails can be split into three groups based on shape. Firstly, those with circular-sectioned shanks (10) are modern; they were predominantly recovered from upper soil layers, e.g. five from 'soil horizon east of concrete beam' (003) and two were from the first layer stripped from an evaluation trench. The remaining 68 nails have square- or rectangular-sectioned shanks, indicating they were hand- rather than machine-made. Such hand-made nails changed little from the Iron Age to post-medieval periods and are therefore difficult to date unless in a securely dated context. The square-sectioned nails here can be split into two broad types based on Ian Goodall's scheme (2011, 164). Type 1 has a flat head of rounded or rectangular/square shape; 36 of these were recovered. They are the most common type of nail on medieval and post-medieval sites. Six nails belong to Goodall's type 3 which has a narrow T-shaped head; they are a less common type and may have had a specialist function. 26 nails were missing their heads and could not be classified.

The shortness of some of the shanks (12-50 mm) suggests they may have been decorative studs rather than nails. This form is similar to coffin nails (e.g. see examples from Whithorn, Wigtownshire (Nicholson 1997, 405) and Auldhame, East Lothian (McLaren and Hunter 2016). However, around half of these nails have curved shanks from removal, suggesting they are unlikely to have been from a coffin and more likely to have

been from dismantled structural timbers. The single nail (SF 10) recovered from the fill of grave (008) is unfortunately missing its head and so its form is unknown. It had a straight shank with traces of mineralised wood adhering, indicating it had been deposited within wood but no other coffin fittings were recovered.

In the nail assemblage 42 nails have curved shanks indicative of removal from wood prior to deposition. Six were clenched, indicating they were still within timber when deposited and 17 are straight, suggesting they were either unused or still within wood. 13 nails did not have enough of the shanks surviving to reveal their shape. There is no pattern to suggest particular forms of nail were found in particular areas. Along with the large amount which had been removed from wood prior to deposition, this suggests most were casually discarded and may have been included in middens and general levels of refuse.

Tools

The tip of a file (SF 73) was collected in one of the trial trenches (023). It has fairly fine teeth, suggesting it would have been used on a hard substance like metal. An intact iron pen knife (SF 21.2) with horn plates riveted to each side and a suspension loop on the end was recovered from a soil horizon north of wall (004) and is relatively recent in date, probably from the mid-twentieth century.

Bars

Six bar fragments are present. Four taper and are probably nail shanks, but with both ends missing it is impossible to be certain. The other two could be part of other objects or have been stock or scrap for a blacksmith.

Other iron artefacts

Three fragments of wire were recovered (SF 124.14, SF 63.1, Sample 008), one of which Sample 008 is composed of several finer wires braided together and is likely to be recent in date. Various fittings were collected, including a hinge (SF 124.15), probably for a door or gate, a hook (SF 4), an escutcheon from a vessel (SF 134.11) and a simple perforated strip mount with broken ends (SF 63.6); none are chronologically distinct. The fragment of horseshoe (SF 165.1) is simple in form but missing its ends, leaving its form obscure.

Conclusions

The overall assemblage and its dominance of nails and broken items are typical of an urban area which has seen many phases of use and disturbance. The two medieval items, the buckle/ brooch and belt fitting are a useful addition to the other medieval finds from the site: the buckle/ brooch in particular is an important find as grave goods in this period are relatively rare.

The vitrified material

By Gemma Cruickshanks

Vitrified material can be produced during a wide range of high-temperature processes, from domestic hearths to metalworking. Excavations at Goosecroft Road produced just under a kilogramme of vitrified material, including fragments diagnostic of blacksmithing as well as undiagnostic material which could have been created during a wide range of activities (summarised in Table 10). The material was predominantly recovered from redeposited contexts, such as midden and ditch/drain fills. As such, it is unclear when in the medieval or post-medieval periods blacksmithing was taking place.

Process	Material	Contexts	Quantity (g)
Ironworking	Blacksmithing debris, including hammerscale and slag spheres	067, 1005, 1014, 1022	371.1
	Undiagnostic iron slag	020, 026, 049, 1013	181.1
Undiagnostic	Coal/ cinders	1005, 1013, 1014, 1015, 1018, 1022	283.7
	Fuel ash slag	003, 053, 054, 067	52.7
	Glassy slag	3	9
	Vitrified stone	26	19
Total			916.6

Table 10: Summary of the vitrified material assemblage.

The assemblage

The material was visually examined and catalogued using common terminology (e.g. Crew and Rehren 2002; McDonnell 2007; Paynter 2002) based upon characteristics such as size, morphology and density. Slags diagnostic of both the smelting and smithing stages of the ironworking process were recovered.

Blacksmithing debris

Hammerscale and slag-spheres are both types of magnetic micro-debris which are diagnostic of blacksmithing. Hammerscale flakes are dislodged while hot iron is being hammered and derive from the oxide/silicate crust which forms on hot iron. Slag spheres form when molten slag droplets are expelled from hot iron during hammering and particularly during welding, solidifying before reaching the ground and creating the characteristic spheres or droplets. When present in large quantities or concentrations this type of debris is a good indication of in situ blacksmithing, as these small fragments are less likely to have been removed and dumped elsewhere, like larger fragments often were. However, all the hammerscale and slag spheres here were recovered in small quantities from secondary deposits, including nineteenth/twentieth century garden soil (context 1005), drain fill (067) and material trampled into (1014) or under cobbles (1022), making it difficult to determine where or when the blacksmithing was taking place.

Undiagnostic iron slag

Fourteen fragments (181.1g) of iron slag were recovered but were too small and/or fragmentary to determine which part of the ironworking process they had derived from. One fragment (SF 335) has a distinct flowed texture, indicating it had been molten, a feature usually attributed to iron smelting rather than smithing, but this fragment is so small it could have originated from either. SF219.3 is very magnetic for iron slag, but X-radiography confirmed it has a porous, unconsolidated structure consistent with slag rather than iron. The porous structure and high magnetic attraction suggest it could be a bloom off-cut from primary smithing activity. The iron slag showed no clear concentration which might indicate an ironworking area and was mostly recovered from secondary deposits such as the midden material (context 1015).

Undiagnostic vitrified material

Fragments of coal, cinder and fuel-ash slag were found across the site and could have been formed in a wide range of processes. Such material is common in urban settings and regularly becomes incorporated into middens and feature fills over time.

Conclusions

The vitrified material assemblage from Goosecroft Road indicates blacksmithing was taking place in the vicinity but the date of this material is uncertain. Blacksmithing was a common activity in medieval and post-medieval urban areas and excavations in similar urban environments have frequently encountered blacksmithing debris (e.g. Cox 1996; Photos-Jones 2010; Spearman 1997) thus it is not surprising the debris from these activities became spread throughout contexts in the surrounding area.

Leather

By Bob Will

Three fragments of leather SF 222 were recovered from a disturbed organic layer (context 049/019) above the subsoil. The leather included a large fragment from the sole of a shoe with stitching holes and seams suggesting that the footware was made from several pieces sewn together rather than one or two piece shoes. The grey clay deposit above the organic layer was dated to 1272–1320 cal AD, but due to the disturbance it is likely that the leather was of a later date.

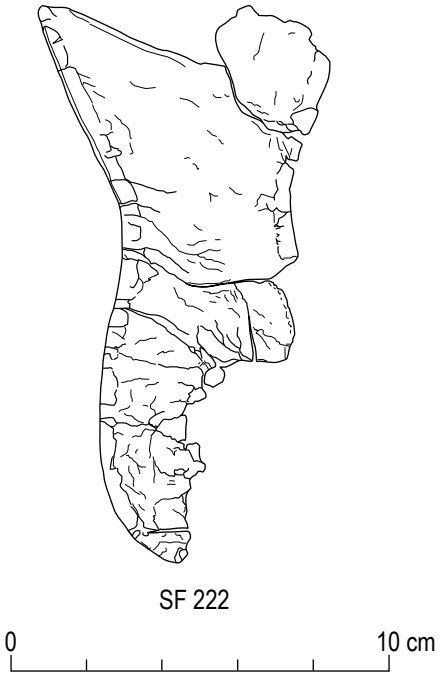

Figure 23: Leather sole fragment.

It is suggested that the leather or leather working was taking place during the fourteenth or fifteenth centuries. The shape of the shoes/boots and uppers are comparable with material recovered from Aberdeen (Thomas 2001) and fit the date range given there.

Description of the sole

Large fragment of the left sole with a thin waist and a rounded heel, it is constructed from three layers of leather and has stitching holes along the two long sides (Figure 23). It is similar to the Type 4 sole recovered from Aberdeen (ibid., 242). Its length measures 148 mm and its maximum width is 65 mm.

The environmental evidence

The animal bones

By Catherine Smith

During the excavation an assemblage of animal bones, dating from the medieval, late medieval and post-medieval periods was recovered. Following initial evaluation of the assemblage it was decided that identification and reporting of the medieval and late medieval material should be prioritised. The remainder of the material, with the exception of one post-medieval context, was quickly scanned but not recorded in detail. Bone from sieved soil samples was considered in too poor a condition to return much data and was not further recorded.

Methods and measurement

The mammal and bird bones were identified by direct comparison with modern comparative material and were allocated to particular bone and species where possible. Where it was not possible to identify bones as far as species, the terms *large ungulate*, *small ungulate* and *indeterminate mammal* were used. Thus, all large vertebrae other than the atlas and axis were described as large ungulate, while small vertebrae were described as small ungulate. Ribs were similarly allocated depending on their size. Large ungulate bones were most likely to have come from cattle, but could also have come from horse or red deer. Similarly, small ungulate bones were most likely to have come from sheep, but could possibly have originated from goat, pig or roe deer. All other mammalian fragments for which neither species nor bone could be ascertained were described as *indeterminate mammal*.

Measurements were made in accordance with the scheme of von den Driesch (1976) and are expressed in millimetres. Additional measurements on the humerus follow Legge and Rowley-Conwy (1988). Mandibular tooth wear and eruption patterns were assessed using Grant's (1982) scheme for cattle and sheep/goats, as well as Payne's (1973) scheme for sheep/goats. Diagnostic zones for long bones were recorded using Dobney and Rielly's (1988) scheme.

Condition scoring

Attributes relating to condition of the bone were in most cases recorded by bag, rather than individual bone, in order to speed the process, unless any particular specimen was of notably different condition. The following attributes were scored:

General: provides a general short-hand description of the overall condition of the bone. Could be one of the following (numerical score in brackets): very poor (1), poor (2), fair (3), good (4). 'Good' would be applicable to fresh bone.

Surface abrasion: describes the degree of erosion of the surface caused by taphonomic factors such as weathering, soil conditions, etc.: scored as heavy (1), moderate (2) or slight (3).

Density: describes the 'heaviness' of the bone. In general, the more well-preserved a bone is the heavier and denser it appears to be, whether through retention of organic material or re-mineralisation from the soil: scored from 1 to 5, where 1 is the least dense.

Friability: describes the degree of crumbliness. Scored from 1 to 5, where 1 is the most crumbly and 5 is the least crumbly.

Total score for poorly preserved bone is therefore lower than that for well-preserved bone. The most poorly preserved would score only 4 points while the best could potentially score 17 points.

A full catalogue of identifications, measurements and condition scores is presented in Excel format as Appendix 1 along with the abbreviations used. A list of contexts from which bones were analysed, with corresponding finds numbers, is shown as a Word document in the site archive.

Results

The bones from all contexts were less well-preserved than anticipated, and the survival of less well mineralised elements such as those from less robust or younger animals may therefore not

have been retrieved. This should be borne in mind when considering the relative frequency of species recovered. Many of the bones were covered with spots of blue vivianite, a form of hydrated iron phosphate formed as a result of reaction between phosphates in the organic bone matrix and iron in the surrounding soil.

The lowest condition score was 6 (Context 026) representing very abraded and friable material, while the highest score was 12 (see appendix in the site archive). Indeed, most of the material had suffered from a degree of erosion, making anatomical measurements difficult. In addition, butchery marks were probably obscured by poor surface condition of the bones. Poor preservation is also indicated by the high proportion of the assemblage which could not be attributed to species and is described as indeterminate mammal. By weight, this unidentified material accounted for nearly 30% of the total.

Species present

The number of fragments from each species is shown in Table 11. Bones are grouped as either medieval, or late medieval (mainly material from contexts 025 and 027). For information on material from post-medieval contexts 023 and 036, see appendix in the site archive).

Most of the material recovered from the excavations came from contexts dated to the medieval period. There were more identifiable fragments, and of a greater weight, of cattle than of any of the other species, both in the medieval and late medieval periods. However, an estimate of minimum numbers of animals based on the most frequently occurring elements (MNI) indicated that there may have been more individual sheep/goats present than there were cattle. In the medieval period, a minimum number of four cattle were present, contrasting with at least ten sheep/goats, the former based on the presence of four left distal tibiae and the latter on the presence of ten right distal humeri. It should be noted that both of these elements are dense and well-mineralised and therefore tend to survive under difficult burial conditions, in contrast to the more fragile epiphyses formed of spongier bone, such as the proximal humerus and radius.

It seems that cattle and sheep/goats were the most frequently occurring of the domestic mammals, while pig, although retrieved in small quantities, was less common than either. Horse was less frequent still than cattle, sheep/goats or pigs (see Tables 11, 12 and 13), but surprisingly, no bones of goat were positively identified. Although goats may have been present in the assemblage, in the guise of sheep/goat, no diagnostic horn cores or metapodia, which would have affirmed their presence, were found.

Species	Medieval	late medieval	post-medieval*	total
cattle	232	85	3	320
sheep/goat	207	80	10	297
pig	26	5	1	32
horse	10	9	4	23
red deer Cervus elaphus	5	2	0	7
roe deer Capreolus apreolus	1	0	0	1
deer sp	1	0	0	1
dog	0	1	39 (skeleton)	40
dog/fox	5	0	1	6
cat	10	0	0	10
Rabbit Oryctolagus uniculus	1	0	1	2
Hare Lepus capensis	1	0	0	1
large ungulate	156	28	5	189
small ungulate	105	11	3	119
indeterminate mammal	963	417	33	1413
fowl Gallus gallus	22	1	0	23
cf fowl	2	2	0	4
Goose Anser anser	4	1	0	5
cf heron Ardea cinerea	1	0	0	1
indeterminate bird	11	3	0	14
fish	5		0	5
Total	1768	645	100	2513

* consists of material from Context 023 only

Table 11: Number of animal bone fragments by species and date grouping.

Species	Weight of bone recovered (g)	% of total
cattle	7322	41.9
sheep/goat	2114	12.1
pig	214	1.2
horse	1026	5.9
red deer	273	1.6
roe deer	38	0.2
deer sp	1	0.005
dog	312	1.8
dog/fox	20	0.1
cat	15	0.08
hare	1	0.005
rabbit	3	0.017
large ungulate	1853	10.6
small ungulate	218	1.25
indeterminate mammal	3983	22.8
all bird sp	92	0.5
fish	10	0.06
Total	17,495	100.117

Table 12: Weight of animal bone in grams, by species.

Species	Medieval	late medieval
cattle	4 (L tibia, distal)	4 (L humerus, distal)
sheep/ goat	10 (R humerus, distal)	4 (L radius proximal)
pig	2 (L radius, proximal)	0

Table 13: Minimum numbers of cattle, sheep/goats and pigs (based on most frequently occurring elements.

Also present were a few bones of dogs, some of them fragmentary and therefore categorised as dog/fox. A partial skeleton from one individual (SF 52), was recovered from post-medieval context 023. Cat bones were occasionally found in the medieval contexts although none were present in the later periods.

Large wild mammals were represented by red and roe deer (*Cervus elaphus* and *Capreolus capreolus*), the former by both antlers and bones, indicating animals which had been killed rather than the collection of cast antlers by humans. The roe deer antler specimen also represented a dead animal since it was found attached to the pedicle, the part of the skull to which the antler is attached and from which it is shed yearly.

Smaller game animals were also present, represented by bones of hare (*Lepus capensis*) and rabbit (*Oryctolagus cuniculus*). It is not possible to say whether the rabbit was eaten or had merely burrowed into the site.

Both domestic and wild birds were present. Domestic fowl (*Gallus gallus*), and goose, either the domestic variety or its wild ancestor, the greylag (*Anser anser*) were present in small numbers. One bone, probably from heron (*Ardea cinerea*) indicates food was being sourced from wetland or riverside habitats.

Age of animals at death

	medieval		late medieval	
age category	n	%	n	%
J	1	1.5	0	0
J/I	11	16.9	3	15.8
I	0	0	0	0
I/A	28	43.1	11	57.9
A	25	38.5	5	26.3
Total	65	100	19	100

Key: F = foetal or neonatal; J =juvenile; I = immature; J/I = juvenile or immature; I/A = immature or adult; A = adult

Table 14: Ages of cattle at death, based on epiphyseal fusion of long bones.

	medieval		late medieval	
age category	n	%	n	%
J	0	0	0	0
J/I	12	19	6	19.4
I	3	4.8	0	0
I/A	25	39.7	16	51.6
A	23	36.5	9	29
Total	63	100	31	100

Key: F = foetal or neonatal; J =juvenile; I = immature; J/I = juvenile or immature; I/A = immature or adult; A = adult

Table 15: Ages of sheep/goats at death, based on epiphyseal fusion of long bones.

Unfortunately, only one sheep/goat mandible, the best indicator of age at death, was preserved. No cattle, pig or horse mandibles survived, although many loose teeth were present, mainly of adults. The single sheep mandible came from an animal at Grant's (1982) mandible wear stage (MWS) 24, corresponding to Payne's (1973) stage D, or 1–2 years old in modern terms.

Epiphysial fusion data is generally regarded as a less reliable indicator of age than mandibular observation, but in this case is the only evidence available. Tables 14 and 15 are a summary of epiphyseal fusion observations based on the main available long bones and phalanges. As noted above, there is a bias towards certain denser epiphyses, particularly those which fuse at an earlier stage of the animals' lives, for example the distal humerus and the proximal first and second phalanges. The presence of these bones tends to skew the distribution towards the immature/adult (I/A) category, but it should be understood that these are as likely to have come from adults as from

immature animals. Similarly, bones placed in the juvenile/immature (J/I) category could come from either juvenile or immature animals and it is not possible to separate them further.

It should also be noted that the sample number of bones which provided age attributes was similarly small for both cattle and sheep/goats (65 and 63 medieval observations, respectively).

With these warnings, it appears that the majority of the bones in both the medieval and late medieval periods came from animals in the immature/adult (I/A) and adult (A) categories. For medieval cattle, 81.6% fell into this category, compared with 84.2% for late medieval cattle (based on sample numbers of 65 and 19 respectively). In the case of sheep/goats, out of a sample number of 63 medieval bones, 76.2% were from immature/adult or adult animals, while of the comparable late medieval sample of 31 bones, 80.6% were immature/adult or adult. It may be inferred that while the true number of juveniles is most probably under-represented, the presence of adult bones indicates that these cattle and sheep/goats were successfully husbanded to maturity over several years.

Evidence of butchery

Most of the butchery evidence relates to knife cuts and chop marks on long bones of cattle, sheep/goat and horse. Two bones are possibly sawn, although abrasion of the cut surfaces of the specimens after burial makes it difficult to be certain. These examples were a sheep/goat innominate in which the ilium has possibly been sawn in a dorso-ventral direction (SF 293, context 065,) and a cattle proximal radius (context 026, SF 110). Since it is well accepted that the main medieval butchery implements were axes and cleavers (and as such appear as emblems of the medieval flesher trade) and that saws were possibly too valuable as woodworking tools to spoil on butchering carcasses, this is an indicator of the possibility that some of the bones in these contexts may post-date the medieval period.

Two horse bones were also butchered. One, a late medieval metacarpal (SF 130) bore at least two knife cuts on its anterior shaft which may be indicative of skinning, since this bone is relatively meatless (context 027). A medieval horse tibia (SF 12), bore many fine striations interpreted as knife cuts on both the anterior and posterior aspects of the shaft, inflicted either as a result of skinning out the hind limb or of removal of the meat (context 1015).

Size of the animals

Where possible, the dimensions of the bones were measured following a recognised scheme of anatomical measurement (von den Driesch 1976). A summary of long bone sizes is shown in Table 16; individual measurements are available in the site archive. However, as noted above, abrasion and recent damage did not allow for the collection of a large body of metric data. Nevertheless, it was clear that the majority of the bones were from small animals typical of the medieval period. Larger, but unfortunately unmeasurable, bones were noted, for example a late medieval cattle calcaneum (SF 118, context 025) was so large that it ought to be suspected that it is of a more modern origin, as was a cattle distal metapodial (SF 177, context 034).

With the exception of two short, stocky sheep/goat bones, an immature radius (SF 284) in medieval context 049, and a juvenile/immature humerus (SF 275) in medieval context 053, the sheep were of the typical slim, long-legged type found elsewhere in medieval Scotland.

Worked antler

A broken fragment of red deer antler (SF 199), from medieval context 025, consisted of a modified tine from which the core material had been scooped, to form a tubular socket. The manufactured internal cavity extends the full length of the artefact and both ends of the object are broken. The intention was presumably to form a handle for a tool. Externally the antler was covered in spots of vivianite, a hydrated iron phosphate mineral, which affects many of the bones in the Goosecroft Road assemblage. The length of the tine is 78 mm, the external diameter of narrower end measures 16.2 mm, and the internal diameter is 9.3 mm.

This fragment may be compared with another worked antler from Stirling. Recovered from an unstratified spoil heap during an archaeological watching brief at Jail Wynd in 2002, this object was also a tine into which a socket had been roughly bored (Smith 2002). A large medieval antler assemblage recovered from a site at 326-332 Linlithgow High Street contained two similar antler tines with holes drilled or bored in the base (Smith 2015) and it may be assumed that this is a recognisable medieval artefact tradition.

Cattle	Cattle		medieval		late medieval	
	bone	measurement	range	n	range	n
	radius	Bd	61.2	1		
	metacarpal	Bp	46.4–48.2	2	46.9	1
		Bd	51.9	1	52	1
	ulna	DPA	48.6	1		
	tibia	Dd	38.3	1		
	naviculo-cuboid	GB	46.6–57.6	2	45.8	1
	metatarsal	Dp	39.4	1		
	1st phalanx	GLpe	50.0–52.5	2		
		Bp	25.0–30.0	3		
		Bd	26.2	1		
		SD	23.4	1		
	2nd phalanx	Bp	26.6	1		
	3rd phalanx	DLS	59.0–70.8	2		
		Ld	45.2	1		
Sheep/goat	Sheep/goat		medieval		late medieval	
	bone	measurement	range	n	range	n
	scapula	SLC	18.3–19.5	4		
		GLP	31.6–33.6	2		
		ASG	21.2–21.5	2		
	humerus	Bd	28.8–30.3	2		
		BT	28.0–28.6	2		
		HT	16.2–17.2	2		
		HTC	13.0–14.9	2		
	radius	Bp	28.6–29.6	2		
	ulna	DPA	23.4	1		
		SDO	19.8	1		
	metacarpal	Bd	22.3	1		
	tibia	Bd	22.0–25.2	6		
		Dd	17.4–20.4	6		
	metatarsal	Bp	17.8–20.5	3		
		Dp	18.8–19.8	3		
		Bd	21.2	1		
	astragalus	GLl	27.2–28.2	2		
		Bd	17.9–18.0	2		
	naviculo-cuboid	GB	22.2	1		
	1st phalanx	GLpe	32.8	1		
		Bp	11.7	1		
		Bd	11.1	1		
		SD	9.8			
Pig	Pig		medieval		late medieval	
	bone	measurement	range	n	range	n
	scapula	SLC	18.4	1		
		GLP	28.4	1		
	humerus	Bd	37.4	1		
		HT	22.3	1		
		HTC	16.8	1		
	innominate	LAR	28	1		
	astragalus	GLl	38.6	1		
		Bd	36	1		

Table 16: Long bone size range summary (cattle, sheep/goat, pig and horse).

Horse	Horse		medieval		late medieval	
	bone	measurement	range	n	range	n
	tibia	Bd	62.1	1		
		Dd	39.8	1		
	1st phalanx	GL			86.6	1
		Bp			54.2	1
					46.8	1
					35.1	

Measurements follow the scheme of von den Driesch (1976) with additional measurements on the humerus after Legge and Rowley-Conwy (1988) and are expressed in millimetres.

Table 16 (Continued): Long bone size range summary (cattle, sheep/goat, pig and horse).

A second antler tine from Goosecroft Road, from a roe deer, was a waste piece consisting of the pedicle, chopped across when removed from the skull, as well as the brow tine and part of the beam, broken across but with part of the spongy core apparently removed. The object (SF 270), may have been intended to form a handle but may either have broken in manufacture or proved otherwise unsuitable (context 054).

Discussion

The assemblage from this excavation sheds some light on the diet of the inhabitants of the site, perhaps relating to the medieval occupation by the Dominican Friars, or Blackfriars. Later post-Reformation occupation is hinted at by the presence of some larger bones of cattle and sheep/goats within the medieval or late medieval collection.

The majority of the bones in this assemblage are of a size that would be consistent with medieval to post-medieval date. The proportions of livestock species are similar to what would be expected at other urban sites in Scotland. There is a high reliance on cattle and sheep/goats, the stock most associated with the trade in animal by-products such as hides, wool and woolfells which were the mainstay of the Scottish export trade throughout the medieval period. The meat from those animals would have supplied the kitchens of the friary. Other animals providing meat and valuable antlers were red and roe deer. The frequency of deer species at Goosecroft Road is little different from that recovered elsewhere in medieval urban Scotland, where the percentage frequency is rarely if ever over 2% in the burghs of Perth, Aberdeen and Elgin (Hodgson et al. 2011, 18). Elsewhere in Stirling, the excavation of the Tolbooth recovered a medieval bone assemblage from which deer bones were entirely absent (Smith 2001). A single antler artefact from Jail Wynd was recovered from a spoil heap and was not part of a bone assemblage (Smith 2002).

Young animals were infrequent at Goosecroft Road, in marked contrast to the Tolbooth site in Stirling where an animal bone assemblage was recovered from excavations prior to redevelopment in 2001 (Smith 2001). At the Tolbooth, some 39% of sheep/goats recovered from the interior contexts died in the youngest age categories (F/J, J, J/I) compared with only 19% at Goosecroft Road. Similarly for cattle, 40.4% at the Tolbooth compared with 18.4% at Goosecroft Road (J, J/I). Since conditions of preservation at the Tolbooth ranged from 'well-preserved' to 'friable and crumbly' this perhaps gives some support to the notion that preservation factors at Goosecroft Road may have been biased towards the retrieval of bones of adult cattle and sheep/goat rather than those of lambs and calves.

Archaeobotany

By Susan Ramsay

The following report details the processing, analysis and interpretation of carbonised and waterlogged botanical remains recovered from samples taken during excavations at Goosecroft Road between 28 July and 6 October 2014.

Methodology

Flotation, sieving and sorting of bulk samples

A program of bulk sampling was undertaken at the site and a total of 36 samples were processed by flotation to recover botanical remains. The flotation process used standard methods and sieves of mesh diameter 1 mm and 500 µm for flots and 2 mm and 4 mm for retents from flotation. The resulting flots and retents were then dried and sorted for the recovery of palaeoenvironmental or artefactual remains.

Dried flots and sorted retents were examined using a binocular microscope at variable magnifications of x4 - x45. For each sample, estimation of the total volume of carbonised material >2 mm and > was made and all charcoal > was identified unless this proved to be too large an amount, in which case a known percentage of this charcoal was identified. All seeds were also identified and recorded and any other plant macrofossil remains were noted.

Laboratory sieving of waterlogged samples

Laboratory sieving of waterlogged contexts was undertaken on eleven sub-samples, most of which had additional samples processed by the flotation method. A known volume of soil (200 - 250 ml) was analysed from each sample. The sub-sample was soaked in cold water and then sieved through a stack of 1 mm and 500 µm sieves. All material retained on the sieves was scanned using a binocular microscope at variable magnifications of x4-x45. The bulk matrix composition of each sample was recorded and a representative sub-sample of each component part retrieved for storage. Subsequently, all seeds and other macrofossils were removed, identified and kept under cold conditions. All retained materials were stored in a mixture of glycerine, ethanol and formalin to retard fungal growth.

Identification of wood samples

Twenty-five hand-collected samples of waterlogged wood were also identified, with some of these samples containing over fifty fragments of wood. For samples that contained large amounts of wood, 50% of the total number of fragments was identified. Each wood fragment was measured, described, any working noted and then identified. The wooden fragments were sub-sampled, by taking a very small wood section from them with a razor blade, and then mounting that section on a microscope slide with methylene blue stain. Identification was undertaken using a high-magnification binocular microscope at x100-x400.

Identification of botanical remains

The testa characteristics of small seeds and the internal anatomical features of all charcoal fragments were further identified at x200 magnification using the reflected light of a metallurgical microscope. Reference was made to Schweingruber (1990) and Cappers et al. (2006) to aid identifications, and vascular plant nomenclature follows Stace (1997) except for cereals, which conform to the genetic classification of Zohary and Hopf (2000).

Results

Results are discussed by feature grouping. Numbers in brackets indicate individual context numbers or features. The results are shown in the appendices in the site archive.

Friary wall and the burial in the south-west corner

A substantial stone wall (017) was uncovered at the southern end of the evaluation trench and subsequent excavation revealed that there were fragments of a skeleton within a grave (008) next to the north face of it. The fill (009) of this grave produced small amounts of oak charcoal, which may be unrelated to the burial itself, although could be the remains of coffin wood burned at a later date.

To the east of the evaluation trench, a foundation trench (062) for wall (017) was excavated. The upper fill (063) produced charcoal of oak, alder and rowan type, with a single carbonised grain of oats the only identifiable cereal from this context. The most interesting finds were uncarbonised seeds of fig, bramble, raspberry and henbane, together with a few seeds of nettles, fathen and buttercup. These suggest food plant remains, together with weeds that might have grown in enriched soils. The fact that these food plant seeds are quite robust suggests they may have originated from sewage and that this deposit contains midden/sewage waste. Henbane is not a food plant but is an extremely poisonous herb that has medicinal properties.

Below (063) was a shallow deposit (064) that contained animal bone, charcoal and mortar. The uncarbonised seeds from (064) were very similar to those from the context above, whilst the charcoal also contained oak, but with addition of birch and hazel. Fragments of uncarbonised oak wood were also identified. Again, it would appear that there is a sewage component to this assemblage, but with the addition of midden waste from hearths and other sources.

Below (064) was the main construction layer

(065), with an almost identical charcoal and uncarbonised seed assemblage to that seen in (064), although the only fragment of uncarbonised wood was identified as willow.

The primary fill (066) of this trench contained a similar range of charcoal to that seen in the fills above, with oak dominating together with lesser quantities of hazel, birch and ash. It appears that this fill must have been more continuously waterlogged than those above, since numerous uncarbonised seeds were found within it. The seeds were generally indicative of waste ground habitats, with sedges, buttercups, nettles, stitchwort / mouse-ear and goosefoots all present. In addition were a few seeds of food plants (fig pips and brambles), with further evidence for henbane, this time with hemlock, another poisonous species.

On the southern edge of the wall (017) were the remains of a stone-built drain or culvert (060). At the west end the drain was filled with a deposit of light grey clay (067). A small quantity of cherry type and oak charcoal was recovered from this fill, together with a few seeds of food plants (figs, bramble and elderberry) and some weedy types were also present. These uncarbonised types are similar to those recovered from the fills of the foundation trench (062). A fragment of cherry type charcoal from (067) was AMS radiocarbon dated to cal AD 1441–1528 (SUERC-59197). The rest of the drain was filled with a mixed deposit of light brown sandy silt (061) but this produced no carbonised botanical remains and only a single uncarbonised seed of elderberry.

An irregular band of stones (029) was located running east-west across the site. Beneath this was a midden type deposit (048) that overlay a dark brown organic deposit (049) that contained wood fragments adjacent to the line of (029). There were abundant fragments of uncarbonised wood in (049), with oak, Scots pine type, hazel, willow and ash all represented. It was particularly notable that many of the oak and Scots pine type / conifer fragments were worked into the form of thin, narrow planks or laths. The willow fragments were often roundwood and one piece of ash was shaped into a square-sectioned ‘pin’ or rod. These remains suggest some form of structure, whether it was simply a fence or perhaps a more substantial building is not clear. Analysis of the sediment around the deposit of wood showed evidence for uncarbonised seeds, with fig pips, a cherry stone, elderberry and hemlock again recorded. This suggests a similar origin and time period to the fills in the foundation trench for wall (017) but whether the wood was dumped into this feature or whether a structure was once located in this area is not clear.

Excavation of (049) revealed a ditch (055) lay beneath this feature. A few fragments of uncarbonised wood were recovered from (055) but these were poorly preserved. The ditch extended from the excavation trench to the foundation of a concrete feature (051). The fill (050) of the linear trench (051) was extremely rich in carbonised and uncarbonised botanical remains. The charcoal assemblage was dominated by oak and hazel, with lesser amounts of alder, birch, ash and rowan type all present. The uncarbonised assemblage was dominated by hazel nutshell fragments, with weeds of waste ground and grassland, together with seeds of figs, strawberry and henbane. A few pieces of probably oak wood were also recorded. As before, this appears to represent midden deposits, with evidence for sewage in the form of food plant remains.

The ditch itself had steeply sloping sides and a flat base and the upper fill (053) consisted of dark grey/brown silty clay with oyster shell, bone, charcoal and pottery. Analysis of the botanical assemblage showed it to be very similar to that obtained from (050) above, but with the addition of a few carbonised grains of bread wheat and oats, hemlock, and numerous cherry and plum stones. In addition, four grape pips were also recorded; the only instances of this species on the site. Large quantities of uncarbonised wood were also recovered from context (053). Oak, hazel, willow and ash were all identified. Some of the oak appeared to be worked into thin planks or laths as before, whilst the hazel and willow were generally pieces of small roundwood sometimes with bark. The ash fragments were shaped into squared section pins or rods as seen in (049). A large piece of spruce / fir plank was also identified from this context. However, this piece of wood was extremely ‘fresh’ in appearance, and appeared to be machine cut. It is likely that this piece of wood is a modern contaminant.

Fill (054) was sealed by (053) and was produced a very similar botanical assemblage to that recorded for (053), although cherry and plum stones were absent and carbonised hazel nutshell was more abundant. The uncarbonised wood from (054) was also dominated by oak in the form of narrow planks or laths, with small roundwood fragments of hazel and willow and 'pins' of ash also present. A few fragments of what may be carbonised leather or hide were noted in the fill (054) of the feature but these were not identified further. A fragment of hazel charcoal from (054) was AMS radiocarbon dated to cal AD 1167–1267 (SUERC-59196.)

At the western end of the ditch, the upper fill was partially sealed by a deposit of grey/brown silty clay (057) that contained oyster shell, medieval pottery and a fragment of glazed medieval floor tile. The only botanical finds from this context were two large fragments of worked oak wood that appeared to have been shaped into planks or posts, one of which had a nail or pin hole within it.

Once ditch (055) had been excavated, a machine was used to uncover the extent of the organic deposit (049) discussed above. It was apparent that this was the same deposit as (019) that was originally uncovered in the evaluation trench and was also noted on other parts of the site. Deposit (019) contained many fragments of uncarbonised wood, with oak and willow both identified, although no obvious working was noted and the willow fragments may be root wood. In addition, traces of rowan type and oak charcoal were also noted.

Pit

Beneath layers of garden-type soils at the eastern side of the excavation area, a feature (069) was noted, which was thought might be the remains of a ditch or pit. Its fill (070) produced small amounts of oak, hazel and willow charcoal together with scarce uncarbonised seeds of bramble and elderberry. A fragment of hazel charcoal from (070) was AMS radiocarbon dated to cal AD 1119–1247 (SUERC-59198).

Central Area South

A large concentration of stones that appeared to be part of a linear feature (027), thought to be a rubble drain, were revealed in the middle of the trench. These stones were set within deposit (025), which produced medieval pottery, glass, tobacco pipe and animal bones together with uncarbonised wood of alder and oak, which did not appear to be worked. Overlying (027) was a concentration of decayed bone (035), which also contained traces of oak charcoal and an indeterminate carbonised cereal grain. To the east of (027), a deposit (035) produced some artefacts and a couple of fragments of alder wood, with no evidence for working.

Central Area North

In this area sections of old railway sleepers and telegraph poles had been found on top of layer (003) and pressed into the underlying dark grey silty clay (018). The charcoal assemblage from (018) consisted of small quantities of oak, hazel and birch, with a few grains of carbonised oats also present. However, this context also contained significant numbers of uncarbonised seeds. These were generally waste ground indicators, in particular nettles, but there were seeds of bramble, raspberry and elderberry, which may be the remains of food rather than just from plants growing in situ. A fragment of hazel charcoal from (018) was AMS radiocarbon dated to cal AD 1272 –1320 (SUERC-59195)

Discussion and synthesis

The charcoal and wood assemblages

Charcoal was common in the upper, medieval layers of the site. A wide variety of charcoal taxa were present, although oak and hazel were probably the commonest types identified. The diversity of charcoal types suggests that there were areas of woodland nearby that could be exploited for fuel.

The uncarbonised wood from the drain and ditch contexts close to the friary wall show a preponderance of narrow, thin planks or laths made from oak and conifer type wood. In addition there are numerous pieces of hazel and willow roundwood and square-sectioned long 'pins' that were exclusively made from ash wood. This assemblage of worked wood suggests either a wooden building, or perhaps a fence was present on the site during the medieval period.

Some fragments of spruce / fir type were identified from ditch fill (053). Spruce and fir

are not native to Scotland so may have been imported, but the fragments had an extremely fresh appearance and the largest fragment was from a plank that appeared to be machine cut. It is much more likely that this piece of wood is a modern contaminant, perhaps from the tip of a relatively modern post hammered into the ground.

Cereals

Carbonised cereal grains were relatively uncommon on the site, although both oats and bread wheat were identified in trace amounts. There were no finds of burnt chaff or carbonised seeds of crop weeds in any of the samples. This suggests that, although many of the deposits are thought to represent midden deposits, they probably do not contain the waste from any cereal processing activities associated with the friary. It may be that fully processed grain or flour was brought onto the site and processing occurred elsewhere.

The presence of oats and wheat instead of barley is in keeping with the medieval dates for this site. A similar situation was observed in medieval towns including Perth, Aberdeen and Elgin (Dickson and Dickson 2000, 213). The identification to species of oats is problematic, and is based on the grain size and shape of the abscission scar. In this study the grains were not confidently identifiable to species, although many were sufficiently large to be of cultivated origins, implying that common oat (*A. sativa*) or bristle oat (*A. strigosa*) were present rather than simply wild oats (*A. fatua*).

Other food plants

Fig pips were found in several contexts on the site, particularly in the drain and ditches. All the fig pips recorded were uncarbonised. They were often found in combination with other edible fruits such as brambles, raspberries and elderberries. In common with these other fruit stones, fig pips pass through the human gut unchanged, making this association significant in a situation where less durable food remains may not have preserved. Fig trees grow along river banks today, having self-sown from pips which have survived sewage treatment works, but none of these trees can ever set ripe fruit in this country due to the complex reproductive biology of the fig and the dependence of the tree on the tiny fig wasp for fertilisation (Dickson and Dickson 2000, 252), but the wasp has only been found as far north as the River Loire in France (Dickson and Dickson 1996). In British archaeological deposits fig pips are strongly connected with sewage, but the seeds must all have come from imported dried fruit rather than locally grown produce, since this would not contain developed seed due to the absence of the wasp in this country. The fig pips were also often found in conjunction with uncarbonised seeds of henbane and hemlock and this will be discussed further below.

A few grape pips (four uncarbonised and one carbonised) were identified as *Vitis vinifera* ssp *vinifera* (cultivated grape) following the criteria described by Zohary and Hopf (2000) and are within the size range described by Smith and Jones (1990). There are no published Scottish records for grapes prior to the Roman period, and British viticulture is not thought to have been feasible so far north (Jones 1981). Consequently it is likely that these pips represent imported fruit, most probably raisins rather than fresh grapes. Cherry and plum fruit stones were also recorded and these fruits could easily have been grown in the local area.

In addition, hazel nutshell was commonly present in the contexts examined from Goosecroft Road. This was found both as carbonised and uncarbonised remains. Heating of hazel nuts can make them easier to shell and so this might explain the charred shells or discarded shells may simply have been thrown onto the fire. Hazelnuts have been extensively eaten in Britain from the earliest Mesolithic period right up until present day as a result of their high fat and protein content and the fact that they can readily be stored over the winter months (Dickson and Dickson 2000).

Medicinal plants

Several of the midden contexts contained seeds of henbane and hemlock, both highly toxic plants. Henbane is a ruderal (waste ground) weed, rare in the Scottish flora today, but which was either more common in antiquity, or was previously intentionally cultivated. The plant has important medicinal components, found especially in the leaves, but also to a lesser extent in the seeds and other parts of the plant. The active ingredients are hyoscyamine, atropine and hyoscine, which have narcotic, analgesic and sedative properties

(Stuart 1989). The seeds of this annual species are well known for their longevity, and have been known to sprout from freshly excavated soil heaps from archaeological excavations, especially those of castles or monastic enclosures (Connolly 1994). Henbane seeds have been found in medieval Perth, at Blackfriars in Edinburgh, at the Tollbooth in Stirling as well as on many other sites, all of which are Roman or post-Roman (Dickson and Dickson 2000, 249; Miller and Ramsay 2001; Miller, Ramsay and Alldritt 2000; Ramsay and Miller 2008).

Hemlock is also a ruderal weed, but one which prefers damp ground. It is rare over much of Scotland but does grow more commonly towards the east, and particularly near the sea (Dickson and Dickson 2000). It may have been spread by cultivation for its medicinal properties from further south in the UK. All parts of the plant are poisonous, including the seeds, although there are some claims that plants that grow in cold climates are less poisonous than those growing in warmer areas. The active ingredient in hemlock is coniine which has painkilling and sedative properties but is a very potent poison if administered incorrectly. Hemlock was the state poison of ancient Greece and was purportedly used to kill Socrates (Stuart 1989). Hemlock seeds were found associated with henbane in a cesspit deposit from the Roman fort of Elginhaugh (Dickson and Dickson 2000) and from the medieval deposits excavated at Blackfriars in Edinburgh (Ramsay and Miller 2008). It was also recorded from deposits thought to have come from an early herb garden (c. 500-730 AD) at Whithorn. The medieval and post-medieval drain fills from Paisley Abbey also yielded seeds of hemlock (Dickson 1996, Dickson and Dickson 2000).

Henbane and hemlock were almost always found in association with fig pips, which were taken to suggest the presence of sewage. It is possible that the henbane and hemlock were simply growing as weeds of waste ground in and around the site at Goosecroft Road. However, it is possible that they were being administered, in the form of seeds, as some form of medicinal treatment and then being excreted with other seeds, such as the figs, and ending up in midden deposits with a high sewage content.

Weed seeds

A diverse assemblage of weed seeds was identified from the medieval samples from Goosecroft Road. The vast majority of these were preserved in an uncarbonised state. In general they were indicative of waste ground (ruderal) habitats. Sedges, buttercups, fathen, docks, chickweed and nettles were particularly common. No weed seeds that are directly related to crop plants were recorded and so it is impossible to say whether crop processing was taking place nearby or to shed light on any agricultural practices that may have taken place at that time.

Summary

The botanical remains recovered from the medieval deposits at Goosecroft Road, Stirling, show the use of a diverse range of wood types as fuel, although oak and hazel appear to have been preferred. From the pollen analysis (see Appendix 2), oak does not appear to have been growing in any quantity nearby and so would have had to have been collected from some distance away and transported to the site. Cereal grains were present in low concentrations on the site and, although carbonised oats and bread wheat were identified, it is not thought that any cereal processing was being undertaken on site. Fig pips were common in drain and ditch deposits and were often found in conjunction with other fruit stones such as brambles, raspberries and elderberries. Other evidence for food remains on the site includes fragments of hazel nutshell, cherry stones and plum stones. Most notable was the presence of hemlock and henbane seeds within several of the ditch and drain deposits, usually in association with fig pips. Henbane and hemlock are highly poisonous but were used in the past for medicinal purposes. The association with fig pips, which are generally thought to be an indicator of sewage, may suggest that these poisonous plants were being ingested for medicinal purposes rather than simply growing nearby. The site produced many waterlogged wood remains from the medieval deposits, in particular the remains of numerous oak and conifer thin, narrow planks or laths, together with square-sectioned pins made from ash. Willow and hazel roundwood fragments were also common and may indicate a timber building or fence was present on the site.

Fossil beetle (Coleoptera) fauna

By Nicki J. Whitehouse

This report summarises the investigations of one sample associated with a ditch fill from context 54 and the results of the fossil beetle analysis, which suggests that the deposit likely represents cess pit material, with insects representing both foul and decaying materials, as well as a 'house fauna' likely representing sweepings deposited to dampen down the cess pits' contents. This interpretation is backed up by the archaeobotanical findings. The assemblages are very much in line with other medieval cess pit assemblages from urban assemblages.

Results

Sample 16 (context 54) *(Table 17)*

Sample Number	Description of deposit	Volume processed (in litres)
Sample 54, Context 016	Dark brown, clay-rich soil, gritty texture; white mark inclusions, plenty of vegetation fragments within matrix, grass or reed-like. Small piece of porous wood, possibly oak.	1.3

Table 17: Description of the sample processed.

This sample originated from a ditch fill associated with the medieval friary. It is undoubtedly a most interesting and diverse assemblage, yielding 46 MNI, across approximately 40 species. Amongst the families recovered, the Staphylinidae rove beetles are especially well-represented, along with the water scavenger hydrophilids, but also synanthropic beetles from the Cryptophagidaea, Lathriididae and Anobidae families, many of which are associated with dry hay and thatching and construction timbers.

There are both aquatic and terrestrial elements to the fauna represented. The small fully aquatic component includes *Haliplus* spp. and *Ernochrus* spp., beetles that live in insubstantial, stagnant waters. There are no species associated with open or flowing waters, indicating that the aquatic habitats were likely shallow and perhaps temporary, rather than permanent. Hygrophilous ground beetles (*Trechus* and *Bembidion* spp.) and staphylinid rove beetles emphasize the damp nature of the sampled environment. Several of these are commonly found in mossy, damp places and waterside situations, such as *Olophrum piceum, Lesteva punctata, L. longoelytrata* and *Quedius fuliginosus*. They are quite commonly associated with fens, although not exclusively so, and perhaps reflect the semi-natural or natural conditions at the site or travelled within materials that had been brought on site. The presence of the hydrophilid *Cymbiodyta marginella*, which is found at edges of stagnant, usually more or less eutrophic freshwater, in the shallow waters, among vegetation (e.g. wet moss and under leaf litter) (cf. Hansen 1987), provides further detail on the site.

A variety of water-side plants are also indicated. Mildly basic environmental conditions are also indicated by the reed beetle *Plateumaris sericea*, whose larvae spin cocoons in rhizomes and roots of bulrush *Typha latifolia*, common clubrush *Schoenoplectus lacustris*, sea clubrush *Bolboschoenus maritimus*, branched burr-reed *Sparganium erectum*, and yellow iris *Iris pseudacorus* (Stainforth 1944), as well as on sedges *Carex* and water-lily *Nuphar* species (Bullock 1993). *Typha* (bulrush) is also exclusively associated with *Telmatophilus typhae* (Koch 1989), whilst *Prasocuris marginella* is typically associated with *Caltha palustris* (marsh marigold) and *Ranunculus* (buttercup) (Bullock 1993). The latter plant is native to marshes, fens and ditches and although clearly associated with the damp nature of the site, may also be part of the background flora of the site. *Limnobaris t-album* also indicates the presence of sedges, *Carex* spp., *Scirpus* and *Cladium* spp., and the common club-rush, *Schoenoplectus lacustris* (Hoffman 1954; Koch 1992). There are thus a variety of waterside plants represented. Several other species typically associated with herbs and other flowering plants are also present, such as *Meligethes sp* and *Phyllobius spp.*

These communities are very much in contrast to the other component of the assemblage, which is very archaeological in nature. Other species are associated with damp, decaying animal (dung) and plant debris, such as *Megasterum obscurum*, which is found in all types of decaying organic matter (Hansen 1987) and *Cercyon haemorrhoidalis*, which is very common in cow dung (Skidmore 1991), although it is also found frequently in rotting plant debris (Hansen 1987). Quite a number of rove beetles are associated with foul decaying conditions, most

of which include dung as their common habitats. *Omalium oxycanthae* is found in rotting, decaying vegetation, in fungi, but also in dung (Koch 1989); *Oxytelus laqueatus* is very common in herbivore dung, but also can be found in the dung of game, dogs and humans (Koch 1989). *Anotylus complanatus* enjoys similar pabula, being commonly found in rotting vegetation, in stable manure and compost heaps, in dung and carrion (Koch 1989); *A. tetracarinatus* and *Leptacinus pusillus* are common in compost and stable manure heaps and herbivore dung (Skidmore 1991), whilst *Tachinus rufipes* is a hygrophilous taxon, found in decaying substances of all kinds, in excrement and carrion (Backlund 1945). The dung beetle, *Aphodius prodromus*, confirms the presence of manure.

Several synanthropic taxa are present. These are species that are favoured by human activities. *Anobium punctatum*, the furniture beetle, is a pest of building timbers and clearly associated with archaeological activities. It is possible this specimen was associated with the oak narrow planks or laths recovered from this sample (Ramsey 2015). *Ptinus fur* is considered mostly an indoor synathrope (Skidmore, unpubl.). It is often found in dwellings, especially in stables in straw and hay waste, liking drier conditions (Horion 1953). It is also sometimes a pest of stored seed products and Armitage et al. (1999) identify it as the most frequently occurring, if not the most numerous, beetle pest of British grain stores. *Cryptophagus sp., Corticaria spp and Lathridius minutus* (grp.) are found alongside these species, being associated with dry mouldy vegetable matter and very common in haystacks, stabling material. It is noticeable that this assemblage component contains a number of clear indicators associated with cess and stabling materials. Several of the above elements (*A. punctatum, Ptinus fur, Cryptophagus* spp.) are also seen as being part of the 'house fauna' package (*sensu* Smith 2013).

Discussion and synthesis

A radiocarbon date associated with hazel charcoal in the fill of the ditch (context 54), provides an approximate date for the context sampled to 1167–1267 cal AD (SUERC-59196). Despite its small sample size, the assemblage provides some interesting insights into the medieval environment of Stirling. Many elements of the assemblage emphasize damp, waterside habitats with a variety of water-side plants. This seems somewhat at odds with the obvious archaeological assemblage that is also present on site, especially the synanthropic fauna. Many of these elements are part of 'house fauna', but these, in combination with a much fouler suite of species that are found in foul/rotting substances, including excrement, suggests close similarities with the 'cess' indicator package identified by David Smith (2013), (Figure 24). As evident in Figure 23, several elements found in the assemblage are listed as indicators of cess, including *Quedius, Philonthus* and *Cercyon* spp., *Ptinus fur* and elements of 'house fauna'. The 'house fauna' tends to become incorporated either as a result of rubbish material being deliberately added to 'dampen' the cess or to encourage a more accelerated composting process (ibid.). However, as the work of Smith (2013) makes clear, many cess deposits contain a mixture of saturated and drier materials and possibly some of these taxa are associated with dry materials within the cess itself. The analysis of the seeds from this sample also confirm the presence of cess, including fig and digestible fruit seeds (see Ramsay, above); wild and uncultivated plants such as nettle, buttercups, elder are common inclusions in cess pits, as here, ruderal species that are likely to have grown in areas around the pits, entering deposits by accident. Other foods, such as hazelnut shells, also present here, are often common in cess pits (Smith 2013), presumably dumped rubbish. Fragile organic remains including leatherwork and clothing can also be surprisingly common (ibid.) and the inclusion of carbonized leather or hide (Ramsey, above) is therefore no surprise. The inclusion of structural timber beetle pests such as *Anobium punctatum* is also quite common in cess pit assemblages and could be associated with the use of wattle or timber as part of a structure or covering of the ditch. Cess pit assemblages frequently also contain the seeds of waterside plants such as rushes and sedges (Smith 2013), as indicated here both by the insect fauna and the archaeobotanical remains. These become incorporated within cess pits as a consequence of waste/flooring materials becoming added to the cess pit deposits as part of the dampening process. This likely suggests the use of rushes and sedges, together with grasses and herbs as flooring materials within nearby houses, which

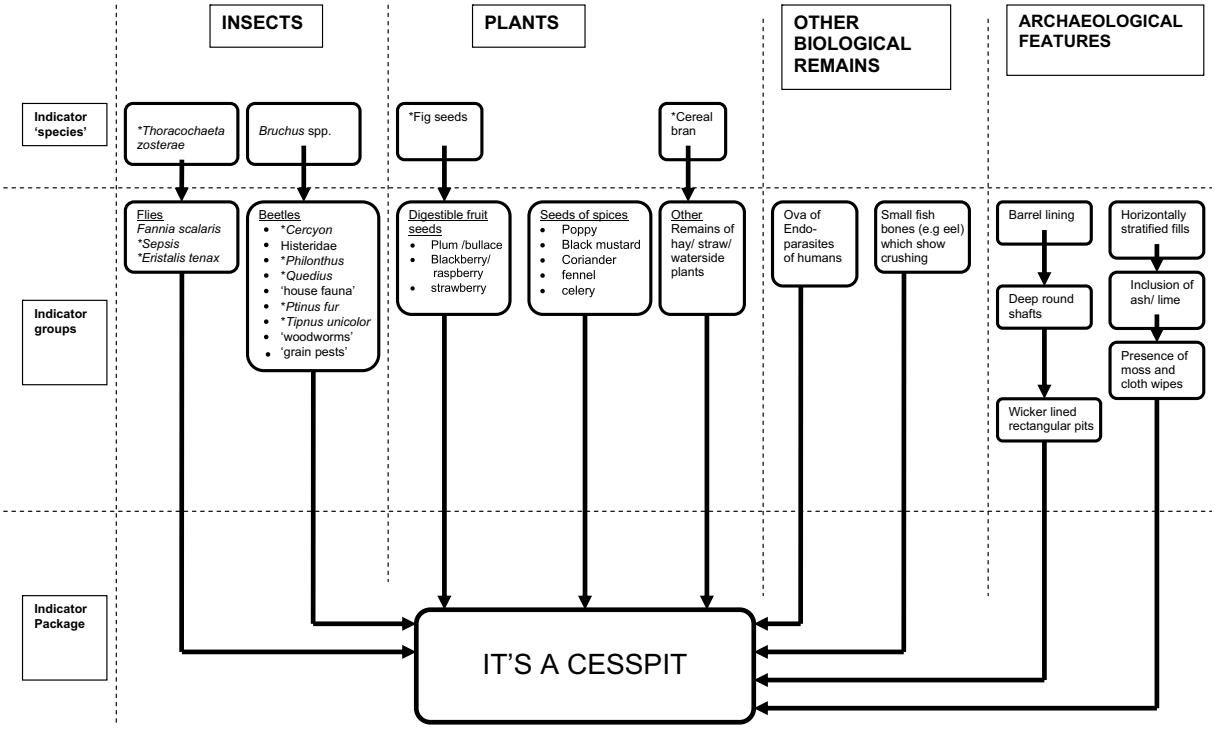

Figure 24: Indicator packages and groups and taxa for the identification of cess pits; reproduced from Figure 4 (Smith 2013).

were periodically disposed of and refreshed. Usage of such materials as flooring is well known within the literature (e.g. Greig 1981; Smith 2013).

Conclusion

It seems fairly clear on the grounds of the beetle fauna, and associated archaeobotanical assemblages that this sample represents the remains of a cess pit and therefore provides useful insights into the sanitation arrangements in this area of the site, and in the use of materials such as sedges and rushes within houses (e.g. as flooring) which were later discarded. The assemblage from this context bear many similarities with similar assemblages from other urban archaeological sites of this period, and includes many typical indicator taxa. It should be noted that not all expected components are present in the assemblage, but this is likely a function of the small sample size.

Discussion

This discussion concerns the significant structures and artefacts found during the archaeological interventions as well as the interpretation of the environmental evidence. The excavated material provides a rare opportunity for study of the structures and deposits in this part of Stirling as they provide some insight into the changing nature and development of settlement within the city.

The early environment

From the two monolith samples collected from the site and the radiocarbon dating of these deposits indicates that that the natural history of the site goes back as far as the middle of the fourth millennium BC (the early/middle Neolithic). The evidence suggests a damp environment, of predominantly alder carr, perhaps lying close to the River Forth. A radiocarbon date from the bottom of Monolith 1 indicated that conditions were similar during the early Bronze Age (the end of the second and the beginning of the third millennium BC). A third radiocarbon date of the early Iron Age (the beginning of the first millennium BC) did not show any direct human interference, but the gradual drying and acidification of the alder carr fen indicated

that environment was changing, perhaps due to drainage. The only obvious evidence of human activity of the area for its resources was a flint piercer (CAT 1).

The history of the site to the beginning of the fifteenth century

The environmental evidence suggests that the area remained damp but it supported pastoral grassland with weeds and shrubs. The radiocarbon dates from the monolith samples suggest the development of the land altered significantly between the eleventh and the middle of the twelfth centuries with the upper levels of the monoliths being disturbed through human activities. There was evidence of tree species and cereal grains suggesting woodland survived nearby and farming was practiced in the wider area. The area was probably being used for a variety of activities, including the disposal of domestic waste, and it was possibly subject to periodic flooding. The earliest medieval human activity included the digging and use of a possible large ditch (069) on the eastern side of the area (Figure 25). It demonstrated the use of the site prior to the construction of the friary during the twelfth and early thirteenth centuries. It seems likely that the ditch was filled in during the construction of the ecclesiastical buildings and it provided the earliest possible date (*terminus post quem*) that the friary could have been constructed c.1119 -1247 cal AD. Evidence from historical documents (see Appendix 1), indicates the friary was established in 1233 on the edge of what was then the burgh of Stirling.

From the excavation a number of significant structures and features associated with the construction and use of the friary were located in its south-west corner of the area and across its central portion, with evidence of later activities towards the north. The structures included a substantial stone wall (017) with external buttresses constructed along its length. The building techniques used, including the use of dressed stone and the design of a plinth course near its base, as well as the massive thickness of the wall, connect it firmly with the friary. Although only a portion of the wall was exposed, there are enough indicators to suggest this was most likely the boundary wall to the friary or one of the main buildings within the friary complex.

A grave was found of a person buried next to the wall, probably between the period 1271 and 1320 cal AD (Table 3) along with a brooch or buckle that may have been part of a belt, added a different aspect to the interpretation of the structural remains. The copper-alloy buckle (SF 9; see Cruickshanks above), provided a rough date for the burial of the thirteenth/fourteenth century AD by typology, and compares well with the radiocarbon date. The person buried was most likely male, but he was not buried in the friary graveyard even though a wide range of people from the local community as well as members of the religious order could have been buried there (Stones et al 1989, 112-3). The strategically placing of the grave beside the friary wall is uncommon but it suggests the location was important in the burial of the individual. The position could also be a reflection of the possible low status of the deceased, of disease carried by the individual, or even the lack of space in the friary graveyard. It has been considered that the skeleton could have been that of a friar, but if this were the case, he would most likely have been buried in the friary cemetery, and therefore the interpretation of this individual as a cleric remains doubtful. However, the close positioning of the grave in relationship to the friary can be interpreted that the individual had a connection to the house during the life of the individual. Alternatively, the burial could have been the result of an illegal but opportunistic disposal of a dead person – close as possible to consecrated ground, but not actually in it (Figure 25).

The location of the grave beside the wall can be compared to a similar but unusual undated burial of a young adult male discovered within the foundation wall of the south nave of the Carmelite Friary in Linlithgow (Stones et al. 1989, 1/C7). Both individuals appear to have been formally buried, with the orientation of their graves respecting the east/west tradition of the time. However, this can also be explained by the fact that the burials took place besides east/west aligned walls. At the Blackfriars Friary in Stirling there were no additional graves in the vicinity suggesting the location was not land that was not normally used for burial, as the cemetery lay west of the excavated site (see Appendix 1). The area demarcated by the boundary wall (017) and a narrow ditch (055) to the north-west, was probably a burgage plot. If so, it seems to have

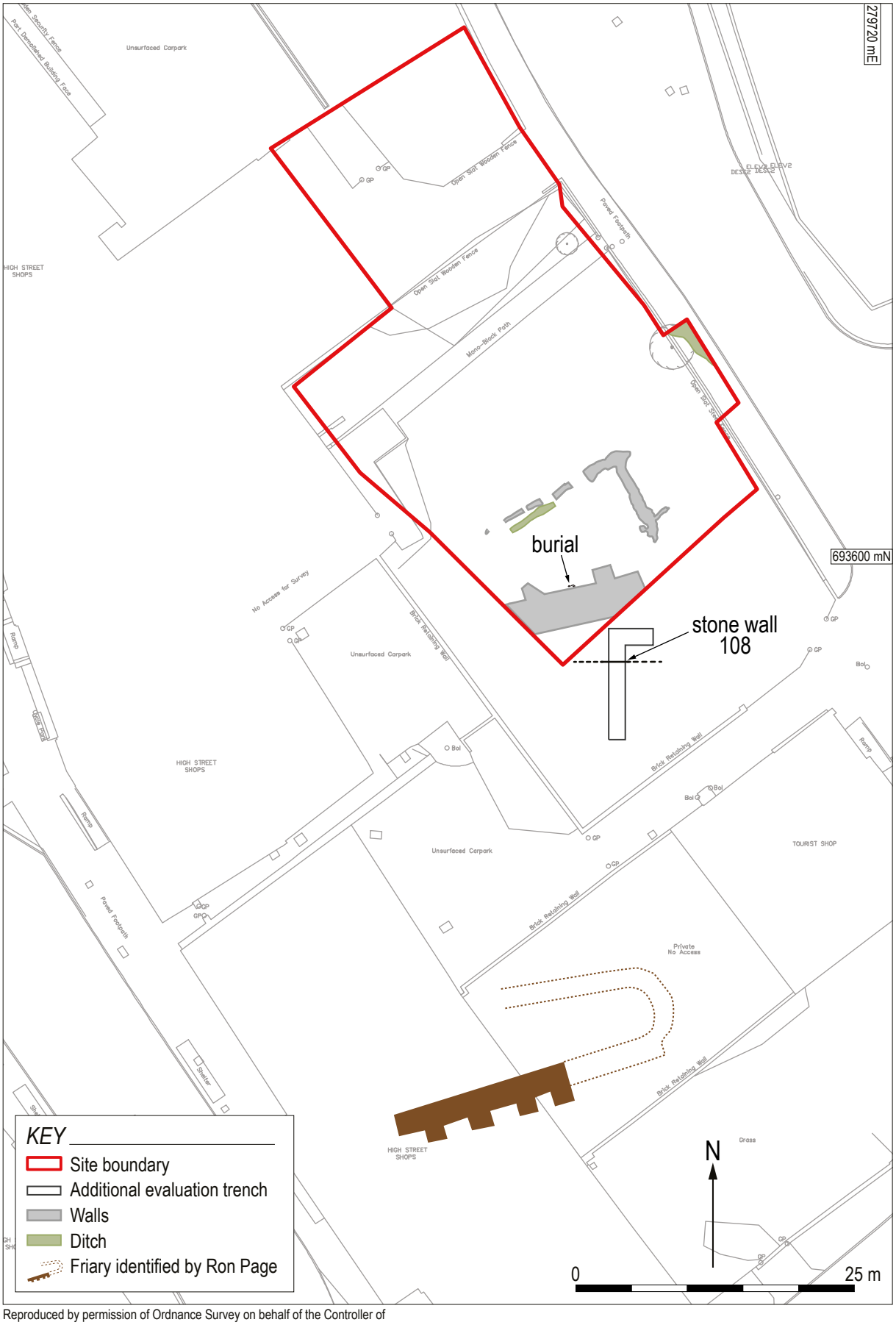

Figure 25: Distribution of medieval features in the excavation trench and surrounding area.

been largely unused for the construction of permanent buildings and is unlikely to have been consecrated ground.

A possible boundary ditch (055) to the north-west that was later replaced by a stone wall (029), and dated to 1167–1267 cal AD, was probably associated to the establishment of the friary and the extent of ecclesiastical property (Figure 25). During the twelfth and thirteenth centuries the evidence from fossil beetle fauna suggest there was static and stagnant water in the ditch fill, and that it was probably used as cess pit. The accumulation of midden material was also noted in the botanical analysis. The filling in of the ditch and its replacement with a stone wall were probably necessary for health reasons.

If the burgh was also expanding at that time to land near the friary a new burgage plot may have been created besides the new boundary. Burgage plots were long linear strips of ground which fronted the main market street where trading would take place, while the manufacture of goods to sell, along with domestic food production, would take place in the land to the rear. During the medieval period, industrial works were often located in these backland areas due to the risk of fire and the hazards they posed to the many timber structures (Coleman 2004, 290). The accumulated debris of pottery and animal bones in this area suggest that if a burgage plot existed here, it was actively used for the disposal of waste, as well as craft or industrial processes, as indicated by metalworking slag (see above).

An evaluation trench to the south of the excavated area located the core of a stone wall (108) within a foundation trench (107, Figure 25). The width and depth of the wall suggested it was a friary building and was possibly part of the church building.

Personal items found during this period of the establishment and use of the friary includes an unusual and rare spotted glass bead (see Campbell above). This is possibly the earliest medieval find on the site and is probably an imported object. The copper-alloy buckle or brooch, mentioned in connection with the burial of a male person, is also a medieval artefact.

Other early pieces found at the site are pottery jugs dated from the middle of the twelfth to the middle of the thirteenth century AD, from Stamford and Yorkshire (see Will, above), along the east coast of Britain. They complemented the contemporary local wares, usually Scottish medieval Redware cooking pots, and provided decorative and functional objects for the table that were in demand throughout the medieval period. It is important to note that the development of local Scottish pottery and potteries was taking place at this time but the demand for luxury and, no doubt, expensive wares by the friary well attested. Evidence of imported pottery goods during the twelfth and the fourteenth centuries included wares from France, greywares and highly decorated jugs from the Low Countries. Decorated jugs in Yorkshire type Wares were also brought in and used during the thirteenth and fourteenth centuries. These goods demonstrated the necessity of sea-borne trade from countries around the North Sea and up the east coast of Britain, into the River Forth well into the medieval period.

Less well dated are the fire-flints, but they again provide incidental information on the transportation of goods by sea, and the expedient utilisation and transformation of exotic (non-local) flint ballast into a necessary and useable object for fire lighting. Although it is not certain that the fire-flints were medieval in date, the association with shipping suggests their contemporary use with the pottery. Fire lighting (and keeping fires alight) was an important function, requiring resources and raw materials that were not easily available locally.

In addition to personal and functional items, there is also evidence of construction and of the building of the friary. The excavation produced the walls of one or more substantial stone buildings, as well as fragments of architectural pieces. Two carved window tracery fragments, possibly from the friary or other high-status religious building, are dated to the last quarter of the thirteenth century (see Fawcett, above). Slightly later in date, but possibly contemporary in their use were rare fragments of coloured fourteenth century window glass, again most likely ecclesiastical in origin (see Murdoch, above). The presence of lead on the site could imply that the material could have been used with both architectural stonework and the window glass (see Cruickshanks, above)

History of the site during the fifteenth and sixteenth centuries

During the fifteenth and sixteenth centuries the function of the boundary wall (017) changed, when a second wall (068) was built to its immediate south, with an associated stone-lined drain (068) lying between them. The rebuilding reinforces the interpretation that the earlier wall (017) was indeed a boundary wall rather than one to an ecclesiastical building. A considerable quantity of medieval pottery, other artefacts and organic material was recovered from the fill of the drain. An organic sample produced a radiocarbon date of between 1441 and 1525 cal AD. It is not known why the drain was built between the walls, but its location could suggest it was part of the kitchens or lavatorium. This interpretation was supported by the botanical remains which indicated the presence of cereals from oats and bread wheat as well as hazelnuts and use of medicinal plants such as henbane and hemlock. It would appear that there was some consideration of health of the individuals in the friary or an attempt at providing medication that necessitated the use of local, and often dangerous, medicinal plants. The drain fill also contained seeds from imported dried figs and raisins (grapes) that were also possibly used for medicinal purposes. The drain also included timber fragments from oak, conifer, hazel and willow and ash, species used for construction but also in buildings.

To the north and east of the friary walls and drain, were located the poorly preserved remains of another possible building (029), or boundary division, with an adjoining wall (027) at right-angles. These features appeared to follow the same alignment as the medieval wall and boundary ditch but due to their fragmentary and poor condition their relationship to the friary, or other features in the excavated area, are difficult to interpret. Their condition may have been due to decay of the building, an abandonment of the friary in 1559, and the destruction and dismantling of its walls and roofs for salvageable materials. The destruction of the friary buildings revealed that one may have had a tiled floor made of imported tiles dated to the mid-fifteenth century and locally-made iron nails and fittings were used in or on wooden components of its buildings. As mentioned in the historical documentation (Appendix 1), the confiscation of church and ecclesiastical property in 1567 meant that these buildings were seen as quarries providing stone and wood for use in other buildings.

Evidence of life in the friary until its demise can be shown by the occurrence of jugs and bowls of Scottish White Gritty Ware dated to the fifteenth century and of fifteenth-sixteen century and stoneware mugs from Seigburg and Raeren, emphasising that North Sea trade was still important for everyday luxury items. From the fifteenth century, Scottish post-medieval reduced wares and oxidised wares began to be noted in the material cultural record, suggesting the wider use of these wares in the burgh especially after the Reformation.

The occurrence of vessel glass dated from the fifteenth century largely complements the use of medieval pottery in the excavated area and indicates the wide range of goods that were available. However, the presence of glass also raises questions of what was drunk and by whom? Imported raisins and figs were components of a trading network that would also bring wine and other beverages into Stirling, possibly to be drunk in the friary.

Post-medieval to modern history

Between the collapse of the friary as an institution and ruination of its buildings, there is a gap in the archaeological record before the next evidence of reuse of the site. In the north of the site the remains of a cobbled surface (1011) and a remnant wall (1008) could date from the seventeenth to the nineteenth century and be associated with later development of the site. On nineteenth century maps (OS 1858) a well is noted immediately west of the area of cobbling with a wide access route to it, possibly related to the expansion of the inhabited area of Stirling. While the area along the eastern edge of the site seems to consist of re-worked and drained medieval soil, probably relating to activities during the post-medieval period, the modern garden soil, field drains and later foundations for buildings indicate continued alteration and use of the properties to almost the present day.

The artefactual evidence of industrial ware pottery is dated from the eighteenth century to modern times, but the only personal piece from this period is a clay tobacco pipe bowl (see Gallagher, above) that was stamped and dated to between 1680 and 1710.

Understanding the friary

What can we conclude abut the friary, its date, location, layout and form? The establishment of the friary was in 1233 and its destruction took place 1559. That approximately 326 year period is supported by the survival of a small number of substantial walls, a ditch and a drain as well as material cultural evidence. The results of the excavation are such that one of the walls was likely to be a boundary wall for the friary that was replaced or reinforced by another with a drain, the latter possibly related to a lavatorium or kitchen (Figure 25). A small fragment of a wall located in the evaluation trench to the south is possibly a robbed out element of the friary church. The paucity of structural remains is most likely due to the fact that the friary was destroyed in the middle of the sixteenth century and became a ready quarry for building projects in the area. Another factor in the poor survival of structural evidence is the alteration of Goosecroft Road to the east, which had an underpass constructed besides the railway and its station, and the installation of a roundabout and the destruction of buildings along Station Road to the south. All these changes would have seriously affected the archaeological record and the survival of friary remains.

The material cultural evidence is also relatively lean in relationship to the surviving structural remains. Two window glass shards, possibly as early as the fourteenth century in date and two window tracery fragments hint at the possibilities of a leaded glass window(s) in an ecclesiastical building which could date to the fourth quarter of the fourteenth century. It was suggested the pieces belonged to a building that was likely to have been contemporary with the south choir aisle in Glasgow Cathedral (see Fawcett, above) where a standard European architectural form of early window tracery was in currency.

The historical research (see Cross, Appendix 1) highlights the known archaeological discoveries towards the north end of Murray Place (the northern part is now called Barton Street), west and south of the current site to Maxwell Place. In this area human remains have been frequently found, as well as reused carved stones, mostly attributed to Cambuskenneth Abbey rather than the Blackfriars Friary. In addition, a cobbled pathway, remnants of a lime mortared wall, and a possible medieval drain were also discovered during the last century or two, along with sherds of medieval pottery. Redevelopment along Murray Place has often led to the lowering of property to bedrock for basements, with soil removed from gardens, and road level or pavement changes have been frequent. This list of archaeological material, and as Cross remarks (page x) there is presumed to have been much under-reporting of findings, contributes to the present discoveries of an ecclesiastical presence with a graveyard. However, the identification of walls as buildings is largely speculative and the layout of the friary is highly uncertain.

The material cultural evidence is more informative in a general way, with the pottery especially highlighting cooking vessels, jugs from different British regions as well as the continent, and also mugs. Trade has been mentioned (above) bringing in luxury table goods from around the North Sea, foodstuffs, and possibly also wine (of which we have no direct evidence), into almost the heart of Stirling. The friary was well positioned, as was Cambuskenneth Abbey, to receive exotic goods by sea as long as the River Forth was navigable. The life of the friars included expensive, luxury items and these combined with the upkeep of the friary itself, indicated an establishment that was expensive to maintain. It is perhaps a twist of fate that by c. 1559 when the friary was disbanded or destroyed, that large parts of its very fabric was quarried away and removed into the construction of local buildings to lessen the economic burden of those projects.

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Archaeological bibliography

Andersen, S T 1979 Identification of wild grass and cereal pollen, *Danmarks Geologiske Undersøgelse* Årbog 1978, 69-92.

Anderson, J (ed.) 1899 *Calendar of the Laing Charters, 845-1837,* No 46. Edinburgh: T & A Constable.

Armitage, D M; Kelly, M P; Amos, K; Schaanning, S and Spagnoli, W 1999. The white-marked spider beetle, *Ptinus fur* (L.) in stored grain - biology, seasonal occurrence and control using a surface insecticidal admixture, *Proceedings of the 7th International Working Conference on Stored-product Protection*, 1, 51-57, Beijing.

Backlund, H O 1945 *Wrack Fauna of Sweden and Finland*. Opuscula Entomologica Suppl. 5.

Ballin, T B 2005 Lithic artefacts and pottery from Townparks, Antrim Town, *Ulster Archaeological Journal* 64, 12-25.

Ballin, T B 2007 The Lithic Assemblage, *in* Cox, A Excavations at Horse Cross, Perth, *Tayside and Fife Archaeological Journal* 13, 175-177.

Ballin, T B 2010 Flaked stone, *in* Barclay, G and Ritchie, A (eds.) *Artefactual, Environmental and Archaeological Evidence from the Holyrood Parliament Site Excavations*. *Scottish Archaeological Internet Reports (SAIR)* 40, 47-49. Available from http://archaeologydataservice.ac.uk/archives/view/sair/volumes.cfm [Accessed 01/09/2018].

Ballin, T B 2011 *Overhowden and Airhouse, Scottish Borders. Characterization and interpretation of two spectacular lithic assemblages from sites near the Overhowden Henge*. British Archaeological Reports British Series 539. Oxford: Archaeopress.

Ballin, T B 2012a State of the Art of British Gunflint Research, with special focus on the early gunflint workshop from Dun Eistean, Lewis, *Post Medieval Archaeology* 46(1), 116-142.

Ballin, T B 2012b *The lithic assemblage from Knowe of Skea, Westray, Orkney*. Unpublished specialist report.

Ballin, T B 2014 *The lithic assemblage from Allt Iain, Cia-Aig, Loch Arkaig, Kilmallie, Inverness-shire, Highland.* Unpublished specialist report.

Ballin, T B 2015 *The lithic assemblage from The Glebe, Iona, Highland.* Unpublished specialist report.

Ballin, T B 2016 Lithics, *in* Toolis, R and Bowles, C *The Lost Dark Age Kingdom of Rheged. The Discovery of a Royal Stronghold at Trusty's Hill, Galloway*. Oxford: Oxbow Books, 54-56.

Ballin, T B 2017 The lithic assemblage, *in* Ellis, C Monks, Priests and Farmers: A Community Research Excavation at Baliscate, Isle of Mull. *Scottish Archaeological Internet Reports 68*, 79-86. Available from: http://archaeologydataservice.ac.uk/archives/view/sair/volumes.cfm [Accessed 01/09/2018].

Ballin, T B forthcoming The Lithic Assemblage, *in* Cameron, A Excavations at the Green, Aberdeen: a medieval Carmelite House revealed, *Internet Archaeology*.

Bass, W M 1995 *Human Osteology: A Laboratory and Field Manual.* 4th Edition. Missouri: Missouri Archaeological Society.

Brickley, M and McKinley, J (eds.) 2004 *Guidelines to the Standards for Recording Human Remain.* Southampton: IFA Paper No. 7, BABAO.

British Geological Survey 2018. Available from: http://mapapps.bgs.ac.uk/geologyofbritain/home.html [Accessed 01/09/2018].

Brooks, C M 1978-80 Medieval pottery from the kiln site at Colstoun, East Lothian, *Proceedings of the Society of Antiquaries of Scotland* 110, 364-403.

Brooks, S and Suchey, J M 1990 Skeletal age determination based on the os pubis: a comparison of the Acsadi-Nemeskeri and Suchey-Brooks Methods, *Human Evolution* 5, 227-238.

Brugmann, B 2004 *Glass beads from Early Anglo-Saxon graves.* Oxford: Oxbow Books

Buckland P I and Buckland P C 2006. *Bugs Coleopteran Ecology Package.* Available from http://www.bugscep.com/ [Accessed 01/09/2018].

Buikstra, J E and Ubelaker, D H (eds.) 1994 *Standards for the Data Collection from Human Skeletal Remains.* Arkansas Archaeological Survey Research Series, No. 44.

Bullock, J A 1993 Host Plants of British Beetles: A List of Recorded Associations. *Amateur Entomologist* 11a, 1-24.

Caldwell, D H and Dean, V E 1992 The pottery industry at Throsk, Stirlingshire, in the 17th and early 18th century, *Post-Medieval Archaeology* 26, 1-46.

Callmer, J 1977 *Trade beads and bead trade in Scandinavia c. 800-1000 AD.* Lund: Gleerup.

Cameron, A; Stones, J A; Evans, D H; Johnston, A and Spiers D 2001 *Aberdeen: An In-depth View Of The City's Past Excavations At Seven Major Sites Within The Medieval Burgh*. Edinburgh: Society of Antiquaries of Scotland.

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

Christie, H 2014 *Got swag? Investigating beads and bead trade in Scotland in the first millennium AD*. Unpublished M.Litt. thesis, University of Glasgow.

Coleman, R 2004 The archaeology of burgage plots in Scottish medieval towns, *Proceedings of the Society of Antiquaries of Scotland* 134, 281-323.

Collie, J 1835 *Plans, elevations sections, details and views of the Cathedral of Glasgow*. London: J Williams.

Connolly, A 1994 Castles and abbeys in Wales: refugia for 'medieval' medicinal plants', 628-637, *in* Dickson, J H and Mill, R R (eds.) Plants and people: economic botany in Northern Europe AD 800-1800, *Botanical Journal of Scotland* 46, 521-706.

Coope, G R and Osborne, P J 1968 Report on the Coleopterous fauna of the Roman well at Barsley Park, Gloucestershire. *Transations of the Bristol and Gloucestershire Archaeological Society* 86, 84 - 87.

Cox, A 1996 The artefacts, *in* Coleman, R J Burgage plots of medieval Perth: the evidence from excavations at Canal Street, *Proceedings of the Society of Antiquaries of Scotland* 126, 718-724.

Crew, P and Rehren, T 2002 High temperature workshop residues from Tara: iron, bronze and glass, in Roche, H (ed.) *Excavations at Ráith na Ríg, Tara, Co Meath, 1997*, 83-102. Dublin: Royal Irish Academy, Discovery Programme Reports 6.

Davidson, D A; Carter, S P and Quine, T A 1992 An evaluation of micromorphology as an aid to archaeological interpretation, *Geoarchaeology: An International Journal* 7, 56-65.

Dickson, C A 1988 Distinguishing cereal from wild grass pollen: some limitations, *Circaea* 5, 67-71.

Dickson, C A 1996 Food, medicinal and other plants from the fifteenth-century drains of Paisley Abbey, Scotland, *in* Behre, K-E and Oeggl, K (eds.) *Early Farming in the Old World*. Vegetation History and Archaeobotany Special Volume, 25-31,

Dickson, J H and Dickson, C 1996 Ancient and modern occurrences of common fig (Ficus carica

L.) in the British Isles, *Quaternary Science Reviews* 15, 623-633.

Dickson, C A and Dickson, J H 2000 *Plants and People in Ancient Scotland*. Stroud: Tempus Publishing Ltd.

Dobney, K and Rielly, K 1988 A method for recording archaeological animal bones, *Circaea* 5, 79-96.

von den Driesch, A 1976 *A Guide to the Measurement of Animal Bones from Archaeological Sites* Harvard University: Peabody Museum Bulletin No 1.

Dumbrell, R 1992 *Understanding Antique Wine Bottles.* Woodbridge: Antique Collector's Club.

Dungworth, D and Girbal, B 2011 *Walmer Castle, Deal, Kent.* Portsmouth: English Heritage research report series 2.

Egan, G and Pritchard, F 2002 *Dress Accessories 1150-1450.* London: Museum of London.

Fraser, M J 1981 A study of the botanical material from three Medieval Scottish sites. Unpublished MSc Thesis, University of Glasgow.

Friday, L E 1988 A Key to the Adults of British Water Beetles. *Field Studies* 7, 1-151.

Gallagher, D B and Harrison, J 1995 Tobacco pipemakers in 17th-century Stirling, *Proceedings of the Society of Antiquaries of Scotland* 125, 1131-1142.

Gilchrist, R and Sloane, B 2005 *Requiem: the medieval monastic cemetery in Britain.* London: Museum of London Archaeology Service.

Goodall, I 2011 *Ironwork in Medieval Britain*. London: The Society for Medieval Archaeology.

Grant, A 1982 The use of tooth wear as a guide to the age of domestic ungulates, in Wilson, B; Grigson, C and Payne, S (eds.) *Ageing and Sexing Animal Bones from Archaeological Sites*. Oxford: British Archaeological Reports British Series 109, 91-107.

Greig, J R 1981 The investigation of a medieval barrel-latrine from Worcester, *Journal of Archaeological Science* 8, 265-282.

Grimm, E C 1991-2011 TILIA & TGView computer program. Illinois: Illinois State Museum.

Guido, M 1999 *The Glass Beads of Anglo-Saxon England c. AD 400-700*. Woodbridge: Boydell Press.

Haggarty, G 1980 The pottery *in* Ewart, G Excavations at Stirling Castle, 1977-78, *Post Medieval Archaeology* 14, 36-46.

Haggarty, G 1984 Observations on the ceramic material from Phase 1 pits BY and AQ, 395-397, *in* Tabraham, C Excavations at Kelso Abbey, *Proceedings of the Society of Antiquaries of Scotland* 114, 365-404.

Haggarty, G; Hall, D and Chenery, S 2011 *Sourcing Scottish Redwares*. Perth: Medieval Pottery Research Group Occ. Paper 5.

Haggarty, G and Lawson, J 2013 The pottery assemblage, *in* Cook, M; Cross, M and Lawson, J *Marlin's Wynd: New Archaeological and Documentary Research on Post-medieval Settlement below the Tron Kirk, Edinburgh*. Edinburgh: Scottish Archaeological Internet Reports 55, 17-29.

Hall, A and Kenward, H 1980 An interpretation of biological remains from Highgate, Beverley, *Journal of Archaeological Science* 7, 33-51.

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

Hall, D W 2007 Excavations at the pottery production centre of Colstoun, East Lothian in 1939, 1969, 1971, 1977 and 1999/2000, *Medieval Ceramics* 28, 34-73.

Hall, D and Hunter, D 2001 The rescue excavations of some medieval Redware pottery kilns at Stenhousemuir, Falkirk between 1954 and 1978, *Medieval Archaeology* 45, 97-168.

Hall, D; Haggarty, G and Vince, A 2012 The medieval pottery, *in Perth High Street Archaeological Excavations 1975 - 1977, the ceramics, the metalwork and the wood.* Fascicule 2. Perth: Tayside and Fife Archaeological Committee.

Hansen, M 1987 *The Hydrophiloidea (Coleoptera) of Fennoscandia and Denmark.*

Fauna Entomologica Scandinavica, 18. Leiden: Scandinavian Science Press.

Harrison, J G 2002 The pottery at Throsk, Stirlingshire c. 1600-c. 1800: context, links and survival, *Proceedings of the Society of Antiquaries of Scotland* 132, 459–473.

Harrison, J G 2012 *A late medieval pottery at Stirling*. Available from: http://www.johnscothist.com/uploads/5/0/2/4/5024620/medieval_stirling_pottery_aug_2012.pdf [Accessed 01/09/2018].

HES = Historic Environment Scotland, National Monuments Record for Scotland. Available from: http://www.rcahms.gov.uk/canmore.html [Accessed 01/09/2018].

Hodgson, G W I; Smith, C and Jones, A 2011 The mammal bone, *in* Hodgson, G W I et al. *The Perth High Street Archaeological Excavation 19751977. Living and Working in a Medieval Scottish Burgh. Environmental remains and miscellaneous finds*. Fascicule 4, 544. Perth: Tayside and Fife Archaeological Committee.

Hoffmann, A 1954 *Coleoptérès Curculionides 2.* Faune de France, 59, 487-1208. Paris: Lechevalier.

Horion, A 1953 *Faunistik der Mitteleuropäischen Käfer, Bd. III, Malacodermata, Sternoxia (Elateridae - Throscidae).* München: , Eigenverlag, Museum Frey.

Hurst, J G; Neal, D S and van Beuningen, H J E 1986 *Pottery produced and traded in north-west Europe 1350-1650*. Rotterdam Papers VI. Rotterdam: Stichting.

Innes, C (ed.) 1843 *Registrum Episcopatus Glasguensis*, Maitland Club, Edinburgh, vol. 1, p. xxviii.

Jessop, L 1986 *Coleoptera: Scarabaeidae*. Handbooks for the Identification of British Insects. London: Royal Entomological Society of London.

Johnstone, L H 2002 *Station Square, Stirling*: *Archaeological Evaluation,* unpublished GUARD, Univeristy of Glasgow archive report 1204.

Jones, M 1981 The development of crop husbandry, *in* Jones, M and Dimbleby, G (eds.) *The Environment of Man: the Iron Age to the Anglo-Saxon Period*. Oxford: British Archaeological Report British Series 87, 95-127,

Jones, R; Will, B; Haggarty, G and Hall, D 2002-03 Sourcing Scottish White Gritty Ware, *Medieval Ceramics* 26 and 27, 45-84.

Kenward, H K 1975 Pitfalls in the environmental interpretation of insect death assemblages, *Journal of Archaeological Science* 2, 85-94.

Kenward, H K and Hall, A R 1995 *Biological Evidence from Anglo-Scandinavian Deposits at 16-22 Coppergate.* The Archaeology of York 14/7. London: Council for British Archaeology.

Kenward, H K; Hall, A R and McComish, J M 2004 Archaeological implications of plant and invertebrate remains from fills of a massive post-medieval cut at Low Fishergate, Doncaster, UK, *Environmental Archaeology* 9, 61-74.

Kilmurray, K 1980 *The Pottery Industry of Stamford, Lincolnshire, AD 850-1250*. Oxford: British Archaeological Reports, British Series, No 84.

Kilpatrick, M 2014 *Station Square, Stirling*: *Archaeological Evaluation*, unpublished GUARD Archaeology Ltd archive report 3863.

Koch, E 1990: Fire, *Skalk* 1990(5), 16-17.

Koch, K 1989 *Die Käfer Mitteleuropas, Ökologie 2.* Krefeld, Goecke & Evers.

Koch, K 1992 *Die Käfer Mitteleuropas. Ökologie 3.* Krefeld, Goecke & Evers.

Legge, A J and Rowley-Conwy, P A 1988 *Star Carr Revisited.* London: Centre for Extra-Mural Studies, Birkbeck College, University of London.

Levey, B 2005 Some British records of *Chaetarthria simillima* Vorst & Cuppen, 2003 and C. seminulum (Herbst) (Hydrophilidae), with notes on their differentiation, *The Coleopterist*, 14, 97-99.

Lindroth, C H 1945 *Die Fennoskandischen Carabidae I-II.* Goteborgs K. Vetensk. o VitterhSamh. Handl.(6) B, 4. Goteborg. (reprinted as English translation 1992) Andover: Intercept.

Lindroth, C H 1985 The Carabidae (Coleoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica*, 15, 1. Leiden: E J Brill.

Lovejoy, C O; Meindl ,R S; Pryzbeck, T R and Mensforth, R P 1985 Chronological metamorphosis of the aurcular surface of the ilium: a new method for the determination of adult skeletal age at death, *American Journal of Physical Anthropology* 68, 15-28.

Lucht, W H 1987 *Die Käfer Mitteleuropas*, *Katalog.* Krefeld: Goeke & Evers.

McDonnell, J G 2007 Iron and ironworking, in Hunter, J *Investigations in Sanday, Orkney, Vol. 1: Excavations at Pool, Sanday - A multi-period site from Neolithic to Late Norse times*. Kirkwall: Orcadian Ltd/Historic Scotland, 439-59.

MacAskill, N 1983 The pottery, 535-542, *in* Wordsworth, J Excavations in Inverkeithing, 1981, *Proceedings of the Society of Antiquaries of Scotland* 113, 520-550,

MacAskill, N L; Brittain J and Scott, C 1987 The pottery, *in* Holdsworth, P (ed.) *Excavations in the Medieval Burgh of Perth 1979-1981*. Edinburgh: Society of Antiquaries of Scotland Monograph Series 5, 156-7.

MacGibbon, D and Ross, T 1899 *Five Great Churches of Galloway*: Volume 10. Publications: Archaeological and Historical Collections, Ayrshire and Galloway Archaeological Association.

McGowan, G and Prangnell, J 2006 The significance of vivianite in archaeological settings, *Geoarchaeology: An International Journal* 21, No. 1, 93-111.

McLaren, D and Hunter, F 2016 The ironwork, *in* Crone, A; Hindmarch, E and Woolf, A *Living and dying at Auldhame, East Lothian: The excavation of an Anglian monastic settlement and medieval parish.* Edinburgh: Society of Antiquaries of Scotland, pp

MacPhail, R I and Goldberg, P 2010 Archeological material, *in* Stoops, G; Marcelino, V and Mees, F (eds.) *Interpretation of Micromorphological Features of Soils and Regoliths*. Oxford: Elsevier.

Mainman, A and Jenner, A 2013 *Medieval Pottery from York. The Archaeology of York: The Pottery.* Volume 16 (16/9). York: York Archaeological Trust.

Mellor, J E and Pearce, T 1981*The Austin Friars, Leicester. London*: Council of British Archaeology Research Report 35.

Miller, J and Ramsay, S 2001 *Blackfriars: archaeobotanical report.* Unpublished GUARD, University of Glasgow archive report 2240.

Miller, J; Ramsay, S and Alldritt, D 2000 Charred and waterlogged plant macrofossils, *in* Haselgrove, C; McCullagh, R; Lowther, P and Mills, C (eds.) *An Iron Age Coastal Community in East Lothian: the Excavation of Two Later Prehistoric Enclosure Complexes at Fishers Road, Port Seton, 1994-5*. Edinburgh: STAR Monograph 6, 40-49.

Moore, P D; Webb, J A and Collinson, M E 1991 *Pollen Analysis*. 2nd edition. Oxford: Blackwell Scientific Publications.

Nicholson, A 1997 The iron, *in* Hill, P *Whithorn and St.Ninian: the excavation of a monastic town 1984-91.* Stroud: Sutton, 404-33.

Nicholson, A and Hill, P 1997 The non-ferrous metals, *in* Hill, P *Whithorn and St.Ninian: the excavation of a Monastic Town 1984-91.* Stroud: Sutton, 360-89.

Page, R and Page, C 1998 An excavation of the church of the Blackfriars, Stirling, *Scottish Archaeological Journal* 20, 103-112.

Payne, S 1973 Kill-off patterns in sheep and goats–the mandibles from Aşvan Kale, *Journal of Anatolian Studies* 23, 281-303.

Paynter, S 2002 *The metalworking remains from Westhawk Farm, near Ashford, Kent.* English Heritage, Centre for Archaeology.

Photos-Jones, E 2010 Iron-making and working, *in* Barclay, G and Ritchie, A (eds.) *Artefactual, environmental and archaeological evidence from the Holyrood Parliament site excavations*. Edinburgh: Scottish Archaeological Internet Reports 40, 24-37.

Punt, W 1976 *The Northwest European Pollen Flora* Vol. 1-6., Amsterdam: Elsevier.

Ramsay, S and Miller, J *Stirling Tollbooth: archaeobotanical report.* Unpublished GUARD, University of Glasgow archive report 806.

Scheuer, L and Black, S 2004 *The Juvenile Skeleton.*

London: Elsevier Academic Press.

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

Shepherd, W 1972 *Flint: its Origin, Properties and Uses*. London: Faber and Faber.

Skertchley, S B J 1879 *On the Manufacture of Gunflints, the Methods of Excavating for Flint, the Age of Palaeolithic Man, and the Connection (sic) between Neolithic Art and the Gunflint Trade*. Memoirs of the Geological Survey of England and Wales. London: HMSO.

Skidmore, P 1991 *Insects of the British Cow-Dung Community*. Slough: Richmond Publishing /Field Studies Council.

Skidmore, P unpublished

Smith, C 2002 The antler tine, *in* Cachart, R *An archaeological watching brief at Jail Wynd, Stirling*. SUAT Unpublished SUAT archive report.

Smith, C 2001 The Animal Bone from Stirling Tolbooth. Unpublished GUARD, University of Glasgow, archive report 806.

Smith, C 2002 The antler tine, *in* Cachart, R *An archaeological watching brief at Jail Wynd, Stirling*. Unpublished SUAT archive report.

Smith, C 2015 Environmental remains: animal bone, antler and mollusc shell, *in* Hunter, D; Brooks, C; Caldwell, D; Stell, G and Middleton, M *Digging Linlithgow's Past: early urban archaeology on the High Street*. ARO16. Archaeological Reports Online. Available from: http://www.archaeologyreportsonline.com/PDF/ARO16_Linlithgow.pdf [Accessed 01/09/2018].

Smith, D N 2012 *Insects in the City: an Archaeoentomological Perspective of London's Past.* Oxford: Archaeopress.

Smith, D N 2013 Defining an indicator package to allow identification of 'cesspits' in the archaeological record, *Journal of Archaeological Science* 40, 526-543.

Smith, H and Jones, G 1990 Experiments on the effect of charring in cultivated grape seeds, *Journal of Archaeological Science* 17, 317-327.

Spearman, M 1997 The smithy and metalworking debris from Mills Mount, *in* Driscoll, S and Yeoman, P (eds.) *Excavations within Edinburgh Castle in 1988-91.* Edinburgh: Society of Antiquaries of Scotland Monograph Series 12, 164-8.

Stace, C 1991 *New flora of the British Isles.* Cambridge: Cambridge University Press.

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

Stainforth, T 1944 Reed-beetles of the genus *Donacia*__and its allies in Yorkshire (Col. Chrysomelidae). *Naturalist* (1944), 81-91; 127-139.

Stapert, D and Johansen, L 1999 Flint and pyrite: making fire in the Stone Age, *Antiquity* 73 (282), 765-777.

Stoops, G 2003 *Guidelines for Analysis and Description of Soil Regolith Thin Sections*. Soil Science Society of America, Inc. USA.

Stones, J A 1989 The burials, *in* Stones, J A; Hall, D W and Lindsay, W J (eds.) *Three Scottish Carmelite Friaries: Aberdeen, Linlithgow and Perth,* 111-16. Edinburgh: Society of Antiquaries of Scotland Monograph 6. Available from: archaeologydataservice.ac.uk/archives/view/ HYPERLINK "Human_Bone_report-150720.doc"psas HYPERLINK "Human_Bone_report-150720.doc"/monograph06 [Accessed 01/09/2018].

Stones, J A; Hall, D W; Lindsay, W J; Bruce, M F; Cross, J F and Spearman, R M (eds.) 1989 *Three Scottish Carmelite Friaries: Aberdeen, Linlithgow and Perth*. Edinburgh: Society of Antiquaries of Scotland, Monograph Series Number 6. Available from: archaeologydataservice.ac.uk/archives/view/ HYPERLINK "Human_Bone_report-150720.doc"psas HYPERLINK "Human_Bone_report-150720.doc"/monograph06 [Accessed 01/09/2018].

Stuart, M 1989 The Encyclopaedia of Herbs and Herbalism. London: MacDonald & Co Ltd, Novara.

Tate, J; Hold, A G and Insker, A 1992 Appendix 2: Neutron Activation Study of 'Throsk' Pottery, *in* Caldwell, D H and Dean, V E 1992 The pottery industry at Throsk, Stirlingshire, in the 17th and

early 18th century, *Post-Medieval Archaeology* 26, 37-44.

Thomas, C 2001 The leather, in Cameron, A S and Stones, J A (ed.) *Aberdeen: an in-depth view of the city's past. Excavations at seven major sites within the medieval burgh*. Edinburgh: Society of Antiquaries of Scotland Monograph Series Number 19, 241-258.

Tipping, R 1995 Holocene evolution of a lowland Scottish landscape: Kirkpatrick Fleming. Part II, regional vegetation and land-use change, *The Holocene* 5, 83-96.

Trotter, M 1970 Estimation of stature from intact long limb bones, *in* Stewart ,T D (ed.) *Personal Identification in Mass Disasters*. Washington DC: Smithsonian Institute, 71-83.

Turnbull, J 2001 *The Scottish Glass Industry 1610-1750.* Edinburgh: Society of Antiquaries of Scotland Monograph series No 18.

Will, B 2001 Station Square, Stirling (Stirling parish), watching brief, building survey, *Discovery Excavation Scotland 2, (2001),* 97.

Will, B 2014 *Station Square, Stirling, archaeological watching brief and excavation.* Unpublished GUARD Archaeology Ltd, Data Structure Report 3884.

Will, B 2015 Station Square, Stirling in *Discovery & Excavation Scotland,* 16.

Will, B, Seratis, K and Arthur, J 2000 *Station Square Stirling, Archaeological Watching Brief and Standing Building Survey*. Unpublished University of Glasgow, GUARD, data structure report 865.

Will, R and Haggarty, G 2008 The medieval and later pottery, *in* James, H and Yeoman, P *Excavations at St Etheran's Monastery, Isle of May, Fife 1992-7*. Perth: Tayside & Fife Archaeological Committee Monograph 6, 136-8.

Zohary, D and Hopf, M 2000 *Domestication of Plants in the Old World*, 3rd ed. Oxford: Oxford University Press.

Appendix 1

The House of the Dominicans, Friars, Preachers and Blackfriars, Stirling

By Morag Cross

The earliest documented history

Station Road, visible but unnamed on the 1st edition OS map, forms the southern boundary. The site has been subject to several previous examinations, most notably by Page and Page in 1994 (HES, Canmore ID 46223; 1996a, b; 1997).

The Dominicans, also known as the Friars Preachers or Blackfriars, established their house in Stirling in 1233, their charter being granted by Alexander II (Cowan and Easson 1976, 121). As was the custom, it was located on the edge of the then-burgh, and the extant documentary records (unpublished documentary evidence in Stirling Council Archives, including notarial protocol books, and registers of sasines) have been well-summarised by Page and Page (1996b, 898), who traced the ownership descent of the various Blackfriars properties, and suggested a curtilage for the monastic enclosure.

The conventual buildings were allegedly destroyed in June 1559 (Cowan and Easson 1976, 121; Page and Page 1997, 120), but a similar assumption about the Franciscan Friary in Shuttle Street, Glasgow has recently been shown to be unfounded (Cross forthcoming). The Franciscan church in Glasgow was still standing in 1594, but any detailed attempt to trace a similar survival in Stirling is made problematic by the loss of Dean of Guild records (Dickson pers. comm.), In addition, the Council minutes for 18 June 1557 to 1 April 1560 are missing (*Stirling Recs* I, 71), and the original minutes for the period May 1560-1565 are mostly concerned with details of Council procedure, and admission to burgess-ship (SCA, B66/15/4).

The evidence for an unspecified level of property-destruction in 1559 is extrapolated from a mention in Robert Lindesay of Pitscottie's *Historie and Cronicles* (Cowan and Easson 1976, 121). Lindesay states that the reforming nobles known as the Lords of the Congregation '*past to Stirling and obtennit the toun thairof witht great ieopardie and syne caist done the freiris baitht gray and black and spullzeit thair places; and siclyk*

reformitt the paroche kirk thairof' (Pitscottie, *Historie* II, 160). '*Siclyk*' means '*in the same way'*, or '*likewise*', and suggests that Holy Rude Kirk received the same abuse as the conventual chapels. However, Stirling's burgh parish church still stood at this date. Similarly, after their initial vandalism, '*syne tarrit ane day or tuo thair and restit thame*', that is, the iconoclasts stayed a day or two in Stirling and had a rest, which seems to rule out wholesale demolition (ibid.).

It may be that the friaries were symbolically desecrated, stripped of ornaments and smashed, but a fire would have been needed to achieve wholesale ruination in such a short time. A conflagration would leave archaeological evidence, as well as being essentially uncontrollable in a burgh containing timber buildings. Outrages against the altar or consecrated host were simpler to accomplish, and such marks of contempt as using buildings for latrines are readily imagined. There are numerous traditions (however accurate they may be), about Cromwellian-era troops stabling horses in churches, such as Dundee and Linlithgow (Dundee 2015; St Michaels 2015; HES, Ref LB25378), and such tactics would certainly be quicker than dis-assembling a building, the lower portions of which were substantial. The Pages remark that the remains of the buttressed wall uncovered in 1904 and 1994 were sufficiently massive that they '*could not have dismantled it without using a pneumatic drill'*, (Page and Page 1996a, 104).

The so-called '*retrospective reference*' (Cowan and Easson 1976, 121; Foggie 2003, 229) to the sacking is in a charter by Andrew McNeill, prior of the Friars Preachers in Stirling, dated September 1559 (*RMS* IV, No 1373). After McNeill's '*forcible eviction'* from the convent and its '*complete demolition'*, for 85 merks recompense, he granted a parcel of land to his relative John McNeill, notary and burgess of the Canongate, beside Edinburgh (*RMS* IV, No 1373). It would be interesting to know whether this actually means '*razed to ground level'*, or '*stripped of easily–accessible materials'*, like doors and slates. The exact fate of the Stirling house must still merit further enquiry, as emotive words like '*ruinous*' were written as much for propagandistic effect as objective journalistic exactitude.

The Pages detailed the post-Reformation history of the priory so thoroughly that it would be a major exercise outwith this report to add substantially to their work. However, because the Victorian historical club, the '*Glasgow Stirlingshire and Sons of the Rock Society'*, chose Robert Renwick, Depute Town Clerk of Glasgow, to edit the '*Extracts from the Records of the Royal Burgh of Stirling'*, his selections were necessarily brief (Anon 1921, ix, xii). He states '*Many of the extracts are rather suggestive of further research'*, and comparison with the manuscript folios for 1560 suggests that about 80% of the total minuted entries, albeit mostly routine, are omitted (*Stirling Recs* I, ii; SCA, B66/15/4). Stirling historian John Harrison has observed passing mentions of individual Friars Preachers in *'Abstracts of the Protocol Book of the Burgh of Stirling AD 1469-1484',* privately published in 1894, but he notes that the original, unabridged manuscript is very difficult to interpret in places (*Stirling Prot* 1894; J Harrison, pers. comm.).

Notes regarding this Dominican house are scattered, but its dedication is alleged to have been to St Kentigern, or St Lawrence (HES, Canmore ID 46223). However, the sources for the tutelary saint, which are Marianus Brockie and Easson (1957), have now either been discredited in Brockie's case (McHugh, pers. comm.), or superseded by later research. In his revised volume, Easson omits any mention of a patron saint (Cowan and Easson 1976, 121). Shirra's assertion that it stood on the site of the Saracen's Head Inn, at the corner of King Street and Friars Wynd, must similarly be disregarded, and his claims of a '*burying ground*' being found there during building work in 1835, still remain unproven (Shirra 1891, 37).

In the first list of Friars Preachers in Scotland, there were eleven foundations at March, 1297, including Stirling (Foggie 2003, 5, 15). James IV was a generous beneficiary to the Franciscans, or Greyfriars, and '*lavishly built a new Franciscan house in Stirling*' although the Blackfriars were well-patronised by the urban middle classes (ibid., 25; Cowan 2012, 116). James IV did have a Dominican at court, John Gill, who had been permitted in 1508 to reside extra-murally, and hear confessions. He was '*unfortunately one of the few friars to be named in Scottish satirical verse*,' mocked in David Lindsay's *Satyre of the Thrie Estaits* (Foggie 2003, 29-30). The moral rectitude of his Stirling brethren was obviously

perilous, as fellow poet William Dunbar, in his comedic '*Dunbaris Direge to the King'*, '*attempted to convince James IV to return to … Heaven (Edinburgh), a glorious paradise … [from] Purgatory (Stirling)… a distressing, painful, dreary place [with] bad food and wine'* (Fitch 2009, 44).

Dunbar was presumably not commenting on the Dominicans' contributing '*the first written record of the distillation of whisky, dating from 1495',* when friar John Cor made '*aquavitae*', a concentrated distilled alcohol (Cowan 2012, 116). Cowan has summarised the Dominicans' urban ministry, where relations with their host towns were usually cordial. '*They ministered to … all social levels, and their biggest financial supporters … wee the burgesses … founding anniversaries'*, or chantries, for their souls' salvation, presumably where they intended on being buried themselves (Cowan 2012, 116). The order's '*most prominent function was burial of the dead'*, and preaching to the public. James V confirmed alms from the crown to the Stirling brethren in 1537, and the Duke of Albany, his sons and father-in-law were all buried there after their execution in 1425, probably a mark of the chapel's relative status, rather than its disgrace (Foggie 2003, 42, 181).

In Stirling, a major source of income for the convent was the revenue from the burgh mill, which was only allowable after 1475, when the Pope Sixtus IV authorized the Domincans as a corporate body, to hold annual rents, or moveable property, and lands or heritable property (Moir Bryce 1911, 33-4; *Bull Ord Praed* III, 528-9). They were permitted to purchase property by the bull, *Nuper Nostras* of 1478, and the relaxation to the Rule was duly adopted in Stirling (assuming the bulls are not later interpolations by forger Marianus Brockie, Dr M McHugh (pers. comm.); Moir Bryce 1911, 34; *Bull Ord Praed* III, 550). In October of the same year, Prior John Brown resigned a tenement, which would have been a communal, rather than personal possession (*Scott Antiq* 1896, 160). In 1479, Brown signed away an annual rent, (frequently 'interest' under another name, forbidden by the church, but acceptable if disguised as another payment), which counted as moveable property (*Scott Antiq* 1896, 162).

The Dominicans had a more erudite reputation than the mendicant Greyfriars, and '*their constitutions provided for study as essential part of their life*' (Ross 1969, 3). Despite the Victorian newspaper's confident assertions that '*the library consisted of 4 missals, 2 psalteries, 4 antiphonies … and 10 processionals'*, Ross counters this with '*we have no catalogue from any library of friars in Scotland'* (*Stirl Obs* 1854b; 1863a; Ross 1969, 11). Of the Scottish Blackfriars' 33 recorded university graduates, half were priors, one such being Francis Wright, prior of Stirling in 1526 (Foggie 2003, 75-6, 159). Some of the Stirling priors appear in the Stirling burgh court records from the 1520s, being sufficiently educated in the law to represent their houses (ibid., 160, 321). Priors Vincent Litstar, George Crichton, and Francis Wright all appeared in the 1520s, as well as two friars acting as procurators, John Coupar, and Thomas Esplene. The Dominicans' skilled legal self-representation shows the '*distinction [in education] between the Franciscans and the Dominicans [in] the Stirling court records'*, where the Greyfriars only appear twice, as opposed to 29 for the Blackfriars (Foggie 2003, 159-60).

The Dominican's acuity in property-management is shown by these early-sixteenth century court cases. Most of the actions concern unpaid rents, another source of income that the Friars had the ability to pursue through the court without calling upon costly external expertise. The foundation charter is missing, and details do not survive of subsequent augmentations or property donations (Page and Page 1996b, 884). The minimum size for achieving '*convent*' status and privileges was twelve friars, any fewer and it was designated a '*place*', with no prior (Foggie 2003, 9). A dozen members would have taken a substantial and reliable income to maintain, along with the concomitant church, and ancillary buildings. Page and Page (1996b, 885) suggest that they had come into possession of the revenues of Stirling's burgh mill(s) by 1535, possibly having owned the same since the reign of James II.

Among their other services, '*they tended the lawns of Stirling Castle'*, and provided convenient meeting rooms and hospitality when royal and official business was executed (Cowan 2012, 117). Edward I lodged in Stirling Blackfriars in 1298, a kitchen for the king's use was erected in 1327, and they acted as safe repositories for laymens' legal papers, such as Lord Elphinstone's writs required for a court case (Page and Page 1996a, 103; 1997, 119; Foggie 2003, 157). Prior '*John*

Brown … confesses that he had in his custody a letter of quitclaim' respecting the property of a canon of Glasgow, apparently being kept securely on behalf of the rector of Kinnell in 1472 (*Scott Antiq* 1895, 63). Page and Page have traced various financial donations from the king, such as those in the *Exchequer Rolls* for 1394, 1397, 1469, 1471 and 1473 for various building works, and for providing office space when audits were undertaken (Page and Page 1996b, 884).

Historian John Harrison has noted a foundation of a chantry, or endowment (which were not necessarily always in a separate 'chantry chapel), by David Murray of Touchadam and Alexander Bruce in August 1473, whereby mass was to be celebrated daily, '*unto the day of dome'*, (SCA, GD189/Box 69; Harrison pers. comm.). This was for the souls of the late William Murray of Touchadam, his son and all those '*persones that war slane with him b[e]side the burgh of Sterline'*, using 10 merks annual rent gifted to the Friary for the purpose, by Alexander Bruce of Stanehouse, from his own lands (ibid.). The mass was to be held at the altar founded by William Murray, and the inhabitants were to be '*warn[ed] … by the handbell to come to their deriges and saulmes in the said kirk*', (SCA, GD189/Box 69; Harrison *pers comm*). William Murray was constable of Stirling Castle, and a newspaper letter of 1916 clarifies that Murray '*and his two sons were killed in a feud with the Bruces of Stenhouse'*, the prayers possibly representing a *post-mortem* spiritual reconciliation between the two families (Campbell 1916). Even the widely-supported Dominicans '*suffered a decline in foundations for prayers for the dead … especially after 1540*', though it is unclear whether this was caused by growing antagonism towards spiritual abuses, religious indifference, or increasing poverty (Cowan 2012, 159).

Post-Reformation

In Glasgow, the property of the Franciscans and Dominicans largely came into the possession of other corporate bodies, namely the Town Council, University and the Incorporation of Gardeners (Cross, forthcoming; Page and Page 1996b, 881). In Stirling, prior Andrew McNeill had already disposed of the land of '*Dalgonogane, lying between the lands of Thomdarrach on the west and Gartcharon on the east'*, to his McNeill relative in 1559 (*RMS* IV, No 1373). It has been suggested this may be Gartacharn Farm near Drymen, or Gartocharn village, south of Loch Lomond, and as Thomdarrach reappears in a list of 1572, it would indeed appear to be Gartacharn Farm (Page and Page 1996b, 885; *RMS* IV, No 2101). The other places granted in 1572 include '*Ballacherne, two Ballats, Gartness, Dalnair, Blairour, Gartharne, Douchlas, Badirow, Thomedarrach'*, some of which are close to the present A81, running north to Aberfoyle, including Gartacharn Farm at Balfron Station, and Ballat crossroads (*RMS* IV, No 2101).

Prior McNeill granted all the residual communal property in 1560 to Alexander Erksine of Cangoir, later 'of Gogar', uncle of the Earl of Mar (Page and Page 1996b, 887). The Erskines were subject to scathing fulminations by John Knox, so to doubly-safeguard their transaction, Erskine of Gogar and McNeill procured a precept from monarchs Francis and Mary, Queen of Scots, then in France, confirming McNeill's grant (*Stirling Chrs* No XLIV). This precept was a warrant, or order, dated 10 May 1560, commanding a charter to be drawn up in Edinburgh under the Great Seal, which would re-state the transfer of assets (ibid.). Whether or not this second charter was composed is not stated, and the matter was further confused when on 15 April 1567, Mary granted the Provost, Bailies and community of Stirling *'the church property and revenues within the burgh'*, for the maintenance of the poor (*Stirling Chrs* No XLV).

These confiscations, if any remained within Catholic representatives' hands by April 1567, included '*tenements, buildings, orchards, yards, annual rents, anniversaries, fruits, profits and emoluments … which formerly belonged to the Dominican or Preaching Friars'*, (*Stirling Chrs* No XLV, 94). The inclusion of the '*rents, alms, obits … chapels, places of friars, yards, with their pertinents … as they lie … in buildings, walls, timber, wood, stone and lime'*, did not technically encompass the town mill as a '*pertinent*', and Erskine unsurprisingly did not want to voluntarily relinquish his mill *(Stirling Chrs* No XLV p95; Fleming 1897, 121). The legislation of 1560 and 1567 was self-contradictory, because, unlike other buildings sitting on the land being sold or conveyed, mills were considered separately in legal terms. This was due to the dues, multures and thirlage accompanying mills, which required separate legal documentation (Fleming 1897,

117-9, 121-2). The Queen's 1567 charter omitted any mention of the mills, and '*the separate conveyance by special description*' which would have encompassed them (ibid.).

The 1567 wording of '*walls, timber, wood, stone'* seems to be a list of building materials suitable for re-use elsewhere, as Stirling's now-redundant and multiple chapels and refectories probably had limited utility for lay Presbyterian purposes. This would be a more credible fate for the religious house, than Knox's infamous 'rascal multitude' deconstructing it almost-literally overnight. Some of the buildings were to be refurbished, again showing that some were still habitable or required only minor repair for new uses. The 1567 charter permits Stirling Council to '*build and repair the ruinous places and … restore … the same for hospitals',* as well as '*to apply the … buildings to be repaired for hospitality and other uses'*, though chiding them that the scramble for lay appropriation of assets '*has happened partly through the negligence of the officers of our said burgh'*, (*Stirling Chrs* No XLV, 95-6).

The precept granted '*in absentia*' by Mary in April 1560 (*Stirling Chrs* No XLIV), if indeed it was ever executed under the Great Seal, was overwritten by this new 1567 mass-disposition of church property to Town Councils. By her 1567 charter, Mary hoped to gain political support against the estranged Lord Darnley (Page and Page 1996b, 888). McNeill's and Erskine's private bargain concerning the mill and other ex-Dominican resources would have been nullified by a clause in Stirling's 1567 grant. This stated '*Considering how dishonestly … [many] friars have … alienated and given away [to] private persons the lands … and emoluments previously mortified to their chaplainries … we … rescind and annul all … such alienations … and sasines by which the first purpose and will of the founders [donors] is infringed … by perverting the same to private uses'*, (*Stirling Chrs* No XLV, 96-7). But although McNeill's grant or sale to Erskine was probably legally void, the subsequent transfer of the mill to the burgh remained a problem.

As explained above, the Queen's 1567 conveyance of the Friary's assets to the town still required a separate sasine for the mill, which was omitted, and thereby decades of litigation ensued (Fleming 1897, 117-9, 121-2; 1902, 461-2). Erskine was in a position to completely ignore Mary's redistribution of wealth, made on 15 April 1567, eight weeks before her final defeat at Carberry Hill. Erskine's brother John, Earl of Mar was tutor to, and subsequently Regent for James VI so Erskine was protected by powerful interests (Page and Page 1996b, 888).

A major income stream derived from the burgh mill and its associated rights, but as a capital asset, the mill was equally attractive to the Town Council, who had few means of raising money. Towns commonly feued out various mills, using the annual profits to fund municipal projects like building town walls (e.g. at Peebles in 1596), or repairing the harbour at Ayr in 1695 (Shaw 1984, 34). The Common Good Fund of Stirling had to subsidise a wide range of activity, '*thair ministerie, their Kirk, tolbuyth, brig, schoir, calseyis [paved roads] … cannot be susteinit without the rents and commoditie of mylnes as utheris tounes hes [we shall] get mylnes able to serve the toun'*, as Glasgow and Linlithgow did (Shaw 1984, 34). The Pages explained why Stirling's post-Reformation '*Council had to buy back the [Friar's] lands to which they were supposed to have had a legal claim*', (Page and Page 1996b, 882). So eager were the Council to recover their rightful inheritance, that in February 1560, they were prepared to '*spend their commoun gude apon the [legal] defens of the burrowmyllis … aganis Alexander Erskyn'*, (*Stirling Recs* I, 78). If town funds were insufficient, they undertook *'to spend of thair awin geir [personal resources] accordingly'*, possibly a rather reckless promise (ibid.).

The assets, or patrimony of the old religion were assessed and quantified in the '*Books of Assumption of the Thirds of Benefices'*, in the 1560s (Kirk 1995, xi, xvi-xx, xxix-xxx). This was partly so that rental income could be redistributed, with one third being assigned to the upkeep of former priests and members of religious orders, until their deaths, one third devoted to the Reformed church, and one third to the royal uses (ibid., xiv-xv). The account of the rental of the Blackfriars, made by April 1565, states that the '*Maison Dieu*' was by then occupied by Lord Graham, 2nd Earl of Montrose, who paid rent of 50/- Scots (Kirk 1995, 554). Buildings so-named were usually hospitals or almshouses, such as those at Dundee, Dunbar and Elgin, (Cowan and Easson 1976, 164-5), therefore Stirling's was not being used for its

intended purpose. It is not among the hospitals in Stirling listed by Cowan and Easson although the *maison dieu* was possibly surplus to requirements as Stirling had at least five such establishments, Cowan's Hospital being a seventeenth century foundation (ibid., 193).

Other Blackfriars rentals listed in the '*Thirds of Benefices*' included lands at Stirling at £3 yearly ('in margin, '*besyd the toun*'), (Kirk 1995, 555). By this time, as detailed below, Alexander Erskine had hold of the Burrowmill, which paid him 36 bolls of malt, and '*Akeynis lands*' at '*the Calwy and besyd the freiris*', paying 3 bolls of malt annually (ibid.). The '*calsay*' or a paved area, re-appears, when the tax-officers noted '*The mail (dues) of the saidis freiris: The Calsay End*', 4 bolls meal (ibid.). Whether this refers to a paved street, or somewhere local like Causewayhead, paved areas excavated in 2015 were certainly a concern of the Town Council in April 1561, when they ordered the chalices belonging to altars in the parish church (Holy Rude) to be sold (*Stirling Recs* I, 78). At the price of 20/- Scots per ounce of silver, '*the money thairof [was] to be applyit to the mending of the calsay*', (ibid.). Paving was more practical, but posterity may have preferred its previous incarnation, as ornamented mass vessels.

The various lands within the burgh, to which the Friars had claim, included their orchard, the Friars Croft, the Bonyard, the Burgh or Burrow Mill, St Michaels Hill, Ryalls Croft and the Brig or Bridge Mill, throughout various long-running legal disputes, remained with the Erskine and subsequently, Leslie families until the 1650s (Page and Page 1996b, 888-9). In October 1652, the Town Council was to pay 16,000 merks (1 merk = 13/6d Scots, itself usually valued at one-twelfth of Sterling currency), to Alexander and William Leslie of Tulloes, for '*the richt of the brig and burrowmylns … the ryall croft mopiscroft and uthers*', (ibid., 889). However, it seems that in 1652, Provost John Short purchased the lands for himself in an obvious 'conflict of interest', in return for an annual payment to the Council of £280 Scots, although the Council could redeem, or recover the mills, Bonyard, St Michaels Hill, and other crofts, by payment of 7000 merks to Short (ibid., 889).

The Council passed an '*Act of Thirlage*', in 1654, thus creating a legal '*servitude*' or burden, compelling the burgh residents to grind their corn at the Bridge and Burgh Mills, in effect enforcing a monopoly of the means of processing grain (Page and Page 1996b, 889). Urban grain mills faced different economic regimes from those in the countryside. '*Little grain was grown within the bounds of the [town] thirlage [area of land subject to, or tied to a particular mill], and most of that needed by bakers [and] brewers was brought in from outwith it*', (Shaw 1984, 33). Unique to burghs was the thirlage of '*invecta and illata*', whereby locally-consumed corn had to be ground at the burgh mill, regardless of where it was grown, hence such a heavily-populated area generated substantial profits for a 'canny' Town Council (Shaw 1984, 25, 33).

The Pages traced the Blackfriars' individual parcels of land within the burgh, over several centuries, and thereby defined the boundaries of the monastic enclosure (Page and Page 1996b, 890-893). Within the limits of the present research, it has not been possible to pursue their work in detail, although it would merit further study, and some points requiring clarification are noted below. The origins of the place-names, such as Berkhouse, Ryall, and Bonyard could certainly be pursued. Nonetheless, '*barn yard*' corrupted to '*bonyard*', as suggested by Page and Page (1996b, 892) seems questionable, considering how many '*barnyards*' appear with various spellings in contemporary inventories of debts and crops owed by the 'defunct', and '*bonyard*' is not among the commonest frequently-occurring variants.

It is elsewhere called '*Borneyeard*' and '*Broun Yardis*', (*RMS* VIII, No 333; *Stirling Chrs* No XLIV), and only seems to become '*barn yard*' in the 1740s, which would be the reverse of the usual adaptation of an original name over time (Page and Page 1996b, 892). Dr C P Graves (*pers comm*) has suggested that '*Bon Yard*' may instead be what it sounds like, literally a '*bone-yard*'. It may indicate the location of charnel pits where the cemetery might have been periodically 'cleared out', and bones deposited in mass graves. The name is actually transcribed as '*Boneyaird*', in documents of 1654 and 1708 summarised in the modern catalogue of the National Records of Scotland (*NRS,* B66/25/223/1-2; B66/25/245).

Eighteenth and nineteenth century

development of the site

Because Stirling is relatively small, and the early street pattern was comparatively unaltered, the location of the Friary church was well-known, doubtless assisted by '*Friars Wynd*' facing the site. In November 1858, Lt Francis E Pratt of the Royal Engineers signed off at the end of the *Ordnance Survey Name Book* for Stirling, possibly having recorded the interviews confirming the '*supposed site of Dominican Monastery*' (*ONB*, OS1/32/24, 73, 112, 114). One informant was Father P McLachlan, RC, who added a note of his own, '*In alluding to the Franciscan [and Dominican] House … I would use the word 'monastery' in preference to 'convent' as monasteries are inhabited by men while convents are generally reserved for religious ladies'*, (*ONB*, OS1/32/24, 50, 73). Despite McLachlan's addendum, the OS notes refer to a Dominican '*convent*'.

Others consulted were Rev William Findlay, and William Galbraith, the Town Clerk, who stated that the house '*stood on the east side of the lane leading from the present meat market … which is still called Friars Wynd'*, which was continued by the more genteelly-named 'Murray' and 'Maxwell' Places (*ONB*, OS1/32/24, 73). The locals continued, '*only persons of distinction were buried in the church'*, although the four decapitated skeletons of the Duke of Albany's family have presumably not been exhumed or otherwise identified as such (ibid.).

The black-letter script reading '*Supposed site of Dominican Monastery AD 1233*' was placed behind the bank, now numbered as 80-82 Murray Place, though it is unclear whether the placement of this legend was intended as a general indication, or a more precise location for the '*monastery*' (OS 1858, XVII.3.10). The development of the Friary location is best continued as a chronology, and the various human and other remains recovered will be summarised as an appendix.

Ronald and Catherine Page in the mid-1990s continued James Ronald's work tracing the various properties of the Blackfriars, showing Ronald, like the Pages, to have been largely accurate and reliable in his research (Ronald 1891, 14-15; 1899, 120; 1904). Nonetheless, a couple of points remain slightly ambiguous. The Pages state that the Friars owned certain lands, listed in 1652 as including '*Frier Croft … St Michaells Hill and Mobiscroft'*, and re-stated as '*in lyk maner … Mobiscroft'*, (Page and Page 1996b, 889, 895 n45). However, in contradiction to this they remark that '*Mobbis Croft alias Balbenis Croft … equates to Forthside, and never belonged to the Blackfriars*' (ibid., 890).

Similarly confusing is the statement that the Council transferred '*the lands lying between the shore causeway and the Burgh Mill dam (i.e. the friars' lands)'* to Cowane's Hospital in 1741, part of which the Pages say comprised Forthside (further entangling this property's ownership), and Berkhouse Croft (ibid., 889). Ronald (1891, 19) states clearly Berkhouse (or Brady's) Croft was not a Friary possession, while the Pages merely imply that it did not belong to the Friary (Page and Page 1996b, 890-1). They simultaneously include it within '*Plots 1-7*' of the former Friary lands (sold by Cowane's Hospital in 1741) mapped in 1834 as '*Spring Garden'* (ibid., 889-90).

The Pages show that in 1708 the Council conveyed part of Friars Croft, and possibly the orchard and some contiguous ground to Cowane's Hospital (Page and Page 1996b, 889). In 1741, Cowane's subdivided and re-sold the area, the central third eventually passing to the railways in the mid-nineteenth century. The southern portion, bounded by Friars Wynd, was '*bought by Patrick Stevenson',* and of this, *'part is … the Fryers Croft and part [is] … Berkhouse Croft'* (ibid., 889-90). In 1790 the same land was acquired by Stirling merchant Alexander Wright. This corresponds with the separate sources relating to Alexander Wright, a bailie or town councillor, who died in 1828 (NRS, Wright 1830, 423-4). He is listed among the '*Nobility, Gentry and Clergy'* in an 1826 *Directory* as living at '*Spring Garden'*, the name his heirs gave to his estate when they divided it into building plots (Pigot 1825, 676; SCA, MP/SB/98). Surveyor William Legate's 1834 drawing of Spring Garden is one of a very small number of such feuing plans surviving for Stirling, and as such, is the main focus of this report (SCA, MP/SB/98).

Spring Garden encompassed most of the north side of Mill Lane (later Murray Place) from Shore Road (later Maxwell Place), to the junctions with Thistle Street (formerly the south eastern end of Mill Lane) and Orchard Place. In Wood's map, this junction is unnamed, but is immediately opposite

and north of W Stirling Glas's ropery (SCA, MP/SB/1). Mill Lane was in 1820 a partially-unbuilt back-street of lower status, the main commercial focus being on Quality (later King) Street, and other Old Town venues.

Murray and Maxwell Places were only laid out in the 1840s, although improvements to Mill Lane had been long-planned, as shown by Wood's map of 1820 (SCA, MP/SB/1). This shows a '*Projected Street'* considerably north-east of the then-existing line of Mill Lane, slicing through Alexander Wright's '*Spring Garden*' orchard and house policies. An informative letter of 1818 describes Mill Lane and Wright's property on its northern edge. '*The access through the town from every side is crooked, narrow, very mean and extremely dangerous. … [At] the Mill Road you should ... widen all along from off the orchard and houses of Bailie Alexander Wright till [Shore Road] … By this plan … safe and level access, at least 60 feet wide … will be made'* (*Cal Merc* 1818a). The line of the new road on the 1834 Spring Garden feuing plan cut off all the existing buildings, placing them somewhere beneath the present Murray Place roadway, and reducing Spring Garden's orchard and horticultural land from 5 acres 6 falls, to just over 4 acres (the new street is shown consuming fully 1 acre; SCA, MP/SB/98).

In 1818, Alexander Wright & Co owned the '*Brick, Tile and Lime Works at Stirling Shore'*, and not surprisingly, he had a proprietorial and business interest in some of the intervening land between Mill Lane, and the river (*Cal Merc* 1818b). By 1828, he had leased the Shore limekilns to Miller and Sinclair, and the brick works to a Mr Christie (NRS, Wright 1830, 425). Wright's executors included Michael and William Connal, whose family were sometime provosts of Stirling, and rich West India merchants in Glasgow (NRS, Wright 1830, 428; MacLehose 1885, 87, 90). Another trustee was John Wright of Broom, related by marriage to the Connals (ibid.).

Wright's posthumous affairs were settled by a '*trust disposition'*, and this reveals more about the use of the former Friary lands in the eighteenth century, as well as matching some details of the Pages' findings (NRS, Wright 1830, 429-36). As stated above, in 1708, Cowane's Hospital acquired the Burgh Council's ex-Friary lands between Mill Lane and the River Forth, and before selling them in 1741 (Page and Page 1996b, 889). This area was subdivided as the Forthside policies to the north, James Watson's (later Baird's) ground in the centre, and Patrick Stevenson's purchase to the south, bounded by Shore Road and Mill Lane (ibid.).

Wright's possessions were the '*gardens or orchards lying at the foot of the friars wynd … formerly possessed by John Stevenson merchant … and by John Jamieson and William Kay his tenants'* (NRS, Wright 1830, 434). Jamieson (or a namesake) is described as a gardener, who might have had professional reasons to rent Spring Garden's four-acre orchard of fruit trees (NRS, Wright 1830, 431; SCA, MP/SB/98). Part of the ground was the croft of '*the deceased Provost William Dow [sic]',* who held office, as 'William Don' from 1741-43, (*Stirling Recs* II, 404). The ground was enclosed on the north and south by stone walls, and separated by a ditch from the 'middle portion', lying to the north-east, sold by Cowane's in 1741 (NRS, Wright 1830, 434). The central section was sold by James Watson in 1744, but Watson's successors retained the right freely access a '*barn … farm and barn yard'* erected on Watson's land. This suggests that throughout the eighteenth century, the ground continued in agricultural use, with only a few houses along the street edge. The '*Spring Well'*, on feuing plot 8 (the northern corner of Station Road) which gave the property its name was probably required for a commercial fruit growers, if that is indeed what the tenants were doing (SCA, MP/SB/98). The eighteenth-century boundary ditches may have been uncovered during the various investigations since the 1990s.

John Stevenson inherited the Mill Lane houses and orchards in 1778, and around 1786, he sold an unspecified part to '*William Corbet, General Superior of Excise [sic]*', (NRS, Wright 1830, 434-5; NLS, Glenriddell). Corbet, whose correct title was '*Supervisor General'*, was the poet Robert Burns's patron in the Excise Service (Lindsay 1996). Stevenson was facing bankruptcy by 1790, and consequently his creditors forced the sale of his Mill Lane grounds, which were bought by tile and brick-maker Alexander Wright (NRS, Wright 1830, 435; Page and Page 1996b, 890, 896 n59). This constituted '*Spring Garden'*, probably named by Wright, who lived in the street-front house with

garden behind, two stances now occupied by the Royal Bank (Nos 80-82) and the former Post Office (Nos 84-86). If the building line was moved east, as various plans suggest, then Wright's house may actually be under the present pavement.

Wright accumulated assets by purchasing outstanding loans secured on properties. In 1809 he lent money to William Laing, maltster, of Park Lane, and as a guarantee or mortgage, acquired a considerable area north of Barnton Street, and west of Shore Road (NRS, Wright 1830, 430-2). The loan was unredeemed, and so Laing lost his new tenement, sugar house and other investments to Wright's heirs after 1828.

1830s Street Improvements and Development of Mill Lane

The Town Council minutes for the 1830s record meetings with various Turnpike Roads Trustees about improving roads, as well as the Council's own preparations for laying gas pipes, paving Mill Lane and rerouting the thoroughfare. All this may have affected any archaeological remains around Spring Garden. Examples include (all from SCA, B66/21/17, which is unpaginated).

9 March 1833 – Turnpike Trustees wish to begin '*making the thoroughfare thro' the town from Port Street by the Mill Lane at foot of Friars wynd to Cowane Street*', and requesting the Council to '*purchase property on this line',* to widen the road.

21 July 1834 – Turnpike Trustees asked to state '*breadth and level of new thoroughfare … along the new line from King Street towards miln lane [sic]*'.

2 October 1834 – Gas Company to extend street lighting to unlighted places, '*such as the … Shore'*, which road ran past Spring Garden, and '*if rock occurs in digging to lay the mains'*, the Town pays.

2 September 1835 – Proposal to spend £200 '*in improving and macadamising … from the bottom of Friars Wynd to the bottom of King Street',* running past Spring Garden in Mill Lane.

23 November 1835 – Council will level and pave Friars Wynd, but householders forbidden to lay 'unofficial' paving in front of own properties.

26 July 1836 – Report on '*Improvements in Friars Wynd'* (incongruously dated '*15 August 1836'*), stating '*rock in wynd will soon be removed and the wynd ready to be paved*', and suggesting groundworks necessary at the junction of '*the new line of road crossing at the bottom',* which became Murray Place. '*The new Street must be sunk two feet two inches lower than the old one*', i.e. the contemporary road surface of Mill Lane, and the new street required excavating '*three feet three inches opposite … the entry to the chapel'.* The Episcopal Church was at the gusset or triangular junction of Shore Road (later Maxwell Place), Barnton Street and Viewfield Place.

Further old ground surface was removed '*two feet six inches opposite Mr Traquair's new house'*, which might have sited been facing Alexander Wright's dwelling, Spring Garden House in Mill Lane. Traquair's property faced Wright on the corner of Friars Wynd and Mill Lane in 1820 (SCA, MP/SB/1). This was still a substantial volume of overburden being stripped, probably without any antiquarian examination for Friary remains, as the Council commissioned the contractors, '*with all possible despatch'*.

19 September 1836 – Cast-iron well to be erected in Friars Wynd, with associated waterpipes.

21 November 1836 – Shore Road to be '*macadamised from William Burd's gate upwards to the Friar's Wynd, and if necessary to handset the road before laying on the metal'*. This new surfacing extended from around the future railway-crossing, or Seaforth Place to Maxwell Place and farther south west.

2 December 1839 – Peter Murdoch, ironmonger, '*is in the course of making a drain from his new building at the foot of Friars Wynd',* from which he was forbidden to discharge '*the sewage water and other nuisances to the syver [ditch or drain] on the side of Shore Road'*.

16 December 1839 – Murdoch is permitted to '*convey the surplus water from his new house at the foot of Friars Wynd in a drain under the new thoroughfare [Mill Lane or Maxwell Place] and to come out on the side of the Shore Road*', guaranteeing that '*no filth of any description will … pass'* through. Murdoch's name is on the most northerly feu, No 15, the small triangular plot now occupied by Brewster Electricians at 32 Maxwell

Place (SCA, MP/SB/98). This trenching would have cut across the Friary's northern ground.

21 December 1840 – Tenders received for improving access to new Mill Lane road from the end of Irvine Place (in Barnton Road north of Maxwell Place).

25 October 1841 – Order to '*improve the access from the Shore Road to the new thoroughfare in front of the Royal Hotel'*, which stood on the corner of Friars Wynd and future Maxwell Place. The streets indicated were all contiguous with former north and western sides of Friary ground at Spring Garden.

19 June 1843 – Council Minutes record the 'Great Disruption' of the Established Church of Scotland. The town had always appointed three ministers to officiate in the former Holy Rude Church, divided into the North, East and West Congregations, but all of the clergy had vacated their charges '*since the 24th day of May'*, 1843. '*All three incumbents in this town … and more than three fourths of the whole congregation'*, had joined the Free Church over doctrinal disputes, which caused huge legal and financial problems for the Council. They had agreed to sponsor a new North Church building, with the now-departed minister fundraising. The official North Church building was eventually erected on feu no 4 of Spring Garden, around No 28 Murray Place (later renumbered as 46-50 Murray Place, see entry for 1970 June).

The Spring Garden feus took years to sell completely, although 1842, rather than Legate's survey date of 1834, is quoted as the date Murray Place was feued (Gifford 2002, 739; McKean 1985, 43-4). The first adverts reveal that the first buildings at the north end of Murray Place were erected around 1844, and Legate's plan was updated with purchaser's names, such as coach builder Henry Kinross. A railway plan of 1844 shows only six feus built on, and nos 9-11 all incorporated into one property (that of Henry Kinross; McPherson and MacIntosh 2013, 8).

In May 1844, '*Miss Fisher … intends to Remove … to the New Buildings, Maxwell Place (opposite the Royal Hotel), where she will carry on her business as formerly'*, and that August, at '*No 2 Maxwell Place, the Misses Nicholson will reopen for the tuition of young ladies'*, (*Stirl Obs* 1844a, b). Houses were being occupied by March 1845, when a death was intimated in Maxwell Place, and various businesses like Henry Baldie's joinery workshop, were opening, thought their exact street number is not stated (*Stirl Obs* 1845a, b). Furniture maker Henry Clugston's name appears on feu 12 of Spring Garden (the future Post Office), which is then scored out and illegibly replaced, possibly reading '*Sawers'*, the name of a Stirling legal firm (SCA, MP/SB/98). Clugston advised his clients in February 1846, that the '*Cabinetmaker and joiner … is to remove [on 15 May 1846] to those premises in the course of erection in his Woodyard, Maxwell Place, immediately opposite the Episcopal Chapel [Viewfield/ Barnton/ Maxwell corner]',* (*Stirl Obs* 1846a).

Henry and William Kinross, long-established as coachbuilders on the north-west side of Friars Wynd/Shore Road (at Viewfield Street), split their company in two in May 1846 (SCA, MP/SB/1; Pigot 1825, 676; *Stirl Obs* 1846b). Henry, who had reserved Spring Garden feus 9-11 and 13-14, transferred his business to '*Premises in the course of erection in the Neighbourhood of the present Works*', (SCA, MP/SB/98; *Stirl Obs* 1846b). These new coachworks may have not been situated in or near Maxwell/Murray Places, or further south in Orchard Place, or elsewhere.

However, in August 1846, Kinross offered for sale '*That substantial new tenement of houses in Murray Place … occupied by Rev Mr Findlay … and Mr Henry Kinross. The … buildings were erected within the last two years [since 1844] … large extent of garden ground attached',* (*Stirl Obs* 1846c). A second block for sale in Maxwell Place was '*that front building … erected within the last few years'*, and housing Mrs Nicholson (ibid.). It may have been No 2, which accommodated the Nicholsons' girls' school (*Stirl Obs* 1844b). The sale property being a '*front building'*, sold '*with garden ground ... exclusive of part of the back ground and buildings erected thereon'*, shows that the feuing stances were already being subdivided into multiple occupation (*Stirl Obs* 1846c). This is confirmed by the Spring Garden plan, where a later pencil line is drawn across feu no 13, splitting it into two, (SCA, MP/SB/98). The terraced and individual town houses being built, some of which survive in Maxwell Place, had sunken areas with basements, involving considerable excavation of ground, and doubtless removing more of the pre-Reformation remains at the same time.

Stirling's Victorian councillors and historians were well-aware that the Friary-owned grounds extended to the gasworks at the south end of Mill Lane, and the Pages confirm this (Page and Page 1996b, 892). When the installation of an underground public lavatory '*at the junction of Thistle Street and Murray Place'*, was discussed in 1896, '*it was suggested the graveyard might have extended that length, in which case the soil would be very soft'*, although the work does not seem to have gone ahead (*Stirl Obs* 1896b). If this was the location of the '*boneyaird'*, the putative charnel pits, then any such remains would have been swept away by the adjacent railway and gas plant.

The gasworks were bordered on the north-west by Spring Garden feuing plots 1-7 (SCA, MP/SB/98), which the Pages (1996, 890) assign to '*Berkhouse or Brady's Croft'*, and which they imply did not belong to the Friars, so the exact status of this area is slightly ambiguous. If feus 1-7, which include the ground surface of Station Road, and now demolished Murray Place south-east of there (under the old Baptist and North Churches), and the Thistle Centre, did not belong to the Friary, no human burials *in situ* would necessarily be expected. It would repay a search of the local newspapers for building construction dates and accompanying archaeological discoveries.

The organic and beetle remains found in 2014 are graphically placed in context by a semi-satirical Stirling columnist, '*Paul Pry'*, in 1847. Commenting on the 'unimproved' sanitary arrangements of the Old Town, he wryly notes '*along Murray Place all will be cleanliness at any rate. There the … surgeons reside and they … take care of their own locality*', (*Stirl Obs* 1847). The 'traditional' method of sewage disposal was this: '*Immediately behind the houses in Cowane Street there is an open ditch which has not been cleaned out for two years, and from which four carts of filth were taken to a garden in town as being the strongest manure which could be found in Stirling*', (ibid.).

Dung-heaps nevertheless lay in Murray Place, without even '*a dyke to … prevent children from being lost in its depths … [and west of Orchard Place] there is a 'manure manufactury' where all … is allowed to ferment … truly horrible … What abominable hole is that there at the foot of the gardens? … the 'Dirten Tide', [effluent flowing into the mill lade or dam] an accumulation of dead dogs and cats … and nameless ingredients … to strengthen the water [of] the Burgh Mill',* (*Stirl Obs* 1847). The '*manufactury*' was the town '*Dung Depot'*, located at the Burgh Mill, Mill Lane in 1855 (NRS, VR 1855). Another writer characterised '*the Dirtin Tide*' as '*a collection of the sewage that came down the surface sewers or 'sivers' from the upper part of town, gathered there and gradually found its way into the adjacent Burgh Mill dam. This unsavoury malodorous 'stank' … occupied what is now Orchard Place'* (Galbraith 1894, 124).

The town dirt cart collected human waste and ashes on Mondays and Thursdays, but failed to convince 'Paul Pry' of its efficaciousness. Likewise, the inhabitants of Friars Wynd and Murray Place in 1849 called the Burgh Mill Dam an '*accumulation of putrid and offensive water and filth'*, giving some idea of what the old Mill Lane inhabitants might have endured before the 1840s (*Stirl Obs* 1849).

Archaeological discoveries during building work in Murray Place

This chronology is mainly concentrated on the northern end of Murray Place, as the area south of Station Road, although relevant, lies outwith the archaeological excavation area.

There have been frequent discoveries of human remains in Murray Place, between Nos 36, the demolished Queen's Hotel on the northern corner of the station entrance (later called Station Road), running north to the Post Office at Nos 1-3 Murray Place (today renumbered as 84-86 Murray Place). The reports of these finds and the accompanying building works are here presented in chronological order. The boundary between Maxwell and Murray Places appears to have fluctuated between the north end of the Post Office, and the north end of the bank. Until at least 1920, the Post Office was officially in Maxwell Place, but the 1961 extension plans place it in Murray Place, and as the Cold Beer Co public house, it is now at 84-86 Murray Place (NRS, VR 1905a, 1920; SCA, Plan No 7217).

1846 July – '*While the … Gas Company were digging in Murray Place, nearly opposite the Eagle Inn [Royal Bank or southern neighbour at Nos 70-72] to lay … pipes they exhumed a human*

skeleton. The spot … was the burial place of the … Black Friars … the body … was in a state of complete preservation. The enamel of the teeth was as fine as ivory … The skeleton was found about 16 or 18 inches below the surface … many [more], should future excavation take place, will be found', (*Stirl Jour* 1846). This body was found under the surface of the public street, which the Council had apparently broadened and moved further east, absorbing the eighteenth century building line, and potentially placing the Friary precinct's boundary under the roadway. The street surface around here had also been artificially lowered by several feet in 1836 (see entry above), possibly leaving burials vulnerable to such exposure (SCA, B66/21/17, 26 July 1836).

1848 March-May – Railway station opened and entrance from Murray Place created through Spring Garden feu no 7 (SCA, MP/SB/98; McPherson and MacIntosh 2013, 8, 36). Local directories and OS maps indicate that the entrance was not initially called '*Station Road*', but just treated as a continuation of Murray Place. Stirling's railway history, the surveying of competing routes, and the Council's support of favoured companies, is covered in the *Burgh Minutes* (SCA, B66/21/17; SB1/1/1), and in the comprehensive publication by McPherson and MacIntosh (2013). The Greenhill to Stirling line opened on 1 March 1848, and that from Stirling to Perth on 22 May 1848, but the only completed station was that at Stirling itself (McPherson and MacIntosh 2013, 36). Various rival companies agreed to share the station in April and September 1853 (ibid., 8-9, 36).

1854 July – Spring Garden feu 11 was built upon by the Edinburgh and Glasgow Banking Company. This saw the erection of the present building housing the Royal Bank of Scotland. The Edinburgh and Glasgow Bank were about to construct '*a new bank with manager's house [on] ground presently occupied by old buildings, which are in progress of being pulled down'*, (*Stirl Obs* 1854a). The architect was John Dick Peddie, and the mason was '*Mr Gillespie of Bridge of Allan'*, (DSA, Peddie; *Stirl Obs* 1854a). The plans are in the former RCAHMS collection (HES, Canmore ID 179933). This later became the National Bank of Scotland, and then the Royal Bank.

1854 November – The '*new bank at the foot of Friars Wynd will soon be roofed',* (*Stirl Obs* 1854c).

1855 April – Opening of Queen's Hotel, northern corner of Station Road and Murray Place (*Stirl Obs* 1855a). This house was originally built by a Dr Moodie, who purchased the empty feu, no 8, and commissioned the first structure there (SCA, MP/SB/98). His house appears on the Scottish Central Railway speculative plan of 1844 (McPherson and MacIntosh 2013, 8). Mrs Hannah Hodge, proprietrix, then converted Moodie's house into a hotel in 1855, with '*Lock-up Coach Houses'*, (*Stirl Obs* 1855a). It was called a '*second class hotel with garden attached, affords good accommodation',* in 1858, suggesting the north side of Station Road was mainly open yards and stables (*ONB*, OS1/32/24, 69).

1855 October – '*The Edinburgh and Glasgow Bank is now removed to the new premises in Murray Place, Stirling, 16 Oct 1855*', (*Stirl Obs* 1855b). A decade later, a local historian recalled that on '*the site of the monastery, in 1855, were found great quantities of human bones, and in trenching what was said to have been part of the original orchard (now the garden of the National Bank), a curious box was discovered … a common or usual snuff-box,'* (*Stirl Obs* 1863b). The box was given to James Dow, manager of the Stirling Gas Company, who seems to have been a keen antiquary, or '*a great curiosity hunter'*, (ibid.*)*. As can be seen from the building timetable, the bones must have been found in summer 1854, not 1855, and the 'orchard' story may be local confusion regarding the genuine orchard which stood there as Spring Garden, in 1834.

1859 January – The Edinburgh and Glasgow Bank sold their modern banking office in Murray Place to the National Bank of Scotland, and the sale notice gives a description of its facilities. '*Feu marked number eleven [Spring Garden feuing plan] … a large Banking Office, Safe, Agent's Room …Wine and Coals Cellars, and Laudnry with Washing House adjoining … The Garden is large … well stocked with Fruit Trees, Bushes, Flowers and Shrubs'*, (*Stirl Obs* 1858; SCA, MP/SB/98). The premises were numbered as Nos 66-8 Murray Place until after 1895, and by 1905 they had been re-designated as Nos 80-82 Murray Place (NRS, VR 1895, 1905b).

1861-2 Winter – Photograph of railway station

from south west, looking east (McPherson and MacIntosh 2013, 10). This shows the entrance in Murray Place, with the as-yet unnamed north side of Station Road visible. The Friary site is occupied by a garden planted with trees and shrubs, within a low stone wall, which turns the corner north into the future Goosecroft Road.

1878 February – Post Office purchases house of Thomas Walker, druggist at 1-3 Maxwell Place, for £2,000 (*Dun Tel* 1878; Cook and Wylie 1895, 24-5). This was on Spring Garden feu no 12, and was known as Maxwell Place at least until the 1920s (now the Cold Beer Co pub, address 84-86 Murray Place). The previous Post Office had proved to be inadequate, in part due to the enormous volume of mail orders generated by Drummond's Tract Enterprise, which published religious pamphlets. During the 1860s, one day's outgoing parcels of evangelical literature could weigh ten hundredweight (508 kilos; Cook and Wylie 1895, 23-4). The Post Office was in both halves of a semi-detached villa, with sunken basement, '*which were adapted to the requirements of the [GPO] Department',* and opened for business in 1879 (Cook and Wylie 1895, 24; *Scotsman* 1893).

1881 – Reused carved stones found when '*a very old property was taken down'* in Port Street (*Scotsman* 1882a). Part of it '*had evidently been built of moulded stones taken from Cambuskenneth Abbey'*, which seems to have been the traditional attribution for any medieval masonry found included in later work (ibid.). Nevertheless, such vernacular folk-tales of the Abbey being the source of all such stonework overlook the Dominican Church as a much closer local quarry.

1882 March – Human remains found behind dentist Leon Jablonski (or Jablinskie) Platt's house, at 62-4 Murray Place (*Stirl Obs* 1882; *Scotsman* 1882b; NRS, VR 1875, 1885). This was immediately adjoining the south side of No 66, the National Bank (now Royal Bank), and has all since been renumbered. On the 1902 location plan for the present yellow sandstone tenement (confusingly now known as 60-68 Murray Place), Platt's property is shown immediately to the north (SCA, Plan No 549). Platt's house thus stood on today's 70-74 Murray Place, lying between the Royal Bank and the tenement behind which the Friary church was excavated in 1994.

The newspapers reveal workmen '*re-laying a drain in the green behind Mr L J Platt's … came upon a large quantity of human bones a few inches below the surface … one of the labourers … when he beheld so many skulls … got into … a nervous condition and considered the place uncanny'*, (*Stirl Obs* 1882). The location was recognised as '*part of the old Dominican monastery'*, (*Scotsman* 1882b). It might have been expected that Platt, as a Licensed Dental Surgeon, would have shown some professional interest in this find, but the paper does not give further details (*Stirl Dir* 1882, 65). Platt, despite his intriguing name, was Scottish, born in Edinburgh and called after a Polish in-law (Platt 2015). His dental practise is still in existence (Platt and Common 2018).

1882 – Carved stones found in Murray Place. While demolishing old houses on the site of the Stirling Arcade, under construction on the west side of Murray Place facing Station Road, '*several carved stones were found, which had been taken from the ruins of Cambuskenneth Abbey'*, (*Scotsman* 1883). Again, the Stirling 'urban myth' that all identifiably-medieval masonry came from Cambuskenneth, is quoted. The Stirling Arcade where the worked stones were found is situated diagonally facing 60-68 Murray Place, where James Ronald (in 1903) and the Pages (in 1994) twice uncovered the remains of the Friary church, a more likely source for the carvings.

1893 June – Sale of Queen's Hotel, on northern corner of Station Road, and Murray Place. Originally 36 Murray Place, this is now three modern shops at No 58. The purchaser was Councillor William Murray, who had erected the Stirling Arcade across the road ten years earlier (*Dun Cour* 1893).

1893 August – The Office of Works and Public Buildings invited tenders for '*the erection of a new Post Office at Stirling*' on the site of the converted double-villa at 1-3 Maxwell Place, which crowded and outdated (*Glas Her* 1893). The plans, dated May 1893, were designed by Walter Wood Robertson (1805-1907), chief architect of the OWPB in Edinburgh (*DSA*, Robertson; SCA, Plan No 37). The sections reveal the substantial existing basement, already 11 feet deep, which was to be further lowered by around 2ft 5 ins, and the old pipes running east from the main sewer, which followed the future line of Goosecroft Road (SCA,

Plan No 37, Sheet 3). The foundation layout plan also survives (SCA Plan No 37, Sheet 6).

Considerable volumes of bedrock were due to be removed, the masonry contractor being ex-Bailie James Ronald (1838-1906), sometime town councillor, builder and an insightful amateur archaeologist (Cook and Wylie 1895, 27; Morris 1906; *Dun Tel* 1906). Ronald's meticulous archival researches produced several relevant papers, including '*The Names and Localities of the Old Crofts in and Around Stirling'*, which has formed the basis of later topographical work on the Blackfriars location (Ronald 1891).

1893 December – Paved surface found under Post Office while James Ronald's workmen were digging foundations. The contemporary newspaper report describes the paving as being '*about 4 feet below the surface',* (*Stirl Jour* 1893). The story continues, *'the road, which is about 6 feet broad and rounded in the centre, crosses the garden nearly at right angle [ie runs SE-NW]. It is causewayed with hand laid freestone and whinstone blocks … well-worn with traffic, as if … used for a long time. It is probable that this … ran from the foot of Friar's Wynd ... to the offices or outhouses of the Blackfriar's Monastery'*, (ibid.).

Ronald's first-hand account, although written a decade later, recalls that '*no human remains'* were found on the Post Office site in 1893, '*but we came upon an old roadway, about three feet six inches below the surface … It was seven feet broad, well-formed and causewayed with freestone blocks … having freestone kerb on each side footpath. It appeared to lead direct from the head of the Shore Road to this building*' (Ronald 1904, 128). Fortunately, Ronald recognised the path's significance, and continues: '*It was considered of so much importance by the architect, Mr W W Robertson of HM Office of Works, Edinburgh that he sent one of his draughtsmen though [to Stirling] to sketch it'* (Ronald 1904, 128).

Despite extensive searching, Robertson's plans and the drawing of the cobbled pathway have not been found. The Stirling Post Office plans are not catalogued alongside Robertson's other Post Office designs in the National Records of Scotland, and this drawing is not among the Post Office Dean of Guild planning applications in Stirling Council Archives (SCA, Plan No 37).

1895 May 24 – Post Office formally opened for public business, costing about £6,000, and having a frontage of '*about 50 feet … with sunk flat [basement]*', where the coal store, battery room and parcel room were situated (*Glas Her* 1895; Cook and Wylie 1895, 26-7).

1895 June – Queen's Hotel on the north west corner of Station Road burned down early one morning, being '*practically gutted … damage is estimated at nearly £700*', (*Aberdeen Jour* 1895). This fire causes the hotelier great, and irresolvable, financial difficulties.

1896 March – John Stewart, ex-proprietor of the Queen's Hotel, sees his creditors attempt to recover their debts. A Stirling butchers and a brewery petition to recover monies due to them by having Stewart's estate sequestrated (*Edin Gaz* 1896).

1896 July – '*John Stewart, sometime hotel-keeper, Queen's Hotel'*, is declared bankrupt (*Standard* 1896).

1895 December – Demolition of Queen's Hotel, '*to make way for the new County Club'*, (*Scotsman* 1896).

1896 February – '*While workmen were excavating the site for the new County Buildings, on which the burying place [of] Blackfriars Monastery … One of the skulls was in excellent preservation, the teeth being perfect, and ex-Bailie Ronald had it removed to the office of Councillor James Thomson, where it can be seen*,' (*Stirl Jour* 1896).

Although public display was not ideal treatment for the skulls, the *Stirling Observer* (1896a) was rather more blas: '*In Stirling we take these [historical] discoveries easy. Little or no interest was … manifested … [when] relics of humanity … [were] unearthed at the old Queen's Hotel. … from [the] top of the Station Road to the Post Office is well known to have been the burial place [of] Blackfriars' Monastery, and every time excavations are carried out … human bones are turned up. One of the skulls [had] the teeth of the upper jaw … not one awanting. … The owner could never have had the toothache, or been at a Burns Club supper*.'

1896 February – Heirs of the late Walter Wardie, of 4 Maxwell Place, agree to surrender to the

Council the ground at the front of their property, '*putting the ground into the footway and laying pavement'*, (*Stirl Obs* 1896c). This small plot had been '*used as a parre-terre'*, or flower-bed, but now the pavement could be widened (ibid.). This possibly entailed further groundworks.

1897 – '*Early in the year the County Club moved into their new quarters in Murray Pla*ce', (*Dun Cour* 1898).

1902 November – Photographer William Mackintosh Rodgers (d 1926), of Victoria Square, Stirling commissioned a purpose-built photographic studio, with offices and tenement flats above, to replace existing houses at 58-60 Murray Place (SCA, Plan No 37; *Stirl Dir* 1903, 152; Ronald 1904, 126). His architect was Ebeneezer Simpson (1854-1934), King Street, Stirling, who signed the plans in November and December, 1902 (*DSA*, Simpson; SCA, Plan No 37). Rodgers did not move into the lavish studio himself, but it was let to various retail and restaurant tenants.

1903 February - The building warrant for W M Rodgers's block of flats was granted by the Dean of Guild on 16 February 1903 (SCA, Plan No 37). The address was renumbered as 60-68 Murray Place, which it still retains.

1903 August – While digging the foundations for Rodgers's development, contractor James Ronald '*came upon two walls at right angles … about four feet thick*', which were identified as part of the monastic precinct (*Scotsman* 1903). As a lecturer and writer on ecclesiastical buildings, Ronald wrote up his findings, finding '*within the house a mass of building much older … which the [previous] builder had utilised …we had to excavate the garden some thirty feet back'* to erect *'offices',* (Ronald 1904, 126). The 'offices' were possibly the two-storey photographic suite forming an eastern extension, as the wash-houses and coal cellars were rather unconventionally included in the integral basement, forming the lower floor of the main tenement and its rear studio extension (SCA, Plan No 37).

Ronald's additional trenching exposed *'a continuation of the same building'* incorporated into the demolished house. As the previous structures were genteel 1840s townhouses, this rock-like core must have survived concealed within the villas, and also inside the earlier eighteenth century street-front dwellings at Spring Garden feu 9 (OS 1858, XVII.3.10; SCA, MP/SB/98). The 1844 Parliamentary plan (MacPherson and MacIntosh 2013, 8) and the 1858 OS map show these conventional, symmetrical and 'polite' dwellings, a deliberate step away from Scottish vernacular pantile, thatch and 'crowstep-gable' style. Irregular masonry was representative of the antiquated 'Old Town', with its poor living conditions and lower status.

As the Pages comment that the lime mortar and stone was petrified, forming a solid accretion which would have required heavy equipment to dismantle it (Page and Page 1996a, 104), the simplest course may have been for Victorian architects to effectively ignore it by 'designing around' it. The wall's concretion may have saved it, because rather than requesting the resident garrison use gunpower to remove it, a course taken to quarry rock at Brunstane House, Midlothian in 1735, the new houses in Murray Place were wrapped around this medieval remnant (NLS, Ms 17477, f204).

Ronald measured the lime-mortared walls as 46' long, 5' broad, averaging 18" high, although many stones had been robbed out, with four massive buttresses, made of locally-quarried Ballangeich stone (Ronald 1904, 126). Ronald identified this as the Friary church, surrounded by '*human remains in such abundance … a churchyard'*, although as with previous such finds, no record was made of their ultimate interment elsewhere (ibid.) (Figure 25).

1934 April – Planning permission granted for the Station Hotel on the south side of Station Road to '*carry out extensive improvements … the erection of ten shops, a garage, offices and a reconstructed public bar'*, (*Scotsman* 1934a). The hotel already occupied the entire southern side of Station road by 1899 (OS, 1896 XVII.NE). As feu 6 of Spring Garden, the Pages suggest this was Brady's or Berkhouse Croft, which was probably not a Friary possession (Page and Page 1996b, 890-1). If this is accurate, no bones would be expected south of this building plot, except those redeposited from elsewhere. Nonetheless, this is presently uncertain and requires further confirmation.

1934 July – Trustees of Stirling District Savings Bank acquire site at north-east corner of Station

Road, facing the station entrance. It was sold by the London Midland Scottish Railway Company (*Scotsman* 1934b).

1935 – Savings Bank erected, designed by John Bruce, of Bruce and Marshall, architects, 20 Murray Place, Stirling (*Scotsman* 1934b, 1935, 1936).

1936 January – Stirling District and County Savings Bank officially opens, having cost £5,000. Stirling's Town Clerk is also chairman of the bank, and so his wife performs the opening ceremony (*Scotsman* 1936). The offices include a boardroom, strongroom and banking hall (*Scotsman* 1934b).

1944 May – Salvation Army alter the County Hotel, Station Road/Murray Place, to form a servicemen's hostel (*Glas Her* 1944a).

1944 August – The Red Shield Club and Hostel opened for servicemen at the County Hotel, at Station Road and Murray Place corner, providing 36 beds, a canteen and other facilities for troops stationed around Stirling (*Glas Her* 1944b)

1961 November – Building Warrant for large 'L-shaped' rear extension to Stirling Head Post Office, granted by Stirling Council's Dean of Guild Court on 30 November 1961 (SCA, Plan No 7217). The plans were dated between January and May 1961, W W Sibbald is listed as '*Architect*', the supervising office is '*Ministry of Works, GOB, Broomhouse Drive, Edinburgh*', and the project is Job No EDB 59131 (ibid.). This eastern right-angled extension (which turns south), two and three storeys high, contained a sorting office, with a basement containing fuel tanks and a boiler-room.

The new concrete foundations are shown, as are concrete floors in the basement and lower floor levels. The '*Public Health Engineer*' for the drainage and cold water services to the lower ground floor was R H Shepherd, with the very extensive network of manholes and connecting pipes in the rear loading dock and yards being shown (SCA, Plan No 7217). The new ground level at the rear is marked, and it is difficult to see how archaeological discoveries could have been avoided given the scale of the extension, which is now addressed as 'Murray Place' rather than 'Maxwell Place', as formerly.

1965 September – Building warrant granted for proposed 3-storey and rear basement shops and office development at 70-72 Murray Place (SCA, Plan No 8567). The developers were Murrayfield Properties Ltd, and the architects were Ian Burke, Martin & Partners, of Glasgow, the plans being dated October 1963. This was a speculative development, as notes state '*Tenants of individual shops to be responsible for making application to local authority for planning … and shop front'*, (SCA, Plan No 8567, Sheet 662/71.14).

An open lane or alley was left on the north side beside the National Bank of Scotland (now the Royal Bank). This site was occupied by the dentist L J Platt, (with the obsolete nineteenth century street address of 62-64 Murray Place), in March 1882, when skeletal remains were excavated in the rear garden (see entry above). The Pages state that in 1965-6, when '*nos 70-74 [were] developed … part of the site of the Dominican Friary was bulldozed down to bedrock. From the site, medieval pottery was collected and deposited in the Smith Museum*', (Page and Page 1996b, 897 n91). They give more detail in the excavation report, '*The 'unpublished pottery … was collected in 1977 when … a car park was formed … lowering the ground level by several feet. The 48 sherds of pottery'* in the museum, were analogous to those found by the Pages (Page and Page 1996a, 108).

1966 June – Building warrant granted for former County Hotel on Station Road NW corner, allowing Stirling and District Properties Ltd to redevelop site as two and three storey block of shops (SCA, Plan No 8877). This is now three retail outlets called 58 Murray Place. The architect was Covell, Matthews and Partners, Glasgow and the plans are dated April 1966, signed by architect Colin D Thorburn (*DSA,* Thorburn; SCA, Plan No 8877).

The old County Hotel had projecting bay windows, but the new plan shows a flat façade and the new pavement is also moved several yards further east, widening Murray Place. Rear elevations show that there was an existing basement, and that '*upfill*' was to be added to raise the ground level to the rear exit. The street-front sunken basement open court or 'area' was to be infilled (SCA, Plan No 8877, Sheet SMP/10). Considerable earth was being redeposited to fill in holes, and to raise the ground level, although no historic finds were officially reported.

1969 April – Public enquiry held into Council's £4million plan to redevelop and pedestrianise Port Street and Murray Place (*Glas Her* 1969). The architects were Walter Underwood and Partners, Glasgow, and the commercial developers were Samuel Properties Ltd, London, who said '*the whole basis [of the project] was the development of back land integrated with the existing shopping frontage*', (ibid.).

It should be noted that the Pages placed the terminus of the Friary property (sited on feus 8-15) north of Station Road, which may explain why no bones were reported during Samuel and Underwood's massive construction project (Page and Page 1996b, 889-90; SCA, MP/SB/98). Alternatively, it may be that little attention was being paid to heritage in 1969-72, because of the amount of money, £4m being invested. Archaeological investigation would have delayed the shopping-centre project, costing money and it may have been rated as a low priority. The early 1970s was the start of 'rescue' and urban archaeology as a general movement within the profession, and it seems curious that no historic finds were located, possibly being unreported for various reasons.

1970 June – Permission was given to Coopers Fine Fare Ltd, food retailers, to build a supermarket costing £139,752 on the site of the former 125-year old North Church, at 46-50 Murray Place (*Glas Her* 1970a). The John Henderson-designed church stood where the single-storey parade of modern shops now sits at around 50A and 50B Murray Place.

1989 – The firm of Thomas Ross, monumental sculptors, occupied 3-5 Station Road. This adjoined the rear gardens of the tenement at 60-68 Murray Place, and of the County Hotel and its successor, the shops at 58 Murray Place (SCA, Plan No 8877, Sheet SMP/9). The firm moved there by 1903, when they were renting a yard from the Caledonian Railway Co (*Stirl Dir* 1903, 153; NRS, VR 1905c). Thomas C Ross died in 1970, but the business was still trading at this site in the mid-1990s (*Glas Her* 1970b; McPherson and MacIntosh, 2013, 15). The firm of Thomas Ross is still extant and is located in Barnton Street (the northern continuation of Murray Place), where is forms part of the J & G Mossman group of memorial sculptors (Mossman 2015). The company may be worth contacting, as they worked in Station Road for almost a century, including when various investigations were undertaken.

A late 1920s photograph of the yard, surrounded by a stone wall, appears in a recent station history (McPherson and MacIntosh, 2013, 15). The Pages report that Eric Ross, presumably one of sculptor's family, excavated *'a well-built medieval drain'* in 1989, on the site of his yard, which was adjacent to their 1994 church excavation site (Page and Page 1996a, 107-8; 1996b, 893). Bones were also found '*probably disturbed, the upper layers of the site were very confused*', and they linked the finds to the Friary (ibid.). It is not clear whether this drain was found in an officially-sanctioned excavation, or was an informal, chance discovery, or if it was ever published.

1994 – Re-examination of archival and property records leads Stirling local historians Ronald and Catherine Page to excavate on the site of James Ronald's 1903 discovery of the church wall at 60-68 Murray Place. They discover more of the medieval structure, and publish the site in full (Page and Page 1996a, b; 1997; Ronald 1904). The Pages note a '*massive circular stair, beside which is a capped well'*, behind 10 and 16 Maxwell Place, in the area of the former Gateway Restaurant, now the Fubar club (Page and Page 1996b, 893, 897 n90). However, it would be unlikely that a Friary would locate its fresh-water source near a functioning graveyard, depending on the water table and the topography. The '*Spring Well'* which gave its name to Spring Garden, and the large well with (a straight flight) of steps shown in the rear gardens of Maxwell Place on the 1858 OS map may be a more likely correlation for the circular well (SCA, MP/SB/98; OS 1858, XVII.3.10).

2001 – Archaeological watching brief during demolition work to either side of the rear of 60-68 Murray Place along Goosecroft Road. No archaeological remains were noted (Will 2001; HES, Canmore ID 217063).

2002 February – GUARD sponsored by Halcrow Group Ltd for Stirling Joint Ventures, Stirling Council, undertook a standing building survey of Reid's furniture warehouse, and a watching brief was also carried out. It is not clear from Canmore whether this is a separate survey from

that undertaken by Bob Will in 2001 (listed by HES separately as Canmore ID 217063), or is identical with that project. In February 2002, an archaeological evaluation of carpark due to be developed. Six trenches machine-dug were majorly devoid of interest, but the ground was chemically contaminated, curtailing investigation. Two fragments of green-glazed pottery were recovered (HES, Canmore ID 236678).

Further archaeological work between Murray and Maxwell Places, Goosecroft Road and Station Road, is fully documented in Canmore. The main results of this documentary investigation have been to suggest that the Friary could not have been 'overthrown' by Knox's proverbial '*rascal multitude'* in a few days, and most probably survived, at least in part, to be turned to other purposes. This may explain how part of the premises, possibly located separately from the main convent, was rented by the second Earl of Montrose, in 1565 (Kirk 1995, 554). The other local legend that bears scrutiny is the idea that '*all recycled medieval masonry must come from Cambuskenneth Abbey*'. The re-used carved ecclesiastical stonework in buildings in Port Street and at Stirling Arcade's Murray Place entrance indicates that some, at least, of this material could well have come from the Blackfriars Church, situated literally facing the Arcade site, across Mill Lane. The massive masonry core from the Church, revealed in 1903 and 1994, may have been preserved by being too solid, 'fossilised' and dense to dismantle. It was then incorporated into later buildings as a structural element, and disguised or went unrecognised until James Ronald and Ronald and Catherine Page uncovered and identified it.

The archives also reveal the volume of earth-moving and changes to road levels in Mill Lane and Murray Place in the 1830s and 1840s, and the frequency of skeletal remains found in the area. Writers' casual comments that bodies, whether disarticulated, redeposited or *in situ*, are '*to be expected'* along the north end of Murray and Maxwell Places, strongly suggests that more finds have gone unremarked, than have been recorded. Locating the present whereabouts of Victorian antiquaries W L Shirra's and the very capable James Ronald's papers might also further enhance understanding of this site.

Historical bibliography

(all archival records except those from Stirling Council are included in a single consolidated bibliography)

Aberdeen Jour 1895 = Stirling Hotel Burned Down, *Aberdeen Weekly Journal,* 12 June 1894, 6.

Anon 1921 Robert Renwick 1841-1920, *in The History of Glasgow*, Renwick, (Renwick, R and Lindsay, J (eds.)), Glasgow Vol I, v-xxvi.

Bull Ord Praed III = Ripoll, T and Brémond, A (eds.) 1740 *Bullarium Ordinis Fratrum Praedicatorum*, Mainardi, Volume 3, 1430-1484.

Cal Merc 1818a = Hints for … Improving the Town and Giving Employment to the People of Stirling, *Caledonian Mercury*, 11 April 1818, 4.

Cal Merc 1818b = Brickworks Shares Sale Notice, *Caledonian Mercury,* 18 July 1818, 1.

Campbell, J W 1916 Reprint of Letter to Rector of Holy Trinity, *Stirling Observer,* 24 October 1916, 5.

Cook and Wylie (Publishers) 1895 *History of Stirling Post Office from the Earliest Times*, Stirling, Privately Published.

Cowan, I B and Easson, D E 1976 *Medieval Religious Houses in Scotland*. London: Longman.

Cowan, M 2012 *Death, Life and Religious Change in Scottish Towns, c1350-1560.* Manchester: Manchester University Press.

Cross, M forthcoming Land Use and Ownership History of the Greyfriars Site in Glasgow, Appendix I in Dalland, M et al., *Excavation of the Greyfriars Friary at Shuttle Street, Glasgow*, Headland Archaeology, Edinburgh.

DSA, Peddie = John Dick Peddie, Architect 1824 -1891, Architect Biography Report, *Dictionary of Scottish Architects.* Available from: www.scottisharchitects.org.uk Accessed 01/09/2018.

DSA, Robertson = Walter Wood Robertson, Architect, 1845-1907, *Dictionary of Scottish Architects,* at www.scottisharchitects.org.uk Accessed 01/09/2018.

DSA, Simpson = Ebeneezer Simpson Architect 1854-1924, *Dictionary of Scottish Architects,* at www.scottisharchitects.org.uk Accessed 01/09/2018.

DSA, Thorburn = Colin Drummond Thorburn Architect 1930-2003, *Dictionary of Scottish Architects,* at www.scottisharchitects.org.uk Accessed 01/09/2018.

Dundee 2015 = Outline History, The Steeple Church, (Congregation Resource, Nethergate, Dundee), at http://thesteeplechurch.org Accessed 01/09/2018.

Dun Cour 1893 = Sale of Stirling Hotel, *Dundee Courier,* 20 June 1893, 5.

Dun Cour 1898 = Building Trade in Stirling in 1897, *Dundee Courier,* 5 January 1898, 7.

Dun Tel 1878 = New Post Office, *Dundee Evening Telegraph,* 1 February 1878, 4.

Dun Tel 1906 = Ex-Bailie Ronald, *Dundee Evening Telegraph,* 13 April 1906, 2.

Easson, D E 1957 *Medieval religious houses in Scotland: with an appendix on the houses in the Isle of Man*. London: Longmans Green.

Edin Gaz 1896 = Sequestration Petition, John Stewart, *Edinburgh Gazette, 24 March 1896,* 293.

Fitch, A-B 2009 *The Search for Salvation: Lay faith in Scotland 1480-1560*. Edinburgh: John Donald.

Fleming, J S 1897 *The Old Ludgings of Stirling*, Stirling.

Fleming, J S 1902 *Ancient Castles and Mansions of Stirling Nobility*. Paisley and London: A. Gardner.

Foggie, J 2003 *Renaissance Religion in Urban Scotland: The Dominican Order, 1450-1560*. Leiden and Boston: Brill.

Galbraith, G T 1894 Old Recollections of Stirling: Second Part, *Stirling Natural History and Archaeological Society Transactions* (1893-4), 108-38.

Gifford, J and Walker, F A 2002 *The Buildings of Scotland: Stirling and Central Scotland*. New Haven CT: Harvard University Press.

Glas Her 1893 = Call for Tenders, Post Office, *Glasgow Herald,* 23 August 1893, 1.

Glas Her 1895 = Opening of New Post Office at Stirling, *Glasgow Herald,* 25 May 1895, 9.

Glas Her 1944a = Stirling Service Men's Hostel, *Glasgow Herald,* 4 May 1944, 6.

Glas Her 1944b = Stirling Services Club, *Glasgow Herald,* 9 August 1944, 6.

Glas Her 1969 = £30,000 an acre sought by objector to plan, *Glasgow Herald,* 23 April 1969, 7.

Glas Her 1970a = Supermarket Plan, *Glasgow Herald,* 26 June 1970, 13.

Glas Her 1970b = Messrs Thomas Ross, Sculptors, Stirling, *Glasgow Herald,* 2 October 1970, 14.

HES, Canmore ID 46223 = Stirling, Dominican Friary or Blackfriars Church, Canmore ID 46223, Site Number NS79SE 40, *Canmore Online Catalogue*, Historic Environment Scotland. Available from: https://canmore.org.uk/ Accessed 01/09/2018.

HES, Canmore ID 179933 = Stirling, 80-82 Murray Place, Royal Bank of Scotland, Canmore ID 179933, Site Number NS79SE 233, *Canmore Online Catalogue*, Historic Environment Scotland. Available from: https://canmore.org.uk/ Accessed 01/09/2018.

HES, Canmore ID 217063 = Stirling, Murray Place or Station Square, Event: Watching Brief (GUARD 865), Canmore ID 217063 Site Number NS79SE 270, *Canmore Online Catalogue*, Historic Environment Scotland. Available from: https://canmore.org.uk/ Accessed 01/09/2018.

HES, Canmore ID 236678 = Stirling, Station Square or Murray Place, Archaeological Record, Site Number NS79SE 657, Project Nos GUARD 2000 (MS/1069/11), and GUARD 1204 (MS/1069/63).

HES, Ref LB25378 = Nethergate, City Churches, Old St Paul's and St David's, or South Church, (Reference: LB25378), Listed Buildings Decisions Portal, *Historic Environment Scotland*. Available from: http://portal.historic-scotland.gov.uk Accessed 01/09/2018.

Kirk, J (ed.) 1995 *Books of Assumption of the*

Thirds of Benefices: Scottish Ecclesiastical Rentals at the Reformation. Edinburgh: Edinburgh University Press.

Lindsay, M 1996 William Corbet 1755-1811, *The Burns Encyclopaedia*. Available from: www.robertburns.org/encyclopedia Accessed 01/09/2018.

MacLehose, J 1885 William Connal, 1790-1856, *in Memoirs and portraits of one hundred Glasgow men.* Glasgow: James Maclehose and Sons, 87-90.

McKean, C 1985 *Stirling and the Trossachs*. Edinburgh: RIAS.

McPherson, F and MacIntosh, J 2013 *Stirling Railway Station: A History of Service to the Community*. Oxford.

Moir Bryce, W 1911 *The Black Friars of Edinburgh*. Edinburgh: T and A Constable.

Morris, D B 1906 Bailie Ronald: A Memoir, *in The Story of the Argyle Lodging* by Ronald, J, Stirling, iii-xxiv.

Mossman 2015 = J and G Mossman, Established 1816, (Company Website). Available from: www.mossmanmemorials.co.uk Accessed 01/09/2018.

NLS, Glenriddell = Glenriddell Manuscripts, *Robert Burns 1759-1796*, Digital Gallery, National Library of Scotland. Available from: http://digital.nls.uk/robert-burns/ Accessed 01/09/2018.

NLS, Ms 17477, f204 = Estate voucher 1735, for Andrew Fletcher, Lord Milton, Fletcher of Saltoun Papers, National Library of Scotland.

NRS, B66/25/223/1-2 = Charter by Stirling Burgh Council in favour of masters of Cowan's Hospital, of annual-rent from … Frier Croft, Boneyaird and … Mobscroft, 6 May 1654; Entry in National Records of Scotland online catalogue, item held by Stirling Council Archives Services. Available from: http://catalogue.nrscotland.gov.uk/ Accessed 01/09/2018.

NRS, B66/25/245 = Discharge by James Watsone and James Gib, preceptors of Cowans Hospital, in favour of Stirling Burgh Council, of annualrent from … Friar Croft, Boneyaird … and Mobs Croft for bond and disposition, 29 Jun 1708; Entry in National Records of Scotland online catalogue, item held by Stirling Council Archives Services. Available from: http://catalogue.nrscotland.gov.uk/ Accessed 01/09/2018.

NRS, VR 1855 = Valuation Roll, Stirling Burgh 1855-6, Dung Depot, Burgh Mill, Murray Place, VR80/1/62, National Records of Scotland. Available from: www.scotlandspeople.gov.uk Accessed 01/09/2018.

NRS, VR 1875 = Valuation Roll, Stirling Burgh 1875-6, Platt, Leon Jablinskie, 62-64 Murray Place, VR80/15/ 80, National Records of Scotland. Available from: www.scotlandspeople.gov.uk Accessed 01/09/2018.

NRS, VR 1885 = Valuation Roll, Stirling Burgh 1885-6, Platt, Leon Jablinskie, 62-64 Murray Place, VR80/18/307, National Records of Scotland. Available from: www.scotlandspeople.gov.uk Accessed 01/09/2018.

NRS, VR 1895 = Valuation Roll, Stirling Burgh 1895-6, National Bank of Scotland, 66-68 Murray Place, VR80/22/377, National Records of Scotland. Available from: www.scotlandspeople.gov.uk Accessed 01/09/2018.

NRS, VR 1905a = Valuation Roll, Stirling Burgh 1905-6, Post Office 1 Maxwell Place, VR80/26/316, National Records of Scotland. Available from: www.scotlandspeople.gov.uk, accessed 6 January 2015.

NRS, VR 1905b = Valuation Roll, Stirling Burgh 1905-6, National Bank of Scotland, 80-82 Murray Place, VR80/26/415 National Records of Scotland. Available from: www.scotlandspeople.gov.uk. Accessed 01/09/2018.

NRS, VR 1905c = Valuation Roll, Stirling Burgh 1905-6, Ross, Thomas, Sculptor, Yard at Station Road, VR80/26/ 416, National Records of Scotland. Available from: www.scotlandspeople.gov.uk Accessed 01/09/2018.

NRS, VR 1920 = Valuation Roll, Stirling Burgh 1920-1, Post Office 1 Maxwell Place, VR80/34/221, National Records of Scotland. Available from: www.scotlandspeople.gov.uk Accessed 01/09/2018.

NRS, Wright 1830 = Wright, Bailie Alexander, Merchant in Stirling, 10 November 1830 (date of registration), Inventory, Trust Disposition and Settlement, Stirling Sheriff Court SC67/36/12, pp 423-48.

ONB, OS1/32/24 = Object Name Book of the Ordnance Survey: Town of Stirling, 1858, Vol 24, (6 inch and 1/2500 scale), *Scotland's Places*, (Heritage Database Portal). Available from: www.scotlandsplaces.gov.uk Accessed 01/09/2018.

OS 1858, XVII.3.10 = Ordnance Survey, *Town Plan of Stirling*, Sheet XVII.3.10 Surveyed: 1858 by Lieut Pratt, R E, Engraved 1859, Published May 1860, Scale: 1:500.

OS 1896 XVII.NE = Ordnance Survey, County Maps, Stirlingshire, Sheets XVII.NE (includes St Ninians, Stirling); Revised 1896, Published 2nd Edition 1901, Scale: 6 ins: 1 mile, or 1:10560.

Page, R and Page, C 1996a An Excavation at the Church of the Blackfriars, Stirling, *Glasgow Archaeological Journal* 20, 103-112.

Page, R and Page, C 1996b The Blackfriars of Stirling, *Proceedings of the Society of Antiquaries of Scotland,* 126 (1998), 881-898.

Page, R and Page, C 1997 Stirling Blackfriars and the Reformation, *Forth Naturalist and Historian*, 20, 119-121.

Pigot 1825 = *Pigot & Co's New Commercial Directory of Scotland 1825-6*. London and Manchester.

Pitscottie, *Historie* = Mackay, A J G (ed) 1899 *Historie and Cronicles of Scotland … by Robert Lindesay* of Pitscottie, Vol II, Edinburgh: Scottis Text Society.

Platt and Common 2018 website. Available from: http://www.plattandcommon.co.uk/history/ Accessed 01/09/2018.

RMS IV = *Registrum Magni Sigilli Regum Scotorum: Register of the Great Seal of Scotland,* Vol IV, 1546-1580, Edinburgh (1882-1914; reprinted 1984).

RMS VIII = *Registrum Magni Sigilli Regum Scotorum: Register of the Great Seal of Scotland,* Vol VIII, 1620-1633, Edinburgh (1882-1914; reprinted 1984).

Ronald, J 1891 The Names and Localities of the Old Crofts in and Around Stirling, *Stirling Natural History and Archaeological Society Transactions,* 1890-1, 1-32.

Ronald, J 1899 *Landmarks of Old Stirling*, Stirling: E Mackay.

Ronald, J 1904 On finding part of an Old Wall in Murray Place, *Stirling Natural History and Archaeological Society Transactions,* 1903-4, 126-30.

Ross, A 1969 Libraries of the Scottish Blackfriars, 1481-1560, *Innes Review* 20, 3-36.

St Michaels 2015 = The History of St Michael's Parish Church, *The Parish Church of Linlithgow St Michaels*. Available from www.stmichaelsparish.org.uk Accessed 01/09/2018.

Scotsman 1882a = Stirling New Buildings and Improvements, *The Scotsman,* 2 January 1882, 4.

Scotsman 1882b = Stirling Discovery of Human Remains, *The Scotsman,* 2 March 1882, 4.

Scotsman 1883 = Stirling in 1882, *The Scotsman,* 2 January 1883, 2.

Scotsman 1893 = Stirling Post Office, *The Scotsman,* 1 September 1893, 4.

Scotsman 1896 = The Building Trade in Stirling in 1895, *The Scotsman,* 1 January 1896, 6.

Scotsman 1903 = Antiquarian Discoveries in Stirling, *The Scotsman,* 6 August 1903, 4.

Scotsman 1934a = A Stirling Warning, *The Scotsman,* 11 April 1934, 14.

Scotsman 1934b = New Premises for Stirling Savings Bank, *The Scotsman,* 10 July1934, 7.

Scotsman 1935 = Stirling Savings Bank, *The Scotsman,* 14 January 1935, 14.

Scotsman 1936 = Encouraging Thrift, *The Scotsman*, 30 January 1936, 12.

Scott Antiq 1895 = Abstracts of the Protocol Book

of the Burgh of Stirling, *Scottish Antiquary, or Northern Notes and Queries* Vol 10, No 38 (1895), 55-64.

Scott Antiq 1896 = Abstract of Protocol Book of the Burgh of Stirling (Continued), *Scottish Antiquary, or Northern Notes and Queries*, Vol 10, No 40 (1896), 156-171.

Shaw, J 1984 *Water Power in Scotland 1550-1870*. Edinburgh: John Donald.

Shirra, W L 1891 Dominicans and Franciscans: The Story of the Friars of Stirling, *Stirling Natural History and Archaeological Society Transactions,* 1890-1, 33-51.

Standard 1896 = Scotch Bankrupt, *The Standard*, 4 July 1896, 8.

SCA = Stirling Council Archives.

SCA, B66/15/4 = Stirling Council Archives, Burgh of Stirling, *Court and Town Council Records, 1560-66.*

SCA, B66/21/17 *Stirling Town Council Minutes* October 1831-April 1847.

SCA, GD189/Box 69, Murray of Polmaise Papers, John Brown, prior of the Friars Preachers of Stirling to say mass for soul of William Murray and others, 6th Aug 1473.

SCA, MP/SB/1 Plan of the town of Stirling from actual survey, Surveyor: John Wood, 1820.

SCA, MP/SB/98 = Plan of Spring Garden [bounded by Friars Wynd and the road to the Burgh Mill], belonging to the heirs of the late Alexander Wright. Surveyor: William Legate, 1834.

SCA, Plan No 37 = Stirling Burgh, Dean of Guild Court, Plan No 37 (7 sheets), Maxwell Place, Post Office, For Office of Public Works, 23 May 1894.

SCA, Plan No 549 = Stirling Burgh, Dean of Guild Court, Plan No 549 (6 sheets), Murray Place, Business Premises and Dwellings, Mr William Rodgers, 1 December 1902, Stirling Council Archives.

SCA, Plan No 7217 = Stirling Burgh, Dean of Guild Court, Plan No 7217 (6 sheets), Head Post Office, Murray Place, Reconstruction, For Head Post Master, 19 November 1961, Stirling Council Archives.

SCA, Plan No 8567 = Stirling Burgh, Dean of Guild Court, Plan No 8567 (4 sheets), 70-72 Murray Place, Two storey block of shops and offices, Murrayfield Properties Ltd, 16 September 1965, Stirling Council Archives.

SCA, Plan No 8877 = Stirling Burgh, Dean of Guild Court, Plan No 8877 (3 sheets), 58 Murray Place, Three Shops, County & District Properties Ltd, 16 June 1966, Stirling Council Archives.

SCA, SB1/1/1 *Stirling Town Council Minutes* May 1847-1864.

Stirl Dir 1882 = *Stirling Directory including Bridge of Allan 1881-82*, [Publ May 1882], Alexander Miller: Stirling.

Stirl Dir 1903 = *Cook & Wylie's Stirling Directory containing … County Information,* 1903, Stirling.

Stirl Jour 1846 = Human Skeleton Found, *Stirling Observer,* 24 July 1846, 4.

Stirl Jour 1893 = Discovery of an Old Road at the Post Office, *Stirling Journal,* 8 December 1893, 4.

Stirl Jour 1896 = Discovery of Human Remains, *Stirling Journal,* 7 February 1896, 4.

Stirl Obs 1844a = Removal Miss Fisher, Port Street, Advertisement, *Stirling Observer,* 16 May 1844, 1.

Stirl Obs 1844b = Misses Nicholson, Tuition, Advertisement, *Stirling Observer,* 1 August 1844, 1.

Stirl Obs 1845a = Death, Henrietta Lawson, Classified Notices, *Stirling Observer,* 6 March 1845, 4.

Stirl Obs 1845b = Dissolution of Co-partnery, Classified Notice, *Stirling Observer,* 2 October 1845, 1.

Stirl Obs 1846a = Henry Clugston, Removal, Advertisement, *Stirling Observer,* 19 February 1846, 1.

Stirl Obs 1846b = Dissolution of Co-partnery, Classified Notice, *Stirling Observer,* 4 June 1846, 1.

Stirl Obs 1846c = Excellent New House Property, Classified Notice, *Stirling Observer, 6 August* 1846, 4.

Stirl Obs 1847 = The Budget of Paul Pry Junior, *Stirling Observer,* 15 July 1847, 3-4.

Stirl Obs 1849 = The Burgh Mill Dam Again, *Stirling Observer,* 4 January 1849, 4.

Stirl Obs 1854a = New Bank, *Stirling Observer*, 8 June 1854, 3.

Stirl Obs 1854b = The Procession … at the Laying of the Foundation-Stone of the High School, *Stirling Observer*, 10 August 1854, 4.

Stirl Obs 1854c = New Buildings, *Stirling Observer*, 9 November 1854, 3.

Stirl Obs 1855a = Notice of Removal, Queen's Hotel, *Stirling Observer*, 26 April 1855, 1.

Stirl Obs 1855b = Edinburgh and Glasgow Bank, Classified Notice, *Stirling Observer,* 25 October 1855, 2.

Stirl Obs 1858 = Edinburgh and Glasgow Bank, Sale Notice, *Stirling Observer,* 2 December 1858, 1.

Stirl Obs 1863a = Civic and Ecclesiastical Memorials of Stirling, *Stirling Observer,* 18 June 1863, 5.

Stirl Obs 1863b = Civic and Ecclesiastical Memorials of Stirling (continued), *Stirling Observer*, 25 June 1863, 6.

Stirl Obs 1882 = Discovery of Human Remains, *Stirling Observer,* 2 March 1882, 4.

Stirl Obs 1896a = Notelets; In some towns … , *Stirling Observer,* 5 February 1896, 4.

Stirl Obs 1896b = Lavatory Accommodation in the Town, *Stirling Observer,* 12 February 1896, 3

Stirl Obs 1896c = Petitions and Plans of Buildings, *Stirling Observer,* 12 February 1896, 3.

Stirling Chrs = Renwick, R (ed.) 1884 *Charters and Other Documents Relating to the Royal Burgh of Stirling 1124-1705,* Glasgow.

Stirling Prot 1894 = Anonymous, 1894 *Abstract of the Protocol Book of the Burgh of Stirling AD 1469-1484.* Edinburgh: Privately Published.

Stirling Recs I = Renwick, R (ed.) 1887, *Extracts from the Records of the Royal Burgh of Stirling AD 1519-1666,* Vol I, Glasgow.

Stirling Recs II = Renwick, R (ed.) 1889, *Extracts from the Records of the Royal Burgh of Stirling AD 1667-1752,* Vol II, Glasgow.

Appendix 2

Evidence for paleo-environmental change in the Stirling Area over Five Millennia

The recovery of deep deposits of waterlogged organic-rich material provided a rare opportunity to study how the environment developed and changed over time up to the medieval period. These deposits were sampled using overlapping monolith tins and bulk soil samples. Radiocarbon dates were obtained from bulk samples collected vertically every 100 mm next to the monolith tins and were used to obtain three radiocarbon dates, one each for the top, middle and bottom of the trench, to provide a dating sequence. The various samples were then analysed for the recovery and identification of botanical remains, fossil beetle remains and soil micromorphology. The full reports can be found in the site archive.

Archaeobotanical Report

By Susan Ramsay

Evidence from much earlier sediments recovered from monolith tins and bulk soil samples, dating as far back as the 4th millennium BC, suggest that the site was originally covered in woodland, with alder, hazel and possibly willow, being the dominant tree types present at that time.

Methodology

Identification of botanical remains

The testa characteristics of small seeds and the internal anatomical features of all charcoal fragments were further identified at x200 magnification using the reflected light of a metallurgical microscope. Reference was made to Schweingruber (1990) and Cappers et al (2006) to aid identifications, and vascular plant

nomenclature follows Stace (1997) except for cereals, which conform to the genetic classification of Zohary and Hopf (2000).

Pollen and stratigraphic analysis of Monolith 1

Monolith 1 (represented by 4 overlapping monolith tins) was sub-sampled at 80 mm intervals between 400 - 760 mm total depth, with samples of 10 mm thickness removed for pollen and stratigraphic analysis. A portion of each sample was examined under low magnification to determine the main constituents of the sediment at each level, and any plant macrofossils were identified and quantified. Pollen samples were prepared by Robert McCulloch, University of Stirling, using the standard methodologies outlined in Moore et al. (1991), with NaOH digestion, treatment with HF, followed by acetolysis and embedding in silicone oil.

Pollen identification and nomenclature follows Moore et al. (1991) and Punt (1976), whilst vascular plant nomenclature follows Stace (1997). Cereal type pollen grains were distinguished using grain size >37 µm and annulus diameter of >8 µm (Andersen 1979), and additional notes by Dickson (1988). A minimum of 500 land pollen grains were counted for each level. Microscopic charcoal particles were quantified into the size fractions defined by Tipping (1995), i.e. 10-25 µm, 26-50 µm, 51-75 µm, and >75 µm.

A pollen sum of Total Land Pollen (TLP) was used, which excluded all aquatics, spores and unidentifiable grains. Percentage values for groups of taxa not included within the TLP sum were calculated as TLP + group and charcoal percentages were calculated as TLP + charcoal. The pollen diagram was constructed using TILIA and TGView (Grimm 1991-2011).

AMS radiocarbon dating was undertaken on single charcoal fragments from three 100 mm deep samples taken from alongside the monolith tins. Therefore the AMS dates do not directly equate to the pollen levels from the monolith tins.

(Details of all the results can be found in the site record including Tables 1-7 as well as the pollen diagram from Monolith 1).

Results

Monolith 1

The pollen and macrofossil results will be discussed together for Monolith 1.

The botanical results from monolith 1 appear to show a significant change in the environment at approximately 400 mm depth. Between 400-800 mm depth, the pollen shows a wooded landscape with alder and hazel dominating, with lesser amounts of oak, elm and birch also present. The dominance of alder suggests a damp woodland environment with little or no evidence for human impact showing in the pollen diagram. Uncarbonised wood and woody roots were recorded in these lower levels, although it was not possible to identify them to type. Sedge, dead nettle and small nettle seeds were found at trace levels. A fragment of hazel charcoal from 600-700 mm depth was AMS radiocarbon dated to 2044 – 1901 cal BC (SUERC-59204) (Table 3) making the lower levels of the site significantly older than medieval in date.

There is a significant change in the environment above 400 mm depth, with the pollen diagram showing trees and shrubs declining rapidly and grasses and sedges increasing. In addition, pollen types that are indicators of human impact begin to become more common, in particular ribwort plantain, bracken, dandelion type and buttercups. The weed flora appears to be more indicative of pastoral grassland rather than indicating that arable farming was taking place in the vicinity. This interpretation is supported by the plant macrofossils, with seeds of sedges becoming more common, and buttercups, brambles and raspberries also recorded. In addition, caddis fly larvae cases were recovered between 200-400 mm, suggesting that there was standing water present on the site at this time. A fragment of hazel charcoal from 300-400 mm was AMS radiocarbon dated to cal AD 1150 –1257 (SUERC-59200).

Above 200 mm there is a significant increase in microscopic charcoal in the pollen diagram and also by finds of macroscopic charcoal from the bulk samples. This charcoal is mainly oak, with lesser amounts of alder, birch and hazel also present. The pollen diagram suggests that oak was not growing in the vicinity of the site at this time and so must have been brought in from

elsewhere. This rise in charcoal is accompanied by a further increase in grass pollen but a reduction in sedge pollen, suggesting that the land was drying out slightly. There are no finds of sedge seeds above 200 mm. Heather and meadowsweet become more common towards the top of the monolith, as does barley-type pollen. It is difficult to determine whether this pollen type is actually indicative of cereal growing in the vicinity since floating sweetgrass (*Glyceria fluitans*), an aquatic grass, also comes under this pollen category. However, in the top 100 mm of the monolith finds of carbonised barley and oats show that cereals were present on site, but it cannot be proven that they were grown nearby. A single grain of flax pollen (*Linum*) at the top of the pollen diagram might suggest that flax growing or processing was occurring nearby. A fragment of alder charcoal from 100-200 mm was AMS radiocarbon dated to cal AD 1020 – 1155 (SUERC-59199). This topmost date is slightly earlier than the date obtained at 300-400 mm, which suggests some degree of mixing of the upper deposits. This mixing was not apparent in the pollen diagram and so it may be that the sediments to the side of the monolith tins that were sampled for dating material were not identical to those sediments within the monolith tins.

Monolith 2

The plant macrofossil results from Monolith 2 also show a significant change at approximately 400 mm depth within the monolith. From 400-1000 mm depth woody fragments are abundant and it may be that these fragments are from root wood. There are small amounts of charcoal present during this zone with alder, birch, hazel and oak all represented but at relatively low concentrations. Sedge seeds are common, and evidence for the actual types of trees growing on the site is provided by a single seed of alder and fragments of hazel nutshell. Buttercups, brambles and raspberry seeds are present and caddis fly larvae cases at 400-600 mm depth suggest some standing water on site. A fragment of alder charcoal from 700-800 mm was AMS radiocarbon dated to 3523 – 3369 cal BC (SUERC-59207), whilst a further AMS date on alder charcoal at 400-500 mm gave a date range of 321 – 206 cal BC (SUERC-59206), indicating three millennia were represented by only 300 mm of sediment.

Above 400 mm, charcoal becomes much more abundant, although the types present in the assemblage are similar but with the addition of willow and ash. Traces of carbonised cereal grain, both oats and barley, are present in the top 400 mm of the monolith, along with traces of carbonised hazel nutshell and a single possible apple pip. Looking at the uncarbonised seeds, it is clear that there is a significant increase in the number of nettle seeds in the top 400 mm of the monolith and this would correspond with the evidence for midden material present on site. Brambles, raspberries and occasional elderberry seeds were also identified and these may be from the same period of occupation as the possible sewage remains identified from the 'friary wall' contexts above. A fragment of willow charcoal from 100-200 mm was AMS radiocarbon dated to cal AD 1025 – 1158 (SUERC-59205). This ties in well with the upper date obtained from Monolith 1.

Discussion

The charcoal and wood assemblages

Charcoal was common in the upper, medieval layers of the site. A wide variety of charcoal taxa were present, although oak and hazel were probably the commonest types identified. The diversity of charcoal types suggests that there were areas of woodland nearby that could be exploited for fuel and the pollen diagram from Monolith 1 indicates that alder, birch and hazel were growing relatively close to the site. Oak does not appear to have been growing in any quantity nearby and so would have had to have been collected from some distance away and transported to the site.

The uncarbonised wood remains found can be separated into two distinct groups. The wood remains from the lowest levels of the site, in the basal monolith deposits, probably represent woodland growing on the site during the prehistoric period, over 5000 years ago. From the pollen diagram it is likely that much of this woodland was alder and hazel, although the wood remains themselves suggest willow was probably common as well. Willow is an insect pollinated tree and so is always under-represented in pollen diagrams.

Evidence from much earlier sediments, dating as far back as the 4th millennium BC, suggest that the site was originally covered in woodland,

with alder, hazel and possibly willow, being the dominant tree types present at that time.

Fossil Beetle (Coleoptera) Fauna

By Nicki J. Whitehouse

Four samples were studied for their sub-fossil beetle fauna associated with Monolith 1. The monolith samples suffered from poor levels of preservation, apart from the lower two samples; these indicate relatively semi-natural conditions associated with an area of wetland with an abundance of wetland plants. The results, in combination with the pollen results from the same location, suggest that the assemblage represents an *Alnus* carr wetland habitat that became increasingly dry and acidic in the upper levels. There are limited archaeological activities implied by the assemblage, but there is evidence for animal activities, either in the form of nearby grazing or stabling

Introduction

Sediment samples were investigated for their fossil beetle fauna the main aims were to establish environmental conditions inferred from the samples and their archaeological significance. Four samples (Monolith 005, 006, 007 and 008) came from a monolith sequence exposed on site. There have been few investigations of urban contexts in Scotland for their fossil beetles and none of medieval Stirling as far as the author is aware.

Fossil beetles can be very useful indicators for reconstructing past environments and details of living conditions on archaeological sites, being sensitive to environmental change and occupying almost every possible ecological niche and type of habitat on land and freshwater. Urban archaeological sites frequently yield copious insect material, often of Roman, medieval and post-medieval date. Some of the best-known examples of this type of work have been undertaken in urban centres such as York (cf. Kenward and Hall 1995), London, Carlisle, Lincoln and elsewhere (e.g. Hall and Kenward 1980; Greig 1981; Kenward and McCormish 2004; and Smith 2012). These works have established the importance of understanding the taphonomic pathways through which insect fossils become part of the archaeological record, which can often be complex. It is thus important to appreciate that interpretations should not be based on single species (cf. Kenward 1975) rather the combinations of different species and groups of related species are critical to the interpretation of archaeological materials (cf. Smith 2013).

Material and methods

Four samples were processed for fossil insect remains. Details of soil descriptions and samples sizes can be found in Table 18. The latter varied between 1 to 1.5 litres of material, which is lower than optimum for the extraction of insect remains.

Sample Number	Description of deposit	Volume processed (in litres)
Monolith 005	Grey/brown in colour; marl inclusions (off-white). Crumbly, gritty soil, with sand and gravel inclusions	0.8
Monolith 006	Dark brown/grey crumbly soil. Sand and gravel in clay matrix; no obvious organic macrofossils	1
Monolith 007	Dark chocolate brown, clay-rich soil. Crumbly appearance. No obvious inclusions.	1.5
Monolith 008	Dark, chocolate brown silty/clay, crumbly texture, rare visible plant remains. No obvious inclusions such as stones, sand.	1

Table 18: Description of the monolith samples processed.

Samples were disaggregated in water over a 300 m sieve to remove any fine fraction from the samples. They were then subjected to the paraffin flotation method devised by Coope and Osborne (1968) to concentrate the insect remains. Flots were sorted under a binocular microscope at x10-x40 magnification. Identification of beetle remains was carried out using the Hicks Collection at Plymouth Museum. The results are displayed in taxonomic order (in the site archive), with minimum number of individuals (MNI) for each taxon. Coleoptera nomenclature follows Lucht (1987); plant nomenclature follows Stace (1991).

Several samples were obtained from a clay-rich soil; these yielded the most abundant remains although levels of preservation were rather limited. The stony nature of the monolith samples was less conducive to preservation, especially the upper samples, and the low volume of material sampled exacerbated this situation. Nevertheless, given the volume of material recovered from monolith sample 008, it is likely that larger sample volumes would have

yielded a much more diverse and satisfactory fauna. In other words, sample size has dictated the small assemblage recovered, rather than lack of preservation.

Habitat information was obtained from the Coleopteran database BUGSCEP (Buckland and Buckland 2006). The species richness and abundance were such that species were not analysed by ecological functional groupings, due to low abundances.

Results

Results are described for the monolith samples. The species list can be found in the site archive.

Monolith samples (samples 008, 007, 006, 005)

The monolith samples yielded a low number of sclerites. Sample 005, at the top, yielded no material, with 006 and 007 yielding just a few fragments. Sample 008 (the bottom-most monolith sample made available) yielded a recognizably greater number of sclerites, suggesting that samples taken from closer to the water table had better preservation. Nevertheless, despite the low number of species recovered, taxa recovered are quite informative of the local environment.

Starting from the basal sample of the monolith, *Sample 008* included 19 MNI, across at least 16 species. The material represents sub-fossils across several families, including ground beetles (Carabidae), water scavenger Hydrophilidae, Staphylinidae rove beetles, Scarabaeidae dung beetles, Chrysomelidae leaf beetles, and weevils (Curculionidae). The inclusion of several more delicate taxa (e.g. the Scirtidae *Cyphon* spp.) suggest that preserved material is not biased towards just more robust specimens, rather that the low numbers preserved are likely the function of small sample size.

Several taxa are indicative of wet and moist conditions; the ground beetle *Pterostichus nigrita* is very eurytopic, living next to freshwater of all types (Lindroth 1945), whilst the presence of *Ochthebius minimus*, *Helophorus* spp., *Helochares* sp. and *Anacaena* sp. all indicate the presence of standing, boggy water in the vicinity. *O. minimus* is often found in stagnant water, from places such as ponds, ditches and pools, usually in muddy ground at the water's edge (Hansen 1987; Friday 1988), a habitat also suitable for *Chaetarthria seminulum*. This small hydrophilid is commonly found associated with moss and mud at the edges of wet mossy areas, adjacent to aquatic, stagnant habitats, but different forms can also live in shallow water with sand and mud (Hansen 1987; Friday 1988; Levey 2005). *Anotylus rugosus* is similarly associated with damp waterside environments, in rotting vegetation, compost, straw and stable manure (Koch 1989). The presence of manure is attested by *Aphodius prodromus*; this beetle is found in all kinds of dung (frequently in horse manure) but also (more rarely) decomposing vegetable matter (Jessop 1986).

Wetland vegetation is also implied. Mildly basic environmental conditions are indicated by the reed beetle *Plateumaris sericea*, whose larvae spin cocoons in rhizomes and roots of bulrush *Typha latifolia*, common clubrush *Schoenoplectus lacustris*, sea clubrush *Bolboschoenus maritimus*, branched burr-reed *Sparganium erectum*, and yellow iris *Iris pseudacorus* (Stainforth, 1944), as well as on sedges *Carex* and water-lily *Nuphar* species (Bullock, 1993). Similarly, *Limnobaris t-album* is commonly found on sedges, *Carex* spp., *Scirpus* and *Cladium* spp., whilst the larvae live in the roots of the common club-rush, *Schoenoplectus lacustris* (Hoffman 1954; Koch 1992).

Sample 007 suggests similar conditions, with some species in common with previously. Several species are indicative of moist conditions, such as *Cyphon* spp., *Bembidion* sp. and *Trechus rubens*, a moisture and shade loving species, that is more or less subterranean (Lindroth 1945; 1985), suggesting moist conditions and suitable habitats for it to burrow under debris, large stones etc. *Anotylus rugosus* is similarly associated with damp waterside environments, in rotting vegetation, compost, straw and stable manure (Koch 1989). The presence of dung continues to be suggested by the dung beetle *Aphodius prodromus*. The previous diversity of species associated with wetland vegetation and plant litter is, however, absent from this sample, suggesting little in the way of vegetation, likely representative of rather muddy, perhaps quite foul, disturbed conditions.

Sample 006 had little to note, aside from two

sclerites of staphylinidae, *Bledius* sp. and *Tachinus* sp.; both are species typical of well-rotted organic matter, quite often associated with foul conditions. *Sample 005* contained no material.

Discussion and synthesis

Of the monolith samples provided, just the basal two samples yielded much by the way of insect fossils, with preservation levels of fossils increasing with depth and proximity to the water table. It is likely that the lack of material in the upper levels is a function of poor preservation conditions, and that the opportunities for good preservation increase through the monolith.

The environmental conditions suggested by the monolith samples imply damp, wetland, boggy conditions, with water-side plants and ruderal species well represented. The archaeobotanical results confirm the abundance of wetland plants such as *Carex* spp. indicated by the insect fossils, in addition to other wetland plants such as *Typha latifolia*, *Schoenoplectus lacustris*, *Bolboschoenus maritimus*, *Sparganium erectum*, and *Iris pseudacorus,* suggesting mildly basic conditions associated with fens. Several rove beetles associated with mossy, fen habitats would confirm this suggestion. The assemblages appear to be relatively unaffected by archaeological activities, although the presence of one or two species such as the dung beetle *Aphodius prodromus* imply the presence of grazing animals in the vicinity (or alternatively stabled animals). Much of this assemblage likely represents semi-natural conditions on the site during a phase of relatively limited archaeological activities at least in the immediate vicinity. There are no species associated with trees or woodlands, although it should be noted that the levels associated with the higher levels of *Alnus* and *Coryloid* pollen (cf. Ramsey this volume) were not sampled for insect fossils so this is perhaps not so surprising. The presence of wetland and fen beetle taxa, coupled with the abundance of *Alnus* within the pollen records at the levels c. 400 mm (sample 008) likely suggest the material represents an Alder fen carr wetland that was becoming increasingly dry and acidic in the upper levels. This explains the low levels of beetle preservation in the upper deposits, as well as sedimentary drainage, which may have been connected to archaeological drainage activities in the area. This change in nutrient status is reflected in both the beetle fauna from sample 008 (reflecting fen conditions, e.g. *Plateumaris sericea*), but also is clearly evident within the upper levels of the pollen diagram, with increasing levels of *Calluna* heather, Ericales and *Sphagnum*, species typically associated with acidic conditions. Moreover, the lower levels of the pollen diagram, below 450 mm, likely represent an expanded *Alnus* fen carr habitat given the high levels of *Alnus* pollen and modest levels of other tree taxa. It is noticeable that the pollen sequence includes a hiatus, likely somewhere around c. 450 mm or so, representing either truncation of the sequence or a drying episode and re-initiation of sediment deposition coeval with increasing archaeological activities on site.

Thin section Micromorphology

By George MacLeod and Dorothy McLaughlin

Soil micromorphology provides a means of analysis at the micro-scale and can identify features that may not necessarily be observed during standard field archaeology (Davidson et al. 1992). The use of thin section micromorphology analysis allows for characterisation of the material observed and helps to inform on aspects of anthropogenic activity at the site. The properties of soils and sediments reflect the environment in which they are formed. The recovery of sediments from archaeological contexts can provide archaeologists with a better understanding of the complex site formation processes, a deeper knowledge of the past anthropogenic processes and the wider paleo-environment of the site under investigation.

During the excavation site monolith tins were collected as part of paleo-environmental research. These were then sub-sampled using Kubiena tins to provide material for micromorphology analysis. The monolith tins were positioned at obvious changes in stratigraphy within the stratigraphic section (Will 2015).

Results

Samples were collected from the cleaned back north-east-facing section of the southernmost original evaluation trench (Monolith 2), which was excavated in early 2014 (Figure 3). Monolith tins were used to collect these samples from the trench then they were then sub-sampled using Kubiena tins. Six Kubiena tins were taken and their positions

relative to the trench and monolith tins is shown in Figure 26. Bulk samples were also collected vertically every 100 mm and these were used to obtain three radiocarbon dates for the top, middle and bottom of the trench (also Figure 26).

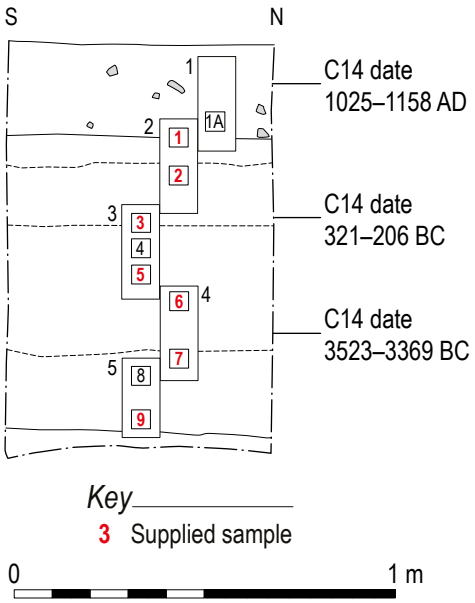

Figure 26: Location of Kubiena tins within Monolith 2, with radiocarbon dates highlighted.

Nine sub-samples from each of the nine samples (K1A - K9) contained coarse mineral material of partially weathered sub-angular, and in the case of K7 sub-angular and sub-rounded, quartz grains. The dotted limpidity observed in PPL is suggestive of the presence of micro-charcoal, humified plant remains (Stoops 2003). The presence of micro-charcoal may be an indication of anthropogenic activity, however, coarse charcoal fragments were only observed in the upper samples (K1A - K3) with sample K3 having only a trace and K1A having 40% (Macphail and Goldberg 2010, 599). Using XPL each of the samples demonstrated speckled birefringence which would indicate that there was random orientation and distribution of the fine material.

Vivianite was observed as a singular nodule in K1A as well as crystals within the matrix and channel voids of K1A and K1. Vivianite formation requires the presence of water; waterlogged soil, an iron source, which could be either anthropogenic or occurring naturally within the soil matrix and material that would provide a phosphate input; bone, manure or cess (McGowan and Prangnell 2006; Macphail and Goldberg 2010). The quantity found in both of these samples was only 2% and without further information it is not possible to determine the cause of the vivianite development in this case, however it indicates that there are high phosphate organic materials present possibly cess or other organic waste.

Plant tissue was observed in all samples with K5 and K7 having the highest percentages (>70%) of mainly fibrous weathered plant tissue. The fibrous weathered nature of the plant tissue may be an indication of wetting cycles and waterlogging within this section of the profile along with excremental pedofeatures, associated with plant tissue, indicative of faunal activity and bioturbation of the organic material. The observed pedal development in each of the thin section slides was granular or sub-angular blocky. The sub-angular blocky development was in areas that also exhibited planar voids which are associated with shrinkage of the sample before impregnation and thus changing the structure of the sample. The thin section slides, K3, K5 (area 2), and K9, each had areas where there was accommodation of the voids and evidence of shrinkage.

Discussion

The presence of charcoal within the upper samples may be indicative of anthropogenic activity taking place in this area of the site or may be a result of transference from elsewhere, either intentionally or by fluvial or aeolian processes. Although several of the fragments were relatively large, the overall percentage observed would not appear to indicate that burning had taken place at this sampling position.

The fibrous weathered plant tissue observed (K5 and K7) may be the result of waterlogging at this point in the profile, however there is no other additional evidence for this. Along with this, the presence of excremental pedofeatures would indicate that there were high levels of disturbance brought about by faunal activity and the absence of other organic material remains suggest a moderate degree of decomposition.

From these six samples it is possible to determine that there is evidence of typical domestic waste materials; charcoal and bone, in the organic debris. No evidence of industrial waste materials was observed in these samples, which would be indicative of industrial activity.

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