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ARO25: Abbots, Kings and Lost Harbours: Looking for Cambuskenneth's Watergate, Stirling

By Warren Bailie

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ARO25: Abbots, Kings and Lost Harbours: Looking for Cambuskenneth's Watergate, Stirling

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Cover Image: St. Ninian's Primary School uncovering the harbour.

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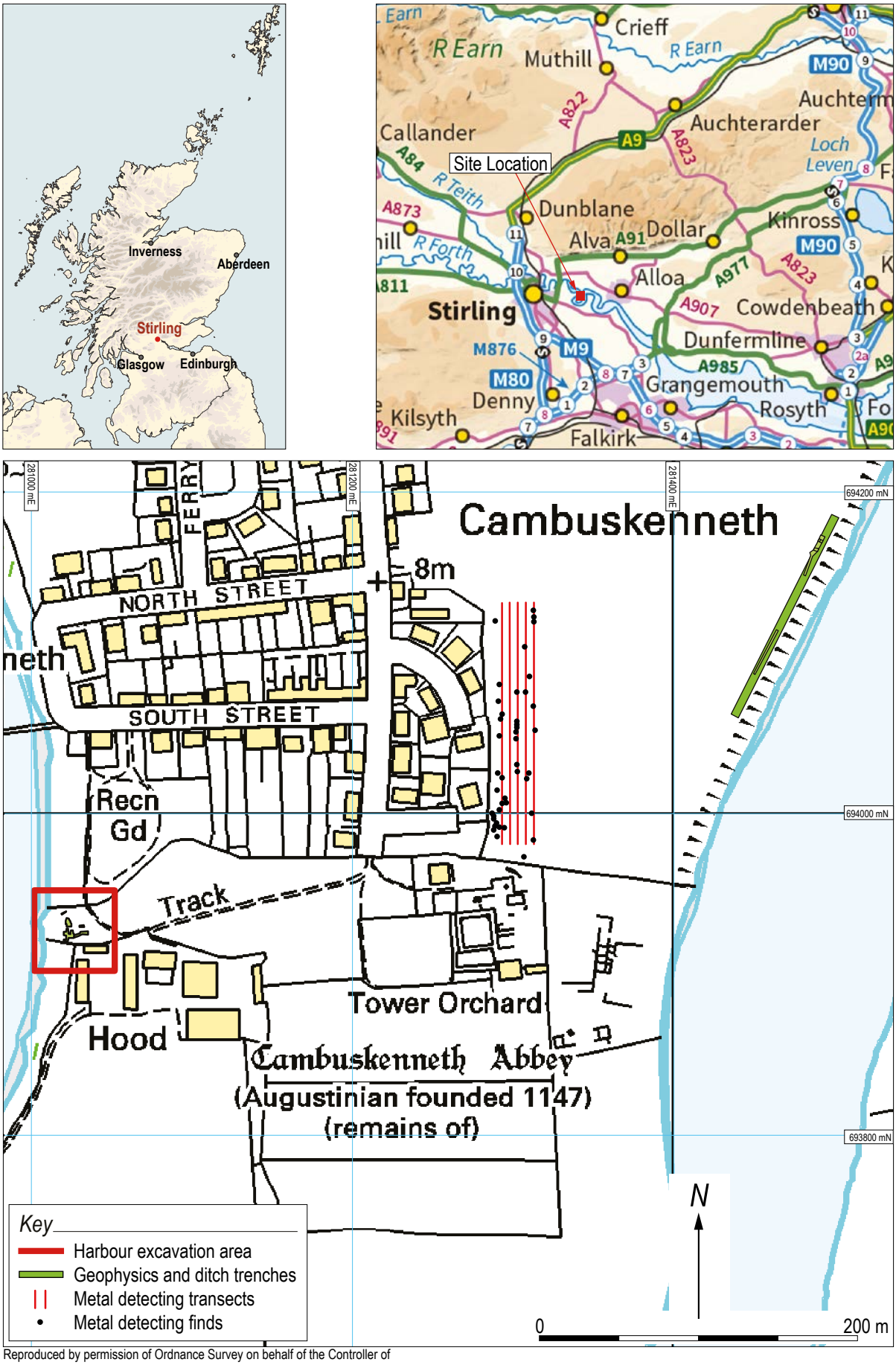

Figure 1: Site location.

Abstract

Community Archaeological Investigations were managed and directed by GUARD Archaeology Limited on behalf of Stirling Council, and ultimately on behalf of the Inner Forth Landscape Initiative (IFLI), at Cambuskenneth Abbey. The investigations were carried out from 7-18 September 2015 coinciding with the Inner Forth Festival, Door's Open Day and Archaeology Month. The work undertaken involved community volunteers in conducting a geophysical survey, hand excavations, metal-detecting, planning, recording and finds processing. In addition an independent metal-detecting survey was also conducted by SARG Club (Scottish Artefact Recovery Group) to the east of Cambuskenneth Abbey on the Abbot's Ford, a summary of the results are included here. Primary School children from St. Modan's, St. Ninians (Plate 1) and Riverside schools took part in the investigations, students from the Scottish Agricultural College also took part. Prof. Richard Oram and Dr. Richard Tipping visited the site during the investigations and provided expertise on the historical and environmental background of the site.

Investigations on the Watergate and harbour revealed a surprisingly intact medieval stone-built structure on the edge of the Forth, and material recovered during the work included animal bone, medieval and later pottery, ceramic building materials (CBM), clay pipe, metal objects and glass.

Plate 1: St. Ninian's Primary School uncovering the harbour.

Introduction

This publication sets out the results of all archaeological investigations undertaken by GUARD Archaeology Limited during these most recent investigations at Cambuskenneth Abbey (Sites and Monuments 90055; Historic Environment Scotland, Listed Building 41086) (Figure 1). The work was undertaken from 7-18 September 2015 under the direction of Warren Bailie. This project was conducted on behalf of the IFLI who had secured funding for a range of eligible projects in the Inner Forth Area in 2015.

Site Location, Topography and Geology

Cambuskenneth Abbey is situated on the low-lying flood plain or carse of the River Forth, some 1.5 km to the east of Stirling Castle at NGR: NS 80868 93940. The flood plain consists of alluvium, clay, sand silt and gravel (BGS 2017). The abbey complex is located within a looping meander of the river creating a holm- or island-like setting, on the north bank of the river, a location that gives it some degree of natural protection/isolation as the river flows by on three sides. Two meanders to the north of the site converge to create a narrow passage at Lady's Neuk.

The area associated with the remains of the Abbey buildings, of which the bell tower is the most obvious element, is protected as a Scheduled Monument (SM9005) and the site is maintained by Historic Environment Scotland. The area covered by the schedule and the tract of land immediately to the west, in addition to the current village to the north, lies within a conservation area designated by Stirling Council.

The main points of access onto the meander, and therefore into the Abbey, do not appear to have been via dry land across the northern neck of the meanders, but via ferries across the western and eastern loop of the river, and a fording point also to the east of the Abbey (Plate 2). Evidence for a link between the western crossing and the Abbey takes the form of an E/W running trackway terminating at the river at a point some 235 m to the west of the Abbey (Plate 3). A prospect of Stirling drawn of the ruins of the Abbey by John Slezer in 1693 clearly shows this track, with buildings to the left (Plate 4). Parts of the building range depicted survive today as Hood Farm.

Plate 2: Abbot's Ford to east of Cambuskenneth.

Plate 3: Track leading to-from Cambuskenneth Abbey site.

Plate 4: Slezer engraving of 1693 showing track running west to the river from Abbey ruins and water gate on river's edge (top of frame). Reproduced by permission of the Stirling Smith Art Gallery and Museum.

Historical Background

The Abbey was founded by David I in c.1140, and was originally known as the Abbey of St Mary of Stirling. However, from c.1201 onwards it was referred to as the Abbey of St Mary of Cambuskenneth (on the basis of Papal Bulls from Innocent III). The place name derives from '*Camas*' or '*Camus*', Scottish Gaelic for 'bay, harbour' with the second part being possibly an anglicisation of the Pictish personal name, '*Cinaed*' or a translation of the Scottish Gaelic for Kenneth, *Choinnich* (Ross 2001, 42). This tradition underpins the location's position at the heart of the idea of a Scottish identity. The abbey was an Arrouasian monastery, where the monks followed a strict interpretation of the rule of St. Augustine. The community was composed from a house of canons, i.e. ordained men, priests in their own right, rather than regular monks. The present ruins, which include the bell tower, foundation walls and elements of upstanding walls, have been dated no earlier than the thirteenth century. The bell tower, probably built after the church, is unusual in being free standing and would have been relatively new at the time of the Battle of Bannockburn (RCAHMS 1963, 122). It is possible that an earlier structure stood on the site, but there is as yet no archaeological evidence for this.

The Abbey is associated with some key events from the Scottish Wars of Independence and indeed was to repeatedly suffer the privations of wars during the late thirteenth and first half of the fourteenth century as these raged. A close association with the Scottish crown is evident through much of the pre-Reformation period, partly no doubt due the Abbey's proximity to

the royal castle at Stirling (RCAHMS 1963, 120). This connection was most clearly established by the burial there of James III after his death under suspicious circumstances following the Battle of Sauchieburn in 1488. In 1303-4 however, Edward I, King of England, was at the Abbey, and here he received Robert Wishart, the Bishop of Glasgow as he swore an oath of fealty, for the fifth time, to the English king. On 11 June 1304 Robert the Bruce and William Lamberton, the Bishop of St Andrews, came to the Abbey to enter into a treaty with one another; it was the start of a partnership which was to climax with Lamberton placing the crown on Bruce's head (according to some) in 1306, following the murder of the Red Comyn. In 1308 Sir Neill Campbell, Sir Gilbert Hay and others swore fealty to the Bruce on the High Altar, swearing then to defend the liberty of Scotland against all enemies.

The Abbey was also the location for a series of important parliaments during the rule of Robert I. The first of these, in November 1314, saw Robert disinherit all the nobles holding lands in Scotland who were not present at the parliament; this included the sons of those who had died fighting for Edward II at Bannockburn, while any who were not present were judged to have declared themselves as Edward's subjects rather than Robert's. This action set the seal on the nature of future conflicts, creating the 'Disinherited', who were the catalyst for the Second War of Independence. Then, in 1326 the entire clergy of Scotland (though presumably only its upper echelons), the earls and barons, but also importantly a good number of lesser individuals, assembled in the presence of the Bruce to swear fealty to his son David on the event of his death, and indeed also to his grandson Robert Stewart, if David should die without issue. The parliament is notable not just for this, but also because it is the first time that the lower order of burgesses are mentioned as having a seat. In short, it can perhaps be regarded the first sign of democracy in an otherwise monarchical system of government – as if to highlight the latter, another order of business was the signing over to the king of ten percent of the revenues of all laymen in the kingdom (Cruden 1953).

Cambuskenneth is one of the few places named in the near contemporary sources relating the story of the Battle of Bannockburn in 1314. The best known of these, Barbour's The Brus, describes how Bruce's baggage was looted by the Earl of Athol, who bore a grudge due to past events and his association with the rival Comyn faction through marriage. The relevant stanza (lines 491-504) reads (Barbour c. 1375):

> *His awyne wyff dame Ysabell. And tharfor sa gret distance fell Betwix him and the erle Davi Off Athole, brother to this lady That he apon Saynct Jhonys nycht, Quhen bath the kingis war boun to fycht, In Cammyskynnell the kingis vittaill He tuk and sadly gert assaile Schyr Wilyam off Herth and him slew And with him men ma then ynew. Tharfor syne intil Ingland He wes bannyst and all his land Wes sesyt as forfaut to the king That did tharoff syne his liking.*

The buildings were reduced to ruins during the Reformation and were quarried for stone until the site was excavated in 1864 by William Mackison, who also restored the bell tower and the pockmarks of the impact of musket balls are still visible. The present plans of the ruins are based on his work. From the plans alone it is clear that not all of the Abbey has been excavated. No ancillary structures, other than two buildings identified on the Slezer engraving, the whereabouts of the medieval graveyard is unknown, neither are the bounds of the precinct known. The present field boundaries are a modern construct placed on the landscape, which probably follow the limits of the 1864 excavations.

Archaeological Background

The Abbey was the subject of antiquarian interest in the nineteenth century and underwent excavation in 1864, partly motivated by the desire to locate the remains of James III. Prior to this time, only limited evidence of the once impressive medieval complex of buildings was visible. This was due to the Abbey's destruction during the Scottish Reformation after 1559, although stone robbing continued to take place after that date. The most obvious feature was the bell tower or camanile, which stood apart from the church. It was renovated at the time of the excavation, both both operations being under the supervision of William Mackison, Burgh Architect of Stirling.

The excavation resulted in the exposure of lengths of foundation wall marking out a number of structures, including the church, the arched doorway of which is still upstanding, the south cloister with sacristy, slype and chapter house on the east side, with the refectory and the kitchen to the south. These can be seen on the ground today, though there is doubt as to the accuracy of the site plan as it is portrayed or the date of the buildings represented (Historic Environment Scotland, Canmore record 47271). Much of the stone work present appears to represent later masonry elements on the basis of the excavation results – the work having been carried out in the main by local labourers.

A series of photographs taken in the 1920s and 1930s appear to show the excavation work possibly associated with the renovation/consolidation of the foundations first laid out by Mackison in the wake of his original 1864 excavations. There is no surviving report or account of this work, which appears to have included removal of turf and topsoil over a considerable area. The architectural features exposed or recreated by Mackison were re-buried at the close of his investigations. It is possible that investigation of the Ministry of Works archives held by Historic Environment Scotland may shed some further light on this fascinating set of photographs.

The Abbey, both within the scheduled area and outside it, has been subject to archaeological investigation in recent years. Topographic and geophysical survey along with a limited programme of excavation was carried out by GUARD, University of Glasgow in 1997. These areas included the eastern limit of the scheduled area, where the remains of two ancillary buildings are visible, one of these including a remnant of a dovecot attached to the end of a long building. It has been suggested that these remains relate to buildings within the Abbey precincts, including houses for agricultural workers.

Trial trenching of a crop mark anomaly to the south of Hood Farm revealed no sign of the possible precinct enclosure but did reveal remnant ridge and furrow and a stakehole. Geophysics of the land to the east of the Abbey buildings, close to the river, established the presence of buried elements of a possible building (identified on the Slezer engraving) and a river wall.

Investigations in 2012 were undertaken by GUARD Archaeology Ltd in collaboration with the Centre for Battlefield Archaeology at Cambuskenneth Abbey (Bailie 2012 and 2013). These investigations involved the local community, Scottish Artefact Recovery Group (SARG Club) and Detecting Scotland metal detecting club and included a geophysical survey, a metal detecting survey and targeted evaluation trenches over potential anomalies. These investigations revealed evidence of surviving medieval layers immediately west of the scheduled area with finds, including a small fragment of carved stone medieval floor tile and pottery. There was also a noticable incline to the layers encountered there, perhaps indicating that a wide gully or bank existed outside the Abbey. The investigations also revealed ephemeral remains of small structures, which may be remnants of turf dwellings or banks used to control water flow across the site. A ditch of post-medieval date was also revealed along the north side of the current main track leading to Hood Farm. The investigations uncovered built remains at the west end of the track which are attributable to the ruined Watergate and range of buildings shown on Slezer's 1697 engraving. The metal-detecting survey covered an area of 17 hectares across the fields to the south and west of Cambuskenneth Abbey. There were a total of 1044 retained finds. These included 36 coins, one of which was identified as an Edward I/II coin giving a late thirteenth to early fourteenth century date for its minting. In addition, 44 musket balls, some of which were distorted or partial, were recovered during the survey. These varied in size from small shot of 5 mm diameter to larger shot of approximately 15 mm. Two possible cannon shot were also found, as were 22 buttons and three buckles.

Other investigations in proximity to Cambuskenneth Abbey took place in spring 2015 where GUARD Archaeology Ltd undertook an evaluation to the east, across the River Forth from the Abbey, at Borrowmeadow (Rennie 2015). Here the remains of a cobbled medieval track or road were discovered in one trench immediately south of the boundary of Borrowmeadow Farm. This was interpreted as the medieval road that led to/from the Abbey ford to the west and was possibly the route to Throsk Palace further east. Finds from the evaluation included medieval pottery from the cobbled surface and a small metal pendant cross.

The most recent investigations in proximity to Cambuskenneth involved a series of test pit investigations ahead of planting a new orchard to the south-east and south-west of the Abbey. Some late-medieval remains were recovered during these investigations (Watt 2015, 172).

In progressing this project, opportunities were sought to collaborate with various individuals and institutions to inform the direction of the investigations. The project engaged with Dr. Iain Banks of Glasgow University's Centre for Battlefield Archaeology in shaping the approach to geophysics on the site, and in investigating the potential role Cambuskenneth and the associated landscape setting and features, may have played in the Battle of Bannockburn. Stirling University's Professor Richard Oram was consulted on the historical context for the investigations and Dr. Richard Tipping was consulted in relation to the environmental and intertidal variations on the River Forth during the history of Cambuskenneth. This collaborative approach is in keeping with ScARF's recommendation for collaboration between sectors and disciplines for archaeological investigations (ScARF 2012a and 2012b).

Results

The investigations at Cambuskenneth (Figures 1 and 2) involved five hand excavated trenches over the Watergate and harbour, a geophysical survey covering 600 m² with two targeted machine excavated trenches and a metal-detecting survey covering approximately 180 m².

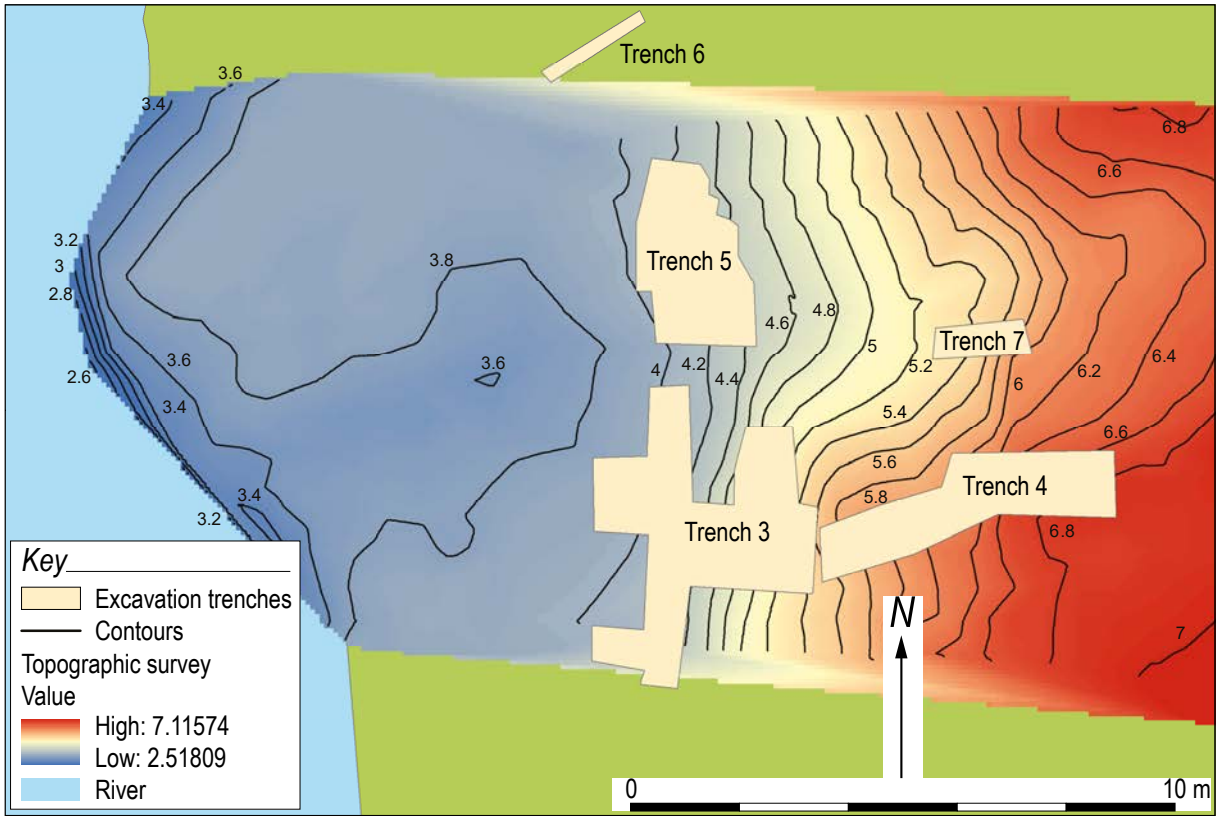

Figure 2: Watergate excavations.

Watergate trenches *(Trenches 3-7)*

A series of trenches (Trenches 3-7) were opened over the position of the Watergate depicted in Slezer's engraving of 1693 (at the Stirling Smith Art Gallery and Museum), and the slope leading down onto the banks of the River Forth to the west (Figures 1 and 2). The trenches revealed a series of built remains of probable medieval origin. At the base of slope there was a revetment of rounded and irregular shaped stones 016. This revetment was set into the grey river clay 007 and extended for approximately 8 m in a north/south orientation within the excavated area (Plate 5).

The revetment supported the lower edge of a harbour structure 006 which also extended north/south but curved upslope to the north in Trench 3 (Figure 3, Plate 6). The structure measured approximately 5 m E/W and up to 8 m N/S. This same structure extended into section to the south along the river bank so the full extent remains unknown. Extending downslope across the breaks of slope was a small mortared wall 015, which extended E/W leading between the mortar foot 003 and the lower edge of the harbour 006.

The harbour structure was overlain by a rubble layer 005, which consisted of loose irregular stones. At least two steps were revealed in the harbour structure 006: one c. 0.6 m east of the lower harbour footing, and the other on the upper slope. The latter is marked by a low wall 015, adjacent to the footing of the Watergate structure 003. Construction layers 010 and 009 were discovered below the lower and upper steps respectively. Both these layers consisted of firm mid-grey silty-clay, with frequent small fragments of sandstone. Both contained artefacts: medieval and post-medieval ceramic sherds, SF 25 and SF 19 respectively, that were recovered from deposit 010 (see below). A fragment of medieval horseshoe SF 46 came from deposit 009. The Watergate footing truncated the wall immediately to the north and east in the 2012 excavations, numbered Wall 013 in the present excavation. The upper level of the footing consisted of a rounded footing 003 (Plate 7) with occasional large stones set into the shell-rich mortar for strength. The footing measured 0.2m thick and approximately 1.4 m in diameter.

Plate 5: Revetment along lower edge of harbour, taken from north.

Plate 6: Harbour 006 taken from north.

Plate 7: Rounded mortar footing 003 at top of slope.

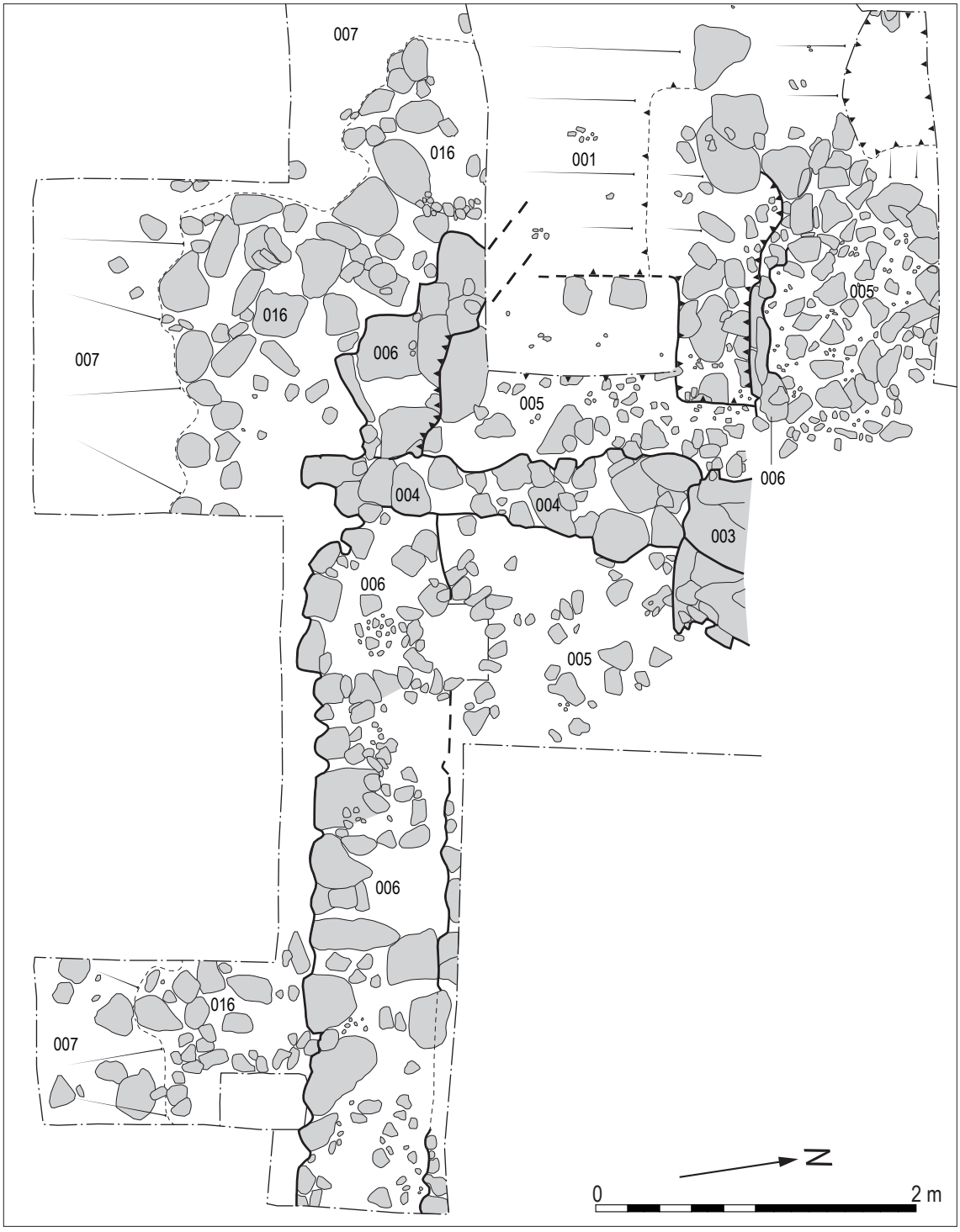

Figure 3: Trench 3 excavations - medieval harbour structure.

On the plateau above the footing and harbour structure there were two walls (Figure 4), both of which had been discovered previously in 2012 (Bailie 2012), although they were not expanded upon during those investigations. The earliest of these walls 014 only survived as one course and was orientated E/W and was constructed of unbonded sandstone, some dressed, and other stone types set directly on natural orange grey clay subsoil (Plate 8). This wall measured a maximum of 1.08 m wide and it was followed for up to 8.1 m as a an above ground feature although only the western 4.3 m was exposed during these investigations. This wall was truncated to the west by the corner of another wall 013. The latter extended from the right-angled corner to the north and west, the angle of the western arm of this wall differed slightly from the line of the E/W truncated wall 014 (Figure 4, Plate 9). Wall 013 was also constructed of unbonded mixed

rounded, sub-angular and dressed stones and measured 0.8 m wide, one course high and 3.2 m E/W was exposed during these investigations. As previously stated, the footing for the Watergate 003 truncated this wall at the western end confirming that wall 013 is part of an earlier phase of the built remains here.

Plate 8: Wall 014 taken from east.

Plate 9: Wall 013 taken from west.

A series of three trenches (5-7) were opened to the north of Trenches 3 and 4 to establish further evidence of the wider harbour structure. Trench 5 revealed extensive modern disturbance in the form of a cast iron pipe and a possible rough surface leading downslope to the edge of the river (Plate 10). Some loose stone-built remains 019 in the north-east corner of trench may represent remnants of the continuation of a harbour structure. Rubble 020 of a similar nature to that observed in Trench 3 was also observed around these remains. Trench 7 revealed further evidence of rubble, including some dressed sandstone blocks. Trench 6 revealed a low wall 023, which extended toward the river's edge. It was set into the upper topsoil levels and the material culture over and within the stonework was wholly twentieth century in date.

As part of the investigations, a survey of the topography was undertaken, to provide accurate figures for comparison to mean tide heights in this area. The top break of slope which coincides with the upper edge of the harbour and Watergate footing is 6.5 m OD, the bottom break of slope, which lies at 3.8 m OD and the lowest harbour edge, lies at approximately 3.5 - 3.6 m OD (Figure 2). A series of three cores were also taken leading from the harbour edge to the river edge following discussions with Dr. Richard Tipping of Stirling University. They established that the river silt lay at c. 1 m below current ground surface, meaning that the river clay lies at c. 2.8 m OD. The material overlying the river silts had also accumulated over the harbour edge and lower slope. In section, the material consisted of 011, a dark organic-rich peaty silt layer overlain by dark grey brown topsoil. Both layers contained a quantity of relatively recent material. This location is close to the river's edge and is prone to both erosion and deposition, perhaps accounting for the frequent modern material in topsoil levels.

In addition to the Watergate investigations, a geophysical survey (Plates 11-14) was undertaken to the north of Cambuskenneth Abbey (Figure 1) over the position of potential enclosing ditches closing off land access to the Abbey from the north. A ditch/palisade is first shown on Bleau's Atlas of Scotland (1654). The geophysical survey was followed by two machine excavated trenches (Plates 15 and 16). From these investigations a pair of shallow linear features of uncertain date were revealed. One copper alloy pin of medieval or later date (SF 004) was recovered (Cruickshanks 2017). A metal detecting survey was also undertaken to the north of the Abbey in the western area of the field (Figure 1); no significant artefacts were recovered during this survey.

Abbey Ford - Independent SARG Club survey

SARG conducted an independent metal detecting survey on the Abbey ford which is located on the Forth immediately east of Cambuskenneth Abbey, see Appendix A for a summary of the findings.

Figure 4: Trench 4 excavations - Watergate.

Plate 10: Trench 5- Loose built remains 019 and modern pipe disturbance.

Plate 11: Results of the resistivity survey.

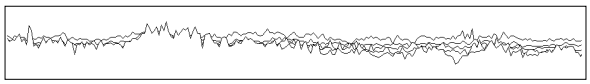

Plate 12: Resistivity results (raw data).

Plate 13: Results of the gradiometry survey.

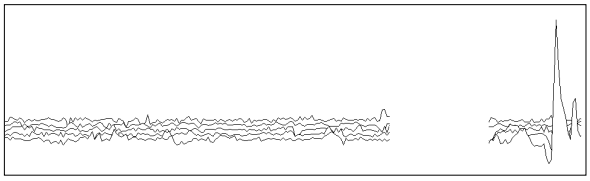

Plate 14: Gradiometry results (raw data).

Plate 15: Linear feature 057 exposed in Trench 1, taken from east.

Plate 16: Trench 2 after stripping of topsoil and testing at intervals, taken from north.

Specialist Reports

The material culture recovered from these investigations on the medieval harbour and the metal detecting survey included animal bone, pottery, CBM, metal, glass and clay pipe. All glass was of modern date and was therefore not examined by a specialist. The other items of the assemblage were examined by the relevant specialists and a summary of each report follows, below. A full report and catalogue for each analysis will be submitted to NMRS with the archive.

Animal Bone

Catherine Smith

Table 1: Catalogue of animal bone analysis

SF no	Context	Trench	Species	Bone	Details
053	1	5	sheep/ goat	R mandible	2 fragments, conjoining. Payne tooth wear stage D; Grant tws=gfa; Grant MWS=29 Estimated age 1 to 2 years
O43	u/s	1	large ungulate	tibia	shaft fragment; abraded; possibly split sagittally
066	u/s	1	cattle	tooth	upper molar; in wear
008	u/s	n/a	cattle	R humerus	shaft; juvenile; abraded
008	u/s	n/a	cattle	femur	2 distal fragments; do not conjoin
008	u/s	n/a	dog	L humerus	distal fused; naturally perforate fossa
008	u/s	n/a	dog	radius	distal fused; abraded
008	u/s	n/a	dog	metacarpal	proximal fused
008	u/s	n/a	large ungulate	rib	3 shaft fragments, conjoining

SF no	Context	Trench	Species	Bone	Details
008	u/s	n/a	small ungulate	vertebra	2 fragments neural spine, conjoining 1 abraded long bone shaft fragment
008	u/s	n/a	wood	-	1 piece roundwood; probably not worked 1 piece roundwood twig; smaller diameter , than above; small cut may be recent damage

Introduction

A small animal bone assemblage was recovered from the excavation. Bones were recovered from trenches 1 and 5 and unstratified contexts and are catalogued in the table above.

The bones were fairly well preserved although several showed a degree of surface abrasion indicating they may have lain above ground, subject to weathering, or perhaps have been redeposited.

Species present

Species present were cattle, sheep/goat and dog. Several bones categorised only as large ungulate (probably cattle) and small ungulate (probably sheep/goat) were also recovered. Cattle were present in two unstratified contexts (SF 063 and SF 008) and sheep/goat in one context (001; SF 053; trench 5). Several fragments from the fore limbs of a dog were identified in an unstratified context (SF 0080). This may represent the partial recovery of a single individual, possibly from a burial.

Age of animals at death

Bones from both adult and juvenile cattle were present. The upper cattle molar tooth (SF 066; trench 1) was fully in wear and therefore probably came from an adult animal, while the sheep/goat mandible (SF 053) was from an animal which died at Payne's (1973) wear stage D, or between one and two years in modern terms.

Butchery

No definite butchery marks were observed. However, an abraded tibia shaft fragment, possibly from cattle (SF 043) may have been deliberately split in the sagittal plane in order to extract the marrow. There was no butchery evident on the dog bones.

Wood

Two further items were identified as pieces of roundwood, the larger of the two possibly not worked, while a small cut or tear in the smaller twig was probably unintentional.

Pottery and Ceramic Building Materials (CBM)

Bob Will

Introduction

87 sherds , or 590 g, were recovered (Appendix B) from the recent archaeological investigations at the Abbey and cover the medieval, post-medieval and modern period (Plates 17 and 18). All the sherds were examined, weighed and recorded according to guidelines and standards produced by the Medieval Pottery Research Group (MPRG 1998 and 2001). No scientific analysis has been undertaken.

Table 2: Summary of ceramic assemblage by type, quantity and weight

Fabric	Total	Rim	Base	Handle	Body sherd	Weight (g)
Scottish Medieval Redwares (SMR)	14	-	-	-	14	151.1
Scottish white gritty ware (SWGW)	4	-	-	-	4	10.8
Scottish Post medieval oxidised ware	2	-	-	-	2	18.7
Scottish Post medieval reduced ware	14	-	-	1	13	125
White earthenware	24	7	2	1	14	69.5
Red earthenware	5	2	-	-	3	32
Brick/tile	21	-	-	-	21	156.9
Stone with glaze	1	-	-	-	1	2.1
Total	87	9	2	2	74	590.3

Plate 17: Pottery sherds 021, 036, 055, 045 and 051.

Plate 18: Pottery sherds 039, 037, 044, 034 and 027.

Scottish Medieval Redwares

Fourteen sherds were recovered in Scottish Medieval redware fabrics; this type of pottery was produced from the thirteenth to the fifteenth century and is found across most of Scotland. It has recently been the subject of an extensive research programme funded by Historic Environment Scotland (Haggarty et al 2010). Scottish medieval redware is the main medieval fabric type in the Stirlingshire area and was probably made at a number of sites using locally available carse clays. There are historical references to a kiln site at Goosecroft in Stirling (Harrison 2002), but that area was largely developed in the nineteenth and early twentieth centuries and no pottery was recovered. There is a late medieval kiln site at Stenhouse near Falkirk which again used local clays and it is likely that this material was available in Stirling and Cambuskenneth. Recent research into the chemical composition of the clay from pottery recovered from excavations in Stirling both in the town (Jones forthcoming) and at the castle (Haggarty 1980) has shown that the clay is chemically identical. Given the readily available clay in the area that is maybe not surprising but it is difficult to say that the vessels from Cambuskenneth and Stirling were definitely made at Stenhouse.

The Scottish Medieval redware sherds are mainly from jugs and have a patchy green glaze. Two of the sherds are decorated with applied vertical strips and applied dots, which is typical of the late thirteenth or early fourteenth century. As both sherds are abraded these may have been moved and re-deposited once broken.

Scottish White Gritty Ware

Four sherds in Scottish white gritty ware fabrics were recovered. This fabric is found throughout Scotland, but particularly in the east of the country. White gritty wares first appeared in the late twelfth century, but the tradition lasts into the late fifteenth century. So far, the only published kiln site is at Colstoun in East Lothian (Hall 2004). This fabric has been extensively studied and it is likely that a number of kilns were in production throughout Scotland (Jones et al 2006). The four sherds that were recovered, all appear to be from different vessels, and cover a wide date range. The earliest sherd is a rim from a possible cooking pot, which could date to the late twelfth or early thirteenth centuries, but there were also three sherds that were thicker walled with a reduced fabric which could date from the fifteenth century.

Scottish Post-medieval Reduced Wares (SPMRW)

Fourteen sherds of Scottish Post-Medieval Reduced Ware were recovered. This fabric type along with Scottish Post-medieval Oxidised Ware was first classified at Stirling Castle (Haggarty 1980) and dates from the late fifteenth to eighteenth centuries. The only published kiln site in Scotland is at Throsk on the banks of the Forth to the east of 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 along with links to other parts of Scotland (Harrison 2002). It has been suggested that it was the draining of the carse that led to the development of pottery production as the carse clays were made more easily accessible (Haggarty and Lawson 2013). Scottish post-medieval reduced wares tend to be thicker-walled than medieval wares and the fabric is often reduced to grey or black with few inclusions, and has a full green glaze. The thicker

reduced wares tend to be used for large jugs or storage vessels. The fourteen sherds from Cambuskenneth include a large fragment of a grooved strap handle where it joined the body of the vessel. The fragment has a reduced body and green glaze decorated with an incised wave decoration typical of SPMRW. Three of the body sherds are quite thin and may be slightly earlier than the others dating to the late medieval period. Four of the sherds were abraded, and along with the four spalls or flakes with glaze, would suggest that the sherds have been moved since they were broken or deposited.

Scottish Post-medieval Oxidised Wares (SPMOW)

Two sherds of Scottish Post-medieval Oxidised Ware were recovered, and like the reduced version dates from the late fifteenth to eighteenth centuries. Scottish post-medieval oxidised wares, while sharing similar traits to the reduced wares, are thicker-walled than medieval wares. The firing conditions are more variable, with vessels and sherds often partly reduced with grey or black patches in a red or orange fabric. The glaze also tends to be patchy and thinner than the reduced wares. The oxidised wares are found in a wider range of vessels, such as platters, bowls, skillets, fish dishes and money boxes, or *pirlie pigs,* as well as the more common jugs. The best range of vessels have been recovered from Throsk and Stirling Castle. The two sherds from Cambuskenneth are both probably from a bowl, as they are glazed on the interior as well as the exterior, and have a raised cordon on the exterior.

Industrial Pottery

White earthenwares

24 sherds were recovered in white earthenware fabrics, this became the predominant fabric type from the later nineteenth century and remains so today. The technique of producing a pure white glaze was developed in the 1790s and quickly dominated the market, and was adopted by most pottery factories. This type of fabric is used for a wide range of vessel forms, mainly tablewares, that are often decorated by a number of different methods or combination of methods. These include hand painting, sponge printing and transfer printing. As the factory pottery industry developed it became very competitive with different factories producing very similar vessel shapes and styles of decoration. As a result, factories started to take out patents and trade marked their production methods, vessel shapes and individual decorative patterns. These trade marks and maker's marks were then stamped onto the underside of the vessels enabling the vessels and factory to be identified and often closely dated.

The sherds from Cambuskenneth are all quite small and abraded, and a number of different vessels are represented including plates, saucers, bowls and a cup. Decoration includes a rim with pink sponge printed design, sherds with blue and white transfer printed designs, along with a number of undecorated sherds.

Red earthenwares

Five sherds were recovered in red earthenware fabrics that can be divided into two groups: brown glazed storage jars and slip-lined bowls. The fabric was fairly uniform red or orange with few inclusions that would suggest that they were being produced in factories rather than small potteries. One rim sherd was from a large slip-lined bowl. These vessels are relatively common and were made at a number of sites throughout Scotland in the nineteenth century.

Brick/tile

21 fragments of brick and tiles were recovered in a range of orange or red fabrics. Two of the larger sherds are probably from field drains as they are slightly curved. Another of the larger fragments may be from a roof tile, possibly a pantile, as its slightly thicker with a rough outer surface. The other fragments are too small to identify.

Discussion

The assemblage covers a wide date range from the medieval to modern period, and provides a good indication of the type of pottery available. The medieval sherds comprise the two main fabric types found in Scotland with slightly more redwares than whitewares. This is similar to Stirling where the redwares are more common. The post-medieval fabrics again consist of the main fabrics found in Scotland. This is not so surprising, as the only known kiln site is at nearby Throsk on the River Forth. The modern material is all fairly small and abraded, and may have come from domestic refuse used on the field as manure.

Metalwork

Gemma Cruickshanks

Summary

Fifteen wrought iron artefacts and one non-ferrous artefact (SF 004) were recovered (Appendix C). The iron artefacts comprise twelve handmade nails of varying form, one strip fragment, one bar fragment and a fragment of horseshoe. None of the iron artefacts are chronologically distinct and all are typical finds on medieval and post-medieval sites.

SF 004 is a fine, copper alloy tapering strip with rounded tip, probably the pin from a brooch or buckle (Plate 19). Pins of this form are found on both buckles and brooches from the medieval period onwards and are not easily distinguishable from each other (Egan and Pritchard 2002, 248). Such pins, especially broken ones like this, were a common casual loss from clothing or harnesses etc.

Plate 19: Copper alloy pin SF 004.

Clay Tobacco Pipes

Dennis Gallagher

A total of seven clay pipe fragments were recovered during the investigations at Cambuskenneth Watergate and harbour. The fragments ranged in date from the seventeenth to nineteenth century.

Seventeenth century

Stem fragment (unstratified/012) has a wide stem bore consistent with a seventeenth and early eighteenth century date. It is slightly burnished indicating that it belonged to a higher quality pipe.

Nineteenth century

Bowl wall fragment with fluting and pellets (055/016). Although post-1800, this style of decoration continued through the nineteenth century and was often used for pipes with spurred bowls and longer stems than the more common short-stemmed cutty pipe.

001/059 – Four stem fragments of nineteenth century date.

011/031- Stem fragment of nineteenth century date.

Overall Discussion

The investigations on the Watergate and the harbour revealed a surprisingly intact medieval stone-built structure on the edge of the River Forth. This part of the river has seen minimal major development beyond the foot bridge that replaced the ferry in 1935, and recent housing development on the west bank. The location of the harbour and the river bank has therefore remained relatively unchanged since probably the later medieval period. The east river bank leading south from the current harbour investigations also appears undisturbed, suggesting the possibility of further medieval harbour remains surviving there. The pottery provided a date range from the medieval to modern period and provides a good indication of the type of pottery available, with some metal objects including nails and a pin, also of potential medieval date. The animal bone was not dated but consisted of cow, sheep/goat and dog bones, with one cow bone showing signs of marrow extraction. The clay pipe was from the seventeenth to nineteenth centuries.

The investigations at the Watergate and harbour recovered pottery sherds SF 19 (Scottish post-Medieval Reduced Ware, late fifteenth to eighteenth centuries) and SF 25 (Scottish Medieval Redware, thirteenth - fifteenth century) and a fragment of a medieval horseshoe SF 46 from construction layers below two parts of the stepped harbour. This suggests a potential date range of thirteenth – eighteenth century for the construction, use and repair of the harbour. None of the *in situ* built remains were removed during the investigations with only loose masonry material removed, and any apparent deposits were investigated through a series of

hand excavated sections. The earliest foundation of the Watergate and harbour could therefore potentially be earlier than the material recovered on this occasion suggests. Without further, and more intrusive, excavation this cannot be confirmed.

The evidence from the topographical survey during these investigations suggesed that the harbour could not feasibly function using the current mean tide levels. This indicates that the mean levels would have needed to be up to 2 m to 3 m higher than they are today in order for the harbour to be viable. The river level therefore must have changed considerably in recent centuries. Given that the Watergate is shown in ruins in Slezer's engraving of 1697, the harbour may have already been abandoned before this time, especially considering that the Abbey no longer functioned after 1559. Other possible evidence of the harbour being out of use is the two-masted boat shown moored further upriver. This was close to the point of a cutting for a road/track leading from the river's edge across what now is the south-western extent of Cambuskenneth village. The water level in Slezer's engraving appears higher than today, with much of the area between Cambuskenneth and Stirling Bridge being under water. This may be due to perspective, especially considering how low the moored boat in the foreground is shown. There is at least one other discrepancy in the print, no bell tower is shown at the Abbey, which we know existed from probably the thirteenth century. From this evidence, we cannot accept that the engraving is wholly accurate, but it is a representation of the scene at that time.

The metal detecting survey in the field north of Cambuskenneth revealed only modern agricultural material and no significant artefacts were recovered. These areas may have been detecting before and this may account for the lack of earlier artefacts recovered.

The geophysical survey revealed potential anomalies on the resistivity and gradiometer plots, and in the case of Trench 2, a large feature seemed to coincide with the possible continuation of one of the ditches observed from aerial imagery and field observation. During the excavation of Trench 2 there appeared to be only bands of dumped industrial waste, probably partly from coal mining, in underlying topsoil levels. In Trench 1, two shallow linear features of uncertain date were revealed below the topsoil.

There are obvious above ground undulations identifying two banks/ditches leading in a slight curve from east to west, and these features probably at one time stretched between the east and west river banks, effectively closing off Cambuskenneth from the north. They are likely to have marked the outer precinct of the Abbey, although each may originate from different periods in the Abbey's history. On Joan Bleau's Map (1654) showing the '*Starling*' (Stirling) area, at least one palisade is shown around the landward side of Cambuskenneth. It should be noted that Bleau's maps were largely based on Timothy Pont's work of the mid to late sixteenth century, which explains why Bleau shows Cambuskenneth Abbey intact almost a century after the Reformation. The two curving features in the landscape later became used for a foot track (southern feature) and a carriage track (northern feature), both of which are annotated on the mid-nineteenth century deeds of Hood Farm, (which were kindly shown to the author by Mr Andrew Rennie, current tenant farmer). A pier and ferrying service are also shown leading north and eastwards across and along the Forth River at this point. A pin from a brooch or buckle (SF 004) recovered from the investigations in this area is of potential medieval date but similar pins are found from the medieval period onwards (Cruickshanks 2016).

Conclusion

We can conclude from the present investigations, and in light of earlier work in 2012, that the remains of a relatively intact medieval Watergate and harbour survive on the east bank of the Forth River, to the west of Cambuskenneth Abbey. This harbour is likely to be related to the Abbey and its development. The Watergate and harbour would have served a number of purposes when in use. They would have afforded the Abbey a degree of control over access to the site from the river and it was probably the point where the Abbey received much of its supplies by boat. In a phenomenological sense, the Watergate also lay along the E/W sightline between Stirling Castle and Cambuskenneth Abbey, and therefore between these two iconic sites of power in the Medieval period. There is also reference to several monarchs visiting the Abbey, including

Edward I, James III was buried there after the Battle of Sauchieburn, and Robert the Bruce held his first parliament there in November 1314. The Abbey, and therefore Watergate and the harbour, played an important role in Stirling's history in the medieval and later periods. The location of Cambuskenneth in its island-like setting, with enclosing palisades or ditches to the north, a Watergate to the west, and an inter-tidal fording point overlooked by the Abbey to the east, give it a defensive character. This same defensive character led to Cambuskenneth being used for the storage of the Scottish baggage train in the lead up to the Battle of Bannockburn. The ford leading east from Cambuskenneth Abbey partially survives on the east bank. Although there was no opportunity to formally map the ford, it was clearly visible immediately adjacent to site of the Abbey complex when exposed between tides during the excavation in 2016. The remains of the ford extended approximately 300 m along the east bank of the Forth River, and extended up to 90 m west into the channel of the Forth, which measures approximately 125 m in width at this point. There were several areas which could be interpreted as routes leading across the ford but without a more detailed study this remains speculation.

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Appendix A: Independent metal detecting survey of the ford

SARG Club conducted an independent metal detecting survey on the Abbey ford which is located on the Forth immediately east of Cambuskenneth Abbey. The survey was conducted on two occasions, 13 and 15 September. The initial day was a test run to determine any risks associated with the inter-tidal survey. The main survey took place on 15 September under particularly low tide conditions. Three key finds from the survey were a Robert II groat, a George II coin, a medieval horseshoe fragment, a horseshoe of possible late-medieval/early post-medieval date, several lead line weights and net weights, as well as a large assemblage of more recent and lighter metal waste.

Appendix B: Ceramic Catalogue

Find No.	Context	Fabric	Sherds	Rim	Base	Handle	No. body sherds	Weight (g)	Comments
7	u/s	white earthenware	14	6	1		7	37.6	rim with pink sponge printed design, blue & white transfer print,
7	u/s	red earthenware	3	1			2	6.2	white slip decorated design over brown glaze
10	u/s	brick/tile	20				20	155	orange/red fabric , many small fragments
10	u/s	SMR	3				3	19	1 abraded jug body sherd with applied dot and strip decoration 13th/14th C
19	10	SPMRW	1				1	4	abraded green glaze smooth fabric
21	8	SPMRW	1			1		51.7	grooved strap handle terminal with inscribed wavy decoration on body
22	7	SPMRW	1				1	0.8	spall or flake of green glaze body sherd
24	11	pipe clay	2				2	24.2	2 complete clay marbles/stoppers - 1 glazed
25	10	SMR	1				1	5.2	thin walled, abraded green/brown glaze
27	7	SMR	1				1	14.5	thicker walls, light green/brown glaze with cordon
28	8	SMR	2				2	77.9	straight sided jug with reddish heat skin and green glaze
29	8	SPMRW	1				1	3.2	spall or flake of green glaze body sherd
34	8	SPMRW	1				1	6.3	thin walled reduced green glaze
36	u/s	SPMRW	1				1	24.9	thick walled with abaraded green/ brown glaze
37	u/s	SMR	1				1	11.3	undecorated body sherd with reduced core
38	u/s	SPMRW	1				1	0.8	spall or flake of green glaze body sherd
38	u/s	SWGW	1				1	1.4	thin walled with reduced core and green glaze 13th century?
39	u/s	SMR	1				1	12.5	applied strip decoration but abraded 13/14th C
40	u/s	SMR	1				1	4.3	undecorated body sherd
41	u/s	red earthenware	1				1	16	brown glaze with white slipped interior - modern 19th/20th C
44	12	SWGW	1				1	7.8	smooth well made fabric, undecorated - French??
45	12	SPMOW	1				1	12.8	abraded light green/brown glaze on exterior & interior, 3 cordons
48		SPMRW	1				1	2.4	thin walled reduced green glaze
49		SPMRW	1				1	3.9	glazed on exterior & interior, abaraded
50	6	stone?	1				1	2.1	spot of glaze
51		SPMOW	1				1	5.9	glazed on exterior & interior with cordon
52		SPMRW	1				1	1.1	spall or flake of green glaze body sherd
55	1	white earthenware	3	1			2	13.2	undecorated flatware
55	1	red earthenware	1	1				9.8	slip-lined bowl
55	1	SPMRW	1				1	5.8	thin walled, undecorated
55	1	SPMRW	3				3	20.1	abraded green glaze

Find No.	Context	Fabric	Sherds	Rim	Base	Handle	No. body sherds	Weight (g)	Comments
58	1	SMR	4				4	6.4	1 glazed, the others fragments
64	1	white earthenware	4		1		3	7.3	1 brown glaze the others undecorated
64	1	SWGW	2				2	1.6	abraded
64	1	brick/tile	1				1	1.9	fragment
	u/s	white earthenware	3			1	2	11.4	handle terminal - cup/bowl, undecorated
			87	9	2	2	74	590.3	

Appendix C: Metal Catalogue

Site	SF no.	Context	Trench / Area	No. of pieces	Material	Description
4063 Cambuskenneth	054	1	5	6	Metal	iron nail fragments
4063 Cambuskenneth	003	50	2	1	Metal	iron nail
4063 Cambuskenneth	046	9	3	1	Metal	Horse shoe fragment, medieval?
4063 Cambuskenneth	062	1	4	2	Metal	iron Nail fragments
4063 Cambuskenneth	018	8	3	1	Metal	iron nail
4063 Cambuskenneth	011	Unstrat.	n/a	2	Metal	iron nails
4063 Cambuskenneth	032	11	3	1	Metal	iron nail
4063 Cambuskenneth	005	53	1	1	Metal	iron nail
4063 Cambuskenneth	004	50	1	1	Metal	Cu alloy belt prong? Pin?

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