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Portmahomack on Tarbat Ness: Changing Ideologies in North-East Scotland, Sixth to Sixteenth Century AD

by Martin Carver, Justin Garner-Lahire and Cecily Spall

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Chapter 5

The Pictish Monastery (Period 2, *c* AD 700–*c* AD 800)

5.1 Introduction and Summary

The developments of the late seventh/early eighth century, which begins our Period 2, required high investment and affected every part of the Portmahomack site (Illus 5.1.1) and much of the peninsula (Illus 5.1.2). On the hilltop (Sector 4), a new and more intensive phase of burial in the *cemetery* began with an emphasis on head-support graves (Chapter 5.2). The burials and the central ritual space were marked out with *carved stone memorials*, ranging from simple grave markers to grand cross-slabs, of which over 260 pieces survive (Chapter 5.3). Some of the burials appear to have been aligned on a *church*, which was not seen, but inferred to have stood adjacent to the east wall of the crypt (Chapter 5.4).

Outside the ritual centre, the site was equipped with a well-designed and integrated *infrastructure* (Chapter 5.5): a turf and stone *dam* was built N–S across the valley which impounded water in a *pool* some 50m across; a *culvert* canalised the water that overflowed across the dam, and guided it downhill to the sea. A paved and kerbed *road* (S13) led from the crest downhill across the valley; there was a *bridge* where it crossed the outflow from the pool, incorporating the overflow culvert, capped in giant blocks of stone (S7). The site as a whole was bounded by two successive *enclosure ditches* (S15, S16).

The sloping ground either side of the road was protected from flooding and erosion by *boundary walls* (east and west). It was on this ground that the *northern workshops* were laid out (Chapter 5.6). The craftsmen here were dedicated to the production of vellum as a writing membrane for books, and their industry was sited in a workshop (S9), with a stone-lined tank for processing skins to the north (S4) and a yard to the south. Further south across the pool and within the enclosure ditch were the *southern workshops* (Chapter 5.7), centred on a bag-shaped building (S1) and dedicated to manufacturing objects from silver, bronze and glass. Part of the debris from the outdoor workspace was captured through being dished into the disused first enclosure ditch (S15). The settlement had an economy largely based on cattle (Chapter 5.8) and had ingeniously adapted locally sourced materials to construct its buildings (Chapter 5.9) as well as to supply its workshops. On the peninsula, new centres were established at Hilton of Cadboll, Shandwick and Nigg. A portage is likely to have been activated and selected landing places were marked by large carved stone monuments (Chapter 5.10).

We argue that this establishment was a monastery on the basis of the form and content of its cemetery, its numerous

memorials, the particular stone carrying a Latin inscription, the infrastructure, the manufacture of writing membrane and ecclesiastical vessels, the diet, the architecture and the contemporary and related centres on the peninsula. It appears to have ended with some violence in an incident that resulted in a site-wide fire and the breaking up of Pictish monuments (Chapter 5.11). This began the post-monastic phase of Portmahomack's history (Chapter 6).

Dating – start

Following the stratigraphic end of Period 1 in Sector 2, a layer of windblown sand was deposited which is thought to have been prompted by the stripping of turf (p 187). Radiocarbon dates modelled eleven stratified Period 2 contexts as being deposited within the range *c* 650 to 780 (Digest 3). A porcupine scat was recovered from a pit cut through the road, S13, suggesting that the monastery was active or under construction by AD 715 to 735, the date range for the coin (see Digest 6.2).

Within Sector 4, the Period 2 burials were identifiable during excavation primarily as graves that were truncated by, or lay below the depth of, the foundations for the medieval Church 2 (p 106). As shown in the stratigraphic model (Illus 3.21), an intermittent horizon of pink sand also served to indicate the start of this stratigraphic phase. Radiocarbon dated burials were modelled as lying between *c* 670 and 790, providing a good concordance with Sector 2 (Digest 3). The period is notable for its preponderance of head-support burials (small stone slabs inserted in the grave, usually near the head), and this rite also continued at a lower level of intensity into Period 3.

Dating – end

A raid, strongly evident in Sector 2, marked the stratigraphic end of Period 2. The raid was signalled in Sector 2 by an extensive fire, which destroyed the standing structures, and the dumping of broken up sculpture, datable to the late eighth/early ninth century. Radiocarbon and typological modelling would place this event after 780 and before 810 (see Chapter 5.11).

On this basis, the monastery was founded between 670 and 735, and the monastic experiment ended between 780 and 810, abridged here to *c* 680 to *c* 810. It had lasted for less than a century.

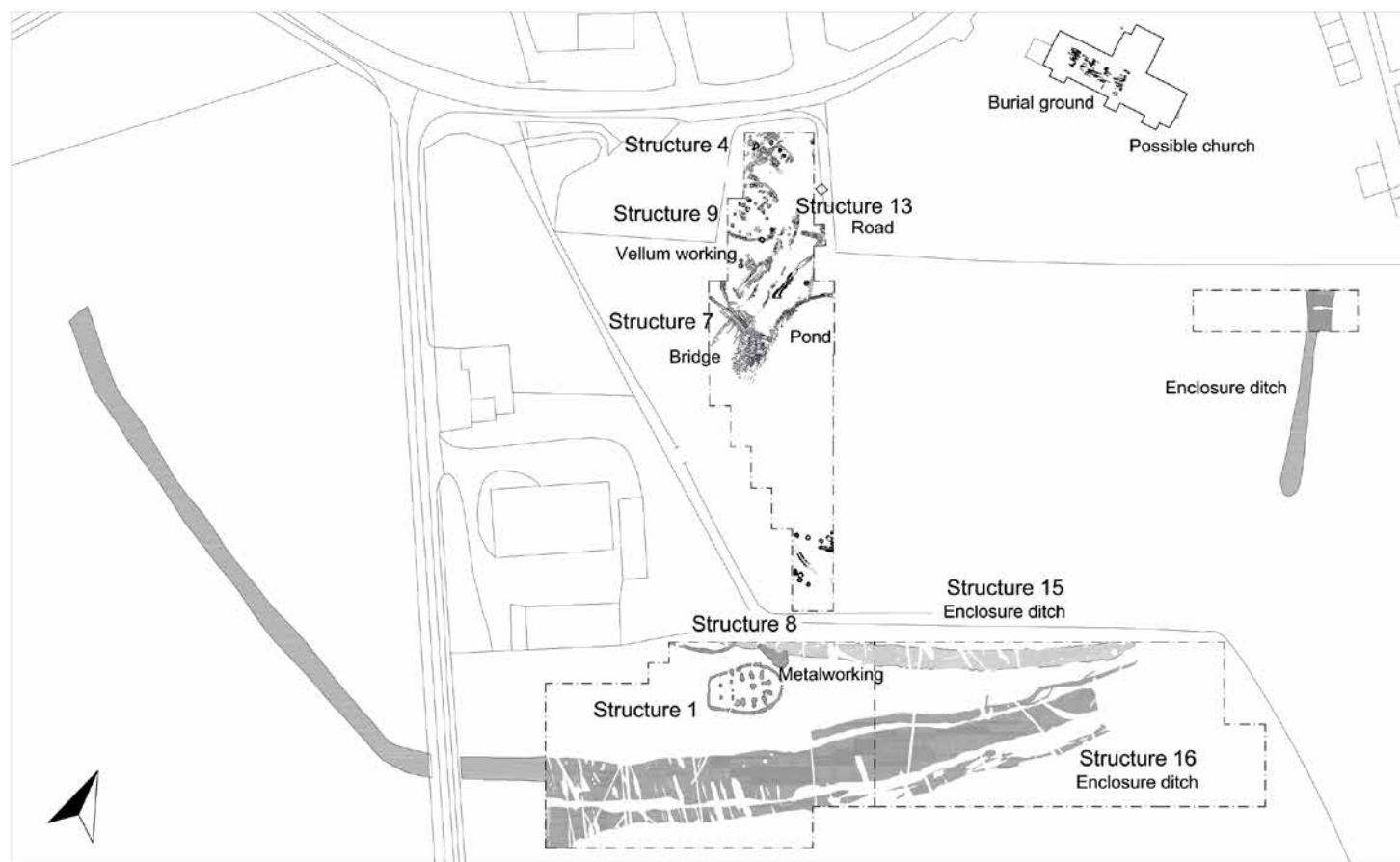


Illustration 5.1.1
Map of the excavated site in Period 2 (eighth century)

5.2 The Monastic Cemetery: Burials of Periods 2 and 3

The burials to be presented here were all excavated within the nave of the present church building or in an adjacent service trench in contexts that predated the first medieval church. They were of three main types: long-cist burials, head-support (including head-box) burials and simple burials. The cemetery was used continuously, although with varying intensity, from the fifth through to the twelfth century. A total of 74 burials could be shown by stratigraphy to precede the construction of Church 2 in the eleventh or twelfth century (Chapter 3, p 54), and of these, 21 were radiocarbon dated (Table 3.1, p 68). Those of the fifth to seventh century (Period 1) could be associated with the cist burial rite and grouped with some confidence (see below and Chapter 4). The burials of the eighth century (Period 2) were harder to detach from those that could be ninth to eleventh century (Period 3), and for this reason are here presented together. It will be argued that although the use of the site in the other Sectors changed radically after the raid that terminated Period 2, in the cemetery itself burial continued in the same tradition into Period 3, although at a diminishing level. Period 3 ends when walls and floors belonging to the twelfth century medieval church (Church 2) were constructed. Burial

began again in the thirteenth or fourteenth century, after an interval following the construction of Church 4. Within the nave of the present church the excavations therefore contacted three different populations in stratigraphic order, 16 burials of the sixth/seventh century (Period 1, see Chapter 4), 58 of the eighth to eleventh century (Periods 2 and 3, this chapter) and 88 of the thirteenth to sixteenth century (Period 4, see Chapter 7, p 296 (Illus 3.21).

Stratigraphy

The first burials on the hill were the long-cist graves of Period 1, which had been cut into glacial sand subsoil. Where related by stratification, long-cist burials consistently preceded head-support burials, and those dated fell within a radiocarbon span of AD 420 and 725. The majority of the long cists were not oriented W-E, unlike those that followed. On this basis, sixteen burials were assigned to Period 1 and of these, twelve were complete or partial long-cist burials and four were simple inhumations without elaboration of the grave. There was a cluster at the west end, proposed to indicate a mound, which formed part of a more extensive mound cemetery (Chapter 4, p 82).

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

Table 5.1.1
Chronology for Period 2 (an excerpt from Table 3.1)

Defined Period	Sector 1 [South Field]	Sector 2 [Glebe Field]	Sector 4 [Church]	The Tarbat Peninsula
HIATUS <i>1–5 years</i>				
PERIOD 2 Monastic eighth century AD 680–810	<p><i>Start: 610–780</i> <i>Infrastructure</i> First enclosure ditch S15 Second enclosure ditch S16 Stake in enclosure ditch [O-10159] 670–890</p> <p><i>Bag-shaped building S1</i> Last use of hearth in S1 phase 1, F65 [S-2621] 700–940; [S-33415] 670–870</p> <p><i>Bag-shaped building S3</i></p> <p><i>Well S8</i></p> <p><i>Metal-working in and around S1</i></p>	<p><i>Start: 645–685/735–765</i> <i>Infrastructure</i> Pool, dam and bridge S7 Road S13</p> <p><i>Boundary walls</i> D2. Animal bone under boundary wall F480 [S-13266] 640–770 D3. Earliest pool C2296 birch twigs [S-14994] 590–760</p> <p><i>Vellum workshops</i></p> <p><i>S4 tank</i> <i>S9 yards</i></p> <p>D4. Hearth in yard F445 640–770 D4. Bone pegs in yard F393 [S-13267] 640–770 D4. Butchered bone C2335 [S-13265] 650–780 Hearth in S9 F495 [S-13581] 650–780 D4. Stake by dam F404 [S-13276] 650–780 D4. Bone row C2000 [S-13271] 660–810</p> <p><i>Sceat of 715–735 (F185)</i></p>	<p><i>Start: 670–760</i> <i>Cemetery with grave markers</i> HS burial 128 [O-13487/fish] 640–770 A3. Burial 171 [S-33414/fish] 660–850 Burial 165 [O-13509] 650–780 Burial 129 [S-33404] 670–880 Burial 153 [S-33410] 650–780 Burial 144 [O-13488/fish] 680–890 A4. Burial 130 [S-33405] 660–780 B2. Burial 160 [O-13486/fish] 680–880 HS Burial 116 [O-13489/fish] 680–880</p> <p><i>Cross-slabs, grave markers, sarcophagus</i> <i>Crosses A–D</i> late eighth-early ninth century</p>	<p><i>The portage?</i></p> <p><i>Monumental cross-slabs at Portmahomack, Hilton of Cadboll, Shandwick and Nigg</i> mid-eighth-ninth century</p>
RAID 780-810	<p><i>End: 700–840</i></p>	<p><i>Burnt workshops</i> Timber 26/C1030 [O-9664] 330–550 (Prob. c 800: old wood) Hazel stake F490 [S-13273] 400—570 (Prob. c 800; old wood) Wattle on terrace F483 [S-13274] 610–690 (Prob. c 800; old wood) D5. Burnt wattle C2704 [S-13275] 650-810</p> <p>Sculpture broken up after late eighth-early ninth century <i>End: 710–780</i></p>	<p><i>Conjectural victims of raid</i> Burial 158 [GU-9296] 680–900 [Blade wound, healed] HS Burial 152 [GU-9297] 780–1000 [Blade wound, fatal]</p> <p><i>End: 690–790</i></p>	

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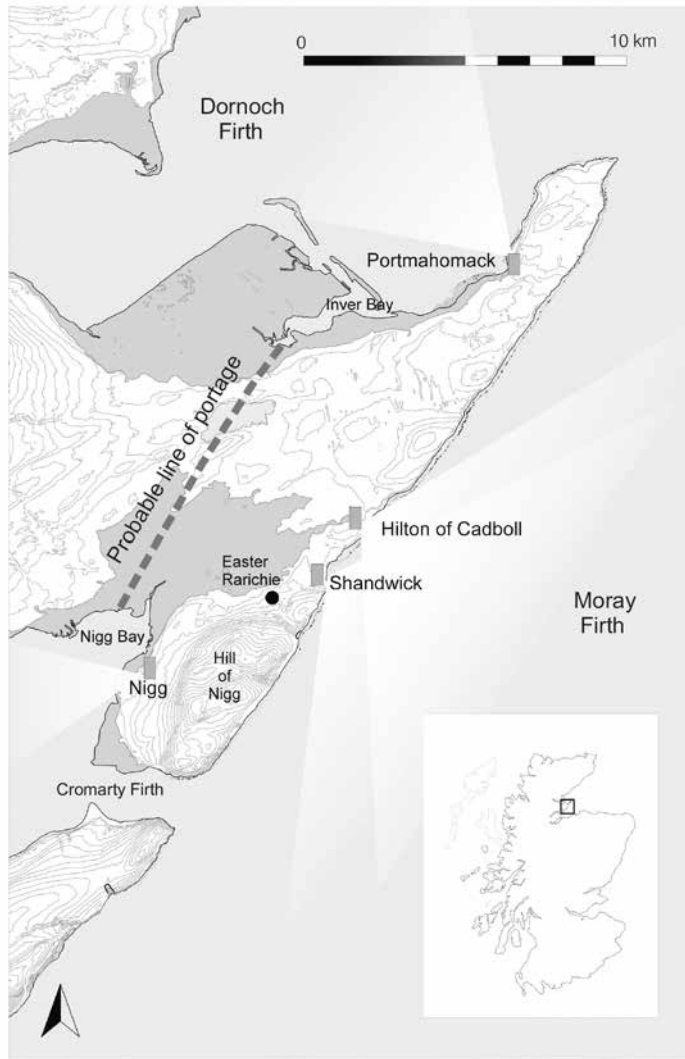


Illustration 5.1.2

Map of the Tarbat peninsula in the eighth century with hypothetical viewsheds commanded by the principal Pictish monuments

There were fifty-eight Period 2 and 3 burials which were stratigraphically later than those of Period 1, were oriented W–E, included head-box or head-support burials or had radiocarbon dates between the late seventh and twelfth century (and shared two or more of these attributes). They are listed in Table 5.2.1 and mapped in Illus 5.2.1. Period 2 burials had cut burials and features of Period 1, and/or cut into an intermittent horizon of pink sand (1064, 1068). Head-box Burial 125 cut long-cist Burials 149 and 162. Head-box Burial 40, and simple Burials 43 and 127 cut ditch F129. Patches of a brown buried soil (1225, 1217) were recorded as having been cut by the foundations for Church 2, and this has also been modelled as the horizon that marked the disuse of the Period 2/3 cemetery. It lay between 17.2m and 17.6m AOD. Period 2/3 burials were disturbed and truncated by the foundations of Church 2 and by the deeper Period 4 burials.

Cemetery plan and development

The basic layout of the cemetery consists of a series of rows where the burials are aligned W–E and one row at the east end where the burials are aligned ESE–WNW. This layout is made more visible in the edited version of the cemetery shown in Illus 5.2.2. The alignment of the eastern row is not dissimilar to that of some of the Period 1 long cists, raising the possibility that it is this eastern row that begins Period 2. However, this is countered by the distance of these graves from the Period 1 epicentre, which is at the far west end, and the fact that the cist graves were then well underground, although marked by a mound; this western area also provided the richest sequence of stratigraphically consecutive burials, including the earliest burials certainly belonging to Period 2 (Burial 128, AD 640–770; Burial 130, AD 660–780). The ESE–WNW orientation also affected stratigraphically late graves Burials 125 and 142 which lie further east.

In general, burials of Period 2 and 3 respected each other. Direct evidence of respect was given by the close and layered siting of graves that usually left preceding burials undisturbed, although they were sometimes so close that mere centimetres separated articulated bones, particularly at the elbows of adjacent burials. Where truncation took place it was often superficial: only toes were lost or the feet of a later burial oversailed the skull of an earlier. This apparent knowledge of the layout and organisation of burial plots persisted into Period 3.

The distribution of the burials shows three forces at work: an initial pull from the pre-existing Period 1 cemetery in the west, a tendency to arrange graves in N–S rows and an attraction from something standing slightly north of east. At the west end, especially in the north-west corner of the nave, there was a notable concentration of twelve burials of Period 1 and 2 interments within an area of c 3.5m². This concentration lies to the immediate north of the main Period 1 cluster, suggested as forming a mound (Chapter 4, p 82; marked on Illus 5.2.1), and may itself have been another mound focused on the deep Period 1 simple inhumation Burial 170. In contrast to Period 1, orientation was true W–E, a pre-echo of the medieval orthodoxy. However, Period 2 burials at the eastern limit of our intervention hinted at a group deviation in orientation closer to WSW–ENE than W–E. This gravitational pull is interpreted here as due to the west wall of a Pictish church (see Chapter 5.4, p 169).

The space occupied by the Period 2 cemetery seems to have been constrained. Burial 189, located within Int 16 on a notably skew alignment, may lie outside or near the northern limit, since subsoil was exposed for the continuation of the trench and no further Period 2 burials were exposed. The free section provided through natural subsoil to a depth of 17.0m AOD provided by the Period 4 Mackenzie grave did not expose or clearly truncate further Period 2 burials in this position. This suggests that the rows of burial did not extend much further north. Likewise, Int 22 (the southern service trench) encountered strata belonging to non-cemetery activity and, where subsoil was exposed, no burials were identified, suggesting that the southern boundary of the Period 2 cemetery also lay nearby between the bounds of Int 17/20 and Int 22 (see Illus 5.2.1). To the west lay the Period 1 cemetery, with its probable mounds, and to the east a possible

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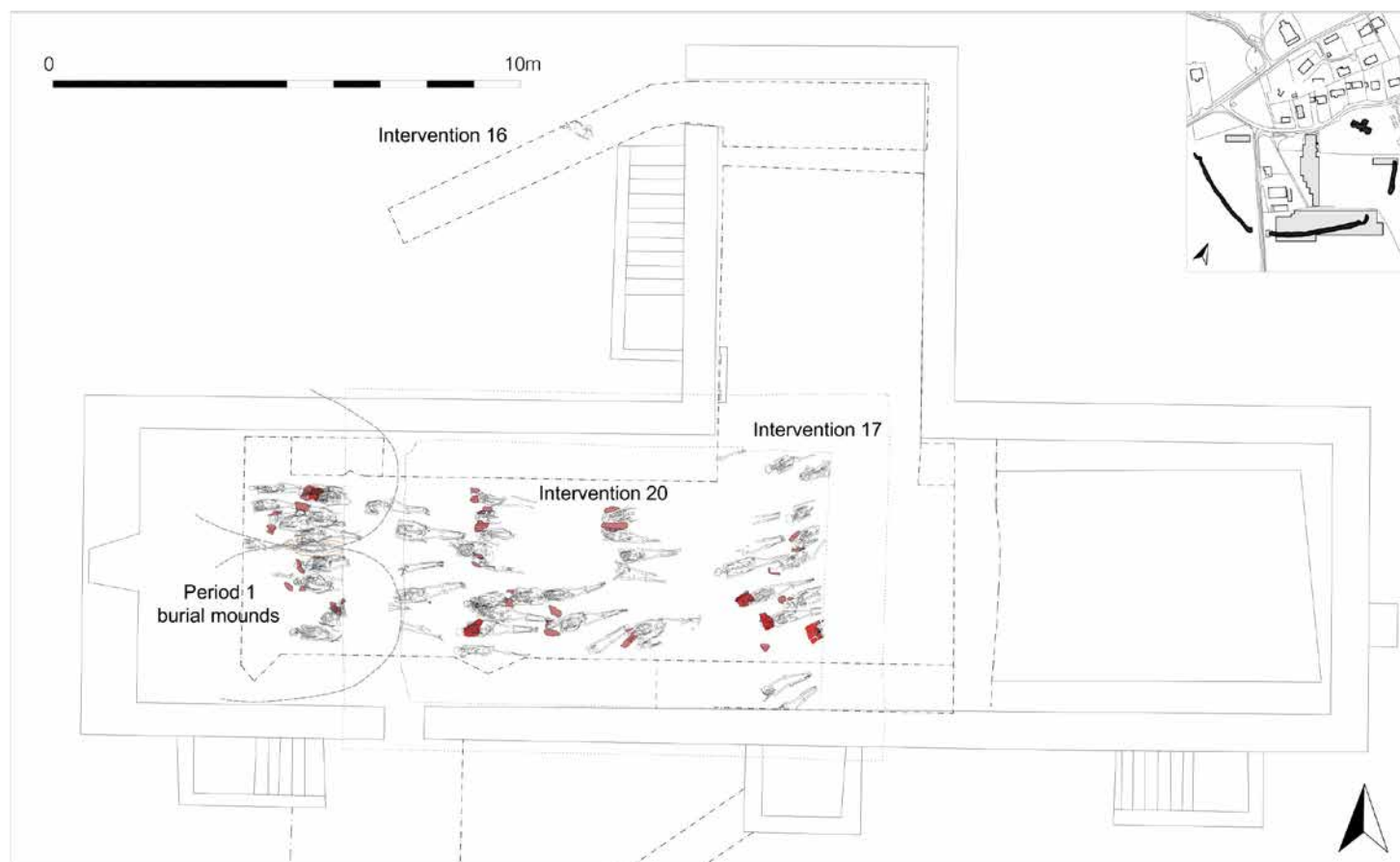


Illustration 5.2.1

Plan of all Period 2 and Period 3 burials, showing location of putative mounds at the west end

church suggested by the orientation of the more easterly burials. These factors suggest that the Period 2/3 cemetery was confined within fixed boundaries at the top of the hill.

Burials of Period 3

Burials that were dug in Period 3, that is from the ninth to eleventh century, have been tentatively assigned by stratigraphy and radiocarbon dating. The latest intact burials, stratigraphically, lie just under the brown sand that signals the construction of the medieval church. They are located over the full length of the nave. The candidates are five from the eastern group (44, 45, 47, 124 and 176), five in the centre (111, 123, 125, 142 and 157) and seven of the western group (136, 156, 145, 147, 164, 152 and 158). Of these seventeen, six were radiocarbon dated, all at the west end, where the longest stratified sequences were to be found. Of these six, three (136, 156 and 111) must be later than 970, while the remaining three (152, 158 and 147) are eighth to tenth century in date.

The transition was seamless, since nine of the seventeen stratigraphically late burials are conventional members of established rows (Burials 152, 158 and 164 at the west end, 157 in the middle and 44, 45, 47, 124, 176 at the east end). Of the six

dated burials, Burials 152 and 158 respected the west row and had dates spanning the eighth to tenth century. Of the remaining four, Burial 147 had a date that spanned the eighth to tenth century but did not respect the rows, and the remaining three (136, 156, 111) that had dates after 970 did not respect the rows either. Burials 136 and 111, although tenth century or later, exhibited the head-support burial rite. Burial 147 (720–960) (an immigrant from the west) was a departure from the established burial rite, being placed on a wicker bier.

From this it can be inferred that the basic structure of the cemetery, with its grave markers, remained visible and accessible into the ninth century, but may have been lost in the two centuries after that. The raid would certainly have disrupted the lives of the population that is being commemorated here, but they remained faithful to some of the established ways of death for at least another century. This suggests an alignment between these burials and the metalworkers of Sector 2, placing both in Period 3A (see Chapter 6, p 280). As a group, these burials had more than an equitable share of trauma, at 47% (see below). Burial 158 (680–900) and Burial 152 (780–1000) had suffered blade wounds, although one had recovered (see below).

The verdict drawn from these strands of information is that the Period 2 cemetery began amongst the Late Iron Age

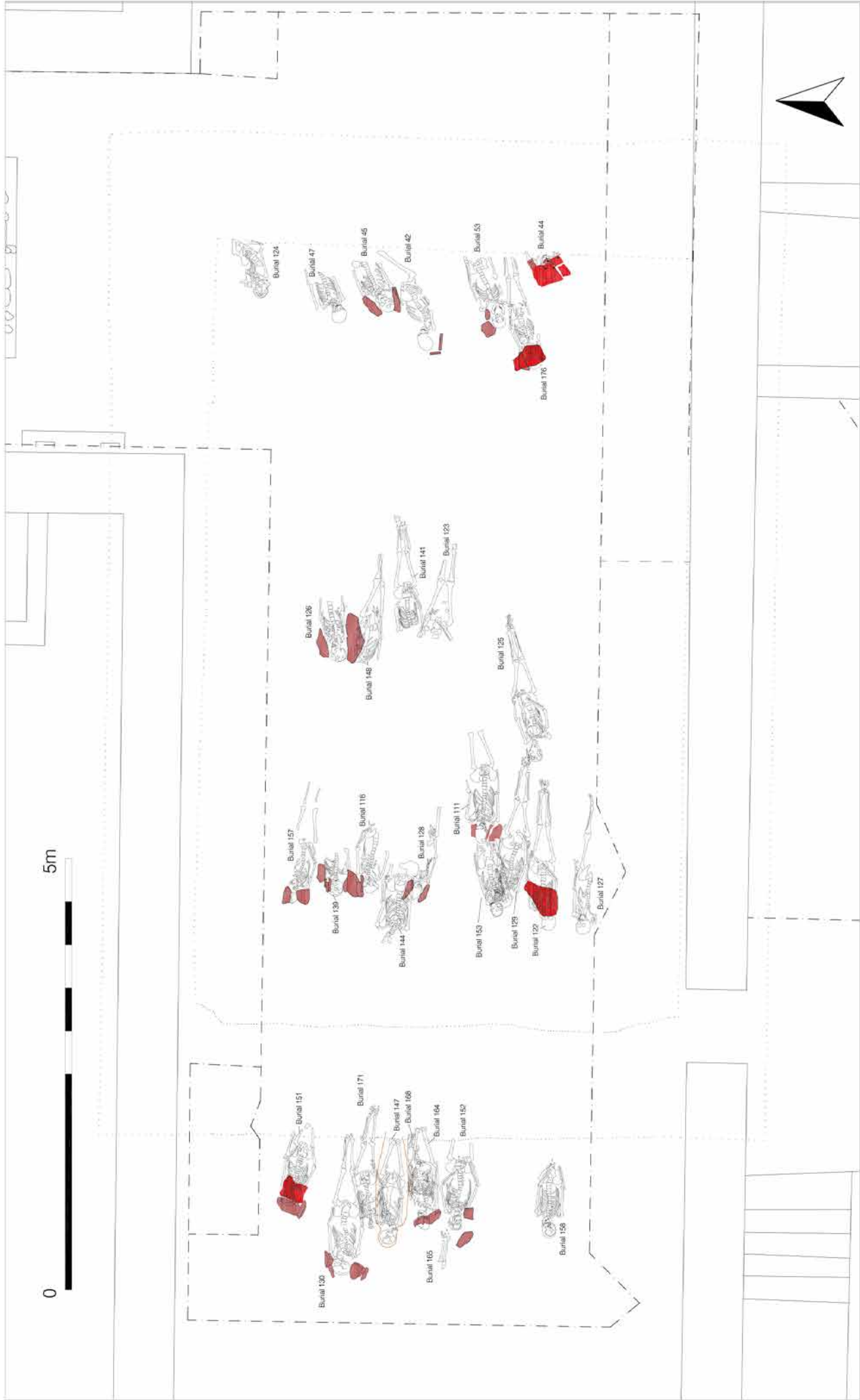


Illustration 5.2.2
Period 2 row burials

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



Illustration 5.2.3

Head-box variants: (a) Burial 126 (F97); (b) Burial 111 (F86); (c) Burial 128 (F103); (d) Burial 45 (17/F107)

burial mounds on the high ground to the west and developed in an easterly direction in orderly rows. At a given moment, within the eighth century, the most easterly row adopted an orientation a few degrees north of east, perhaps reflecting the erection of a church (Chapter 5.4). This alignment also affected burials further west (for example Burials 125, 137, 141, 142, 143). Burials made at the end of Period 2 conformed to the cemetery layout at both ends, at least in the first century following the late eighth/early ninth-century raid. But there is an indication that by the tenth century, if not before, the cemetery had lost its surface plan, if not its location. If late stratified burials are correlated with radiocarbon dating and membership of a row, it would seem that the majority of the

burials (forty-one) were interred in Period 2, with no more than seventeen in Period 3, nine in the ninth century and no more than eight in the two centuries that followed. These numbers cannot be known precisely, but they indicate a drop in the use of the cemetery in the ninth century, and diminishing numbers in the tenth and eleventh with a concurrent loss of the cemetery's structure.

Grave markers

Indirect evidence that the burials were visible from the surface, and their positions respected, was provided by thirteen small cross-slabs, probably grave markers, which were found in the

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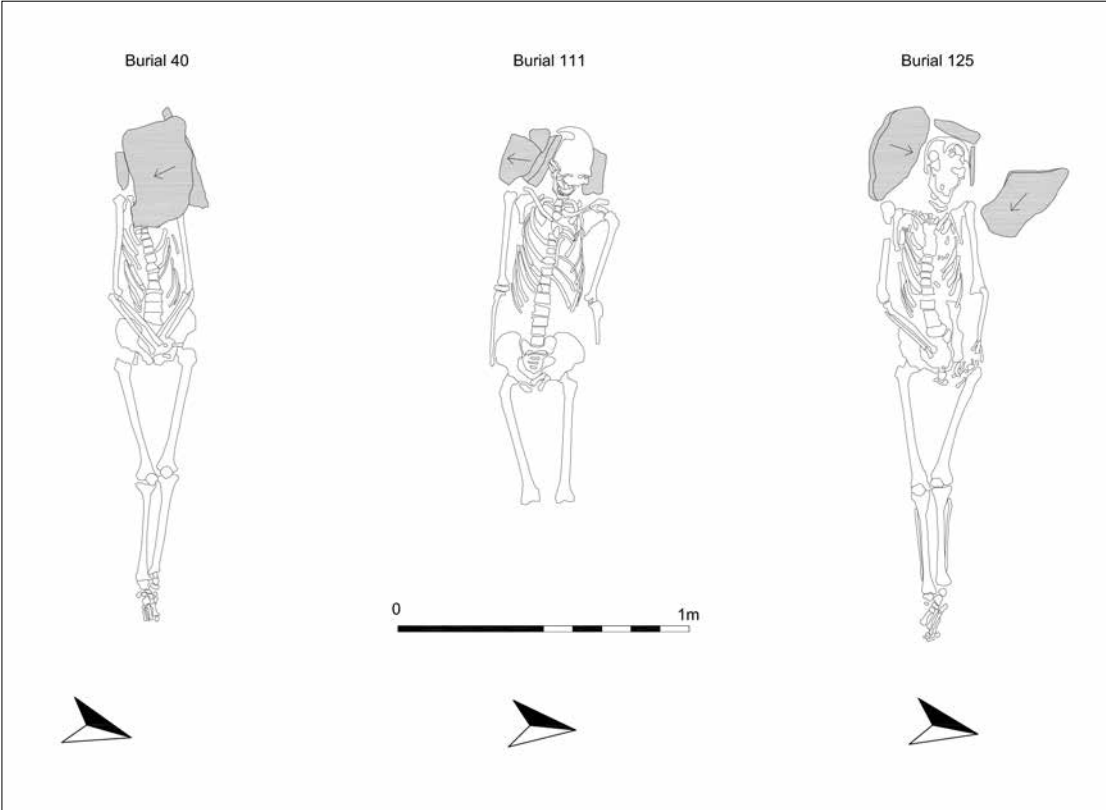


Illustration 5.2.4
Head-box burials: Burials 40, 111, 125

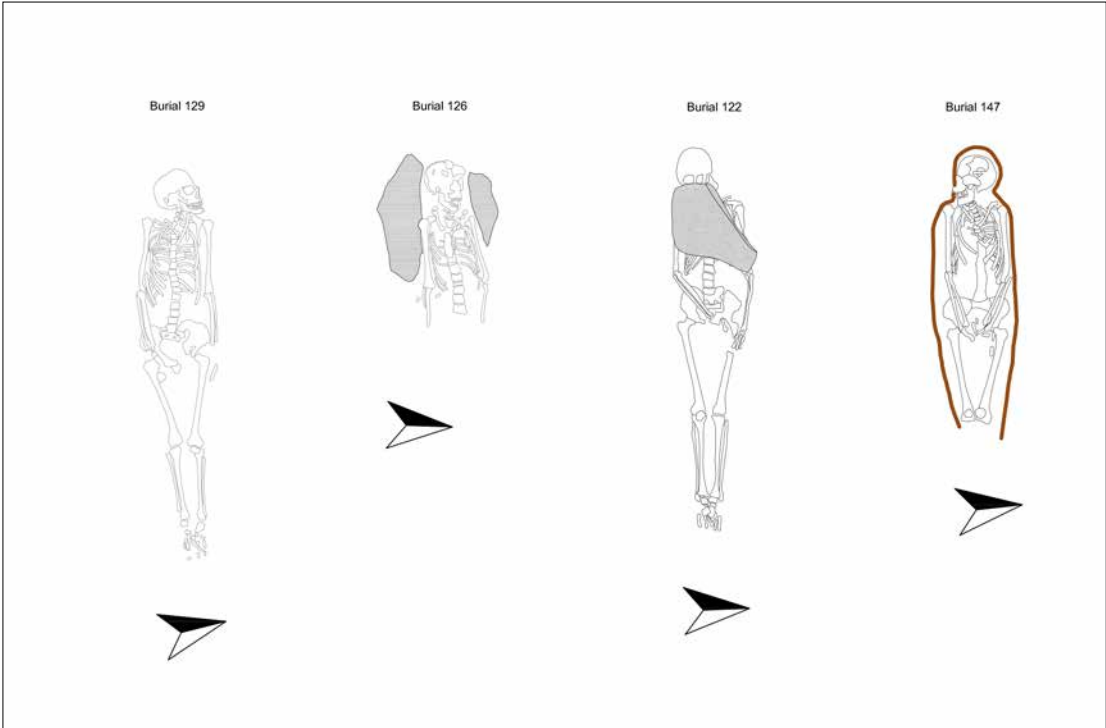


Illustration 5.2.5
Burial variants: Burial 129 (simple); Burial 126 (head-box variant); Burial 122 (head-box variant); Burial 147 (wicker bier)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



Illustration 5.2.6
Wicker bier, Burial 147

area or reused in the fabric of the present church (see Chapter 5.3, p 130). One simple marker, TR25, incised with a crude cross, was recovered from a service trench (C1008) from a context that might possibly be early enough to attribute to Period 1, but its height (between 17.3 and 17.5m AOD) suggests a closer equivalence with the buried ground surface for the Period 2 cemetery. The other grave markers were recovered from secondary contexts dating to Period 4 or later, the majority in circumstances suggesting that they had been disturbed by the construction of the medieval Church 2 (Chapter 7, p 289). There is no grave marker that can be certainly assigned to a period before c 700, or after c 800, although of course this remains possible (Chapter 5.3, p 148).

Burial rite

Of the fifty-eight Period 2/3 graves (Table 5.2.1), twenty-one (36%) featured the head-support burial rite, where small slabs of stone had been set beside the head or over the face (Illus 5.2.3,

5.2.4). Twelve well-preserved examples were head-box burials, where slabs were set either side of the head with a covering slab enclosing the head. Five other settings consisted of two slabs to the sides of the head, and where disturbance could be invoked are recorded as probable head-box burials. Some variations seemed to be intentional. Burial 122 had a large slab placed over the head and upper torso with no other slabs (Illus 5.2.5). Others were so poorly preserved that the original rite could not be read, and are recorded simply as head-support burials. Some Period 2 burials were noted during excavation as 'shrouded,' and examination of burial photographs and body position has allowed the identification of further examples. In total, thirteen shrouded and eight probably shrouded burials have been identified within Period 2. The evidence for shrouded burial consisted of signs of constraint in the skeleton, notably showing the upper body, particularly shoulders and arms and lower limbs, positioned unnaturally close together at the knees and feet (for example see Illus 5.2.4, Burial 40). Both simple inhumations and head-box burials included shrouded

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Table 5.2.1
Period 2 and 3 burials

*Burials that are probably or possibly of Period 3 (ninth-eleventh century) are marked with an asterisk. For abbreviations used in trauma, see D4.1.

No.	Type	Occupant	Stratification	Height AOD	Analyses	Date
38	Simple, extended, supine, probably shrouded	Male 46–59 y Ht 1.70m/5' 7"	Overlay head slab Burial 42 and cut by head-box Burial 45		Neoplasm, SJD, Dental, periostitis	
39	Simple, extended, supine	Adult, Prob. male Ht 1.68m/5' 6"	Represented by lower legs only, cut by Burial 47		Fracture: R.Proximal Fibula	
40	Head-box, extended, supine, shrouded	Male, 46–59 Ht 1.74m/5' 9"	Cut into Period 1 ditch 20/F129			
42	Head-side-slab; extended, supine	Male 46–59 Ht 1.78/5' 10"	Overlain by Burial 38, later truncated by Burial 45		L.Rib Fracture, OA, SJD, DJD, Spina bifida occulta, Dental	
44*	Head-box; extended, supine, oriented W–E; skull and upper torso only	Prob. male, 46–59 y	cut by Church 2 east wall foundation 17/F85	Skull – 16.8		
45*	Head-box; extended, supine, oriented WSW–ENE	Male, 46–59 y Ht 1.71m/5' 7"	overlay Burial 38	Skull – 16.8 Sacrum – 16.6		
47*	Simple extended, supine, oriented WSW–ENE	Male, 26–35 y Ht 1.74/5' 8"	cut by Church 2 east wall foundation 17/F85	Skull – 16.9	Dental, Entheses	
48	Simple extended, supine, oriented WSW–ENE represented by lower legs, minus feet	Prob. male, 36–45 y Ht 1.66m/5' 5"	cut by head-box burial 45, later truncated by deep Period 4 Burial 35	Tibia – 16.9	Entheses: L4, Cancanei	
50	Simple extended, supine, oriented W–E, represented by upper right leg only	Prob. male adult Ht 1.64/5' 5"	disappeared beyond northern baulk, truncated by Period 3 Burial 1	Tibia 17.0		
51	Simple extended, supine, oriented SW–NE; represented by lower right arm, lower torso and legs	Male, 36–45 y Ht 1.64/5' 5"	truncated to west by Church 2 south wall 20/F62	Sacrum – 16.7 Tibia – 16.7	Fracture (R.5th MT), OA, DJD	
52	Simple extended, supine, shrouded, oriented SW–NE	Male, 46–59 y Ht 1.66/5' 6"	aligned with Burial 51, cut by Church 2 east wall 17/F85 and south wall 20/F63	Tibia – 16.7	Periostitis (R.Fibula)	
53	Simple extended, supine, furnished with (disturbed) head slab, oriented WSW–ENE	Male, 46–59 y	cut into Period 1 ditch 20/F129, cut by head-box Burial 176	Skull – 16.8 Sacrum – 16.6	SN, Calculus, caries, abscess, mand. tori.	
54	Simple oriented WSW–ENE	Male, 18–25 y Ht 1.73m/5' 8"	legs cut by 17/F72 foundation trench of north wall of Church 2	Skull – 16.83	Local Pulmonary infection (TB?) Calculus, DEH	
111*	Head-box; extended, supine, oriented W–E	Male, 26–35 y Ht 1.68m/5' 6"	cuts Period 2 Burial 143 and Burial 153	Skull – 17.2 Sacrum – 16.9	Immigrant?	AD 1020–1170
116	Simple extended, supine, furnished with (disturbed) head-box, oriented broadly W–E	Male, 46–59 y	cut by Burial 117, cut Burial 144	Skull – 17.1 Sacrum – 16.8	OA: verts, L.shoulder	AD 680–880
118	Simple represented by legs	adult male		Tibia – 17.2	Fracture: R.5th MT Tuberosity	
121	Simple extended, supine, oriented W–E	Male, 26–35 y Ht 1.67m/5' 6"	preceded Period 2 Burial 144, head truncated later by Church 2 west wall 20/F73	Sacrum – 16.9 Tibia – 16.9	Compression (L1), Spondylolysis (L5), SN, Os Acromiale, DJD	
122	Head-slab; extended, supine, probably shrouded, furnished with slab covering lower face and torso, oriented W–E	Male, 46–59 y Ht 1.74/5' 9"	aligned with Burial 127 and 129	Skull – 17.1 Sacrum – 16.8 Tibia – 16.9	OA, SJD, Dental, Fractures (T7, R.Fib, L.Rad)	

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

Table 5.2.1
Period 2 and 3 burials (cont.)

No.	Type	Occupant	Stratification	Height AOD	Analyses	Date
123*	Simple extended, supine, oriented broadly W–E	Male, 60+ y Ht 1.75/5' 9"	post-dated Burial 141	Sacrum – 16.7 Tibia – 16.8	Fracture (R.5th Prox phalanx), OA (Hip, L4-5)	
124*	Simple extended, supine, oriented WSW–ENE	Male, 18–25 y Ht 1.77m/5' 10"	disturbed and repositioned while partially articulated, later cut by Church 2 east wall 17/F85	Skull – 16.8 Sacrum – 16.7	Scurvy (?) C1 to Occipital fusion, SN	
125	Head-box; extended, supine, oriented WSW–ENE, furnished with probable head-box and shrouded	Male, 60+ y Ht 1.73m/5' 8"	post-dated Period 1 cist Burial 149 and may have reused robbed stones from cist for head setting, also cut Period 2 Burial 129 but did not disturb it	Skull – 17.0 Sacrum – 16.9 Tibia – 16.9	Fracture (L.Tib/Fib), OA (L.Hip, C.verts)	
126	Head-support; extended, supine, oriented W–E	Male, 46–59 y Ht 1.70m/5' 7"	post-dated Burial 148 but did not disturb it	Skull – 16.8 Sacrum – 16.7	SJD, OA, SN, DJD, Dental Abscesses, Calculus	
127	Simple; extended, supine, oriented W–E	Prob. male, 36–45 y Ht 1.62m/5' 4"	aligned with Burial 122 and 129, disappeared beyond southern baulk	Skull – 16.8 Sacrum – 16.6 Tibia – 16.7	Local Oat or wheat starch in calculus	
128	Head-box; extended, supine, oriented W–E, furnished with probable head-box	Prob. male, 46–59y	post-dated by Burial 144 but not disturbed by it, later truncated by Burial 117	Skull – 17.1 Sacrum – 16.8		AD 640–770
129	Simple; extended, supine, shrouded, oriented W–E	Prob. male, 18–25 y Ht 1.66/5' 5"	aligned with Burial 127 and 122, post-dated but not disturbed by Burial 125 and 153	Skull – 16.9 Sacrum – 16.7 Tibia – 16.8	Migrant from Scandinavia	AD 670–880
130	Head-box; extended, supine, probably shrouded, oriented W–E	Prob. male 46–59 y Ht 1.70m/5' 7"	buried in dense north-west zone, post-dated Burial 171 but did not disturb it, post-dated by double Burial 136/156 but not disturbed by them	Skull – 17.3 Sacrum – 17.20 Tibia 17.10	Local	AD 660–780
133	Simple; extended, supine, probably shrouded, oriented W–E	Male, 60+ y Ht 1.69/5' 6"	truncated by Church 2 west wall 20/F73	Sacrum – 16.9 Tibia – 16.8	DJD, SJD, OA (Verts, Hips, Tarsals)	
135	Simple; extended, supine, oriented W–E	Prob. male, 46–59 y	post-dated head-box Burial 154, cut by Church 2 west wall 20/F73	Sacrum – 17.3	SJD, SN, Possible Scheuermanns (T11)	
136*	Simple; extended, supine, oriented W–E in possible double burial with Burial 156	Male, 36–45 y Ht 1.74m/5' 8"	In dense north-west zone, post-dated but did not disturb head-box Burials 130 and 151, cut by Church 2 west wall 20/F73	Skull – 17.0	Immigrant?	AD 970–1040
137	Head-slab; extended, supine, oriented W–E	Prob. male 36–45 y Ht 1.74/5' 9"	cut by head-box Burial 173	Skull – 17.0		
139	Head-box; extended, supine, oriented W–E, furnished with probable head-box	Male, 46–59 y Ht 1.64/5' 5"	post-dated by head-support Burial 157	Skull – 17.0	Scurvy, Vert OA, SN	
140	Simple extended, supine, probably shrouded, oriented broadly W–E	Male 18–25 y Ht 1.66m/5' 5"	post-dated head-box Burial 154	Sacrum – 16.9 Tibia – 16.9	Immigrant? SN, R.Os acromiale, CC Entheses	

PORTMAHOMACK ON TARBAT NESS

Table 5.2.1
Period 2 and 3 burials (cont.)

No.	Type	Occupant	Stratification	Height AOD	Analyses	Date
141	Simple; extended, supine, shrouded, oriented W-E	Male, 36-45 y Ht 1.69/5' 6"	post-dated by Burial 123, later truncated by Period 4 Burial 113	Sacrum - 16.6 Tibia - 16.7	SN, Spondylolysis, Sacralisation, R.Fibula Fracture	
142*	Simple; extended, supine, oriented SW-NE	Male, 46-59 y Ht 1.74m/5' 8"	post-dated head-box Burial 173	Sacrum - 16.9 Tibia - 17.0	OA, Fracture (R.5th MT), O.Dissecans?	
143	Simple; extended, supine, shrouded, oriented W-E	Male, 60+ y Ht 1.68m/5' 6"	post-dated by head-box Burial 111	Sacrum - 16.8 Tibia - 16.8	SN, OA, Infection	
144	Simple; extended, supine, oriented W-E	Male, 46-59 y Ht 1.61m/5' 4"	post-dated by Burial 116 but not disturbed by it, later truncated by Burial 117	Skull - 17.1 Sacrum - 17.0	Local Anomalous diet Barley starch in calculus OA(Verts), SN, DJD, Dental diseases	AD 680-890
145*	Simple; extended, supine, oriented W-E	Male, adult	Disappeared beyond southern baulk, cut Burial 158 and cut by Church 2 west wall 20/F73	Skull 17.1	Vert OA, L.Clavicle Fracture, Caries	
147*	Wicker-coffin; extended, supine, oriented W-E, furnished with anthropomorphic cover	Male, 26-35 y Ht 1.72m/5' 7"	cut toes of Burial 160, lower legs cut away by Church 2 west wall 20/F73	Skull - 17.3 Sacrum - 17.10	Immigrant from west	AD 720-960
148	Simple; extended, supine, probably shrouded, oriented W-E	Male, 60+y Ht 1.78m/5' 10"	cut by head-box Burial 126, truncated later by Period 4 burial		OA (R.Wrist, R.Hip, L.Knee & verts, Periostitis (L.Femur), DJD/SN	
151	Head-box; extended, supine, shrouded, oriented W-E	Male, 46-59 y Ht 1.72m/5' 8"	post-dated Burial 155, 167 and 174 in dense north-western zone, pre-dated double Burial 136 and 156, later truncated by Church 2 west wall 20/F73	Skull - 17.1 Sacrum - 16.9	OA, SJD, DJD, L.Mid Rib Fracture	
152*	Head-slab; extended, supine, oriented W-E	Male, 26-35 y Ht 1.74m/5' 8"	aligned with and very close to head-box Burial 164	Skull - 17.2 Sacrum - 17.1	Blade wounds x 3, Dental, Max Sinusitis(?)	AD 780-1000
153	Simple; extended, supine, shrouded, oriented slightly towards WSW-ENE	Male, 36-45 y Ht 1.71m/5' 7"	post-dated Burial 129, cut by head-box Burial 111	Skull - 17.1 Sacrum 16.9	Immigrant from Scandinavia SN/Scheuermanns, Vert fractures, Dental	AD 650-780
154	Head-box; extended, supine, shrouded, oriented W-E	Male, 46-59 y Ht 1.73/5' 8"	post-dated Burial 140, later cut away through torso by Church 2 west wall 20/F73	Skull - 17.1	SJD, DJD, OA, Infection (R.Tibia), Dental	
155	Simple; extended, supine, shrouded, oriented W-E	Female, 46-59 y Ht 1.65m/5' 5"	post-dated Burial 170, post-dated by head-box Burial 151 but not affected by it in dense north-western zone, buried adjacent to female Period 2 Burial 174	Sacrum - 17.0 Tibia - 17.0	SJD, Osteoporosis(?)	
156*	Head-box; extended, supine, oriented W-E, with head-box	Male 36-45 y Ht 1.71m/5' 7"	Possible double burial with Burial 136 although recorded heights are 0.20m higher	Sacrum - 17.2	Immigrant?	AD 970-1040
157*	Head-box; extended, supine, oriented W-E, furnished with probable head-box	Male, 46-59 y Ht 1.74/5' 8"		Skull - 17.0 Sacrum - 16.8 Tibia - 16.8		

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

Table 5.2.1
Period 2 and 3 burials (cont.)

No.	Type	Occupant	Stratification	Height AOD	Analyses	Date
158*	Simple; extended, supine, shrouded, oriented W–E	Male, 46–59 y Ht 1.73m/5' 8"	aligned with row of Period 2 burials, cut by Burial 145	Skull – 17.1 Sacrum – 16.9	Local Blade wound (L.Parietal), Fractured L.Ribs, OA: L&R ACC; Verts, SN, Dental disease	AD 680–900
159	Simple; extended, supine, oriented W–E	Child, 10 y	aligned with Burial 140 and 121, cut by Church 2 west wall 20/F73	Sacrum – 16.9 Tibia – 16.9		
160	Simple; slightly flexed, supine, probably shrouded, oriented W–E	Prob. male, adult Ht 1.66m/5' 5"	Predated Burial 169 and beneath Burial 147 in dense north-western zone, disappeared beyond western limit of intervention	Sacrum – 17.1 Tibia – 17.1	OA: R (& L?) Hip, L3	AD 680–880
164*	Head-box; extended, supine, shrouded, oriented W–E	Male, 46–59 y Ht 1.66m/5' 5"	aligned with head-box Burial 152 (Period 3), cut away by Church 2 west wall 20/F73	Skull 17.2 Sacrum – 17.0	Lytic(Neoplasm?), Entheses, sacralisation Fractured ribs,OA/SJD/DJD, Dental	
165	Simple; supine, extended, oriented W–E; represented only by lower legs	adult, sex undetermined,	post-dated Burial 163, post-dated by head-box Burial 152 (Period 3)	Tibia – 16.9		AD 650–780
167	Simple extended, supine, oriented W–E; represented by part right side	Male, adult Ht 1.67m/5' 6"	early burial in dense north-western zone post-dated by Burial 174	Sacrum – 16.8		
168	Simple; extended, supine, oriented W–E	Prob. Male, 36–45 y	pre-dated head-box Burial 164	Sacrum – 16.9		
171	Simple; extended, supine, oriented W–E	Male, 36–45 y Ht 1.75m/5' 9"	post-dated Burial 169 and post-dated by head-box Burial 130	Sacrum – 16.9 Tibia – 16.9		AD 660–850
173	Head-box; extended, supine, oriented W–E	Male, 46–59 y	cut Burial 137, post-dated by Burial 142	Skull – 17.0 Sacrum – 16.7	SJD, Granuloma/Abscess, Scheuermann's, SN, Max Sinusitis, Ankylosing Spondylitis (?)	
174	Simple; extended, supine, shrouded, oriented W–E	Female (?), adult	post-dated Burial 167, post-dated by head-box Burial 151, buried adjacent to female Period 2 Burial 155	Skull – 17.1 Sacrum – 17.0	Neural arch entheses	
176*	Head-box; extended, supine, probably shrouded, oriented WSW–ENE	Male, 46–49 y Ht 1.62/5' 4"	aligned with Burial 53, 42, 45, 47 and 124, cut by Church 2 east wall 17/F85	Skull – 16.9 Sacrum – 16.7	OA, SJD, dental, fracture, infection (sinusitis), cribra orb, spondylolysis (L5)	
189	Simple; extended, supine, oriented NW–SE	Male, 26–35 y	encountered within Int 16 cut into subsoil covered with buried soil	Skull – 17.55 Sacrum – 17.35	Calculus & DEH	

individuals. Radiocarbon dating suggests that head-box burial began after the mid-seventh century and was being used into the ninth to eleventh (here Period 3); simple inhumation began during Period 1, persisted throughout Period 2 and into Period 3. One radical deviation of burial rite was noted: Burial 147 (Period 3) appeared to have been buried within an anthropomorphic, organic matrix which was analysed and identified as highly humified organic remains, possibly wood or wicker (Illus 5.2.6).

The goals of the analyses of the skeletal material included age, sex, congenital conditions, trauma, diet and place of birth, and the methods applied were osteology, stable isotope signatures of carbon, nitrogen, oxygen and strontium, and examination of calculus on the teeth (Digest 4).

Age/sex profile (Digest 4.1, 4.2)

Taking both periods together, the population of the cemetery was 93% male: fifty-four males, two females, and one child, with

Table 5.2.2
Early medieval trauma
 *Burials assigned to Period 3

Burial	Phase	Age	Sex	Bone	Side	Description
39	2	adult	M	fibula	R	Proximal end – well healed (with callus formation), complete, oblique fracture
42	2	adult	M	rib		Healed fracture with new bone formation which has developed into a facet for articulation with a middle rib
51	2	middle adult	M	fifth metatarsal		Non-united fracture at the base (tuberosity)
122	2	old adult	M	fibula	R	Proximal end – well healed (with callus formation), complete, oblique fracture
123*	2	old adult	M	fifth proximal phalanx	R	Well-healed, complete, straight fracture across the shaft
125*	2	old adult	M	tibia fibula	L	Both are well-healed, complete, oblique fractures on the distal ends, but the tibia also has gaps and cloacae present along the fracture line. The ends of the fracture overlap by approximately 35mm and as a result, the left tibia is shorter than the right. In addition, the proximal end of the fibula shaft is angled slightly medially and the fracture ends overlap by approximately 22mm. This individual also has OA of the left hip (secondary?), and probably walked with a limp
141	2	middle adult	M	fibula	R	Proximal end – well healed (with callus formation), complete, oblique fracture
142*	2	old adult	?M	fifth metacarpal fifth metatarsal	R	Fusion at an angle with the proximal phalanx – trauma? Non-united fracture at the base (tuberosity)
145*	3	middle adult	M	clavicle	L	Non-united fracture approximately mid-shaft, with healed irregular new bone formation on both sides which articulated with one another. The ends of the bones are displaced such that the medial portion of the clavicle overlaid the lateral portion (anteriorly)
151	2	old adult	M	rib		Healed fracture of a middle rib
152*	2	adult	M	skull		Three blade wounds
158*	3	old adult	M	ribs		Mid-shaft fractures on four middle ribs. One rib also has a lytic lesion (oval with rounded edges – approximately 4.4 x 2.8mm in size) approximately 20mm away from fracture, possibly indicative of infection. This individual also had evidence of trauma to the skull
164*	2	middle adult	M	rib		Rib fracture as well as a trauma or infection to the pelvis (see below)
170	1	middle adult	M	clavicle	L	Well-healed fracture near the conoid tubercle – slightly displaced, so that the lateral end is slightly inferior to the rest of the shaft
176*	2	middle adult	M	clavicle ribs	L	Non-united fracture approximately 25–30mm from the acromial end. One side is flared, and the other is rounded, forming a pseudo-joint. Five healed middle ribs

one undetermined. It may be significant that the two females (Burial 155, 174) were interred side by side within the dense north-western zone. The age profile was unusual. Of those that could be assessed, twenty-three of the men (and one woman) had died after forty-six, with five men dying at sixty or older, 67% (29/43). The child's age was assessed at ten years old, a likely age for a novice.

Physique

The stature of men was around 1.70m (5' 7") with three measuring 1.78m (5' 10"). Fifty-two per cent of the monastic population were affected by spinal joint disease, particularly at T10, L1 and L2. These observations, along with three cases of spondylolysis (a condition which may occur as a result of bending and lifting in an upright posture) and three cases of compression fractures of the vertebrae (possibly as a result of a vertical force injury) suggested that the monastic period individuals may have participated in activities resulting in lower back stress more frequently than the medieval individuals that succeeded them (p D27). There is also evidence to suggest that this stress began at younger ages than in the medieval period.

Teeth

Calculus, abscesses, ante-mortem tooth loss and dental wear were more frequently observed in the monastic than in the medieval period, implying that in Period 2, the diet may have been more coarse. Indeed, a small piece of stone was embedded in the pulp cavity of one of the well-worn teeth from Period 2. The heavy wear may have also resulted in exposure of the pulp cavities, causing dental abscesses. The presence of heavy calculus may be associated with diet type and/or the lack of oral hygiene to remove plaque build-up.

Trauma

Fifteen persons (23%) had suffered fractures or more severe damage, of whom eight were among those seventeen assigned to Period 3 (47%). These included breakage of arms, legs and ribs (Table 5.2.2). In addition to these accidents of the workplace, there was also evidence of interpersonal conflict at Tarbat – sharp-edged weapon wounds were present on two skeletons, both buried in Period 3 (Burials 152, 158). A middle-adult male (152) had three sharp cut marks to the skull (Illus 5.2.7). One was approximately 72mm in length and extended across both parietals, with radiating fractures extending from both ends (one curved into the right side of the frontal bone and the other curved along the left parietal). The cut was angled such that one side was sharp and the other was broken post mortem, but it did not extend into the endocranial surface (although there was a fracture line along the wound). The second wound bisected the lamboid suture on the left side. It was 41mm in length, and was slightly angled and did not penetrate the inner table. The last fracture was on the right side of the occipital; however, much of the area was broken post mortem and the extent of the wound was difficult to assess. A radiating fracture extended from this cut towards the cranial base. There was no evidence of healing,

suggesting this individual did not survive after the wounds were inflicted. As two of the cuts were on the back of the head, it is likely that the assailant attacked from behind. Given that one of the fractures was on the crown of the head, the individual may have been below the assailant at one point (eg kneeling). As injuries with larger weapons are more likely to produce terminal fractures (Wenham 1987), it is possible that a weapon such as a sword might have been used to produce these fractures.

The other casualty was an elderly male (158) who had two well-healed fractures on the left parietal. They were smooth parallel depressions extending from the coronal suture approximately 46mm and 30mm posteriorly, and 12mm and 10mm wide, but did not extend into the internal table. Given the linear nature of the injuries, it is possible that a large blade was used to inflict these injuries, probably in a 'face-to-face' position.

Disablement

Three middle-adult males from Period 2 had collapsed vertebrae. In Burial 153, three vertebrae were flattened on the left side of the body, and one on the right side, resulting in scoliosis. In contrast, the anterior surface of the first lumbar vertebrae of Burial 121 was wedge shaped, resulting in kyphosis (hunchback). Burial 176 also had kyphosis as a result of three wedge-shaped vertebrae.



Illustration 5.2.7
Head wounds sustained by Burial 152

It is possible that these individuals sustained these fractures as a result of a vertical force injury. Burials 121, 141 and 171 had spondylolysis (degenerative osteoarthritis).

An elderly adult (Burial 128) had a fused sacroiliac joint on the right side (the left side was missing), as well as fusion between vertebrae and ribs. The osteophytes on the cervical vertebral bodies were square and ‘bamboo’-like in appearance, with fusion also occurring between the lamina and transverse processes. In addition, the atlas was fused to the occipital in such a way that this individual’s head would have been permanently raised and tilted to the right side.

Stable isotope analysis

Twenty-five skeletons from Periods 1, 2 and 3 were sampled for their carbon and nitrogen isotope signatures and the results used to infer the likely sources of nutrition. They were found to depend largely on terrestrial plants and animal protein, with no marine component (see Chapter 5.8, p 224). Thirteen skeletons from Periods 2 and 3 were sampled for their oxygen and strontium isotope signatures. Three out of the eleven that were measurable were local to the peninsula, and eight were immigrants, including four from Period 3 (Table 5.2.3). It was noted that two of the immigrants had data consistent with an origin in Scandinavia. Of these, Burial 129 was buried with a standard W–E orientation in one of the central rows. Burial 153 apparently knew the spot, since he was buried on top of his compatriot. The later of the two burials was dated AD 650–780 by radiocarbon, and adopted the WSW–ENE orientation of the east end. This implies that both were fully fledged members of the monastic community.

Starch (Walters, Digest 4.6; OLA 7.2.2.2)

As a result of isolating and analysing starch granules extracted from calculus on the teeth of three skeletons, it could be shown that one of them had been eating barley, and another oats or wheat.

Discussion

Adrian Maldonado’s recent study of radiocarbon-dated burials in first millennium Scotland shows that long-cist burial, barrow burial and cairn burial have their roots in his Middle Iron Age (200 BC–400 AD) (2011, 39), but there is a surge in the numbers of

Table 5.2.3
Oxygen/Strontium isotope signatures for Periods 2 and 3

(Chapter 3, p 60; Walther, OLA 7.2.3.1)

2	Burial 54	Local
	Burial 127	Local
	Burial 129	Scandinavia
	Burial 130	East Britain (not local)
	Burial 140	East Britain (not local)
	Burial 144	Local
	Burial 153	Scandinavia
3	Burial 147	Western Britain
	Burial 158	East Britain (not local)
	Burial 111	East Britain (not local)
	Burial 136	East Britain (not local)

all three rites from AD 400–650 (his Late Iron Age; *ibid*, 98, 123, 127). It would be reasonable to add Class I symbol stones to this ‘Late Iron Age package’, since most of the carved stones in context were retrieved from the sites of cist burials (*ibid*, 258). Burials with small slabs placed about the head (his ‘head-box’ burials) herald a new order; they originate in the seventh century and continue into the twelfth century, and are associated primarily with churches (*ibid*, 103).

The Portmahomack burials conform well to this scheme. As noted in Chapter 4, burials at Balnabruach, dated to the Middle Iron Age, are followed in the Late Iron Age a few hundred metres further north along the ridge overlooking the sea by a likely chain of Period 1 graves that includes at least two groups of cist graves, probably under barrows. Three contemporary cist graves lay under a barrow in Sector 2 (p 85), while on the hilltop beneath the church (Sector 4) one barrow is implied by a rising mound created by a succession of six superimposed cist graves, the earliest of which contained a mature woman (p 77). A second example of intensive burial begins immediately to the

Table 5.2.4
Starch analysis

Sample Number	Period	Size of granule	Shape of granule	Possible identification
Burial 144 [F98]	2	15.09µm (length), 17.46µm (width)	Round/slight oval	Barley
Burial 127 [F128]	2	13.82µm, 11.71µm	Round	Oat or wheat
Burial 127 [F128]	2	13.72µm (length), 11.02µm (width)	Round/slightly oval	Oat or wheat
Burial 127 [F128] (attached to above mentioned granule)	2	10.20µm (length), 9.45µm (width)	Round/slightly oval	Oat or wheat
Burial 149 [F117]	1	11.27µm, 11.83µm	Round/bell-shaped	Undetermined

north of this with Period 1 Burial 170. Eight males and three females were identified among the sixteen burials of Period 1, six of which were radiocarbon dated to AD 550–700 (Period 1). It is proposed in Chapter 4 that a series of ring ditches seen as parchmarks from the air in 1945 were barrows related to a theme of prehistoric burial that stretched from Balnabruach to Chapel Hill (Chapter 4, p 100).

A number of mounds were therefore visible to the Period 2 community, and one if not two were used as a focus for Period 2 burial parties, who were attracted to them. The only two women in the cemetery were buried side by side on, or in, the more northerly of these proposed barrows at the west end of the Sector 4 excavation area. Compared with its Period 1 predecessor, the Period 2 cemetery is tightly packed and well ordered, and overwhelmingly male. It remains possible that there is a women's burial ground elsewhere, as inferred at Inchmarnock (Lowe 2008, 257; cf O'Sullivan J 1994, 359–60). A degree of segregation was implied at Hartlepool where there was a male cemetery group adjacent to St Hilda's church (Groups A & D) which included graves edged with pebbles, and there was also a high-status burial ground with pre-monastic roots at the tip of the peninsula where women's graves were unequivocally marked with their names (Loveluck in Daniels 2007: 205). Nevertheless the space of the Period 2 burial ground is confined (see above, p 109). The location of the two Period 2 women at Portmahomack would conform to a model whereby the monastic cemetery grew from an existing burial ground, in which earlier loyalties were exercised.

Period 2, from 700, excludes cist burials, but sees the first of the burials with small slabs. The majority are head slabs placed beside the head (head support) or beside and over the head (head-box), while others are body slabs, placed in the grave beside the body. It is not excluded that some head-support burials represent examples of disturbed head-boxes with the facial stone missing. Other aspects of the Period 2 cemetery also mark a new sense of order and control: the use of grave markers and the respect accorded to previous interments by those that followed. The shift to graves in rows, and to strict W–E orientation in the eighth to ninth century is another sign of spatial control, also paralleled at the Isle of May and Whithorn (Maldonado 2011, 227). Although there are few burials that can be directly dated after 800, we have argued for seventeen, six with radiocarbon dates, that should have run into the ninth, tenth or eleventh century, if with diminishing intensity.

The head-box burial rite is thus associated with better mortuary management in a more institutional Christian context, and may have originated with the early monastic project (Hadley 2002, 214; Maldonado 2011, 102). One explanation offered for the rite is that the stones are designed to steady the gaze of the head and so give greater emphasis to an expectation of salvation (Thompson 2004, 117–26). The idea that the corpse is making some kind of ingenious exegetical statement is also supported by Maldonado (2011, 202–3). More cultural and referential explanations might be preferred. Since so many attributes of Late Iron Age and Early Medieval ritual practice have their roots in the prehistoric past, real or perceived, it behoves us to at least put the small slab to the same test (James 1992, 102; Carver 2009a; Maldonado 2011: 260). In this respect it is worth noting that the

use of small stone slabs in various guises is very widespread in Britain and known in Europe, even if the contexts in which they were employed are diverse. Burials from 100 locations in Wales have shown a variety in grave structure, from single markers to stones with plank lining to the rare stone-lined cists to the 'head-cists' at Capel Maelog, all seen as 'confined to Christian practice' (Longley 2009, 108–11, 126). Practice in Aquitaine also includes coffins with stone supports, cists and stone coffins, the two latter being eighth-century preferences (Colardelle 1996, 294–5). At Castelseprio (Province of Varese, Italy), head-slab and side-slab burials followed the installation of a massive ninth-century founder grave of mortared stone with a sword carved in relief in the stone slab top, and were seen as retrospective references to its stone lining (Carver 1987).

Confining ourselves to Britain, there are numerous variations on this theme of small stone inserts, related to the culturally British parts of the island in the fourth to seventh century, even where the full cist burials are rare. The cemetery of Wasperton in Warwickshire proved particularly useful in this respect in that it was completely excavated, ran from the third to the seventh century and included culturally Roman, culturally British, culturally Saxon, culturally Anglian and seventh-century Anglo-British burials in the same cemetery. Those designated culturally British were orientated W–E and contained stones and sometimes traces of planks (Carver et al 2009). The rite appeared in the fifth-century sub-Roman phase, and continued into the seventh century, many of the examples occurring within one corner of the cemetery enclosure into which no other type of burial penetrated. The burial rite was apparently professed by one group throughout the whole period of 400 years, so making the case not only for a familial or religious group but for the survival of specific long-term loyalties, allowed in this case by the absence of an authority to impose orthodoxy.

The parallels cited at Wasperton were mainly drawn from Wales and the West Country, the homelands (according to stable isotopes) of several of the individuals buried in this way. The late and sub-Roman phases at the cemetery at Cannington, Somerset, offer good examples. Here, 'a significant number (thirty) of the graves had some blocks apparently deliberately placed within the graves, in one case a complete surround, in five by the head and in two under the head'. FT26 (409) had a stone capping and could be considered 'analogous to the cist graves of the Early Christian west and north' (Rahtz et al 2000, 410). 'Stone used in these ways seems to be a late phenomenon, in the late fourth century or later and is proposed as a Christian attribute by Woodward' (ibid, 417; citing Clarke 1979, 355–6). At Lankhills, Winchester, Clarke (1979, 143) pointed to thirty-eight graves where flints or tiles had been deliberately placed, from blocks all the way round (G284) to token placements by head, shoulder and hips (G296) 'almost all of them [thirty-eight] belonging to the period after *c* 370' (ibid, 428). Clarke preferred a ritual explanation, seeing the stone inclusions as a reference to the Tomb of Joseph of Arimathea given to Christ, which was 'hewn out of rock' (Matthew 27:60) (ibid, 428). In their study of Llandough, Holbrook and Thomas demonstrate how rough stone inclusions characterise late Roman and post-Roman cemeteries in the south-west of Britain (Holbrook & Thomas 2005, Table 4, p 19).

The head-box/body-slab rite, like the long cist, can thus be seen as having deeper prehistoric and Roman roots. However, specific early medieval communities could potentially draw on a broad repertoire. At Thornybank, Midlothian, among over 100 burials belonging to the mid-first millennium, there were long cists, pebble-lined infant burials, log coffins, two square-ditched graves and a four-poster. The majority of thirty radiocarbon dates centre on 230–680. In the neighbourhood was a pit alignment, ring groove and Bronze Age rectilinear enclosure (Rees 2002). At the Hirsell, where the stones added to the eleventh- to fifteenth-century graves were distinguished from those in natural deposits, there were quartz pebbles in children's graves, some head sets, slab pillows and covering of legs (Cramp 2014, 100, 134). Head-support burials are also found in cemeteries dated eighth–eleventh century in Yorkshire and Lincolnshire, where their use was found to be unrelated to the sex of the deceased (Buckberry 2007, 122). At Barton-upon-Humber token head-support stones were employed in fifty-four burials, the majority within coffins. The earliest identifiable burials in the cemetery were radio-carbon dated AD 975–1010 (Rodwell 2011, 224–6, 234).

If the head-box rite was favoured by ecclesiastical and monastic communities in the eighth century, the practice also endured, as can be seen in Portmahomack's Period 3 where it continued to command allegiance into the ninth century, perhaps among the survivors of the Viking raid. Raided or not, the early ninth century is likely to have seen the break-up of the monastic estates, and the redistribution of their responsibilities and assets into small 'secular' church properties, in north-east Scotland, as in north-east England (Cramp 1980, 18; Carver 2001, 17–18). These hypothetical new centres may have professed the head-box rite as a statement of connection with the former establishments. At Balblair, Newhall Point, Ross, on the Black Isle, across the Cromarty Firth from Tarbat, there were fifty-eight excavated graves, including twenty-one with head-boxes, dating to the end of the first millennium (Reed 1995, 789; Maldonado 2011, 244). Although admittedly harder to see in casual discovery, finds of head-box and allied burials are rare elsewhere on the peninsula (Chapter 4, p 256). This suggests either that the eighth-century monastery had centralised burial at Portmahomack or that the head-box itself is indeed diagnostic of monasticism. On its own therefore, head-box burial is a helpful guide to early ecclesiastical sites, but tight dating and context will still be required to distinguish the monastic phase from what was to follow it.

Argument for a narrative

Burial would seem to have begun at the west end of the cemetery and lasted longest there. This was the most dense zone of burial, as well as the highest in altitude. It was in the western edge of the area examined that Period 1 cists had resulted in, or been topped by, hypothetical mounds, seemingly continuing to attract burial in Period 2 (p 109; and see Illus 5.2.1). The two female graves were also found here in association with the more northerly cluster.

Period 2 burial may have begun in a pre-existing cemetery of cist graves, using simple interment, but quickly introduced the head-box rite, identified in this context as a specific signal of organised Christianity (cf Maldonado 2011, above). Period 2 graves

were added in rows, which show a slight difference in orientation: those in the west and centre are orientated strictly W–E, while those at the east end are aligned ten degrees north of east. The heights of the skulls are slightly lower towards the east, but so is the ground. Longley notes that the orientation of early medieval graves in Wales is predominately ENE, although deciding this 'is not diagnostic' (2009, 126). In the case of Portmahomack, the ENE group at the east end is thought to be responding to a feature in the landscape. The skew east wall of the crypt, which is orientated nine degrees north from true east, offers the possibility that the alignment of the eastern graves is shared with a church building (see Chapter 5.4, p 109).

The narrative proposed is that the new community of the early eighth century began to bury in the pre-existing Period 1 cist cemetery, perhaps focused on known mortuary landmarks that survived as mounds. The alignment of the new burials, W–E, was already practised among some the burials of Period 1 (Burials 169, 170, 179, 180). Grave digging then spread eastwards in rows, within a demarcated area and employing grave markers. According to the isotopic ratios, those commemorated were well fed on a high-protein diet, ie meat, and avoided fish. The community, which is culturally Pictish according to the sculpture, identifies only three persons as local out of eleven measured for oxygen and strontium isotopes, although five others are from 'East Britain'. The reference to a British substrate in the burial practice is a theme that will be reprised in the next chapter about the stone carving. Surprisingly perhaps, two of the community were brought up in Scandinavia, although they were fully integrated into the Christian ritual and their deaths, before 780, are likely to have predated any raid. It would be unwise to assume that there was no traffic in the North Sea before the Vikings crossed it. At a given moment, the eastern rows began to align with their feet a few degrees north of east, implying the influence of a new ritual focus. Given the skew alignment of the east wall of the crypt, a possible candidate for such focus is a church building, which is thus a late arrival in the story of the cemetery. The latest stratified burials (Period 3) are those likely to have been interred after the fire that terminated the monastic phase in the neighbouring workshop. They are not numerous in the ninth century when the workshops revive under new management, and still less numerous in the two centuries after that (Chapter 6). It is not unlikely that the church, assuming there was one, would also have been a target in a raid that broke up some of the largest stone monuments.

The monastery recruited from a wide catchment area, as befits an ideological project, including just one westerner, five from elsewhere in eastern Britain, and two apparently of Scandinavian origin. The gravitational pull of the cist graves and the Late Iron Age cemetery that straggled along the crest of the hill was felt at the beginning and at the end of the century during which an idealistic community developed its monastic complex, introduced a new burial rite, erected stones large and small, built a church and, at the end, abandoned the experiment to begin again elsewhere. The sequence in the cemetery shows how intellectual allegiance can long endure at one level, even while it welcomes innovation at another.

5.3 Early Medieval Memorials

Introduction

Three groups of carved stones were recorded at Portmahomack. The first, and largest, consists of more than 250 pieces of sculpture that can be broadly dated to the sixth to ninth century (early medieval). The second group comprises a few pieces belonging to the eleventh to sixteenth century (medieval) which have been found in the church fabric or buried in the churchyard; and the third consists of gravestones still standing in the churchyard which can be assigned to the seventeenth to twentieth century (post-medieval). This chapter is devoted to the early medieval memorials, while those erected in the medieval and post-medieval periods are referred to in Chapter 7. These groups are not as disparate or irrelevant to each other as one might imagine, since they are all memorials and relate to people who were buried at Portmahomack over a period of 1,500 years. The differences and similarities observed between them thus throw into contrast the structures and motivations of the different communities that revered this place (Carver 2005b).

The early medieval sculpture from Portmahomack forms one of the most important assemblages brought to light in Pictish Scotland and is unique in that the great majority of the known pieces were recovered by archaeological excavation. The assemblage was nevertheless trailed throughout the nineteenth and twentieth century through chance discoveries made by gravediggers and antiquaries, and included the outstanding pieces TR1, the lower part of a cross-slab, and TR10, which carries a Latin inscription. Of more than 300 carved stone fragments recovered during the present campaign, about 230 carry identifiable features. Added to the thirty-four curated pieces known from before 1996, these together total 264. All are listed in the catalogue (Digest 5.1), with their context, dimensions and descriptions. A photograph of each piece will be found in the OLA 7.1.8.1. Table 5.3.1 shows the pieces assigned to their probable parent monuments.

Pictish sculpture has had a long tradition of art-historical study, demonstrating its wide web of contacts, its intellectual sophistication, and its exceptional contribution to insular and European creativity (eg Foster 1998; Henderson & Henderson 2004). The art of the new Tarbat collection has already attracted attention and resulted in valuable observations and insights (Henderson & Henderson 2004, *passim*; Meyer 2005; 2011).

The present opportunity is exceptional: the occasions when an assemblage of sculpture may be addressed primarily by designed archaeological research are extremely rare. Thus while the form, ornament and iconography of the assemblage forms part of this study, they are not the whole of it, and indeed the iconographic detail of the assemblage remains among its more elusive aspects. The approach taken here is to treat the 264 fragments as artefacts and interrogate them for their social, political and ideological meaning using archaeological procedures: namely, the recovery of the objects, their raw materials (p 137), their classification by shape and ornament (p 148), their association through shared features and refitting (p 159), the likely form of the monuments and their original position and purpose in the community (p 165). These studies have led us to propose a sculptural repertoire at Portmahomack that includes a number of simple grave markers

and a stone sarcophagus or grave cover originally displayed in the cemetery on the hill (where the church now stands), four major crosses situated at its boundaries, and embellishments that should relate to the fittings of a stone church, including parts of a probable shrine or *cancellum* and an architectural corbel. The monumental centre assembled at Portmahomack is put into its regional context by the other great standing cross-slabs, for which the Tarbat peninsula is renowned, at Nigg, Shandwick and Hilton of Cadboll (Chapter 5.10). Later in this book, a historical and intellectual context is proposed for this brief outburst of artistic brilliance at the north end of Christian Europe in the eighth century (Chapter 8).

Recovery

The earliest of the antiquarian visitors, Charles Cordiner in 1776, paid a visit to the monuments at Shandwick and Hilton, and was then escorted by ‘Mr M’Leod of Geanies’ to the Tarbat churchyard where he saw several fragments of ‘obelisks’, no less inferior but ‘shattered to pieces’ (Cordiner 1780, 66, 75; Illus 5.3.1). The pieces (belonging probably to TR2) were still there in 1845 when George Denoon, a Tarbat schoolmaster, reported that ‘fragments of what is said to have been a Danish cross’ were still to be seen scattered among the grass in the churchyard (Illus 5.3.2). At that time ‘a low, green mound adjoining the east gable of the church was pointed out as the site on which it [the Danish Cross] stood’ (NSA XIV, 461). It was a mound with an evil reputation: ‘There was a tradition that [victims of] the plague had been buried there’, wrote Hugh Miller, after visiting in the 1880s, ‘and so rooted was the aversion to disturbing it, that it was not until the late parish minister took a spade in hand and actually threw off his coat to dig *in propria persona* that the gravedigger could be induced to break into ground accursed by the presence of the plague’ (Miller Jr 1889, 442; NMR no NH98SW0014).

Although not necessarily seen by Cordiner, and not mentioned by the Rev D Campbell (the minister who wrote the *New Statistical Account* for Tarbat), a quite separate piece of sculpture was already in the churchyard in the early nineteenth century, since it had been removed from there to Invergordon Castle by the time Stuart drew it, before 1856 (Stuart 1856, plate xxx). It had been situated further to the east of the green mound and consisted of the wreckage of another great cross-slab, fallen and broken into two. The Ordnance Survey (1907) marked it east of the church and east of the ‘Danish Cross’ at NH 9151 8402. The larger piece of this cross-slab is said to have been thrown into a grave and covered up (OS *Object Name Book* 1872), and thus should still lie buried near the Dingwall Memorial. It was the stump of the base, with a snapped-off tenon, that remained on the surface in the churchyard. Its ornamented face has an indeterminate figurative scene with a vine-scroll border, and along one side of the slab are four Pictish symbols carved in relief (TR1; Illus 5.3.3). The rear side has been defaced and smoothed, which might imply preparation for its reuse as a recumbent grave cover, as had been done with Hilton of Cadboll (see p 253). Two other smaller pieces were also retrieved from the grass at about this time: one was a stone boss in the form of a circle nearly a foot (300mm) across, shaped like a wreath and

PORTMAHOMACK ON TARBAT NESS

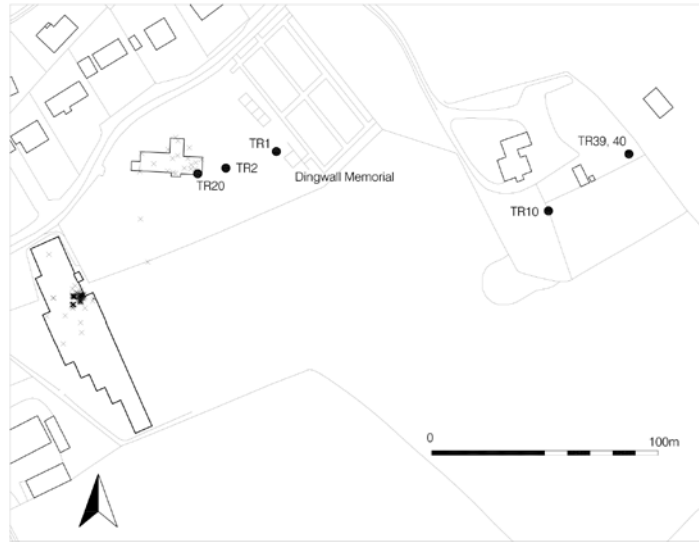


Illustration 5.3.1

Findspots of early sculpture inside and outside St Colman's Church

containing seven small bosses (TR5; Illus 5.3.4). Another was a triangular fragment of sandstone ornamented with a geometric fretwork in sharp relief (TR8; Illus 5.3.5). Mr Macleod, the occupant of Invergordon Castle, displayed the Hilton slab and Portmahomack's TR1 side by side in his garden. The smaller pieces were arranged in a room in the tower or stacked near the door with geological specimens.

New discoveries followed in the later nineteenth century. Sometime in the 1880s a Mr William Mackay retrieved a carved boss from 6–7ft down in the burial place of Ross of North Balkeith (TR6; Illus 5.3.4). The same gravedigger dug up and retained a fragment of sculpture 'about four yards from the east gable of the church in the burial place of Roderick Bain of North Tarrel' (this is the exquisite TR7; Illus 5.3.4). Miller noted that it was freshly 'broken off by wanton violence' and suggests that it had long lain buried. Allen and Anderson (1903, II, 92, no. 7) say it was found 'four yards from the west gable' (ie in the Macleod enclosure) but Roderick Bain's grave is four yards south of the east gable, so Miller was right. When Hugh Miller Jr visited in the 1880s, both these pieces were on the windowsill at the west end of St Colman's Church, and he arranged for them to be donated to the National Museum of Antiquities of Scotland in Edinburgh (Miller Jr 1889, 435).

A most significant addition to the early chance finds was soon afterwards noticed in the coursing of the garden wall of the Portmahomack manse, a quarter of a mile from St Colman's Church, where it was spotted by the Rev Dr J M Joass of Golspie, curator of the Duke of Sutherland's museum at Dunrobin (TR10; Illus 5.3.6). It carried a Latin inscription in insular majuscules, resembling those used in the gospel books of Northumbria (the Lindisfarne Gospels) or Iona (the Book of Kells), but executed in relief (Higgitt 1982). This is one of only a handful of possible Latin inscriptions so far found on Pictish monuments. Those at Fordoun, Dupplin and St Vigeans are thought to commemorate kings or clerics (Henderson & Henderson 2004, 170, 190). TR10

will be shown to belong to a large cross-slab (Cross C) with an apostolic theme celebrating an unidentified, but probably saintly person (p 157).

The discovery of TR10 had already been made when, at the turn of the century, J Romilly Allen and Joseph Anderson visited the Tarbat peninsula. They saw the re-erected Nigg stone outside the vestry of its church overlooking a steep slope and dripped on by the rain; Shandwick stood in a field overlooking the firth and Hilton was at Invergordon Castle. In their survey (published 1903), Allen and Anderson numbered ten fragments or sets of fragments as originating from 'Tarbat' – meaning Tarbat Old Church at Portmahomack (ECMS III, 88–95). Seven of these were at Invergordon Castle, two already in the National Museum and one still in St Colman's Church. A visit of the Inverness Scientific Society in 1903 confirmed a similar tally and recorded the opinion that the churchyard at Portmahomack 'contained at one time three sculptured stones of the Columban period', an opinion repeated in the *Third Statistical Account* of 1957: 'The churchyard has also yielded fragments of three Celtic crosses of the finest type, made of the warm yellow sandstone from the tall coast cliffs near Rockfield, and from other places and caves round the coast'. The three crosses were presumably implied by the largest pieces, that is TR1, TR2 and TR10.

Only a few carved stone fragments came to light during the ninety years following 1903, and the recording of their provenance was poor. One fragment (TR11) described as a 'small boss richly fretted like a knot of young adders interlaced' had been seen by Miller (1889) at Invergordon, but did not materialise in the National Museum, and must be assumed lost (unless this is a fanciful description of TR6). A new find was reported from St Colman's by D J Ross, merchant, of Portmahomack and given to the NMS in 1927 (TR12; Illus 5.3.7). Another was found while digging a grave at a depth of six feet: the greater part of the slab it belongs to remains in the grave, under the coffin, but no lover of art or archaeology was on hand to say where this grave might be (TR13; PSAS 73 (1939), 333; this stone was passed to the National Museum in 1939; Illus 5.3.7). Another was seen in the churchyard briefly by James Ritchie in 1914 before it was destroyed (Ritchie 1915; TR15; Illus 5.3.8). A piece bearing a tight form of interlace was noted in the relieving arch of the west tower by the Royal Commission of Ancient and Historical Monuments investigator recording the church in 1956 (TR14; Illus 5.3.8).

In the course of the twentieth century, the Invergordon collection of sculptural trophies was gradually transferred through the good offices of the Macleod family to the National Museum in Edinburgh: the Hilton slab and TR1 together in 1921 by Captain R W Macleod (PSAS 56 (1922), 63) and nine further fragments by Lt Col R B Macleod of Cadboll in 1956 (PSAS 87 (1956), 239; TR2, 2a–c, 4, 5, 8, 9,10). In 1991, the Tarbat Historic Trust began its campaign to restore the church of St Colman, and cleared the crypt under the supervision of archaeologist Jill Harden, during which exercise two more pieces of sculpture came to light (TR17, 18; Illus 5.3.8). During the attention raised by the 1994 campaign David Henry spotted a cross in the churchyard wall (TR19), and a stone post in use as a recent grave marker (TR27), both of which were removed and placed in the care of the Tarbat Historic Trust (Illus 5.3.9; 5.3.10).

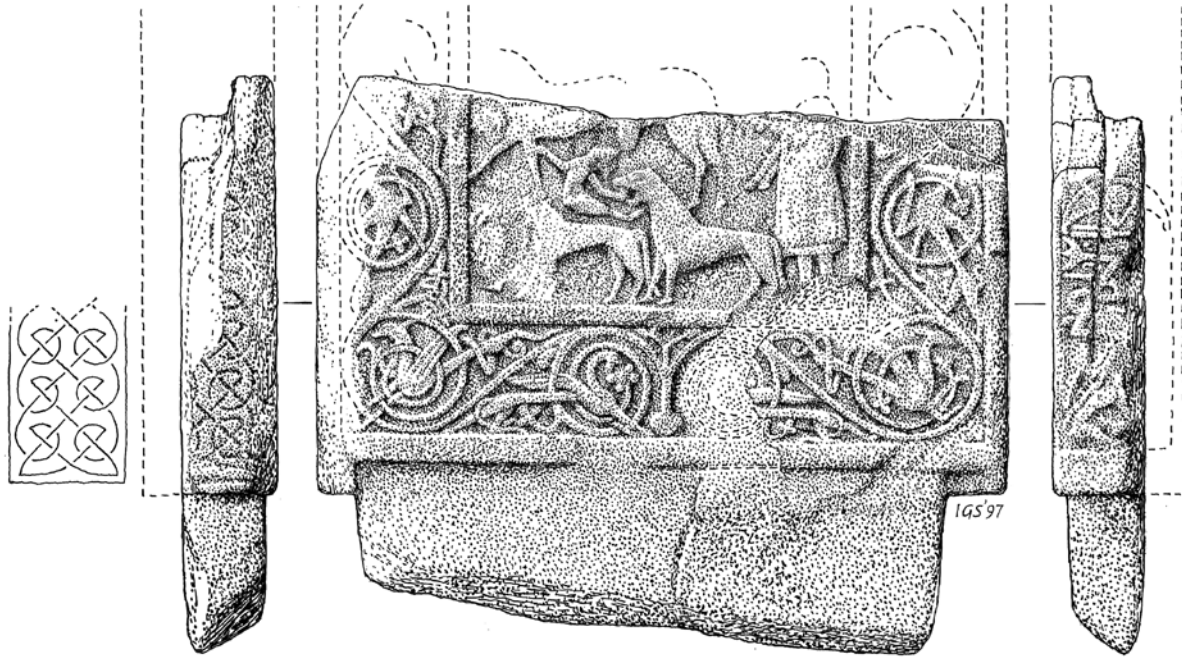


Illustration 5.3.2

Cross-slab base TR1 (650×1100×150mm), showing the ornament on the sides. The back is shaved of ornament



Illustration 5.3.3

Cross-slab panel TR2; the largest piece (2b) is 490×470×50mm



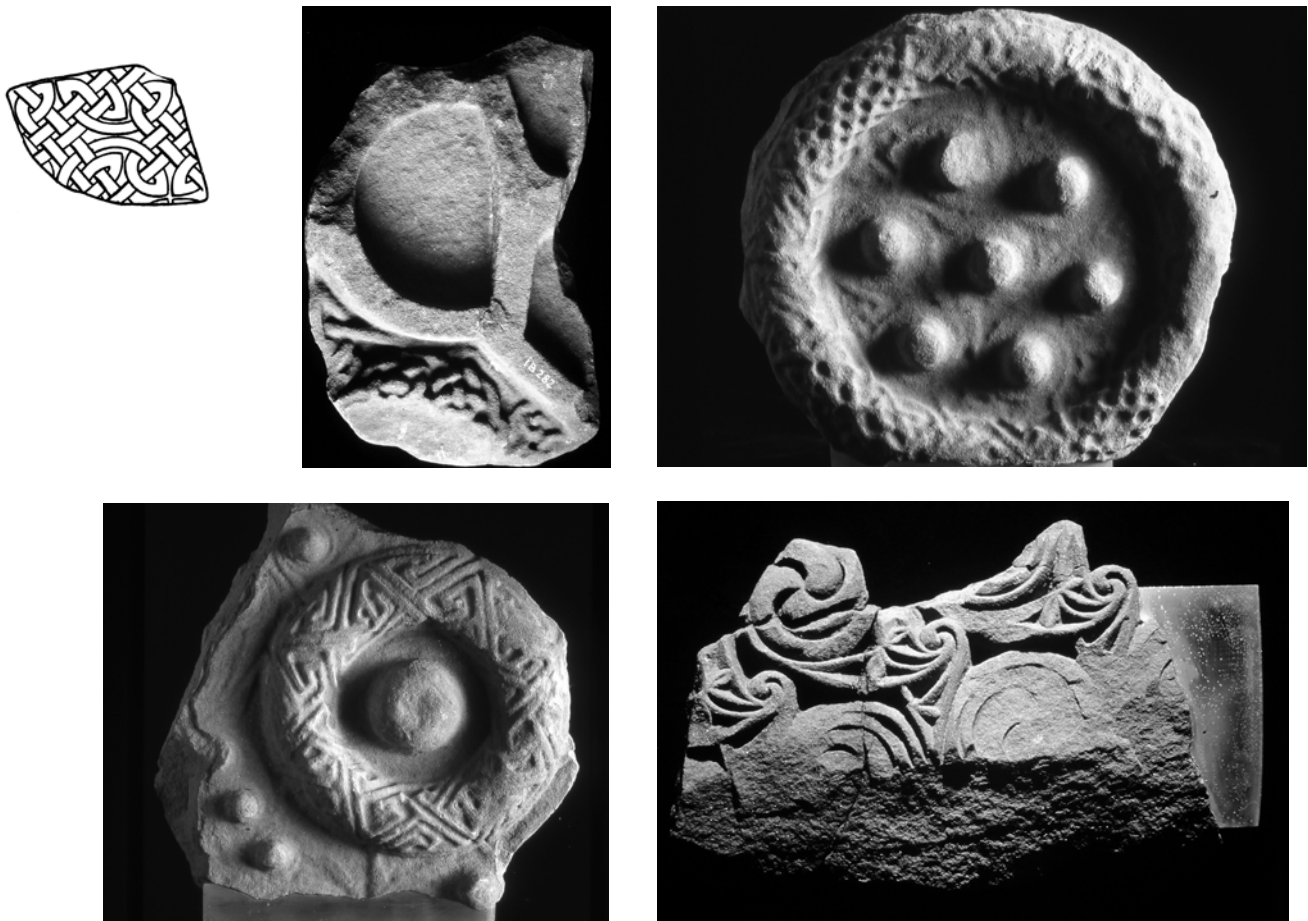


Illustration 5.3.4

From top left: Interlace fragment TR3 (150 x 90 x 50mm) (ECMS II, 90); cross armpit TR4 (270x190x35mm); boss TR5 (310 in diameter, 55mm thick), boss TR6 (340x300x40mm); fragment TR7 (240x175x15mm)

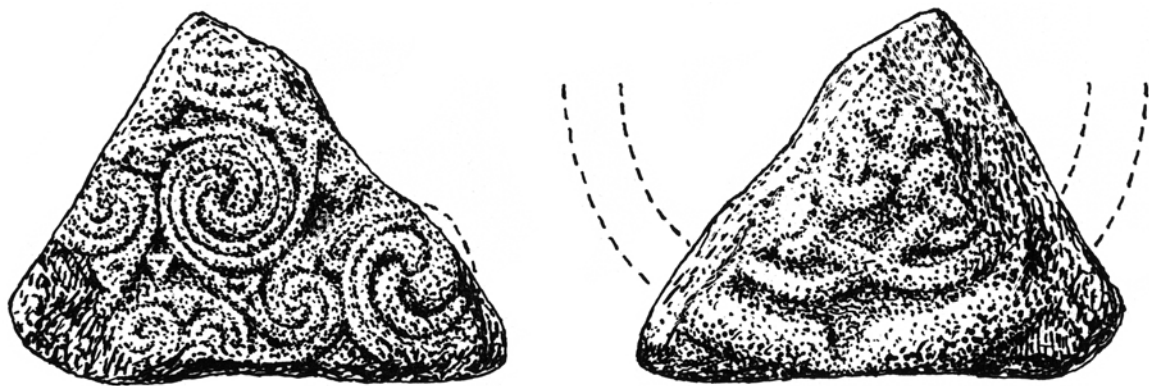
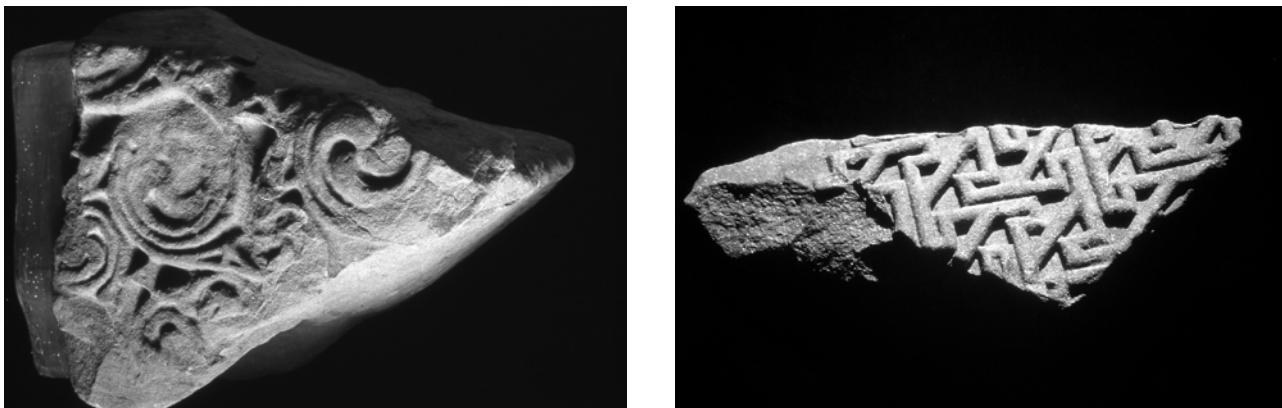


Illustration 5.3.5

Top right key pattern panel TR8 (250x160x60mm); remainder a central panel TR9 (220x180x190mm)



Illustration 5.3.6

Inscribed edge piece TR10 (470×310×170mm). The inscription is carried on the side of the monument and the triangular panel is on the orthogonal front face where it forms part of the cross (see TR20). For inscription see text, p 157

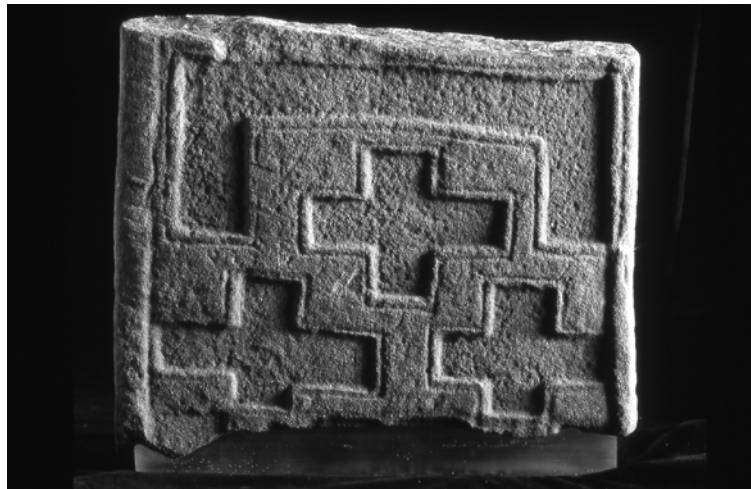


Illustration 5.3.7

TR12, with cockrel and fox (170×190×40mm); TR13, fragment of *cancellum* or shrine (430×350×80mm)

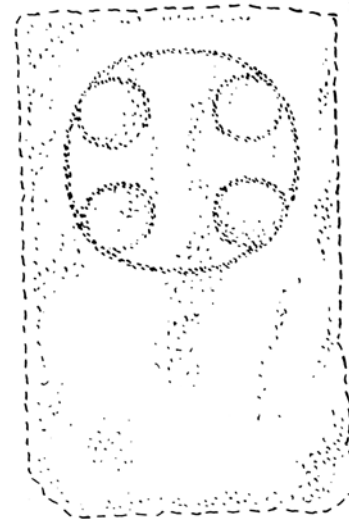


Illustration 5.3.8

TR14 interlace panel remains in situ in the west end of St Colman's Church (210×160mm); grave marker TR15 (c 1000×600×175mm) now lost; from the crypt clearance, 1991 – TR17, fragment of shrine panel (215×190×25mm); decorated fragment TR18 (82×111×72mm)



Illustration 5.3.9

Grave marker TR19, and its location in the churchyard wall (340×126×80mm)

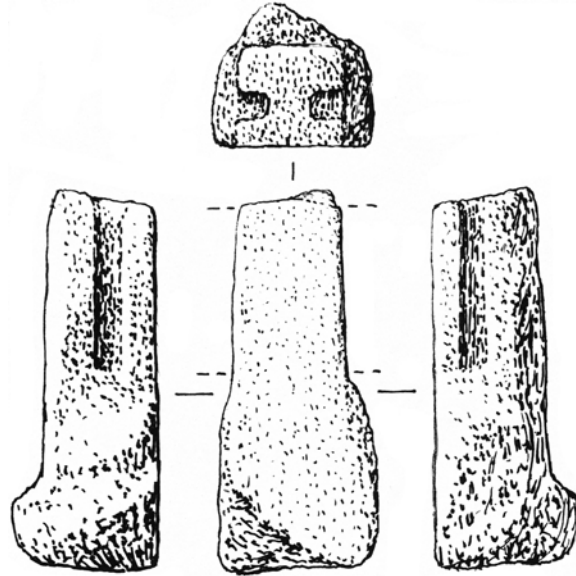
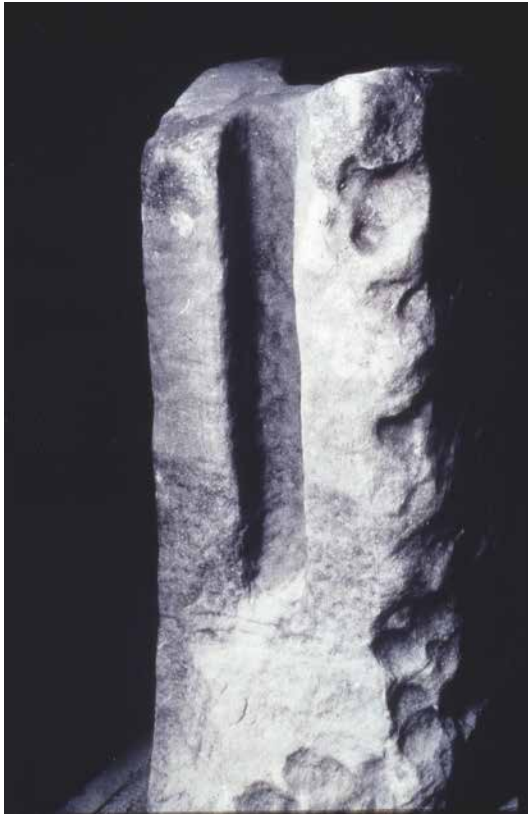


Illustration 5.3.10

Grooved stone post TR27 (560×150×140mm). The grooves are 40 to 50mm wide and 40mm deep. (Below) Stone shrine corner posts from St Ninian's Isle, Shetland (Small et al 1973, plate VII). The grooves are about 2.5ins (60mm) wide
© University of Aberdeen



Illustration 5.3.11

Discovery of the 'Apostle Stone' (TR20) incorporated into the medieval crypt vault

PORTMAHOMACK ON TARBAT NESS

After formal investigations began in the church in 1996, several early medieval carved stones were seen in the fabric or were exposed during excavation or clearance (Illus 5.3.12). TR 20 ‘The Apostle Stone’ was located in the south wall of the vault of the crypt, extracted in 1997, and replaced by a time capsule deposited by local schoolchildren (Illus 5.3.11, 5.3.13). Grave marker TR21 and the ‘Boar Stone’ (sarcophagus lid TR22) were found in the foundations of the north wall of the medieval church (Illus 5.3.14, 15, 16). Grave markers TR30, 31 and 33 were found in the foundations of the south wall of the medieval church and TR29 in the west wall of the crypt (Illus 5.3.17). A fragment (TR32) was recovered from rubble infill beneath the supporting arch of the belfry (Illus 5.3.17). Grave marker TR34 was found beneath the stair to the Laird’s Loft during the restoration. Two further pieces belonging to the Portmahomack assemblage were recovered by Richard Blossie while building a wall at Seafield from stones recycled from a barn demolished at Portmahomack manse (TR39, 40; Illus 5.3.1; Illus 5.3.18).

The remaining 230 pieces were all recovered during formal archaeological excavations in the Glebe Field on the south-west side of the churchyard (Sector 2). A small residual piece had reached medieval layers (TR23) and was recovered first. The ‘Calf Stone’ (TR28, 35) was the first large piece to be found: it had been

reused to line a culvert serving the post-monastic community in Period 3 (Illus 5.3.19). The remainder, that is the vast majority, were stratified in layers placed by multiple dates at the end of Period 2 and the beginning of Period 3 (Illus 5.3.20). These layers are modelled by radiocarbon dating to have been deposited after 780 and before 810 (Chapter 3, p 259). The sculpture, freshly carved, should lie within the eighth century, although stylistic parallels offer some support for an early ninth-century date for the latest products at Portmahomack.

The Glebe Field pieces were generally very fresh, but had been broken up with a heavy tool into pieces that were mainly fist sized. They were dumped over the burnt-out workshops, in the eastern ditches of the road S13 and into the pool (Illus 5.3.21). The disused Period 1 wicker-lined well (F527), dug into running sand, subsided during the following centuries, ingesting material from the later pool, notably a large fragment of sculpture (p 141; TR227/260).

The overall distribution of the assemblage shows that the monuments were focused on the hill that now carries St Colman’s Church, even if some had been subsequently dispersed. It can be reliably surmised that an assemblage several times greater than that already recovered still lies beneath the ground in the churchyard, and in the Glebe Field south of it, areas now under

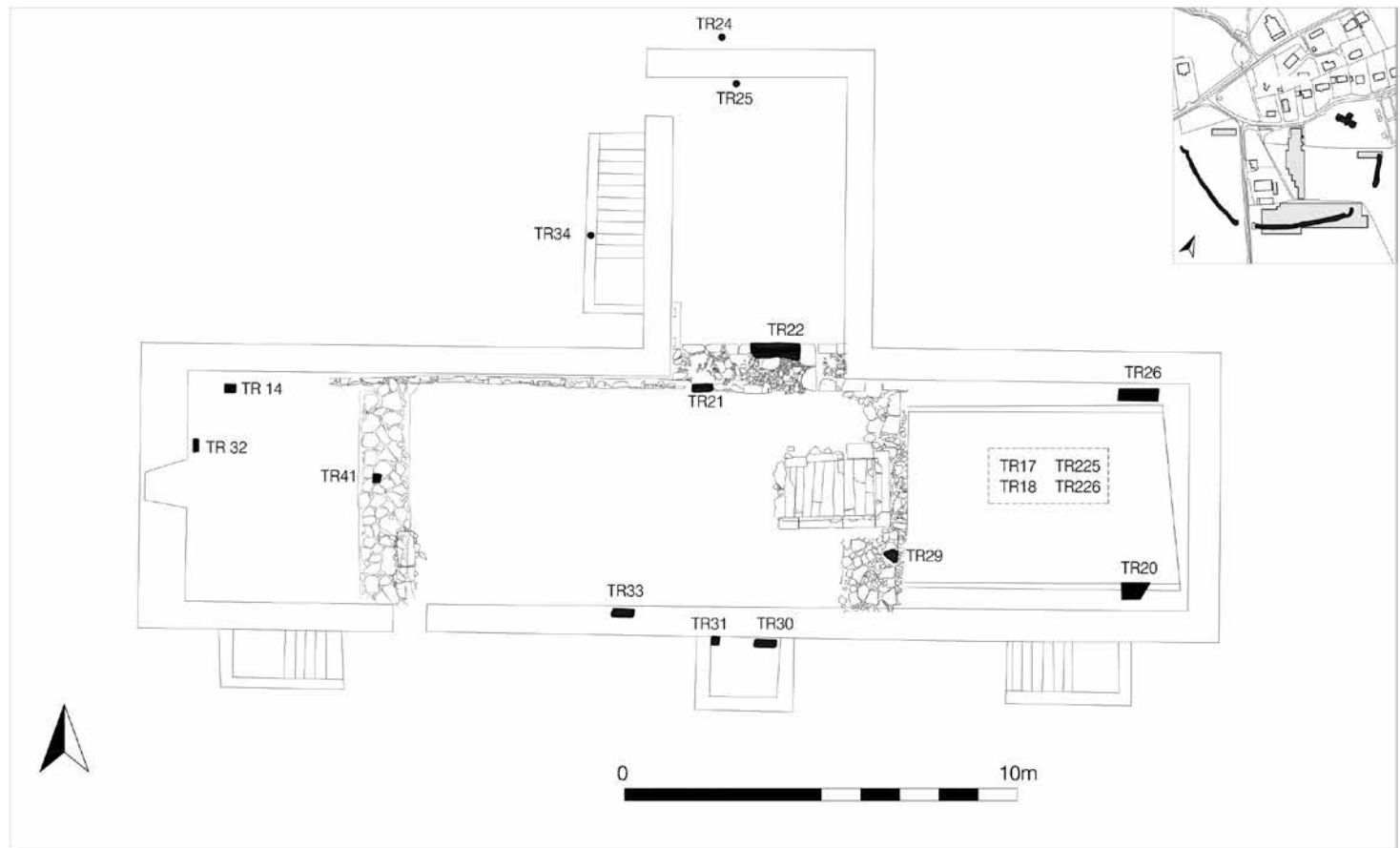


Illustration 5.3.12
Findspots of sculpture inside the church



Illustration 5.3.13

The 'Apostle Stone' or 'Dragon Stone', a large cross-slab piece TR20, found in the crypt vault (710×410×178mm)



Illustration 5.3.14

Pictish sculpture reused in the foundations of the twelfth-century church (Church 2). Grave marker TR21; Sarcophagus lid TR22

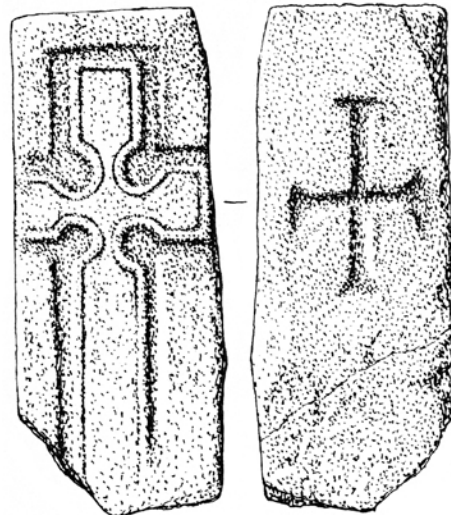


Illustration 5.3.15

Grave marker TR21 (510×510×45mm)

PORTMAHOMACK ON TARBAT NESS

(a)



(b)



(c)



(d)



(e)

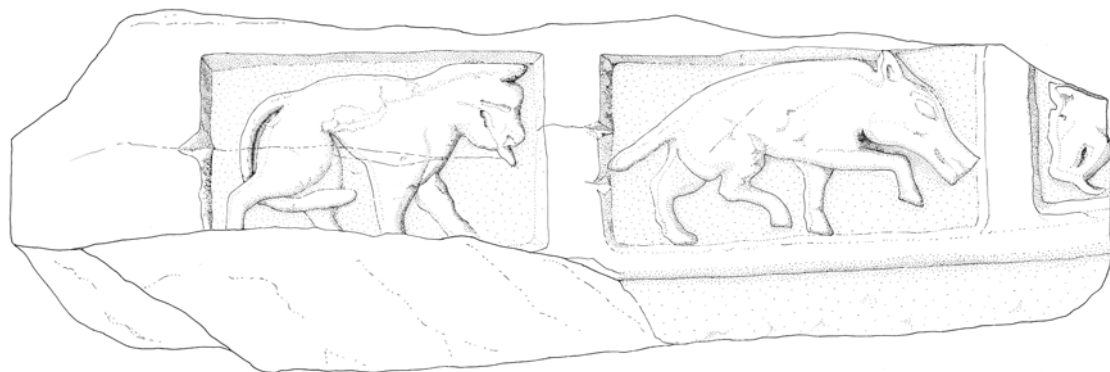


Illustration 5.3.16
Sarcophagus lid TR22 (1065 × 460 × 230). (a) Cross at short end; (b) three-quarter view; (c) detail of boar panel; (d) side view; (e) drawing

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



Illustration 5.3.17

Sculpture from the medieval fabric of St Colman's Church.
(left) TR29 in situ (325 × 325 × 72mm); (right) TR32 (140 × 90 × 60mm)

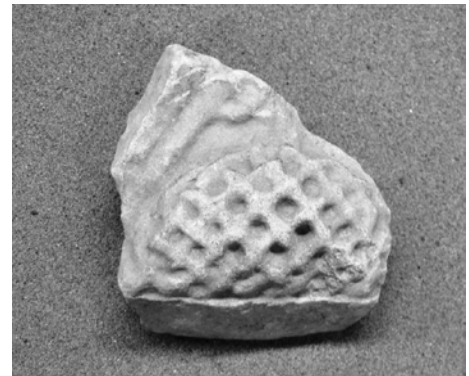


Illustration 5.3.18

Block retrieved from the manse steading beyond the churchyard by Richard Blosse; both faces (TR40; 370 × 270 × 190mm). Fragment of boss, also found by Richard Blosse (TR39)



Illustration 5.3.19
Discovery of the 'Calf Stone' (TR28) in the Glebe Field (Sector 2)

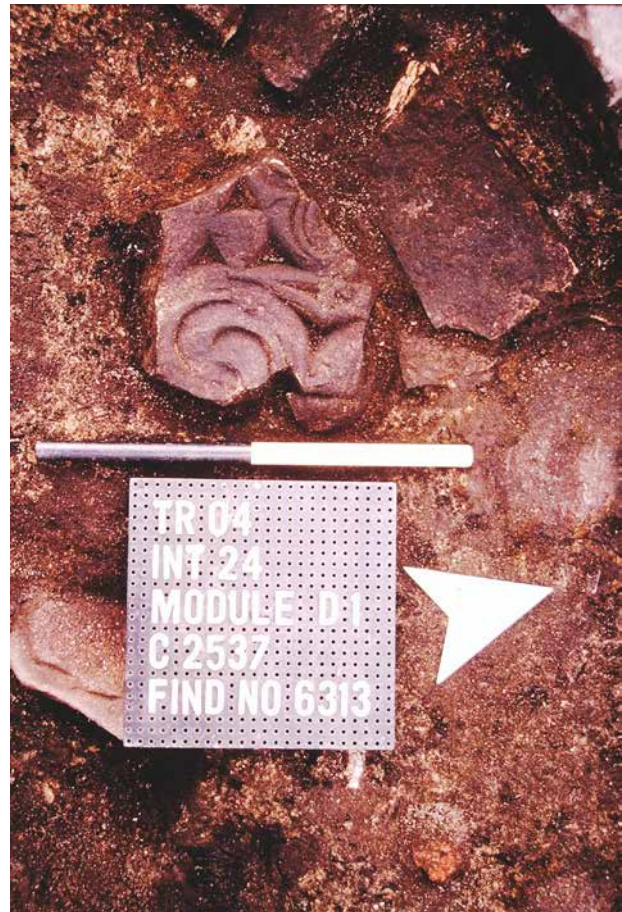


Illustration 5.3.20
Carved stone fragments exposed over the primary burning layer in the Glebe Field (Sector 2)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

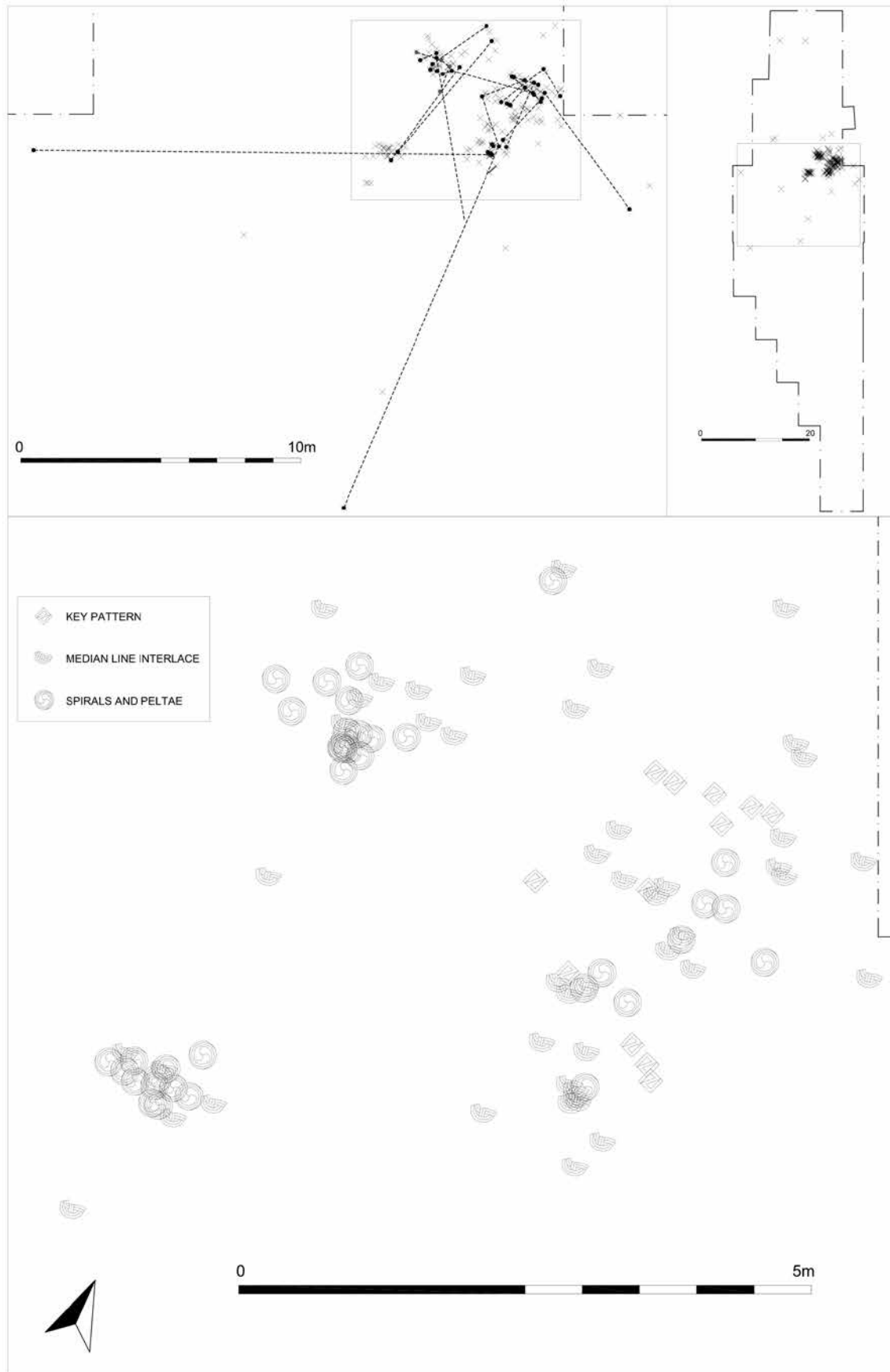


Illustration 5.3.21
Distribution of ornamental fragments in Sector 2, Int 14–24, showing cross-joins

PORTMAHOMACK ON TARBAT NESS



Illustration 5.3.22

Refitting fragments in the Scottish National Portrait Gallery, Queen Street, Edinburgh



Illustration 5.3.23

Mason/sculptor Barry Grove (left) making the first of the Tarbat replicas (TR1) observed by Raymond Lamb

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

state protection (Chapter 2, p 18). The stratified group still retained some of its associations, in that pieces with similar ornament or borders appeared to have been deposited close to each other. This was endorsed in many cases by the fact that fragments could be conjoined. Precise recording of each piece in the ground, followed by refitting (Illus 5.3.22), offered an opportunity to study a very varied set of artefacts in an unusually direct manner.

Raw materials

Drawing on research by Barry Grove and Nigel Ruckley

The stone used for sculpture and building was examined with a view to matching the pieces and determining their provenance. The geology of the region and the likely quarries used were reviewed by Nigel Ruckley (Digest 6.9; OLA 7.5.1). Our conclusions profited from the experienced opinion of Barry Grove, the sculptor and mason we recruited to make replicas of TR1 and, later, the Hilton of Cadboll cross-slab (Illus 5.3.23).

The nineteenth-century local scholar Hugh Miller had already undertaken a geological examination of the pieces of sculpture he encountered, and it is instructive to recall his views. In 1889 he observed that TR6 and 8 were cut from 'pale olive-green sandstone speckled with mica – a stone similar to certain tough flags associated with the shale and fish-beds of the [Middle] Old Red Sandstone on the southern side of the peninsula, chiefly near Geanies' (Illus 5.3.24). Petrologically, he found TR6 'to be identical with both of the two fragments figured by Stuart' (ie TR1 and TR 2). He felt that the fragments he saw were worn and may have derived from a cross that had met the same fate as the Ruthwell cross, which was broken up in compliance with the ecclesiastical edict of 1642 and had lain in Ruthwell churchyard for a century. TR7 was cut from 'the warm yellow sandstone of the tall coastal cliffs near Rockfield village, and of the secluded cliff-bound site, marked "Hermitage" on the OS map, known among older people as the temple or Teampull'. Shandwick, Hilton and TR6 and 8 are of greenish stone. Miller found another stone in the base or pedestal of the Shandwick stone which had anthropomorphic ornament and was of 'warm reddish stone different from all the others' (1889, 441).

The petrological verdict one hundred years later was that TR10 (the

inscription) and TR20 (the Apostle Stone) could have come from the same geological formation. The two stone bosses, TR6 and TR5 were seen to have affinities with TR2. The small fragment that carried deep-cut peltaic ornament (TR7) was not thought to have a geological match to TR20. A group of stones, defined by the presence of iron blebs or of Liesegang rings, include the finest of the Tarbat sculptures (TR1, TR10 and TR20), as well as the other monumental stones sited elsewhere on the Tarbat peninsula: Nigg, Shandwick and Hilton of Cadboll (this also applies to the chippings recovered at the Hilton chapel in 1998).

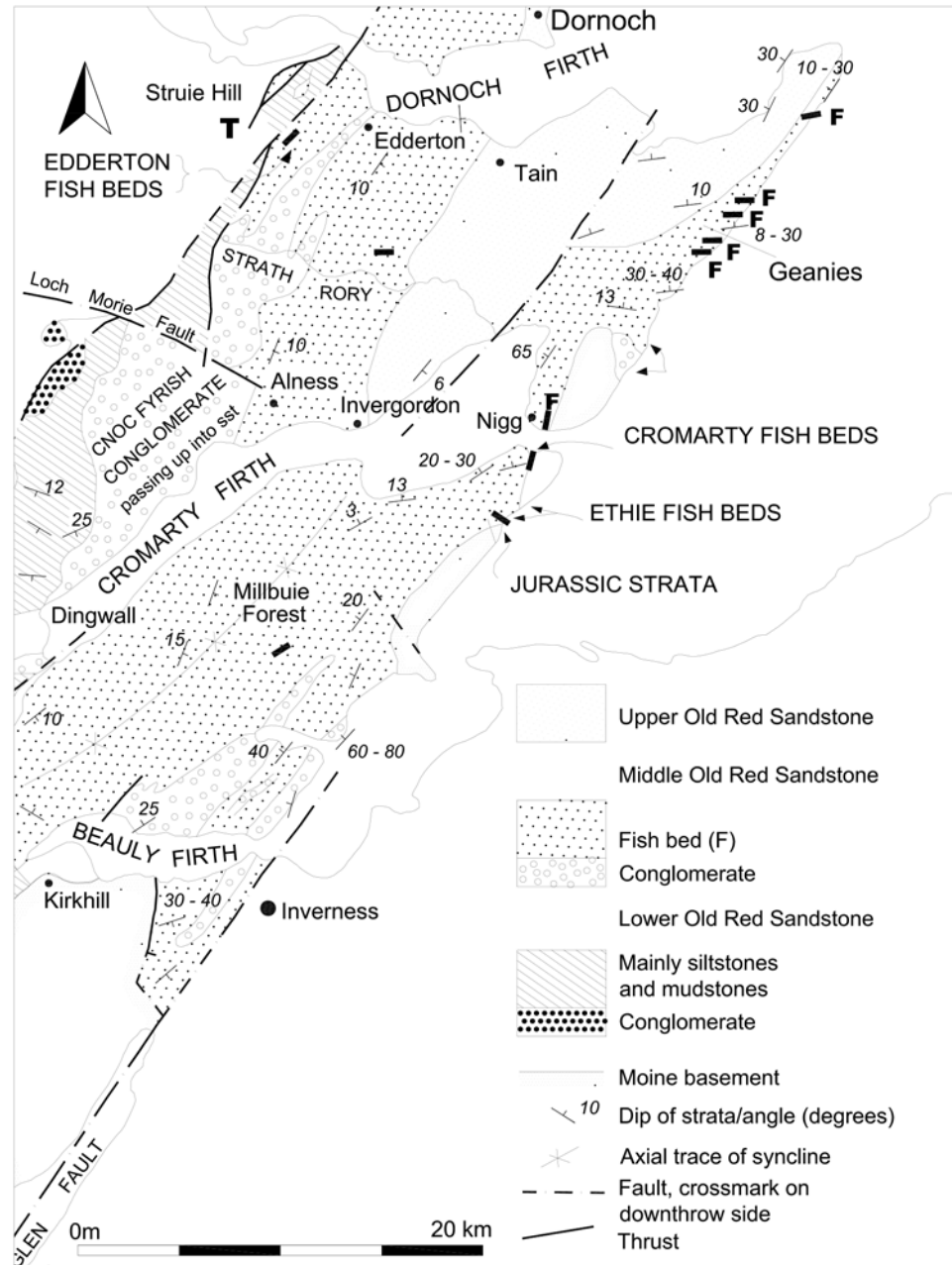


Illustration 5.3.24

Geological map of the Tarbat area, showing outcrops of Old Red Sandstone (ORS) and Middle Old Red Sandstone (MORS)

No rock exposures examined by Ruckley on the Tarbat peninsula showed the presence either of the iron blebs or the Liesegang rings, so the source for the major Tarbat monuments was thought to lie beyond the peninsula. However, the sculptor Barry Grove has affirmed that stone of this kind is present on the east side of the peninsula among the Middle Old Red Sandstone (MORS), particularly near Geanies, so endorsing Hugh Miller's verdict of a century ago. Neither the interlace panel TR2 nor the spiral piece TR7 match geologically with TR10 or 20 and thus are unlikely to have formed part of the same monument.

The panel TR2 has affinities with the bosses TR5 and 6, and these with Triassic deposits on the south side of the Moray Firth, so may have come from outside the peninsula. The grave marker TR21 is also probably imported. It is composed of clast-free colour-laminated fine-grained sandstone (see OLA 7.5 for technical description). Although the quarry at Shandwick has reddish laminated sandstones with mica-rich bedding planes, TR21 bore no resemblance to the range of stone in the quarry and does not seem to come from the Tarbat peninsula.

These results suggest that the Tarbat assemblage can be classified into at least four different stone fabrics. The largest and most important cross-slabs, including TR1, TR10/20 and those at Nigg, Shandwick and Hilton of Cadboll, are made of a fine sandstone likely to come from the MORS outcrops on the east coast of the peninsula, or, if not, a fine freestone from elsewhere. The two bosses TR5 and 6 and the panel TR2 come from another source, perhaps lying outside the peninsula (although Miller would include TR1 in this group). The small and portable grave marker TR21 seems to be exotic, and could have been pre-carved elsewhere. The Calf Stone TR28/35 is the only ornamental piece certainly carved from the coarse Upper Old Red Sandstone seen on the beach at Portmahomack itself.

There is little information about how the larger stone blocks were quarried and extracted, given that they would be up to a metre wide, 20cm thick and nearly 3m long (2700×990×210mm in the case of Shandwick). It may be supposed that the extraction and transport of stones to carve

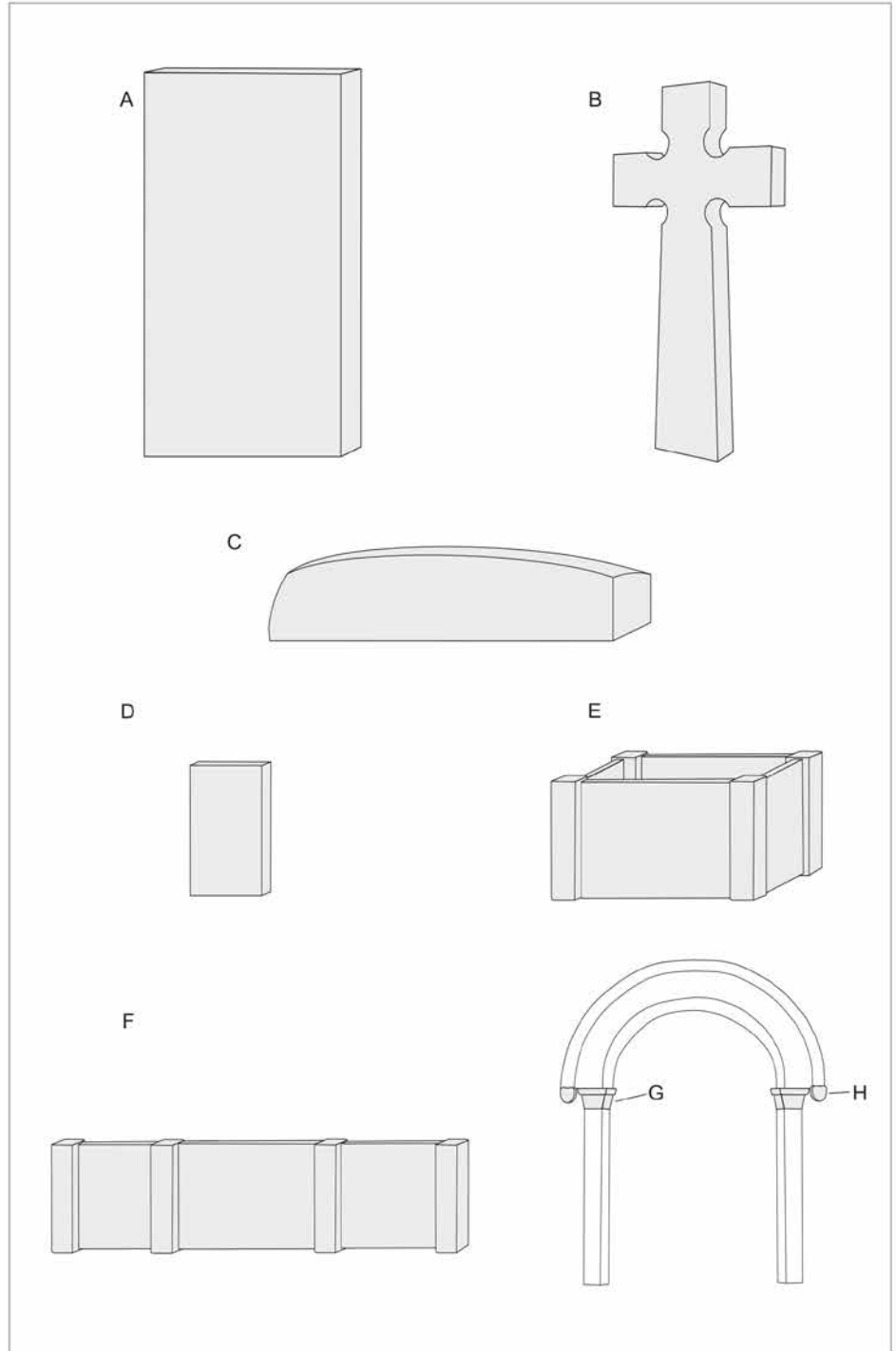


Illustration 5.3.25

Repertory of the principal forms at Portmahomack: (a) monumental cross-slab; (b) monumental cross-shaft; (c) sarcophagus; (d) grave markers; (e) panelled shrine; (f) *cancellum*; (g) corbel or impost; (h) label-stop

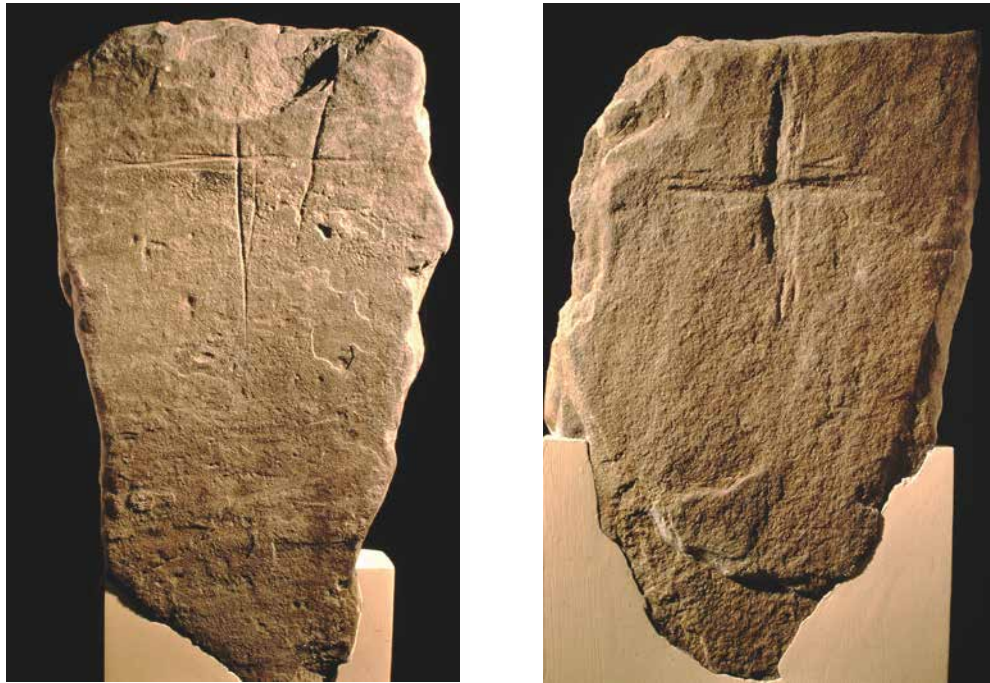


Illustration 5.3.26

Simple grave markers scratched with a cross: (left) TR24 (470×245×130mm); (right) TR25 (231×195×47mm)

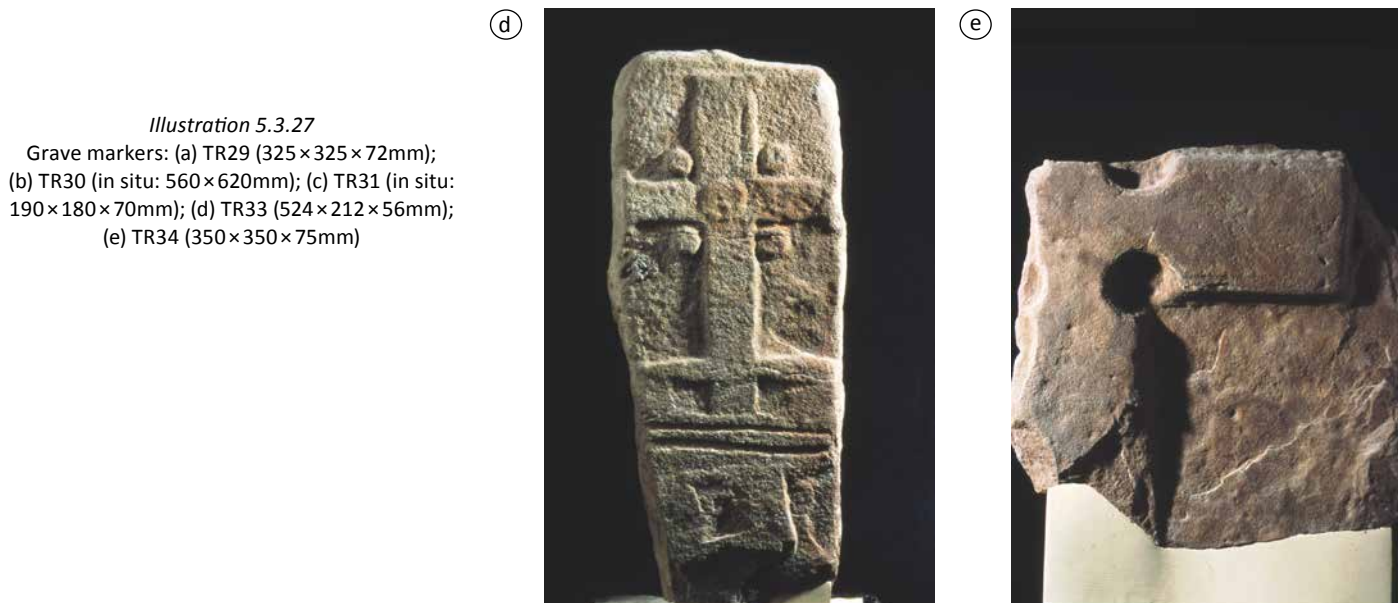
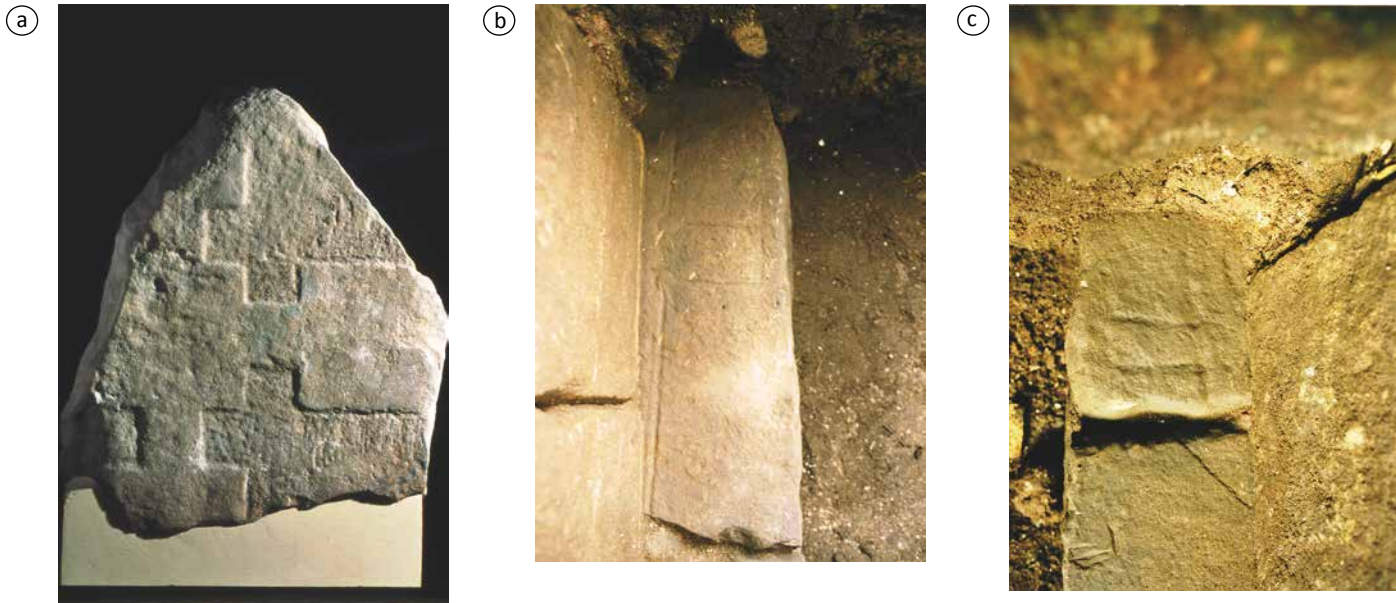
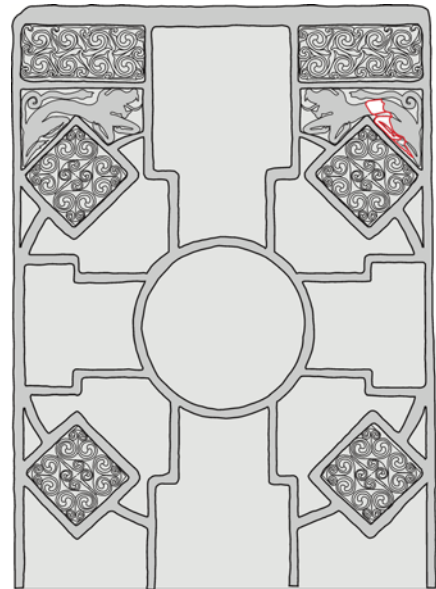
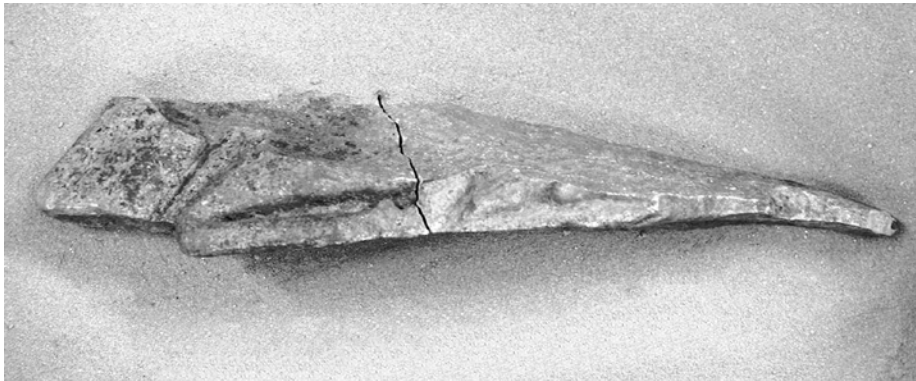


Illustration 5.3.27

Grave markers: (a) TR29 (325×325×72mm);
 (b) TR30 (in situ: 560×620mm); (c) TR31 (in situ:
 190×180×70mm); (d) TR33 (524×212×56mm);
 (e) TR34 (350×350×75mm)



Illustration 5.3.28
 Fragment with face of holy man, TR201 (124×45×28mm).
 Probably part of TR20



TR205

Illustration 5.3.29
 Fragment with animal leg, TR205 (285×80×35mm), showing its likely position on TR20



Illustration 5.3.30
 Bird head in panel, TR218 (150×70×150mm)

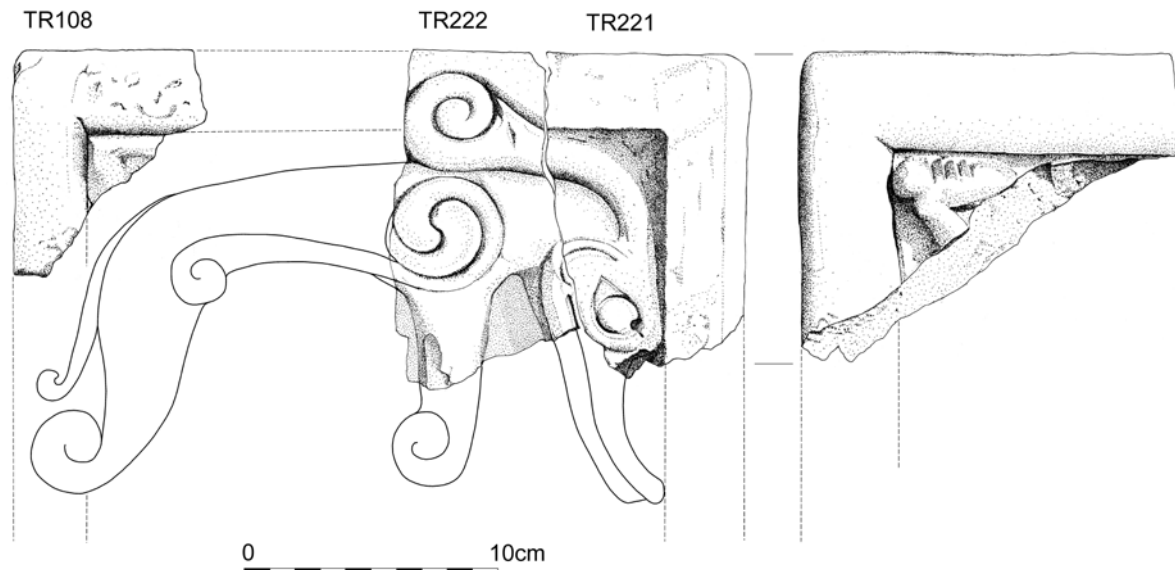


Illustration 5.3.31

Conjoining panels TR221/222, with the form of the Pictish beast reconstructed. TR221 measures 147×121×98mm. With related corner piece TR108 (90×75×55mm)

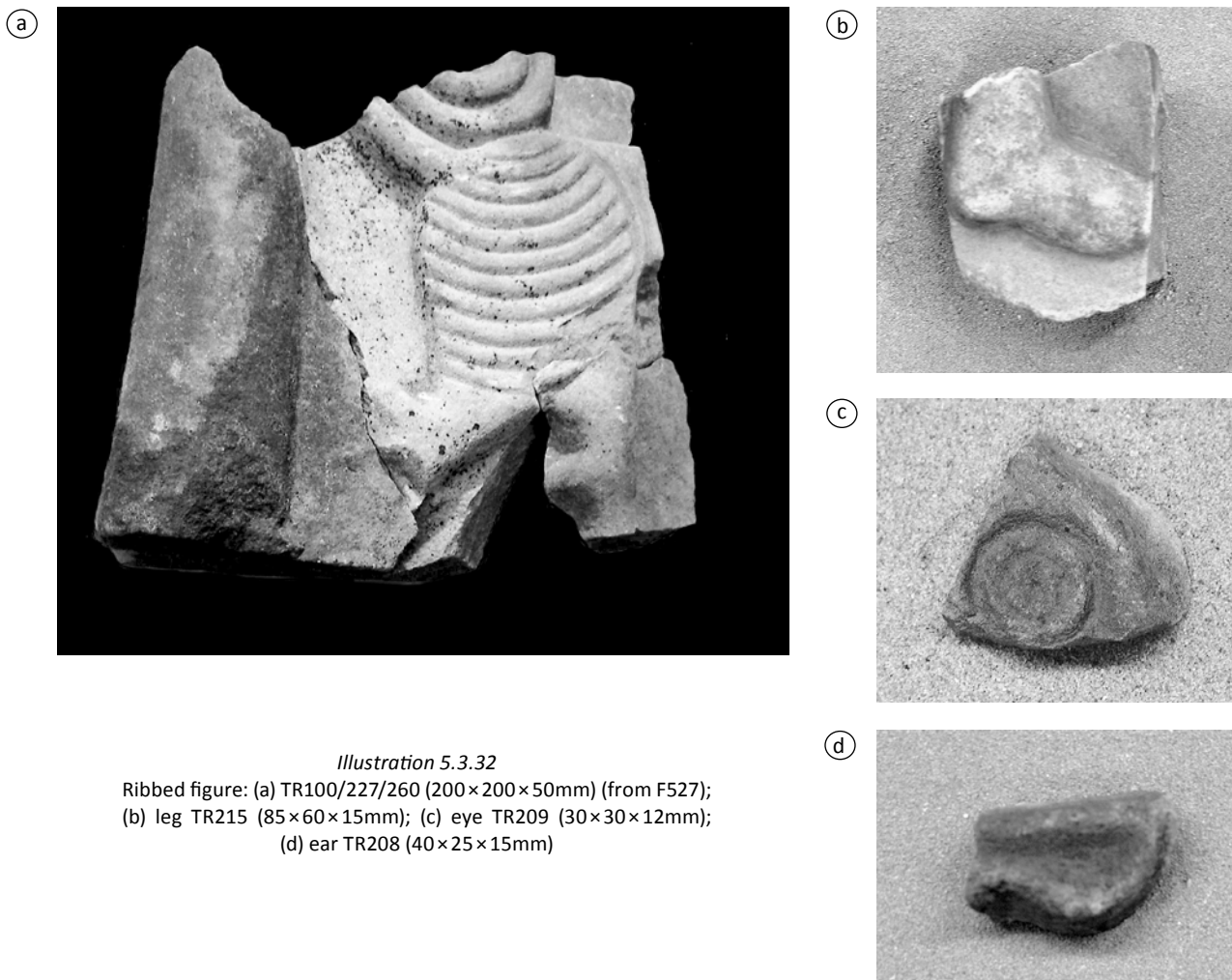


Illustration 5.3.32

Ribbed figure: (a) TR100/227/260 (200×200×50mm) (from F527); (b) leg TR215 (85×60×15mm); (c) eye TR209 (30×30×12mm); (d) ear TR208 (40×25×15mm)

PORTMAHOMACK ON TARBAT NESS

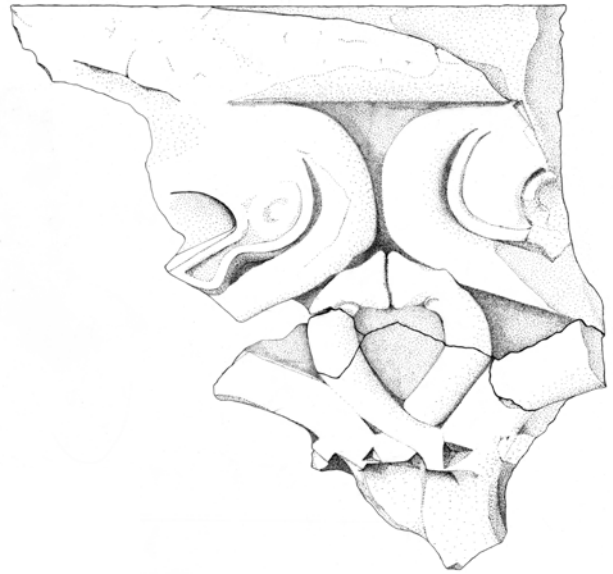


Illustration 5.3.33
Affronted equines, TR216 (280×260×89mm)



Illustration 5.3.35
Tight knotted interlace, TR149 (97×42×21mm)

Illustration 5.3.34
Conjoining set of key pattern, TR74 and others
(Set 1 see Digest 5.1)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

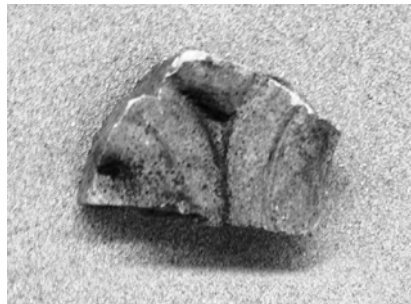
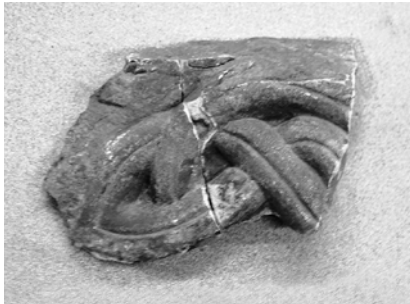
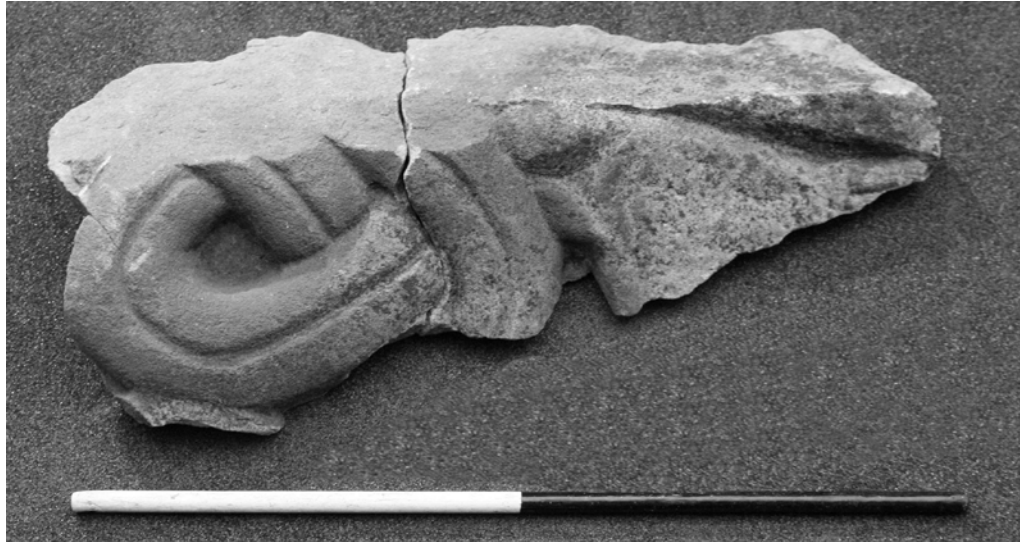


Illustration 5.3.36

Interlace with incised median line, TR258 (280×80×70mm); TR183 (150×90×85mm); TR162 (45×70×56); TR171 (95×37×70mm)

(a)



(b)



Illustration 5.3.37

Flat spiral ornament. Conjoining Set 4: (a) TR229, 231, 233, 237, 239; (b) Conjoining set 1: TR45, 54, 114, 129

PORTMAHOMACK ON TARBAT NESS

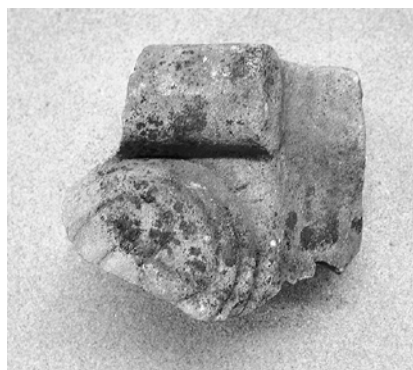


Illustration 5.3.38
Flat spirals TR116, 123, and spiral bosses
TR128, 130

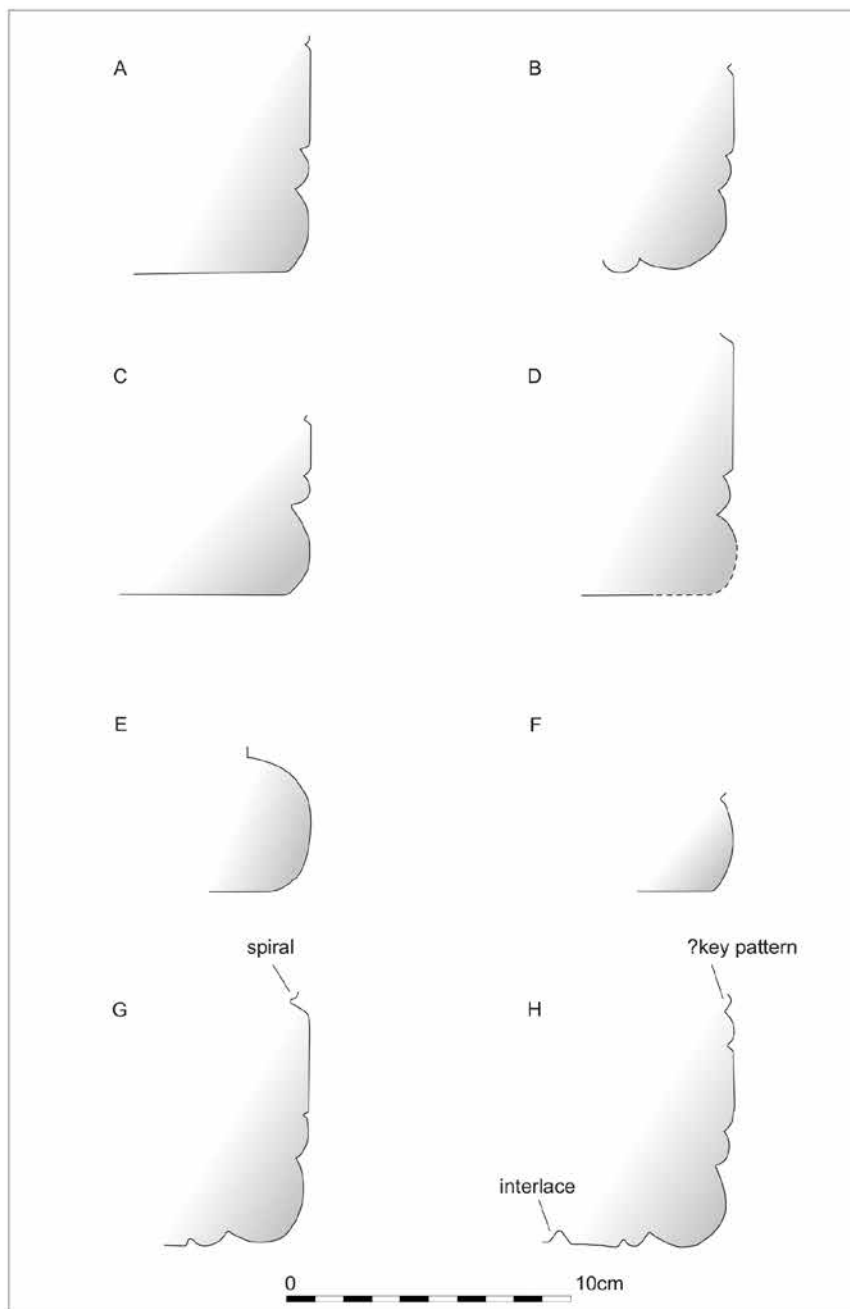
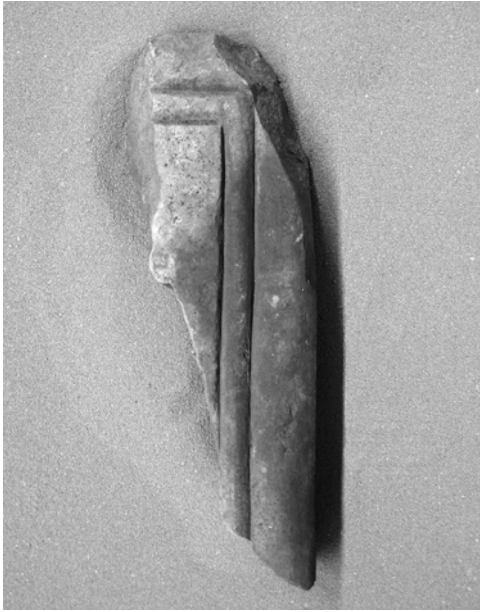


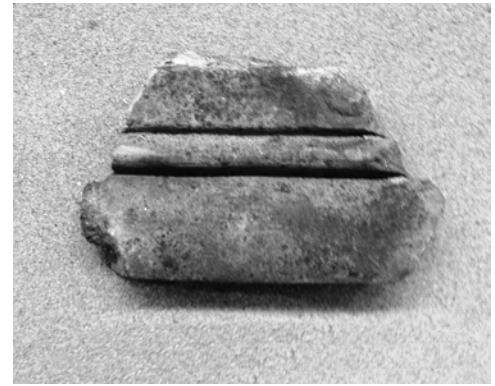
Illustration 5.3.39
Profiles showing types of moulding on edge pieces in the
Glebe Field assemblage, Types A–H



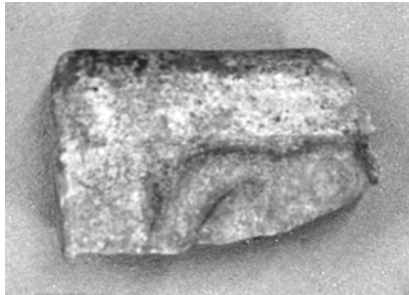
(a)



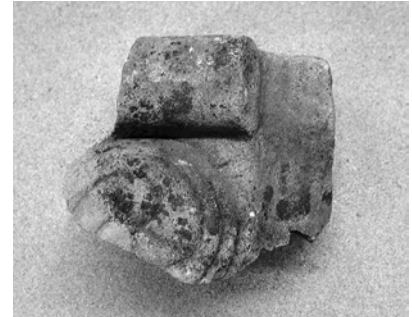
(b)



(c)



(e)



(f)



(d)



(g)

Illustration 5.3.40

Examples of mouldings of Type A–E and G (TR56 measures 230×80×75mm). (a) TR56; (b) TR42; (c) TR104; (d) TR238; (e) TR221; (f) TR128; (g) TR242



Illustration 5.3.41

Corner piece TR257 (Type H) (185×120×111mm)

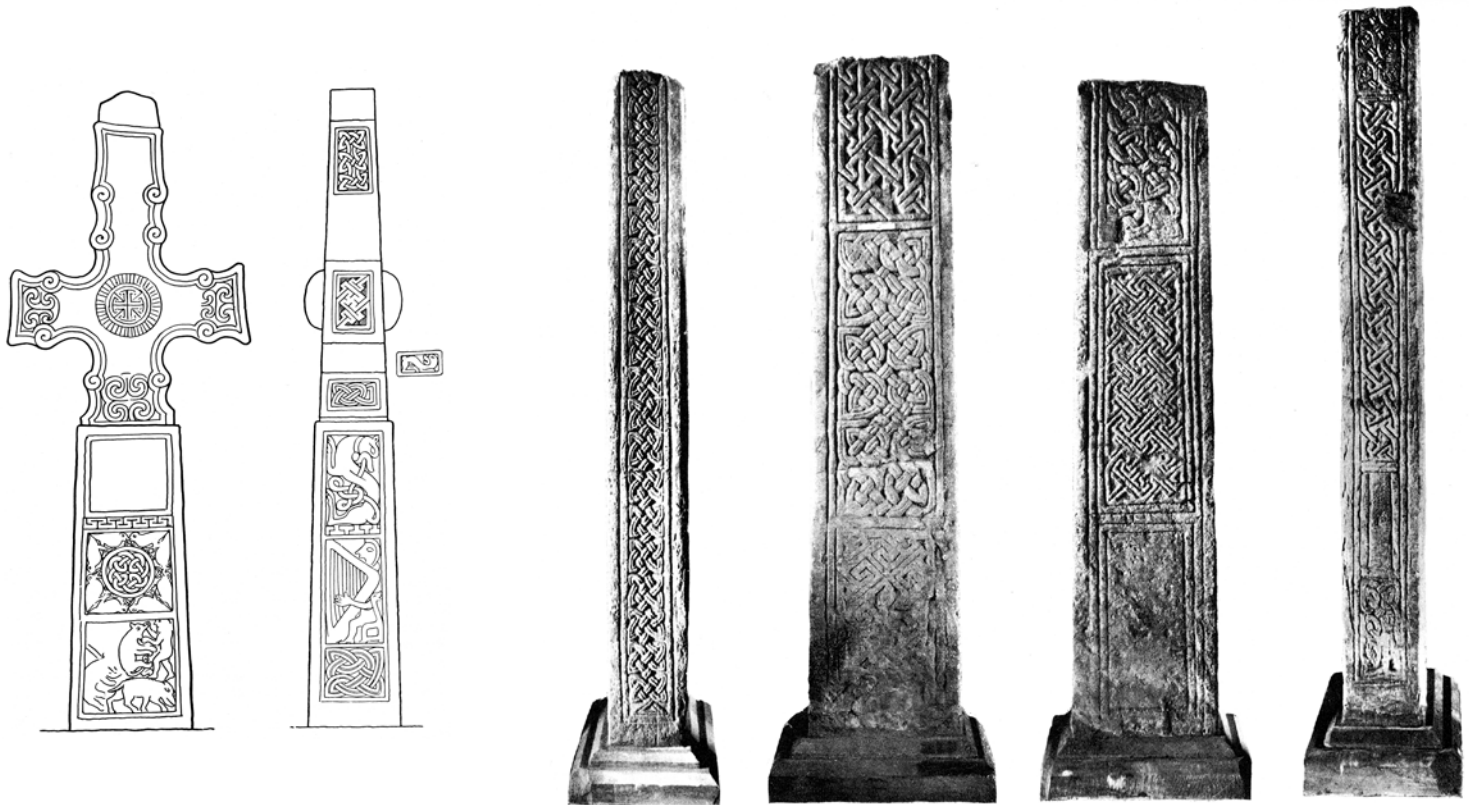
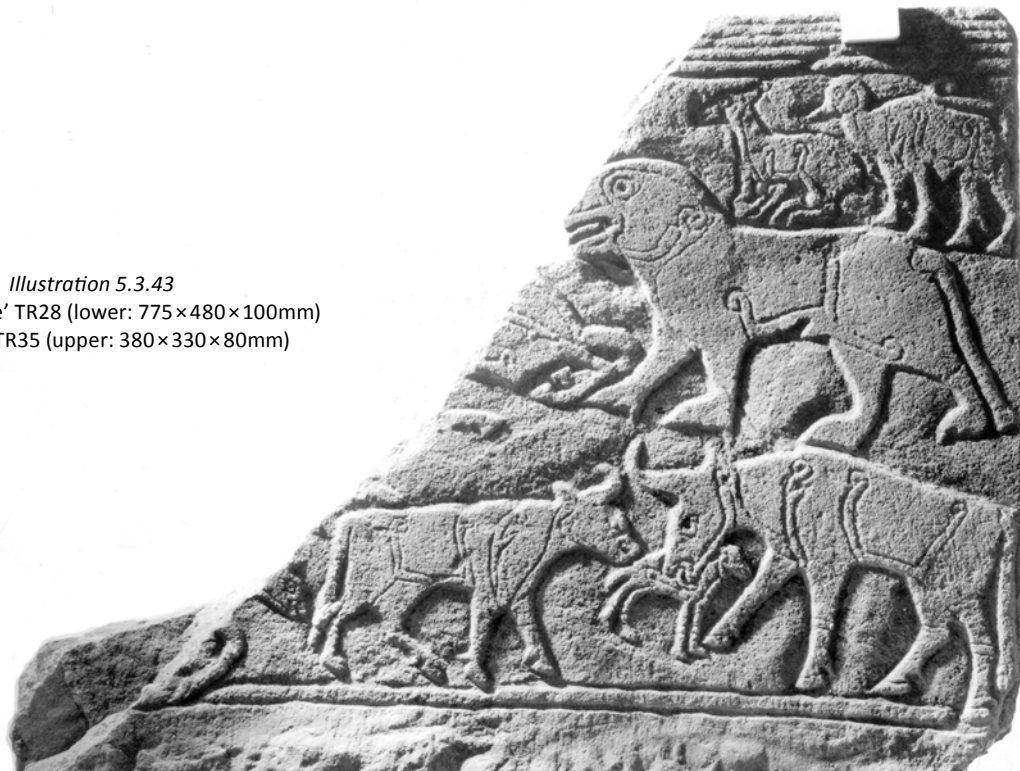


Illustration 5.3.42
Comparative forms of cross-shaft: the Dupplin Cross (left) and St Andrews 14 (ECMS II, Fig 334A; Fig 373A)

Illustration 5.3.43
The 'Calf Stone' TR28 (lower: 775×480×100mm)
refitted to TR35 (upper: 380×330×80mm)



THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

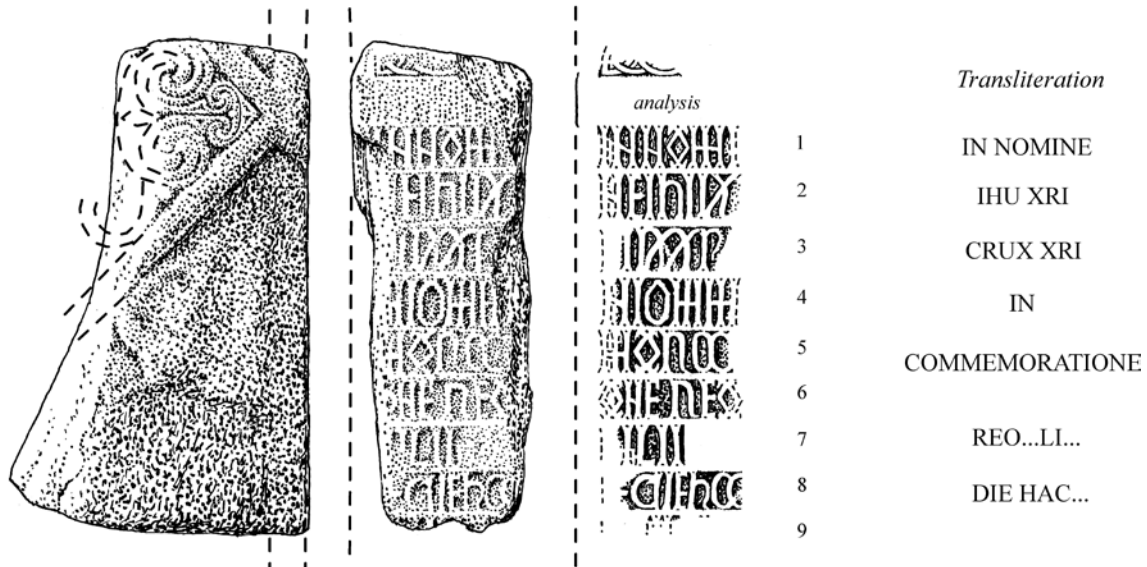
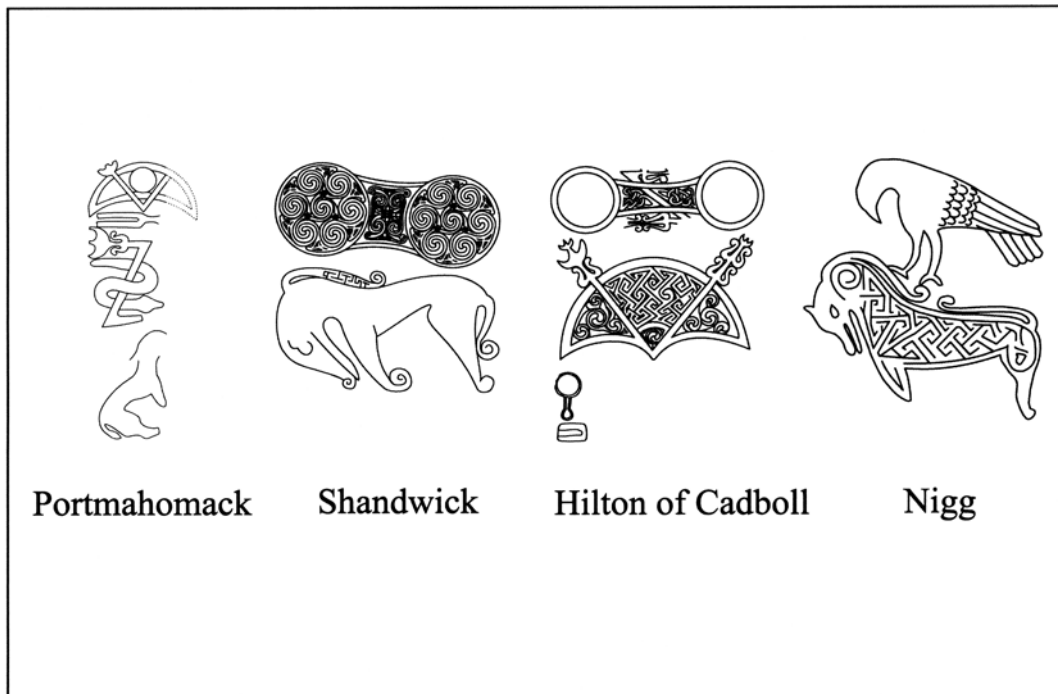


Illustration 5.3.44

Inscription on TR10 and transliteration (above); Pictish symbols displayed on monuments on the Tarbat peninsula (below)



Nigg, Shandwick, Hilton and the four monuments of comparable size at Portmahomack would have required teams of around thirty men apiece (also Chapter 5.9, p 229).

Classification: repertoire of forms

Seven main forms of monument have been recognised so far amongst the 264 pieces of carved stone in the Portmahomack assemblage: cross-slabs, cross-shaft, sarcophagus, grave markers, parts of a shrine or *cancellum*, a corbel or impost and (possibly) a label-stop (Illus 5.3.25 a–h). The majority of fragments are likely to derive from *monumental crosses*, the largest pieces being those that have been found in and around the church. TR1 consists of one side and one edge of a *base with tenon* (Illus 5.3.2). TR2 is one side of a centre panel (Illus 5.3.3). TR20 has both sides of a *top corner section* with the cross one side and apostles the other (the Apostle Stone; see Illus 5.3.13). Decoratively, these three pieces have little in common, and may be viewed as the parent pieces of three different monuments, to which other fragments may be variously assigned (see below). The form in each case indicates a *cross-slab* (Illus 5.3.25 A) of a type common in Pictish Art; see for example Aberlemno, Angus (Henderson & Henderson 2004, Illus 186), Elgin (ibid, 188) or locally Hilton of Cadboll, Shandwick and Nigg (Chapter 5.10). The general shape of these monuments is rectangular (Cramp type b; Cramp 1984a, xv). Given their method of recovery (by gravediggers), other pieces found in the churchyard were usually of larger size and so also likely to belong to cross-slabs (Illus 5.3.4, 5). The bosses TR5 and 6 may belong to TR2. TR10, the inscribed stone (Illus 5.3.6), surely belonged to TR20 since it carries an identical (and unusual) pattern on its face. TR9 features a roundel so may be a survivor from a cross centre; it carries a pattern that relates to TR20. The spirals glimpsed on TR40 (see Illus 5.3.27) also suggest a relation with TR20. At first sight it would seem that both TR9 and TR40 are too thick (at 190mm) to have belonged to TR20 (at 178mm), but studies of whole slabs show quite a variation in thickness so these associations are not disqualified.

Fourteen small, plain and relatively thin slabs of stone carrying a cross are designated as *grave markers* (TR15, 19, 21, 24–6, 29, 30, 31, 33, 34, 41, 225, 226). The simplest are simple indeed, unshaped pieces of stone carrying a scratched cross, recovered in a service trench (TR24, 25; Illus 5.3.26). The discovery of similar objects in early Christian contexts on the West Coast does suggest that such things were part of the formal symbolic repertoire (Fisher 2001, 28; Lowe 2008, 98–104). On TR19 (see Illus 5.3.9) the cross is rendered in relief. On the well-finished TR21, the cross is shown in relief against a recessed background, with a deep incised cross on the other side (see Illus 5.3.15). Other examples feature a variety of simple cross forms (Illus 5.3.27). These too have close parallels in early Christian sites on the west coast. The unworked base of eg TR 33 suggests that the grave markers stood upright in the ground, probably at one end or the other of a grave. The concentration of these finds in the area of the monastic burials endorses their use as grave markers. (Note that TR15 is lost; TR30, TR31 remain in situ in the church; TR41, 225, 226 are not illustrated.)

TR22 (Illus 5.3.16a–f) is designated as a *sarcophagus lid*. It features standing or strolling animals in relief within recessed panels along one side, which shows that it was used in a horizontal position, and the underneath of the frieze side is recessed. The height of the stone appears to vary from one end to the other, suggesting that the top surface slopes with respect to the base (Henderson & Henderson 2004, 40). The surviving end face has a cross in low relief. The animals, from left to right, take the form of a lion and a boar, the latter confronted by another large feline (head only). Alternatively this monumental stone may have been used as an architectural building block, in which case it would have had to be placed at a quoin or as an impost for a chancel arch (so that the two adjacent faces were visible). It has also been suggested that TR22 was an altar (Nadine Alpino, University of Kiel, pers comm). However, the rebate on the base, which appears to be primary, and the slight taper, does suggest that this heavy monolith was the lid of a stone coffin, or a recumbent slab laid over a grave. TR108/221/22 (Illus 5.3.31) forms two orthogonal faces with rebated panels featuring animals. This fragment may also derive from a sarcophagus.

A few of the 230 carved stone pieces recovered from the Glebe Field (Sector 2) may originate in one of the monumental types already mentioned. TR201 (Illus 5.3.28) is a human face, which is the right size and style to belong to cross-slab TR20, while TR205 is a hooped and clawed leg that provides a mirror image for TR20's dragon (Illus 5.3.29). TR218 (Illus 5.3.30) has adjacent recessed panels, one with a bird's head, separated by a rib 15mm wide. TR108, 221 and 222 together form the corner of a rectangular block, featuring the head of a Pictish beast and upturned foot (Illus 5.3.31). These have a border that varies between 25mm and 40mm. Another corner fragment with 40mm/25mm borders is TR108. It is possible that these four fragments belonged to a side panel or end of a sarcophagus like TR22 (Illus 5.3.16), which, however, has a rib thickness of 40mm. Figurative ornament is also discerned on five other pieces: TR100/227/260 suggests the body of a creature with ribbed body, TR215 a leg, TR209 resembles an eye and TR208 an ear (Illus 5.3.32). TR216 (Illus 5.3.33) represents two affronted equines.

The majority of the Glebe Field pieces would appear to derive from a single monument, as suggested by their ornamental similarity and a number of joins. Among the certainly identified examples, twelve pieces are from panels carrying *key pattern* (Illus 5.3.34), fifty-four have *interlace* mostly identified as made from strands incised with a median line or groove (Illus 5.3.36), two pieces show tight *knotwork* (Illus 5.3.35). Sixty fragments carry *spiroform ornament* (Illus 5.3.37) and four fragments were *spiral bosses* (Illus 5.3.38). The Glebe Field assemblage also contained fifty-seven pieces of *moulded edge pieces* (Illus 5.3.39–41). The majority of these do differ from the surviving parts of TR1, 2 and 20, so their absence from the churchyard is significant. Their form is more appropriate to a *cross-shaft* than a *cross-slab*, so Pictish parallels have been sought in the free-standing crosses exemplified by Dupplin and St Andrews 14 (Illus 5.3.42; Form *a* in Cramp 1984a, xv). These moulded edges may imply a fourth cross at Portmahomack; alternatively they may strengthen the case for architectural fittings.

Architectural sculpture

Some of the less certainly identified pieces may derive from fittings integral to a building, as seen in Anglo-Saxon churches. At Wearmouth and Jarrow, for example, there was evidence for string courses, friezes, framing for openings, relief figure sculpture, enclosures marked out by rows of upright baluster shafts and a terminal for a stone chair. Sculpture was painted over a white lime background, the most enduring traces being red and black (Cramp 2006a, II, 162–4). Panels carrying inscriptions or figurative carving were also set into or stood against walls at Jarrow, Wearmouth and Whitby (ibid, 165).

Architectural sculpture in Pictland is indirectly implied by the arch segment at Forteviot and lintels at Meigle and Dunblane, as well as panels and posts which ‘provide the best evidence to date for church building’ (Henderson & Henderson 2004, 205–8). At Portmahomack, a group of thin decorated panels (TR13, 17 and 28/35), together with a stone post (TR27), is suggested as belonging to one or more church fittings, perhaps an *altar*, *shrine*, *above-ground cist* or *cancellum* (a stone screen between the chancel and the nave) (Illus 5.3.7, 8, 10). TR13 and 17 are too thin (90mm and 25mm) to belong to cross-slabs. Of the stone panels, TR28/35 (Illus 5.3.43) has one decorated face, is 100mm thick and has a ribbed top and an unworked base, showing that it would have stood above the ground, with a height of up to 520mm showing. TR13 (Illus 5.3.7) is 76mm thick and ornamented both sides. It should therefore have stood on its side or end. The pattern of recessed crosses (3, 5 or 7?) is suggestive of an altar table, but this would hide the reverse-side pattern, so TR13 more probably stood as *cancellum* screen before a chancel or part of a panelled shrine as at St Ninians’ Isle, Shetland (Small et al 1973, Fig 9, Plate VII). Of the panel fragments, only TR17 (at 25mm) is thin enough to be accommodated in the groove of the stone post, TR27, where it may have belonged to the panel of a shrine.

Heads in the round and their implications

Stone architecture at Portmahomack is also implied by two heads fashioned in the round. TR206 is a frontal fragment of a frowning head (Illus 5.3.45), while three other pieces (TR217, 223 and 263) conjoin and form a species of corbel (Illus 5.3.46). Fragment TR219 carries an ornamental scheme that relates to the swept-back hair or mane on TR206. Another fragment fashioned in the round is the interlaced TR39, but this more likely derives from a large boss on a cross-slab (perhaps TR2). Isolated high-relief insular animal and human heads have been proposed as label-stops for doors and openings (as at Deerhurst, now on an inner doorway), or as a figurehead protruding from a wall (*prokrossos*, as at Deerhurst, above west door) or as terminals to chairs (Bailey 2005; Bryant 2012, 176–81). The eighth-century animal-head terminal from Monkwearmouth (AS11) was seen as deriving from a stone chair rather than a label-stop or *prokrossos* (Cramp 1984b, 130; 2006a, II, 171 (Illus 5.3.48b)). Animal-head terminals from Lastingham have also been assigned to stone chairs (Lang 1991, 172–3) (Illus 5.3.48d). Both these examples cite King David’s chair as depicted in the manuscript Durham BII30, f 81v, where the animals look

inwards and upwards from the top of the chair back. Likewise, TR206 might have served as the terminal knob for a stone chair back, as depicted on the slab at Kirriemuir 1 (Henderson & Henderson 2004, 211–12). Alternatively it might derive from an architectural feature, either side of a door, as at late eighth- or early ninth-century Deerhurst. Heads used as label-stops tend to look down (as Deerhurst 18), whereas *prokrossoi* or the examples considered to embellish chair backs (as at Lastingham 10A and Wearmouth AS11) look up or across (see Illus 5.3.49). However it is not always easy to tell when the head is detached from its anchor point.

The Corbel

(The following section has profited from the guidance and opinions of George and Isabel Henderson and colleagues attending the seventh International Insular Art conference at Galway, 2014.)

TR217 and its conjoined additions are not from a chair: the head, with large eye and criss-cross hair, protrudes from beneath a convex corbel with a flat top, implying that it was set in a wall and supported a beam or arch (Illus 5.3.46). It is well dated. Two of the three pieces that make up the corbel (TR217, 223) were found in the layer of burning above the eighth-century workshops (C1547). The third was among crucibles dumped over the western boundary wall by the metalworkers who were installed after the raid, in the early ninth century (C3463; see p 130). While the stratified context of the Portmahomack corbel in layers of the eighth/ninth century is secure, a contemporary parallel has proved hard to find. The arrangement of a head carved in the round beneath a corbel is best known from the twelfth century and later, where it is deployed to support rafters, tie-beams, the springing of an arch, or as stops to a hood moulding (eg at Kilpeck, Bury St Edmunds, Trondheim or Bourges). Anglo-Saxon impost profiles are commonly angular rather than curved, as at Escomb or Lincoln St Peter (Taylor & Taylor 1965, Illus 464; ibid, 395). Stone corbels jutting out from walls of early Irish churches are known, if of uncertain purpose (Ó Carragáin 2010a, 88). At White Island, Co Fermanagh six flat-topped statues dating from the ninth to eleventh century are thought to have acted as pairs of caryatids supporting a pulpit or preaching chair; they are now built into the church wall (Hickey 1985; Edwards 1996, 170). Early medieval travellers may also have observed heads under corbels in Rome, deriving from the *caryatid*, *telamon* or *atlante* figures supporting architraves.

The practice of embellishing openings in churches with animal (and human) heads in the round is known in the west of Britain where it is noted from the eighth into the eleventh century, for example at Bitton, Deerhurst, St Oswald’s, Gloucester and Worcester 1 (Bryant 2012). The Anglo-Saxon church at Deerhurst retains eighteen carved stones in their original positions in the fabric: these include beast heads protruding from the walls (*prokrossoi*, nos 9, 10, 15) and zoomorphic label-stops on openings and on the chancel arch (nos 11–14, 16–19), and flat-topped ‘ship stem’ capitals (nos 24, 25), all now assigned to a single building dated by radiocarbon to the late eighth/early ninth century (Rahtz et al 1997, 174; Bagshaw et al 2006;



Illustration 5.3.45
 Corbel with convex chamfer and head modelled
 in the round: conjoining fragments TR217
 (154×115×55mm), TR223 (130×54×65mm)
 and TR263 (72×56×30mm)

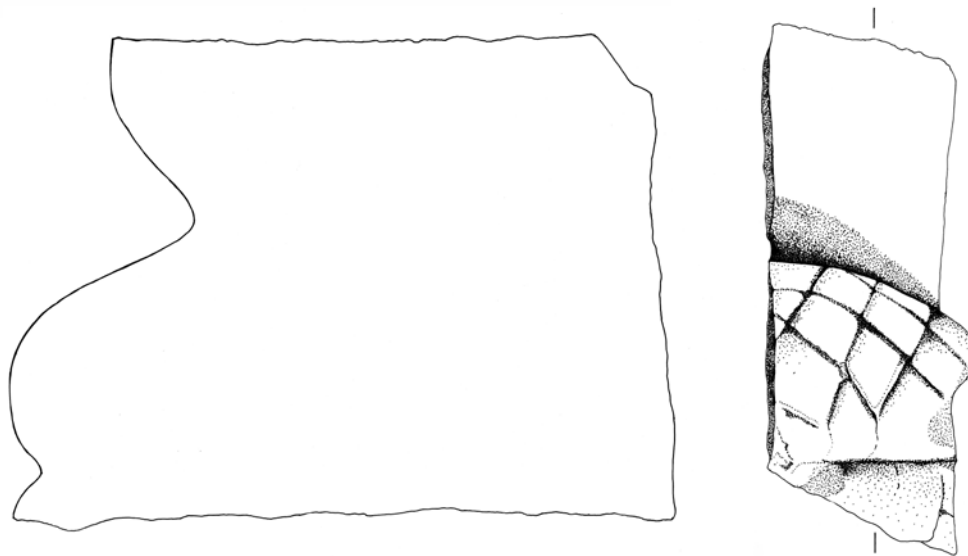


Illustration 5.3.46
 Left: Impost at Malles (ninth century) and
 Bobbio (late twelfth to thirteenth century)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

Table 5.3.1
Fragments assigned to forms of monument at Portmahomack

Type of Monument	Sub-type	Components
Monumental cross	Base	TR1
	Body pieces	TR2, TR7, TR9, TR12, TR40
	Corner piece	TR20
	Bosses	TR5, 6, 39
	Edge with inscription	TR10
	Part of hollow–arm cross	TR4
	Fragments bearing anthropomorphic or zoomorphic images	TR108/221/222 (Pictish beast), 102 (?), 201 (Apostle head), 202 (head?), 204 (beak?), 205 (dragon leg), 208 (ear), 209 (eye?), 215 (foot), 216 (equids), 218 (bird), 220 (?), 100/227/260 (ribbed creature)
Grave markers		TR15, 19, 21, 24–6, 29, 30, 31, 33, 34, 41, 225, 226 [14]
Sarcophagus	Lid	TR22
Shrine, cist or <i>cancellum</i>	Stone post	TR27
	Panels	TR13, 17, 28/35
Label-stop or chair knob	Head	TR206, 219
Impost or label-stop	Corbel	TR217/223/263
Unassigned	Moulded edge pieces	TR 42, 48, 50–60, 64, 68, 70, 71, 73, 76–85, 89, 90, 97, 98, 101, 103–7, 109–13, 203, 213, 214, 232, 238, 243, 246, 247, 249, 251–56 [57]
	Pieces from panels bearing key pattern	TR8, 49, 61, 62, 63, 69, 72, 74, 75, 86–8 [12]
	Fragments from panels bearing spirals	TR18, 114–27, 129, 131–43, 146, 147, 229–31, 233, 235–7, 239–42, 244, 248, 250 [54]
	Spiral bosses	TR128, 130, 144, 145
	Fragments bearing median–incised or other interlace	TR 37, 38, 148, 150–77, 178–99, 224, 228, 234, 245, 259, 261, 262 [60]
	Corner pieces with moulding, interlace and key pattern	TR32, 257
	Pieces of tight knotwork	TR14, 149
Unidentified		TR3, 11, 16, 91–6, 141, 142, 200, 207, 210–12

Hare 2009; Bryant 2012, 110, 179). It has been determined that all the animal-head label-stops and *prokrossoi* formed part of a design innovation dated to the late eighth to early ninth century (Bryant 2012, 179; Gem 1984, 237–8). Five of the beast heads were originally painted in red and yellow iron oxide, charcoal black and calcium carbonate white (Emily Howe in Bryant 2012, 112–15). Although there was an upper floor at Deerhurst, none

of these is claimed as being a corbel, although the capitals (nos 2, 25) supported the chancel arch, and elements of a flat-topped string course survived at high level (ibid, 55).

Iconic beasts (or humans) placed on openings (or objects) and expressing a severe and protective demeanour seem to form an important part of the vocabulary of Christian conviction in its transitional phase, continuing the apotropaic function of the

PORTMAHOMACK ON TARBAT NESS

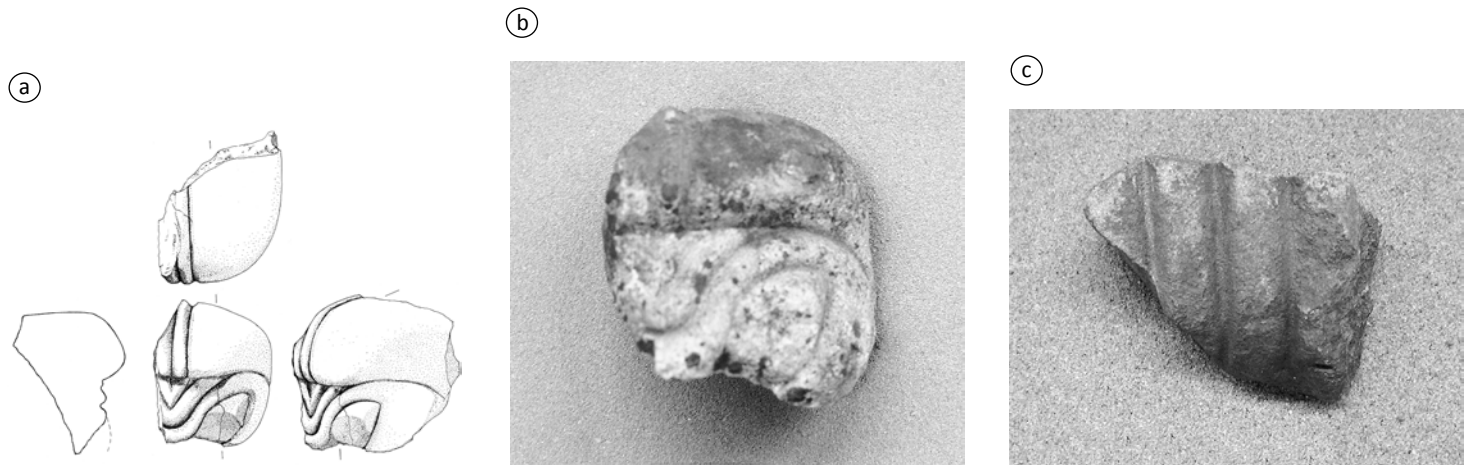


Illustration 5.3.47
 (a), (b) Head TR206 (90×80×80mm); (c) Fragment TR219 (50×65×40mm)

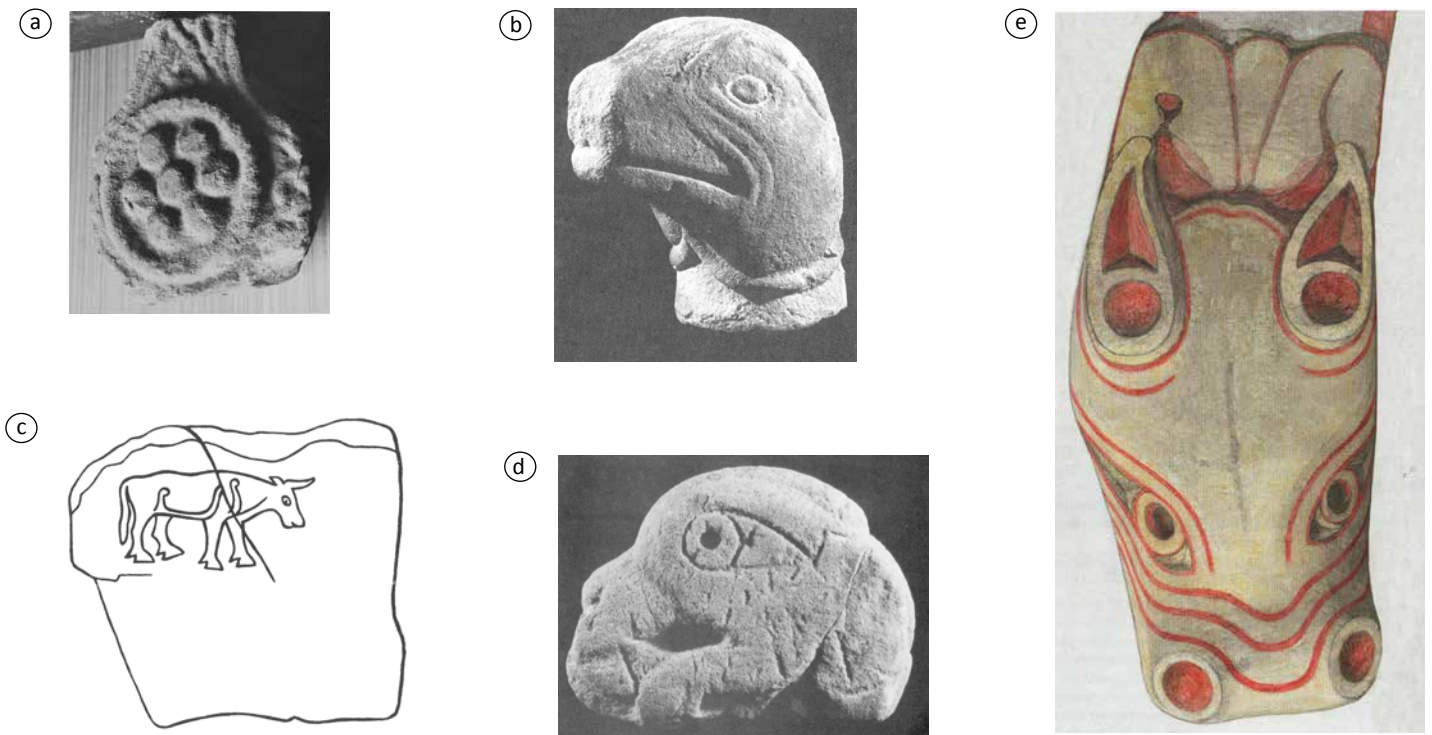
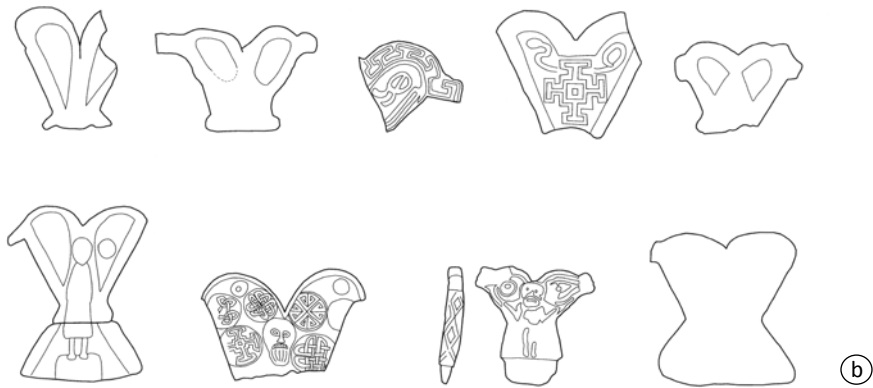


Illustration 5.3.48
 Comparative ornament and figures: (a) Encircled bosses, Carpernway Hall, Lancs (W G Collingwood MS GB 479, Sackler Library Oxford, Fig 434); (b) Monkwearmouth, ASII Cramp 2006 (© Corpus of Anglo-Saxon Stone Sculpture, photographer T Middlemass), II, 172; (c) Inverness 2 (ECMS II, Fig 107); (d) Lastingham 10A Lang 1991 (© Corpus of Anglo-Saxon Stone Sculpture, photographer T Middlemass) 172–3; Fig 614; (e) Deerhurst 18 Bryant 2012 (© Corpus of Anglo-Saxon Stone Sculpture Volume X The Western Midlands, Colour Plate 1)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



(a)



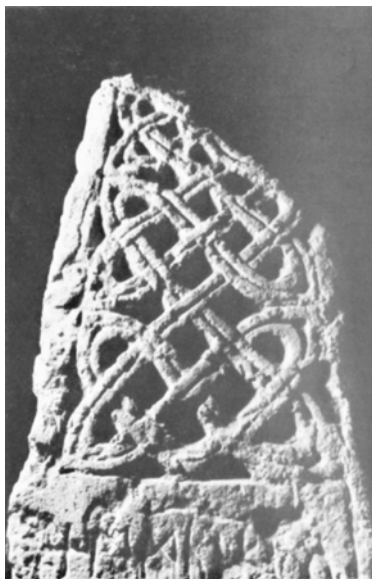
(b)

Illustration 5.3.49

(a) Possible fragment of 'butterfly' roof finial from Portmahomack TR264 (210×130×100mm); (b) Comparative examples from Ireland (Ó Carragáin 2010a, 42); (c) St MacDara's Island, Co Galway (© National Monuments Service, Department of Culture, Heritage and the Gaeltacht)

(c)

Illustration 5.3.50



(a)



(b)

(a) Hackness I Lang 1991 (© Corpus of Anglo-Saxon Stone Sculpture, photographer T Middlemass) Fig 462; (b) Telfont Magna Cramp 2006 (© Corpus of Anglo-Saxon Stone Sculpture, photographer D Craig) Fig 518; (c) Gattonside (ECMS II, Fig 453)

(c)



ornamental beasts of the pagan era. ‘The translations of old themes and images into new meanings could have been as potent a factor in conversion as was the similar practice in poetry’ (Cramp 2006a, II, 167). This is the most likely role for an eighth-century corbel, as opposed to that suggested for their twelfth-century successors: addressing marginalised persons outside the church walls (Magrill 2009). More appropriately, heads either side of a chancel arch or doorway offer power and so bring comfort and security to those that enter. Eleonora Destefanis (pers comm) has pointed out that human heads are incorporated into lintel-bearing corbels of the late twelfth/early thirteenth century on the doorway from the cloister at Bobbio, and that heads may be seen bearing the imposts of pillars of the ninth-century chancel at Malles (Illus 5.3.46). These observations raise the further possibility that the straight moulded pieces that make up most of the Glebe Field assemblage derive from jambs or lintels, offering an image of unexpected grandeur. However the verdict here is that these moulded pieces belong to a cross-shaft (Cross D, below, p 165), leaving the corbel as the main witness of an architectural construction.

Although the competence of the Portmahomack head remains startling for its place and date, there is indirect evidence that relates it to a general insular context. Outfacing paired heads in the church at Breedon on the Hill (Jewell 1986, 109, Plate LIIIe) and heads deployed as the imposts in the Canon Table arcade in the Barberini Gospels (Rome Vat. Lat. 570; Henderson G, 2001, Fig 14.4) show that cephalomorphic corbels could have formed part of the insular repertoire. Human heads fashioned in the round are otherwise features of late eighth-century Pictish carving: the David on the St Andrews sarcophagus, the Elgin Matthew and the left-facing desert father on the Nigg cross-slab share signature features of ‘large almond-shaped eyes, a moustache, elaborate curls and a high brow’ (Henderson I, 1994, 81–2; see also James et al 2008, Illus 4.16 (.16) for a possible face from Hilton). These examples imply that the Portmahomack corbel can find a home within this extended family.

An identity for our head might be indicated by the criss-cross pattern that covers it and bunches forward in a neat circular ‘brow’. This could be intended as hair, a hair net or a head cover. James Lang (1993) noted the use of heads carved in the round in Roman memorials and busts, subsequently serving as models for niched eighth-century figures at Otley, Easby and Masham (ibid, Fig 32.3). Roman men with tight curls or waves appear as aristocratic or imperial figures, and the style was affected by Offa (Jewell 1986, 109). The Portmahomack head does not echo this kind of hair, nor does it resemble the images of filets, crowns, diadems or helmets seen on Anglo-Saxon coins and deriving from emperors and kings (as assembled by Gannon 2003, 25–54). However a domed head covered by a criss-cross pattern is depicted on a Series L, Type 13 late Secondary penny, which Gannon suggests as ‘another way of portraying the texture of hair, or representing caps in precious fabrics’ (Gannon 2003, Fig 2.40, 51). This figure belongs to a group thought to be wearing diadems, held on with knotted strings at the back, while knotted hair, hanging by the ear, may be intended as a sign of status in both pre-Christian and Christian iconography (ibid, 49–50). The surviving side of the corbel has knotted hair or a knotted tape slightly forward of where the ear would be. Clerical or divine figures are also apparently figured wearing head dress.

A seated figure at Fowlis Wester appears to wear a domed cap. On the Forteviot arch, two of the figures wear hoods and the third and largest (perhaps Christ: Henderson & Henderson 2004, 145), wears a diadem with a tie at the back (ibid, Fig 211; cf Gannon 2003, cf Fig 2.35, 48).

Given the exemplars of heads on the Tarbat peninsula and at Portmahomack itself, together with the presence of a ‘porcupine’ sceat (p 260) and the known proficiency of the ‘practised hands’ of sculptors, it is hard to accept the head cover as an obscure version of something exotic, and more tempting to interpret it as a real, if unfamiliar, artefact. Since there are no convincing indications of hair, a diadem or crown, the pattern may refer to a religious head cover. Ecclesiastical head gear today comes in prodigious varieties worn by clerics (and latterly academics) at various ceremonies (see www.dieter-philippi.de/en/the-philippi-collection/head-coverings-1). These surely have deep roots. Examples of domed or ‘boule loaf’-shaped caps of woven wool are noted on Christian, Muslim and Jewish clerics. One of the more common is the ‘Oxford cap’, a type of beret used to cover and enclose the hair. The head might therefore indicate a wise or holy person (male or female) who wears a cap or bonnet with the hair bunched inside it with tape hanging by the ear securing it in place. Such a person might belong to the group of ancestor saints proposed for the great cross-slabs (p 337). The corbel can be seen as the best evidence that the eighth-century monastery had a stone church (Chapter 5.4, p 339).

A footnote to this section on architectural carved stone is TR264, recovered residually in a Period 7 soil in Sector 2, which resembles the ‘butterfly finials’ known to have been placed on gabled ends in early Irish churches such as Church Island, Co Kerry or Macdara’s Island, Co Galway (Ó Carragáin 2010a, 42–3) (Illus 5.3.48). It is included for the sake of completeness rather than as crowning (in any sense) the case for an early church building.

Repertoire of Ornament

The contribution of Kellie Meyer to the study of the ornamental schemes on the Tarbat peninsula is warmly acknowledged (Meyer 2005; see also Meyer 2011 and OLA 7.1.8.2).

The principal diagnostic ornamental schemes used in the Portmahomack assemblage are *key* or *fret pattern*, *interlace* and *spirals*, while TR1 features a notable border of inhabited *plant scroll*. These all find wide application in early medieval Ireland, Western Scotland, Southern Pictland and Northumbria. There is a small range of *figurative images*, of which the majority are stand-alone beasts with mythical or semi-mythical attributes. Ornamental fields are bordered by *edge pieces*, which show a variety of mouldings. The following analysis examines the Portmahomack repertoire with a view to determining what sorts of monuments were erected there. The artistic and intellectual context of the monuments that are envisaged is discussed below.

Edge pieces (see Illus 5.3.39–41)

The Glebe Field assemblage includes a number of edge pieces that may derive from cross-shafts or slabs or buildings. Forty-

Table 5.3.2
Fragments assigned to types of moulding

Singular mouldings	Type E	TR20, 99, 106, 109, 128, 205 (dragon leg), 221 (Pictish beast), 222
	Type F	TR101 [not illus.]
Multiple mouldings	Type A	TR43, 44, 45, 47, 50, 51, 54, 55, 56, 58, 59, 67?, 68, 71, 72, 86, 87, 89, 107, 122, 123, 124, 129
	Type B	TR42, 62, 66, 79
	Type C	TR103, 104
	Type D	TR57, 238
	Type G	TR242
	Type H	TR257

one examples were sufficiently complete to reveal the mouldings embellishing the angle between two orthogonal and adjacent faces. Only one piece (TR257) had sufficient surface in both planes to observe the continuation of recognisable ornament. There was no example of a complete width with two parallel faces. Two main groups and six variants (A–H) have been distinguished (Table 5.3.2).

Singular mouldings are represented by Types E and F. *Type E* has a single shallow convex profile 40–60mm wide, connecting two flat faces. F is incomplete, but likely to be similar, although both faces may not be flat. The convex border matches the top edge of TR20, so that membership of this group potentially indicates an association with a cross-slab. The top border of TR20 is 50mm wide, and the ribs of the panel sides are 25mm wide, but there is no border.

Multiple mouldings are represented mainly by *Type A*, the most prevalent numerically, which joins a moulded face to a flat face. The moulded face has a shallow moulding 30mm across nearest the edge and a steeper moulding 15mm across which borders it on the inside of the face. Types C and D are close variants of Type A. Minority variants B, G and H have symmetrical mouldings on both faces (Illus 5.3.40; ECMS I, 86 calls the A/B edge a double-bead moulded border). The mouldings of this group are not matched directly by the ‘churchyard collection’, and are not features of Hilton, Nigg or Shandwick. Similar forms can be seen on the Dupplin cross (back face) where the inner narrow moulding is used to contain the panels, and on St Andrews 21–4 (Henderson & Henderson 2004, Illus 278; Illus 264–7). Both of these are cross-shafts rather than cross-slabs.

A *plant scroll* occurs only on TR1 (Illus 5.3.3), and closely resembles that on Hilton of Cadboll (see below). It may be classed as an iconographic as well as an ornamental theme, since it is considered to represent the Eucharist (Henderson & Henderson 2004, 29, 138; Meyer 2005, 183, 190).

Key pattern is composed of abutted ribs of stone forming a geometric maze. Where the pattern is arranged in squares it recalls the lands of keys and may be referred to as key pattern

(Henderson & Henderson 2004, 23, Illus 16). Six of the variants recorded in ECMS have been found at Portmahomack. The numerical majority of the Portmahomack examples consists of ribs 10mm wide and corresponds to ECMS no 974 (compare Drainie [Kinnedar] 14 (ECMS ii, 149); see Illus 5.3.38). It is well represented in the area (Rosemarkie 1 and 2, Shandwick) and further afield (Reay, St Vigean 24, Meigle 4, St Andrews 1, 7, 8, 14, 20; Meyer 2005, 65n).

The key pattern on TR8 (see Illus 5.3.5) is shared with Shandwick and Burghead (ECMS no 14). TR13 (Illus 5.3.7) has a band of fret pattern on one side equating to ECMS no 977, which appears at Kells, Ireland (ECMS I, 354). Key pattern 829B, which is closest to the design that appears on Face A of TR40 (see Illus 5.3.27), appears on the cross-shaft at Nigg, as well as on monuments at Ulbster, Canna, Kilmartin, Burghead, Aberlemno, Ardchattan, Abercorn and Norham in Northumberland. The key pattern on TR6 (Illus 5.3.4) is closely related to ECMS patterns nos 1020 and 1022, and finds a close parallel on the Monymusk Shrine (Meyer 2005, 200). Carved stone *bosses* with key pattern wreaths occur at the centre of the cross-heads of St John’s and St Martin’s crosses at Iona (RCAHMS Argyll 1982, 6.82, 6.83; Fisher 2001, 131–4). The stone boss with a decorative relief has obvious ties to metalwork, especially to the raised metalwork bosses found on Irish shrines, characterised by a central jewel or smooth metalwork stud and surrounded by filigree wreaths (Meyer 2005, 51). The specific relationship with the metalwork bosses on reliquary shrines might be significant, as it has been suggested that certain cross-slabs, especially those with a particularly ‘metallic’ appearance might have functioned as types of public reliquaries reflecting the appearance of specific metalwork shrines more privately located within ecclesiastical centres (Henderson I 1993, 216).

The *spirals* are similar to those seen on Hilton (ECMS no 1078) and Shandwick (ECMS no 1079). Some have elliptical pellets at the corners, as in ECMS pattern no 1025 (TR128). At Portmahomack there are fifty-four examples on fragments of panels (see Illus 5.3.37), and four spiral bosses (TR 128, 130, 144 and 145; Illus

5.3.38). Peltae forming C-shaped connections between spirals and terminating in smaller spirals of their own can be found on Nigg and Shandwick as well as on St Vigeans and Keills, just to name a few examples (Pattern nos 1051–5, 1066–71 in ECMS I, 389–90).

In general, spiral and peltaic forms are found on carved stones throughout Pictland, *Dál Riata* and Ireland, and the motif seems to be typically ‘Celtic’ (ie occurring in Ireland and west and north Britain), not frequently appearing on Anglo-Saxon stones, though a notable exception is a late eighth- to early ninth-century carved panel from South Kyme, Lincolnshire (Everson & Stocker 1999, 248–51, Illus 339, 343). The triple-band spirals in this panel are connected by simple peltae, one of which is embellished with a floriate design not unlike those on TR7.

Spiral designs are also prolific on Celtic metalwork from the sixth century, appearing on both secular and religious objects and those of less certain function, such as hanging bowls with decorated escutcheons (Youngs 1989; Bruce-Mitford 2005). The Tara and Hunterston brooches display spirals and connecting peltae with almond-shaped floriate embellishments (Meyer 2005, 114). The spiral panel on the early ninth-century Brunswick, or Gandersheim Casket, though based on the triskele type, does contain trefoil embellishments at the extremities that resemble the almond-shaped leaves in the peltae on TR7. It is quite likely that this design was influenced by the virtuoso variants of spiral and peltaic ornament in the *Book of Kells*, *Book of Durrow*, and the *Lindisfarne Gospels*, all of which feature triple-band spirals and elaborately decorated peltae (Meyer 2005, 115n). The *Book of Durrow*, in particular, features peltae with almond-shaped ‘leaves’, rather than the simpler triangular embellishments (Meehan 1994, 18, 65).

Spiral pattern no 1096, found on and around the central bosses within the wreath of TR5, is found on a variety of insular objects, such as the Lullingstone bowl, the *Book of Durrow*, the *Book of Kells*, and on the Maiden Stone, St Vigeans 6 and on the Kilnave Stone (ECMS I, 398). Small raised bosses connected by peltae can be seen on a variety of Irish High Crosses such as the ninth- to tenth-century cross at Durrow, Co Offaly; early tenth-century Cross of Scriptures at Clonmacnoise, Co Offaly and the tenth-century Muirdach’s cross at Monasterboice (Richardson & Scarry 1990, 38, plates 63–6, 85–8, 158). TR5 is paralleled by a wreath with seven bosses at Carpernway, Lancs (Illus 5.3.48).

Interlace

There are twelve examples of single-strand interlace, mainly from the churchyard, and at least forty-one examples of a type with an incised median line or groove, all from the Glebe Field. Among the singular examples, the pattern on TR2 has no direct parallels but is quite similar to ECMS 708, which is found on the central panel of the cross-head on the Nigg slab (ECMS I, 281, II Fig 74). ECMS 619 (seen on TR17) is carved on St Madoes 1, illuminated in the Stockholm Gospels and the Vespasian Psalter, and worked in metal on the Hunterston brooch and a penannular brooch from Mull, as well as on the croziers of St Damhnad Ochene and St Dympha (ECMS I, 239). TR149 and TR14 have single-strand 10mm-wide knotwork (‘knitting’) (Illus 5.3.35). Interlace pattern 658A (on TR14) appears on St Andrews 14, the Kells crosses in Ireland and in the *Book of Durrow* and the *St Gall Penitential*. The

interlace patterns 713 and 714, which are closest to the design on Face B of TR40, can be seen on slabs at Collieburn, Brodie, Glamis 2, and Gattonside.

The interlace type dominating the Glebe Field assemblage (and confined to it) consists of rounded strands 20–30mm wide incised with median lines or grooves (see Illus 5.3.36). *Median-incised interlace* occurs widely in Pictish areas, for example on St Andrews 14, 31, 15 (ECMS II, 363), Abernethy, Kirriemuir, Benvie, Glamis and Drainie (Kinnedar). But it is also widespread in the rest of Britain: at Melling, Neston and Lancaster St Mary in north-west England (Bailey 2010); Whithorn and locality (ECMS ii, 481–91), Govan (ECMS ii, 462), Gattonside, Melrose (ECMS II, 432) in south-west Scotland; at Sutton on Derwent, Lastingham and Hackness in Yorkshire (Lang 1991); in south-west England at Gloucester (London Road) (Bryant 2012, Illus 357; where it is dated to the mid-ninth century) and Ramsbury and Knook (Cramp 2006b). The dates given are late, ranging from the late eighth to tenth century, although some examples, eg Teffont Magna in south-west England, have been dated to the eighth/ninth century, which would suit Portmahomack (Cramp 2006b, Fig 518). Some of these ornamental forms raise the possibility of associations with the British areas of the west as opposed to, or in addition to, the more familiar parallels with Northumbrian and Irish motifs (Illus 5.3.48; 5.3.50).

Figurative

A number of *animals*, real and imaginary, were fashioned by the Portmahomack carvers.

Those on TR1 (Illus 5.3.3) are unidentified (but see iconography below, where Meyer identifies the most prominent beast as a lion). The front face of TR20 (cross-side; Illus 5.3.13) has a composite beast, with fangs, a snake’s-head tongue and snake’s-head tail, and legs terminating in hooves with claws. On the reverse side of TR20 is a row of clerical figures carrying books, and in an upper register two lion-like creatures confronted over the half-carcass of a deer. A bear-like animal is seen at the top right. The face TR201 (Illus 5.3.28) is likely to belong to this monument, as is also the leg TR205 (Illus 5.3.29), which should derive from a symmetrical confronted beast.

The sarcophagus lid TR22 (Illus 5.3.16d) features two ‘strolling’ animals, a lion and a boar, moving towards the head of an unidentified third. TR28/35 (Illus 5.3.43) presents the busiest animal pageant. A family of cattle occupy the lower register, a cow and a bull, the latter licking a calf. Above this bucolic scene a large lion confronts the knees of a horse, and above that a creature with a sharp beak menaces a lamb-like victim. TR218 (Illus 5.3.30) takes the form of a bird’s head. Fragments TR221/222 carry parts of a Pictish beast in low relief (reconstructed in Illus 5.3.31). Other fragments have elements in low relief suggestive of a leg, an eye and an ear (Illus 5.3.32). TR100/227/260 appears to belong to a creature with a ribbed or hatched body (Illus 5.3.32). TR216 shows two horse-like creatures with opposed hooves and affronted heads (Illus 5.3.33). Most of these parts of stand-alone creatures are referenced on Pictish sculpture elsewhere, as at Meigle (ECMS II, 330–7; see also Illus 5.3.48c). A cross-shaft (now reused as a lintel) at Acton Beauchamp (Herefordshire) dated to the early ninth century also features curvilinear ribbing on a number of

birds and animals (Bryant 2012, 281, Illus 496). At Gloucester St Oswald's 4, a creature with a ribbed body and an arrowhead tail stands on a patch of median-incised interlace. This composition is dated to the mid-ninth century (Bryant 2012, 211, Illus 289, 291). Serpents are prominent on TR2 and the Nigg and Shandwick cross-slabs. As well as signifying death and redemption, they have been suggested as showing a link with the Columban *familia* and the western liturgy (Meyer 2011, 186).

Crosses and other symbols

The forms of the *cross symbol* in the Portmahomack collection are very diverse and range from the simple scratch marks of TR24 and 25, to the elaborate saltire cross proposed for TR20 (see Illus 5.3.53). A well-established hypothesis relates the simple cross-marked stones as evidence for the advance of Christianity through the countryside, but varieties of cross form may also indicate regional preferences (Henderson & Henderson 2004, 165). The admixture of types seen at Portmahomack might be explained as a chronological evolution, where the design (and increasing expertise) reflect changes over a century or more. But there is no archaeological bar to all the carved stone grave markers standing in Period 2 and given the short span of monasticism at this site, another reading could be that of social difference, and yet another the exercise of liturgical preference in an age of experiment.

Kellie Meyer (2005, 249ff) has reviewed the *forms of the cross* on the peninsula noting references to wider Pictland and to Iona. She interprets TR33 as combining the form of the *majestis crucis*, *crux gemmata*, the *suspendium* and *patriarchal cross*. The presence of such a cross at Portmahomack means that the ritual of *adoratio crucis* was probably practised there. The patriarchal cross features on Iona 18a and on the Monza reliquary and other reliquaries, and on Merovingian coins (Meyer 2005, 250–4). The *saltire cross* proposed for TR20 (see below) finds some echoes in illuminated manuscripts (the *Book of Kells* and the *Book of Deer*) which use the diagonal form to divide a page (Henderson & Henderson 2004, 218). The form is associated with St Andrew, executed on an X-shaped cross, but Meyer (ibid) derives it from the chi-rho, as re-employed by Constantine for the Roman imperial standard. The wide variety of cross forms used at Portmahomack and on the peninsula indicate a highly developed and well-informed Christian community.

The *Latin inscription* on TR10 also signifies a mature eighth-century atelier. It is composed in insular majuscules and rendered in low relief and is the longest so far known from Pictland. The inscription has been read: '[I]N NOM[IN]E IHU X[PI] CRUX XRI [IN] COM[MEM]ORA[TIO]NE REO[.]LII [D]IE HA[C]', translated as 'In the name of Jesus Christ, the/a Cross of Christ in memory of Reo[...].lius.... on this day' (Higgitt 1982, 306). The lettering is closely connected to that of the Lindisfarne Gospels, suggesting that a similar codex was present at Portmahomack, although the lettering on the cross is trending towards that in the Book of Kells, suggesting a date in the second half of the eighth century (ibid, 317). In the last century, the name 'REO ...' was read as 'REOTETII', and identified it with 'Reothaide or Reodaide whose death is recorded under the year 762 in the Annals of Ulster, and under 763 in the Annals of Tigernach. In both he is

called 'Ab. Ferna', which however is understood to be Ferns in Ireland [as opposed to Fearn in Easter Ross], and the difficulty of connecting him with Tarbat remains' (ECMS II, 95). Higgitt considered that 'the traditional identification of the name as that of an eighth-century Irish abbot of Ferns is not compatible with the extant letters on the stone' and he believed that the name was probably Pictish (1982, 317).

Pictish symbols are clearest on TR1, where they are rendered in relief along one edge. Four symbols may be identified which are (in descending order) the crescent and V-rod, the sword or 'tuning fork', the snake and Z-rod and the Pictish beast (Illus 5.3.2). A Pictish beast featured in TR108/221/222, possibly constituting panels from a sarcophagus (Illus 5.3.31). Pictish symbols were carried on all three major surviving monuments on the Tarbat peninsula (Illus 5.3.44). The most convincing attempt to assign meanings to the symbols suggests that they signify personal names (Samson 1992; Forsyth 1997). At Portmahomack, the execution in low relief and the location on the edge of the slab used both for the symbols on TR1 and the inscription on TR10 corroborate that function: the memory of a named individual. The Latin inscription and the Pictish symbols may be considered as analogous ways of labelling the monuments. While not providing a 'Rosetta Stone' for the Pictish language, the 'names' signalled on TR1 and TR10 show that the monastery at Portmahomack was a project in which Picts were prominent (see Chapter 5.10).

Iconography

Animals in insular art perform both by virtue of their own symbolic properties, and the role they are portrayed as playing. Beasts celebrated for their fierce temperaments were depicted as having been tamed by Christ. The damaged figurative scene on TR1 has been argued to be *Daniel in the lions' den*, a strong redemption theme (Meyer 2005, 185–8; 192ff). Serpents (on TR2), which signify death, are overcome (Meyer 2005, Ch 2; 2011, 182–3). Distressed animals menaced by composite beasts (as on TR28/35) are seen as signifying aspects of the world's terror, which Christ can control (Henderson & Henderson 2004, 85). The lion and the boar, which occupy adjacent niches on TR22, are noble if dangerous beasts, denoting royalty (Meyer 2005, 237). The bird on TR218 also echoes the theme of nobility, since the falcon, eagle and bird of prey have been shown to have been adopted by the Byzantine and European aristocracy in the seventh century (Akerström-Hougen 1981). Meanwhile, the family of cattle portrayed on TR28/35 has been interpreted as a holy family 'representing the old and new covenants' (Meyer 2005, 247).

The scene on the upper register of the back face of TR20 features two lions disputing or sharing the half-carcass of a deer, while a bear slinks to the top right. For Meyer this is a reference to sheep in peril in 1 Samuel 17:34–37, a text which also mentions a bear; the scene would be followed by David rending the lion's jaw (Meyer 2005, 224). For Henderson and Henderson (2004, 142) the tableau illustrates Genesis 15, 9–11, where Abraham obeys God's command to make an offering of a heifer, a goat and a ram, dividing them *per medium*. Jeremiah 34:18–20 expatiates on a covenant with God that depended on a correct division in two

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equivalent parts: the lions could represent the princes of Judah who failed to fulfil the covenant.

The lower register of TR20, reverse, shows four *clerical figures*. These recall the apostles on the Cuthbert coffin and the identification of apostles is endorsed by the recognition of St Andrew from his heavily dishevelled hair, as portrayed on a sixth-century mosaic at Ravenna. The left-hand figure has lower shoulders, so may be seated, and a nimbus, so may be Christ. But the right-hand figure stands at the edge of the stone, so this would imply a representation of Christ and six apostles, and may imply an association with baptismal sites (Bailey 1996, 58–9; Lang 1999; Henderson & Henderson 2004, 146–7; Meyer 2005, 215). Alternatively, they may offer an image of a priest celebrating mass (Meyer 2011, 189). However, our reconstruction prefers twelve apostles in a row for reasons given below. These observations suggest that all the iconographic material at Portmahomack fits within an orthodox Christian context, and indicates a wide knowledge of Christian teaching and symbolic language. The contemporary, and more complete schemes featured on Hilton, Shandwick and Nigg reveal a still broader intellectual repertoire (see pp 249–56).

Affiliations

In sum, the ornamental and iconographic references place the Portmahomack assemblage in the eighth up to the early ninth century, with links to Ireland, west Scotland, south Pictland, Northumbria, Mercia, Cumbria and south-west England. Some art historians have argued for a special relationship between Pictland and Mercia (Henderson 1994, 81; Webster 2012, 143–6) and Plunkett was led to expect Mercian-Pictish connections by a documented alliance between Athelbert of Mercia and Angus son of Fergus in 750 (1998, 225–6). The latter rightly accepts that

connections were not diffused, but targeted, and assumes that these targeted links result in the production of similar kinds of aspirational art, as from Breedon to the St Andrews sarcophagus (ibid, 213). On these readings, Mercian carvers taught Pictish sculptors the art of carving in high relief, and this in turn explains the quality of the Portmahomack corpus. Some reinforcement of this view might be gleaned from the artistic Mercian references seen on the ‘book plaque’ (14/1286; see Chapter 5.6, p 211).

However, the course of artistic currents and their direction of flow can be misleading: rather we may be seeing the surviving nodes of an interrupted network. In her study of early Mercian sculpture, Rosemary Cramp notes that three of her four schools have links to neighbouring areas, while the fourth (Group 1), comprising Breedon, Fletton, Castor and Peterborough, is grand, architectural, innovative and engages with eastern influence (1977, 192, 194, 206). This group is consequently more diagnostic of the state-of-the-art rather than a regional speciality. If Breedon, St Andrews and Tarbat resemble each other, that is because they flourished at the same time, not because cultural credit always moves from south to north or west to east. The missing links disentitle affiliation, and not only in Pictland where the ‘authentic independent insular voice’ is surely the norm (Henderson & Henderson 2004, 217). Similarities then become artefacts of the period rather than results of diffusion: diffusion is not required. As Nancy Edwards reminds us, ‘sculptors, metalworkers and indeed manuscript illuminators on either side of the Irish sea in the late eighth and early ninth century had a similar outlook, a similar attitude to art and design and were working in a similar milieu’ (1998, 225–6). Although a late eighth-century flowering focused on Mercia suits the political reputation of Offa, it is as likely that the innovative sculpture formed part of a more widespread contemporary initiative, spearheaded in the north and west by the fundamentalist monastic movement (p 175). For this reason also,

Table 5.3.3
Direct association of moulding type with ornament

Moulding	Spiral	Spiral boss	Key	Median incised interlace
A	123, 124, 129		72, 86,	
B			62	
C				
D				
E		128		
F				
G				
H				257
U				257
No border		130, 144, 145–7		

Table 5.3.4
Association of conjoining sets with moulding type [K=key; I=Interlace; S=Spiral]

Moulding	Conjoining set 1	Conjoining set 2	Conjoining set 3	Conjoining set 4	Conjoining set 5
A	43 (S?), 44, 45, 47, 54, 55, 59, 68, 72 (K), 107, 114(5), 129 (S)	56, 67?			
B	62 (K)-----	66, 42, 79			
C					
D					
E					
F	101				
G					
H	257 (I)				
U	58, 60, 69 (K), 74, 78, 97, 257 (I)	243 162(I), 163(I), 171(I)	38 (I), 156(I), 177(I); 239(S)	229(S), 231(S), 233(S), 237(S),	217, 223, 263 (label-stop)

it is reasonable to expect that art will celebrate saints as often as kings.

Reassembling the Portmahomack monuments

Associations between pieces

There is a distinction in the usage of ornament as between the Glebe Field assemblage and that in the churchyard. The *key pattern* falls into two groups: the more numerous Glebe Field collection and the five singular examples from the churchyard. In the repertoire of *spirals*, the group of four *spiral bosses* connect to TR20 via a Type E edge, but the remaining spirals, mainly in low relief, seem to belong together in the Glebe Field, with at least one conjoining group. The *interlace* likewise falls into two groups, the numerically dominant type (median incised) in the Glebe Field, and the smaller group of twelve diverse types predominantly from the churchyard. The Glebe Field group also shows a general distinction from the churchyard in its preference for mouldings: Types A–D, G and H as opposed to Types E and F, which occur in the churchyard. If all the ornament in the Glebe Field were to be assigned to TR1, 2 or 20 we would have to suppose that, as with the Dupplin Cross, the double-bead moulding occurs only on their lower half, and that this was the part transported to the Glebe Field and broken up there, while the upper half remained near the west end of Church 1 and was broken into larger pieces before being incorporated into the foundations of Church 2. This is unlikely.

The implication is that the broken pieces in the assemblage from the Glebe Field (Int 14–24) largely represent parts of a different monument to those that survived in the churchyard.

This monument featured type 974 key pattern, flat spirals, median-incised interlace and edges with double-beaded moulding. In general, it is the Glebe Field assemblage that has the forms of ornament that are later in date.

The scattered components of the three cross-slabs in the churchyard and the Glebe Field monument were assigned largely from physical and stylistic associations. Table 5.3.3 shows the few direct associations that were observed between ornament and mouldings. Table 5.3.4 shows the five main sets of conjoining fragments, and the mouldings and ornaments with which they are associated. Conjoining Set 1 includes four fragments with flat spirals and three with key pattern that connect with Type A, B or H moulding. Conjoining Set 2 also connects to A and B mouldings, although they report no ornament. Spiral boss TR128 connects to Type E moulding, as by implication do its three similar bosses (TR130, 144, 145). The ornamental groups as well as the pieces that conjoin were found near to each other on the ground, reinforcing the impression that these remains resulted largely from the breaking of a single monument (Illus 5.3.21).

It can be deduced that a major monument was broken up in the Glebe Field that featured type 974 key pattern, flat spirals and median-incised interlace, and that it should date towards the end of Period 2 (late eighth /early ninth century). These associations represent an example of a varied repertoire. Median-incised interlace occurs with regular key pattern at Collieburn (near Kintradwell, Brora; ECMS II 52). Median-incised interlace and regular key pattern occurring with double-beaded moulding can be seen at Gattonside, Melrose (ECMS II, 433) (see Illus 5.3.50).

By the same token, there should have been at least three monuments thrown down in the churchyard, of which TR1, 2 and 20 respectively survive as the parent pieces. Few pieces from

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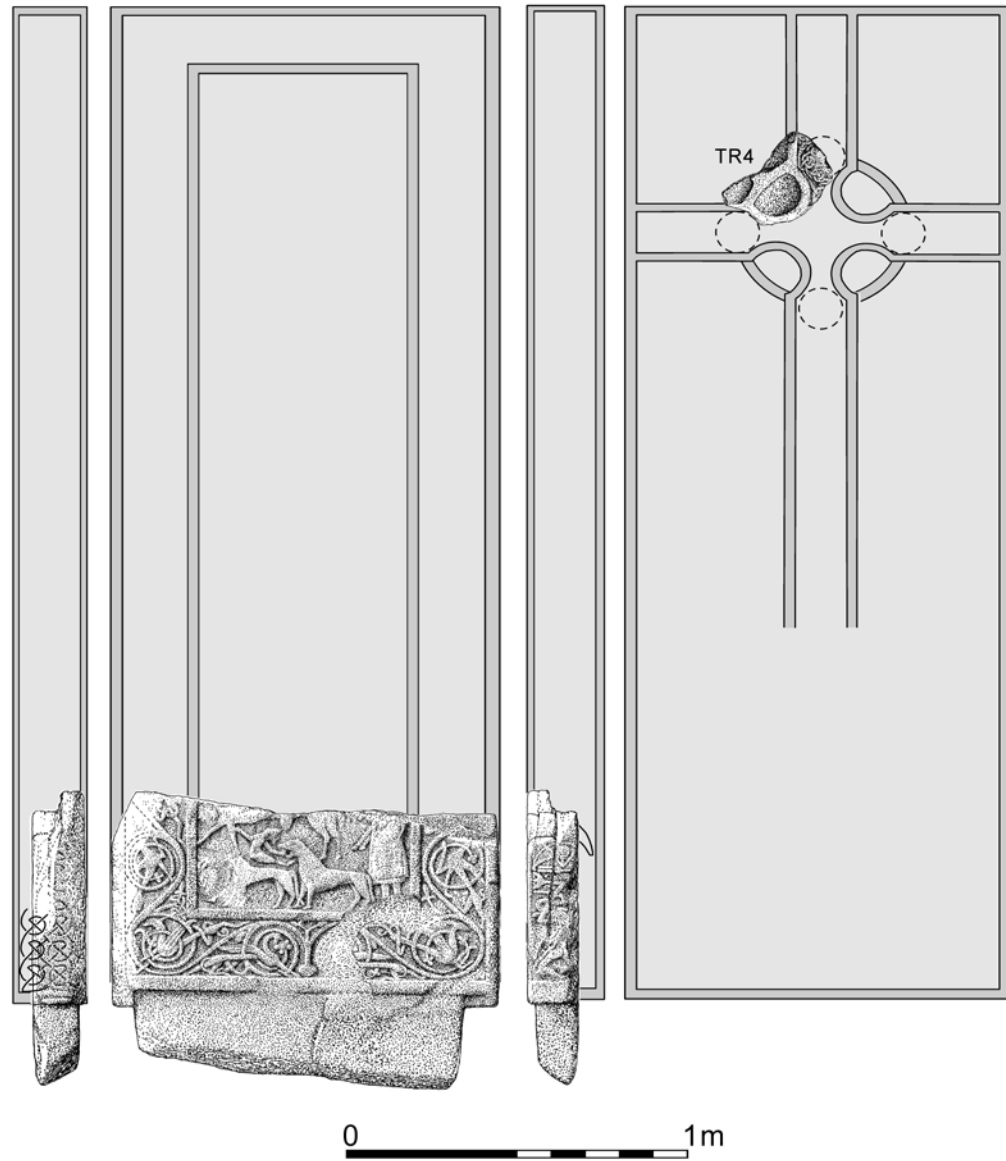


Illustration 5.3.51
Proposed form of Cross A

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

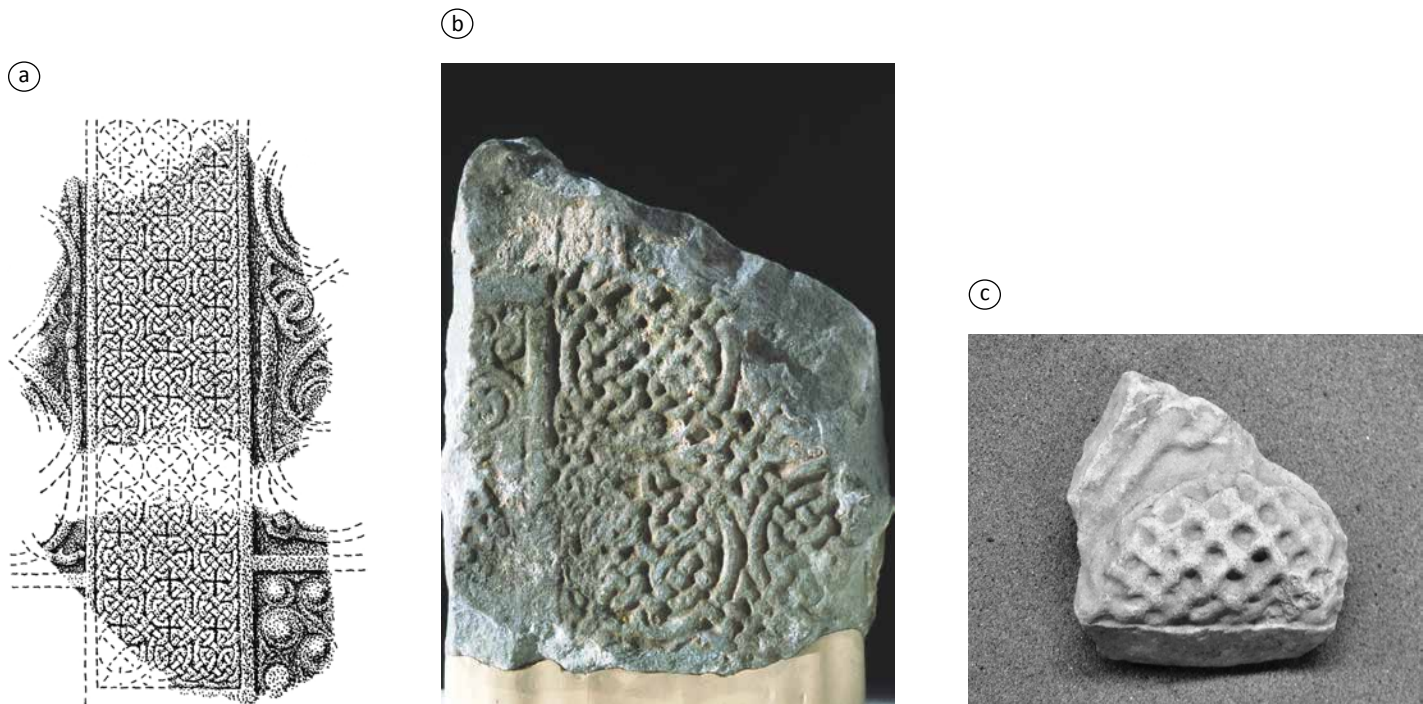
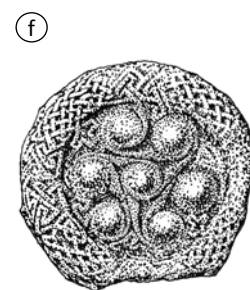
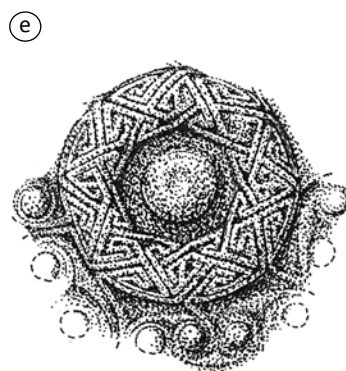
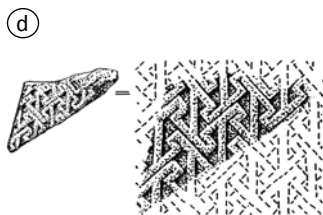
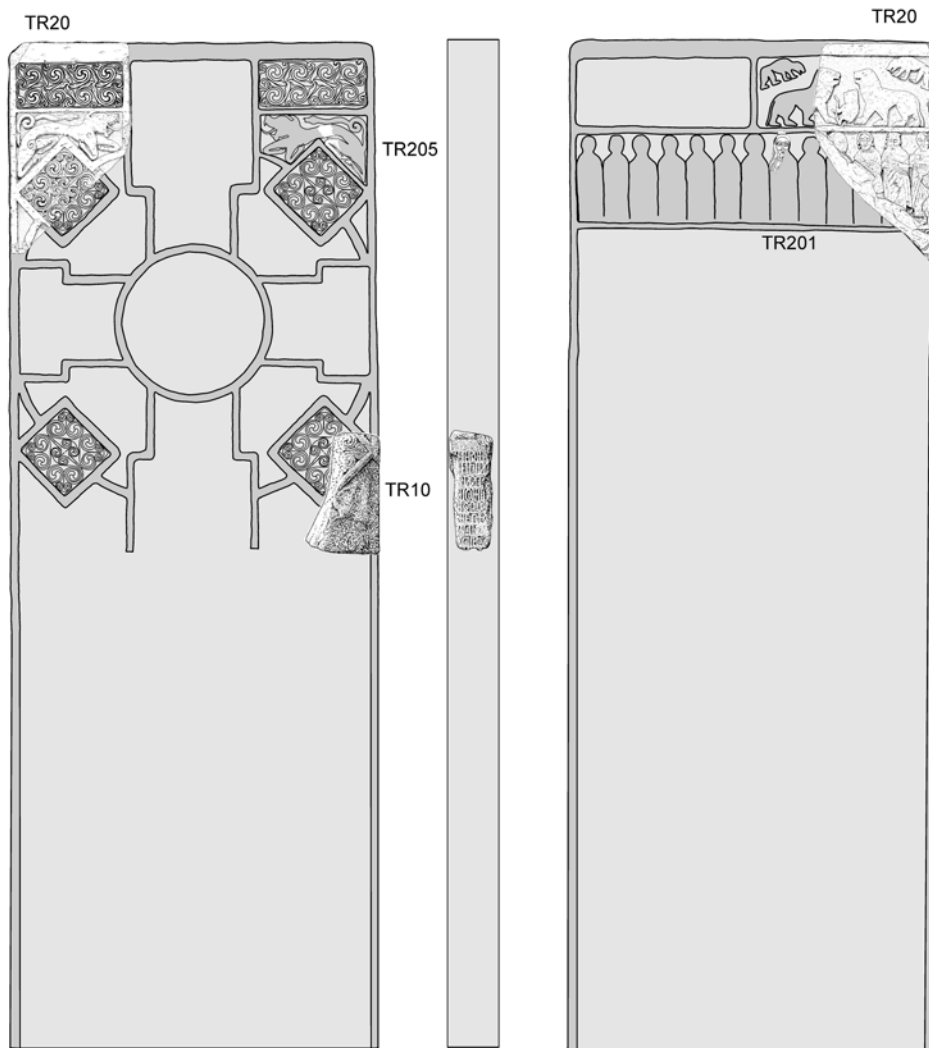


Illustration 5.3.52
Components of Cross B: (a) TR2; (b) TR40; (c) TR39; (d) TR8; (e) TR6; (f) TR5

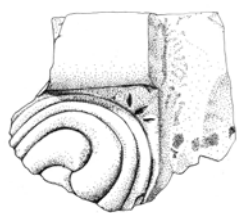


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0 1m

Illustration 5.3.53
Proposed form of Cross C



0 10cm

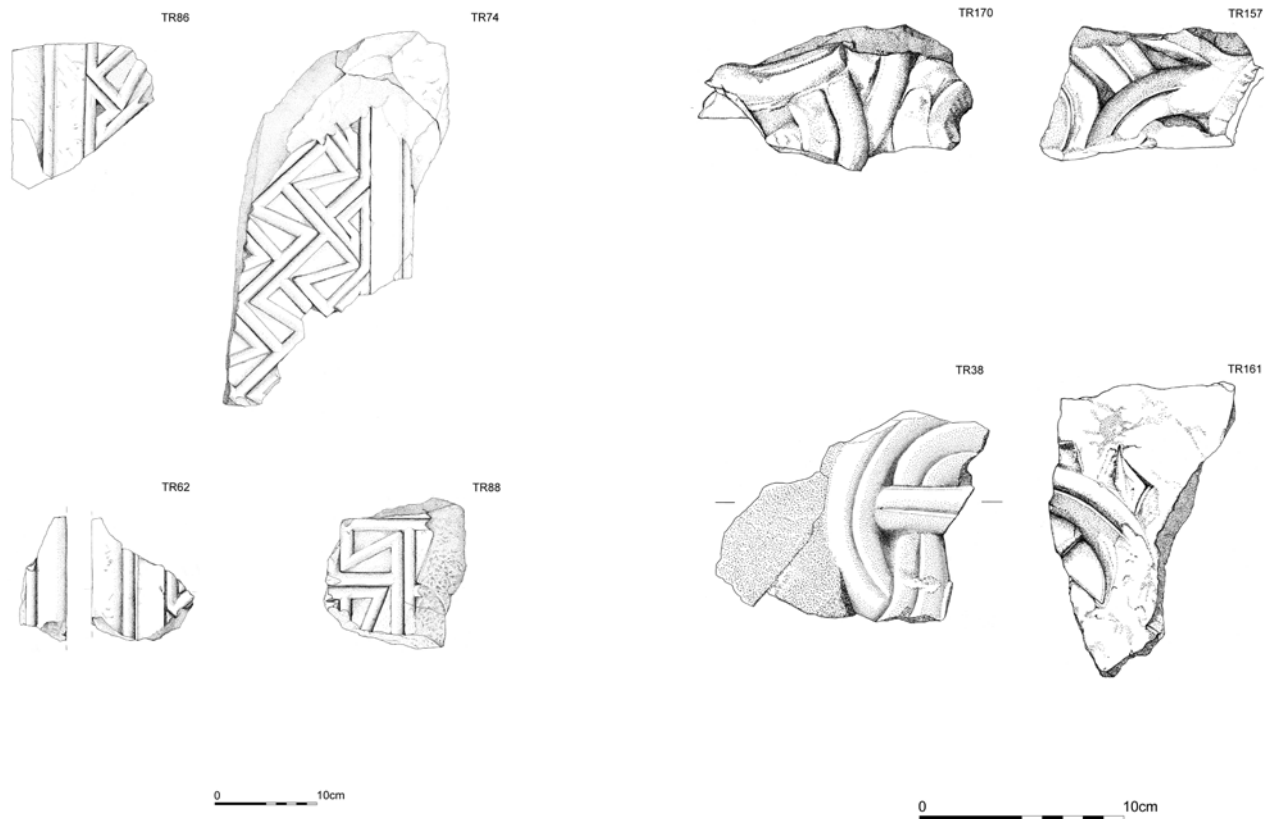


Illustration 5.3.54
Ornamental components of Cross D

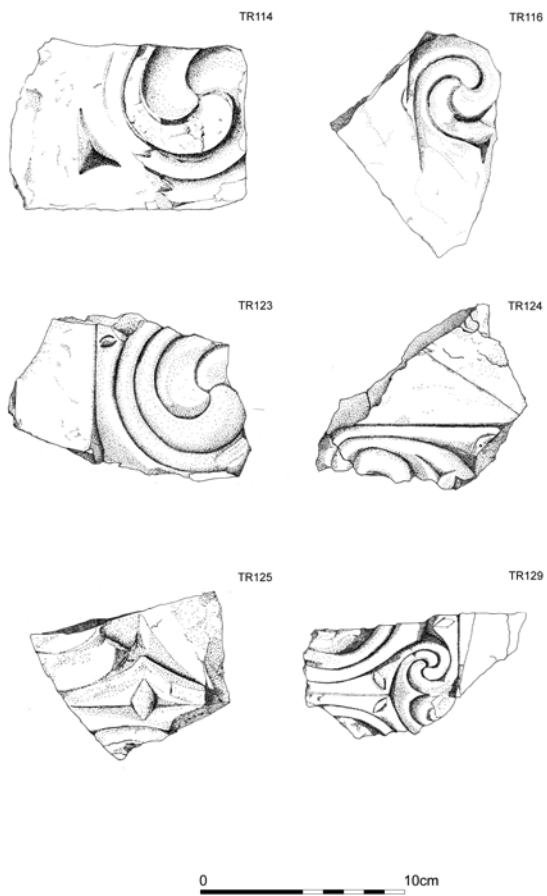


Illustration 5.3.55
Sculptor's chisel (24/4921)

Table 5.3.5
Associations of fragments with hypothetical cross-slabs

Parent piece	Location	Geological associations	Stylistic associations
CROSS A TR1	E of Cross B	TR4; TR6 [Miller]; TR7?	TR7
CROSS B TR2 'Danish Cross'	E of Church	TR5, 6, 8	TR4, 5, 6, 9 (centre piece), TR39, TR40
CROSS C TR20	NW of Church	TR10, 20; not TR7	TR10; TR9 (centre piece), TR201 [face of holy man]; TR205 [dragon leg]; TR218 [bird]; TR216 [horses]; TR260 [ribbed body]; TR108/221/222 [Pictish beast]; Spirals TR128, 130, 144, 145; Type E, F mouldings
CROSS D	W of Church		Type A–D, G, H mouldings; flat spirals; key pattern; median-incised interlace

the Glebe Field assemblage can be assigned to this more distant group, but there are some. As mentioned above, TR201, the face of a holy man, matches the apostles in TR20 and is the same size (50mm across) (Illus 5.3.28). TR205, a hooped and clawed leg, matches the dragon in TR20, and appears to belong to a beast that is a mirror image of the first and confronted with it (Illus 5.3.29). TR216 (horses) and TR260 (ribbed body) have an edge moulding that resembles the Type A/G group less than the Type E/F group, so both may belong to cross-slabs in the churchyard. The corner piece TR221/2, which carries a Pictish beast, is also designated as having a Type E moulding, so may have belonged to TR20. If the beast runs head up (as TR1) it could sit in a side panel, leaving its orthogonal face (with the mysterious leg in the air) to form a back panel. In this position it might have served as the back corner of the missing half of TR20. Although not claiming an E moulding, TR108 provides a corner fragment not dissimilar in form. An alternative (and preferred) interpretation of TR108/221/222 is that it forms part of a sarcophagus. In either case, the Pictish beast is likely to be performing in a high-status ecclesiastical context.

The type of monument broken up in the Glebe Field

The majority of the pieces found in the excavations in the Glebe Field were recovered from a grey brown soil with charcoal (C1510, C1547) laid down over the demolished monastic workshops. Most of the pieces showed evidence for being freshly broken up shortly before burial, for example TR111 where the back had been sheared away by a single blow. Only one example was noted as 'quite abraded'. Staining was seen on several pieces that were investigated to determine whether the discolouration had arrived on the stone before or after burial. Of the thirteen examples cited as having staining attributed to the presence of iron or minerals, all that had precise locations lay close to each other around the four square metres 882/3, 994/5. On one example, TR66, the staining was noted on the face of the broken edges. This and the proximity of the findspots suggest that this staining was post-depositional.

Evidence that the sculpture had been subjected to burning was noted on several examples: TR42 and 65 showed cracking, TR84, 109, 131, 147, 187 and 188 were discoloured red or pink

apparently by heat, TR82, 98, and 207 had black accretions and TR57 and 70 had dark patches. The distribution of these was a little broader than those with staining, over nine square metres from 880–883 E and 993–996 N. None of these pieces conjoin. Some support for the idea that the sculpture had been subject to fire before being broken up is given by the pieces TR145 and 147, which conjoin and both of which were affected by heat. Against this is the observation that very few of the edge pieces appear to have been burnt, and yet they would be most vulnerable to a fire in situ. The association with a soil in which evidence for burning was prevalent suggested that the sculpture had either been broken up and dumped before a fire took place in the workshop area, or was broken up and gathered together with burnt debris and then dumped on the workshop area. In either case it can be argued that the breaking of the sculpture and the fire were close to each other in time. Seven pieces were noted as having traces of *red pigment* (TR149, 160, 162, 163, 164, 171, 181). These were all examples of interlace. They were distinguishable from 'reddening by heat' and no example featured both. Unlike the other colouration, this can be attributed to the painting of the original monument.

The presence of a dominant group of border pieces, many of which conjoin, argues for a standing cross-shaft with a double-beaded moulding at its corners. The borders also argue for the presentation of the iconography in framed panels, as at Dupplin. The observed links between the border pieces and key pattern (TR72) and spirals (TR129) suggest they belonged to the same composition. Although forming a different interlace pattern, the tight knotwork of TR14/149 was also painted red and TR149 was found with the dominant median-incised interlace in the Glebe Field.

Unfortunately no edge piece survives to a complete thickness. The only complete width observed in a piece with two parallel faces was TR221/222, which was 165mm thick. This differs by 13mm from TR20 (178mm), but is nearly the same width (168mm) as the inscribed stone TR10, which could derive from the same monument. On the other hand TR10 is incomplete. TR40 has a thickness of 190mm. TR1, which had had its back removed, is 152mm thick. Shandwick is 210mm thick, Nigg is 127mm. Hilton is 210mm thick at the base and 240mm thick higher up, and the

upper part would have been even thicker before the removal of the cross face in or before 1676. The variety of dimensions observed in the same monument makes association (or disassociation) by thickness alone a capricious exercise.

Forms of the demolished monumental crosses

The question of how many cross-slabs once stood at Portmahomack was addressed by examining three criteria of association: geological, stylistic and location of discovery on the ground (Table 5.3.5). Geological investigations (p 137) provide associations that are often tentative, since all the pieces are made from a broadly similar sandstone. However, the evidence would appear to be reasonably strong that TR10 and TR20 can belong together but not to the same slab as TR2. TR1 is 150mm thick and TR2 is 50mm thick; it is therefore possible that TR2 was planed off TR1, which was originally 200mm thick, and thus close to TR9. The bosses TR5 and TR6 can both belong to the same stone as TR2. However TR1 is reported as geologically associated with TR20 and the grand monuments at Nigg, Shandwick and Hilton, but not with TR5 or TR6. TR7 cannot belong to TR20. Thus there are at least three slabs, based on TR1, TR2 and TR20. The bosses TR5 and TR6 should belong with TR2 and TR7 should belong to TR1 or TR2.

Miller thought that, geologically, TR1 could belong to the same slab as TR2 (above), but although both were found east of the church, they seem to have originated from separate locations. Since the ‘other half’ of TR1 was buried in a grave, its association with many of the larger surviving fragments is unlikely. In particular TR9, which represents a centre and a whole width of a slab, and TR4, the arm of a cross, are likely to have belonged to the top centre of a slab, so they should more readily find a home with TR2 or TR20. Stylistically, there is a family of pieces associated with TR2 and another with TR10/20. TR14 might have belonged with TR20 or TR2; the location would favour the association with TR20. TR1 does not obviously connect with either TR2 or TR20.

On this scheme *Cross A* is represented by TR1, TR4 and possibly TR7. It stood to the east of Church 1 (and east of Cross B). It is the Class II cross-slab noted by the Ordnance Survey. *Cross B* is represented by TR2, and possibly included TR4, bosses TR5, TR6, key pattern TR8, centre piece TR9, boss TR39, and TR40). It stood to the east of Church 1 (and west of Cross A) and is the ‘Danish Cross’ referred to in the nineteenth century (see p 123). *Cross C* is represented by TR20 and TR10, and possibly apostle TR201, dragon leg TR205, bird TR218, horses TR216, ribbed animal TR100/227/260, Pictish beast TR221/2, corner TR218 and spiral bosses TR128, 130, 144, 145. Its original location is unknown, but it was found scattered between the Glebe Field (TR201 etc; Table 5.3.6), the medieval vault (TR20), the churchyard (TR9) and the post-medieval manse (TR10). If Cross D stood near its wreckage, a suitable place for Cross C might be on the mound to the west of Church 1 or on the north side of the churchyard near the road (Illus 5.3.55).

The Nature of Cross D

Cross D is represented by the double-beaded mouldings, median-incised interlace and key type 974 on pieces deposited in the Glebe

Field. These could belong to a cross-shaft, but before settling on that, the possibility was examined that some of the material may have been architectural. This was certainly the case for the remarkable corbel TR217, an object that is singular in every sense, there being only one example at Portmahomack and no parallels from elsewhere. The use of an ornamental corbel in the twelfth century and later includes the support of a roof, the support of an arch or the support of a lintel. While corbels serving to support a roof should be several in number, the corbels flanking a doorway or chancel arch could be as few as a pair, and this is its most likely role.

The expectation that arises is that other pieces of the Glebe Field assemblage might have had an architectural function. It is not impossible that the smooth moulded edge pieces performed as cladding for moulded jambs or lintels, such would be implied by the high quality of the corbel. The Dunblane stone, cited by Henderson and Henderson as a likely lintel and inferring the presence of a church (2004, 209), places passages of median incised interlace, key pattern and animal interlace side by side much as is proposed here for Cross D. On the other hand, there were no traces of mortar on any of the pieces or on the corbel, nor was there any obvious masonry included in the debris deposited over the burned workshops. For this reason, the panels with interlace, spirals and key pattern might be better placed on a cross-shaft. The matter should be left open until other large assemblages are excavated, preferably with the total excavation of a contemporary church. At Portmahomack, the assumption *pro tem* is that the Glebe Field assemblage belongs by and large to a demolished free-standing cross-shaft of the late eighth to early ninth century.

Models

Cross A finds its principal echo in Hilton of Cadboll. No fragment of vinescroll has been identified among the pieces recovered elsewhere in the assemblage and it is assumed that the upper half of TR1 (and its trimmings) lies buried somewhere near the Dingwall memorial. It will have had a cross on one side and historiated panels on the other, perhaps continuing the one that survives. The original slab should have stood some 3m high (Illus 5.3.51). *Cross B* is rich in bosses and should owe much in its design to Nigg, but the fragments are too exiguous to propose a form (Illus 5.3.52). The reconstruction for *Cross C* is based on Elizabeth Hooper’s model for TR20 and features a St Andrew’s cross, with two confronted dragons, the inscribed stone on one edge, a Pictish beast on another and twelve apostles on the back (Illus 5.3.53). The components for a model for the Glebe Field cross-slab (*Cross D*) are edge pieces, key pattern, spirals and median-incised interlace (Illus 5.3.54). Imaginative reconstruction is elusive but ought to be based on a cross-shaft of the type of St Andrews 14 (see Illus 5.3.42).

Biographies of the monumental cross-slabs and their original locations

The *original siting* of the major early medieval monuments may be implied by the secondary contexts in which they were found, on the grounds that large pieces were cumbersome to move at hazard.

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Some had been reused in the foundations of the early church, others were found in a single deposit in the Glebe Field, others in the graveyard and further afield (see Illus 5.3.1). The degree of recycling could be estimated to some extent by the traces of earlier mortar and the amount of weathering. The pieces reused in the *Church 2 foundations*, ie reused in eleventh century and originally on the west side of Church 1 (or within Church 1), were TR21, 22, 30, 31 and 33. In the *Church 4 foundations* (thirteenth century) were TR14, 20 32 and 26, but these may also indicate recycling of Church 2 fabric. Pieces found in *post-medieval buildings* may have also been recycling from rebuilding operations at the church. These were TR10 (manse garden wall) and TR39 and 40 (originally in the manse steading). Those remaining in the *churtyard*, include TR 1–9, 11–13, 15, 19, 24, 25, 27 and 34. These include both simple grave markers and major cross-slabs, but gravediggers may not report the less decorated fragments. These can all be associated with an early cemetery.

Those in the *Glebe Field* were deposited over the workshops so should represent breaking up or reuse in the ninth century (Chapter 5.11; Chapter 6). Since there are so many pieces and the connections between them are strong, this should represent the demolition of one major monument. The pieces are relatively unweathered and had been forcibly hammered from a recently

erected monument. The material found in the church and churchyard was more weathered and had sometimes been reused for building. The implication is that the major memorials were levelled at the raid or soon after, say in the early ninth century and that the larger stones surviving from the monuments were recycled 300 years later when Church 2 was built. TR6, which is associated with TR2 (Cross B) was found at a depth of 6–7 feet before 1889. This implies that the ‘Danish Cross’ was broken up before 1889 and, unless reburied in a grave, perhaps a considerable time before then. The back face of TR1 had been smoothed off, perhaps in preparation for reuse as a grave cover. A comparable event had afflicted the Hilton of Cadboll slab in 1676 (see p 253). Antiquaries reporting the existence and location of Class II and ‘Danish’ crosses were thus most likely offering inferences from the observation of broken pieces.

We can infer that the cross-slabs and grave markers were mainly located in an early cemetery on the hilltop (see Chapter 5.2), which may also have been the location for an eighth-century stone church (Chapter 5.4). Wherever the cross-slabs stood, they probably had liturgical roles and may have emulated the stations of ceremonial processions such as were practised at Rome and Inishmurray (Meyer 2005, 341; O’Sullivan & Ó Carragáin 2008). On this basis, they could possibly have been

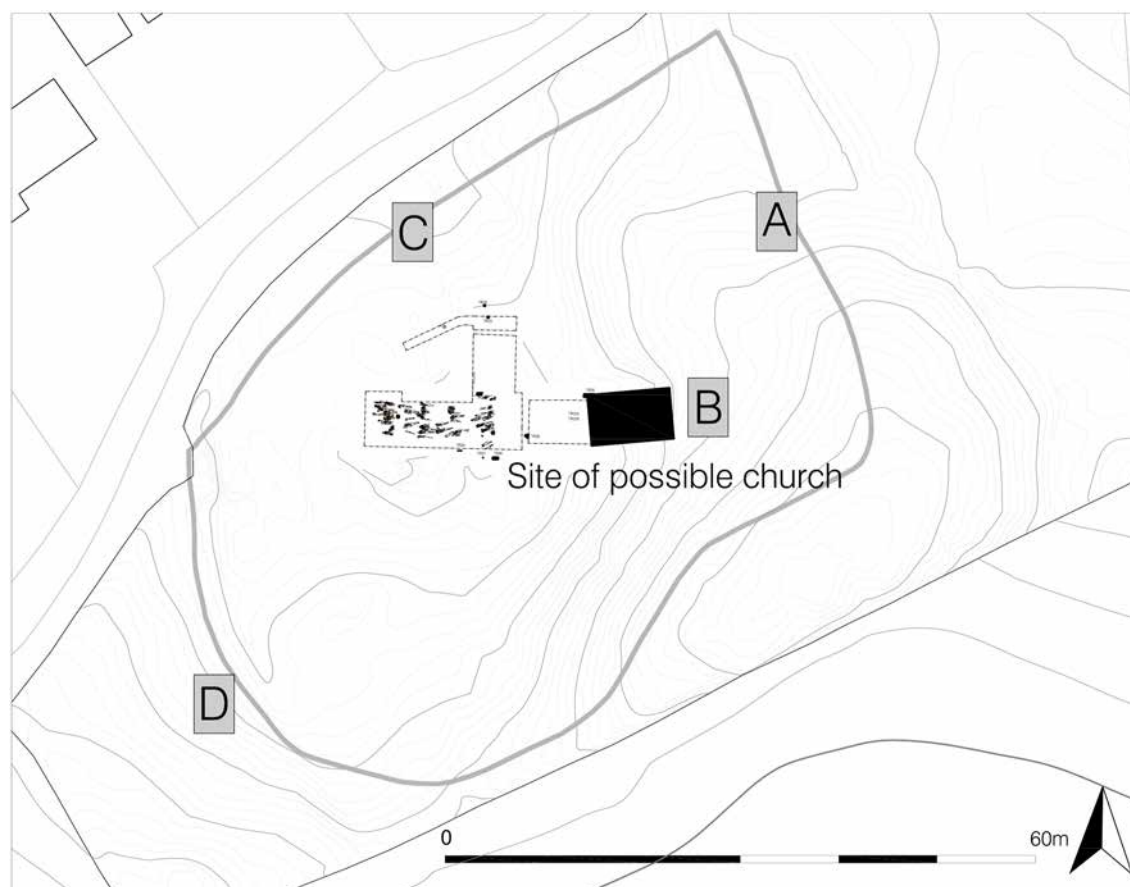


Illustration 5.3.56

Plan of the churchyard showing the hypothetical locations of Crosses A–D as deduced in the text

sited at entrances to the inner enclave implied by the (later) graveyard enclosure (Illus 5.3.55). Two of the grand cross-slabs were sited to the east (the TR2 group: ‘Cross B’) and further east (the TR1 group; ‘Cross A’). TR20 provides the nucleus for a cross-slab somewhere near the church (‘Cross C’), here proposed as lying to the north of it. The Glebe Field collection suggests a cross-shaft, placed between the church and the workshops (‘Cross D’). Cross D is placed on the path where it crosses the inner churchyard bank. While their locations are hypothetical, sited by inference, four large monuments would probably mark out the inner precinct of the monastery, and the same form of territorial declaration is also proposed for the peninsula as a whole (Chapter 5.10).

Some conclusions

The Portmahomack assemblage should thus have included four grand crosses c 3m high, a number of short grave markers marked with plain crosses, a sarcophagus and possibly a panelled shrine which stood in the cemetery, while a stone building (presumably a church) was embellished with architectural impostos or label-stops and a *cancellum*. The large number of thick fragments worked in high relief suggests that the cross-slab formed a major subject of investment at Portmahomack. Each featured the cross together with one or more iconographic schemes referring to events or individuals from scripture. The latest of these monuments, Cross D, was probably a cross-shaft rather than a slab, resembling Dupplin or St Andrews 14. The remaining three were cross-slabs, one carrying a Latin inscription commemorating an individual and one (or possibly two) bearing Pictish symbols. In this, and in the detail of their ornament, they resemble the surviving cross-slabs at Nigg, Shandwick and Hilton of Cadboll, to be discussed in Chapter 5.10.

The stylistic dating cited above puts the carvings within the seventh to early ninth century, with an emphasis on the latter part of that period. The simple incised grave marker TR25 was found while digging a service trench at a level that might plausibly be assigned to Period 1, although its context is thought to align more convincingly with the ground surface of the Period 2 cemetery (Int 16, p 27). The forms of ornament on Crosses A–C (and the lettering of the Latin inscription) would allow them a date in the eighth century. The ornament assigned to Cross D has parallels that are dated in the late eighth or early ninth century. Overall the timespan for the production of the sculpture at Portmahomack is compatible with that of the burials, craft and all the other events of Period 2 as determined by radiocarbon dating, namely c AD 680–810 (Table 3.1).

The wide range of stone carving represents an impressive achievement over a relatively short timescale. Apart from one portable grave marker (TR21) made of exotic stone, all the output would seem to have been contrived from local materials. It seems unlikely that such large sculptural pieces would have been carved in situ (at or near the Geanies quarry) since moving a completed work would have risked damage. In the areas excavated at Portmahomack there were no dumps, spreads or areas covered with associated debris such as stone chippings that one might associate with sculptors’ waste. However, there was a

sculptor’s chisel from Sector 2 (24/4921) (Illus 5.3.56). This iron tool is complete and has a fine double-bevelled end suitable for detailed work, including epigraphy. Sculptor’s chisels have rarely been identified in Britain (cf Manning 1976: Fig 16 no 70), and the findspot in the vellum workshop is a nice reminder that this was a single artistic community, whose members carved stone, built buildings, made vellum and cast objects of bronze and silver.

There are few pointers to the way that stone carving at Portmahomack changed its emphasis over the century or so it was in operation. Common sense would suppose an evolution from a simpler (TR24/25) to a more complex (TR20) output. But it is equally possible that the first monument was the grandest, and that lesser works followed as skills or contacts diminished. Perhaps more attractive, given their variety, is a picture of a steady provision of grave markers through the period, with the different forms of expression a reflection of figures of greater prominence or greater humility. The making of cross-slabs A–D constituted major projects and perhaps signalled particular episodes of high investment. It would be a reasonable deduction that such investment was in the hands of a king or lord. This appears to be the burden of the documentation from Clonmacnoise, where Ragnall O’Floinn has proposed that the 700 or so memorials were concentrated in ‘a number of short periods when the monastery came under the control of powerful neighbouring kings’; in the late eighth century these were Kings of Connacht, in the mid-ninth to early eleventh century, the Clann Cholmain kings, and in the twelfth century the Kings of Connacht again (Ó Floinn 1998, 97). It can be argued that the Pictish symbols signify names (p 157) and since the major Tarbat monuments (Cross A, Hilton, Shandwick and Nigg) carry them, individuals should be itemised by these, as well as by the Latin inscription on TR10. It is not easy, in the case of Pictland, to be sure that these persons must be kings. Even at Clonmacnoise there are grounds for saying that those commemorated by cross-bearing stone markers are predominately churchmen, the principal managers of the monastic estate (Swift 2003, 119). It also seems logical for such a devotional institution to put its highest premium on holiness. There is a third possibility, advanced both for the Portmahomack precinct and for the peninsula as a whole, namely that the individuals celebrated on cross-slabs are neither kings or churchmen, but saints, of actual or legendary acquaintance and not excluding those to whom churches are dedicated (Carver 2008a, 187–8).

The rapidity with which this small group of artisans achieved such a diverse and masterly output has naturally raised thoughts of imported expertise, but we can offer little hard evidence of whether and when the Portmahomack community entertained initiatives from beyond its natural frontiers. Some of the grave markers bear a close resemblance to those known at Iona and the west coast of Scotland and one of these, at least, was imported as a finished piece perhaps from that area (TR21). This piece, easily lifted by one pair of hands, may have been part of a stock of grave markers available at major Irish centres and serving gift, trade or proselytization as suggested at Clonmacnoise (King 2009, 340). Anglian motifs are quoted with equal enthusiasm and in high-status contexts (such as the vinescroll on TR1). The contacts with the Northumbrian, western Scottish and Irish ecclesiastical

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repertoire might have been anticipated, but there are also indications that an important if neglected source of ideas may be found in west Britain, from Govan to Gloucester (see above). This was also the case with the form of burial (p 121), so it might be legitimate to sense a 'British' substrate linking the north-east and south-west parts of the island.

The carved stone from Portmahomack shows that northern Pictish sculptors were major contributors to the flowering of Christian art in its first millennium. They were well versed in its repertoire, were creative in their own variations, were as knowledgeable of the liturgy as any of their Continental peers and, as artists, were more inspired than most. The Portmahomack monastery emerges as a player in Europe's long eighth century,

writing its own highly sophisticated and eclectic manifesto in which the sculpture played a major role (Chapter 8, p 340).

5.4 Evidence for a Stone Church

Inference for a church

The existence of a Pictish stone church at Portmahomack is implied by the eighth-century cemetery (Chapter 5.2), the large quantity of Christian sculpture, including architectural pieces (Chapter 5.3), and the craft activity (Chapters 5.5–5.7), which taken together present a convergent case for an early medieval monastery (p 337). The eighth-century cemetery was eventually



Illustration 5.4.1

Aerial photograph showing St Colman's Church with present churchyards and curved bank of earlier churchyard boundary showing to SW of church (NMRS B49260, 1991)

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succeeded in the same place by a medieval church, aligned W–E. The first manifestation of this church was a stone foundation laid out as a simple rectangle, in the eleventh or twelfth century (Church 2), onto which a chancel was added to make Church 3. In a major development of the thirteenth century, the church was lengthened and a belfry added to the west and a crypt added to the east (Church 4; see Chapter 3, p 56 and Chapter 7, p 292).

The co-location of the eighth-century cemetery and the twelfth-century church suggests that a Pictish church would have stood at this location rather than elsewhere on the hill (Illus 5.4.1). ‘Was there such a church?’ and, if so, ‘what form did it take?’ are the questions addressed here. An enclosed Christian ecclesiastical settlement *without* a church is theoretically possible, but could not be demonstrated without the excavation of the whole enclosure. The questions must therefore be reframed as, ‘what is the evidence for a church from this excavation?’, ‘where was it located?’ and ‘what is its implied form?’

In order to distinguish between the probable, the possible, the permissible, the conjectural and the inferential with reasonable transparency, the argument for a church is presented at three levels. *Archaeological evidence* is offered by the anomalous east wall of the extant crypt, by the alignment of eighth-century burials and by the eighth-century architectural sculpture. This suggests that there was a stone church built of faced rubble with architectural fittings. *Circumstantial evidence* comes in the form of the context provided by the monastic infrastructure, the sequence of burials and the disposition of carved stone fragments. *Comparative evidence* can be gleaned, rather sparsely, from the handful of examples in Ireland, Northumbria and the Anglo-Saxon south-east that might vicariously reflect the character of early church buildings in Scotland, the form of which remains, at the time of writing, largely unknown (Foster, forthcoming).

Archaeological evidence

None of the excavations inside or outside the present church revealed structural stone or timber-derived features of a form of church that could be certainly assigned a date before the twelfth century (see Chapter 3, p 56). However, the upstanding fabric of the crypt, the alignment of the eighth-century burials and certain pieces of sculpture did give some indications of a former stone building. The most easterly row graves of the eighth-century cemetery had departed from an E–W alignment by ten degrees or more, and this was attributed to the influence of a newly erected building (Chapter 5.2, p 109). It had been noted during the study of the church fabric that the west face of the east wall of the crypt showed a similar, if lesser, divergence (nine degrees) from the alignment of the east wall of the later medieval church (Church 4); this implied that the east wall of the crypt belonged to an earlier build (Illus 5.4.2). It therefore seemed worthwhile to explore the hypothesis that the medieval crypt incorporated or concealed fabric from a Pictish stone church.

Examination of the crypt

The crypt as encountered in 1997 consisted of a barrel vault abutting and closed by east and west walls, accessed by a flight

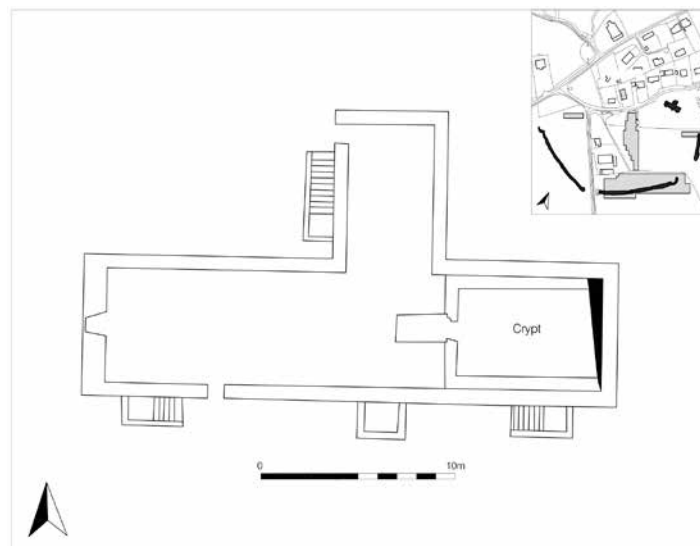


Illustration 5.4.2

Plan of Church, showing skew east wall of crypt (19/F3) in black

of steep stone steps descending from the level of the nave floor (Chapter 7, Illus 7.10, p 296; OLA 6.2/3.4.4). The fabric of the vault had incorporated a large piece of eighth-century cross-slab (TR20, p 129) and retained what appears to be a section of a thirteenth- to fourteenth-century window mullion (Chapter 7, p 297). There were medieval burials interred above the vault



Illustration 5.4.3

East wall of crypt, with aumbry (below) and lights to the outside (above)

PORTMAHOMACK ON TARBAT NESS

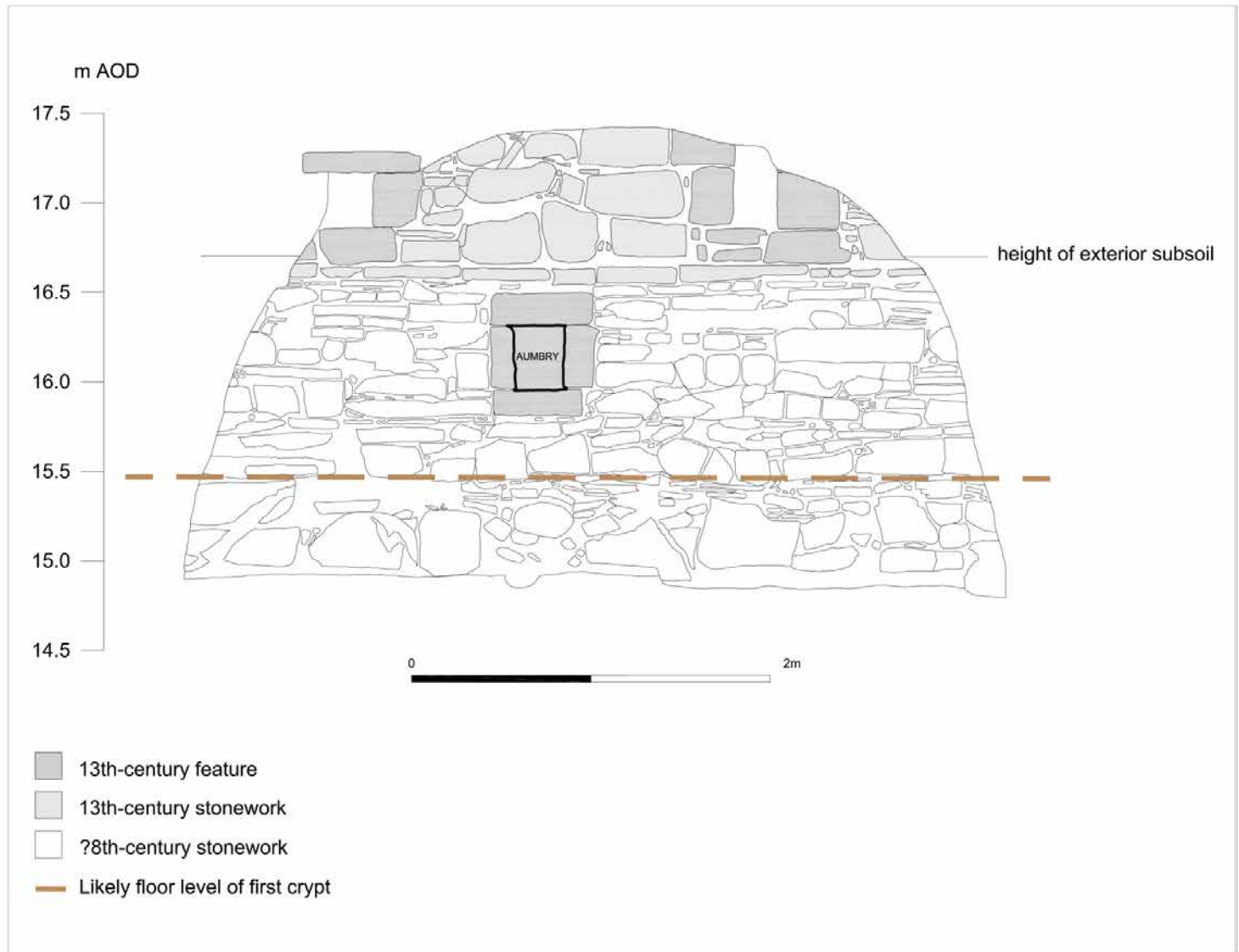


Illustration 5.4.4
Face of east wall of crypt, elevation

(p 292). The stone frame of the door into the crypt featured a mason's mark (p 294). The vault, doorway and the steps in their present form are therefore deemed to be medieval but no earlier than the thirteenth century and have been assigned to Church 4. As it has survived, the west wall of the crypt, orthogonal to the vault and incorporating the west door and steps, also belongs to the medieval church.

The focus is therefore on the skew east wall (F3). It measures 4.25m internally along the ground and 7.5m externally. Its west face (F3) shows a primary build of unsquared red sandstone blocks of various sizes, the larger blocks comprising the lowest courses (Illus 5.4.3). About two-thirds of the way up, there is a course of flat slabs, above which the wall continues in yellow sandstone; while not exactly ashlar, this part of the fabric is contrived in squared stones, similar to the fabric of Church 4. Slightly off centre is an

aumbry composed of four stone slabs. Above, to north and south, are two lights formed of large blocks that are integral with the higher courses but precede the vault (Illus 5.4.4). The aumbry may be an integral part of the first build, given the straight coursing abutting it on the south side; or it may have been added as part of the rebuild, given the tumbled coursing abutting it on the north side, and the similarity of its build to that of the lights. The latter seems the more probable, since the aumbry is off centre, and the southern courses may have been relaid during its insertion. Since the inner (west) face of the east wall is not orthogonal to the rest of the building, so the internal length of the crypt is 6.76m long on the north side and 7.2m on the south side. There are therefore three builds: a primary of coarse blocks in red sandstone, a secondary of yellow sandstone squared blocks with two lights, likely to represent the build or rebuild of the thirteenth century

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Church 4, and a vault of the fourteenth/fifteenth century. The first phase is eligible for consideration as a wall that predates the thirteenth century. However it does not belong to Church 2/3, the east end of which was cut away when the crypt was built (Chapter 7, p 293). There remains the possibility that this wall served a still earlier church, which will here be referred to as 'Church 1'.

A west-running Church 1A?

In theory, such a relict wall could be the east wall of Church 1, or its west wall. If the building ran west (option A in Illus 5.4.5), its east and west walls would nearly coincide with those of the crypt, and its footings would be more or less concealed by the present church. To elude detection, its west wall would need to lie west of the present crypt but no further west than the east wall of Church 2, or we should have found it. The masonry complex west of the crypt incorporated the east wall of Church 2, the truncated extension of Church 3 and the foundations of Church 4 including the west wall of the crypt (17/F88 & 97; OLA 6.3.1, 37). Assuming the west wall of Church 1A lay beneath this complex, it would measure c 11.25 × 7.5m externally. However, the present crypt is largely underground, so the feasibility of this location depends on the relative heights of the ground surface in the early Middle

Ages. If the floor of the church was more than about 0.5m below its contemporary ground level it would be difficult to access and so not easily viable in that location. The following analysis attempts to relate the likely floor of a Church 1A occupying the site of the crypt with the likely ground surface of the Period 2 cemetery that was its contemporary.

The highest ground surface outside the south-west corner of the present building is c 19m AOD, and the present ground surface outside the east end is 17.5m, so the present church lies on a hill sloping downwards towards the east (Illus 5.4.6). The old ground surface used by the Pictish cemetery can be estimated from the depths that the skeletons were buried. The depth of the capped Burial 188 in Sector 2 was 15.10–14.26 = 0.84m as excavated (OLA 7.2, Fig 7) but the top of extant subsoil immediately north was recorded as 15.40m (OLA 3.1.1). Thus the minimum depth of a cist grave could be estimated at about 1.20m from turf to base, allowing for a topsoil 20cm thick. In Sector 4, the three recorded skulls of Period 1 (in Burials 149, 170, 172) all lie at 16.9m AOD, suggesting a ground level of 17.90m (allowing for a 20cm-deep skull). Period 2 skulls in the western row (Burials 151, 171, 169 and 164) lie at about 17.1m, implying a ground level at about 17.9m AOD. In the eastern most row, argued as aligned with a church, the tops of skulls

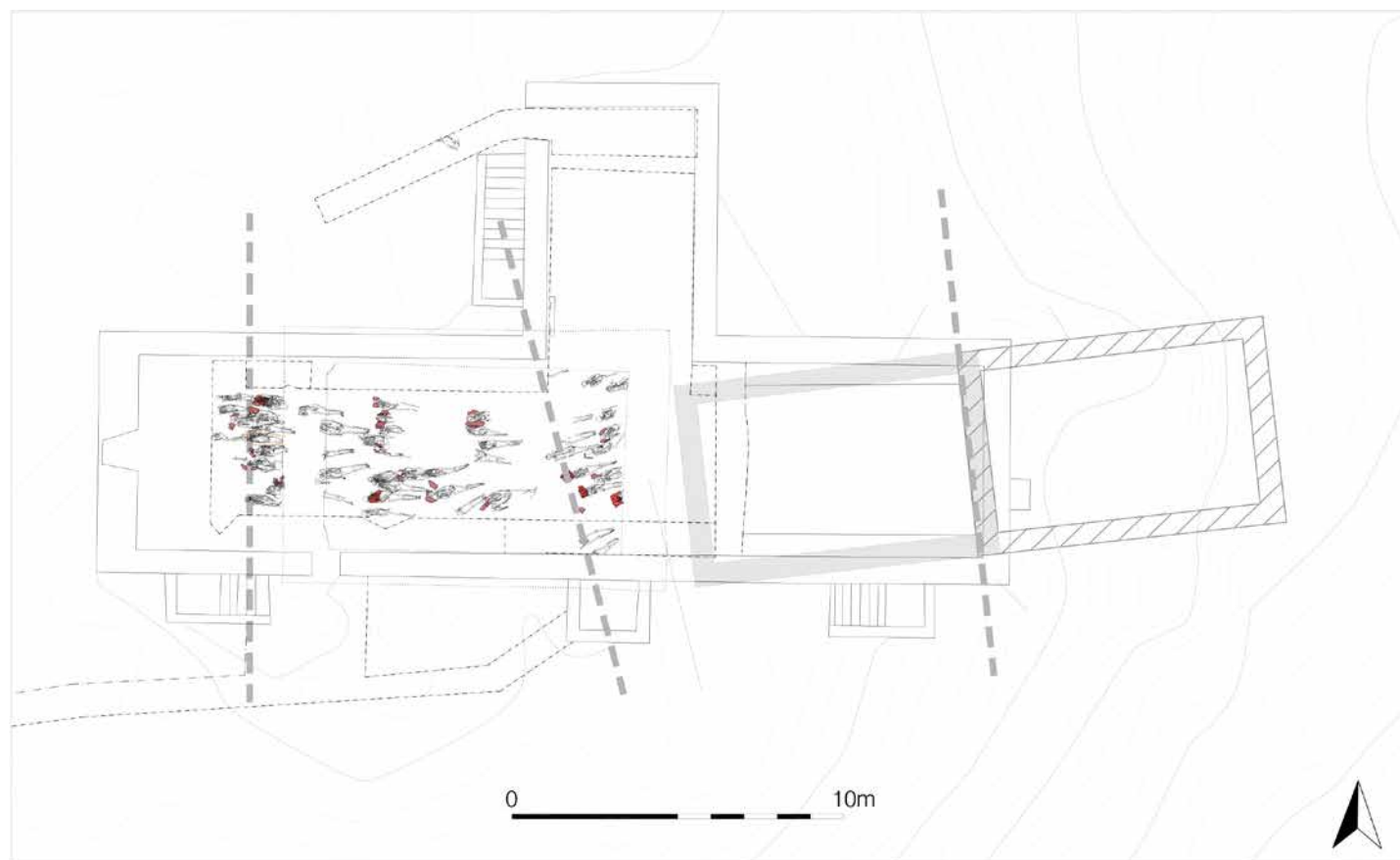


Illustration 5.4.5

Plan of church showing orientation of Period 2 burials and two possible positions for Church 1

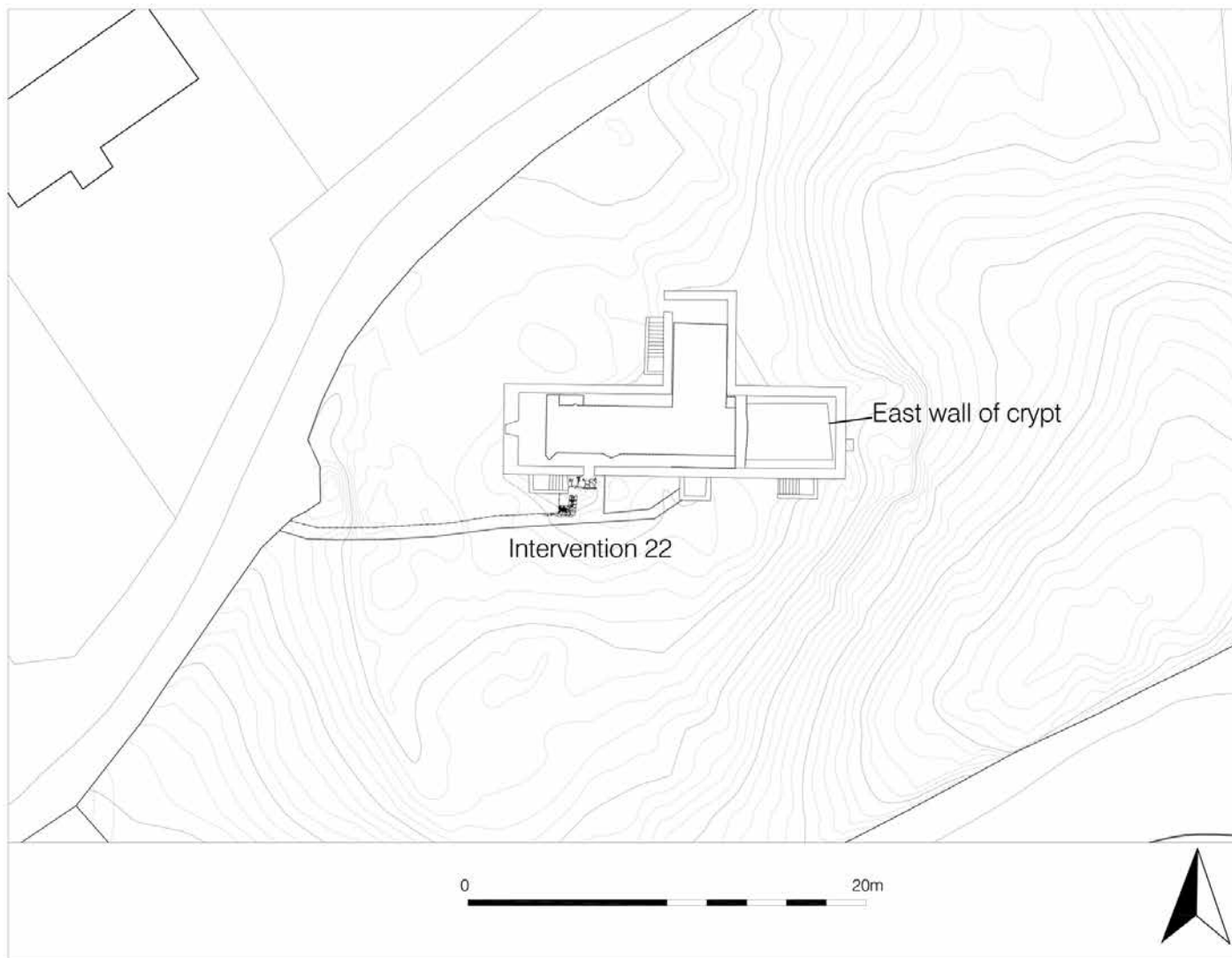


Illustration 5.4.6
Contours of the Church site

lay at about 16.9m implying a ground surface at 17.7m. Thus the general topography of the cemetery slopes gently towards 17.7m AOD at its recorded eastern end (Illus 5.4.7).

The threshold of the medieval Church 2 was at 18.0m, but the height of its floor was estimated at *c* 17.6m AOD from the height of the top of the foundation courses; its footings lie about a metre deeper at *c* 16.70m AOD (OLA 6.4/3.4.1). Up to 30cm of the soil covering the Period 2 graves was thus truncated when Church 2 was built, taking with it a quantity of grave markers, some subsequently incorporated into the Church 2 fabric. Inside the crypt, the base of the stones of the east wall (F3) lie at 14.73–14.87m, and the west wall (F4) at 14.93m. The lowest level of the crypt floor is currently at 15.025m. The top of the aumbry is at 16.41m AOD. F3 (the east wall of the crypt) was reported by the architect as cut 1.5m into subsoil externally, implying a current subsoil surface at 16.5m at the east end. The south and east

external walls of the crypt were thirteenth-century dressed stone to a depth of 1m below the chamfered plinth (which was at 17.7m AOD), ie to *c* 16.7m AOD, which should therefore represent the old ground surface outside the east end in the thirteenth century (OLA 6.3/, 3.4.4). The eighth-century old ground surface would have been much the same, since it could not have been lower than the extant subsoil. The floor for a western Church 1A therefore must have lain somewhere between *c* 15m and 16.7m AOD (ie not lower than now, not higher than the thirteenth-century old ground surface). If the aumbry was in use in Church 1, then the floor could not have been much higher than it is now (15m AOD). If not, then the floor could be higher, say 15.50m to allow for a wall footings buried by half a metre (Illus 5.4.4). This study implies that in Period 2 there was a drop down from the old ground surface to the floor of Church 1 of 2.4m, roughly what it is today: the present Step 2 is at 15.41m, Step 10 is at 17.50m; the height of church floor

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at 18.13m. (OLA 6.3, Fig 25). The situation is summarised in Illus 5.4.7.

Thus if an eighth-century Church 1A ran west from the east crypt wall, it was already underground, and was in effect already a crypt. This is not impossible culturally (see below), but practically it would require steps and the top of its steps would need to be inside a building or the crypt would rapidly become a cistern. Since no additional walls were found, a Church 1 in this location would need to have the same footprint as Church 2 plus the crypt of Church 4, and it would require the same elements: steps and a vault. Stratigraphically this cannot be so, since the steps are cut through the west wall of Church 2 (Illus 7.2, p 290). An earlier study had concluded that while the case for a Church 1A on the crypt site was weak, it was at least possible (Carver 2008a, 86). Here the detailed use of the cemetery data throws additional doubt on this location, although the alignment of the eastern Period 2 burials, and of the east wall of the crypt, are anomalies that still demand explanation.

An east-running Church 1B?

If Church 1 ran east (Church 1B in Illus 5.4.5), F3 would become its west wall. Its floor level of c 15.50m would be still 1m below

extant subsoil at its west end, but further east, the ground level drops away quite rapidly: judging from the trend of the modern topography, it would drop about one metre in five (Illus 5.4.6). While there was still no access from the west, there would be a fair chance of fitting a north or south door opening at contemporary ground level. It would thus have been only partially subterranean (at its west end) and at floor level at its east end, as shown in Illus 5.4.7. In this scheme, the aumbry would be a later addition.

Outside the east end of the present church is a square patch of ground level with its highest part at the east end (Illus 5.4.8). It extends eastwards 5m, at which point its eastern limit is marked by a row of stones. This row seems to belong to two burial vaults marked by pillars. The more southerly is a Ross vault; the northern vault is unmarked. Graves associated with these two plots are Mackenzie, Corbett and McDonald. It was about 5m east of the crypt on 'a low green mound' that pieces of Cross B (the 'Danish' TR2) were located (Illus 5.3.1, p 124).

If the east wall of the crypt is to be used to determine the width of Church 1B, it needs to be greater than 4.25m and less than 7.5m, the internal and external lengths of the east wall, F3. Pits dug by the architect inspected both exterior eastern quoins without encountering any reliable signs of east-running walls (OLA 6.4/2.1.3). The length is even less certain. To fit within the

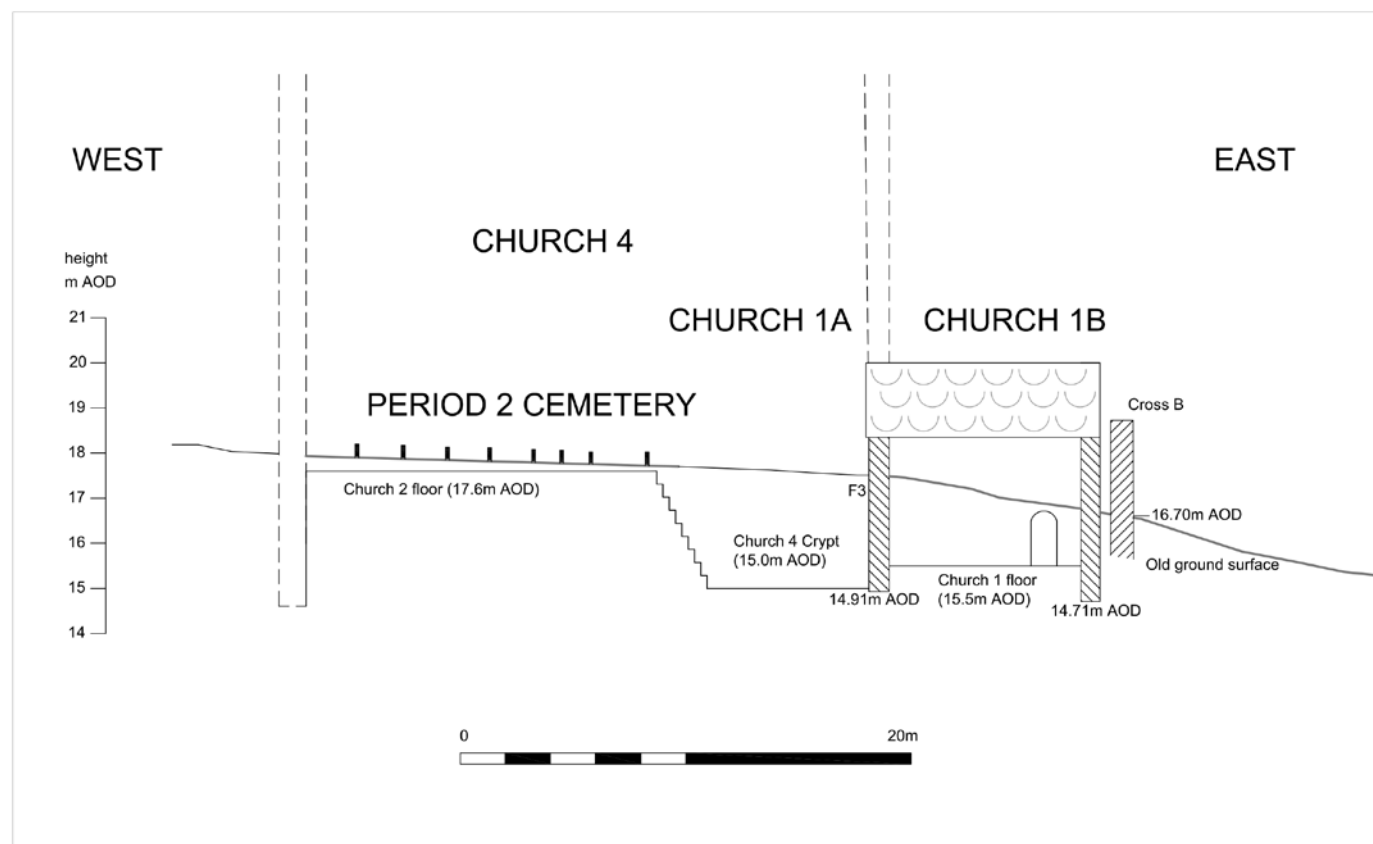


Illustration 5.4.7

Profile W–E through Church 4, showing the old ground surface in the eighth century with the hypothetical Church 1 in the 'B' position (vertical exaggeration $\times 2$)



Illustration 5.4.8

Outside the east end of the present church, the possible site for Church 1B

platform observed, Church 1B would have to be more or less square. The ratio of length to breadth for plans of early churches is variable (see below, Table 1) but would be unlikely to fall below 3:2. Assuming an external minimum width of 5.25m, this would give Church 1 a hypothetical length of at least 7.9m. Cross B that had stood somewhere to the east of the present church would be a suitable monument to mark the east end of the hypothetical Church 1B.

If such a building existed, it may have been destroyed in the raid, the time that the crosses were felled (p 259). At the time Church 2 was built, the ruin of Church 1B would lie partially underground and about 12m away. In this case, the medieval builders had room to enhance their ground plan with a chancel (Church 3) without disturbing the ruin of Church 1. Given the recycling of sculpture disturbed by this building operation, it would be no surprise if some of the stones of Church 1 had also ended up in Church 2, except perhaps for the part still underground. In this scenario, it would be the thirteenth-century builders (of Church 4) who recommissioned the west wall of Church 1B as the east wall of their crypt. The implication is that this wall was available for re-employment, whether through pragmatism or piety.

The archaeological case that there was an early church at St Colman's has been assembled from three sources, two of which we have reviewed: the alignment of the crypt wall and the alignment and topography of the Period 2 burials. The third element is perhaps the strongest argument for the existence of a church, although not for its location: the finds of fragments of sculpture that imply use within a building. Mentioned in the last section were panels and a stone post (TR13, 17, 27), which imply a *cancellum*, if not a shrine, on parallels drawn from St Ninian's Isle (see p 138; Thomas 1973). Henderson and Henderson would see shrines of the post and panel type as being normally mounted indoors (2004, 208). Other forms of carving may imply a building by virtue of having been employed inside it. The slab at Flotta (Orkney) was an altar table mounted on vertical slabs as implied by vertical grooves on the back, and an altar and reredos are discerned at Rosemarkie (ibid, 210–11). The Hendersons also suggest that large cross-slabs such as those erected on the Tarbat peninsula were designed to be kept and seen indoors (2004, 180–1; Foster, forthcoming).

Of particular interest in the Tarbat assemblage were heads modelled in the round, which were suggestive of architectural fixings. If TR206 could be the knob of a stone chair (Chapter 5.3, p 149; Henderson & Henderson 2004, 211), it would be harder to say the same of the TR217 group, the form of which, when assembled, appears to be that of a flat-topped chamfered corbel (Illus 5.3.45, p 150). The corbel is an architectural device keyed into masonry to support a feature proud of the wall, such as a statue, a roof beam, a corbel table or the springing for an arch, the anthropomorphic form imitating a person appearing to bear the load. It may also appear as a label-stop for the hood moulding around an opening. In any event, the presence of a corbel implies a stone building. The main parallels to the form are twelfth century in date, and its occurrence in the eighth century is challenging (see Chapter 5.3). However the component parts of this conjoining group were stratified above the burning and below the medieval horizon (C1547), so they must represent detritus from the Pictish period (Period 2). In Chapter 5.3 it was argued that the corbel finds an antecedent in twelfth-century Bobbio and ninth-century Malles, as well as in depictions on eighth-century Canon Tables, implying its use on the impost of a chancel arch or a doorway (p 150). TR264 can also be called as a witness of some sort, resembling as it does a butterfly finial of a kind well known in early medieval Ireland (see Chapter 5.3, p 153, Illus 5.3.49). Given the context and parallels for Pictish architectural sculpture discussed in Chapter 5.3, the elusive eighth-century stone church at Portmahomack is likely to have featured a corbel, perhaps on a doorway impost, an arch, a *cancellum*, a shrine, a sarcophagus and perhaps horizontal friezes, all carved expertly with diverse ornament and animal and human figures, much of it probably painted.

Circumstantial evidence

The area examined as the potential church site occupies the high ground in an enclosure marked by a C-shaped ditch which enclosed a burial ground, stone sculpture, craft activities and

infrastructure, all of which correlates to the monastic movement of the seventh/eighth century (see Chapters 5.2, 5.3, 8). The eighth-century burials occupy the highest point and form a continuous sequence with a cemetery that had begun in the fifth century or earlier. Since there is little overt sign of Christianity before the eighth century in this part of Britain, the church is likely to be a late arrival in the early medieval sequence. Assuming that the long-used cemetery was to be respected, a church would have been placed to the south or east, in each case on a down slope.

The eighth-century community had the capacity to quarry and shape stone, as is signalled by the large number of carved stones, including cross-slabs some 3 × 1m, which would be extracted and transported from the east side of the peninsula (Chapter 5.3, p 229; Illus 5.9.1). Large amounts of stone were also used in the construction of a road, a revetment wall, a dam and a megalithic bridge (Chapter 5.5). There was no trace of mortar mixing, but calcite was extracted from shells, so the use of mortar ought not to be excluded (Chapter 5.6). The construction of a stone building using shaped, squared and faced and perhaps even mortared sandstone blocks is thus plausible.

There is an expectation that once a church is built, subsequent churches will occupy the same site, so that Church 1 would be found under or very close to the medieval and later churches. This need not be the case, especially in a site with a well-documented hiatus. However there is little doubt about the focus of the early sculpture and its Christian and monumental character. In addition to the carvings that are likely to represent grave markers, four crosses (three slabs and a shaft) are proposed in Chapter 5.3. Where they have not been exported for building or levelling purposes, their fragments are focused on the hilltop.

Although the medieval church was constructed well after the Pictish monastery, there were clearly memories to be accommodated. The medieval church and cemetery continue the monastic cemetery in the same place; the medieval crypt was thought to have housed relics of St Colman in the mid-sixteenth century and in the nineteenth century it was declared to be a structure built by St Columba (Carver 2009a, 10). The crypt could have been related in the minds of its medieval builders with the real or supposed burial of St Colman within the Period 2 cemetery on the high ground to the west.

Circumstantial evidence therefore points to the construction of an eighth-century church on the hilltop, adjacent to a burial ground and standing stone monuments of the same date. There are no carvings and few burials that can be confidently assigned to the mid-ninth to eleventh century, so a church at this site should be a construction of the eighth century (pace Yeoman 2009, 233).

Comparative evidence

Early Celtic church buildings survive in greater numbers in Ireland than in Scotland or Wales and have been the subject of more comprehensive examination there. Timber-built and carpentered churches and oratories are theoretically part of the early scene. The ‘Irish method’ was to use hewn oak and thatching with reeds, and was contrasted to the ‘Roman method’ of building in stone (Ó Carragáin, T 2010a, 15). Tomás Ó Carragáin remarks that it

is ‘now widely recognised that in eighth-century Northumbria the choice of building materials had become emblematic of the wider dispute between “Irish” and “Roman” factions’ (ibid). The remains of timber churches are notoriously elusive, but an oratory built in turf is suggested by a perimeter of vertical stone slabs at Illaunloughan (Ó Carragáin, T 2010a, 17; White Marshall & Walsh 2005, 15, 23). Virtually all the early Irish churches survive as single rectangular rooms (unicameral) constructed in faced dry-stone rubble. By the eighth century, church builders were using mortar. Chancels were added in the ninth to tenth century, connected to the nave by arches, as at St Kevin’s, Glendalough, and this type of scheme endured until the twelfth century (ibid; MacGibbon & Ross 1896, 9).

Differences in construction can be regional rather than chronological (Harbison 1970; Ó Carragáin, T 2002; 2005). In Ó Carragáin’s analysis, five types of pre-Romanesque church were distributed in different parts of Ireland, and all were significantly absent from Ulster. Ó Carragáin’s survey confirmed several features as generally diagnostic of Irish pre-Romanesque churches: all were constructed with plinths; building blocks are large; and spalls (stone chips) are uncommon; the door is always in the W wall; most early churches have a window in the S wall, but a significant minority were lit only by an E window. *Antae* (external projections on E or W walls) occurred in 89% of his dry-stone Type 1 churches. Six out of nine aumbrys occur in his Type 2 churches (early mortared). All pre-Romanesque churches appear to be designed as single-room rectangular buildings (Ó Carragáin, T 2002, 90, 102, 45, 87, 76, 74, 80), while single-phase bicameral churches are very rare (Hare & Hamlin 1986, 134). Surviving examples of mortared stone churches are unicameral, with a single door in the west wall, one window in the east and south walls and steeply pitched roofs covered with thatch, lead or shingles (Ó Carragáin, T 2010a, 140). Corbelled dry-stone beehive huts and clachans need not be indicative of an early date but may be adopted in the eighth to tenth century. Their use was in deliberate contrast to the sacred character of churches (Ó Carragáin, T 2002, 140). On the Irish model, an insular church of the sixth to ninth century would therefore have been single cell, rectangular, dry-stone or mortared, corbelled or roofed with timber beams, with a west door and an east or south window, may have antae and could well have an aumbry. Early churches in Ireland could remain ruinous for long periods. On the practical side, their rubble construction did not lend itself to recycling in coursed walls, but ideologically the interior of a roofless chapel did attract burial in the Middle Ages and later.

In Wales, there are no upstanding remains of churches dated earlier than the twelfth century (Davies 2009, 44), and the expectation is that churches were built in timber to go with the cemeteries from the seventh century, although this has yet to be demonstrated (Longley 2009, 126, 251). At Capel Maelog, the first church was built in the late twelfth century some time after the establishment of the cemetery, and without any intervening timber phase church. Amy Pritchard’s investigation concluded that while cemeteries may or may not have had timber churches, churches in stone should have begun to appear from the later eighth century, with the adoption of the Roman Easter (Pritchard 2009, 258).

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Seventh to eighth century upstanding stone churches are known in Northumbria, notably at Jarrow and Escomb, both making use of reused Roman stone. Jarrow has two churches (west and east). The surviving foundation inscription, dating to the late seventh century, refers to the earliest, western building, but the east church is likely to follow closely in date (Cramp 2005, 151, 160). The east church was here placed on the crest of a gentle downslope; it measured 4.66–4.82m wide by *c* 12.8m long and had a south door (ibid, 147–8, 154). The west church was not preceded by a timber phase. Its nave measured 19.81m × 5.49m and its chancel 5.49m × 4.27m internally (ibid, 160). This well-explored site also featured stone buildings additional to the church, one with an integral carved stone column (AS37 in Jarrow Building A; Cramp 2006, II, 166). The seventh/eighth-century church at Escomb was bicameral and probably also had a door in the south wall of the nave in its first phase (Taylor 1978, 985; Pocock & Wheeler 1971). Among examples with reasonably complete plans, the early Southumbrian churches are bicameral with chancels and south and west doors, but these may open into *porticus* (eg Bradwell-on-Sea, Canterbury St Martin, Canterbury St Pancras; Taylor 1978, 974ff).

Could there have been an early crypt at Portmahomack? In Ireland, burial inside the church was quite uncommon and the original cemetery retained its spiritual power. Revival of the cult of relics in the early Christian period (Carver 2009a) led rather to the creation of shrine chapels for remembering the special dead built over graves away from the church. These were unicameral, smaller than twelve square metres (Ó Carragáin, T 2003b; 2010a, 66–9, 84–5). In the south of Europe, relics were exhibited in underground crypts that could be visited

by the public – a form of devotion designed to serve pilgrims developed in Rome and furthered in France as at the Hypogée of Mellebaude at Poitiers (sixth century) or Jouarre (seventh century). This scheme seems to have been adopted in northern and southern England, using an annular passage as at St Augustine’s Canterbury or separate access and egress passages as at Repton, Ripon and Hexham (Taylor 1978, 1014–17). An early church could be provided with a lighted crypt by burying its western half in a hillside, as at Lastingham, North Yorkshire. Thus an eighth-century church, drawing on Roman, French or Northumbrian models, can already have included the idea of a crypt to house a special relic.

The evidence for early churches in Scotland itself has been beset by poor dating and confused by documentary expectations. These latter suggest that early constructions would be in timber, wattle at first and then in oak board from the early eighth century, as at Iona, while (following Bede) after AD 710 churches in Pictland would be constructed in stone (*iuxta morem Romanorum*) (HE V.21). The difficulty is that no church building has actually been identified in Pictland or *Dál Riata* earlier than the mid-eleventh century (Ferne 1986; Yeoman 2009, 228). In 1986 Eric Ferne showed that all Scotland’s prime candidates for early churches (those surviving at Abernethy, Brechin, Egilsay, Restenneth, Edinburgh Castle and St Andrews) may all be dated *c* 1090–1130. He found the variety in their structure to be typical of this period and notes architectural references to both Ireland and (at Egilsay) to the North Sea lands. In 1994 Neil Cameron suggested that there was a well-established tradition of stone church building before the twelfth century. In general he meant the eleventh, for example the foundations at Birsay attributed

Table 5.4.1
Length/width ratios of some unicameral churches from external measurements
(for bicameral churches see Lowe 2008, 266)

Site	Length [ft]	Width [ft]	Length [m]	Width [m]	Ratio
Portmahomack Church 1A			[11.25]	[7.5]	[1.5]
Portmahomack Church 1B			8.1	5.25	1.5
Portmahomack Church 2			12	8	1.5
Howmore, South Uist	17 feet 7 inches	11 feet 6 inches	5.4	3.5	1.5
Tigh Beannachadh Lewis	18 feet 2 inches	10 feet 4 inches	5.6	3.2	1.75
Dun Othail, Lewis	17 feet	11 feet 3 inches	5.2	3.5	1.5
St Columba, Balivanich, Benbecula	33 feet 6 inches	14 feet 6 inches	10.5	4.5	2.3
Island of Wyre Orkney	19 feet 2 inches	12 feet 10 inches	5.9	4	1.5
Lybster, Caithness	17 feet 10 inches	10 feet 11 inches	5.5	3.4	1.6
Egilsay, Orkney <i>c</i> 1000	29 feet 9 inches	15 feet 6 inches	8.8	4.8	1.8
Brough of Birsay <i>c</i> 1100	28 feet 3 inches	15 feet 6 inches	8.7	4.8	1.8
St Oran’s Chapel, Iona, about 1074	30 feet	16 feet	9.2	4.9	1.9
Birnie before 1184	42 feet	18 feet 6 inches	12.9	5.7	2.3
St Ninian’s Shetland			6.5	5	1.3
Auldhame			8.3	5.7	1.46

to the church built c 1060 for Thorfinn, Earl of Orkney. But, as he points out, the monolithic stone arch from Forteviot implies that eighth- to ninth-century church building in stone must have been achievable in Scotland (Ferne 1986; Cameron 1994, 1996; Alcock 2003, 285; Yeoman 2009; Foster forthcoming). Henderson and Henderson add the Rosemarkie panels and the Meikle lintel as good arguments for Pictish church building in the eighth century (2004, 208–11).

It is interesting to compare the ratio of length to width in the earliest of the churches collected by MacGibbon and Ross (Table 1). It can be said that those which are undated, but expected to be early, have ratios around 3:2, ie 1.5 (as in Ireland: Murray 1979, 83), while those that are known to be Romanesque have ratios larger than this. The ratio of length to width may thus provide a crude indication of early date.

Anglo-Saxon churches exhibit a wide range of ratios of width to length in Anglo-Saxon churches from 1:1 to 1:4. Those thought to be pre-Viking also vary: 1:6 for the three churches at Canterbury, 2:5 for Bradwell and Jarrow east, 1:3 for Escomb (Taylor 1978, 1032–3, Table 745). This implies that these ratios, so rarely available from complete early plans, are not ready to report reliable trends.

Excavated examples

Even at sites of high potential that are no longer in use, understanding of the development of early church building in Scotland has been impeded by academic excavators working on too small a scale. At St Ninian's Isle, the excavation of the medieval chapel in 1955–60 produced a confused result, subsequently reinterpreted through the ingenuity of later authors (Small et al 1973, 5, 12, 15–20). It was seen as the site of a prehistoric and early medieval burial ground with an eighth-century church and a composite stone shrine. This phase was terminated in the late eighth/early ninth century with the burial of the St Ninian's Isle hoard in a box within its presumed nave. The site was revisited in 1999–2000, but unfortunately the intervention was on too small a scale to improve greatly on the precision of the previous model. It endorsed the existence of a probable eighth-century church and shrine, and proposed its continued use through the ninth to eleventh century, especially for the burial of infants (Barrowman 2011, 174–9). The form of the church is unknown but suggested on the indications of surviving earlier foundations to have adopted a similar footprint as the medieval chapel, and to measure about 6.5 × 5m internally [1.3] (ibid, 42, 186 Fig 5.1, 197).

A timber post and plank building with a stone exterior was discerned under the medieval chapel on the Brough of Deerness and interpreted as a Norse secular chapel with a settlement rather than a monastery (Morris & Emery 1986). At Inchmarnock, a first stone church was thought to have been built after 650–780 surrounded by a rectilinear palisaded enclosure, but the church that became a focus for burial dates only from the ninth/tenth century (Lowe 2008, 82, 255). At the Hirsell in the Tweed Valley, the sequence began with a square cell constructed in the tenth/eleventh century, augmented by an apse in the late eleventh/twelfth century, lengthened by a nave in the mid-twelfth and enhanced by a thickening of the west wall in the thirteenth century (Cramp

2014, 72). The burials at the Hirsell were all later than the church (ibid, 134).

The implications of a Church 1 situated at the site of the crypt (1A) or further east (1B), is that in either case the cemetery took precedence over the church. The monastic (eighth-century) burials occupied the high ground overlooking the sea and represent a continuous development from a Late Iron Age (sixth/seventh-century) burial ground. At Iona the site of the early cemetery is not known but is likely to have been south of the church (at Rèilig Odhrain) and separated from it by a 3m-deep ditch; the layout at Reask and Eileach an Naoimh also suggests an initial separation of the dead from the ceremonial centre (McCormick F 1997, 63–5). The sites of the earliest burials at Wearmouth and Jarrow also remain uncertain, but in both cases the excavations focused on areas south of the church (Cramp 2005). At Jarrow there were Anglo-Saxon burials north and south of the eastern church, which may itself have been funerary (Cramp 2005, 167, 356). Although pre-monastic burials are known at Wearmouth and Jarrow, they are not thought to have had any relevance for the monastic builders (ibid, 355).

A working model for the north and west might be that early churches join previous cemeteries, while later churches start them. Future understanding will depend on examining cemeteries in plan and churches in depth, in the same place. At Auldham, the burial ground was in use from the seventh to the seventeenth century in radiocarbon years, and erected within it after AD 650 was a small timber oratory (Building 1), which was replaced on the same footprint by stone foundations in the mid-eighth to mid-ninth century (Building 2). It was unicameral and measured c 8.3 × 5.7m (John Barber and Anne Crone, pers comm). This may survive analysis to be claimed as Scotland's first sight of a pre-tenth century church.

Conclusion

The little information we have to date offers some comfort that a partially subterranean church at Portmahomack, measuring 8.1 × 5.25m, would not be out of place in the Ireland or North Britain of the later first millennium. Following the Irish tradition, it should have a door in the west end and a window in the south or east wall, and an aumbry might well be a feature of such a church. This would not be possible in the site we have examined. Following the Northumbrian tradition, it might be cut into the side of a hill, with the west end subterranean and the east end lit by natural light, and entered by a less perilous south door. This is the hypothetical design labelled as Church 1B. A roof height at about 20m AOD might be surmised so that it rose above the barrows on the crest. This implies east and west walls up to 5m at the gable. The number of people who could stand inside this space to say the Divine Office was about thirty, or about twenty kneeling. It was therefore probably large enough to house the whole community in prayer together. Such a building could also be used to host the shrine of a founder, or a special relic or both. The building of a stone church may have signalled conformity with the Roman practice, an event that correlates with the cross-slabs in the later eighth century. By this time too, the burials appear to have aligned to the presence of a building (Chapter 5.2) and large cross-slabs stood at the edge of the inner

precinct, with one erected immediately east of the proposed site of Church 1B (Chapter 5.3, p 166).

By analogy with Jarrow, it seems highly probable that a full sculptural package such as we encounter at Portmahomack would have served a stone building. The consultancy agreement between Nechtan and Ceolfrith described by Bede (V.21) included the provision of experts to build a stone church dedicated to St Peter in Pictland. Given the association between Nechtan and Fortri (Woolf 2006), it is not excluded that some of this deal bore fruit in Easter Ross. If a 'cemetery chapel' was implanted in eighth-century Whithorn (Hill 1997), the Northumbrian architectural innovation could equally have penetrated into northern Pictland, arguably far more accessible from Jarrow (by sea) than Galloway (see Chapter 8, p 341).

If the skew east wall does represent the lineament of an early church, it is unlikely to belong to the ninth to eleventh century (our Period 3) by which time the monastic project seems to have died. This makes a stone church of the later eighth century a possibility that we may continue to entertain. The people of Period 2 were certainly used to lifting (p 228) and shaping large stones, so that the squaring of ashlar for megalithic dry-stone construction would present them with few problems. For these reasons, the lower courses of the west end of the crypt could still belong to what would be, at the time of writing, the only standing wall of an eighth-century church in Scotland.

5.5 Infrastructure

Introduction

The Period 2 settlement was laid out according to a design that promoted a new ideology, while exploiting the natural properties of the location. The cemetery, marked by standing stone memorials, occupied a dry site on the hilltop, which was also the likely location for a church (see Chapters 5.2–4). The primary objective of the infrastructure was the creation of a dry space beside the hill with controlled access to water (Illus 5.5.1). The *enclosure ditches* intercepted groundwater draining down the hill to

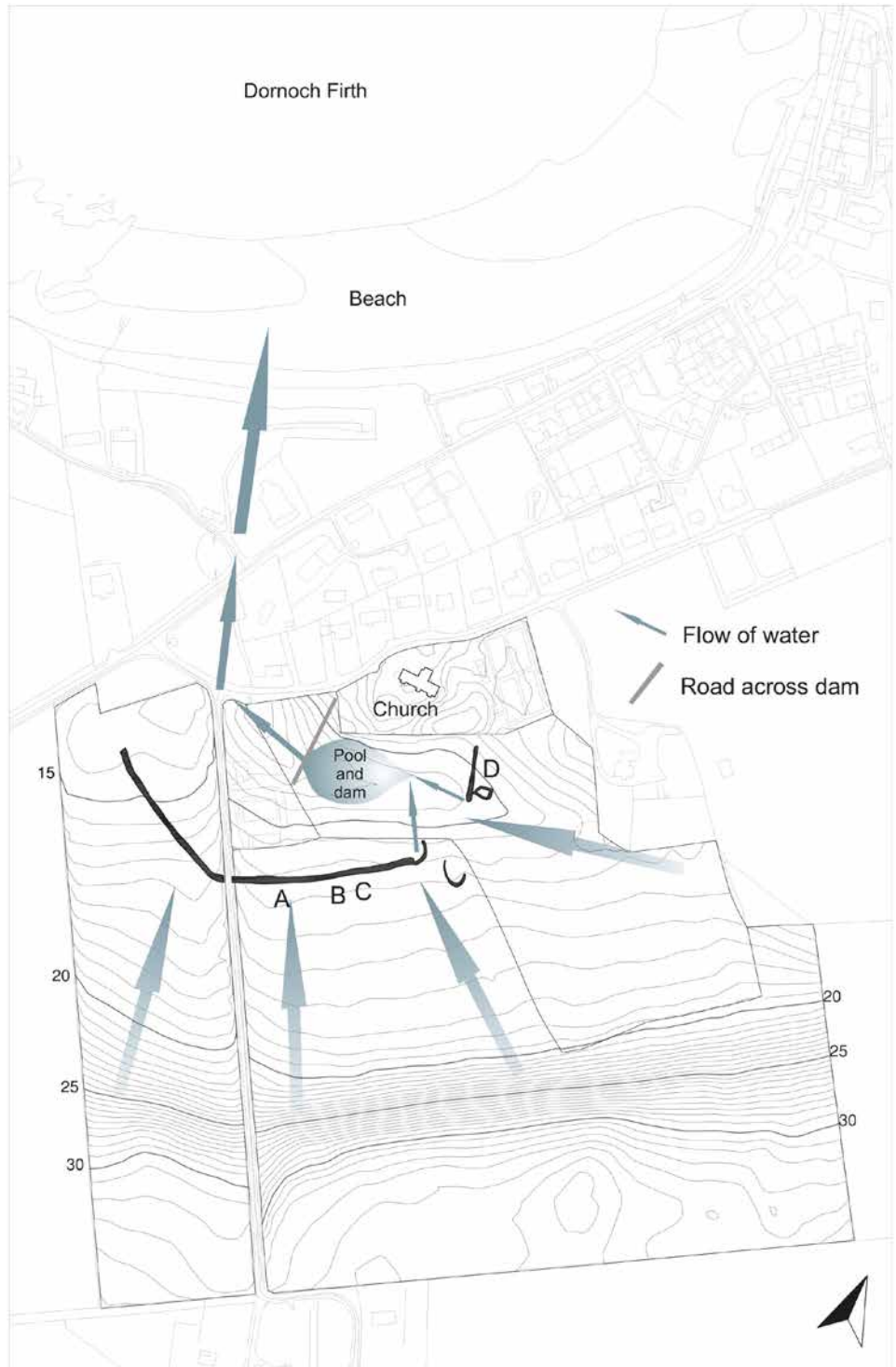


Illustration 5.5.1
Contour map of the site, showing the direction of drainage and the effects of impounding the valley stream

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

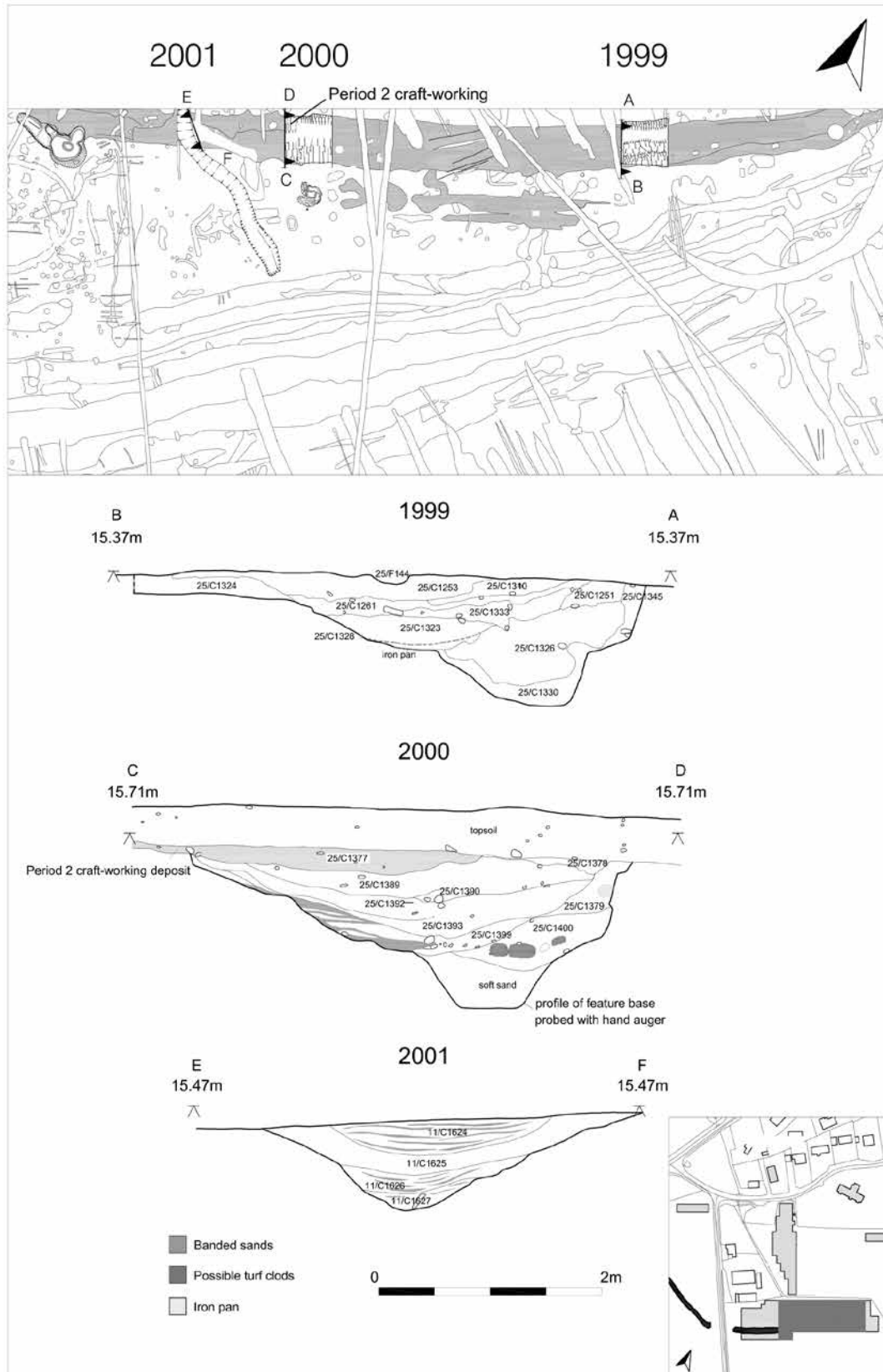


Illustration 5.5.2
Plan and sections of first enclosure ditch S15 in Sector 1

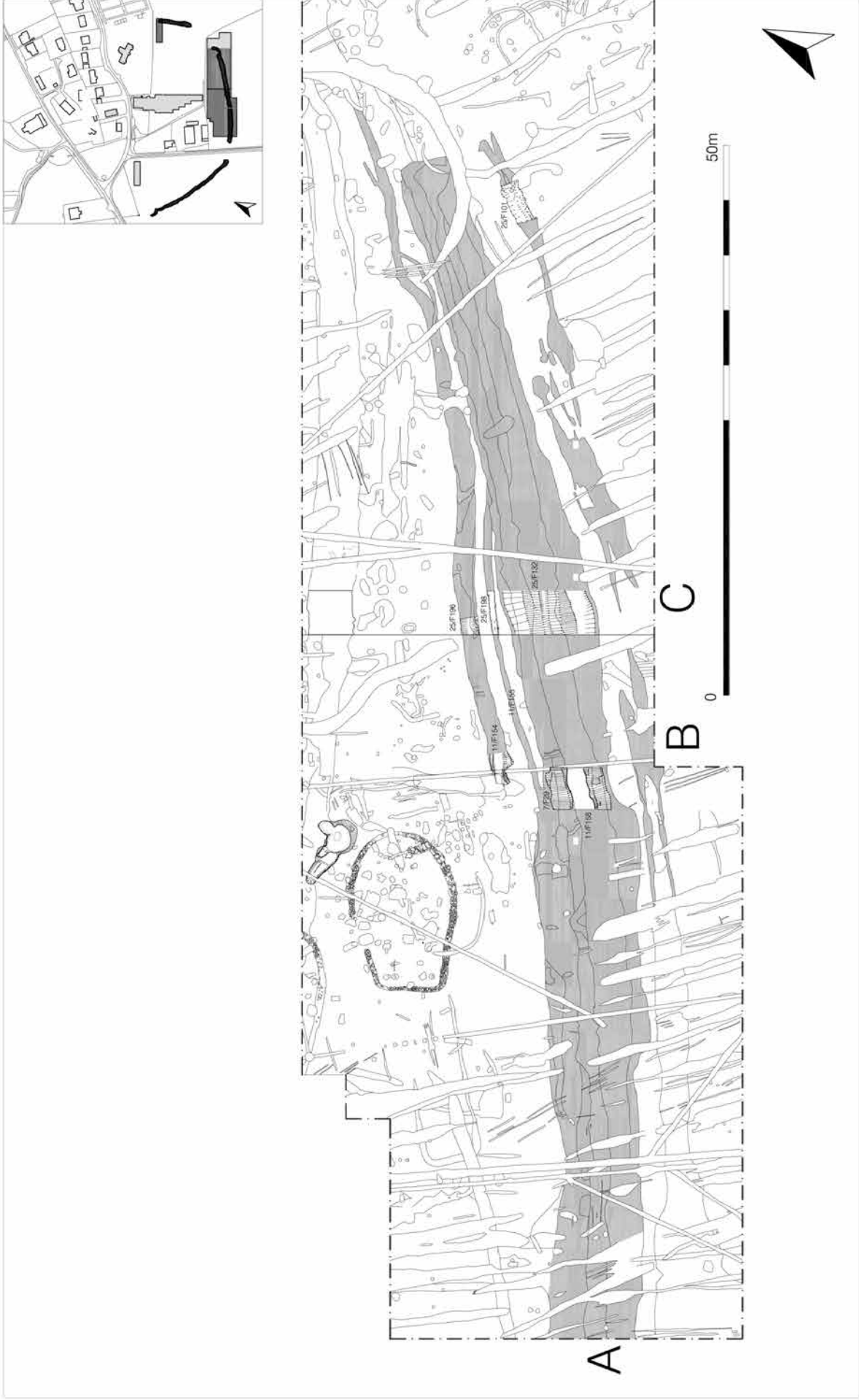


Illustration 5.5.3
 Plan of the second enclosure ditch S16 in Sector 1

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

the south and dispersed or impounded it. Aerial photographs suggested that the original plan of the main enclosure ditch took the form of a flattened C, with east and west arms heading towards the beach and the firth. The ditch system embraced the area of the monastic settlement, as so far known, so probably would have been among the primary elements of the foundation.

The *stream* originating from a catchment to the north-east on Bindal Muir ran down the valley E–W. This was the main source of fresh water, needed for the sustenance of men and animals, for baptism, and for the industries that were planned. Attempts to obtain water from this source in its marshy pre-monastic phase had been complicated, remedial and small scale (Chapter 4, p 88), and something more massive and reliable was required. A *dam* laid across the valley impounded the water carried by the stream and canalised the overflow from the dam through a *culvert*. The *pool* so formed spread out to the south and was marked to the north by *boundary walls*, separating the pool and its drainage from the northern settlement area. Industries were to develop within the enclosure on either side of the valley, so it was important to establish a dry route between them. A paved *road* with kerbs and ditches led down the slope from the cemetery hill to the bottom of the valley. It was taken across a *bridge* to the west of the dam, composed of massive capstones, like a clapper bridge. Road, bridge, dam, boundary walls and enclosure ditch thus worked as a single designed infrastructure, to provide a dry working area and provide humans and animals with water.

Enclosure ditches (S15, S16) (OLA 6.1/3.3.1)

The *first enclosure ditch* S15 was sampled in three discrete areas, in 1999, 2000 and 2001 (Illus 5.5.2). Excavation of the feature in 1999 and 2000 was hampered by the presence of rising groundwater and unstable sections, but the basic form of the ditch was established and corroborated, using a hand auger where necessary. The first cut measured over 1.80m wide by 1.30m deep with a steep northern edge. The original southern edges been lost to a



Illustration 5.5.4

Definition of second enclosure ditch S16, with features inside the enclosure (right), looking west



Illustration 5.5.5

Definition of second enclosure ditch, with features outside the enclosure (right), looking east

PORTMAHOMACK ON TARBAT NESS

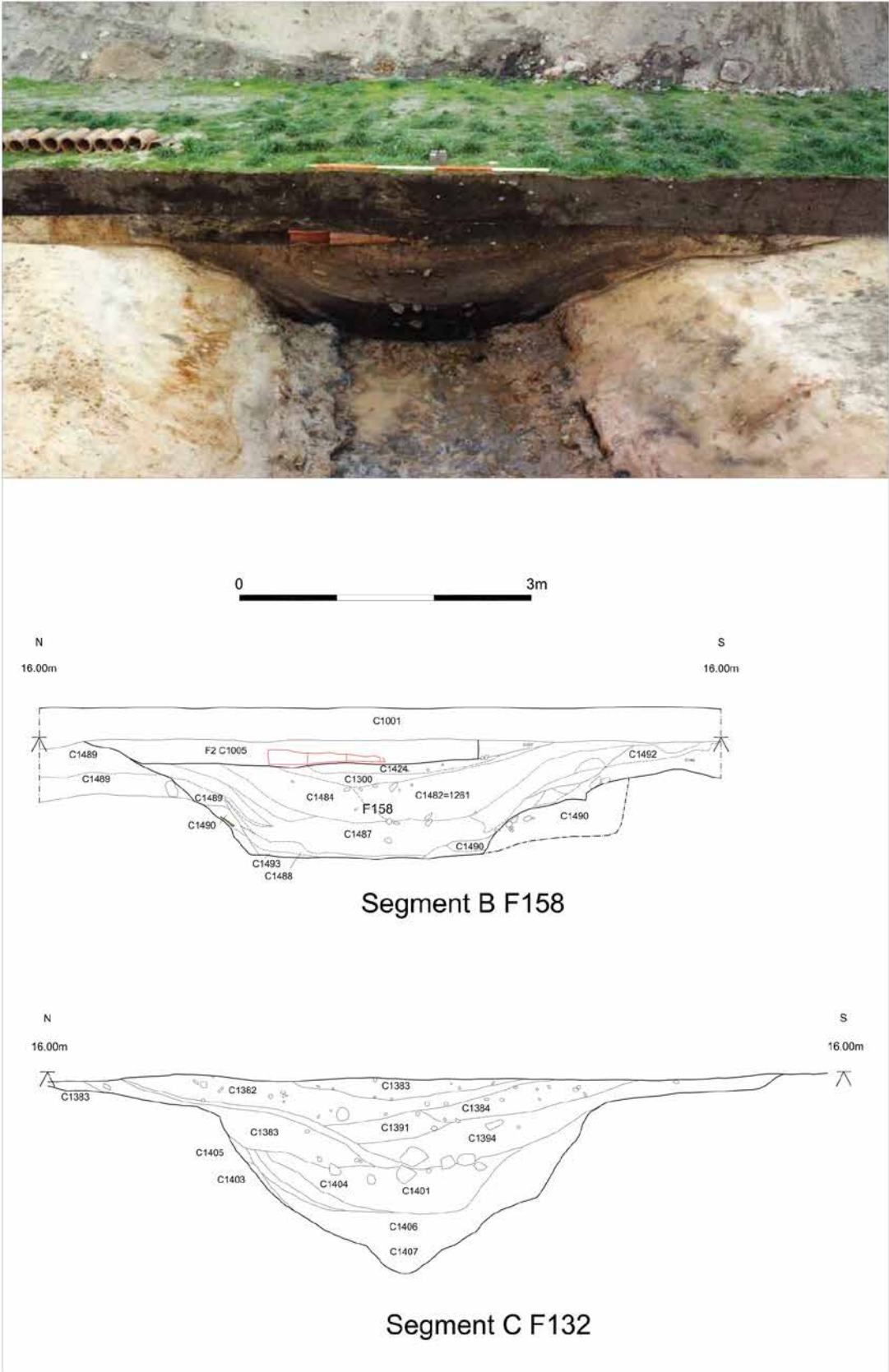


Illustration 5.5.6

Sections across the enclosure ditch at F158 (Segment B; photograph and drawn section) and F132 (Segment C)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

Table 5.5.1
Excavated segments of the second enclosure ditch, S16; F158, F132

Segment	Profile	Maximum width (m)	Height AOD at base of ditch	Minimum depth (m)	Fills
A (Int 1, 1991)	Flat-bottomed	7.2	c 14.25m AOD	1.4	standing water with erosion from bank
B (Int 25, 2000)	V-shaped at base	8.15	13.93m AOD	2.0	standing water clogged by organic debris
C (Int 11, 1996)	Flat-bottomed	6.0	14.75m AOD	1.2	wattle lining containing standing water clogged by organic debris
D (Int 8, 1994)	Flat bottomed, stepped	4.0	13.87m AOD	1.0	–

broad shallow recut measuring up to 4.10m wide by 0.95m deep (OLA 6.1/3.2.1). The initial fills of the first cut in the 1999 and 2000 sections were soft pink sands, presumably laid down in watery conditions, with occasional clods of local pink clay, iron pan and dark silty sand (turves?) perhaps deriving from edge collapse. The broad shallow recut was filled slowly with pink sand, followed by a pink-grey sand seen as windblown, a thin grey-silt turf line and a final substantial fill of buff sand, also seen as windblown. Dished into the ditch in the sample excavated in 2000 was a later deposit of dark greyish-brown silt, which contained a rich assemblage of Period 2 metal- and glass-working waste (see p 212).

The story from the 2001 section was rather different, appearing as a U-shaped profile without any recut. Its refill sequence was the same as the secondary phase elsewhere, namely slow and intermittent, an initial silting, erosion from the edges, a thin deposit of dark grey silt and a levelling of buff sand. The overall sequence implied in S15 is that a ditch initially dug to drain or carry water was replaced by a broad and shallow successor on the same line. Here time elapsed in which turf grew or sand was blown in. These amorphous ‘windblown’ deposits ought to have originated from bare sand, ie from the beach, or from surfaces exposed by ploughing or stripping turf, events occurring in the life of the ditch, with grass recolonising the ditch in the intervals. Subsequent settling of the backfill system appears to have taken place during Period 2, since an important assemblage of Period 2 craft-working waste was captured in the resulting hollow, surviving fortuitously beneath the level of the modern plough (Chapter 5.7).

As an aspect of monastic development, S15 appears to be a false start, and the *second enclosure ditch* S16 was a more effective piece of engineering. It was this robust and extensive linear feature that led to the original discovery of the site (Chapter 1, p 11), being seen as a cropmark in 1984 and in 1995 as a parchmark (Illus 1.9, 2.9). The southern run (in Sector 1) was subsequently defined and mapped along a length of 109m, terminating in a butt-end on the east side (Illus 5.5.3). In plan, the feature was accompanied to north and south along its lengths with parallel grooves and depressions (Illus 5.5.4, 5.5.5).



Illustration 5.5.7
General view of the infrastructure S7, showing the road, the dam, the pool, the bridge, the culvert and the boundary walls

PORTMAHOMACK ON TARBAT NESS

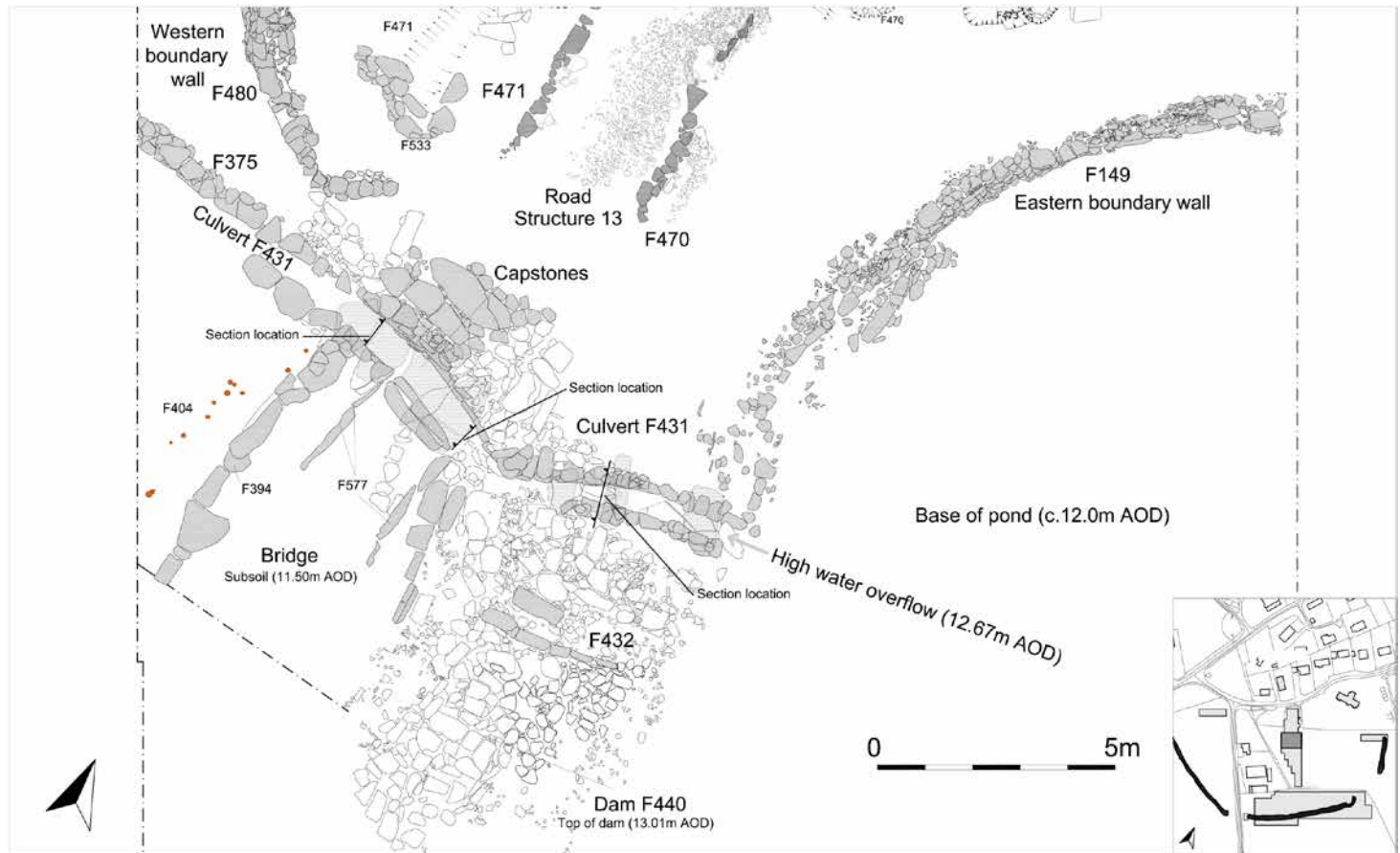


Illustration 5.5.8
Plan of S7

Segments of S16 were excavated in three locations in Sector 1 (A, B, C), and a small length of the eastern run was defined in Int 8 (D) (Illus 5.5.1; Table 1; OLA 6.1.1/3.4.2).

Segment A (Int 1, 1991) was excavated during the initial exploration of the site by Jill Harden (Chapter 2, p 18). It exposed a ditch cut into a natural deposit of pink cobble-rich clay-sand. The maximum depth exposed was *c* 1.40m below modern ground surface, and the profile a flat-bottomed base 2.6m across, with sloping sides widening to a maximum *c* 7.2m at the surface. The earliest deposit encountered within the ditch consisted of a laminated organic deposit (L2), which had the appearance of having accumulated slowly and intermittently and in the presence of water. During the accumulation of this laminated deposit, interleaved slumping shoulders of pink boulder clay were noted on both the north and south sides of the ditch, interpreted as deriving from internal and external banks. Three samples from the peat layer gave radiocarbon dates between the second and sixth century AD.

Segment B (1996; F158) was excavated within Int 11 on the southern run of the ditch east of Segment A (Illus 5.5.3). The form of the ditch at this point consisted of a flat-bottomed feature 2.40m wide at the base with sloping sides around forty-

five degrees widening to over 6.0m N-S (Illus 5.5.6). It reached a depth of 1.2m. Stakes of wet-preserved wood were recorded in situ along the shoulders or recovered from the deposits inside the ditch, implying an initial wattle lining of the lower part. A sample of one wooden stake returned a radiocarbon date of AD 670–890 (95.4%). Within and subsequently overlying this wattle-work an organic-rich deposit accumulated, interleaved at the sides with sand eroded from the shoulders of the ditch. The final fills observed were tipplings of grey humic sand representing a rapid backfilling, and including a sherd of medieval pottery.

Segment C (2000; F132) was excavated within Int 25, 12m east of Segment C (Illus 5.5.3). The ditch here had a V-shaped profile and was 8.15m at its widest and the water-logged sequence permitted a detailed study of the organic fill (Illus 5.5.6). The earliest deposit was primary silt (C1408), accompanied by a hurdle-like structure (C1403). An organic layer then began to accumulate that was rich in taxa indicating a body of standing water (C1407). The plant assemblage was dominated by elder and interpreted as deriving from over-hanging scrub from a hedgerow. Neighbouring activity was signalled by the presence of dung beetles indicating nearby livestock (C1407). A black clay then

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formed (C1406) followed by a wefted mass of leaf fragments and wood (C1405). These continued to imply an elder hedgerow, but detritus now included arable weed seeds, traces of uncharred heather (twigs, shoots and flowers), bog moss (*Sphagnum*) (leaves) and bog myrtle (*Myrica gale*). By implication, land nearby was under cultivation and other plants were being imported from areas of heathland or bog. Organic deposition was interrupted by grey silty sand (C1403), followed by twiggy debris including blackberry or bramble, willow and a substantial chunk of elder trunk wood (for detail see Digest 7.4; OLA 6.1.1). Willow twigs from this context (C1401) gave a radiocarbon date of AD 680–940 (Digest 3.2). The final surface of the ditch fill was littered with stones.

Segment D (Int 8 1994; F35–F37; Illus 5.5.3) targeted the ditch at the bottom of the valley on the east side as identified in the 1984 aerial photograph. The enclosure ditch was successfully encountered and here had a flat base and measured 4.0m wide and up to 1m deep.

Evidence for a bank

Direct evidence for banks, either internal or external, was elusive. Sector 1, including the area of the enclosure ditches examined, had been levelled by cultivation in the Middle Ages (and later) erasing all earthworks. The shallow features that ran intermittently along the northern and southern sides of the enclosure ditch (Illus 5.5.4, 5.5.5) were all defined against subsoil and investigated in detail by excavation, but without a clear outcome. There were no traces of timber structures, such as would be left by a palisade or timber revetment. The external features initially had the appearance of intermittent depressions made by wheeled traffic and were thought to represent a track around the outside of the enclosure. This was not supported by excavation, but such uneven wear patterns would not be untypical of droveways made by cattle. The distribution of ancient podzol (p 97) shows that the original form of the terrain here was not undulating, although it sloped downhill from east to west.

Banks were more credibly inferred from erosion products in the excavated segments A, B and C. The layers comprised grey silt-sand implying sand and turf and clay-sand resembling

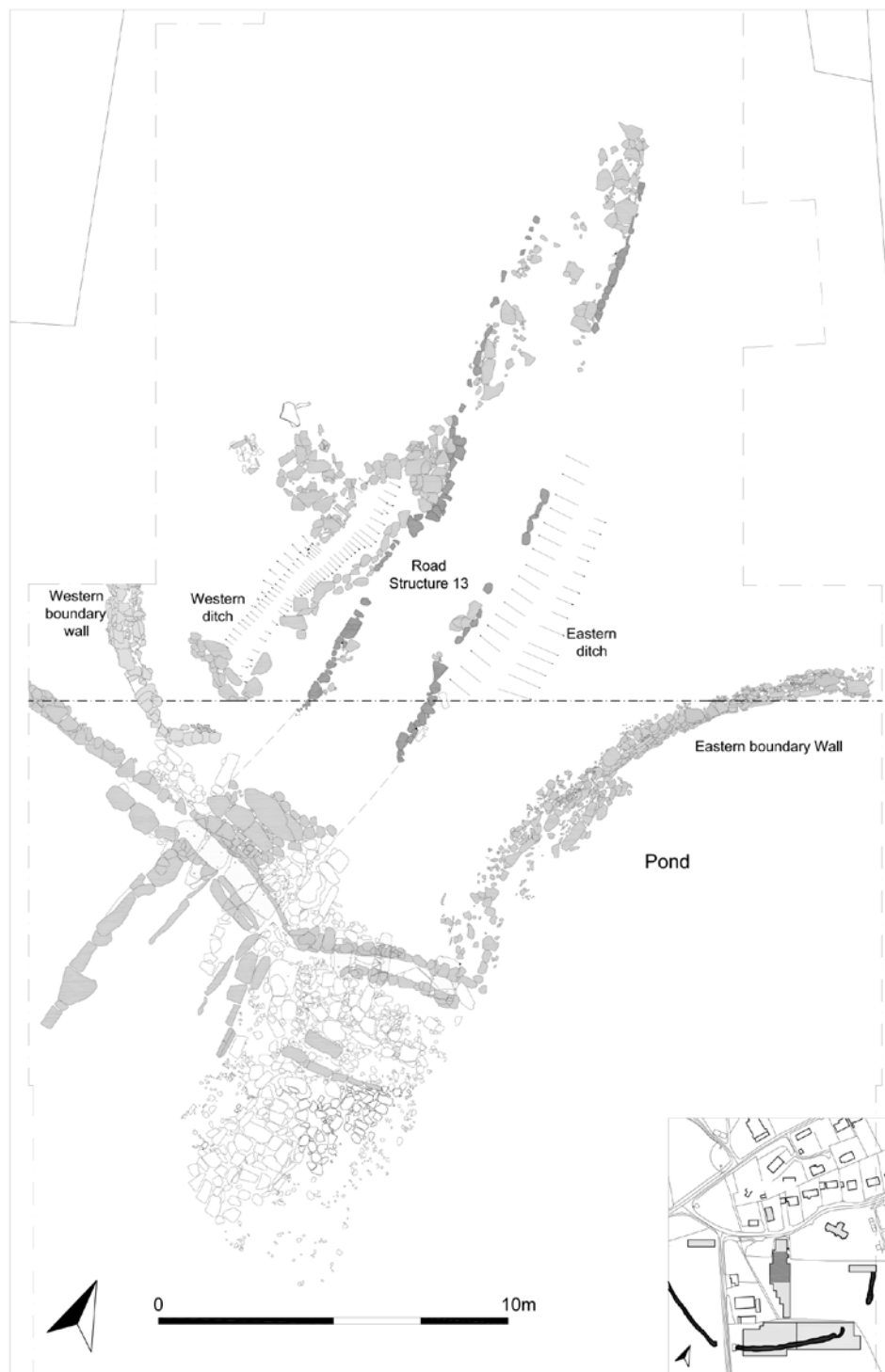


Illustration 5.5.9
Plan of road, ditches and boundary walls

the impermeable subsoil that supported the water table. There was no indication of whether banks stood north or south of the ditch, or both, although the relatively active palimpsest on the south side favours that any upcast here would have been shorter lived.



Illustration 5.5.10
Section across the road S13, showing camber and (under the road) stones belonging to S11 (Period 1)



Illustration 5.5.11
Road S13: degraded paving stones

Nature and history of the enclosure

The first attempt to provide an enclosure (S15) was contacted only in Sector 1. The overall course of this first ditch is not known and in the area examined it collapsed or was backfilled leaving a depression that later captured the remains of metalworking (Chapter 5.7). The second ditch, S16, created an enclosure with a plan of a flattened C that contained the working part of the known monastic settlement. A three-stage biography seems appropriate for it. In its original form, the ditch was flat-bottomed, just cutting into the impermeable cobbled clay-sand. Its sides were revetted with wattle-work above the water table and it broadened to 6–8m wide at ground level. The quarried upcast of turf, sand, cobbles and clay-sand probably formed a bank on the inner (northern) side. This bank would be narrow – no broader at the base than 6m to allow it to stand between

the ditch and S1. The butt-end of the ditch implies an entrance to the enclosure in the south-east corner. The subsoil as a whole slopes down from east to west, encouraging the water to move in this direction. But the segments sampled suggest that water was standing, at least in parts. It could be used to water animals, especially perhaps cattle, but the access would be steep from the south and impeded from the north (by the bank). The ditch was soon overhung by elder, dropping elderberries into open water from an adjacent tree line or hedge line, perhaps growing on the bank. The presence of a few dung beetles suggested ‘a landscape dominated by grazing land’ (Digest 7.4, C1407).

In a second stage, the ditch deposit diversified with alder and willow, and included weeds of cultivated land together with heather and moss probably imported from further afield (ibid, C1405). The third stage saw the ditch choked with branches and

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grey sandy soil pushed in probably as a result of the levelling of the bank (ibid, C1401). The ditch was subsequently ploughed over with rig and furrow. These three stages have been aligned respectively with Period 2 (eighth century), Period 3 (ninth to eleventh century; Chapter 6) and Period 4 (twelfth to sixteenth century; Chapter 7).

Road and ditches (S13) (OLA 6.2/3.3.2)

The infrastructure created at the northerly end of Sector 2 was a massive operation comprising a kerbed road with two roadside ditches, two boundary walls, a pool created by a dam with a culvert running over it and a bridge (Illus 5.5.7). There was some indication of a preparatory event in which sand and detritus of the Period 1 settlement had been spread by wind, before construction started (Chapter 4, p 99; Digest 7.5). This may have been promoted by the exposure of the sand surface caused by the stripping of turf used to construct walls (Chapter 5.9, p 236). Land north of the pool was prepared during an episode of levelling using a quantity of mixed clayey silt layers with a component of charred material, animal bone and small fragments of sandstone. Overlying these dirty mixed deposits was a markedly clean layer of bright yellowish-white sand. This preparatory sand was shared by the road (S13) and the vellum workshop (S9) showing they were conceived as a single development (Illus 5.5.8; and see Illus 3.12; Chapter 5.6). The other elements were integrated within this design: the dam (F440) that created the pool was joined to the east boundary wall (F149) and the culvert (F431), collectively termed S7. The road (S13) crossed over the culvert, and was served by two roadside ditches (F470, F471); the more westerly of these (F471) terminated at the western boundary wall (F480).



Illustration 5.5.12
Eastern roadside ditch under excavation, F470

The width of the *road* was about 3m, and it was recorded along a length of 40m where it crossed Sector 2 (Illus 5.5.9). It was founded on a homogenous causeway composed of a single, large deposit of imported gravelly sand subsoil, featuring lenses of dark brown silt, perhaps remnants of a redeposited buried soil. This material had been shaped along its length so as to provide



Illustration 5.5.13
Boundary walls: (a) East, F149; (b) West, F480, base showing bone raft

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Illustration 5.5.14

Dam, looking south with the pool to the left; with northern overflow culvert (F431) in lower part of picture and southern overflow culvert (F432) just beyond it

a gradual and even gradient for the road as it travelled downhill from north to south (consequently, the sand make-up became deeper towards the pool). It was cambered across its width to throw off water into the roadside ditches (Illus 5.5.10). It was equipped along each edge with stone kerbs formed of cobbles of



Illustration 5.5.15

Detail of top of dam, showing southern culvert (F432) in the foreground

various sizes and originally surfaced with thin slabs of yellow and red sandstone, much degraded as found (Illus 5.5.11). In places the road surface seems to have been refreshed in an ad hoc manner with compacted ash.

Roadside ditches

The *western ditch* increased in depth down the slope towards the west boundary wall. At this point it was equipped with a stone baffle consisting of five boulders and smaller stones set in a V-formation and channelling water towards the pool (F533). Elements of an original timber lining and an area of sandstone-slab consolidation were seen. The ditch was subject to infilling from the adjacent industry: a group of vellum pebbles had tumbled into the open wood-lined feature and were found where they had scattered (Illus 5.6.11). Within the ditch, overlying the wooden lining, were brightly coloured ash deposits intermingled with more broadly deposited ash, which gradually raised ground

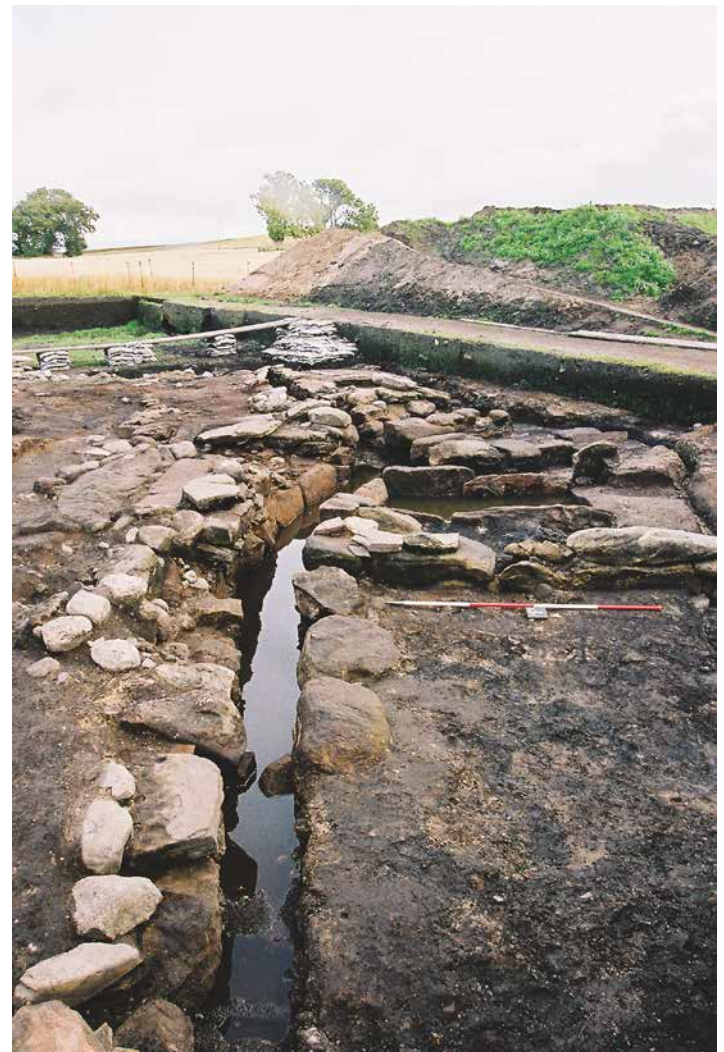


Illustration 5.5.16

Culvert F431, excavated

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levels in the southern part of the vellum-working yard. Deposits contained a variety of material, mainly charcoal and charred organics, calcined fragmentary animal bone, unburned animal bone and occasional artefacts, such as flint strike-a-light flakes (Digest 7.5).

The *eastern roadside ditch* shared many characteristics with its eastern counterpart. In its earliest guise, it had a neat U-shaped profile, initially filled with a grey silty sand with a high percentage of small angular and rounded stones (Illus 5.5.12; uphill is in the foreground). A fragment of worked whale bone was recovered from among the stone component (24/7666) tentatively identified as the tip of a whale-bone mattock, which presumably broke during the initial excavation of the ditch. The stone component is thought to have been intended to encourage the movement or drainage of water before silting occurred. A thin layer of sticky, black silt (C2144), which followed the contours of the feature seemed to represent a developing turf line or a deliberate lining. The ditch was designed to channel water for collection and storage downslope, rather than encouraging it to exit the workshop zone altogether. The use of the ditch for water collection was endorsed by a stone-lined pit (F470), which had been sunk into it, apparently to intercept and store water or other liquids. The ditch subsequently silted up with a series of dumps and spreads, which almost levelled the eastern roadside ditch, although it persisted further downslope as a shallow depression that would receive fragments of broken sculpture in Period 3.

Boundary walls

Eastern boundary wall

The eastern boundary wall (F149) varied in thickness from broad at its base to narrow at its surviving summit (Illus 5.5.13a). It ran for c 14.0m oriented broadly E–W, curving south at its western end where it joined with the S7 culvert (F431). The stone make-up of the wall consisted of a basal course of beach boulders that formed the foundation for the upper courses, which became gradually smaller and more slab-like. The stone component was respected by a line of charcoal that followed the north side of the wall and was visible intermittently for most of its length and is interpreted as the remains of a hurdle (F483).

Western boundary wall

The yard adjoining S9 to its immediate south was contained by a south-westerly boundary wall F480 which enclosed an area measuring c 12.0m N–S bounded to the east by the western roadside ditch. The principal make-up of the wall consisted of rough angular sandstone blocks bonded with turf (C3637), atop a raft of butchered animal bone (C3122) (Illus 5.5.13b). The wall measured 3.80×0.70m, turning eastwards for a length of 1.50m before terminating. The deposition of the bone raft may have been to combat soft, waterlogged ground conditions, suggested by the presence of Period 0 deposit C3541, as well as a number of landscaping deposits. To the west of wall F480, deposits revealed a consistent occupation deposit characterised by a thick, plastic

dark grey silt containing animal bone and occasional shell suggesting food refuse. Overlying this horizon, a series of rapidly accumulating deposits were laid down, suggesting localised inundation.

The boundary walls, constructed of boulders bonded with turf (p 230) were originally free-standing and their purpose was to demarcate the industrial zone to the north. For persons or animals entering from the south via the bridge and road, it is not excluded that they mark the beginning of an area of restricted access, where special crafts are practised.



Illustration 5.5.17

Culvert F431 pre-excitation with surviving roof slabs in situ. The pool is in the foreground and the collapsed megalithic bridge stones in the background. The water table is at the level typically reached when pumping stops

Dam, culvert and bridge S7

Construction

The Period 2 water-management scheme would have begun with the building of a dam across the valley (Illus 5.5.14). This comprised a dump of clay with branches, perhaps dug out of the stream that ran down the valley where the pool was to form. It included some animal bones deriving from the previous period



Illustration 5.5.18

West of dam, showing elements of bridge: capstones, with culvert running under, and supports for the timbers, encased in clay

(Period 1). The bulk of the dam elevation (F440) was continued upwards with stone rubble. On the west side it was roughly faced with yellow sandstone blocks, giving an overall width of 4.0m. Two culverts were built over or through the dam of which the more southerly (F432) survived as a short open channel with little sign of use (Illus 5.5.15).

The more northerly culvert, F431, was the main overflow channel for water breasting the dam (see Illus 5.5.8). Stratigraphically, it provided the key link between all the component parts of the water management structure of Sector 2, since it was bonded with the dam, the road, the east boundary wall and the bridge. The culvert was traced for *c* 15.0m (Illus 5.5.16). Its entry from the pool was at the same height as the extant dam, which it must have served as an overflow. It proceeded across the dam at right angles, oriented broadly E–W, and was here formed of parallel stone walls built on a floor of flat stone slabs, capped with large, thin sandstone slabs (Illus 5.5.17). This form of the culvert was maintained for the 4m thickness of the dam. Thereafter it continued unridged, without a floor and with cobble-built side walls, altering direction after a further 2m to cross the road line at right angles. Here the culvert was reinforced on the south side with large monolithic recumbent slabs, the lowest of them a natural seaworn slab, marked with a number of small grooves.

On the north side it was buttressed with large sandstone blocks supporting the capstone. It is likely that a trough quern found in the bridge area must have fallen off the south revetment, where it had been reused for building (Digest 6.1). The culvert was roofed with four massive sandstone capstones, the top surfaces of which were equivalent to the level of the road. Westwards, beyond this megalithic construction, the culvert walls returned to cobble-built, with a possible rammed-cobble base merging with the make-up of the western terrace wall.

Bridge

To the south-west of the capstones were three rows of stones set orthogonally, with a fourth at an angle of five degrees to the others (Illus 5.5.18). Together these stone rows appear in plan as a continuation of the road line (see Illus 5.5.8, 5.5.9). The most westerly (F394) was made of large stone blocks and its foundations lay on subsoil at 11.47m AOD. The two centre rows (F577) were simply stone slabs set on edge. Investigation of the strata between them revealed a sequence of deposits consisting of widespread concreted glacial gravel and sand, beneath a grey sand, similar in composition to the post-Period 1 flood deposit (Digest 7.5). The eastern stone row (C3492) appears to have been displaced along with several large stones from the capping of the dam.

It is argued that this configuration represents the foundations of a bridge; it is clear that the settlement required one. Road, pond, dam, culvert and terraced walls formed an integrated system that collected water into a pool and controlled the disposal of excess quantities down the re-entrant that led northwards to the sea. Once this infrastructure had been put in place, those working in the vellum workshop would be cut off from those working in the metal smithy (Chapter 5.7) and the fields beyond. People and cattle inside the enclosure would need to find a way of crossing the stream or the pool. They could have used the top of the dam, but it is not evident that they did so, and it would be more logical to use the road. The large stones capping the culvert at the termination of the road were clearly expected to bear weight, implying that the road should have continued over them. The wall of large sandstone blocks, founded on cobbles (F394), and two lines of upright slabs (F577) all continue the direction of the road and maintain the same width. If the bridge was made of wood, timber baulks about 40cm thick and 4m long could have lain across F394 and F577 from E–W, with a layer of N–S planking laid on these. This would raise the height from the top of the foundation stones, ie F394, F577 (at 12.6–12.4m AOD) to the top of the capstones C3572 (13–13.10m AOD) (Illus 5.5.19).

An alternative would be to bridge the crossing using stone slabs, so constructing a ‘clapper’ bridge like Tarr Steps on Exmoor (dated *c* 1000 BC) or Vila da Ponte in Portugal (medieval). This bridge would be required to deliver a wagon or a herd of cows without their getting bogged down, but need only have enough headroom for the tailrace. A third alternative would be to create a raised weir against F394, allowing cattle and people to cross the shallow outflow with only slightly wet feet. However, there was no sign of the expected massive blocks, or of the large amounts of rubble that would be necessary to create a raised ford and weir.

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The most likely option is that timbers of the same kind and length as required for the rafters of S1 (Chapter 5.9), would be laid across the top of upright stones. The span required was 4m but it was supported at intervals. A large scantling was perhaps not necessary since the number of timbers could be simply multiplied. In this way the length of the bridge could continue as long as need be to get to dry land from the doors of the vellum makers to those of the metal-smiths’.

Excess water had flowed around and between these stone ‘piers’ although most of it would be canalised through the culvert when it was working. Beyond wall F394, water was released from the overflow. Here was a group of upright stakes along with collapsed examples of undetermined function, one of which returned a radiocarbon date of AD 640–770.

Disuse of Structure 7

The fills that relate to the use of the culvert consisted of an orange, possibly waterborne sand, and a black silt containing frequent twigs and organic material, and a thin, greasy, dark grey silty clay. A fragment of waterlogged leather, perhaps from a shoe, was recovered from the black silt (24/7810; Digest 6.16.1). These deposits are consistent with the function of the culvert as providing an overflow from the pool. The culvert had later slowly become filled with peat and a final backfill of brown silt. In places, the peaty fill of the culvert also gave out to a mixed deposit of concreted sand and pebbles, suggestive of deliberate blocking (Illus 5.5.20). At the pool entrance to the culvert there was a dump of disordered stones, and fragments of sculpture were found to the north against the dam (TR257). The pool still held water when metal-smiths were active in Period 3, since their debris sank into it. The road was resurfaced with pebbles while the capstones were still in place, suggesting the continued and necessary operation of the hypothetical bridge into Period 3.

Discussion

The Period 2 enclosure in Sector 1 was clearly not intended to be defensive, being at the foot of a slope. Its roles of collecting and draining water were equivocal, but the ditch (and bank) would at least protect the south industrial area (and S1) from flood water. The western arm has not been examined, but given the topography it too would have helped to canalise water towards the firth. The eastern arm was discontinuous in the cropmark, but its line crosses the re-entrant formed by the stream that provides the destination for ground water on the east side. These practical matters no doubt served to complement the function of the enclosure in demarcating a sacred space for the monastic settlement.

The land enclosed by ditch S16 in Period 2 measured 235m across at the widest (E–W), while the distance from the edge of the enclosure to the top of the ridge (Tarbatness Road) was 123m and from the road to the beach 200m, or 323m in all from the south edge of the enclosure to the beach. This enclosed an estimated 2.9ha of useful land south of the Tarbatness ridge, and 5.1ha of hypothetically enclosed dunes between the road and the sea, making 8ha in all. This larger figure is comparable to the broader areas enclosed at Hoddom and Iona (Lowe 2006, 186),



Illustration 5.5.19

The bridge area with the capstones removed, and all deposits removed to subsoil

although much smaller than Clonmacnoise (13ha) (Murphy 2003, 22). In general, these bank-and-ditch enclosures tend to the shape of a splayed C, more rectilinear than curvilinear, and it can be proposed that in addition to their symbolic role, their practical function is to manage the flow of water between the high ground behind the monastery and the sea or river in front of it.

Monasteries are assumed to have defined themselves with such a *vallum* at, or shortly after, foundation. The ditch at Hoddom was dated by radiocarbon on charcoal from its accompanying palisade to AD 600–680 and AD 600–755, indicating ‘construction in or around the middle of the seventh century’ (Lowe 2006, 171–2). However, peat formed beneath the bank at Iona returned a date of 5 BC – AD 125 (68%) suggesting that the vallum was based on an Iron Age enclosure (McCormick F 1997, 49). The earliest organic fill of the major ditch at Iona, 3m wide and 2m deep, was dated AD 610–780 (95%), post-dating the death of Columba in AD 597 (ibid, 50). The excavated Clonmacnoise ditch was 5–6.2m wide and 3.75m deep, and a radiocarbon date on animal bone in the fill (cited as AD 714–873) indicated that ‘the ditch was backfilled in the late eighth to early ninth century’; the ditch was taken to be in place when the timber bridge was built across the Shannon in AD 804, as part of ‘a major expansion of the monastery in the eighth/ninth century’ (Murphy 2003, 19; O’Sullivan & Boland 2000). The dates assigned to these ditches are naturally dependent on such carboniferous contexts as survive in context – usually rather few. The first Portmahomack ditch (S15) was constructed and backfilled before the Period 2 metalworkers became active. The second ditch (S16) was equipped soon after its construction with a wattle-work

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revetment dated to AD 670–890. These are data without much historical precision. Events within the enclosure elsewhere are argued to be contained between AD 680 and 810 (Chapter 3). Since all the dated events appear to be broadly contemporary, an

archaeological judgement is that the first enclosure ditch served the monastery between *c* 670 and *c* 700, and the second from *c* 700 to *c* 810, probably remaining visible until the tenth century or thereabouts (Illus 3.1).

A metalled road is a practical investment, with perhaps an additional symbolism. Paving is used to create dry areas of passage in many sites in early medieval Britain and Ireland, especially where there is a good supply of slabs, for example in the entranceway to the rath at Deer Park Farms, Co Antrim (Lynn & McDowell 2011, 120–4) and the more modest entrance and internal walkway of the eighth-century byre-houses at Pitcarmick (Carver et al 2012, Illus 22). However in Ireland formal paved ways are said to be more common on ecclesiastical sites, and mostly associated with sacred areas within a monastery, connecting cemeteries, shrines and oratories (O’Sullivan et al 2014, 173–4). Paved areas and streets have been defined at Downpatrick leading to a cemetery, at Church Island

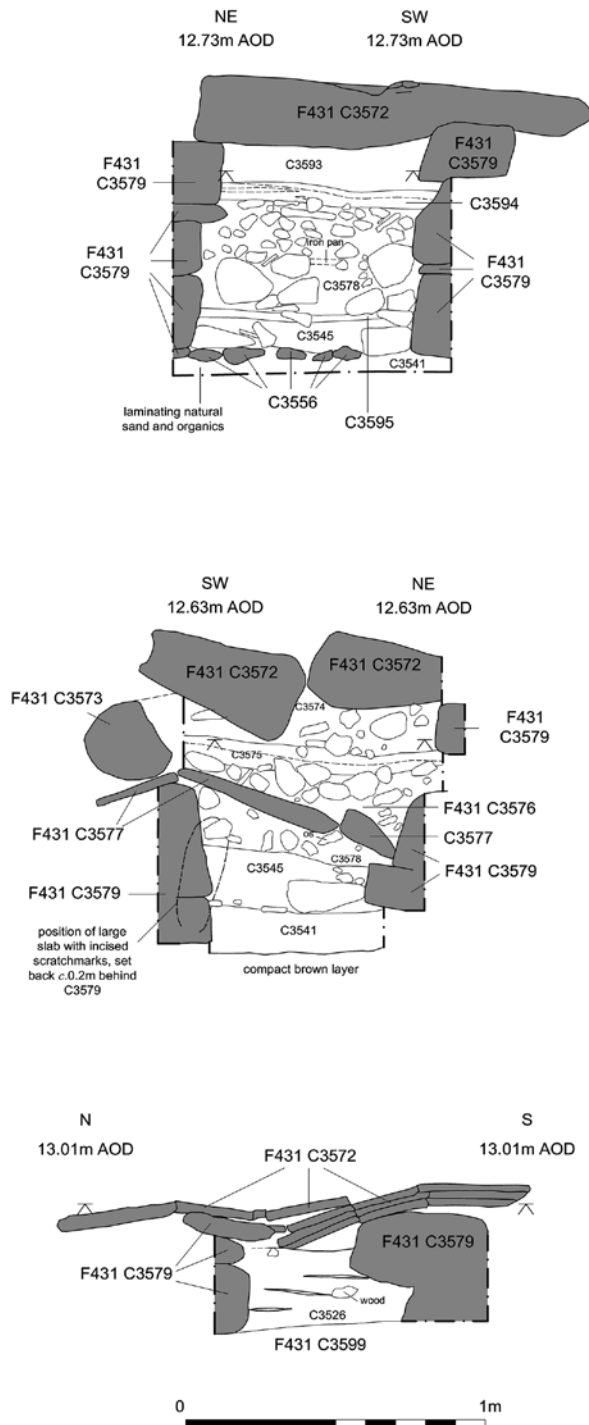


Illustration 5.5.20
Sections across the overflow culvert F431, showing the concreted fill (right)

leading to an oratory, on Inishmurray joining a cell and a *leacht*, while areas of identified monastic sites at Illaunloughan and High Island were extensively paved (ibid, 174). At Clonmacnoise paved streets were maintained from the late seventh century (King 2009, 345), one being 3m wide and at least 18.5m long (O’Sullivan et al 2014, 175). An eighth-century metalled road excavated at Chancery Lane in Dublin was 2.35m in width, and had surface of tightly packed rounded stones set into the natural boulder clay; it had one roadside ditch, but no kerb (Walsh 2009; O’Sullivan et al 2014, 193).

In Britain there are also indications of an early ritual role for dedicated pathways. At Cannington hillfort, Somerset, the focus of post-Roman burial was a burial mound containing a slab-marked fifth-century grave approached by a path that would be ‘created by foot-traffic’ (FT26; Rahtz et al 2000, 55). At Hallow Hill, St Andrews, Fife, a roadway crossed a long-cist cemetery SE–NW. The surface was densely reinforced with a thin layer of small pebbles and its ‘slightly ragged’ edges gave a width of 2 to 4m. It was respected by the long-cist graves (there dated sixth to ninth century), which implies that it preceded and structured the cemetery (Proudfoot 1996, 441). The monastic cemetery on the Isle of May was defined to the west by a kerbed paved road (Yeoman 2009, 235). Thus while pathways to ritual destinations may be fifth century or earlier, the establishment of formal paved streets is probably an attribute of the eighth-century monastic expansion. At Portmahomack, dry-stone construction was deployed only in the infrastructure (and possibly the church, see Chapter 5.4). In this respect its road represents a special investment, and being kerbed, paved and with roadside ditches with V-profile, has more than a hint of *romanitas* about its construction.

Was there a mill?

It has now been well demonstrated that early Irish monasteries, and indeed secular settlements, were equipped with watermills from the seventh century onwards and excavated mills have provided diagnostic footprints in timber and stone (MacErlean & Crothers 2007; Jackman et al 2013). At Raystown, Co Meath, the presence of several mills was signalled by ditches running downhill, some up to 2m deep, which fed small ponds intended to provide heads for square three-sided timber wheel pits (which partially survived). However there were no remains of flume, wheel or millstones (Seaver 2006). The wheel pit of the mill at Kilbegly measured some three square metres and there were no millstones; on the other hand, timbers both small and massive, including a geared hub, planks, pegs and a penstock orifice were recorded over a watercourse more than 27m long (Jackman et al 2013, 63). The water scheme may be spread wide and involve several ponds, leats and races (eg High Island: White Marshall & Rourke 2000, 190).

Particularly well defined and fully published is the tide mill at Nendrum where water from the tide was impounded by a dam c 4m wide with the wheel pit sited against it (McErlean & Crothers 2007). Its back wall was integral to the dam and it had two side walls at right angles to it, the fourth side being open (to the lough). The interior space of the wheel pit measured

2.45×2.2m and accommodated a wooden wheel with an estimated diameter of 97.20cm. Two millstones had fallen into the wheel pit from a floor above. There were no direct traces of a mill house. A penstock 3.78m long was constructed in stone and tapered in its bore from 1×0.85m at the mouth to 0.55×0.60m at the orifice. This latter had a hole c 20cm in diameter to provide the jet that drove the paddles on the wheel. The penstock was buried in the dam at an angle of fifteen degrees, its mouth at low water level (there 0.95m AOD) and its orifice at the level of the wheel (there at – 0.10m AOD). The fall was thus about 1m over 4m (ibid, 215).

Although the fine examples from Ireland cited above had yet to be published, the excavation of S7 at Portmahomack was undertaken with the expectation of a mill in mind, and the search to define it continued until the final days of the campaign (cf OLA 1.2.2, 11 August 2007). The interpretation given above – as a dam, pool, road and bridge – was based on the observed structures and the absence of any flume, paddles, penstock, wheel, wheel pit, bearing or millstones. The dam itself was not removed during excavation since the water had no means of escape to the west and the pumps could not cope with the outflow: the relevant area of the excavation would have been drowned (see Illus 5.5.17). A subsequent analysis was carried out on paper to discover if the dam area could have concealed a penstock and wheel pit with sufficient head of water to drive it. This was found to have been technically possible: if the Nendrum layout were transferred to S7, the wheel pit would lie hard up against the dry side of the dam F440, while the penstock would be buried deep within it. If the dam had survived to its original height, the maximum water level in the pond would be at c 13m AOD, the mouth of the penstock would need to lie between about 12 and 12.5m AOD and its jet emerge about 11 to 11.5m AOD providing a head of water between a metre and half a metre deep. However, there was no trace of a wheel pit in this position nor of an outflow at the level of the natural subsoil. If there was once a mill in this position, it must have been thoroughly dismantled.

There remain two alternative possibilities. A mill might lie further down the hill, on the course of the stream that still runs to the sea today. A possible location would be the point at which the stream is crossed by the Tarbatness Road, where there has endured the rectilinear stone structure known as the Baptistry well (Tobar a’ Baistaidh; OS 1880) at one time serving as the town water supply but which has now been refurbished as a heritage item. There was certainly a megalithic structure in the immediate vicinity, since large blocks were disturbed when the car park for the Tarbat Discovery Centre was created in 1999. No obvious remains of a mill structure were noted downstream from this point.

It does also remain possible that a mill was never built. The hydraulic infrastructure just described would serve a mill, but does not require a mill. A pond would be required in any case to capture water for drinking (humans and cattle) and for industry (vellum and metalworking). It is noticeable that the Period 2 monastic economy was focused on cattle more than on arable; there is only scant evidence for local grain production although barley was eaten (see below, Chapter 5.8, p 222). The rotary querns that were found are of the hand-driven kind and all but one have



Illustration 5.6.1

Period 2 Sector 2 northern workshops, looking north towards the Dornoch Firth. The road S13 runs down the slope from the ritual centre by the church. The vellum-working area is to its west (left)

late medieval contexts. It is concluded for the present, and with a weather eye on future discoveries, that milling technology did not reach Portmahomack at the same time as the other monastic skills, or was not needed if it did.

5.6 The Northern Workshops

Introduction

The ‘northern workshops’, situated in the northern half of Sector 2, were concerned with the preparation of hides, and specifically of parchment. The industry was integrated with the development that was planned and constructed in the late seventh to early eighth century, and may have formed part of the original blueprint, since it was laid out on a specially prepared site (p 181). The industrial activity was disposed either side of a paved and cambered road (S13) that led down the slope from the ritual centre on the hill (Illus 5.6.1; Chapter 5.5). To the west of the road lay a stone-lined tank (S4), a workshop (S9) and open yard (Illus 5.6.2). The associated distribution of artefacts, animal bone and craft-working residues suggest that these structures were host to the working of skins which, it will be argued, included the production of vellum. To the east of the road lay an open area defined by a stone-and-turf bank with stone-lined pits and large, underground stone-built structures, apparently built in the tradition of souterrains. This area was

littered with bones, predominately those of cattle, but with minor fractions of pig, sheep/goat and occurrences of other animals including horse, red deer, roe deer, seal, wolf, fox, otter, whale and porpoise/dolphin (Chapter 3, p 60).

The preservation of structures, finds and the distribution of finds was exceptional. The workshop had been set on fire while still in business and its fittings and equipment had been largely abandoned where they had been used. An array of tools, with flint strike-a-light flakes and small pebbles, surrounded hearths in the workshop and its yard. Serviceable and specialised iron tools and pumice rubbers all appeared to have been dropped in hasty retreat in advance of a conflagration (Chapter 5.11). The area had however also suffered extensive disturbance from developments in the ninth and thirteenth century (Chapter 6, 7). This made the structure of the workshop (S9) in particular hard to read. Some diagnostic hide-working artefacts were found residually in later periods.

The evidence for the industrial activities given by structures, artefacts and residue samples will be presented here beginning with the west side of the road (from north to south) and then the east side.

This presentation will include references to the likely use of the features and artefacts encountered. These are reviewed and critically assessed in a final discussion which assembles the arguments for identifying the area as dedicated the making of parchment for manuscripts (first advanced in Carver & Spall 2004).

The stone-lined tank, S4 (OLA 6.2/3.3.3)

S4 consisted primarily of a stone-lined trough or tank (F72) sunk into the ground, surrounded by rammed surfaces of large rounded pebbles (Illus 5.6.3). The whole structure was dedicated to sophisticated water management. To the north, a funnel of angled slabs appeared to collect water, perhaps from a spring, which was supplied to the tank via a stone-lined and lidded conduit (F552). From the opposite side, another stone-lidded culvert (F376) drained liquid away downslope (Illus 5.6.4). A thin layer of green clayey silt was defined in the lowest part of the tank, which ultimately became clogged with a grey clayey silt. From this was retrieved an iron, wood-handled hook (Digest 6.1; 14/2012, 2016; Illus 5.6.5). The tank would have contained about 1,500 litres of liquid. Given its broader context (see below), the structure is interpreted as a facility for the washing and liming of small hides and the object is interpreted as a hook for retrieving pelts from the tank. A truncated pit (F554) at the north-west end of the tank contained a consignment of whelks, proposed, along with periwinkles and *spirorbis*, as a source of lime.

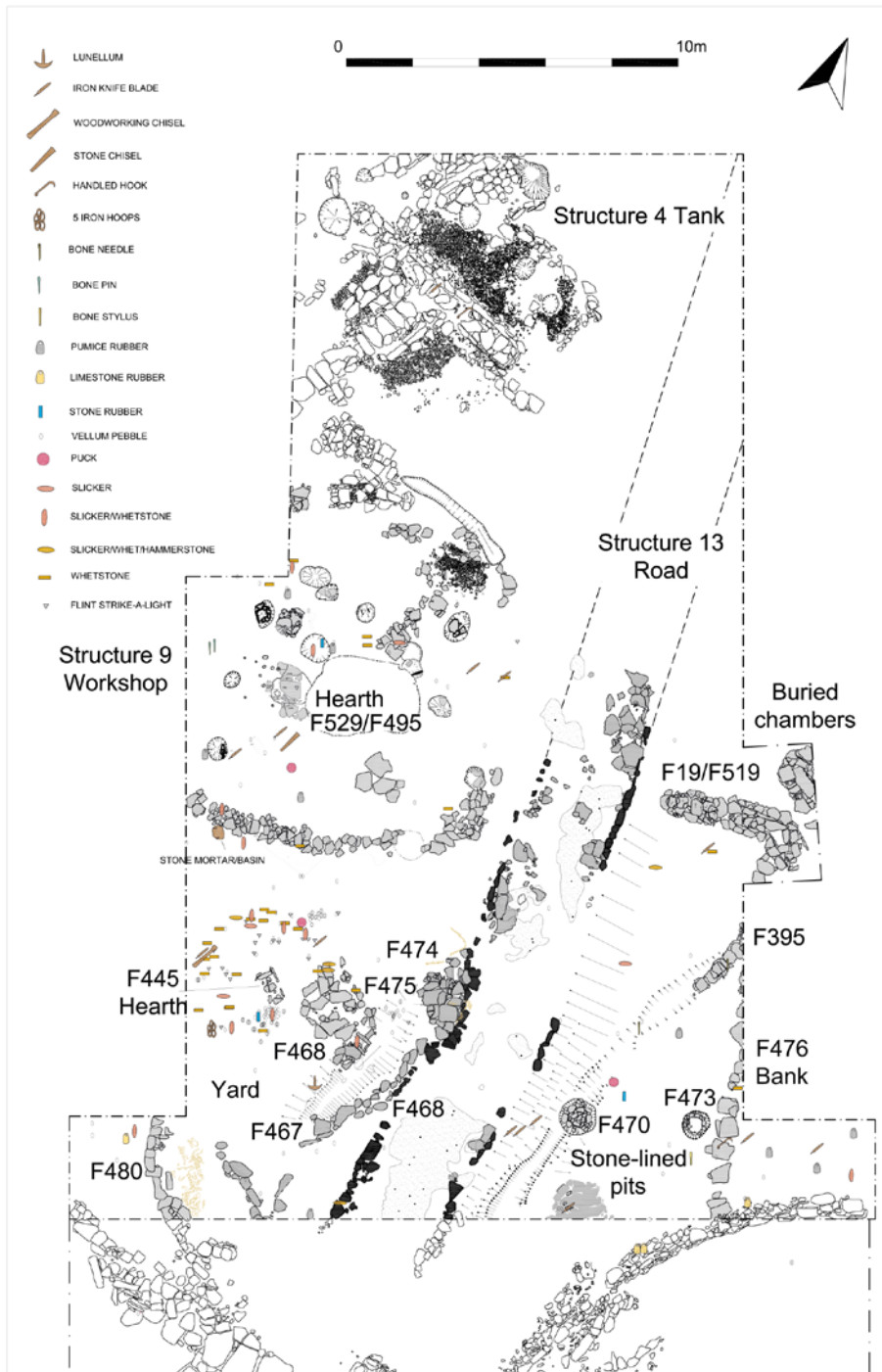


Illustration 5.6.2

Plan of workshop area with structures and distribution of finds related to vellum-working

Workshop, S9 (OLA 6.2 at 3.3.4)

Structure

S9 was a demarcated space shaped like a horseshoe in plan and enclosing a hearth-cum-kiln, two working stances and an earth floor, containing a spread of artefacts. The building was

defined by a curving gully to the north (F31) and a complementary curving terraced wall to the south (F434) (Illus 5.6.6, Illus 5.6.7). Between the two were several post-pits, asymmetrically disposed, but seen as roof supports. On the west side of the space so defined was a hearth that had seen two phases of use (F495). A small area of slabbed and cobbled hard standing (F378) joined S9 with S4 to the north, and was linked within the S9 zone to a kerbed pathway (F522) heading for the central space (which had unfortunately been obliterated by a late medieval well, F13). These arrangements are likely to have provided access to the workshop. The building had been eroded on its east side and the west side was incomplete, further exploration westwards being inhibited by a live electricity cable.

The overall form of S9 was reminiscent of the much better-defined bag-shaped building S1 (Chapter 5.7), and appeared to constitute the battered remains of a building of similar type. Alternatively, the wall and gully define an outdoor working zone in which the posts supported beams, racks and frames for stretching and drying hides. The architectural viability of workshop S9 is examined with the other buildings in Chapter 5.9, p 228.

Activity in S9

Evidence for activity in S9 was threefold: a focal hearth refurbished during the life of the structure; two clusters of large stones thought to have functioned as working stances; and floor surfaces with artefacts, many of which were in situ (see Illus 5.6.2). The *stone-built hearth* had two main phases of use (Illus 5.6.8). The earliest (F529) consisted of a broad, slightly irregular scoop cut into subsoil, with an initial lining of turf interrupted by cleaning out. Occasional fragments of degraded sandstone suggested that it had been stone-lined at some stage. Its fill consisted of ash represented by brightly coloured clayey silts. In its second phase (F495), the refurbishment of the hearth consisted of the insertion of a base stone and kerbs to north and south with associated working platforms made of sandstone slabs. A small stone hole indicated there was also probably a stone kerb

on the west side. To its east, the hearth had been cut away by the excavation of a large medieval well (F13). Surrounding the hearth in its second phase were several post- and stake-holes, suggesting that it had incorporated a hood or a similar structure above it.

The earliest fill of the refurbished hearth contained a distinctive deposit that consisted principally of partially burnt

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and unburnt winkle shells set in a matrix of soft brown sand. Towards the centre of the feature, burning had rendered the shells grey and soft. Elsewhere within the floor of S9 were ashy deposits that included burnt shells and seaweed, and it was apparent that shells had been deliberately burnt, probably for the preparation of quicklime (see below). The latest hearth fills consisted of bright orange clayey silts containing frequent lenses



Illustration 5.6.3
S4, washing tank, under excavation looking north-east

of pure turf charcoal and occasional pockets of unburnt turf present as decayed brown silt. They also included a small flint chip from fire lighting, a common find in working areas around hearths within the craft-working zone. The very latest fill was a layer of bright white, pink and orange clayey silt that could be related to an episode of intense burning encountered throughout the site. This suggested that S9 fell out of use following the site-wide fire that marks the end of Period 2 (see Chapter 5.11, p 256).

Work stances

Clusters of large slabs found in situ within the building were identified as possible *working stances*. To the north of the hearth was a stack of slabs tightly bonded with clay that would have risen to waist height, and suggested a 'table' on which hides could be laid (F512; located on Illus 5.6.7). On the south side of the interior of the building, another possible working stance consisted of five large, flat sandstone boulders set closely together to form a surface *c* 1.5m², associated with a small post (F531). These slabs had clearly been collected from the shore, since their upper surfaces were covered with small solution holes. Other than providing a broad, flat working surface, their specific purpose was not identified.

Patches of intact trodden *floor surface* were identified within areas of S9, likely to represent only the earliest layer of accumulating occupation deposits. Layer C2950 consisted of a mid-brownish-grey compact sandy silt flecked throughout with small pieces of charcoal and burnt shell. It varied over large areas, being more sand-derived in places, and darker or redder with no shell inclusions elsewhere. Artefacts recovered from this layer included four iron knives, seven whetstones, stone slickers, vellum pebbles and four pumice rubbers (Digest 6.1). There was also a stone-working chisel that could be associated with the making of sculpture (p 163). The backfill of structural posts to the north and south yielded a slicker/burnishing stone and triangular abrasive stone.

The south yard (OLA 6.2 at 3.3.4)

To the south of S9 lay an enclosed *yard* limited by the road (S13) and a stone-and-turf wall (F480) founded on a raft of butchered animal bone (Illus 5.6.2; Illus 5.5.13a for the animal bone raft). The strata in the yard were identified by micromorphology as reworked and trampled peat-ash midden material (Digest 7.5, location 4). The yard area had been prepared during an episode of levelling using a quantity of mixed clayey silt layers with a component of charred material, animal bone and small fragments of sandstone. Overlying these dirty mixed deposits was a markedly clean layer of bright yellowish-white preparatory sand. This sequence created and maintained a level platform for the deposits forming the overlying floor surface of the vellum-working yard. Subsequently, the surface was overlaid with a convoluted series of ash dumps, some of which accumulated during Period 2 occupation of the yard and may have been a deliberate attempt to raise the ground level within this zone. These deposits contained a mixture of burnt and unburnt material, mainly animal bone presumed to have derived from nearby craft-working hearths (for the use of animal bone as fuel, see Chapter 5.8, p 223).

Hearth

Four unworked sandstone blocks formed three sides and the base of an open-fronted hearth measuring 1.0×0.50m (F445) (Illus 5.6.9). Originally there appeared to have been a freestanding 'fireback', a dry-stone construction forming a heat shield and/or reflector at the back of the hearth, which had collapsed eastwards – presumably when the workshop was abandoned, since no

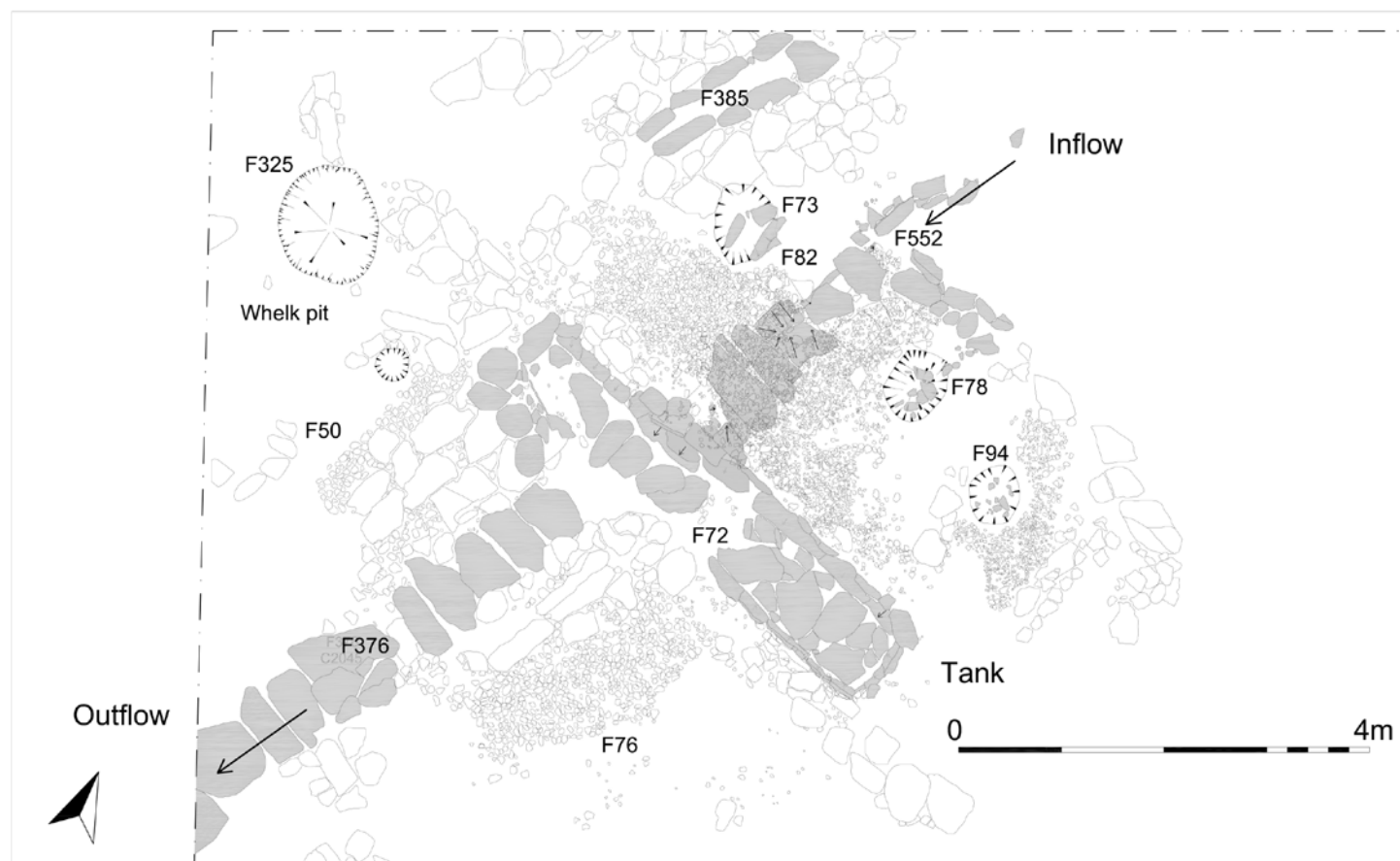


Illustration 5.6.4
Plan of S4

attempt was made to reinstate the feature. While no hearth base-stone was identified as part of the primary construction, it seems possible that one may have been incorporated originally, since during the use and maintenance of the feature, at least two linings of sandstone were put in place. Primary ash fills were interleaved among the sandstone refurbishment of the hearth base. The hearth was surrounded by an array of artefacts and large spreads of lime-like residue lay close by.

Features connected with industrial activity in the yard had encroached on the western roadside ditch. Adjacent to the hearth was a slab-built sandstone surface (F474) that appeared to form an area of hard-standing. It was contiguous with a stone-built culvert positioned on the western shoulder of the western flanking ditch, and draining into it (F467). Between the road and its flanking ditch were two stone-lined channels (F468, F475) both also apparently concerned with the management of water (OLA 6.2/3.3.2). In this area there were several concentrations of complete cattle metapodia, set in groups. The collapse of channel F475 had swallowed a large cache and an orthogonal array had been deliberately pressed into the ditch edge (Illus 5.6.10a–b).

A large collection of craft-working artefacts was recovered from the yard (see Illus 5.6.2), many associated with skin-working,

including a half-moon knife, twenty-nine whetstones, rubbers and slickers and two iron blades. Many small pebbles were identified as imported into the site and concentrated in the area of S9 and its yard (Illus 5.6.11). A small pit (F399) contained a collection of eighteen small quartzite and four jasper pebbles. A woodworking chisel and a group of five iron hoops suggest the manufacture of wooden apparatus. All these, and the cattle metapodia, can be specifically related to the process of producing membranes for writing (see p 199 below).

East-side industrial features (OLA 6.2, 3.3.4)

The structures encountered in Period 2 on the east side of the road were more enigmatic but contemporary with, and related to, the activities in S9 and its yard, as indicated by the distribution of artefacts. The area was delimited to the east by a *stone-and-turf bank*. At the south end were two *stone-lined pits*, and to the north were two narrow and originally *subterranean chambers*. Within this area a consolidated ground surface was identified, associated with a scatter of butchery waste and a number of craft-working artefacts (Illus 5.6.2).

The *stone-and-turf bank* (F476) provided a N–S division about 4.0m long as defined within an otherwise open area. It

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Illustration 5.6.5
Iron hook with wooden handle (14/2012 and 2016) found in tank. Scale in centimetres

consisted of a linear arrangement of large boulders, each propped individually with smaller stones to create an eastwards tilt. Once in position, the stones were packed with soil and covered with turves. Included in the make-up were charred seaweed and shells, as in the hearth and floor of S9 (see below).

To the west of the bank were two circular *stone-lined pits*. The more easterly, F473, was made of tightly packed beach pebbles and cobbles lining its sides, bottoming out onto underlying deposits. The pit had been backfilled with a loose matrix of dark brown sandy silt with frequent pebbles. The second stone-lined pit (F470) was similarly made with river and beach cobbles packed tightly against its edges and a base formed of sandstone slabs. The function of these features is unclear but F470 had been cut into the roadside ditch suggesting that it was drawing and retaining water from it.

To the north was a set of linked *subterranean chambers* (F19, F519, F395) which appear to have been associated with other features that remain largely unexcavated beneath the churchyard wall (Illus 5.6.12; see Int 26, p 41). The most easterly component (F19) took the form of an underground channel with a stone lid, stone block sides and a stone slab base. Removal of the lid identified secondary backfills over a possible waterborne fill overlying the slab base. The westerly section (F519) also consisted of a lidded stone channel formed by slab sides but notably no base. It butt-ended uphill to the west. There were several secondary backfills consisting of mixed sandy silts overlying deposits that appeared to be related to silting during use. Large stones were placed around the edge of the construction cut, stacked where the feature butt-ended, and capped with sandstone slabs, many of which had cracked and collapsed slightly. Once capped, the feature was sealed with turves and fine sand, manifest as a bright orange 'crust' over all capstones and levelled with pale grey sand; some effort had been involved in carefully sealing and levelling the feature. Dissection showed that it was intended to function as a hollow underground space. To the immediate south, a third chamber (F395) appeared as a free-standing stone-built feature with



Illustration 5.6.6
S9 looking east. The areas of yellow sand are excavated medieval pits

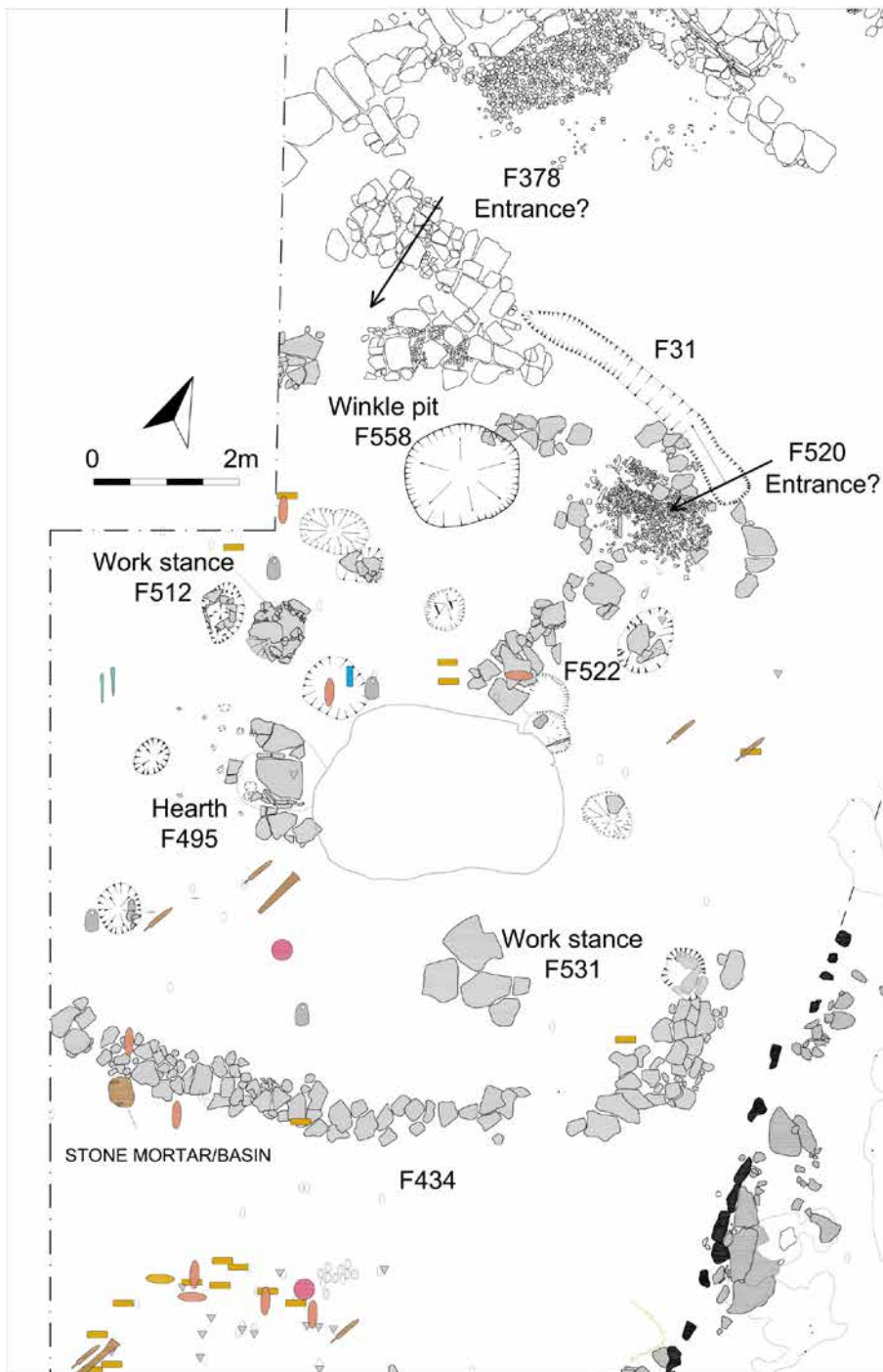


Illustration 5.6.7
Plan of S9. For legend, see Illus 5.6.2

walls and capstones covered or sealed with turf. Secondary soft, sandy silt backfills were excavated from within the channel of the feature (C2445) but appeared to have accumulated naturally by percolating through the lid, post use. It was plugged to the south but appears nonetheless to have drained into the roadside ditch (F462/472). A complete leatherworking needle (3680) was

recovered during its excavation. In general these features seem intended to enclose a subterranean space rather than drain it, and are chambers rather than channels. In this they resemble miniature souterrains or storage chambers, and their similarity to cist graves may not be irrelevant.

The stone-built features east of the road were associated with an expanse of *consolidated ground surface*. This layer was very distinct and appeared as a compacted, leathery sandy silt, the upper surface of which was littered with animal bone, identifiable largely as cattle bone (OLA 6.2.1/34). The artefact assemblage included a further four further pumice rubbers, a leatherworking needle, three fragmentary limestone rubbers, six iron blades, six whetstones/slickers, and near the bank, a bone stylus (24/7189/7190).

The area east of the road, with its bank, stone-lined pits and subterranean chambers signals a robust outdoor activity connected with the processing of cattle. The large amount of animal bone, including but not restricted to groups of cattle metapodia, within the workshop yard and adjacent eastern area suggest that animals were being butchered and flayed. The stone-lined pits appear to be collectors of water, making use of the roadside ditches channeling water off the hill. The artefacts, animal bone and calcite ash all suggest links with the activity in S9 and its yard on the other side of the road. The stone-and-turf bank recalls the stance in S9, there more surely associated with the treatment of hides.

The nature of the west-side industry

The ground surface associated with the stone structures east of the road is interpreted as a use horizon for skin-working and is considered analogous, in its composition and its assemblage, to contemporary layers within S9 and its yard and with S4 to the north. Although separate from each other, these three areas are depositionally and stratigraphically equivalent (see Illus 3.13).

While an association of all three areas with processing cattle hides is reasonably certain, acceptance that this workshop was also intended for the preparation of writing membrane requires further argument. The broad material toolkit for producing manuscripts in insular Britain and Ireland is reasonably well known: the hides used are mainly calf and (especially in England) sheep. The animal should be bled rapidly

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Illustration 5.6.8

Hearth in the workshop; in its first phase F529 (a) and second phase F495 (b) and a section (c)

to avoid marking the membrane with veins, then skinned and the skin soaked in lime. Stretching on a frame is an essential stage in the production of parchment (as opposed to leather). Here the skins are stretched taut and scraped with a curved knife, before being smoothed with rubbers and ‘pounced’ with pumice or an equivalent degreaser (Gameson 2011b, 14–17). Contacts with each aspect of this process can be demonstrated at Portmahomack.

There are four sets of evidence for the industrial activity encountered: evidence from structures, evidence from artefacts, evidence from animal bones and evidence from lime residues. While only few of these items, taken individually, are specifically diagnostic, taken together the assemblage and its associated structures provide a comprehensive testimony for vellum production.

Evidence from structures

The structures recorded on the west side of the road were the stone-lined tank S4, the enclosed area S9 with hearth and ‘stances’ and the yard to the south with a hearth, stance and water-management features. On the east side there was a stone-and-soil bank and a set of three subterranean chambers probably clad in turf. The east side was also host to two stone-lined pits, while the surface was littered with the bones of animals, predominately cattle, indicating that they were slaughtered in the vicinity. While the northern subterranean chambers acquired water and the southern channel drained it, their original design would appear to have involved the exclusion of air by lagging with turf. The preservation of hides (as other organic materials) can be achieved by immersion in acidic and/or anaerobic deposits, as in the case of bog butter, a form of food preservation known in Scotland since the second century AD (*New Scientist* 20 March 2004). These airtight chambers may have been intended to create similar conditions for the preservation or conservation of skins using salt, fat or the acid percolating through the turf roof to preserve a roll of skin awaiting processing.

On the west side, the tank S4 was clearly intended for the immersion of something in water that could be let in and let out again. Washing bloody hides and their immersion in a preservative liquid are likely uses. A paved surface led to the S9 area where there was a working surface at waist height, suitable for repetitive jobs such as scraping or smoothing. Elsewhere a set of horizontal boulders offered another kind of working stance – a flat drained surface at ground level. The central hearth had been used to roast shells, to extract the lime. The space as a whole was covered, if not roofed (see Chapter 5.9, p 246).

The south wall of S9 provided a terrace that dropped down a level from the floor of S9 to that of the south yard. The yard was open space bounded by the terrace wall, the road and the boundary wall F480. Within it was a hearth and a working stance, a supply of water from the roadside ditch and a route for effluent down it. The hearth, washing area, rows of bone pegs and the scatter of artefacts evoke artisans working freely in the open air on a sandy surface, but with method and neatness. Assuming this was a space where hides were pegged in timber frames, it implies work that would best suit long summer days.

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Illustration 5.6.9
Hearth in the yard, F445

Evidence of the artefacts

The artefacts from the workshop zone may be grouped into six: knives, pucks and slickers, needles, stone rubbers of various materials, small white pebbles and bone pegs (for description, dimensions and provenance see Digest 6.1). Many of these can be seen to have to do with the working of hides, but at a particularly delicate level of application.

Knives

The *lunette* or *half-moon knife* or *lunellarium* (24/4575) is complete and measures 73mm blade to tang and 68mm wide

with a double-bevelled curved bladed edge (Illus 5.6.13). Evidence for the use of convex curved blades or ‘half-moon’ knives in skin-working is ancient and diverse. Convex lithic scrapers for skin-working form part of Aurignacian toolkits (Rahme 2011, 40) and depictions date from c 1400 BC, when a tomb painting at Thebes shows a panther skin being cut using a half-moon blade (Waterer 1956, 150). Lithic scrapers are replicated in metal in the Early Iron Age in Britain with ten copper-alloy socketed leatherworking blades recovered from across England (Pitts 2012, 7). Images of lunette leather-cutting tools are later depicted on Roman shoemakers’ tombstones, and an iron example has been recovered from the tannery in Pompeii (van Driel-Murray 2011, 79). Tanged examples almost identical to the Tarbat tool have been recovered from the Anglo-Saxon site at Flixborough, Lincolnshire (Ottaway 2009, 278–9) and from Hedeby (Westphalen 1993, Taf 27, 8), where they are attributed to leatherworking. The tools may be seen in images of leatherworking guilds into the post-medieval period and in nineteenth-century tool catalogues (Salaman 1986). Examples are depicted in various medieval manuscripts, three of them directly in association with the preparation of vellum. The convex curved skin-workers’ blades were used for cutting and trimming, for paring and splitting and for cleaning and thinning. The lunette knife thus performs as both a knife and a scraper, and here the presence of four other knives (Illus 5.6.13) suggests the craftsmen had recourse to other ways of doing the cutting.

Pucks and slickers

Convex blades may be connected to a group of five stone discs recovered from Period 2 deposits (8/211; 14/3558; 24/4577, 4732, 7830) and a large group of slickers/whetstones (Digest 6.1). The discs have a close affinity to modern axe ‘pucks’ used for



Illustration 5.6.10
a–b: Cattle metapodia lined up for use, as found on site



Illustration 5.6.11
Excavating vellum pebbles in the western road ditch

sharpening the convex curving blades of axes and are identified as circular whetstones. By analogy, the Tarbat pucks may relate specifically to the maintenance of convex skin-working blades. A total of twenty-eight stone slickers/whetstone/hammerstones were recovered from S9 and its yard. Many show signs of having been used to sharpen blades (visible metallic residue), to polish skins (brown blooms) and as hammers (pock-marked ends). A similar group of these multi-purpose stone tools was recovered from a cache at Dunadd (Lane & Campbell 2000, 178–9).

Pumice and limestone rubbers

Ten pieces of pumice were recovered, of which eight were near complete or identifiable fragments of shaped rubbers commonly perforated for suspension on a thong (Digest Illus D6.1.6). With one exception (11/1063) the pumice finds came from the workshop area (14/3958; 24/4019, 4752, 4793, 6784, 7307, 7308, 7704, 7710). A close parallel to the pumice rubbers was recovered from Birsay (Curle 1982, 70, Illus 45:601a). According to Anthony Newton, pumices similar to that found at Portmahomack are dacitic in composition and have been related to eruptions from the Katla volcanic system in southern Iceland (Digest 6.16). It is likely that the pumice was retrieved from either local contemporary or ancient raised shorelines. Three naturally abrasive stones were also recovered and were probably exploited as such, being fine-grained, hard garnet mica schist and amphibolite (14/4011; 24/5245, 6994). Four fragmentary limestone rubbers were also identified, again all with perforations (24/6214, 6656(2), 8468). The rubbers are characterised by their chalk-like powdery surfaces and could have been deployed in whitening and finishing. A natural limestone lump (24/7858) and fragment of quaternary peripheral sponge (24/6214) may both have been similarly exploited.

Needles and styli

Also recovered from the terrace were three bone needles, identified by their eye and round section (24/4616, 14/3560 and 14/3680), and two styli (13/53 and 24/7190) (Illus 5.6.14). These have been examined, identified and reported on in their British context by Steve Ashby (see Digest 6.4, Section 3.2, p D88). Bone styli are less common than those of copper alloy, but they have been shown to serve adequately for use with a wax tablet, using the point to write and the broad end to erase the script. The Portmahomack styli find a parallel at Whitby (MacGregor 1985, 124), and the use of styli in general is a characteristic of east-coast establishments, whether determined as monastic or not. In contrast, styli are rare on northern and western monastic sites where scratch marks on slates were used for writing practice, as at Inchmarnock (Campbell 2010, 140; Lowe 2008). In Scotland, objects of similar form from the multi-period settlement site of Skaill, Deerness in Orkney were identified as ‘spatulate-headed pins’ (Porter 1997, Fig 8.3), and it may be that the evidence for early writing in various media will increase with further exploration.

Vellum pebbles

A total of 238 small, smooth pebbles, primarily white, red and rose-coloured quartzite or quartz, but also including porcelanous jasper, chalcedonic quartz and polished granite pebbles, were recovered across the terrace, primarily from around the hearth in the yard, including from an immediately adjacent pit and tumbled into the western ditch of S13 (see Illus 5.6.11; Illus 5.6.15). The pebbles had clearly been collected selectively and imported into Sector 2, and are here referred to as ‘vellum pebbles’, due to their interpretation as part of the apparatus for suspending skins (see below, p 209). Pebbles played an important role in Pictish life as shown by the cult of the painted pebble – an example of which was found residually in the workshop area (Illus 6.5a, p 266).

Evidence from animal bones

The animal bone from the workshop area was overwhelmingly of mature cattle (three years old plus), but other animals present in small amounts (goat, seal) may also have been exploited for their skin. There was evidence for a range of specialist implements in use for butchering, along with refined and systematic cutting practices (Digest 7.1). The tools inferred were predominantly knives – potentially with steel cutting edges. Skinning marks were noted on otter, and a high frequency of cut marks registered from marine mammals. The metapodia aligned in the yard, which were in primary association with the production there, were from mature cattle aged between eighteen and thirty-six months. However this need not imply that such cattle were also the subject of processing. These metapodia were stored in arrangements that suggested a specific function (as pegs, see below).

While the majority of cattle were mature, calves were exploited, with Period 2 prominent over other periods both in the number of calves and the number of neonates. It was concluded that the Period 2 herd produced both cattle hides and calf skins

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Illustration 5.6.12
Subterranean structures west of the road: F519 (a); F19 (b); F395 (c)

in significant quantities. This is discussed in the context of the monastic economy in Chapter 5.8, p 225.

Evidence for lime burning

There were several indications that seashells were being used for the preparation of quicklime in the S9 zone, as revealed by analysis of grey, greasy ash found in the hearth (F495) and on the floor. This has been reported as containing fused, slightly calcareous glassy ash with spirorbids, sometimes fused into ash clasts. Also present were burnt marine mollusc shell, including periwinkle, *Littorina* and charred plant material from seaweed and burnt and unburnt turf (Digest 7.4, Table 1, C1917). Similar material was also found in the bank (F476) on the east side of the road (Digest 7.4, C3171). Allan Hall concludes that 'the assemblage as a whole points to imported seaweed and shells, presumably burnt to produce a form of lime for processing skins' (ibid). Lime burners evidently extracted a lime-rich ash from seaweed and the minute *spirorbis* shells that cling to it. Elsewhere, collected shells had been stored. There was a deposit of whelks next to the tank (above), and adjacent to the (northern) entrance area of S9 were two *winkle pits* (F558 and F575), each lined with dark brown sand and containing a deposit of pure winkles. *Nucella lapillus*, the dog whelk, produces a purple dye used in manuscript illumination (Gameson 2011b, 89), but the Portmahomack shells appear to be examples of *Buccinum undatum*, the common whelk (Digest 7.3) more likely collected for lime production. To produce quicklime (calcium oxide), the calcium carbonate in the shells would need to be heated to 825 degrees Celsius in a reducing atmosphere; this requires an apparatus akin to charcoal burning, with a flue and chimney (Wingate 1985, 70–1). This may explain the unburnt turf-and-winkle component in hearth F495 and the stake-hole arrangement around it (above). Equally, the use of smoke and heat to preserve hides should not be ruled out and the purpose of the stake-built structure may have been twofold.

Quicklime is used primarily to make mortar and plaster, which are known components of specialised stone building in the eighth century: for example, plaster at Wearmouth/Jarrow (Cramp 2006a, 2–18), a mortar mixer at Wearmouth (Cramp 2005, 93–5) and another in the Northumbrian royal centre at Dunbar (Perry 2000, 63–4). Dolomitic limestone does occur in northern Scotland at Assynt and Durness, which would be a near source of lime mortar, and limestone objects did reach Tarbat (above, p 202). But if knowledge of mortar-making was exported



Illustration 5.6.13

The parchmenter's toolkit: lunette knife 24/4575; blades (24/6596; 24/670; 24/7673; 24/7681). Scale in centimetres

to the far north as part of the monastic package, it would have been unlikely to rely on shells, and the production at Portmahomack suggests a more specific small-scale application. Slaked with water, quicklime produces a strongly alkaline solution of calcium hydroxide, which is caustic to the touch and used for dehairing and degreasing pelts. This interpretation converges with that of the assemblage from the workshop as a whole.

Parallels

The difficulty in interpreting the Portmahomack industry lies in its currently unusual character and lack of parallels. Large-scale excavations where manuscripts are known to have been produced have not apparently chanced upon a vellum workshop, or even offered a diagnostic assemblage, other than a high proportion of calfbones (see below, 'Source of hides'). There are echoes, however, from sites not known to have been producing manuscripts. The assemblage from Dunadd included seaweed as well as neonatal cattle (Campbell 2010, 142; Lane & Campbell 2000, 223, 226–7). At Deer Park Farms, Ulster, the finds included seaweed (Lynn & McDowell 2011, 520), eighty water-rolled pebbles (ibid, 285), a small trough (ibid, 394), a 'bed-end' with a line of pegs in slotted beams (ibid, 423–5; 116) and an iron hook (ibid, 285; Fig 15.13; 295). These objects were declared enigmatic ('No directly comparable objects are recorded from contemporary sites in Ireland') but possibly connected with textile working and dyeing (ibid, 618). At Jarlshof, seal bones were 'extremely prolific' in the post-broch levels and the excavator comments, 'in this connexion the small stone discs found on broch and wheelhouse sites may be associated with some industry such as the stripping and curing of skins. The curiously shaped rubbers, or polishers,

also give the impression of tools employed in the processing or softening of pelts, while the whalebone pegs from Shetland sites may well have been used in the drying and stretching of skins upon a ground frame' (Hamilton 1964, 69).

The processing of animals naturally produces meat and blood as well as bone and hide, cattle in particular giving a considerable variety of by-products (lard, intestines, sinews, hooves, horn, hair) all of which could be pressed into service as conserved food, thongs and glue. It may be that the stone-lined pits and underground chambers had some role in the storage or treatment of animal products. The presence of whale and dolphin in the bone assemblage brings to mind the extraction of oil. At Finnmark, excavators defined slab-lined pits as used for extracting oil from marine mammals. The pit was filled with hot stones and blubber thrown onto them, the oil collecting in the pit (Olsen et al 2011, 90–1).

Numerous modern practitioners have experimented with parchment-making, often by drawing on evidence from contemporary traditional communities. These may be useful in opening up the variety of treatments that are possible. In experiments well informed by Inuit,

Sami and native American practice, Susanna Harris described how a hide may be conserved by drying and oiling rather than immersion. She worked on the dried skin using flint end-scrappers, often retouched to give them more bite; the membrane came off like sawdust and left the skin white. It was then conserved with emulsion and held in the smoke of an open fire to make it 'more chemically stable' (Harris 2012). In the case of early medieval Britain, the argument relies more securely on analogies nearer to home, in particular European practice as recorded in documents.

Documentary accounts of vellum-working

Written accounts of how to make writing membrane survive from Rabbinical texts from the end of the third century BC (Reed 1972, 99) and include great variation in production, but for medieval Europe they begin in the eighth century whence they coalesce into an established medieval method that can be traced through the following centuries into the modern workshop. The tradition recorded in these sources allows us to establish the pedigree of the medieval craft.

The earliest European source is the Lucca Manuscript written in a northern Italian monastery in the eighth century, which describes as follows:

How parchment has to be prepared: place (the skin) in lime water and leave it there for three days. Then extend it on a frame and scrape it on both sides with a sharp knife and leave it to dry

(*Codex 490*) (Reed 1972, 133)

This is the earliest reference to the use of lime as a treatment agent in skin-working in the literature, with earlier traditions referring

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to vegetable-based substances (Reed 1972, 135–8). The use of lime in leather production did not in fact become commonplace until the later medieval to early post-medieval period when liming pits are regularly encountered archaeologically (Thompson & Mould 2011), only becoming *de rigueur* in the modern tannery since the introduction of chromium tanning. Subsequent medieval texts for parchment-making also stipulate repeated applications of lime, and during these early centuries it can be seen to be peculiar to the preparation of writing membrane and not, as the traditional assumption would have it, to any and all leather production.

A riddle in the tenth-century Exeter Book provides a more complete, if oblique, account of making a Bible in Old English:

An enemy came and took away my life and my strength also in the word; then wetted me, dipped me in water; then took me thence; placed me in the sun, where I lost all my hair. The knife's edge cut me – its impurities ground away; fingers folded me. And the bird's delight with swift drops made frequent traces over the brown surface; swallowed the tree-dye with a measure of liquid; travelling across me, left a dark track. A good man covered me with protecting boards, which stretched skin over me; adorned me with gold. Then the work of smiths decorated me with strands of woven wire ... Ask me my name. I am a help to mortals. My name is a glory and salvation to heroes, and myself am holy.

In the twelfth century, Theophilus provided the following description for goatskins, highly prized by the parchmener. His account includes greater detail on the applications of lime, soaking and washing, controlled drying and wetting during stretching and indications as to the use of pumice:

Take goat skins and stand them in water for a day and a night. Take them and wash them until the water runs clear. Take an entirely new bath and place therein old lime and water mixing well to form a thick cloudy liquor. Place the skins in this, folding them on the flesh side. Move them with a pole two or three times each day, leaving them for eight days (and twice as long in winter). Next you must withdraw the skins and unhair them. Pour off the contents of the bath and repeat the process using the same quantities, placing the skins in the lime liquor and moving them once each day over eight days as before. Then take them out and wash well until the water runs quite clean. Place them in another bath with clean water and leave them there for two days. Then take them out, attach cords and tie them to the circular frame. Dry, then shave them with a sharp

knife after which leave them for two days out of the sun. Moisten with water and rub the flesh side with powdered pumice. After two days wet it again by sprinkling with a little water and fully clean the flesh side with pumice so as to make it quite wet again. Then tighten up the cords, equalise the tension so that the sheet will become permanent. Once the sheets are dry, nothing further remains to be done (Reed 1972, 74).

The twelfth century also provides an early manuscript image of a tonsured monk with curved blade and sheet suspended in a frame, and into the thirteenth-century production by the laity for a number of consumers including monasteries themselves is depicted (de Hamel 1992, 12–13) (Illus 5.6.16a, b). Sources that post-date Theophilus are more numerous but reiterate the method. Parchmenters in thirteenth-century Bologna rehearsed this process of repeated liming, thorough washing and extended soaking in fresh water followed by stretching (Thompson 1956, 25). Similarly, a further late thirteenth-century source states:



Illustration 5.6.14

The parchmener's toolkit (continued): three needles (24/ 4616, 14/3560 and 14/3680), and styli (right) (24/7190, 7665, 13/53) (for scale drawings see Illus D6.1.7)



Illustration 5.6.15

'Vellum pebbles' from the yard area (for scale drawings see Illus D6.1.6).
Scale in centimetres

Likewise concerning skin: how parchment may be made from it: The flayed skin from the calf is placed into water. Lime is mixed in which bites into all the raw skin. This should fully clean it and remove the hairs. The circular frame on which the skin is stretched is made ready. Let it be placed in the sun so that the fluid is removed. Approach with the knife which tears away the flesh and hairs. It quickly renders the sheet thin.

(*De animalium natura*, quoted in Reed 1972, 134)

The same source goes on to describe the application of pumice and chalk to sheets being prepared for binding into quires. The transition to lay production is also attested in the fifteenth century, when a *Pergamentmacher* can be counted among *der Zwölf Brüder* and is depicted using the distinctive curved blade (Treue et al 1965, 63) (Illus 5.6.16c), the name of which is provided for us by Paul of Prague in his *Liber viginti artium – a lunellarium* (Thompson 1956, 26).

With the advent of paper-making and printing we can trace the beginnings of a decline in the craft and by the Enlightenment *Diderot et d'Alembert* record parchment-making as a *metier disparu* and provide drawings of every conceivable piece of equipment for a *parcheminier* and stages of production (Illus 5.6.17). In Britain, parchment workers were recorded at work before the Second World War (Salaman 1986, 330), but the William Cowley Parchment Works, Newport Pagnell, Northamptonshire is the last surviving British producer whose longer-term survival was recently helped by the rejection by Parliament of proposals to substitute goatskin vellum for Acts with archive-stable paper;

the proven longevity of parchment cannot be rivalled easily by other media. The William Cowley Parchment Works provides evidence for continuity of craft-production techniques in spite of some elements of mechanisation through the late nineteenth to twentieth century, many of which are still undertaken in the modern workshop (Illus 5.6.16e, f).

Implications for practice

There are some further necessities of the craft that these sources elide. An animal pelt intended for writing membrane requires swift, efficient and thorough bleeding. If blood stagnates in arteries the pelt will be marked by veined blemishes, so the decision to turn an animal hide or skin into a writing membrane would ideally have been made prior to slaughter to avoid this flaw (Gameson 2011b, 16). Without intervention, a pelt is attacked by bacterial processes within twenty-four hours of death (Covington 2009, 72). For leather production such flaws would not preclude use, but for writing membrane some form of preservation such as drying or salting or swift immersion in lime would need to have been implemented very soon after flaying.

Accumulatively these sources establish the baseline for the craft, which can be underpinned by reviewing the underlying chemical processes (for an account see Thompson 1998, 1–2). Briefly, the three layers of the make-up of a skin or hide – epidermal, dermal and subcutaneous – require either chemically assisted removal or alteration of their molecular make-up to achieve the desired product. The epidermis, which hosts the hair root system, is essentially made of keratin, rich in an amino acid based on strong sulphur-sulphur bonds, which are broken in alkaline conditions facilitating mechanical removal. The subcutaneous layer, the fleshy layer of fat and muscle, is also more easily removed following alkaline treatment. The dermal layer, or corium, which forms the finished product, is made of complex helical bundles of long collagen fibres in a matrix of non-collagenous proteins, which without swift intervention putrefy after death. Putrefaction is suspended by the removal of the non-collagenous proteins to prevent clumping of the collagen strands through alkaline treatment, essentially allowing them to be washed out. Critically, this pre-tanning treatment is where leather-making and parchment-making diverge: if leather is desired the skin must be submerged in a substance designed to replace the washed-out protein matrix with tannins; if parchment is required, drying and thinning under suspension must follow. This chemistry underpins the persistent and characteristic references to liming, dehairing or scudding, sluicing and washing skins in the historic accounts of parchment-making.

Interpretation: Portmahomack's parchemenerie

Workshop complexes such as this are rarely encountered in situ and much of the challenge of interpreting the Period 2 findings lies in their novelty. With assemblages of such significance it is incumbent on us to not merely state the uncontentious – that skin-working was taking place – but to see whether the evidence will allow a focus on the preparation of vellum and offer greater insight into its method, processes and practice. The Latin inscription

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(TR10, see p 4), has long intimated that book production was possible at Portmahomack. But this association is not cited in the argument that follows, which relies solely on the archaeological evidence recovered in context.

An assemblage dedicated to leatherworking only, familiar from the Middle Ages and later, is less evident here. There are no incontrovertible signs of *tanning*, such as bark, a series of layaways, or an ‘indicator package’ of plants and insects (Hall & Kenward 2003a; 2003b; 2011). No leather offcuts were present within the excavated sample, despite the fact that preservation conditions at Tarbat were favourable. Our interpretation does not aim to preclude leather production – after all, books would need to have been bound in something and carried in satchels,

feet shod and bodies clothed, all requiring leather – but rather to explain the nuances of the particular environmental, structural and artefactual evidence encountered in the production site by the road in Sector 2.

The eastern workshop

The preponderance of bones of mature cattle implies that large numbers of cattle hides were produced in this area. Some objects, like the convex and other knives, could find a role in the cutting of hides for a variety of purposes, many of them heavy duty. There is little doubt that such a workshop must have been part of the establishment at Portmahomack, and had played a major role in its economy, as is discussed in

(a)



(b)



(c)



(d)



(e)



(f)



Illustration 5.6.16

(a) Monk using a *lunellarium* (Staatsbibliothek Bamberg MS Patr. 5 f1v). Mid-twelfth century; (b) Monk inspecting a sheet of parchment (The Royal Library, Copenhagen GKS 4, 2°, vol 2, f. 183ra). Thirteenth-century; (c) Monk using a *lunellarium* from *Das Hausbuch der Mendelschen, Zwölfbrüderstiftung zu Nürnberg* (Stadtbibliothek Nürnberg Amb. 317. 2°, f. 34v); Fifteenth century. (d) Preparing the surface of vellum from ‘Parchemenier’ in *Diderot et d’Alembert’s Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts et des Metiers* published 1751–77. Eighteenth century; (e) Scraping vellum in a frame from Charles Tomlinson’s *The Useful Arts and Manufactures of Great Britain* published 1848. Mid-nineteenth century; (f) Vellum preparation on a frame, courtesy of Jesse Meyer, Pergamena Parchment and Leathers, Montgomery, New York. Twenty-first century.

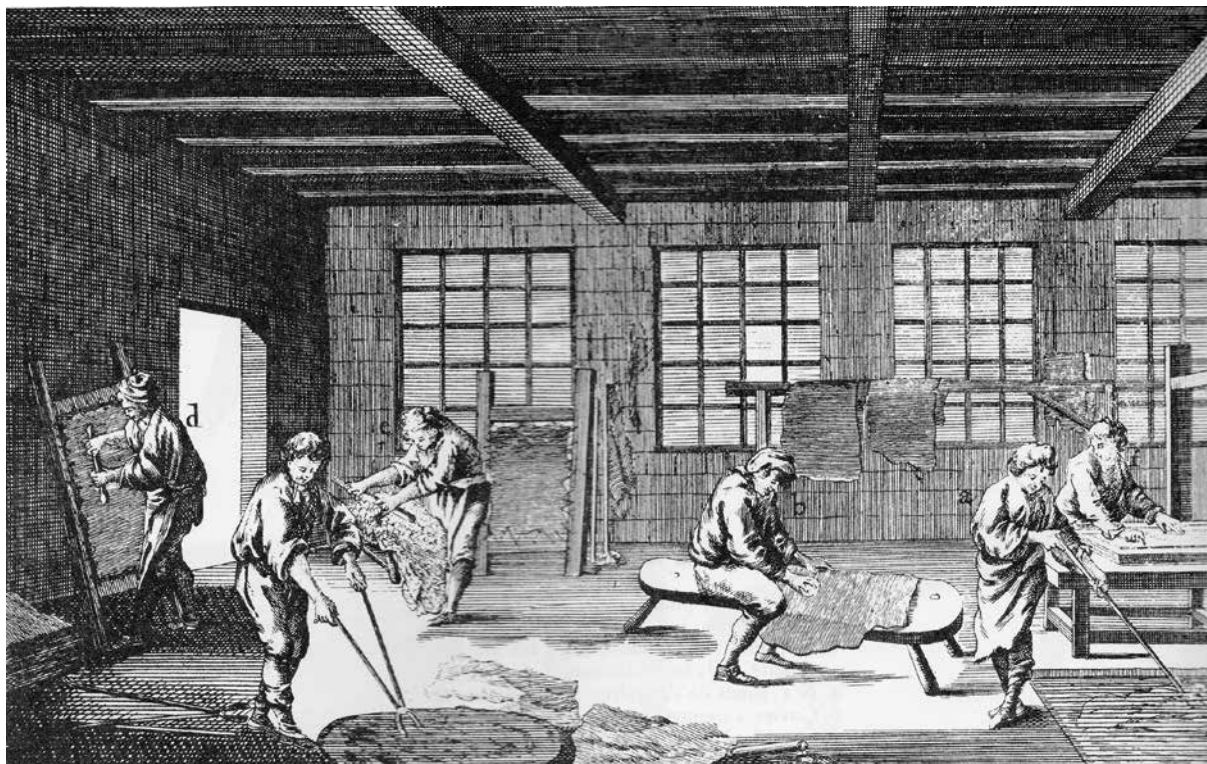


Illustration 5.6.17

The parchment-making process (Diderot & d'Alembert 1751, 'parcheminier')

Chapter 5.8. It is possible that the structures on the east side of the road could have lain within the domain of leatherworkers as well as butchers. The subterranean chambers provided storage for animal products, and the large bank provided a working surface. But in general, the making of leather goods at Portmahomack was inferred rather than observed, and in the absence of tanning pits, offcuts in the pool or tools such as awls and drawknives, must have taken place elsewhere. The eastern side of the area might be seen as a distribution point in which a wide variety of animals were processed for specific products, including food, skins, furs and oil. Among these products may also have been a small group of items of interest to those who made books: calfskins, goatskins, glue, sinews and bone styli. Since it lay just across the road, it is hardly surprising that objects and detritus strayed across from the western workshop. Few vellum pebbles were found, but there were four pumice rubbers, the limestone rubbers, two bone needles, a proliferation of small iron blades and a stylus, all suggesting a finishing activity on the east side.

The western workshop

LIMING

The workshop on the western side is markedly different in character, being organised, specialised and dedicated. Here the structures, artefacts and residues converge towards one interpretation, namely the production of vellum. S4 was clearly used as a washing tank in which skins were soaked and rinsed, a

process likely to have been frequently repeated. Endorsement that this treatment included soaking in a lime solution to loosen flesh and hair is provided by evidence for the production of quicklime on site from burning shell in a reducing atmosphere. The tank itself is relatively small ($4.4 \times 0.80 \times 0.40$ m deep), not really large enough for multiple cowhides or oxhides, but adequate for batches of calf, goat or sealskins. Wet skins may have been lifted and moved with the aid of handled hooks such as the example recovered from the tank. This object is particularly appropriate given the caustic nature of lime.

Shell has the advantage of being a very pure form of calcium carbonate (Wingate 1985, 20). The burnt lime (quicklime) can be activated by the addition of varying quantities of water to make calcium hydroxide or slaked lime with the consistency of a loose paste, a cloudy liquid known as 'milk of lime' and from that by settling into a saturated solution known as 'lime water' (Wingate 1985, 6). The main deposit found at the north end of the yard was a laminated accumulation with a greasy, almost soapy feel, presumably the result of saponified fats from hide and skin. This suggests that hides were being scraped clean and re-treated with lime at that spot, perhaps in the lee of the building or leant up against it. Given evidence for the emergence of lime-based treatment of writing membrane in the eighth century, this substance is especially diagnostic of the craft at the time. The same agent would also have served to whiten skins. Four pumice rubbers were recovered within S9 suggesting the sloughing of skins and hides with pumice on the stone stances, and probably on benches and in frames. The historic accounts imply that controlled drying,

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both in and out of the sun, including superficial rewetting, was a carefully controlled stage for which S9 provided an ambience.

Outside the south wall of S9, a small stone-cut basin was found (Illus 5.6.18). On its upper side, the smooth convex cavity suggests the holding of water or use as a mortar for blending pastes; on the underside are two parallel grooves indicating some supporting device, such as two vertical slabs that would make it accessible at waist height, for example to assist delicate washing, dyeing, scouring or mixing operations. Alternatively it could have been supported by a trestle in the manner of a simple folding camp-stool, with struts about 15cm long. While a tripod would be more stable, a bipedal frame could support a heavy basin.

STRETCHER FRAMES

The next part of the process requires the skins and hides to be stretched on frames for cleaning, thinning and smoothing. This was deduced from the occurrence of several diagnostic artefacts. Evidence for the treatment of suspended hides takes the form of the distinctive assemblage of *vellum pebbles* along with worked metapodia which may have acted as *bone pegs*, and a significant group of stone rubbers. The hearth in the yard was clearly a focal point, indicated by the density of the scatters of flint chips, vellum pebbles and skin slickers/whetstones. A mineralised crust of wood shavings on the iron tools recovered from the floor of the yard and a long-handled chisel shows that woodworking was an allied craft, as might be expected with the requirement for wooden frames. The medieval depictions of parchment-makers show that the lunette blades were used to scrape the skin while suspended, which is likely to be the stage at which the Tarbat *lunellum* was deployed. The array of stone rubbers and whetstones from this zone is also significant. Diderot and d'Alembert depict a stone (*quevre*) used to sharpen curved blades (Planche III, Fig 20) as well as a similar stone tool which closely resembles the elongated stone whetstones/slickers which they identify as a skin peeler (*pierre à peler les peaux*) (Planche III, Fig 3; Illus 5.6.17).

The use of small smooth pebbles in the suspension process is attested in modern practice (Reed 1972, 138). Wim Visscher of William Cowley is recorded using them in his modern workshop (de Hamel 1992, 11), while John Seymour (1984, 121) recorded an Australian sheepskin-worker who folded pebbles into the edge of skins tied in with binding lanyards to avoid cutting slots. The frame depicted in the *Hausbuch der Mendelschen* also appears to use small toggles in the suspension method. Diderot and d'Alembert illustrate the use of small wooden dowels (*brocher*) threaded through the edge of the pelt to distribute the stress of tensioning (Planche IV, 13–15) and the use of small balls of skin peelings known as pippins has also been recorded (Salaman 1986, 331–2). The general principle is to avoid piercing the skin by wrapping the corner around a pebble with a cord, the other end of which is secured to a peg on the frame. This avoids creating a hole, which would enlarge under tension.

Diderot and d'Alembert depict wooden pegs (*chevilles*) used to tension skins in suspension (Planche III, Fig 6) and the use of wooden pegs was probably more commonplace. Steve Ashby comments on two of the bones (14/4499 and 14/4500): 'They have been cut from the distal ends of cattle metapodials, and



Illustration 5.6.18

Sandstone mortar or basin found in the area of S9. The rim has been broken off on one side

show signs of wear around the condyles. Though they are not diagnostic in isolation, they are arguably consistent with a use in the stretching out of hide that constituted a key component of the process of vellum manufacture. The smooth areas between the condyles of the distal articulation and the broken point at mid-shaft may relate to wear from a thong or cord of some sort; this is consistent with the proposition that the pegs were turned in order to increase the tension under which a hide was being held, in a manner somewhat akin to the tuning pegs of a stringed musical instrument' (Digest 6.4, Section 3.2.2). Although no frames were recovered, the bones were prepared and stuck in the ground in rows, giving a strong impression that they were awaiting a systematic employment in set numbers (see Illus 5.6.10a–b). Bone-rows have been found on other early medieval

sites, where they have been encountered forming edges to hearths (Malcolm et al 2003, 23–4; Mulville et al 2003; Sharples 2012). Post-medieval bone alignments have also been associated with flowerbeds (Armitage 1989, 147–60) or floor surfaces (Divers et al 2002, 61–75). None of these examples offers a convincing explanation of the Portmahomack bone-rows.

Various treatments of writing membrane with stone tools while stretched in frames are suggested by an array of rubbers recovered from the workshop area. Historic accounts of treatment include chalk and pumice, both while the skin is suspended and also as ground into a ‘pounce’ for application in paste or as a grease-absorbent and abrasive powder. Pumice is valued for its abrasive qualities and the rubbers often showed signs of wear on their faces; notably, several rubbers incorporated a white residue in their vesicles. Their use on writing membrane is supported by Theophilus’ description of its use in cleaning the flesh side of a sheet. Its association with use in manuscripts is also strengthened by Willibald’s eighth-century adventure during which he witnessed a volcano erupting on Lipari and saw the pumice ‘which writers use’ floating on the sea and being collected (*Hoedeporican* sourced in Levison 1946, 44; Wright 2011, 23 and note). Diderot and d’Alembert also show raw chalk and pumice together (*morceau de chaux non-éteinte* and *Pierre-ponce*) and depict their deployment in the workshop on the *table à poncer* on which a sheet is being rubbed.

SOURCE OF HIDES

There has been a long-held assumption (as implied by the word *vellum* from the Latin *vitellus*, calf) that book production will result in a large deposit of calf bones. This equation is by no means inevitable. At Jarrow, where the giant *Codex Amiatinus* was made, the faunal assemblage was dominated by sheep and ‘the cattle bones show an almost complete absence of bones from neonatal and juvenile animals’. On the other hand, there was a ‘relatively high frequency of shellfish’ including 117 periwinkles (Cramp 2006, II, 560). Iona had its own leather workshop making shoes and using the hides of cattle, horse, red deer, seal and hairy sheep/goat. Of the cattle leather in the ditch, only 6% was calfskin. There was no evidence (in the remains from the ditch) of the specialist preparation of calf hides that would have been necessary to produce vellum for books (McCormick 1997, 62). On Lindisfarne, where at least one celebrated codex was produced, excavations by Deirdre O’Sullivan at Green Shiel (unpublished) located ‘a dump of juvenile and neonatal calves under the floor of Building E’, claimed as evidence that calfskins were being produced for the monastic scriptorium (O’Sullivan & Young 1991; O’Sullivan, D 2001, 42). At Hartlepool a 10% cull of calves was considered small, but adequate to supply parchment (Daniels 2007, 118, 207). At Flixborough where styli were used in the ninth century, a small number of calves killed before weaning were identified in the bone assemblage and have been tentatively cited as evidence for vellum production (Dobney et al 2007, 234–5).

The size of all these assemblages are overshadowed by the numbers of folios required for the larger codices, assuming they use only calves. A total of 185 hide sections were needed for the Book of Kells, perhaps requiring a herd of 600 cattle to sustain a

breeding population (Campbell 1999, 33), but the calves need not have been culled in the same season and could have been drawn from a numbers of herds as tithe rent. Deconstruction of the length of time required to prepare the *Codex Amiatinus* and its two companion volumes suggests that such a project would have taken up to twenty-eight years to complete, suggesting that the requisite folios (c 1,550 calf skins) may also have been prepared over a number of years, probably undertaken on a seasonal cycle, while works of smaller magnitude may have required up to thirty hides a year (Gameson 1992, 3–9). Gameson calculates that the production of all the fifty-five surviving volumes of the Salisbury scriptorium would have needed the provision of only twenty-eight calf or sheepskins a year (Gameson 2011b, 21). In this light it is easier to conceive how scattered monastic granges in the Cheviots could have sustained the demand from Lindisfarne.

Parchment may also be properly made from sheepskin, but at Portmahomack goat rather than sheep was always identified, indicating that this comparatively hardy animal was favoured by the Tarbat terrain and its herdsman (Digest 7.1). Goatskin, rather than kidskin, is highly prized by the skin-worker as it can be dehaired more cleanly than a fleece and makes both high-quality leather and writing membrane. The seventh-century Cuthbert gospel (formerly the Stonyhurst Gospel, acquired by the British Library in 2012) is bound in dyed goatskin.

By-products of animal processing would have provided glue and sinews for binding from across the road. Oak gall for ink, orpiment and madder for colour and a variety of quills to service the exquisite penmanship were not encountered in the Portmahomack workshop. However these requirements of the finished codex are more likely to have been deployed in a calmer, more sheltered space within the inner precinct near the church (Gameson 2011b, 74–89).

Conclusion

The preservation of writing membrane in British archaeological contexts is exceptionally rare and confined to special circumstances (Spall 2011, 97). Since it does not involve tanning it remains highly susceptible to decay in damp or wet conditions. Among the few exceptions is the Faddan More Psalter preserved by interaction between proteins and amino acids within its sphagnum peat bog environment in much the same way as a bog body is preserved (Covington 2009, 455). Consequently, to date, evidence for vellum and parchment production has been sought most commonly in animal bone assemblages, often at monastic sites known for book production. This analysis has been heavily influenced by a quest to identify the production of the finest quality calfskin vellum because it is expected that insular membrane constitutes just that, based on the study of great surviving works, and limited historical texts. The rare mention of *abortivum* in medieval texts has resulted in the equation of thin writing membrane with uterine vellum whether or not aborted calves were actually exploited (Thompson 1956, 27). However, there are growing calls for a review into the analysis of book-making technology and recent studies conclude that ‘a great many codicological conclusions have been based on ... incorrect



Illustration 5.6.19
Fragment of cast copper-alloy sheet with insular ornament (14/1286). Late eighth/early ninth century; perhaps from a book plaque

identifications' (Clarke M 2011, 25–6) and that the 'identification of the main animal species used is often unreliable' (Pickwood in Neate & Howell 2011, 11).

The distinction between calfskin and mature hides in leather, which undergoes significantly less working than writing membrane, is known to be difficult (Mould et al 2003, 3265). In spite of the existing consensus, 'the study of the materials used for making books is in its infancy' and 'we remain remarkably ignorant about the materials of the conventional early book' (Clarke 2011, 25–9). Not until a greater body of data is confirmed by scientific analysis can understanding of how the manufacture of writing membrane interacted with animal husbandry practice in the insular world be authoritatively explored. Indeed, at early medieval sites across Britain whose economies are based on cattle, often specialised milking herds with a consequent surplus of young calves, we have set ourselves an almost impossible task. O'Connor discusses the relationship between assemblages of butchered bones and skin-working practice and concludes that it remains hard to define (O'Connor 2003, 3231–4). In practice it is possible that hides of older juvenile cattle may have been split and that the skins of goats and sheep were also used. This requires new thinking in the interrogation of bone assemblages as evidence for writing membrane. The choice of material may extend beyond the first hand evidence provided by the surviving deluxe codices. At the same time, the excavation of the Portmahomack workshop has generated a new range of correlates: tanks, pebbles, pegs, slaked lime and tools ranging beyond the *lunellarium*.

Found in the overburden near S9, one last object hints at the making of books at Portmahomack and the date that they were made. This was a small fragment of copper-alloy sheet carrying insular ornament (14/1286; Digest 6.1; Illus 5.6.19). The pattern has not been deciphered, but the combination of asymmetric curved limbs and open lattice recalls Mercian motifs of the late eighth to early ninth century,

such as that on the Witham pins, Hedda stone or Barberini Gospels (Alexander 1978, Illus 171, 175; Webster 2012, 138–44; Illus 88, 95). The sheet itself may have derived from, or been intended for, the metal cover of a book, adorned as was the Lindisfarne Gospels by Bilfrith the Anchorite (Gameson 2011a, 8; Gameson 2011b, passim; cf Gameson 2011c, 721). This is a small reminder of the range of artistic ideas being shared at Portmahomack with masterworks that have survived from the same period all over the islands of Britain and Ireland (see Chapter 5.3, pp 167–8).

The evidence indicates that vellum-making at Portmahomack combined imported technology with a knowledge of local resources and their chemistry. A case for the specialised production of membrane for writing has been argued, without assuming a monastic character for the site. But since the production of books was a craft typical, if not exclusive, for monasteries in the early medieval period, one identification does lend support to the other. Once the evidence for vellum manufacture is accepted, it is permissible to imagine much of the accoutrements with which such establishments are credited: a scriptorium, a special book on the altar decorated with Pictish art, a library containing sumptuous volumes donated from elsewhere, the maintenance of annals and the manufacture of codices to supply other houses. Although anonymous today, Portmahomack potentially functioned at the level of learned and high-status European Christian centres already famous in history, and would have been accepted as their peer.

5.7 The Southern Workshops

Introduction

The components of the southern workshops are the building (S1), the well (S8) and a zone of craft activity captured by subsidence into the previously backfilled inner enclosure ditch (S15) (Illus

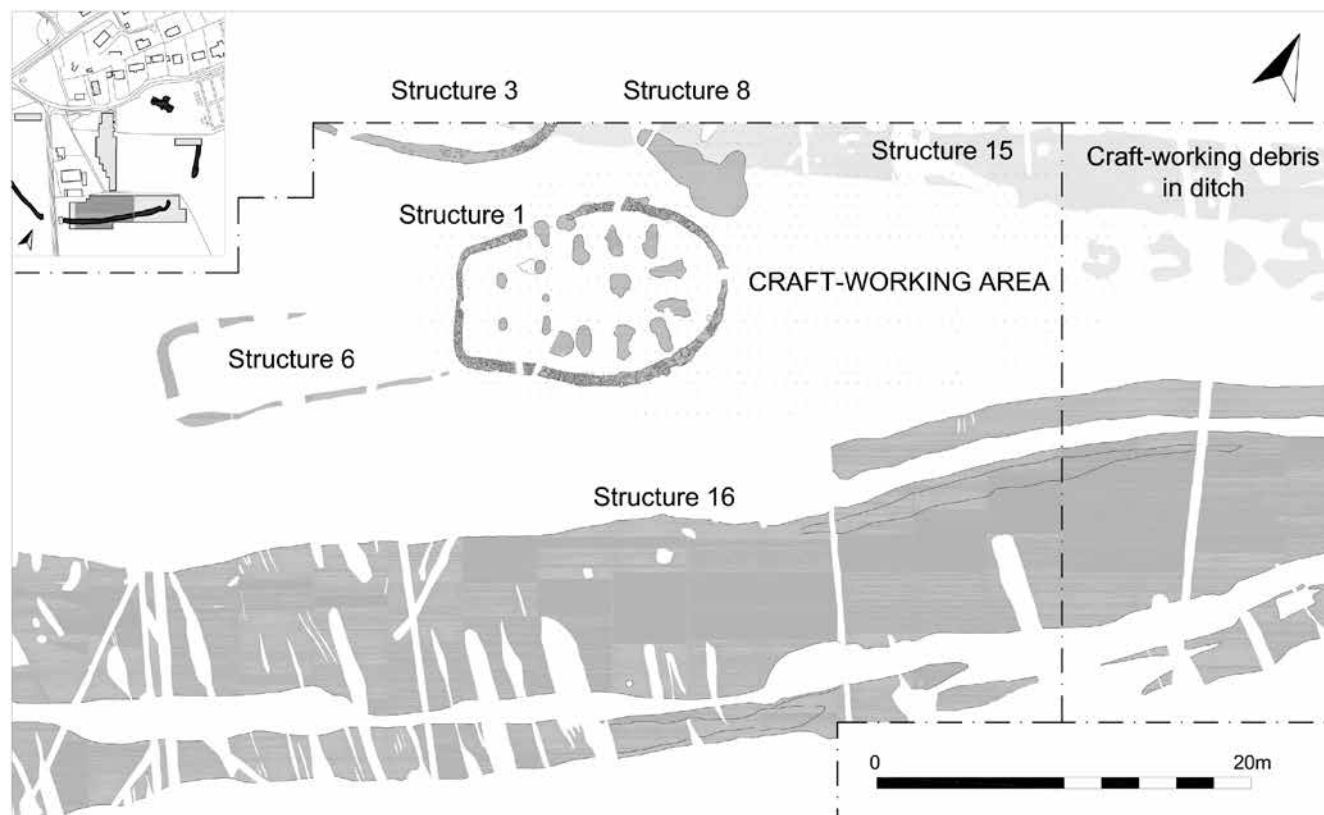


Illustration 5.7.1

Map of southern workshops, showing S1, S8, S16 (second enclosure ditch) and craft debris over S15 first enclosure ditch



Illustration 5.7.2

Craft-working area captured by first enclosure ditch (S15), in course of excavation

5.7.1). The majority of the diagnostic objects for metal- and glass-working came from contexts in the ditch (see Digest 6.1), but there were sufficient finds in the neighbouring area to show that workshop activity was fairly widespread and that the bag-shaped building (S1) stood within it. There was also a dense surface scatter of animal bone focused on S1, which is interpreted as deriving mainly from bone used as fuel (*bone coal*: Chapter 5.8, p 223). Although surface features such as furnaces and kilns had been erased by later ploughing, there were enough indications in the rich assemblage to show that the occupants of the Period 2 settlement had been engaged in the production of high-status composite objects of copper alloy, silver and glass, with an emphasis on the special equipment required for Christian ceremonies.

Period 2 craft-working deposit captured in the enclosure ditch, S15

A deposit 10cm thick, rich in craft debris, had been captured in a depression in the backfilled inner enclosure ditch (F179) (Illus 5.7.2; see Chapter 5.5, Illus 5.5.2c for the craft-working deposit viewed in section). This deposit had survived the ploughing of subsequent centuries that elsewhere had removed early medieval strata down to the natural subsoil. It yielded the most indicative evidence for early non-ferrous metal-, glass- and enamel-working from the site. Notable were clay moulds bearing intricate cross or peltaic designs probably used for making composite glass-and-

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metal objects (25/687, 25/855). Two glass studs were recovered, one of dark blue glass containing silver wire cells filled alternately with yellow or red enamel, the other a simple opaque white stud with negative geometric design (25/686, 25/1452). A fragment of glass-working crucible (11/3551) and a heating tray covered with opaque yellow enamel were also retrieved (11/3469). The assemblage is discussed below.

The area of the upper backfill of the ditch was investigated at very high resolution (Level E, see p 23), in the hope of defining structural features or hearths (Illus 5.7.3). At the east end, F203 proved to be a circular, steep-sided post-hole containing a number of fills suggestive of installing and removing a post. Seven fragments of ceramic mould had fallen into it. Due west of F203, a possible double post-hole (F202) seen during horizon mapping, but not subsequently excavated, yielded two fragments of crucible and a fragment of clay mould from the upper fill during cleaning. To the north a further post-hole (F219) was identified and excavated, revealing an oval cavity containing possible packing stones. A fragment of crucible and two fragments of unidentified fired clay had entered after the post-hole was disused. Adjacent to these structural features were further features: a small scoop F216, a stone setting F218 and a possible butt-end of a gulley (F34).

Feature F216 proved to be a shallow scoop filled with a variety of craft-working detritus including five fragments of crucible, three fragments of clay mould and multiple unidentified fragments of fired clay including probable clay mould or daub. Stone setting F218 consisted of two small red sandstone slabs, one set vertically, the other tipping inwards. Covering the flat slab was a concentration of charcoal lumps and small fragments of clay mould. The remains are too fragmentary to identify them with any confidence as a working stance, although the components are suggestive of hearth material, albeit possibly redeposited or dispersed by the plough.

Some distance to the west was a butt-ending linear feature filled with ash-rich silt in three separate deposits. This feature (F34) may represent part of a more extensive linear feature or discrete scoop; in either case it received craft-working waste, some of which was very small and unlikely to have travelled far. Included in the range of material recovered were several fragments of crucible, daub, slag, a fragment of clay mould, small iron objects and a droplet each of copper alloy and dark blue glass.

The objects from the upper fill of the enclosure ditch are described in Digest 6.1 and reviewed below. The assemblage was

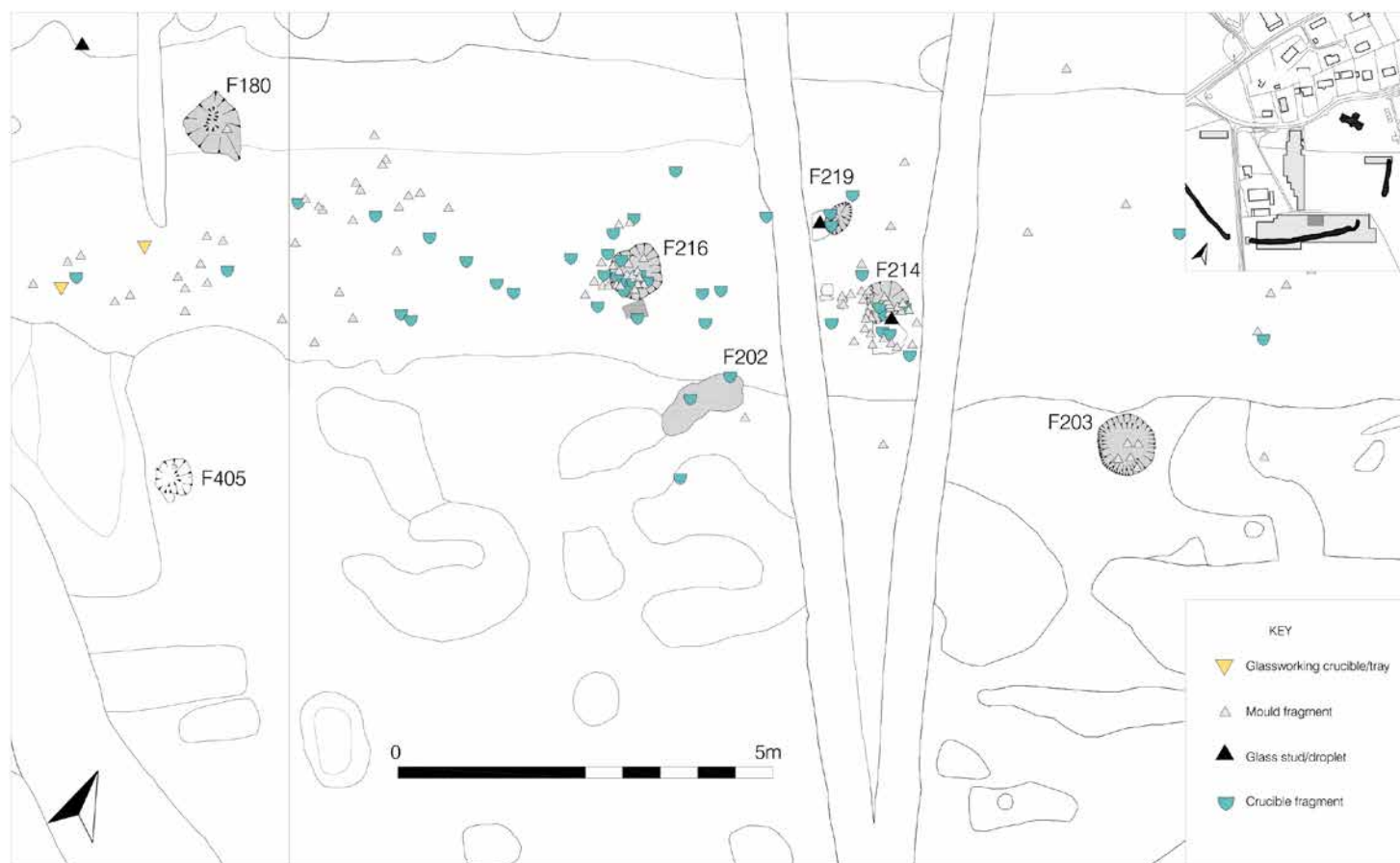


Illustration 5.7.3

Plan of captured craft area showing findspots of Period 2 metal- and glass-working debris

PORTMAHOMACK ON TARBAT NESS

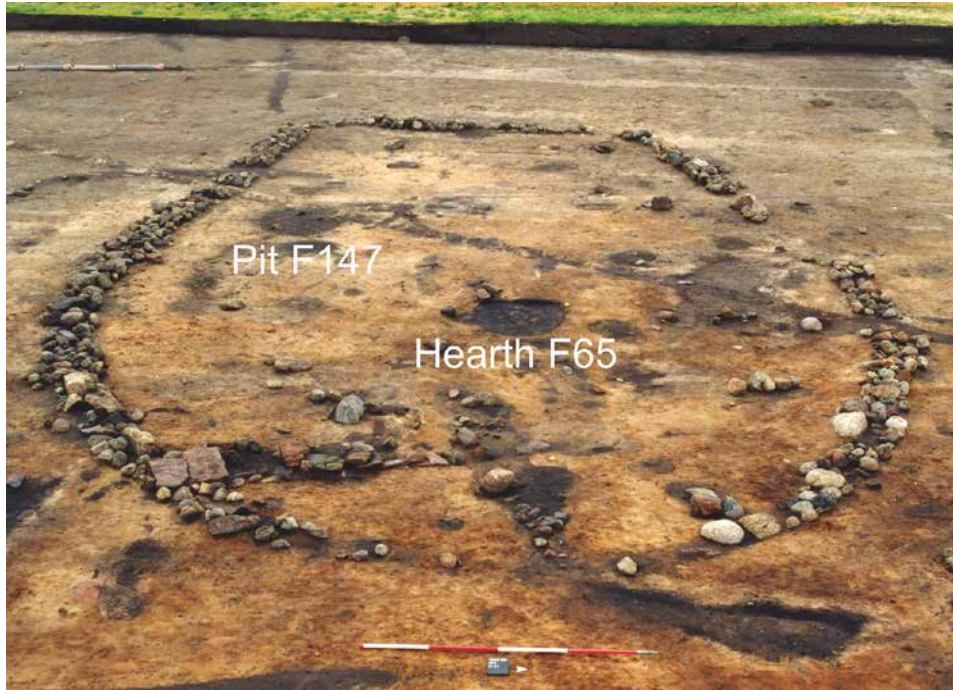


Illustration 5.7.4
S1 defined, before excavation

the richest encountered at Portmahomack, but its survival was fortuitous and the area was not resolved into a comprehensible working space (OLA 6.1 at 3.3.2). By contrast its near neighbour, S1, had the best preserved ground plan of any structure, although the assemblage here had been largely dispersed.

Structure 1 (Illus 5.7.4)

The set of features assigned to S1 consisted essentially of a cobble-filled foundation trench establishing a bag-shaped plan, and a series of internal post-holes. It took the form of a semicircle joined to a trapezium with the post-holes marking five internal bays. A set of four post-pits marked the site of an entrance on the north side. It was shown to have had two phases of construction, assigned to Periods 2 and 3 (Chapter 3, p 38; Illus 3.6). In Period 2, the building used single posts and a central hearth; while in Period 3 it had double post-holes, perhaps

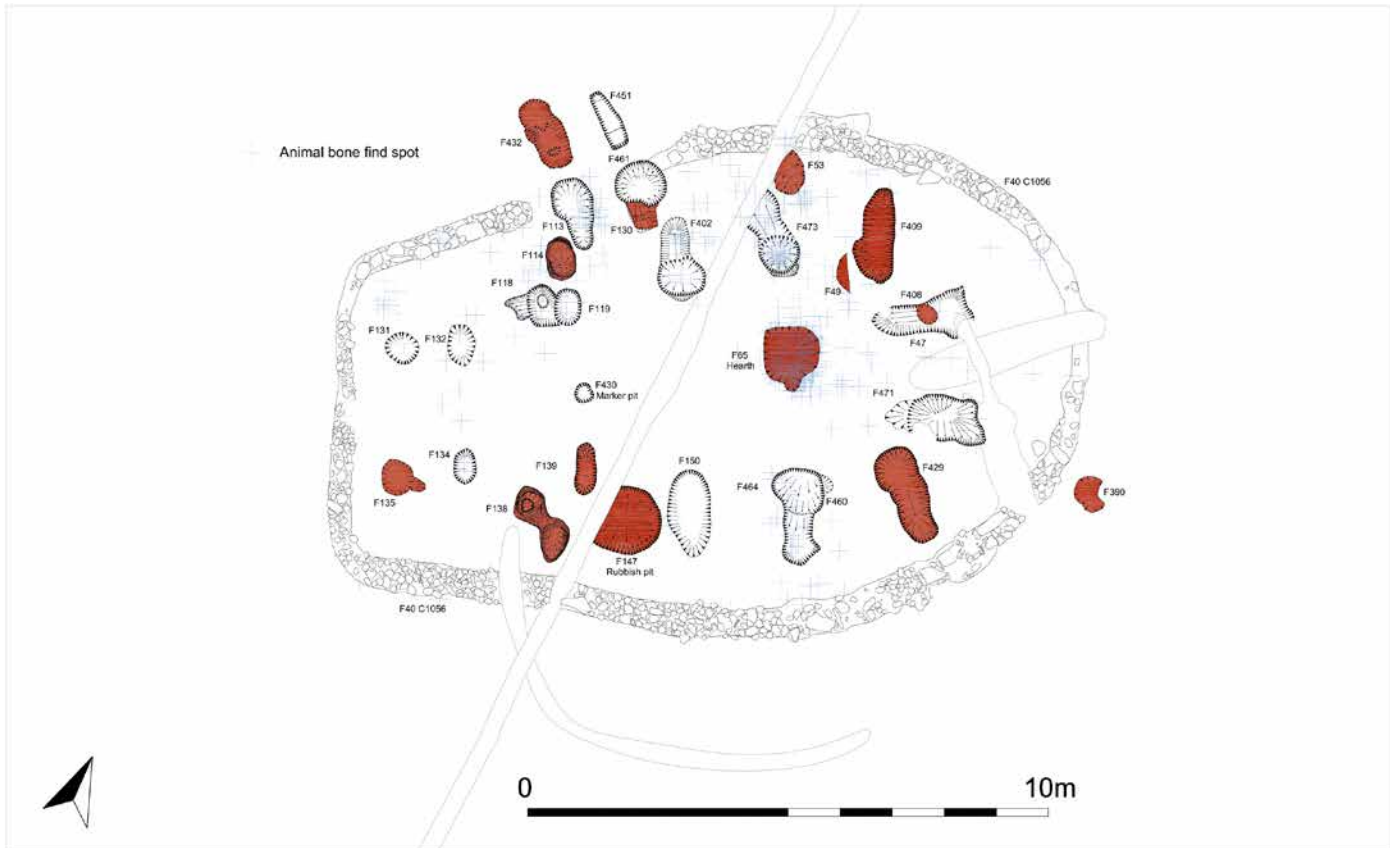


Illustration 5.7.5
Plan of S1 showing location of finds relating to metal- and glass-working (in red) and animal bone (in blue)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

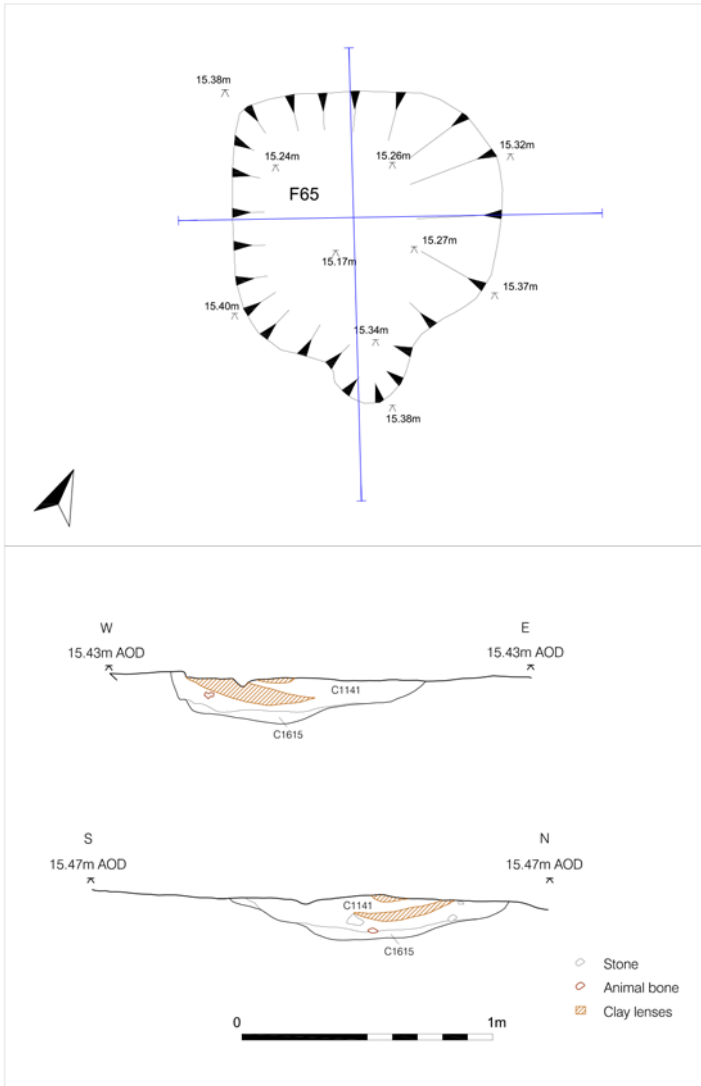


Illustration 5.7.6
Hearth F65 plan and section

supporting an upper storey, and an internal heated flue (for the architecture of S1, see Chapter 5.9, p 235).

Internal non-structural features

Investigation of the building demonstrated an association with metal- and glass-working through material captured in its hearth, in later post-pits and in a large pit on the south side, F147 (Illus 5.7.5). Central to the eastern end of S1 was a *hearth*, which measured c 1.5m in diameter and survived as a steep-sided concave scoop c 0.3m deep (F65) (Illus 5.7.6). The assemblage included animal bone, burnt and unburnt, small quantities of slag, occasional small fragments of copper alloy and iron objects, shell fragments (notably winkles), burnt nutshell and a burnt flint scraper. Testing of the flotation residues with a magnet attracted material, some of which was hammerscale. Radiocarbon dating of a fragment of calcined animal bone from hearth fill C1141

produced a calibrated date of AD 700–940 (95%) (Digest 3.2). The flint scraper (11/592) probably represents residual prehistoric material rather than an object made for metalworking in S1.

The *pit* (F147) was defined as a circular feature, straight sided with a concave base, measuring 1.2m in diameter, and truncated to the west by a field drain (Illus 5.7.7). The earliest deposit appeared to form the remains of a possible clay lining within the feature, which then accumulated a mixed fill with frequent charcoal, lenses of clay, slag, daub and 400g of mixed animal bone. A distinct dump of pale yellow clayey silt (C1540) was deposited within the pit and contained fragments of daub, a fragment of ceramic mould (11/3580), calcined animal bone and occasional charcoal. A final deposit of bone-rich dark brown silty sand contained over 1kg of mixed animal bone and some daub.

Three post-holes of S1 produced pieces of thin, translucent muscovite mica sheet in the order of 15×25mm (11/4467, 4468,

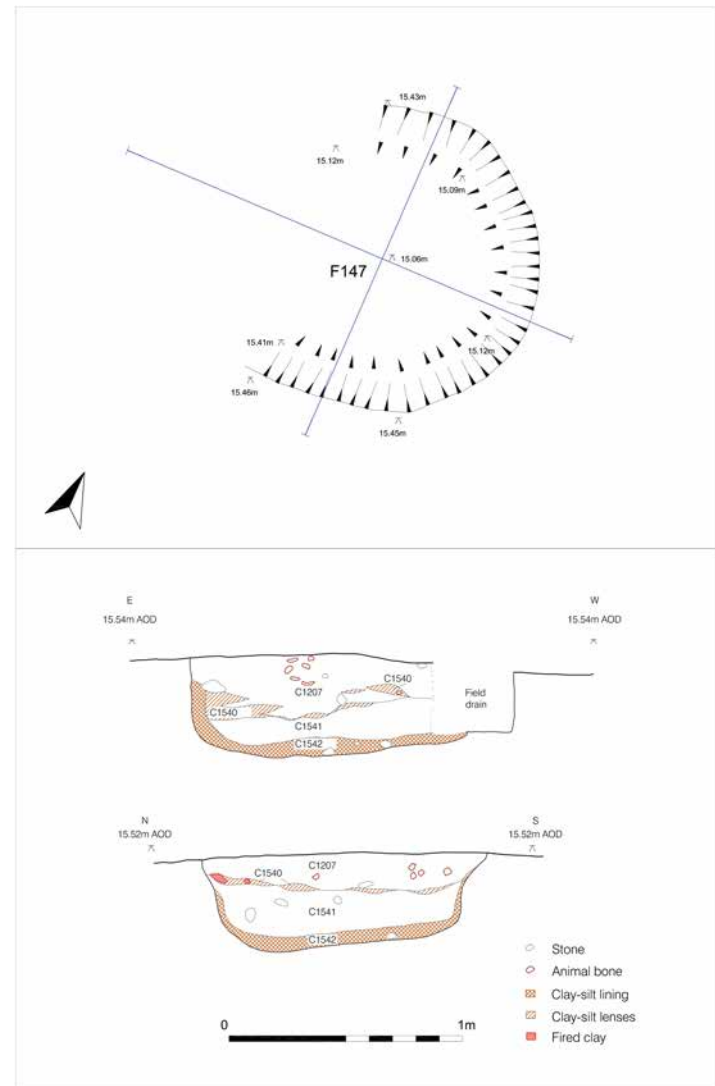


Illustration 5.7.7
Pit F147 plan and section

4469, 4470). The nearest potential source of muscovite mica of this size is the Fearn granite outcrop further up the firth (Noel Fojut, pers comm). The importation of the mica sheet to the site and its recovery from a building with craft-working associations is noteworthy since the use of sheet mica has been noted in insular metalwork. The Moylough belt shrine uses transparent mica to enable a glimpse of the leather belt that it contains (Youngs 1989, 59).

The features of S1 produced about a kilogram of slag, comprising hammerscale, smithing slag and a smithing hearth bottom (Digest 6.9/4.2; the features are marked in red on Illus 5.7.5). Animal bone recorded in the ploughsoil was strongly patterned over the hearth in S1 and the south side of neighbouring S3. This bone is interpreted as belonging to Period 2, and its association with metalworking is explained by its use as bone coal (Chapter 5.8, p 223).

Structure 8

Situated between S1 and the backfilled enclosure ditch was S8, a well, initially timber lined (in Period 2) and latterly rimmed with stones (in Period 3) (for location see Illus 5.7.1; analysed Chapter 3, p 39, 40; Illus 3.7, 3.8). The original construction of S8 consisted of a large circular 'bowl' measuring 3.0m in diameter narrowing to 2.30m at the its base, c 0.30m into pink boulder clay being a total of 1.20m deep. It had a lobe worn down in use by overflow, an attempt to encourage the water to rise or an access point for people or cattle. Two post-holes were sited in positions suggestive of support for a well-head bucket. Here clean water was accessible to the occupants of S1 and also the craftsmen working on the other side in the depression over the backfilled enclosure ditch.

Assemblage: eighth-century metal- and glass-working (see Digest 6.5 and 6.6 for detailed descriptions, dimensions and scale drawings)

Largely due to the depositional history of the Period 2 assemblage, crucibles and moulds tended to be fragmented to a point where only broad identification was possible. Nevertheless, the working of copper and silver alloys has been signalled by EDXRF analysis of crucible fabric (Digest 6.5), and sufficient fragments survive to allow characterisation of crucible technology and a unique assemblage of glass-working waste, trays, moulds and studs that survive in remarkably good condition. Cast objects implied by moulds show that escutcheons, discs and studs of silver and copper alloys were being produced, alongside glass studs with metal wire inlay, and glass cabochons. The evidence points to the production of highly accomplished composite pieces and items mostly referring to existing contemporary ecclesiastical objects.

Metalworking

The *crucibles* represented among the 108 fragments from Period 2 are identified as Heald Types A1, A/B1 and G1. Heald Type A crucibles are pyramidal or triangular-mouthed with a V-shaped profile and pointed or slightly rounded bases; Heald Type B crucibles are conical, round-mouthed with a V-shaped profile. A1 and A/B1 are common, long-lived forms used in Scotland

from the Early Iron Age until the eighth century (Heald 2003, 50) and also known from a range of early historic sites in Ireland, including Lagore, Cathedral Hill, Armagh, Garranes and Garryduff among others (Comber 2004). Heald Type G crucibles are small, deep vessels formed around a thumb or finger with a handle modelled by pinching overlapping wall fabric into a small lug handle (Type G1 crucibles have handles horizontally pinched, Type G2 are vertically pinched and Type G3 has a handle pinched from the side to form a tear-shaped vessel). Type G1, dateable in Scotland to the seventh to eighth century, is associated at other sites with both copper and silver alloy working (Lane & Campbell 2000, 141; Curle 1982, 40–1). It was the predominant identifiable type in the Period 2 assemblage, with a minimum of nineteen vessels. Type A/B1 has similar associations and five vessels were clearly identified, although more of both types were probably in use. EDXRF analysis confirmed that the Period 2 crucibles in the Tarbat group were used to work with copper alloys, possibly quaternary alloys, and silver alloys, and there is an apparent emphasis on silver-working.

Only eleven of the Period 2 metalworking *mould fragments* gave indications of the object cast. Identifiable objects included a stick pin with horned head and collar (25/1401), a small sub-rectangular hoop possibly from a small buckle or link (11/3546), and a simple strap end and link (11/3643). The assemblage also included seven simple plain discs or the rear valve of decorative escutcheons (11/3548 and 3569; 25/759, 761, 899, 1433, 1486).

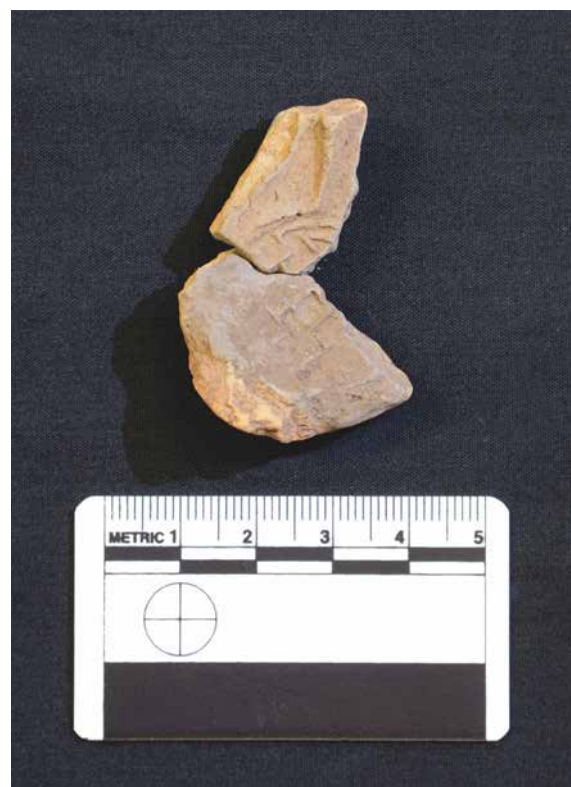


Illustration 5.7.8

Period 2 geometric disc mould 11/4269; 25/855

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

Most notably, two conjoining fragments of upper valve including part of an ingate were recovered, deriving from the casting of a small domed disc measuring c 23mm diameter. The mould bears an eroded geometric interlace matrix and would have produced a sunken, grille-like pattern probably to receive an inlay of contrasting metal, enamel or glass (11/4269 and 25/855) (Illus 5.7.8).

Slags (Cecily Spall, with Catherine Mortimer Digest 6.9)

Slags recovered from Period 2 deposits and features included seven *smithing hearth bottoms*, *dense slag*, *undiagnostic slag* and *vitriified furnace lining*; small occurrences of possible *tap slag* were also recorded. More than half of the ironworking slags recovered from Sector 1 derived from Period 2 deposits and frequently from features belonging to S1 (see above). Nearby Period 2 deposits

trapped in the sinking fills of the inner enclosure ditch (S15) produced over 4.5kg of slags including dense slag (recorded with adhering vitriified furnace lining), smithing hearth bottoms, vitriified furnace lining and a single possible instance of tap slag, although given the make-up of the associated assemblage and that the fragment is isolated and small it most probably represents fayalitic run slag from smithing. Nearby Period 2 features F34 and F401 produced 5.6kg of slags including five smithing hearth bottoms and vitriified furnace lining.

Glass-working

Glass-working evidence dominates the Period 2 assemblage and takes the form of moulds, crucibles and heating trays, glass studs, waste droplets and trails of blue, opaque white and opaque yellow glass (see also Digest 6.7). Glass arrived as cullet, often



Illustration 5.7.9

Period 2 glass moulds and heating tray: (a) 25/687, 1431, 855, 4269; (b) 25/1432/1496; (c) 11/3447, 3448, 3602; (d) heating tray 11/3469



reworked Roman glass (see Campbell, below) and may have travelled from far afield. That found at Jarrow was acquired from the Mediterranean and the Near East (Cramp 2006a, 154). A total of seven *glass moulds* were present in the Period 2 assemblage (Illus 5.7.9). The moulds are distinguished from metal moulds as they are ‘open’, i.e. they do not show signs of uniting with another mould. Nor do the interiors of the moulds show signs of reduction, which is common in moulds that have received molten metal. A good example of this technique in action is the one-piece clay mould with delicate stepped-cross ornament recovered from Lagore, Co Meath, which retained its stud of pale green glass in situ (Hencken 1950, Fig 62; Youngs 1989, 205).

Two of the glass *stud moulds* are very similar to that from Lagore and to three stud moulds of identical compass design from Iona (Graham-Campbell 1981, 24, Fig III.Ib). The Tarbat stud moulds both have elaborate cross ornament, of floreate and geometric form, on small circular matrices (25/687 and 25/1431) (see Illus 5.7.9a). The moulds are characterised by a raised rim, which is often largely broken away or eroded, but can be easily surmised especially when compared to the well-preserved Lagore mould. Mould 25/1431 is concave in profile and bears a geometric cross design so familiar elsewhere as to ‘go unremarked on insular cross-marked stones’ (Henderson & Henderson 2004, 109) and which can be found in repoussé form on the underside of Bowl Nos 5 and 6 from the St Ninian’s Isle treasure (Small et al 1973, Bowl Nos 5 and 6). The matrix would have produced a slightly domed glass stud; comparanda proliferate on ecclesiastical metalwork, notably the Ardagh Chalice and Derrynaflan paten and wine strainer (Youngs 1989, 206), and a domed glass stud also decorates the house-shrine mount from Llangorse Crannog, Powys (Redknap 2008, 364–5).

The largest glass mould is of notable size and can be identified by four fragments bearing the matrix of a circular, spiral-decorated disc (25/1432 and 25/1496) (see Illus 5.7.9b). The diameter suggests the casting of a flat glass disc *c* 44mm in diameter. The spiral-and-peltae design contained within a moulded border is shallow, and eroded, but partly legible. Peltaic and spiral decorated discs in metal feature regularly in the insular metal repertoire, such as the basal escutcheon from the St Ninian’s Isle hanging bowl. The St Ninian’s Isle disc is *pressblech* but is similarly ornamented and of comparable diameter (Small et al 1973, Bowl No 8), likewise the possible lead model disc from Birsay again of similar size and in the same tradition (Curle 1982, 48–9, 117). A fragment of red glass disc with triskele decoration recovered at Dunadd showed flow lines in support of the method of manufacture of these items. Although this item measured only *c* 19mm in diameter, its presence, along with a possible lead backing disc, was interpreted as evidence for the dismantling of a fine piece of metalwork ‘of the calibre of the Ardagh Chalice’ (Lane & Campbell 2000, 174–5; Henderson J 2000b). A mould for casting a metal disc from Eilean Olabhat has a similar diameter (45mm) and bears decoration in the form of three raised spiral bosses surrounded by trumpet spirals (Armit et al 2008, 82–7).

All these glass moulds would have produced glass studs with diameters ranging from 32mm to 44mm and this large size

makes them difficult to parallel closely in existing pieces. They must have been used to adorn correspondingly large items of metalwork to which they would have been attached using a bezel of hammered sheet metal probably united to the parent object via a rivet. Their size precludes use on items of personal ornament and it has been posited that flat glass discs may have been suitable for fitting onto the foot of a sheet metal vessel (Youngs 1989, 206), which is noteworthy in terms of understanding how 25/687 and 25/1432/1496 may have been deployed in the Period 2 workshop.

Four Period 2 glass moulds form a group. Each mould appears to have been sliced off a rolled tube of clay and where the matrices survive small simple cells can be identified; the finished products would have been small, domed, square, circular or triangular glass studs (see Illus 5.7.9c). Dimensions of the moulds are consistently 5mm for the sides of both square studs and the axes of triangular studs, so perhaps they were all to adorn to a single item. Similar moulds were recovered from the glass-stud workshop at Lagore where again simple circular, triangular, square and sub-rectangular studs were being produced (Hencken 1950, Fig 62). Many items of high-status insular metalwork are embellished with simple glass studs imitating semi-precious gemstones or cabochons. No other examples of such moulds are known from Scotland, but glass studs of smaller order survive on Pictish metalwork such as on a number of items from St Ninian’s Isle, and brooches from Rogart, Aldclune & Clunie (Small et al 1973; Henderson & Henderson 2004, 99–105).

Glass analysis

(see report by James Peake and Ian Freestone in Digest 6.8, and especially Appendix 1 to this report for colour photographs of the glass)

An assemblage of glass fragments from the Tarbat monastery excavations were analysed by SEM-EDXA, four of which were early medieval: blue stud (25/686) and three pieces of opaque yellow waste glass – trail (25/1385), driblet (25/1458) and patches on the heating tray (11/3469). The stud is made of a glass of Roman type that is likely to represent reuse of early material. This type of glass was decoloured using manganese and antimony oxides (eg Jackson 2005). The blue colour may derive from small amounts of cobalt present in the glass not detectable by EDXA (Freestone et al 2008). The remaining three glasses (all opaque yellow) are unambiguously consistent with early medieval glass technology. Before the fourth century, opaque yellow glass was largely based upon the use of antimony oxides, and the lead-tin yellow pigment found here is characteristically early medieval. It was produced by adding pre-formed yellow pigment to a soda-lime-silica glass, which, in some cases at least, was recycled material.

Excerpt from the report on the Portmahomack glass by Ewan Campbell (see Digest 6.7 for full report)

The collection of glass-working debris from Period 2 deposits at Tarbat is so far the most extensive in Scotland for the entire medieval period, and is important in showing the range of glass-

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



Illustration 5.7.10

(a) Period 2 opaque white glass stud 25/1452 (diam 5mm); (b) Period 2 blue glass stud 25/686, showing silver wire inlay (diam 11mm); (c) Detail of stud from Derrynaflan paten

working processes: it includes raw glass, molten droplets and trails, crucibles and heating trays. Similar collections are known from contemporary monastic sites in England and Ireland at sites such as Glastonbury (Bailey J 2000), but the same range of glass-working activities also took place on secular high-status sites such as Lagore and Garranes (Henderson J 2000a, 144–7). Glass was almost certainly not made from its mineral constituents in north-west Europe at this period, but was manufactured in the Mediterranean on an industrial scale, and the raw material exported as lumps of cullet broken from massive slabs. The cullet was then melted down to make vessels or other items such as beads and inlays (Freestone et al 2008, 32–3). The material can be divided into two groups, one of deep blue glass, and the other of opaque yellow.

The first stage in the glass-making process was the acquisition of cullet. Lumps of raw glass rarely survive from this period. There is one large block of red glass from near Tara, and a yellow one from Moynagh Lough crannog excavations, both in Co Meath, Ireland (Youngs 1989, 201), and much smaller shaped slabs from Glastonbury Abbey (Bailey J 2000, 171; Evison 2000, 189), but all that is usually found are glass mosaic cubes and selected sherds of glass, collected and destined for melting down (Campbell 2007, 92–6; Hill 1997, 296). A small spall (11/362) and a glass droplet (11/4136) are probably derived from melting down this cullet. The glass stud 25/686 may have been one of the products of this blue glass-working.

The other pieces are related to working of opaque yellow glass. The crucible fragment 11/3551 would probably have been used to prepare the opaque yellow glass by mixing lead-tin ores with raw glass, as was found at Dunmisk, Co Tyrone (Henderson J 1988; 2000a, 144). There are traces of metal ore within the glass adhering to the crucible wall. The thickness and curvature of this crucible show that it would have been quite large – the ones from Glastonbury held up to two litres of glass (Bailey 2000, 170, Fig 13). This is larger than the general metalworking crucibles of the period such as those from Dunadd (Lane & Campbell 2000, Illus 4.40). The dribble of yellow and green glass (25/1385) may have been associated with this stage of the process. The heating tray (11/3469) would then have been used to re-melt the prepared opaque yellow glass (Illus 5.7.9d; Digest 6.8, App 1 for colour photograph). The stirring marks where trails of glass have been lifted are still visible on the base of this tray. The eyed shape of this tray is unusual, though it is clearly related to ‘dog-bowl’ types found on many sites (ibid, 134, Type B), and some of the Birsay and Clatchard Craig examples are oval (Curle 1982, Illus 25; Close-Brooks 1986, Illus 27, 107). The fragment of trail or rod (25/1458) is a remnant of one of the trails lifted from this type of tray, possibly used to create a reticella rod by twisting with another of natural-coloured glass (see Digest 6.8, App 1 for colour photograph).

The two decorative *domed glass studs* are the most spectacular glass finds, and are important in showing the type of material that was produced at Tarbat. The similarities in design of the two studs suggest they derive from, or were intended for, a single composite piece of metalwork. Both designs are based on a tripartite division of the circular stud using a combination of arcs and straight lines to form pseudo-cloisons which would have been filled with silver. The smaller of the two (25/1452), in



Illustration 5.7.11
Comparative objects:
Derrynaflan paten (above);
Ardagh Chalice (below)



opaque white glass, has grooves for silver wire decoration, but this is now lost or had not been applied, while on the larger (25/686) the wire survives and can be seen on X-ray to be almost complete (Illus 5.7.10a, b). The pattern of decoration, a doubly tripartite division, one of arcs and one of straight lines, sometimes stepped, is paralleled in more elaborate versions on some of the smaller studs from the Derrynaflan paten (Ryan 1993, 30, Pl 14; Ryan & Ó Floinn 1983, Plates 55, 57, 59, 61), and the same decorative elements are used in other studs. While some of these studs have a quadripartite decorative scheme, many others are tripartite. The central triangle with concave sides, which is so prominent in the Tarbat stud, is a particular feature of the Derrynaflan studs on Frames 1, 12 and 5 (ibid). These studs use blue and red for the decorative scheme, and this may have been the original colour scheme of 25/686 (as red enamel often fades to white), but blue and yellow is another possibility. The larger stud (25/686) is similar in size to the Derrynaflan studs, and the Tarbat stud is clearly in the same workshop tradition, if not from the same craft-worker. Very similar studs are seen on secular metalwork on the back of the ‘Tara’ brooch from Bettystown, a piece conventionally dated to the early eighth century, but otherwise most surviving artefacts with these studs are ecclesiastical, such as the Ardagh Chalice, Moylough belt shrine, and the Derrynaflan wine strainer.

The smaller Tarbat stud has a similar decorative scheme, but in a simplified form without any stepped elements. The small size would seem to preclude its use on large items like a paten or chalice, but slightly smaller studs almost identical to those on the Derrynaflan paten are seen on the rear of the ‘Tara’ brooch (Youngs 1989, Pl on 77 upper), though it is difficult to find a parallel for such a small stud. It may have been from a small brooch such as that from Co Westmeath (Youngs 1989, 206, No 211) which has small studs of about 7mm in diameter on its front face, or may have been a subsidiary stud like those on a possibly ecclesiastical mount also probably from Westmeath (Youngs 1989, 147, No 141). Most of the parallels quoted above probably date to the eighth century. The only comparable piece from a well-dated archaeological context is a detached stud with gold wire inlay that was found in an early eighth-century deposit at Deer Park Farms, Co Antrim (Youngs 1989, 206). An eighth-century date is likely for both the Tarbat studs.

The production of inlaid glass studs is attested at a number of secular and monastic sites, including Lagore and Iona, where moulds have been found, and at Garryduff and Dunmisk where unfinished studs were found (Henderson 2000a, 146). Thus it seems that this type of stud was not made in an exclusively ecclesiastical milieu, but was also produced on high-status secular sites.

Conclusion

The areas of Sector 1 examined had been occupied by an eighth-century workshop in which the emphasis was on the manufacture of composite decorative objects requiring highly skilled, time-consuming manufacture, assembly and finishing. Comparison with the products of workshops from secular sites shows that moulds for the manufacture of items such as the brooches,

finger rings and dress pins are rarities at Tarbat in Period 2; indeed penannular brooch moulds which form such a dominant component of comparable assemblages from Birsay and Dunnadd are absent from the repertoire. By contrast, the metal and glass studs being produced at Tarbat can be found on contemporary ecclesiastical pieces including chalices, a paten and wine strainer, and shrines including those of house and belt form, all items which represent highly specialised items rich in symbolic art suited to the celebration of the Eucharist and the curation of relics (Illus 5.7.11).

5.8 Economy

Introduction

Like communities of any kind, the Pictish establishment at Portmahomack required to operate an economic system in which resources and subsidies were balanced with subsistence and output. It was certainly successful: from its small beginnings by a marsh, the settlement greatly expanded its area and its industries and flourished for a brief and brilliant century. If it is reasonable to assume that this monastery, here as elsewhere, was established by a gift of land, it remains to see what they made of it. Could the community have become rich by means of production? If so, via which commodities, and how was the surplus reinvested? Here we review the natural resources as known today, and then the evidence from the excavations, particularly the plants and animals, and explore the question of how far the community was dependent on gifts, self-sufficiency, delivering services or profit-making. Hypothetically, an early medieval monastery could operate either on the redistribution of assets, like the secular elite, or the sale of spiritual benefits, like a merchant, or a blend of the two.

Resources

Portmahomack lies almost at the centre of an arc of sandstones that extend from the south shores of the Moray Firth, across the Black Isle and northwards in a thin coastal strip of sandstone towards Helmsdale where a mass of granite emplaced during the late phase of the Caledonides separates the strip from the extensive Old Red Sandstones of Caithness. The Tarbat peninsula, apart from the hill of North Sutor, is composed of Devonian sandstones belonging to the Old Red Sandstone supergroup. The coastal strip from Tain eastwards towards Portmahomack and Tarbat Ness is comprised of Upper Old Red Sandstones of the Balnagown Group (UORS), whilst sandstones exposed along the coast from a little south of Shandwick and extending northwards along the southern coast of the peninsula to Wilkhaven are comprised of Middle Old Red Sandstones of the Strath Rory Group (MORS). The base of the UORS is conjectural, but is thought to run on a line from Nigg Bay to Hill of Fearn and then north-east to Pitkerrie, Meikle Tarrel and on the coast at Wilkhaven. Middle and Upper Jurassic sediments of clayey siltstone, sandy siltstone interbedded with calcareous siltstone, and coarse, poorly fossiliferous bituminous siltstone are exposed on the foreshore south of Balintore (Illus 5.3.24; Ruckley in OLA 7.1.12).

These rocks contained no metals, but the underlying solid geology of iron-oxide-rich Old Red Sandstone coupled with the wet, boggy conditions of parts of the site from the Iron Age onwards would probably present suitable conditions for formation of iron ore. Iron smelting was identified across the firth at salvage excavations within the historic core of Dornoch in deposits of eighth to fifteenth century date, from which fragments of bog ore were positively identified (Coleman & Photos-Jones 2008, 13–15; for medieval iron extraction see Chapter 7 and Digest 6.9).

In its recent history the peninsula is described as a favoured place: ‘there are no lakes or rivers in the parish, but there are a number of small lochs or natural ponds, which become dry in summer; and fresh water springs are to be found in every corner, particularly in parts near the sea. One of them at Portmahomack is remarkable for the lightness of its water’ (FSA, 635). At this time (1799) the land was fertile. The parish produced more corn than was needed by its inhabitants (*ibid*, 639) and exported the surplus south by sea from Thomas Telford’s harbour (Chapter 7, p 319). Exports from Portmahomack increased greatly between 1827 and 1836. Oats and bere barley were grown in rotation, with wheat ‘for the gentry’ and ploughs were made almost entirely of wood. Lime was obtained by burning seashells (Mowat 1981, 23–48). All the same, this was a downturn compared with the big yields of barley and honey obtained in the warmer weather before 1780 (FSA, 390).

The principal fuel had been peat, but this was now becoming scarce: ‘The privilege of the scanty mosses in the parish is restricted to a few families living on the properties to which they belong’ (FSA, 646) and ‘the common people burn turf, a few peats, and some heath, carried from a distance of eight miles’ (FSA, 388). But by 1845, ‘the tenants do not now, as they did (not many years since) occupy the greater part of the summer in cutting and carrying home peats and turf from the mosses of the parish of Loggie’ (SSA, 37).

The late eighteenth-century snapshot provokes a reasonable expectation that arable farming could have prospered in the first millennium. However the climate underwent several changes since then, and it is likely that the operations of Fearn Abbey between the twelfth and sixteenth century would have significantly improved the overall yield of cereals. The local developments included the reclamation of land and the importation of soil (p 247). The introduction of fertile soils from elsewhere (‘plaggen soils’) has been identified as an early medieval agricultural signature (Lowe 1998, 204–5; Barber 1981, 359), although there was no evidence for it in Period 2, and indeed little for cereals, in contrast to meat and dairy products.

Farming

Site survey demonstrated that the St Colman’s site was well supplied with water in the eighth century. It flowed from lochans to the east and ran over an impermeable sand-clay subsoil. The occupants tapped into the water table using wattle, plank or stone-lined wells (pp 92, 37–40). The monastic community dammed the flow down the central valley to create a pool, and collected water from the hillside via the enclosure ditch (Chapter 5.5).

Although there was archaeological evidence for cultivation from Period 1, in the form of plough pebbles and burnt grain (Chapter 4, p 94), there was very little in Period 2. This was endorsed by botanical analysis of hearths and pool silts, which offered records of plants but few of the normal foodstuffs. There were small quantities of barley grains from S9 and S1 (Digest 7.4) and research on pollen in the pool showed that cereal values were rising at a time probably to be equated to Period 2 (Laura McHardie in OLA 7.4.4.). This might imply that a crop was growing at a little distance away. Micromorphology showed that soils were mobile and there were several deposits of windblown sand, some probably provoked by stripping turf for building or burning (Digest 7.5). In the immediate area of the monastery, in both Sector 1 and 2, there was a wealth of animal bone, dominated by cattle, but also including pig, some sheep/goat and a range of wild creatures including sea mammals. These animal resources supplied the bulk of the *diet*, but were also used for *building* and as *fuel* to support the on-site industries.

The study of the main enclosure ditch (Chapter 5.5) indicated that it was accompanied on its inner side by a bank topped by an elder hedge and in Period 2 the neighbouring land was under pasture. Subsequently the still-open ditch received cereal remains as well as heather and marsh plants brought in from elsewhere. But this latter stage is thought to belong to Period 3 (Chapter 6).

Plant remains

The main sources of plant remains in Period 2 were the hearths in S1 and S9, the sequence in the pool and the filling of the main enclosure ditch. Hall and Kenward report (Digest 7.4) that evidence for plant foods at Tarbat was meagre. The records for wheat, with a single exception, and for rye, are all from Period 1 deposits, other cereals present then being barley, with (occasionally) oats. From the Period 2 hearth (F65) in S1, oat and barley grains (but no wheat) were recorded, and five samples (from three contexts) furnished charred hazel nutshells. Barley grains were found in hearth F445 in the yard of S9, and in the ultimate pool levels.

Starch caught in calculus showed that two individuals buried in Period 2 had been eating barley, and oats or wheat (Walters, Digest 4.5). Considering the large quantity of soil that was excavated and subjected to flotation from numerous contexts and the likely preservation provided by the pond and the fire, the quantities of grain are small and certainly not as might have been expected if cereals were grown or processed and a mill was operating in the immediate area (see Chapter 5.5, pp 193–4).

Wood burnt as fuel in the hearth of S1 (F65) comprised alder, birch, hazel, *Pomoideae* (perhaps rowan or hawthorn, for example), with hazel, oak, and willow/poplar/aspens being the most frequently recorded (Hall in Digest 7.4). Heather root/basal twig fragments were recorded in six samples, with other parts of heather plants noted in several of them: buds, flowers, twigs – presumably from cut or pulled heather brought as fuel or from recycled heather thatch, for example. There were occasional fragments of charred root/rhizome and herbaceous material, which may have arrived with surface-cut turves. The context from

which these taxa were recovered (a site-wide fire) indicated that they had been employed in construction: oak for frames, hazel for wattle panels, turf for walls, and heather and rushes for thatch (see Chapter 5.9, pp 228–46).

Hearths in S9 showed that turves had also been deliberately employed as fuel; patches of surviving *mor humus* imply the use of surface turf. Micromorphological analysis of the ash reported the burning of a silty, moderately humified peat. Some of the ash clasts are dominated by biogenic silica, implying remnants of peat that had been subject to relatively high temperatures (>600°C) resulting in the combustion of nearly all of the organic matter (Simpson et al 2003). In contrast, the clasts dominated by charred and burned organic matter have not been subject to such high temperatures and combustion is incomplete. One explanation of the different temperatures is that the peat was utilized for two different purposes: burnt at a high temperature for ‘industrial’ use, such as the smelting of iron, while a lower temperature was adequate for domestic use (Digest 7.5).

Faunal remains

The largest assemblage of animal bone by period (NISP = 7820) was recovered from Period 2, and this formed the main focus of analysis (Seetah in Digest 7.1; OLA 7.3.1; Chapter 3, p 60). The principal contexts producing animal bone were within the workshops in Sector 2, and a dense scatter associated with Structures S1 and S3 in Sector 1 (Illus 5.8.1). Cattle were overwhelmingly the dominant species at 75.69% of the domestic meat species identified, with pig at 12.60% and sheep or goat 3.31% (Chapter 3, Table 3.6). Also exploited in Period 2 in significant amounts were red deer, roe deer, goose (*Anser* sp) and seal, as well as dogs; and present in small amounts were horse, cat, fox, wolf, otter, chicken, raven, gull, shag, gannet, capercaillie, whale and porpoise/dolphin (see Chapter 3, Table 3.8).

Age diagnostics indicate that cattle were generally slaughtered at three years or more (with evidence for ‘senile’ animals also indicated by the tooth wear profile). This points towards secondary product exploitation in cattle – milk, butter, cheese – a conclusion reinforced by the presence of a sizeable component of neonate and juvenile animals (see below). All the cattle would have provided significant quantities of meat. Pathological changes associated with traction were noted on some seventeen individual elements. These were predominately on cattle distal limb bones, with five examples of eburnation (hardening) (OLA 7.3.1 at 3.4).

The body part representation indicates that all carcass units were present on site (OLA 7.3.1 at 4.3) showing that the animals were raised locally or brought in on the hoof. The metrical data shows very little variation between individual animals, suggesting that the animals themselves were drawn from a relatively restricted geographic region (OLA 7.3.1 at 5.2). Slaughter by poleaxing was noted in the Tarbat assemblage on a skull bearing a slightly off-centre ‘puncture’ with associated circular and spiralling fracture marks. The fractured (but still attached) bone just above the circular indentation indicates that a punch point, with blunt force, was used rather than an actual cut. Very sharp knives were used in butchery: the evidence from detailed microscopic analysis of

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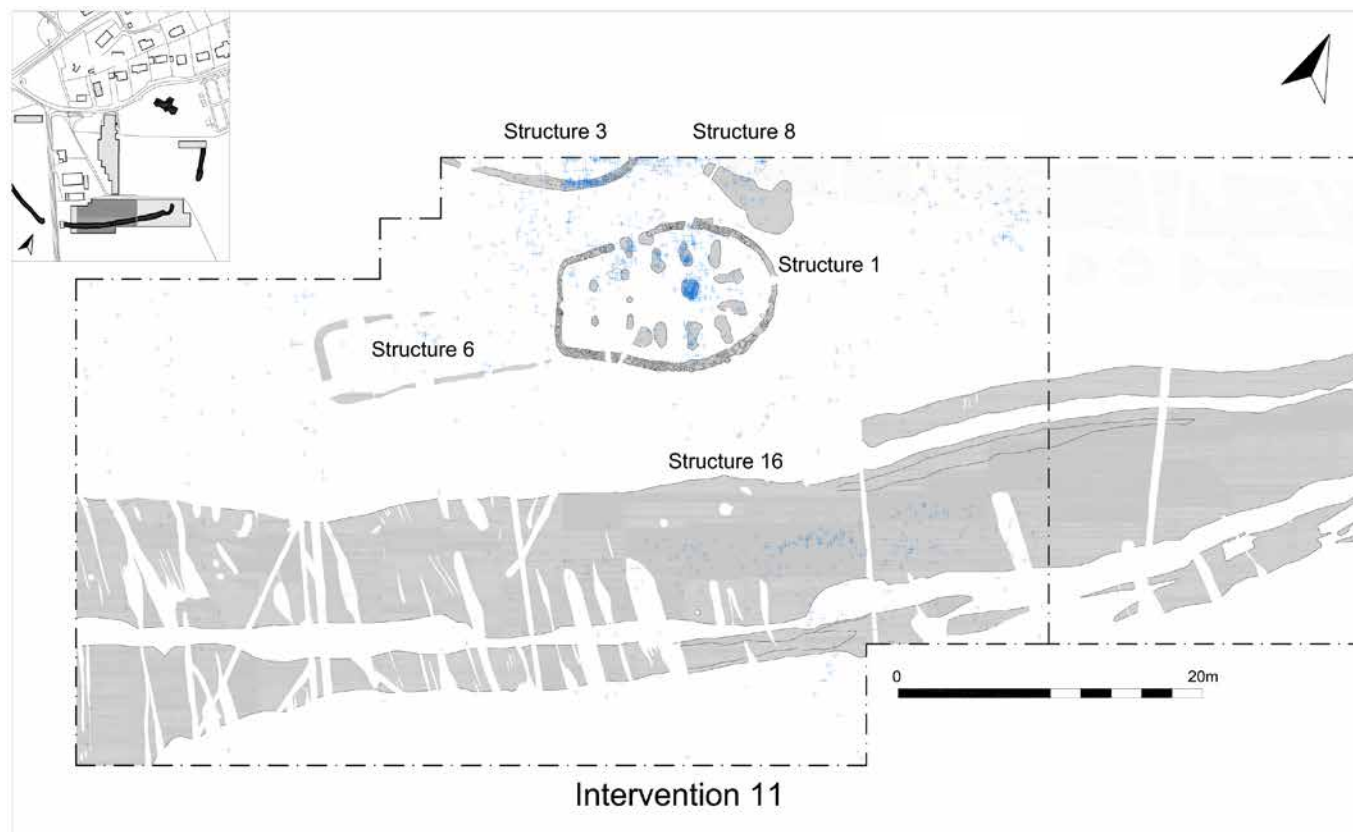


Illustration 5.8.1
Sector 1 animal bone distribution

the surface of the marks themselves would suggest that some of these blades potentially included steel technology (OLA 7.3.1 at 3.3). Cut marks were noted on both fur-bearing animals (otter) and game (red and roe deer). Despite the frequency of cut marks noted on cattle, the highest occurrence of butchery relative to the number of specimens was recorded on marine mammals from all size categories.

A direct association between cattle farming and vellum production can be seen in the twenty-five adult metapodials found in the vellum workshop, lined up for use as pegs (Chapter 5.6, p 201). Since vellum is made from calfskin, there is an expectation that a monastic assemblage should be dominated by calves, with the corollary that an assemblage showing a high proportion of calves points to the production of vellum (see Chapter 5.6, p 210). However, the relationship may be less direct. At Portmahomack, Period 2 produced thirty juveniles (nineteen neonates), as opposed to Period 3's twenty-five (twelve neonates) and Period 4's twenty (nine neonates). Of the eleven juvenile mandibles that were noted as having the deciduous premolar present, none were recovered from Period 1, six derived from Period 2, with a further three from Period 3, and two noted from Period 4. The specialist commented that 'although these figures are small, they would seem to suggest a greater representation of calves in Period 2, and a decline in Period 3' (OLA 7.3.1 at 4.2 and

5.1). An association between vellum-making and the calf cohort was endorsed by their relative age: 'The finds of juvenile bones certainly support the presence of vellum processing. In fact, the majority of juvenile cattle bones are neonatal, falling into an age range between 185 and 255 days (Prummel 1987). A few examples are older, based on tooth eruption, but overwhelmingly the calves are very young individuals' (Seetah in OLA 7.3.1 at 5.3). It can be concluded that while a preponderance of young calves may be a pointer towards vellum production, a small number does not preclude it. A stronger argument that vellum was being produced on site may be composed from structures, materials and tools, as developed in Chapter 5.6 (p 211).

Calcined animal bone was found in hearths related to both lime burning and metalworking, where it was identified as fuel. The use of 'bone coal' to achieve high temperatures has been explored in Scandinavia where bone has been found in Iron Age forges, smithies and iron bloom (Gansum 2004). When mixed with charcoal, the bone helps to carbonise iron, so making steel. Terje Gansum detects a deeper symbolic meaning in the use of animal bone in manufacture, whereby animals or ancestors lend their attributes to swords and other weapons through the forging process (ibid; Hedeager 2011, 140).

A smaller but still sizeable quantity of animal bones was retrieved from Sector 1, where it was concentrated on S1 and its

immediate surroundings. The majority of the bones were found in Period 3 contexts but their focus on the S1 hearth suggested an origin in Period 2. Overall, cattle dominate at 96% of the assemblage, and the quantities and association with S1 suggest a use of the bones as fuel (Illus 5.8.1; Chapter 3, Table 3.7). Only the bones captured in the metalworking scoop in ditch S15 were of a mixed proportion suggesting diverse exploitation: eighteen bones of cow, twelve of pig, six of sheep/goat, one of red deer and one of seal.

Wild animals

The most abundant non-domesticates were red and roe deer, although figures for red deer are inflated due to the presence of a relatively large number of antler fragments. Fur-bearing animals included dog, fox, wolf and otter. The number of wolf finds is significant: wolf finds are notoriously rare, therefore the recovery of bones from four individual animals over Periods 2 to 4 may be suggestive of an enduring local population. The finds of capercaillie would almost certainly have made their way into the assemblage via hunting, given the type of habitat – dense coniferous upland – that it requires. Geese were recorded in greater numbers than domestic chicken; however, this component included individuals from a range of species as opposed to domestic geese only. From the materials present it was not possible to refine the identification of the geese component to species level. One ‘wader’ was recorded and this was likely a grey heron (*Ardea cinerea*) (Seetah in Digest 7.1).

The marine mammal cohort, although found in small numbers when compared to the overall size of the assemblage, showed a particularly noteworthy level of diversity. Unfortunately, fragmentation – particularly of the largest whale species – and the state of preservation made concrete identification problematic. However, it was clear that large (minke whale sized), medium (porpoise sized) and small (dolphin sized) cetaceans, along with seals (common/harbour seal, *Phoca vitulina*, and possibly grey seal, *Halichoerus grypus*) were all present (OLA 7.3.1 at 3.1.1).

The community at Iona had ownership of a neighbouring rookery of seals (LC I.41; Sharpe 1995, 143; O’Sullivan, D 2001, 46), and beached marine mammals were regarded as acceptable food (Bieler 1963, 9, 177). Dolphins, porpoise, whales and seals were also exploited in Pictland; Cuthbert was provided with a miraculous meal of roast dolphin on a midwinter visit there (*Prose Life of Cuthbert* II.4; Colgrave 1940, 83). While it is usually assumed that the main purpose of obtaining marine mammals was to eat them (Gardiner 1997), a rather more valuable commodity would have been oil (Loveluck 2007, 93). Cetaceous oil could be burned to give light (Lebecq 2000, 129), which is maybe why a dolphin was depicted on Roman lamps. A Christian community had ritual obligations that required oil: the maintenance of the altar light and as chrism to anoint the newborn and the dying.

Fish

The fish assemblage, although small, included freshwater or marine char, oceanic cod and mackerel (Holmes in Digest 7.2).

Char are present in deep glacial lochs in Scotland, and could have been caught in the highland lochs Morie or Glass, c 26 miles away by land, or loch Ness, c 30 miles away by sea (National Library of Scotland 2012). However, all three species are available in coastal waters or further out to sea. The increase of cod in the eighth to ninth century is consistent with the increase in cod fishing in the Viking age period (ninth to eleventh century) (Barrett et al 2000, 151; Barrett et al 2004, 624).

Shellfish

Shellfish from Period 2 came from discrete features (Holmes in Digest 7.3). There was a concentration of whelks in and around pit F554 in the S4 area, and winkles gathered in a pit were recorded further to the south, also in association with the vellum-working yards (Chapter 5.6, p 203). Although the use of dog whelks (*Nucella lapillus*) for the production of purple pigment for manuscript production has been documented as occurring in Anglo-Saxon Britain, little direct evidence has been forthcoming (Biggam 2006, 2). Unfortunately, the only whelk shell from this site complete enough to be identified to species was that of the common whelk (*Buccinum undatum*), which is distinct from the dog whelk. Common whelks are found on the lower shore, and could be easily exploited. Limpets, oysters and cockles were less commonly recorded. With the exception of two flat winkles (*Littorina obtusata* or *Littorina fabalis*), the rest were identified as the common or edible winkle (*Littorina littorea*), both of which species inhabit the middle and lower shore areas. Native British oysters (*Ostrea edulis*) were present, and could have been picked from freshwater, estuarine or marine beds. Cockles and limpets are also common finds on the middle and lower shoreline.

Resources: available or acquired?

The diet of the monastic community, as suggested by animal and plant remains, consisted predominately of beef, its dairy products (milk, butter and cheese), with minor contributions from pigs supplying meat, and sheep/goat (mostly goat) for dairy products. There were traces of barley, nuts and an uncertain quantity of fruit and vegetables. A limited amount of fish and some dolphin were also apparently eaten. These conclusions are endorsed by stable isotope analysis on the skeletons of individuals buried in Period 2: the early medieval monastic community were consuming a significant amount of terrestrial animal protein, but with one exception they were not ingesting marine protein (fish, sea mammals, shellfish) (Curtis-Summers in Digest 4.3). The barley was consumed most likely as bannocks and beer, but there was little evidence in this period for large-scale cultivation from the excavated area. The land in the vicinity was mainly pasture, with the enclosure marked by a ditch, a bank and a hedgerow (p 280).

Documentary evidence for diet in early Celtic monasteries records an ideology of practice that purported to regulate consumption within an abstemious regime. Recorded rules determine what is eaten, when and how much: ‘Let each be given a loaf, thirty ounces in weight’; ‘the ration of bread is not reduced

when a piece of fish, some curds, a little cheese, hard boiled egg or apples are allowed. If the apples are large, five or six will suffice with the bread. But if small then twelve may be allowed ... The following are allowed by way of relaxation at Easter: eggs and fat, with the meat of wild deer and wild pig ... The cook, milker and kitchener are to do extra penance when guilty of spilling produce, whether milk or grain' (O'Maidin 1996, 24). The principal foodstuffs mentioned by Adomnán are cereals, and the monks appeared to have lived mainly on bread and cheese, with onion, carrot, watercress, wild garlic, cabbage apples, plums and hazelnuts (Murray et al 2004, 180–1). Where meat is mentioned, it is that of red deer or wild boar (ibid). Venison appears to have been a deliberate preference at Iona (ibid, 186).

This ideal regimen is curiously at odds with the lavish high-protein diet of beef and dairy products reported here. But the protein-rich beef eaters of eighth century Portmahomack were not alone; nearly every monastic assemblage in Scotland and Ireland is dominated by cattle, while in England it is sheep (McCormick F & Murphy 1997, 605–7; Loveluck in Daniels 2007, 206–7). However, much of the written information cited above comes from ninth-century documents serving the reformist movement of the Céli Dé, the objective of which was to 'restore monasticism to its rightful place' after a period of notoriously relaxed practice (O'Dwyer 1981, 192). On these grounds, it seems legitimate to draw a distinction between the eighth century and the ninth. The archaeological evidence for eighth-century diet aligns with that of the secular elites, making it easier to see the monasteries as the home of a spiritually propelled aristocracy (see below and Chapter 8, p 339). The devotional initiatives of the ninth century would have introduced a degree of fastidious regulation in Ireland and Scotland, this at a time when the *Rule of Saint Benedict* had yet to be adopted in Rome (Ferrari 1957, 407). At Portmahomack, cereal returned as the staple in Period 3 (ninth century), although the evidence for the continuation of monastic life in that period is markedly slight.

The faunal evidence, combined with the evidence of the infrastructure, shows a developed management strategy predominately using locally based resources. The emphasis is on cattle, used for traction, dairy products, meat, blood and hides (including vellum from calfskin). Pig (for meat) and goat (for dairy products) are present in marginal numbers. Wild species may play a small role in the subsistence of the early monastery (cf McCormick & Murray 2007, 104), but they were selected for crucial uses: fur from mammals, feathers (quills) from birds, lime from shellfish and seaweed.

The archaeological evidence reveals a community well able to exploit local sandstone, beach cobbles, timber and turf in a major landscape development (Chapter 5.5) and the construction of buildings (Chapter 5.9). The community was also engaged in three intensive industries: the production of sculpture (Chapter 5.3), vellum (Chapter 5.6) and metalwork (Chapter 5.7). Stone for carving was quarried on the east side of the peninsula. Vellum-making drew on the cattle herd and the collection of shells, seaweed and pebbles, and presumably quills and gall for ink and dyes for illumination. Peat, turf, wood and bone coal were all available locally to stoke fires. Only the metalworkers would certainly have needed to acquire non-local resources: glass,

bronze, silver and gold, and perhaps iron, all of which would need to be imported. For precious metals it might come as recycled coinage or other Roman or Byzantine artefacts, while the glass came as cullet from the Mediterranean or the Near East (Chapter 5.7, pp 217–18). The supply of raw materials or the means of buying them may have been acquired by donation: for example treasure or weaponry donated by secular lords. However, the expansion of the monastery to encompass the whole peninsula and the demand for more books and vessels to furnish daughter foundations suggests the need for a liquidity beyond gift aid.

There are indications of each of the economic strategies mentioned in the questions that began this section. We can assume that the land at least would have been donated (Chapter 4, p 104). The plant and animal evidence supports a vision of subsequent self-sufficiency from local resources. The establishment may have been primed with non-local raw materials (copper, silver), but in the long term would these require to be purchased on the back of a surplus? In the argument that follows, the suggestion is that such a surplus would come most readily from cattle farming and the sale of spiritual benefits.

A model for the monastic economy

In an economic sense, a monastery is a settlement like any other, and its occupants must eat, even when the control of their diet is abstemious to the point of fetish. The foundation is enabled in the first place by the gift of productive land, and, at a basic level, that is all that is needed from a sponsor to secure the presence of a college of holy persons in the neighbourhood. However, a preliminary endowment would kick start the investment, in this case, for example, a herd of cattle. The establishment can anticipate further sources of income, namely the rendering of spiritual services in exchange of donations, and the profits that result from successful farming. Economists Ekelund et al (1996, 42) comment: 'In the corporate structure of Christendom, the medieval monastery operated as a downstream franchised firm, receiving quality assurance and name-brand recognition from the church of Rome in return for certain payments (upstream).' Their study of the Cistercian monastic economy showed that the delivery of spiritual benefits in exchange for endowments included marriage licences and fees for teaching children, as well as donations for the support of the souls of the departed. We need not doubt that these were seen by donors as the purchase of real benefits with a high level of quality control, and maintained as such, even if in monetary terms they were not actually earned from any visible production or result in any verifiable reward. Or, as an economist is disposed to put it: 'As a dominant-firm monopolist in the salvation industry, the medieval church could be expected to pursue demand maintenance policies, including the establishment of rules and regulations governing the interpretation of church doctrine' (Ekelund et al 1996, 86). In other words, this was a market that wrote its own rulebook. However, the production industries were also potentially profitable. The cost of labour was minimal, since even lay brothers agreed to trade wages for religious advantage. Combined with the knowledge, particularly agricultural knowledge, embedded in the monastic package, this encouraged a rapid advance from subsistence to surplus.

It is not clear how far such an economic system, as observed in Cistercians, would have obtained in the monastic movements of the sixth to eighth century. In any new community that was adopting the Christian form of governance, especially one that had never been a Roman province, the endowing of monasteries was economically much simpler than the quasi-imperial episcopal pyramid with its diverse ranks of employees. The members of that latter hierarchy would all need salaries, of a kind that could only be found, as it had under the empire, by taxation. An ability to tax and redistribute liquid benefits would always be a challenge in a non-monetary economy. Besides, there is some evidence that the 'college of specialists' was a format already familiar, and so more acceptable, to Late Iron Age communities in the north and west (Carver 2009a).

Notwithstanding the hypothetical importance of donors and the frugal consumption of its inmates, it is unlikely that a large establishment even in its earliest days could function solely on subsistence and gifts. The *Céli Dé* exercised a system of tithe, where a herd was led through a passage and every tenth animal taken for the monastery (O'Dwyer, 1981, 82, 91). Services to the monastery could be rewarded by board and lodging: 'Monks of the priestly order get house, garden and bed, sack of meal and its condiment; a milch cow every quarter. In return he is to provide baptism and communion. The teacher of donated children gets a milch cow after teaching 150 psalms. Also the bishop who marks the young man gets supper for a party of five' (O'Maidin 1996, 35). It is likely that donations, including that of more land, would follow the rise of the Portmahomack monastery during the eighth century, and that bullion arrived in the votive manner suggested above. But specific fees and returns for prayers, masses and devotional intercessions designed to benefit donors are largely undocumented in our era. This leaves the evidence on site from which to reconstruct the economy, and especially to work out whether it required subsidising, was self-sufficient or generated a surplus.

In this respect it is logical to focus on the principal commodity suggested by the assemblage, namely cattle. Cattle were raised locally at Portmahomack which is likely to have offered plenty of grazing (p 186). The output from the live herd would be milk, butter and cheese, and calves. The cattle provided traction for pulling carts laden with sacks of grain or dragging rocks for carving up from the beach. The peninsula also had land suitable to grow barley, with the bulls and cows available to pull ploughs of unspecified type.

Tribute or rent might be due from tenants, payable in livestock (Murray et al 2004, 181), but once the whole peninsula became part of the monastic estate (p 255) there was less to pay to landlords and surplus could increase. Shells, pebbles and metapodials were available for collection locally. There might be some outlay on special stones for smoothing, inks and dyes, precious metals as scrap or coinage, and coloured glass to turn into church plate. These things should have been available within the monastic network that stretched from Ireland, western Scotland and Northumbria to France and Rome, but a reliable supply would still need to be paid for. Indications from Clonmacnoise are that the monastic demand could be considerable: 'Silver, copper, gold, semi-precious stones ... amber, lignite and E-ware pottery ...

were all brought to the site ... references to merchants from Gaul importing wine to Clonmacnoise indicate that the monastery was part of both an inter-regional and international trading network' (King 2009, 344). However there was no indication as to how such merchants were recompensed.

It might be assumed that profit could be maximised because monastic labour was 'free' in the sense of being given freely. The monastic use of slaves is argued to be a crucial part of their economic viability on the continent (Carver 2015, 17), but their role in the Celtic north is equivocal. Enslavement of both sexes was practised in Ireland from at least the fifth century to the twelfth. The Irish laws relating to the seventh and eighth century contain many references to slaves, so it may be concluded that they carried out much of the manual labour in establishments that could afford them. Herding (cows, pigs, sheep) was a particular job for young people. Adult male slaves were used for wood cutting, while female slaves prepared milk, butter, cheese and bread (Kelly 2000, 438–9). Slaves were also commodities used for gift and exchange: a milch cow was equivalent to one ounce of silver, while a girl slave fetched three milch cows (ibid, 58). It need not be assumed that the Celtic monk had an interest in slave girls, equivalent, say, to his contemporary in a Baghdad palace, but there were unpaid servants in a monastery supported by subsistence payments gilded by spiritual benefits. At Portmahomack such persons are not visible in the cemetery, where women and children are absent, and the men who are commemorated in a ritual manner also bear the scars of physical labour (Chapter 5.2, p 119). As we have it, there is some reason for regarding the devotional community as coincident with the workforce, whether engaged in metalworking, carving or husbandry.

Even so, an ever-growing army of monastic farmers, artisans and experts (smiths, carvers, herders, ploughmen, butchers) would need to be fed, if not paid. Although it is hardly feasible to calculate how far surplus kept in advance of liabilities with any precision, there is every sign of increasingly conspicuous expenditure in the form of the monumental crosses, each one of which would have required several man-months from extraction to installation. The production centres uncovered by the excavation were dedicated to books and church vessels, neither of which were necessarily saleable; rather they may be seen as supporting the expansionist project, producing the essential equipment (book, chalice, paten, ciborium, reliquary) for newly formed convents budding off from Portmahomack.

Assuming the main monastic capital was held in cattle, it is not excluded that butter and cheese were exchangeable assets. Cheese can be made in a robust, portable form and Irish butter is recorded as arriving in early medieval Bobbio, northern Italy (O'Sullivan et al 2014, 266); butter was a taxable commodity in the northern isles, having twice as much fat as cheese and drawing down more revenue in consequence (Challinor 2004). However, the most likely items of surplus that could be turned into portable and storable capital were the hides of mature cattle, which must have been available regularly and in large quantities as the herd was renewed. The kind of tough leather produced had a number of mainstream applications in the Celtic zone, including shoes, belts, straps, bridles, bags, coverings for tables, beds and the inside of a chariot, and surfaces for flailing grain

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(Kelly 2000, 54). Leather was also used to clad boats, the joints being smeared with butter (*ibid*, 55). Leather was fashioned into tankards and wine skins and sinew was used to make the thongs required to lash the timbers of nail-free buildings (eg Walker in Lowe 2006, 184). The export of hides from Ireland is mentioned by Giraldus Cambrensis (Kelly 2000, 55). At Portmahomack, organic preservation was rare in Sector 2, but fragments of leather found inside the overflow culvert of the dam (24/7810) were interpreted as coming from a hide shoe of a kind encountered in British and Irish early historic sites and in Anglo-Scandinavian York (Thomas in Digest 6.13). This suits its context, lying within a culvert blocked in the eighth/ninth century (see Chapter 6, p 192).

The use of cattle hide as an instrument for running an economy surfaced in recent history, providing an interesting analogy for the early medieval north. The early nineteenth-century ranchers of the American west used cattle hides as currency, dubbing them ‘Californian banknotes’ (Sheffer 2013). Hides and tallow were more important than the meat, which was sometimes left to rot in the sun. The leather was not merely a form of currency, although it was that too: ‘in addition to [being] a form of exchange, hides had myriad uses as beds, blankets, saddles, shoes, furniture, luggage, door and window coverings, fencing and rope’ (*ibid*). To these can be added armour, since before the indigenous peoples had easy access to rifles, the Europeans clad their horses in leather skirts that protected them from arrows (Mitchel 2004). By 1830 the extensive grazing on offer meant that Texas had become a cattle powerhouse. Disputes over the control of this resource with its owner, the now independent Mexico, led to the annexation of Texas by the United States in 1845 and war with Mexico in 1846 (Sheffer 2013).

Returning to the early Middle Ages, a recent study emphasises that cattle have long been valued more for their hides than their flesh (Campbell J, 2009, 52, citing Adam Smith, *Wealth of Nations*, I, 319–21). In 1007, a tax of one hide was levied on every farmer in Meath to pay for the high altar at Clonmacnoise. Hides were also used as the unit of tax over a large part of Iron Age and Roman Britain, and this continued: the English system of assessment in hides was in place by the seventh century and had a long future ahead of it (*ibid*, 53–6). As demonstrated by Michael Spearman, cattle products, and hides in particular, were the principal currency and the mode of storing wealth as late as the twelfth century in Scotland, when they provided liquidity for the early Scottish burghs (Spearman 1988a, 1988b). As with the earlier monasteries, and the later ranchers, this too was an attempt to capitalise assets in a non-monetary economy. Tanning, a large scale and obtrusive industry, was only marginally signalled at the Portmahomack northern workshop (see Chapter 5.6, p 200). If, as suggested by this hypothesis, large numbers of tanned hides were being produced for currency, the activity must have had its focus elsewhere in the monastic park.

Finbar McCormick has shown that in the west the cattle economy was a feature of both monastic and lordly centres in the seventh/eighth century, but that it began to lose its primacy to grain after AD 800. As at Portmahomack, the eighth-century community at Iona focused on cattle rearing, while also hunting red deer and collecting winkles and whelks (McCormick in

Barber 1981, 318). The highest cattle concentrations in Ireland are the two early phases at Clogher and Phase 8 at Knowth, where beef accounted for over 80% of the meat consumed. McCormick considers that the explanation is economic: ‘the faunal assemblages are reflecting a national value system in which cattle, particularly dairy cows, are the basis of wealth’ (McCormick & Murray 2007, 105). He sees the creation of 45,000 ring-forts as relating primarily to the need to protect cattle (*ibid*, 109). At Knowth, the ring-fort became redundant in the ninth century as the status of cattle decreased (*ibid*, 110). A new prescription is reflected in an increase in the number of horizontal mills and the conversion of pasture to arable after AD 800 (*ibid*, 115). In Viking regions ‘old value systems based on cattle ownership gave way to a value system



Illustration 5.8.2

Family of cattle depicted in an eighth-century carved stone panel from Portmahomack (TR28/35, detail)

based on silver bullion’ (*ibid*, 7). It seems likely that in a period that saw exchange becoming more essential to the distribution of wealth, grain offered a more versatile and divisible subsistence asset, while silver (and bronze) provided the currency. This aligns well with Period 3 at Portmahomack.

Conclusion

Provided the initial endowment included a herd of cattle, the economic system of the monastic phase at Portmahomack would have offered some self-sufficiency and potential for surplus generation from its inception. The cattle provided sustenance, traction and leather, and the community clearly regarded them

with affection (Illus 5.8.2); for another cow portrait in the region, see Illus 5.3.48c. Once local leather needs were served, hides constituted an item of surplus that could be deployed as portable wealth or stored capital. It could be used to buy in precious metals to make church plate, which, with homemade vellum, provided the essential kit for the foundation of new houses in the monastic network. As increased grazing was assigned by donation, capital and wealth also increased. At some point it became theoretically possible to lease back monastic land and so acquire paying tenants, whose rent would also need to take some storable form beyond labour. Increasingly ostentatious expenditure, focused on the lofty purposes of an exclusive enclave, will no doubt have attracted its own comeuppance. At the same time, increasing liquidity will have aided the trend towards a more commercial circulation of goods destined to make its appearance in Chapter 6.

5.9 Architecture of the Bag-shaped Buildings

Introduction

Construction at Portmahomack in the pre-monastic period (Period 1) comprised round buildings, probably contrived of turf and timber, discussed in Chapter 4. Construction in the monastic phase (Period 2) saw a radical departure from roundhouse technology. It comprised a possible stone church (Chapter 5.4) and major infrastructure, including a kerbed and paved road, a dam of dumped clay and branches capped with stone, boundary walls of uncut rubble and turf, a tank, culvert and pits constructed of stone slabs, and a bridge over the culvert of megalithic capstones (Chapter 5.5). The monastic builders also created two or possibly three examples of a new type of open hall, with a ground plan shaped like a bag or more precisely a sporran. The form and viability of these structures (S1 and S9) is the subject of this chapter.

Early medieval buildings in the north of Britain are notoriously individual in their shapes, and buildings of the Pictish period more than most. In the west and the northern isles, the complex Atlantic roundhouses (CARs) are slab built, figure of eight or lobed, often the result of modifying brochs and wheelhouses, as Old Scatness 7 (Romankiewicz 2011; Dockrill et al 2010). In the south and east, roundhouses morphed into circular sunken hollows, as Easter Kinnear (Driscoll 1997), or byre-houses, as at Pitcarmick (Carver et al 2012). All these diverse types have been claimed as Pictish (eg Ralston 1997), but it can be argued that the variety is a product of regional difference and inheritance for which a Pictish label might be inappropriate (Carver, forthcoming a). In the case of monasteries we enter another kind of *terra incognita*, where architectural innovation might be expected but not easy to discern since there is little to compare with it. Our structures do not refer directly to the large roundhouse at Iona (Barber 1981) or to the rectangular barns of Hoddom (Lowe 2006, 173), the cells of Hartlepool (Daniels 2007, 32–3) or the grand halls of Jarrow (Cramp 2005, 207).

Early medieval buildings can be disconcertingly irregular, with semi-random posts and scatters of stones. One approach to their resolution is through ethnographic study using the observed practices of the eighteenth to twentieth century, in which the names of Alexander Fenton and Bruce Walker are paramount

(Fenton 1999 [1976]; Fenton & Walker 1981). Particularly helpful in this regard is the suggested use of turf and crucks (Highland *cuppils*) lashed with rawhide, which explain the irregular spans and spacings encountered (Fenton & Walker 1981; Fenton 1968; Walker & McGregor 1996; Walker 2006; Lowe 2006, 183; Walker in Lowe 2006, 184). A second is through experiment (Noble 1984, and see the ongoing examples constructed at the Highland Folk Museum). A third approach is through archaeological study, attempting to search for the rationale of early medieval construction in its roundhouse ancestry. There are examples of a roundhouse apparently morphing into a longhouse, as at Carn Dubh (Rideout 1995, 153–5; see Harding 2009 for the last years of the roundhouse in Scotland). A potential derivation is implied where roundhouses are superseded by rectangular houses, as at Camlin 3, Co Tipperary (Flynn 2009). At Clonmacnoise, habitation was reorganised in the late seventh and early eighth century, when post-and-wattle roundhouses gave way to stone-based roundhouses, to be superseded in turn on the same plots by rectangular buildings (King 2009, 345). The trend in Ireland, and probably in Scotland, is that round gives way to rectangular around 800 (O’Sullivan et al 2010, 34) occasionally via hybrid variations (Harding 2009, 189–92).

The investigation in this chapter will be focused mainly on the building at Portmahomack that was best defined on the ground, namely S1. By good fortune, the remains of this building were virtually intact at foundation level, and on detailed excavation its plan proved unusually regular and symmetrical. We begin with a review of the building materials available, with suggestions as to how they may have been employed, then examine the plan, form, and function of S1 and the rationale of its design. Lastly, we review the more partial remains of the important but badly conserved structure that can be seen as complementary (S9).

Materials: stone, timber and turf

There were no complete standing buildings of the Pictish period at Portmahomack, so reconstruction relies on inferences drawn from ground plans and from comparisons with other archaeological and ethnographic examples in the form of verbal or photographic reports. There were, however, some constructions of the Pictish period, all in stone, which should give an indication of the architectural and engineering capabilities of the Portmahomack community. In the sixth century, cist graves were furnished with stone slabs measuring up to 0.5m long and 10cm thick (see Illus 4.8, p 84). In the eighth century, a road was constructed with kerbs and paving, with a bridgehead constructed of megalithic capstones up to 40cm thick and estimated to weigh up to a ton (Illus 5.5.18, p 190). Revetment or terrace walls, constructed with rubble laid in dry-stone technique rose to some 1.5m freestanding (Illus 5.5.13). These structures were founded on cambered gravel in the case of the road, and on dumps of animal bone in the case of walls on marshy ground. The culverts that provided overflows to the pond were not mortared, but tightly fitted to make a smooth square-sectioned channel (Illus 5.5.17). None of this stone was masoned, but there is first-hand indication that cutting sandstone into squared blocks presented no problem of technique: at least four monumental crosses were made in the eighth century, faced

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on four orthogonal sides and carved in relief with geometric precision (Chapter 5.3). At the same time, simpler grave markers were more roughly shaped (TR33) and some (TR25) not shaped at all.

It can be concluded that the local people were aware of the properties of the stone available, and designed their responses to structural challenges according to the demands of prestige as well as function. It seems clear that expertise was also subject to ranking; that is, some structures (the cross-slabs, the road) demanded rigorous and expressive design and execution, while others (boundary walls, grave markers) were allowed to proceed pragmatically with a free hand. It is not excluded that some skills were imported, but that is true of the whole monastic enterprise. It does not imply that masonry was the work of foreigners, and jerry-building of the locals, since the Picts had ownership of every aspect (see p 167).

The stone available locally was (and is) comprised of large beach cobbles made smooth and round by the breaking waves, and sandstone from the softer Upper Old Red Sandstone (UORS) and Middle Old Red Sandstone (MORS) bedrock on the peninsula (Digest 6.10). Being sedimentary, the sandstone may break off naturally in slabs or be helped on its way by a wedge hammered or a crowbar levered into a fissure. It was demonstrated experimentally that eight reasonably able-bodied young adults can carry a stone measuring c 650 × 1100 × 150mm, if with difficulty and only as far as a Land Rover (Illus 5.9.1). Larger stones than this, which included all the cross-slabs and the bridgehead capping, would have needed to draw on those enigmatic methods of megalithic transport surmised for prehistoric tombs, which may have been still current. The modern stone quarries that are known (and have been used to make cross-slab replicas) lie on the east side of the peninsula at Geanies and Cadboll (see Chapter 5.3, p 137). If stone slabs were anciently quarried there, then transportation by boat from beach to beach would be the most feasible way of supplying Shandwick, Nigg and Portmahomack.

As the name implies, the UORS sandstone is predominately red, but occasional bands of the MORS are orange and may be yellow in tone. There are indications that MORS was sought after for high-prestige projects such as cross-slabs (Chapter 5.3, p 138). UORS was used to construct the first medieval church (Church 2), while the later medieval churches used the MORS. A specially selected stone was used for the seventeenth-century belfry of Church 5, which achieved a distinctive golden colour. This too is thought to have derived from a local source in the MORS on the peninsula (Digest 6.10; OLA 7.5.1/1.3.3).

These preliminary remarks are intended to indicate that the Picts knew how to source, transport and, when necessary, to cut stone. Such structures as we have suggest that most building made use of rubble and selected natural slabs. But the use of ashlar for prestige architecture (such as a church, Chapter 5.4) is not excluded, since the same techniques were employed to fashion cross-slabs.

There is no direct information on the size of available trees in the Moray Firth area, and thus of the roof space that could be spanned without intermediate support. In early modern times the spanning and roof support of vernacular buildings has been noted to employ the 'Highland crucks' – two matching timbers ('cuppils'), naturally grown or contrived, which together form an arch (Fenton & Walker 1981, 45).



Illustration 5.9.1

Crew of strong individuals attempting to transport a slab of stone from the beach at Geanies to a vehicle (destined to be carved as the replica of TR1)

At Portmahomack there is direct evidence for the use of squared oak timbers and wattle panels. A surviving timber post in Period 1 (F438), burnt posts (eg in Int 26) and the ghosts of posts in post-pits (eg F114, F454 in S1; F486, F491, F508 in S9) indicate the structural use of squared oak timber. Oak used in the vellum-working area could have been standing for 150 years when it was destroyed by fire (Chapter 3, Table 3.1). The shadows of planks were seen in the well (S8). A wattle fence and wicker-lined well show that structures of woven rods were in use from Period 1 (p 92). The rods were taken, or perhaps coppiced, from alder, willow or from hazel (implied by a hazelnut in S11). From the

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hearth in S1, there were fragments of charcoal from alder, birch, hazel, *Pomoideae* (perhaps rowan or hawthorn, for example), oak, and willow/poplar/aspens. Hazel, oak, and willow/poplar/aspens were the most frequently recorded (Digest 7.4).

When the northern workshops were burned down in the late eighth/early ninth century, they left evidence of robust long-lived wattle-work and heather roofing. The hazel roundwood was shown to have come from well-grown plants typically 15mm in diameter implying the management of woodland producing poles suitable for hurdles (providing long straight specimens) (Allan Hall Digest 7.4). The charred samples from S9 suggested that the burnt roof was largely a pegged heather thatch perhaps with cut turves as underlay (ibid). Other candidates for roofing material were 'charred herbaceous stems, perhaps from some large sedge-like plant such as bulrush or sea club-rush (*Scirpus lacustris/maritimus*) and most likely material from a thatched roof' (ibid).



Illustration 5.9.2

Reconstruction at Highland Folk Museum in 2013: turf-and-stone alternate coursing

Thus far, the material equips a carpenter to build with squared oak timbers (earth fast or framed), infill with wattle, and roof with turf and pegged heather. However, there was no direct evidence on how walls were made: no trace of daub or clay cladding and for this reason it is necessary to examine the viability of using turf. Burnt turf was certainly present in both the northern and the southern workshops (ie S9 and S1), but its use in making walls needs to be distinguished from its use in roofs or as fuel. Traces of turf in hearths imply use as fuel, but turf associated with the site-wide fire could have derived from walls (Hall in Digest 7.4).

The use of turf as *bonding* within the west boundary wall (F480) was inferred from a dark layer resembling a turf line

(C3637; Chapter 5.5, p 189). The same wall, erected on wet ground, was founded on a raft of animal bone. There was little evidence that constructors had made use of clay or clay and boole (rubble bonded with clay; Walker 1977). A sandy clay was available beneath the sand subsoil and would have been excavated from the enclosure ditch in large quantities, but was apparently not used for building: baked clay displaying the negative imprints of cobbles or wattles was absent from the area of the Sector 2 fire. The fibrous nature of turf, also used as a fuel at Portmahomack, means that it could disappear as ash and we are more than usually dependent on analogy and inference to suppose its employment in building.

Ethnographic turfing

Although the Norse are credited with promoting the use of turf as a building material in the North Atlantic region, there are good reasons for accepting that its use in Scotland was well developed before the ninth century (see Chapter 5.8; *Orkneyinga Saga* (7; sa 891–4) Sharples 2005, 183). It is highly probable that good quality turf grew in the Moray Firth area, and that the Picts made use of it. Since it survives poorly on archaeological sites, it will be worth briefly summarising some of the ethnological evidence, if only to assess the likely method and feasibility of its employment.

The traditional use of turf in Scotland to make walls and roofs is a recurrent theme in the literature of vernacular architecture: 'In Scotland, and especially in the northern and western parts, turf was pared from the fields and used to make walls, whether alone, in layers alternating between stones or as a thick core to stone linings' (Fenton 1968; Brunskill 1982, 134). 'In remote parts of northern and western Scotland both thatch and turf roof was hung as "divots" diamond set at low pitch. Thatch was often of heather rather than straw, was renewed each year and was also laid to a low pitch but secured with the aid of coarse rope nets tied to stone weights or projecting blocks' (Brunskill 1982, 137). Turf and heather for roofing has been documented in Scotland in the recent past (Walker et al 1996).

Turf is essentially earth bonded by fibre, and as such can be cut to shape and deployed in versatile ways. The tradition remains strong in Iceland, where Skagafjörður Heritage Museum documents the techniques (Sigurthardottir 2008). For walls, the turf is cut in rhomboidal blocks and left to dry for about two weeks, and then laid one by one across the wall width; this gives the face of the wall a zigzag (or herringbone) appearance (*glauumbaer*) (ibid, 11). Skimming the surface turf provided thin plates of *reithingstorf*, originally placed under a saddle, but used

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too for covering stone benches. For roofing, the thinner turfs are laid in long overlapping strips parallel to the ridge (*ibid*, 8).

Examples recorded in Scotland manifest certain features: the turf blocks are laid on a stone foundation or a dwarf wall, and the wall faces are clad either side with wattle panels ('stake and rice'). In theory turf walls can rise to two storeys and carry a roof, but in Scottish examples the roof is supported not on the wall plate but on rafters borne by paired crucks (highland cuppils) (Walker & McGregor 1996, 7–14). The feet of the crucks may be embedded inside the turf wall: 'It is more common to find the lower portion of the cruck built into the wall and standing on a large stone in the base of the wall to form some protection from rot' (Fenton & Walker 1981, 45).

The walls of blackhouses recorded in western Scotland in the nineteenth century were 1.5–1.8m high, the lower half of stones, the upper of turf, and the walls revetted internally with coursed stones (Fenton & Walker 1981, 75). But an all-turf house could also stand: one has been noted at East Geirinish, South Uist (*ibid*, 74), and turf buildings were recorded in the Highlands until the late 1700s. Pennant noted houses made entirely of turf when he passed through Moray in 1759 (*ibid*, 75).

Supposing a bonding role for turf can help explain the viability of walls seemingly composed of unstable stacks of unshaped boulders that occur on early medieval sites, and abound at Portmahomack (for example the boundary walls, p 187). Building methods using alternate courses of turf and stones were noted by Alexander Fenton (1968) and have since been recorded in gable walls in Angus, Aberdeenshire, Perthshire, Cromarty and a church in Sutherland at Ach-na-h'uidh (Fenton & Walker 1981, 27, 73–7; Walker & McGregor 1996, 17). The walls are founded on a course of stones and made up with two layers of turf to each layer of stone, to form a 'many-decker sandwich' (*ibid*). Stone-and-turf alternate coursing has also been noted at Skatastathir in Austurdalur, Iceland, a method said to be preferred where cows or horses were to be stalled (Sigurthardottir 2008, 20–1).

The method of construction could start with the roof or the walls. In Irish examples, the roof frame was erected first and the 'sod wall' raised around it. The roof covering consisted of wattling

interwoven with straw, over which strips of thin turf were laid and pegged down with wooden pegs (White Marshall & Walsh 2005, 25). Turf-and-earth houses are said to be easy to erect and to benefit from speedy building using lots of hands. Turf walls are said to provide 'unfailing insulation from the cold' (Sigurthardottir 2008, 4). Modern architects report that earth houses have low R-values – that is they absorb heat easily, but a high K-value, that is they store it well (Easton 1996, 33–5).



Illustration 5.9.3

Reconstructions at Highland Folk Museum in 2013: (a) couples supporting a porch; (b) upright post and tie-beam; (c) dwarf wall of turf on stone

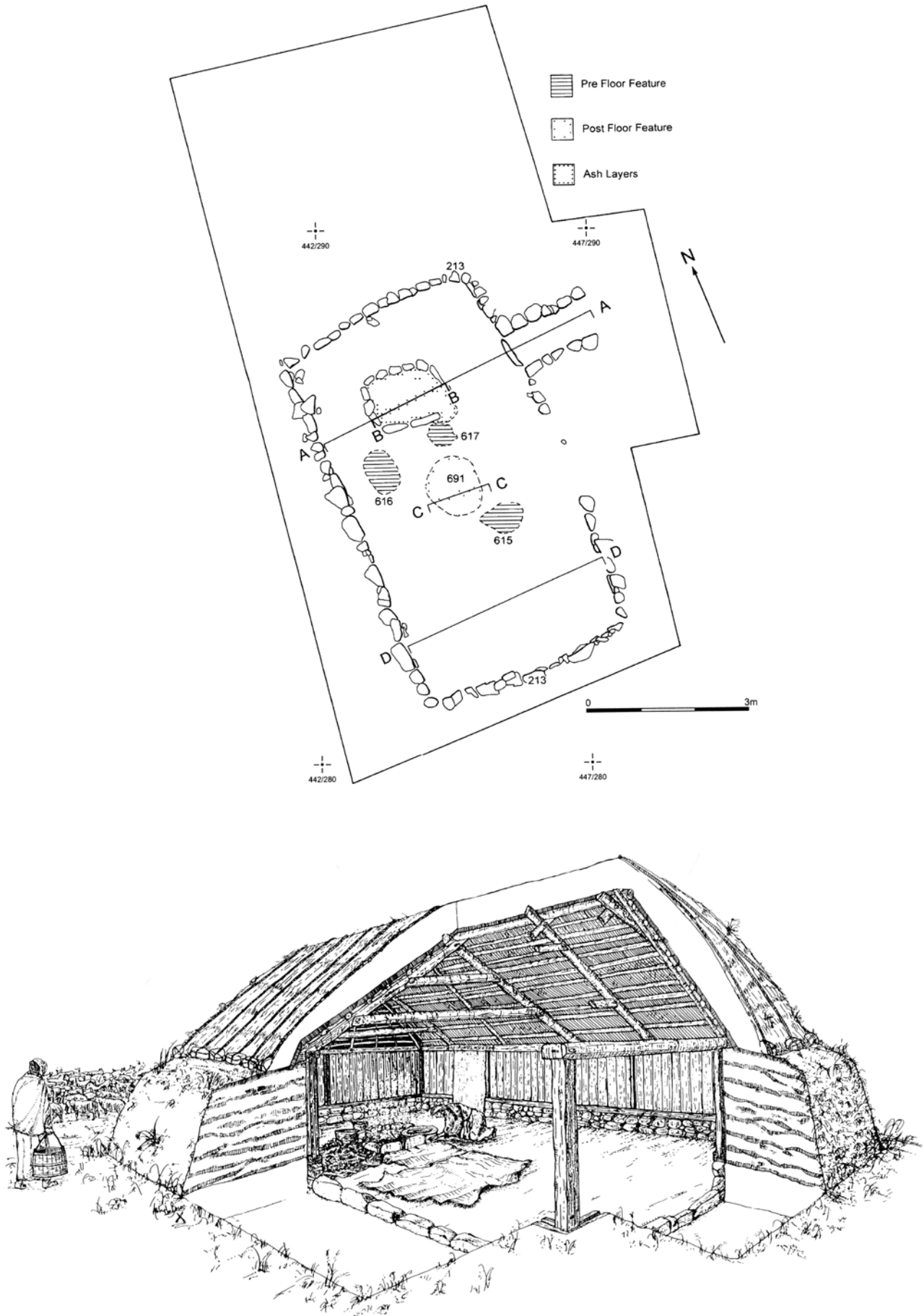


Illustration 5.9.4

Plan and reconstruction of the Viking house in Trench D at Bornais (Sharples 2005 (illustration by Ian Dennis), Figs 36, 107)

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Illustration 5.9.5

S1: overhead view of centre and east end on first definition



Illustration 5.9.6

S1: overhead view during excavation, showing stone-filled perimeter trench F40

Experimental turfing

An experimental turf wall constructed at the Highland Folk Museum in the 1970s was made of turves laid grass to grass and earth to earth, was 4ft (1.22m) wide and rose vertically on the inside and battered on the outside. It ‘stood up well to subsequent abuse, including school children climbing on it, a severe flood which undermined a small part of it but left the bulk standing intact, and the constant attention of sheep and goats’ (Noble 1984, 72). It settled only 6in (15.2cm) in its first year. A second wall with two vertical faces was inherently unstable and could be pushed over. A turf building was erected based on battered walls with pairs of crucks and rafters supported by purlins. This modest construction was demanding on grassland: the walls of a c 12m long building required the stripping of an acre of turf (0.4ha). It was also learnt that it was inadvisable to build in winter, as there was a price to pay in spring when frozen turf thawed. The main architectural problem was how to give stability to short ends, whether hipped or gabled (ibid). More recent reconstructions at the Highland Folk Museum demonstrate the viability of turf-and-stone walls, all-turf walls, and cruck and post-and-beam roof supports (Illus 5.9.2; Illus 5.9.3a, b, c).

Archaeological turfing

The use of turf in prehistoric buildings has been surmised, based on these or

other analogies. The analogies are reasonable since, as Bruce Walker (2006) points out, turf construction would have been familiar in early medieval Scotland from its use in Roman forts and the Antonine wall, and there are good reasons for supposing that the practice has deeper roots than the Roman. Denis Harding’s review of the Iron Age roundhouse notes

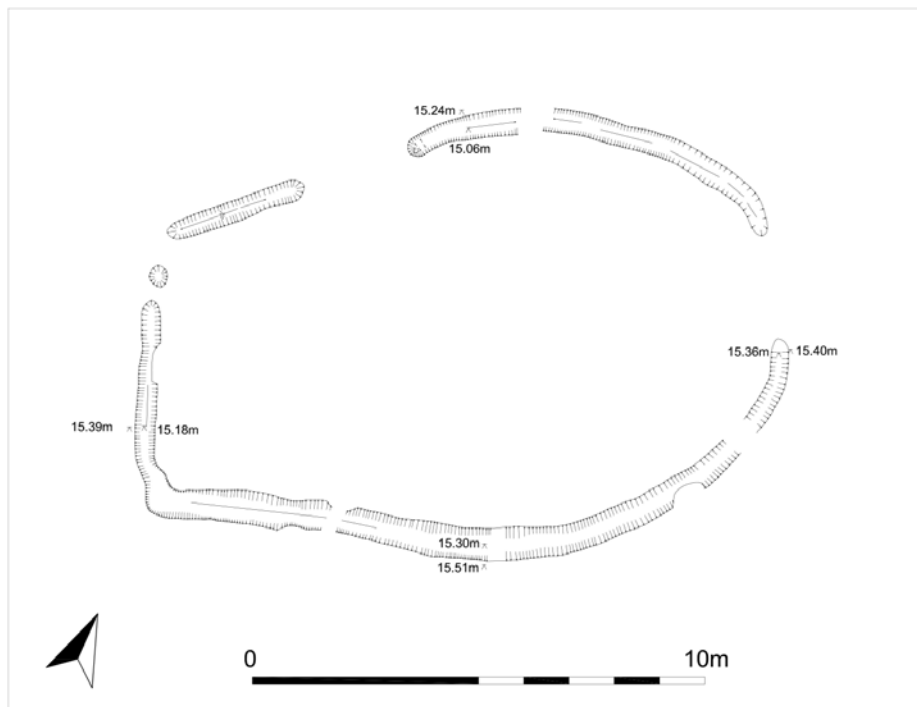


Illustration 5.9.7

S1: plan of the perimeter trench F40

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Illustration 5.9.8
S1: excavating a post-pit

that upright slender stone slabs may imply revetment for turf walls (2009, 51). The use of stone-and-turf coursing was also claimed for Bronze Age roundhouses at Pitcarmick, Perthshire (Carver et al 2012).

Upright slabs were also held to imply turf or sod walls at the early medieval monastic site on Illaunloughan Island, Co Kerry, where they were employed in the construction of two conjoined circular buildings (Huts A and B) and a rectangular oratory, all of the seventh/eighth century AD. The oratory had three post-

holes at the gable end to support the roof (White, Marshall & Walsh 2005, 15, 23). At Pitcarmick, the Pictish 'Pitcarmick-type' houses were dated to the seventh/eighth century and argued to be longhouses, or rather byre-houses, constructed of walls made with turf-and-stone coursing 2m wide, as implied by depth of the 'porch' and the width of the surviving east end of Building E1. Internally they were divided into two, a dwelling area with hearth at the east end and an area for cattle or sheep with a central paved drain to the west. The round ends were thought to have indicated a curved gable supported by 'stabiliser posts', as used experimentally in the 'craftsperson's house' at the Highland Folk Museum (Carver et al 2012).

At Bornais, Mound 3, the Viking house in Trench D survived as an incomplete rectangle of stones marking out an area 4×7.3m internally, with no internal post-holes. There was an entranceway 1.7m long on the east side (Sharples 2005, 53). The perimeter stones made a foundation 30–50cm wide, which was thought inadequate to support more than a dwarf

wall, and the excavator reconstructed the form of the house by supposing that these dwarf walls supported a timber frame joined by vertical timber cladding, and the whole was embraced by a turf wall (ibid, 183; Illus 5.9.4). The width of the wall was suggested by the length of the entrance, which was seen as a passage rather than a porch.

There is therefore some reason to suppose that wall-building in turf, or stone with turf bonding, had been a traditional method of construction in Scotland since the Bronze Age, and during the early



Illustration 5.9.9
S1: examples of primary post settings

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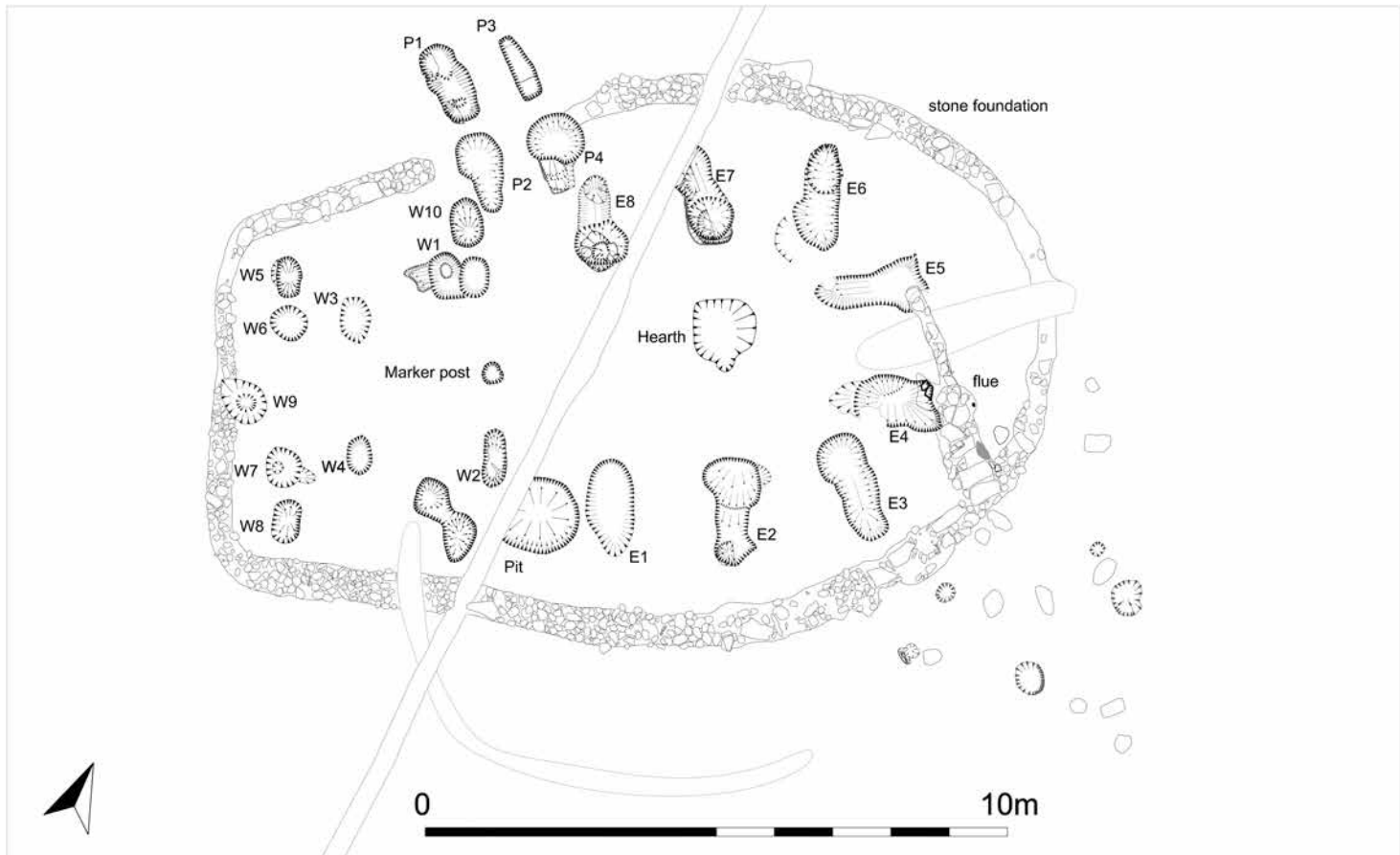


Illustration 5.9.10
S1: master plan

Middle Ages had received additional impetus from the Romans, the Irish and later from the Norse. Structures that have post-holes but no above-ground walls (like S1 and S5) can be seen as more solid and better insulated where a thick turf jacket is employed. Dry-stone walls that appear inherently unstable, for example the boundary walls of the northern workshop, become more credible if proposed as turf bonded. In the northern workshop there is good evidence that turf was also used to cover a stone-cored bank and subterranean structures or culverts (as in Sector 2, Period 2: p 203). The numerous plough pebbles associated with the boundary wall F149 have been attributed to their arrival with turf used as bonding (p 96).

It remains to review the architecture of the major buildings at Portmahomack, and propose how they were constructed and used.

Structure 1

The set of features assigned to S1 in Sector 1 consisted of a cobble-filled foundation trench (F40) giving the bag-shaped form, and a series of internal and external post-holes. It was defined at Horizon 2 (p 20), as a group of post-pits cutting early ard marks and surrounded by a rubble wall (Illus 5.9.5, 5.9.6).

When excavated the plan of the rubble wall was shown to be bag-shaped (Illus 5.9.7). The post-pits, many of them double, contained stone slab pads (Illus 5.9.8, 5.9.9). The spatial layout was unusually clear and symmetrical. A number of other features were assigned to S1 or are considered to represent contemporary activity: a hearth central to the east end of the structure (F65), a stone-lined flue (F79), a large lined pit (F147) containing metalworking debris and a cluster of post- and stake-holes outside the building, thought to represent the position of a stoke-hole for the flue. All these features are shown on the composite plan (Illus 5.9.10).

It was demonstrated by stratigraphic analysis that this composite plan represents two phases of building, the first assigned to Period 2 and the second to Period 3 (Chapter 3, p 38; Spall in OLA 6.1.1 at 3.4.1; Hummler in OLA 6.1.2). The original posts were distinguished by being circular and supported on a stone pad, and having clean sand backfills. Post P4 was cut by the perimeter stone foundation, showing that the stone foundation was an addition to the initial post array. The post-pits of Period 3 mostly held double posts, some with square scantling, cutting through the earlier post-pits and replacing their posts. The stratigraphic history of each is given in Table 5.9.1. The flue had cut through the line of the perimeter stone foundation, indicating

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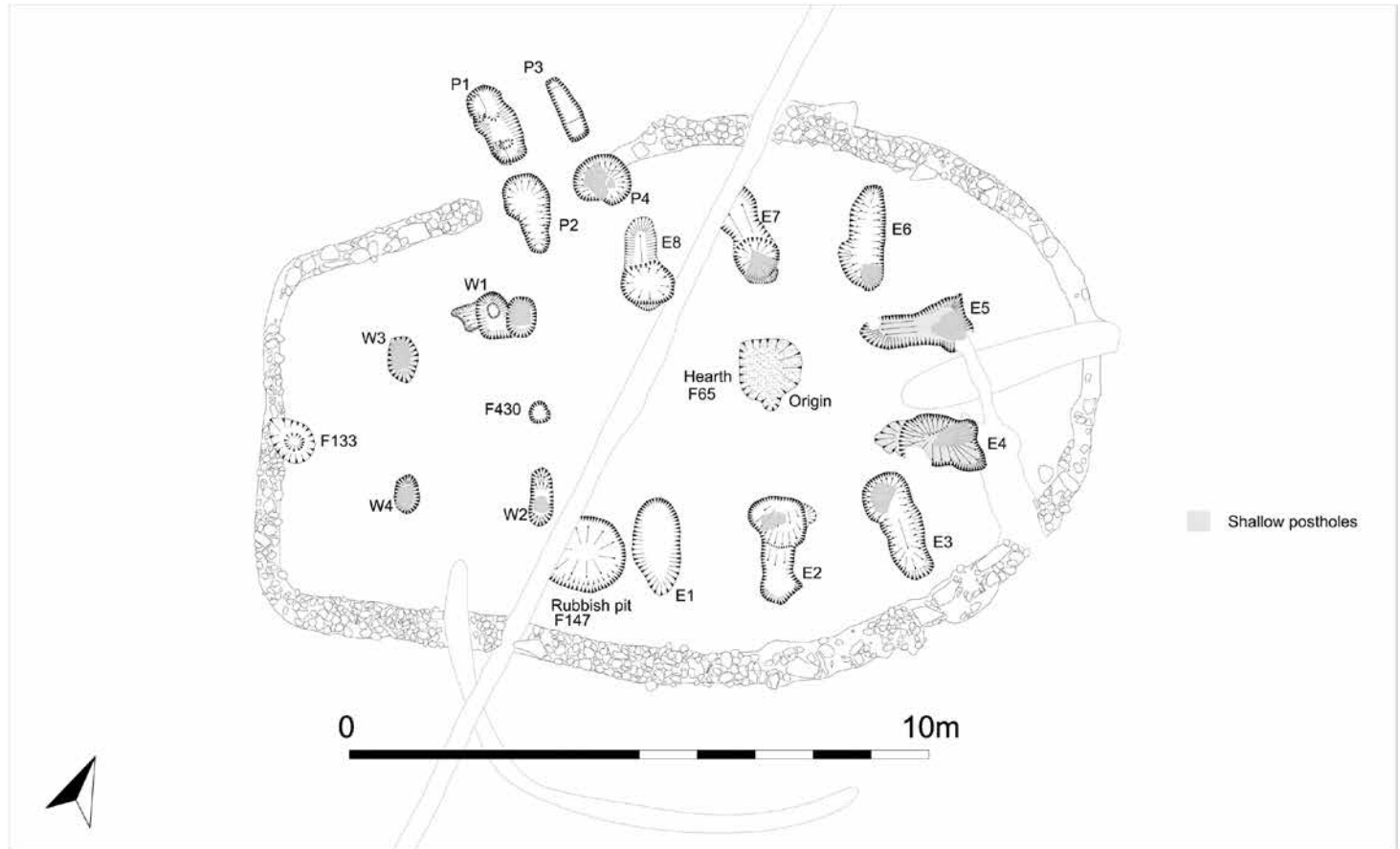


Illustration 5.9.11

S1: plan in Period 2, showing the posts at the east end (E), the west end (W) and the entrance posts (P)

that it belonged to the second phase, and by implication making the hearth redundant. The pit F147 was assigned to the first phase by virtue of its content, which places it with the metalworking of Period 2 (see Chapter 5.7).

On this basis, the Period 2 building consisted of an internal array of single posts, with an entrance and a central hearth (Illus 5.9.11). In the Period 3 layout, the principal roof posts were replaced by double posts, posts were added at the west end, a flue replaced the hearth and an upper story is implied. Here we consider the architecture of S1 in Period 2. Its form in Period 3 is presented in Chapter 6, pp 276–8.

Design of Structure 1

The ground was not terraced, and must have been deemed to be level by the builders. The heights of the post-pads reflected the slope of the subsoil, gently down from 15.0m AOD in the south to 14.71–14.78m AOD in the north. The base of the stone foundation trench also showed a difference in height from 15.20m in the south to 15.10m in the north. This shows that the depths were standardised, but measured from the surface. It is likely that the turf would have been stripped off and stacked, and possibly the topsoil too, leaving a construction surface roughly equivalent to

the surface of the subsoil. Any subsequent accretion of occupation levels had been removed by the plough so that, in effect, the building was excavated from the same ground level at which it had been built.

Post array

The layout of the building showed a precise and unusual symmetry (Illus 5.9.12). A semicircle of six single posts on the east side (E2–7), having its point of origin at a stake-hole to the south of the hearth, was joined from its diameter by three pairs of posts on the west side, forming a trapezium (E1/8; W1/2; W3/4). There was a pair of post-holes either side of the doorway (P2, P4) and a matching pair to the north-west (P1, P3). These four posts formed an entrance. Where measurable from their voids, the posts were circular in scantling. It was not just the spatial arrangement that was symmetrical, but also the depths of the original posts as determined by the voids in the posts pits. Deep post-holes are matched with deep post-holes on either side, while shallow post-holes face each other and even the presence or absence of pad stones is mirrored on each side (see Table 5.9.1). Red sandstone post-pads also formed a distinctive signature of the first phase ('Ps' on Table 5.9.1). The colouration and striation

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Table 5.9.1

Structure 1: structural components (Source: OLA 6.1.1, 6.1.2)
(with the shorthand labels E1, E2 used on the plans)

Key to post structure:

Ps – padstone; Cr – circular scantling; Sq – square or rectangular scantling; 400mm – diameter or width of post where known; 480mm – depth of post from subsoil (including post pad)

	Original (Period 2)	Refurbishment (Period 3)	Dismantling (Phase 3)
East end E1	F150 (Cr 400mm, Ps) (480mm)	F148 (making double; Ps) (480mm)	Removed (F149)
E2	F460 (Ps) (610mm)	F426 (Ps) (310mm) F427 (buttress) (260mm)	Removed
E3	[F429] (Ps) (480mm)	F442 (Cr 400mm) F448 (buttress; Cr 400mm)	Replaced by F439, F441 (buttress)
E4	F472 (Ps) (360mm)	[F472] and F471 (buttress)	[F470, 467 – unrelated]
E5	F47 (Ps) (320mm)	F47 (replacement) and F408	
E6	[F409] (Ps) (510mm)	F49 (320mm) and F52 (buttress?) (200mm)	
E7	F455/473 (Cr 40cm, Ps) (560mm)	F466/462 (Ps) (360mm) and F463 (buttress) (210mm)	
E8	[F402] No Ps (650mm)	F129 (Cr 30cm) (440mm) and F128 (buttress) (110mm)	
West End W1	F118/9 (Cr, Ps) (700mm)	F117 (Sq) (370mm)	
W2	F443 (Ps) (430mm)	F453 (300mm)	Removed
W3	F132 (Cr 300mm, Ps) (150mm)		
W4	F134 (Cr 250mm, Ps) (210mm)		
W5		F435 (buttress to W6); Angle of buttress 60 deg (500mm) F115 (Cr replacement) (260mm)	Removed
W6		F131 (Cr 300mm) (650mm)	
W7		F135 (Cr 300cm) (650mm) F438 (replacement)	
W8		F136 (buttress to W9) Angle of buttress 56 deg. (520mm)	
W9	F133 Marker post	F133 (Cr 40cm) (450mm)	
W10		F114 (Sq, Ps; buttress to W1) Angle of buttress 60deg (500mm)	
W11		F138 (N) (Cr 25cm) (720mm) F138 (S) Buttress (Cr 400mm) Angle of buttress 70deg. (570mm)	
Porch			
P1	[F432] (560mm)	F110 (300mm); F445 (250mm) (buttress) F113/C1783(Sq) (600mm)	F126 Removed
P2	[1767] (800mm)		
P3	[F451] (400m)	F454 (200mm) (Sq); F450/459 (250mm) (buttress); F130 (650mm)	
P4	F461 (Cr; Ps) (750mm)		
Perimeter wall	F40 (1056)		
Heating	Hearth F65	Flue F67/79	
Marker posts	F430 F133	F133 (450mm)	

Top of subsoil at 15.10–15.52m AOD

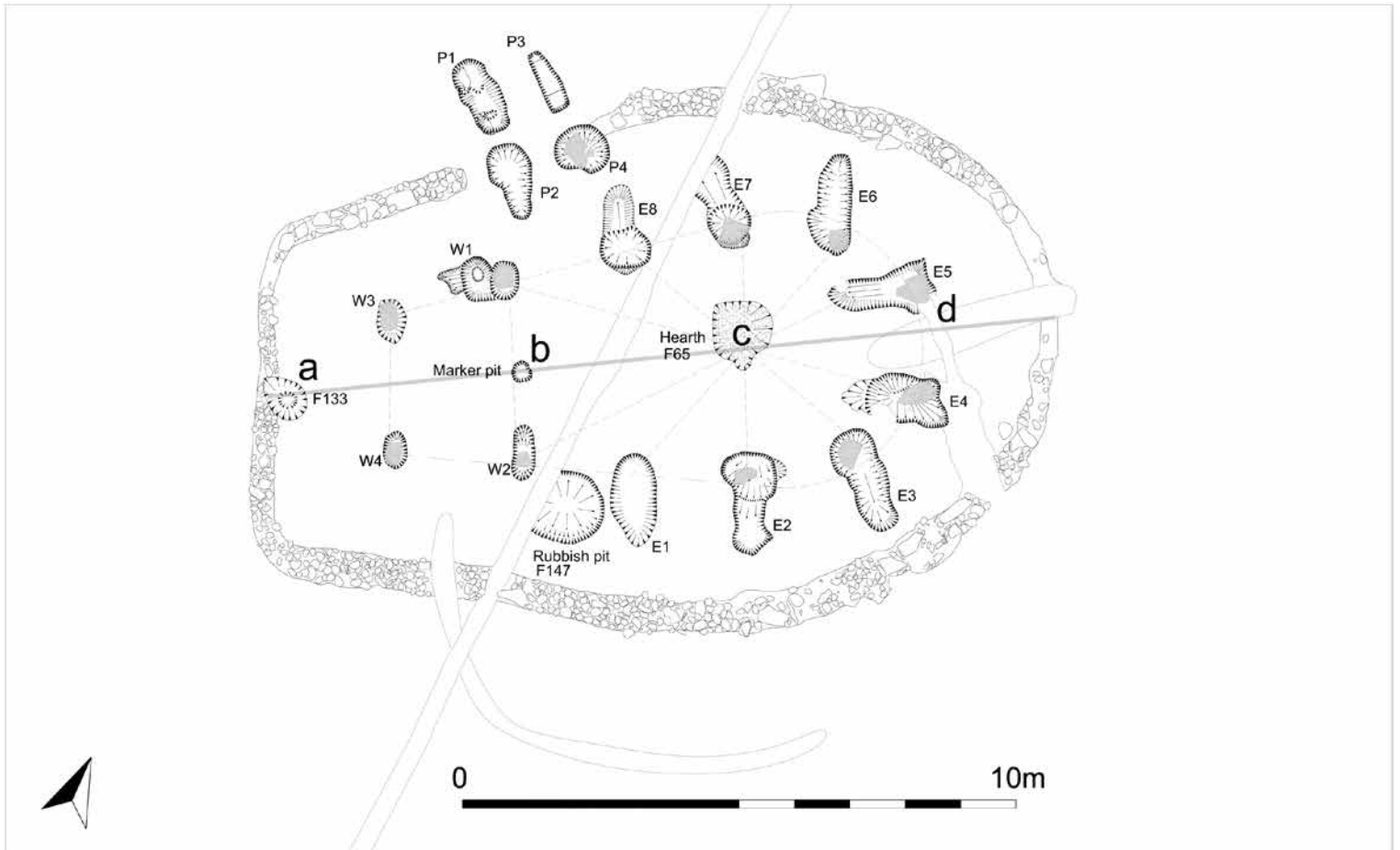


Illustration 5.9.12
Nodal points for calculating the metrology of S1

of the sandstone slabs used for post-pads in some post-holes appeared to match closely, and to have been split along bedding planes from the same original block.

Construction procedure

The hearth is offset from centre, but a small stake-hole lay on its southern lip (see OLA 6.1, Plate 26), which lies at the centre of the semicircle of eastern posts. Taking this point as the origin, the six posts at the east end were laid out on a radius of 5.1m at approximately thirty-six degree intervals. The east end thus resembles a roundhouse with an opening leading out to the west. The post-pits are teardrop-shaped in plan with the deepest, roundest part nearest the hearth. These appear to be primary so should denote the method by which round posts, 400mm in diameter, were pushed upright with their feet on a post-pad. E1-3 and E6-8 are robustly founded at 480-650mm deep. The couple at the east end (E4, E5) are markedly shallower at 320mm and 360mm. These may be posts with a different function to the others, or perhaps they have suffered more from truncation, for example by the insertion of the flue, or later erosion that also removed

the eastern part of the perimeter wall (Illus 5.9.6). However, the recorded heights of the top of the subsoil only reflect the expected gentle slope of the subsoil. The possibility is that these two posts were originally omitted to provide more space, and added during the use of the building in Period 2. This has implications for the design of the roof.

West of the origin post by the hearth lie the sockets of two more marker posts (F430 and F133) each at an interval of 4.1m. These pits belong to the primary planning of the building and mark out its long axis. The post-pit at the west end (F133) was recorded as both cut by the perimeter trench (OLA 7.7, 15), and cutting it (OLA 6.1 at 3.4.1); and possibly both are true. It first served as a mark and then in Period 2 as a larger pit 450mm deep (W9) to support a structural post. A fourth post might be expected on the same axis and at the same interval, but this would be very close to the later (Period 3) flue, and may not have been seen.

This axial line suggests that a curvi-trapezoid form was intended in the initial design. Beginning with the two posts either side of the hearth (E2 and E7), the building continues westwards in three pairs of diminishing span (E1/8; W1/2; W3/4)

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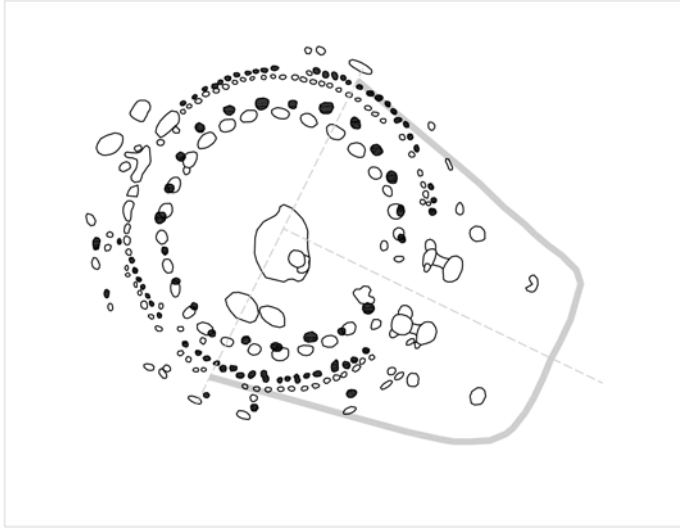


Illustration 5.9.13

S1 as an adaptation of the Pimperne House (based on Harding 2009, 58, Plate 16b)

forming, with the west wall, four bays. The depths of the posts is about half a metre except for E4/5 at the east end (320mm, 360mm) and W3/4 at the west end (150mm, 210mm). There is some uncertainty about which period to assign the four posts at the west end of the building (W5, 6, 7, 8). The setting that omits them has the virtue of symmetry – the perimeter wall is then added at the same distance from all the posts (Illus 5.9.12). The two centre posts W6 and 7 are robust and deep (at 650mm) and they would offer a symmetry of their own to the layout, especially without the shallow pair W3, W4. On the other hand, these posts did not have pad stones (which W3 and 4 do), and are set with a pair of buttress posts (W5, W8) of similar size that suggests a single design. The four western posts have therefore been assigned to the Period 3 rebuild (p 276).

The two door posts, P2 and P4, were massive at 750mm and 800mm deep and are set opposite the second bay. At Period 3 there were certainly two outer posts, such as would imply an entrance porch, and they were elaborate, employing both an upright and a raking buttress. The evidence for two outer posts in Period 2 was more elusive, but the number of recorded cuts and complex stratigraphy suggests that there had been an original outer pair, P1 and P2, in the same place as their successors (OLA 6.1.2 at 5.3.6).

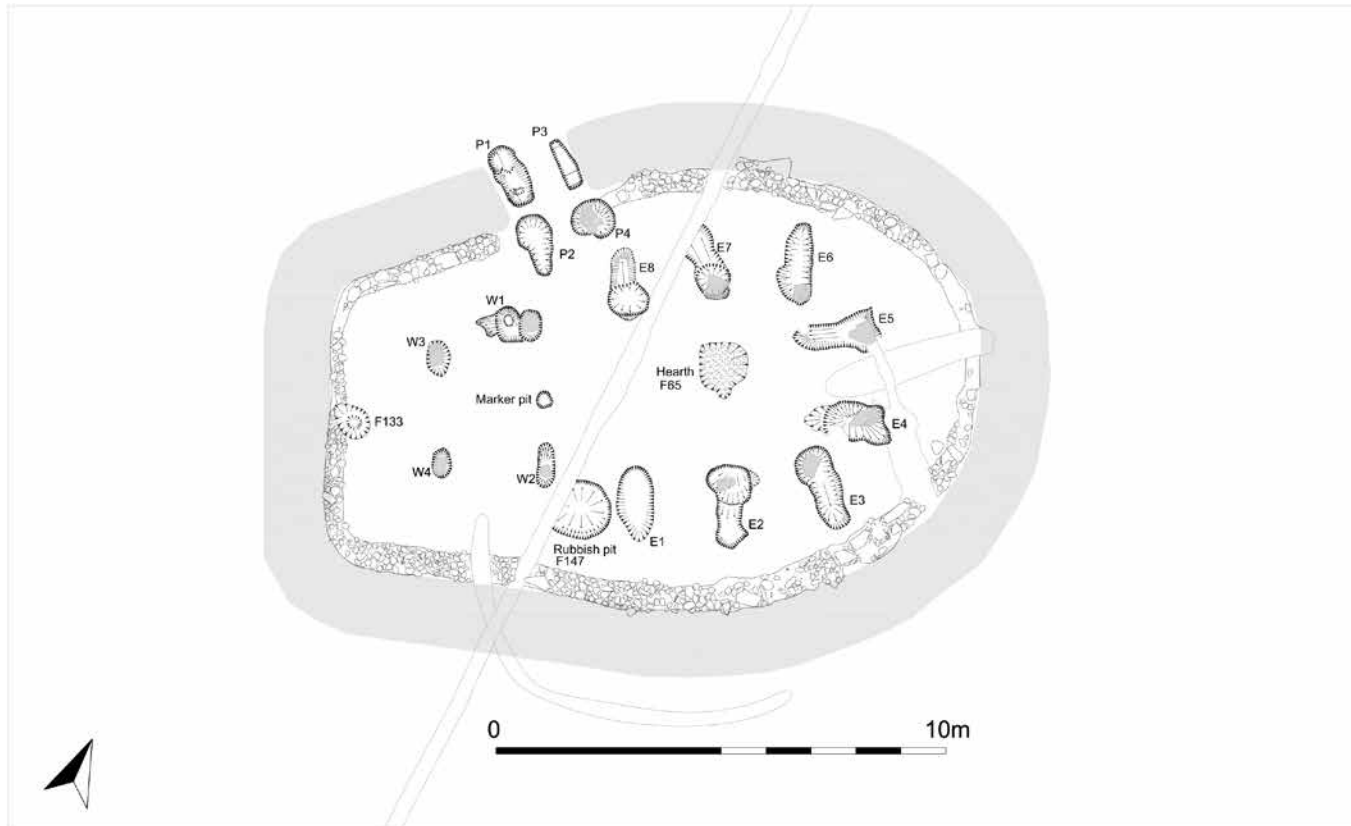


Illustration 5.9.14

S1: reconstructed plan with a turf jacket

Perimeter wall

The form of the perimeter trench consisted of a bowed east end and a straight-ended west end with splayed walls interrupted by an entrance to the north (see Illus 5.9.7). It measured 14.44m at its longest by 9.85m at its widest, internally enclosing an area of c 110m². The profile of the ditch containing the stone wall was U-shaped, and varied in width between 0.15m and 0.45m and in depth between 0.25m and 0.30m. The fill consisted of tightly packed hard round stones set in a soft silty sand matrix; the cobbles were interlocked, resisting excavation. The most likely source for the pebbles and cobbles is the beach: a large piece of eroded whalebone found its way amongst the cobbles in the foundation trench. The wall trench cut door-post P4, implying that the timber

could be explained by the availability of different-sized crucks, controlling not only the width of the building but the height of its roof. In this case the roof would run down westwards and eastwards from a high point over the hearth.

An alternative that respected the integrity of the circular design would be to treat the east end as a roundhouse, with a western extension attached as an exaggerated, elongated porch. The rafters would rise from the ground like a tent, bound together at the top, and deriving their principal support from a ring-beam carried by the circle of posts, as at Pimperne (Harding 2009, 38, 58, pp 200ff; Illus 5.9.13). This results in the maximum free space around the hearth in the centre. At Pimperne, an outer ring of small post-holes or stake-holes suggests a ‘stake and rice’ wattle wall, and outside this a turf jacket for which this provided the ‘wainscot’. The porch was joined to the roundhouse using short stout posts to create a rectangular lobby, like the entrance to a circus tent. It would have a gabled roof joined to the roundhouse roof by interweaving the thatch (ibid, Plate 15, 16). Once this is achieved there is no reason why the porch should not continue for some distance. It would terminate in this case with a wall rather than an entrance (our entrance being in the north wall).

The feet of the long rafters implied by this ‘long-nosed roundhouse’ could be anchored in the stone filling of the perimeter ditch, which could also function as a soakaway. The perimeter ditch could also serve as the foundation for a dwarf wall, on which a turf wall was erected (as proposed for the seventeenth-century building at Inchmarnock: Lowe 2008, 232, 238–41). But at less than half a metre across it would not provide a substantial platform. Here we

propose that it marks the inner revetment of a broad turf wall, providing a soakaway and supporting panelling to provide the wainscotting for the interior turf jacket. Accepting the example of Bornais (above), the four entrance posts would form not a porch but a covered corridor through the turf wall, which would in consequence be c 2m thick (Illus 5.9.14).

An alternative adaptation of roundhouse architecture might use upright posts lashed to a continuous ring-beam and tie-beams between posts. The tie-beam, especially at the east end, could be equipped with a king-post to help carry the weight of the meeting point of eight rafters. From the outside this would look much the same as a cruck frame, but would require more carpentry, particularly the cutting, shaping and joining of timbers (Illus 5.9.15). The disadvantage of proposing such a scheme is that it stands out from both the later (Scottish) ethnographic tradition and the earlier buildings in the Pictish heartland (ie at Pitcarmick), both of which invoke crucks as the preferred method of roof support. It would require us (as at Pitcarmick) to look south

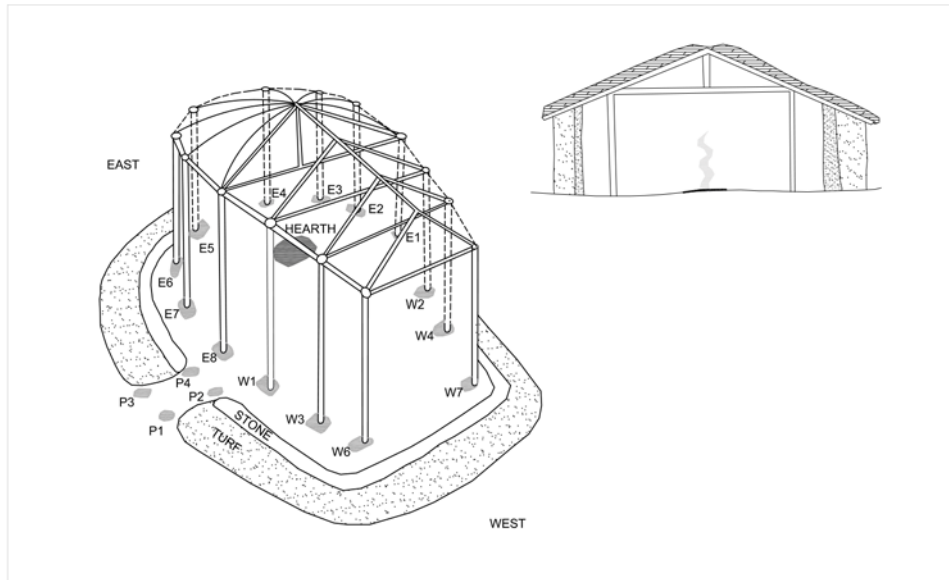


Illustration 5.9.15
S1: three-dimensional reconstruction

posts were erected before the wall was founded. The sandstone slab fragments, some quite substantial, were similar to those used in the post-hole construction and may represent waste from splitting and dressing packing and pad stones.

Interpretation

Accepting the plan shown in Illus 5.9.11 and 12, we can advance some ideas for the walls and roof of such a building, in the absence of its superstructure. Armed with the analogies and microfloral evidence from the site (above), it would be logical to propose that the post array (built first) supported a roof of heather thatch and/or turf, and the walls depended on turf and wattle for cladding, revetted by a stone or plank wall on a stone foundation, as at Bornais (above, Illus 5.9.5). One solution for the roof would be to suppose that all the major post-pits were actually seating for crucks of variable span. This would work for the three pairs of the trapezium, and possibly for the three pairs around the hearth (ie all apart from E4 and E5). As indicated above, the variable span

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as well as west for exemplars. The meticulous excavation of Brian Hope-Taylor at Yeavering revealed a striking level of architectural sophistication and engineering precision in seventh-century Northumbria, and so opened a door that cannot easily be closed (1977, 147). His trail has been followed by a number of studies that exemplify or refine his conviction that early medieval building in Britain was architectural and followed a measured design (Millett & James 1983; James S et al 1984; Marshall & Marshall 1991; 1993; Hamerow 2012, 22–3). While the rectangular double-square plan, opposing doorways and load-bearing plank walls of the English examples will not be invoked here, other innovations such as frames of upright jointed squared timbers set in deep post-holes, tie-beams, rafters and repeated metrology deserve to be given a hearing. Since the works of sculptors and metalworkers reveal close contact between north and south there seems no good reason to deny it to the architects that housed them.

Metrology

In Chapter 5.7 we argued for the use of S1 in Period 2 as a workshop for metal-smiths engaged in making sacred vessels. For this reason, it need not surprise us if a passion for geometry and elegance of form was applied to their building. We have already noted some geometrical niceties in the way the ground plan was conceived and laid out using measures of length and angles. Its remarkable symmetry has also been suggested to indicate an example of metrology, in which the spacings and span of the post setting follow a simple mathematical concept (Carver 2008a, 128–32; cf Hope-Taylor 1977, 122–47). The lengths on the ground between post settings were recorded archaeologically in metres, and it was found that these lengths could be converted to whole numbers using a unit of measure equivalent to twelve and a half English inches – dubbed the Tarbat foot, equivalent to 31.75cm. Distances in *Tarbat feet* embodied in the building are shown in Table 5.9.2 (see also Illus 5.9.12). Given that the original marking

out of post positions has vanished, we should not count on a precision of finer than 100mm for the distances between them. However the distances as paced out are clearly symmetrical so we are permitted to believe they were measured, and if measured, meaningful. Although the figure given for the Tarbat foot claims no great authority, let alone ubiquity, it is a legitimate way of expressing the chosen lengths used in S1, and more particularly the ratios between them. The intention is only to respond to a case of evident cognition and explore a little the methodological mind that was plainly operating in the eighth century.

The modules used for laying out can all be obtained from a single standard length (=1), doubled to give twice as long, and each length added to the previous, so 3, 5, 8, 13, 21, 34 ... It is these numbers, rather than simple multiples, which appear to feature in our table. These numbers will be recognised as the beginning of the Fibonacci series, which works on this principle (each number being the sum of the two previous). The ratio between one number and the next in the series eventually tends to the Golden Section (0.618), the proportion in which a line is divided ‘so that one segment is to the other as that to the whole’ (Chambers Dictionary; $1.618 \times 0.618 = 1$). Together with its inverse, the Golden Number (1.618), the Golden Section has been valued by artists for millennia. Fibonacci used his series to express the rate at which rabbits multiply and show it would eventually stabilise, but the series occurs also in plants and notably in shells, where the spiral is a progression of curves of increasing radii, in which each radius is a multiple of 1.618 times the one before. The plan of our building is a semicircle joined to a trapezium, where the base of the trapezium is coincident with the diameter of the semicircle. The ratio of the shorter side (the west wall, 21Tf) to the length (34Tf) is 0.62. The ratios of the spans used in the trapezium is 0.625 (10/16) and 0.615 (8/13). This is not to say that anyone was working in decimal points or even by multiplying or dividing these numbers. If a piece of twine is folded in half, and added to

Table 5.9.2

Measurements of post-hole spacings of S1 in Tarbat feet (1Tf = 31.75cm)

The length of the stone foundation (external) was 14.44m and its width across the hearth 9.8m

Length	Metres on the ground (to nearest 10cm)	English inches	Tarbat feet
Span E2–E7	5.1 [radius 2.55]	200	16 [radius 8]
Span E1–E8	4.1	162.5	13
Span W1–W2	3.2	125	10
Span W3–W4	2.5	100	8
Span of Entrance	1.6	62.5	5
Width of Perimeter aisle	1.6	62.5	5
Length of W wall	6.6	260	21
From F133 to F430 (a–b)	4.1	162.5	13
From F430 to origin (b–c)	4.1	162.5	13
From origin to end (c–d)	2.55	100	8
Length from West end to perimeter of east circle (a–d)	10.75	425	34

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Illustration 5.9.16
Perimeter wall of S3

half itself (making three) and added to the original (making five) and this is added to the three (making eight) and this to the five (making thirteen) and so on, a builder has a number of measures that, without attributing to them any figure, bear a satisfying relationship to each other.

As well as having a practical function, it is not improbable that these natural properties had sources in traditional spirituality, and maybe they should be numbered among the intellectual gifts of Christianity. Given the context in which the Period 2 smiths were working, the resemblance of S1 to an apsidal church can scarcely be accidental. However we should also recall what our research has continually striven to recognise: the prehistoric roots of even so abstruse and monkish a matter as metrology. Metrology has been sought and found in monuments from the Neolithic onwards, with greater or lesser conviction. In the

present instance we could simply note the Iron Age propensity for axial symmetry, and note Denis Harding's opinion that there seems to be good evidence for the use of metrical conventions in the grander timber roundhouses and brochs (2009, 59). These conventions may be of a learned or Mediterranean character (ibid, 295), but it seems as likely that early art and architecture derived its rules from relationships long observed in nature, like those in a spiral shell, and incorporated them into their own contributions to creation. A study of the Hunterston Brooch implied the use of a metric in metalwork that was aware of both Roman and Irish practice (a foot measuring 32.64cm was recognised: Whitfield 1999, 311).

In S1 it is possible to see a genuine piece of architecture, in which the mechanics of building are harnessed with devotional lore to create an elegant, warm environment suitable for the creative motor of the worker in precious metals.

Structure 3

S3 was a curvilinear feature filled with cobbles which echoed the form of the S1 perimeter wall in plan and composition. Most of it lay beyond the northern limit of the intervention to the north, and no post-holes were seen (Illus 5.9.16). It was probably of Period 2, sharing with S1 an attraction for animal bone (Illus 5.8.1). The implication is that S1 did not stand alone (OLA 6.1 at 3.3.3).

Structure 9 (OLA 6.2.1, 3.4.4)

S9 was the focal space in the northern workshops (Chapter 5.6, p 195; Illus 5.6.2). It had been greatly disrupted by subsequent activity meaning its plan was hard to read (Illus 5.9.17). This



Illustration 5.9.17
S9 under excavation, seen from the west

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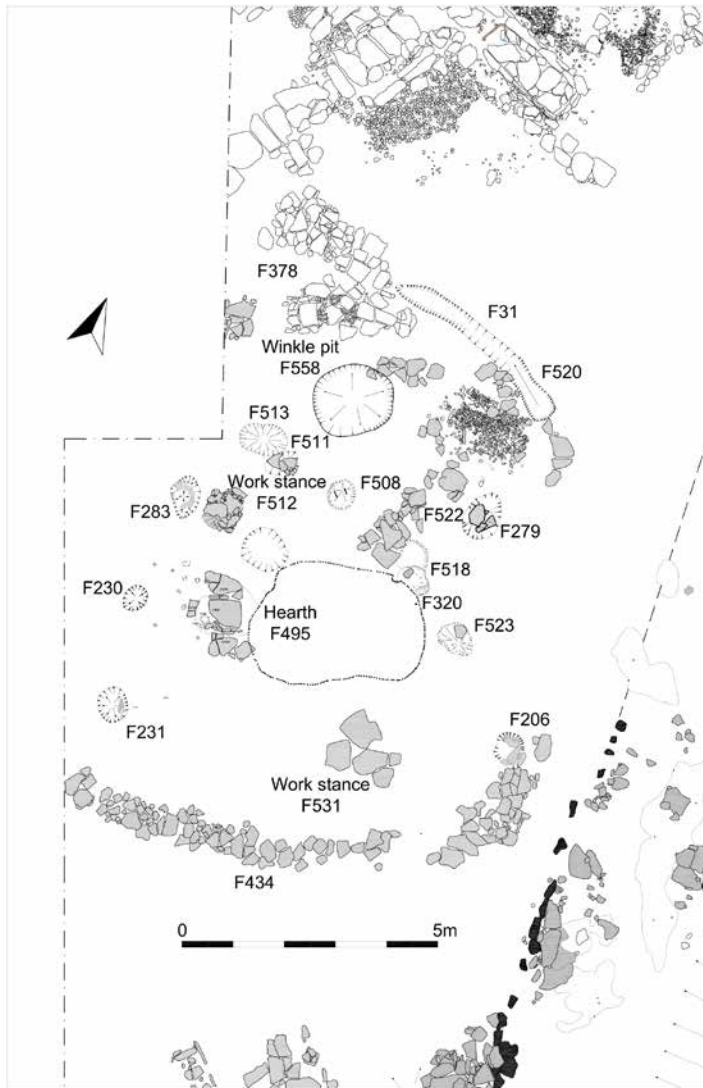


Illustration 5.9.18

S9: plan showing principal structural elements

was in contrast with the other purpose-built workshop, S1, but there were hints that S9 was a building contrived from similar materials and possibly having a similar form. S9 was defined in the north by a curving gully (F31) and a platform of slabs (F378), in the south by a curving dry-stone wall (F434), and in the centre by nine major post-holes (Table 5.9.3) and a hearth (F495). The east end was largely missing where it meets the road and the west end remained inaccessible beneath the baulk. Taking the south walling and the north gully as a guide, the area encompassed a semicircular zone with a radius of 4m (compared with the 4.9m external radius of S1) and an axis NW–SE (Illus 5.9.18). The post-holes within this locus present no obvious pattern, and the stance F512, not the hearth F495, would lie at its centre. On analogy with S1, three pairs of posts would be expected within the semicircle. The structure is aligned to the south-east where it just touches the road. Again on analogy with S1, its entrance

would coincide with the metalling of S4. By the same token, the exit culvert of S4 would pass into, through or under the western bay of S9. If the form of these features recalled that of S1 (above) it was less clear how the S9 structure stood up, or indeed that it was a structure. The use of the S9 area as a workshop was intensive, and the same area was subject to repeated visitation in Periods 3, 4 and 5. Defining the character of the structure proved harder than determining the nature of the craft practised within it (Chapter 5.6).

Preparation

Overlying Period 0 buried soil and possible podzol was a thin, patchy layer of charred organic material identified tentatively as burned scrub, overlaid by spreads of redeposited sand and gravel subsoil. Clear views of these levelling deposits were afforded by the excavation of the hearth, which showed them to be confined to the south interior of S9 and particularly beneath terrace wall F434. Conversely, to the north of the building, a slight depression in ground level coincident with the line of the northern post-holes



Illustration 5.9.19

(a) and (b) clay silts representing burned turf walls in S9

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Table 5.9.3
Structure 9: post-holes

Feature no	Contexts	Description
F206	<i>packing</i> C1566 <i>post void</i> C1579 <i>backfill</i> C1566	possible principal on southeast side, 0.40m × 0.30m × 0.30m deep
F230	<i>backfill</i> C1615	principal on west side, truncated, 0.45 diameter × 0.20m deep
F231	<i>backfill</i> C1616 <i>post void</i> C1697	principal on west side, truncated, 0.70m × 0.60m × 0.35m deep
F279	<i>backfill</i> C1706; C1679; C1716 <i>packing</i> C3463	principal on north side, 0.95m × 0.70m × 0.70m deep
F283	<i>packing</i> C1825 <i>backfill</i> C1696; C1824	principal on west side, 0.85m × 0.60m × 0.55m deep
F320	construction backfill and packing C1821 post-void backfill C1772	internal and possible pair or replacement with F518, 0.70m diameter × 0.55m deep, possibly related to threshold
F508	<i>construction backfill</i> C2881 <i>primary burning over</i> C2863 <i>post-removal levelling</i> 2880	internal, 0.60m diameter × 0.50m deep, signs of charring during primary burning, possibly related to threshold, post removed
F511	<i>construction backfill</i> C2978 <i>packing</i> C2953 <i>backfill</i> C2979	internal or possible pair/replacement of principal F513, 0.60m × 0.40m × 0.25m deep
F513	<i>backfill</i> C2980 <i>post-pipe backfill</i> C2981	principal and possible pair with F511, 0.95m × 0.60m × 0.50m deep
F518	<i>construction backfill</i> C3006 <i>packing</i> C3004 <i>burning over backfill</i> C2992; C3003	internal, 0.50m diameter × 0.50m deep, possible double post-hole or replaced by F320, possibly related to threshold
F523	<i>construction backfill</i> C3101 <i>packing</i> C3102 <i>post void</i> C3100 <i>backfill</i> C3098	internal, 0.70m × 0.60m × 0.50m deep

of S9 was detected. The footprint of S9 has therefore been prepared by creating a terrace demarcated to the south by the line of small slabs that constituted F434.

Post-holes

Several post-holes within S9 cut directly into the levelling layers and contained only material derived from them in their backfills. These provided the primary criterion for membership of the S9 group, and they are listed in Table 5.9.3. A series of post-holes have been defined as *principal posts* defining the wall lines of the structure (shaded in Illus 5.9.20), while a second group delimited by the first seem to define *internal* structures. Two sets of post-holes (F511/513 and F518/320) were located close together and may represent double settings or alternatively the replacement or removal of posts during a building's life. Many of the post-holes, both principals and internals, were identified by the presence of sandstone packing around a likely square timber post, all of which had been removed. Others were not supported by any packing stones, although neither type was consistently deployed in plan.

A curved western alignment of principal posts (F231, F230, F283 and F511/513), embraces the hearth and stance (F512) and appears to respect them. A curving row to the north-east (F511/513, 508, 518/320, 523) also suggests structural purpose, perhaps an enduring one since two posts had been replaced. F206 was a post-pit near the apex of the semicircle. Otherwise, posts on the south side were comparatively elusive. Several scoops were excavated immediately to the north of F434 but none could conclusively be said to be post-holes. A number of structures for stretching and drying hides such as beams, racks or frames might be invoked for at least some arrangements of internal posts. Nails and other items of possible structural ironwork found in S9 suggest the construction or repair of a timber frame. The *wall* (F434) was made with level, tessellating sandstone slabs with voids between the slab make-up, filled with small mixed gravel. It was not a foundation, but a shallow slab wall that defined the likely southern limit of a terrace of redeposited subsoil laid to prepare the working area of S9. Burnt bullrushes were found on the floor suggesting the structure was roofed.

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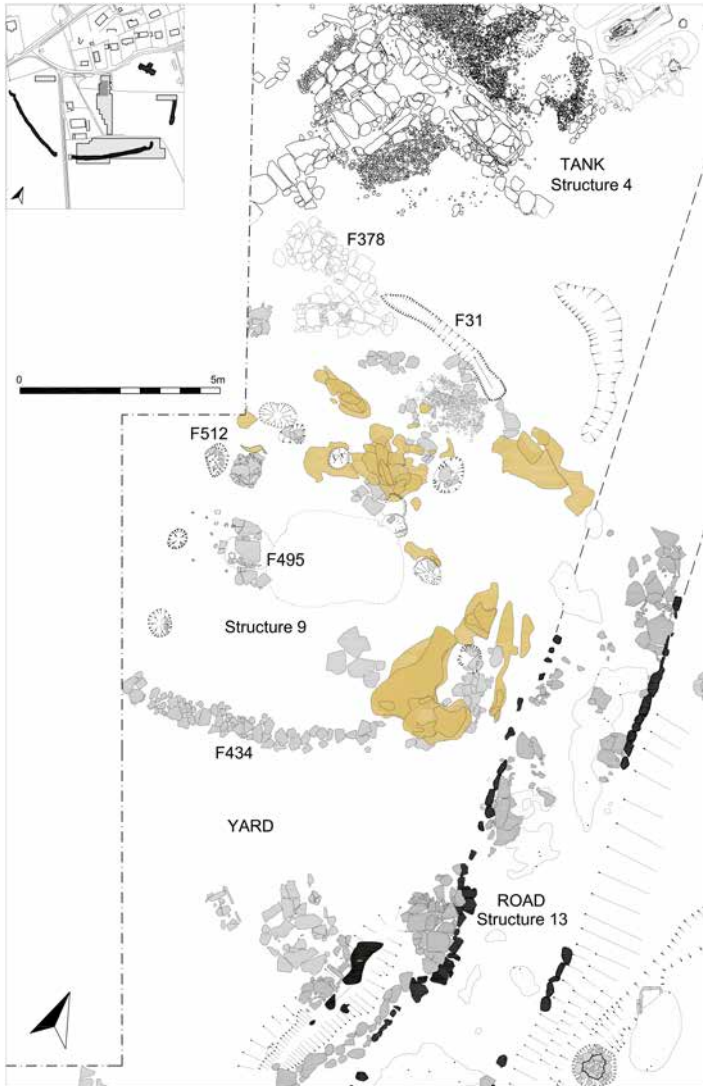


Illustration 5.9.20

S9: plan, showing distribution of clay silts, probably deriving from burned turf walling (ochre stipple)

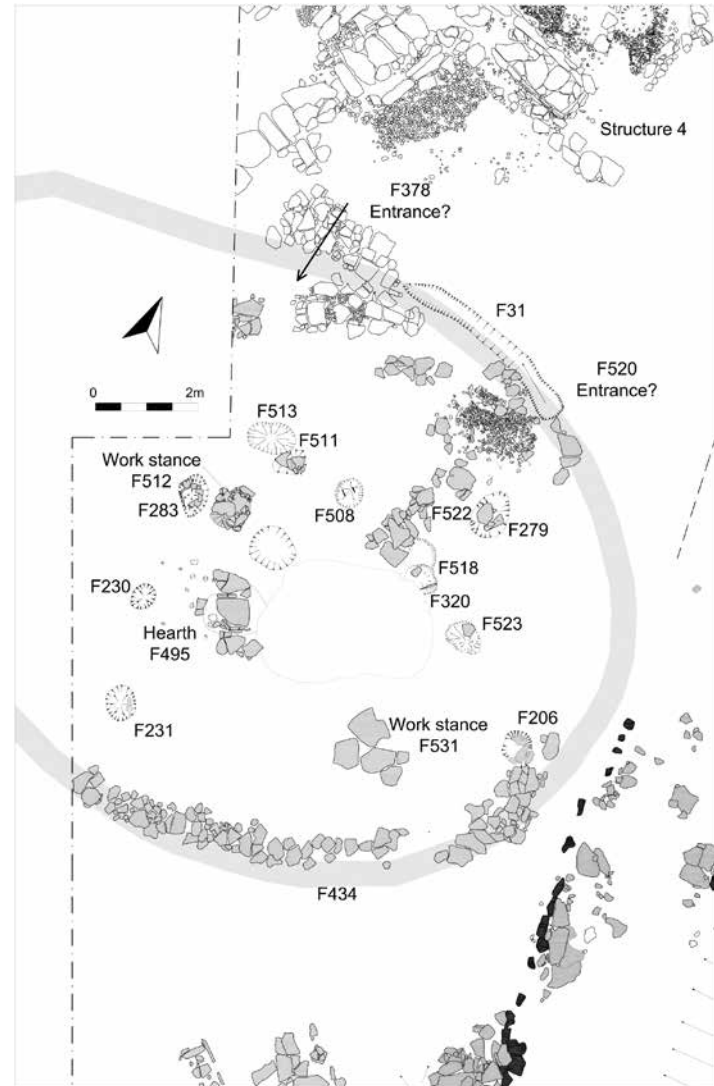


Illustration 5.9.21

Plan showing hypothetical form of S9

A possible *entrance* from the north-east was marked by a small area of slab hardstanding and cobbled surface (F378) that linked S9 to S4. Slabbed and cobbled patches (F514, F520) leading to a series of stepped slabs (F522) suggested one possible itinerary within the building. Surface F520 was made of rammed pebbles consolidating an area measuring approximately $1.50 \times 1.0\text{m}$, with a setting of small red sandstone kerbs, at least on the western side. The kerbs suggest a deliberately laid feature leading to the north of S9. The uppermost stones of F520 were largely level and this had been achieved by stacking the stone make-up increasingly towards the southern end to compensate for the slope down into the interior of the building. The group of features has thus been interpreted as a stone-built threshold and walkway, but it may have had an industrial purpose. Inside the S9 space were two work stances (F512, F531), essentially piles of slabs providing a worktop at waist height, a hearth (F495) and two lined pits filled

with winkle shells (F558, F575 the first shown on Illus 5.9.20). The function of these features is discussed in the context of vellum-working in Chapter 5.6.

Turf walls

The hypothesis for the superstructure of the building is based on the premise that turf was probably employed as a primary building material. Clayey-silt ash consisting of turf- and peat-ash was encountered in many places in and around the northern workshops (Illus 5.9.19). Interpretation of these deposits was usually guided by their immediate context. In hearth fills, they were interpreted as fuel (p 222), but elsewhere they occurred as layers of made ground often interleaved with dark silts, including as ad hoc surfacing of the road. These are residues attributed to the site-wide fire that consumed the workshop area. Within the

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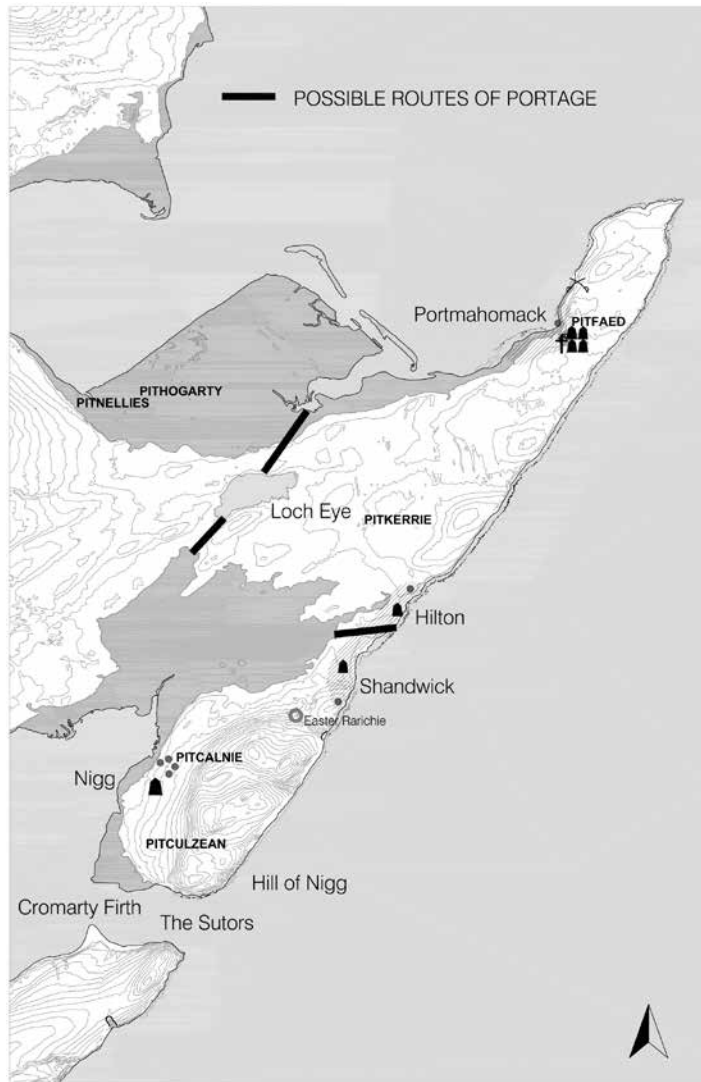


Illustration 5.10.1

Model of the geography of the peninsula in Period 2, showing Pictish places and possible route of portage

area of S9, their distribution follows the footprint of the building, raising confidence that they are owed to the conflagration and collapse of walls largely raised in turf (Illus 5.9.20).

Assessment and verdict

The form of S9 remains uncertain. The patterns offered by the posts were neither straight nor circular and did not resemble the configuration of S1. The lines of neither gully F31 nor wall F434 were true curves onto which a form like S1 could be mapped, and neither constituted a solid form in the manner of the S1 perimeter wall. If S9 continued in the manner of S1 it would collide with the exit culvert from S4.

A possible alternative is that S9 represents an outdoor yard similar to that contiguous with it immediately to the south. Such an upper yard, on a levelled platform demarcated by wall F434,

would represent a major workspace serving the tank S4, to which it had once probably enjoyed fully paved access. The structural posts may possibly have supported two curving windbreaks protecting the hearth area from the north-east and north-west, or racks for suspending hides. Turf could have been stacked and dried for fuel or employed in cladding the windbreaks. It might be concluded that the processing of hides and the generation of astringent ash are activities more appropriately and more agreeably conducted out of doors.

However, post-holes 500mm across and 500mm deep (the principals) ought to have been load bearing. The burning pattern left by the fire is a good indication that turf structures were employed. The area of S9 defines a persistent space with a long-lived hearth near its centre and the delicate work of preparing high-quality hides for parchment, as argued in Chapter 5.6, would demand shelter. Our verdict is that S9 was a building, probably not unlike S1 in its original form, but frequently modified during its life and destroyed by fire (Illus 5.9.21).

5.10 The Peninsula

Introduction

Three famous carved stone Pictish monuments of the Tarbat peninsula stand at Nigg, Shandwick and Hilton of Cadboll (Illus 5.10.1). They are among the largest and grandest of the known Pictish cross-slabs, each up to 3m high and 1m broad, carved in relief with elaborate ornament and pictorial scenes. All three have been thrown down and re-erected at least once, and their original sites remain uncertain, although the cross-slab at Shandwick is thought to be at, or very near, its original location.

Together with Portmahomack, where four large crosses stood, these indicate four sites that were certainly active on the eighth-century peninsula. Their locations coincide, or nearly, with the main concentrations of Iron Age burials, which in turn



Illustration 5.10.2

Map of the Tarbat peninsula by John Speed, before 1610

map on to the most accessible beachheads on the north-west, east and south-west sides (Chapter 3, p 61). Inference of a Pictish presence is given by the site of Easter Rarichie, a site of probable Iron Age date that was still significant in the Middle Ages (p 318). Four place-names in ‘*Pit-*’ may indicate former Pictish estates. The name of the peninsula itself, Tarbat, is derived from Gaelic *tairbeart* (overbringing) implying its use as a portage. (The place-names and monuments on the peninsula are assembled in Digest 8.)

It was suggested in Chapter 2, p 28, that the form of the Tarbat landscape in the first millennium and earlier was more evidently that of a peninsula, with a broad isthmus linking it to Tain and the mainland. The eastern seaboard is a continuation of the geological fault that runs across Scotland as the Great Glen. By virtue of its geographical situation at the south-west end of the peninsula, the Nigg area is likely to have been the principal focus of settlement on the peninsula in the early prehistoric period (Illus 4.28). It is sheltered by the Hill of Nigg, and lies adjacent to the strait between the North and South Sutors that provides an entrance to the Cromarty Firth from the open sea. There were landing places in the Bay of Nigg and probably at North Sutor where the ferry now comes in. It had the earliest cluster of prehistoric burials near the North Sutor, and the grand cross-slab (and the medieval chapel) face the Bay of Nigg.

Read from the recent contours, the Hill of Nigg was itself nearly an island, joined by a narrow isthmus to the rest of the peninsula. At the south end of this isthmus was the fort of Easter Rarichie, and the Shandwick cross-slab overlooking Balintore bay. At its north end is the Hilton cross-slab, the Chapel of St Mary’s and the deserted medieval village of Cadboll Fisher. Here there is a shingle beach that has periodically acted as a landing place. There are other potential landing places for small light boats, provided by inlets and flat rocks at many points along the long east coast of the peninsula. But the best landing place on the peninsula is that at Portmahomack, with a broad sandy beach at the back of a bay looking on to the relatively sheltered Dornoch Firth. In the first statistical account it is recorded as the haven where vessels running to Dornoch or Tain may take shelter when overtaken by storms, and ‘there is not in the northern part of Scotland, and what is called the low country, a place better calculated than Portmahomack, if so well, for a fishing station, from convenience of its harbour, its nearness to the sea where the fish is to be found, proper ground adjoining whereon to erect houses, and plenty of excellent freestone at hand to build them’ (FSA, 643).

There is much still to discover about the Pictish presence on the Tarbat peninsula. Here we review briefly the known character of the four main sites preceded by the possible route and period of operation of the portage.

Portage

The *prima facie* case for a portage lies in the coincidence between the place-name and the geography of the peninsula. The greatest advantage to a mariner would lie in a route between the Cromarty and Dornoch Firths, since this would connect two areas of relatively calm waters and avoid running round the Ness

and through the Sutors. Speed’s Map of the early seventeenth century implies that the Bay of Nigg was then deeply indented (Illus 5.10.2). Assuming that land has acquired a mantle of sand since then, there is a case for supposing that bays both north and south of the peninsula once offered sheltered access to the firths. The southern part adjacent to the Bay of Nigg is the area most likely to have been reclaimed through the importation of soil by Fearn Abbey (see p 221). Given this more accentuated landscape, a second portage suggests itself beginning at Hilton, connecting the eastern seaboard directly with the Bay of Nigg. Since at least the Iron Age, the three main centres of population, as indicated by burial, would appear to have been Portmahomack, Balintore/Hilton and Nigg. These are the places marked by the great cross-slabs in the eighth century, and also the most likely landing places, so a connection by portage is not improbable.

A portage route that connects the Dornoch and Cromarty Firths can take advantage of the perched lake of Loch Eye, formerly Loch Slin (or Flynn). Loch Eye today is only eight feet deep, raising the possibility that it was created or enlarged by digging, as at the Norfolk Broads, created through peat extraction by medieval monasteries and averaging less than thirteen feet deep (Lambert 1960). This might align with landscaping operations instigated by Fearn Abbey, including the introduction of plaggen soils (above). However, the contours support the existence of a natural depression at this point, which could therefore have provided a long-lived water catchment. Pont’s Map of 1583–96 shows a river channel running from Loch Flynn (Slin) southward to the Cromarty Firth, implying that this was a routeway in the Middle Ages (Carver 2008a, 184–5).

As an exploratory study, the following survey tracks a hypothetical route from south to north, making no assumptions, but using the terrain as it is today.

Cromarty Firth to Fearn Abbey

The route that follows the lowest contours is now taken by ‘the Canal’. It rises 10m in 4km (1:400). At the Abbey, the mill works have obliterated any previous arrangement. They remain visible 50m north-west of the abbey nave as a narrow burn coming in under a single-arch bridge at NH 837 774, and as a splayed outwash at NH 835 773.

Fearn Abbey to Loch Eye

The likely route follows the present ditch/burn running from the Abbey Mill to Loch Eye where the boat could be put back in the water. It rises 5m in 2km (1:400).

Loch Eye to Inver

Here there is a steep bluff down to Inver. If the argument for the route depends mainly on the gentleness of the contours, then there are three candidates. Route A passes between Lochsln Farm and Lochsln Castle then along a lochan to Newton Cottage (where there is a chapel) and then down the track to the Fendom Burn. This has the advantage of suggestively old places en route. The distance is 2.4km. Route B is longer and passes along the ridge before turning to the ford at Inver. The distance is 3.4km. Both these routes actually run at a height of 20m AOD for much of their

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length. The distance from the ridge is 700m in both cases, so the slope of portage is 20m in 700m, or 1: 35. Loch Clais a' Chreadha once lay between Wester Arbol (NH 875 813) and Cockle Hill (NH 862 815). Its southern limit is probably 'Watertown' on the 1885 OS Map. This would imply a Route C which left the Inver channel at Inver links or Arbol and passed E or W of Gallow Hill

into the loch at Choc [Cnoc] a' Mhuillinn Ghaoithe (NGR 874 815) [Hill of the mill stream?]. From this loch it might be water all the way to Loch Eye. The journey can be calculated as 0.7m at 1:35, 1.7km flat, 0.7km by water and 8.3km at 1:400, giving a total of 11.4km. But this could come down to about 8km if a higher sea access is assumed.

It can be seen that numerous uncertainties attend the mapping of the portage, due to the appearance and disappearance of lochans and the alterations in the landscape likely to have been executed by the Abbey of Fearn. The portage could not easily function once the Abbey mills were built at Fearn (ie after 1238–42). At the same time it can be seen that the overland route was never likely to suit large vessels, which, on the other hand, had less need of it. The historical context favours its use in the first millennium by Picts and by Gaelic speakers (who named it)



Illustration 5.10.3
Valley north-west of Nigg Church

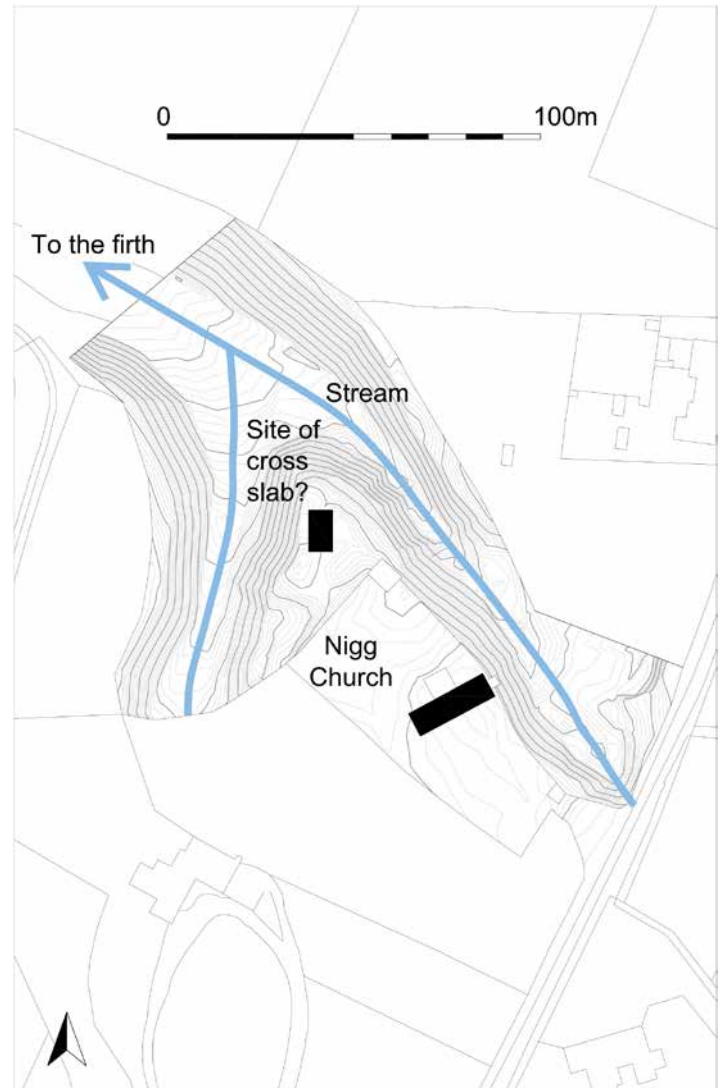


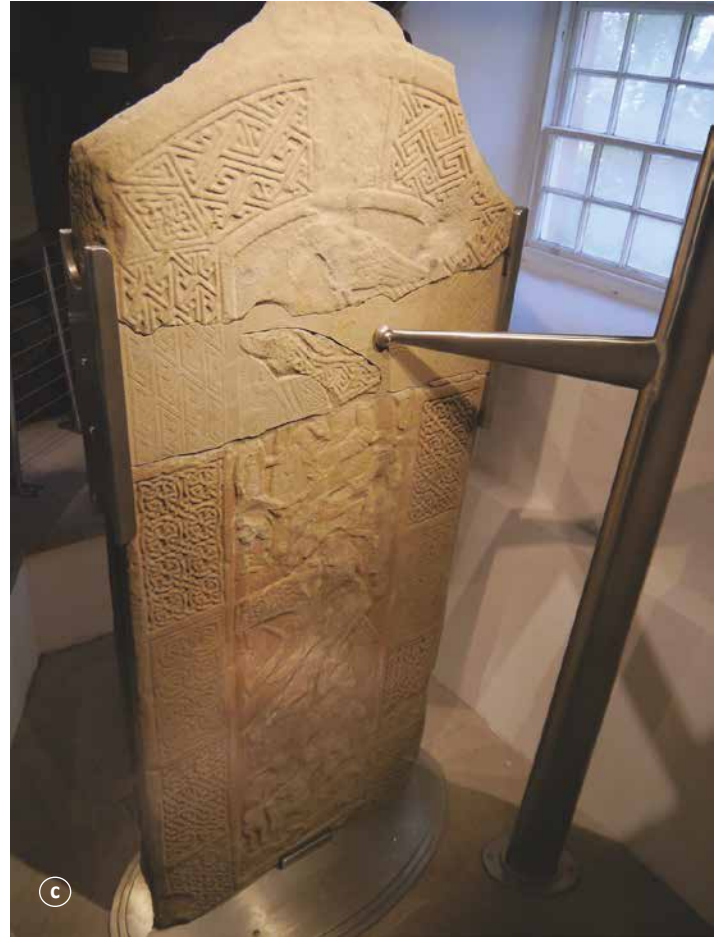
Illustration 5.10.4
Contour survey of the locality of Nigg Church with the possible original location of the cross-slab (conjectural)

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



Illustration 5.10.5

Nigg cross-slab: (a) cross-side (detail), the story of Paul and Anthony; (b) cross-side (detail) snakes and bosses; (c) David side. The modern mounting of the cross presents a challenge to photographers



rather than by Norse. A skin boat, being of itself portable, could be carried from Inver to Loch Eye, a total of 2–3km, after which it could slip down to the Cromarty Firth generally waterborne. Both proposed portages are in the nature of short cuts, where travellers on foot carrying or towing light craft crossed from beach to beach via marshy ground and low upland. They would facilitate a community in which traffic mainly passed over water. In this respect, the landfalls of Nigg, Shandwick and Hilton (and Balintore which lies between them) and Portmahomack would naturally serve as nodal points.

Nigg

The site at *Nigg Church* (NH 856 747) consists of a promontory flanked by two re-entrants, today much overgrown, that converge to form a steep narrow valley, resembling a forked hollow way, which leads to the shore of the Cromarty Firth (Illus 5.10.3, 5.10.4). The north-easterly re-entrant is narrow and steep and a small burn runs along it. Persons on foot or pack animals can make their way from the summit of the promontory down either of these converging valleys to the foreshore on the Bay of Nigg. The first statistical account reports that ‘behind the church’ there were foundations above 90ft in length that went under the name

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of the ‘Bishop’s House’ (FSA, 592). Nigg may mean ‘promontory’ in Gaelic (FSA, 588), but it is interestingly also recorded as Wigg (SSA, 18). The area was provided with some twenty wells.

The church at Nigg was a parish church dedicated to St Fiacre in 1626, but the earliest reference to a church here is 1255–6 (cf Portmahomack). The present church, a mainly eighteenth-century building, lies NE–SW across the promontory surrounded by a fenced churchyard. The cross-slab was seen there by Petley in 1811/12, by Hugh Miller in the 1830s, by Stuart before 1856 and by Allen and Anderson before 1903 (Petley 1831, 352; Miller Sr 1835, 41; Stuart 1856, 11; ECMS ii 75–8). Its original position is not remembered, but it was said to have ‘always’ stood in the churchyard when it was blown down during a storm in 1727 (FSA, 594 gives the date as 1725). It was subsequently placed up against the east gable of the church until the end of the eighteenth century, when it was removed to gain access to the family vault of Ross of Kindeace. During this operation it fell and broke into several pieces. When Petley saw it in 1811/12 it had been restored with the larger piece of the slab erected upside down, so he had it taken down and reassembled the right way round. When seen by Allen and Anderson at the turn of the twentieth century, the upper and lower pieces had been joined with cement and

fastened with metal clamps. However, a third section about eight inches (200mm) high, originally belonging between the other two, parts of which had been seen by Petley, was missing (ECMS ii, 77, 81). In this condition it was erected, according to Allen and Anderson ‘in a new stone base at the W end of the church immediately outside the vestry, at the top of a very steep slope’ (ECMS ii 76). There is some confusion about the cardinal points in Allen and Anderson’s account. The church is oriented SW–NE, so that the vestry, outside which the stone was re-erected overlooking the very steep slope, lies at the north-east (not west) end. A porch was subsequently erected over the stone at the north-east end. At the foot of the slope beneath, a piece of the missing section was recovered from the burn by Niall Robertson during a site tour conducted by Isabel Henderson in 1998. The stone has now been again restored to take account of the missing section, and re-erected inside the church at its south-west end (RCAHMS No. 231; NH 804 717). On analogy with the church of St Colman at Portmahomack, the earlier church at Nigg may have been aligned NE–SW with a ‘north’ aisle added on the north-west side at the Reformation. The stone is now housed inside the church at its south-west end and has been recently restored, presenting something of challenge to photographers



Illustration 5.10.6

Shandwick cross-slab: (a) the ‘paradise’ scene, with Ewan Campbell; (b) spiral explosion, of fifty-two spirals; (c) the cross is now protected in a glass box. Aidan MacDonald and Roger Mercer admire the cross-side in the company of Jean Mackenzie, Trustee (see also Illus 1.5, Illus 1.6)

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(Illus 5.10.5). The original siting of the Nigg monument, if in the churchyard and subject to strong winds, is likely to have been in the centre of the promontory at its forward end.

The ornament and iconography of the Nigg monument is among the most elaborate of the entire Pictish corpus and has been extensively studied (Henderson & Henderson 2004, *passim*; Meyer 2005, Chapter 2; Meyer 2011). It is a rectangular slab 2.36m high (as currently restored), 1.03m wide and 130mm thick. As it stands now, the cross-side faces south-east. It is infilled with fret pattern, and geometric and zoomorphic interlace. It is flanked by panels of spiral bosses and interlace bosses around which snakes coil. Above the cross a pediment contains a vignette representing St Paul and St Anthony in the desert, fed with a circular loaf by a raven and accompanied by docile lions, perhaps those who helped St Anthony bury St Paul (Illus 5.10.5a; Ó Carragáin, E 1989). On the back, surrounded by an arched frame of interlace and fretwork panels, is a composite scene featuring, from top to bottom, a bird of prey, a Pictish beast, a spearman following animals, King David with sheep, harp and lion, and a figure brandishing two cymbals behind a horseman and a hunting dog pursuing deer (Illus 5.10.5c; Henderson & Henderson 2004, 127).

Henderson and Henderson draw an analogy between the cross-side and a page of illuminated manuscript, and propose that the bosses might symbolise the Old and New Testaments (Illus 5.10.5b). Meyer sees in the Nigg serpent bosses a reference to a metal reliquary or a local saint's shrine and surmises that there was an actual reliquary at Tarbat containing a relic of St Columba (Meyer 2005, 198–200; see also OLA 7.1.8.2). The back face resembles a consular diptych, featuring the figure of the 'Master of Animals' carrying a pelt, for whom Henderson and Henderson propose deep roots in Pictish art and thinking. King David (perhaps in some measure the local successor to the *Master*) is represented with his sheep, lion and harp. The man with the cymbals is perhaps an accessory to the hunt denoted by horseman, hound and deer, frightening the animals out of their lairs (Henderson & Henderson 2004, 67, 138–9, 125–8, 131).

Shandwick

The monument at Shandwick (NH 856 747) stands on the 25m contour in open ground above Shandwick village and beach. A chapel is thought to have stood nearby, although it has not been located (Macdonald & Laing 1970, 137). Watson (1904) records a number of places in the area: Tobar Cormaig (Cormac's well, at Shandwick farmhouse) and nine paths leading down to the shore (Digest 8). He retails the story of the three Danish princes that

survived in folklore as an explanation (in the Gaelic community) for the origin of the three great cross-slabs of Shandwick, Nigg and Hilton. He relates,

'At Nigg Rocks, below Cadgha Neachdain, there is a graveyard, now covered in shingle. Here the Danish princes were buried. Their gravestones came from Denmark and had iron rings in them to facilitate their landing. So local tradition. This most unlikely spot for a graveyard was not selected without some good reason, the most probable being that hermits once lived in the caves, whence the place was reckoned holy ground ... At Clach'a Charaidh, [the Shandwick stone] all unbaptized infants of the parish were buried up till fairly recent times. It is now cultivated.'

He also states that at Easter Rarichie, 'the curate of Nigg lived and the field behind his house is called "raon a chlaidh", the graveyard field. The plough goes over it now and formerly used to strike the gravestones, but these are now removed' (*ibid*, 56,



Illustration 5.10.7

St Mary's Chapel, Hilton of Cadboll (photograph by Ian Keillar taken June 1985)

57; Digest 8). Surveys were carried out in 1998 but without useful result.

The cross-slab was seen by Charles Cordiner in 1780 who described it as surrounded at the base with large, well-cut flagstones, by Petley between 1811 and 1812, by Hugh Miller in the 1830s, by Stuart before 1856 and Allen and Anderson before 1903 (Cordiner 1780, 65; Petley 1831, 346, Plates XVIII, XIX; Miller Sr 1835, 41; Stuart 1856, 10; ECMS ii 68–73). The stone had been damaged before 1811 (Meyer 2005, 93) and was blown down in about 1846, according to Allen and Anderson, when it broke into two pieces. It was subsequently clamped together and re-erected 'on a circular stepped base that conceals some of the sculpture at the bottom' (ECMS ii, 68). In 1988 an area 8 × 8m was excavated

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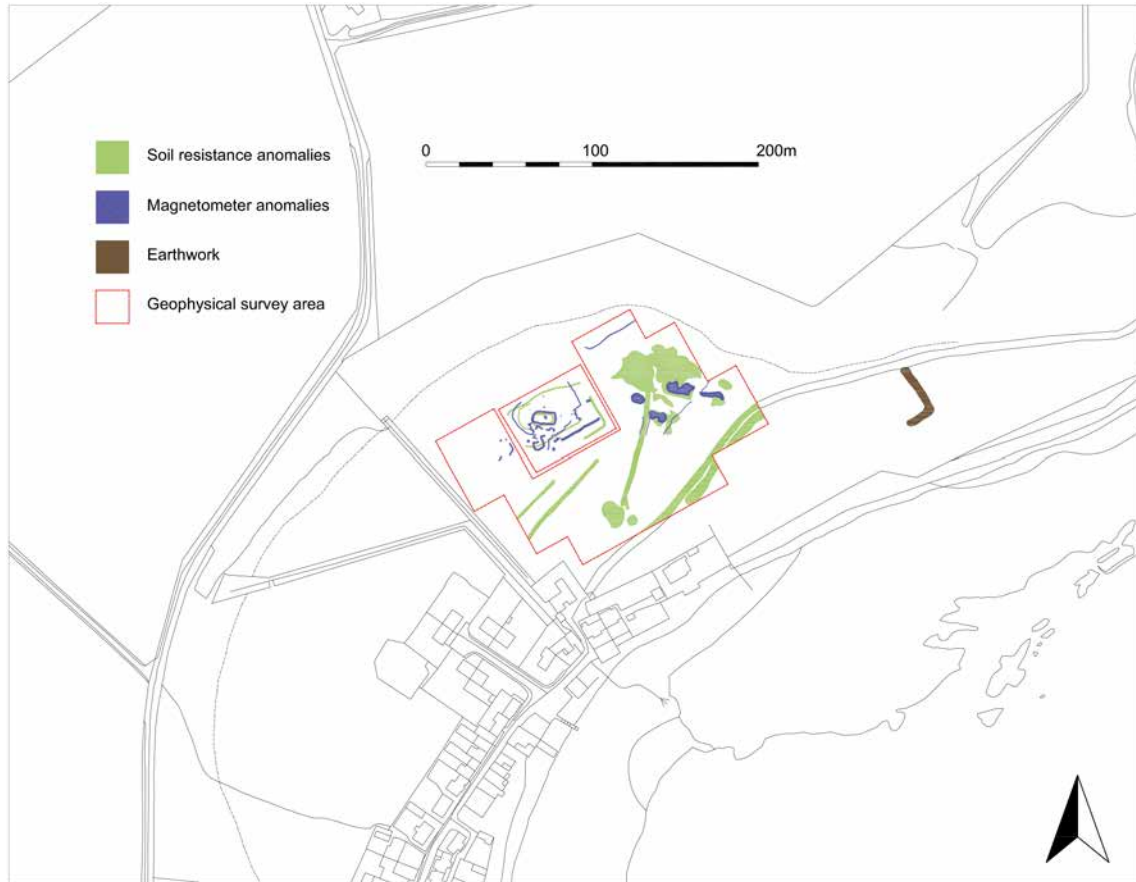


Illustration 5.10.8
St Mary's Chapel, Hilton of Cadboll. Site survey by FAS in 1998

around the base, and a steel and glass protective shelter erected. No features were reported from the excavation (Graham Robins in Carver 1998b; James H 2005, 95–7).

The slab is now 2.97m high but at least another 200mm is thought to lie below ground. It is 1m wide and 190mm thick (Illus 5.10.6). The cross-side faces east across the sea, and takes the form of a jewelled cross flanked by cherubim and seraphim (Henderson & Henderson 2004, 152). Below these are two animals seen as lions, one of which has a cub, brought back to life, dangling from its jaw in an allusion to the resurrection (Meyer 2005, 123). The lions, and the serpents below them, are seen as recognising the power of Christ. On the back face contained in a series of panels are represented (from top to bottom) a double disc inlaid with spiral ornament, a large Pictish beast sheltering two small sheep (Illus 1.5), and a busy scene featuring mounted horsemen, two warriors sparring on foot, a crouching archer and a dozen animals or birds all moving from left to right (Illus 5.10.6a). Below this is a virtuoso panel of spirals exploding from four small spirals at the centre through widening circles of eight, sixteen spirals of increasing size, completed with four pairs of spirals in the corners (Illus 5.10.6b). The lowest visible pair of panels containing fret pattern and knotwork are now partly

hidden. The Pictish beast is seen as benign and protective, and the populated panel as a reference to the Last Judgment and a description of the otherworld (Henderson & Henderson 2004, 77; Meyer 2005, 131). The back face of Shandwick certainly lends itself to interpretation as an evocation of paradise, and one with ancient roots. The cross-slab overlooks the Moray Firth, but is now enclosed in a protective glass shelter (Illus 5.10.6c; Illus 1.6).

Hilton of Cadboll

The cross-slab at Hilton of Cadboll is associated with the site of St Mary's Chapel located at NH 883 791 (RCAHMS 1979, No 210), on the foreshore north of the present village of Hilton (Illus 5.10.7). It is not known for sure where the monument was first erected, but recent excavations and detailed study of the stone's 'biography' have increased confidence that it stood near the present site of St Mary's Chapel, which itself was founded in a place that was originally Pictish (Foster & Jones in James et al 2008). An archaeological evaluation of the site was commissioned by Tain Civic Trust from the present authors in 1988, with the collaboration of RCAHMS and Graham Robins (Carver 1998b; OLA 8.2; summarised in James et al 2008, 391–8). Earthworks and geophysical anomalies

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Illustration 5.10.9

Hilton of Cadboll cross-slab: (a) upper part, in the National Museum; (b) lower part, reverse; (c) lower part, cross-side; (d) the Hilton replica, cross-side, with visitors in 2007: (left to right) John Bradley, Heather King, Bernard Meehan, Jill Harden, Rosemary Cramp, Airlei Hindmarch, Laura Hindmarch, Betty O'Brien and Niall Brady



mapped in this survey located a series of features surrounding the chapel, which stood within an enclosure (Illus 5.10.8). These were interpreted as belonging to a deserted medieval village, and equated with the documented settlement of Cadboll Fisher. By 1478, the names Catboll-fisher, Cadboll-abbot and Wester Cadboll apparently referred to the present Hilton, Balintore and a settlement to the west respectively (ibid, citing *OPS*, 442–3). In 1561 to 1566 the seashore site was known as the Fishertown of Hilton, and furnished fish to Fearn Abbey, suggesting that the foreshore was specially developed as a fishing village. By 1610 it was known as Bail' a' chnuic, 'cliff town' (Gordon & Macdonald c 1988, 18). The Cadboll Estate Maps of 1813 show a 'Hilltown' located 'behind the eroded cliffline at the back of the raised beach' with 'Fishertown of Hilltown' on the present site of Shore Street. It thus seems likely that there was once a settlement above the cliffs called Cadboll, which subsequently spawned two others, Hilltown in the same place and Fishertown beside the beach. The chapel itself and its earthworks fit well with Cadboll Fisher, a daughter settlement of the Abbey of Fearn dating to the thirteenth century and later. Although the place-name 'Hilton' has been adopted by the present seaside settlement, it should originally have been on a hill as pointed out by Watson in 1904. Such a hypothetical antecedent village is unlocated, but it raised the possibility that the Hilton cross-slab was transported in antiquity with its collar stone, perhaps in connection with the dedication of the seaside chapel, from an adjacent hilltop site (Carver 1998b; cf James 2005, 101).

The Hilton of Cadboll cross-slab, perhaps the most famous of all Pictish carvings, has been associated with the St Mary's Chapel site since the seventeenth century (Illus 5.10.9a). It is likely to be the 'obelisk' blown down in a gale in 1674 (Foster & Jones in James et al 2008, 206). It had certainly been taken down before 1676 since it was broken at the base, while its front side, which may have once carried a cross, had been shaved and carried an inscription of that date commemorating Alexander Duff and his three wives. Before 1780, the stone was said to have

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stood near the ruins of a chapel dedicated to the Virgin Mary, 'under the brow of the hill on which the farmhouse of Cadboll is situated' (Cordiner 1780, 65). By 1811, it was lying near the seashore face down when Cordiner is said to have discovered carving on the underside and had the stone turned over (ECMS ii, 61). Before 1856 it was lying 'in a shed, the wall of which was believed to have formed part of an ancient chapel' (Stuart 1856, I, 10). By 1903, the stone had been removed to Invergordon Castle, where it stood on a modern base in the grounds at the side of the carriage drive half a mile south of the castle. In 1921 Captain Macleod of Cadboll sold his property and donated the Hilton stone to the British Museum. It arrived there by 3 February but following protests in the press, Macleod agreed it could be returned to Scotland and donated to the National Museum in Edinburgh, where it remains (the fully documented biography is related in Foster & Jones in James et al 2008, 238ff).

The Hilton of Cadboll monument exhibited in the NMS was evidently only the large upper section of the monument, since the ornament was discontinuous at both top and bottom, and there had been some speculation as to the whereabouts of the other parts as well as the shavings from the front face. Excavations by Historic Scotland in 2001 revealed a substantial lower part of the cross-slab on the west side of the chapel ruins (Illus 5.10.9b, c; James 2005, 97–101; James et al 2008, 27–74; see also Chapter 2, p 29). This 'stump', the original base of the monument but minus its tenon, was in situ in a pit supported by packing stones, including one half of a notched collar stone (Setting 2). An earlier setting (Setting 1) was located 30cm east of the first and took the form of a pit containing massive packing blocks. A second notched slab, likely to be the other part of the collar stone (032) was found 2m away on sand that gave an OSL date in the twelfth century. On this basis, the excavator concluded that the monument had been originally set within a paired collar stone (Setting 1) supported by large blocks and edged with kerbstones (James 2005, 100; James et al 2008, 40–9). Although there was no direct dating for this first setting, it was assigned to the Pictish period on the basis of seventh- to ninth-century radiocarbon dates on associated charcoal and two early burials to AD 680–900 (SUERC-9141, GU-13807) and AD 680–890 (SUERC-9142, GU-13808) (James et al 2008, 46–9, 358).

At a given moment, the tenon had broken and was rotated, the collar stone was smashed 'with a hefty blow' and the slab fell (James et al 2008, 44–6). The slab, minus its tenon, was then re-erected and reset in a pit packed with blocks and thin flat slabs (Setting 2; *ibid*, 50–2). OSL analysis of sand (042) beneath a discarded piece of collar stone (032) gave a date in the early twelfth century: AD 1100 ± 70. Sands associated with the lower portion (the stump) also gave dates in the twelfth century: AD 1120 ± 70 (016) and AD 1140 ± 70 (019) (James et al 2009, 344–5). The chapel is likely to have been constructed at this time, the late twelfth century (or in the thirteenth century, *ibid*, 55). Human burial (re)commenced at this point. A layer with fragments shaved from the face (007) gave an OSL date in the late sixteenth century: AD 1570 ± 25 (*ibid*, 345). Large amounts of chippings were recovered from the area.

This sequence complements that at Portmahomack, suggesting there was a Pictish foundation at Hilton beachside within a time

span equivalent to Period 2 (the long eighth century). The cross-slab, a highly individual and prominent investment, was erected there in the late eighth or early ninth century. It was thrown down by force sometime in the ninth to eleventh century (Period 3), and then re-erected, minus its tenon in the context of a revival of the twelfth to thirteenth century (Period 4). Subsequently, the re-erected cross-slab was desecrated between the late sixteenth and late seventeenth century and discarded by the early nineteenth century. Over the millennium, the people of Hilton certainly visited their vacillating loyalties on this unfortunate piece of stone (cf Jones in James et al 2008, 232 ff).

A replica of the Hilton of Cadboll upper stone was initiated by Jane Durham in 1994 and a tender obtained from the sculptor and stonemason Barry Grove in 1997 (Carver 1998b). Barry Grove carved one side of the recumbent stone while it was housed in a shed at Balintore, copying the extant reverse side of the monument



Illustration 5.10.10

Students visiting the salmon shed where Barry Grove carved the replica of the Hilton of Cadboll cross-slab

as it was then known (Illus 5.10.10). This took fourteen months in 1998–9, after which the stone was erected at the west end of St Mary’s Chapel. Subsequently (2003–5) he was commissioned to carve a cross on the obverse side, following a design of his own making, but making use of pieces recovered in the 2001 excavations (Illus 5.10.10; James et al 2008, 254). All the pieces are in the care of the National Museums of Scotland, but at the time of writing the upper Hilton cross-slab has yet to be reunited with the excavated stump which has been claimed by members of the local community and is held in the Seaboard Memorial Hall.

The upper part of the Hilton stone measures 2660×1400×240mm and contains two panels framed at the sides by inhabited vinescroll and at the base by spirals. The upper panel contains a double disc and Z-rod symbol above a crescent and V-rod, inlaid with spirals and fret pattern. Below are two isolated discs containing knotwork. The lower panel features the famous scene of a horsewoman accompanied by a man with a big nose (largely hidden but riding beside her), two armed horsemen, two trumpeters on foot, two hounds and a deer. A symbolic mirror and comb are placed in front of the lady’s horse. The base stone measures 850×1400×210mm and features on the back face the continuation of the vinescroll frame, and on the front face a stepped platform for a cross ornamented with fret pattern and zoomorphic interlace. It can be deduced that the cross-slab originally stood 3.5m above ground level, and that the base was at least 30mm thinner than the upper part – actually more since the upper part had been trimmed.

The vinescroll on Hilton is very close to that on TR1 and the zoomorphic ornament on the base is strongly reminiscent of the Gandersheim Casket – Mercian work of the eighth century (Henderson & Henderson 2004, 42, 73, 113). The iconography of the hunting scene is seen by the Hendersons as deriving from Classical exemplars, such as the Sasanian lion hunt, perhaps as depicted on a Roman sarcophagus (Henderson & Henderson 2004, 128–9). As such it is a ‘literary construct not a literal account’, not so much a hunt as a parade, symbolic of the good life and good leadership, rather than evidence for secularity or a conjunction between church and state: ‘the tension is there, but it is between the ethos of a heroic past being transferred into a Christian present within an art form’ (Henderson & Henderson 2004, 128–9). The woman could certainly be the person who is celebrated: Boniface thought a mirror and comb were gifts fit for a queen, so the Hilton figure echoes the queen of Carthage who rides out with horsemen and hounds, her purple cloak clasped by a gold fibula as described in *Aeneid* Book IV (ibid, 128–9; Bede II.11). For Meyer, the Hilton lady is taking part, more specifically, in a wedding parade (Meyer 2005, 168). In spite of the highly realistic depiction of horses, hounds, weapons and trumpets, the preference has been to treat the scene as richly allegorical, the soul seeking Christ, ‘as pants the hart for the cooling stream’, or the ‘majestic rider’ parading to his (her) celestial home (Goldberg in Clarke et al 2012, 152–5). The subject-matter depicted on the front face of the slab is not known in detail, but featured a cross on a stepped base. One of the scenes flanking this cross might have alluded to the expulsion from paradise, as suggested by a fragment among the trimmings, which featured an angel following bare legs (Henderson & Henderson 2004, 152).

Discussion

It can be inferred that the Tarbat peninsula in the eighth century was a major maritime crossroads with at least four havens and one, or possibly two, portages. It connected waterborne traffic between north and south, and between the east coast and ultimately via the Great Glen to and from the Irish Sea. The landmass of the peninsula is not large, but it is varied and fertile (see Chapter 5.8). Those three areas that feature a concentration of Iron Age burial and have the best landing places are also the sites of the major Pictish monuments: at Portmahomack overlooking the Dornoch Firth, at Hilton and Shandwick overlooking the Moray Firth and at Nigg overlooking the Cromarty Firth (Illus 5.1.2). All the monuments appear to have been erected within a few decades of each other, in the period AD 750–800.

One or two observations may be advanced on the eighth-century peninsula, pending its further research. The crosses were erected as the monastery at Portmahomack was nearing the height of its achievements in the later eighth century, at places corresponding to the points of entry into the peninsula from the sea. This suggests that territory is being marked, and that the territory in question is that of the monastic estate. Since each cross stood near a haven it would be logical if each had a role in helping mariners to find it, that is, as a seamark. Such a function would be most effective if the cross-slab was skylined, as viewed from a boat. This would work well for the original positions proposed for Portmahomack, Nigg and Shandwick, especially if the stones were coloured (Illus 5.10.1).

The economic, political and spiritual purposes of marking the landscape in this way have been demonstrated by studies on the Dingle Peninsula and Inishmurray (Ó Carragáin 2003a; O’Sullivan J & Ó Carragáin 2008). Prime beneficiaries would include pilgrims who might know little of the place, other than by reputation, and would be glad of navigational guidance. But the marking-out signified more than landownership or haven-finding, since these elaborate monuments also acted as signposts to the ritual geography of the landscape. They might also have supported internal perambulation (as at Inishmurray) where each acted as a station in a devotional and penitential round (ibid, 329).

In this event it would be expected that the cross-slabs would have a strong spiritual message, and the iconography makes this very clear, through the prominence of the cross and the citation of the monks Anthony and Paul at Nigg, King David also at Nigg, a possible Daniel at Portmahomack and numerous allegorical references to the teaching of the Old Testament at all four (see the deductions by Henderson and Henderson, Meyer and Goldberg above). At the same time the ‘secular’ character of the scenes on Hilton and Shandwick has been discussed, and the gigantic undertaking of the carving and erection of such monuments has been seen as inevitably requiring the sponsorship of a royal power. The discussion on the economy in Chapter 5.8 offers a counter to this latter idea: monasteries were uniquely placed to accrue large amounts of capital which could be dispensed *ad maiorem dei gloriam*, for the greater glory of God. The reality of the scenes might be explained as tutelage re-encoded from Roman Christian or Roman Classical sources (Henderson & Henderson, above), but there is undoubtedly an indigenous character in the riders

(Hilton) and fighters (Shandwick) that demands further analysis (Alcock 1993; Carver 1999b).

Given that these monuments were erected at a similar time, in a similar style, for a similar purpose, but are different in content, they do not appear to be the work of a secular patron, and their locations endorse a role in devotional perambulation. Four of the monuments carry Pictish symbols, and a fifth, a Latin inscription (Illus 5.3.44, above). It has been suggested that the symbols represent names (Samson 1992), an idea that receives some endorsement by the similar positioning of the Latin inscription of Cross C and the Pictish symbols on Cross A at Portmahomack. In most cases these names are proclaimed as prominently as the cross, though on the other side. The persons commemorated would therefore be acceptable as holy persons, and the scenes that accompany them as scenes from their lives (Carver 2008a; c). These 'hagiographies in stone' may refer to the better known members of the heavenly hierarchy (Columba, Mary, Martin, Peter, Andrew), but there is an attraction in supposing that, in this case, local saints are being cited. This is implied in the first place by the use of Pictish symbols to spell out the names and in the use of 'clips' that do not immediately map on to known lives or recall existing iconography. The use of local saints, even if long dead or semi-legendary, is in accordance with the tradition-seeking agenda of new religious regimes in the later first millennium (cf the Mercians celebrated by Æthelflæd in her ninth/tenth-century church dedications: Carver 2010b, with references). Naturally the celebration of local saints does not preclude a celebration that uses both allegory and familiar artefacts.

The whole peninsula was a body of sanctity with its beating heart at Portmahomack. There were key touchpoints at the principal places of access, each long settled and commemorated by burials from at least the Iron Age. The major monuments, seamounts manned by saints, celebrated local holiness with equal status. Each acted as a station on an itinerary that beat the bounds of the estate, while bonding the community, advancing its project and welcoming visitors. Each no doubt had a cemetery, perhaps for laypersons: head-box burials have not been reported, although they may not have been recognised. Such a community, not actually on an island but occupying the nearest thing to an island on the north-east coast, probably had a wide catchment that included neighbouring monasteries. We can assume that its mission would have been known, understood and respected in Inishmurray, Iona, Whithorn and Jarrow.

5.11 The Raid

The end of the monastic experiment is clearly marked in Sector 2 by an extensive fire over the northern workshops, and the deposition of freshly broken sculpture. Evidence for a widespread conflagration was identified in the form of discontinuous spreads of brightly coloured scorched sand, burnt stonework and charred organics, including oak timbers, wattle, possible thatch, heather

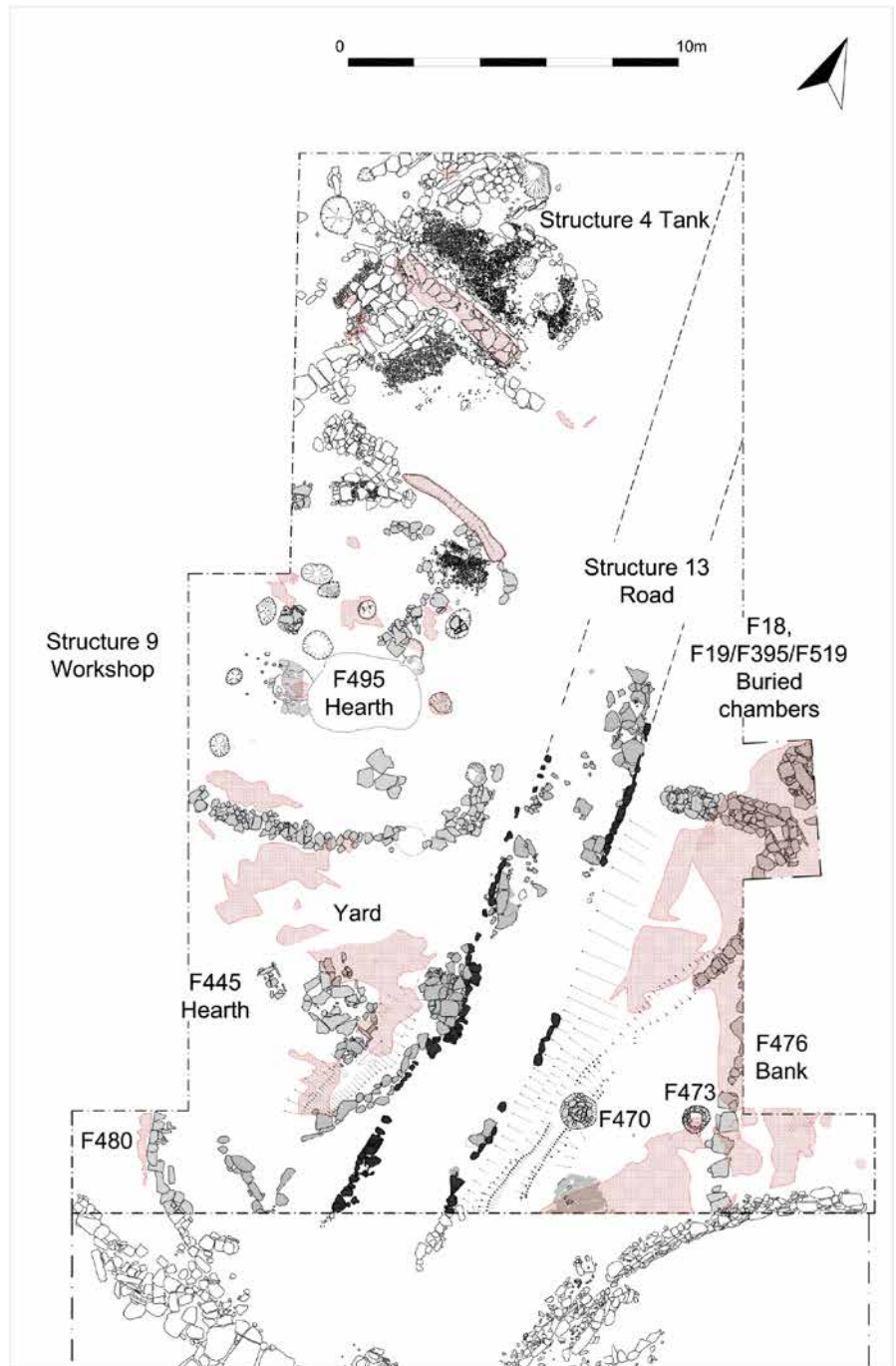


Illustration 5.11.1
The extent of the primary burning

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)



Illustration 5.11.2
Examples of primary burning: (a) adjacent to the eastern boundary wall, context C2704; (b) detail of charred woven wattle within C2704



Illustration 5.11.3
Examples of broken and discarded sculpture in situ: (a) above primary burning on the east side of the road in Int 14; TR74 is visible (b) at the west edge of the pond, TR257. Although found in different places, TR74 and TR257 probably belonged to the same monument (Set 1; Digest 5.1)

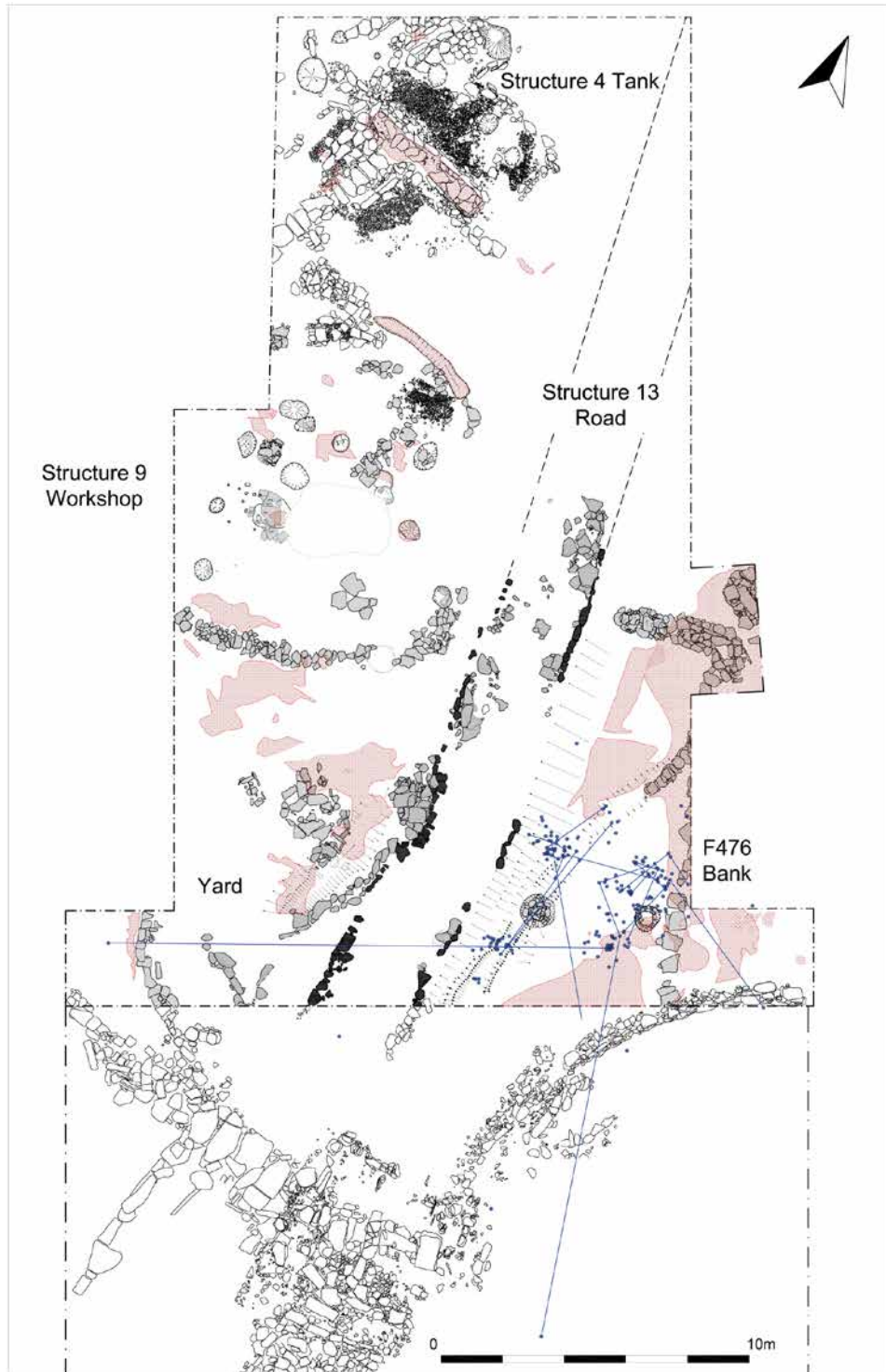


Illustration 5.11.4
Distribution of sculpture fragments

and turves (Illus 5.11.1). These layers and spreads of burning were labelled *primary burning* during excavation, and the term is retained here. There follows a short tour of the damage.

There was no evidence for primary burning on the *road surface* but scorched sand was recorded on the western shoulder of the *western roadside ditch* with small lengths of charred planks. A layer of primary burning was draped within the *tank* (S4), after which it was covered by a layer of windblown sand. The final fill of the hearth (F495) in *workshop* S9 was reminiscent of the burning found elsewhere and the nearby working stance (F512) was marked by burning. The latest fill of gully F31 consisted of very similar material and would also appear to have been open as a feature when the fire occurred. Three post-holes belonging to S9 were associated with burnt deposits. A squared post-ghost was identified in the pre-excavation plan of post-hole F508 as a charred line, suggesting that this post was extant and at least partly burnt during the fire. Post-hole F518 was also associated with a patch of primary burning and so was the final backfill of post-hole F523, which contained frequent charred rods of wood. Two spreads of primary burning were identified over and to the immediate north of wall of S9, F434. This wall was later covered with a windblown sand deposit that included the skeleton of a dead seabird. Elsewhere smaller spreads were identified in or near the S9 building consisting of bright white, yellow and pink compacted ash with a component of charred organic building material, possibly roofing or flooring material, such as rush or thatch. Within the S9 *yard* a small strip of primary burning was identified to the immediate west of wall F480 and overlying the yard surface.

Good evidence for destruction by fire was recorded on *the east side of the road*, where burning appeared to have been particularly intense over the stone-built features (Illus 5.11.2). Burning was detected in large swathes over extant surfaces as far south as the foot of the *eastern boundary wall*, preserving a variety of charred organics including possible heather rope and collapsed woven wattle. Here the stonework tipped sharply to the north and showed signs of

THE PICTISH MONASTERY (PERIOD 2, c AD 700–c AD 800)

heat reddening and blackening. To the immediate north of the wall was a charred wattle hurdle F483 and a consistent spread of disordered charcoal lumps reminiscent of hurdle poles. A burnt stake was thought to be part of a hurdle. Several plough pebbles were recovered from the area of the boundary wall, many of them sooted. They are thought to be derived from turf used as bonding for the boundary wall (p 96). A 'turf bonding material' was recorded in the immediate locality of the wall (C2737).

Broken sculpture

A total of 230 fragments of smashed sculpture was recovered from Period 3 and later deposits (Illus 5.11.3), by far the majority from spreads of rubble to the east of the road (C1510, C1547, C2701 and C2537; Chapter 5.3). The breaks were generally fresh, implying the use of a heavy tool such as an axe or sledgehammer. Many of the fragments conjoined, including those in the dump within eastern roadside ditch (F180), signalling a common source and a contemporary deposition (Illus 5.11.4). Cross-joins between TR217, 223 and 263 provided a critical link between Period 3 activity to the east of the road and dumping of a rich craft-working deposit to the west of the vellum-yard wall F480 (see Illus 5.3.30). Conjoining parts of the 'Calf Stone' TR28/35

were reused as the lining and cover of a Period 3 culvert (F166; p 134). This indicates that the deposition of the sculpture was part of a clearing up and levelling operation after the raid, as the site was being made ready for redevelopment. Since most of the ornament was crisp and bore traces of pigment, and breaks were fresh the pieces should have been deposited not long after it was made, thought to be in the late eighth or early ninth century (Chapter 5.3, p 165).

In Sector 1 to the south, the raiders did not set fire to S1, although metalworking ceased and the transmogrification of the building into a kiln barn indicated a change of emphasis towards farming in Period 3. On the hill, it is likely that four major monuments were broken up at this time and were reburied or remained in the churchyard (Chapter 5.3, p 123). The church, if it existed, is likely to have met a similar fate (Chapter 5.4).

Date of the raid

The date of the raid is argued from stratigraphy, finds and radiocarbon dating (see Chapter 3, p 34). The stratification was strong in Sector 2 where the primary burning provided a clear and broadly contiguous horizon, separating features related to

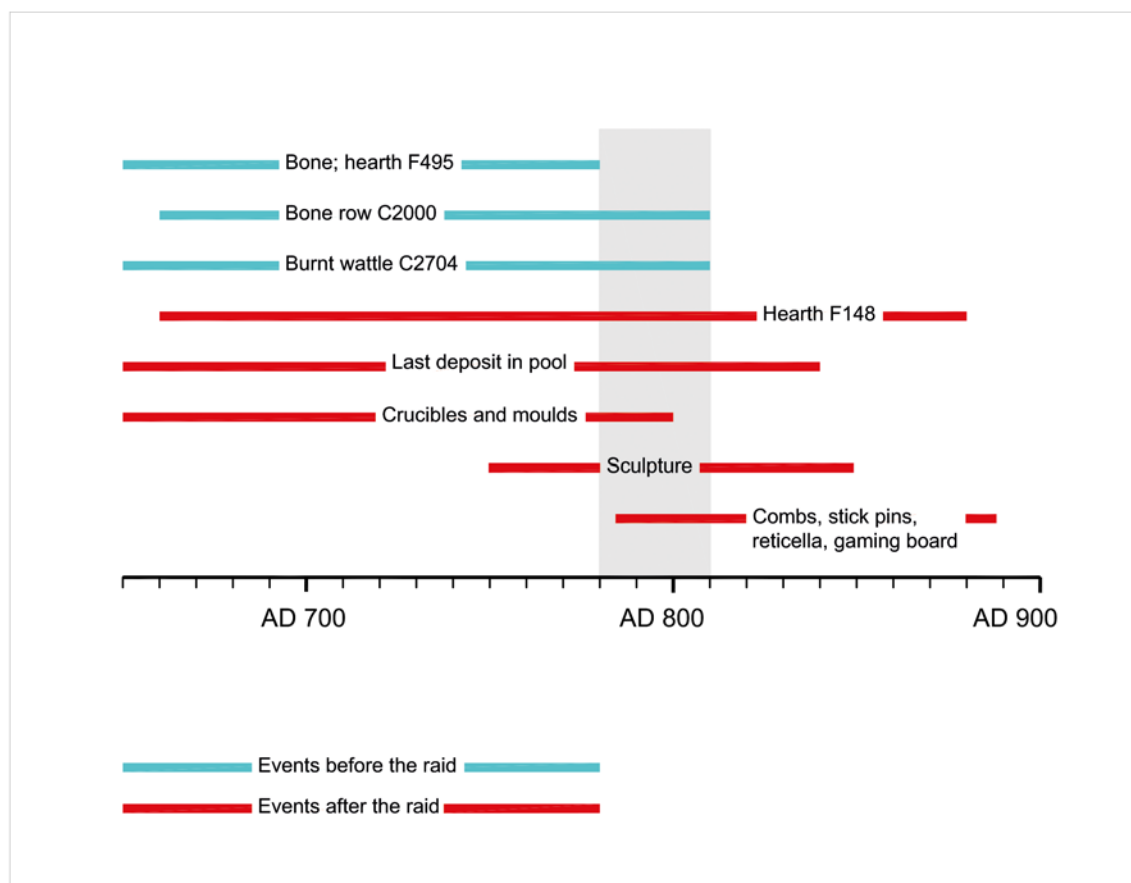


Illustration 5.11.5

Diagram of date ranges supporting the argument for a raid between AD 780 and 810

parchment-making and butchery from the dumped carved stone and then the metalworking industry that followed (Period 3, Chapter 6). The time interval was stratigraphically very short, with no trace of a hiatus. The objects that lay on the burnt surface indicate that the event should have occurred both no earlier and no later than the late eighth or early ninth century. A porcupine sceat from a Period 3 pit (F185) was redeposited from layers associated with the Period 2 road S13 (Digest 6.2). The coin dates to *c* AD 715 to 735, so the raid should have taken place after that. The pieces of sculpture dumped in the northern workshops are very fresh, the latest typologically dated late eighth or early ninth century (see Chapter 5.3, p 167). The metalworkers of Period 3 used crucibles and moulds that occur elsewhere in contexts usually dated no later than AD 800 (p 267). Other objects, including combs, a fragment of reticella vessel and a gaming board were deposited soon after the fire at a date likely to fall in the ninth century or later (Chapter 6, p 262). A copper-alloy stick pin was dropped just before the burning took place and two others were found in the latest levels of the pool. These were of a type considered to be current at the ‘time of the Viking raids’ (Chapter 6, p 262). The expectation from cross-dating with other sites is that the raid should have occurred towards the end of the eighth century, or at latest in the early ninth.

Direct radiocarbon dating was weakened by early dates (fourth to seventh century) taken from burnt old wood likely to have been cut centuries before or used in earlier construction (Chapter 5.9). The stratigraphically latest events in the workshops of Sector 2 before the fire were the last use of the hearth in the yard (F445), the bone pegs lined up there (F393), butchered bone (C2335) and the last use of the hearth in S9 (F495). There was 95% radiocarbon certainty that these had been deposited before 770 or 780. The latest reliable Period 2 radiocarbon limit seems to be 810 from a cattle metapodial in the yard (C2000/S-13271) and the same date from a piece of burnt wattle on the boundary wall (C2704/S-13275) (Table 3.1, p 69; Digest 3.3). Hearth F493 and its successor F148 were constructed by the eastern boundary wall immediately after the fire. These formed the vanguard of the Period 3 metalworking industry. The radiocarbon date put the last use of F148 before 880. Taking these outer limits as indicators implies that the fire should have happened before 810 and life after the fire should have restarted before 880. Since there was no indication that the workshops had been long abandoned before the fire struck, the terminal date of 780 is significant: the last use of the principal hearth and the latest preparation of bone pegs must have occurred before then, but not so long before as to invalidate all the dates of artefacts, including the sculpture and the sceat (715–35).

There was no stratigraphic hiatus in the cemetery (Sector 4), so burials made before or after the raid cannot be surely

separated. Assuming they were broadly contemporary, the three latest burials attributed to Period 2 or the first phase of Period 3 share the years between 780 and 900 (Burials 158, 152, 147); two of these were injured by blade wounds and one died of them (see Chapter 6, p 281).

There were patches of windblown sand over some areas of the workshop (see above), but the stratigraphy in general related a rapid transition and a change of use with no interval of abandon. There was continuity in the cemetery, a redesign and reuse of S1 in Sector 1 and, in Sector 2, the metalworking began immediately over the layers of the fire. Bayesian analysis computes an interval of between five and 150 years after the fire, though possibly half that (Hamilton in Digest 3.1). However, even an interval of seventy-five years is challenged by the Sector 2 hearth F148, which was installed directly after the fire and used the eighth-century metalworking apparatus of the monks to initiate the Period 3 industry. A radiocarbon date likely to refer to its ultimate stoking – 660–880 at 95% confidence (SUERC-13281) – suggests that it had been used and disused before 880.

Illus 5.11.5 shows the date spans provided by radiocarbon and by artefact typology, coloured blue where they relate to deposition made before the raid and red when made after it. The raid and the intervals before and after it are reckoned to be of short duration. Reconciling these factors places the raid between 780 and 810 (in grey). This band defines the interval in which the date ranges of materials stratified before and after the raid can overlap. Naturally there is elasticity in this model, but the window of thirty years helps the different data achieve an equilibrium.

Conclusion

Scandinavian raids are reported in documents from all over east and north Britain and Ireland, ranging from 787 at Portland Bay, 793 at Lindisfarne, 794 at Iona, 795 at Rathlin in Ireland, and continuing on and off for the next forty years. Thus there is plenty of context for a raid at Portmahomack in the late eighth/early ninth century, even if no documented record of the event has survived. Although Ragnall Ó Floinn rightly warns us against attributing every outbreak of fire to the Vikings (1998, 98), in the present case the raid was rather more comprehensive and the Viking Norse are seen as the probable protagonists. The conflagration and the break-up of monuments fit well with the politics of the early Norse campaign, but the archaeology gives less status to the event itself than to the economic changes that followed the raid. Whatever its exact date, it marked a radical change in the character and activity of the settlement, one which might be portrayed as its transformation from a monastic to a trading mode. This is the subject of Chapter 6.