



University  
of Glasgow

Batey, C., and Paterson, C. (2012) A Viking burial at Balnakeil, Sutherland. In: Reynolds, A. and Webster, L. (eds.) *Early Medieval Art and Archaeology in the Northern World: Studies in Honour of James Graham-Campbell*. Series: *Northern World* (58). Brill, Leiden, Netherlands, pp. 631-659. ISBN 9789004235038

Copyright © 2012 Brill

A copy can be downloaded for personal non-commercial research or study, without prior permission or charge

The content must not be changed in any way or reproduced in any format or medium without the formal permission of the copyright holder(s)

When referring to this work, full bibliographic details must be given

<http://eprints.gla.ac.uk/45706/>

Deposited on: 21<sup>th</sup> February 2013

## A VIKING BURIAL AT BALNAKEIL, SUTHERLAND

Colleen E. Batey and Caroline Paterson

Heavy storms in May 1991 caused extensive sand blows in the dunes of Balnakeil Bay, Sutherland (Figure 1). These partially uncovered the remains of a human skeleton, which were discovered by Mr and Mrs Powell, who were holidaying locally. They promptly informed the local police of their discovery, handing over a copper-alloy pin which had been lying on top of the skeleton. Following confirmation by the local doctor that the remains were indeed human, and of some antiquity, archaeological investigation commenced.<sup>1</sup>

### *The Excavation*

Excavation was undertaken by Dorothy Maxwell (née Low) and Robert Gourlay of the Highland Regional Council. The remains were situated in the most northerly dune of the northernmost of the two bays at Balnakeil (NC 3865 7068). The bones protruded from the edge of the dune, approximately 4m above the high water mark, and some 5–6m below the dune top (Figure 2). The visible remains initially consisted of most of the vertebrae, rib cage, pelvic bones and the left elbow joint. Some of the leg bones had been dislodged, and it is presumed that they had fallen from their original position as the sand had blown away. There was no visible evidence of the skull or bones of the right arm, due to the position and angle of the skeleton, which seemed to have been laid on its right side, so that the rib cage and remaining sand overburden were obscuring the rest of the skeleton. The angle of the body in relation to the sand dune further indicated that the skull probably survived within the main dune, close to a piece of exposed corroded metal. The wind erosion of the dunes had led to a highly unstable situation, with the strong possibility of an imminent collapse of the dune face. This would have led to the burial—and indeed

---

<sup>1</sup> A preliminary joint paper by D.M. Low, C.E. Batey & R. Gourlay was published in 2000. Preparation for that paper was undertaken in 1994 and at that time conservation analysis was only at a preliminary stage. This paper provides a fully revised publication of the grave and its contents following detailed conservation analysis.

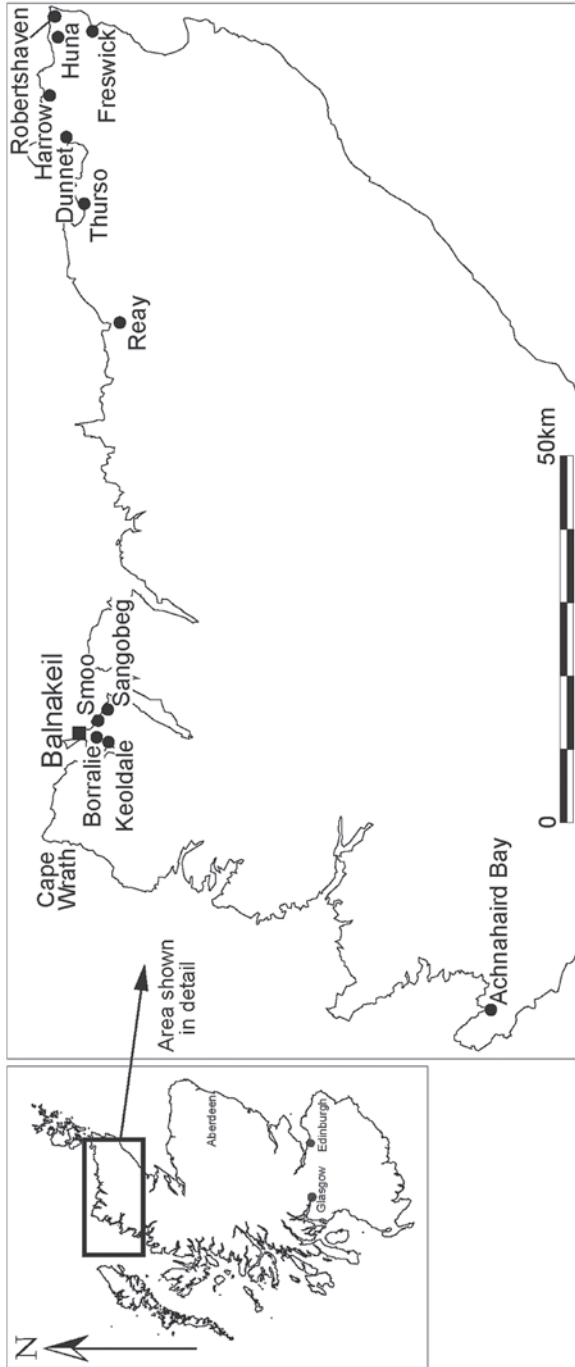


Figure 1. Location of Balnakeil and Norse sites of Sutherland and Caithness mentioned in the text. Gillian McSwan GUARD.

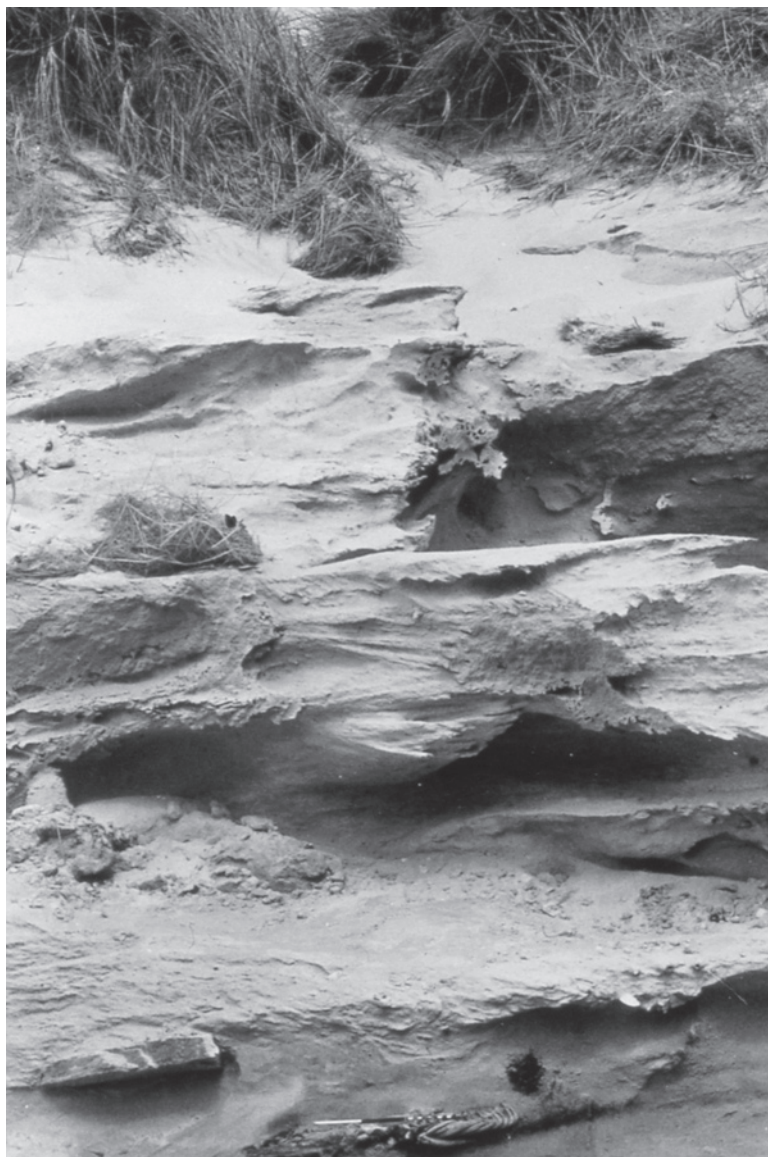


Figure 2. *In situ* burial underlying substantial dune overburden. Copyright Highland Regional Council.

the excavators—being covered with a large weight of sand that would have destroyed more of the fragile remains.

A number of objects were found lying in association with the skeleton and were mainly concentrated around the pelvic area. The full recording through photographs and drawings was followed by clearance of the sand overburden, and it was during this process that the corroded remains of an iron object were found projecting upwards from the skeleton. This was later identified as a spearhead with part of the shaft still attached. Once all of the overlying sand had been removed, the skull could be seen lying on its right side, with the corroded remains of a shield boss lying on the back of the skull (Figure 3). In the area of the neck, three beads were found, two of amber and a third of glass with blue and white ‘eyes’.

A stain in the sand around the skeleton had a defined edge to it, suggesting to the excavators that the body had been buried in a shroud or container of some description. The position of the ring-brooch as well as that of a pin fragment (which was actually corroded to the skull) might support the former interpretation, although it could be that the large number of corroding iron artefacts in the assemblage produced sufficient iron oxides to concrete the surrounding sand and give this impression.

Some of the finds in the pelvic area may originally have been held in a container—perhaps a leather bag. Once all of these finds had been recovered, the bones were lifted and this then enabled one of the most significant finds to be recovered. This was the remains of a sword, together with its well-preserved organic scabbard. The body appeared to have been placed over the sword, thus concealing it from view. The mineralised straw subsequently identified on the lower face of the sword scabbard suggests that the body was buried in a pit cut into the sand and lined. Straw is also preserved on the upper surface of the shield-boss, indicating that straw was not simply laid on the floor of the pit, but was also used to cover the burial. Corrosion on the hilt of the sword preserved random clumps of feathers, indicating that some form of bedding or pillow was also present.

To prevent further damage of the fragile sword and its scabbard, the remains were isolated and lifted within a block of sand. The remains were initially taken to the Archaeology Office of Highland Regional Council, Inverness, where they were re-examined.<sup>2</sup> Many of finds proved to be in

---

<sup>2</sup> Gourlay & Low n.d.: this includes the preliminary identifications by Highland Regional Council Archaeology Department.



Figure 3. Burial with main grave goods in excavation. Copyright Highland Regional Council.

a poor and fragile state, necessitating immediate basic conservation work, carried out on the advice of the National Museums of Scotland, prior to transportation to their Conservation Laboratories in Edinburgh.

### *The Human Remains*

The initial anatomical investigation of the skeleton was undertaken by Ywonne Hallén shortly after the find arrived in Edinburgh; this was revised by Laura Sinfield in 1998 in the light of discussion with her colleagues in Forensic Medicine and Oral Pathology in Edinburgh. Below is a brief summary.<sup>3</sup>

The skeleton is incomplete,<sup>4</sup> probably on account of the circumstances of recovery. Although the sexing of adolescent skeletons is problematic, features such as slightly prominent orbital ridges, a crest at the posterior end of the zygomatic process, a narrow subpubic angle of the pubic bone and large mastoid processes can be taken to indicate male attributes. The approximate height of the individual is 146–154cm (4'9"–5').

On the basis of the fusing of the right rami pubis and os ischii, the skeletal age is indicated as more than 8 years. The lack of epiphyseal fusion suggests an age less than 13, and the femur measurement suggests an age range of between 9–11 years. Sinfield however suggests that the age of 13 is actually the most likely on the basis of the teeth development. This is considered to be a more reliable source of age determination since femur measurement, and to a certain extent epiphyseal fusion, can be affected by a number of external factors, such as nutrition, disease, minor illness or psychological trauma.<sup>5</sup>

Although the skull is mostly complete, it is damaged in the area of the right parietal bone. There is slight cranial warping, which is a post-mortem feature and not a function of either disease or disability as had been originally suggested. Most of the adult teeth are present, although the permanent canines on the left and right, which are still within the jawbone, are in the wrong place, being positioned behind the front teeth at a diagonal angle, which has resulted in the retention of the milk teeth canines. The second incisor on the left has been lost postmortem. There

---

<sup>3</sup> For the full report, see Graham-Campbell & Paterson forthcoming.

<sup>4</sup> See full listing of bones recovered in Appendix Two.

<sup>5</sup> Laura Sinfield pers. comm. following her discussion with Dr Iain MacLeod of the Dental Hospital, Edinburgh.

is no evidence of major systemic illness, decay or tartar build-up, and in fact the boy had good oral hygiene. Through the combination of four different methods of looking at dental development, an age range of 9.5 to 14.5 years is estimated.<sup>6</sup>

There are two minor pathological notes. Firstly, there are bilateral erosive lesions (irregular pitting) on the distal ends of both humeri, of unknown cause. This was suggested by Hallén to indicate osteomyelitis (a non-specific bone inflammation possibly caused by a bacterial infection). Sinfeld however notes its presence on the inside of the trabecular bone and comments that osteomyelitis cannot affect this bone. Secondly the right clavicle, humerus and ulna seem enlarged compared to the left side, suggesting right-handedness and a physical lifestyle, possibly as a response to the over-use of developing limbs.

### *The Grave Assemblage*

The complete assemblage was assigned to the Royal Museum of Scotland and accessioned in 1992 as NMS IL 921–967. These items are discussed below in accession number order.

#### *Iron Sword with Fragmentary Scabbard (IL 921)*

The sword has a total surviving length of 860mm and is now in three major fragments: the hilt with the majority of the blade, and two further fragments of blade now conjoined (Figures 4 and 5). The blade tip appears to be missing, with a clean break visible on x-ray of the lower portion of the scabbard (Figure 6). The tip was missing prior to the deposition of the sword, with mineralised scabbard remains extending beyond the break. There are extensive mineralised organic remains associated with the corrosion products of the sword, indicating substantial survival of the scabbard. Much of the information on the sword has been gleaned from x-ray, because the mineralised organics obscure details of the sword beneath.<sup>7</sup>

The hilt is intact and distinguished by its triangular pommel, which appears to have been cast in one piece with the upper guard. Both the

---

<sup>6</sup> 12 years (according to Brothwell 1981); 12 years ± 30 months (i.e. 9 ½–14 ½ years) (Bass 1987); 12 years ± 9 months (Hillson 1990); 13–14 years (van Beek 1983).

<sup>7</sup> Our thanks to Kim Nissan who conserved the sword and scabbard and provided tentative identifications for the associated mineralised organic remains.



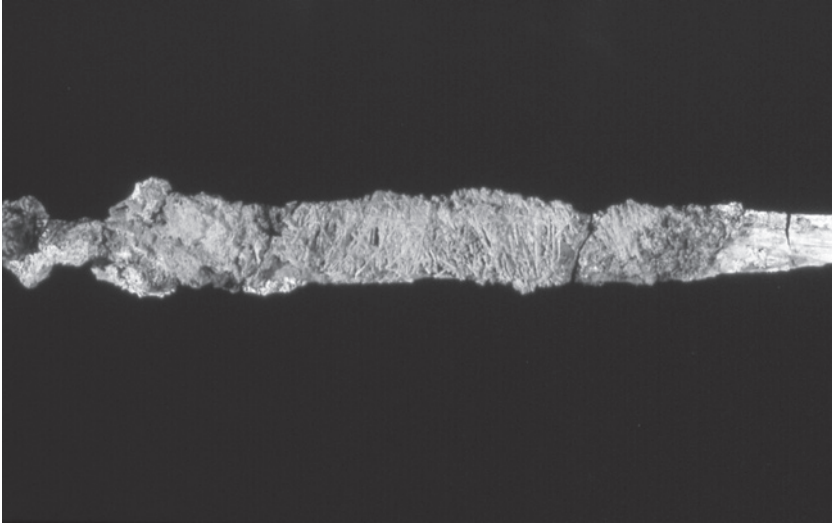


Figure 4. Sword (IL 921) showing scabbard and straw. Copyright Trustees of the National Museums of Scotland.

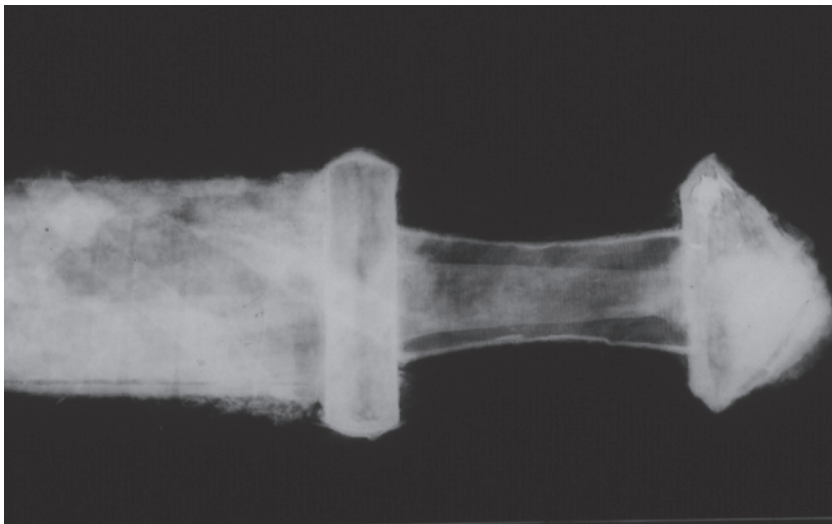


Figure 5. Sword (IL 921) x-ray of hilt with scabbard binding and hilt padding visible. Copyright Trustees of the National Museums of Scotland.

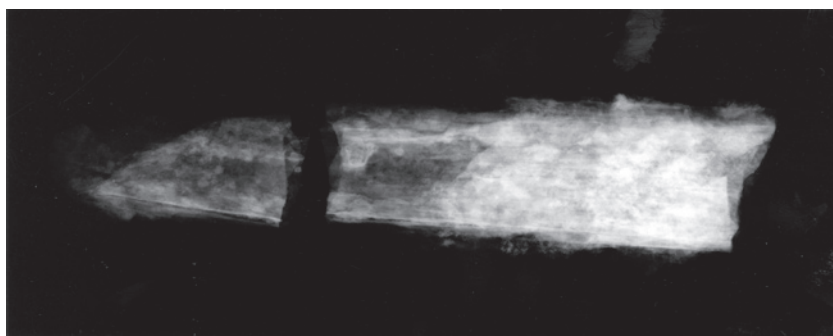


Figure 6. Lower sword blade ( IL 921) showing broken tip. Copyright Trustees of the National Museums of Scotland.

upper and lower guards are straight and have horizontal medial ridges, giving their narrow ends a sharply angled appearance. The lower guard appears to be elliptical in section, with a relatively broad central portion. The section of the upper guard is unidentifiable, and there is no evidence for plating or inlay. The grip is neatly bound with an intact horizontal binding of S-plyed yarn.<sup>8</sup> From x-ray the tang can be seen to be intact. Between the tang and the binding is a mineralised organic grip of wood. The blade is double-edged and has no indication of pattern welding.

The nature of the scabbard and its protective wrappings are of great interest, as such organic materials rarely survive. From x-ray it is possible to determine a thin line running parallel with the blade edges. This is presumably the mineralised remains of a wooden scabbard, and mineralised wood is clearly seen covering most portions of the blade, its grain running along the axis of the blade. The scabbard probably took the form of two laths of wood, bound together with thin bands of textile (1mm in width) apparent on x-ray, particularly in the upper area of the blade. Similar mineralised bindings are apparent on blades from Cleverns and Schortens, Germany.<sup>9</sup> Just covering the wooden scabbard on the second-largest fragment of the Balnakeil blade is a fine tabby-weave textile. Its alignment with the sword blade indicates that it may have been an element of the scabbard wrapping, as opposed to a garment lying alongside the sword in the burial. On the outside of the scabbard and in the area of the hilt is a further tabby wrapping of a more open weave. From x-ray this appears

<sup>8</sup> Thea Gabro-Sanders, pers. comm.

<sup>9</sup> Geibig 1991: 328, Taf. 118.1, 344, Taf. 134.3.

partially folded and wound around the hilt and grip. Also embedded in the sword's corrosion products are feathers and straw, presumably representing bedding materials on which the boy was laid to rest. The straw is generally aligned horizontally across the scabbard.

The sword's triangular pommel, visible on x-ray, assigns it to Petersen's types B, C or H. The apparently broad, elliptical cross-section of its lower guard suggests that it belongs to type H, though hilt components of the above types are known to have been interchangeable.<sup>10</sup> The possibility that the pommel and upper guard are a single casting is unusual, with only two Norwegian parallels being listed by Petersen, namely Dynna, Gran, and S. Farnen, Hedrum.<sup>11</sup> Most type H swords have inlaid hilts, but no such inlay is visible on the x-ray of this sword. However, there is a small group of type H swords which do not have inlaid hilts,<sup>12</sup> and it is likely that the Balnakeil sword belongs to this category. The intact binding on the grip is exceptional in its preservation, being the only known survival of such a fine organic binding. It provides an insight into the organic bindings of grips that rarely survive, although grips bound with gold, silver and copper-alloy wire are known from Scandinavia.<sup>13</sup>

Type H swords are the most common sword-type of the Viking Age,<sup>14</sup> with a wide distribution both in place and time, spanning from the early ninth century until the middle of the tenth century.<sup>15</sup> According to Petersen the guards of swords early in this series are always ridged and fairly substantial. It is possible therefore that the Balnakeil sword belongs to the earlier, rather than later, end of the sequence. The plain hilt would substantiate an early date, because all the type H swords without inlay from Scandinavia belong to this earlier phase.<sup>16</sup> This would probably suggest a date of the late ninth, rather than early tenth, century.

The absence of a blade tip within the scabbard indicates that this sword was damaged prior to its deposition. This could be interpreted as the intentional ritual 'killing' of the weapon prior to burial, as suggested for other swords, including the Scar sword, which is likewise broken within an intact scabbard.<sup>17</sup> Both damaged swords could equally be interpreted as the prag-

---

<sup>10</sup> Petersen 1919: 93.

<sup>11</sup> Petersen 1919: 93, 95, fig. 83.

<sup>12</sup> Petersen 1919: 92–93.

<sup>13</sup> Petersen 1919: 145, figs. 116, 176, fig. 136; Graham-Campbell 1980: 246, no. 250.

<sup>14</sup> Petersen 1919: 89.

<sup>15</sup> Petersen 1919: 98–100.

<sup>16</sup> Petersen 1919: 99.

<sup>17</sup> Nissan in Owen & Dalland 1999: 105.

matic deposition of damaged equipment. Wooden scabbards are known from several swords found in the British Isles,<sup>18</sup> but the mineralised organics associated with the Balnakeil sword are exceptional in their survival.

*Iron Shield-Boss (IL 922)*

The high-domed shield-boss, of 130mm diameter and 75mm in height, has a sharply angled concave neck between the base of the dome and the offset flange (of approximately 18mm in width). The boss is corroded with substantial mineralised organic deposits covering its outer surface, including a quantity of irregularly angled straw (Figure 7). Its interior

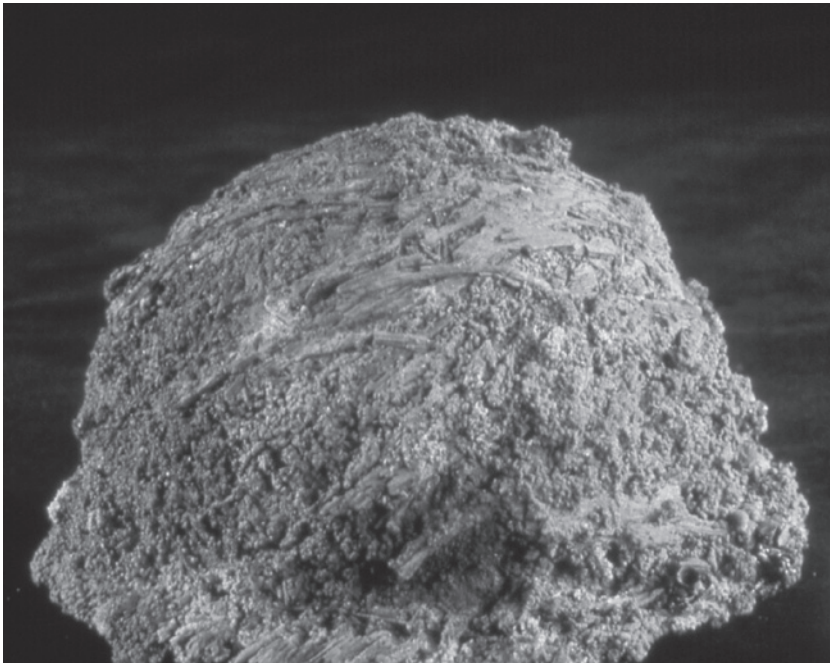


Figure 7. Detail of the shield boss (IL 922 ). Copyright Trustees of the National Museums of Scotland.

<sup>18</sup> Bersu & Wilson 1966: 52–53, 70–71; Cubbon 1982: 443–446, 455–456; Nissan in Owen & Dalland 1999: 109–110.

has stalactite-like corrosion deposits. X-rays and the survival of mineralised wood on the underside of the flange identify the probable location of four equally spaced rivets, one of which appears to be clamp-like and may have been associated with the attachment of the grip. Fragments of a smooth mineralised organic surface on parts of the flange may represent the remains of a leather covering to the wooden shield-board. Seven fragments of mineralised wood, two of which are attached to the spear-head socket, and one to a shaft fragment that conjoins with the spearhead, most probably belong to the shield-board (IL 923).

Although this shield-boss can be paralleled most closely by type R 562,<sup>19</sup> its substantial angled neck and high dome also associate it with R 564, which suggests that it may be early within the R 562 series, which Petersen dated from the mid-ninth to the mid-tenth centuries.<sup>20</sup>

The boss was found at an angle over the interred boy's head, covering the back of his neck. Shields frequently appear to have been deposited close to the head, commonly covering it, as noted at Birka.<sup>21</sup> It has been suggested that at Balnakeil the shield together with the spearhead formed a canopy to protect the boy's head.<sup>22</sup> However, it is more likely that the spear rested on the shield-board and assumed its projecting stance only with the collapse of the shield-board.

#### *Mineralised Wooden Shield-Board (Il 923)*

There are seven fragments of mineralised wood with an average thickness of *c.* 7mm, which corresponds with the thickness of some contemporary wooden shield-boards.<sup>23</sup> Two of the fragments are attached to mineralised fragments of spear shaft, indicating that this flat wooden object was located near to the boy's head, and thus to the shield-boss. It seems probable therefore that these fragments represent the mineralised remains of the shield-board, which would have extended from the boss above the boy's head across to where the spear-head was situated.

<sup>19</sup> Rygh 1885.

<sup>20</sup> Petersen 1919: 47.

<sup>21</sup> Arwidsson in Arwidsson (ed.) 1986: 38.

<sup>22</sup> Low et al. 2000: 26.

<sup>23</sup> Dickinson & Härke 1992: 47.

*Iron Spear-Head (Il 924)*

The spear-head is now in three fragments, with an overall length of 144.8mm. It originally had an elongated slender blade, the tip and neck of which survive, together with a small unidentifiable fragment. The blade is narrow and of lozenge cross-section, but as the two blade fragments do not join, it is not possible to estimate its original length. The angle of the shoulder is more acute on one side than the other, as is fairly common for type K spearheads.<sup>24</sup>

Soon after its recovery, the spearhead was identified as having mineralised insect frass adhering to its surface, tentatively identified as woodworm.<sup>25</sup> This was matched by the same material on a mineralised shaft, which conjoins with the spearhead, forming its socket.<sup>26</sup> The neck at the base of the blade is of circular section with a diameter of 12mm, corresponding almost exactly with the diameter of core metal at one end of the detached socket, confirming that the blade and socket belong together, joining at this point. This tapering iron socket is filled with mineralised wood, extending beyond its base.

There are also a few fragments of mineralised wood, which transversely cross the shaft. Three additional fragments of mineralised wood of cylindrical form were recovered from unknown locations in the burial and almost certainly belong to the same spear-shaft. Indeed one of these cylindrical fragments, mineralised to a flat piece of wood, joins with the end of the spear-socket fragment, the grain of the flat wood aligning exactly with one of the fragments transversely corroded to the shaft. These flat fragments have been tentatively identified above as fragments of shield board, which appears to have underlain the shaft.

The angle of the shoulder, together with the long, narrow nature of the blade identify the spearhead fragments as belonging to Petersen's type K, a light throwing-spear.<sup>27</sup> This type is usually assigned a Norwegian origin, but the absence of a prominent midrib, as paralleled on examples from Ballateare, Isle of Man, and Kilmainham/Islandbridge, has led to suggestions of Insular manufacture for this form which is of late ninth- or early tenth-century date.<sup>28</sup>

---

<sup>24</sup> Petersen 1919: 32, figs. 21–22; Graham-Campbell 1980: 249, no. 260.

<sup>25</sup> Theo Skinner pers. comm.

<sup>26</sup> Andrew Whittington, pers. comm.

<sup>27</sup> Petersen 1919: 31–33.

<sup>28</sup> Bøe 1940: 26; Bersu & Wilson 1966: 57–58.

The cylindrical shaft of the spearhead was recovered pointing at an angle of 45 degrees above the skull. Special symbolic significance was accorded to spears within burials, with their lengthy hafts frequently being accommodated,<sup>29</sup> and even protruding over the sides of coffins, as at Cronk Moar, Jurby, Isle of Man.<sup>30</sup> At Balnakeil the projecting angle is most likely to have been as a result of the collapse of the shield-board over which it was laid.

*Iron Knife (IL 925)*

Although little core metal survives, x-ray reveals the outline of a knife of 140mm total length beneath the mineralised organics visible on the exterior of this corroded object. The exact definition of the knife's profile is hard to determine on account of its advanced state of corrosion. There is, however, a distinction between the mineralised wood grain covering the haft and a smooth material, possibly a leather sheath, in the area of the blade, which probably also covered the handle. A fragment of finger bone (metacarpal) is corroded diagonally across the area of the blade.

Although unstratified within the burial, the finger bone associated with this knife would indicate that it was either placed in the boy's hand or in the area of his waist. Knives are commonly associated with child burials and were recovered from 27 such graves at Birka.<sup>31</sup>

*Copper-Alloy Penannular Brooch-Pin (IL 926)*

The brooch-pin consists of a looped pin shank (139.2mm in length) with a penannular ring (c. 25mm in diameter) corroded to its head. The shank is of sub-rectangular section with traces of a white metal surface surviving at its upper end. The pinhead has a pair of horizontal grooves at the base of its loop, which is decorated with a pair of vertical grooves. The ring has club-shaped terminals with an opening of c. 5mm between them. It is corroded fast within the looped pin-head (Figure 8). Mineralised yarn adheres to the lower section of the ring and is either part of the garment to which it was fastened, or the fastening itself.

<sup>29</sup> Gräslund 1980: 30–31.

<sup>30</sup> Bersu & Wilson 1966: 67.

<sup>31</sup> Gräslund 1973: 174.



Figure 8. Detail of head of the brooch pin (IL 926). Copyright Trustees of the National Museums of Scotland.

The clubbed terminals of this brooch-pin are not unlike those belonging to penannular brooches from the burials at Bhaltois, Lewis and Kildonan, Eigg.<sup>32</sup> Brooch-pins were in fashion during the second half of the eighth and the ninth centuries,<sup>33</sup> with Batey regarding it in the light of a parallel from Lagore Crannog as possibly of Irish origin.<sup>34</sup> Although the penannular brooch-pin form predates the floruit of the ringed-pin series, some are found in later contexts, witnessing to their longevity.<sup>35</sup> It is, however, also possible that this brooch-pin was an heirloom.

The brooch-pin was recovered from the lower regions of the skeleton, and copper-alloy corrosion products were noted on the left femur. Its position so low in the burial is paralleled in the male grave from Reay, Caithness,<sup>36</sup> together with several other pagan inhumations, where it could indicate the use of a cloak as a shroud.<sup>37</sup>

#### *Copper-Alloy Pendant Capping (IL 927)*

This object consists of a tapering socket of sub-rectangular section capped with a flat-sectioned ring, of overall length 46.4mm. The socket is broken at its lower end, but the single perforation on one long side was most probably matched by another on its now fragmentary opposite side. The

<sup>32</sup> Grieg 1940: 76e, fig. 43; 67–68, fig. 39.

<sup>33</sup> Fanning 1994: 5.

<sup>34</sup> Hencken 1951: 73, fig. 15 no. 1531 or 1200; Batey 1993: 157.

<sup>35</sup> Fanning 1994: 5.

<sup>36</sup> Grieg 1940: 20.

<sup>37</sup> Fanning 1994: 127.



attachment ring is broken at its apex, the respective ends now being slightly out of line with each other. The surface of this socketed object is corroded and slightly pitted in appearance.

Although this object was initially identified as a possible strap-end,<sup>38</sup> other interpretations are possible. Its form, suspension loop and wide socket indicate that it functioned as a capping for an object of thicker section than a strap. Its sub-rectangular section and perforations suggest that it may have been the decorative capping for a pendant whetstone, closely paralleling a fine silver example, complete with whetstone, recovered from a tenth-century inhumation burial (grave 251) from the Carlisle Cathedral excavations.<sup>39</sup> The socket's cavity extends to the neck of the suspension. Although much slimmer in all its dimensions, its form is not unlike that of an Insular drinking-horn terminal from Gausel, Rogaland, Norway,<sup>40</sup> which may suggest an Insular origin for this capping. An Insular origin for this object is further indicated by its metallic composition of leaded bronze.<sup>41</sup> It was recovered from the disturbed lower body area close to the ring-brooch.

#### *Copper-Alloy Pin (IL 928)*

A tiny length of copper-alloy rod, some 12mm long is likely to be the shank of a small pin. It was found corroded to the front of the boy's skull, and may have been associated with some form of organic head band (now decomposed). Ornate headbands of precious metallic thread have been recovered from Birka,<sup>42</sup> and appear to have had a particular association with child burials.<sup>43</sup> Simple copper-alloy pins were also used to fasten veils or act as shroud pins,<sup>44</sup> with the latter being more likely in this context.

#### *Iron Fish-Hook (IL 929)*

Two fragments of corroded iron join to form what is probably a fishhook of 43mm in length. Both fragments are bound with mineralised yarn

<sup>38</sup> Batey 1993: 157.

<sup>39</sup> Mike McCarthy, formerly of Carlisle Archaeological Unit, pers. comm.

<sup>40</sup> Petersen 1940: 169, 171, fig. 137.

<sup>41</sup> Troalen & Tate 2006.

<sup>42</sup> Geijer 1938: 145–47.

<sup>43</sup> Gräslund 1973: 171.

<sup>44</sup> Hayden & Walsh 1997: 136.

confirming their association. Corrosion has destroyed the tip where one might have expected a barb, but the upper terminal, although corroded appears to have had a looped eye at a 90 degree angle to the hook, as is typical for fishhooks.<sup>45</sup>

The complete fishhook is visible in the initial record photographs of the burial, where it is out of context, having probably fallen from the cluster of artefacts at the lower end of the boy's body. The mineralised yarn binding is likely to be the line, bound round the hook for safekeeping, just as thread was wound round individual needles in needle-cases. Fishhooks are rare finds from this period, partly due to their small size and poor chances of survival. Petersen recorded only 18 from Norway<sup>46</sup> and Ottaway has produced a summary of the finds from the British Isles.<sup>47</sup> Although a couple of fishhook fragments were recovered from Jarlshof, Shetland,<sup>48</sup> and one from Westness, Rousay, Orkney,<sup>49</sup> this is to date the only fishhook to have been recovered from a pagan Norse grave in Scotland.

#### *Mineralised Needle Cluster (IL 930)*

A mineralised cylinder (36.3mm long) of neatly wound yarn, originally supported by an organic tube, contained three iron needles, the broken off stumps of which are apparent at the narrower end. Mineralised accretions adhere to the outside of this object, together with a few loose threads. The cylinder of yarn is broken in a few places, but is otherwise remarkably intact. It is possible that there was a wooden divider that separated the needles and provided additional support. A little mineralised wood protrudes from the wider end of the cone, but there are otherwise cavities between the surviving needles, making it difficult to determine the nature of the material around which the thread mineralised. Striations in the x-ray would suggest that this may have been wood. The needles themselves are individually bound with mineralised yarn, presumably as a means of storage.

It would appear that these needles were not contained in a needle-case of bone or metal, as is typical for the Viking period,<sup>50</sup> but were set within

<sup>45</sup> Ottaway 1992: 601, fig. 248.

<sup>46</sup> Petersen 1951: 277.

<sup>47</sup> Ottaway 1992: 600–601.

<sup>48</sup> Hamilton 1956: 153, no. 77, pl. 23.

<sup>49</sup> Sigrid Kaland pers. comm.

<sup>50</sup> Petersen 1951: 324–28.

a now-degraded cylindrical case bound with thread. An almost identical needle tidy was recovered from Scar, Sanday.<sup>51</sup> Needle cases were recovered from two or possibly three child graves at Birka<sup>52</sup> but are otherwise almost exclusively associated with female graves.<sup>53</sup>

*Two Slender Iron Shafts with Flints Adhering (IL 931–932)*

There are two slender lengths of iron of circular cross-section, each of which has a small flint flake attached to its corrosion accretions. L (total) 42.2mm; W 10–8mm. X-ray reveals the original diameters of the two shafts to correspond exactly with the truncated needles protruding from the ends of the needle cluster (IL 930). Although their corrosion deposits are different, it is possible that these shafts belong to two of the three needles, stored within the needle cluster. The associated flints could have been used for cutting thread. Their attachment through corrosion could indicate that this sewing equipment was held within a small container.

*Copper-Alloy Stud (IL 938)*

A small hemispherical rivet or stud of corroded copper alloy, with a head 7mm in diameter is of unknown function. On account of the diameter of the stud's shank corresponding with that of the perforations in the gaming pieces (IL 941–954), it has been suggested that this stud could have adorned one piece identifying it as a 'king piece'.<sup>54</sup> However, no copper-alloy staining is apparent on the surviving gaming pieces, but as the set is probably incomplete, it remains a possibility that a now-missing peg may have been differentiated in this way.

*Possible Iron Shear Arm Blade (IL 939)*

A length of corroded iron with flattened sub-rectangular form is unidentifiable due to extensive corrosion. It is 82.6mm in length. Fine mineralised textile is wrapped diagonally around much of its surface. The identifica-

---

<sup>51</sup> Smith in Owen & Dalland 1999: 95–96.

<sup>52</sup> Gräslund 1973: 174.

<sup>53</sup> Petersen 1951: 327.

<sup>54</sup> Trevor Cowie, pers. comm.

tion of this object is uncertain, but the fine textile wrapping might suggest that it is a possible shear arm blade from a small pair of shears. Shears in burials were frequently wrapped in textiles prior to their deposition. They are as common a find in male graves as female ones<sup>55</sup> and together with the cluster of needles (IL 930) provided the Balnakeil boy with a sewing kit.

*Antler Comb (IL 940)*

Remains of a composite single-sided comb now in seven fragments, include six tooth-plates with additional loose teeth, together with one fragment of back-plate, of shallow cross section (Figure 9). The overall surviving length is c. 145mm. The two squared-off end tooth-plates are decorated with a pair of vertical grooves, a similar groove also appearing along the surviving edge of the back-plate. Corrosion and staining indicate that the comb was fastened with iron rivets, there being one in situ

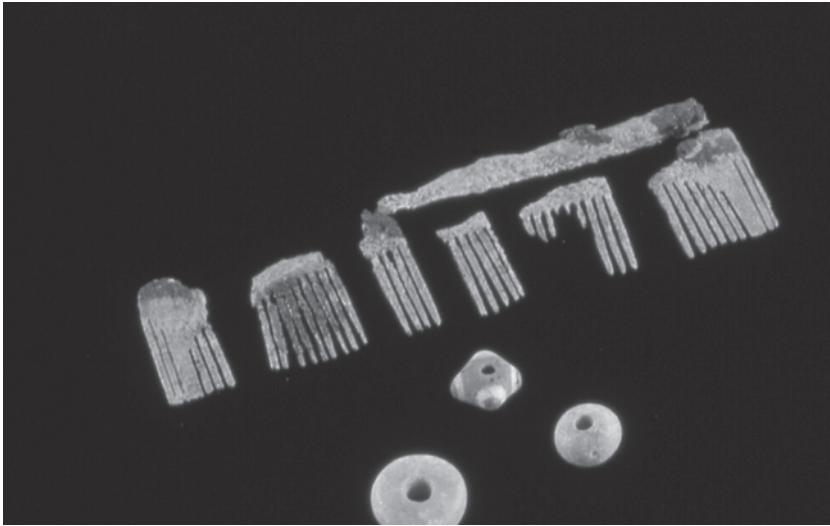


Figure 9. Comb (IL 940) and three beads (IL 956–958). Copyright Trustees of the National Museums of Scotland.

<sup>55</sup> Petersen 1951: 318.

in both end-plates. One of the tooth-plates has an attached fragment of mineralised tabby weave.

The poor condition of this comb, in particular the fragmentary back-plate, preclude the possibility of assigning the comb to a type with certainty. However the shallow back-plate cross-section and incised ornament are typical for Ambrosiani's class A combs, which date from the mid-ninth to tenth centuries and are of Scandinavian origin.<sup>56</sup> The comb was recovered from the area around the boy's waist.

*Fourteen Bone Gaming Pieces (IL 941–954)*

Fourteen conical gaming pieces survive to varying degrees (Figure 10). They appear to have been flat-based, with a conical apex. Bone pegs pass vertically through their centres and presumably extended beyond the base, as on one example, for attachment to a gaming board. Some of the pieces are impregnated with iron corrosion and staining. The pieces are

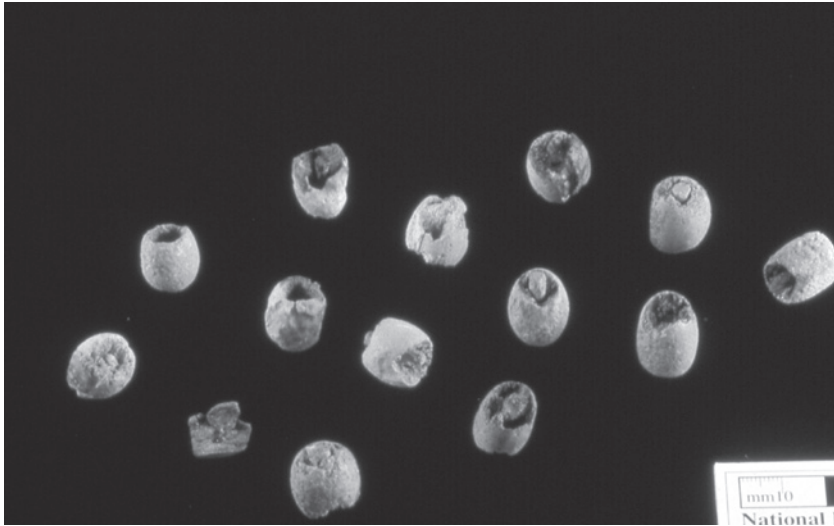


Figure 10. Gaming pieces showing bone pegs (IL 941–954). Copyright Trustees of the National Museums of Scotland.

<sup>56</sup> Ambrosiani 1981: 24–29, 34.

remarkably regular in size, approximately 20mm in height with a basal width of 11mm.

The worn condition of the gaming pieces precludes a closer identification of the bone<sup>57</sup> and method of manufacture. The shiny surface patina on one of the above fragments indicates that they were originally polished, though their form appears natural as opposed to turned. Their outer surfaces are generally smooth, with cancellous material only visible in their interiors exposed by damage, indicating that the bone, possibly antler, had been carefully selected. It is possible that they were fashioned from the points of antler tines, with similar usage being noted elsewhere.<sup>58</sup> Antler points have a terminal of compact material suitable for polishing, whilst their porous core could be drilled to accommodate the bone pegs.

The gaming pieces were recovered from the area of the boy's legs, in a relatively compact group, indicating that they were originally contained in a now disintegrated pouch of organic material.<sup>59</sup> This find location closely parallels that of the gaming pieces from Scar, Sanday, Orkney.<sup>60</sup> There may have been more gaming pieces, since several were lying on the surface around the burial at the time of its discovery, and fourteen would not constitute a standard set size for the game of hnefatafl, particularly with the absence of a 'king piece'.

*Amber Bead (IL 956)*

Annular bead of opaque amber, with diameter of 19.7mm.

*Amber Bead (IL 957)*

A small globular bead of opaque amber, 13.5mm in diameter. The bead is irregular in shape with the perforation slightly off-centre. It was chipped in antiquity.

---

<sup>57</sup> Andrew Kitchener pers.comm.

<sup>58</sup> Ambrosiani 1981: 124–125, 132–133, fig. 82: 6.

<sup>59</sup> Low et al. 2000: 26, 28.

<sup>60</sup> Owen in Owen and Dalland 1999: 127.

*Glass Bead (IL 958)*

This polychrome globular bead of glass paste, has four protruding knobs of white collared dark blue glass. Max. D 14.8mm; H 8.4mm. The 'eyes' are spaced equidistantly around the bead's circumference. The bead is flawed with small air bubbles and has some damage to the protruding areas.

Beads were commonly deposited in children's graves, particularly around their necks or in the chest area, and amber ones appear to have had an amuletic function.<sup>61</sup> The three beads were recovered from the area of the boy's neck (Figure 9), around which they were probably suspended. The Balnakeil burial is unusual in having more than one amber bead, with single amber beads being more usual.<sup>62</sup> Glass 'eyed' beads were concentrated to within the latter part of the ninth century and beginning of the tenth century, and are exclusive to Scandinavia, the Baltic Littoral and Staraja Ladoga.<sup>63</sup>

*Pumice Stone (IL 959)*

Single piece of dark grey pumice stone, discoloured from its close proximity to corroding iron and sand, measuring 41 × 33mm. It is possible this stone was a stray beach find. However, its clear association with corroding iron, and by extension the grave assemblage, make it likely it was a grave-good, perhaps used originally in the preparations of skins. Fragments of pumice were also recovered in association with the rich female pagan Norse burial recovered from Westness, Rousay in 1963 (IL 741B).<sup>64</sup>

*Five Flint Flakes (IL 960–964)*

Five small flakes, two of which were adhering to iron shafts, tentatively identified above as needles (IL 931–932), have been interpreted by Alan Saville as residual fragments of prehistoric artefacts which have subsequently become incorporated within the Viking-period grave.<sup>65</sup> It is, how-

<sup>61</sup> Gräslund 1973: 173–174.

<sup>62</sup> Gräslund 1973: 173–174; Cowie et al. 1993: 169–170.

<sup>63</sup> Callmer 1977: 88, 98.

<sup>64</sup> Stevenson 1989: 241. Graham-Campbell & Paterson forthcoming.

<sup>65</sup> This group includes a fragment which is almost certainly a fragment of a microlith of Mesolithic age and is suggested as being probably the most north-westerly example recorded (as of 1997). Alan Saville, pers. comm.

ever, highly likely that such flints were in contemporary usage as striking and cutting tools, as suggested for the two flint fragments recovered from a male grave excavated in 1926 in Reay, on the north Caithness coast.<sup>66</sup>

*Quartzite Pebble (IL 965)*

A small white quartzite pebble stained on one side with iron corrosion. Although as an unworked water-worn pebble this could be a natural deposit in the sand, there is also the possibility that it may have been intentionally deposited as a grave good, particularly as it was clearly alongside a corroding iron object. White quartzite pebbles are commonly found in early Christian graves in areas bordering the Irish Sea,<sup>67</sup> and this example may be a ritual offering reflecting the influence of the Celtic church, despite this being an otherwise pagan inhumation.

*Overview of the Assemblage*

The Balnakeil boy is a remarkable find, not only for the wealth of grave goods accompanying him, but also for the unusually good preservation of organic materials. Pagan Norse child burials have traditionally been hard to identify in the archaeological record on account of the paucity of associated finds and skeletal material.<sup>68</sup> Within Scotland there are only a few positively identified Viking-Age child burials, including three from Bhaltos, Lewis,<sup>69</sup> and the heavily disturbed burial of a child aged approximately 10 years from Scar, Sanday, Orkney.<sup>70</sup> It is hard to generalise with such a small sample, but the range of associated finds, where they exist, does not go beyond that of a few simple items such as a bead or pin. This contrasts sharply with Balnakeil, where the adolescent boy of approximately 12–13 years was accompanied by a rich assemblage of weapons, tools and personal items. His compliment of weapons is typical for an adult male and all are full size, suggesting that within contemporary society he was regarded as an adult. This corresponds with the situation for pagan Anglo-Saxon graves, where documentary analysis suggests that the

<sup>66</sup> Edwards 1927: 203–204.

<sup>67</sup> Crowe 1982.

<sup>68</sup> Gräslund 1973.

<sup>69</sup> Cowie et al. 1993; Dunwell et al. 1995.

<sup>70</sup> Owen & Dalland 1999: 29.



threshold to adulthood was around 10 to 12 years,<sup>71</sup> with a similar threshold proposed for the Viking Age based on later sources.<sup>72</sup>

If the priest thinks that baptism was not correctly administered, whether it was words or actions that were deficient, then the penalty is lesser outlawry for anyone, man or woman, of twelve winters or more.<sup>73</sup>

The adolescence of the Balnakeil young man may be reflected in the presence of a needle cluster; an object type more commonly associated with adult female burials but also found in child burials.<sup>74</sup>

The range of weapons accompanying the boy is impressive, with a sword in its scabbard (though the tip appears to have been broken prior to deposition), a shield and a spear. Personal items included a knife, a capping (possibly for a pendant whetstone), a fragment tentatively identified as a shear arm, and a needle cluster with associated flints. An antler comb accompanied the youth, and two amber beads and a glass one were for adornment. He also possessed a brooch-pin, though this may have secured the shroud as opposed to his clothing in the burial context. The fishhook with preserved line is unique within a Scottish grave context. The fourteen gaming pieces are of an unusual type, having been fashioned from antler tine tips, but like the other sets from Scotland appear to have been used in conjunction with a pegged board. Twenty-two whalebone gaming pieces were associated with the adult male buried in the Scar boat burial<sup>75</sup> and twenty-five with a rich male boat burial from Westness, Rousay.<sup>76</sup>

The mineralised straw on the lower face of the sword scabbard suggests that the body was buried in a pit cut into the sand and lined. Straw is also preserved on the upper surface of the shield-boss, indicating that straw was not simply laid on the floor of the pit, but was also used to cover the burial. Corrosion on the hilt of the sword preserved random clumps of feathers indicating that some form of bedding or pillow was present. Shrouded burials within pits are paralleled by a few coffinless burials at Birka,<sup>77</sup> as are coffinless graves with feather-beds and a chamber grave with a possible straw-filled pallet.<sup>78</sup> Mineralised feathers were also found

<sup>71</sup> Crawford 1999: 21ff, 47ff.

<sup>72</sup> Lillehammer 1989: 98.

<sup>73</sup> Mjöll Snaesdóttir pers.comm.; Dennis, Foote & Perkins transl. 1980: 25.

<sup>74</sup> Gräslund 1973: 173.

<sup>75</sup> Owen & Dalland 1999: 127.

<sup>76</sup> Kaland 1993: 313.

<sup>77</sup> Gräslund 1980: 12–13.

<sup>78</sup> Gräslund 1980: 14.

in association with a sword at Westness, Rousay, Orkney suggesting the presence of a feather pillow.<sup>79</sup>

The artefacts could suggest a deposition date for this burial sometime in the mid-to-late ninth centuries. Of significance in the debate over the date of this burial, are the results published by Barrett and Richards<sup>80</sup> of two samples of human bone from the Balnakeil skeleton, which were submitted for radiocarbon analysis. SUERC-2894 provided a date before present of  $1350 \pm 35$ ; SUERC-2895 provided a date before present of  $1265 \pm 35$ . These were combined as  $1308 \pm 25$  before present, with a date range of 660–940 (mixed atmospheric/marine calibration, 95.4% range).<sup>81</sup> Recent study by Sarah-Jane Clelland of Bradford University has included these determinations: at 2 sigma, a date range of 680–831 (94% probability that the date lies in this range) and 837–864 (6% probability that the date lies in this range). Using Calib v5.0.2 which advises rounding up to the nearest 10-year interval, a combined calibrated date range of AD 680–860 is suggested.<sup>82</sup> Whichever of these date ranges is preferred, there is clearly a discrepancy between the scientific dating of the skeleton and the artefactual material that is difficult to reconcile. The isotopic signal from the bone collagen indicates a borderline mixed diet even after taking into account the marine effect on the determinations. It is not appropriate to account for the earlier skeletal date and the later artefactual date by assuming that the body had been laid out for some time before burial, as in virtually all cases the minor bones of the extremities were present in the grave, yet these would have been vulnerable to loss if the body had been re-interred. The suggestion from the artefactual material of a late ninth-century dating with the possibility of a slightly later assignation indicated by the Insular components, would seem to be just beyond the very latest date indicated by radiocarbon means. It would seem most likely that a date in the mid-ninth century is suggested here, with a longer lifespan for of some of the artefacts than had perhaps been anticipated. It is of considerable interest to note that recent radiocarbon determinations from pagan graves at Cnip in the Western Isles, whilst overlapping with the Balnakeil range (780–900 at 68% probability and 720–970 at 95% probability)<sup>83</sup> are clearly later than those from Balnakeil.

---

<sup>79</sup> Graham-Campbell & Paterson forthcoming.

<sup>80</sup> Barrett & Richards 2004.

<sup>81</sup> *Ibid.*: 256, table 1.

<sup>82</sup> S.-J. Clelland pers. comm, S.-J. Clelland 2006.

<sup>83</sup> Graham-Campbell 2006.

*The Local Context* (Figure 1)

Although this is at present an isolated burial in Balnakeil Bay, with its nearest neighbouring grave of possible Norse character being at Keoldale,<sup>84</sup> Batey suggests that, in the light of there being a history of stray finds of Norse date from the area, there could be further burials in Balnakeil Bay, possibly representing a cemetery.<sup>85</sup> A number of graves discovered on the north coast of Scotland, further to the east at Reay in Caithness have been discussed elsewhere.<sup>86</sup> Gradual recovery of that evidence from sand blows over a number of years has however lead to uncertainty about the actual quantity of burials represented at Reay. The isolated find of an oval brooch from Thurso and also of a Baltic-type penannular brooch from Harrow<sup>87</sup> on the north coast may be indications of additional burials, although each of these finds appears to be isolated.

The overall picture of Norse settlement on the north coast of Scotland has, however, changed markedly within recent years. Examination of the Norse place-names in the area by Waugh has led her to conclude that the whole region of the north coast of Scotland ought to be considered as a whole in onomastic terms,<sup>88</sup> and work by Crawford<sup>89</sup> on the historical issues of the area confirms that the province of Strathnaver itself owes more to its affinity with events in Caithness than to those of Sutherland (as defined on a modern map). There is an increasing body of archaeological evidence in the area to bolster this view. The stray finds from Balnakeil Bay could suggest settlement in the vicinity of the burial discussed here, although actual structural evidence datable to this period is not currently confirmed. However, excavations at Borralie, Durness by Olivia Lelong have revealed middens with possible structural remains dated to the Norse period,<sup>90</sup> as indeed have those by Kevin Brady and Olivia Lelong at Sangobeg to the east.<sup>91</sup> Combined with traces of Norse presence at Smoo Cave identified by Tony Pollard,<sup>92</sup> these are all important indicators of activity along this stretch of the Sutherland coast.

<sup>84</sup> Lethbridge 1950: 96.

<sup>85</sup> Batey 1993: 158.

<sup>86</sup> Batey 1993: 152–154; Graham-Campbell & Batey 1998: 125–127.

<sup>87</sup> Batey 1993: 158–159.

<sup>88</sup> Waugh 2000: 23.

<sup>89</sup> Crawford 2000: 1.

<sup>90</sup> Lelong & Gazin-Schwartz 2005: 26.

<sup>91</sup> Brady & Morris 1998: 83, no. 42. Brady et al. 2008: 64–67.

<sup>92</sup> Pollard 2005.

Further east along the Caithness coast, excavations by Pollard at Dunnet Bay revealed Norse settlement and midden traces,<sup>93</sup> and the work of Batey on identifying a possible Norse boat burial and settlement at Huna<sup>94</sup> and additionally at Robertshaven by John O'Groats<sup>95</sup> most recently excavated by James Barrett (although dated to the late Norse period),<sup>96</sup> indicate an extensive north coast focus for Norse activity. The major excavations at Freswick Links, although located on the east coast of Caithness, suggest large-scale fishing activity in the late Norse period, an activity which was most likely focussed in the turbulent seas of the Pentland Firth.<sup>97</sup> As the landfall nearest to the Orkney Norse strongholds to the north, such a concentration would be anticipated, but until the more recent archaeological investigations on the Mainland side of the Pentland Firth, this situation was not confirmed. The crucial landmark of Cape Wrath, a pivotal maritime location, lies only a short distance from Balnakeil, and it is not hard to imagine fleets of Norse vessels sitting out bad weather in the sheltered anchorage of Balnakeil Bay, prior to heading southwards past Achnahaird Bay on the west coast, which has traditionally had associations with the Norse<sup>98</sup> and onwards to the lands of the Suðreyar and the markets of the Irish Sea.

### *Acknowledgements*

The considerable assistance of Trevor Cowie, Andy Heald and Neil McLean of the National Museums of Scotland has greatly facilitated progress in the completion of this paper. Additional photographic and graphic work has been supplied by Highland Regional Council through Dorothy Low and in Glasgow, patient support and production by both Gillian McSwan of GUARD and Lorraine McEwan of the Department of Archaeology is warmly acknowledged. Thanks are also due to Erin-Lee McGuire for editorial assistance with particular reference to the skeletal material. Finally we wish to thank James Graham-Campbell for his keen observations and sharing of knowledge over the years.

---

<sup>93</sup> Pollard 1996: 17–19.

<sup>94</sup> Batey 1993: 152.

<sup>95</sup> Batey 1984: CAN 041.

<sup>96</sup> E.g. Barrett 1997.

<sup>97</sup> Morris et al. 1995.

<sup>98</sup> Long 2002: 287–288.

*Appendix 1: Indeterminate Fragments from the Grave Assemblage**Iron fragments (IL 933–936)*

There are six corroded fragments of iron, the identity of which is unknown. Two tapering fragments are of thin, rectangular cross-section and have mineralised wood grain on one side. A further small fragment appears to belong to a similar tapering mount/clamp.

*Copper-Alloy Fragments (IL 937)*

Two conjoining fragments of corroded copper-alloy tapering rod of unknown identification. The object appears to have been of sub-circular section, with a rounded end; its surface is obscured by corrosion blisters.

*Iron Fragments (IL 955/i, IL 955/ii, IL 955/iii)*

IL 955/i A corroded iron clump attached to gaming pieces. X-ray reveals that it comprises an iron strip (52mm long and 13mm wide), with a pointed V-shaped terminal, which is transversely crossed by an iron nail. The surface of this iron clump is corroded and includes traces of copper-alloy corrosion, mineralised thread and bone. IL 955/ii An unidentified sub-rectangular piece of iron corrosion distinguished only by a profusion of corrosion blisters and part of the mineralised shell of one of the above gaming pieces, to which it was attached. IL 955/iii A small corroded iron nail, which reveals may have had a copper-alloy capping to its head (of diameter 8.5mm). The outer shell of one of the above gaming pieces is corroded to it between its shank and head. These iron fragments which had gaming pieces attached to their corrosion products were clearly positioned adjacent to the latter within the burial. A possible interpretation is that they may have formed part of the frame for a now decomposed gaming-board, such as those recovered from Birka,<sup>99</sup> and loss accounts for the absence of further rivets and binding strips.

*Appendix 2: Human Skeletal Remains Recovered*

Cranium

Mandible

Vertebrae—11/12 thoracic vertebrae, varying degrees of preservation

<sup>99</sup> Arbman 1940: Taf. 146, 1 & 2.

Sacrum—5 sacral vertebrae present, no coccyx

Scapulae—both right and left present

Clavicle—both right and left present, but differing preservation and right seems enlarged (see Humeri)

Ribs—all 12 present, but in varying degrees of preservation

Humeri—both right and left are present, right is distinctly larger than left, suggesting right-handedness, and because distinction is apparent, this suggests a physical lifestyle

Radiae—both present, same variation between right and left as in humeri

Ulnae—both present, same variation between right and left as in humeri

Hip bones—right and left ischii, right pubis and right iliac blade present, iliac blade is weathered from exposure

Femurs—both left and right present, copper corrosion on left femur

Tibiae—both right and left present

Fibulae—only diaphysis and small part of distal end from one bone present, side undetermined

### Bibliography

- Ambrosiani, K., 1981. *Viking age combs, comb making and combmakers in the light of finds from Birka and Ribe*, Stockholm.
- Arbman, H., 1940. *Birka I: Die Gräber. Tafeln*. Stockholm.
- Arwidsson, G. (ed.), 1986. *Systematische Analysen der Gräberfunde, Birka II: 2*, Stockholm.
- Barrett, J.H., 1997. Fish trade in Norse Orkney and Caithness: a zooarchaeological approach, *Antiquity* 71, 616–638.
- Barrett, J.H. & Richards, M.P., 2004. Identity, Gender, Religion and Economy: New Isotope and Radiocarbon Evidence for Marine Resource Intensification in Early Historic Orkney, Scotland, UK, *European Journal of Archaeology* 7: 3, 249–271.
- Bass, W.M., 1987. *Human Osteology: a Laboratory and Field Manual*. Missouri.
- Batey, C.E., 1984. *Caithness Coastal Survey 1980–82: Dunnet Head to Ousdale*, Durham.
- , 1993. The Viking and late Norse graves of Caithness and Sutherland in C.E. Batey, J. Jesch & C.D. Morris (eds.), *The Viking Age in Caithness, Orkney and the North Atlantic*, 148–164, Edinburgh.
- Bersu, G. & Wilson, D.M., 1966. *Three Viking Graves in the Isle of Man*. London.
- Bøe, J., 1940. Norse Antiquities in Ireland, in H. Shetelig (ed.), *Viking Antiquities in Great Britain and Ireland, Part III*, Oslo.
- Brady, K. & Morris, C.D., 1998. *North Sutherland Survey: Coastal Zone Assessment. Kyle of Durness to Torrisdale Bay. Vol 2: A Detailed Site Gazetteer for the Built Heritage and Archaeology*, Glasgow unpublished GUARD Report 516.
- Brady, K., Lelong, O. & Batey, C., 2008. A Pictish burial and late Norse/Medieval settlement at Sangobeg, Sutherland, *Scottish Archaeological Journal* 29: 1, 51–82.
- Brothwell, D.R., 1981. *Digging Up Bones*. London.
- Callmer, J., 1977. *Trade Beads and Bead Trade in Scandinavia ca. 800–1000 A.D.*, Bonn & Lund.
- Clelland, S-J., 2006. *A Reassessment of the Westward Expansion by the Atlantic Vikings Across the North Atlantic, 800–1000AD*, unpublished University of Bradford MSc dissertation.
- Cowie, T., Bruce, M. & Kerr, N., 1993. The discovery of a child burial of probable Viking-Age date on Kneep Headland, Uig, Lewis, 1991: Interim Report, in C.E. Batey, J. Jesch & C.D. Morris (eds.), *The Viking Age in Caithness, Orkney and the North Atlantic*, 165–172, Edinburgh.
- Crawford, B.E., 2000. Medieval Strathnaver, in J.R. Baldwin (ed.), *The Province of Strathnaver*, 1–12, Edinburgh.
- Crawford, S., 1999. *Childhood in Anglo-Saxon England*, Sutton.
- Crowe, C., 1982. A note on white quartz pebbles found in Early Christian contexts on the Isle of Man, *Isle of Man Natural History and Antiquarian Society* 7: 4, 413–415.
- Cubbon, A.M., 1982. Find of a Viking sword, spear and shield at Claghbane, Ramsey, Isle of Man, *Proceedings Isle of Man Natural History and Antiquarian Society* 8: 4, 439–457.
- Dennis, A., Foote, P. & Perkins, R. (transl.), 1980. *Laws of Early Iceland. Grágás*. I, Winnipeg.
- Dickinson, T. & Harke, H., 1992. *Early Anglo-Saxon Shields*, Archaeologia 110.
- Discovery & Excavation in Scotland 1991*. Sutherland District, Balnakeil Bay (Durness parish), Viking Burial. Council for Scottish Archaeology, 46, Edinburgh.
- Dunwell, A.J., Cowie, T.G., Bruce, M.F., Neighbour, T. & Rees, A.R., 1995. A Viking Age cemetery at Cnip, Uig, Isle of Lewis, *Proceedings of the Society of Antiquaries of Scotland* 125, 719–752.
- Edwards, A.J.H., 1927. Excavations of graves at Ackergill and of an earth-house at Freswick Links, Caithness, and a description of the discovery of a Viking grave at Reay, Caithness, *Proceedings of the Society of Antiquaries of Scotland* 61, 196–209.
- Fanning, T., 1994. *Viking Age Ringed Pins from Dublin*, Medieval Dublin Excavations 1962–81, Dublin.

- Geigib, A., 1991. *Beiträge zur morphologischen Entwicklung des Schwertes im Mittelalter. Eine Analyse des Fundmaterials vom ausgehenden 8. bis zum 12. Jahrhundert aus Sammlungen der Bundesrepublik Deutschland*, Offa-Bücher 71, Neumunster.
- Geijer, A., 1938. *Birka III. Die Textilfunde aus den Gräbern*. Stockholm.
- Gourlay, R.B. & Low, D.M., nd. *The Remains of the Balnakeil Viking: The Story So Far*, Inverness.
- Graham-Campbell, J.A., 1980. *Viking Artefacts: a Select Catalogue*, London.
- , 2006. Valtos, in *Reallexikon der Germanischen Altertumskunde*, Band 32, 64–66.
- Graham-Campbell, J.A. & Paterson, C., forthcoming. *The Pagan Norse Graves of Scotland*, National Museums of Scotland.
- Gräslund, A.-S., 1973. Barn i Birka, *Tor 15*, 161–179.
- , 1980. *The Burial Customs: a Study of the Graves on Björkö, Birka IV*, Stockholm.
- Grieg, S., 1940. Viking Antiquities in Scotland, in H. Shetelig (ed.), *Viking Antiquities in Great Britain and Ireland*, Part 2, Oslo.
- Hamilton, J.R.C., 1956. *Excavations at Jarlshof, Shetland*, Edinburgh.
- Hayden, A. & Walsh, C., 1997. Small finds, in C. Walsh (ed.), *Archaeological Excavations at Patrick, Nicholas and Winetavern Streets, Dublin*, 132–144, Dingle.
- Hencken, H. O'N., 1950. Lagore Crannog: an Irish royal residence of the 7th to 10th centuries AD, *Proceedings of the Royal Irish Academy* 53C, 1–247.
- Hillson, S., 1990. *Teeth*, Cambridge.
- Kaland, S.H.H., 1973. Westnessutgravningene på Rousay, Orknoyene. *Viking* 37, 77–102.
- , 1993. The settlement of Westness, Rousay, in C.E. Batey, J. Jesch & C.D. Morris (eds.), *The Viking Age in Caithness, Orkney and the North Atlantic*, 308–317, Edinburgh.
- Lelong, O. & Gazin-Swartz, A., 2005. *Borrallie, Durness. Data Structure Report*, Glasgow unpublished GUARD report 1925.
- Lethbridge, T.C., 1950. *Herdsmen and Hermits*, Cambridge.
- Lillehammer, G., 1989. A child is born. The child's world in an archaeological perspective, *Norwegian Archaeological Review* 22, 89–105.
- Long, A., 2002. *Achnahaird Sands, Coigach, Wester Ross: An Assessment of a Late Medieval Highland Settlement and its Implications for the Wider Region*, unpublished University of Glasgow MLitt thesis.
- Low, D.M., Batey, C.E. & Gourlay, R., 2000. A Viking burial at Balnakeil, Sutherland, in J.R. Baldwin (ed.), *The Province of Strathnaver*, 24–34, Edinburgh.
- Morris, C.D., Batey, C.E. & Rackham, D.J., 1995. *Freswick Links, Caithness. Excavation and Survey of a Norse Settlement*, Inverness and New York.
- Ottaway, P., 1992. *Anglo-Scandinavian Ironwork from Coppergate*, London.
- Owen, O. & Dalland, M., 1999. *Scar—A Viking boat burial on Sanday, Orkney*, East Linton.
- Petersen, J., 1919. *De norske vikingesverd. En typologisk-kronologisk studie over vikingetidens vaaben*, Kristiania.
- , 1940. *Viking Antiquities in Great Britain and Ireland*, Part V, Oslo.
- , 1951. *Vikingetidens redskaper*, Stavanger.
- Pollard, T., 1996. *Excavation of Norse Buildings and other Structures at Marymas Green, Dunnet Bay, Caithness*. Glasgow unpublished GUARD report 306.
- , 2005. The Excavation of Four Caves in the Geodha Smoo near Durness, Sutherland, [www.sair.org.uk/sair18](http://www.sair.org.uk/sair18).
- Rygh, O., 1885. *Norske Oldsager*, Christiania.
- Stevenson, R.B.K., 1989. The Celtic brooch from Westness, Orkney, and hinged-pins, *Proceedings of the Society of Antiquaries of Scotland* 119, 239–269.
- Troalen, L. & Tate, J., 2006. *XRF analysis of a pendant whetstone cap from Balnakeil (C & AR 13145)*, Edinburgh, National Museums of Scotland Analytical Research Section unpublished Report No. AR 06/17.
- van Beek, G.C., 1983. *Dental Morphology—An Illustrated Guide*, 2nd edn, Bristol.
- Wagh, D., 2000. A scatter of Norse names in Strathnaver, in J.R. Baldwin (ed.), *The Province of Strathnaver*, 13–23, Edinburgh.



