

# A Viking burial from Kneep, Uig, Isle of Lewis

R D E Welander\*, Colleen Batey† and T G Cowie‡

with contributions by Lise Bender Jørgensen, Mary Harman  
and C Scott Mackenzie and illustrations by E Helen Jackson

## ABSTRACT

*In 1979 a rich female Viking burial was discovered on Kneep headland, near Valtos in the Isle of Lewis. Owing to the circumstances of its recovery, little is known of the context of the burial but sufficient information was recorded to permit a reasonably accurate reconstruction of the disposition of the contents of the grave: these included two oval brooches, a fine assemblage of segmented glass beads, a ringed pin, a knife, whetstone and needle case, a sickle and a matching buckle and strap-end. Fragmentary remains of textiles were also recovered from the grave. On the basis of the bronze metalwork the grave may be dated to the 10th century AD, and represents a significant addition to the inventory of Viking burials from the British Isles.*

## CIRCUMSTANCES OF DISCOVERY (illus 1–2)

Trevor Cowie and Colin Scott Mackenzie

The Viking burial described in this report was discovered in the summer of 1979. The investigation of the grave was undertaken by the Procurator Fiscal (CSM) and the following account of the discovery is based upon his official Treasure Trove report to the Crown Office.

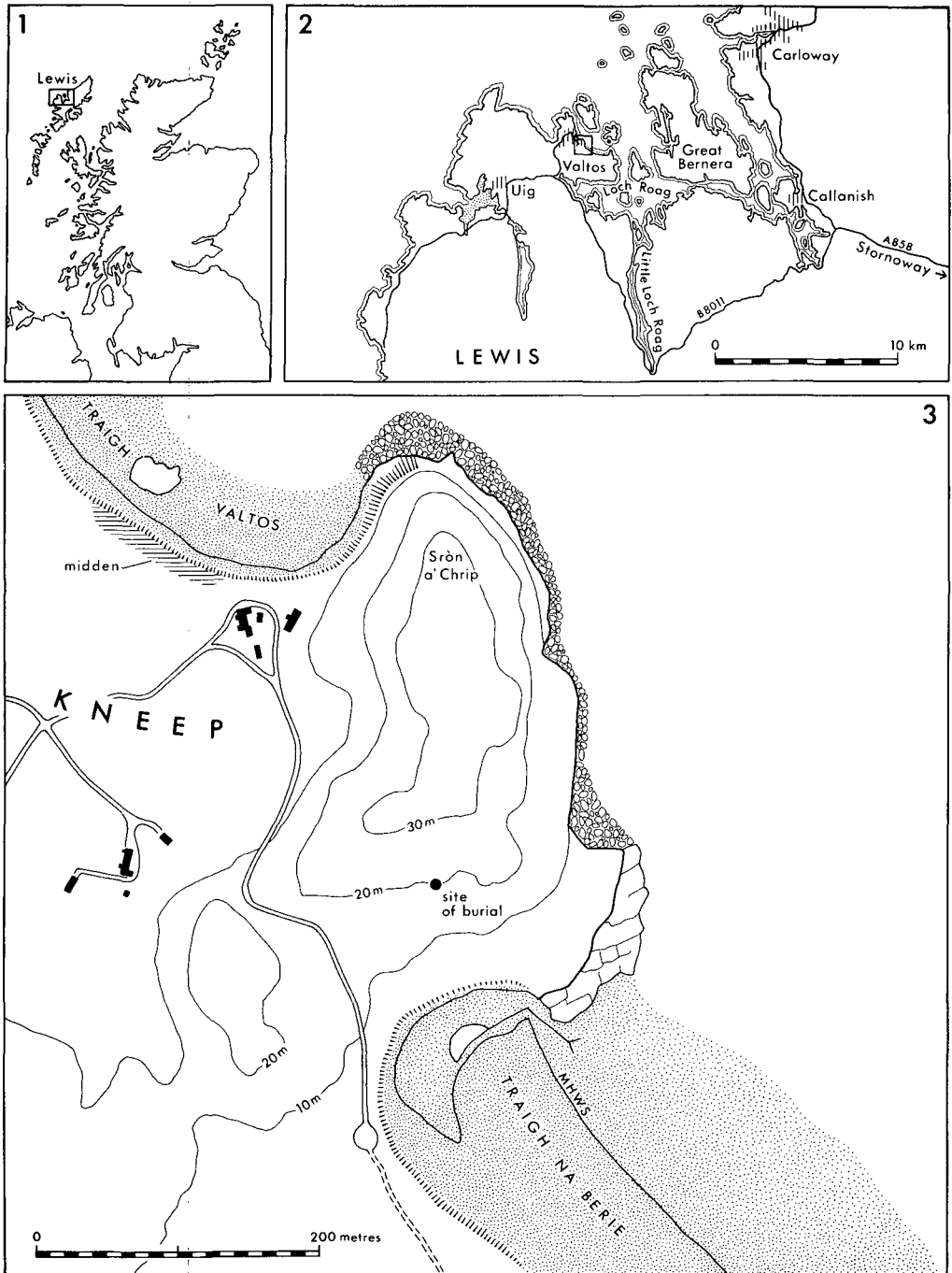
Where necessary, amendments have been made to the terminology of the original text in order to correspond with the catalogue of the grave goods which follows and to incorporate supplementary information received from one of the finders, Mr W J Maclean. After the recovery of the burial, one of the writers (TGC) was asked to arrange the safe transport of the finds and the human remains to Edinburgh and to inspect the site on behalf of the National Museum. Although no professional archaeological examination of the grave was possible, the discovery had been recorded fully enough to permit reconstruction of the layout of the burial. This has been made possible by the ready co-operation of all those concerned in the original investigation.

In July 1979, Mr and Mrs W J Maclean were on a camping holiday at Traigh na Berie, near the townships of Valtos and Kneep in the parish of Uig, Isle of Lewis. On Saturday 21 July, they reported to the police at Stornoway that the previous day they had come across human remains protruding from an eroding sandbank on the headland at the north-western end of Berie beach (illus 1). The age of the remains was in doubt and the Procurator Fiscal was contacted. The following morning, the

\* Ancient Monuments Laboratory, Historic Buildings & Monuments Directorate, Scottish Development Department, 9 Melville Street, Edinburgh

† Department of Adult and Continuing Education, Springfield Mount, The University, Leeds

‡ Department of Archaeology, Royal Museum of Scotland, Queen Street, Edinburgh



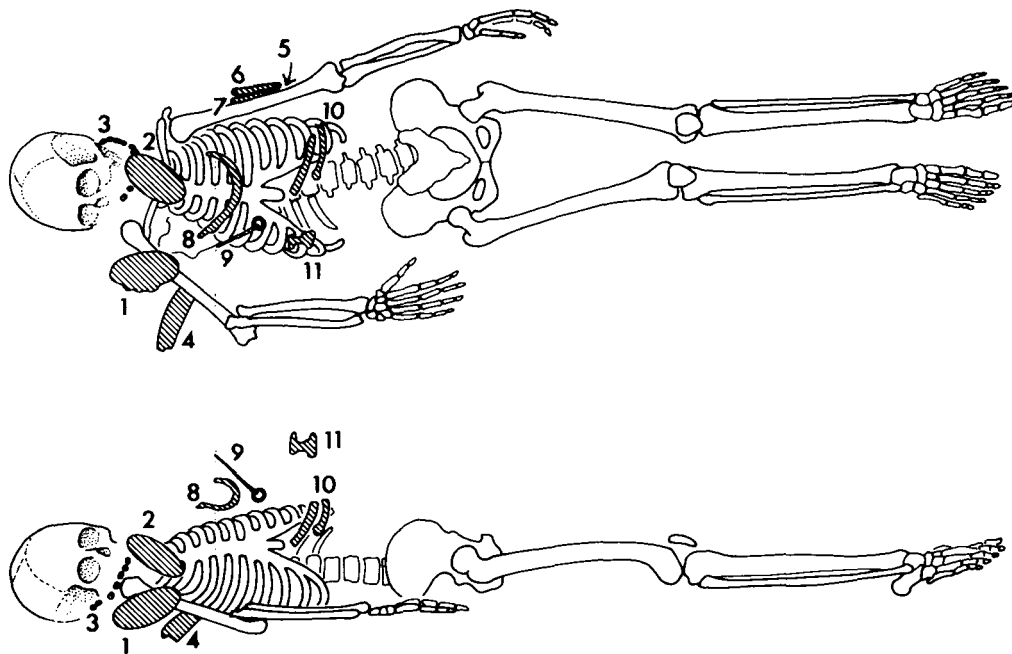
ILLUS 1 Location maps

Fiscal, accompanied by Detective Constable W J Murray, called at the Maclean's tent and went to the site, accompanied by them, their two children and an American couple, Professor and Mrs S Lawson with whom they were on holiday.

The site lies on Kneep headland (NGR NB 099 364) overlooking Traigh na Berie, one of the largest and most scenic beach dune and machair systems in Lewis (Ritchie & Mather 1970, 59–62). The headland itself is covered by blown sand supporting a thin turf cover, broken on the east by a series of blow-outs, or sand-bunkers scooped out of the slopes by the wind.

The particular sandbank in question lay roughly 18 m west of what the party was later informed was the site of the prehistoric cairn investigated by Dr J Close-Brooks during 1976 and 1978 (*Discovery Excav Scot* 1976, 56; *ibid* 1978, 34; Close-Brooks, *forthcoming*), the archaeological potential of the area having been recognized since the 1930s (Lacaille 1937). The bank was about 1.5 m in height and had been scoured by wind action on its southern side. The bones which were visible towards the base of the exposed section were those of a human foot and were bleached by exposure. There was no tissue adhering to the bones and their general appearance suggested that this find would be similar to other discoveries of ancient skeletal remains found from time to time on the west coast of Lewis (and indeed the rest of the Outer Hebrides), which it is considered offensive to the public to allow to remain exposed or run the risk of being further uncovered. The decision was therefore made by the Fiscal to remove the bones and the bank was cut back about 0.3–0.45 m along its exposed face. The skeleton lay approximately parallel to the face of the sandbank and, as it turned out, only a few centimetres below the old ground surface at the base of the bank. As the bank was cut away, a darker band of sand (probably indicating an old soil horizon) was observed running above the grave at a height of about 0.3 m from the foot of the bank. That band was not broken by the grave, and as the sand was cleared away above the skeleton, it became obvious that the remains were ancient. The Fiscal decided to carry on and clear away the bones for disposal, there being no obvious reason to counter such action. On the off-chance of something turning up, however, the cleaning of the covering sand was carried out with care. Mr Maclean then came across a bronze pin (catalogue no 9 (see below)). This was the first sign that the grave might be of more than passing archaeological interest. At that stage, it was decided the bank should be cut back further and the succeeding operations were carried out as delicately as possible with the tools available so as to gradually uncover the body. The decision to proceed was made by the Fiscal, aware of the interest that the activity had aroused in the score or more campers staying in the immediate vicinity (some of whom had already in fact approached the site asking questions).

When the skeleton had been carefully uncovered, it showed the body to have been lying fully extended, slightly on the right side, with the arms at the sides. According to Mr Maclean who assisted in the uncovering of the burial, a brown 'occupation level' [almost certainly a buried soil horizon] ran below the skeleton, which was orientated approximately south-west/north-east and tilted slightly downwards towards the head. It is also appropriate to acknowledge Mr Maclean's contribution to the reconstruction of the layout of the grave (illus 2), an exercise made possible by the photographs and sketches which he generously placed at the authors' disposal. The ribcage had collapsed and the bone disarticulated on touch. The pelvis had also been previously disarticulated. Lying beside the upper left humerus was a whetstone (6). Alongside it was a bone needle case (7). Lower down the left humerus, first the haft, and then the blade, of a very badly corroded iron knife were uncovered, apparently contained in a sheath (5). Above the right lower ribcage an iron object was found, so badly corroded as to be unrecognizable at the time of excavation, but subsequently identified as a sickle (8). Two oval lumps thickly covered in what appeared to be decomposed fabric or tissue protruded, one over the right clavicle, the other immediately under the left jaw. On being gently loosened, they came away to reveal two gilded bronze oval brooches of intricate design (1–2). The brooch on the right was



ILLUS 2 Reconstruction of the layout of the burial (see text)

found upside down, and is presumed to have moved since deposition of the body. The lumps of matter in which the brooches were embedded were also removed carefully and retained for analysis. The brooches were not otherwise touched and were submitted to the museum still half covered with what appeared to be the remains of fabric (see report on textiles below). Numerous beads (3) were found in the area of the neck: these were placed uncounted in a separate bag in their state as found. On top of the right arm lay an incomplete antler comb (4), in fragments. Across the lower left ribcage lay a short strap-end with bronze studs and a matching buckle (10). Mr Maclean also noted that the rivet (11) was turned up in the sand dug away from above the skeleton, and its direct association with the remainder of the finds is doubtful.

The debris from the excavation was deposited on the down-hill side of the bank. The skeleton was removed for scientific examination and the artefacts were carefully boxed. Although the sand underneath the grave was briefly searched for anything of further significance, the ground on either side of the skeleton was disturbed as little as possible. Nothing further was noted and as the attention of the general public was becoming too persistent, the site was backfilled to its original depth (say 1.5m) and abandoned.

After the recovery of the burial, one of the writers (TGC) was asked to inspect the site on behalf of the National Museum. It was clear that the grave had almost certainly been divorced from its stratigraphical context by the investigation of the site, possibly compounded by subsequent unrecorded disturbance of the sandbank. The sand face in question was clearly deflating to the level of a compact medium brown sandy soil horizon, presumably that referred to by Mr Maclean as underlying the skeleton. A series of roughly rectangular stone slabs, up to 0.5 by 0.25 m across, could be seen emerging from the sand face near the site of the burial; they appeared to represent the remains of coarse walling built on this buried surface, but no attempt was made to uncover this

further. Stones noted by the finders just downhill from the grave are likely to represent collapsed portions of this walling rather than part of the construction of the grave. Consequently, nothing is known of the original form or context of the burial, beyond the fact that it is likely to have been a simple dug grave. The land surface contemporary with the grave was not identified with certainty but may have been that noted by the finders some 0.3 m above the foot of the sand bank.

There were several turning points in the operation, changing as it did from a criminal investigation to archaeological salvage. In retrospect, alternative decisions could have been made, particularly had it been known to the investigators that the very area was of particular archaeological interest or that there was, as it happened, professional help actually available on the island at the time. However, given the isolation of the site (33 km from Stornoway and almost as far from the nearest one-man police station), and the practical problem of setting a police guard on the site, the unconcealed interest of holiday makers in the near vicinity and the difficulty of contacting any experts within a reasonable time (it being the Sabbath), it is felt that however regrettable with hindsight and in the light of the apparent importance of the finds, such decisions were all decisions made in the field and must be accepted as such. These decisions were not taken lightly but by the time the significance of the finds was appreciated, the Rubicon had been crossed and the practicalities dictated the action taken.

## THE HUMAN SKELETON

Mary Harman

The skeleton is in excellent condition, and virtually complete, with only a few metacarpals and phalanges missing. The adult dentition is complete and there are no caries or abscesses; the upper third molars have not fully erupted and the lower ones are slightly higher than the adjacent teeth, so that the occlusal surfaces of the wisdom teeth only just meet and show very little enamel polishing. Slight alveolar resorption indicates some periodontal disease, and there is a deposit of calculus on all the teeth; this is most pronounced on the labial surface of the upper molars, and the lingual surface of the lower molars, but it also covers much of the occlusal surfaces of the third molars. Wear on the teeth suggests an age of between 35 and 40 years, using the criteria published by Brothwell (1965, 69).

The size and slenderness of the bones and the configuration of the skull and pelvic girdle indicate that the remains are those of a female.

The height, estimated from the total length of the long bones, was 5'3" (1.6 m) using the formula of Trotter and Gleser as given by Brothwell (1965, 102). There is very slight evidence of osteo-arthritis on the ninth thoracic and first lumbar vertebrae; the fifth lumbar vertebra and the proximal end of the sacrum show more pronounced signs of the disease but are not severely affected. There are no other signs of disease or injury.

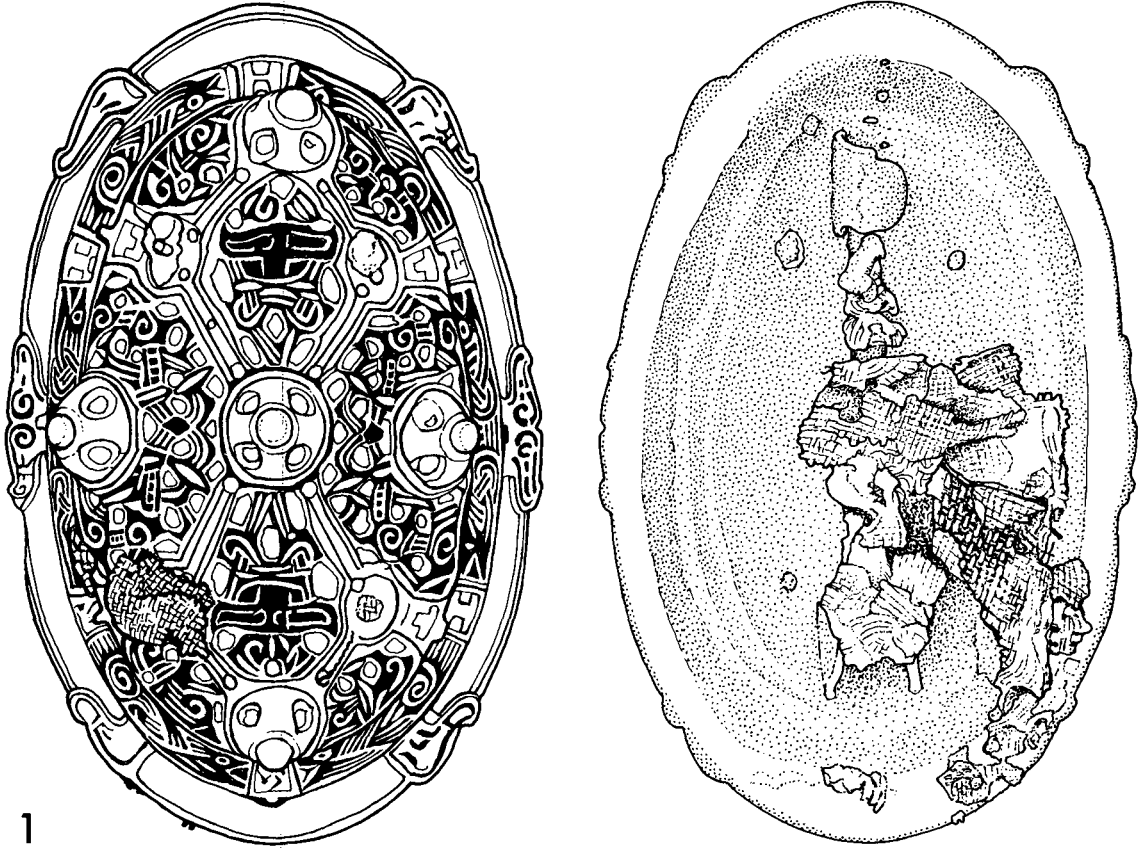
The skeleton is unusual in having an extra sacral vertebra.

## THE CONTENTS OF THE GRAVE

CATALOGUE (illus 3-9)

Richard Welander

The objects are in the Royal Museum of Scotland, Edinburgh. Qualitative X-ray fluorescence (XRF) analysis gave sufficient indication to permit identification of the copper alloy artefacts as bronzes and the term bronze is therefore used throughout. The catalogue numbers correspond with the key to illus 2.



1

ILLUS 3 Kneep Viking burial: oval brooch (Catalogue no 1) (scale 1:1)

1-2 Two oval brooches, double shelled, gilt bronze of type P51 (Petersen 1928) ornamented with zoomorphic designs (illus 3-5, 9). Upper shell of lattice openwork with five cast bosses; three, along the length of the brooches, are linked by grooved bands or channels, originally containing braided silver wires (some still remain *in situ*). Four channels radiate from the central cast boss and each is interrupted by a circular field containing the decayed remains of an applied boss (see below) - four in total on each brooch (see illus 5). The zoomorphic designs on the lower shell are confined to the sides and the flanged rim of the brooch. The former are composed of eight rectangular fields separated by raised panels, plain or decorated abstractly, and of a white metal appearance. The rims are decorated with stylized animal heads in profile, also of white metal appearance. On the undersides are catch plates and hinge mountings for iron pins surrounded by textile remains (see report on textiles below).

The brooches are not an identical pair, differing slightly in the details of design and ornamentation. The upper shell of brooch 1 has been dented and damaged in antiquity.

#### Dimensions

##### *Brooch 1*

Overall - L 110 mm W 71 mm H 39 mm.

Upper shell - L 88 mm W 55 mm H 26 mm.

Lower shell - L 110 mm W 71 mm H 13 mm.

*Brooch 2*

Overall – L 109 mm W 73.5 mm H 39 mm.

Upper shell – L 85 mm W 54 mm H 26 mm.

Lower shell – L 109 mm W 73.5 mm H 13 mm.

Royal Museum of Scotland catalogue no: IL 799–800.

- 3 Forty-four coloured glass beads (illus 6, 9) : these include 39 segmented and five unsegmented beads in yellow, blue, silver and gold. The majority of the former have two segments (26 beads), the remainder having three (11 beads) or four segments (2 beads).

Dimensions

L (average) between 9 and 13 mm.

D (average) between 3 and 6 mm.

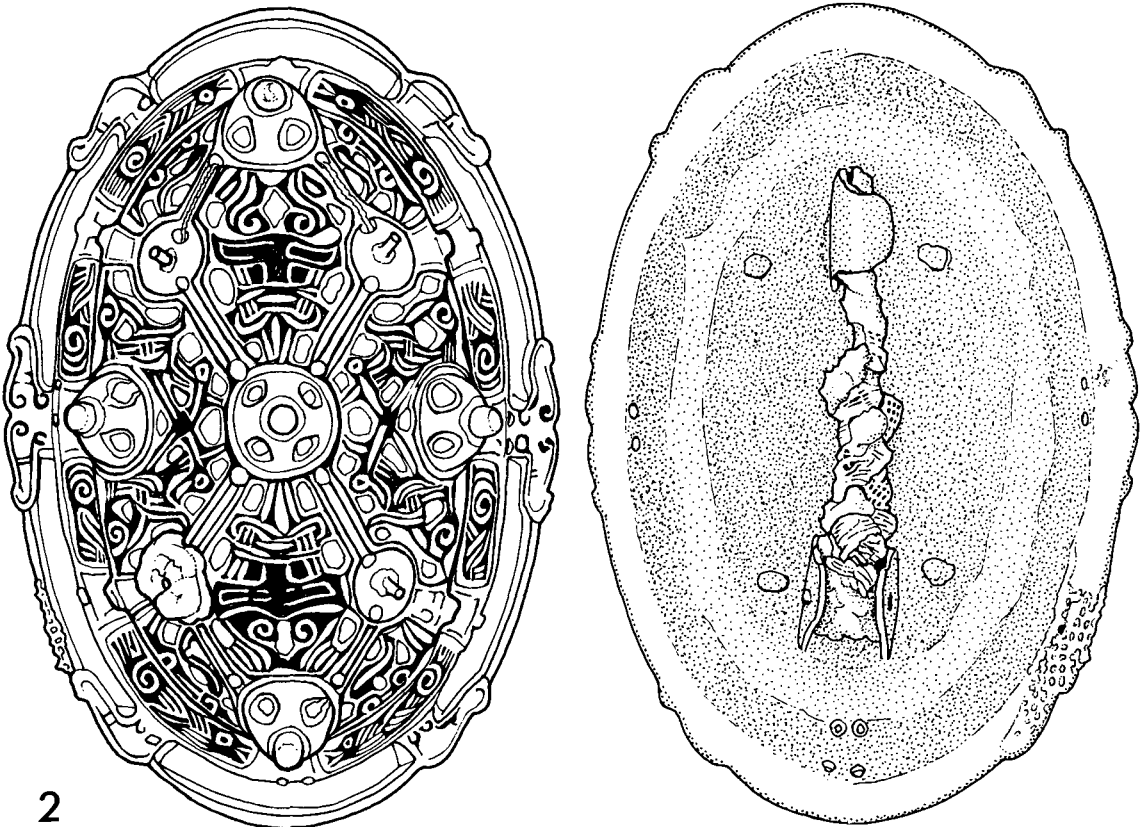
Museum catalogue nos: IL 801–844.

- 4 Composite single-sided comb, of antler, with convex top and incised decoration confined to central area of both backing plates (illus 7). Nine tooth-plates are secured in position by five iron rivets. One terminal plate is missing.

Dimensions

L 185 mm W 40 mm T 15 mm.

Museum catalogue no: IL 845.

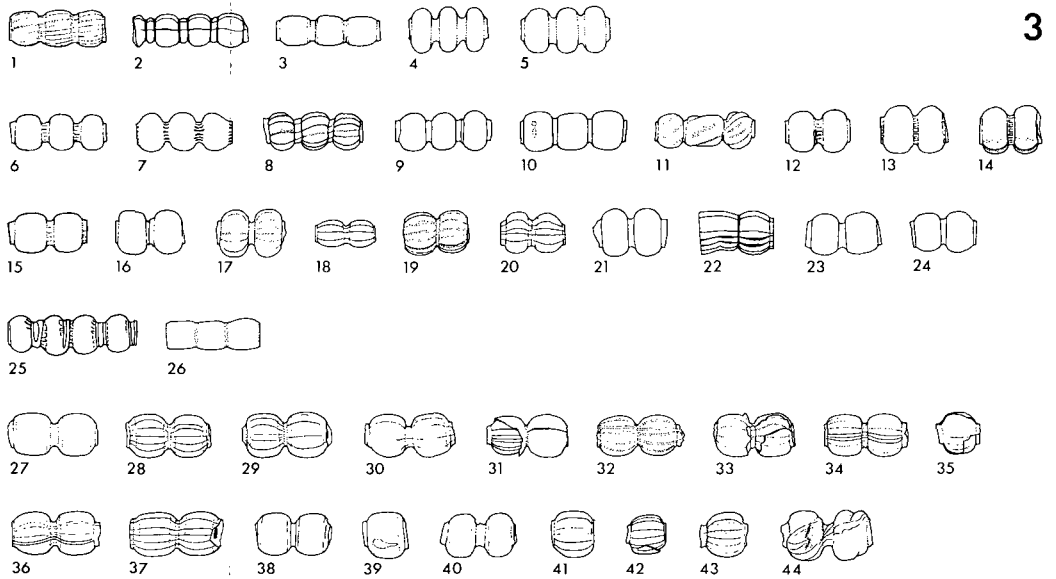


2

ILLUS 4 Kneep Viking burial: oval brooch (2) (scale 1:1)

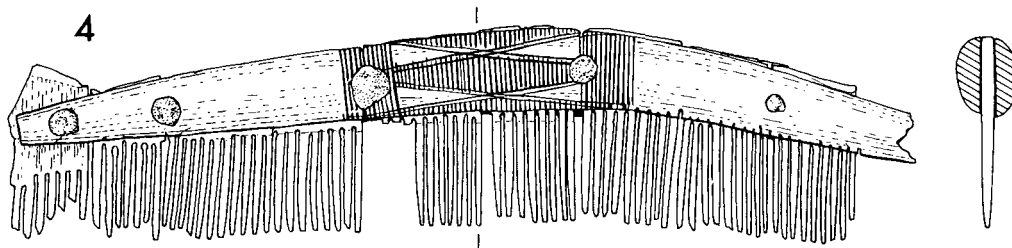


ILLUS 5 Kneep Viking burial: detail of seating for soldered boss, silver wire and zoomorphic decoration on upper shell of oval brooch (2)



ILLUS 6 Kneep Viking burial: segmented beads (3). 1-5: yellow; 6-26: blue; 27-44: silver/gold (scale 1:1)





ILLUS 7 Kneep Viking burial: antler comb (4) (scale 2:3)

- 5 Iron knife : short, stocky blade (illus 8). Triangular cross-section with single cutting edge. Areas of the heavily corroded surface covered with organic remains, representing fragments of leather sheath. Tang of rectangular cross-section covered with clearly visible remains of wooden handle. Terminal of tang protrudes slightly beyond wooden handle – possibly a point for attachment.

Dimensions

L 175 mm (blade 75 mm; handle 95 mm; terminal 5 mm) W (at hilt) 35 mm.

Museum catalogue no: IL 846.

- 6 Pendant whetstone of fine grained quartzite with perforated terminal (illus 8).

Dimensions

L 92 mm W 12 mm T 6 mm (across terminal hole) D (of hole) 2.5 mm.

Museum catalogue no: IL 847.

- 7 Bone needle case containing fragments of two iron needles (illus 8). The needle case has been fashioned from a bird bone. While the exact bone and species are unidentifiable, the late Dr I H Lyster commented that it would be consistent with the radius or possibly the humerus of a large bird, with gannet, cormorant, greylag goose or swan all being possibilities.

Dimensions

*Needle case*

L 84 mm D 8 mm T (of wall) 1 mm.

D (of side perforations) 3 mm.

*Needles (after repairs)*

L (complete needle) 45 mm.

D 2 mm.

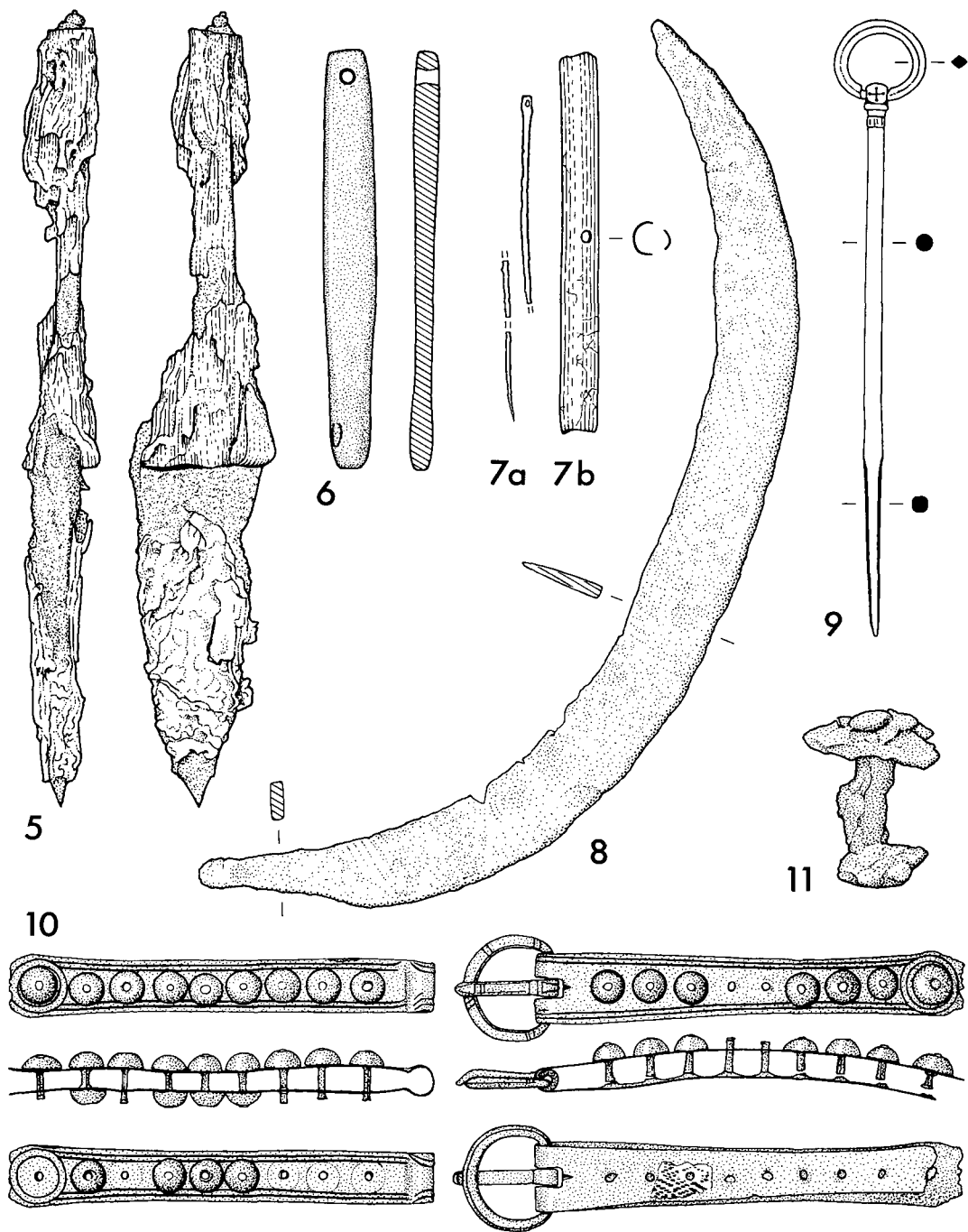
W (head) 3 mm.

D (eye) <1 mm.

L (needle fragment) 30 mm.

D 2 mm.

Museum catalogue nos: IL 848–850.



ILLUS 8 Kneep Viking burial: knife (5); whetstone (6); needlecase and needles (7); sickle (8); ringed pin (9); strap-end and buckle (10); rivet (11)

- 8 Iron Sickle (illus 8). Blade complete, in three rejoined fragments. Traces of wood on handle.

Dimensions

L (terminal to terminal) 220 mm.

W (at centre of blade) 20 mm.

T (at centre of blade) 4 mm.

Museum catalogue no: IL 851.

- 9 Ringed pin (illus 8). Bronze, with oval ring, slightly articulating, of rhomboidal cross-section. The pin head is polyhedral with side faces perforated to hold the tapered ends of the ring. The front and rear faces of the head are decorated with a small incised cross. Below the head is a prominent collar, formed of two parallel grooves and containing incised hatching. The upper shank is circular in cross-section; the lower portion tapers to the point and is square in cross-section.

Dimensions

L (shank) 121.5 mm D (shank) 4 mm.

L (ring) 20 mm W (ring) 18 mm D (ring) 3 mm.

Museum catalogue no : IL 852.

- 10 Matching belt buckle and strap-end of bronze (illus 8; 11). A small bronze tack (not illustrated) was found in the closed terminal of the strap-end. Decorated with nine studs, present on both faces of strap-end, but only on the outer face of the buckle. The ring of the buckle is decorated with four pairs of transverse incisions. Edges of facing plates decorated with fine incised double contours along their length. *Organic remains, probably leather, found between plates of each item.*

Dimensions

Buckle: L 117 mm W 16 mm T 12 mm.

Strap-end: L 93 mm W 14 mm T 12 mm.

Museum catalogue nos: IL 853–854.

- 11 Iron Rivet (illus 8). Round or sub-rectangular head with circular cross-sectioned shank; rectangular plate perforated by shank, terminal of which is bent over on to the plate. Badly corroded. Traces of wood on shank and inner surfaces of head and plate.

Dimensions

L 40 mm D (shank) 5 mm D (head) 20 mm.

L (plate) 25 mm W (plate) 20 mm T (plate) 3 mm.

Museum catalogue no: IL 855.

TECHNOLOGICAL DISCUSSION

Richard Welander

The artefacts fall into 11 distinct groups: two oval brooches; a ringed pin; a matching belt buckle and strap-end; a small knife and sickle; a comb and needle case (with fragmentary remains of two needles inside the case); a pendant whetstone; a number of coloured glass beads; a single iron rivet and finally fragments of textile (see below) adhering both to the objects themselves and found about

the skeletal remains. Each of these items (or groups of items) was examined in detail in the laboratory with the intention of determining the original method of fabrication of each piece as far as possible using simple visual examination, and to suggest the likely techniques employed during manufacture. It was hoped that some wider inferences might be drawn from the results of such examination, but the exercise has perhaps posed more questions than provided answers, and may have served only to highlight some wide gaps in our understanding of Viking-Age technology in Scotland.

#### The bronzework

Four fine examples of the Viking-Age bronzeworker's craft are present: the two gilded oval brooches, the ringed pin and the matching pair of ornamental belt fittings.

The two *oval brooches* (1–2; illus 9) are the most complex and ornamental pieces from the assemblage. In general form, they are very similar but are not an identical pair, having a number of small stylistic differences (see below). Both, however, are identical in construction. Each is of gilded cast bronze and has been formed from two main elements or shells, positioned one on top of the other. The main body of the upper shell consists of an open lattice work of stylized animal ornament: this is seated on the surface of the lower shell, a simple gilded dome. Eight rectangular fields containing zoomorphic designs decorate the sides of the lower shell separated by smaller, raised rectangular panels, usually plain but in some cases incised with abstract designs. These raised panels, and also the stylized animal heads in profile on the flanges of the rim of the lower shell are of tinned or silvered appearance, but XRF analyses detected no silver in these areas and the levels of tin were no higher than those in the base bronze. The explanation for this may be that these surfaces were in some manner acid-etched by the craftsman to remove the copper from the surface, leaving a tin-rich surface layer, which, when polished, gave a lustrous white metal finish. This suggested technique provides an interesting contrast to the alternative and widely used method of applying tin to the surface using soft solder. The craftsman perhaps preferred to etch these small surfaces, finding it to be a more controllable method. The upper surfaces of both the upper and lower shells were otherwise gilded, almost certainly using the mercury amalgam or 'fire gilding' technique (Dodwell 1961, 89–90).

The two shells of each brooch were conjoined and, to some extent, secured together by four small projections pointing downwards from the upper shell. These were positioned so as to clip on to the upper edge of the raised spacing panels around the sides of the lower shell. Once located in position, the two shells were then securely fixed together by four bronze rivets, projecting upwards (and probably punched through) from the lower shell, but concealed from casual view by the upper shell. The ends of these rods, bent over and flattened, were observed on the underside of the lower shells (illus 3–4). Each rod emerges through a small central hole in a circular setting cast into the upper shell and projects about 5 mm above the surface.

In these areas on each of the brooches were found the deteriorated remains of applied bosses. Qualitative XRF and wet chemical analyses showed these bosses to be made originally of a lead/tin alloy (66% Pb; 28% Sn) similar in composition to soft solder. Curle in his examination of similar oval brooches from Oronsay, Argyll and Reay, Caithness gives the following description:

'On the sides equidistant between these (cast) bosses are four flat circular panels, each perforated in the centre with a hole, forming the setting to which were attached hemispherical projections probably formed of lead plated with silver or some other metallic substance' (Curle 1914, 297).

In an unpublished study of oval brooches, Werner has described these areas as settings for loose bosses (ie not cast-in with the body of the brooch) of tin/lead covered with embossed silver foil (Werner 1971). No traces of silver were observed or detected by analyses of these areas on either

brooch, but the deteriorated condition of the bosses may well have caused such evidence to be lost through corrosion processes.

Whatever the exact composition of these applied bosses, it appears clear that they formed the caps to the projecting rods, each applied possibly as a heat-softened mass and smoothed, perhaps with a leather wipe, to form a simple domed projection. Despite their primarily functional purpose it is worth commenting briefly on the visual contrast the applied bosses, as well as the other 'white metal' or tinned areas of the brooches, would have had on the original appearance of the freshly finished piece. The contrast of gold with 'silver' was without doubt intentional, indeed central to the craftsman's original design (cf Vierck 1977, 46).

The craftsman's skill in combining art with technology is also evident in the use of fine twisted silver wire over the upper shells which not only further embellished the brooches, but also served as an additional means of securing the two shells (see *illus 5*). Two fine strands of wire were twisted together to form a single length. The wire was probably produced by 'strip drawing' through a draw-plate, examples of which have been identified from a number of Scandinavian sites. The length of wire was threaded through one of the pairs of holes on the upper edge of the raised panels at either end of the longitudinal axis of the lower shell, then passed through into the space between the upper and lower shells, to emerge through small holes in the upper shell and run along pre-cast channels between the bosses on the upper surface. Once threaded, the loose ends of the wire would presumably have been twisted together and concealed from view on the underside of the lower shell. Only portions of this wire decoration remain *in situ* on the brooches from Kneep, particularly 2, and it was not possible to determine how the terminals of the wire loop were closed. The perforations at either end of the lower shells may have had a further function as points of attachment for a glass bead necklace, worn suspended between the two brooches, which were worn over the owner's left and right clavicle. A further set of holes may be observed on one of the brooches (2), positioned below the upper set at the base of the raised panel immediately above the flanged rim, and these may also have been suspension points for a necklace.

The concealed backs of the lower shells, from where much of the preserved textile remains were recovered, heavily impregnated with corrosion products from the iron pin and spring mechanism, were themselves completely covered by faint textile impressions embedded in the cast bronze. The modern discussion surrounding the production techniques of oval brooches in Scandinavia, begun by Zachrisson (1960), widely recognizes these textile impressions to be associated with the casting technique used in the production of oval brooches (Maryon 1954, 223). The textile was used to separate elements of the mould (in this case, a bipartite mould) and to create the void into which the molten metal would be poured. The definition of the impression of the textile weave is not sharp and is consistent with the appearance one might expect from cloth caked with a thick clay slip. The thickness of the threads of the original textile, where discernible in the impressions on the Kneep examples, is broadly similar in dimension to the thickness of the castings (which are themselves remarkably thin, typically between 1 mm and 2 mm). Clay-impregnated cloth was used to line the first part of the mould, prior to packing in further mould material to form the second part of the mould. The textile would be destroyed during the firing of the mould, leaving only an impression removed from the upper surfaces of the shell, probably in the finishing of the cast.

The *ringed pin* (9) is of a simple form and is made entirely in cast bronze. The piece would originally have been cast as two separate elements – the pin shaft with its hexagonal head and the open-ended ring. The simple cross motif on the front and back fields of the hexagonal head appears to have been cast-in from the original mould. A pattern of simple incised lines decorates the neck of the pin in a band immediately below the collar at the base of the hexagonal head. This decoration appears to have been added after casting (perhaps 'personalized' for each new customer?). The pin head is

indented on either side with a tapering depression into which the terminals of the ring were seated, enabling the ring to rotate about the head of the pin. It was not possible to determine whether or not these depressions originally pierced the centre of the head.

In contrast, the ring and pin of the *strap-end and buckle (10)* appear to have been constructed in an entirely different fashion. The ring was cast as a closed loop; the buckle pin being subsequently attached by being bent over and around the ring. This closed loop construction is typical of most belt buckles and is well able to withstand the rigours of daily use. It may be that the reason why ringed pins are not uncommonly found without their ring attachment is due to the craftsman's desire to produce essentially a decorative piece at the expense of functional robustness.

The buckle ring and pin are the only cast elements present in the strap-ends. The buckle and belt terminals were fabricated from thin sheet bronze (typically, 1 mm or less in thickness), which was cut to shape and folded over to form the front and back plates. Planishing marks left by the hammering out of the sheet are clearly visible on the back plates of both strap-ends. Examination of the cut edges suggested that this procedure had been done with some form of punch or chisel rather than shears; the small 'window' to accommodate the buckle pin would have been cut in a similar manner. The simple incised line border decoration was probably executed prior to folding the sheet over. The assembled buckle was then positioned with the pin through the 'window' and the sheet folded over the end of the belt material. Traces of deteriorated organic remains were found between the folded plates and were tentatively identified as leather.

To secure the strap-ends to the belt, nine small bronze rivets were punched through from the back, piercing the leather and emerging through the front plate. Each rivet was capped with a small hemispherical bronze boss, again produced from thin sheet-metal hammered and annealed over a suitably shaped template. The rivets perforate the crown of each boss and it appears likely that the technique used to secure the bosses to the rivets and to punch through the rivets was a single procedure (the crowns of the bosses are somewhat flattened suggesting that they may have been hammered against a flat surface).

A small bronze tack (not illustrated) was found *in situ* embedded in organic remains between the plates of the belt strap-end at the folded end. No satisfactory explanation of its function was reached, but it is presumed to be associated in some manner with the attachment of the belt tongue.

#### The ironwork and associated artefacts

The deteriorated condition of the ironwork from the site made the elucidation of much of the fine detail of each of the items difficult. The two artefacts of greatest interest are the small knife (5) and sickle (8).

Clear traces of a wooden handle were found on the *knife* tang discernible both by eye and from X-radiography. In proportion to the tang, the knife blade itself, which is single-edged, is relatively short and stocky. Embedded in the corrosion products over the blade area are visible traces of a leather sheath, although insufficient remains to determine whether or not this was the means whereby the knife was suspended. The terminal of the tang appears to extend beyond the wooden-handle by about 5 mm and is somewhat nodular, suggesting it may possibly represent the remains of an attachment ring.

The iron *sickle* was recovered in fragments and is much deteriorated by corrosion. As with the knife, some traces of wood were found associated with the short tang and were presumably the remains of a handle. Radiography showed the curved cutting edge to be heavily pitted and worn relative to the back of the blade, a deteriorated condition commonly associated with heavily worked, case-hardened steels intended to produce sharp cutting edges when in use (similar conditions were noted on the knife blade).

The presence of a small pendant *whetstone* (6) in the assemblage points to the importance attached to regular maintenance of these tools during their daily use. The recovery of two fragmentary needles, or perhaps more correctly bodkins *in situ* inside the bone needle case points to one possible use for the knife: the cutting and trimming of yarns, cloth, hides and so on in the manufacture and repair of clothes and other soft materials. The sickle was probably used to cut and gather herbage, perhaps for use in daily cooking. It would seem too small and fragile to have been effective in larger-scale crop-gathering.

The curious occurrence of a single iron rivet with plate is discussed elsewhere (see below), but it is worthy of note that the rivet had clearly been used prior to burial; traces of wood were found between the head and plate.

#### The comb

The manufacture of the *antler comb* (4) is comparable with any number of known examples, the techniques used in comb-making being remarkably similar throughout the Viking world with variation only in their overall design and ornament. The details of the manufacturing process have been fully discussed by MacGregor (1984, 88); in this example, the comb plates were secured together with iron rivets, but bronze rivets were also commonly used, mostly at a later date. The heavy wear patterns on the teeth (horizontal striations along the length of each tooth) indicate considerable and perhaps prolonged use prior to burial. The teeth of the surviving terminal plate are only shallowly cut compared to the other plates suggesting that it may originally have belonged to another damaged or broken comb, plates from which were removed and reused. Unfortunately the lack of the other terminal plate allows no comparison and this must remain conjectural. The surviving terminal plate has no attachment point and it was not possible to determine whether or not the comb has been attached in any way to the belt or clothing.

#### The beads

The assemblage of 44 *glass beads* (3) is of particular interest due to their uniformity of shape and their range of colours. All are examples of the segmented bead type, a simple glass tube constricted at regular intervals to produce segments with the appearance of short rows of similarly coloured, roughly spherical beads. The number of segments varies from one to four, the majority (26 beads) being double-segmented. Threaded as a single string, the beads form a necklace 465 mm long. If worn in this arrangement, suspended from and between the oval brooches, the necklace would have hung well down across the chest of the wearer, and multiple strands would perhaps seem more likely.

There appears to be some correlation between the number of segments and the colours of individual beads. The largest single group consists of blue double-segmented (13 beads); the rest of the beads being distributed between the three remaining colours (silver, gold and yellow) and the segment numbers (6 silver double-segmented; 5 gold single-segmented and 7 double-segmented; 7 blue triple-segmented and 1 quadruple-segmented; 4 yellow triple-segmented and 1 quadruple-segmented).

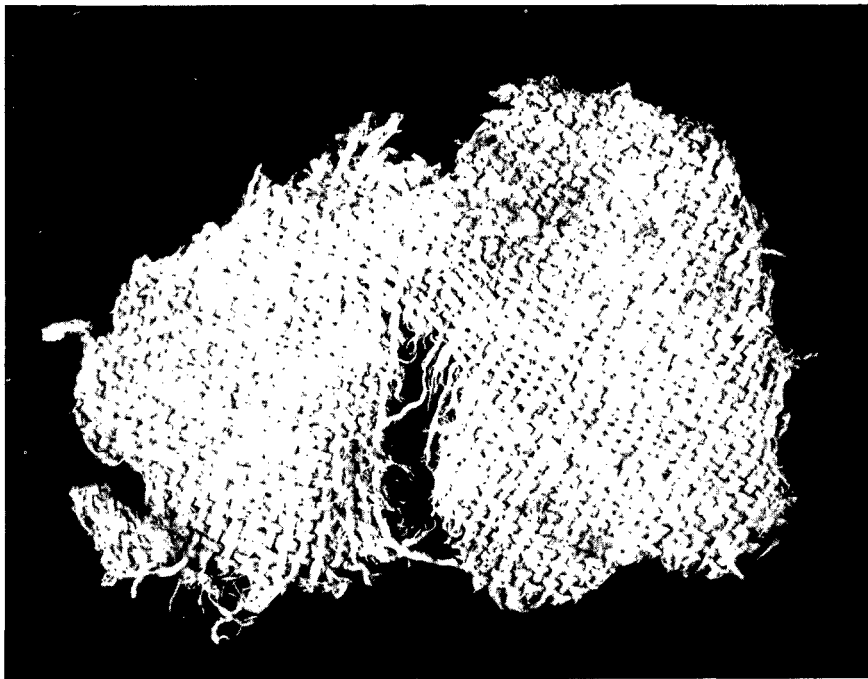
The possible original arrangement of the beads on a string was considered, but no conclusions could be drawn beyond noting that as the majority of the beads form groups of even numbers (8 silver, 12 gold, 20 blue, 4 yellow), the assemblage *could* have lent itself to either a symmetrical arrangement as a single thread, centred on the two exceptional blue and yellow beads with four segments (illus 9), or perhaps a double-threaded arrangement, roughly replicating the colour pattern on both threads.

Quantitative XRF analyses gave some indication of the probable colourants used in the

manufacture of the glass (probably soda glass). The vivid clear blue glass is coloured primarily with salts of iron with small traces of copper and strontium. High levels of lead and tin are present in the opaque, yellow glass beads with traces of iron, copper, zinc, manganese and silver. The colourant was probably salts of tin, the opalescent agent most probably being lead (possibly lead arsenate). The marked visual distinction between the silver and gold beads belies the fact that no traces of gold were detected on the gold beads, only silver being present in both groups.

The production of these two latter groups of beads appears to have involved further stages beyond the initial manufacture of the basic bead and its segmentation. The basic beads would have been formed from a length of thick-walled glass tube, held and formed on a central metal rod. This would originally have been dipped into molten glass of the appropriate colour and the glass gathered-up on to the rod. On cooling both the rod and the glass would shrink, releasing the central rod. The segmentation of this glass tube would have been done while the glass was still plastic, either by using some form of crimping tool or possibly by pressing the glass tube (still supported by the metal rod) into a prefabricated template. This template would perhaps have been similar in form to an 'organarium', a double-sided mould described by Theophilus (Dodwell 1961, 68–9) and recognized in use in the production of beaded metal wires of this period (Duczko 1985, 21). Certainly a number of the beads have a marked collar between each bead, very reminiscent of such beaded wires.

The silver beads were produced by coating a section of clear glass beads with silver, probably by dipping in molten silver. It was not possible to determine whether or not this coating of the core bead was done before or after segmentation. The required number of segments would have been snapped off the longer length (clear glass cores are obvious at the broken terminals of beads) and it seems likely that the silver dipping was done prior to this. The 'gold' beads were produced in a similar



ILLUS 10 Kneep Viking burial: fragment of fine linen fabric from top of brooch (2) (scale 3·5:1)





ILLUS 9 Kneep Viking burial: the oval brooches and the beads (1-3)

manner but not coated, after silver dipping, with an additional layer of clear glass, the optical effects of which gave the bead a marked golden colouration.

### Conclusion

Each of the objects recovered from the grave would have required a wide range of specialized skills in their production. Viewed as a whole, they represent many man-hours of work, possible only in a well-organized craft-based community with ready access to source materials and trade. No such centre has been recognized in the Western Isles or within Scotland at this period and we can only assume that the artefacts recovered from this site would have been imported from centres in Scandinavia (such as Birka in Sweden) or possibly, Ireland (Dublin).

Certainly the level of technological sophistication in the production of such pieces as the oval brooches, the ringed pin or the glass necklace would have required elaborate, well-established workshop facilities capable of manufacturing items essentially for ornamentation. However, it seems unlikely that any community would wish to remain entirely reliant upon trade from abroad to furnish itself with the more basic essentials of life. The smithing of simple iron tools (the knife, sickle and needles) for daily domestic use would have required relatively simpler techniques, the facilities for which could have been more readily established, and the production of such personal utilitarian items as clothing (textile making and leather working) and other essential products could well be viewed as domestic industries. If the woman buried on Kneep headland is seen as a member of one of the first few generations of Scandinavian settlers in the Western Isles of Scotland, the presence of the range of artefacts buried with her may perhaps reflect not only the continuing links with the Scandinavian homeland, but also a strengthening technological base in new territories.

### THE TEXTILE REMAINS (illus 10–13)

#### Lise Bender Jørgensen

Both of the oval brooches contained actual fragments of textiles, once part of the dead woman's clothing, while a further textile impression is preserved on the reverse of the bronze belt buckle. The very faint textile impression embedded in the cast bronze of the backs of the brooches were unidentifiable and have not been discussed further here (see above).

Oval brooch *1* has a textile fragment on the top, 1.1×1.1 cm. Weave: tabby; spin: Z/Z; count: 19/11 threads/cm. On the reverse of the same brooch, textile remains can be seen covering the pin area, 4.5×3.5 cm. Weave: tabby; spin: Z/Z; count: 16/10 threads/cm. To this can be added a loose fragment from the inside of the brooch, namely a piece of organic material with faint textile



ILLUS 11 Kneep Viking burial: detail of reverse of buckle (*10*) showing imprint of worsted diamond twill (scale 2.5:1)

remains, c 2×1 cm. Weave: indeterminable; spin: seemingly unspun; count: 18/? threads/cm. The material is probably either a linen or perhaps silk (in view of the unspun fibres).

Oval brooch 2 has textile remains around the pin, probably remains of the loop that fastened the braces of a pinafore skirt to the oval brooches. Two different fabrics could be distinguished:

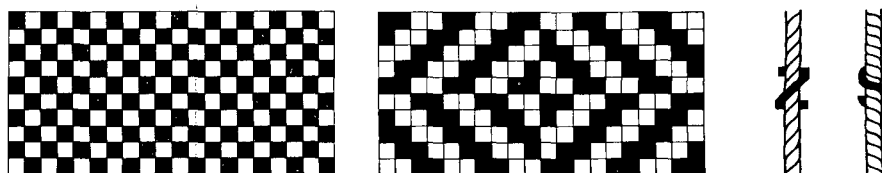
- (a) Weave: tabby; spin: Z/Z; count: 12–13/about 20 threads/cm.
- (b) Weave: tabby; spin: Z/Z; count: 14/10 threads/cm.

To these can be added some loose textile fragments: from the top of the brooch, several textile fragments, the largest piece being 2×1.5 cm. Weave: tabby; spin: Z/Z; count: 10/11 threads/cm. Material: probably linen. Also from this brooch, a textile fragment 3 cm×2 cm. Weave: tabby; spin: Z/Z; count: 28/16 threads/cm. Material: probably linen (illus 10).

A number of other samples of organic remains were submitted for examination but contained no identifiable textile structures apart from a probable fragment of bead string, made out of several parallel or slightly twisted threads, their direction of spinning being indeterminable.

Finally the bronze belt buckle (10) shows an impression of fine diamond twill with a pattern unit 20/10; spin: ?; count: 32/16 threads/cm (illus 11).

The textiles from the two oval brooches probably derive from three or four different fabrics. One is a repp-like tabby (illus 12) with a count of around 19–20/10–12 threads/cm, while the other is more balanced at 14/10 threads/cm. The fabric with count 16/10 may be a variation on one of the two others, but may also be the remains of a separate fabric. Finally, the fine linen fabric from brooch 2 with a count of 28/16 must in all probability be considered as a separate type of cloth.



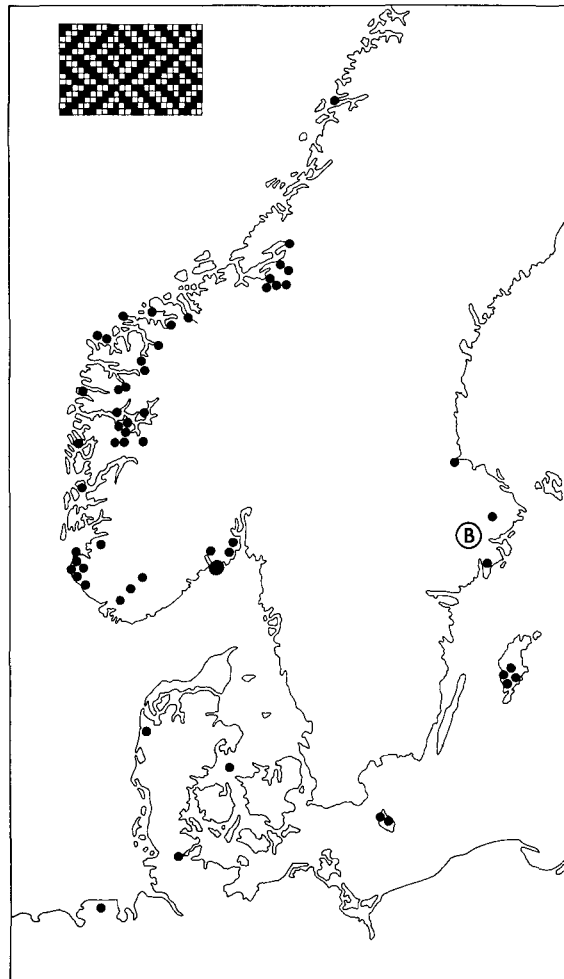
ILLUS 12 Diagrams to illustrate (from left to right): tabby weave; diamond twill 20/10; Z- and S-spinning

Most of the types of fibres cannot be determined with certainty. Two fragments, however, are in all probability linen, and this corresponds with fabrics found in Scandinavian Viking graves. A reconstruction of the dress of the dead woman is difficult with such fragmentary textile remains, but again a comparison can be made with Scandinavian Viking-Age fashion. Oval brooches were a very common feature of wealthy Viking-Age women's dress, and they were worn with a pinafore skirt over a tunic. Over this costume a kind of cloak could be worn.

The tabby weave cloth covering the pin area of brooch 1 must be the remains of a tunic, while the cloth fragment on top of the brooch may either be the remains of the pinafore skirt or of a scarf or other over-garment. The loop fragments found on brooch 2 are certainly the remains of the braces of the pinafore skirt. Detailed reconstruction of the costume is not facilitated by the general similarity of the textile remains from the grave. The loose fragments cannot be satisfactorily interpreted.

The textile remains all belong to the same general type of cloth, one which is very common in Scandinavian Viking-Age graves (Bender Jørgensen 1984, 131). In Denmark, about 75% of all Viking-Age textiles are of this type, while in Sweden and East Norway the percentage is slightly lower, representing about 60–65% of all textile remains. In West Norway, however, this type only constitutes about 40% of the textiles.

From the British Isles, textile remains from 32 sites (mostly graves) have been analysed; 20 from Scotland, two from the Isle of Man, and 10 from Ireland (see appendix). Apart from two or three pieces, all determinable textile fragments were of the same type as the tabbies from Kneep: only a grave from Kildonan, Isle of Eigg, and a grave from Cronk Moar, Isle of Man, contained other types of fabrics. However, the textile imprint found on the bronze belt buckle is of quite a different type of fabric, namely a group of fine worsteds first described in the publication of the textile finds from Birka in Sweden (Geijer 1938). This type of fabric is found abundantly at Birka, and also at the other important trading centres of Viking-Age Scandinavia, namely Hedeby (Haithabu) in Slesvig and Kaupang in Norway. In addition it is found in the royal Norwegian ship graves of Oseberg and Gokstad, and in a very limited number of other Viking-Age graves in Denmark, Sweden and East Norway – but in West Norway it is found in more than a third of all graves with textile remains, ie 38 out of 103 graves (illus 12–13). From the preceding Merovingian Period, corresponding fabrics are



ILLUS 13 Distribution of worsted diamond twills in Scandinavia during the Viking Age (B=Birka)

found in the princely Swedish boat graves in Uppland, on the Baltic islands of Gotland, Oland and Bornholm, in Scania and again fairly abundantly in West Norway. Outside Scandinavia, this type of fabric is found in a few graves from the cemetery of Dunum in Frisia, and in an undated grave from Grenigoe, Orphir, Orkney (Henshall 1952).

Among the textile remains examined from 32 Viking-Age graves from the British Isles, examples of this type are only found as imprints (as on the Kneep buckle). This may indicate that this type of fabric was used by the bronze founder while making the buckle, rather than that it was worn by the woman interred at Kneep.

The origin of the fine worsted diamond twills of Scandinavia has been the subject of much discussion since Geijer (1938) suggested that they may be identical to the *pallia fresonica*, the Frisian cloth mentioned in contemporary sources. A Syrian origin has been suggested (Hald 1950, 202), and lately an Anglo-Irish origin has been suggested (Ingstad 1979), based on the fact that many of the Norwegian graves containing this type of cloth also contain Anglo-Irish artefacts.

The fact that the textile remains from these 32 sites from the British Isles do not include a single piece of fine diamond twill *except as* imprints is an important argument against Ingstad's theory of an Anglo-Irish origin for this fabric, the undated grave from Grenigoe, Orphir, Orkney being the only piece of this type from this part of north-west Europe. According to all available information, both from contemporary sources, the sagas and from archaeological evidence, it is suggested that the Viking settlement of Scotland and Ireland was mainly Norwegian, and if the Norwegians imported fine fabrics from the British Isles we should expect to find them in the graves here too. Instead the concentration of fine worsteds in west Norway points to an origin in this area. The fact that they are sometimes found as imprints on metal artefacts, as at Kneep, suggests that these fabrics were traded at the market centres (confirmed by their presence at Birka, Kaupang and Hedeby), where the bronze founders also worked (Bender Jørgensen 1984, 131–2).

## THE FEMALE VIKING GRAVE AT KNEEP AND ITS WIDER SIGNIFICANCE

Colleen Batey

The pagan female Viking grave found at Kneep in July 1979 is a significant addition to the graves of the period already recovered from the Western Isles, a region with a notable concentration of such burials (Shetelig 1945, 9).

In a Hebridean context, the discovery of this grave reinforces a small but significant group of finds which provide the archaeological evidence for the Norse settlement of the Uig district of Lewis, and the Kneep/Valtos area in particular. These include the rich female grave group found near Valtos School in 1915 (MacLeod *et al* 1916); bone and copper alloy pins and probable Norse pottery from locations on or near Kneep headland and a few diagnostic fragments of Norse pottery from multi-period midden deposits near the shore at Kneep itself (Close-Brooks, forthcoming); a fragment of an oval brooch recovered from eroding midden deposits at Mangersta, a small sandy embayment in the cliff coastline to the south of Uig Bay (Carson 1977, 370, fig 3, no 72) and sherds of Norse pottery later recovered from the same site (T G Cowie, pers comm). Gradually therefore, archaeological evidence is accumulating to complement the historical and place-name evidence of Norse settlement in the Western Isles (cf Fellows-Jensen 1983, 165). Finally, mention must be made of the 'Lewis Chessmen', found at Ardroy on the south shore of Uig Sands (Taylor, M 1978): as well as reflecting the strength of Scandinavian influences in the Hebrides later in the medieval period, they are perhaps also tokens of the continued prestige and wealth enjoyed by the leading members of the communities living in the district.

Despite the absence of controlled excavation and recording, the relatively careful retrieval of the

grave contents has permitted a level of analysis not undertaken on the great majority of Viking artefacts previously recovered from Viking burials in Scotland. The results suggest that other Viking grave groups would also repay detailed scientific investigation and that this would greatly enhance our knowledge of British, and in particular, Scottish Viking graves, personal effects and technology. Such work could also take us some way towards the quality of investigation now seen in Scandinavia, where one may cite in particular the work of Dr Birgit Arrhenius on pre-Viking garnet jewellery (1985), while the work of Inge Hagg, published as long ago as 1974, provides a significant milestone in the study of artefacts from graves of the Viking period.

The range of artefacts from the Kneep grave provides us with the opportunity of examining a comprehensive female assemblage of the Viking period. Additionally, perhaps, one might have hoped for a trefoil brooch or a pair of shears, but the absence of these does not detract from the obvious quality of the artefacts represented in the grave, and the reflected wealth of the deceased.

Recent work by Jansson on the production of oval brooches has resulted in detailed re-evaluation of Petersen's classic study (1928). The type represented at Kneep (P51) has been discussed in detail (Jansson 1981) and he has suggested a date in the late ninth or early 10th century AD (pers comm). The damaged brooch *I* is similar to Jansson's type Sa3, the type example of which comes from Gnezdovo, Smolensk (Jansson 1981, 19, pl V); however, the other brooch is more difficult to match. Jansson has also commented on the presence of applied 'pewter' bosses (1981, 2–3). The application of silver wire is commonly distinguished on this type of brooch and the presence of perforations at or near the border (presumably for suspension) has been noted on examples from Birka (eg grave 1062: Arbman 1940, taf 65, no 3). The large number of Viking-period burials at Birka has permitted detailed chronological analysis of this and related artefact types (cf grave 860B: Arbman 1940, taf 65, no 5 and grave 961: *ibid*, taf 66, no 8).

Geographically closer, the oval brooches recorded from St Kilda are also rather similar in form to the Kneep examples (Taylor 1969, 135), while the pair from Three Mile Water, Co Wicklow are also comparable (Bøe 1940, 74–5, fig 47). However, the lack of a detailed published catalogue of Irish Viking graves is a matter of continuing regret and it is generally only possible to refer to out of date synthetic works such as that of Bøe for Irish parallels.

The damage noted on one of the brooches is particularly interesting in view of the fact that this was sustained in antiquity. It is possible that this item was an heirloom, especially as the other datable artefact in the assemblage, the ringed pin, may indicate a date somewhat later in the 10th century. Another explanation is perhaps equally plausible. Inevitably a lady away from Scandinavian homelands, where such brooches were being manufactured, would not easily be able to replace a damaged item. There is no evidence for the production of these brooches in Britain at present.

The preservation of the textiles on the brooch pins has been discussed above and is commonly to be expected in funerary contexts of the period. The preservation of textile remains within the iron corrosion products of artefacts has enabled detailed analysis to be undertaken, particularly of the Birka group in Sweden (Hagg 1974). For example, it has been possible to reconstruct in part the upper areas of female Viking dress, as a pinafore with loop straps overlying a pleated linen garment.

The string of beads, found in the area of the neck, can be considered in conjunction with the pair of oval brooches. These may originally have hung between the brooches, which were worn over the collar bones. The beads provide a significant increase in the number available for study from the period in Britain. The assemblage predominantly comprises the segmented form very commonly recovered in Scandinavia, and made, for example, at Paviken and Helgo in Sweden and Ribe in Denmark (discussed *in* Lundstrom 1976).

The few non-segmented examples, five in all, were obviously manufactured along the same lines as the rest of the beads. They strongly resemble single segments of the larger beads, but no joins

were noted among those recovered. The most interesting feature of this bead assemblage lies in the relative uniformity of the group; they are all variations of the segmented form. The group recovered in the female grave at Ballinaby, Islay, for example, contained mosaic, applied decoration, jet, amber, burnt clay and glass beads (Grieg 1940, 38). Unlike the Kneep group, such a range of bead types is much more suggestive of piecemeal collection of beads. Even the collection of beads from Birka grave 854, which includes a large number of segmented beads, has relieving elements such as melon or crystal beads and silver rings (Arbman 1940, taf 118). A number of very fine groups of beads have been recovered from Viking contexts, amongst which the most distinguished include those from Hon, Norway (Graham-Campbell 1980, 143, no 486) and Eidem, Norway (*ibid*, 44, no 152). The range of colours represented in the Kneep group is entirely consistent with those commonly found in Scandinavia.

The ringed pin represents a type discussed by Fanning (1969; 1983) and may be dated to the later 10th/early 11th century on the basis of parallels among pins recovered from excavations in Dublin (T Fanning: pers comm). The type has Irish origins and has a distribution in Ireland, Scotland, and west Norway in Viking graves. The pin was most commonly employed as a cloak pin and its position in the Kneep grave is consistent with this.

The presence of two belt fittings in this grave is rather unusual. Scandinavian studies of Viking dress have most commonly suggested that the garments were worn loose and that items, customarily suspended in *male* dress from a belt, eg knives, were hung from one of the oval brooches in the case of female attire (Hagg 1974, fig 34, 41). The position of the knife, needlecase and whetstone in this grave is not conclusive. Allowing for displacement in the burial process, they could have been suspended from the brooch at the left shoulder, or they could alternatively have hung from the belt.

Similar examples of the strap-end form have been recovered from Ardskinish, Colonsay (Grieg 1940, 61, fig 34) although it is conceivable that this is a male grave group, and from a male grave in Eigg (Grieg 1940, 69–70, fig 40: Grave 3b). An earlier find of a female grave from Valtos included a buckle for a belt (MacLeod 1916; Grieg 1940, 75–7, fig 43). Despite these examples, they are not commonly found in Scandinavian female graves in this form. Geijer notes the absence of any kind of belt in the Birka female assemblages despite the recovery of strap ends in some of the graves (Geijer 1979, 221). The two from the assemblage under discussion are very fine examples and it is most likely that they were attached to a leather belt.

The items which may possibly have related to the belt – the needlecase, whetstone and knife – were found within a small area at the left hand side of the skeleton. There is no evidence for the attachment of either the comb or the sickle, but this may be simply a reflection of the incompleteness of the objects.

The needlecase is of a very simple and common type and its interest lies more in the fact that it contained two iron needles. The type is well known in Scotland: as examples only, one may cite the discovery of an almost identical example with needles in position from the recent excavations at Pool, Sanday, Orkney (Dr John Hunter: pers comm), while Grieg illustrates an empty needle case from Càrn a' Bharraich, Oronsay in Argyll (1940, 42, fig 24).

The small perforated whetstone could have been used for sharpening the needles or the knife. Such portable examples are also well-attested in Viking and early medieval contexts such as Deerness, Orkney (Batey 1986) and Balladoole, Isle of Man (Bersu & Wilson 1966, pl VIII, F). The finest range available for study, however, comes from Birka in Sweden, where some still retain a metal ring for suspension (Arbman 1940, taf 186). They are not exclusive to either sex when found in grave contexts.

The knife is a simple form with traces of both leather and wood remaining, representing a leather sheath and a wooden handle. No method of suspension is obvious, except for a slight trace of a

knob at the top of the hilt. Allowing for corrosion, the knife has a stocky blade with proportionately broad shoulder and elongated tang. It is most likely that it served many functions, much as a modern penknife.

The presence of a sickle can be readily paralleled in other grave finds, for example, the Viking cemetery at Pierowall, Westray, Orkney (Greig 1940, 96, fig 54). It is possible that it may have been more common in female graves although a very similar piece is recorded from a male grave from Hovland, Ullensvang (Shetelig 1912, 161, fig 385). However, it is an item appropriate to graves recovered in a rural setting and perhaps it is no surprise that the town cemetery of Birka, Sweden produced no such artefacts.

The comb recovered from the grave is a find which could equally have a male or female association; being comparable for example with that from a male burial (Grave 581) from Birka (Arbman 1940, taf 162, no 6). It is very similar to examples from Viking contexts in Ireland, the publication of which is eagerly awaited.

The presence of a single iron rivet in the assemblage is somewhat perplexing. Other graves have also produced a single example, such as Ardskinish, Colonsay (Greig 1940, 61e). While it is likely that this represents the presence of a wooden item in the grave, it is insufficient to suggest a coffin as at Deerness, Orkney (see Batey *in* Morris with Emery 1986), far less a boat as at Pierowall, Orkney (Greig 1940, 93, fig 52; Thorsteinsson 1968) or Westness, Orkney (*Discovery Excav Scot 1980*, 25).

The Kneep burial thus provides a significant addition to the inventory of Norse burials from the British Isles, not only because of the intrinsic quality of the contents of the grave, but also because the post-excavation work carried out in the laboratory has shown the level of technological information that can be obtained during the conservation process. Superficial inspection of other Viking-Age grave groups in the collection of the National Museum indicates that much still remains to be gleaned from earlier discoveries.

## APPENDIX

Textile remains associated with Viking Age artefacts (in most cases, oval brooches) have been analysed from the following 32 sites, the majority of them graves.

- RMS: Royal Museum of Scotland, Edinburgh
- NMI: National Museum of Ireland, Dublin
- Kildonan, Isle of Eigg, Scotland (RMS: IL 164)
- Pierowall, Westray, Orkney, Scotland (RMS: IL 197)
- Langhills, Caithness, Scotland (RMS: IL 217)
- Isle of Tiree, Argyll, Scotland (RMS: IL 219)
- Castletown, Caithness, Scotland (RMS: IL 221)
- Clibberswick, Unst, Shetland (RMS: IL 222–223)
- Unst, Shetland (RMS: IL 313)
- Colonsay, Argyll, Scotland (RMS: IL 322)
- Càrn a'Bharrach, Oronsay, Argyll, Scotland (RMS: IL 329–330)
- Càrn a'Bharrach, Oronsay, Argyll, Scotland (RMS: FC 183a)
- Reay, Caithness, Scotland (RMS: IL 334–335)
- Isle of Sanday, Orkney, Scotland (RMS: IL 343)
- Isle of Sanday, Orkney, Scotland (RMS: IL 347)
- King's Cross Point, Arran, Scotland (RMS: IL 356)
- Ospidale, Sutherland, Scotland (RMS: IL 377)
- Westness, Rousay, Orkney, Scotland (RMS: IL 729, IL 735)
- Chaipaval, Northton, Harris, Hebrides, Scotland (RMS: IL 750)
- Kiloran Bay, Colonsay, Argyll, Scotland (RMS: L. 1924. 5–6)
- Kneep, Isle of Lewis, Hebrides, Scotland (RMS: this paper)



Cronk Moar, Isle of Man (Bersu & Wilson 1966)  
 Balladoole, Arbory, Isle of Man (Bersu & Wilson 1966)  
 Arklow, Co Wicklow, Ireland (NMI 1901:50–52)  
 Island Bridge, Co Dublin, Ireland (NMI: R 2404)  
 Island Bridge, Co Dublin, Ireland (NMI: R 2405)  
 Island Bridge, Co Dublin, Ireland (NMI: R 2406)  
 Island Bridge, Co Dublin, Ireland (NMI: R 2420)  
 Island Bridge, Co Dublin, Ireland (NMI: R 2421)  
 Kilmainham, Co Dublin, Ireland (NMI: 1881: 253)  
 River Bann, Ulster, Ireland (NMI: 1886: 31)  
 Unprovenanced, Ireland (NMI: X 1636)  
 Unprovenanced, Ireland (NMI: RSAI 17)  
 Unprovenanced, Ireland (NMI: 1907:113)

### ACKNOWLEDGEMENTS

Credit for the discovery of the Viking burial at Kneep must go to Mr Will Maclean who first spotted the toe-bones of the skeleton protruding from the face of the sand-bank: a special debt of gratitude is due to him for immediately reporting the discovery, and for generously placing his photographs and sketches of the ensuing investigation of the grave at the authors' disposal. The excavation of the burial was undertaken by the Procurator Fiscal for the Western Isles, Mr Colin Scott Mackenzie, assisted by Mr Maclean and Detective Constable W J Murray, and we are especially grateful to Mr Mackenzie for his ready collaboration in the production of this report.

The subsequent conservation and detailed examination of the artefacts was undertaken (mainly by RDW) at the Conservation and Research Laboratories of the then National Museum of Antiquities of Scotland, under the supervision of Tom Bryce whose help and advice are gratefully acknowledged. Thanks are also due to Dr Jim Tate for undertaking a series of XRF analyses on the metalwork and for helpful discussion of their significance.

Our debt to Mary Harman and Lise Bender Jørgensen for their specialist contributions is clear, while special thanks are due to Helen Jackson for preparing the splendid line drawings which accompany the text. We are also grateful to Doreen Moyes and Ian Larner for a variety of photographic work, particularly the photographs included in the report. For helpful advice and comments on specific artefacts, we are indebted to Dr Joanna Close-Brooks, Ingmar Jansson, Theo Skinner, Tom Fanning, members of staff of the Dept of Geology at the Royal Museum of Scotland, and the late Dr Ian Lyster. The text has been read by Olwyn Owen and Mike Spearman and we are grateful to them for their helpful suggestions: any remaining imperfections are the responsibility of the authors.

### REFERENCES

- Anderson, J 1880 'Notes on the contents of two Viking graves in Islay, discovered by William Campbell, Esq., of Ballinaby; with notices of the burial customs of the Norse sea-kings, as recorded in the sagas and illustrated by their grave-mounds in Norway and in Scotland', *Proc Soc Antiq Scot*, 14 (1879–80), 51–89.
- Arbman, H 1943 *Birka I: Die Gräber*. Kungl. Vitterhets Historie och Antikvitets Akademien Stockholm. Uppsala.
- Arrenhius, B 1970 'Knivar från Helgö och Birka', *Fornvännen*, 65 (1970), 40–51.
- Arrenhius, B 1974 'Om knivar och knivtypologi', *Fornvännen*, 69 (1974), 105–10.
- Arrenhius, B 1985 *Merovingian Garnet Jewellery: emergence and social implications*. Kungl. Vitterhets Historie och Antikvitets Akademien. Stockholm.
- Balfour, J A 1909 'Notice of a Viking grave-mound, Kingscross, Arran', *Proc Soc Antiq Scot*, 43 (1908–9), 371–75.

- Batey, Colleen E 1986 'The finds', in Morris, C D with Emery, N, 'The chapel and enclosure on the Brough of Deerness, Orkney ...', *Proc Soc Antiq Scot*, 116 (1986), 301–74, fiche 2: A1–4: G7.
- Bender Jørgensen, L 1984 'North European textile production and trade in the 1st millennium AD – a research project', *J Danish Archaeol*, 3 (1984), 124–34. Odense.
- Bersu, G & Wilson, D M 1966 *Three Viking graves in the Isle of Man*. London. [= *Soc Medieval Archaeol Monograph*, 1.]
- Bøe, J 1940 *Norse Antiquities in Ireland*. Oslo. [= *Viking Antiquities in Great Britain and Ireland* part III, ed Sheteig H]
- Brothwell, D R 1965 *Digging up bones*. London.
- Carson, M 1977 'Iron-age finds from the Isle of Lewis', *Proc Soc Antiq Scot*, 108 (1976–7), 370–5.
- Close-Brooks, Joanna forthcoming 'Excavation of a cairn at Kneep, Uig, Lewis', *Proc Soc Antiq Scot*, forthcoming.
- Curle, J 1914 'On recent Scandinavian grave-finds from the Island of Oronsay, and from Reay, Caithness with notes on the development and chronology of the oval brooch of the Viking time', *Proc Soc Antiq Scot*, 48 (1913–14), 292–315.
- Dodwell, C R (ed) 1961 *Theophilus – De Diversis Artibus*. London.
- Duczko, W 1985 *Birka V: The Filigree and Granulation Work of the Viking Period: an analysis of the material from Bjorko*. Kungl. Vitterhets Historie och Antikvitets Akademien. Stockholm.
- Fanning, T 1969 'The bronze ringed pins in the Limerick City Museum', *North Munster Antiq J*, 12 (1969), 6–11.
- Fanning, T 1983 'Some aspects of the bronze ringed pin in Scotland', in O'Connor, A & Clarke, D V (eds), *From the Stone Age to the 'Forty-Five: Studies Presented to R B K Stevenson*, Edinburgh, 324–42.
- Fellows-Jensen, G 1984 'Viking settlement in the Northern and Western Isles – the place-name evidence as seen from Denmark and the Danelaw', in Fenton, A & Palsson, H (eds), *The Northern and Western Isles in the Viking World: Survival, Continuity and Change*, Edinburgh, 148–68.
- Geijer, A 1938 *Birka III: Die Textilfunde aus den Gräbern*. Kungl. Vitterhets Historie och Antikvitets Akademien. Uppsala.
- Geijer, A 1979 'The textile finds from Birka: Birka III Die Textilfunde aus den Gräbern, revised by the author', *Acta Archaeologica*, 50 (1979), 209–22.
- Graham-Campbell, J 1980 *Viking Artefacts: a select catalogue*. London.
- Grieg, S 1940 *Viking Antiquities in Scotland*. Oslo. [= *Viking Antiquities in Great Britain and Ireland*, part II, ed Shetelig, H.]
- Hägg, I 1974 *Kvinnodrakten i Birka. Livplaggens rekonstruktion på grundval av det arkeologiska materialet*. Uppsala. [= *Archaeol Studies Uppsala Univ Instit North European Archaeol*, 2.]
- Hald, M 1950 *Olddanske Tekstiler*. Copenhagen. [= *Nordiske Fortidsminder*, 5.]
- Henshall, A 1952 'Early textiles found in Scotland: part I', *Proc Soc Antiq Scot*, 86 (1951–2), 1–29.
- Ingstad, A S 1980 '“Frisisk klede?” En diskusjon omkring noen fine tekstiler fra yngre jernalder', *Viking*, 43 (1980), 81–95.
- Jansson, I 1981 'Economic aspects of fine metalworking in Viking Age Scandinavia', in Wilson, D M & Caygill, M L (eds), *Economic Aspects of the Viking Age*, London, 1–19. [= *Brit Mus Occas Pap*, 30.]
- Lacaille, A D 1937 'A stone industry, potsherds and a bronze pin from Valtos, Uig, Lewis', *Proc Soc Antiq Scot*, 71 (1936–7), 279–96.
- Lundström, A 1976 *Bead making in Scandinavia in the Early Middle Ages*. Kungl. Vitterhets Historie och Antikvitets Akademien: Antikvarisk Arkiv 61. Stockholm. [= *Early Medieval Studies*, 9.]
- MacGregor, A 1984 *Bone, Antler, Ivory, and Horn*. London.
- MacLeod, D J *et al* 1916 'An account of a find of ornaments of the Viking time from Valtos, Uig, in the Island of Lewis', *Proc Soc Antiq Scot*, 50 (1915–16), 181–9.
- Maryon, H 1954 *Metalwork and Enamelling*. London.
- Petersen, J 1928 *Vikingetidens Smykker*. Stavanger.
- Ritchie, W & Mather, A 1970 *The Beaches of Harris and Lewis*. Aberdeen.
- Shetelig, H 1912 *Vestlandske graver fra jernalderen*. Bergen. [= *Bergens Museum Skrifter. ny Raekke* Bd 11 No 1].
- Shetelig, H 1945 'The Viking Graves in Great Britain and Ireland', *Acta Archaeologica*, 16 (1945), 1–55.
- Taylor, A B 1969 'The Norsemen in St Kilda', *Saga-Book of the Viking Society*, 17 (1966–9), 116–44.

- Taylor, M 1978 *The Lewis Chessmen*. London.
- Thorsteinsson, A 1968 'The Viking burial place at Pierowall, Westray, Orkney', in Niclasen, B (ed), *The Fifth Viking Congress: Torshavn, July 1965*, Torshavn, 150–73.
- Vierck, H 1976 'Eine südkandinavische Relieffibel. Zum feinguss im frühen Mittelalterzeit', in Narr, K J (ed), *Aus der Sammlung des Seminars für Ur- und Frühgeschichte der Universität Münster*, Münster, 137–209. [= *Münstersche Beiträge zur Ur- und Frühgeschichte*, Band 9.]
- Werner G 1971 *Silverpressbleck som dekorationer – element på vikingatida ovalspannen*. Uppsala University: unpublished paper.
- Zachrisson, I 1960 'De ovala spannbucklorernas tillverkningsätt', *Tor*, 6 (1960), 207–38. Uppsala.

*This paper is published with the aid of a grant from the Royal Museum of Scotland*