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The Celtic brooch from Westness, Orkney, and hinged-pins

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SUMMARY

A richly equipped ninth-century Norse grave found at Westness on Rousay was part of a cemetery investigated in subsequent years by a Norwegian expedition, and will be included in its report. One of the ornaments, a silver and gold Celtic brooch or cloak-pin, was probably made in Ireland about the middle of the eighth century – a hypothesis which the present discussion of its relationships seeks to establish. A major series of miniature-brooch pins is identified and called hinged-pins. Besides normal varieties some pins hitherto dated considerably earlier are brought into the series. The Westness brooch seems to stand at the head of this series in time, as well as being the largest, most elaborate and richest known example. Though greatly inferior to the 'Tara' brooch it reflects a significant number of that ornament's features. Its perhaps surprising imperfections are described, among other details of structure and design.

DESCRIPTION

THE DISCOVERY

In 1963 some human bones and four objects – two Norse oval brooches, a rectangular plaque of bronze and a Celtic brooch – were found at the farm of Westness, Rousay, on 26 October when a hole to bury a cow was dug beside the shore on Moo Ness (NGR HY 375 293). They were promptly sent by Mrs H W Scarth of Breckness to the National Museum in Edinburgh for identification. The cow was soon disinterred. Then from 4 to 7 November Miss A S Henshall from the Museum recovered, mainly from the spoil heaps, the remaining contents of a completely destroyed grave; it probably had been built of slabs laid horizontally (*Discovery Excav Scot 1963*, 40; MS report). Because of bad weather a small corner of the grave was left unexamined.

Brief reports by Dr A Whyte and Professor A D Lockhart showed that the grave was that of a woman and a full-term infant, who presumably had died at childbirth. Adult bones had also been recovered from a disturbed grave 3 m away.

The whole find was claimed by the Crown and placed in the National Museum (*Proc Soc Antiq Scot*, 98 (1964–6), 334), catalogued IL 728–41. It was the richest Viking grave till then recorded in Scotland. In addition to the Celtic brooch, the pair of oval brooches (Rygh type 649), and the rectangular plaque (a gilt bronze mount filled with a wolf or lion on a background of interlace), it had

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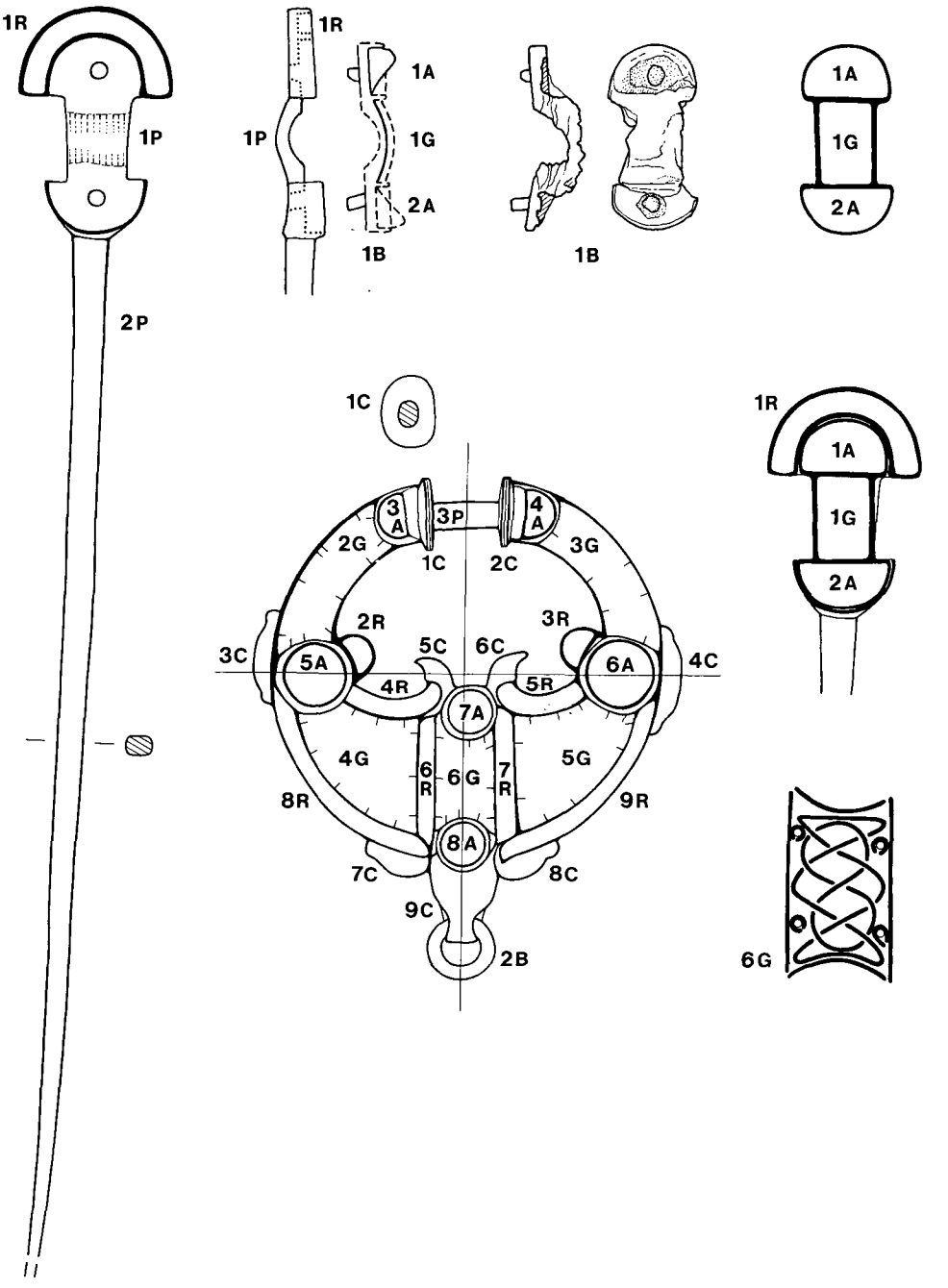


ILLUS 1 Westness brooch: full size diagrams of pin, bridge and ring; compartments and insets – A amber, B bronze, C cast, G gold, P plain, R red glass, – position of 'stitches'. Reconstruction of 6G, scale 2:1

included 40 assorted beads some of millefiori glass, a long bone hair-comb, implements for textile preparation, a sickle, a small piece of pumice and a bronze basin.

Full publication was deferred in order to link with that of the cemetery, on which excavation was carried out by the Norwegian Archaeological Society under the direction of Dr Sigrid Hanssen-Kalend for 14 seasons between 1968 and 1984. The grave will be no 1 in their forthcoming report.

THE BROOCH (illus 1–5)

This is technically a hinged loose-ring pin, but its ring in the form of a pseudo-penannular brooch is too large and ornate for the whole to be readily called a pin; it probably fastened a cloak or heavy shawl. It is of base silver (interior as low as 32% – XRF analyses in appendix) gilded on the front, inset with gold, amber and red glass, and the general appearance is striking and harmonious. Like only three other Celtic brooches in the British Isles its decoration includes animals in gold filigree. Photographs before conservation were soon published, and a short descriptive and comparative paper (Stevenson 1964; 1968; NMAS 1966, pl 9). Features of 'the Westness brooch' were included in an account of the Hunterston brooch and its successors (Stevenson 1974), and parts of the present paper have recently been summarized (Stevenson 1987). A colour photograph, with some inlays restored, is pl 22 in Renfrew 1985.

Illustration 1 shows at full size the three structural parts which will be described in succession: the pin; the bridge which forms a hinge with the bar on which the ring swivels; the broad ring. Their subdivisions, whether cellular or solid, are numbered and lettered according to material, notably that of the insets which are considered separately. A discussion of comparisons and conclusions then follows.

Pin

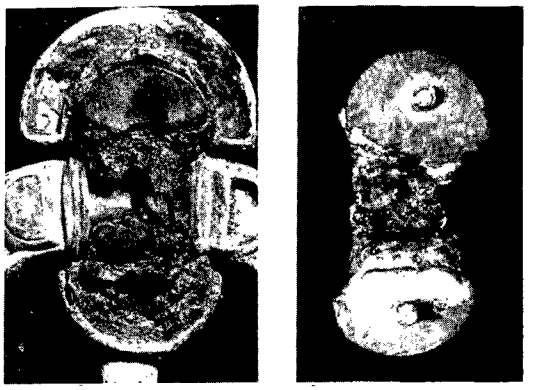
The pin and the subdivisions of its elaborate pin-head are cast in one piece now 175 mm long. The *shaft* (2P) is undecorated and tapers from 4 mm by 5 mm in rounded cross-section where it leaves the head (not quite centrally) to 2 mm at the blunt point. The lower 105 mm are flattened on front and back faces, and it has become slightly bent in a forward curve beginning at the snout of the animal-head on the ring (9C), with a backward kink after c 45 mm. The XRF-analysis show the cleaned surface 'skin' to consist of about 70–74% silver, but this may be more than twice the original richness owing to copper-depletion, primarily due to corrosion.

Pin-head

The pin-head, 30 mm by 20 mm overall, consists of two semicircular cells (1A, 2A) linked by a plain broad band (1P) and completed by a more than semicircular channel like a crest (1R), from which the top edge has corroded away. The cell walls, 1·7–3·0 mm high from their c 1·5–3 mm thick floor, go round the curved edges, but on the straight only close the ends of the channel. They are not significantly sloped. The porous back of the pin-head is mostly flat, with a gentle convexity at 1P over the length of the hinge (section, illus 1). Round the curved edges there have been very low raised margins; round 2A there remains only a trace of the fine sharpening-up inside furrow.

Bridge

A shaped bridge of bronze (1B) is extremely corroded but was firmly attached (illus 2) until removed and replaced by perspex. It was fairly well preserved where in tight contact with cells 1A and 2A (illus 3), to each of which it was fastened by a round copper rivet 1·8 mm in diameter, visible on the back of the pin-head. These were respectively 3·85 and 5·05 mm long, of which the bridge thickness was 2·55 and 2·3 mm. A curved rectangle of gold, found loose by Miss Henshall, fitted over



ILLUS 2–3 Westness brooch details: pin-head with bridge as found plus amber inset, and underside of bronze bridge with copper rivets (scale 1·5:1)

the curve of the bridge. Corrosion-filled gaps then recognizable along a side and one end represented bronze walls surrounding cell 1G, perhaps thicker than the silver walls of 1R. It may be deduced that the bridge was of cast metal. A D-shaped amber inset, also found by Miss Henshall, fitted into cell 1A on top of the bridge-end (illus 2), leaving space for a dissolved bronze (and gilded) bezel probably slightly higher than the wall of 1R, as reconstructed in illus 1. Cell 2A appeared to have lost its inset before burial.

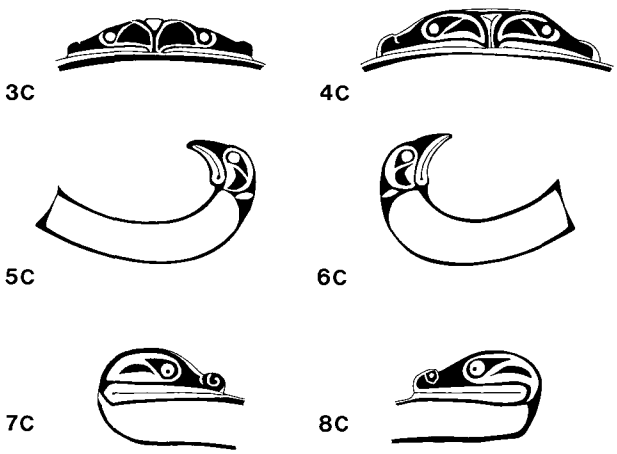
Ring

The ring is circular, 54 mm in diameter, and about 3·8 mm thick at the left side while some 3·5 mm at the right. Various modelled features project from the circumference, all no doubt cast complete in one piece. The cells are 1·3–1·6 mm deep. Grooves scraped at the base of their walls may have been done on the model, like the incised lines on the back (p 245). All exposed surfaces on *the front and sides* have been mercury gilded, including the inner sides of the cells. Completely hidden by the pin-head and bridge is a rounded bar (3P) about 4 mm thick joining the quadrants of the *hoop*. These begin with an oval buffer (1C/2C) grooved along its front edge, that rises about 3 mm above the principal compartment (2G/3G) or 2 mm above the D-shaped bezel at its start (3A/4A). Surrounding the other half of the kidney-shaped centre of the ring are two vestigial triangular *terminals* and the filled-up 'gap' between them (4–6G) – forms derived from the earlier penannular brooches and emphasized by narrow channels, which outline them and were originally filled with red glass (4R–9R). Four circular bezels, the outer sides of which curve inwards to nearly 2 mm above the adjacent walls (illus 7), held bosses of amber, one at either end of the 'gap' (7A/8A) and a larger one standing up clear c 2·1 mm where the triangles join the hoop (5A/6A).

Design

The design is as usual symmetrical on either side of the axis through the 'gap'. The designer placed the centre of the large bosses on the diameter at right angles to that axis (illus 1). He seems to have used a module of one-third of the radius of the ring. So the interior of boss 6A at c 9 mm equals 1 unit, the centres of the small circular bosses are 2 units apart, the width of the 'gap' 1 unit at its lower end, and the widths of 1A and 2A on the pin-head are 1½ units. The large compartments of the hoop are at most 1 unit wide, but not uniformly because the inner curves are sharper than the outer.

The inner lines are continued in a slow spiral curve to end at the tip of the beak of *two bird-heads*



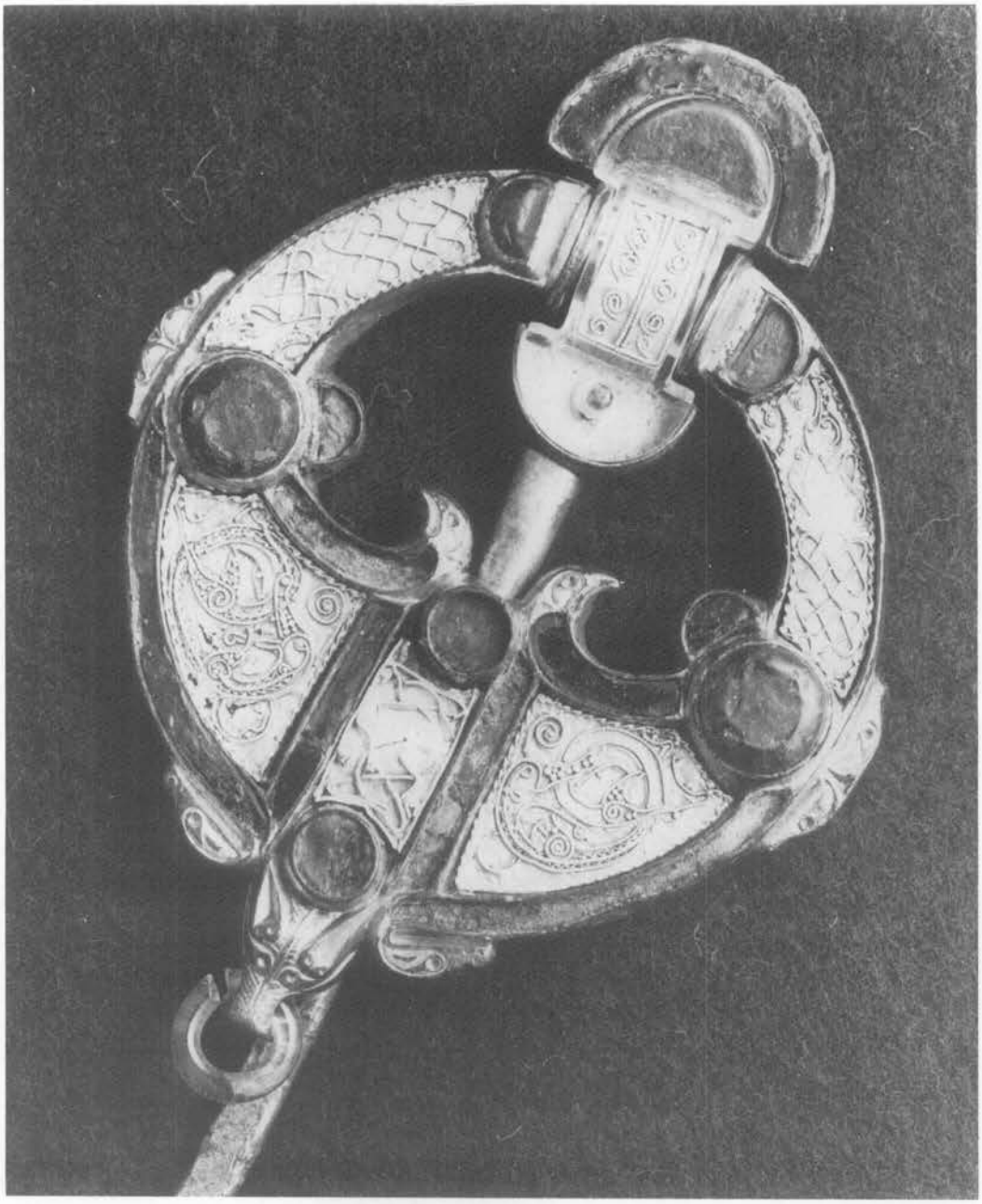
ILLUS 4 Westness brooch: silver-gilt details (scale 2:1)

in profile back to back (5C/6C), modelled in a chip-carving technique at the centre of the brooch. Where the large bosses impinge on the curve a small D-shaped cell projects towards the pin-head (2R/3R). It appears that, after the right-hand interior curve had been cut out on the model, its template had to be tilted slightly to give enough width for the hinge when being used to cut out the other half (probably from the back which there has the smoother curve). This brought the bird-head 5C closer to the vertical axis than the other; it is also less elegant. The boss 7A was then placed centrally between the heads, but the rest of the interior of the ring was little affected.

As if resting on the outside of the circle there are six small *snake-heads* in profile (illus 4). Two back to back pairs of them (3C/4C) are close to the large bosses, but are asymmetrically placed relative to them. It would seem that the outer circumference and its projections were cut out first of all. 4C set mostly below the horizontal axis is probably the correct one. 3C stretches as far above the axis as the other below it, which suggests that their template marked to meet the axis had been moved round to the opposite end but not reversed. That 3C is also shorter overall may be due to a mistake in finishing. The errors in placing and cutting hardly affected the single snake-heads (7C/8C) which turn back from the outer corners of the 'terminals'. They are 1 unit long. The outer channels 8R and 9R are represented as bodies curving to join the narrow necks. The eye-balls are larger conical drill-holes than those of the other creatures. The nostrils are circles too small to be compass-drawn despite the dot in 8C.

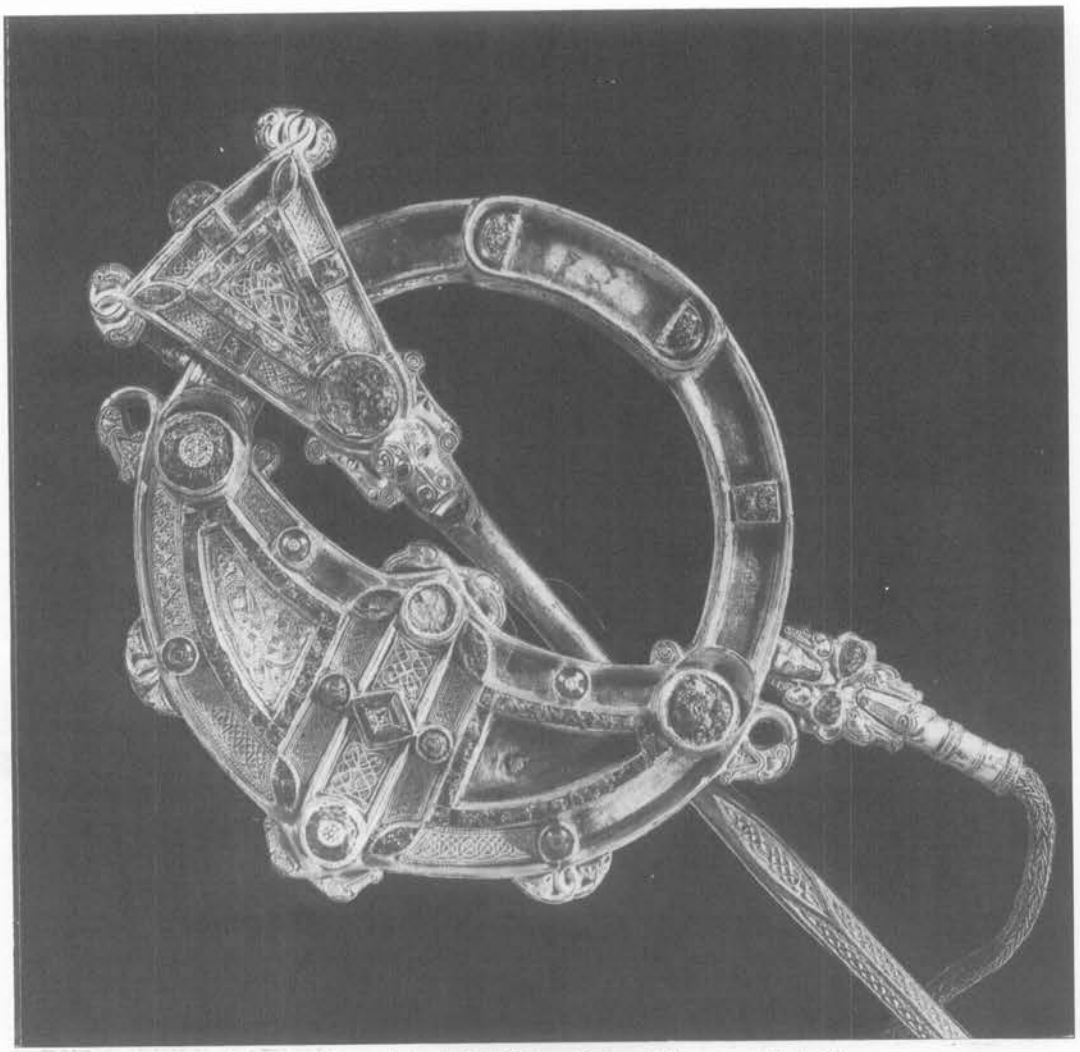
From the boss at the lowest point in the 'gap' there projects an *animal-head* viewed from above, 9C (illus 7). It measures 1 unit from its squared-off snout to the back of the head along the median ridge from which run oblique corrugations. The long pointed ears have chip-carved hollows and a pair of false-relief circles at their base, above each comma-shaped eye. The modelling of this head begins halfway up the edge of the ring from an offset which slopes upward towards the broad end of the snout, on which nostrils are not marked. To allow a small sliding ring (2B) to be held as if in the mouth a perforation has been provided 2–3 mm in diameter, and the edge has been widened to almost 5 mm. The ring is of cuprous metal. Now 2 mm thick, it was about 9 mm – 1 unit – in external diameter, which would have allowed a cord of up to 4 mm thick to be fastened through it in front of the snout. It has been replaced in perspex.

Most of the gliding has been worn off the outer edge. The paired snake-heads, but not the single



ILLUS 5 Front view of the Westness brooch after conservation, with perspex bridge and small ring, covers on empty compartments 7A, 1, 3, 5, 8R and beside glass tessera in 6R (scale 2:1)

ones, are 1 mm thinner than the edge. Just above them a very fine incised line runs round the circumference (perhaps omitted in part), and another about 2 mm down from it is interrupted by the heads, but both lines are recognizable on 7C (illus 7). Too fine to be actually decorative, the even fainter lines on the back of the ring imply that they were intended to be so. The outer wall of both 8R and 9R has been dented inwards by ancient accidents. On the inner edge the gilding is worn at the

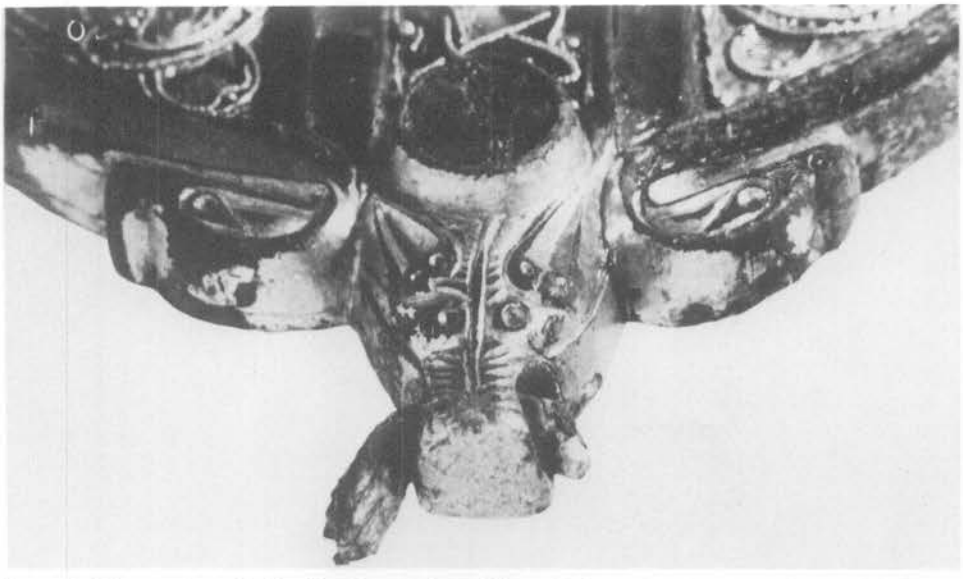


ILLUS 6 Front view of the 'Tara' brooch (scale 1:1) (Photo National Museum of Ireland)

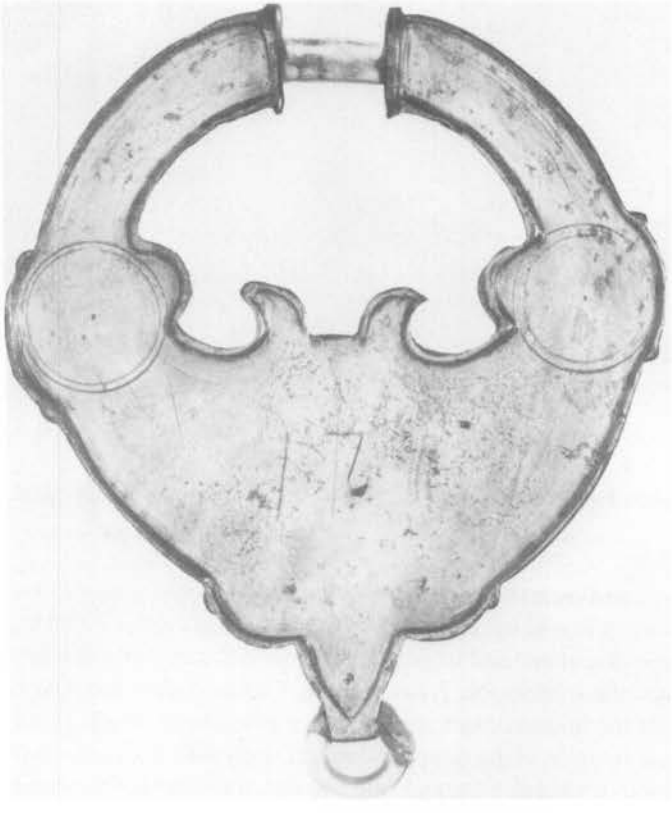
margins of the bird-heads, and has been cut through deeply by the corners of the pin-head.

The back of the ring (illus 8)

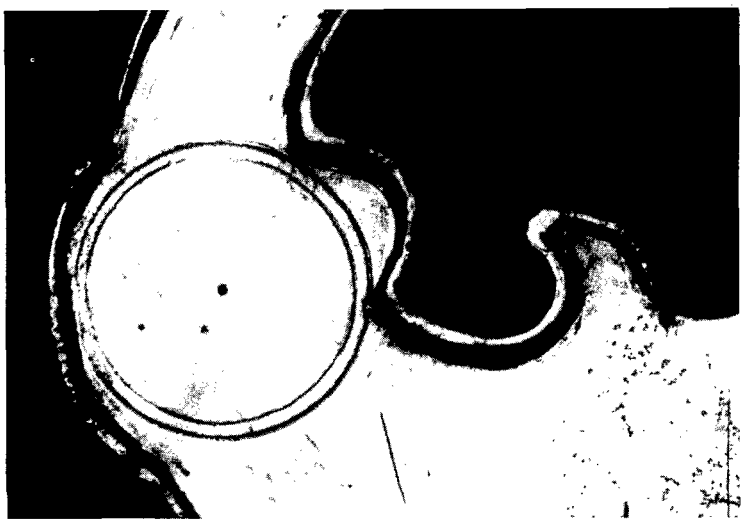
This has an attractive shape, and seems to have been designed to be worn facing the front on less 'dressy' occasions. It is all silver without gilding. Rounded raised margins at most 0·7 mm high follow the edges, broadening at the animal's snout, and interrupted between the bird-heads where the pin can lie. At the sides of the hinge the buffers rise 2 mm instead. Compass-drawn circles in double outline have been incised behind the lateral bosses and on to the projections beside them. Fainter pairs of lines run concentric to the margins of the hoop, and more faintly still, and more than twice as far apart, follow the outline of the 'terminals'; they go into but not between the bird-heads. These incisions or scratches were made on the softer model before casting, for parts of the outer circle behind 6A have been distorted when the raised margins were modelled and sharpened up with a



ILLUS 7 Westness brooch: details of lower edge, with small ring put back as found (scale c 3·6:1)



ILLUS 8 Westness brooch: back of brooch-ring cleaned, small ring superimposed (scale 1·5:1)



ILLUS 9 Westness brooch: detail of back showing distortion of circles (scale 3:1)

furrow along their base (illus 9). Similarly the outer circles are kinked behind 2R and 3R. As seen from the back the front and back edges of 2R do not curve evenly, thus confirming the observation from the front that there has been adjustment when the model was cut out. There are a number of surface flaws in the polished silver which is now c 75% pure. Three not quite parallel scratches below the bird-heads may have been a deliberate mark.

The insets

Though some of these are missing and others damaged, the surface was sufficiently firmly encrusted with sand when received at the Museum to make it probable that their loss, except where specified, and all the damage, except to the small ring, had occurred before burial. Coloured lids have been inserted cosmetically, and to protect original adhesive.

The loose surviving *amber* of the pin-head is shaped rather like the segment of an orange (11 mm by 6 mm by 4 mm), quite flat on the shiny underside but centrally depressed above. Its position was evident, while its assumed counterpart left no recognizable trace on the corroded bridge-end at 2A. The top of its curve originally rose clear of the cell wall. (To avoid fastening it to the perspex a substitute now replaces it.) On the hoop 4A is empty but 3A is intact; the amber stands proud like half a dome cut down obliquely towards the similarly sloping outer face of its D-shaped cell. The main bosses rise some 2 mm above their raised bezels. Their tops are flat but have an irregular rounded ridge at the edge within which the surface is matt and uneven in comparison with the convex sides. Evidently they were modelled or moulded when quite soft, as suggested by the British Museum Research Laboratory noting evidence of air bubbles at the surface of 3A. There was also speculation whether the amber might have been reconstituted from powder. The slightly inward turned bezels fit closely round the amber; 7A was empty. The amber at 8A is low, all below the bezel's rim from which the gilding has been worn off. Although half the surface has fractured and flaked away, the other half is like the centre of the large bosses, suggesting that it was always depressed.

Of remains of *adhesives*, some was found in the floor of 3R and of 7A. It was identifed as beeswax that had lost some of the higher organic acids, by analysis at the National Gallery in London. No trace of adhesive was seen under the gold panels. The British Museum reported that considerable

residues in the long channels, 1R, 4–9R, consisted of an underlayer of beeswax and an upper c 0·1 mm of black or more often grey brittle material, of which only small amounts remained in the c 1·5 mm deep cells. Some of the adhesive has been left in position.

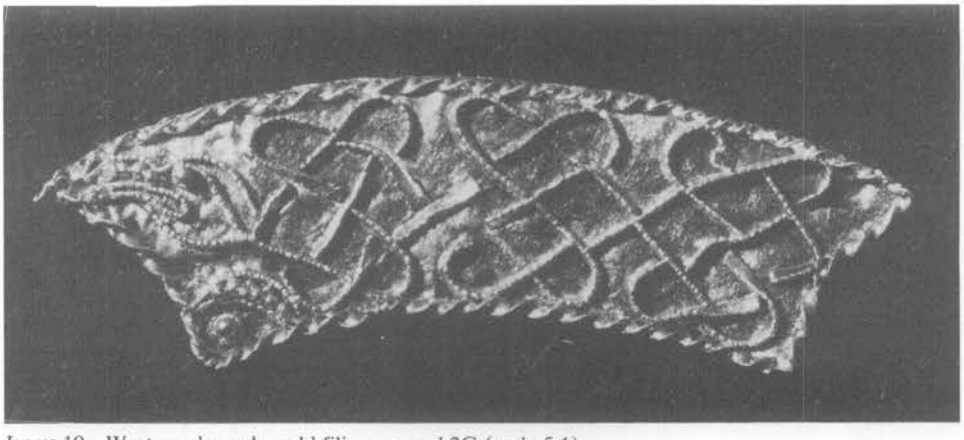
Ridges in this adhesive showed that tesserae had been inset, 5–8 mm long and differing fractionally in thickness and finish on the underside. Of these one remains undisturbed. It is of translucent *red glass*, 6 mm by 2 mm by 0·5 mm, pointed to fit into the lower end of 6R, the upper surface flush with the channel wall on one side and just below it on the other. Another piece, shown in the left end of 1R in the early published photograph, is now lost. It was squarish, but could be seen from the impressions in the adhesive (illus 2) to have already lost about half its 6 mm. There appear to have been three tesserae in 4–5R, four in 1R, and four also in 8R. Some at least of those in 8R and 9R must have falled out before or when the outer walls of these channels were dented inwards, where unprotected by the snake-head projections. It may be assumed that all were of the same glass. Red glass rather than amber probably filled the two empty D-shaped cells 2R and 3R, because the inside of their rims are not turned in, and do not rise above the adjacent elongated compartments like the amber-filled bezels.

The British Museum reported that although the tesserae had the red-brown colour of garnet, X-ray diffraction and the presence of many bubbles proved they were glass. Manganese was suggested as colourant. Red lids of plastic have been laid in 1–3R, 5, 6 and 8R as shown in illus 5, and amber coloured in 7A.

The *gold* insets consist of gold foil back-plates to which filigree wires and granules have been invisibly soldered by the gold-and-copper technique which vapourizes the copper; by it gold could be united with gold, not with silver or bronze. The inset of 1G, found loose, is a rectangle measuring 11 mm by 6 mm by 0·1–0·15 mm, curved to fit on to the bridge. On it are two lengths of beaded gold wire about 0·3 mm thick, two close together up the centre and two more each along a short and a long side, bent sharply at the corner. Others about 0·25 mm thick form in each rectangle five spirals which though undamaged are extremely irregular in plan and curvature: on one side two S-shaped pairs bent in opposite ways and a little comma-shaped coil, on the other a larger coil, then an S with a loose semicircle branching from its centre, followed by a spiral and a coil back to back.

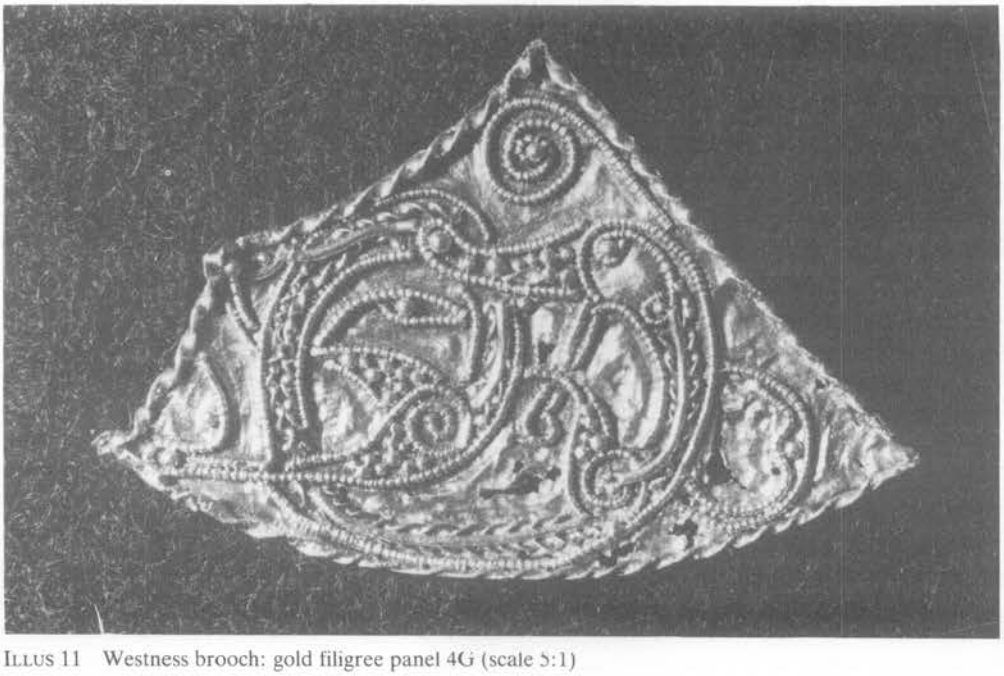
On the *hoop* the back-plates in 2G and 3G were originally secured by 'jewellers' stitches'. These were quite corroded and only the scars from which they were scraped now remain (cf Stevenson 1974, 26, pl xv). These are most irregularly spaced as approximately shown in the diagram illus 1. The foil here is flat except for some probably accidental bumps (illus 10). Two unevenly twisted plain ribbons of wire meeting in diametrically opposite corners lie along the margins of panel 2G but a single wire surrounds 3G. The beaded wire forming the interior design has been of similar gauge to that of 1G, but has been flattened and then soldered upright on one of its still beaded edges – less firmly for much has been bent, distorted or lost. Set in short lengths it forms an open lattice, three knots of interlace as Romilly Allen (1903) pattern no 533 in a continuous strand, a scheme that is widespread. Here, however, the interlace represents the geometricized body of a bird. The head springs from the left-hand end, so that while the one in 3G is near the hinge the other is at the hoop-junction. Below each head is a single claw. The claws and strong beaks are filled with granules heaped in, very irregularly spaced and 0·35–0·25 mm in size. Below each claw there is an 0·5 mm pellet in a wire collar, all of the upright flattened beading. In 2G a smaller pellet is set in a curl of wire that forms the eye and trails backwards outlining a 'cap'. In 3G the eye-pellet is missing and there are two extra collared pellets between claw and head.

Irregularities in detail are more marked in the *main panels* of filigree, and in the placing of their stitches – 11 each, but none at the narrow end of 4G (illus 1). Each contains a single ribbon animal (illus 11–12), outlined in beaded wire, curled one and a half times like an ornamental C. The heads are

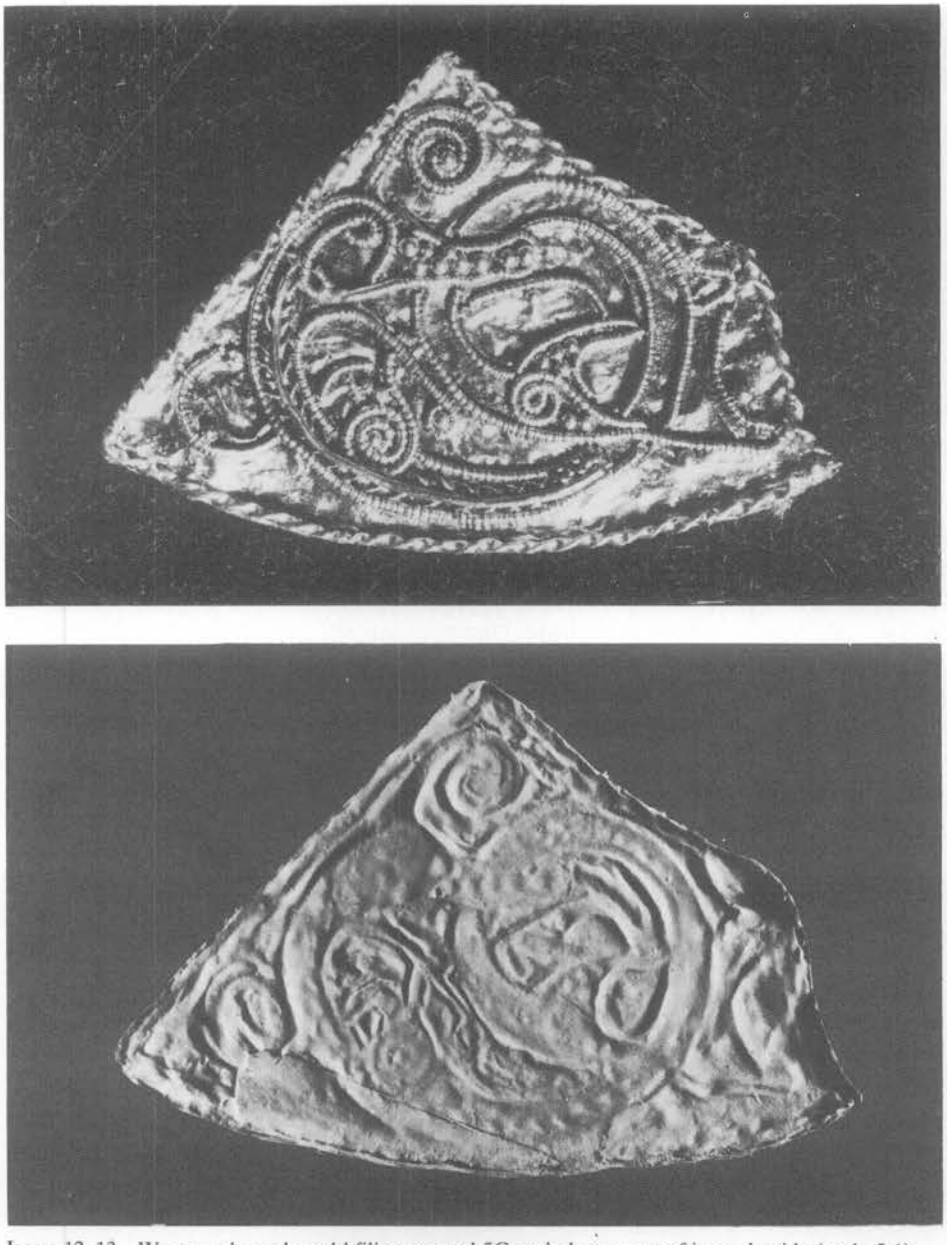


ILLUS 10 Westness brooch: gold filigree panel 2G (scale 5:1)

back to back, up towards the right-angled corners of the 'terminals'. As best seen in 4G, the wide-open jaws are about to close on their own body. The hind legs straddle the body, which is also crossed interlacewise by the long upper jaw but runs tangentially to the lower jaw. The near foreleg is intended to stretch over the lower jaw and under the body into the centre. The other foreleg scratches the back of the neck; each paw has a long claw projecting from what was intended to be a single-ball pad. Instead of an ear a large spiral with two and a half or three turns sticks up from the top of the head towards the centre of the brooch. Similar but smaller spirals mark the joints at shoulder and hind-quarters. The eye and back of the jaw on the profile head are formed by a C-shape of wire, turned in at the ends to encircle a gold granule. The design similarly provided for a pellet in each spiral, at the tips

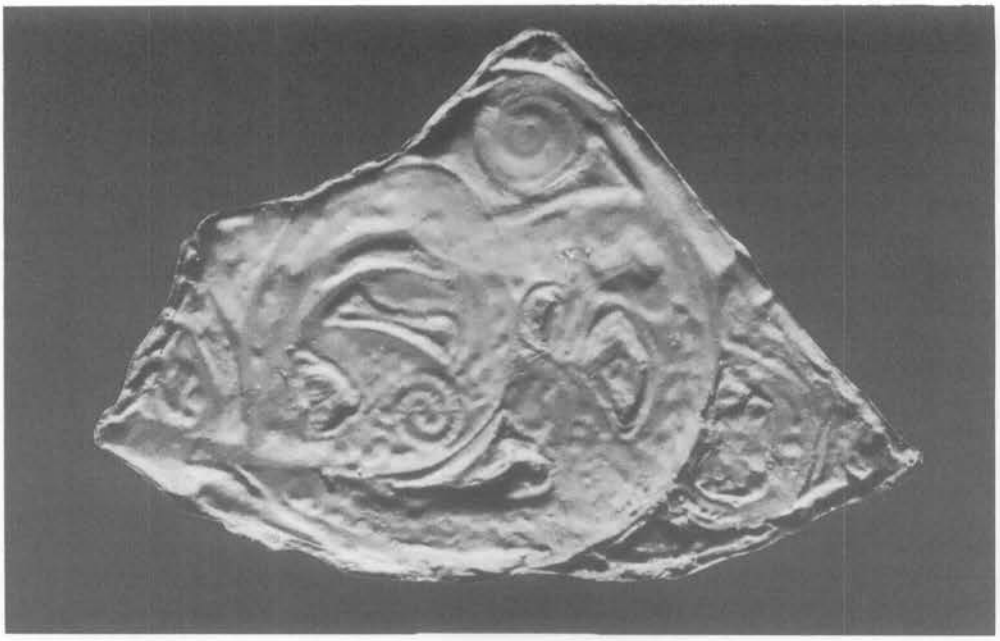


ILLUS 11 Westness brooch: gold filigree panel 4G (scale 5:1)



ILLUS 12–13 Westness brooch: gold filigree panel 5G and plaster cast of its underside (scale 5:1)

of the jaws, at the hind-legs' ankle-joints, and in each foot. The snouts and haunches are filled with granulation, in diameters ranging from nearly 0·5 mm to about 0·25 mm. The neck and body in three sections are, or should be, filled in with two strips of plain ribbon wire twisted in opposite directions and set close together, with a plain round wire laid above and between them. It is fractionally thinner than the c 0·3 mm main beaded wires, being the same as that from which they were formed by pressure, as can be seen on an unfinished beaded stretch on the paw in the lowest corner of 5G. Long ribbon wires less tightly twisted form a frame round the edge of the panels, one wire to two sides.



ILLUS 14 Westness brooch: plaster cast of underside of panel 4G (scale 5:1)

In investigating how far the execution has been less good than the design, each of these panels needs to be described separately, remembering that magnification gives us an enormous advantage over the original craftsman, short-sighted though he may have been. The many ridges and indentations of the gold foil plate must be examined, primarily from the back. It is 0·1–0·75 mm thick and torn in various places. As the *underside* is confusing of course when simply turned over, positive casts were made so that front and back could be seen the same way up. (An independent attempt without such casts came to quite different interpretations: O'Meadhra 1986, fig 4.) In 5G (illus 12) the sharp ridges occasionally glimpsed on the front beside and below the beaded wires can be seen to be indeed parts of a preparatory repoussé sketch of the animal, guidelines for the filigree. Their /\-shaped cross-section where they are most prominent suggests pressure from the back into a relatively hard die (perhaps incised with a knife into lead or stone), rather than the trace of a pencil-like point directly on the gold foil. The sketch was not a precise drawing, as can be seen for example from the angular outer curve of the head-spiral: the overlying spiral of wire has naturally been curved smoothly, and lies partly on the outside and partly on the inside of the ridge, leaving the angle exposed. Here as elsewhere parts of wires and, most noticeably, individual pellets have been pressed down, perhaps while the goldsmith was laying down the filigree before the fixative and gold flux was fired: see for example the granulation along the snout. Another kind of depression from the front was occasionally made to strengthen the relief by outlining with a blunt point the outside of a wire already fixed in position. Good examples are along the lower wire of the body in front of the snout just mentioned, and above the adjacent claw, causing a ridge between them; a complication is that the body wire there is partly on and partly inside the sharp guide-ridge.

A further example of imprecision in the sketch, that has muddled the craftsman in an area only a couple of millimetres across, is where the lower jaw and the foreleg intersect close to the body. For, instead of building the jaw with five lengths of wire (as in 4G), he has used a single long wire for both it and the front of the neck, and has laid this in between the two ridges marked for its upper and lower outlines. As the leg could no longer be interlaced correctly with the jaw, a tiny piece of wire was

inserted (obliquely) to continue it between jaw and body. Though the guidelines for the adjacent shoulder are, outwith its sprial, just a jumble, its length of beaded wire is only slightly misplaced. Both sections of the rear half of the body are empty, but that this is due to later loss rather than omission is evident from indentations similar to those the cast shows below the twisted wires in the front half, though fainter and less numerous. The soldering may have been insecure or the filigree may have been unpicked, or both. The wires for the underneath of all four paws are also absent, yet the granule in each is present and one must suspect omission; in the top-right corner there is no room for the wire, while the other rear leg has a pellet instead of a second wire for its shank and the existing long wire is on the wrong guide-ridge. Pellets for the ankle-joints are also misplaced, and others are missing from the curls at the ends of the C-curve that form the eye and corner of the jaw. On the other hand an indentation at the cheek, seen on the cast, suggests that an obviously misplaced pellet may have been deliberately removed. There is space for another pellet on the adjacent upper jaw but no indentation for it, nor for the existing granule at the tip. The over-large shoulder contains only two pellets compared with five in the smaller space in 4G, and a fragment of beaded wire has been inserted partly in lieu.

The other animal, in 4G, is indeed more accurate and complete, though not to the extent of implying a different craftsman. It has some flaws; the hind paws have no lower wire, and one paw is even more crushed into the corner than in 5G, and has a stray pellet on the tip of the claw, near another on the body. The near front leg is not well aligned with its paw; a length of plain wire is missing from the body and the beaded wire from half the belly; the pellet on the lower jaw and that on the rear spiral are missing. The hindquarters, however, are well proportioned and have accommodated nine and ten granules compared with four and two in 5G, but the latter are all of fair size, c 0·5 mm, while the former are often smaller, nearly down to 0·25 mm. Two of the granules on the snout and upper jaw are about 0·7 mm, and a fragment of twisted strip has been put in too. The positive cast of the back shows up the indentations made by the wires better than the guide-ridges as a whole, notably at the hindquarters spiral. Where the ridges are strong they are not always well placed; for example the front paw and claw has the lower wire neatly positioned but the guide-ridge was too far out.

The geometric interlace in the central panel, 6G, is considerably damaged. It has been even more vulnerable than the flattened wires on the hoop, though the back-plate is similarly flat, for all its beaded wires c 0·25 mm thick are mounted on strips of ribbon c 0·5 mm high set on edge. The pattern has thus gained extra visual depth, but less resistance to knocks or sideways pressure. It may be reconstructed (illus 1) as having, within a frame of one wire along each side, two interlacing strands, of which one forms a figure of eight and the other a diamond set between the centres of the eight and extended as a triangle at either end. The base of the lower triangle is curved, conforming to the curve of the plate. That at the other end is straight, and has escaped damage although the frame beside it has gone with part of the foil. Beyond each side curve of the eight there is a pellet in a collar, but unevenly spaced and missing at upper right. One collar is larger and U-shaped, reminiscent of the Hunterston brooch's snake heads – perhaps a clue to the nuances of the design. There were fastening stitches, unevenly placed.

COMPARISONS

PINS AND BROOCHES

The closed gap

When the centuries-old fashion in Ireland and Scotland of wearing penannular brooches gave way sometime after AD 700 to the then new-fangled pseudo-panannulars, the method of fastening

one's brooch had to be changed. It was no longer possible to lift the pin-shaft through the gap (now closed) between the terminals, after it had been speared through the cloth, and then to turn the ring through 90° so that the pin rested firmly across the front of the hoop. Instead either one had to lift the point of the pin above the hoop, then pull the cloth up between the centre of the brooch and push it back over the point of the pin, getting the same result by a process as awkward as its description (though inevitable in medieval and later ring brooches, as well as in small Scottish heart-shaped brooches into the 19th century): or with the pin under the hoop one ran it through the cloth as of old, but then simply left the bulk of the brooch to hang as a decorative but otherwise functionless adjunct to the pin-head, as a large-ringed pin in fact. It was this that became usual until Scotland and, considerably later, Ireland reverted for a while to penannulars. It is evinced by two new features in the larger brooches. Pins were lengthened to twice the diameter or more, counteracting the backward pull of the top-heavy brooch-ring; and a small ring or loop was occasionally added to the lower side of the circumference, preferably at the back, to hold a cord which could be knotted over the end of the lengthened pin-shaft. This was doubtless the immemorial usage for pins with rings or holes of any kind in their head, from which fibular brooches had been derived. When the gap of the pseudo-penannulars was closed by one or more bars, as most frequently, one of them may have held a cord. Another solution to the problem may have been pin-heads in the form of hooks, that could be clipped on to the hoop after cloth drawn up through its complete ring had been pierced, as suggested by Raftery (Mahr & Raftery 1941, 128). But hooks are usual mainly on 'Pictish' brooches which have a gap, and are on some others clearly non-matching replacements, as on the Breadalbane brooch, from which indeed a closing-bar has been cut away.

The finest and best-known Celtic brooch which has both a long pin and a cord-attachment is the 'Tara' brooch (illus 6), for which a date no later than about AD 750 can be argued (Stevenson 1974, 34–6; 1987, 93; but cf Ryan 1983b, 121). It is so far unique in having a 'trichinopoli' chain instead of a cord, and also because the attachment for it is at the side and very elaborate: inconvenient, and experimental. The 'Tara' brooch might still have been used as a true brooch, for the pin-head can slide freely along the whole semicircle of the hoop and the central space at about 65 mm by 35 mm is large enough for cloth to be pulled through it. Yet the length of the pin-shaft, at over 160 mm, would have made this very awkward even with fine cloth; also the elaborate chain would have been unnecessary, unless to link to another as on Roman paired brooches, or to a small safety-fastener as on some Victorian brooches, for neither of which is there other evidence at the period.

Relation of the Westness to the 'Tara' brooch

In visual effect 'Tara' has undoubtedly always been a brooch. And so is Westness, despite its centre measuring only 35 mm by 15 mm and its pin-shaft being proportionally longer, over 140 mm. The fixed alignment, however, of its pin on the hinge-bar puts it mechanically along with unequivocal ring-pins.

The hoop, 'terminals' and filled gap of the Westness brooch despite their simplified detail resemble 'Tara's' gold-mounted front more closely than do those of any other brooch. The general proportions and the use of amber and gold, including animal panels, are shared indeed by the massive pseudo-penannular but true brooch from Hunterston. Westness seems to copy Hunterston's otherwise unique buffers, but has them at the other end of the hoop-quadrants. But Hunterston does not have features the other two share: D-shaped amber insets at either end of the pin-head; D-shaped insets on the hoop – on 'Tara' (and some others) placed at the end of the curvilinear cartouche (rectangular on Hunterston); large single bosses in the gap, as it were fusing the opposing pairs from the pseudo-terminals – widely copied, particularly on pins as we shall see; narrow frame of inlay round the animal panels – on others all-metal; snake-heads on the circumference, in positions where

'Tara' too has heads, that are shown to be snakes by their bodies and by the fish-tails which correspond to the tails of Hunterston's filigree snakes, and to the assimilation of snakes and fish in *Genesis*, chapter 1 (Stevenson 1974, 39). Westness's pairs of heads repeat the outline of 'Tara's' pairs of fish-tails. Its idea of having a projecting animal head echoes that on 'Tara's' pin-head: the considerably later Roscrea brooch has both (Ryan 1982; 1983b, no 62). The bird-heads projecting into the centre, though not their details, also link particularly with 'Tara' and Hunterston, as does the completely filled-in gap quite exceptional in brooches. Moreover designs in the 'gap' of the three brooches appear closely related. Westness's rounded diamond threaded through a figure-of-eight makes a simplified version of the snake interlace in 'Tara's' two central panels, which each approximate to two figures-of-eight and a large diamond (clarified by an unpublished drawing by Mrs Whitfield). And they have essential features in common with the plain cast interlace in the back of Hunterston's 'gap', in which two elongated figure-of-eight loops subtly form a globe between them (Stevenson 1974, pl XI B, cf Romilly Allen pattern no 274/591). It is remarkable too that the central filigree designs in these 'gaps' are formed by the extremely rare technique of a beaded wire mounted on a flat wire on edge, otherwise found on brooches only on 'Tara's' pin-head.

It has been suggested (Whitfield 1987) that this particular *technique* was an Irish invention, along with others similarly intended to heighten relief – flattened beaded wire on edge and two beaded wires one above the other. Though goldsmiths in Ireland continued to emphasize and elaborate relief in various ways, the basic idea and these simple variations could have readily occurred to the highly original mind of the deviser of the Hunterston brooch's prototype which brought about a revolution in Celtic brooches. He, however, drew so much of his inspiration and knowledge from Anglo-Saxon/Germanic metalworking traditions (Stevenson 1974, 29–30; 1983, 470), that not only these minor innovations in filigree, but major novel techniques which he also used, may well have been developments of that mature stage of Anglo-Saxon metalwork in the late seventh and early eighth century which is lost to us because of the cessation of grave-goods (Stevenson 1974, 32). Those novel techniques are cast silver cells derived from soldered cloisonné, well-developed fine-line interlace, the extensive use of amber for insets and its enrichment with gold filigree.

The raised margin on the back of Westness might be compared to 'Tara's' margin round its elaborate cast decoration; but other brooches too have it round plain areas. The faint concentric circle decoration continues the tradition of geometric incision which was a long-persisting feature of the back of zoomorphic brooches. Concentric circles are illustrated by Kilbride-Jones (1980, nos 74, 89 the Ballinderry brooch c AD 600, and 132) of which the latter two enclose a *hexafoil* – as again found on a Viking-period hinged-pin in the Isle of Man (below p 264; Stevenson 1987, pl IIb). Conceivably the Westness circles were originally intended to contain this apotropaic Christian symbol related to the chi-rho.

The straight upright side of the Westness animal panels is 2 mm longer than that of 'Tara's' corresponding panel and the curved arc is similar, so that although the apex is truncated the area is slightly larger. The Westness *animal* is coiled like 'Tara's', though shorter and less tight, but is quite exceptional among those on brooches (and pins), whether filigree or cast, in being drawn from the spectator's, not the wearer's, point of view; while the back is as usual along the longest side of the panel, the head is in the upper not the lower corner. 'Tara's' animal has a longer head-lappet and tail, and unlike Westness only one of each pair of legs, though the cast animals on the back have both. The eye-and-jaw delineated by a curled C-curve is similar on each brooch, as is the ribbon-body filled with a ridge of wires, in 'Tara' not three but five, using two-ply for emphasis. 'Tara's' filigree is not only perfect and finer-gauge but denser and more complicated, almost excessively so. But it is sparing of granules, not used for filling, whereas in this Westness is nearer to Hunterston. So too it is in having not several toes or pads on the animal's paw but a single 'ball and claw' as found earlier in the

Lindisfarne Gospels and later in Irish cast metalwork, for example, the Roscrea brooch. Lastly the bird-heads on the Westness hoop have beaks rather like those of 'Tara's' cast birds.

Imperfections

The weaknesses and errors noted in the detailed examination should perhaps be summarized, if only to make clearer that they seem due to failures of craftsmanship rather than of design, and so suggest that different individuals were responsible for these. They also throw light on working methods, in so far as they have been correctly interpreted. The fractional difference in thickness between the left and right halves of the ring may only mean that the flat blank for the model was not quite level when cast. Except for the distortions of the circles on the back that indicate a soft material, no evidence was noticed for the substance of the model such as is provided by a brooch from Aldclune in Perthshire (Stevenson 1985, 238). The unbalanced positions of the pairs of snake-heads and the irregularities at the 'gap' seem to show, however, imperfect use of templates during the cutting out of the model, which was compensated for by small adjustments when the compartments were modelled. On the hoop the almost identical filigree birds do not balance, for one head is rather lost among the features of the hoop-junction instead of extending the area of interest at the hinge; it seems possible that the craftsman again failed to reverse a pattern as the designer intended, and unlikely that the left side was turned correctly although the animals on the hoop of the Hunterston brooch face the 'terminals'. The weakness of having ribbon wires soldered on edge was not allowed for sufficiently, and there is complete irregularity in the spirals on the bridge. Pellets of granulation of very uneven sizes were used for filling spaces and even supplemented by bits of wire, might be left on top of one another, got scattered accidentally and quite often omitted (once in 6G with the collar as well), though some may just not have adhered properly. The guidelines for the animals, marked on their back-plates, were sketchy and incomplete and wires have been misplaced and omitted, though some loss due to imperfect soldering can be shown. The scraped stitches were most irregularly placed. Omission from the model of hexafoils in the drawn circles on the back is possible.

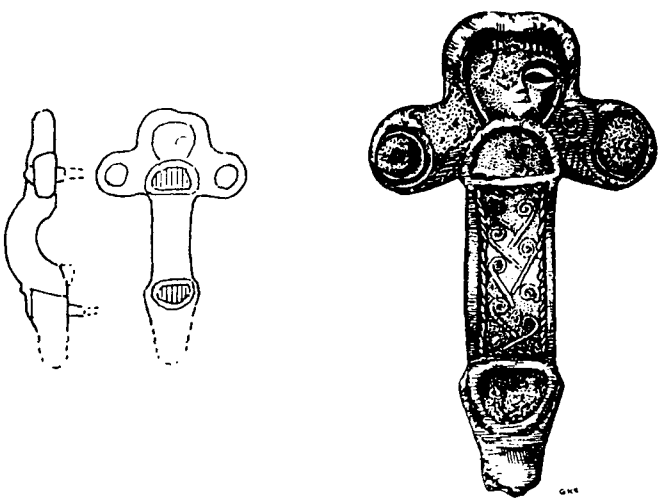
Innovations

It would seem in short that Westness was closely subsequent to 'Tara', the result of a skilled redrawing of the basic design, scaled down and modified to allow much less fine detail on a smaller ring – 54 mm compared with 87 mm (and 2·6 times the area) or Hunterston's maximum 122 mm. The imperfect workmanship hardly detracts from its effectiveness. The knot-pattern birds are most unusual in style and spirit, very different from the old Anglo-Saxon snake-headed interlace; seven or more simpler knots are, however, used as bird bodies on the Monymusk reliquary's roof-tree (Stevenson 1983, 473). The animals too, represented as lying on their backs, are perhaps intentionally slightly comic. (There is much humour in the illumination of the Book of Kells and some on later sculptured monuments.) The rounding of the central space to a sort of kidney-shape by a pelta-like curve would seem perfectly 'in period', and one would not draw attention to the resemblance of the result, in particular the proportions and spacing of the two projecting bird-heads, to non-zoomorphic late Roman (Germanic) buckles (Evison 1968, pl lv a–b), if these heads had not been atrophied by subsequent designers, and if an origin in fifth-century Germanic buckle design had not been proposed for the buckle of the Moylough belt (Evison 1968, 234–5; but see Harbison 1981). At any rate the upward curve and gaze of the long-necked birds gives a vigour at the centre of Westness that complements the vivid colours of the whole and balances the strikingly placed animal head below.

The ring through this animal's mouth, more faintly reflected in later pins, seems to be a novel

conceit in Celtic art. It is more probably of Mediterranean inspiration than local reinvention prompted by the rings at the necks of hanging-bowl escutcheons. The creature's corrugated snout and long ears are in the classical tradition of sea-monsters, the ancient Greek *ketos* which became Jonah's whale (Boardman 1987; Weitzman 1979, nos 365–6). Corrugation seems to be specified by twisted wire on the snouts of both 'Tara's' and Hunterston's filigree animals. On a sarcophagus panel in the Vatican the elongated snout is very like that of the St Ninian's Isle inscribed chape (Weitzman 1979, no 361; Wilson 1973, no 15).

The essential elements of the Hunterston design, the layouts of the 'terminals' and of the 'gap', seem so clearly derived from seventh-century Anglo-Saxon and Germanic ornaments (Stevenson 1974; 1983), that it may be more than a coincidence that when the Westness's designer forsook the scheme of matching pin and terminals his choice for pin-head resembles a rare variety of small 'equal-armed' brooch probably made in the Isle of Wight early in the sixth century (Mrs S Hawkes *in litt*), which consists of unequal half-moons with D-shaped insets connected by a curved bridge (Smith 1923, pl xiv 4). One of only two pin-heads of similar design is unfortunately just a fragment, on the splendid brooch from Kilmainham. It has a lower half-moon set with amber and part of a parallel-sided arch to cross the hoop, recessed and 'stitched' for a gold panel. Perhaps significantly that brooch also provides the closest analogy to the bands of red glass inlay. Once demonstrably in four tesserae, they curve like the one on Westness's pin-head round each lobe of the quatrefoil terminals and enclose a half-moon, of gold filigree however (Cone 1977, colour pp 132–3). To judge from the form of its terminals and longitudinally-zoned hoop, Kilmainham seems to come at about the beginning of the revival of true penannulars which became fashionable among the Picts, and its uncertain provenance from the neighbourhood of the ninth-century Norse cemetery of Dublin is no proof of Irish manufacture. Yet there is no strong reason against this, nor for it despite Wilson (1973, 84). However, D-shaped cells such as project from the outer edge of Kilmainham's lobes are not so far evident on Pictish work, but had been developed into a continuous fringe by the time of the undoubtedly Irish and still later large pseudo-pennanular from Roscrea. Though this has a projecting animal head like Westness, its small ring is fixed shyly to the back (Ryan 1982, 19–21).



ILLUS 15 Pin-head from a grave at Skjeggenes, Alsten Fylk, Norway – outlines 1:1, drawing c 2:1 (National Museum, Copenhagen)

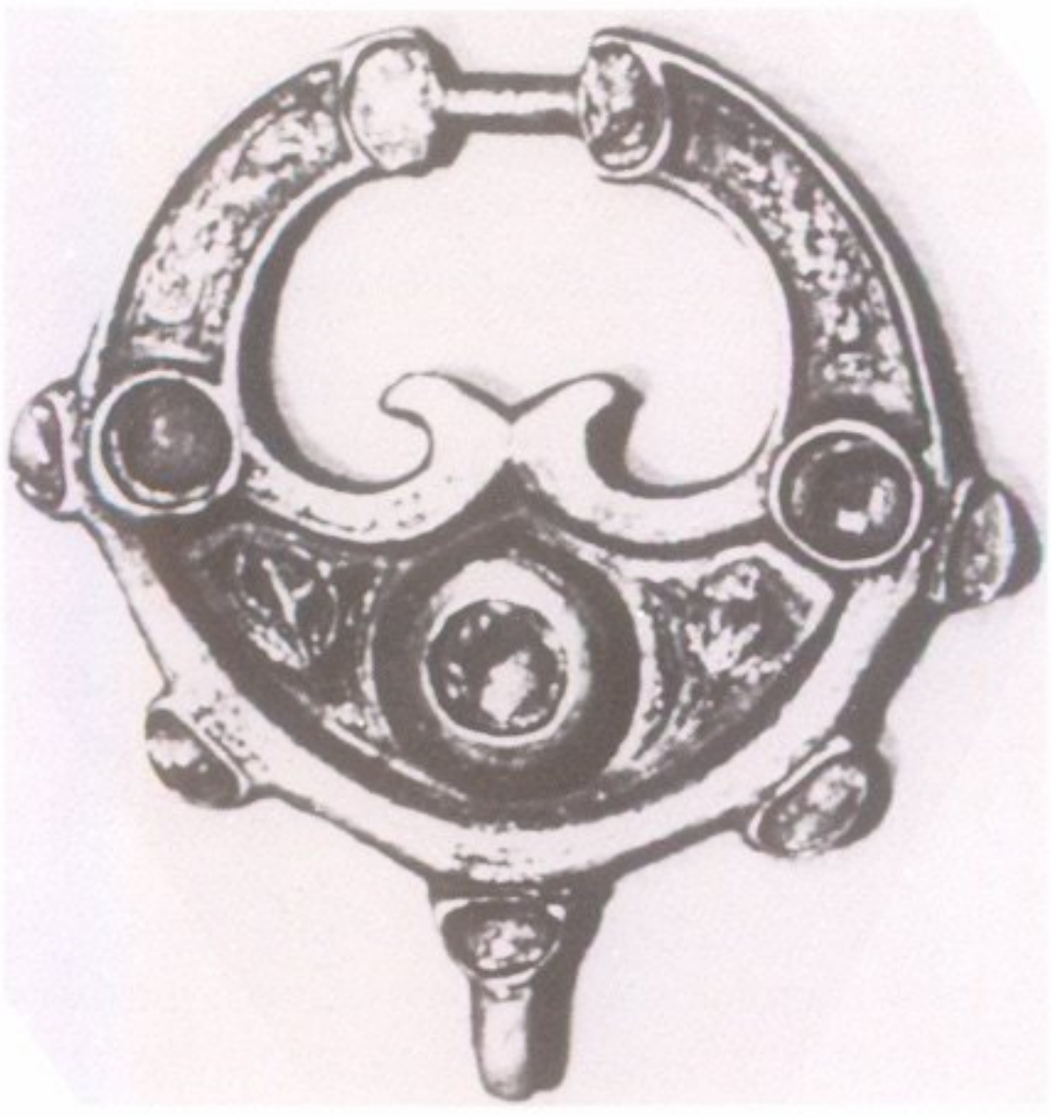
A recently published fragment from Skjeggenes in northern Norway (illus 15; Liversage 1983), a silver-gilt pin-head evidently reused as a mount, has like Kilmainham an arch continuous with the truncated shaft and inset with gold filigree. The bridge has been at the back, as normal on brooches through doubtless less hemispherical. Cuprous rivets to hold it are in a D-shaped recess at either end, under a red inset thought not to be glass but garnet. A human head, between very stylized creatures whose heads meet over the top, seems intended to form with them an ambiguous reminiscence of a crucifix, comparable to the monument long known at Kiloran, Colonsay (Anderson 1881, fig 82). As Irish colleagues first recognized, this must be the pin-head of a ringed-pin related to Westness. It is the only other one of similar richness. One may suggest that the rivets in the circular projections replace amber studs and that the ring's diameter was about 45 mm. A full study has now appeared, including the filigree and the iconography (Bourke *et al* 1988).

HINGED-PINS

The hypothesis that the whole series of pseudo-penannular brooches and contemporary penannulars decorated in similar techniques were descended from a single prototype, to which Hunterston is closest and 'Tara' a later elaboration, was a reworking of Reginald Smith's broader study (1914), and was supported by a tabulation of ramifying 'family resemblances' (Stevenson 1974). Little attention has been paid to members of the family which are small bronze castings, almost all less than 45 mm across and rightly included in E C R Armstrong's typological study of mainly loose-ring Irish pins (1922, 75–7), inspired by Smith's publications on brooches and hand-pins. As shown in his pl xii, fig 4.4 there are examples with a partially open gap in the manner of the large brooches, but usually only in those whose origin goes back to the apparently early successors of Hunterston which have very simple triangular 'terminals' like those on the brooch found at Eidfjord in Norway (Mahr & Raftery 1932–41, pl 23.1). Versions of the considerably later rosette and ball terminations are scarcer; they can be seen in Armstrong pl xii, fig. 4. But much the most numerous varieties have the completely closed gap and other features which relate them to the Westness brooch. Of the four or five ring-mechanisms that Armstrong illustrated the miniature brooches use two, which he did not specifically distinguish: the pin is allowed to slide along the hoop as in the big brooches, or only to swing on a hinge-bar like Westness.

Many foreign brooches such as Anglo-Saxon disc-brooches had a hinged safety-pin, but this adaptation without a fitted catch is unusual. It is found, however, on some annular Anglo-Saxon brooches of sixth- to seventh-century date in Sussex and Northern England, the pin of which swings on the open beaks of opposed bird-heads. An example only 30 mm in diameter, at Chesters in Northumberland, has as a modification a hinge-bar between the beaks (Miket 1978). That a similar one reached Ulster is suggested by a ringed-pin which must be a much later copy (Henry 1965a, pl 5a, diameter 30 mm); opposite the heads linked by a bar, its functional hinge has the all-round swelling buffers discussed below, p 264. It is thus contemporary with another revival, the Germanic eagle-heads on the well-known brooch from Antrim (Smith 1923, fig 174), now recognizably of mid ninth-century date.

Most of the pins that have Westness features have its hinge; and its seems to the writer that all Irish hinged-pins are descended from the Westness type in this respect. The features most commonly shared are the kidney-shape of the central space – with paired projections reminiscent of the Westness bird-heads (illus 16, from Ireland, BM 98.6.18.22, diameter 42 mm) or more often a single peak or curve; a boss where the hoop joins the 'terminals', and two more between them on the 'gap' or a single one often oval; D-shaped prominences as buffers at either side of the hinge (may be on front and back, degenerating by losing their insets, becoming solid or round); other D-shapes or small



ILLUS 16–19 Hinged-pins: details (scale 1·5:1) – Ireland (British Museum; photo Whitfield); 'Glasgow' (NMS); Dunipace, Stirlingshire, (NMS); Ridgemount, Co Meath (NMS)

reminscences of heads projecting from the circumference; and a larger projecting head or loop. A fine example is described and illustrated by Ryan (1983b, no 64 – Cormeen, Co Cavan, 37 mm across). Its narrow buffers approximate to Westness, of which also its unique strap-like pin-head decorated with interlace and topped by a human head like illus 15 could be a variation; a later eighth-century date might therefore be preferable to ninth.

Less frequently there is instead of the central boss or bosses a vertical skeuomorph of the terminal ends. With this may go a large half-moon rather than kidney-shaped interior, as adumbrated on the Eidfjord brooch but distinct in the highly decorated brooch of perhaps the late eighth century found in Co Cavan (Mahr & Raftery 1932–41, pl 22.1). There is then, as might be expected, a sliding instead of a hinged pin.

These two streams, which naturally interact, are conveniently illustrated by the only two such pins in any way attributable to Scotland (illus 17–18; National Museums FC 10–11), even though both are exceptional in various ways: in particular their openwork infilling is a development that relates to some very simplified pins probably of still later date (Armstrong 1922, pl xiii, fig 2, 1–3). FC 10, found near *Dunipace*, Stirlingshire, is 30 mm across, of cast base silver. Its gilt decoration somewhat unusually includes interlaced animals. The buffers at the hinge are solid though slightly indented. Its central now empty boss (shown filled in Anderson 1881, fig 20) has been made independent, suspended between two pointed ovals attached to the hoop quadrants and a third orthodoxly in the 'gap'. The ovals retain amber insets, thus recalling those of the 'Tara' brooch. The pin-head however, by having a small panel of cast interlace recalls the pins of Pictish brooches (Wilson 1973), as well as Cormeen just mentioned, but is simply bent round the hinge; scratched herring-bone on the curve may be secondary, like the animal roughly sketched on the back. The other pin, unprovenanced 'bought in *Glasgow*', is of poorer quality but also with cast animals. It has a gap partially closed by a bar and an imitation bezel. On the circumference are six reminiscences of heads and a D-shaped setting in place of the pin-head, the shaft most surprisingly being hinged on upright lugs on the back, like a disc-brooch. A relationship with Pictish brooches, and so a late eighth-century date, should be indicated by the three ridges on the hoop, the central one a cable (cf Wilson 1973, pls 33–5).

An elaborate hinged-pin from *Ridgemount*, Co Offaly, also long in the National Museums in Edinburgh, is near in size to Westness, 50 mm across (FD 10, illus 19; Mahr & Rafftery 1932–41, pl 37.4). It is of cast bronze gilt in front and tinned on back and edge. Unfortunately the head and shaft are missing, and the ring damaged at the hinge has been repaired; the intact buffer swells out most at the back. There was an enlarged boss at the very centre of the ring, with zoomorphic supporters instead of bird-heads, and below that a diamond and a second boss, all very reminiscent of 'Tara', and of Westness if one remembers the diamond half-hidden in the central filigree (illus 1, 6G). That relationship is emphasized by a projecting animal-head, without any form of string holder. As seen by the wearer there stretches from either side of the diamond a bird-head with pear-shaped eye and pointed corrugated beak. Smaller compartments contain chip-carved interlace. Similar eyes and other traces remain at each junction to indicate a head looking up the hoop. The insides of the circular bezels are much fresher than the also empty diamond, which suggests for them insets of a different material lost after finding. The design-module may have been a fifth of the diameter. A date in the first half of the ninth century is possible, when the diamond or lozenge was being featured on brooches, perhaps as a Christian symbol (Richardson 1984, 32).

There are many variations of these miniature-brooch pins in the National Museum of Ireland, the British Museum, and elsewhere. Most are unassociated finds but others come from excavations such as Cahercommaun, Co Clare, Carraig Aille, Co Limerick and notably Lagore, Co Meath. From these it can be seen that the use of *enamel* is less uncommon on these ringed pins than on brooches. Thus from Cahercommaun there is a hinged-ring, diameter 24 mm, with semicircular interior space

and a loop for a string on the back, which is enamelled all over in rectangular designs, yellow against red (Hencken 1948, fig 19, 575). A comparable but plainer example from Lagore (Hencken 1950, fig 18 A), with only partially closed 'gap' and no hinge, has a smooth plano-convex hoop which suggests a ninth-century date. What appears to be a hybrid at Carraig Aille II as Ó'Ríordáin hinted (1949, 67–8, fig 8, 173), is a four-fingered hand-pin which instead of a small hole in its 'palm' has a double opening with a central peak carrying an imitation boss and below it a pointed oval from which stretch curved lines reminiscent of 'terminals'. Its enamelling and curvilinear emphases seemed to the excavator to run counter to a date later than the early eighth century, but this need not be so as ringed pins such as Ballybunnion (p 263 below) help to show.

EARLIER MINIATURE-BROOCH PIN TYPES?

Other pins from Lagore and elsewhere raise the question how far the fashion for brooch-like pins preceded the 'Tara'/Westness derivatives, for there are examples that derive from older types of brooch or may do so. All are truly penannular and none hinged:

(a) Like zoomorphic brooches class D – circular enamelled terminals with ring-lugs on the periphery, diameters 37–32 mm (Kilbride-Jones 1983, fig 50, cf fig 49);

(b) Zoomorphic derivative, diameter 20 mm, back of head plain and flattened into a triangle with internal border of dots – Lagore unstratified, fig 18, 365;

(c) Hybrid ring, c 28 mm by 24 mm, half-moon interior and dotted contour (but on back) like a plain penannular 38 mm brooch (small pin) from Lagore – fig 6, 1009, probably seventh century; on front enamelled panels set with millefiori as in Kilbride-Jones (1980) zoomorphic classes C–D, but including swastikas; hoop plano-convex undecorated except for a sunk cartouche keyed for enamel, suggesting ninth century – Lagore early find not in Hencken (Nat Mus Ir 1961, 95, fig 26). Cf ring from Scilly Isles (O'Neill 1963, 210), which has a triangle at the hoop-junction like the enamelled Lagore fig 18 A;

(d) Disc-ended thin ring, c 17 mm with metal inlay – Lagore period Ia (fig 15, 1531), or enamel – 'Ireland' (Henry 1965, fig 5i);

(e) Plain flat terminals with inner space nearly circular and cusp or vestigial zoomorphic snout – Ballinderrry I, Co Meath, diameter 40 mm (Hencken 1936, 154, fig 24D); Lough Faughan, Co Down, 30 mm (Collins 1955, 59, fig 9, 23); possibly ninth- to tenth-century – cf similar shape but with bar across gap, and terminals all red enamel, diam 15 mm in British Museum (1913.7.10.4).

No pins of these kinds are known from Scotland. On several of them there is evident influence from the large and medium-sized brooches with plain or virtually plain terminals, which may also have underlain the Hunterston brooch's prototype (Stevenson 1974, 32–3); some Scottish seventh-century examples are in form rather like (e), but significantly without cusps. It is unlikely that plain brooches ever ousted the strongly decorated zoomorphic brooches (unknown in Scotland), or that either type was immediately replaced by the pseudo-penannulars. So both probably continued in Ireland well into the eighth century, *pace* Kilbride-Jones (1980), whose revised dates would hardly allow the zoomorphic series much beyond the fifth. The historical dating of Lagore and its excavated stratigraphy are both hardly watertight, and in any case would not force a date on any of the pin-types (a) – (e) earlier than the late seventh century. It is possible that the idea of miniaturizing the Eidfjord and Westness types of pins came from one or other of them, but features can readily be adapted and most may be considerably later, as tentatively noted.

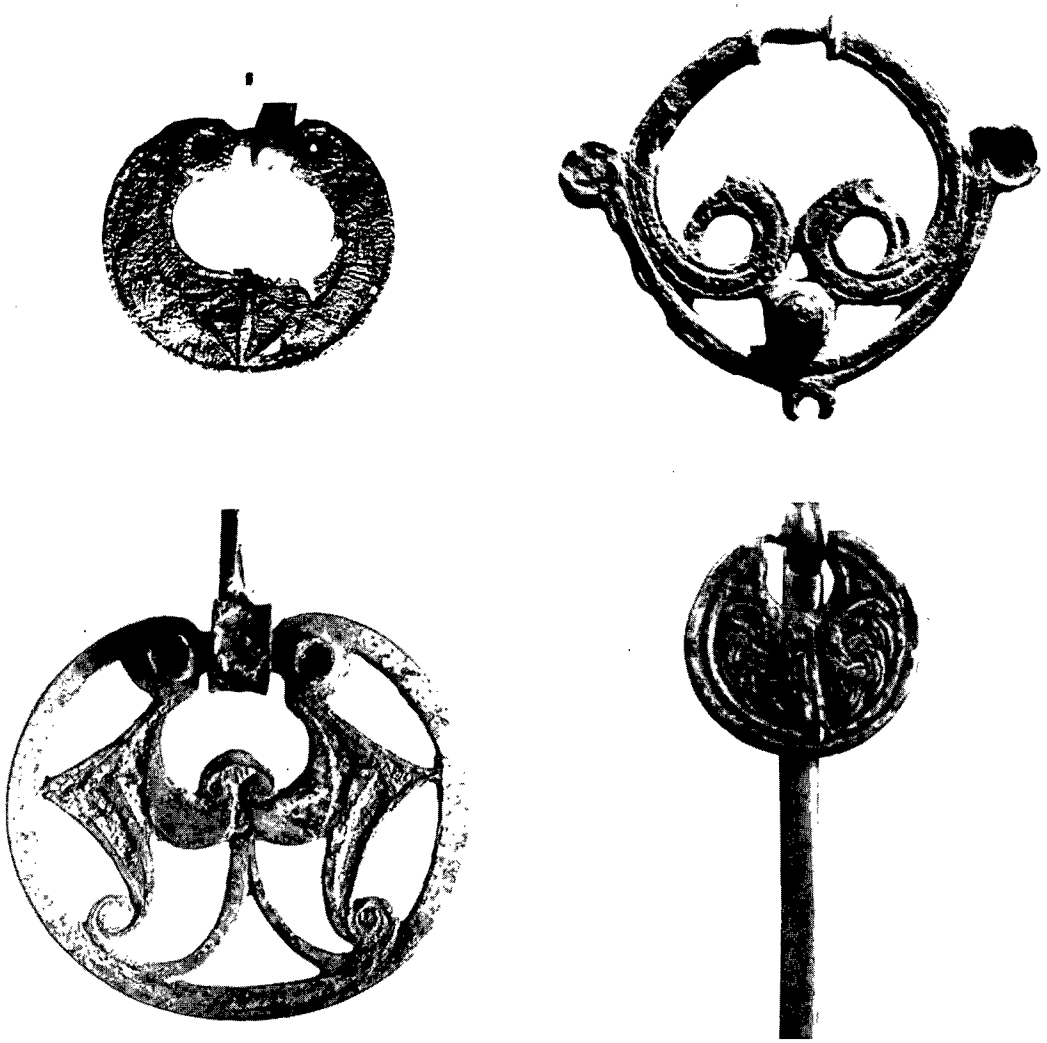
It still seems likely that the whole sequence of loose-ring pins in Ireland, Argyll and the Western Isles began with Armstrong's first group, those that have key-ring spirals in baluster-heads, perhaps as early as the fifth century yet continuing in use at Lagore (Fanning 1983a, 325, 330). These seem to have led in Ireland to simple rings sliding through folded-over heads, some penannular with looped

terminals (perhaps related to (e) above) – in iron at Carraig Aille II (Ó'Ríordáin 1949, fig 10). Beak-ended and 'omega' ring-heads (Armstrong 1922, fig 3) may have descended from them. But the chronology of all these is far from clear, as is the origin of the pivoted-ring (below p 264) that was normal on the Hiberno-Norse ringed-pins.

UNORTHODOX HINGED-PINS

Miniature-brooch hinged-pins not hitherto implicitly accepted as closely related to the eighth- to ninth-century brooches are not numerous. Two well-known but exceptional decorative pins, however, that have the hinge-element prominent in their designs have been dated to the early seventh century or even much earlier. They are not only relevant to this present enquiry but to the controversial content of the Irish artistic repertoire of that century. In the case of the pin from *Armoy*, Co Antrim, in the British Museum, which has a crescentic disc only 28 mm by 25 mm in diameter, attention has been concentrated on the dolphins (illus 20 after Haseloff from Roth 1979). The circular settings on either side of the hinge are a rare variation, but being combined with a kidney-shaped open space and a pointed oval opposite the hinge, the whole must form part of the 'Westness series'. The shape of the jaws (not well shown in the published drawings: Henry 1965, 73, fig 20b; Fowler 1963, 131–2, 'c fifth century', and fig 7.1; Roth 1979, fig 22.2) forms a diamond situated in the 'gap' like that on 'Tara' and Ridgemount, illustrated above, and others too. Gaping jaws similarly placed but with an oval human head between them, decorate a hinged-pin from *Grousehall*, Co Donegal, though they were not recognized by Ó'Ríordáin (1935, 182; Fowler 1979, 155); c 37 mm across, it has a three-legged openwork centre rather like Dunipace, and amber-coloured glass studs. The background of the Armoy design is hatched, probably to secure enamel, which is not uncommon on miniature-brooches as already mentioned. The dotted contours and inner details of the dolphins may be compared to those of creatures forming an initial in Durham MS A II 10 (Roth 1979, fig 26). However, the persistent free use of dotted lines in manuscripts, as in MacDurnan's Gospels (Henry 1967, pl opp p 18), might have influenced an unusual design at any time. Dotted margins are found not only on plain seventh-century brooches but also on the back of the Roscrea brooch (Ryan 1982, pl 8). All told this pin might be placed in the latter part of the eighth century, but no earlier.

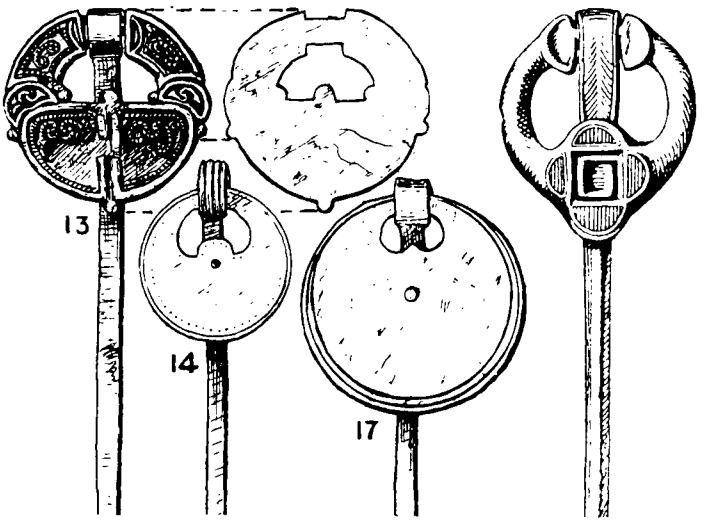
A similar date may now be proposed for a unique unlocalized pin of curvilinear openwork in the National Museum of Ireland (Armstrong 1922, fig 2.1; Mahr & Raftery, I pl I.4, II 92 'c AD 400'; Fowler 1963, 131 and 155; Roth 1979, 81–3, pl 31, 7). It too has a hinge (illus 22) and had insets on either side in high circular collets. (That they recur on a number of crescentic disc pins in that Museum which can be shown to be bogus (R 1639 etc, R O'Floinn *in litt*) need not arouse suspicions.) The ring is quite large, 42 mm by 38 mm. The open space at the hinge is relatively small, though little more so than in Armstrong's considerably evolved hinged pseudo-penannular fig 1.13 (illus 24), and is shaped by a semi-circular projection as in one of the plain loose-discs, no 14, which as he demonstrated is a further radically simplified derivative. The projection in Ridgemount (illus 19) is also comparable. On the projection there is a stalked pelta, of itself no indicator of date and found in filigree on the Derrynaflan paten c 800 (Ryan 1983a, pl 42). The tinned or silvered surface reserving the pelta, and in the angular features, is carefully hatched, perhaps as decoration rather than keying for enamel. The narrow plain surfaces carry single or double contour lines of dots, also used on the disc illus 24, 14. Incised and raised lentoids in the angles show that these are devolved trumpet-spirals. Uta Roth drew attention to the curvilinear openwork of the then unpublished hanging-bowl escutcheon from West Wickham, Kent (1979, pl 33.1; Brenan 1985). It has a fairly similar design, apparently the other way up but pins were usually designed for the wearer looking down. There is a large pelta with no kidney-shaped space round it. Its date may be the second quarter of the seventh century at earliest, to judge by the incised version on its solid broken-backed trumpet spirals of the stalk-and-leaves motif



ILLUS 20–23 Hinged-pins: details (scale 1·5:1) – Armoy, Co Antrim (British Museum; photo Haseloff); Isertkelly, Co Galway (photo National Museum of Ireland); Ireland (both NMI, photos Haseloff)

characteristic of the 'developed trumpet-pattern' escutcheons and the Book of Durrow, rather than the single or paired lentoids of the Lullingstone bowl and the 'Cathach of St Columba'. Any connection between the West Wickham design and that of the hinged-pin must be rather distant. Experiment with openwork was producing other extreme adaptations of the Westness design, as well as the filled-in centre form already noted from Dunipace and Grousehall. A basically orthodox example, diameter 30 mm, comes from Isertkelly, Co Galway (illus 21, Nat Mus Ir 1932, no 6144). It has the Westness bird-heads exaggerated, not atrophied as usual. Of its insets only a small blue glass boss in the 'gap' remains and there is a rather ugly loop for a cord.

Restriction of the pin-head's sliding movement by making the brooch-ring crescentic and so making a hinge-bar, and buffers, unnecessary, may have been a halfway step towards the disc form



ILLUS 24–25 Hinged-pin and two derivative pins with loose discs: details, from E C R Armstrong; Irish hinged-pin: detail from British Museum Guide (scale 1:1)

just considered. An example only 17 mm across from *Ballybunnion*, Co Kerry, has lost from the 'gap' a relatively large inset boss, such as it should be noted do not occur on definitely pre-eighth-century Irish ornaments, in contrast to flat enamel and millefiori. Because of Celticizing incised scrolls, which by outlining the boss also recalled the shape of the 'terminals', this pin has been dated to c 300 or a couple of centuries later (Raftery, J 1940, pl iv, 55–56; Fowler 1963, 131).

A pin which has a 20 mm hinged disc without any form of flanking buffers (illus 23 after Haseloff, NMI W 302 unprovenanced) has been thought to be of seventh-century date because its cast decoration is double-contoured interlace with central beading (Roth 1979, 111). Opposite the hinge there is a hole for a cord, or an intermediate ring as Armstrong's fig 1.20; 14 and 17 in illus 24 have a comparable hole but at their centre. The pin-head, decorated with converging grooves, consists of a thinning of the shaft neatly rolled into a cylinder. (Though not often mentioned, the many pin-heads that similarly are not simply folded over, and their association with varieties of pins, deserve a separate study.) The interlace is in panels skeuomorphic of terminals, as on a sliding-ring miniature-brooch pin from Lagore, on which the interlace forms a triquetra (Hencken 1950, fig 6.643). Broad-band interlace is far from peculiar to the seventh century, and the same beaded kind was sketched on a slate 'motif-piece' at Lissue Rath, Co Antrim, in the 10th century (O'Meadhra 1979, 96–7, figs 130A9 and B8). The only example of interlace on Irish seventh-century metalwork would still seem to be the unique 'equal-armed' brooch from Ardakillen (Henry 1965, 9, pl 10; Mahr & Raftery I, pl 1, 5, II, 17–18 'c 350 AD'), if it is genuine.

FINAL DEVELOPMENTS

Various late forms of brooch are copied on sliding-ring pins (Armstrong 1922, pl xii, fig 4, 1–3 – for 3 cf Dickinson 1982). The hinged-pins too continued to evolve for a time. A pseudo-penannular reflecting Pictish disc-terminals with projections (cf Wilson 1973, pl xliv b) found at Carraig Aille II, Co Limerick, has unfortunately lost its diagnostic hoop, but from the same site there is a hinged-pin of gilt bronze, diameter 32 mm, with unique horseshoe-shaped terminals, containing a metal boss and interlace, joined by a bar and a boss and scrolls that are a transformation of the projecting animal

head (Ó'Ríordáin 1949, 68–9, fig 8, 148 & 136). At either side of its hinge *the hoop swells* uniformly all round – a developed form of front-and-back buffers that is frequent, and evidently late. An example with a plano-convex hoop has 'terminals' and 'gap' formed by a lozenge with four discs at its corners, perhaps once enamelled (NMI. E.92.216 diameter 27 mm). There is a comparable design with different shapes, red glass inlay and D-shaped buffers in the British Museum (illus 24; Smith 1923, fig 183b, 26 mm across).

Swelling buffers emphasized by two ornamental grooves are part of an orthodox ring c 35mm across from a Norse grave at Knock y Doonee, Isle of Man. It has a decorated pin-head, strongly kidney-shaped centre, sunk curvilinear areas for enamel on the cusped 'terminals' and a circular one on the 'gap', with a vestigial projection below it. On the back are a hexafoil incised in two circles embellished by dots and hatching and a possibly secondary perforation as if for a cord (Fanning 1983b, fig 3). An ultimate degeneration is represented by a 15 mm ring from Clonmacnois. It has swellings at the hinge, plano-convex hoop only widening slightly to form a low boss at the 'gap' on which there are possibly spots of enamel as eyes and a mouth; from there a large drop-shaped loop projects at right angles (NMI accessions (1959) 97, fig 28). A no doubt contemporary pin found at Cush (Ó'Ríordáin 1940, fig 35, 319, diameter 25 mm) has swellings, circular stud and small outward projection but no other vestige of 'gap' or 'terminals'. The hoop has continuous *transverse ribbing*, echoing that of the old zoomorphic brooches, and because of this both pins have been ascribed to the third century (Fowler 1963, 130, 155). Ribbing was also revived on a small ninth-century penannular brooch found on Luce Sands, Galloway (Wilson 1973, 86, pl xliv a), and on a normal hinged-pin from Lagore (Hencken 1950, fig 18 B).

It may be suggested that the Hiberno-Norse ringed-pins which have a single knob or longer projection at the lowest point of a small plain ring, or three round the circumference, were influenced by such simplified hinged-pins (Armstrong 1922, pl xiii, fig 2; Fanning 1983a, fig 140.3 from Oronsay). They like almost all the other Hiberno-Norse pins of various kinds studied by Fanning, are not hinged or sliding but *pivoted*; their ring is open, with pointed ends that pivot in the pin-head whether it is polyhedral, crutch-shaped or simply folded-over, 'looped'. A unique highly decorated 37mm silver-gilt knob-ring, however, has swellings flanking presumably a hinge-bar. Its single projection is a complex swivel studded with amber and terminating in a tiny solid ring. A date about 900 has been suggested for it (Ryan 1983b, no 65). A plain ringed-pin from Colonsay also has the swellings and may be hinged (Fanning 1983a, no 8).

In final developments perhaps also about 900, extraordinary miniature ring-brooches of somewhat heavy cast silver were joined to an extremely long pin by a short tab with a gudgeon-hinge at each end (poorly published Mahr & Raftery I, pl 40.1, Kilkenny?, ring 63 mm, pin 560 mm; pl 41.2 (upside down) no loc, ring 50 mm). This hinge design and pin were probably derived from the Hiberno-Norse 'kite-brooches' which had been evolved from our series; one from Kilkenny (58 mm across its concave lozenge) retains the animal head for a fastening-ring, and the central opening though reversed and largely filled (*ibid*, I, pl 21.1 and 40.2; Ryan 1983b no 69). A pointed-oval 'kite-brooch' has the inset silver filigree animals such as the 'ring-brooches' have evidently lost (Mahr & Raftery I, pl 21.2, no loc; Ryan 1983b no 70).

CONCLUSIONS

The search for the affinities of the Westness brooch has served to emphasize its peculiar position. It is isolated between the full-sized brooches and the much cheaper, and almost always much smaller, loose-ring pins. Granted that comparative silver analyses are not available, it shares relatively the richness of the more expensive of the former. Yet it is executed with considerably less than

their precision, even though skilfully designed to incorporate and modify more of the range of features represented on the richer face of the incomparable double-sided 'Tara' brooch than are to be seen on other brooches. At the same time it seems to lead the way to a high proportion of the less highly decorated ringed-pins that reflect the tradition of the Hunterston and 'Tara' brooches – by its reduced size, its hinge mechanism, its inner space rounded to a kind of kidney-shape, and by the attachment for a safety-cord opposite the hinge.

Little of the relevant evidence has come from Scotland, and an origin in Ireland for the Westness brooch seems certain, at a date soon after that of the 'Tara' brooch, and therefore possibly in the second quarter of the eighth century. This assumes a date not much after 700 for the Hunterston brooch, the Germanic inspiration of which and closeness to artistic stimuli from the Lindisfarne Gospels have recently been further demonstrated (Stevenson 1983, 469–72; 1987, 94) without any solution to the problem where it was made, although the argued overwhelming influence of its prototype on subsequent Irish ornaments might postulate Ireland. This date for Westness is a generation or so earlier than that in the late eighth century suggested for the wonderful filigree-ornamented paten and stand in the Derrynaflan treasure (Ryan 1983b, 37).

Joseph Raftery (1981) has criticised the way the eighth century AD 'has become a sort of miraculous cauldron into which every decorated metal object is dropped with relief' and too little justification. More detailed stylistic arguments have been attempted here to outline a sort of type-stratigraphy with cumulative associations, on the basis that earlier design-features can be copied at much later dates, but not vice versa. There can, however, be no doubt that from towards the end of the seventh century, following the growth of ecclesiastical and kingly contacts between Ireland, Northumbria and the Continent, and Pictland too, there was a widespread increase in the material manifestations of wealth in the British Isles, however puzzling the economic basis remains to us. The movement of skilled craftsmen was stimulated and the cross-fertilization of ideas. In Ireland at any rate repercussions came well down the social scale, as is shown by the many variations of modest pins, which have fortunately survived because too small and easily lost to have been almost invariably recycled as scrap.

APPENDIX

X-RAY FLUORESCENCE ANALYSIS R6576, WESTNESS BROOCH

J Tate

1. Gilding

The brooch has been gilded by the mercury amalgam technique, mercury being clearly present in several of the spectra.

2. Gold panels

The two large panels were analysed on the back surfaces after removal from the brooch. The average of two measurements on each are:

L H Panel	F0833B	4·0% Cu	76·2% Au	19·8% Ag
R H Panel	F0838B	3·6% Cu	79·1% Au	17·3% Ag.

These values are not taken to be significantly different since the analysed surfaces were not perfectly flat, nor was any abrasion carried out to remove a possibly gold-enriched surface.

One of the panels was examined using a Scanning Electron Microscope to look in more detail at the construction of the various wires and gold spheres. Although the metal joint between the spheres and the base panel could clearly be seen, no significant compositional differences could be determined between the sphere, joint and base. (It was anticipated that these would in any case be small due to diffusion during annealing and masked by surface corrosion etc.)

3. Body metal

Removal of the gold panels allowed analysis of the metal body to be made with light abrasion over an area of about 2 mm square (behind the RH panel). The differences in composition before and after abrasion show a surface enrichment in silver of about 6%, presumably by removal of the copper-rich phase from the alloy during burial corrosion. The final composition obtained was:

61·2% Cu 1·2% Au 0·9% Pb 32·4% Ag 4·3% Sn.

The spread in the results of several measurements indicates an uncertainty of ±1% for copper and silver and ±0·2% for the other elements. Calibration uncertainties give rise to additional errors of about the same magnitude (±1% for silver).

Surface analyses of the back of the brooch and of the tip of the animal snout give a somewhat different picture; for both the alloy was found to be apparently much higher in silver, for example for the animal snout reaching as much as 76% silver.

The compositions from these areas are closer to the results from the pin (below) and are thought to indicate the large compositional difference between surface and bulk, presumably due to extensive corrosion, perhaps enhanced by initial cleaning methods and by alloy segregation on casting. The metal behind the gold panel must have been protected to some extent during burial (especially if the gold was separated from the body metal by beeswax or some other organic layer), which may be the reason for a less copper-depleted surface. A further problem is that from this kind of non-destructive surface examination it is not possible to know whether there has been any deliberate silver addition to enhance the decoration: this could be the case for the snout.

4. The Pin

The pin is quite badly pitted and has clearly undergone considerable corrosion. Two flattish areas were chosen and after light abrasion with 600 grade silicon carbide paper yielded the following:

F1141B, 96 mm from tip	16·5% Cu	2·1% Au	1·7% Pb	70·7% Ag	8·9% Sn
F1142B, 14 mm from tip	13·2% Cu	2·6% Au	1·4% Pb	73·6% Ag	8·8% Sn.

As mentioned above, these values are close to those from the back and edge of the brooch body but considerably different from the body metal behind the RH panel. The two possible explanations are (1) that the panel analysis was on a copper-rich area in the metal or (2) that all the surface analyses indicate the present composition of the corroded surface and that this copper-depleted 'skin' is quite thick. The second of these seems credible, particularly as the initial examination of the brooch before cleaning (Werner & Organ 1965, unpublished) led to the conclusion that:

> 'the original cross-section of the pin is now represented by a central core 2·6 mm in diameter encrusted with cuprite to an overall diameter of 3·2 mm. The crust is therefore about 0·3 mm thick. The central core appears to have been made of base silver. It now consists of mineral corrosion products to a depth of 4·5 mm along its axis, as ascertained by drilling.'

The pin is tapered and it is not clear quite where on its length the above figures were measured: the present diameter of the tip is only about 2 mm. However, it is clear that an extensively corroded surface 'skin' might extend some fractions of a millimetre into the bulk metal. Although a considerably thinner copper-depleted layer has been found on several pieces of Viking silver, these have been of a somewhat different composition (much less tin), whereas the pin of the Aldclune Brooch (Lab no 6777) was found to have a surface copper-depleted 'skin' from 0·1 to 0·3 mm thick. This thickness is greater than the typical analysis depth for XRF (eg 0·01 mm for copper and 0·18 for silver in a silver/copper matrix).

5. The bridge

The bridge is highly corroded, the centre part being completely mineralized. Analysis of a flat area on the back surface (next to the shorter rivet) showed it to be bronze with a small amount of lead, it is not a silver alloy.

6. The rivets

These are quite pure copper: it was not possible to perform a quantitative analysis with the rivets in place on the bridge but both tin and lead are present in only small amounts.

7. Amber and glass

The amber and the one fragment of original glass all show puzzlingly large amounts of tin. The tin may be from corrosion products lodging in the cracks and crazing, at least for the amber. It has not been possible to examine this further.

8. The crest

The outer edge of this is badly corroded and of a greenish-yellow colour. It contains a large amount of iodine and may be a coloured consolidant which, when applied during initial conservation, matched the gilding better. There is no remaining gilding evident.

Conclusion

In summary it appears that the brooch and pin were both made from a base silver alloy containing as little as 32% silver. The present surface composition is much higher in silver. Some difference is expected as a result of preferential corrosion of the copper-rich phase of the alloy. This will have occurred during burial, but it cannot be ruled out from this examination that deliberate silver enrichment of the surface was produced by the craftsman. The extent of corrosion is not uniform, being dependent on the initial state of the metal, local variations in the acidity of the surroundings during burial and the amount of protection of the surface. The depth of the corrosion is likely to be as much as several hundred microns, but cannot be determined directly except by destructive sampling. A further possibility is that alloy segregation occurred during casting, perhaps by topping-up or changing the crucible.

The pin appears to have a higher tin composition; it is difficult to know whether this is significant or again a result of the extensive corrosion which has occured.

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