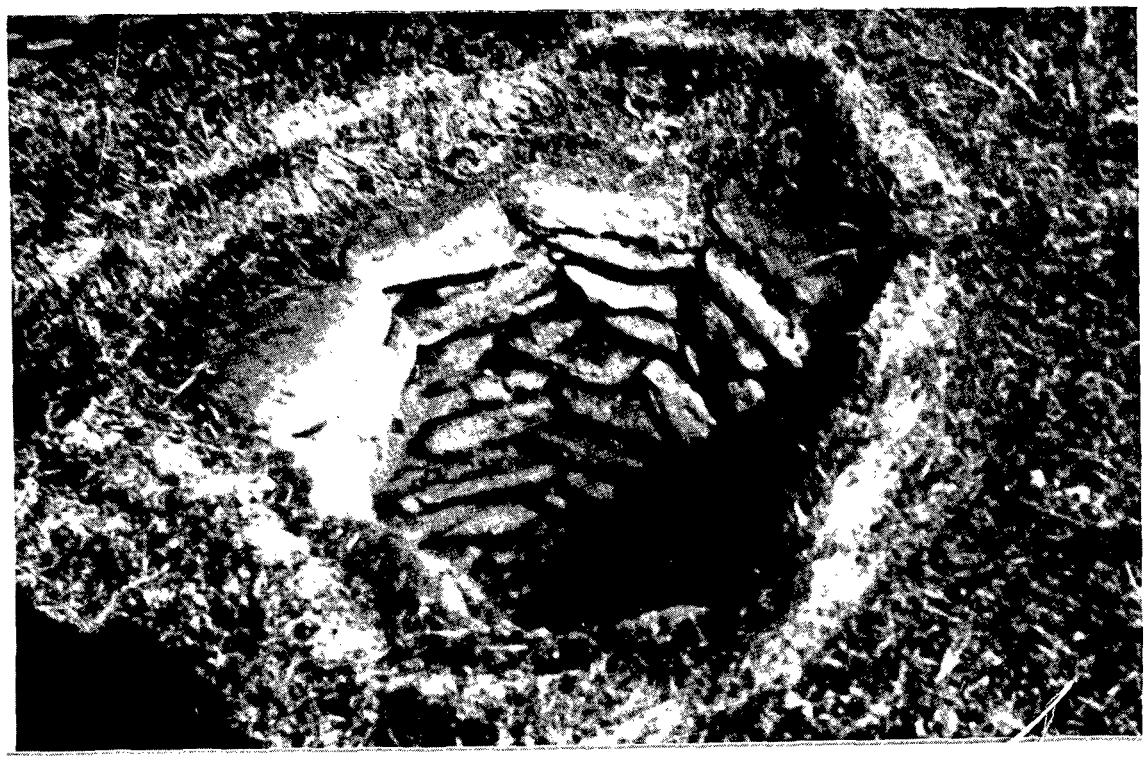
2 AREA II : THE PICTISH ASSEMBLAGE

THE PICTISH HORIZON

The Pictish horizon in Area II followed the original natural ground surface sloping downwards from the E side of the cemetery to the cliff edge. It has been divided into five zones where the objects were found (Ill 5: 3). Zones 4 and 5 were the only two zones where Pictish objects were recovered from more than some 20 mm above the natural clay. In Zones 4 and 5 the stratigraphy was deeper; Zone 4 is subdivided into phases a and b. Zone 5 is subdivided by Hunter and Morris (Appendix) into phases 1a, 1b, 2a and 2b.

These levels are assigned to the Pictish period on the basis of the pins and the mould types excavated. The finds include a large number of small pins, a few combs, fragments of coloured glass, a couple of stone bar moulds and other small items, but the main finds from the Pictish horizon in Area II consist of debris from what appears to have been an important bronze-working centre.

A small well had been constructed at the W side of Zone 1 and is possibly the only known Pictish well (Ill 6). It was built of flat, rounded beach stones, about eight of which formed the circle in each course, and it was approximately 0.75 m deep and 0.35 by 0.25 m at the top. There was some evidence of clay-bonding at foundation level where the wall rested on solid bedrock but there was no bonding in the upper courses. The fill was of loose earth and stones and yielded no finds. A short distance away there were two post-holes, each about 0.07 m in diameter and cut to a depth of about 0.12 m into the natural clay. Between the post-holes and the well there was a layer of ashes



ILL 6 : The Pictish well

and loose earth which contained broken clay moulds, crucibles and small fragments of coloured glass. The entire zone was rich in broken moulds, crucibles and fragments of bronze plating.

Zones 2 and 3 both contained quantities of broken moulds, fragments of crucibles and burnt stones, the last of which were scattered across a larger area than the zones indicated on the plan.

Zones 4 and 5 both relate to areas where extensive Norse building had followed. The natural grey clay in Zone 4 was approximately 0.60 m below the level of the lower Norse horizon paved passageway, with an intermediate level of rough paving between the two. Pictish finds occurred both above and below this paving. The earliest level of Zone 4, where some of the finds were actually embedded in the clay, is referred to as Zone 4 Phase a, and the level between the intermediate paving paving and the lower Norse horizon paving of Passage 1 as Zone 4 Phase b. Zone 5 was thoroughly investigated in 1973 and 1974 by Dr John Hunter and Mr Christopher Morris (Appendix). Here too the natural clay was c 0.60 m below the paving of the lower Norse horizon.

The Zone 5 phases (Appendix) which most nearly equate with those of Zone 4, are 1b, 2a and 2b. 1a belonged to an earlier Pictish occupation than that of the bronze workers. The only find was a small hipped pin (*47*).

BONE AND ANTLER

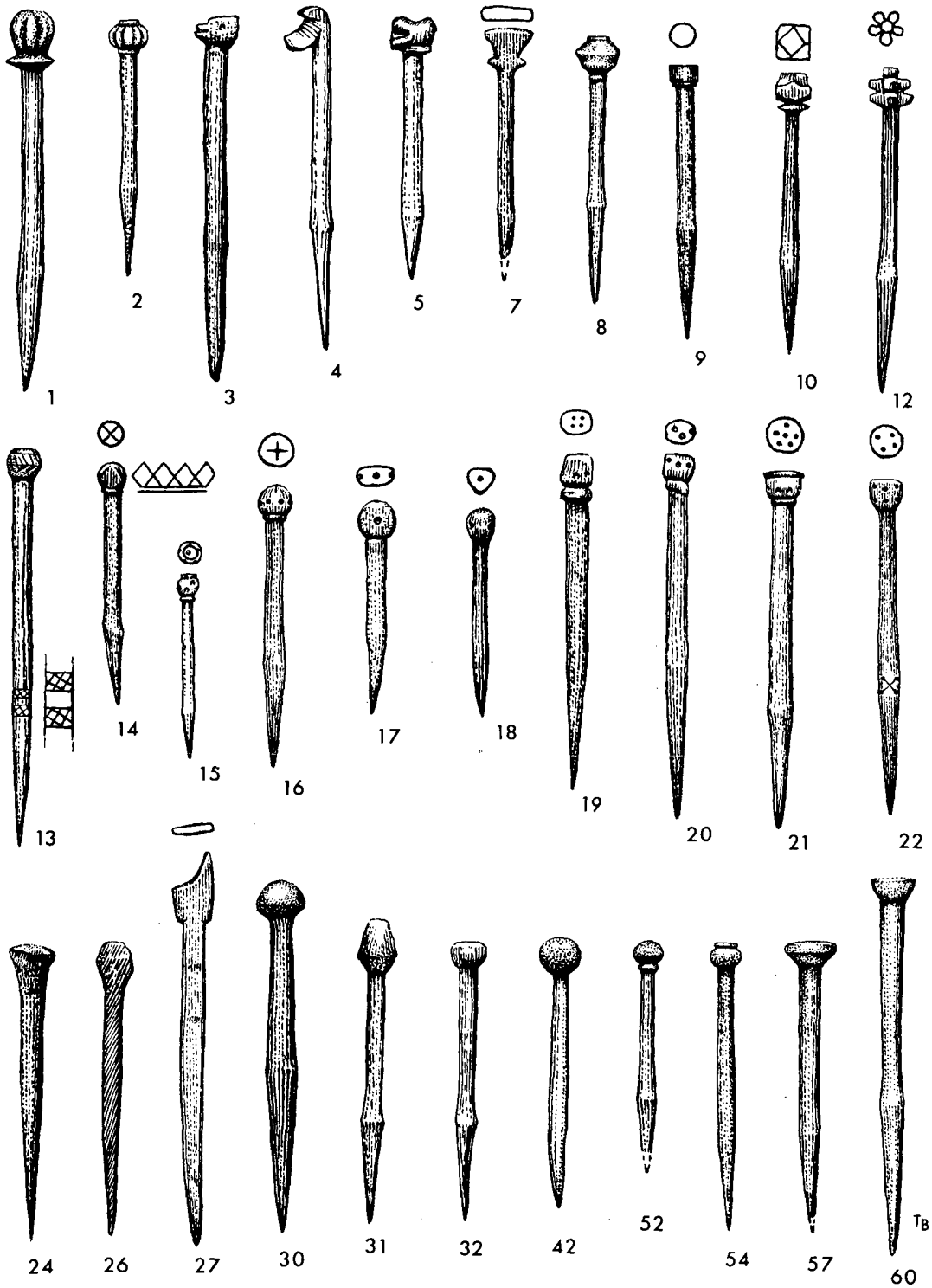
Small hipped pins (Ill 7)

The small pins are the most typically Pictish of all the finds on the Brough. The majority are 'hipped' pins, defined by Stevenson (1955, 285, fig A) because of the swelling which occurs on most of them part of the way down the shank which is thought to have been designed to impede slipping. Tracing their derivation from the Romano-British pins with simple ball-heads, Stevenson dates their appearance in N Scotland to a late post-Broch period not far removed from the 7th century. Seventy-seven of these pins have been found at Birsay, nearly every one in perfect condition.

The majority were scattered among the Pictish zones, one of these (*47*) was found in the earliest phase (1a) of Zone 5 and may pre-date the bronze working period. Of the rest, seventeen were found in the lower Norse horizon, two were found in the middle Norse horizon, five were from house sites in Area III and six were unstratified. They are all discussed together as a type.

The Birsay small pins (*1-77*) vary in length from 28 mm to 66 mm. By this period, the ball-head, although still retained, was only one of many decorative head-styles. Some of the heads were elaborately carved; for example two are melon-headed (*1, 2*) and three have animal heads set at right angles to the shank (*3, 4, 5*). Another (*7*) has a thistle-shaped head which is unusual as in section it is flat and all the other heads are carved in the round. Most elaborate of all is a mace head (*12*) with two rows of five projections and another projection on top. Pins *13-22* have patterns made up of incised lines, crosses and chevrons and different groupings of dots rather than elaborate carving. One (*13*) has panels of hatching round the shank which may be an additional guard against slipping. No two are alike, and as none of the decoration could have been noticeable at a distance of more than a few feet (1 m), it seems possible that it was designed as a mark of ownership. Illustrated pins *24, 26, 27, 30-32, 42, 52, 54, 57* and *60* show the more common head-types which had no additional ornamentation: mushroom, acorn, button (ten examples), simple ball, the original type (ten examples), ball with collar (three examples), ball surmounted by disc (three examples) and the half ball (eleven examples).

The distribution of these pins not only covers N Scotland but extends to the W islands and more sparsely to Ireland. It is interesting to note how true to type they all remained; the same basic head shapes were repeated endlessly and even the more elaborately carved heads had parallels far and near. There is, for example, a mace-headed pin from a late wheelhouse at Jarlshof (Hamilton 1956, fig 39), and there are two melon-headed pins from Lagore (Hencken 1950, 193, fig 105). The animal heads, although they were not replicas of each other, all followed the same tradition, the finest of all being a horse's head with open mouth and even the teeth clearly cut on a pin from the island of Kerrera near Oban (Lethbridge 1950, 95, fig 1). A group of pins from Dun Cuier, Isle of Barra, consists of types which could equally have come from Birsay (Young 1956, pl 20).



ILL 7 : Small bone pins. Scale 1/1

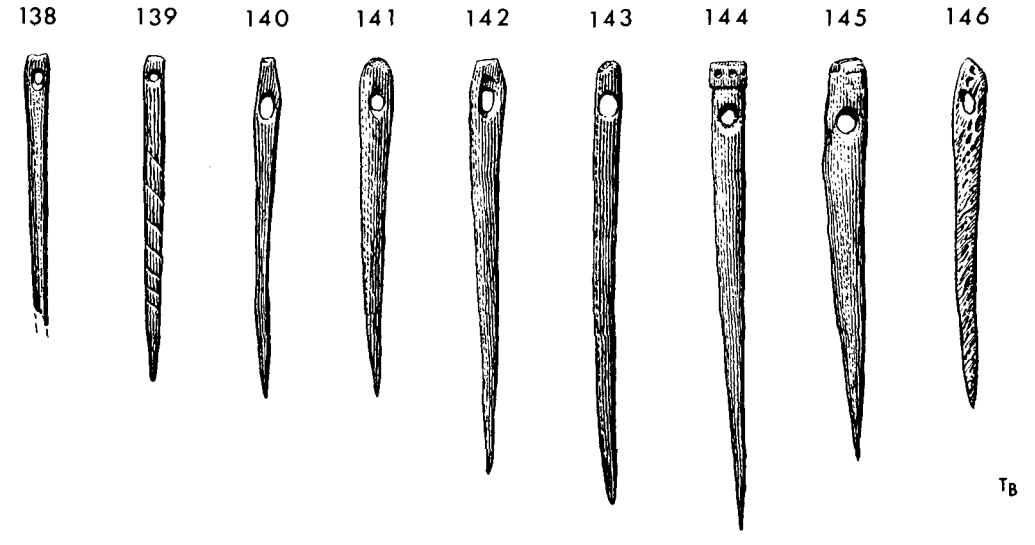
Stevenson (1955, 286) has suggested that these bone pins might also have served as patterns for bronze-casting, to be pressed into a clay mould. That this was in fact the case can be shown by some of the Birsay pin-moulds (Ill 18: *331, 332* and Ill 57). Stevenson (1955, 286-7) considers that such pins date from around the 7th Century AD.

Large pins not perforated (Ill 48)

Only one large pin, *87,* came from the Pictish horizon. The shank was broken and the remaining length is 62 mm. The head is large and flat with elaborate wings.

Needles (Ill 8)

Of the thirteen small needles that have survived only four were from the Pictish horizon (*139, 141, 142, 149*). *139* is finely cut, with a small eye and a spiral line incised down the length of the shank.



ILL 8 : Small bone needles. Scale 1/1

Pins with iron shanks and globular heads (Ill 38)

Pins with large globular heads of hollow bone and iron shanks have been found on broch sites in Orkney, in the W islands, and in Irish crannogs. There are four examples from Birsay; only one, *262,* is from the Pictish horizon. The other three, *259, 260* and *261* were found in a Norse context, but Stevenson (1955, 292-3) considers them to be a native type, Scottish rather than Irish.

Picks and pointed implements (Ill 35)

Only one of the many picks and small pointed implements (*172*) is from the Pictish horizon.

Hair combs

In all there are thirty-eight combs (*193-230*) from the Brough, including fragments which are sufficiently complete to be placed in their correct category. In addition there is one nearly complete comb-case and there are fragmens of two others. The combs comprise a number of different types, both native and Norse, the larger number being native, and they provide a sequence from Pictish to late Norse. In discussing the technical details of these combs the terminology set out by Galloway (1976, 155-6, fig 48) has been followed with one exception: the term 'high-backed' has been subsitituted for the phrase 'single sided with tooth segments extending above the connecting plate'.

The native examples are all composite antler combs with iron rivets. They include both single-sided high-backed combs and double-sided combs, the latter being sub-divided into Type A and Type B.

Double-sided combs: Type A (Ill 10)

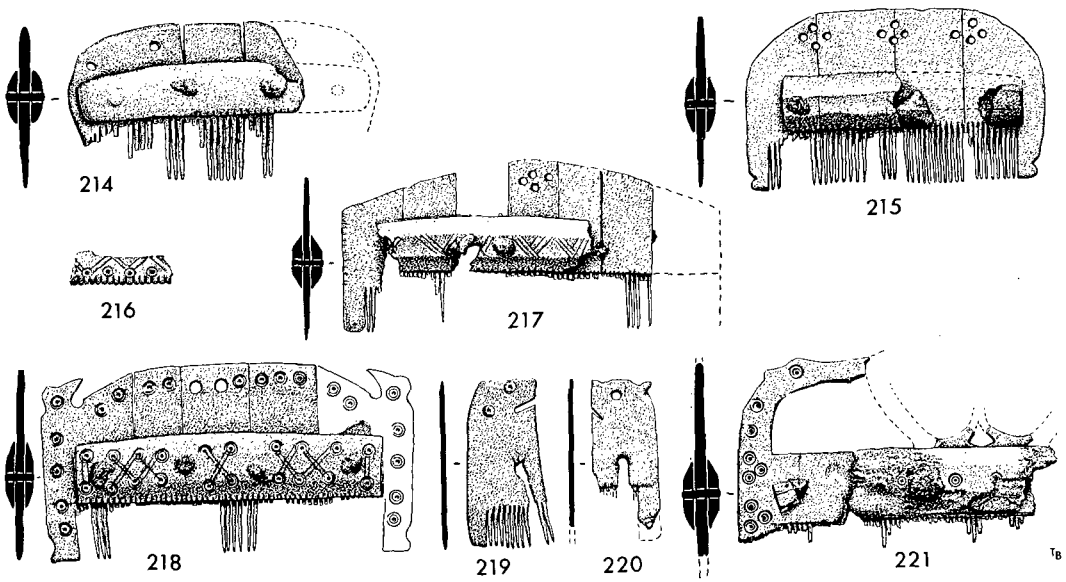
Double-sided combs, of which there are nineteen examples, outnumber all the rest at Birsay but they appear to be derived from two different traditions and can be divided into two groups, those of Type A which were exclusively found in the Pictish horizon and those of Type B which were only found in the lower Norse horizon. The latter will be described with the Norse finds.

Type A is a small group with only four examples (*195-198*). Their distinguishing feature is that the teeth are graduated, becoming progressively shorter over the last 30 mm or so of the end of the comb, thus leaving a triangular or D-shaped solid zone which is generally decorated. The connecting plates are rather thick in cross section and are often bevelled at the ends and sometimes also along the length of the plate. The segments were not always of equal length; use must have been made of ready cut tooth segment blanks which differed in width, examples of which were found from the comb factory in Southampton (Addyman and Hill 1969, 75, pl 6a). Consequently, the decoration of each end of a comb sometimes differed. Sometimes there are holes for suspension. No empty space was left undecorated. *196* and *197* illustrate these features. This type of comb was often found on the same sites as the single-sided high-backed combs and was, judging by the similarities in disposition and type of decoration, probably contemporary. Both types of comb are represented on Class I Pictish Symbol Stones the implications of which will be considered below. They were also common in Ireland, for example at Cahercommaun (Hencken 1938, 42, fig 26).

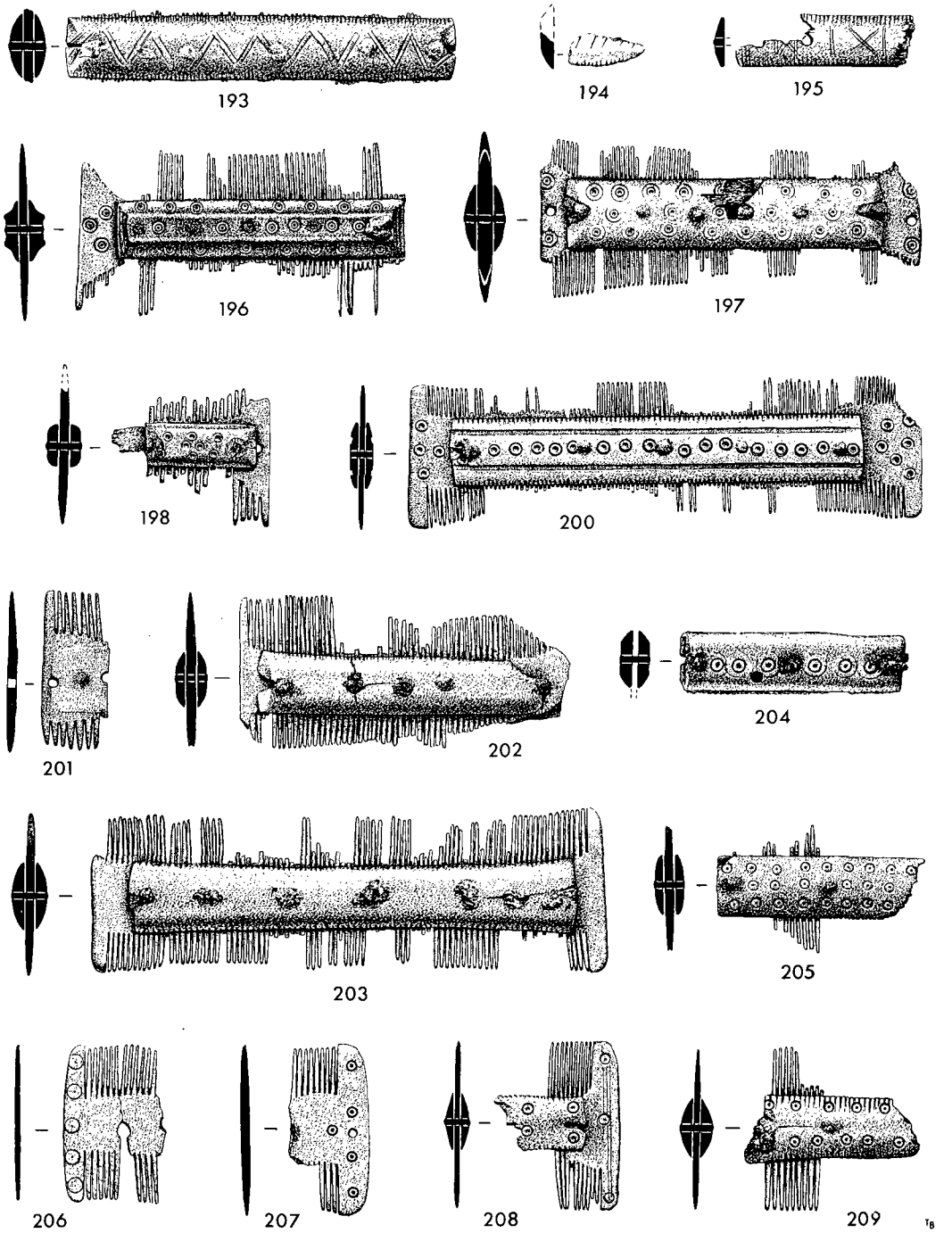
Single-sided combs: high-backed (Ill 9)

There are five single-sided high-backed combs which are nearly complete and fragments of two others. Of these seven examples, only three (*214, 215, 219*) were from the Pictish horizon, four were from the lower Norse horizon and a stray half of one from the Pictish horizon was found in Area III. They are known from so many other sites in N Scotland that they can be classified as Pictish. No two are alike and because of their highly individual treatment and comparative rarity they are described in some detail.

214 has a simple rounded back with two small perforations. One end has been broken and smoothed for re-use. There is a close parallel from the Broch of Burrian (MacGregor 1974, fig 11: 150). *215* also has a rounded back and small nicks at the base of each end segment; a broken fragment of a connecting plate is bevelled. The whole comb had evidently fallen apart and two of the segments were found in Area III, one in the upper part of House Site C, the other in the adjoining building, while the remaining two segments, still with a portion of the connecting plates attached, were found on the other side of the cemetery in Area II, in the Pictish horizon Zone 1. There is a parallel to this comb from Burrian (MacGregor 1974, fig 11: 149) which also has a rounded back and groups



ILL 9 : Single-sided high-backed combs. Scale 1/2



ILL 10 : Double-sided combs. Scale 1/2

of decorated holes. *217* from the lower Norse horizon is a longer comb with two of seven original tooth segments missing. The one remaining end segment is straight-sided, the back is curved, and the outline decorated with short, oblique, incised lines. There is also a group of four decorative holes, similar to those on *215*.

218 from the lower Norse horizon is a more elaborate comb. One end segment is missing but the one that remains has been carved at the top in the shape of a bird's head; there is also a nick at the base similar to those on *215*. There are two holes in the central segment, presumably in this case for suspension not decoration, and the whole is outlined with dot-in-double-circle. The pattern

on the connecting plates is unusual, having been carefully planned to fit around the rivets, the short space at each end having a vertical double line connecting the ends of two rows of dot-in-circle, while the centre has groups of crossed lines.

220 and *219* are single end tooth segments only. Each has a short oblique cut near the top of the inner side, this combined with dot-in-circle on one and a perforation on the other, gives a false impression that they are zoomorphic. The top of *220* has a curved wavy outline and has a parallel in a high-backed comb from Lagore (Hencken 1950, 188).

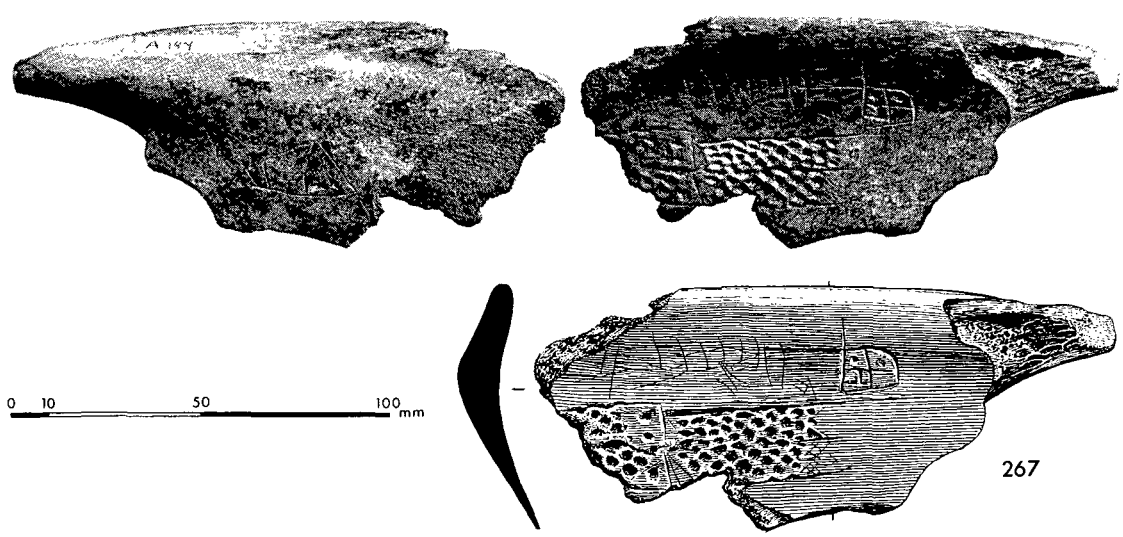
Of the last of these combs, *221,* only fragments remain. It has clearly had an openwork back; a narrow band curves upwards and inwards from the only nearly complete segment to survive, and from the centre segment the beginning of other curved bands have been broken off. The decoration is dot-in-double-circle. A comb, also with an openwork back, but heavier, from Dun Cuier, Isle of Barra, is carved on somewhat similar lines. A date in the early-7th century has been suggested (Young 1956, 316-7, fig 13: 1).

The decoration on the tiny fragment, *216,* resembles that of *218. 222,* is a thin, shaped fragment of curved plate decorated with random dot-in-circle, it is possibly a trial piece for a high-backed comb. *223* is a piece of a rather thicker shaped plate also decorated with dot-in-circle and is possibly a botched end segment.

Trial pieces (Ill 11)

Apart from the small pins and combs there were few bone artifacts from the Pictish horizon. The most interesting, *267,* is a fragment from an ox scapula which had been used as a trial piece. Three sides had been broken and the remaining surface smoothed and polished. On one face was a roughly drawn design based on a triangle, and on the other, under a row of random incised lines and a figure somewhat resembling a flag, rectangular panels showed an attempt at chip-carving. Guidelines in the form of a criss-cross pattern of diamond shapes had been incised, not very accurately, on either side of the trial carving. This consisted of rows of depressions, some diamond shaped, others circular, which had been gouged out rather than excised. To the left of this panel further guide-lines extended, but the few shallow holes in this part of the bone were irregularly spaced and it would seem that the trial had been abandoned before any attempt at interlace.

This use of bone as a trial piece for chip-carving, albeit a failure, is not uncommon. There is a well-known parallel from Lagore (Henry 1965, 93-4, pl 37) where a variety of designs is set out on a single large bone, some with the outline only incised, others complete including interlaced animal forms and chip-carving set in panels. These, it was suggested, might have been used directly as patterns from which casts could have been taken in wax. Chip-carving does not appear on any other artifacts



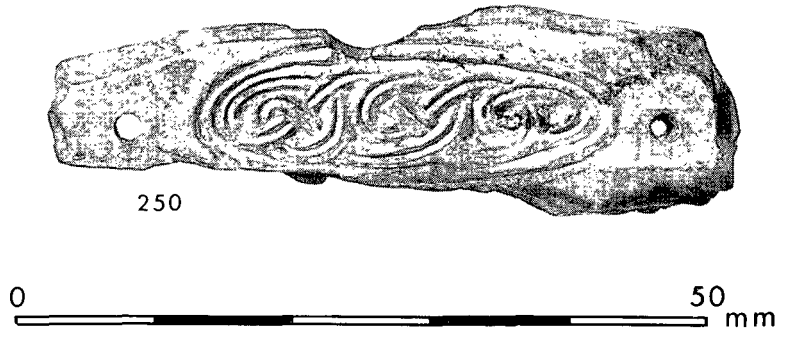
ILL 11 : Bone trial piece: views to show section and trial decoration

found at Birsay, but it is plain that the technique was known. It occurs on the panels of a brooch in the St Ninian's Isle hoard (Small et al, 1973, 67-8, pl 31), with which links will be demonstrated later. It is also well known in Ireland, and there are several parallels between objects from Birsay and from Irish sites such as Lagore, Loch Gur and Cahercommaun.

Another fragment from an ox scapula, *268,* has a broad arrow engraved at one edge and so may be cited as a trial piece. An unstratified fragment of long bone, *269,* has faint incisions, including part of a circle on it.

Mount (Ill 12)

250 is a small oblong mount, 50 mm long, with a small perforation at each end. The edges have been broken and consequently the outline is irregular. Along the centre an oval panel, slightly pointed at one end, is outlined by a double incised line filled with a design of looped, rather than interlaced, double strand which stops short of the narrow end where a separate oval ring has been inserted to fill up the space. While not typically Pictish, in the opinion of Mr Graham-Campbell (pers comm) it may be accepted as such. This looped form of interlacing with additional rings can be compared (Ill 59) with that in the almond-shaped spaces between the arms of the cross on the Papil cross-slab and the loose double-stranded knotwork on the Bressay Stone in Shetland (Allen and Anderson 1903, fig 4, 6).



ILL 12 : Bone mount with interlace decoration

Ox phalanx (Ill 38)

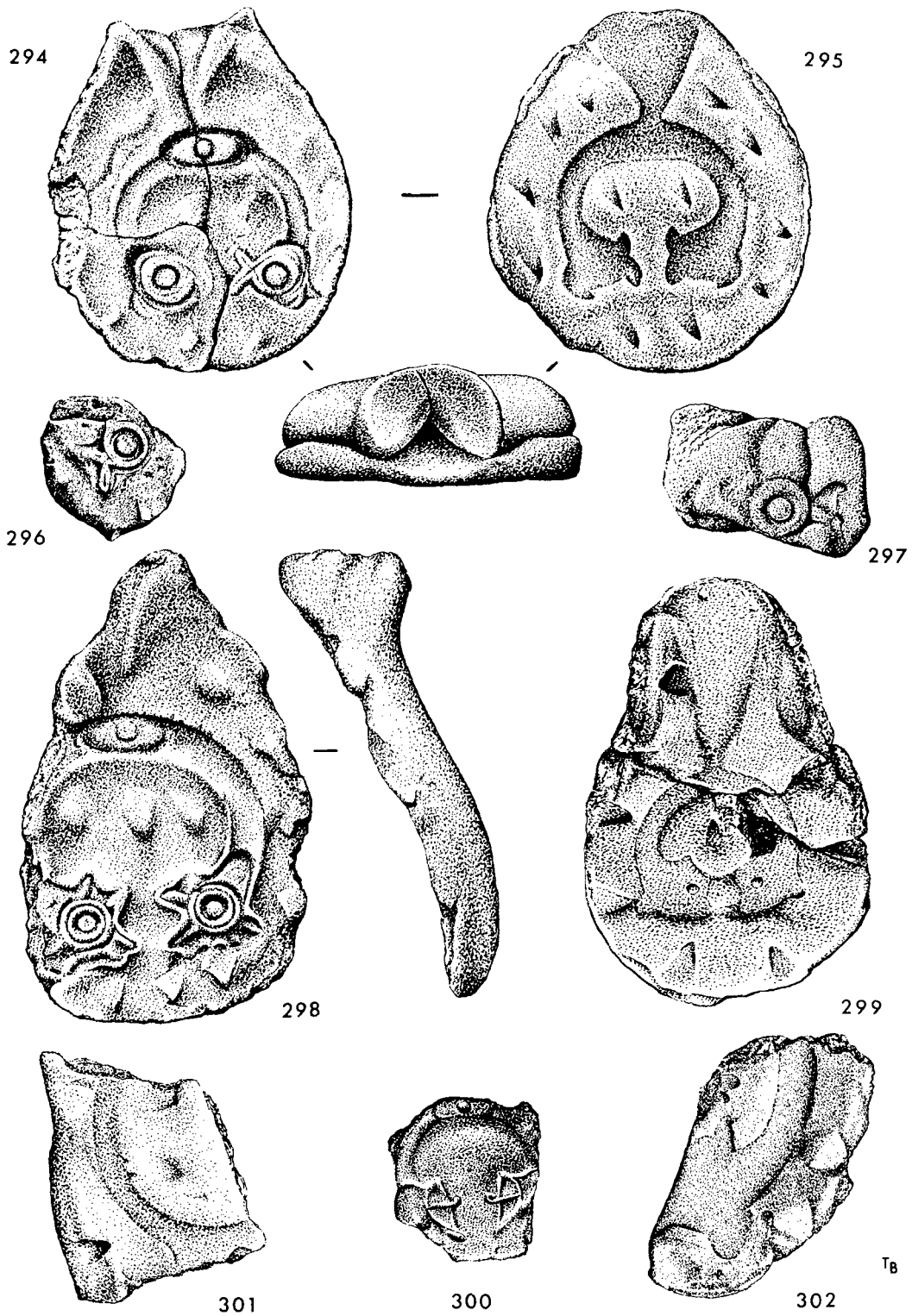
272 was made from the first phalanx of a ox. It has two holes at the posterior end and is socketed at the base. It superficially resembles two bones from the Broch of Burrian (MacGregor 1974, 88, fig 16: 210, 211), which have been identified as playing pieces and one of which is engraved with a symbol on each side. The Birsay bone shows none of the signs of wear characteristic of such playing pieces. A third phalangeal bone from Burrian (MacGregor 1974, fig 16: 212) has been tentatively identified as a socketed handle, but the hole in the Birsay example is very small and shows no signs of wear.

Former (Ill 38)

A small tapered object of antler, *266,* has no apparent function, it may have been connected with bronze-casting and its possible use will be discussed in connection with moulds.

CLAY: MOULDS

Birsay must have been an important centre of bronze casting before the arrival of the Norsemen, for by far the most numerous of the Pictish finds are the many hundreds of fragments of clay moulds



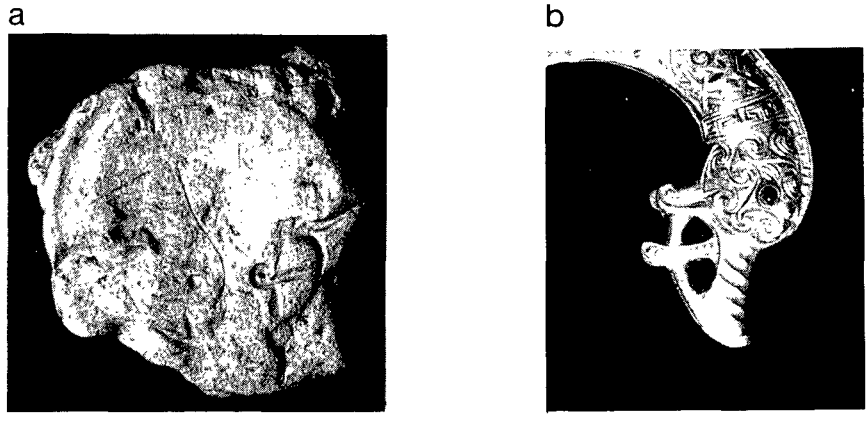
ILL 13: Brooch moulds. Scale 1/1

found scattered throughout the Pictish horizon, the largest concentration being around the small well. The fragments are nearly all wasters from two-piece moulds; one or other of the two halves having been broken in the extraction of the casting. Perhaps not surprisingly it is the smaller moulds which have remained relatively intact; these were chiefly for the manufacture of personal and often ornamental small objects: brooches, finger rings, dress pins and small plates which were sometimes attached to rings.

Moulds for penannular brooches

Moulds for sixteen penannular brooches which can be grouped into seven different types have survived and, although only one mould is complete, it is these brooches which supply the evidence for dating the bronze working period on the Brough, through their close links with the brooches of the St Ninian's Isle hoard. The Birsay brooches vary in size from 21 mm across the hoop, to an estimated 58 mm. There is no evidence of pins and the distinction between ring-pin and brooch would be difficult to make, were it not for the fact that they are brooch types and that elsewhere other equally small brooches have been found with their pins still attached for example at Culbin Sands (Close-Brooks 1974, fig 2: 962).

300 (Ill 13), the smallest of all the Birsay brooches, has the most direct connection with the St Ninian's Isle hoard and strangely the parallel is not with one of the penannular brooches but with the smaller of the two sword chapes (No 16: Small et al 1973, 65-7, pl 30). The brooch has the conventional oval cartouche with central setting at the top of the hoop that is one of the characteristics of the St Ninian's Isle brooches, but the terminal appears to be based on the design of the sword chape with its porpoise-like head, (Ill 14). The intricate spiral pattern and the ornamental



ILL 14 : (a) Penannular brooch mould 300 (b) St Ninian's Isle sword chape terminal (not to scale)

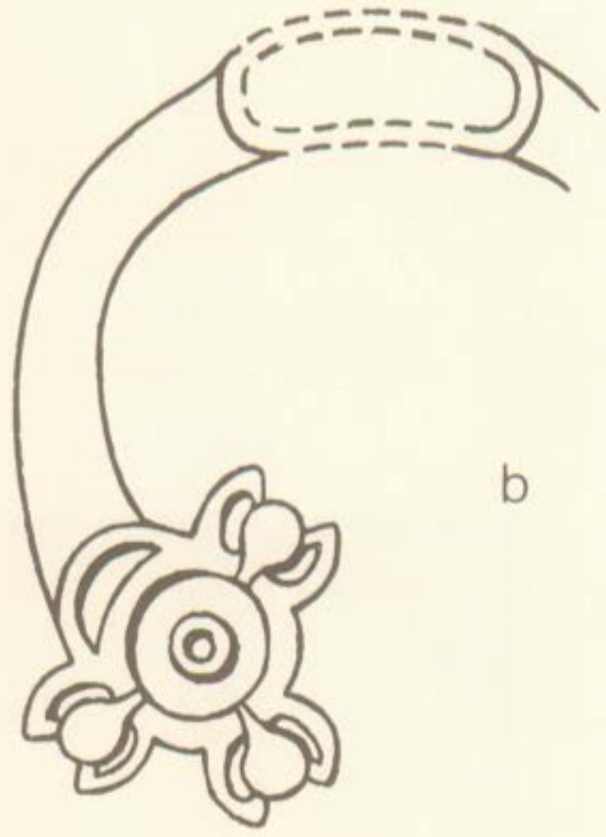
collar of the chape are missing but it would be difficult to reproduce such detail on a smaller scale. However, although on the brooch part of the broad snout is missing and what remains of the head is incomplete, there can be no mistaking the angle of the wide open jaw with its long triangular teeth gripping the protruding tongue. Possibly this brooch gives evidence of the significance of the porpoise in the Early Christian period, referred to by Dr Wilson (Small et al 1973, 123) in discussing a porpoise bone found amongst the St Ninian's Isle treasure. Porpoises are, to this day, common mammals in Scottish waters, particularly in the W, and it is perhaps relevant to mention that they are portrayed, usually in pairs, on a number of the Class II Christian symbol stones, for example at Ulbster in Caithness and at Brodie near Elgin (Allen and Anderson 1903, fig 30a, 136), also on a corner post of a shrine at St Ninian's Isle (Small et al 1973, 33-4, pl 4a) where they are described as 'a pair of opposed S-dragons', and just recognisable on a shrine corner post from Papil (Small et al 1973, pl 13: 27a).

There are four, possibly five, other brooch-moulds from Birsay where the terminal is formed from a single bird or animal head (Ill 13). One of these, *294* and *295,* is the only mould found on the site where both sides are virtually complete; the back half had been broken into three pieces in the extraction of the casting but no part is missing. The terminals are so designed, as were those

298

a

452



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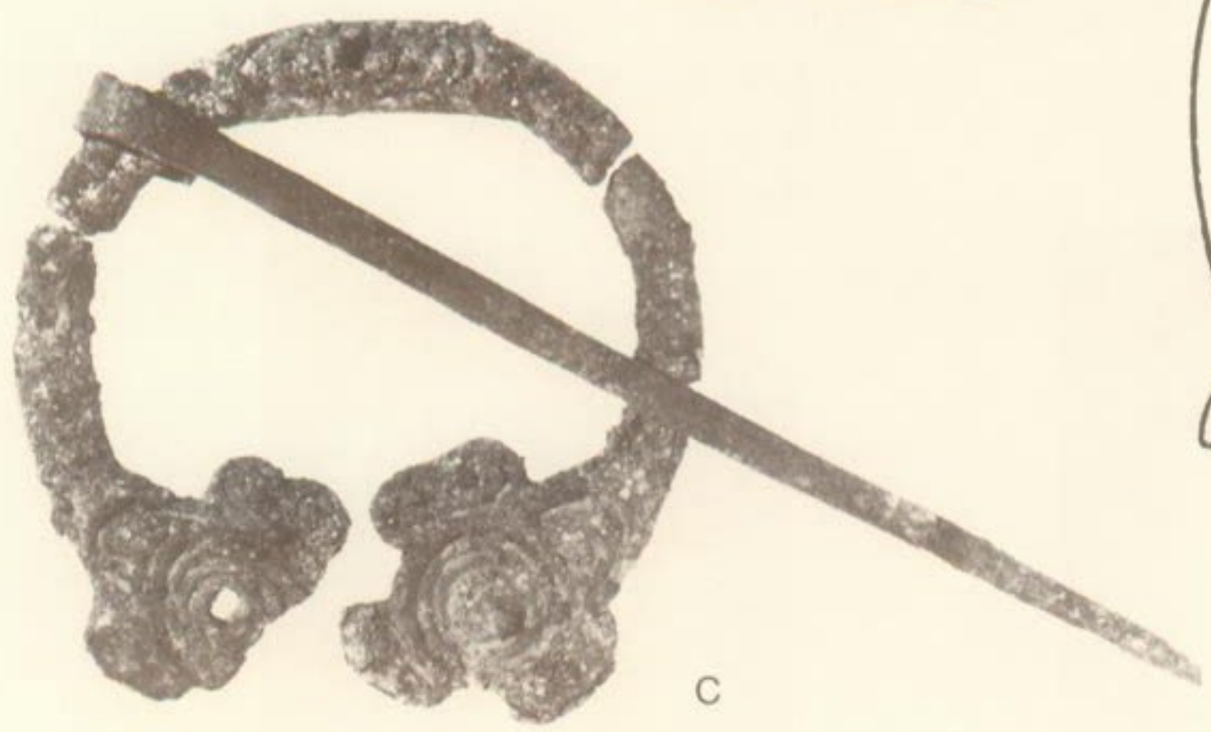

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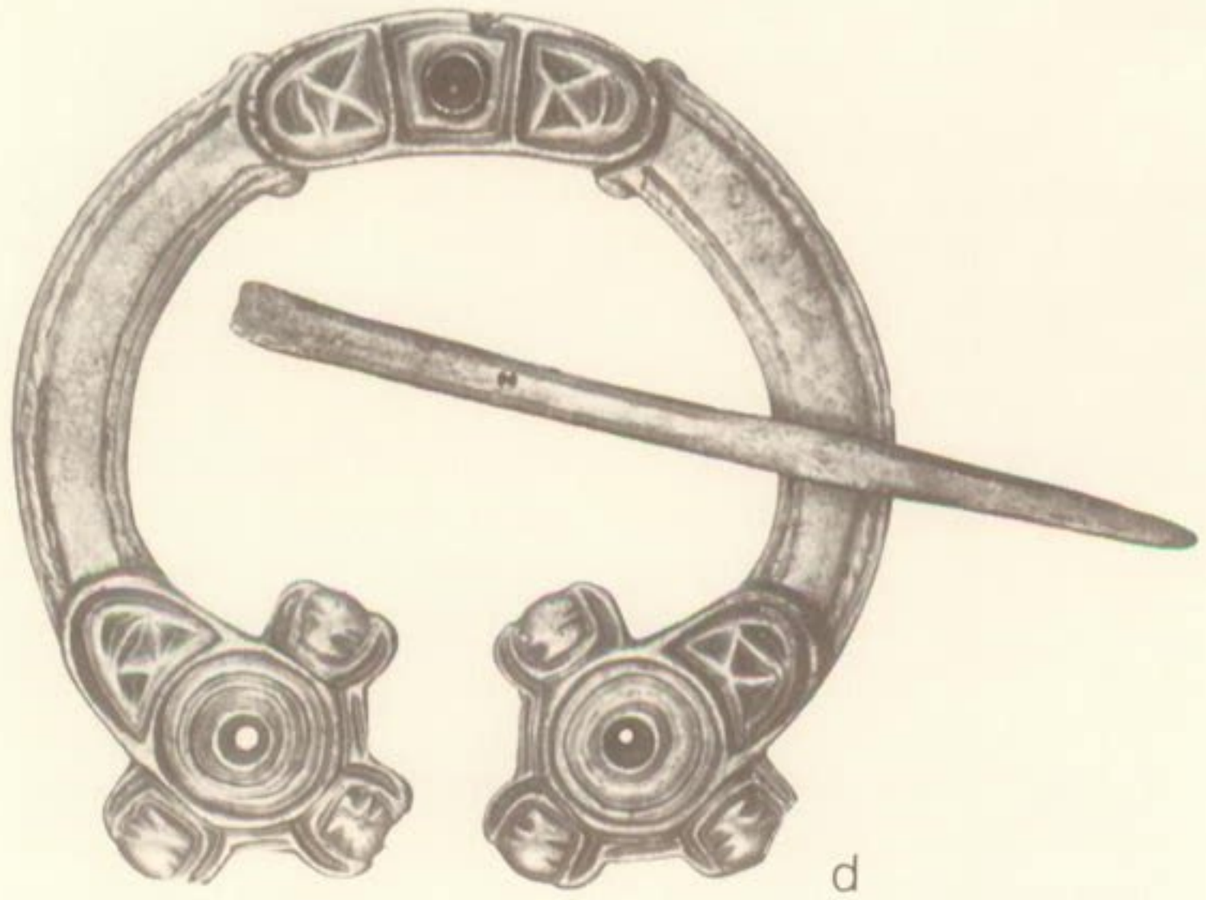

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e

ILL 15 : Penannular brooch mould 298 and penannular brooch 452 with comparisons; (a) cast from mould 298 (b) reconstruction of 452 showing terminal and cartouche (c) penannular brooch from Machrins, Colonsay (d) brooch No. 24 from St Ninian's Isle (e) brooch from Helgheim, Sogndal, Norway (not to scale)

of *300*, that it was the wearer of the brooch looking down on it who would get the correct view. Each terminal was modelled on the head of a large-eyed crested young bird with wide open beak confronting that of the other. The base of each head forms a cusp at its junction with the hoop and each bird's eye forms the central setting of a terminal. *296* is a small fragment of a terminal showing part of a bird's head similar if not identical to that on *294*; it is rare to find a repeat of the same design. *297* is a damaged fragment bearing a circular terminal. Unfortunately only the back halves of two other brooch-moulds, which judging by the outline of the matrices almost certainly had zoomorphic terminals, have survived; *299* is for a small brooch 26 mm across the hoop, while *302* would, if complete, have been the largest brooch on the site, an estimated 58 mm across the hoop. The outlines of both matrices compare, although distantly, with the outline of Birsay *295*, described above, and of a St Ninian's Isle brooch (No. 28: Small et al 1973, 79, pl 34). *301* is only a fragment and little remains of the matrix of the brooch beyond a part of the hoop.

There is only one example of a brooch mould with lobed terminals *298* (Ill 15). Only the front half remains and that is not complete; the measurement across the hoop would have been 38 mm. It belongs to a group typified by the eight silver brooches of the St Ninian's Isle hoard (eg No 24, 28: Small et al 1973, pl 33, 34) which are based on animal heads set between pairs of horns, distantly derived from one of the Rogart brooches (Anderson 1881, 2, fig 7). An actual bronze brooch of this type (*452*) but with rather less degenerate terminals than those shown on the mould, was found at Birsay in the lower Norse horizon (see p.62). Other parallels include a brooch from Machrins, Colonsay (Small et al 1973, 89-90, 95, pl xlvi: b) and a brooch from Helgheim, Norway (Small et al 1973, 89-90, 95, pl xli: b).

303 (Ill 16) is a mould for a brooch almost as small as *294*, measuring only 24 mm across the hoop. Its cartouche with the central setting is its only link with the St Ninian's Isle tradition; the small terminals are circular consisting of a plain band surrounding a central setting and a plain band forms the junction with the hoop. Moulds for brooches no larger than these come from the Mote of Mark (Curle 1914, 144, fig 13: 4-8) and from Dunadd (Christison and Anderson 1905, 313, fig 35).

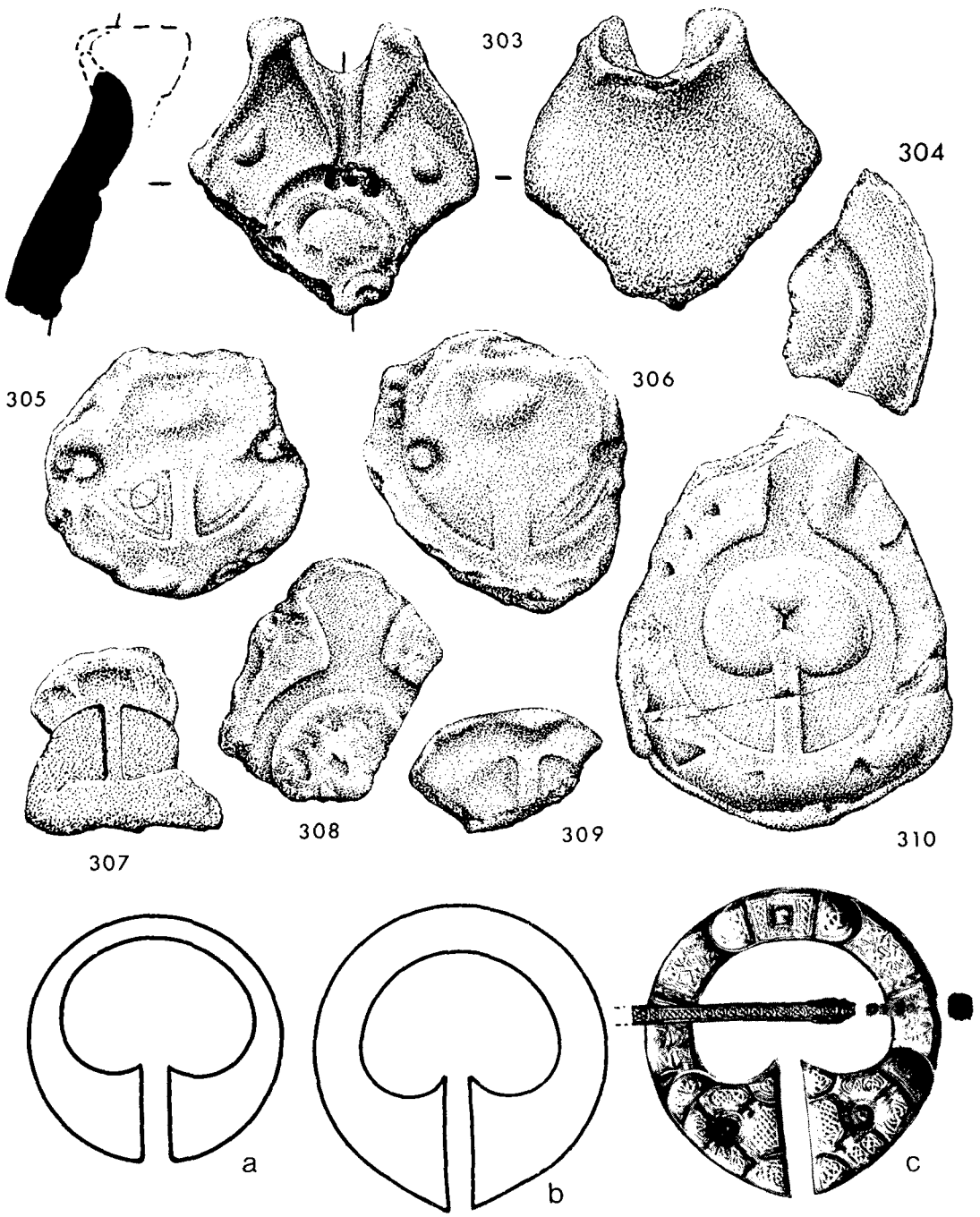
Brooches in the older tradition of triangular terminals are represented on four brooch mould fragments. None are sufficiently complete to show the top of the hoop, but two, *305* and *306*, (Ill 16) appear to have the terminals outlined with a narrow raised band and there is the possibility of interlacing in the fill. These, although they are much smaller, resemble a brooch from near Abergeldie (Small et al 1973, pl 44c) which has the same raised outline to the triangular terminals and, what is more important, the same circular setting at the junction with the hoop; its cartouche has the usual central setting, but it is rather longer than is general and is rectangular instead of oval in shape. *310* (Ill 16) has triangular plate terminals with the same flared up-turned ends and kidney shaped interior zone, although to a lesser degree, as one of the St Ninian's Isle brooches (No 17: Small et al 1973, pl 31). It is probable that the many fragments of coloured glass found at Birsay were the source from which the fillings for the many sockets of the penannular brooches were made.

315 (Ill 18) is a fragment of the front half of a small brooch mould of which only a part of the hoop and the cartouche remains. The cartouche is in the form of a long, narrow rectangular panel, the sunk field enclosed within a clearly defined edge; in the centre a small rectangle is flanked by a vertical bar on one side, the corresponding bar on the other side is missing. This unusual design of the cartouche also occurred on a large bronze brooch from Coll which was exhibited at a meeting of the Society of Antiquaries of Scotland in 1881 but has not been seen since (Stewart 1881, 79-81). In the centre of the panel on the Coll brooch was a socket, shown as empty, but presumably once having held coloured glass as some of the sockets on the terminals still did. The central rectangle on the Birsay mould, however, was excised and would therefore have been a plain raised form when the brooch was cast.

317 (Ill 18) was too small to identify but it also had a rectangular decorated panel. *316* (Ill 18) although also having a rectangular decoration, is unlikely to have been a brooch mould as it is atypical of the Birsay brooch moulds on which the ingate invariably leads into the top of the hoop.

Moulds for small ornamental objects

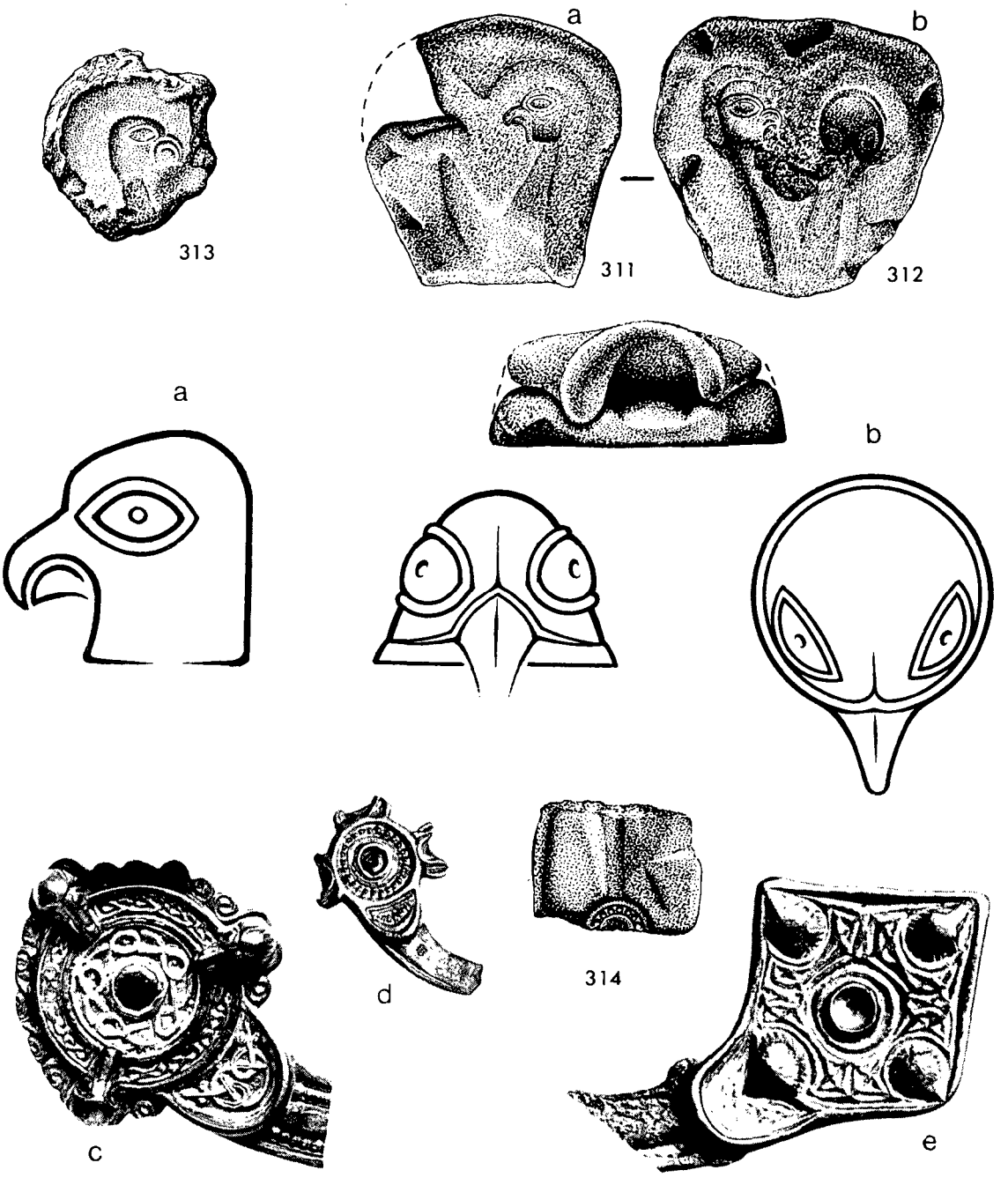
Several moulds were designed for small castings which could have had no independent function. The castings could have been components of larger objects or, less probably, they could have been



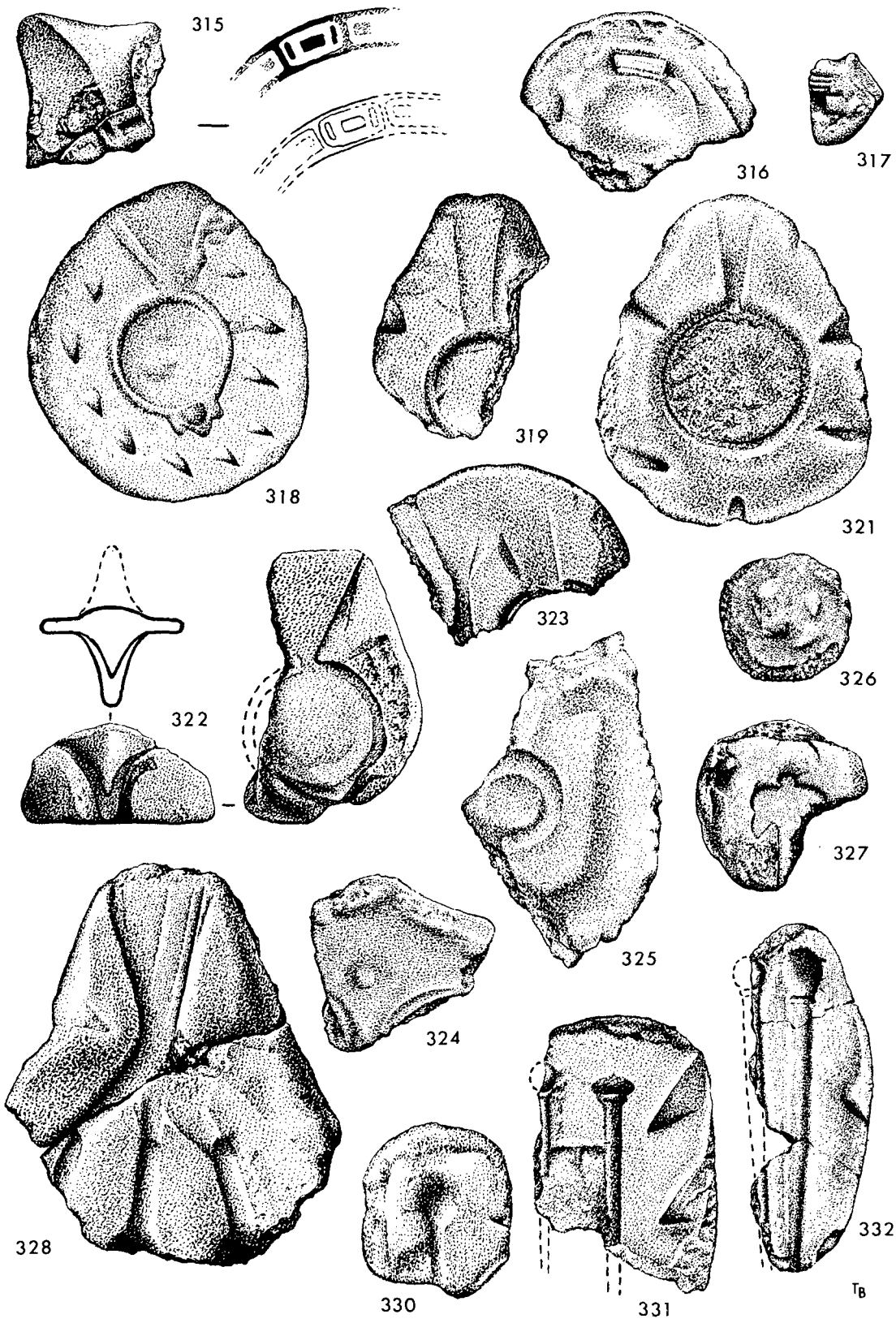
ILL 16 : Penannular brooch moulds. Scale 1/1 (a) and (b): patterns for kidney-centred brooches (c) brooch No. 17 from St Ninian's Isle (not to scale)

used as part of a composite pattern die. *311* and *312* are the front and back halves of the same mould (Ill 17). The back half is complete and shows two bird's heads; the first head (a) is in profile, with rounded skull, large almond shaped eye and small parrot like beak. The second head (b) might represent a similar bird; the head is viewed as it were upwards from the inside of the round skull, with both large eyes visible and the small pointed beak protruding into the ingate. The front half of the mould is very worn and is incomplete, showing only a matrix of the bird's head in profile identical to that on the back half. Both heads would have had flat bases. Another small mould, *313* (Ill 17) shows a bird's head in profile, almost identical to (a).

The bird's head modelled in the round is similar both in appearance and in size to four heads on the square terminal of a brooch from what was probably a woman's grave of the Early Viking period found at Hålen in Norway (Petersen 1951, 54, fig 58). Degenerate versions of a similar terminal are found on two of the brooches from St Ninian's Isle (Nos 21, 22: Small et al 1973, pl 33). In both cases the heads are cast in one with the terminals but this was not always the case; on the Rogart



ILL 17 : Moulds for birds head attachments; upper and lower half of mould showing bird's heads a and b (c) terminal of brooch from near Perth (d) terminal of brooch from Urquhart Castle, Invernesshire (e) terminal of brooch from Halen, Leikanger, Sogn, Norway (not to scale)



ILL 18 : Moulds for pins, rings and enamel inlay. Scale 1/1

brooch (Small et al 1973, pl 42d) the bird's heads are separate castings pegged in from the back of the brooch.

314 (Ill 17) is a mould for a small flat disc with a central setting surrounded by a ring of pellets. What may very well be a casting from this mould is described with other bronze objects from the Pictish horizon (p. 43). A parallel for the decoration on this disc is found in the centre of the lobed terminal of a brooch from Urquhart Castle (Ill 17d) (Small et al 1973, pl 44b).

It is improbable that either the bird's heads with the high profile or the disc were designed for attachment to a brooch; it is not only to brooches that attachments were made. For example the little animal head at the junction of the stem and the bowl on the St Ninian's Isle spoon is a separate casting attached by a rivet (No. 9: Small et al 1973, 57).

Moulds for pins (Ill 18, 22)

Pins for a variety of uses were evidently cast in quantity; moulds for different types were distributed throughout all the five Pictish zones. The majority appear to have been for dress-pins but many were incomplete. Of the heads which survived, three in particular closely resemble those of the bone pins illustrated beside them (Ill 57): *330* animal headed, *331* a flattened round head with collar, and *332* a barrel shaped head.

327 (Ill 18) might be an elaborately shaped head, but has no parallel at Birsay. *328* (Ill 18) is for three pins; the heads are incomplete but were either large ball or half ball and the shanks were thick and short with blunted points. *329* was for similar pins.

357 to 367 (Ill 22) are fragments from a group of moulds on each of which were the matrices for perhaps half a dozen small pins with heads formed either by a single or double disc. The heads averaged 5 mm across and the shanks 30 mm in length. It is not certain whether they were intended to be single pins, or whether they would have been left joined to each other for ornamental use. Fragments of two similar moulds *368, 369,* were found in Area III, House Site D.

Moulds for rings (Ill 18)

The majority of the rings are plain, such as *319, 320* and *321.* Only two are ornamental; *318* has a cluster of four knobs, the effect almost resembling precious stones, *322* is incomplete but the surviving back of the mould shows a deep triangular extension.

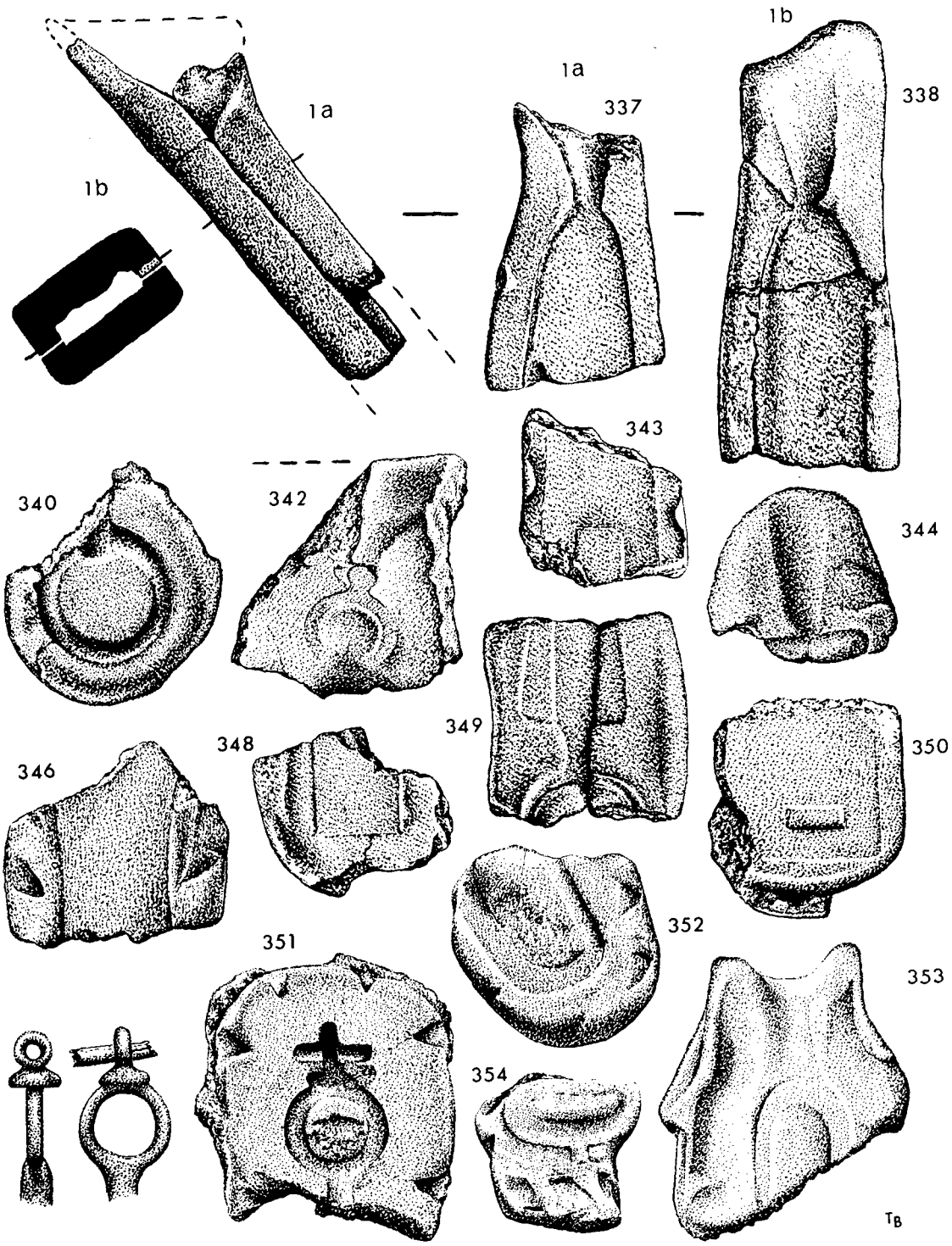
Moulds for small links and plates (Ill 19)

About a dozen mould fragments were for casting objects such as small links and plates but on none was the matrix complete. *337* and *338,* in spite of having been found on different parts of the site, were from the front and back of the same mould and show it to have been for a plate, rather thick in section, curving to a point as it reached the ingate. Other plates, possibly buckle-plates of which only the bottom end remains, were for straight sided plates with squared ends, such as *348* and *350,* the latter having had a small panel cut out of the centre. *349* was intended for a tapering plate with a raised panel down the centre which continued beyond the top of the plate and was cast with a fixed ring. On *351* only a ring, with a subsidiary ring attached to it at right angles, remains. Another plate, on *346,* has curved sides. There are two other fragments for what might have been buckles: *352* the terminal of the back of a mould and *353* the top end of a mould with the ingate intact, both showing part of an oval band of which one side was rather wider than the other. *354* shows a small portion of the matrix for an open ended oval ring.

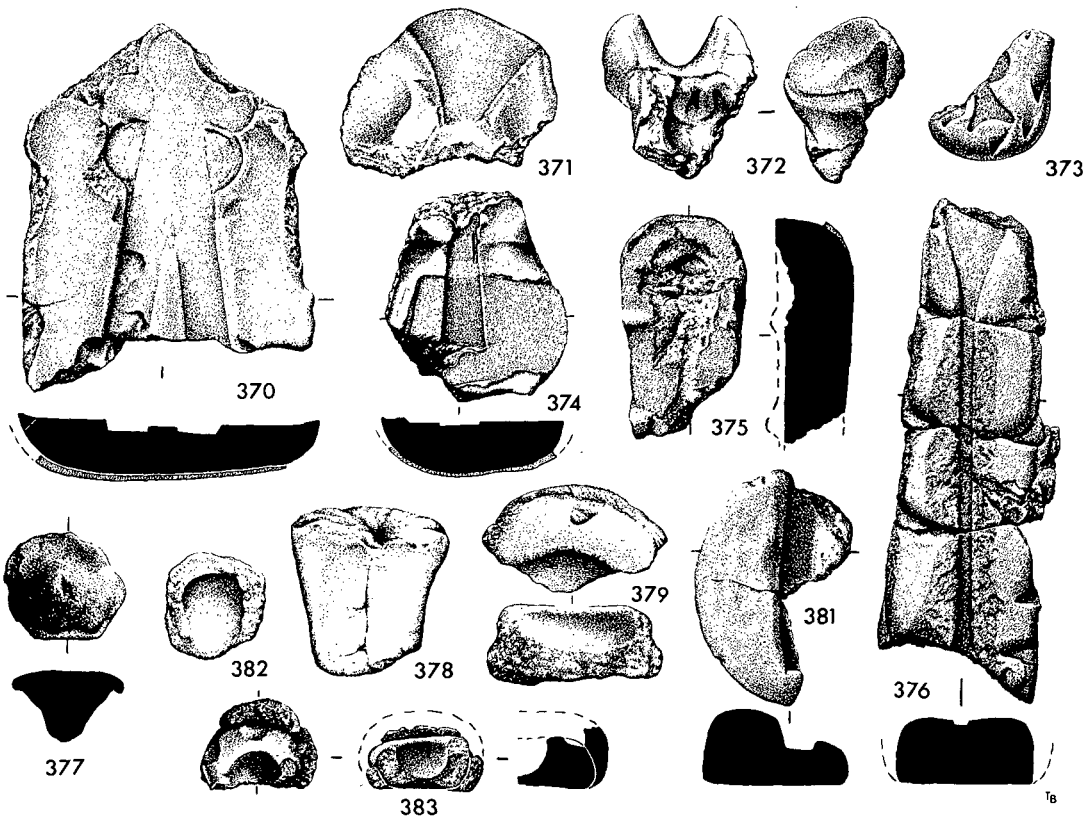
Larger moulds (Ill 20)

Finally, there is a group of fragments of larger moulds, surprisingly few in number considering the extent of bronze working for which there is evidence on the Brough. *370* is more incomplete than most, having no outside edge and not a single key remaining, so there is no evidence as to whether it is the back or the front. It measures 99 mm by 77 mm and is by far the largest worked mould waster on the site. The terminal of the matrix is nearly complete and shows a tapering shaft ending in a trefoil with a pointed groove down the centre. Immediately above the trefoil are two semicircular loops, one on each side of the shaft. The second of the large moulds, *376* was in four pieces. It is a back half with keys down the edge. The ingate is small indicating that only a small amount

of bronze was required. The matrix was clearly intended for a pin; although the head is missing, the point as usual leads directly from the ingate. A clue to what the head might have been like is given by *374*, the terminal of the back half of another large mould, showing the end of a matrix of a tapering shaft which nearly fits onto the end of *376* and could be the head of a brooch pin which would have been bent over the hoop.



ILL 19 : Moulds for plates and links. Scale 1/1



ILL 20 : Larger moulds. Scale 1/2

The technology of the moulds

The second aspect of the study of the moulds was the technical one of their manufacture. Mr Norman Robertson, with whom much of the work on the moulds was shared, experimented with the reproduction of similar moulds and his account is as follows:

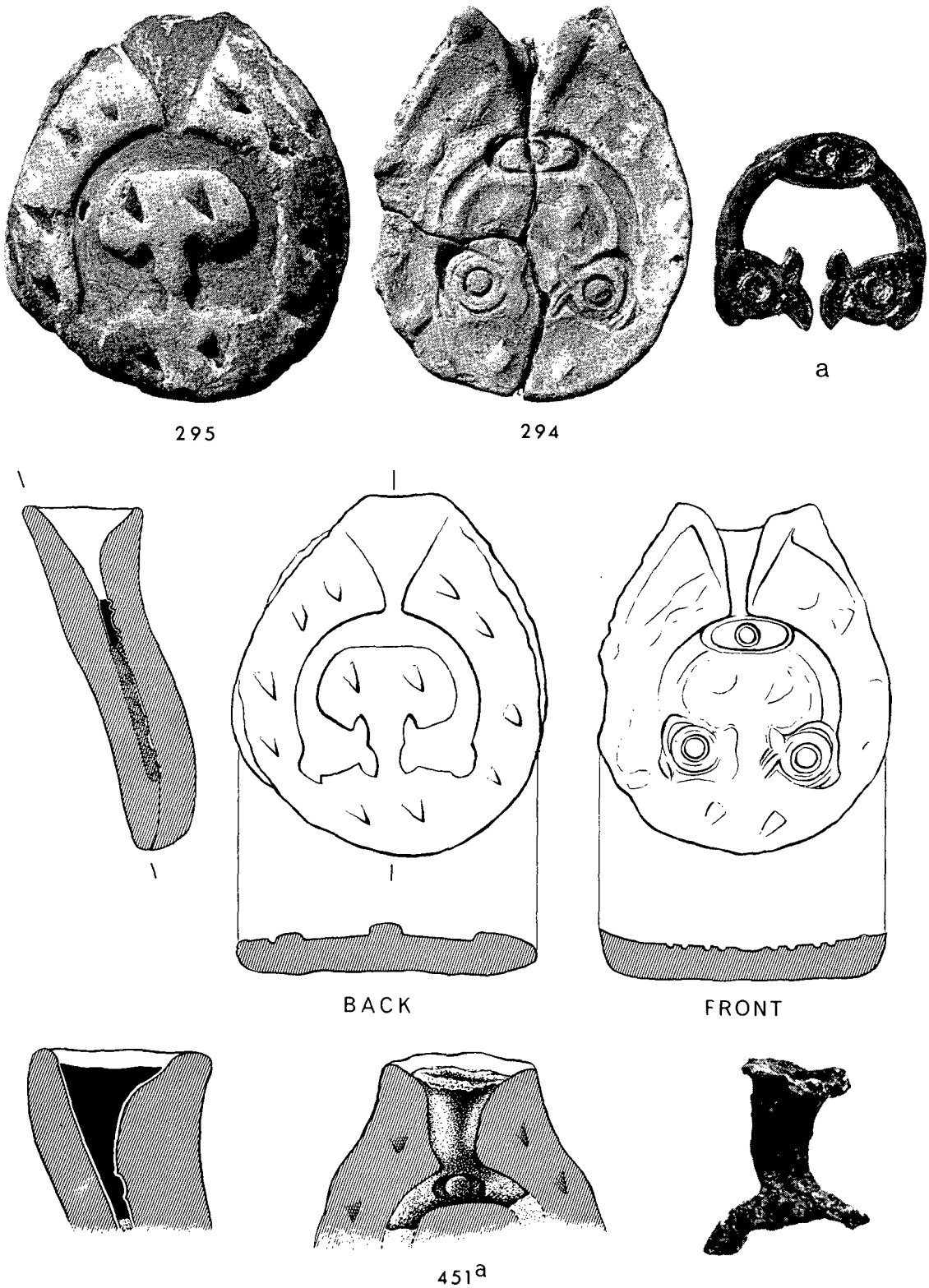
"It is evident that during the working life of the Birsay foundry, numerous moulds were constructed but many of them are now represented by no more than a single fragment. Seemingly most of the moulds had been broken into pieces when the castings were extracted from them. The predominance of unbroken back portions suggests that the front pieces, with the more elaborate matrices, suffered most damage at this stage in the operation.

Only one example of a two-piece mould has survived complete with its two parts fitting neatly together (*294* and *295*). However, there are many other fairly substantial fragments still bearing well-preserved impressions. These waste pieces are not only important for their record of the original products extracted, but equally for the evidence they provide of the method used by the Birsay bronze-founders to construct these somewhat elaborate moulds.

In order to gain a better understanding of this casting technique, some trial moulds were made as an experiment. They were formed, each part in turn, by following precisely the same procedure as the original examples appear to suggest. After a few attempts, it was found that with a little practice it was not difficult to obtain a satisfactory and serviceable mould.

The following reconstruction of the technique used at Birsay is based partly on the experience gained from these experiments and partly from observations made on the original material.

At Birsay, a very fine clay was used to form the moulds for castings bearing small details. For larger and less ornate work, the moulds were made of a clay tempered with



ILL 21 : Techniques of casting. Front and back sections of mould, 294 and 295, and the cast (a) from them. The two sections of mould fitted together for casting. Ingot remnant 451a and its relationship to the mould

a coarser grit such as granulated quartz. A fine natural clay similar to the Birsay material was used in the experiments.

To achieve the best results, it is necessary, first of all, to prepare the clay by mixing it thoroughly to an even consistency. It should be worked well in the hands until it is soft and pliable. It is also very important that it should not be sticky. In the first attempts, the little pads of clay which make up the two halves of the moulds were dusted with talcum powder. This was done to make sure that the pattern would not adhere to the wet clay. However, subsequent attempts proved that this practice was unnecessary. If the clay is in the required condition when the master pattern is pressed on to it, then the pattern will part from the mould without any difficulty.

To begin the operation, the first part of the mould to be formed is the back portion. It is made by pressing a small pad of clay, somewhat larger than the object to be cast, on to a flat board or stone. After trimming the pad to a suitable outline, its edge is finished wth a rounded bevel. This convex edge is intended for fitting into a corresponding concavity on the edge of the front portion. Its main purpose is to ensure that the two halves of the mould are positioned correctly when they are re-assembled later. The master pattern is now pressed firmly on to the pad of clay to a depth of approximately half its thickness. Similarly a funnel-shaped former (*451a:* Ill 21), already fashioned for the purpose, is squeezed in above the object to form the ingate for the mould. Lastly, several impressions made with the tip of a knife-blade are set around the edge of the mould to serve as keys for registration afterwards. At this stage, this half with the object and former still in place, is left exposed to the air for several hours to allow some of the moisture to evaporate.

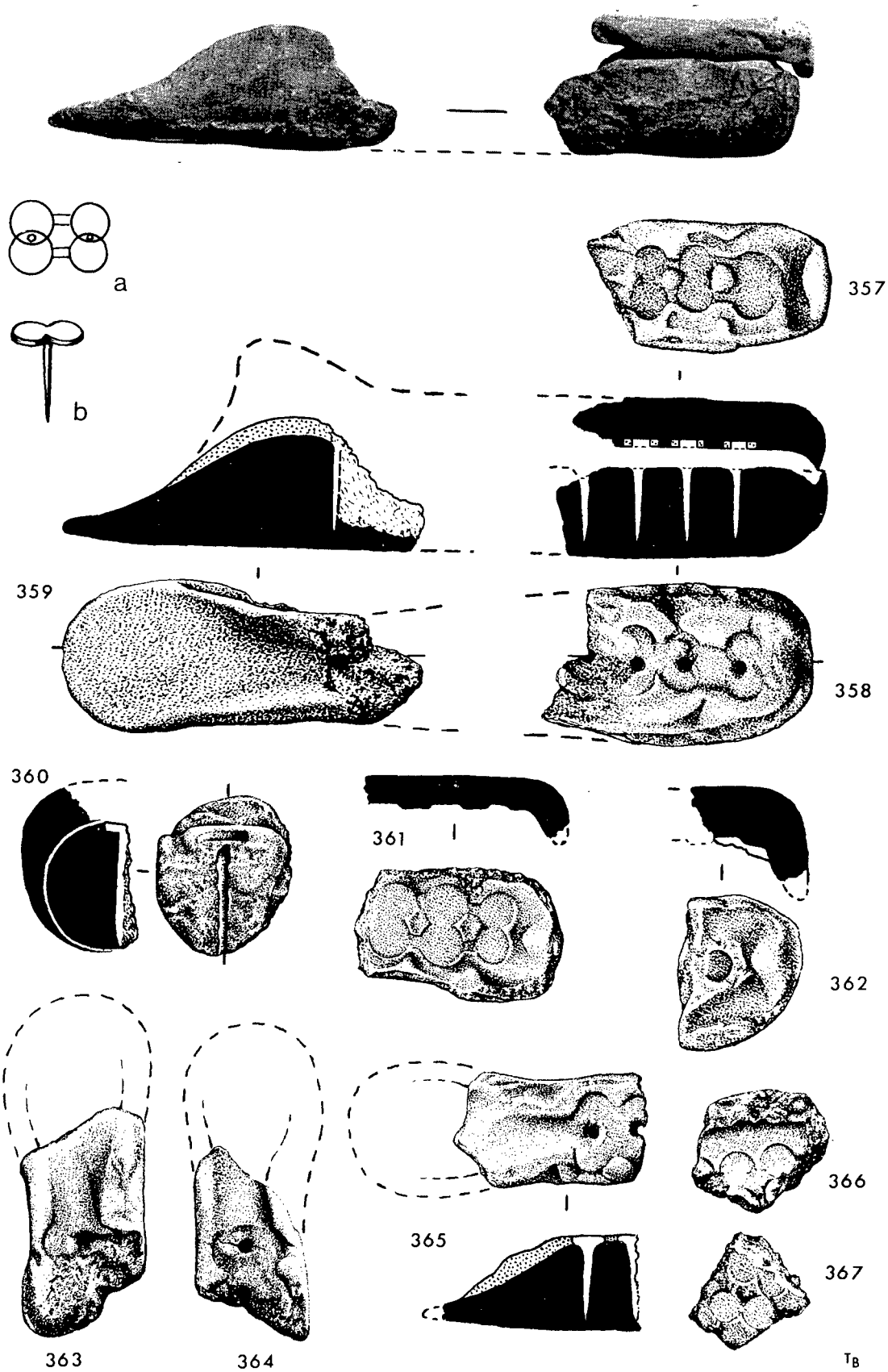
When the clay is firmer, it is time to make the front portion of the mould. It is formed by carefully covering the master pattern and the keyed edge of the first half with another pad of clay. This pad should be squeezed down very gently on to the object and former in order to get the best impression possible. Special care should be taken not to distort the back portion. At the same time, the top of the ingate is opened out and shaped to provide the filler for conveying the liquid metal into the mould. Again, the whole mould with its contents is laid aside to dry off slowly for a further period at room temperature. Artificial heat should never be used to hurry the drying process; the clay should be allowed to contract naturally.

In a few hours, the two parts of the mould can be separated quite easily to extract both pattern and former. By now, the clay is in a leather-like state but still flexible enough to allow manipulation of the mould-parts if perchance there are any undercuts in the pattern.

When the mould is re-assembled, all that remains to be done is to seal the join. Following the original method, a very thin strip of clay is applied along the seam between the two portions, allowing a little of it to project over the back of the mould. Such a strip is visibile in *383.* Using a wet finger, one edge of the strip is worked well into the front portion while the projecting edge is turned downwards to clasp the back half firmly. By this simple technique the two halves of the mould are held tightly together for the duration of the casting process.

Finally the complete mould is put aside in a cool dry place until it has dried out and is ready for oven-drying which is the next stage in the operation."

Two moulds made by Mr Robertson were handed over to Dr Ethel Eaton at the laboratory of the National Museum of Antiquities. She first fired them in a pottery kiln to make sure no moisture was left. Then the requisite quantity of bronze was placed in a small crucible made from clay with the addition of a little sand. It was then melted in a charcoal furnace. The moulds were placed in sand at a slight slant, evidence for which had been observed when the two halves of one mould from Birsay had been placed together (*294, 295:* Ill 21) and this observation was confirmed when other moulds were found with both halves nearly complete. Then the melted bronze was poured in. The first attempt was not entirely successful as too much metal had been used and this had led to a leakage



ILL 22 : Moulds for small ornamental pins. Scale 1/1

round the matrix, but with the second experiment the amount had been judged correctly and an almost perfect replica emerged of the coin that had been used as a pattern. The only fault was that a small piece had come off the edge probably when the ingate filling was detached.

There were small variations in the construction of the moulds according to the shape of the object, or objects, to be cast. The back half of the mould being normally shallow, the ingate was the same and usually triangular in shape; the ingate of the front half was deeply rounded. The small, D-shaped antler object, *266* (Ill 38), might have served as a former for such a mould ingate.

When several pins were cast in the same mould they were set fanwise, the points almost meeting at the ingate as in *332*; but, if the shanks were too thick, extensions were added to the ingate to form channels to reach each pin point as in *328* (Ill 18). If two objects wider than pins were to be cast in the same mould, the whole ingate was widened and then divided to reach the matrix of each object, as in *323* (Ill 18). An exception to the shallow back halves of the moulds was found in the group of moulds for small ornamental pins (*357-369*: Ill 22) where the pins were pressed vertically into the back of the mould instead of horizontally. This led to an awkward adaptation where the back ingate, instead of lying flat, was tilted at a steep angle. The construction of the pins with double heads appears curious, the shanks being attached to the double disc-shaped heads at the narrow point where the discs overlapped (Ill 22a, b). The pins were jointed together in a series by tiny bridges. They could have been extracted from the mould in one piece, as was the case at the Mote of Mark, where a rake-like bronze object emerged from a somewhat similar mould (Curle 1914, 147, fig 15). Alternatively, as first suggested by Lloyd Laing (1973, 67-8) it may have been intended for a number of small pins which would have been broken off individually. That the Birsay pins were not intended to be kept intact in one long series is indicated by the fact that each of the moulds had been broken off transversely for the extraction of the casting some way along the mould.

The general custom is that a two-sided object was placed with its back, that is the plain side, against the back of the mould. An exception is seen on mould *312*, (Ill 17) on the matrix for the three-dimensional bird head seen in plan. In this case the pattern had been pressed head first downwards into the clay of the back of the mould and, had it not broken off, its flat disc base would have appeared as a shallow depression on the front half of the mould *311*. In this case also, the back half of the mould is deeper than was normal.

All these moulds so far discussed used a simple technique, but evidence of a more complicated technique is shown in *351* (Ill 19), where a small ring was set at right angles to the larger ring to which it was attached. To accomplish this, a core had to be made to fit through the pattern for the upper ring. This core would have been taken out with the pattern when it was removed after drying, replaced before the two halves were finally joined and only finally removed after the cast ring had been extracted from the mould. Its impression can be seen in the matrix.

The last detail to be described in considering the moulds is that of the keys. As has been explained, they were only used for positioning the two halves during the initial drying before the pattern was taken out. They vary in size, shape and number and also in their position on the mould, not apparently following any particular rule. This can be seen by comparing the illustrations of moulds. Sometimes they are set right on the centre, sometimes near the edge. In one case there are both large and small key sockets on the same mould, *310* (Ill 16). It seems possible that an individual craftsman would have had his own method as regards the making and the placing of the key sockets, using a large or a small pointed instrument as best suited him. In some of the moulds, usually those of finer clay, they are so small as hardly to be seen and are placed almost on the edge. In the case of the moulds for the small ornamental pins (*357-369*) an additional method of positioning the two sides appears to have been the formation of an overlapping end to the top half of the mould, this can be seen clearly in both the diagram and the photograph (Ill 22).

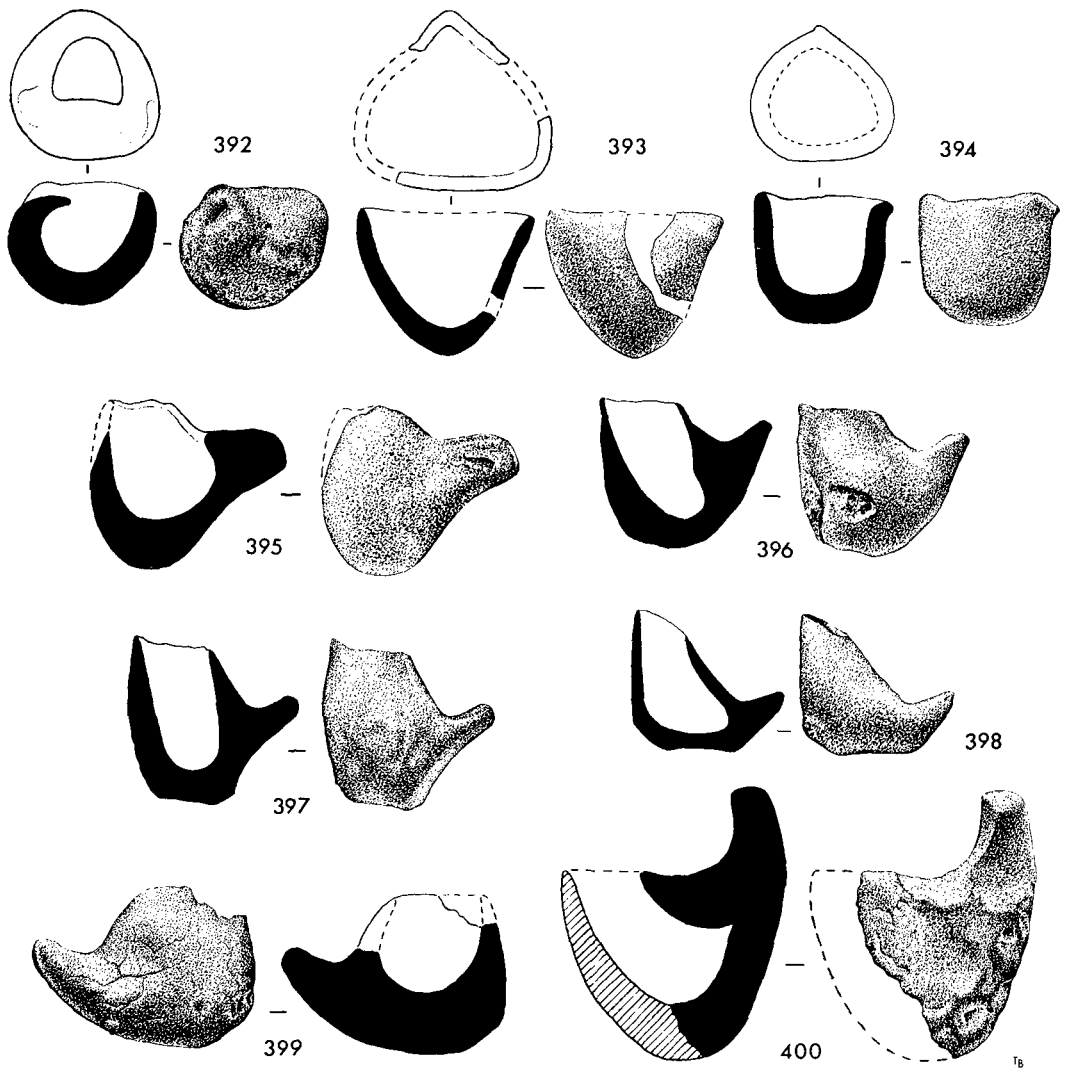
Not all the problems were resolved. There is evidence that perhaps additional pieces were introduced in the mould construction to overcome undercutting and so allow the object to be withdrawn more easily, particularly in the case of larger castings. Examples of such additional pieces for small moulds are *377* (Ill 20) and *384*.

In addition to the moulds described, some 185 fragments of minor interest are catalogued in groups under numbers *385* to *391* and there are several hundred less easily recognisable fragments.

CLAY: MISCELLANEOUS

Crucibles (Ill 23, 24)

A large number of fragments represented at least sixty small crucibles; nine were nearly complete. Of these only three were without lugs. The first, *392,* from the Pictish horizon is the only one of its type; it is 30 mm high, bag shaped, with rather thick sides curving in from a rounded base to a D-shaped opening, on each side of which is a small protuberance, presumably to enable tweezers to obtain a grip. The base is vitrified. *393a* and *393b* are two fragments of another crucible. It is 44 mm high, pyramidal in shape with a pointed base, the sides sloping outwards to a large triangular



ILL 23 : Crucibles: profiles and sections. Scale 1/2

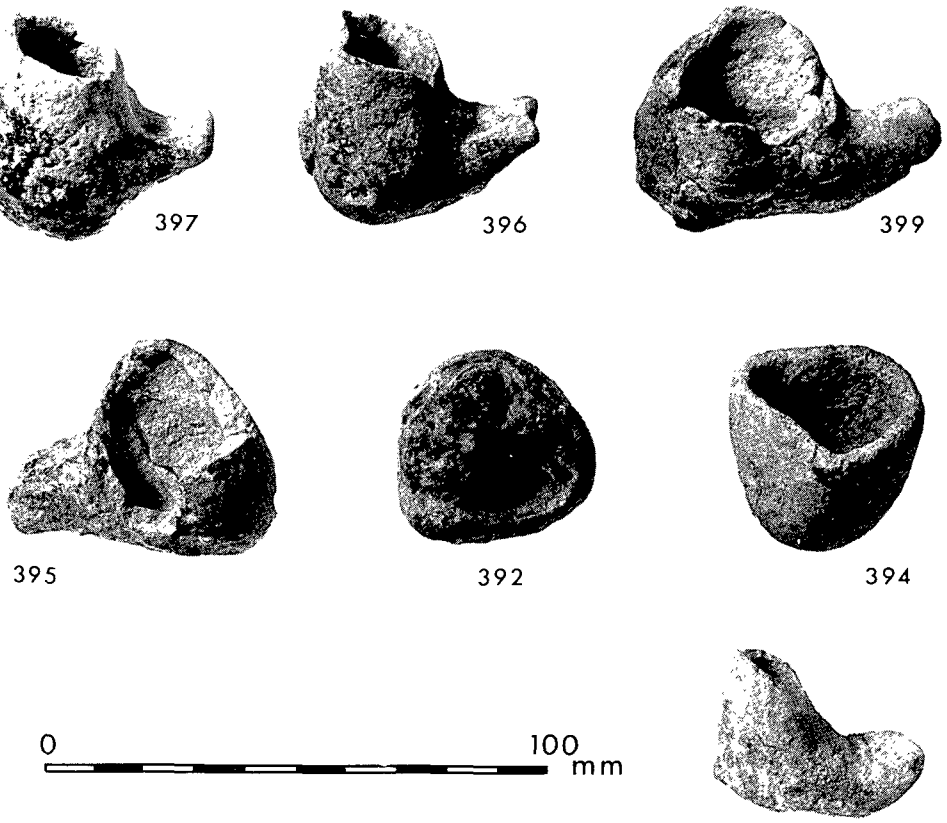
opening with a pointed lip. This type was common at Lagore where there were twenty-four examples (Hencken 1950, 235, fig 117). There were no signs of either burning or vitrification.

The third crucible without lugs, *394,* was found in Area III. It is 33 mm high with upright sides and a rounded base, the opening is rounded with a pointed lip.

The other six crucibles all had lugs, they were relatively deep, and the sides narrowed as they reached the top so there was no possibility of seating for a lid. They varied in height from 42 mm to 56 mm. Their differences were minimal; the lug could be set high as on *395, 396* and *400,* half way up the side of the bowl as on *397,* or almost at the bottom as on *398* and *399.* The bases were rounded except in the case of *397* and *398* where they seem intended to be flat, but neither crucible

could remain upright without support. All show signs of vitrification but *400*, which was incomplete, may have been spoiled in the firing. Three similar crucibles were found at Dunadd with lugs set low, half way up and near the top respectively (Christison and Anderson 1905, 313, fig 35).

In addition to the crucibles described there was a large number of fragments some of which could be identified as belonging to small crucibles, including eight rounded bases, eight pointed bases



ILL 24 : Crucibles

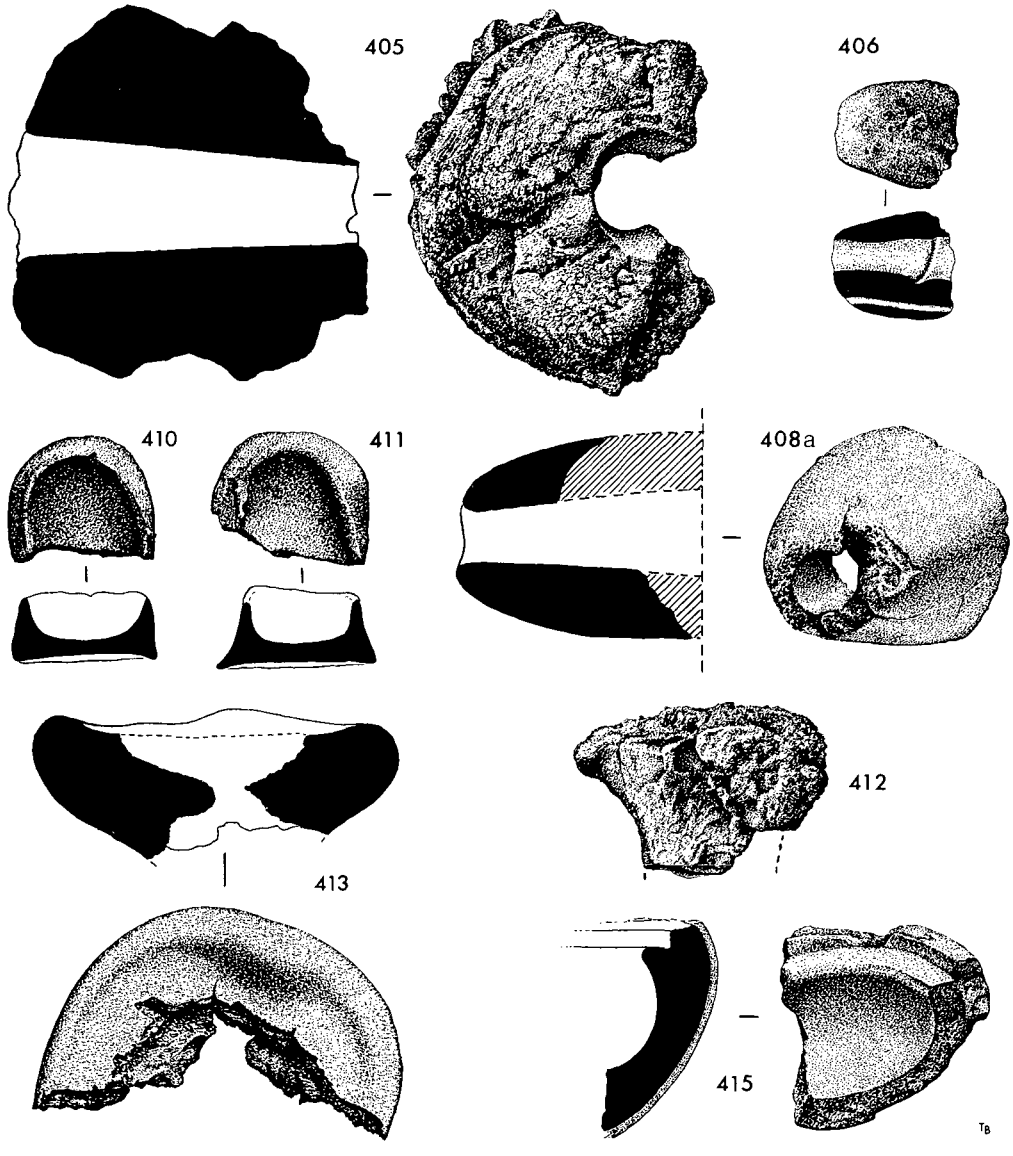
and nineteen rim fragments. There were also rim fragments from large crucibles. All came from the Pictish horizon with the exception of *395, 402* and *404*, which were unstratified finds from Area II.

The quantity of bronze that the Birsay crucibles could have contained must have varied considerably. When Dr Eaton carried out her experiment in casting she was struck by the very small amount of bronze that was required to make approximately the size of object for which the majority of the Birsay moulds were intended.

It seems possible that the crucibles, which could be formed in a matter of minutes, were each made of a size to suit the amount of bronze required for a particular object. They are entirely different types from the earlier, shallower, lidded crucibles such as were found at Helgö (Lamm 1973, fig 2) or Dinas Powys (Alcock 1963, 12) and are nearer in form to those from Ireland, for example from Carraig Aille II (O'Riordáin 1949, fig 20), and from Scotland at Dunadd (Christison and Anderson 1905, fig 36-7).

Flat bottomed containers (Ill 25)

410 and *411* are fragments of flat bottomed oval containers; about half of each remains. They have rounded ends and vertical sides. Both show signs of firing. Parallels, referred to as crucibles, were found at Lagore (Hencken 1950, 237, fig 117).



ILL 25 : Flat-bottomed containers, tuyères and blowpipes. Scale 1/2

Dishes (Ill 25)

Fragments of dishes of uncertain purpose, *413-417,* were found unstratified and in the Pictish horizon.

Tuyères and Blowpipes (Ill 25)

Many of the fragments of burnt clay, particularly of those scattered around the well in Zone 1, and in Zone 5, may have come from tuyères or blowpipes, but only three (*405, 406, 408a*) are clearly recognisable, (*405* and *406* were from Area X).

BRONZE

Miscellaneous cast bronze

With few exceptions the small number of bronze finds from the Pictish zones were all connected with various aspects of bronze casting and in some cases were actual products from the local moulds.

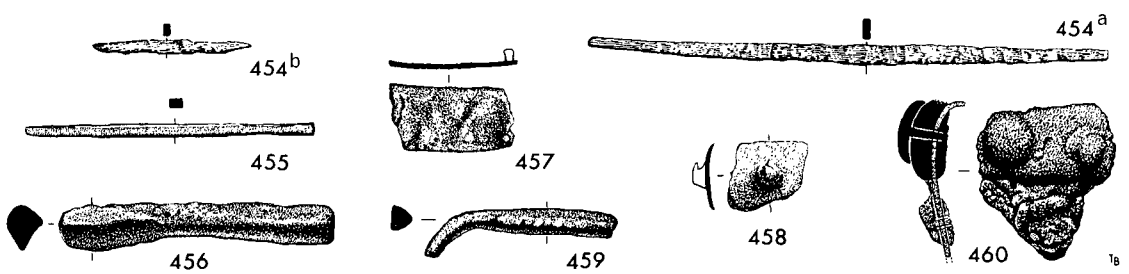
Of these the most interesting is *438a*. It is a small disc, 11 mm in diameter. It was considerably corroded but after conservation it was possible to distinguish on the front a small central boss surrounded by a ring of pellets and a narrow raised band around the edge of the disc. The disc is of the same size and the pattern appears to be identical with that of the matrix on the broken mould *314*. This is further proof, if proof be needed, of the manufacture of small pieces, which having no independent function could only have served either as an attachment to some larger object, or as part of a master pattern for some such object. A second disc, *438b* of which not much more than half has survived, appears to be similar. Its surface is badly worn but from the way corrosion has left small regular indentations all around the edge it would seem that it too may have had a ring of pellets. Its present reduced diameter is 10 mm. A third disc, *439*, which is perforated at the centre, is incomplete and too worn to be identified in any way. Its estimated diameter is 20 mm. Finally there is a small hemispherical object, *437* (Ill 39), 12 mm in diameter, the base of which is too worn to give an accurate estimate of its original size. The rounded top is roughened by wear but it is approximately the size of the matrix of mould *383* (Ill 20). Unfortunately only the back half of this mould has been found so it is impossible to know what the front half of the matrix would have been like, so no suggestion that there might be any connection between this half mould and the hemispherical object can be made.

There are also fragments of two bronze rings which could well have been cast on the site. *446* would certainly have been a finger ring. Only about half of it survives; it would have been 20 mm in internal diameter. It is plano convex and extremely delicately moulded with a section of only 1 mm. *445* is circular in section. Its estimated internal diameter of 26 mm is too large for a finger ring and it might belong to any of the many categories of rings for suspension, fragments of matrices for which appear on many of the moulds.

Two strangely shaped fragments, *451a* (Ill 21) and *451b* must have come from the actual casting of an object, having been formed inside the ingate at the top of a mould from the overflow of liquid bronze. Each would normally be cut off from the completed casting when it had been extracted from its mould. This had been done to *451b* but in the case of *451a* something had gone wrong in the extraction of a small penannular brooch. The top part of the hoop had broken off and remained attached to the ingate filling, the small cartouche with its central disc can clearly be seen. The shape of the ingate shows the flat back and the sharply curved front typical of the majority of the Birsay moulds.

Sheet bronze

A few fragments of sheet bronze provide some evidence that bronze working other than casting took place. *420* consists of what appear to be small, flat, broken pin shafts between 36 mm and 6 mm in length. The longest of these is tapered and expanding at the top. It is possible it could have been a pin for one of the small penannular brooches. It constrasts with the more usual cast pins such



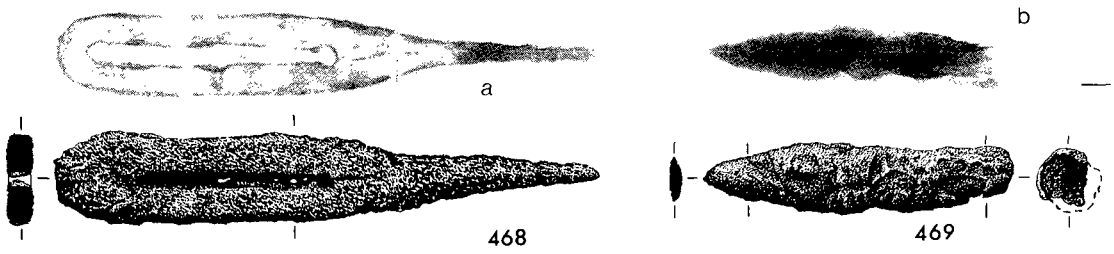
ILL 26 : Bronze objects. Scale 1/2

as *418* and *419*. The other fragments (*426:* Ill 39, *464, 465*) are too small for conclusions to be drawn; they are rectangular in section. All these are little more than scraps of metal, which had probably been discarded as had the mould and crucible fragments amongst which they were found. However *458* (Ill 26) must have broken off an artifact. It is a fragment of a sheet of bronze plating roughly diamond shaped about 40 mm by 20 mm with a small solid square angled hook formed by a rivet

in the centre. *454b* (Ill 26), a small bar only 43 mm long, pointed at both ends and with rough surfaces, fits in no particular category. An unstratified find *454a* (Ill 26) is a similar bar, although at 140 mm much longer, narrowing at each end with the same type of deliberately roughened surface.

IRON

Evidence of iron-working was apparent from small quantities of iron slag found principally in Zone 5; a small number of worked iron fragments, too corroded to be identifiable, were scattered amongst debris from all the Pictish zones with the exception of Zone 2. Only two pieces from the Pictish horizon have survived in recognisable form. *469* appears to be a socketed spear-head, 80 mm long, the major part of the socket broken off (Ill 27); it resembles a type of spear-head from Dunadd (Craw 1930, fig 5: 38) but is too corroded to make a certain comparison. *471* (Ill 41, 41x), a socket with pointed end, is incomplete; no impression can be formed of the tool or weapon of which it was once a part.



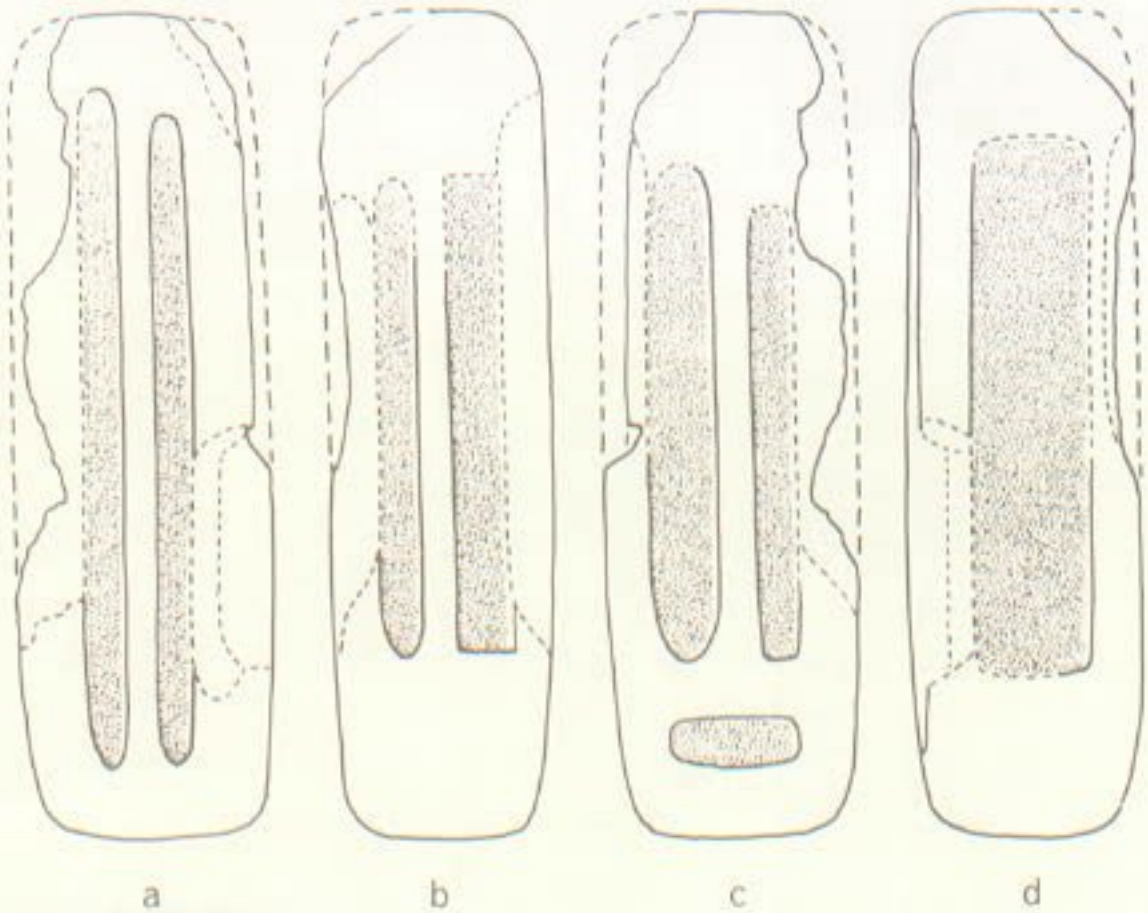
ILL 27 : Spearhead 469 and iron implement 468. Scale 1/2

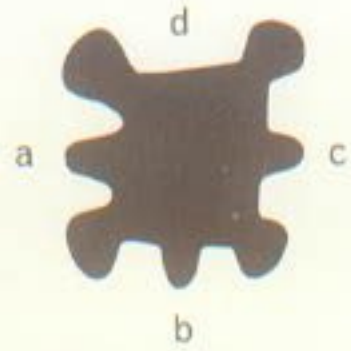
Finally, *468* (Ill 27), an unstratified find from Area II, is of such a distinctive type and one with such a wide distribution, not only in Pictish territory but also from Irish and Scottish sites, that it seems justifiable to place it with the pre-Norse finds. It is a slotted pointed tool, made, as are all the others, from a narrow flat plate ending in a long point; such plates vary in length from 87 mm to 150 mm. An X-ray photograph of the Birsay example revealed hitherto unknown details of the slot and show it to be a more complicated implement than had been realised. The slot is 74 mm in length, 5 mm in width at the upper end tapering gradually to 4 mm at the bottom; the botton is ogival in shape, a little more than halfway down two opposing curves have been cut in the sides of the slot to form a circle and at the bottom it expands slightly to form another circle. The long point could have been fitted into a socketed handle. Hencken (1938, 53) suggested that they could be connected with the making of some coarse fabric, such as rush matting. The X-ray of the Birsay tool has made known details of its construction but makes its function no clearer.

Parallels have been found, for example in Ireland where there were three from Cahercommaun (Hencken 1938, 53, fig 32), one from Lagore Crannog with a suggested date of 8th to 10th century (Hencken 1950, 118), two from Oldcourt in County Cork (Murphy 1961, 88, fig 5: 14 and 15) and another from Carraig Aille (O'Ríordáin 1949, 78, fig 10: 343). From a Scottish area, no less than eight have come from Dunadd (Christison and Anderson 1905, 318, fig 53).

LEAD

There was only one fragment of lead, *507* (Ill 53), a ferrule formed from a strip 4 mm wide bent into a circle with an eyelet hole at each end.





0 100 mm

ILL. 28 : Stone bar-moulds

STONE

Stone moulds for metal bars (Ill 28)

The majority of the few stone artifacts from the Pictish horizon were found in Zone 1. Two were connected with metal-working. *570* is a fragment of a mould of flaggy sandstone, 92 mm long, with one side and one end broken off, leaving only part of a matrix for a wide bar. *573* is of fine-grained sandstone, 82 mm in length, but only part has survived. On one side is the matrix for a bar and on the other the matrix for a circular disc. A somewhat similar mould to this comes from Dunadd, but with a matrix for a smaller disc (Christison and Anderson 1905, fig 34). *572,* a similar sandstone mould from Area III, is 38 mm long. It is also incomplete, part of the matrices for one wide and one narrow bar remaining.

Spindle whorls and discs (Ill 43)

Several possible spindle-whorls were found in the Pictish horizon. Two are dome shaped; *524* is of siltstone, and *525* is of laminated sandstone. *545* is part of a flat disc of tuffaceous sandstone with part of a large central perforation remaining. *536* is a shallow sandstone disc, probably natural, with a small central perforation. *523*, an unstratified dome shaped disc, with rudimentary borings on either side, may be an unfinished spindle whorl.

Porphyry or Verde Antico

608 is a fragment of dark green porphyry. When it was found near the well it measured approximately 36 mm by 15 mm by 110 mm in section, but it has now been broken into three pieces. Both sides have been dressed and polished. Quite a number of fragments of porphyry have come from other sites in Scotland including St Ninian's Isle (Small et al 1973, 31-2), Hunday in Orkney (Nat Mus Antiq, Scotland: AL 51), Moorland Moor, Caithness (Nat Mus Antiq, Scotland: GJ 193) and Balmerino, Fife, (Nat Mus Antiq, Scotland: NX 512). It has been suggested that such pieces were brought to Scotland by pilgrims (Stevenson, pers comm).

GLASS: A REPORT BY JOHN HUNTER

Vessel fragments

The vessel fragments are those which might be expected in NW European contexts of the 8th and 9th centuries and possibly slightly earlier. Few can be assigned with any certainty to specific vessel types. Nevertheless certain characteristics are worthy of comment and can be paralleled elsewhere, notably in Scandinavia. Glass in British contexts is rare in the Christian era and the material from Birsay is therefore of some importance.

Of the eight vessel fragments, *635* is a light blue body fragment decorated with an applied filigree rod containing an opaque white spiral. It is from a particularly rare group the distribution of which has been discussed by Holmquist (Holmquist and Arrhenius 1964, 251-6). There is a strong Scandinavian frequency now supplemented by British examples from Whitby, North Yorkshire (Peers and Radford 1943), Saxon Southampton (Hunter 1980) and Repton, St Wystan (Hunter forthcoming: b). They reflect a high degree of technical expertise and must be considered to be among the best quality vessels available in the period.

A second body fragment, *623*, also light blue decorated with an applied rod wound with a fine opaque white trail is of similar style although the technique of manufacture is different. Here the trail is wound on the exterior of the rod and not within as with filigree glass proper. Many of the Scandinavian filigree vessels are also decorated with horizontal opaque yellow trailing. It is conceivable that the Birsay fragment *631*, decorated with marvered opaque yellow trails, may also belong to a filigree decorated vessel.

The opaque red body fragment *633*, with colouring formed by layering of light and dark red giving a streaked effect, is perhaps the most remarkable in colouring terms. A similar example is known form Valsgärde, Sweden (Arwidsson 1942, 70). Opaque red glass is rare and a particularly fine example from Repton, St Wystan has been interpreted as possibly belonging to a lamp (Hunter

forthcoming: b). Again the Birsay fragment is evidence of a high quality product. More common is the vessel represented by *634*, a body fragment from a mould-blown vessel, probably from a small squat jar of the type illustrated by Harden from Barfriston, Kent (Harden 1956, fig 25: VIII). This is probably the earliest type represented and may be dated to the 7th century.

Only one rim fragment, *636*, appears in the material and was recovered from below the paving in Zone 4 phase a. The rim is rounded, thickened and slightly out-turned. This form is common to many small vessel types of the period and although in poor condition can be hesitantly ascribed to a later form of palm cup.

Window glass

Perhaps the most remarkable fragments from the site are the three examples of window glass. One, *641*, is a dark green but badly weathered rectangular quarry, grozed on three edges and chipped at one corner. This was discovered in the cemetery near the apse and may have belonged to the church.

The other two are earlier. Window glass of this period is only known from a few sites in Britain, notably the monastic establishments at Monkwearmouth and Jarrow, Repton, St Wystan and Winchester (Hunter forthcoming: a). The blue fragment *640* with the curved grozed edge indicates that the original quarry was part of a window mosaic. The quarry shape of the dark yellow fragment *639* is unknown. It would seem unlikely that either belonged to a building on the site.

Miscellaneous glass

Several of the glass fragments probably belonged to decorative mounts. Three of these are likely to have been semi-spherical in form. *642* was manufactured using layers of opaque red and black glass paste, the outer surface being smoothed and decorated with opaque white marvered trails set in loops. *646* and *647* are similarly decorated but on a surface of black and opaque blue respectively. *644* is in the form of a square mount with flattened base and right-angled corners. The colour is opaque blue with opaque white marvering on the surface. There is some evidence that these items were manufactured around a core of re-used glass. Similar fragments have been found at Kaupang, Norway and I am grateful to Mrs C Blindheim for kindly showing them to me. A complete example has recently been discovered at Dundurn, Scotland and I am grateful to Professor L Alcock for bringing this to my attention.

The opaque light blue cube *645*, slightly damaged on one face, may have belonged to a larger mosaic decoration form. These are known to have existed on the continent during the Carolingian era and several found their way to Scandinavia. Some are known to have been partially covered with gold foil and their significance has been discussed by Lundstrøm (1971, 52-68).

Equally interesting is the square garnet mount *648* with the two chamfered edges. Miss J Cronyn of the University of Durham kindly examined the mount microscopically to determine its material. This undoubtedly belonged to an item of cloisonné jewellery and is sufficiently thin to have merited the use of a gold foil underlay. It is a significant item in the assemblage and one which strongly points towards the re-use of materials on Birsay. It is unlikely that this type of jewellery was manufactured on the site, or indeed that any of the vessel fragments reached the site in complete vessel form. Apart from the rectangular window quarry all the items were discovered in close proximity and represent a collection brought together for a specific purpose. The common factor is colour and brightness. Their relationship to vessels, windows or specific objects is to some extent irrelevant. In effect they constitute a type of hoard and the assemblage can be dated accordingly. Their function was seemingly in re-use and it would seem most likely that they were brought together for melting down to make beads, inlays for metalwork or mosaics. The latter may be evidenced by the waster *643*, one end rounded with the other cut showing an oval section, the outer surface wound with firm opaque white marvered trail, probably from a rod used in the production of mosaic or mounts. Such processes have already been suggested at Dinas Powys, Wales (Alcock 1963, 52), at Helgö, Sweden (Holmquist and Arrhenius 1964, 243-60) and more recently at Ribe, Denmark (Bencard 1973, 42). Trade in brightly coloured fragments would seem to have been an accepted commercial routine across NW Europe. The garnet which is easily mistaken for glass seems to have been included accidentally.

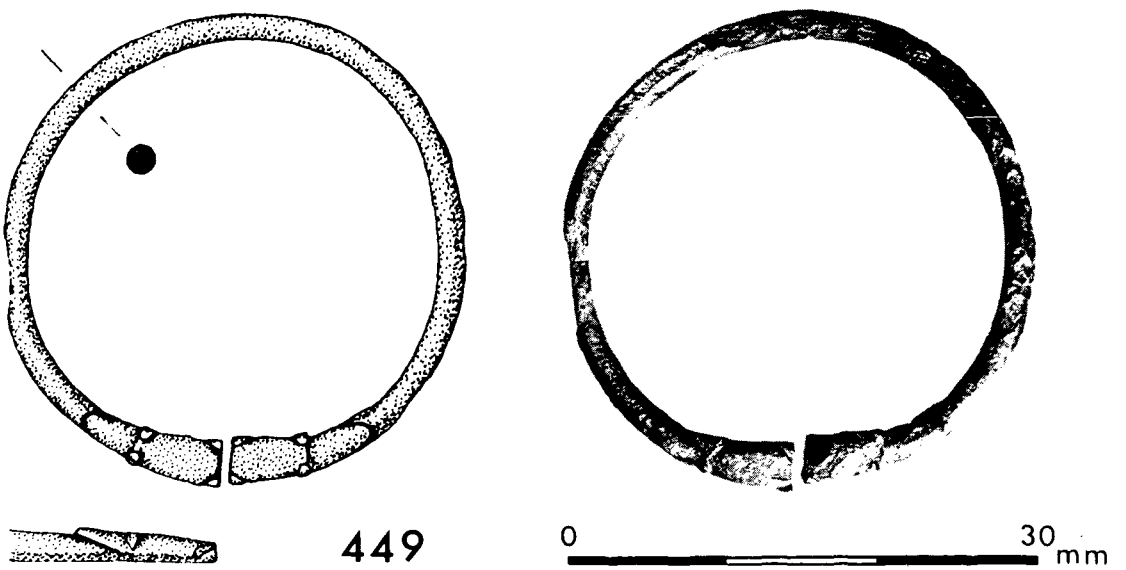
ISOLATED PICTISH FINDS FROM BELOW LOWER NORSE HORIZON

There are two objects, *509* and *449* found in 1956 below the lower Norse horizon in areas where the Pictish occupation was not fully excavated. They cannot be attributed with certainty to the bronze-working phase of the Pictish occupation, and indeed seem to be earlier and have therefore been treated separately.

BRONZE

Penannular brooch (Ill 29)

449 which was below the paving of Room VI, was excavated in 1956; it is a small bronze penannular brooch, 22 mm across the hoop, the hoop showing wear half way up one side, presumably from its pin. The terminals are zoomorphic, belonging to Mrs Fowler's Class F, (Fowler 1960, 151, fig 1), which may date to the 4th and 5th centuries AD (Fowler 1964, 103-7. Close-Brooks 1975, 227). A brooch which is a close parallel has been found in an excavation at The Howe, near Stromness (Hedges and Bell 1980, 50-1). It was found in a context which the authors related to a Pictish building succeeding the dilapidation of the adjacent broch. It is in excellent condition. It is larger, at 30 mm across the hoop, than the Birsay example.



ILL 29 : Bronze penannular brooch 449

LEAD

Disc (Ill 30)

A lead disc, *509* (Curle 1974, 301-7, pl 24), was excavated in 1956 from below Room IV of the lower Norse horizon. It is 50 mm in diameter by 5 mm in section, decorated on one side with an engraved spiral pattern. Scratches and surface irregularities give the impression that the design has been poorly executed but it might even have been a trial piece.The centre point for a compass is clearly visible

however the imperfections could have been caused solely by later abrasions. The design is a version in negative form of the trumpet spiral pattern known from a number of varying sources, in MSS for example on the spiral page of the *Book of Durrow,* in champlevé enamel on the escutcheons of hanging bowls such as that from Hitchen (Henry 1936, pl 32), in impressed silver on the Moylough

ILL 30 : Decorated lead disc. Scale 1/1 (a) Birsay disc, negative (b) Birsay disc, positive (c) hanging-bowl mount from Hitchin

belt-shrine (O'Kelly 1965, pl 19a) and nearer at hand, also in impressed silver on the disc attached to the omphalos of the St Ninian's Isle hanging bowl No 8 (Small et al 1973, 56, pl 25b). The ornamentation of the design on the Birsay disc has been considerably simplified from the classic versions cited above; the trumpet endings have been omitted and the simple pelta form substituted, and the three leaved twigs around the circumference have been reduced in each case to single leaves. It could not have been used directly as a pattern for a two piece mould, being a negative, but could have been used for cire-perdue or as a die or stamp for impressed silver, or in view of the scratches and surface irregularities it could have been a trial piece. It has been discussed in detail (Curle 1974, 301-7, pl 24) and recently Professor Alcock has pointed out that a disc from such a pattern could have been found anywhere in Britain in the 6th, 7th or even 8th centuries.

PICTISH FINDS FROM NORSE LAYERS

There was a significant number of Pictish finds found in the lower Norse horizon, and one from a room in the middle Norse horizon, whereas there were no diagnostically Norse finds from the Pictish zones. The implications will be discussed later.

BONE AND ANTLER

Small hipped pins (Ill 7)

There were seventeen small hipped pins scattered through the various dwellings of the lower Norse horizon and two hipped pins, *4, 42,* from the middle Norse horizon. Five others were from House Sites in Area III.

Pins with Iron shanks and globular heads (Ill 38)

Four pins of this type were found at Birsay. *259, 260* and *261*, came from the lower Norse horizon, Room VII and Passage 1 and only *262* was from the Pictish horizon, but it is generally accepted (Stevenson 1955, 292-3) that they are a native type.

Single-sided combs: high-backed (Ill 9)

The high-backed combs are undoubtedly a native type. Of the seven examples found, four (*217, 218, 220, 221*) were from the lower Norse horizon. They are discussed fully with the Pictish examples.

BRONZE

Pin (Ill 39)

418 a small unmistakably Pictish pin, with spatulate flattened head 30 mm long, was found on the pavement of Room VII in the lower Norse horizon.

Brooch

A Pictish penannular brooch (*452*) and the fragment of a similar terminal of another (*453*) were both found in the lower Norse horizon. *452* is the same type of brooch as that shown in the matrix of mould *298* and was probably cast on the Brough. Its discovery in the lower Norse horizon is discussed below.

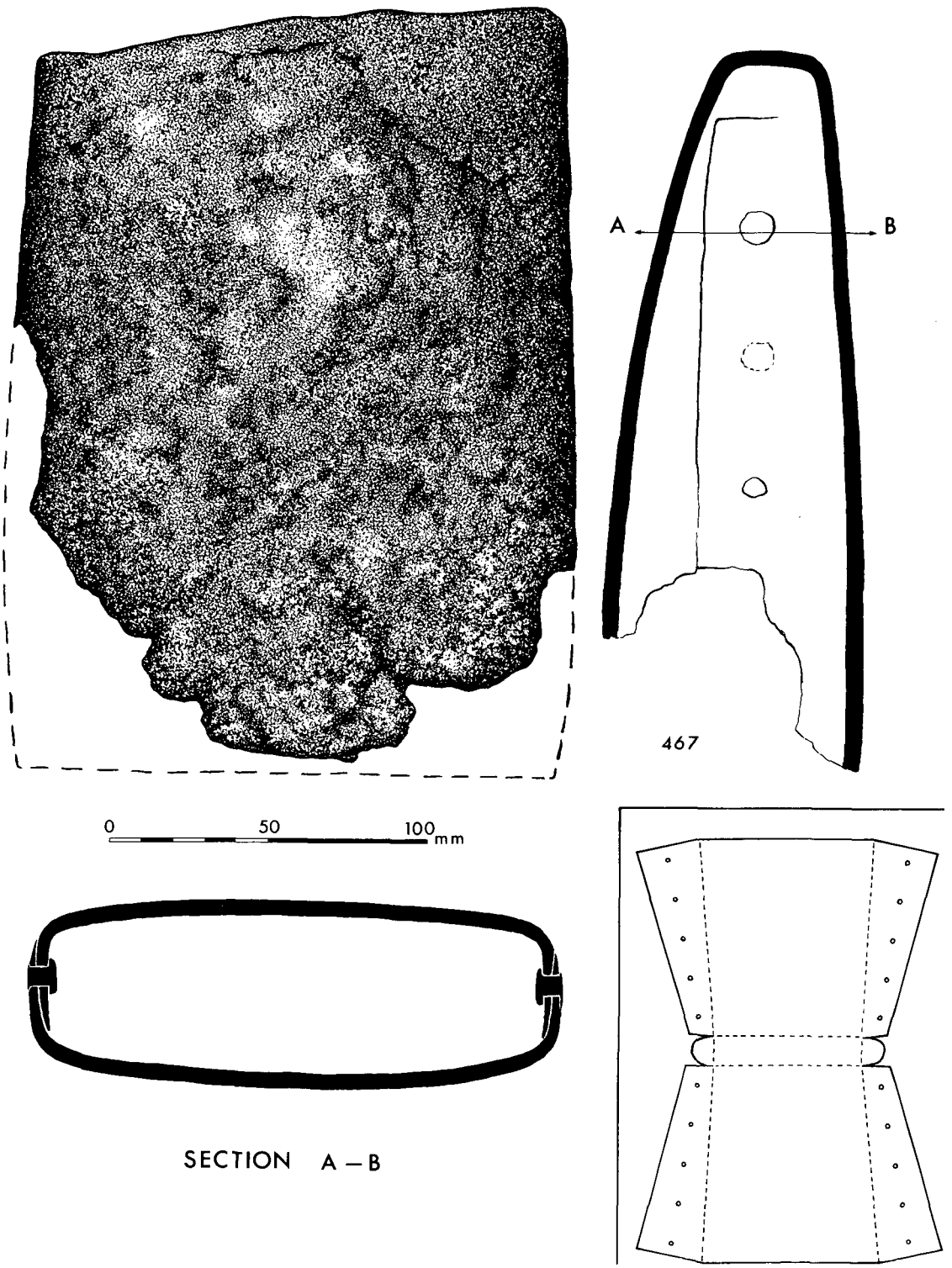
IRON

Bell (Ill 31)

467 another interesting find was the remains of a bell in the ashes of the sunk hearth of Room VI in the lower Norse horizon. Corrosion was such that it was not possible to determine exactly how it had been constructed. Other bells of similar appearance were made from a single sheet of iron, bent round into a quadrilateral form with the overlapping edges joined by riveting; possible rivet holes were visible on the Birsay bell and it was probably fashioned in the same manner. The estimated measurements are 255 mm in height by 175 mm in width, with a breadth of 38 mm across the top and 178 mm across the bottom.

During cleaning and restoration, traces of copper corrosion were discovered. These corrosion products give the impression of being sandwiched between two layers of iron, but preliminary X-ray fluorescence and microscopic analyses show that the inner crust of this sandwich is iron corrosion rather than basic metal. The bell therefore appears to have had an internal bronze coating, but it is not yet possible to say whether the coating was originally over the outer surface as well.

Other examples of iron bells coated on both inner and outer surfaces have been found. Originating with the early hand-bells of Ireland, hand-bells of this type were not uncommon in Scotland and are said to have been in use until the 12th century. Joseph Anderson (1881, 158, fig 54) lists a number of them including one found buried at the Knowe of Saverough (Saever Howe) less than two kilometres from the Brough of Birsay village. A bell (Ill 31a) in almost perfect condition and approximately the same size was found in S Scotland near Kelso in 1882 (Smith 1882, 227-8); it was of iron with



ILL 31 : Iron bell 467 with a diagram to show the suggested pattern for cutting and constructing the bell (not to scale)

ILL 31a : Iron bell from Kelso

some of its original coating of bronze still adhering, and was fastened down each side with three iron flat-headed rivets. As was usual there was no clapper but a rounded handle of thinner iron plate had been pushed through each side of the top of the bell and strongly riveted.

PICTISH FIND FROM THE CEMETERY

The only characteristically Pictish find from Area 1 was the symbol stone and it is discussed later with other finds from the cemetery.