Dunragit the Prehistoric Heart of Galloway

Appendix 13:

Jet Spacer-plate Necklaces and Spacer Bracelet from East Challoch Farm

By

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Introduction

Two complete early Bronze Age spacer-plate necklaces, plus one spacer-plate bracelet, all of jet, were discovered in two stone-lined graves at East Challoch Farm. Grave 023 at Site 16 contained a three-strand necklace (Necklace 1), while the sub-cairn grave 177 at Site 17 contained a necklace with a maximum of seven strands (Necklace 2), plus a two-strand bracelet. None of the plates was decorated. All the components were examined microscopically at magnifications up to x50 by the author, and were X-rayed by Gretel Evans (AOC Archaeology) before and after being cleaned and conserved[1]. In addition, one spacer plate from Necklace 1 (Sp2, SF 22) and one fusiform bead from Necklace 2 (SF 71) were analysed by Dr Lore Troalen (NMS) using X-ray fluorescence spectrometry (XRF), to determine their elemental composition. Each piece of jewellery will be described first, then the overall significance of, and *comparanda* for, both of the necklaces and the bracelet will be discussed.

Necklace 1 From Site 16, Grave 023 (Plates 1, 3-11, Figure 1)

The 31 components of this three-strand necklace comprise two triangular terminal plates, six spacer plates and 23 fusiform beads, of which two beads had probably been used as toggle-like fasteners; the other beads were arranged with a single row between each of the plates (Plate 1). The X-ray image, annotated with the SF numbers of each of the components, is shown as Plate 2, and Figure 1 shows drawings of the plates. The necklace was found at the broader, south-east end of the grave (Plate 3), partly lying on one of the stone slabs forming the base of the grave (with a thin layer of sediment between the necklace and the stone), not far from the Food Vessel. The latter (Plate 3.1, 3.2) will originally have been placed upright, but it must subsequently have toppled over. Just under half of the necklace - the right-hand side when viewed from above, but the left-hand side as worn - was found in an arc reflecting its original curvature as laid flat on the base of the grave, with the plates in their original respective positions, and some of the beads only slightly out of position (Plate 3.3). The third spacer plate dipped down, and two further spacer plates and several beads were found at a slightly lower level. Spacer plate 5 (SF 14) was found on its edge, and its position is marked in Plate 3.2 and 3.3. The sixth spacer plate, the left terminal plate and seven beads were found among the spoil from the grave fill in the same general area, having initially not been spotted; their precise positions were not recorded in detail. No trace of the necklace thread, which must have been of an organic material, was found, despite careful searching.

Plate 1: Necklace 1, re-strung, annotated to identify the terminals (L – left, as viewed from the front; R – right) and spacer plate numbers. Note that it is likely that the fairly uncracked surfaces of Sp 2 and Sp 3 had actually been the undersides of these plates rather than the upper (outer) surfaces, as shown here. Photo: Alison Sheridan.

[1] The conservation work involved applying consolidant to many of the beads and plates; this has given them a sheen over and above that created by the original polishing of the components.

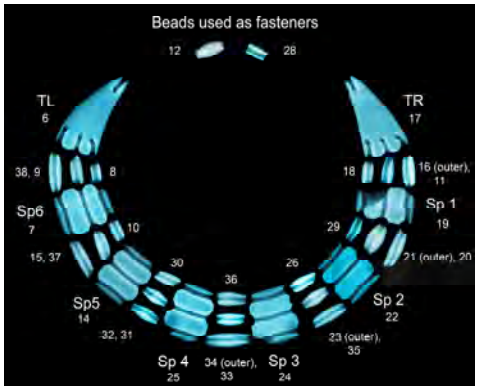

Plate 2: X-ray image of the beads and plates in Necklace 1, annotated with the SF numbers of the components. The overall shape difference between this and Plate 1 is due to the fact that this image is made up of X-rays of the individual components, arranged with gaps between the beads and plates. X-ray: Gretel Evans; image composition: Alison Sheridan

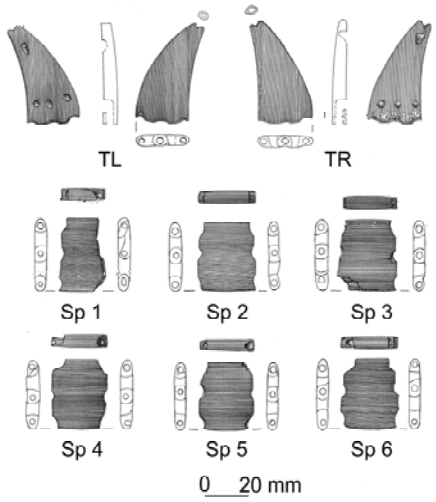

Figure 1: Necklace 1 plates. Drawing by Marion O'Neil

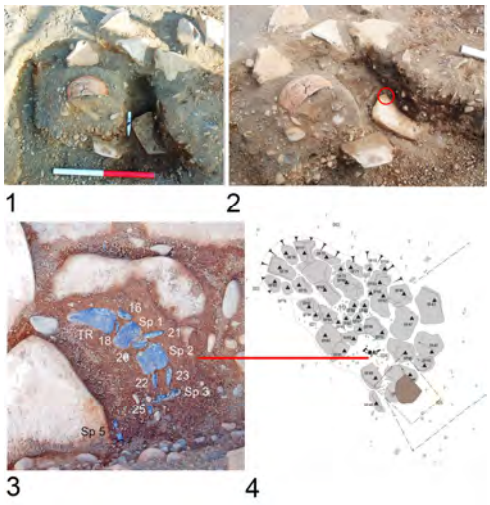

Plate 3: Necklace 1 components in situ: 1. The south east end of Grave 023 at an early stage in the excavation, the Food Vessel can be seen on its side, and bead SF 11 is on the find label; 2. Detail showing (ringed) the findspot positions of Sp 5 (SF 14, on its edge) and adjacent fusiform bead SF 15 in relation to the Food Vessel; 3. The arc of necklace components. Note the position of Sp 5, towards the bottom left of the image. 4. Plan of the grave, showing the relative positions of the Food Vessel and the arc of the necklace. Photos and plan: GUARD

The various components are described below (with all dimensions in mm, and maximum lengths (L) widths (W) thicknesses (Th), and diameter (D) given). More detailed descriptions of individual components are available in the site archive.

Terminal Plates (Plates 1, 2, 4 and 5, 1)

These are both undecorated, and both show heavy thread-wear and bead-on-plate wear. Each had been perforated at its broad and narrow ends using the 'elbow-boring' technique, with one end of the perforation drilled from the end of the plate and the other drilled from the underside at a right-angle (Plate 2, 4 and 5, Figure 1). Each has a single perforation at the narrow, apex end and three perforations at the wide end. The pair is closely matched in size and shape. The designation 'TR' and 'TL' (right-hand and left-hand terminal respectively) relates to the ends of the necklace when viewed from above (e.g. on Plate 1); as noted above, the 'TR' would have been at the left-hand end of the necklace when worn.

TR (SF 17): L 49.9 mm; W 26.2 mm; Th 6.8 mm; perforation ext. D range 2.6-4.1 mm, narrowing to c. 2 mm. Roughly triangular, with the outer edge convex and the inner edge slightly concave; rectangular in cross-section, with rounded edges. There is heavy wear to most of the holes. At the apex, the thread had worn a V-notch into the hole and had also pulled away part of the surface between the ends of the hole on the underside, leaving a narrow rectangular gap (Plate 4.1). The thread had also worn a groove at the lower edge of that hole, and another groove extending towards it from the middle hole at the broader end of the plate (Plate 4.2, 4.3). Smoothing of part of the edges of the other two holes on the underside (Plate 4.2, 4.3) shows how the strand-groups converged as they entered the apex hole. Along the lower edge of the plate, hollows had been ground by the pressure of the beads, and on the underside this pressure had detached a chip from the outermost hole (Plate 4.2). The plate had been polished to a high sheen - slightly less so on the underside, where diagonal striations from the process of grinding and polishing are visible (Plate 4.3). There is also an old, worn flake scar on the inner edge near the apex, from where a flake had become detached during the manufacture process (Plate 4.1, top right). There is extensive criss-cross cracking, denser on the upper (outer) surface (Plate 4).

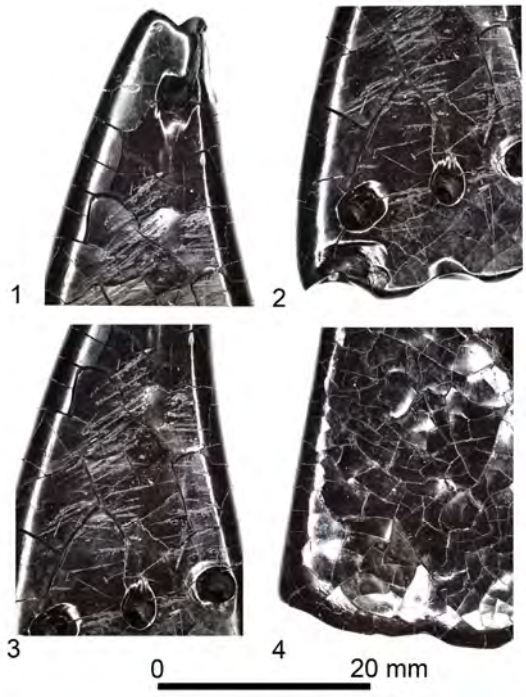

Plate 4: Microscope images of Necklace 1 right-hand terminal (SF 17): 1. Underside towards apex, showing marked thread-wear to hole and ancient chip scar to right. 2. Underside at broader end, showing thread- and bead-wear. 3. Middle section of underside, showing grinding striations. 4. Upper surface, showing extensive criss-cross cracking. Images: Alison Sheridan

TL (SF 6): L 50.9 mm; W 25.4 mm; Th 6.3 mm; external diameter range of the perforations 2.2-4 mm, narrowing to c. 2 mm. Roughly triangular, with the outer edge markedly convex and the inner edge more concave than on TR; rectangular in cross-section, with rounded edges. Medium to heavy thread- and bead-wear to all the holes, with a V-notch having been worn into the hole at the apex by the thread. On the underside there is a very shallow thread-hollow that had been worn between the apical perforation and the middle perforation at the broader end. On the upper (outer) surface, thread-pull had worn a notch into one of the holes (Plate 5, left and bottom). Along the lower edge, as the deep indentations worn by the beads can be clearly seen (Plate 5, bottom). There are a couple of faint striations between two of the perforations along the lower edge; these derive from the shaping of the edge through grinding. Both the upper and lower surfaces had been polished to a high sheen. There is extensive criss-cross cracking all over the surface, with some cupping on the underside, and one fragment has become detached.

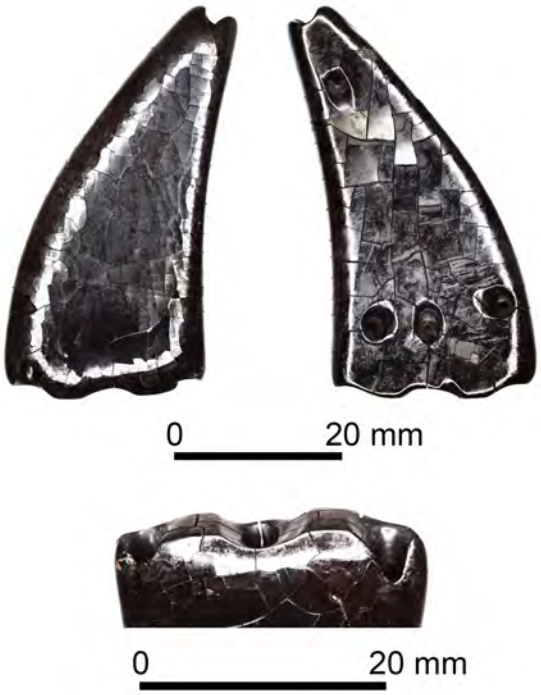

Plate 5: Microscope images of Necklace 1 left-hand terminal (SF 6): left, upper side; right: underside; bottom: oblique view of the perforated edge, showing marked bead-wear hollows and thread-wear notch. Images: Alison Sheridan

Spacer Plates (Figure 1, 6-10)

These are all undecorated, and all have three lateral through-perforations drilled from both ends of the plate - as is clearly visible on the X-ray (Plate 2). The unperforated edges are rounded, and the perforated edges had been squared off; in lateral cross-section they are roughly rectangular. All show heavy signs of wear, with indentations along the perforated edges where the ends of beads had ground against the plates. The numbering of the plates is shown on Plate 1.

Sp 1 (SF 19; Plates 1-2, Plate 3): L (unperforated edge to unperforated edge) 33.8 mm; W c. 20.2 mm; Th 6.8 mm; perforation ext. D range 5.3–7.8 mm, narrowing to c. 3.4 mm further down the holes. Relatively narrow and minimally trapezoidal in plan; the unperforated edges are minimally convex. Much of the underside is missing, probably as a result of heavy pressure from one or two adjacent beads. There may be some thread-pull wear as well as bead-on-plate wear at one point. Both surfaces have a medium sheen and there is fine hairline criss-cross cracking on the underside and less dense criss-cross cracking on the upper side.

Sp 2 (SF 22; Plates 1, 2, 6, Figure1): L 30.8 mm; W 23.1 mm; Th 7.9 mm; perforation ext. D range 4.5-7.1 mm, narrowing to c. 2.5 mm. Sub-rectangular in plan, with minimally convex unperforated edges. There is a large flake scar extending from the outermost hole on one side, probably caused

by bead pressure. There are a few very faint diagonal striations on each of the perforated edges, from where they were ground to be flat and straight. The whole of the exterior, except for the perforated edges, had probably been polished to a high sheen, but on the virtually uncracked surface (Plate 6, lower) it survives to a lower sheen than on the other side. There is extensive criss-cross cracking (and some cupping of the surface between the cracks) over the shinier surface; two tiny flakes had become detached prior to conservation. Note: while the necklace has been re-strung with the uncracked side uppermost, it seems likely, to judge from Plate 3.3, that this had actually been the underside of the plate.

Plate 6: Microscope images of Necklace 1 spacer plate Sp 2 (SF 22). Note: it is unclear whether the extensively-cracked surface had been the upper (outer) surface; it may well have been. Images: Alison Sheridan

Sp 3 (SF 24; Figure 1, Plate 7): L 31.3 mm; W 26.6 mm; Th 6.8 mm; perforation ext. D range 4.5-5.8 mm, narrowing to c. 2.7 mm. This is very slightly trapezoidal in plan, its outer edge is wider than its inner edge; the unperforated edges are minimally convex. There is a large flake scar on the outermost hole on one side - the side with a higher sheen and with criss-cross cracking. A sizeable chunk is missing from the other side and edge at the other end of the same perforation. This damage is almost certainly due to bead-on-plate pressure. Diagonal grinding striations are visible on both of the perforated edges. One surface has a higher sheen than the other; this has extensive criss-cross cracking, in contrast to the other surface which is duller and has more superficial cracking. As with Sp2, in the re-strung necklace this less cracked side has been placed uppermost, although it may well be that it had originally been the underside.

Plate 7: Microscope images of Necklace 1 spacer plate Sp 3 (SF 24). Note: it is unclear whether the extensively-cracked surface had been the upper (outer) surface; it may well have been. Images: Alison Sheridan

Sp 4 (SF 25; Figure 1, Plate 8): L 31.7 mm; W 24.9 mm; Th 6.6 mm; perforation ext. D range 5.9-6.7 mm, narrowing to c. 3 mm. Minimally trapezoidal in plan, with fairly straight unperforated edges. A large flake scar extends from one end of the outermost hole on the underside (assuming that the underside is the side with the slightly lower sheen) and there is a smaller flake scar at one end of the middle perforation on the upper surface. There are hints of very faint striations on one of the perforated edges. One side, presumably the uppermost side, has a slightly higher sheen. There is criss-cross cracking over all of the surfaces, but it is denser on the presumed upper side.

Plate 8: Microscope images of Necklace 1 spacer plate Sp 4 (SF 25). Images: Alison Sheridan

Sp 5 (SF 14; Figure 1, Plate 9): L 30.4 mm; W 25.1 mm; Th 6.6 mm; perforation ext. D range 3.75-6.3 mm, narrowing to c. 2.5 mm. Roughly rectangular, with the outermost unperforated edge being minimally convex. Bead-wear includes chipping to one end of a middle hole on one side (presumed to be the underside). One side, assumed to be the upper side, has a slightly higher sheen than the other. Hairline criss-cross cracking throughout.

Plate 9: Microscope images of Necklace 1 spacer plate Sp 5 (SF 14). Images: Alison Sheridan

Sp 6 (SF 7; Figure 1, Plate 10): L 30.1 mm; W 25.5 mm; Th 6.5 mm; perforation ext. D range 5.5-7.4 mm, narrowing to c. 3.3 mm. Slightly trapezoidal in plan, with the inner unperforated edge fairly straight and the exterior unperforated edge minimally convex. Faint grinding striations along one perforated edge. High sheen on both surfaces and extensive criss-cross cracking on what is assumed to be the upper surface; the underside has fine linear cracking and a little criss-cross cracking. Two tiny flakes and crumbs have become detached as a result of this cracking.

Plate 10: Microscope images of Necklace 1 spacer plate Sp 6 (SF 7). Images: Alison Sheridan

Beads (Plates 1, 2, 11)

Twenty-three fusiform and sub-cylindrical beads, ranging in length from 9.5 mm (SF 8) to 25.5 mm (SF 34), were found (Plates 1 and 11). Given that the necklace had had three strands, with one row of beads between each pair of plates, only 21 beads would have been required to fill the spaces between the plates, with seven beads on each of the three strands. The other two beads probably served as part of the mechanism for fastening the necklace since, unlike the necklace in grave 177, there was no triangular fastener.

The original positions of most of the beads can be determined from the positions in which they were found, and from this it is clear that the beads increased in length from the innermost strand to the outermost strand and also, to a certain extent, from the ends of the necklace towards its centre, thereby helping to create the necklace's crescentic shape. While the positioning of some of the beads in the re-strung necklace is necessarily conjectural (Plate 1), and in fact the position of bead SF 28 should be switched with that of bead 8 (they were accidentally positioned incorrectly during the re-stringing process), it is nevertheless believed that the overall pattern with regard to the relative sizes of the beads has been correctly recreated.

The beads are mostly slender fusiform to roughly cylindrical in shape, and many have marked bead-on-plate wear to their ends, where the edges have been ground into smooth, domed shapes (e.g. Plate 11.1-3). In several cases straight ends have been worn into sloping ends (e.g. Plate 11.1, 3, 4 left). Thread-pull grooving and/or chipping (the latter either from thread-pull or from bead-on-plate tension) is present on several beads (e.g. Plate 11.2 left end, 11.4 right). Beads 11 and 36 (Plate 11.5) are incomplete and it may be that the missing parts had broken off through the pressure of the tight stringing; their fracture surfaces are worn. Manufacturing traces are scarce, with faint grinding striations present on only three beads (SF 11, SF 32 and SF 31: Plate 11.6 right) and very faint traces of longitudinal faceting (from the original shaping of the bead) being visible on SF 11 and SF 31 (Plate 11.6 right). The holes had been drilled from both ends of the beads, as is clear from the X-ray image (Plate 2), and in most cases any rilling - internal ridging from the rotation of the drill - had been worn smooth (e.g. Plate 11.4 right). Faint traces of broad rilling can be detected in the holes of beads SF 15 and 3 (Plate 11.3, 11.6); the views down these holes also show how the drilling had been undertaken from each end of the bead. Bead SF 23 has two old shallow flake scars on its side, probably detached during manufacture; and bead SF 9 has a tiny patch of 'orange peel surface', indicating where the raw material was cut with a knife, causing tiny circular spalls to pop off. The beads had been polished to a medium to brilliant sheen. Surface degradation, in the form of hairline criss-cross cracking, was noted on several beads (e.g. Plate 11.1, 3, 6 left).

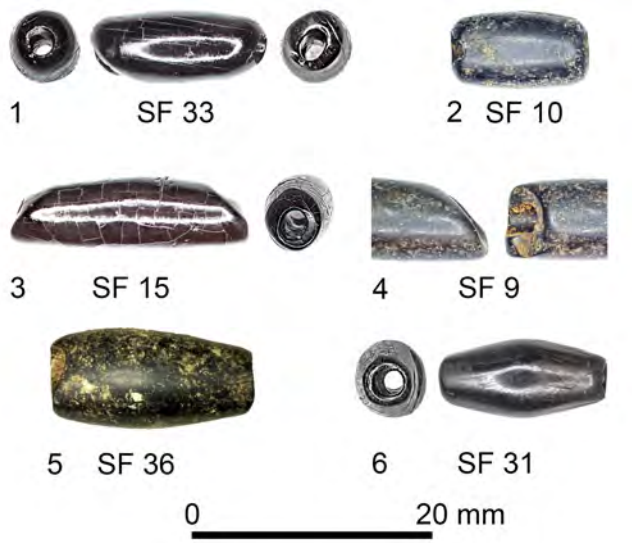

Plate 11: Microscope images of beads from Necklace 1: 1. SF 33; 2. SF 10; 3. SF 15; 4. SF 9 (end views only); 5. SF 36; 6. SF 31. Note: the photos of SF 9, 10 and 36 were taken prior to conservation cleaning of the beads. Images: Alison Sheridan

Material

The same raw material had been used to manufacture all the components in the necklace. This is a black material (showing as black to dark brown on bead SF 18), soft enough to shape relatively easily, which is warm to the touch and not 'stony' in appearance or feel. This, and the fact that it flakes with a conchoidal fracture and shows an 'orange peel' texture in the knife-cut area of one bead, all points towards the material being jet, and this was confirmed by the compositional analysis of one of the spacer plates (Sp 2) using X-ray fluorescence spectrometry by Dr Lore Troalen, National Museums Scotland. This showed the characteristic high zirconium, low iron signature of jet and the most likely source is the area around Whitby in North Yorkshire, the only substantial source of good quality jet in Britain. The cracking noted on most of the components is a feature observed on much other prehistoric jet jewellery (e.g. the early Bronze Age buttons from Rameldry Farm, Fife: Sheridan and Davis 2003) and it develops, seemingly inexorably, as the artefacts dry: upon initial discovery they do not appear to be cracked. This kind of jet has previously been referred to as 'soft jet' (e.g. in Woodward and Hunter 2015, chapter 7) but it differs from what gemmologists refer to as 'soft jet' insofar as the latter cracks relatively rapidly after artefact manufacture, whereas the archaeological finds appear to retain structural integrity over millennia until they are removed from their damp depositional micro-environment and dry out. As discussed in a recent publication on prehistoric jet jewellery (Sheridan 2017), the source of this specific kind of jet within the jet-bearing deposits of the Whitby area has not yet been located, but given the frequency with which it was used during the early Bronze Age and its general compositional similarity to 'hard jet', it is not to be doubted that it originates in the Whitby area. As regards the differential cracking of the 'front' and 'back' sides of Sp 2 and Sp 3: this is a feature that has been noted in several other jet spacer-plate necklaces (Sheridan 2017), and is yet to be understood fully. It is normally argued that the surface that had been in contact with the skin (or garment) may have taken in lipids that will have helped to prevent cracking, and if that is the case, then lengthy wear prior to the deposition of the necklace in the grave might account for this; but the phenomenon has not been noted for the other plates.

General Comments on the Necklace from Grave 023

Clearly a complete necklace is represented here and, to judge from the consistency in the design and manufacture of the components, their material and their patterns and degree of wear, it contains all of its original beads and plates, with no substitutions. The degree of wear noted on most of the components indicates not only that the necklace must have been worn for some considerable time before its burial, but also that it had been tightly strung, so that during wear the ends of the beads would have ground into the perforations of the spacer and terminal plates, and the pull from the thread left its mark on several of the beads and plates. As noted above, the thread must have been made from an organic material, of sufficient tensile strength to hold the components tightly together and narrow enough so that three strands could all pass thorough the holes in the terminal plates; sinew, linen, tree bast and certain plant roots are all candidates. The overall internal width of the necklace when worn is approximately 95–100 mm, and so when worn it will have lain fairly high on the neck; according to current necklace length terminology, it would count as a 'choker'. Its internal diameter is comparable to the width of a non-obese adult female neck – something that accords with other evidence indicating that jet spacer-plate necklaces were worn by females.

The position of the components in the grave strongly points towards the necklace having been placed there on its own, rather than having been worn on the corpse's neck at the time of burial. The well-preserved arc of plates and beads, with the outer surface of the plates uppermost, appears more regular than the usual pattern of plate and bead disposition where a necklace had been worn and the corpse had decayed *in situ* (as seen in grave 177, below): even without any bioturbation, usually the necklace does not retain its shape quite as closely as seen here, once the thread and the body have decayed. That the arc had continued is suggested by the position of Sp 5, found on its edge beside one of the slabs lining the floor of the grave (Plates 3.2, 3.3), and by the (slightly disturbed) positions of Sp 3 and Sp 4. Moreover, had the necklace been on the corpse, the position of the latter (probably lying on the right side, if female) would have had to be at a radically different orientation from that of the grave pit in order to produce the observed position

of the arc of plates and beads. Deposition of a necklace on its own is unusual: normally it appears that necklaces had been worn on the corpse.

Necklace 2, From Grave 177 (Plates 12-21)

As noted above, this comprises a triangular fastener, two terminal plates, four spacer plates and 108 fusiform beads; Plate 12 shows the necklace in its reconstructed form, while Plate 13 shows X-ray images of the components (annotated to show their SF numbers) and Figure 2 shows drawings of the fastener and plates. The components were found in a cluster near the northeast end of the grave pit (Plate 14), lying just above the stone slabs lining the pit, and with the beads and plates of the bracelet mixed in with those of the necklace. Plate 14.1-14.3 shows, the fastener (SF 67) and the two terminal plates (SF 68 and 100) were found close to each other; the upper pair of spacer plates (SF 69 and 103) were found nearby, with SF 69 lying on top of SF 103; and the lower pair of spacer plates (SF 70 and 82) were found a short distance away, their longer lower edges facing away from the other plates. There had clearly been some degree of post-depositional bioturbation, as shown, for example, in the fact that the lower, broader end of the right-hand terminal plate (as viewed from the front, as in Plate 12) is facing nearly 180 degrees away from that of the left terminal, SF 68. Nevertheless it is clear, from the disposition of the plates and beads, that the necklace must have been worn around the neck of the corpse, collapsing in on itself as the body decomposed. It is also clear that the deceased must have been buried lying on the right side. Aspects of the necklace's taphonomy are clear: the fact that the underside of the left-hand terminal plate (TL, SF 68) is visible in Plate 14.1-2 indicates that it, and the fastener, must have lain on the lower, right side of the neck and must have fallen away when the organic thread broke. Logically, it follows that the lower of the two Sp 1 plates, SF 103 (Sp 1 L), must have been on the same side of the necklace – although what one is seeing in Plate 14.3 is the upper surface of this spacer plate, not its underside, as is clear from the fact that the longest, outer edge is to the left. This is plausible as the plate will have lain on the collarbone, and as the body decomposed, it will have sunk down without being flipped over. By the same logic, the lower spacer plate SF 70 is also likely to have lain on the left side of the necklace (as viewed from the front), since its longer edge is to the left. Note: in the necklace reconstruction (Plates 12, 20, Figure 2) and in the description below, SF 70 is incorrectly presented as being on the other, right, side of the necklace, and SF 82 is presented as being on the left. This is because the necklace re-stringing was done before the detailed photographs and plans could be examined. This does not make any difference to the overall shape of the necklace as restrung, however.

Plate 12: Necklace 2, re-strung. Note that the left hand lower spacer plate will originally have been on the right side of the necklace (with its longer, leading edge to the outside), and vice versa. Photo: Alison Sheridan

Plate 13: X-ray images of the components of Necklace 2, with the SF numbers given. Note that SF 82 would originally have been Sp 2R, and SF 70 will originally have been Sp 2 L. The seven strands that run between the lower pair of spacer plates are laid out in straight lines, with '1' being the innermost strand and '7' the outermost, with the beads in their correct relative positions. X-rays by Gretel Evans; composition by Alison Sheridan

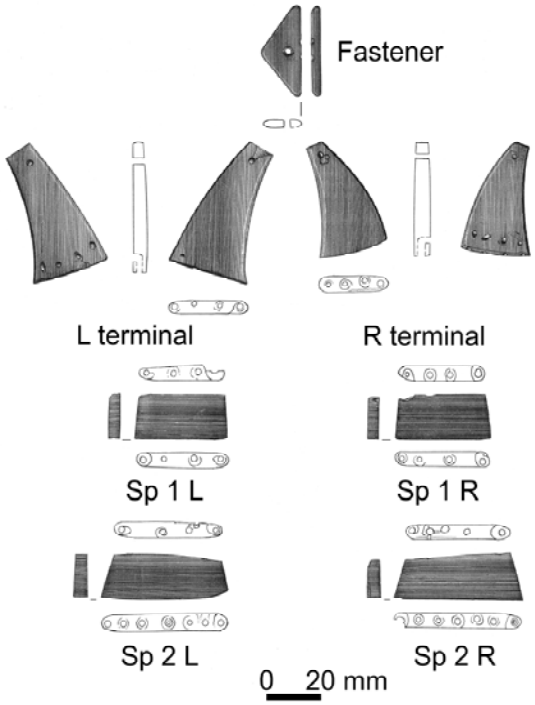

Figure 2: The fastener and plates of Necklace 2. (Note: SF 82 would originally have been Sp 2R, and SF 70 will originally have been Sp 2 L.) Drawing by Marion O'Neil

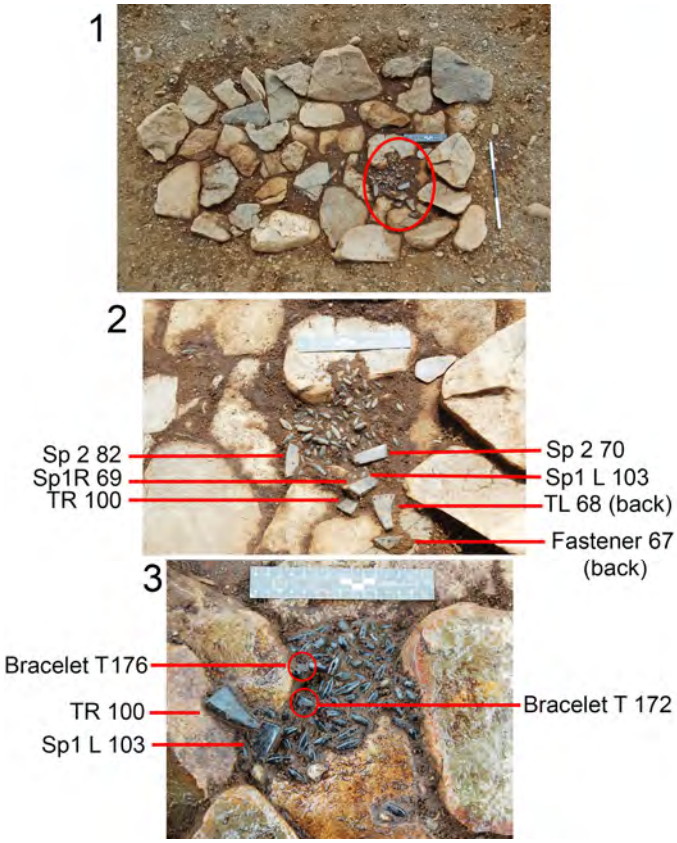

Plate 14: Necklace 2 and bracelet in situ in grave 177: 1. General view, with the position of the components (and thus of the head and hands of the deceased) ringed in red; 2. The upper layer of beads and plates; note that SF 70 will have been Sp 2 L and SF 82 will have been Sp 2 R, in opposite positions to those shown on Plate 12; 3. The next layer down of beads and plates; note the bracelet terminal plates, ringed. Photos: GUARD; annotations by Alison Sheridan

The individual components can be described as follows (with dimensions once again expressed in mm, and the left/right orientation of the plates referring to the position as viewed from the front rather than as worn):

Fastener (SF 67, Plate 15)

This is a slender, flat, isosceles-triangular object, 33.3 mm long, 14.7 mm wide and 3.8 mm thick, with a transverse perforation around 2 mm wide close to the longest edge and just to one side of the apex. Its edges are rounded and its surfaces are flat. There is minimal chipping to the perforation on one side, probably caused during the drilling process, and there are two shallow thread-wear grooves on the long edge, on either side of the perforation (although there is no obvious thread-wear to the perforation itself). The fastener had been polished to a high sheen all over.

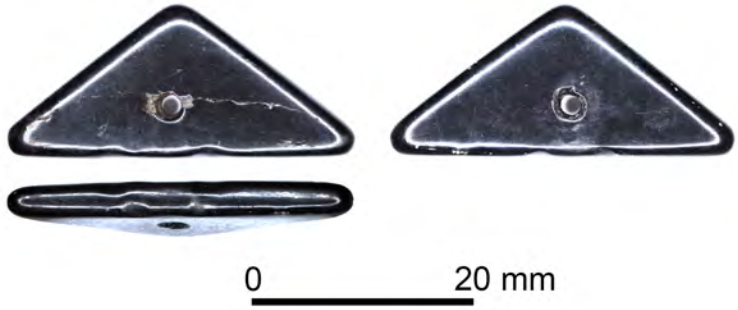

Plate 15: Microscope images of the Necklace 2 fastener (SF 67). Images: Alison Sheridan

Terminal Plates (Figure 3, Plates 16 and 17)

These sub-triangular plates have been perforated in the same way, with one transverse hole immediately below the apex and four elbow-bored holes along the lower edge, the holes opening to the underside of the plates. The TL is longer and broader than the TR.

TL (SF 68, Figs 15 and 18): L 51 mm, W 29.7 mm, Th 6.9 mm; apical perforation D c. 2.5 mm; D of elbow-borings c. 2.4 mm, broadening on the underside to a maximum of 4.4 by 2.2 mm. The apex and the lower edge are squared off (with the former sloping slightly); the outer edge is slightly convex; and the inner edge is markedly concave. Manufacturing striations are visible on the underside, the upper edge and the lower edge, and on the outermost perforation along the lower edge the drill had accidentally burst through the upper surface of the plate. The middle two perforations along the lower edge are closer to the upper surface than the outer two. The somewhat oval shape of two of the perforations on the underside probably relates to chipping during the drilling process. The plate had been polished to a fairly high sheen, except on the upper and lower edges. There is very slight bead-on-plate wear on the lower edge, particularly on the innermost and outermost holes; thread-wear consists of a softening and polishing of part of the circumference of the apical hole, plus a shallow, fan-shaped hollow extending between the perforation and the apical edge on the upper surface.

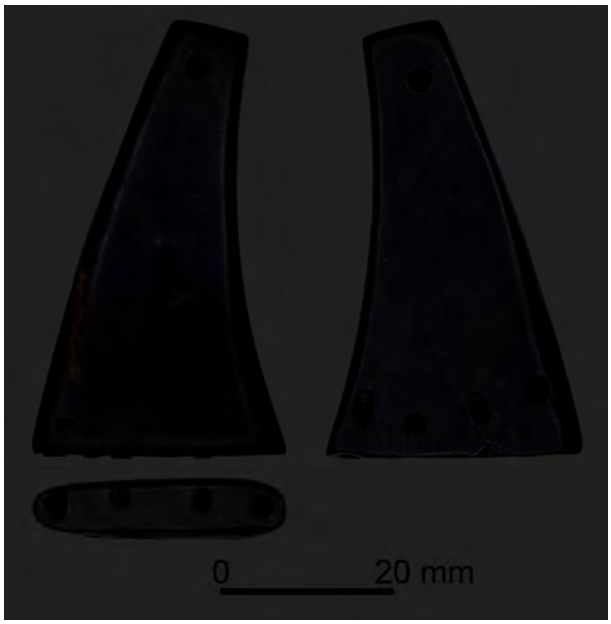

Plate 16: Microscope images of the Necklace 2 left terminal plate (TL, SF 68). The front (upper) surface is at the left. Images: Alison Sheridan

TR (SF 100, Plate 17, Figure 2): L 42.2 mm, W 25.7 mm, Th 7.2 mm; apical perforation D c. 2.3 mm; D of elbow borings c. 2.1 mm, broadening on the underside to a maximum of 3.2 by 2.8 mm. The apex (which is narrower than on TL) and the lower edge are squared off; the outer edge is slightly convex; and the inner edge is markedly concave. Manufacturing striations occur in the same areas as on TL, and there is chipping (from the drilling process) to the outer edge of the apical perforation and to one of the perforations on the underside. One of the perforations along the lower edge is closer to the upper surface than the others, and on the underside, the re-positioning of the drill in one hole has resulted in a roughly oval hole. The level of sheen is similar to that on TL. There is slight bead-on-plate wear along the bottom edge, but no obvious sign of thread-wear.

Plate 17: Microscope images of the Necklace 2 right terminal plate (TR, SF 100). The front (upper) surface is at the right. Images: Alison Sheridan

Spacer Plates (Figure 2, Plates 18-20)

The upper pair, Sp 1 L and Sp 1 R, each have four through-perforations while the lower pair each have five perforations along their top and seven along their bottom, the increase being effected through Y-boring two of the perforations, as can be seen from the X-ray (Plate 13). Plate 13 also shows how the perforations had been drilled from both sides of each plate. The unperforated edges of all the plates are rounded and minimally convex, and the upper and lower (i.e. front and back) surfaces are flattish. In plan the plates are all trapezoidal, to a greater or lesser degree.

Sp 1 L (SF 103, Figure 2 and Plate 18): L 35.3 mm; W 16.5 mm; Th 6.2 mm; D of perforations c. 2.4 mm. There are faint longitudinal grinding striations on the upper and lower edges and signs of slight bead-on-plate wear at all the perforation ends, most marked on the innermost and outermost holes and near-imperceptible on the second hole along on the lower edge. On the underside, a large chip had been pulled off from the innermost perforation, almost certainly through pressure from the adjacent bead; this has revealed the interior of that borehole, where faint traces of rilling from the drill can be seen. The borehole cuts through a brown patch in the jet. All of the surfaces except the upper and lower edges had been polished to a high sheen. There is extensive hairline criss-cross cracking on the upper and lower surfaces.

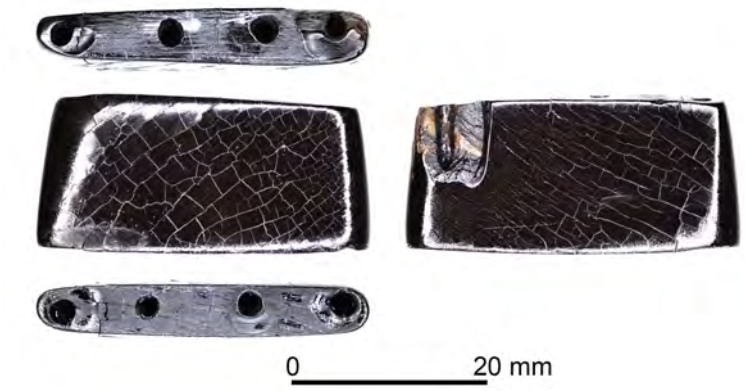

Plate 18: Microscope images of the Necklace 2 upper left spacer plate (Sp 1 L, SF 103). The front (upper) surface is to the left. Images: Alison Sheridan

Sp 1 R (SF 69, Figure 2 and Plate 19): L 36.5 mm; W 16.6 mm; Th 6.5 mm; D of perforations c. 2.4 mm. There are faint grinding striations along the upper and lower edges. The pattern of bead-on-plate wear generally matches that on Sp 1 L except that the bead on the innermost perforation, on the upper edge, had ground a deep hollow. The sheen and surface degradation matches that seen on Sp 1 L.

Plate 19: Microscope images of the Necklace 2 upper right spacer plate (Sp 1 R, SF 69). The front (upper) surface is to the left. Images: Alison Sheridan

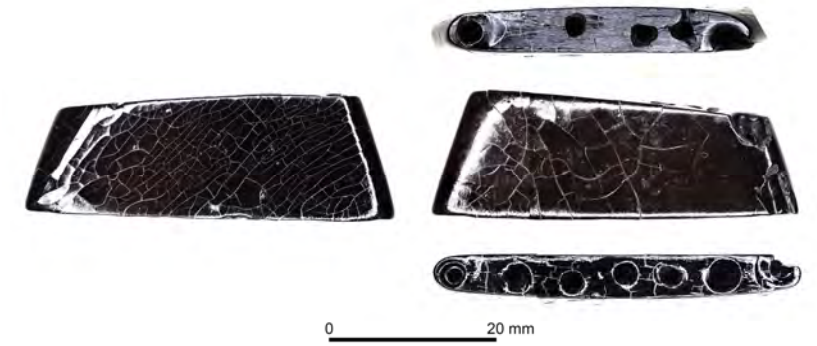

Plate 20: Microscope images of the Necklace 2 lower right spacer plate (Sp 2 R, SF 70) – this will originally have been on the left side of the necklace. The front (upper) surface is to the left. Images: Alison Sheridan

Sp 2 L (SF 82, Figure 2): L 46.4 mm; W 16.5 mm; Th 7 mm; D of perforations c. 2.4 mm. The upper and lower edges of the plate are minimally convex. There are faint grinding striations along the upper edge of the plate. The second perforation from the inner edge on the top is close to the surface of the plate, and chipping around it (from the drilling process) has left an indent in that surface. Bead-on-plate wear is present on four of the five holes along the top surface (but not on the second one along), and on all of the holes along the lower edge. On the top edge, the heaviest wear is to the innermost and outermost holes, although along the bottom edge there is not such a marked contrast. The pattern of surface polish and degradation is as per the Sp 1 and Sp 2 L plates. As noted above, this plate will actually have lain on the right side of the necklace, as viewed from the front, with its longer side to the right.

Sp 2 R (SF 70, Figure 2 and AS Plate 20): L 48 mm; W 16.8 mm; Th 6.4 mm; D of perforations c. 2.4 mm. There are faint grinding striations along the upper and lower edges. The spacing of the perforations along the upper edge is not regular, with the three at the inner side of the plate being bunched together. The distribution along the lower edge is more regular. There is chipping to one of the perforations along the upper edge (from the drilling process) and, along this edge, the innermost and outermost perforation ends show bead-on-plate wear, with a large chip missing from the innermost perforation. Along the lower edge, all the perforations show bead-on-plate wear and the innermost perforation has a large chip missing. The pattern of surface polish and degradation is as per the Sp 1 plates. As noted above, this plate will actually have lain on the left

side of the necklace, as viewed from the front, with its longer side to the left; this means that the damage to the innermost hole (as seen on Plate 14.1) would have been clearly visible when the necklace was worn.

The Beads (Plates 12, 13 and 21)

The 108 beads are fusiform in shape, often asymmetrical in plan view, and they vary in length between 10.9 mm (SF 195) and 24.8 mm (SF 145), with the shortest beads lying on the innermost strand (strand 1), and the longest on the outermost strand (strand 7); the longest bead is at the centre of the outermost strand. The 14 beads that lie immediately below SP 2 L and Sp 2 R are flattish on two sides, enabling them to fit comfortably within these confined spaces (Plate 21.1). Of the seven strands between the lower spacer plates, all but strand 3 comprise 13 beads; strand 3 has 12. Most of the beads in the necklace retain faint traces of the longitudinal faceting that had been a part of their initial shaping (Plate 21.2), and many also have faint grinding striations towards one or both ends, again relating to this initial shaping. A number have minimal to moderate traces of bead-on-bead or bead-on-plate wear. The beads had been perforated from both ends, as is clear from the X-ray (Plate 13), and had been polished to a high sheen.

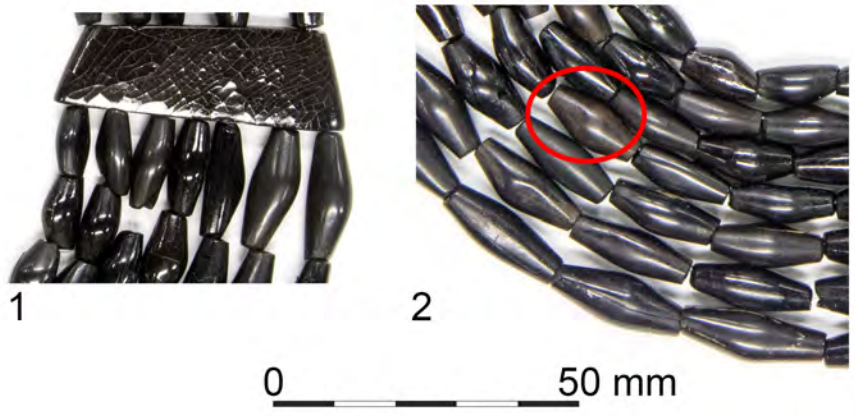

Plate 21: Beads in Necklace 2: 1. Flat-sided beads immediately below Sp 2R; 2. Selection of beads from the lower part of the necklace, showing the gently faceted shape of many of the beads, with a particularly clear example (SF 121) that also has faint grinding striations ringed. Photos: Alison Sheridan

Because the re-stringing of the necklace occurred before the author had access to the full set of plans and photos, it is likely that some original juxtapositions of beads have not been retained (although these are still identifiable from the detailed archive plans). It also seems likely that two short beads, SF 196 and 201 that were found at the bottom of the cluster of beads, actually belong in the bracelet, perhaps in lieu of SF 86 and 95. However, this does not alter the overall shape of the necklace as re-strung; the relative positions of different lengths and shapes of bead are as they would have been originally.

Material

As with the necklace from grave 023, the material has been confirmed as jet through XRF compositional analysis (of bead SF71). It is notable that a far lower proportion of the components have criss-cross cracking than was noted on Necklace 1, and this suggests that hard jet had been used in most cases. The presence of natural inclusions such as quartz grains in some beads, and occasional dull brown patches in others, are characteristic of jet.

General Comments on the Necklace From Grave 177

This necklace, like the one from grave 023, appears to be complete and the consistency in its manufacture, design, material and degree of wear indicates that all the original elements of the necklace are present. In other words, there is no evidence for the substitution of any elements from a different necklace. The internal diameter of the reconstructed necklace (c. 95-100 mm) is

identical to that of Necklace 1 and, like that necklace, it would have been worn high on the neck, collar-like.

That the necklace had seen some wear prior to its deposition is clear from the bead-on-plate wear, and this wear also indicates that the necklace had been tightly strung to form a fairly rigid collar. The pattern of wear, with most strain falling on the innermost and outermost perforations, is characteristic of spacer-plate necklaces. The degree of wear is, however, far less marked than that seen on Necklace 1 from grave 023, and it is likely that the larger and more elaborate necklace from grave 177 had not been worn for very long when it was buried.

The fact that the necklace had been on the neck of the deceased, and had collapsed in on itself as the body decayed, is characteristic of many spacer-plate necklaces, although often there is a greater degree of post-depositional bioturbation.

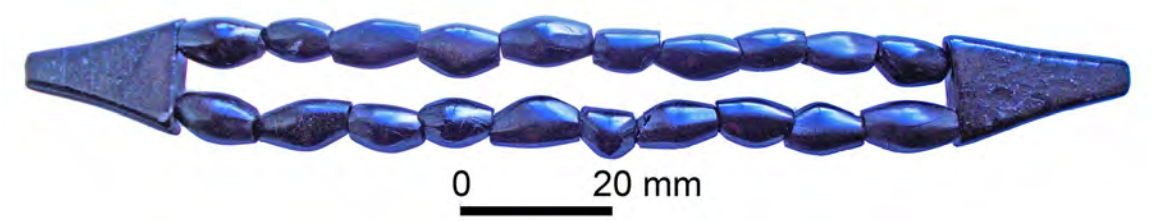

Plate 22: The bracelet from grave 177, reconstructed. Photo: Alison Sheridan

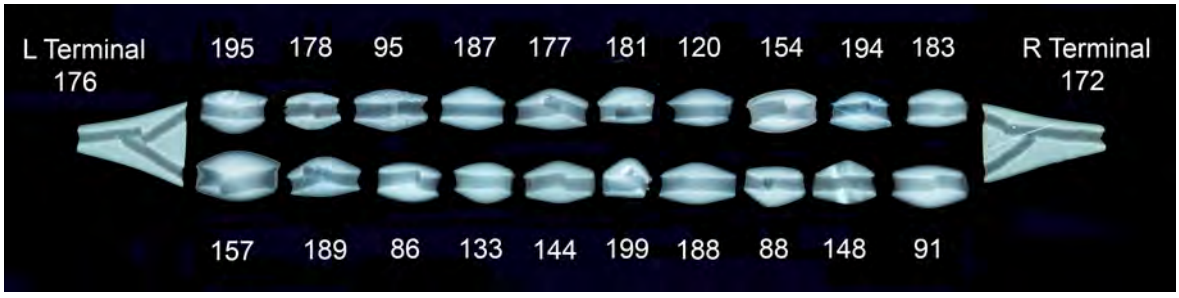

Plate 23: X-ray of the bracelet components as reconstructed, annotated to show the SF numbers. (Note: 'left' and 'right' are arbitrary terms). X ray: Gretel Evans; image composition: Alison Sheridan

Plate 24: Microscope photographs of the bracelet terminal plates. Images: Alison Sheridan

The Bracelet From Grave 177 (A Plates 22-24, Figure 3)

This comprises two triangular terminal plates plus 20 tiny, fusiform and sub-fusiform beads which would have been arranged in two strands of ten beads each. As noted above, its components were found mixed with those from Necklace 2; they were mostly below the highest level of beads and plates. Terminal plates SF 172 and 176 can be seen *in situ* in Plate 14.3, the former fairly flat, and the latter positioned vertically, with its broad perforated end uppermost. All these features suggest that the bracelet had been worn on one of the deceased's wrists, and that the arms had been drawn up so that the hands would have been in front of the face.

Plate 22 shows the bracelet reconstructed; Plate 23 shows the X-ray view, annotated with the SF numbers (and note that 'left' and 'right' are used arbitrarily here). Figure 3 and Plate 24 show drawings and photographs of the plates (with Figure 3 including a drawing of one of the beads, SF 199).

Both of the terminal plates are roughly isosceles-triangle shape, with squared-off apices and lower edges and slightly concave sides. Each had been through-bored in a 'V' pattern, so that the two holes along the bottom edge converged into a single hole at the apex (Plate 23).

Terminal Plates

TL (SF 176): L 19.4 mm; W 15.2 mm; Th 4.9 mm; perforation D c. 2.25 mm. There are fairly crisp grinding striations along the lower edge, except where they have been worn away by bead-on-plate wear (Plate 24). The latter is present at both the holes but there is no obvious thread-wear; the apical perforation is minimally dished, but this could theoretically relate to the drilling process. The surfaces (but not the perforated edges) had been polished to a high sheen and they display a small amount of irregular, hairline criss-cross cracking.

TR (SF 172): L 21.7 mm, W 14.5 mm, Th 5 mm; perforation D c. 2.3 mm. There are faint grinding striations along the lower edge, interrupted (as on TL) by bead-on-plate wear at both the holes. This wear is slightly heavier than on the other terminal, with the beads having ground shallow hollows into the plate. The slightly irregular shape of one of the holes could be due to the repositioning of the drill during the perforation process, rather than to thread-pull wear. The surfaces (but not the perforated edges) had been polished to a high sheen and they display a small amount of irregular, hairline criss-cross cracking. On one surface there is a narrow diagonal band of matte brown colour; this is a natural feature of the jet.

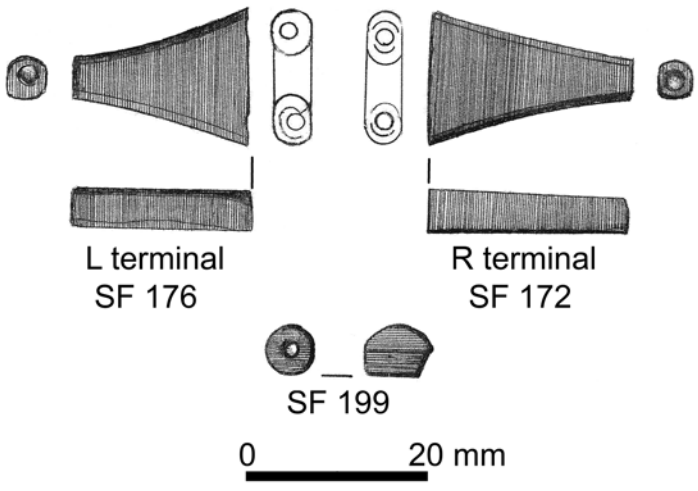

Figure 3: Drawings of the bracelet terminal plates and of bead SF 199. Drawings by Marion O'Neil

The Beads

The 20 beads that belong to the bracelet are small and fusiform, some slender and others plump, ranging in length from 8.2 mm (SF 199) to 13 mm (SF 94); the thickest is only 7.5 mm (SF 96). There is an overlap with the length of the shortest beads in the necklace and, as noted above, it is

likely that SF 196 and 201, found at the bottom of the cluster of beads, actually belong in the bracelet, rather than the necklace, and that SF 86 and 95 from the bracelet belong in the necklace. They are polished to a high sheen.

Material

This is identical to that used for Necklace 2.

General Comments on the Bracelet

When strung, the bracelet would have fit snugly around an adult wrist; laid flat, it is 146 mm long. The similarity in the style of manufacture, material and degree of wear between the bracelet and the necklace strongly suggest that both had been made together, as a set (*parure*). The fact that the components of the bracelet were found mixed with the necklace parts suggests that, as noted above, both had been worn by the corpse; burial in a contracted position, with the arms drawn up, would mean that the wrist would have been close to the neck.

Overall Discussion of the Spacer Plate Jewellery From Graves 023 and 177

These two necklaces and the bracelet constitute the 55th to 57th finds of spacer plate jewellery in Scotland. While they lie some distance south of a west Scottish cluster, which includes a necklace plus two-strand bracelet from Kintyre Nurseries, Campbeltown (Peltenburg 1979), the recent find of a spacer-plate necklace at Berk Farm on the Isle of Man (see https://manxnationalheritage.im/news/spectacular-bronze-age-finds/, Accessed 01/11/2020), along with finds from Northern Ireland, including an isolated spacer plate at Derrycraw, Co. Down, found in 2005 (Chapple *et al.* 2009), show that they form part of a northern Irish Sea distribution pattern (Figure 4). The Dunragit spacer-plate necklaces and bracelet are not the only jewellery of jet, and/or jet-like, material to have been found in this part of Dumfries and Galloway: a disc-bead necklace, comprising 187 disc-beads and a triangular fastener, was found inside a late Beaker at Stoneykirk, just under 10 km southwest of Dunragit (Mann 1902), and a couple more disc-beads have been found on Glenluce Sands, under 5 km from Dunragit (ibid. 588). These could be broadly contemporary with the spacer-plate jewellery. The relationship between Early Bronze Age spacer-plate and disc-bead necklaces has been discussed by this author elsewhere (Sheridan 2015).

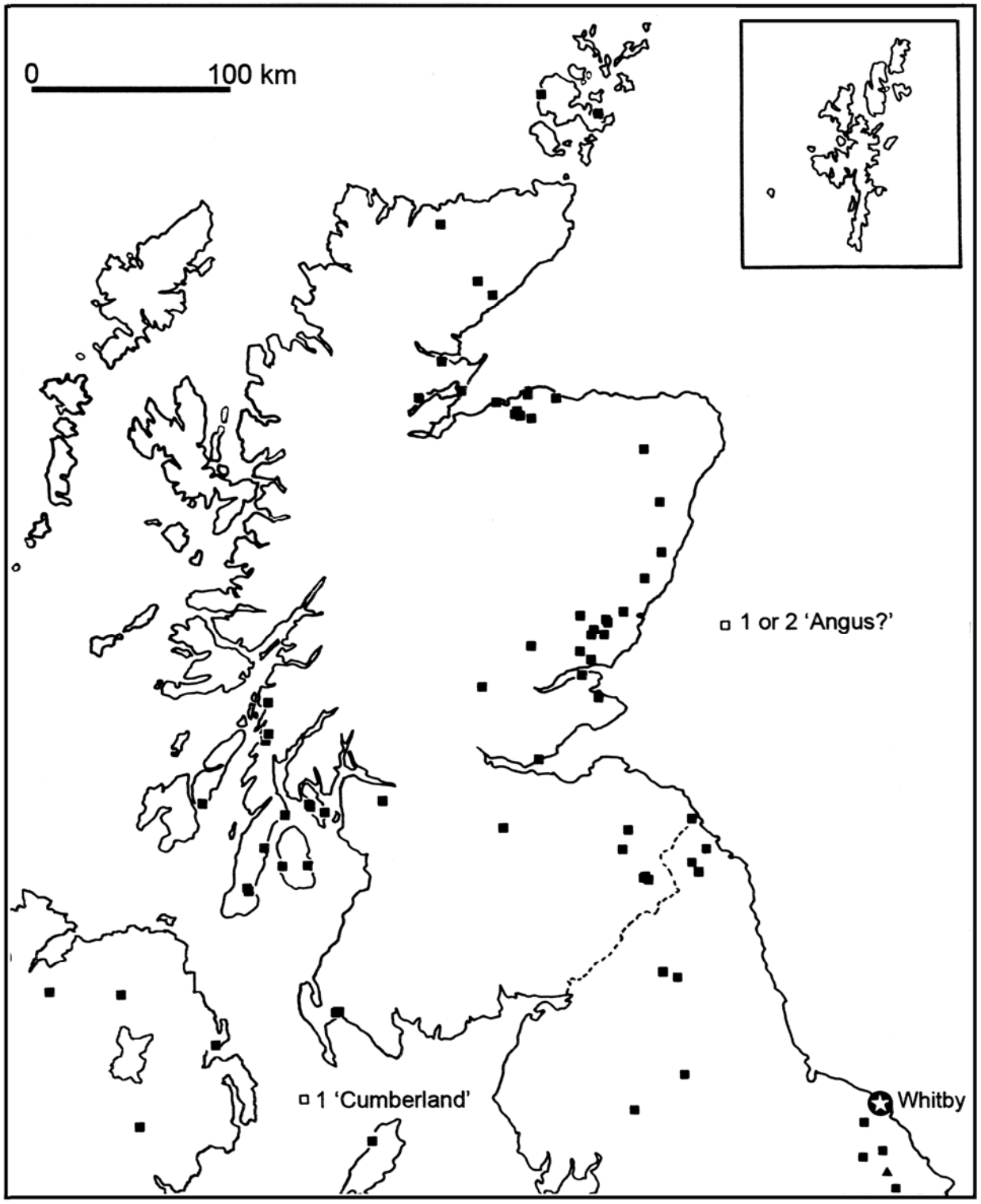

Figure 4: Distribution of spacer-plate jewellery of jet and jet-like materials in northern Britain and the north of Ireland. Map by Alison Sheridan

The shape of the necklace from grave 177 is the commonest shape of spacer-plate necklace in northern Britain, and it constitutes a skeuomorph of the gold lunulae that will have been in use when jet spacer-plate necklaces started to be made, during the 22nd century BC. The variant form of spacer-plate necklace seen in grave 023 can be paralleled closely at Blindmill, Aberdeenshire

(Stuart 1866), and in northern England, for example at Middleton-on-the-Wolds, East Yorkshire (Woodward and Hunter 2015, 292-5 and fig. 7.2.3). Both of the Dunragit necklaces and the bracelet will have been manufactured in the Whitby area, and acquired by the local elite. They constitute rare and precious possessions that will have underlined the status of the women who wore them.

The presence of a set of necklace-plus-bracelet is rare; in addition to the Campbeltown example noted above, other examples include the set from Poltalloch in Kilmartin Glen, where a plain, single-strand bracelet with no plates appears to have been added to a spacer-plate necklace (Sheridan and Davis 1995); a set of spacer-plate necklace plus a three-strand spacer-plate bracelet from East Kinquharrie, Angus (Sheridan 1998); and a spacer-plate necklace plus a pair of bronze bangles from Melfort, Argyll and Bute (Clarke *et al.* 1985).

While no meaningful radiocarbon dating was possible for either grave, but with an early fourth millennium date from residual material being obtained from grave 023, for example, nevertheless all the spacer-plate jewellery can be dated to a fairly narrow range of c. 2150–1950 BC. This is on the basis not only of radiocarbon dates for spacer-plate jewellery of jet and jet-like materials elsewhere (as discussed in Sheridan 2015), but also of dates relating to Tripartite Bowl Food Vessels, both in Scotland (Sheridan 2004; 2016; and cf. Dunure Road, Ayr: Sheridan 2007c) and in Ireland (Brindley 2007). The Dunragit Tripartite Bowl Food Vessel is comparable to Brindley's 'stage 2' Bowl Food Vessels, with a likely date range of 2080–1980 cal BC: ibid. 250).

Where the sex of the deceased associated with jet and jet-like spacer-plate jewellery has been reliably determined, it has consistently been female, and so it is safe to assume that the people buried in the two graves at Dunragit had been high-status women. As for what was the source of the wealth that enabled the elite in this part of Scotland to acquire these precious items of jewellery, it may be that they participated in controlling the flow of Irish metal from southwest Ireland via northeast Ireland, thence up the Great Glen to northeast Scotland, and eastwards to northern England. That, at least, seems to be the basis of the wealth in Kilmartin Glen, at the heart of the southwest Scottish cluster of spacer-plate necklaces. Alternatively, it could just be that the inhabitants of Dunragit were able to amass sufficient surplus from their agricultural activities to be able to participate in the early Bronze Age practice of signalling wealth and status using this ostentatious, exotic jewellery.