



## Broken bead or pendant roughout of jet-like material from Swandro

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In June 2015, excavations in Area E at Swandro uncovered an intriguing fragment of jet-like material that had broken across a hole that had been drilled through it. (The item is Small Find No. 2344, from context 3153.) The item was passed to the author for study and identification of the raw material; it was accordingly subjected to non-destructive compositional analysis by various techniques including particle-induced X-ray emission (PIXE) and X-ray diffraction (XRD) spectroscopy at the Louvre laboratory, Paris, the analyses being undertaken by Dr Lore Troalen (NMS) and Julia Novion Ducassou (an intern student at NMS in 2016) as part of a broader study of jet and jet-like materials.

The object consists of a flat, irregularly-shaped tabular fragment of jet-like (but not jet) material, 14.4 x 19.4 x 6.4 mm, which had broken when an attempt had been made to drill a narrow hole through it (Figs. 1–3). The diameter of the hole is c. 1.75 mm. The hole had been drilled from one of the two flattish sides, and the piece had evidently broken as the drill bit approached the other side. The perforation is parallel-sided and there is no rilling (i.e. grooving from the rotation of the drill bit) in its interior. Given the narrowness of the hole and its orientation, perpendicular to the broad flat surfaces of the fragment, it is likely that the intention had been to manufacture a bead or pendant (not a spacer plate, as some people had initially assumed). Since drilling a hole is the riskiest part of the bead-making process, it is not surprising that no attempt seems to have been made to shape the outer edges of the fragment (if the maker had indeed intended to modify the fragment's shape; one cannot rule out the possibility that the intention had been to wear it simply as a perforated piece of raw material).



The material is black, compact, light and slightly warm to the touch, and it breaks conchoidally to reveal a shiny fracture surface. The shape of the fragment indicates that it occurs naturally in tabular form, and microscopic examination indicates that it is structurally amorphous. While all of these properties can be found in jet, compositionally the material differs from jet in having a low zirconium content, fairly high iron and strontium content, and is low in titanium and chromium and has no measurable amount of vanadium or germanium. It is neither a cannel coal nor a shale, and while its shiny conchoidal fracture is reminiscent of that seen in cloustonite (which can be found in the Yesnaby area of the west Orkney Mainland), the author is not aware of any deposits of cloustonite that are as thick as this, or are free from inclusions. Moreover, compositional analysis of a raw material sample of cloustonite did not provide a close match. Albertite was considered as another potential candidate material, and indeed the V-perforated button found at Isbister had been found (through analysis by Mary Davis, then of NMS, undertaken around 20 years ago) to be of this material. Albertite is known to outcrop at Dingwall on the north-east Scottish mainland. However, albertite was among the raw material samples that were analysed alongside artefacts of jet and jet-like material in the 2016 investigations, and it did not offer a match for the Swandro material. One of three black beads from Skara Brae that were analysed using PIXE, NMS X.HA 650, was found to be of the same material as the Swandro object. It is suspected that the material probably outcrops on Orkney, but that the source area has not yet been found. The raw material deposit is most unlikely to be extensive – otherwise one might have expected to see many more artefacts made of this material on Orkney. Geological fieldwork would be necessary to investigate this matter further.

*Comparanda* for the object are hard to find, not least because we are probably seeing an early-stage roughout rather than a finished object. Moreover, we also do not know for certain whether it was collected and perforated during the Neolithic period, when



the chamber tomb was in use, or at a later period. Beads of black material (and indeed of bone painted black) are known from Neolithic contexts in Orkney, from Skara Brae and Stonehall (Sheridan 2016), while from the Early Bronze Age there is a jet necklace spacer plate from Tankerness Moss (on display in Orkney Museum) and the aforementioned albertite V-perforated button from Isbister (on display at Isbister visitor centre).

Whatever the final intended form of the Swandro object had been, and whatever its date, it may be that the piece of raw material was collected because it is of such an unusual and visually striking (and presumably rare) material. We do not know whether the person who collected it was aware of jet and of its supposedly special powers (as discussed, inter alia, in Sheridan 2017), or even thought that it was jet. If this is a Neolithic artefact, then an analogy could perhaps be made with the presence of a bead of lead ore found at Quanterness (Davidson and Henshall 1989, 153, No. 47). There, a natural pebble of an unusual and visually striking material had been selected and made into a bead – perhaps in the belief that it possessed amuletic properties.

## References

- Davidson, J. & Henshall, A.S. 1989. *The Chambered Cairns of Orkney*. Edinburgh: Edinburgh University Press.
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## Figures



Figure 1. View of the flat surface from where the perforation had been drilled.

Photo: © Alison Sheridan



Figure 2. View of the flat surface showing the conchoidal fracture scar where the piece had broken during drilling of the perforation.

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2 mm

Figure 3. View showing the perforation; the drill had penetrated the material from the upper surface, and the piece had broken as it approached the other side.

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We would like to express our thanks to Dr Alison Sheridan for kindly providing us with this report, for the photographs and for arranging for the PIXE analysis.

We cannot yet date this interesting find as we do not have radiocarbon dates from any of the associated archaeological layers: all we can say for certain is that it is pre-Iron Age, but probably much earlier. Radiocarbon dates cost around £315 plus VAT so £378 each - any donations towards the cost of dating our bead/pendant most gratefully received - thank you for your support!

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