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Coals from Newcastle

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Anyone with an interest in Romano-British jewellery will be acquainted with beads, armlets, hairpins and finger-rings made of jet and, indeed, Catherine Johns in *The jewellery of Roman Britain* (1996) dedicated many pages to the discussion of items of personal adornment made from jet and shale. Traditionally, archaeologists have identified jewellery with a black and shiny surface as being made from jet, with a geological source at Whitby in Yorkshire (*Eburacum*, 141) and a probable Bronze Age or late Roman date of manufacture, whilst those objects with a grey and matte surface were expected to be products of the Kimmeridge shale beds in Dorset and most likely to be of Iron Age date (Calkin 1955; Davies 1936). Any artefacts of either material found elsewhere in the Roman Empire, such as the jet armlet from Monte Gelato in Italy (Allason-Jones in Potter 1997, n° 147), were presumed to be Romano-British exports or items which had been transferred by travellers returning to their home land or soldiers arriving at a new posting. Even the large quantity of black Roman jewellery found in the area of Cologne and Bonn was presumed to be made up of Whitby exports, even though there were some stylistic disparities.

Recent analytical work has revealed that all that was black and shiny in the ancient world was not necessarily carved from jet (see Allason-Jones & Jones 2001 for a bibliography of the various analytical methods which have been explored). This analysis has tended to concentrate, with varying degrees of success, on identifying the geological materials which were utilised for jewellery and small domestic items in the prehistoric, Roman and later periods. These stones are now known to include jet, shales, torbanite, cannel coal, and detrital coals with a range of different sources for each type. This has shed interesting light on the jewellery trade in the Roman period, particularly as some of the material, such as torbanite, was brought in from areas beyond the frontiers of the Roman Empire. This detailed knowledge, however, has also complicated discussion of the subject.

Although modern archaeologists can now assign a source to most black shiny objects it is clear that most Roman craftsmen were not too concerned as to the source of the material with which they worked. No doubt, geographical indicators assisted a jeweller in knowing the problems inherent in any piece of stone he was planning to work with, but his decision as to what to make may have involved subtle indicators such as weight, shine, and inclusions which would tell him, possibly subconsciously, whether the material was suitable. Analysis has indicated that many craftsmen had a preference for making pins from jet; armlets, tables and trays from shale; and finger rings and beads from cannel coal and jet (Allason-Jones 2002). This, however, was not an invariable rule and some artefacts, such as pendants, may be carved from any material (Allason-Jones 1996).

The extensive collection of jet objects found on the Rhineland has always caused much concern in discussions on the Roman jewellery trade as they share much in common with the British objects, yet are subtly different in some of their decorative details. Analysis at the University of Newcastle upon Tyne, using reflected light microscopy (Allason-Jones & Jones 2001), has revealed the presence of a higher pyrite content in the German material than in the Whitby products, which suggests that the craftsmen in the Cologne/Bonn area were working independently of the British craftsmen and using other sources of jet and shale for their products. Curiously, while the analysis of material from British sites has shown the regular use of cannel coal and detrital coals in place of jet, no artefacts in the Rhineland have, so far, proved to have been carved from these materials. Evidence is also starting to emerge that France and Spain also had a small trade in jet goods in the 3rd century AD: a few artefacts made from jet from an as yet unlocated source have been found at a Roman site at Bordeaux whilst three objects found in excavations at York have produced a reflectance measurement of 0.35/37 which is consistent with the

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Fig. 1 — One of the black glass pendants from Cologne, without its metal frame. Scale approximately 2:1.

measurements recorded for jet from Asturias on the north coast of Spain (Allason-Jones 1996; Suarez-Ruiz *et al.* 1994). Analysis of some black artefacts from Aquincum in Hungary have suggested that many had their source in the Rhineland, rather than Britain, but a few beads produced unusually low readings of 0.14 and 0.1 which suggests that they came from a hitherto unknown source, possibly in Hungary itself (Allason-Jones & Jones 2001).

Jets, shales and coals were not the only materials used to produce artefacts that were black and could take an attractive shine. These alternative materials would not have fooled the craftsmen responsible for their use. Whether they fooled, or were intended to fool, their original purchasers is open to debate.

The most obvious substitute for jet is black glass. Whilst the research on jet and shale referred to above was confined to material from British sites, the use of black glass seemed to be limited and probably not intended to copy jet specifically. Obvious examples are the black glass cones used to decorate the centre of both the oval and circular gilded disc brooches, popular in Roman Britain in the 3rd century AD (Snape 1993, 27-8, Groups 15.1-15.2; Johns 1996, 181-2). A number of these have been found where the central cone has fallen out, sometimes being replaced in the Anglo-Saxon period by red and yellow opaque beads which were heated until malleable then pressed into the space left by the cone. However, none have been found with a jet or shale cone, nor have separate cones of jet and shale been found, which would seem to suggest that for gilded disc brooches the preferred centre was of glass.

Glass is also found as an inset for pendants but while black glass, or its nearest equivalent, is known to have been used occasionally, as in a gold box pendant from

Cologne (RGMC Accession Number D318), it is not common (Fig. 1). An exception to this is the use of 'black' glass in the base of some Hercules' club pendants, an exception which can be seen most clearly in the Thetford treasure where very dark blue glass discs with gold inlay adorn both a Hercules' club pendant and a gold finger ring (Johns & Potter 1983, nos 21, 28).

It was only when the research moved to the Continent, and particularly to Eastern Europe, that black glass objects began to be found in significant numbers and in forms which appeared to be aping the jet products of Britain and the Rhineland. This was particularly so with plain armlets, a number of which were found at Aquincum in Hungary (Aquincum Museum accession numbers: 69.21.11; 91.2.119; 52396; 52381; and 1983.iii.24). The manufacture of a glass armlet obviously differs fundamentally from the carving of a similar product in jet, shale or cannel coal so, whilst it is conceivable that the craftsman might not be aware that he was carving a good quality shale or cannel coal when he thought he was carving jet, he would need completely different skills to make a glass armlet and there could have been no confusion. It is equally unlikely that any potential purchaser would be fooled once he or she had handled the object in question. Whilst even a poor quality shale can be stained, oiled and polished to give the appearance of jet, at least for a few weeks, a glass armlet would immediately look and feel different, particularly as the craft worker/s responsible for the Aquincum armlets lacked the skill of those making the Kilbride-Jones (1938) Types 1, 2 and 3 armlets. The Aquincum armlets include many bubbles, vary in width and thickness around their circumference and even have a somewhat untidy join where the circle has been closed (Fig. 2, left). It may be deduced from their general form, however, that these armlets were intended to copy their jet and shale counterparts.

Also from Aquincum, there is an annular black glass finger ring of D-section with a deep cable motif confined to its outer surface, suggesting it has been made in a mould (accession number 441/50837). This can be paralleled with a second glass example from Bonn (RLB accession number 29673) but also with jet examples from York (Allason-Jones 1996, nos 171, 172), Housesteads on Hadrian's Wall (unpublished), and Hastenwath in Germany (Hagen 1937, A4). The latter example has not been seen by the present author but its photograph in Hagen's paper has features, such as variability of section, which suggest that it too may be of glass. Carving a cable motif on the outer surface of a finger ring is easier when working with jet than attempting to do so when the material is shale; however, producing such a result with glass is not simple and one has to wonder why it was attempted, particularly as simply twisting the pliable glass so that the cable is continuous produces the same effect with less effort. The answer may be that the craftsman was aiming to produce a finger ring that looked as if it had been carved from jet.



Fig. 2 — A glass armlet next to a jet armlet, from Aquincum. Scale 1:1.

Another jet finger ring from Aquincum clearly copies jet examples. This has a shallow triangular section and a small, low, circular panel and can be paralleled in jet at York (Allason-Jones 1996, nos 169 and 167). Metal examples are commonly found throughout the Roman world and, indeed, Catherine Johns has already identified that ‘rings of this substance [jet] tended, on the whole, to be inspired by the forms of metal rings and to be decorated mainly with linear engraved ornament’ (Johns 1996, 69-70). At Aquincum we appear to have a glass finger ring copying a jet finger ring which itself is copying a metal finger ring.

The black glass beads discussed by Guido (1978) reveal a variety of shapes and sizes: segmented beads, biconical beads, disc beads and melon beads, all forms which are also known in jet, shale or cannel coal; for example the segmented beads can be paralleled with the grooved cylinder beads of jet (e.g. York: Allason-Jones 1996, n^o 10) while the biconical beads resemble the jet beads from the Rhineland described by Hagen as ‘ellipsoid’ (1937, 124). Disc beads of jet and shale are widely known throughout the Roman Empire, usually with double lateral piercings and used as armlet beads (e.g. South Shields: Allason-Jones and Miket 1984, nos 7.55-67). Melon beads, although more common in blue glass or turquoise faience, are also known in jet and black glass (Cologne: Hagen 1937, D19). Plain black glass disc beads

seem to have been more common in the Iron Age than the Roman period in Britain (see Guido 1978, pl. II) but jet examples occur from the late 2nd century to the 4th century in Britain and throughout the Continent. However, Guido (1978, 15) comments that ‘beads which appear to be black were never common in Britain before the beginning of the 5th century [BC]: they were then imported from Germanic sources and also appear, from their number there to have been manufactured in Ireland as well’. This is a period when jet had lost the popularity it had assumed in the Bronze Age and it may be suggested that glass took over as the material for black beads, although some of the forms, such as the biconical beads, may have harked back to the biconical beads used in Bronze Age spacer necklaces (Newman 1976). Guido discusses a few globular and annular black glass beads from late Iron Age and early Roman contexts but remarks that ‘during the Roman period jet from Whitby or occasionally shale may have been preferred. The real popularity of ‘black’ glass came at the very end of Roman times, introduced by Germanic peoples, whose beads are frequently decorated in opaque red, yellow or blue’ (1978, 15). As the fashion for jet jewellery had waned by the end of the Roman occupation of Britain it may be deduced that black glass and geologically derived black materials alternated in popularity, possibly depending on availability or on the skills or origins of the craftsmen of the period.

On the Continent black glass beads in the Roman period tend to cluster in the areas where jet necklaces are also found. For example, at Aquincum, which has produced a number of fine jet necklaces and armlets, there are a number of globular black glass beads (accession number 91.2.68) which can be compared with jet examples at York (Allason-Jones 1996), South Shields (Allason-Jones & Miket 1984, n° 7.75) and Cologne (Hagen 1937, C.18), although it is not known if they came from necklaces or armlets. More common are the half melon beads, which were threaded transversely to form flexible bracelets; examples of this type can also be found at Aquincum (accession numbers 52378, 138 and 91.3.12). Curiously, none of the flat hemispherical beads of jet which are found throughout Britain and the Rhineland, have been found copied in glass.

Even though the manufacturing technique differs markedly between glass and the geologically derived materials, it would appear that jewellers when making up a beaded necklace or when repairing a necklace were not fussy about having all the beads in the same material. A necklace in Bonn Museum, which was found in a jeweller's shop, included ten black melon beads amongst other types; some of the melon beads were made from jet, some from glass (accession number 38.317). A beaded necklace from York had one grey glass bead amongst its 91 jet beads (Allason-Jones 1996, n° 9).

There is a halfway stage between glass and jet: vitrinite. Vitrinite is a natural substance which is generally the dominant component of coal. It consists of a woody tissue that has decomposed in an anerobic, water saturated environment, which converts it first into a humic gel but later hardens to a black glassy material. One finger ring from Bonn when analysed revealed a reflectance measurement of 0.40 indicating vitrinite from a coal of lignite rank (corpocollinite) (RLB Accession Number A14245) whilst another from Laurenberg had a reflectance measurement of 0.83 and appeared to be from a vitrinite band in quite a high-ranking coal seam (RLB Accession Number 61.616) (analysis by J.M. Jones). As vitrinite can come from similar sources to jet and cannel coal, however, it is unlikely that a Roman jeweller would consider it to be a substitute material.

Other natural geological sources which look like jet and have been used in Roman jewellery include haematite and obsidian. The former can be seen set in a gold ring from Cologne (RGMC accession number D528) whilst Cologne has also produced a fine inset for a brooch carved from obsidian – an igneous rock composed entirely of black natural glass - with the image of a helmeted and bearded male bust (RGMC accession number 540).

More prosaically, items are found made from burnt bone. When found these are usually presumed to have been burnt accidentally, but examples in the collections at Bonn suggest they may have been deliberately charred to provide the black team of a two colour gaming set (RLB accession numbers: 15421; 14251; 14252) in place of the

more common bun-shaped glass playing pieces or elaborate jet playing men (Allason-Jones & Miket 1984).

The question remains: why was there a market for objects that looked like jet? In the case of the burnt bone counters one can presume that cost was a factor, as well as the ease in acquiring the raw material. In the case of the glass armlets of Aquincum one might also presume that isolation from the regular geological sources led jewellers to improvise in order to provide what their customers wanted. However, this still does not answer the question as to why black armlets, beads, hairpins, etc which had become so popular at the end of the 2nd century in Britain and on the Rhineland should be considered so desirable that copies in other materials were also in demand.

The study of jet in Roman Britain has revealed that the bulk of the finds come from female graves or could be interpreted as being for female use. It is, of course, very difficult to label a particular item as being exclusively for use by either gender but in the case of jet there is an Empire wide bias towards jewellery and artefacts which are traditionally associated with female activities (see Allason-Jones 2002). Jet artefacts are rarely found in the graves of men: at Oakley Cottage in Gloucestershire part of a jet armlet was found in a man's grave (Reece 1962), and Grave 107 in the Jakobstrasse excavations in Cologne produced a male corpse with a jet knife handle (Friedhoff 1991), whilst an unusual burial at Bainesse, Catterick of a man wearing a jet necklace and jet bracelets, has been identified as that of a *gallus*, a follower of the goddess Cybele (Wilson 2002, II, 41). A jet dagger handle from the Walbrook Mithraeum may not have come from a grave but its specifically male context may qualify it for inclusion in this short list of jet objects used by men (Shepherd 1998, 161).

The inclusion of jet in predominantly female graves may suggest that the material had some religious or magical significance for women. Both Pliny (NH 36) and Galen (*De simpl. med. facult.* IX.203) refer to jet's efficacy in relieving 'suffocation of the uterus' and its use in uncovering attempts to simulate virginity, but neither writer seems to explain why it should be favoured by women for inclusion in their funerary deposits. Both Pliny and Galen imply that jet was used medicinally by burning or swallowing; neither refer to jet being used as a talisman or as amuletic jewellery and it is noticeable that while there are some items, such as the phallus pendant from Wroxeter (unpublished), which might have been worn as amulets, they are very rare in comparison with bronze and gold amulets.

Two artefact types of jet that do point to a religious connexion are the Medusa pendants and the cantharus headed pins. The former are mostly found in Britain and Germany with the greatest number of the British examples coming from York. The appearance of Medusa as a motif on 4th century mosaics and onyx cameos suggests that she became more important during the 3rd and 4th centuries AD, precisely the time when jet became

popular. This was also a time when there was a renewal of interest in the eastern mystery religions.

The cantharus, a two-handled drinking cup of Greek origin, was considered by the Romans to be sacred to the god Bacchus and it is likely that the pins of jet which have their heads carved into the form of a cantharus were linked to Bacchic worship. Bacchus, as well as being the god of wine, was also worshipped as an Eastern saviour god who could lead the dead to a life of triumph just as, in legend, he had led Ariadne out of exile. The appearance of objects with Bacchic motifs in a grave, therefore, is ambiguous as it is unclear if the deity is being invoked as a preserver from death or as the god of the wine which played such an important part in the funerary rites. The cantharus, however, was also used as a motif in early Christian art and it is not usually possible to tell the difference between a pagan and a Christian cantharus. The discovery of the burial of a possible *gallus* at Catterick, however, may suggest that there was also a link between jet or the colour black and the worship of Cybele (Wilson 2002, II, 41).

At York, it is noticeable that many of the jet grave goods are associated with gypsum burials. There has been much debate as to whether the practice of using gypsum was intended to preserve the body or hasten its decay. Some authorities see it as a Christian rite aimed at preserving the body until the Day of Resurrection but a link with Medusa has been observed at Lullingstone. Philpotts offered the opinion that the practice was introduced into Britain in the late 2nd or 3rd centuries AD, 'either directly by North African immigrants practising their traditional regional rites or as a secondary development by people from Italy or the Rhineland where plaster burials had been adopted from African practices' (Philpotts 1991, 95). The fact that the Rhineland has produced such a large group of jet objects may be of significance here. The complete lack of jet jewellery from Africa, an area where jet is not found geologically, may be of less importance.

Gypsum burials may have reflected the high status of their occupants and the quantity and quality of some of the grave goods found in gypsum burials may confirm this, as does the care with which some of the coffins and tombstones accompanying such burials were carved. However, it is dangerous to use this evidence to imply that jet and shale were only used for the jewellery of the higher echelons of society and that any copies of their products in other materials must imply a wish by the less wealthy to ape their richer neighbours. Well-constructed coffins tend to protect the grave goods they contain whilst bodies buried in light wooden coffins or on a bier or simply wrapped in a shroud may not survive well and their accompanying grave goods can become scattered through time.

One aspect of jet not shared by shale, coal or glass is that it is electrostatic. This may have given it special religious or magical significance and may explain why a preponderance of jet artefacts were intended to be worn in

contact with either the skin or the hair, where the electrostatic properties would have been noticeable. However, as none of the other black materials are electrostatic, their substitution would not have been acceptable in all circumstances. It is also noticeable that in many graves, particularly at York where jet was easily available, there is a type of very small armlet with a small diameter and very obvious lathe ridges on its inner face. The size and the lack of obvious wear, which would have removed the lathe scar, suggests that they were intended purely as grave goods and not as wearable jewellery. Such armlets tend to be found in graves which have few or no other grave goods. This might imply that it was the material which was important; however, not all these armlets were of electrostatic jet, which may further suggest that it was the colour black which was important. In this case, whether your day-to-day jewellery or your grave goods were of jet, shale, glass or blackened bone would have been irrelevant. Sadly, none of the research so far has revealed any indication as to what the colour black meant to the different ethnic groups whose material culture has produced black jewellery.

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