

## *The Circulation of Garnets in the North Sea Zone, c. 400-700*

*Helena Hamerow*

□H1□*Introduction: garnet inlaid metalwork in the North Sea zone*

Garnet inlaid metalwork is one of the most instantly recognizable emblems of the elite culture that emerged in the North Sea zone during the fifth to seventh centuries. The giving and receiving of such precious objects played a key role in cementing socio-political relationships, by enhancing the honour of both donor and recipient (Arrhenius 1985; Arrhenius 1998; Bazelmans 1998). The use of garnet inlays derived ultimately from Graeco-Roman lapidary traditions, with the deep purple-red colour of the stones connoting rank and wealth (Webster 2012, 59-60; Adams 2011a). Provenance studies are revealing the sources from which the garnets used in early medieval metalwork probably originated (see, *inter alia*, Quast /Schüssler 2000; Perin et al. 2007; Mannerstrand 2003; but see also Adams 2011a for a cautionary reminder of the complexities and challenges involved in such analysis). Remarkably little, however, is known of the conditions in which trade in these gemstones was conducted and how they circulated within northwest Europe and Scandinavia. This paper approaches these questions by considering where garnets are likely to have entered North Sea (and Baltic) exchange networks; what the decline in the availability of garnets – especially the timing of that decline -- suggests about the networks by which they circulated; and whether scientific analysis can shed light on how garnets circulated amongst merchants, goldsmiths and clients.

Our primary evidence comes in two forms. Most abundant, of course, are the finished items of ornamental metalwork with garnet inlays; some of these were imported from other regions, above all the Frankish world, but many were made within the North Sea zone itself. Such precious objects – most of which derive from burials -- circulated relatively widely via gift exchange, exogamy, warfare, tribute and other means. Much less numerous but no less informative are caches of raw and worked garnets that have been found in both burials and settlement contexts. As a working hypothesis, it is suggested here that such caches of stones were less likely to have circulated widely, e.g. via gift-exchange or exogamy. If this hypothesis is correct, such

caches would have remained close to their original point of entry into a region and close to where they were first acquired by a jeweller or an agent acting on behalf of a patron. Their distribution would in this case be more likely to reflect networks of trade.

Archaeological evidence for the landing places where international trade in costly, high-status goods took place during the fifth to seventh centuries is likely to be highly ephemeral in nature. The distribution of imports in early Anglo-Saxon England nevertheless sheds some light on the question of entry points. In a paper published in 1988, Jeremy Huggett distinguished two mechanisms by which high-value imports entered England by plotting their distributions (Huggett 1988). Some goods, notably amethyst and crystal balls, clearly entered via a small number of 'central places' in east Kent, a region which had preferential access to such goods thanks to its close political and geographical relationship to Francia. Huggett's distribution maps suggest only limited re-distribution of such items into other regions. Other imports, however, such as amber, ivory, and gold coins display a more diffuse distribution, pointing to the presence of several entry points along the eastern seaboard of Britain (Huggett 1988, figs. 1, 2, 5; Naylor 2012, fig. 2). These two patterns presumably also reflect different patterns of supply and different networks of social relations. To which of these two categories do garnets belong? It has long been assumed that they too entered England exclusively via the kingdom of Kent, perhaps through places like Sarre and Dover, sites that may have served as royal toll stations and entrepots for foreign merchants travelling from Continental emporia such as Quentovic (Hawkes 1982, 76; Whitehouse 1992). But did all garnets enter Anglo-Saxon England in this way?

A recent national study of Anglo-Saxon grave goods involving a sample of around 600 sixth- and seventh-century graves from 224 sites, does reveal a major concentration of garnet inlaid metalwork in east Kent, with smaller clusters occurring in East Anglia and the Upper Thames Valley (Fig. 1; Hines and 2013).<sup>1</sup> Excavated cemeteries, however, are not necessarily a

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<sup>1</sup> Figure 1 shows the distribution of cemeteries included in the Hines and Bayliss study that contained the following garnet-inlaid artefact types: buckles of type 3-c; disc brooches of types 2-b, 2-c and 2-d; and pendants of types 1 and 9-b. While

good proxy for the overall distribution of such objects, as there appear to have been regions of England where garnet-inlaid metalwork was used but not -- or only very rarely -- deposited in graves. This becomes apparent when the distribution of garnet-inlaid metalwork found by metal-detectorists and recorded on the Portable Antiquities Scheme is considered (**Fig. 2**). This reveals that such metalwork in fact reached a wide area, within which several 'hot spots' are apparent: not only East Kent, but also Norfolk, the Isle of Wight, and Staffordshire (the last being due entirely to the exceptional 'Staffordshire Hoard'; Leahy 2015). The overall distribution of garnet-inlaid metalwork thus tells us relatively little about the entry points and the circulation of garnets as a raw material.

#### *□H1□Garnet caches from Anglo-Saxon England*

What might a consideration of caches of loose, unmounted garnets tell us? Five such caches are known from Anglo-Saxon contexts at the time of writing (**Fig. 1**). One was found in the grave of an adult female dating to the seventh century in the cemetery at Lechlade (Gloc). A purse near the head of Grave 71 contained 195 small, unpolished, unworked garnets. Most of the stones were apparently too small to be suitable for mounting in jewellery (the largest were c. 3 mm in diameter, but many were only 1-2 mm; Adams 2011b). The purse also contained a cowrie shell, while bronze and silver sheet fragments point to the presence in the grave of a wooden box (Boyle et al. 1998). At the Buttermarket cemetery, Ipswich, another seventh-century female burial contained a cache of 17 uncut garnets (again apparently too small to have been used as inlays) in a bag along with two cut and polished garnets, probably removed from a piece of jewellery; the bag also contained a silver necklace (Grave 4275; Scull 2009). Grave 250 from the Buckland cemetery at Dover produced the earliest known cache of loose garnets, from a female burial radiocarbon dated to Cal AD 425-545 (Parfitt 2012). Seven loose, flat-cut and roughly shaped garnets were contained in a bag suspended from an ivory ring; the largest was 16 mm in length and all were roughly shaped (ibid. 399-400). The burial also contained two bell beakers, a weaving sword, an antler burr pendant, and a necklace with a gold bracteate.

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this distribution is therefore not comprehensive, the Hines and Bayliss study constitutes the largest sample available and is broadly representative.

Two of the garnet caches were found in male burials: an early seventh-century burial under Mound 17 in the princely burial ground at Sutton Hoo in SE Suffolk contained a leather purse holding seven roughly polished garnets and one which was carefully polished and cut to the shape of a bird's beak, as well as a fragment of millefiori glass (Carver 2005, 115, 243). Other grave goods included horse gear, feasting equipment and a sword. The seemingly isolated seventh-century smith's grave at Tattershall Thorp (Lincs.) contained six flat-cut garnets. These had probably been placed in two separate parcels inside one of several boxes found in the grave. Five of the stones were finely wheel-cut and polished, roughly 4 mm x 2 mm, with a thickness of 1 mm. Three of these were broken and perhaps intended to be used in repairs (Hinton 2000, 83-6). The grave is situated between the Hull estuary and the Wash, a coastal zone notable for its access to international exchange networks in this period (Loveluck / Tys 2006). The burial also contained, *inter alia*, iron tools and metal scrap, a fragment of a balance-pan, an openwork disc from the Rhineland, copper alloy decorative studs from the sheath of a seax (also probably of Frankish manufacture), and a Kentish glass beaker.

As recently noted by Sue Harrington and Martin Welch, the distribution of these caches of loose garnets is similar to that of balances and weights, lending support to the hypothesis that the former are closely connected to long distance trade networks (Harrington/ Welch 2014, 163; Scull 1990). Indeed, of the five cemeteries containing garnet caches, two also produced complete or fragmentary sets of balances and/or weights – rare finds in Anglo-Saxon graves -- while the Tattershall Thorpe burial contained both garnets and part of a scale pan. Lechlade Grave 134 contained a balance pan (Boyle et al. 1998) and the Dover Buckland cemetery produced two sets of balances and weights (from Grave 'C' and Grave 265b. Evison 1987, 120; Parfitt 2012, 405-6). The Buttermarket cemetery produced neither scales nor weights, yet it seems likely that individuals buried in several richly furnished graves were high-status foreigners engaged in long-distance mercantile activity at the emporium of Ipswich (Scull 2009). At the very least, those who oversaw the burials of these individuals – who were furnished with distinctive belt sets and weapons of Frankish or Frisian origin – clearly wished to emphasize their international connections.

The site of Rendlesham, just upriver from Sutton Hoo and probably associated with it, has recently yielded a remarkable range of rich and exotic metal-detector finds. Rendlesham is identified by Bede as a *'vicus regius'* where King Swithhelm was baptized, while the finds point to the existence here of a trading station (Bede, *HE* iii.22). They include Byzantine coins and coin weights (used to check gold coins and weigh bullion) as well as Frankish gold coins and abundant evidence for the recycling of silver and bronze. Chris Scull has suggested that this material arrived as part of a package of trade goods and is evidence not only of 'high-value currency transactions' taking place by the early seventh century, but also of mercantile contact between the kingdom of East Anglia and the Byzantine world (Scull 2014). It is entirely plausible – indeed likely -- that the garnets found in the Mound 17 burial arrived in East Anglia via Rendlesham.

Johan Nicolay has recently reiterated the long-standing view that garnets from South Asia reached the North Sea world by the same route as Byzantine gold, namely via the Franks (Nicolay 2014, 223). The possibility that the trade in garnets occurred in tandem with the trade in gold bullion may, as already noted, be strengthened by the distribution of Anglo-Saxon graves containing balances and weights used in the buying and selling of precious metals. Yet the Upper Thames Valley, a region with a cluster of balances and weights, has relatively few gold and silver artefacts (Harrington / Welch 2014, 163). This may imply that the distribution of balances also relates to trade in other precious goods with a weight value, such as amber, bronze scrap and garnets.

#### *□H1□ Garnet caches and workshops from southern Scandinavia and a question about Frisia*

A number of garnet caches – some comprised of hundreds of stones -- are known from southern Scandinavia. The following list of examples is not intended to be exhaustive, but rather to provide a sense of the chronological, geographical and contextual range of these finds (Fig. 3).

Excavations at Gamla Uppsala, the site of a royal complex dating to between the late sixth and eighth centuries, have revealed the well preserved remains of one of the largest timber buildings dating to this period from the whole of Scandinavia. A short distance away, two partly excavated buildings

appear to have served as garnet workshops, and one of these has produced more than 550 raw and partly worked garnets (Ljunqvist et al. 2011, 579; Ljunqvist pers. comm. 2015).

The high status cult and craft complex at Sorte Muld on the island of Bornholm has produced not only a number of roughly shaped loose garnets dating to the late Germanic Iron Age or Viking Age, but also fragments of the grid-patterned gold backing foil used in cloisonné jewellery, as well as a matrix for stamping such foils. At least some of the cloisonné metalwork found at Sorte Muld – where thin, polished plates of garnet are set within a metal framework -- could therefore have been made there (Lund Hansen 2009). A number of weights, but no scales, have also found, mostly ranging from 1-10 grams (Thorsen 2009).

At Slöinge in SW Sweden, a large number of unworked garnet crystals were found associated with a late Germanic Iron Age settlement. Many were found in the ploughsoil but some also came from settlement contexts such as pits and post-holes. In one case, a cache of raw garnets was found in the posthole of a house dated by dendrochronology to c. 710-720, together with fragments of gold foil figures, (*guldgubber*), a type of find associated with cultic activity (Mannerstrand and Lundqvist 2003).

Excavations at the site of Paviken I on Gotland identified a zone yielding a range of imports and raw materials and evidently devoted to craft and trade. It produced 278 garnets, all but one of which were uncut; most were found in a single concentration. Other finds included unworked amber, iron ingots, and glass. These finds have tentatively been interpreted as the remains of a warehouse connected with long-distance trade. Some of the small fragments of raw garnet could also be waste associated with the working of garnets. The site dates primarily to the ninth and tenth centuries, but some Vendel period finds and features were also identified and it seems likely that the garnets are associated with this earlier period (Lundstrom 1973).

Several other sites have also produced finds of loose garnets including the trading town of Ribe (Dk), where ‘lumps of garnet’ were found in settlement contexts (Jensen 1992, 17). Other examples come from the island of Helgö, now thought to have been an early cult centre, where 14 worked garnets were associated with a cremation, while another four were associated

with buildings in a craft area (Arrhenius 1971, 48 and fig. 53; Lundstrom 1973, 75). The exceptionally rich 'magnate centre' at Gudme, on the Danish island of Funen produced five or six garnets associated with a very large building dating to the fourth century (Mannerstrand and Lundquist 2003, 170; Arrhenius 1997, 43-44).

Finds of garnet-inlaid metalwork from the Frisian zone are too few to allow any clear conclusions about the circulation of garnets within that region to be drawn. It is surprising that garnets appear not to have been more widely used within the region, given the well-documented role of the Frisians in international trade, their ready access to gold, and their close contacts with Anglo-Saxon England and Scandinavia during the sixth and seventh centuries (Heidinga 1997; Nicolay 2014). An exceptional group of finds from the high status, presumed royal, centre at Wijnaldum should nevertheless be mentioned here (Besteman et al. 1999). This remarkable site produced not only a spectacular gold brooch with garnet cloisonné, probably dating to c 630, but also a die for making the grid-patterned backing foils as well as a single piece of raw garnet (although this last find cannot now be confirmed; Adams 2011b; Nicolay 2014, 259). Other finds, including scales and weights, suggest the presence of a workshop where gold and garnet jewellery was made as well as a place where precious materials were bought and sold.

#### *□H1□ Garnet caches: Questions of context and control*

The context of many of these finds of loose garnets means that their date is imprecise, but it is nevertheless clear that they range from the Migration Period to the eighth century and probably beyond; many of the Scandinavian finds – with the notable exception of Gudme – appear to be relatively late.<sup>2</sup> In contrast to England, none of the Scandinavian caches comes from a burial. This may be due on the one hand to the relatively small number of furnished inhumations in Scandinavia dating to this period and, on the other, to the near-absence of early Anglo-Saxon high status settlements with well

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<sup>2</sup> At the trading site of Kaupang in Norway, for example, five small, unworked garnets were found, all post-dating 800. Whether garnets were used as inlays for metalwork at such a late date is unlikely, however, and the possibility has been mooted that they were used as a form of abrasive in workshops (Resi 2011, 154).

preserved cultural layers. Whatever the reason, the depositional contrast is striking.

It will have become clear from the preceding examples that, in Scandinavia, caches of garnets are invariably found at sites that have also produced concentrations of precious metals and other exotic goods. In nearly all cases, these sites have been identified as magnate residences or trading centres: nodes within a supra-regional trade network that have produced evidence of long-distance contacts, craft production for high-status consumption, elite residences and cultic activity (see Høilund Nielsen 2014 for a thoughtful critique of the application of the term 'central place' to such complexes; see also Nicolay 2014, 228). While the same cannot be said of all imports, or for the whole of the North Sea and Baltic regions, the evidence from Scandinavia does suggest that access to garnets was closely controlled by ruling families and that they circulated primarily via socially-embedded exchange networks.

In England too, garnet caches occur in regions – notably the East Kent coast and SE Suffolk – characterized by concentrations of rich finds and proximity to long-distance maritime or riverine trade routes (for Kent, see Brookes 2007, 146-51). Even the cemetery at Lechlade, despite being situated far inland, lay at a major junction for long-distance commerce, where an ancient 'salt way' crossed the highest navigable point of the River Thames (Hamerow et al. 2013, 56, 68). As all of the known English garnet caches have been found in burials, a direct association with elite settlements cannot be demonstrated. The possibility remains, therefore, that free peasant traders also had access to garnets via 'gateway' sites in key geographical locations, as has been argued for other – albeit less valuable -- imported goods around the southern North Sea coastal regions (Høilund Nielsen 2014; Loveluck and Tys 2006; Heidinga 1997, 29-31).

Johan Nicolay has recently argued that exotic luxuries such as garnets were transformed into finished objects in magnate centres and redistributed from such centres 'in an extensive, interregional network of social relations' (Nicolay 2014). Harrington and Welch have argued in a similar vein that the distribution of scales and weights in England suggests that high quality metalwork, rather than being produced by itinerant smiths, was made by craftsmen working in 'central places' where lightweight but valuable goods

such as garnets, bullion, and metal scrap, acquired by agents on behalf of aristocratic patrons -- or perhaps by the clients themselves -- were converted into precious objects (2014, 207).

Noel Adams has, however, suggested that the caches of garnets found in burials could imply that some clients brought their own gems to goldsmiths for setting (Adams 2011b, 87). These could all have been obtained at the same time (as the uniformity of the Lechlade garnets might suggest), or they might have been acquired over a period of time from different sources, in which case an item of garnet-inlaid metalwork would contain stones of varying composition. Recent analysis of the garnets used in three Anglo-Saxon composite disc brooches, all strikingly similar in size and design and found in the same part of Upper Thames Valley (the early heartland of the West Saxon kingdom), casts new light on this question. All three brooches were manufactured around the middle of the seventh century, presumably in the same workshop (**Fig. 4**). Two come from graves in a poorly recorded cemetery excavated in the nineteenth century at Milton (Oxon.), while the third was found in 2009 in a burial at West Hanney (Oxon.), c. 10km to the West (Hamerow 2015). The garnets from the three brooches were subjected to XRF analysis to establish their composition. The ratios of four elements common in garnets– iron, titanium, manganese and chrome – were found to be particularly diagnostic.<sup>3</sup> It must be stressed that these represent preliminary results and the approach needs to be tested more widely, yet the initial results are striking (**Fig. 5**). These clearly reveal the use of two distinct compositions of garnets, suggesting that two ‘batches’ – i.e. garnets deriving from the same parent stone -- were used; [further work has the potential to define the two groups more tightly]. One of these is present in all three brooches while the West Hanney brooch also contains stones from the second batch. The workshop that produced these brooches appears not to have drawn on a ‘mixed bag’ of garnets acquired from various sources, for example including recycled stones from older items of metalwork. Quite apart from potentially providing powerful evidence that these brooches were produced in the same workshop at around the same time, these provisional results may indicate that supplies of garnets could reach

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<sup>3</sup> The analysis was undertaken by Professor Andrew Shortland of the Cranfield Forensic Institute, who has kindly provided the data presented in Figure 4.

a goldsmith's workshop in a relatively unmixed state, despite the long distances travelled.

### □H1□ *A declining supply*

Several studies of Merovingian garnet-inlaid metalwork clearly point to a sharp decline in the availability of almandine garnets beginning in the second half of the sixth century (Arrhenius 1985, 36 and 98; Quast/Schussler 2000). Chemical analyses of the garnets used in fifth- and sixth-century metalwork indicate that the most likely sources of these stones were India and Sri Lanka.<sup>4</sup> This sharp reduction in the supply of garnets from the later sixth century onwards is hypothesized to be the result of the disruption to long-distance trade routes through the Arabian Peninsula caused by Sassanid expansion (von Freeden 2000; Adams 2011a). The decline in garnet use followed a different chronological trajectory in England, however, where garnets had always been used more sparingly than in the Frankish world. Here, garnet inlaid metalwork reached its peak in the late sixth and first half of the seventh century, as testified by deluxe objects such as the Kingston brooch and the Sutton Hoo shoulder clasps (Webster /Backhouse 1991, 29-30, 50). Indeed, supplies of garnets and other prestigious goods acquired through exchange networks linking England to the Mediterranean world did not see a significant decline until third quarter of the seventh century.

Nevertheless, from around the second quarter of the seventh century, a decline in the availability of garnets in England is evident, for example in the increasing use of 'cannibalized' garnets taken from older items. A good example of this practice is the composite disc brooch from Monkton, Kent, where T-shaped garnets, apparently from an older piece, have been combined with irregularly shaped and, in some cases, broken stones to produce a design accurately, if disparagingly, described by Sonia Hawkes as 'sadly deficient' (Fig. 6; Hawkes 1975, 247; 250-51).<sup>5</sup> A shortage of garnets is perhaps also implied by the seventh-century composite disc brooch from Harford Farm,

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<sup>4</sup> See Adams 2003, n.1 for a useful review of the scientific analyses of early medieval garnets carried out over the past fifty years.

<sup>5</sup> The brooch's back-plate also appears to have been reused (Hawkes 1975, 250-51).

Norfolk, where gold patches used to repair the rim lack the garnet inlays used in the original (Penn / Anderson 2000, 46-8, fig. 84).

The Harford Farm brooch and other late examples of garnet-inlaid metalwork, such as a composite disc brooch from Boss Hall (also in Norfolk), also appear to reflect a 'general impoverishment of lapidary skills' by the middle of the seventh century, while the small size and irregular shape of the stones suggest a lack of large, fresh garnets (Adams 2011b; Scull 2009, 88-91). These later objects used garnets that were not wheel cut but had been shaped by hand. As a result, the garnet inlays had simple, usually geometric shapes and chipped or 'grozed' edges (**Fig. 7**; This is also seen on later Vendel/early Viking Age garnet inlaid jewellery in Scandinavia, and is referred to by Arrhenius as 'retouching'; Arrhenius 1985, 76). The use of garnet inlays nevertheless appears to have continued until at least the middle decades of the seventh century in England (Scull 2009, 90). Some of the latest examples of garnet-inlaid jewellery found in England come from burials in or near the major emporia, a distribution that may not be coincidental (see Pestell 2011, fig. 29.5).

Researchers have long held the view that the Anglo-Saxons' supply of valuable imports such as garnets and gold depended on relations with the Franks, and that Frankish elites used trade in such precious materials to enhance their political and economic clout with regions around the North Sea (Wickham 2000).<sup>6</sup> It is probably significant, therefore, that access to gold also declined significantly in England (and in the Northern Netherlands) during the second half of the seventh century, evidence of which can be found in both the jewellery of the period and in the disappearance of the gold 'thrymsa' coinages (Nicolay 2014, 101).

This decline in the availability of garnets and gold was not, however, the result of a wider economic or mercantile crisis, as demonstrated by the boom in the silver 'sceatta' coinages and the expansion of the emporia around the beginning of the eighth century. Indeed, the appearance in the middle

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<sup>6</sup> It is interesting to note, however, that a recent consideration of Frankish imports to Scandinavia does not consider garnets (Ljungkvist 2009).

decades of the seventh century of garnets cut *en cabochon*,<sup>7</sup> such as those used in the spectacular necklace found at Desborough (Northants.), alongside cowrie shells and other rare and exotic materials, may even hint at the emergence of new trade routes around this time (Webster/Backhouse 1991, 28; Hinton 2011, 434-5; Hines / Bayliss 2013).

□H1□ *Sources and trade routes: some concluding questions*

The distribution and context of garnet caches thus indicates that, between c. 400-700, garnets circulated around the North Sea and Baltic regions via nodes in an international trading nexus that was largely – though perhaps not entirely – controlled by a supra-regional ruling elite. The conditions under which this trade was conducted remain unclear, although some of the sites where garnet caches have been found could have been places where rulers levied tolls on such high-value imports (Loveluck / Tys 2006).

The chronological disjunction between the decline of garnet use in the Frankish world and the North Sea and Baltic regions raises some interesting questions. Had Scandinavia and Anglo-Saxon England been entirely dependent on relations with the Franks and on the Rhine corridor for their garnets, the decline in the supply of stones to these regions should have followed the same chronological trajectory seen in France and southern Germany. That it did not do so suggests that these regions were able to exploit a new trade network -- perhaps involving the Russian river systems that came to play such a vital role in the Viking Age -- or a new source of garnets, or perhaps both. Chemical analysis of some of the Scandinavian garnet caches has suggested that a possible source for these are the garnet-rich rocks that occur in SW Sweden (Mannerstrand / Lundquist 2003; Lundström 1973). Significant in this regard are the results of an analysis of loose garnets undertaken by Jonna Sarén Lundahl, who concludes that, soon after c. 600, Swedish garnet sources replaced South Asian ones in Scandinavia. This shift, she argues, corresponded to the change from wheel-cut to 'chipped' garnets and marked the beginning of local, Scandinavian production of garnet-inlaid cloisonné (Lundahl 2011). Further closely targeted

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<sup>7</sup> The chemical composition of some cabochon garnets indicates a likely origin in Bohemia, though others appear to be re-used, having probably been prepared in Byzantine workshops (Quast/Schüssler 2000; N. Adams, pers. comm. 2015).

analytical work is needed to resolve such questions, and to clarify the complex and varied ways in which garnets and garnet-working technologies moved between England, Scandinavia and Francia.

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