# A Seventh-Century Necklace from Hardingstone, Northamptonshire

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*An unpublished necklace assemblage from Northamptonshire, typical of female burials of the later seventh-century 'Final Phase' and including some unusual elements, is introduced and analysed. Framing this case study is a discussion of the wider significance and potential of these distinctive objects for understanding the prominent role of women in seventh-century England.*

In 1967–8 a small Anglo-Saxon inhumation cemetery was uncovered at Martin's Lane, in Hardingstone, Northamptonshire (SP 764574). One of the three graves from the site contained a necklace of beads and pendants, of a type characteristic of the well-furnished female graves of the seventh century in Anglo-Saxon England.

Recent refinements to the chronology of the latest phase of Anglo-Saxon furnished burial have drawn attention to this group of high-status women and the objects that distinguish their graves from those of contemporaries.[1] Of the suite of grave-goods that typically accompany these women, necklaces are particularly significant. Partly, this is due to their distinctiveness: in both their overall form and individual components, seventh-century necklaces differ markedly from the long bead-festoons of the fifth and sixth centuries.[2] This explains the prominence of necklace material in chronological frameworks,[3] with the introduction of many pendant- and especially bead-types being one feature that marks the transition to the Final Phase of furnished female burial in the seventh century.[4]

Beyond this typological and chronological interest, however, the wider class of seventh-century necklace material has been somewhat neglected. Some particular bead- and pendant types have been assessed in relation to broad social questions – amethyst beads as evidence for long-distance trade and economic developments[5] and cruciform pendants in light of the wider processes of Christianisation,[6] for example – but as composite objects, discussion of necklaces has been rather narrow in its focus. Certainly, a disproportionate amount of attention has been focused on the most spectacular examples, such as that from Desborough (another Northamptonshire find), largely because necklaces of this strata represent the greatest investment in precious metals and imported materials and are therefore the clearest indicator of the material wealth of these high-status women. There is, however, a much larger corpus of necklace material, much of it far less elaborate than Desborough, but linked by the widespread use of a restricted group of elements and an emphasis on delicacy in form and design. Indeed, based on her study of Conversion Period grave-goods, Geake estimated that over a quarter of furnished female graves contained a necklace.[7] It is to this wider group of material that the Hardingstone necklace belongs.

Necklaces like that from Hardingstone are more obviously assemblages of material, a feature perhaps masked by the coherency in terms of materials and design of finds like Desborough. This deliberate curation of elements into a single piece of jewellery invites us to think about the multiplicity of messages that necklaces communicate. In addition to the much-discussed themes of long-distance exchange, Christianisation and social stratification, other questions can also be asked of this corpus of necklace material: how did women access this material, and how and for how long did it circulate through female networks of exchange? How were necklaces assembled and worn, and what messages about status, cultural affiliations and female fashion did they communicate? Do these items have a sentimental, as well as an intrinsic, value, and might this explain their selection for inclusion in some female graves? A comprehensive analysis of this jewellery therefore has the potential to contribute to a more complete picture of a prominent group of women within seventh-century society.

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[1] Hines and Bayliss 2013; Hamerow 2016.
[2] Geake 1999, 203; Owen-Crocker 2004, 143–4.
[3] See Geake 1997, Hines and Bayliss 2013 and Brugmann 2004 for important typological and chronological studies.
[4] Hyslop 1963.
[5] Huggett 1988; Harrington and Welch 2014, 159–161.
[6] Crawford 2003; MacGregor 2000.
[7] Geake 1997, 51.

The aims of this article are therefore twofold: to present a detailed study of a single, complete, and previously unpublished necklace, composed of some unusual and interesting elements; and more broadly to demonstrate the potential of these assemblages to shed new light on social transitions in the seventh century.

## THE SITE

The Hardingstone cemetery was discovered in 1967–8 during rescue excavations in advance of the construction of a primary school. A report on the Iron Age and Romano-British remains from the same excavations appeared soon afterwards,[8] but the Anglo-Saxon material was never published.

There is a significant amount of Anglo-Saxon activity in the area, much of it concentrated on the Iron Age hillfort at Hunsbury, around 3km to the east of the Martin's Lane cemetery.[9] Of greatest relevance is the record of a cemetery of several burials discovered in the parish of Hardingstone in 1860, the exact location of which was unfortunately not recorded.[10] The only extant object from this cemetery – a circular gilt-bronze mount decorated with a star-shaped arrangement of cloisonné garnets and a cruciform design of fishes around a central boss – is suggestive of a seventh-century date.[11] The exact relationship of this antiquarian discovery to the three graves at Martin's Lane is unclear, but it is at least evidence of other, relatively high-status seventh-century funerary activity in the immediate vicinity.

The Martin's Lane cemetery adds to a small but significant group of seventh-century burial grounds in Northamptonshire. Aside from the notable discovery at Desborough,[12] a small group of eight seventh-century burials was uncovered at Wakerley, during excavations of an Iron Age settlement and Roman agricultural complex. Wakerely provides a close parallel for the Martin's Lane cemetery: the majority of the burials were unfurnished or very simply furnished, while one grave, that of a young woman, contained a necklace of beads and wire-rings.[13] Stray finds recorded on the PAS database have also added to the small corpus of seventh-century necklace material from Northamptonshire.[14]

## THE CEMETERY

Regrettably, little information about the Martin's Lane cemetery is preserved in the site archive. Three burials were found, two of which were furnished. While the objects themselves were retained and associations with particular graves recorded, no plans of the grave or their location within the wider site exist and the current location of any recovered skeletal material is unknown.

Of the three burials excavated, grave 1 was unfurnished and grave 2 contained an iron knife under the left elbow and an iron buckle (A) in an unknown position. As well as the necklace, grave 3 contained an iron knife; the position of this item in the grave is not recorded. Two knives are present in the site archive, but it is now impossible to determine to which grave each belonged.

A. IRON BUCKLE
D-shaped loop, simple tongue. Hoilund-Nielsen type: BU8.
Dimensions: length 25mm; width 18mm. Weight: 5.7g.

[8] Woods 1969.
[9] Hawkes 2007, 148; Jackson 1994, 34; Metcalf 1976, 1–2; Fell 1953.
[10] Bateman 1861, 190.
[11] Bateman 1861, 190; Smith 1902, plate I; Meaney and Hawkes 1970, plate III; Geake 1997, 171.
[12] Baker 1880.
[13] Cook 1978.
[14] See, for example, DENO-859998, a gold and garnet pendant from Hargrave, and NARC-09F5D2, a gold bulla pendant from Orlingbury.

B. IRON KNIFE

With curved back and curved cutting edge; Evison type 2. Break across the tip of the blade.

Dimensions: total surviving length 177mm; blade length 128mm; maximum blade width 29mm. Weight: 11.6g.

C. IRON KNIFE

With straight back and curved cutting edge; Evison type 1. Tip missing.

Dimensions: total surviving length 125mm; blade length 91mm; maximum blade with 15mm. Weight: 31.4g.

The buckle is a simple form, in use throughout the sixth and seventh centuries.[15] The knives also belong to relatively common, long-lived types that are not particularly chronologically sensitive.[16] Nevertheless, the objects from grave 2 and the absence of grave-goods from grave 1, are not inconsistent with a seventh-century date for the cemetery as a whole. Conversion period cemeteries typically contain a high proportion of unfurnished and very simply furnished knife-and-buckle burials.[17]

## THE NECKLACE

The necklace was found in grave 3. The position of the items in relation to any surviving skeleton is unfortunately not recorded, but there is a sketch of the necklace present in the site archive, and it is on this that the numbering of the various elements, and the reconstruction (Fig 13), is based.

1. OPAQUE GREEN GLASS BEAD (FIG 1)

Short cylindrical glass bead with a wide perforation. Spiralling winding marks visible around the perforation. Dark opaque green in colour, with thin streaks of red, following the direction of winding. Light wear around the perforation. Surface of the glass moderately weathered.

Dimensions: diameter 7.4mm; length 5.3–5.5mm; diameter of perforation 4.1mm. Weight 0.5g.

Høilund-Nielsen type: BE1-WoundSp.

FIG 1

Opaque green glass wound spiral bead (1). Diameter 7.4mm. *Drawing by the author; photograph by J. Veitch.*

Wound spiral beads are named for their method of manufacture, which involves winding molten glass around a mandrel. This process leaves distinctive spiralling marks around the perforation. Beads of this type have a wide and fairly even distribution throughout Anglo-Saxon England, and are largely an insular type, with few parallels in continental cemeteries.[18]

The red streaks in the glass are unlikely to represent a deliberately added secondary colour, but instead suggest that the copper used to colour the glass was incompletely oxidised, and a small proportion of the glass coloured red by copper in its reduced state remained in the mix. This is

[15] Hines and Bayliss 2013, 243–5.
[16] Evison 1987, 113; Hines and Bayliss 2013, 370.
[17] Meaney and Hawkes 1970, 45; Boddington 1990, 181.
[18] Brugmann 2004, 41 and fig 44.

not particularly unusual; similar patchy oxidisation was noted in opaque green wound spiral beads from grave 91 at Edix Hill (Cambs.),[19] and the author has found other examples during first-hand examination of beads from seventh-century graves at Cleatham, Castledyke South (both Lincs.) and Shudy Camps (Cambs.).[20] It is not clear whether these beads represent an intentional decorative effect the artisan sought to achieve, or whether they reflect the particular technique and skill level of the bead-maker.

2. SPHERICAL SILVER BULLA PENDANT (FIG 2)

Spherical silver bulla pendant, comprising domed sheet metal back- and front-plates, joined by means of a very narrow flange. Reverse is shallower than the front. Reeded suspension loop, with traces of a least three ribs, is a separate piece of metal. Backplate was dented and the suspension loop bent slightly to one side, both probably prior to burial. Front-plate is cracked, and a small piece of silver has broken away from one edge. Light wear to the suspension loop.

Dimensions: diameter 8.1mm; length including loop 10.3mm; depth 5.9mm; width of suspension loop 2.4mm; diameter of suspension loop 3.4mm. Weight: 0.3g.

FIG 2
Spherical silver bulla pendant (2). Length including loop 10.3mm. *Drawing by the author; photograph by J Veitch.*

Spherical bulla pendants are a variant of the more common hemispherical type.[21] They were recognised as such by Geake in her survey of Conversion period grave-goods, but not distinguished as a separate sub-type in Høilund-Nielsen's recent typology.[22] Similar spherical silver bullae were found as part of necklaces from Lower Brook Street, Winchester (Hants.) and Street House (N. Yorks.).[23] Additionally, a number of gold examples are recorded on the PAS database.[24]

3. OPAQUE YELLOW GLASS BEAD (FIG 3)

Opaque yellow biconical glass bead. Winding marks around perforation. Several grooves running around the bead, perpendicular to the perforation, with sharply-defined vertical edges. Surface of the glass moderately weathered.

Dimensions: diameter 6.5–6.8mm; length 4.8–4.9mm; diameter of perforation 3.8mm. Weight: <0.1g.

Høilund-Nielsen type: BE1-WoundSp.

[19] Malim and Hines 1998, 80; Mortimer n.d., 4.
[20] The author is grateful to Rose Nicholson of the North Lincolnshire Museum and Imogen Gunn of the Museum of Archaeology and Anthropology, University of Cambridge, for granting permission to record necklace material in their respective collections.
[21] See below, [p].
[22] Geake 1997, 36; Høilund-Nielsen 2013.
[23] Hawkes 1990, 629; Sherlock 2012, 45.
[24] CAM-379F45 from Uttlesford (Essex), SWYOR-2B14B6 from Langton-by-Wragby (Lincs.), SF-71F723 from Snetterton (Norf.) and NARC-09F5D2 from Orlingbury.

FIG 3
Opaque yellow wound spiral bead (3). Diameter 6.8mm. *Drawing by the author; photograph by J Veitch.*

This is the smallest of the wound spiral beads, and of a slightly different, biconical, shape. As well as the characteristic winding marks visible around the perforation, this bead has a series of deep grooves in the surface of the glass. The shape of these grooves – rounded at one end and pointed at the other – is suggestive of trails of a secondary substance, applied to the surface of the bead during manufacture, which has since decayed. Compositional analyses[25] of the glass found very slightly elevated levels of iron and tin and lower levels of lead in the grooves compared to the surface, suggesting the secondary material may have been a white (or perhaps paler yellow) opaque glass.[26] This would also fit with the susceptibility of white glass to decay in the burial environment.[27]

The location of the grooves does not seem to have been intended to produce a particular pattern on the surface of the glass, such as waves or spots. Indeed, generally wound spiral beads are monochrome. It may be that this bead represents an experiment by a bead-maker working with both yellow and white glass, using a spare supply of the latter to produce an interesting visual effect, applying thin trails of contrasting white glass to the surface of the yellow bead.

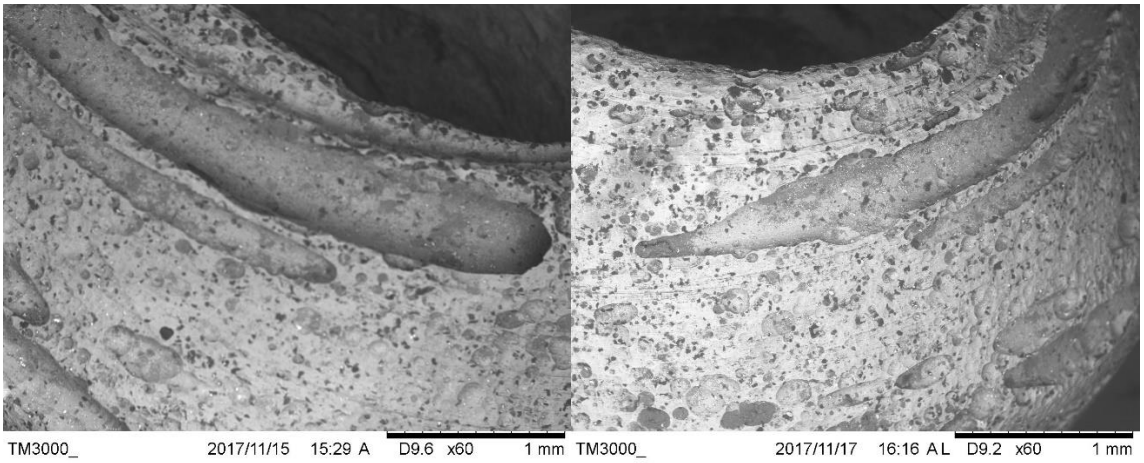


FIG 4
SEM images of the opaque yellow bead, showing the profile of surface grooves. Image taken at 60x magnification using a Hitachi TM300 scanning electron microscope. *By the author.*

4. HEMISPHERICAL SILVER BULLA PENDANT (FIG 5)

Hemispherical silver bulla pendant, constructed from a flat sheet metal backplate and a domed front plate, with a flange around the boss. Suspension loop, formed from a separate strip of metal in a three-ribbed reeded design, extends in a tongue-shaped projection down the back of the pendant, and is

[25] See below, [p], for details.
[26] Bayley 1999, 91.
[27] Brugmann 2004, 24.

curled over and attached to itself to form the loop. Light wear on the loop. Front of the pendant is in relatively good condition, with no obvious signs of damage. Backplate is cracked and slightly concave.

Dimensions: diameter 11.5mm; length including loop 15.1mm; depth 4.6mm; width of suspension loop 2.2mm; diameter of suspension loop 3.1mm. Weight 0.5g.

Høilund-Nielsen type: PE8.

FIG 5
Hemispherical silver bulla pendant (4). Length including loop 15.1mm. *Drawing by the author; photograph by J Veitch.*

The hemispherical type is the most common form of bulla pendant, and they have a wide distribution throughout England. The majority are silver, although small numbers of gold and a few copper-alloy examples exist.

Bulla pendants were introduced to England in the seventh century as part of the wider imitation of Late Antique jewellery styles.[28] The question of how and why this distinct element of female costume and fashion was transmitted from the eastern Mediterranean to northern Europe has not yet been satisfactorily resolved,[29] but the presence of bulla pendants in Lombardic cemeteries, such as Cividale and Nocera Umbra, may suggest that this influence arrived via the Italian peninsula.[30]

The popularity of bulla pendants may also owe something to their visual similarity to cabochon pendants,[31] although this relationship was clearly more complex than one of simple substitution, since they are frequently found together, as the Hardingstone necklace demonstrates.

### 5. OPAQUE LIGHT GREEN GLASS BEAD (FIG 6)

Opaque light green short cylindrical glass bead. Monochrome. Winding marks around the perforation. Surface of the glass moderately weathered.

Dimensions: diameter 7.9mm; length 5.0mm; diameter of perforation 3.5mm. Weight: 0.5g.

Høilund-Nielsen type: BE1-WoundSp.

[28] This object type ultimately has classical prototypes; the first examples are found in Etruscan jewellery, and they were also widely used, often as amulets, in the Roman period. See Higgins 1961, 141.
[29] But see Geake 1997, 1999 and Hyslop 1963, 192–3 for discussion.
[30] Menis 1992.
[31] Geake 1997, 37.

FIG 6
Opaque light green wound spiral bead (5). Diameter of bead 7.9mm. *Drawing by the author; photograph by J Veitch.*

This bead was also produced by winding the glass around a mandrel, and the manufacturing traces can be seen particularly clearly around the perforation.

6. SILVER SUSPENSION LOOP

Two fragments of curled reeded sheet silver, with traces of at least three ribs. Traces of break on the smaller fragment.

These fragments of silver almost certainly derive from a reeded suspension loop. They suggest the presence of another silver pendant. It is not possible, on the basis of the surviving fragments, to determine how the loop was connected to the rest of the now-missing pendant, and therefore to suggest what kind of pendant it may have been.

7. TRANSLUCENT TURQUOISE GLASS BEAD (FIG 7)

Very short translucent turquoise annular glass bead with a small perforation and an asymmetric profile. Lower surface is very irregular in profile. Upper surface is smooth and rounded and shows little evidence of weathering. Uneven pattern of moderate wear around the perforation.

Dimensions: diameter 8.3mm; length 3.4mm; diameter of perforation 1.9mm. Weight: 0.4g.

Høilund-Nielsen type: BE1-Dghnt.

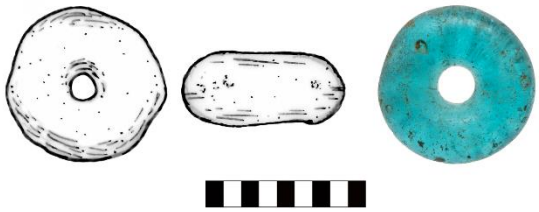

FIG 7
Translucent turquoise doughnut bead (7). Diameter 8.3mm. *Drawing by the author; photograph by J Veitch.*

Doughnut beads are produced by placing a blob of molten glass on a flat surface and piercing it with a thin, awl like implement.[32] The irregular profile of the underside of this bead preserves the uneven texture of the surface on which the bead was made and annealed. The upper surface of the bead is very smooth and may have been fire polished.

Doughnut beads seem to be an exclusively insular type, found in small numbers across Anglo-Saxon England, with concentrations in the upper Thames valley, the Humber estuary and East Anglia, and very few parallels on the continent.[33]

[32] Hirst 2000, 122; Brugmann 2004, 21.
[33] Brugmann 2004, 41 and fig 43.

8. SILVER SUSPENSION LOOP (FIG 8)

Silver suspension loop, formed from a single sheet of silver with a triple-ribbed reeded design, rolled to create a loop. Projection is broken and has a jagged profile. Break across the base of the loop, which is probably post-depositional. A small piece of metal has broken away from the edge at the front of the loop; this damage may have occurred in antiquity.

Dimensions: length 6.1mm; width 2.3mm; diameter of loop 2.2mm. Weight: <0.1g.

Fig 8
Silver suspension loop (8). Length 6.1mm. *Drawing by the author; photograph by J Veitch.*

This loop must originally also have been part of a silver pendant. In this case, enough survives to allow for comparison with other elements of the necklace, which reveals that the shape and construction of this loop is most similar to that of the hemispherical bulla pendant (4). It seems likely that this surviving loop was once attached to the flat backplate of a hemispherical silver pendant.

Suspension loops made from strips of reeded sheet metal are one of the most common types used in the construction of seventh-century jewellery.[34] The apparent popularity of this form is likely due to the fact that the ribbed shape was both decorative and, like corrugated iron, stronger than flat sheet metal. No marks associated with manufacture were visible on the Hardingstone suspension loops, but examination of other contemporary gold objects has suggested that they were probably produced by draw-swaging, which involved pulling the flat strip of metal through a die.[35]

9. DARK BLUE GLASS BEAD WITH COPPER-ALLOY CORE (FIG 9)

Semi-translucent dark blue glass bead with a hollow copper-alloy tube forming the perforation, visible at either end. Globular shape with a very irregular profile around the perforation. Striations running around the outside of the bead, perpendicular to the central perforation. Red discolouration of the glass around the copper-alloy tube. Several longitudinal cracks. Surface of the glass moderately weathered.

Dimensions: diameter 6.3mm; length 7.2mm. Weight: 0.3g.

FIG 9

[34] Coatsworth and Pinder 2002, 118.
[35] Pinder 2001.

Dark blue glass bead with copper-alloy tube (9). Length 7.2mm. *Drawing by the author; photograph by J Veitch.*

This bead was made by rolling a thin sheet of copper alloy into a tube around an iron mandrel and winding a trail of hot glass around the tube. As the glass does not seem to cover the copper-alloy tube, it is possible this was cut to length after the glass had been applied, which may explain the uneven profile of the bead at each end. The fractures along the length of the bead, parallel to the copper-alloy tube, are the result of internal pressures created as the metal corroded and increased in volume.[36] The red discolouration is likely to be cuprite corrosion.

The purpose of the copper-alloy tube is not immediately clear. It is not likely to have been visible when the bead was strung, suggesting this was not done for aesthetic reasons. Instead, the most plausible explanation may be that the copper-tube served a practical function, making the bead easier to remove from the mandrel.[37] When made in the traditional way, some skill is required to separate a wound glass bead from the mandrel by means of a sharp tap. By using a copper-alloy tube, the bead can be removed simply by cooling the mandrel, perhaps with water, until it contracts and separates from the hot copper and glass. Once the bead has cooled, the copper-alloy tube can be cut to length, and any distortion of the tube pushed back into shape.[38]

This bead is of a very unusual type.[39] There are only a very small number of parallels, all of them from seventh-century cemeteries, at Ducklington (Oxon.), Lechlade (Glos.), Camerton (Som.) and possibly also Winnall (Hants.).[40] Translucent dark blue glass seems to be the most commonly occurring form, but there are examples of beads with copper-alloy cores in various colours, both monochrome and polychrome. A parallel for this method of manufacture can be found in beads from later seventh- and eighth-century century cemeteries in southern Germany and Austria.[41] These continental examples are typically almond-shaped, rather than globular, and frequently made from translucent turquoise or light blue glass, although darker blue examples are known.[42] It is not clear, therefore, whether beads of a similar type in Anglo-Saxon England represent imported beads or the imitation of a particular region-specific manufacturing technique. Interestingly, the same areas of southern Germany and Austria that produce this bead types also produce many of the Byzantine-style objects often found in Anglo-Saxon England.[43] If this is evidence for import, the westerly, inland distribution of these beads in England is surprising.

10. SILVER PENDANT WITH DARK BLUE GLASS INLAY (FIG 10)

Semi-translucent piece of hemispherical dark blue glass attached to a flat silver back plate, with a silver suspension loop. Air bubbles visible at the surface of the glass. Suspension loop is integral with the backplate and has been rolled to create the loop; no traces of reeding or other decorative treatment. Small twisted piece of silver below the suspension loop.

Surface of the glass is weathered and iridescent in places. Areas of the silver backplate are missing at the edges, opposite the suspension loop. Crack across the top of the suspension loop, perhaps where repeated wear had weakened the metal.

Dimensions: diameter 10.0mm; length including loop 12.6mm; depth 4.5mm; width of loop 3.6mm; diameter of loop 1.9mm. Weight: 0.7g.

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[36] Frey and Greiff 2009, 375.
[37] Ibid., 377.
[38] The author is grateful to Sue Heaser for sharing the results and photographs of her experiments making replicas of these beads.
[39] It does not appear in the recent bead typologies of Guido 1999, Brugmann 2004 or Høilund-Nielsen 2013.
[40] Ducklington grave 2 (Dickinson 1977, 90–1), Ducklington grave F47.2 (Chambers 1975, 191); Lechlade graves 95/1 and 172/2 (Boyle et al. 1998, 97 and 127); Camerton graves 32 and 79 (Horne 1933, 48, 57); Winnall grave 5 (Meaney and Hawkes 1970, 10).
[41] Katzameyer 1997, 152–3; Frey and Greiff 2009, 373.
[42] Frey and Greiff 2009, 374.
[43] See, for example, Drauschke 2010.

FIG 10
Silver blue glass cabochon pendant (10). Length including loop 12.6mm. *Drawing by the author; photograph by J Veitch.*

This object falls into the broad category of inlaid pendants.[44] Of these, glass pendants are a relatively common type, with a wide distribution throughout England and concentrations in Kent and the midlands. The Hardingstone pendant is of a relatively simple form: a piece of monochrome glass (usually blue or green), typically convex in shape, set in a precious metal frame. Close parallels for the Hardingstone pendant include examples from Kingston Down and Bekesbourne (Kent), Cumnor (Oxon.) and Chamberlain's Barn (Beds.).[45]

However, the Hardingstone pendant is unusual in that the method of attaching the glass cabochon to the backplate is not immediately clear. There is no evidence for the kind of metal collet typically used to secure inlays in comparable seventh-century cabochon pendants, visible either on the backplate or the lower edge of the glass. This type of construction is rare, although the pendant from Chamberlain's Barn might provide a parallel, as it too survives as a hemispherical piece of glass and a silver backplate.[46] A plausible explanation is a layer of paste solder between the backplate and the cabochon, although no traces of such material are visible on the Hardingstone pendant. It is also possible that the small, thin piece of silver directly below the suspension loop is the remains of a clasp, used to hold the cabochon in place. Additional clasps would presumably have been required for this method of attachment to work, and such fittings may have been lost from the lower edge of the pendant, where parts of the backplate are missing.

The air bubbles at the surface of the glass suggest the hemispherical cabochon has been produced by abrading a larger piece of glass, perhaps a tessera.[47] This may have been achieved using emery and sandstone, in the form of grit of several degrees of fineness, as these are known to have been used to cut and polish gemstones in antiquity.[48] Interestingly, this manufacturing technique is more consistent with the skills of a jeweller, rather than a glass-worker.

11. DARK BLUE GLASS BEAD WITH COPPER-ALLOY CORE (FIG 11)

Semi-translucent blue glass bead with hollow copper-alloy tube forming the perforation, visible at both ends. Globular shape with a very irregular profile around the perforation. Striations running along the length of the bead. Several longitudinal cracks. Surface of the glass moderately weathered.

Dimensions: diameter 7.6mm; length 7.8mm. Weight: 0.4g.

[44] The most recent typology classified inlaid pendants primarily by colour, rather than material, with the result that the Hardingstone pendant is not a particularly close fit for any of the PE9 sub-types. See Høilund-Nielsen 2013, 213–4.
[45] *Novum Inventorium Sepulchrale*; PAS find SUR-2A2601; Hyslop 1963, fig 12c.
[46] Hyslop 1963, 179.
[47] Small numbers of tesserae have been found in Middle Saxon sites such as Whitby, Flixborough and Glastonbury. Some may have been antiquities, scavenged from mosaic floors in abandoned Roman buildings, but they could also represent imported objects, as production of tessara is known to have continued into the eighth century at Italian glass-working centres. Evison 2008, 72; Evison et al 2009, 108–9.
[48] Coatsworth and Pinder 2002, 146, 150.

FIG 11
Dark blue glass bead with copper-alloy tube (11). Length 7.8mm. *Drawing by the author; photographs by J Veitch.*

Although slightly larger, this bead is an extremely close parallel to the other glass bead with a central copper-alloy tube (9), in terms of colour and manufacture.

12. TRANSLUCENT DARK BLUE ANNULAR BEAD ON A SILVER WIRE RING (FIG 12)

Very short translucent dark blue annular glass bead with a small perforation and an asymmetric profile, suspended on a silver wire ring. Upper surface of the bead is smooth and rounded; lower surface is flat and relatively smooth. Two large chips of glass are missing from the base of the bead. Uneven pattern of moderate wear around the central perforation. Surface of the glass shows little weathering.

Silver wire ring is roughly circular in shape. Ends of the wire are different thicknesses; one tapers to a point, the other has a blunter profile. Ring has a simple terminal type, with the blunter end of the wire formed into a hook around the opposite end, which has then been twisted backwards and around the ring. Nick in the wire close to the terminals, probably caused by a blade.

Dimensions: diameter of wire ring 26–27mm; thickness of wire 1–2mm; diameter of bead 12mm; length of bead 4–5mm; internal diameter of bead 3.1mm. Weight: 2.3g.

Høilund-Nielsen types: WR4; WR1-c (ring) and BE1-Dghnt (bead).[49]

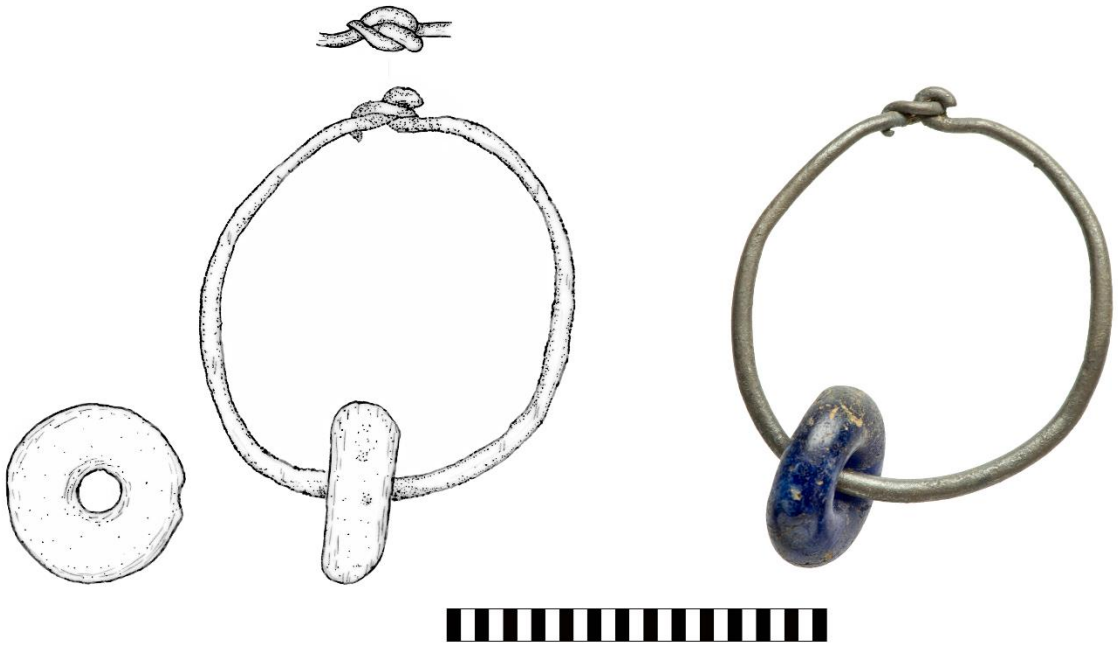

FIG 12

[49] Høilund-Nielsen 2013, 204, 216–7.

Semi-translucent dark blue annular bead suspended on wire ring (12). Diameter of ring 27mm. *Drawing by the author; photograph by J Veitch.*

There are no marks on the wire ring that can definitively prove how the wire was manufactured. However, extensive scholarly discussion of wire production in the early medieval period has suggested that block-twisting, which involved twisting a thin, square- or rectangular-sectioned metal strip to produce a rounded cross-section, was the most commonly-used technique.[50] No evidence for wire-drawing (pulling metal through holes of decreasing size in a drawplate) exists dated to before the eighth century.[51] The glass bead is a fairly large example of a doughnut bead.[52]

Although glass beads and silver wire rings are among the most common elements of seventh-century necklaces, beads suspended on wire rings are relatively rare, even accounting for the fact that presumably there will have been several cases in which the relationship between glass beads and fragmentary wire rings was no longer recognisable upon excavation. Given that both beads and wire rings could be worn as separate elements of a necklace, the suspension of some beads from wire rings is evidence of a clear process of selection, either on the part of the manufacturer or the wearer. In the case of the Hardingstone example, the bead is distinguished from others on the same necklace by its greater size but is comparable in both colour and type to other beads worn alongside it. Perhaps the provenance, or even the biography, of certain beads singled them out as being suitable for suspension on rings.

## ANALYSIS OF THE SILVER OBJECTS

The silver objects were analysed qualitatively using an Oxford Instruments ED 2000 EDXRF (energy dispersive x-ray fluorescence) spectrometer at 35kv in air. It was necessary for the analysis to be totally non-destructive, so no sample preparation or surface cleaning was undertaken before analysis. The results (Tab 1) therefore characterise the surface of the objects, and do not reflect the bulk composition of the metal. Nevertheless, this qualitative data is useful when considering the source of the silver and for making comparisons on the basis of composition between items from a group of contextually-related silver objects.

Visual examination of the objects had shown that the two bulla pendants and the cabochon pendant were constructed from several separate pieces of silver. For this reason, multiple points were analysed. The fragmentary suspension loop (6) is extremely fragile, and so was not analysed.

Like much Anglo-Saxon silver jewellery, the metal used to make the Hardingstone objects probably derives ultimately from recycled Roman silver, which was debased using available supplies of copper-alloy.[53] The presence of small amounts of zinc and gold is evidence of this debasement at an earlier stage of the recycling process, the former probably through the addition of scrap brasses and gunmetals and the latter perhaps via the recycling of gilded silver objects, since both zinc and gold are largely absent from late Roman silver.[54] The bromine is a result of the corrosion of the silver; other elements, including iron, titanium, calcium and manganese derive from the soil.

While previous compositional analyses of seventh-century jewelley have provided evidence for repair and replacement of elements like suspension loops and backplates,[55] the analysis of components of single items from the Hardingstone necklace revealed very similar compositions, suggesting that the individual items were each manufactured in a single episode. This is consistent

[50] Whitfield 1990; Coatsworth and Pinder 2002, 91; McFadyen 1998, 81–9.
[51] Whitfield 1990, 24–5.
[52] See above, [p.].
[53] Harrington and Welch 2014, 168–9.
[54] Caple and Clogg 1995; Leigh et al. 1984.
[55] Hawkes et al. 1966; Brown and Schweizer 1973.

with the lack of evidence for repair identified during visual examination of the objects. Between different objects, however, there is variation in the amount of copper, lead and other minor elements present. This suggests that the objects were made from different source metals, perhaps in a series of different manufacturing events. Analysis of other related groups of seventh-century silver objects has revealed comparable patterns.[56] The Hardingstone necklace, therefore, is more likely to represent a collection of curated material, rather than a coherent, commissioned piece.

| **Object and analysis** | **Highest concentration** | **Relatively high concentration** | **Other** | **Trace elements** |
|---|---|---|---|---|
| 2 (spherical bulla pendant), non-dented side | Ag | Pb, Br | Fe, Cu | Ca, Ti, Mn, Zn, Au, Sn |
| 2 (spherical bulla pendant), dented side | Ag | Pb, Br | Cu, Fe, Ca | Ti, Mn, Zn, Au, Sn |
| 2 (spherical bulla pendant), top of loop | Ag | Pb, Br | Cu, Fe | Ca, Ti, Mn, Zn, Au, Sn |
| 4 (hemispherical bulla pendant), loop | Ag | Br | Pb, Fe, Cu | Ca, Ti, Mn, Zn, Au, Sn |
| 4 (hemispherical bulla pendant), backplate | Ag | Br, Pb, Fe | Cu | Ca, Ti, Mn, Zn, Au, Sn |
| 4 (hemispherical bulla pendant), front | Ag | Br | Fe, Cu, Pb | Ca, Ti, Mn, Zn, Au, Sn |
| 8 (broken loop), top | Ag | Cu | Fe, Ti, Br | Ca, Mn, Pb, Zn, Au |
| 10 (glass cabochon pendant), loop | Ag | Br | Fe, Cu | Pb, Ca, Ti, Mn, Zn |
| 10 (glass cabochon pendant), reverse | Ag | Br | Fe, Cu | Pb, Ca, Ti, Mn, Zn, Sn |
| 12 (wire-mounted bead), wire | Ag | Br | Fe, Cu, Pb | Ca, Ti, Mn, Zn, Sn |

Table 1: Compositional data for the Hardingstone silver objects.

## ANALYSIS OF THE GLASS OBJECTS

The composition of the glass objects was analysed using a Hitachi TM3000 scanning electron microscope (SEM) with an Oxford Instruments SWIFT ED microanalysis capability, at 15kv with a count time of sixty seconds. No sample preparation or surface cleaning was undertaken prior to analysis, so the results are necessarily qualitative.[57] This data is used to characterise bulk glass type, to identify colourants and opacifying agents and to compare glass objects from the same necklace (Tab 2).

The beads and pendant inlay were all made from the same basic soda-lime-silica glass, a type widely used in Anglo-Saxon England, in vessels and window glass as well as jewellery.[58] Low levels of magnesium and potassium suggest that the source of the soda was natron, rather than plant ash, and therefore the glass was almost certainly produced in its primary, raw form in the eastern Mediterranean.[59] Previous studies have identified several different kinds of sand, based on

[56] Caple and Clogg 1995, 404; Wilthew 2006a, 373.
[57] Glass objects are particularly susceptible to de-alkalisation, a process in which groundwater leaches alkali ions, including sodium, calcium, potassium and magnesium, from the glass, leaving a flaky, iridescent silica-enriched surface layer. See Peake 2013, 112.
[58] Bimson and Freestone 2000.
[59] Henderson 2000, 355.

variable levels of mineral impurities, suggesting that glass was manufactured at a number of primary production centres.[60]

The compositional data also reveal the colourants and opacifiers added to the glass. Copper, in its oxidised form, coloured three of the beads (1, 5 and 7), producing a green hue where lead was present in the glass and turquoise where lead was absent.[61] Tin is the opacifier in the two opaque green beads (1 and 5), and is the colouring and opacifying agent in the yellow bead (3), in the form of crystals of lead-tin oxide suspended in the glass matrix. The colourant of the four dark blue semi-translucent glasses (beads 9, 11 and 12 and the cabochon inlay of the pendant) was probably cobalt. Although this was not detected at measurable levels in any of the blue glasses, cobalt is by far the most powerful colouring agent that can be added to glass, producing a deep blue tone at levels as low as 10ppm.[62] Copper can also produce a blue colour, so that fact that this is absent from all but one of the blue glasses supports the identification of cobalt as a colourant.

The results of this compositional analysis also allow for a number of interesting observations regarding manufacture. Previous studies of early medieval yellow glass have shown it was produced in a two-stage process, involving heating a mixture of lead and tin oxides to produce a pigment, before adding this to an existing base glass.[63] In addition to this specialised production process, yellow glass is particularly unstable and requires careful control of temperature to avoid the colour fading.[64] It may be, therefore, that beads made from yellow glass were produced by only a small number of artisans or at a few production centres.

Since tin is known to have replaced antimony as an opacifier from the fourth century onwards,[65] the absence of antimony in the opaque glasses suggests that these were not made using recycled Roman cullet, but from fresh supplies of glass that reached north-western Europe in the early medieval period.[66] The absence of antimony in the semi-translucent blue glasses also shows that Roman cobalt-coloured opaque glass was not the source of the cobalt.[67] Again, these objects probably represent imported early medieval glass types, and given that cobalt would have been a rare, and therefore expensive, mineral in north-western Europe, it seems likely that these glasses arrived in their coloured form.[68] Interestingly, the four visually-similar cobalt-blue glasses are heterogenous in composition, with variable levels of sodium and aluminium, including the two very similar beads with the copper-alloy core. This may suggest production from different sources of blue glass.

The only potential candidate for a bead made from recycled Roman scrap is the turquoise doughnut bead (7). Quantitative analysis of beads of this type from Eriswell (Suff.) found that they were all of a 'Roman' bulk glass type, and therefore probably represent the use of recycled material.[69] This, coupled with the exclusively insular distribution of the type, led Peake to argue that doughnut beads represent objects manufactured by Anglo-Saxon glass-workers using available supplies of ready-coloured translucent Roman cullet.[70]

Compositionally, as well as typologically, the Hardingstone glass objects represent a fairly heterogenous group. It is likely that multiple base glasses are represented, including both post-Roman and possible recycled Roman types. There are some potentially prestigious items: a number of cobalt-blue items that may have been produced using an exotic, imported blue glass and a yellow

[60] When analysed quantitatively, it is possible to assign early medieval glasses to established sub-groups that relate to these different primary production centres. See Freestone et al. 2008; Peake 2013; Henderson 2000.
[61] Wilthew 2006b, 389.
[62] Bayley 1999, 90.
[63] Peake and Freestone 2014; Heck et al. 2003.
[64] Peake and Freestone 2014, 15.
[65] Tite et al. 2008, 68.
[66] Indeed, antimony-opacified glass has only rarely been identified in Anglo-Saxon beads. Wilthew 2006b, 393.
[67] Peake 2013, 341.
[68] Ibid., 265.
[69] Ibid., 254.
[70] Ibid., 513.

| Object | Si | O | Na | K | Ca | Mg | Al | S | Cl | Ti | Mn | Fe | Cu | Zn | As | Sn | Sb | Pb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 (green wound spiral bead) | 20.95 | 50.80 | 7.40 | 0.53 | 2.04 | 0.37 | 1.18 | | 0.63 | ? | ? | 0.27 | 2.35 | ? | ? | 1.46 | ? | 10.93 |
| 3 (yellow wound spiral bead) | 20.43 | 48.64 | 3.16 | 2.45 | 2.32 | 0.28 | 2.40 | 0.42 | 0.74 | ? | ? | 1.07 | ? | | ? | 3.29 | ? | 13.2 |
| 5 (light green wound spiral bead) | 24.32 | 45.80 | 5.84 | 0.94 | 3.06 | 0.40 | 1.42 | | 0.93 | ? | ? | 0.41 | 1.42 | ? | ? | 0.95 | | 13.8 |
| 7 (light blue doughnut bead) | 20.43 | 66.66 | 6.64 | 0.24 | 1.98 | 0.30 | 1.08 | ? | 0.31 | ? | ? | ? | 1.62 | ? | ? | ? | ? | |
| 9 (dark blue globular bead with copper-alloy core) | 20.55 | 62.13 | 8.11 | 1.21 | 2.25 | 1.21 | 1.02 | ? | 0.43 | ? | ? | ? | 1.61 | ? | | ? | ? | ? |
| 10 (dark blue glass cabochon inlay) | 9.33 | 77.39 | 2.50 | 1.26 | 2.31 | | 1.82 | 1.35 | 0.80 | ? | | ? | | | ? | | ? | |
| 11 (dark blue globular bead with copper-alloy core | 36.28 | 51.39 | 1.39 | 1.86 | 4.07 | ? | 1.45 | 0.24 | 1.32 | ? | 0.71 | ? | ? | ? | ? | ? | ? | ? |
| 12 (dark blue doughnut bead) | 23.03 | 69.21 | 3.64 | 0.30 | 1.53 | ? | 0.93 | | 0.53 | ? | ? | ? | ? | | ? | | | |

Table 2: Compositional data for the Hardingstone glass objects. All expressed as weight percent. '?' represents elements identified during analysis, but which were present at or near the detection limits of the machine, and so had a significant error margin.

glass that may have been the product of a specialist. Other items, however, probably reflect smaller-scale, localised glass-working, utilising available supplies of glass cullet and scrap metal as colourants.

## RECONSTRUCTION

The reconstruction of the necklace (Fig. 13) is based on a labelled sketch in the site archive. It is not known whether this was based on the excavation plans or notes but given that many of the features of this reconstruction find parallels in other seventh-century necklaces, it is at least plausible that this sketch accurately records the position and association of the various beads and pendants. For example, wire rings are very commonly found at the ends of necklaces, where their function may have been to support a string of beads between them.[71] Similarly, the reconstructions of necklaces from Finglesham (Kent) show the same alternation of beads and pendants and the grouping of related materials (of shared material or colour) seen in the Hardingstone necklace.[72]


FIG 13
Reconstruction of the Hardingstone necklace, including hypothetical reconstruction of the pendants represented by the fragmentary suspension loops (6 and 8) and the original construction of the cabochon pendant (10). *Drawing by the author.*

## DISCUSSION

Almost all the objects on the necklace can be assigned to chronological phases established by the major English Heritage-funded radiocarbon dating project. The bulla pendants, cabochon pendant, wound spiral beads, doughnut beads and the wire-mounted bead all belong to phases D and E, corresponding to a period beginning in the 630s and ending with the general cessation of furnished burial in the 680s.[73]

[71] It is this position, close to the jaw, that has led many wire rings to be misidentified as earrings. Geake 1997, 49.
[72] Hawkes and Grainger 2006, figs 2.73, 2.94, 2.114.
[73] Hines and Bayliss 2013, 46.

With information about the layout of the cemetery and the skeletal remains from grave 3, comments concerning the social identity of the deceased would be on much firmer ground. However, a contextual approach does allow some conclusions to be drawn. Necklaces are a strongly gendered object; none have been found in the graves of osteologically-male individuals, or graves containing male-linked items.[74] They have, however, been found in the graves of young children, such as that of a child of five years or younger at Finglesham (Kent) and the double grave of an eight-month-old infant and an eight-year-old child at Marina Drive (Beds.).[75] Therefore, if necklaces were a marker of female status, this was almost certainly mediated by social factors other than age.

Certainly, grave 3 is the most richly furnished of the three graves discovered at Hardingstone. Hamerow has argued that the funerary treatment of this group of seventh-century women reflects their important role within elite families.[76] Women were key to dynastic security, through child-bearing and marriage alliances, while the prominence of women in the early Anglo-Saxon Church was a means for ensuring the spiritual security of the family. In other words, these burials served to established and reinforce legitimacy, both political and social. It is possible that the elevated social position of the individual in grave 3 and the communal memories of her burial and commemoration made the grave the focus of the other near-contemporary burials in the vicinity. Although this must remain speculation without further information regarding the layout of the cemetery, it is not difficult to find other examples of relatively rich female burials, many of them with necklaces, serving as foci for other, typically more sparsely furnished graves.[77]

This type of short, delicate necklace and the individual elements (cabochon pendants, bulla pendants, wound spiral beads etc.) of which it is comprised find parallels in well-furnished female graves across England. The context of these finds suggests they are an expression of an elite, but importantly not regional, feminine identity.[78] This homogeneity of female dress fashion may reflect a network of female communication and contact in the seventh century, perhaps maintained through exogamous marriage alliances and female monastic foundations.[79]

Primarily this jewellery was an expression of status, given the investment in exotic and esoteric materials. More complex messages surround the imitation of Late Antique jewellery styles and a possible connection with Christianity. While it is true that there is nothing explicitly Christian about the Hardingstone assemblage, many other necklaces do prominently display cruciform iconography.[80] There are also tantalising references in the written sources to elite women, many of them connected to the Church, wearing necklaces.[81] The significance of the classical or Byzantine prototypes for some seventh-century necklace elements is less well understood. Do these items simply represent the east-west movement of objects, which were valued and imitated as prestige imports with little knowledge of their ultimate origin? Or can we see in cabochon pendants, bulla pendants and amethyst beads the transfer of ideas, and a desire to imitate through jewellery the high-status female costume of the Late Antique eastern Mediterranean?[82] Against the background of the conversion process, which aligned Anglo-Saxon England more closely with continental

[74] Geake 1997, 51.
[75] Hawkes and Grainger 2006, 35, 334; Matthews 1962, 27, 31. See also Hamerow 2016, 428.
[76] Hamerow 2016.
[77] At Westfield Farm, Ely the grave of a teenaged girl (1) with a necklace and other rich grave-goods under a barrow seems to have served as the focus for at least sixteen other burials, while at Street House a bed burial (42), again with a spectacular assemblage of necklace elements, was found at the centre of a very unusual arrangement of graves forming a square shape. See Lucy et al. 2009 and Sherlock 2012.
[78] Geake 1999; Hamerow 2016.
[79] Yorke 2003; Harrington 2011, 91–2; Hamerow 2016, 436–7.
[80] MacGregor 2000.
[81] See Yorke 2011 and Crawford 2003, 2–3.
[82] This may also have been expressed through costume, as well as jewellery and dress accessories. Although of course the evidence for this is ephemeral, there are indications that the seventh-century saw changes to female dress, including a longer head-covering and a thin sash or girdle worn around the waist in place of a belt. Walton Rogers 2007, 167, 221.

politics, a conscious affiliation with new sources of spiritual authority and political power through visual and material culture seems plausible.

A detailed examination of the Hardingstone necklace also emphasises the importance of thinking about these items in terms of their potential personal significance, as an expression of a more individual identity. This is particularly relevant in the case of necklaces, given that they are assemblages of contextually-related objects, and therefore represent a deliberate process of selection and curation of different elements. Indeed, although seventh-century necklaces are characterised by the use of a relatively restricted group of component elements and share an overall stylistic similarity, within these parameters there is great deal of variation. The results of the compositional analysis of the Hardingstone necklace, suggestive of production from several sources of scrap silver and pre-coloured cobalt-blue glass cullet, seems more consistent with the collection and curation of objects from several sources, perhaps produced by different artisans and potentially over some period of time, rather than a coherent, commissioned piece of jewellery.[83] Certainly, the heterogenous compositional data fit with the fact that the necklace contains a range of object types, showing various manufacturing techniques. A useful modern analogy for this process of collection and curation might be the gradual addition of charms to a charm bracelet. The variation seen among the corpus of seventh-century necklaces may be a product of personal taste, as well as the availability of individual object types.[84] Minor wear on the elements from the Hardingstone necklace also attests to what must have been an extended period of use before burial. Assessment of other seventh-century pendants has noted comparable instances of extensive wear and repair.[85] Such evidence for the individuality and use-life of this necklace provides a glimpse of the sentimental and deeply personal value of this type of jewellery. It seems likely that it was this sentimental value, coupled with the deep symbolic resonances of necklaces, that prompted the deliberate selection of this object for deposition in a grave that was otherwise sparsely furnished.

## CONCLUSION

The Hardingstone necklace seems to have had a significance that was at once public and personal. While it almost certainly represents a meaningful piece of personal jewellery, the necklace also visually expressed an identity common to a group of high-status seventh-century women. Although this was a feminine identity, the exclusivity of necklaces shows that it was an identity mediated by social status and shaped by the changing political and religious climate of seventh-century England.

The Hardingstone find provides a small, but valuable, addition to a growing corpus of distinctive well-furnished seventh-century female graves. By focusing on the objects selected for placement in their graves, particularly the symbolically-charged necklaces, it is hoped future research will shed more light on the prominent role of women during a formative period of English history.

[83] There is scope for future research using targeted quantitative analytical techniques to explore these questions of collection and curation more sensitively.

[84] This hypothesis may also explain the presence of more unusual, potentially 'amuletic' elements like animal teeth and shells and reused *objet trouve* on other seventh-century necklaces. See Meaney 1981 on amulets and Sherlock 2016 on reused antiquities.

[85] Hawkes et al. 1966; Hamerow 2016, 429; Williams 2010, 33.

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