



***Staffordshire Hoard
Research Report 17***

Investigative Conservation of the
Die-impressed Sheet from the
Staffordshire Hoard

Fleur Shearman,
Duygu Camurcuoglu
Marilyn Hockey
Graeme McArthur

2014

This report forms part of
The Staffordshire Hoard: an Anglo-Saxon Treasure
edited by C. Fern, T. Dickinson and L. Webster
and published by the Society of Antiquaries of London

Information about this report

This report was produced in 2014 as part of Stage 1 of the project. It deals with the material that was eventually catalogued as in the list that follows. A K number concordance is not provided as individual K numbers containing many fragments were frequently eventually found to be part of multiple catalogue entries. Considerable amounts of work in Stage 2 were carried out on the material reported on here. During the Stage 2 work a greater understanding of the die-impressed sheet especially was developed, and this report should be regarded as an interim statement only.

The work was carried out in the Department of Conservation and Scientific Research in the British Museum and is copyright the Trustees of the British Museum.

Catalogue Number	Name in publication
593	Helmet-band in cast silver-gilt, inset with a silver-gilt sheet band, showing a continuous procession of kneeling or running warriors.
594	Sheet band in silver-gilt showing a continuous procession of creatures.
595	Sheet panel in silver-gilt showing a mounted warrior.
596	Multiple sheet panels in silver-gilt showing three warriors marching right.
597	Multiple sheet panels in silver-gilt showing three warriors marching left.
598	Sheet band in silver-gilt showing moustached heads.
599	Fragments of a sheet panel in silver showing dancing warriors.
600	Fragments of a large sheet covering in silver with multiple panels of animal art and gilded borders.
601	Sheet panel in silver-gilt with animal art.
602	Fragments from a sheet panel in silver-gilt with animal decoration.
603	Sheet panel in silver-gilt with animal decoration.
604	Fragments of silver sheet with herringbone pattern border.
605	Fragmentary silver sheet with animal art.
606	Small fragments of silver sheet with die-impressed sheet.
607	Bracket in silver-gilt, trimmed with reeded strip.
608	Remains of a bracket in silver-gilt, trimmed with reeded strip.
609	One fragment of reeded strip with nail, 4mm.
610	One fragment of reeded strip with nail, 4mm.
611	Reeded strip in silver-gilt, 5mm wide.
612	Two clips formed of silver reeded strip.
613	Reeded strip in silver-gilt, 8mm wide.

DEPARTMENT OF CONSERVATION AND SCIENTIFIC RESEARCH

Investigative conservation of the die-impressed sheet from the Staffordshire Hoard

Conservation Report No. 2014/7/CGM/4.

Fleur Shearman, Duygu Camurcuoglu, Marilyn Hockey and Graeme McArthur

Abstract:

This study forms part of the first stage of the English Heritage-funded research and analysis project 'Contextualising Metal-Detected Discoveries: Staffordshire Anglo-Saxon Hoard'. The report details work carried out by conservators in the British Museum to group, conserve and reconstruct the fragments of die-impressed silver and silver-gilt sheet and other associated material in the Staffordshire Hoard. Some comparisons are drawn with similar artefacts recorded elsewhere and observations made on future work potential enabled by the results of this study.

CSR Project no. PR07444
October 2014

Table of Contents

Abstract	1
1. Introduction	3
2. Methodology	3
2.1 Condition-check, audit and unpacking	3
2.2 Initial sorting and re-packing.....	4
2.3 X-radiography and soil removal	5
2.4 Reconstruction, mounting and final packing	5
3. The Grouping Exercise at BMT.	7
4. Results of BM Conservation.....	7
5. Discussion.....	8
5.1 Friezes 1-6: Warriors	8
5.2 Frieze 7. Kneeling or Running warriors, with silver tray	11
5.3 Panel 8 Horseman riding down warrior	14
5.4 BM 8a Atypical Warrior.....	15
5.5 BM 8b Warrior Caenby type	17
5.6 Frieze 9. 'Beaked' quadrupeds (also called serpentine zoomorphic)	18
5.7 Panel 10 Silver, non-linear. Interlace design	19
5.8 Frieze 11. Facing moustached heads	20
5.9 BM 12+ Miscellaneous fragments.....	21
5.10 Reeded strip 14mm	22
5.11 Reeded strips 11mm, 8mm, 5mm	23
6. Analysis of Die-impressed Sheet.....	24
7. Conclusion	24
Acknowledgements	26
References.....	26
Appendix 1 - Conservation Records.....	27
Appendix 2 - Annotated Images	43
Appendix 3 - Post-conservation Packing guide	83
INDEX of K numbers referenced in the report	85

1. Introduction

As noted in the English Heritage Project Design (PD) 'Contextualising Metal-Detected Discoveries: Staffordshire Anglo-Saxon Hoard. Stage 1' (Cool 2013), the work on the die-impressed sheet fragments in the Staffordshire Hoard posed a considerable challenge to conservators, as the material is extremely fragile and was broken into a very large number of fragments (estimated at some 1,500), varying greatly in size. The work that was required was regarded as very important for PD Research Aim 7.2 ('What does the Hoard consist of?') (Cool, 2013, 37). Without it, it would not be possible to understand the original form of the material and confirm whether it could be decoration from helmets or other items. Because of the fragility of the objects it was decided that the groundwork would all take place at one location, the British Museum (BM) (Cool 2013, 51).

The role of the BM conservation strand is identified in the PD at 14.2v and described fully at 15.7. Completion of National Geographic funded work on materials analysis and subsequent enabling of conservation for various object types was undertaken prior to the commencement of work on the die-impressed material. Remaining work on sword fittings and other items from the hoard submitted to the BM with their scientific queries was rolled together with the main EH funded programme and is referred to in the PD at 15.8i (Cool 2013, 51-52). Items identified by Birmingham Museums Trust (BMT) as needing analytical support included a silver bracket fitting (K787) and parts of the crouching/kneeling warrior frieze (Frieze 7) and its associated silver retaining tray.

After analysis work had been carried out to establish the materials used as fixatives for the tray (Stacey 2014), conservation work involving the use of adhesive or consolidant could be carried out. Identification of the wood from the silver fitting K787 was carried out by Caroline Cartwright (Cartwright 2012) and subsequent to this, further matching silver fragments were identified among metal fragments submitted as part of the die-impressed sheet project and added to the fitting (Shearman 2014, BM report no. 2014/6/CGM/3/FS).

The main consignment for the die-impressed sheet project, which arrived in June 2012, consisted of five boxes of silver and silver-gilt die-impressed sheets, reeded strips and other metal fragments associated with the same K number groups. Added to this, in August and then in November 2012, further small groups arrived from BMT and Potteries Museum and Art Gallery (PMAG). Finally, in July 2013, twenty-seven items of die-impressed sheet-related material was extracted from the new Treasure finds (2012 T860) and brought to BM conservation to be incorporated in the project.

The PD always envisioned that the work on the die-impressed sheets would be a task that would continue beyond this first stage (15.7ii), and would not be complete by the end of the period allotted in the PD for initial work. The BM contracted work was completed at the end of January 2014 when all material was returned to Birmingham for the Grouping Exercise.

2. Methodology

2.1 Condition-check, audit and unpacking

All conservation was carried out as defined in 15.5 of the project design (Cool 2013, 46). As stated in the PD at 15.7, the main aim of the work was to "gather the pieces into likely groups that belong together and then engage in the painstaking work of discovering the joins that will allow the shapes and the patterns to be identified" (Cool 2013, 51). As the first part of the work, the conservation team audited and condition-checked all of the material which was delivered to the BM. The condition check was carried out by comparing against available photographs supplied with conservation documentation from BMT. All fragments had been very well packed by BMT conservators for travel to London and no transit damage was reported. Only one fragment was noted as having changed in appearance from its condition photo.

2.2 Initial sorting and re-packing

In their original packing, multiple K numbers as well as mixed fragments from different groups and friezes might be found in any individual box, bag or sample tube (example shown in figure 1). Following the audit and condition check, the fragments were initially sorted into silver-gilt die-impressed sheet, reeded strip and other categories, including plain silver-gilt. To aid flexibility and efficiency in this first phase of sorting, the fragments were re-packed according to these categories and their associated K numbers recorded on the new packing. Similar packaging materials and boxes were used, although fragments previously in bags, such as the reeded strips, were transferred to individual small clear boxes. As the number of different 'object' types was augmented, as a result of this initial sorting, an additional six large polyethylene boxes were introduced and labelled accordingly, to contain and separate out the different groupings.



Figure 1. Parts of Frieze 9 packaged as it arrived at the BM in October 2012.

Initial sorting was based on the provisional iconographic frieze types as identified, named and numbered by curator David Symons of BMT, as in the following list:

- Frieze 1 Larger size warriors moving to left.
- Frieze 2 Larger size warriors moving to right.
- Frieze 3 Smaller size warriors moving to left.
- Frieze 4 Smaller size warriors moving to right.
- Frieze 5 Eagle-crested warriors moving to left (possibly the same as 3).
- Frieze 6 Eagle-crested warriors moving to right (possibly the same as 4).
- Frieze 7 Running, kneeling warriors (aka running man or crouching warrior).
- Panel 8 Horseman riding down warrior.
- Frieze 9 'Beaked' quadrupeds (also called serpentine, zoomorphic).
- Panel 10 Interlace panels (silver, non-linear).
- Frieze 11 Facing moustached heads.

2:3 X-radiography and soil removal

X-radiography of any fragments still embedded in soil, such as that in figure 2 below, was carried out to aid their allocation to type and enable join finding¹. Examples of frieze types were also X-radiographed to view any technical differences which might be discernible. This was followed by cleaning and removal of all remaining soil from the material submitted to the BM; all soil was bagged and identified by association with the K number of the object from which it came. Dissolution of soil accretions was enabled by immersion in or application of solvent (industrial methylated spirit) or distilled water (Shearman 2014, 110).

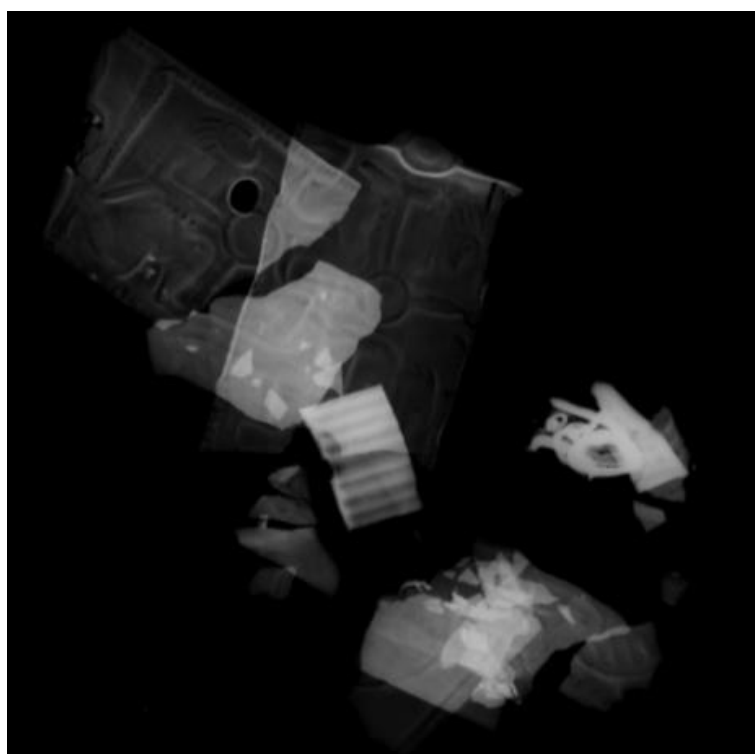


Figure 2.. X-radiograph of K235 embedded in soil.

2.4 Reconstruction, mounting and final packing

During the initial sorting stage the categories defined at BMT were augmented by the addition of previously unrecognised subgroupings and groupings; namely BM 8a, BM 8b and BM 12+ (see Table 1), and the separation of miscellaneous material and broken sword fittings from the targeted groups of friezes. Several hundred joins were then made and recorded, both between and across K numbers. Reconstruction of plain silver-gilt pieces was progressed to assess their morphology and possible function (Shearman 2014, 110).

In 2009, at an early stage of the Treasure Process, while the hoard was still in the custody of the BM, small groups of fragments representing diagnostic frieze types were selected for display by curators at the Potteries Museum and Art Gallery, Stoke and at BMT, as part of fund-raising activities before acquisition. To enable them to be safely displayed, some frieze fragments were removed from bags partially cleaned and mounted using the system described in the paragraph below. The work was carried out by F. Shearman (two examples, K1412 and K1406, can be seen

¹

Conservation X-radiography was carried out using a TORREX TRX 5200 radiation-shielded X-radiographic/Fluoroscope inspection system with maximum kV of 150, operating at a standard 3 mA.

in figure 1). No joins were stuck at that stage, but fragments were laid out in their relative positions and lightly adhered to twin-walled corrugated polypropylene backing sheet. This work was subsequently reversed at the BM in 2013 in order to facilitate the sorting and reconstruction.

In the reconstruction of fragmentary assemblages it is necessary to make physical joins in order to allow the emergence of two- and three-dimensional form, as well as to safely maintain co-locations. For the work reported on here joins were made and adhered with HMG heatproof and waterproof adhesive (cellulose nitrate) and join sequences requiring support were backed with nylon gossamer tissue. Where necessary fragments were mounted on twin-walled corrugated polypropylene sheet (brand names Correx® or Corriboard®) interleaved with nylon gossamer and lightly adhered to the mount at the edges. As stipulated in the PD, only soil, rather than tarnish, was removed. Related K numbers were printed in small fonts and adhered onto the back wherever possible (Shearman 2014, 111).

Following conservation, the joined or associated elements and remaining fragments were packed according to their frieze or object type. For example, all joined elements of Frieze 7, fragments of the 'tray' associated with it and other unjoined fragments identified as being associated with it, were packed in Plastazote® cut-outs in clear polystyrene boxes (Stewart® 'crystal clear' and/or Carmo Ultraplast®), labelled with a description and identifier numbers, including K numbers. Clear polystyrene boxes were then packed in larger Really Useful® polyethylene boxes, similarly labelled (Fig. 3). A total of twenty-one large polyethylene container boxes were returned to BMT.

The location of the fragments within their boxes is important to maintain, as this represents their location within groups. It is strongly advised that they are not routinely removed from their boxes unless as part of the next phase of conservation, primarily to avoid damage because of their extreme fragility, but also to maintain correct associations. At this stage the boxed 'type' groupings are as important to maintain as K number associations.



Figure 3. Die-impressed sheet, reeded (formerly fluted) strip and other groupings, packed for return to BMT.

3. The Grouping Exercise at BMT

The Staffordshire Hoard die-impressed sheet and associated material, which had been sent to the BM in October 2012, was returned to Birmingham in February 2014. Over a two-week period in March a grouping exercise was held at BMT, to identify associations and groupings in the Hoard. Fleur Shearman attended this exercise for two days in the second week and reports the following:

- It was noted that some glue joins had broken down.
- The two boxes labelled 'Miscellaneous Mixed Fragments' and 'Miscellaneous Metals' were accessed by C. Fern, who removed a number of fragments, mainly sword fittings, from these boxes, to unite them with appropriate groupings elsewhere in the Hoard.
- F. Shearman identified and noted c. sixty fragments of die-impressed sheet and reeded strip, as well as plain silver and silver-gilt sheet, not previously sent to the BM. These fragments were placed in one of the emptied boxes, re-labelled as 'New Fragments Identified at the Grouping Exercise'.
- Two other fragments found (K1778 and K523) were clearly part of the Frieze 7 'tray' (K1778 joins the end of the long strip) and were placed in the box already containing Frieze 7 and tray.
- These additions are listed in the Excel spreadsheet '*Record of Foil fragment joins made at the BM for assessment report*', F. Shearman, 2014.

4. Results of BM Conservation

When the material arrived at the BM, 11 different patterns had already been identified by David Symons the BMT curator. During the work at the BM, Fleur Shearman and Duygu Çamurcuoglu identified and gave identifier numbers to additional patterns or groups:

Fragments showing atypical warriors were assigned to BM 8a and BM 8b to indicate their affinity with the other warrior types, although there were no joins between these fragments and friezes/panel 1 to 8. Variants within the 'beaked' serpentine quadrupeds have also been identified. Four new design types have been added, currently identified as group BM 12+ Miscellaneous (Shearman 2014, 111).

Small fragments of plain, undecorated, silver-gilt sheet were reconstructed to investigate the possibility that they might be part of plain areas of sheet from panels such as the Horseman Frieze 8, which was very fragmentary and had areas of plain silver-gilt. Some fragments were easily discounted as they were too thick and some were quite clearly parts of other objects such as hilt plates. Much remains to be done with this group, including investigation of similar material at BMT which never came to the BM. Some of these fragments, obviously sword-related, were moved out of the BM packing by C. Fern at the February 2014 grouping exercise.

The reeded strips (formerly described as 'Fluted Strips') have been sorted according to their width; their width acts as their descriptor. Four different widths are present: 5mm; 8mm; 11mm and 14mm. Joins for many fragments of reeded strip remained un-made as time ran out at the end of the BM project, but they were allocated to width category as much as possible, and then grouped within width category, by identifying finished ends, holes and any nails within those holes. In one instance, fragments of plain silver-gilt and 8mm reeded strip which were originally held together with soil, with nail holes aligned with each other, were reconstructed. This unique and important co-association (K1491 and K1493) may have been repeated many times in the original assemblage, but because of the fragmentary nature of the group other similar evidence does not survive.

Following sorting and conservation, the list of groups and the numbering sequence of the die-impressed sheet project is now as shown in Table 1. A complete list of all material received by the BM, which was also investigated and reconstructed and includes other classes of material, appears as Appendix 3.

Frieze 1	Larger size warriors moving to left.
Frieze 2	Larger size warriors moving to right.
Frieze 3	Smaller size warriors moving to left.
Frieze 4	Smaller size warriors moving to right.
Frieze 5	Eagle-crested warriors moving to left (possibly the same as 3).
Frieze 6	Eagle-crested warriors moving to right (possibly the same as 4).
Frieze 7	Running, kneeling warriors (aka running man or crouching warrior) plus 'tray'
Panel 8	Horseman riding down warrior.
BM 8a	Atypical warriors: miscellaneous.
BM 8b	Warrior, Caenby type (silver).
Frieze 9	'Beaked' quadrupeds (also called serpentine, zoomorphic).
Panel 10	Interlace panels (silver, non-linear).
Frieze 11	Facing moustached heads.
BM 12+	Miscellaneous fragments, die-impressed/decorated silver-gilt sheet
Reeded strip	5mm
Reeded strip	8mm (including K 1491 and K 1493, attached to plain sheet)
Reeded strip	11mm
Reeded strip	14mm
No number	Plain silver-gilt.
No number	Sword fitting fragments, gold, garnets, niello and other misc. material

Table 1. Groupings of die-impressed sheet and associated material after conservation at the BM.

The amount and distribution of joined material is itemized by K number in the Conservation Record for each Frieze, Panel or other group (Appendix 1). A differentiation has been recorded there between joins made within a K number and those where multiple K numbers have contributed to the joined element. The multiple K number category includes joined pieces where between two and twelve K numbers have contributed. It has not been uncommon for fragments identified by the same K number to have contributed to more than one frieze type (Shearman 2014, 112). Details of fragments joined across K number can also be found in the annotated images in Appendix 2. The images used there are from varying sources and are not to scale.

5. Discussion

5.1 Friezes 1-6: Warriors

The largest group of die-impressed sheet comprises Friezes 1-6, which depict warriors. These were grouped at an early stage by David Symons of BMT, and fall into two main sets of left- and right-facing profile groups. Early requirements for exhibition had meant that one set of left-facing warriors (K1382) had already been cleaned at BMT. This preliminary cleaning was not repeated across the group, since it makes join-finding more difficult, as tarnish and corrosion provides valuable clues. Fragments added to K1382 have been left uncleaned.



Figure 4. Left facing triple warriors; shown with sheathed sword and holding small plain shields. The central figure wears a mail-coat and his companions on either side appear to wear textile garments.

Warriors were generally found as groups of three within one die type, as in figure 4 above, and could either be shown wearing a mail coat (centre) or a textile garment (left and right). They have plain shields, pole arms or spears pointing downwards, as found on similar sheets elsewhere, and all wear an eagle-crested helmet. Variations in scale were present as had been noted by David Symons at BMT. The footprint of the die also varied.

Representations of ring mail coats in comparable examples are shown as circles, as in figure 5 below. The Staffordshire Hoard representations appear as raised dots transferred from the die.



Figure 5. An example of soldiers wearing mail coats depicted as circles (Stolpe and Arne 1927: pl.XLII).

Some sheets, such as that depicted in figure 6 below, have been cut to fit specific shapes with both a straight and a curved cut edge. These will act as clues to placing the fragments in spatial relationships on a helmet or other item. Part of a second warrior can be seen at the right-hand edge of this sheet, suggesting that this piece was also made using a die depicting a group of multiple warriors.



Figure 6. Silver-gilt sheet depicting a warrior facing to the left cut to fit a specific semi-circular shape.



Figure 7. Example of the eagle-crested helmets worn by the warriors in Friezes 1-6.

Figure 7 shows an example of an eagle-crested helm from a 'warriors moving to the left' frieze from the Staffordshire Hoard. For comparison, figure 8 below shows two different examples of crested helms discovered elsewhere, one with similar eagles and one with boars.



Figure 8. Valsgärde eagle-crested helmets (left) (Bruce-Mitford 1978, 217, fig. 164). One of the Torslunda dies with boar-crested helmets (right) (Bruce-Mitford 1978, 209, fig. 156), none of this latter type have been found in the Staffordshire examples.

5.2 Frieze 7. Kneeling or Running warriors, with silver tray



Figure 9. K235. Detail of running or kneeling warrior from Frieze 7.

This frieze depicts a series of kneeling or running warriors, as in figure 9 above. They wear a sword or seax belt and carry a spear and a small plain shield. Their hair is shown clearly. As on the stabbing figure from the Horseman Frieze 8, no garments are indicated.

Frieze 7 was directly associated with fragments of a silver 'tray' or channel-fitting, a c.15mm wide strip, with c.3mm high retaining walls along its edges. One fragment of frieze 7 was detected *in situ*

in a fragment of the tray (Fig. 13). When the fragment of frieze was removed during conservation, material beneath it retained the imprint of the frieze sheet (Fig. 14). The organic component of this material was identified as beeswax (Stacey 2014, 3).

The silver tray, or channel fitting, was very fragmentary and had clearly been deliberately broken up, pre-deposition. It retains a definite shallow curve along its reconstructed length, which is original to its intrinsic shape. It was extremely brittle and corroded and had fragmented into numerous pieces post-deposition, which were nevertheless identifiable and could be reconstructed. The two side-walls of the tray are not symmetrical; one is curved inward and gilded and the other right-angled in section and bears notch marks. The measurement of the fragments, when connected length-wise, add up to the approximate circumference of a skull which may well suggest the foundational object is a helmet. It may have been a band around a helmet, rather than over the head in a nose to nape arrangement, which was the case with the York helmet (Tweddle 1992, 951).

K1734



Figure 10. K1734 fragment of the silver tray from Frieze 7.

Two rivet holes are present on the fragment from the tray shown in figure 10 and holes like this are repeated along the tray. The smaller perforations match holes in the die-impressed sheet and were used to attach it to the tray, while the larger, squarer holes would have attached the tray to the substrate.

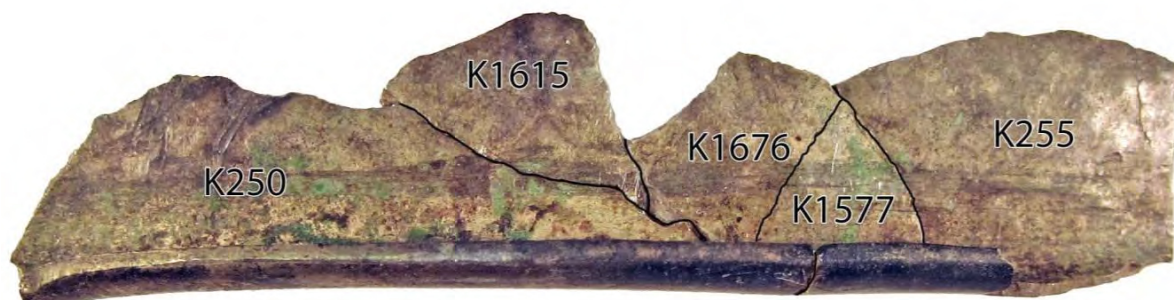


Figure 11. Reconstructed fragment of silver tray.

The amount of K numbers in the small reconstructed fragment of tray in Fig. 11 shows that the object had been additionally broken up in the ground, after it had been disassembled before deposition. This dual evidence on the same object is confirmed by microscopic examination of break edges. The bent, cut, splayed and distorted ends of the silver tray throughout its length indicate a vigorous deliberate disassembly, while the clean breaks within the tray indicate damage to the corroded and brittle metal after burial.



Figure 12. Longest section of silver tray with part of frieze 7 digitally placed in position.

Figure 12 above shows the longest sequence of the frieze, digitally located in position on the silver tray. This could be achieved because one fragment (K235) was found in situ in a piece of the silver tray as shown in figure 13 below. Additional joins could then be confidently made on either side, extending the known shape and form of this object. The distorted broken ends of silver tray also match up with breaks in the die-impressed sheet.



Figure 13. K235 before conservation with a fragment of sheet in situ.

Iron staining around the large rivet hole on the left of K235 in figure 14 below is clear, suggesting it may have been attached to an iron object, perhaps a helmet casque. Also present are small rivet holes, which would have been used to fix the sheet in addition to the organic fixative. The curved edge is uppermost, suggesting a retaining function, and gilding is also present on this surface which corresponds to the running warrior in its normal vertical orientation.



Figure 14. Impression of the warrior in fixative material in K235, after removal of the sheet.

The potential fixative for the sheet on K235, shown in figure 14, has been analysed by BM scientist Rebecca Stacey using Fourier transform infrared spectroscopy (FTIR, Raman spectroscopy and gas chromatography-mass spectrometry (GC-MS). "The results support the interpretation of the black layer as a construction material used as a fixative or filler within the void between the sheeting and the tray. It is unclear whether the waxy red/brown layer represents a separate upper layer of beeswax fixative or fill, or if it is formed from accumulation of soil-derived material that has mixed with beeswax from the layer below." (Stacey 2014, 4).

5.3 Panel 8 Horseman riding down warrior



Figure 15. Panel 8. The reconstructed panel of a horseman riding down a warrior.

There is a comparison for this scene, on the Sutton Hoo helmet, shown in figure 16 below. In the Sutton Hoo example, the 'fallen warrior' who stabs the horse is clothed and is clearly grasping the bridle of the horse rather than the leg, unlike equivalent figure in Staffordshire Panel 8. No equivalent smaller figure from the back of the horse has yet been found in the Staffordshire Hoard.

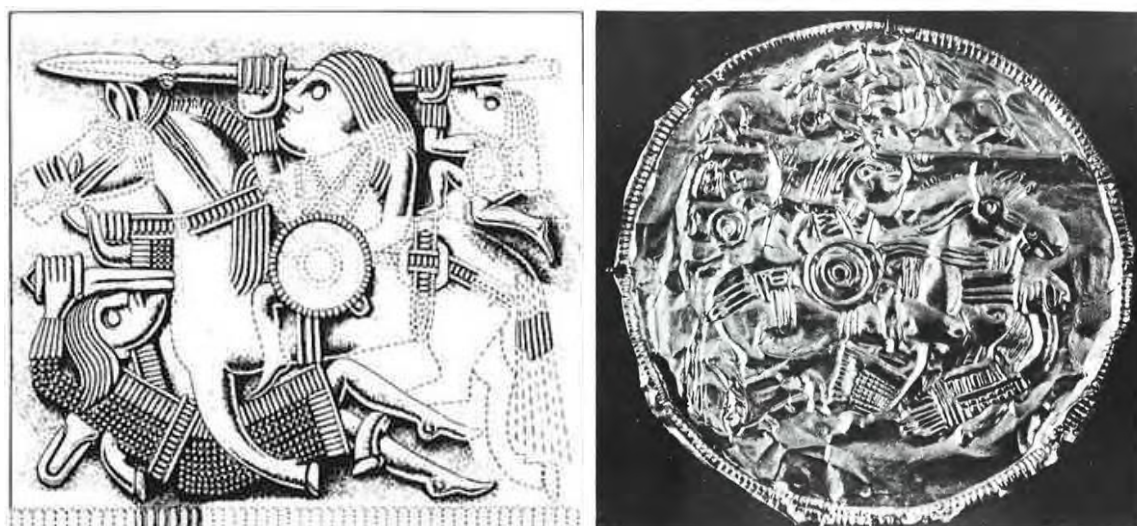


Figure 16. A die-impressed sheet from the Sutton Hoo helmet with a similar horseman design (left) (Bruce-Mitford 1978, 149, Fig. 110). Repoussé gold disc brooch from Pliezhausen, Germany (right) (Bruce-Mitford 1978, 194, Fig. 146).

Similar examples are also known from Scandinavian and Germanic sites, such as the disc-brooch above from Germany (Fig. 16 which is very similar in form to the Sutton Hoo example. The example below in figure 17, from a helmet found in Vendel grave 1, Sweden, differs in that it depicts a horseman being led by a small male figure.



Figure 17. Helmet from Vendel grave 1, with a horse and rider being led. ((Stolpe and Arne 1927).

5.4 BM 8a Atypical Warrior

BM 8a shows a new shield type and atypical form of warrior who is positioned more frontally than the others previously described, which are shown in profile. BM 8a has been reconstructed from small fragments K542 and K166.



Figure 18. Two fragments depicting an atypical bossed shield K542 (left) K166 (right).

The bossed shield shown in figure 18 may suggest the depiction of a central shield boss with disc headed rivets. Appliqués and fastenings for a handle attachment are indicated on the Swedish example in figure 19 below, in which, incidentally, the artist shows what may be a die-impressed sheet and reeded strip covered helmet. This basket-weave pattern is similar to that used to show woven textile on the Warriors friezes in figure 4. This should urge caution in the sorting of small dissociated patterned fragments of what might be presumed to be garment textile, as the same tools can be used for the portrayal of different iconographic details.

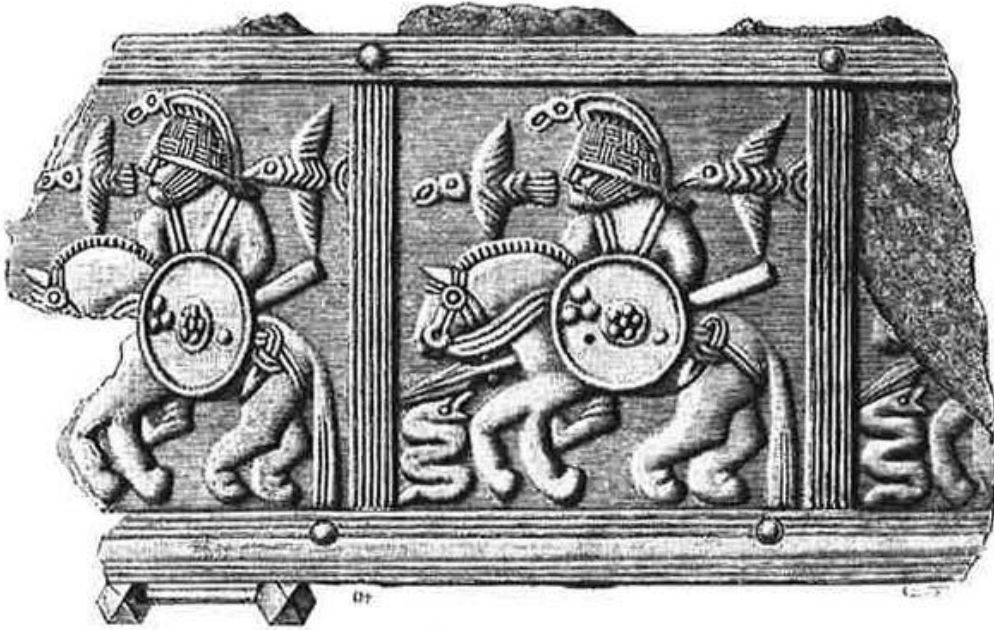


Figure 19. Example of die-impressed sheet depicting bossed shields from Vendel, Sweden (Stolpe and Arne 1927).



Figure 20. K866 Variant fragment of mail not found on warriors Friezes 1-6, with diamond motif (left). K1342+K762 shows possible arms or legs and border-like motif (right).

Figure 20 above shows two more atypical fragments. On the left K866 depicts a fragment of mail with a diamond motif, possibly representing a diamond-twill woven textile. This exact motif is not seen in any of the Warriors friezes 1-6. On the right in figure 20, K1342+K762 show possible arms or legs and a cable-like linear motif, common to a variety of stylistic representations including textile edging, panel borders etc.

For convenience, these pieces have been packed for return to BMT with Horseman 8 and new Warrior/shield BM 8a. It is hoped that further joins may help to resolve the questions posed by these anomalous fragments.

5.5 BM 8b Warrior Caenby type

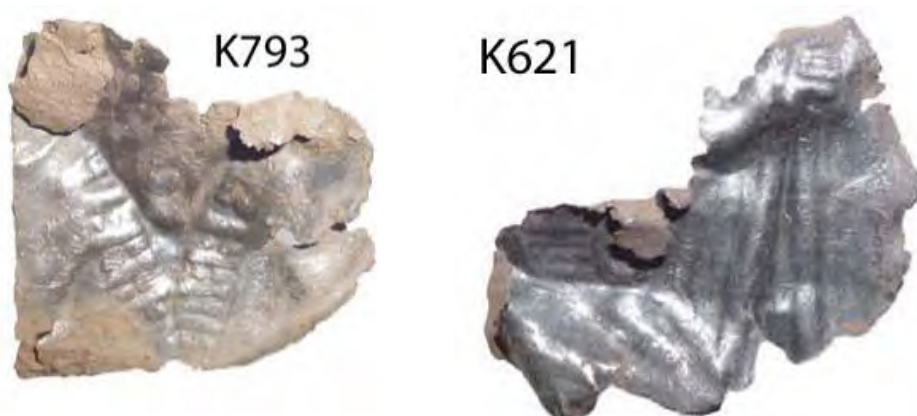


Figure 21. Two fragments of a frontal facing warrior K793 (left) and K621 (right).

Numbered BM 8b are various small and much corroded silver sheet fragments grouped together because of similarities of corrosion, absence of gilding, presence of iron corrosion and possible presence of solder. The singularities of this group would merit further investigation. K793 (Fig. 21) suggests the face of a frontally facing warrior dressed in a tablet-woven-bordered, front opening male gendered garment. It is without either upper or lower parts but suggests similarities with the Sutton Hoo dancing warrior pair and a fragment from Caenby shown in figure 22 below.

Fragment K621 is also incomplete and shows a kneeling, belted warrior holding a pair of spears. He may be shown naked. There are known parallels for aspects of its design, on objects such as the Finglesham buckle (Hawkes 2006), also in figure 22 below.



Figure 22. Top left: Fragment from a seventh-century tumulus at Caenby, Lincolnshire, showing a man in a horned headdress with bird head terminals (Bruce-Mitford 1978, 206, fig. 153). Bottom left: Dancing warrior pair from the Sutton Hoo helmet (Bruce-Mitford 1978, 149, fig. 110). Right: The Finglesham Buckle depicting a naked, spear-holding figure (Hawkes 2006, 413, Plate XIV A).

K1008 (Fig. 23) would appear to show part of a horned headdress. Possible presence of tinned copper was noted on this fragment and would merit future investigation.



Figure 23. Small fragment from Group BM 8b (Warrior, Caenby type), showing what could be part of a horned headdress.

5.6 Frieze 9. 'Beaked' quadrupeds (also called serpentine zoomorphic)



Figure 24. BM1. The longest (15cm) reconstructed strip from Frieze 9. (Digitally divided at arrows)

The design of Frieze 9 consists of duck heads with serpentine bodies following each other in a row, looking backwards to the right. Along the top and bottom of the frieze there are borders of original full width (unlike frieze 7, which appears to have been cut down, possibly to fit its 'tray'. It would appear that the borders might have been perforated at intervals, and some perforations appear in the decorative scheme itself. This frieze is now made up of lengths of silver-gilt die-impressed sheet fragments, but may originally have been, or been seen as, a continuous strip on an object such as a helmet. Physically cut or finished ends were identified and resultant sections were packed separately and total lengths measured. Eight main sections of the frieze were reconstructed and numbered Sections BM1-8 within Frieze 9. Figure 24 above shows BM1, the

longest reconstructed sequence, at 15 cm. Future work may be able to reveal the size of the die used to create this repeating pattern. The fragmented section at top centre of figure 24, mostly made up of K237, has a layer of iron corrosion which may relate to an original iron substrate or may arise from proximity to other iron during burial.

One known parallel for this design is the Danish horse-harness mount from the Swedish National Museum shown below in figure 25. Although far from identical, the head, body and legs are all arranged very similarly (Høilund Nielsen, 2010, ¶18).



Figure 25. Horse-harness mount from the Swedish National Museum (Høilund Nielsen, 2010).

5.7 Panel 10 Silver, non-linear. Interlace design.



Figure 26. K785+K146. Non-frieze 10, item with interlaced design.

Non-frieze group 10, one item of which is depicted in figure 26 above, is quite different to the silver-gilt sheet friezes in terms of size, form and surface decoration. The metal is thicker and better-preserved. The decorated fragments are without gilding, but gilding is present on at least one plain border piece and other border fragments may be relevant (these have been packed with this group). Furthermore, the fragments do not form a linear frieze and are therefore best described at this stage 'non-frieze' or panel. Although there are many fragments of this group, very few have been found to join, so there is as yet no complete picture of how the original object(s) would have appeared, other than that they were nailed to a substrate. Most fragments in the group have an interlaced design, including paper-clip jawed gripping beasts with almond-shaped haunches. New

additions were also found at the Grouping Exercise in February 2014.

There are definite parallels with Sutton Hoo material, in this case the interlaced panels from the Sutton Hoo helm, as can be seen in figure 27 below left.



Figure 27. Comparison between part of 20 (right) and the interlaced panels of the Sutton Hoo helm (Bruce-Mitford 1978, 149, fig. 110) (left).

5.8 Frieze 11. Facing moustached heads.



Figure 28. Frieze 11. Front-facing moustached heads.

Only a few fragments of this frieze, shown in figure 28 above, survive. The band of repeated motifs on this frieze is narrow, at only circa 1cm. The die of moustached heads is stylistically similar to vandykes on the Taplow vessel mounts for small horns or drinking cups such as those in figure 29 below.



Figure 29. Gilt copper alloy vandykes from two wooden cups found at Taplow, Buckinghamshire. BEP 1883,1214.42 (British Museum).

5.9 BM 12+ Miscellaneous fragments



Figure 30. Two examples of different feet from fragments similar to the serpentine Frieze 9.

Group BM 12+ comprises additional very small zoomorphic or geometric fragments of friezes/panels/objects. The fragments in figure 30 show atypical feet from a serpentine frieze similar to Frieze 9.

Fig. 31 shows a reconstructed panel or backplate with an interlaced beast with eye and paperclip jaws, while figure 32 shows joining fragments of haunch.



Figure 31. A panel/backplate with interlace beast with eye and paperclip jaws.



Figure 32. Joining fragment of haunch/back leg.

5.10 Reeded strip 14mm.

It is hoped that study of the reeded strip will give information about where and how it was attached to the parent object and its function as part of it. As a common form of edging, which in the hoard most certainly held nails, it must have been attached to a metal or organic substrate which may in some instances have been curved.

The widest strip is 14mm across. It is curved and has been reconstructed into two long joined sections, one of which is shown in figure 33 below. The reeding pattern on the 14mm strips has two wider channels between reeds where probable nail holes can be seen interspersed regularly in a zigzag pattern. Some fragments were reconstructed from smaller half-width fragments, which it was possible to position by location of the nail holes and the wider channels.



Figure 13. Reeded Strip 14mm. Wide, flat, curved.

Much of the remaining strip is in short sections and the level of curvature of the object on to which they were fastened is at present unknown and is difficult to ascertain without further work. The strip shown in figure 33 above was nailed to the front of what is presumed to be a curved object such as a saddle bow (an example of which from York is shown in figure 34 below or perhaps even helmet brow arches.



Figure 34. Saddle bow from Coppergate, York. Length 31cm (Wilson 1984, 111).

5.11 Reeded strips 11mm, 8mm, 5mm

There are also strips with widths of 11mm, 8mm and 5mm. Fragments of 8mm strip are by far the most common, but the most important co-association found to date is that between K1493 and K1491 (see page 76 for annotated image).

The 5mm strips are mainly straight but there are some curved fragments (Fig. 35). These strips all contain only one wider, central 'reed' channel with regular holes for attachment to a substrate. Some nails are still present such as that in figure 35. Observations on the distinction between nail and rivet fastenings, based on the form of surviving examples, could provide a worthwhile area for future study.



Figure 35. Flat curved 5mm reeded strip joined across three K numbers with a nail found in situ.

A few fragmentary examples of 'U-shaped' reeded clips, such as K1513 in figure 36 below, were also found and were reconstructed. They may have had a variety of possible constructional uses including on helmets and may even indicate fastenings for vessel mounts as found in other examples.



Figure 36. Riveted reeded clip K1513, side view.

6. Analysis of Die-impressed Sheet

X-ray fluorescence (XRF) analysis was carried out by Eleanor Blakelock (Blakelock 2014) on the front and back of some silver fragments from different friezes to determine whether they could be grouped by their metal composition. If successful, this might have aided the reconstruction of the friezes. With the exception of the silver sheet with interlace decoration (Frieze 10, the front faces were gilded. However as the quote from the report below states, the analysis at different points of the friezes gave such a range of results within each frieze that no discrete groups could be safely identified.

“The composition of most of the foil fragments fell in the range of c.93-97 wt% silver, 1-2 wt% gold and 0.7-2.5 wt% copper. Traces of lead were present in all of the foils. With the exception of the interlace foils (frieze 10, the XRF analysis of the fronts of all the foils revealed the presence of mercury gilding which prevents direct access to the silver alloy below. Surface XRF of the fronts of the foils therefore cannot be used to group them. The analysis of the backs of the foils showed a range of compositions, which overlapped between friezes and therefore did not help in the identification of compositional groups linked to specific friezes.” (Blakelock 2014, 6.

7. Conclusion

The work carried out at the BM has resulted in a greatly increased corpus of joined fragments within the Staffordshire Hoard die-impressed sheets and most of the c.1500 fragments sent to the BM have been sorted and assigned to associated groupings. This means that there is considerable potential for a range of additional work in Stage 2. This is likely to include assigning additional unique identifying numbers to the new groupings. As noted previously, many joins unite varying quantities of different K numbers and frequently the same K number contributes to several different pieces. This work will need to be prioritised early in Stage 2 (Shearman 2014, 113.

During the Grouping Exercise at BMT in February 2014 additional pieces were recognised that were relevant to the work reported here and which had not been part of the material sent to the BM. These will need to be reintegrated with the rest of the die-impressed sheet and strip material. Any new joins identified should be microscopically identified and verified before final adhering, in order to minimize the likelihood of error. The characteristics of the fragments, i.e. repeating motifs or plain surfaces, plus often extremely small join areas, can easily lead to mistaken associations and repeated joining and re-joining will weaken the fragments themselves and compromise the ability to find true joins.

Further work may allow completion of friezes and thus possibly the identification of the footprint of the die of at least one of each of the diagnostic types. In the reconstruction of the die-impressed material it may be necessary to use various surviving fragments from the same die as a guide to re-creating a composite picture of a frieze or panel. Electronically scanned and measured images may well be the way forward, but any initial physical conservation reconstructions must be verifiably accurate.

Now that larger expanses of scenes are available it will be possible to relate the sheets to other possibly better-preserved examples from elsewhere. Investigative cleaning and allocation to type has also elucidated miscellaneous corroded fragments of silver such as those assigned to the atypical Warrior group BM 8b which have enabled comparison to be made to the fragment from the Caenby barrow in Lincolnshire (Bruce-Mitford 1978).

There is also potential for exploring, through accurate measurement, not only the possible original use of the die-impressed sheet material, but also how many versions of the same scene are present and the number of dies used (Shearman 2014, 113).

For Friezes 7 and 9 a start has been made in measuring the lengths of the strips reconstructed and calculating how long they might have been. These two friezes are approximately as long as would be needed to encircle a head around the temples. The accumulated lengths of the reconstructed elements of both of these friezes measure c.40 cms. The extension of this work would clearly have the potential to help calculate how many items this material may have decorated (Shearman 2014, 113).

There is also potential for a more complete reconstruction of the broken and disassembled silver tray for Frieze 7 which may also relate to helmet parts. At the Grouping Exercise, for example, Shearman and C. Fern found additional joining fragments. These were placed with the pieces that had been worked on at the BM (Shearman 2014, 113).

For the reeded strips it may be noted that the tighter the curve of the item to which the strip was attached, the more rivets or nails would probably have been needed to hold it closely in place; the joins completed have allowed the spacing of the holes to be calculated. Surviving nails or rivets, as well as the distribution of surface deposits such as iron corrosion may also be investigated further and this provides the potential in Stage 2 to explore more closely the morphology and nature of the original substrate (Shearman 2014, 113).

The question of disassembly forms another area with much potential for future work. There is certainly evidence of sheets being cut or torn, most obviously where the silver tray has been distorted due to repeated flexing. Examination of broken ends under high magnification, ideally using scanning electron microscopy (SEM), could provide much information on how this material was disassembled.

Fleur Shearman Duygu Camurcuoglu Graeme McArthur Marilyn Hockey

November 2014

Acknowledgements

Thanks are due to Susan La Niece, Eleanor Blakelock, Rebecca Stacey, Caroline Cartwright and Catherine Higgitt of the BM CSR Science Group for their assistance throughout this project.

References

Blakelock, E., 2014. *XRF analysis of silver foils from the Staffordshire Hoard*. BM Science Report PR07444-14.

British Museum. *Collections Online*. Retrieved on World Wide Web on 13/08/2014 at: http://www.britishmuseum.org/research/collection_online/search.aspx

Bruce-Mitford, B., 1978. *The Sutton Hoo Ship-burial. Volume 2. Arms, Armour and Regalia* (London).

Cartwright, C.R., 2012. *Organic materials from the Staffordshire Hoard: Part 2*. BM Science Report PR07444-3

Hawkes 2006: Chadwick Hawkes, S.E. and Grainger, G., 2006. *The Anglo-Saxon Cemetery at Finglesham, Kent*. Oxford University School of Archaeology Monograph 64, Oxford.

Cool, H.E.M., 2013. *Contextualising Metal-Detected Discoveries: Staffordshire Anglo-Saxon Hoard (Project 5892) Revised Project Design*. Barbican Research Associates.

Høilund Nielsen, K., 2010. *Style II and all that: the potential of the hoard for the statistical study of chronology and geographic distributions*. Retrieved on World Wide Web on 13/08/2014 at: <http://finds.org.uk/staffshoardsymposium/papers/karenhoilundnielsen>

Shearman, F., 2014. Appendix 4: BM Conservation Strand. Assessment Report in Cool, H.E.M., *Contextualising Metal-Detected Discoveries: Staffordshire Anglo-Saxon Hoard Stage 2 Project Design Version 2 Submitted 29th August 2014*. Barbican Research Associates. 110-113.

Shearman, F., 2014. *Investigative conservation and analysis of a silver bracket fitting in the Staffordshire Hoard* BM Conservation Report No. 2014/6/CGM/3/FS.

Stacey, R., 2014. *Identification of material in trays for silver foils*. BM Science Report PR07444-18.

Stolpe, H. and Arne, T.J., 1927. *La nécropole de Vendel*, Monografiserien 17, Stockholm: Kungl. Vitterhets Historie och Antikvetetsakademien.

Tweddle, D., 1992. *The Anglian Helmet from Coppergate. The Archaeology of York, The Small Finds, 17/8*. Council for British Archaeology, London.

Wilson, D.M., 1984. *Anglo-Saxon Art*. Thames and Hudson.

Appendix 1 - Conservation Records – BM die-impressed sheet project

Silver-gilt die-impressed sheet:

Friezes 1,3,5. Warriors moving to left. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Friezes 1,3,5. Silver-gilt die-impressed sheet depicting warriors moving to the left. Each carries a spear in his right hand and shield in his left, with a sword, in a scabbard, at his waist. The armour worn varies from mail, represented by raised dots, to what appears to be a woven textile. The largest reconstructed fragment shows a central mail-coated warrior, with another on either side, wearing textile garments. Where head fragments are present, they depict eagle-crested helmets. These, as well as the two different sizes of warriors present, are differentiated as below:

Frieze 1 Larger size warriors moving to left

Frieze 3 Smaller size warriors moving to left

Frieze 5 Warriors wearing eagle-crested helmets, moving to left. Possibly same as Frieze 3

Pre-Conservation Condition: Severely fragmented. Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate. Mount: Corrugated polypropylene sheet.

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. Where mounted, nylon gossamer was interleaved between the fragments and a sheet of corrugated polypropylene sheet. HMG was used to secure the nylon gossamer to the fragments and the corrugated sheet, by tack-applying it, lightly, at the edges only. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers:

(4 frags K1319+K1405+K1407+K1400.

(5 frags K1690x2+K1694x3.

(9 frags K1664x5+K435x3+K436.

(5 frags K1495+K1771+K1774x3.

(13 frags K1423x7+K1416x3+K1417.

(3 frags K1416+K1420+K1503.

(3 frags K1420+K1417+K1416.

(9 frags K1382x2+K1392x6+K1383.

(2 frags K1332+K795.

(3 frags K829+K968+K961. (Previously listed on Excel join inventory as 'moving to right')

Joined within same K number (quantity of fragments may not be recorded: K828, K237.

Possible related fragments: K237, K1016, K1392, K1409, K1460, K1562, K1577, K1596, K1636.

Possible border fragment: (3 frags K1416x2+K1412

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis:

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7381, 7416, 7417, 7507.

Silver-gilt die-impressed sheet: Friezes 2,4,6. Warriors moving to right. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Friezes 2,4,6. Silver-gilt die-impressed sheet depicting warriors moving to the right. . Each carries a spear in his right hand and shield in his left, with the sword apparently obscured by his body, the chape end only being visible. The armour worn varies from mail, represented by raised dots, to what appears to be a woven textile. Two different sizes of warriors are present and are differentiated as below:

Frieze 2 Larger size warriors moving to right

Frieze 4 Smaller size warriors moving to right

Frieze 6 Warriors wearing eagle-crested helmets, moving to right. Possibly same as Frieze 4.

Pre-Conservation Condition: Severely fragmented. Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate. Mount: corrugated polypropylene sheet.

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. Where mounted, nylon gossamer was interleaved between the fragments and a sheet of corrugated polypropylene sheet. HMG was used to secure the nylon gossamer to the fragments and the corrugated sheet, by tack-applying it, lightly, at the edges only. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joins across K numbers:

(10 frags K5067x3+K512x3+K1694x2+K493.

(10 frags K1577x6+K1574x4.

(18 frags K1476+K1593x6+K1596x6+K1621+K1664x2+K1667+K1013.

(2 frags K1423+K1412.

(5 frags K506+K5039+K1690+K1328x2.

Joined within same K number (quantity of fragments may not be recorded: K5017x2, K1503x3, K282x16, , K1109.

Possible related fragments: K7, K748, K819.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis:

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7380, 7416, 7417, 7507.

Silver-gilt die-impressed sheet:

Frieze 7. Kneeling/Running Warrior and associated Tray. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Frieze 7. Silver-gilt die-impressed sheet depicting a kneeling or running warrior facing to the left, holding a spear and shield and wearing a belt and scabbard. No garments are indicated.

Associated with this is a thicker silver strip of 'tray' with a rim along each edge that held the frieze. A small area of the fixative material used to hold the frieze in place survives and shows the impression of a kneeling warrior. This provided a fixed position which allowed subsequent fragments of the frieze to be located. Other clues were the iron staining and disassembly breaks. Analysis has shown this fixative to contain beeswax alongside other materials. Iron staining is also present around rivet holes indicating that it may have been attached to an iron substrate. The tray has evidence of being bent and cut during disassembly.

This frieze retains a shallow curve that is original to its intrinsic shape.

Pre-Conservation Condition: Severely fragmented. Soil on the front and back surface of fragments. Very thin, brittle and corroded, gilded silver sheet. Thicker corroded gilded silver sheet for the tray. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers:

Frieze:

(15 frags K1556x2+K237x2+K1437x2+K1432x2+K235+K234+K285+K1574x4.

(15 frags K1532x13+K1550+K1628.

(7 frags K1529x6+K1515.

(4 frags K1643+K1625+K1627+K1643.

(2 frags K1593+K1643.

(9 frags K1556x8+K1562.

Tray:

(14 frags K235+K234+K1561x2+K1608+K1577+K1634+K794x2+K1627x3+K1650+K1778. Length=18.0cm.

(3 frags K1541+K1615+K282. Length = 3.50cm.

(2 frags K1615+K834.

(2 frags K523+K51.

(6 frags K250+K1615x2+K1577+K1676+K255. Length = 4.50cm.

Joined within same K number (quantity of fragments may not be recorded: K1574x5, K1, K1550.

Possible related fragments:

K51, K96, K228, K235, K237, K243, K734, K794, K1395, K1418, K1515, K1529, K1574, K1577, K1596, K1615, K1667.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

Samples for analysis see Stacey, R., 2014. *Identification of material in trays for silver foils*. BM Science Report PR07444-18.

X-ray: 7380, 7381, 7385, 7405, 7406, 7507.

Silver-gilt die-impressed sheet:

Panel 8. Horseman. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Panel 8. Silver-gilt die-impressed sheet, depicting a horseman carrying a shield facing to the left, with a naked crouching figure in front stabbing the horse in the chest area.

Pre-Conservation Condition: Fragmented. Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate. Mount: Corrugated polypropylene sheet.

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. Mounted: nylon gossamer was interleaved between the fragments and a sheet of corrugated polypropylene sheet. HMG was used to secure the nylon gossamer to the fragments and the corrugated sheet, by tack-applying it, lightly, at the edges only.

Joined across K numbers:

(11 frags K1400x3+K1615x2+K1624+K156+K1621+K1437+K1409+K1397.

Possible related fragments: K1373, K1397, K1405, K1597.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis:

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7409, 7410.

Silver-gilt die-impressed sheet:

BM 8a. Miscellaneous. Atypical Warriors. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Fragments of silver-gilt die-impressed sheet depicting warriors that do not match those present in friezes 1-7. Fragments show shields with a boss and rivets as well as different mail and textile armour.

Pre-Conservation Condition: Fragmented. Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer.

Joined across K numbers: (4 frags K1342x3+K762.

Possible related fragments: K166x2, K345, K542, K763, K828, K866, K1031, K1109, K1333, K1363, K1397, K1504.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7416, 7417, 7507.

**Silver die-impressed sheet:
BM 8b. Warrior Caenby Type. Conservation Record**

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Die-impressed silver sheet grouped together because of similarities of corrosion and absence of gilding. K793 depicts a warrior facing forwards dressed in a tablet-woven bordered, front-opening male gendered garment. Similar to a fragment found in Caenby, Lincolnshire. K621 depicts a belted and buckled kneeling figure holding two spears.

Pre-Conservation Condition: Fragments. Soil on the front and back surface of fragments. Extremely thin, corroded and fragile, with worn, torn and bent edges. Silver chloride present; tarnish-blackened front surface, with possible iron corrosion and solder present.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes. Paraloid B72.

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. Manual cleaning to reveal detail in selected areas. K1008 consolidated with Paraloid B72, 2.5% in IMS.

Possible related fragments: K621, K793, K1008, K1701, K12.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7416.

Silver-gilt die-impressed sheet:

Frieze 9. 'Beaked' quadrupeds (serpentine). Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Duygu Camurcuoglu, Fleur Shearman

Digital photography:

Before, during and after shots taken with Sony Cybershot DSC-W55 and Panasonic DMC FS16v Lumix digital cameras.

Description: Frieze 9. The frieze is made up of silver-gilt die-impressed sheet fragments. The design consists of duck heads with serpentine bodies following each other in a row, looking backwards to the right. Border elements are present along the top and bottom of the frieze. It would appear that the borders might have been perforated at intervals, and some perforations appear in the decorative scheme itself.

Pre-Conservation Condition: Fragmented. Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished, with some iron corrosion in areas.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. Where mounted, nylon gossamer was interleaved between the fragments and a sheet of corrugated polypropylene sheet. HMG was used to secure the nylon gossamer to the fragments and the corrugated sheet, by tack-applying it, lightly, at the edges only. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers:

9/BM1: (39 frags)

K1519+K1517x3+K1593x4+K237x3+K1519x3+K1383x3+K1392x2+K1412x9+K1417+K1416x5
+K1419+K1418x2. Length = 15.0cm.

9/BM2: (16 frags) K1519+K1517x8+K1593x2+K1532+K1406x3+K598. Length = 7.5cm.

9/BM3: (15 frags) K1383x7+K1417+K1416x2+K1423+K1412+K1519x3. Length = 8.0cm.

9/BM4: (2 frags) K1150. Length = 4.5cm.

9/BM5: (7 frags) K512+K966+K1203+K1495+K1179x2+K1690. Length = 3.0cm.

9/BM6: (4 frags) K1412x2+K1416+K1418.

9/BM7: (2 frags) K1113+K1115.

9/BM8: (3 frags) K795.

(2 frags) K209+K207.

(2 frags) K1171+K1172.

Joined within same K number (quantity of fragments may not be recorded): K1203.

Possible related fragments: K171, K191, K216, K416, K1363, K1383, K1495, K1664.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam) cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7381, 7385, 7405, 7406, 7416, 7417, 7507.

Silver die-impressed sheet:

Panel 10. Zoomorphic interlace. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Duygu Camurcuoglu, Fleur Shearman

Digital photography:

Before, during and after shots taken with Sony Cybershot DSC-W55 and Panasonic DMC FS16v Lumix digital cameras.

Description: Panel 10. Silver die-impressed sheet depicting an interlaced zoomorphic design including gripping beasts with almond-shaped haunches. Some fragments with a gilded border. Nail- or rivet-holes present.

Pre-Conservation Condition: Soil on the front and back surface of fragments. Thicker, well-preserved, silver die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer.

Joined across K numbers: (2 frags) K785+K146.
(2 frags) K521+K24.
(2 frags) K839+K840.
(2 frags) K795+K1186.
(2 frags) K216+K1694.

Possible related fragments: K15, K75, K155, K170, K212, K218, K226, K520, K527, K757, K790, K813, K838, K1088, K1161, K1574, K1589, K1676, K1690.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam) cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis:

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7416, 7507.

Silver-gilt die-impressed sheet: Frieze 11. Moustached Heads. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Frieze 11. Silver-gilt die-impressed sheet depicting three male moustached faces with a border along the top and bottom.

Pre-Conservation Condition: Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished. (K1775 pre-cleaned at BMT.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers: (4 frags K1775+K795x2+K1701.

Possible related fragments: K1621, K1679.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray: 7507.

**Silver-gilt die-impressed sheet:
BM 12+ Miscellaneous fragments. Conservation Record**

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Small fragments of die impressed silver-gilt sheet depicting additional designs. These include a geometric knotwork interlace, different feet and atypical fragments, a reconstructed panel with interlacing beasts and the joining fragment of a haunch/back leg.

Pre-Conservation Condition: Soil on the front and back surface of fragments. Very thin, fragile, silver-gilt die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers: **(5 frags)** K542x3+K1340x2.
 (8 frags) K1690x5+K1353+K216+K1332.
 (2 frags) K1493+K1495.
 (4 frags) K858+K905x3.

Joined within same K number (quantity of fragments may not be recorded): K178, K5020x2.

Possible related fragments: K185, K858, K1023, K5020, K5079.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam) cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray no.: 7416.

Silver-gilt sheet:

Reeded Strip 5mm, 8mm, 11mm, 14mm. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: A series of reeded strips of silver-gilt sheet composed of four different widths; 5mm, 8mm, 11mm, and 14mm. The 5mm, 8mm, and 11mm strips have one wider channel in the centre that contains rivet holes; the 14mm strip has two. Some sections are curved whereas others are straight.

Pre-Conservation Condition: Soil on the front and back surface of fragments. Very thin, fragile, gilded silver die-impressed sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers:

5mm: (3 frags) K507+K1327+K5076.
(3 frags reeded clip) K1513+K1327+K1719
8mm: (2 frags) K1491+K1493.
(4 frags) K1628x2+K1494x2.
11mm: (3 frags) K762+K841+K1331.
14mm: (12 frags) K1524x6+K1459+K1628+K1413+K794+K99+K36.
(10 frags) K1130+K1213+K526+K147+K1553x2+K1678+K1576+K1689x2.
(3 frags) K35+K750+K628.
(4 frags) K776+K1208+K1151+K43.

Joined within same K number (quantity of fragments may not be recorded):

5mm: K1513, K1719.
8mm: K282, K1015, K1262, K1410, K1413, K1443, K1506x3, K1513, K1524, K1553, K1576, K1592, K1617, K1628x2, K1680, K1689, K1699.
11mm: K1506, K1553, K1590.

Fragments/K numbers non-joining:

5mm: K85, K385, K517, K683, K707, K1592, K1719, K1478,
8mm: K50, K74, K166, K237, K423, K424, K532, K832, K859, K930, K1013, K1065, K1156, K1173, K1262, K1270, K1304, K1305, K1331, K1348, K1360, K1413, K1443, K1451, K1478, K1494, K1553, K1566, K1576, K1592, K1617, K1668, K1678, K1699, K1744, K5012, K5029.
11mm: K80, K127, K227, K407, K533, K542, K770, K1362, K1394, K1577, K1590, K1679, K5059, K5080, K5072.

Unallocated to width at present time:

K74, K166, K416, K599, K930, K981, K1015, K1065, K1157, K1331, K1370, K1459, K1506, K1513, K1524, K1566, K1586, K1668, K1680, K1689, K1715, K1743, K5024, K5029, K102, K190, K208, K216, K220, K385, K426, K433, K435, K502, K525, K1694, K110, K333, K508, K605, K749, K861, K869, K889, K914, K915, K922, K1091, K1154, K1207, K1214, K1288, K1301, K1303, K1320, K1354, K1433, K1545, K1744, K791.

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam) cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis:

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray nos.: 7380, 7381, 7416, 7417.

Silver-gilt sheet: Plain silver-gilt. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Small fragments of plain silver-gilt sheet.

Pre-Conservation Condition: Soil on the front and back surface of fragments. Very thin, fragile, gilded silver sheet. Tarnished.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary the joins were backed with HMG and nylon gossamer. As necessary and where possible, related K numbers were printed in small fonts and adhered onto the back of the fragments with HMG.

Joined across K numbers: (2 frags) K1493+K1627.
(8 frags) K1615x4+K1495+K1774+K1771.
(2 frags) K818+K171.

Joined within same K number (quantity of fragments may not be recorded): K435, K1091, K1363, K1393x2, K1417, K1493, K1533, K1627.

Possible related fragments: K166, K210, K436, K634, K637, K794, K1065, K1332, K1393, K1504, K1567, K1608, K1615, K1690, K1701, K5064

Packing: Joined elements and associated fragments individually packed in Plastazote (polyethylene foam) cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to frieze type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray no.: NA

Miscellaneous Metals and Mixed Fragments. Conservation Record

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: Small miscellaneous fragments, from categories other than die-impressed sheet and reeded strip, including sword fittings, gold, foils, garnets and niello fragments.

Pre-Conservation Condition: Soil on surfaces of fragments.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes, nylon gossamer, HMG heatproof and waterproof adhesive (cellulose nitrate).

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept. The fragments which join to each other were adhered with HMG. Where necessary joins were backed with HMG and nylon gossamer. As necessary and where possible, related K numbers were printed in small fonts and adhered to fragments with HMG.

Joined across K numbers:

Silver hilt plate	K282 a1 and a4 +K1541 (Reintegrated with swords at Grouping Exercise)
Cast silver-gilt with niello	K1667+K1608
Silver with gilt rivet border	K1562+K1582+K1567x2+K1667+K1676 (pecked silver)
Silver pommel/hilt tray	K282+K1493

Joined within same K number:

Style 2 silver	K1068x2 (similar fragments: K213, K1027)
----------------	--

Cleaned only:

Niello samples

Gold and garnet: K282, K237, K1394(foil).

Gold: K133, K1655, K225, K1490, K1667.

Copper alloy: K754, K1162, K762(part), K1332(part), K219.

Cast fragments: K1466, K763.

Ridged Ag-gilt border: K1657, K98.

Packing: Joined elements and fragments individually packed in Plastazote (polyethylene foam) cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to type, join association and identification number.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray no.: NA

All K-numbered fragments of die-impressed sheet and reeded strip (as received by British Museum not recorded in other BM conservation records.

Conservation Started: Within period June 2012 – February 2014

Conservation Finished: Within period June 2012 – February 2014

Conservator: Fleur Shearman

Digital photography:

Photographs taken using a Panasonic DMC FS16v Lumix camera.

Description: All K-numbered fragments of die-impressed sheet and reeded strip not recorded in other BM conservation records.

Pre-Conservation Condition: Soil on surfaces of fragments.

Materials: Cotton swab, cocktail stick, pin vice with a cactus spine, soft brushes.

Treatment: Carried out using a Kyowa stereo microscope at x20 magnification. Removal of soil by gentle swabbing with cotton wool swabs, de-ionised water and/or IMS. All soil kept.

Packing: Fragments individually packed, where practicable, in Plastazote (polyethylene foam cut-outs in clear polystyrene boxes, within polyethylene boxes, in groups according to type, join association and identification number. Tiniest fragments in glass sample tubes.

Samples for analysis :

All soil kept after removal. Any organic deposits and corrosion products were kept in situ.

X-ray no.: NA

Appendix 2 - Annotated Images - BM die-impressed sheet project

Selected images representative of iconographic/diagnostic type. Images not to scale.

Silver-gilt sheet.

Friezes 1,3,5. Warriors moving to left.

Joins across K numbers:



K1319+K1405+K1407+K140



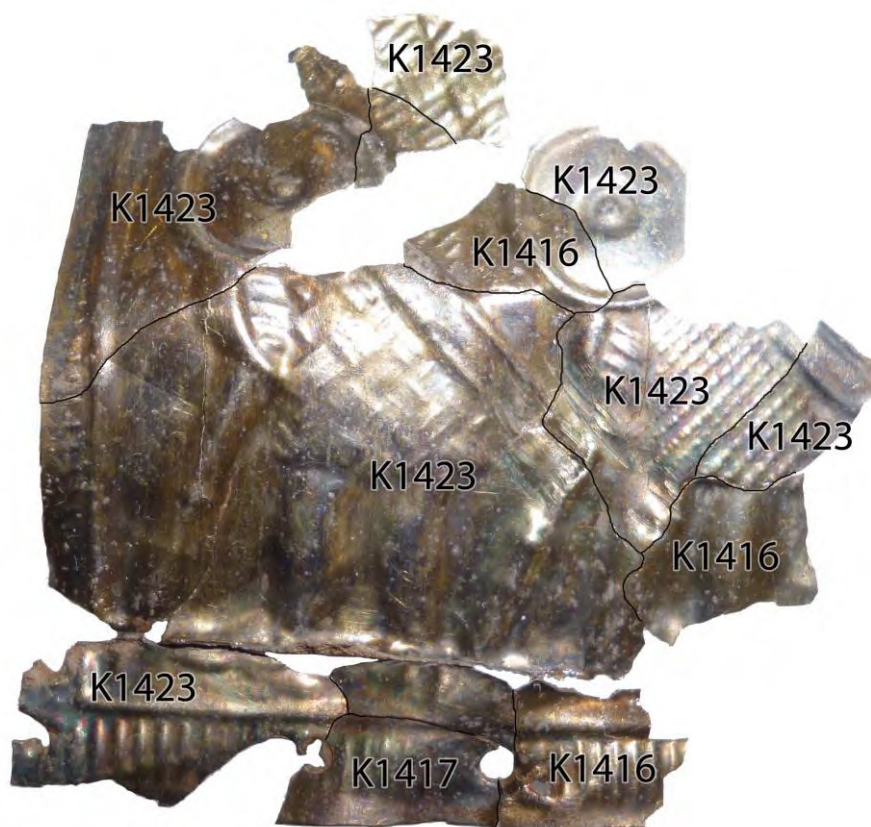
K1690x2+K1694x3



K1664x5+K435x3+K436



K1495+K1771+K1774x3



K1423x7+K1416x3+K1417



K1416+K1420+K1503



K1420+K1417+K1416.



K1382x2+K1392x6+K1383.

K1332+K795:

No image

K829+K968+K961:

No image

Other fragments



K237

Possible border fragment



K1416x2+K1412

Silver-gilt sheet:

Friezes 2,4,6. Warriors moving to right.

Annotated Images.

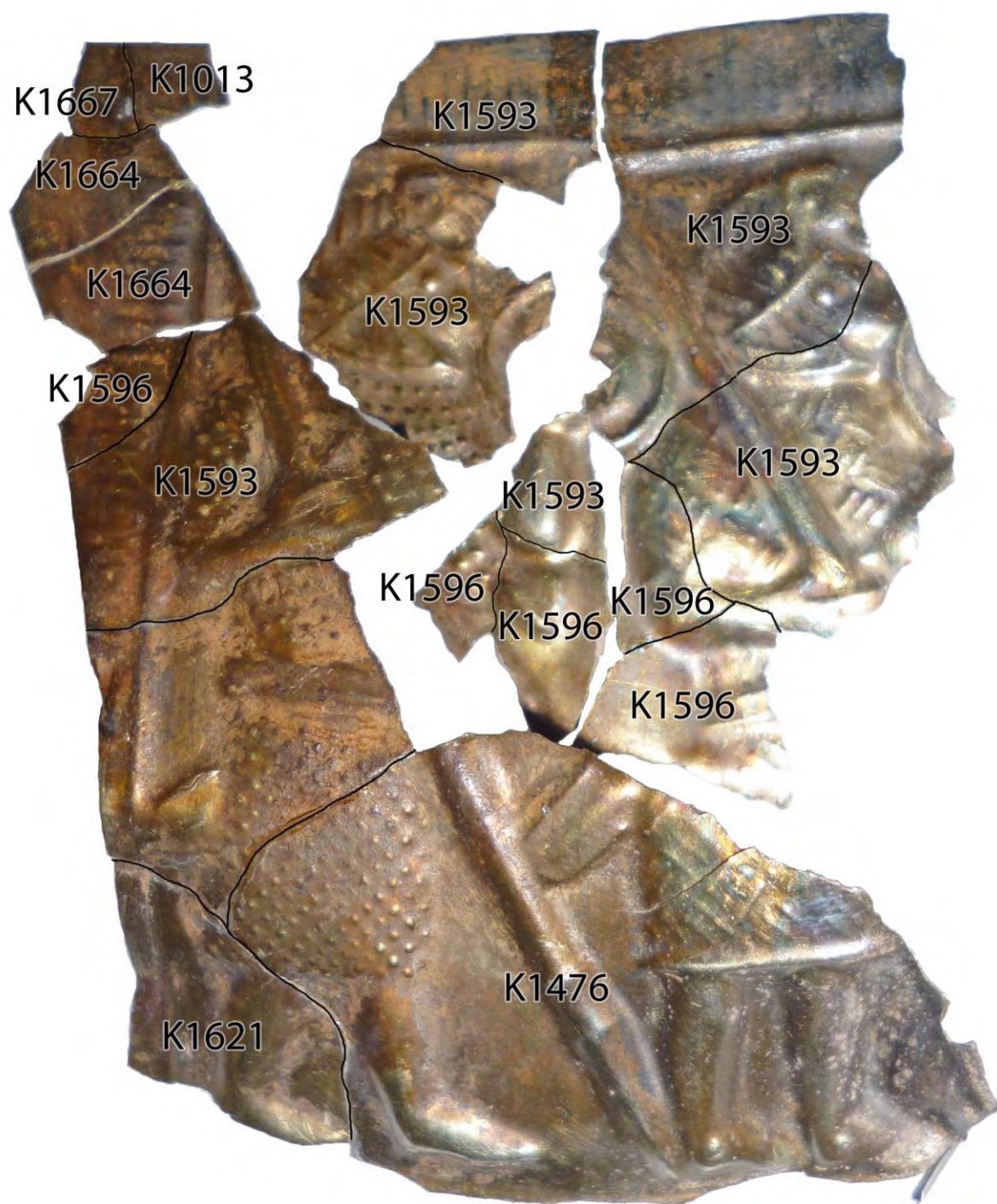
Joins across K numbers:



K5067x3+K512x3+K1694x2+K493x2



K1577x6+K1574x4



K1476+K1593x6+K1596x5+K1621+K1771?+K1664x2+K1667+K1013



K1423+K1412



K506+K5039+K1690+K1328x2:

Joins within K number:



K5017x2



K1503x3



K282x16

K55, K1109:

No images.

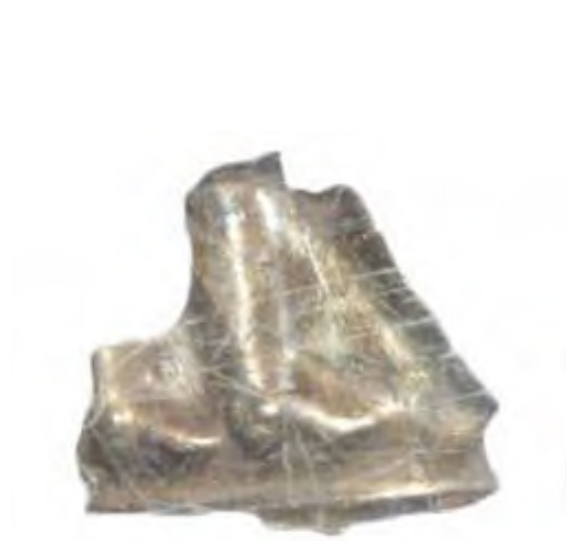
Other possible fragments



K7



K748



K819

Silver-gilt sheet:
Frieze 7. Kneeling/Running Warrior and Tray.

Annotated Images

Frieze:
Joined across K numbers:



K1556x2+K237x2+K1437x2+K1432x2+K235+K234+K285+K1574x4 (digitally divided for page)



K1532x13+K1550+K1628



K1529x6+K1515



K1643x2+K1625+K1627



K1593+K1643



K1556x8+K1562

Frieze joins within K number



K1574x5

Tray



K235+K234+K1561x2+K1608+K1577+K1634+K794x2+K1627x3+K1650+K1778.

Length = 18.0cm:
(digitally divided for page)



K1541+K1615+K282. Length = 3.50cm



K1615+K834



K523+K51



K250+K1615x2+K1577+K1676+K255. Length = 4.50cm

K1, K1550:

No images

Other possible fragments



K51



K96:



K243



K794

K1734



K1734

**Silver-gilt sheet:
Panel 8. Horseman.**

Annotated Images

Joined across K numbers:



K1400x3+K1615x2+K1624+K156+K1621+K1437+K1409+K1397

Possible border fragment



K1342x3+K762

Silver-gilt sheet:

BM 8a Miscellaneous. Atypical Warriors.

Annotated Images

Fragments



K542



K166x2



K828



K866

K866



K1031



K1109



K1333

Silver sheet:
BM 8b. Warrior Caenby Type.

Annotated Images

Related K numbers

K621



K621

K793



K793

K1008



K1008



K1701

K1701

K12



K12

Silver-gilt sheet:

Frieze 9. 'Beaked' quadrupeds (serpentine). Annotated Images

Joined across K numbers:

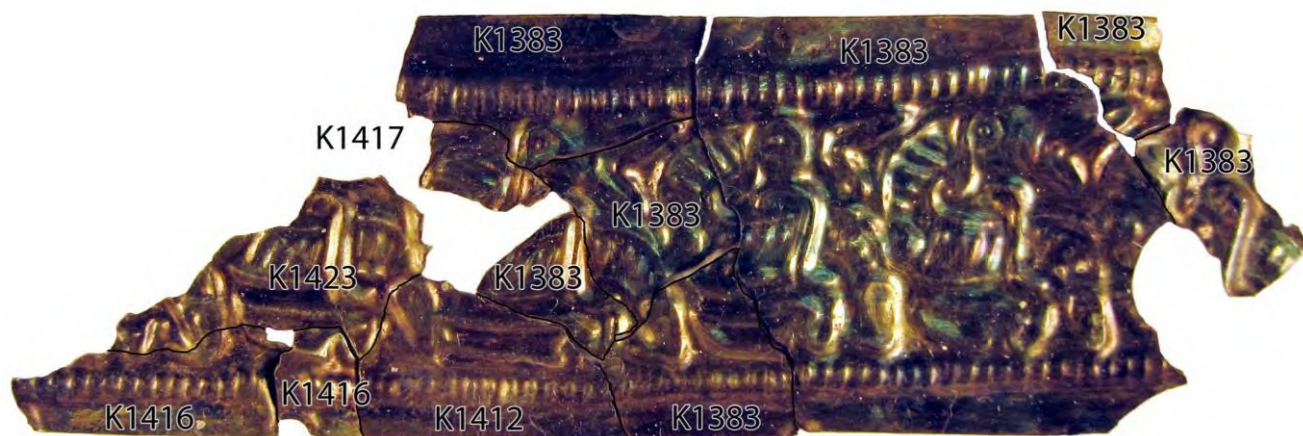


9/BM1: K1519x4+K1517x3+K1593x4+K237x5+K1383x3+K1392x2+K1412x9+K1417+K1416x5+K1419+K1418x2.

Length = 15.0cm. (digitally divided for page)



9/BM2: K1519x2+K1517x8+K1593x2+K1532+K1406x3+K598. Length = 7.5cm.



9/BM3: K1383x7+K1417+K1416x2+K1423+K1412. Length = 8.0cm.



9/BM4: K1150x2. Length = 4.5cm.



9/BM5: K966+K1203+K1495x2+K1179x2+K1690+K512. Length = 3.0cm.



9/BM6: K1412x2+K1416+K1418



9/BM7: K1113+K1115



9/BM8: K795x3



K209+K207

K1171 K1172



K1171+K1172

Joined within K number:

K1203:

No image

Other numbers:



K1363



K1383



K1495x2

Silver sheet:

Panel 10. Zoomorphic interlace.

Annotated Images

Joined across K numbers



K785+K146



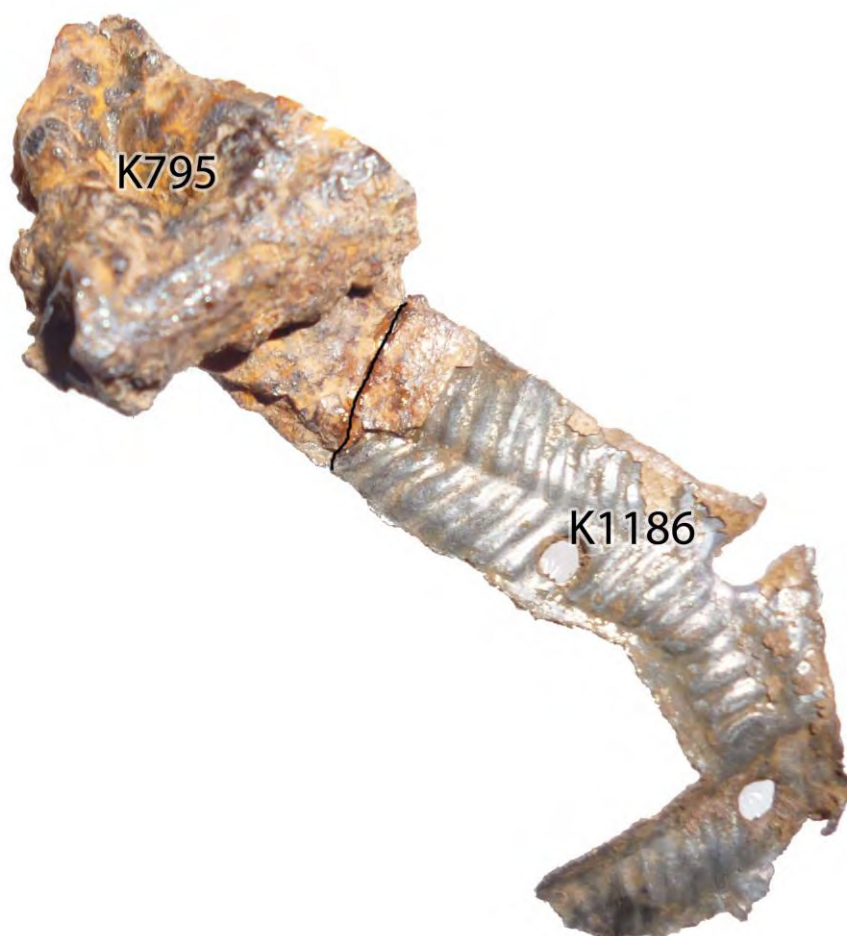
K521

K24

K521+K24



K839+K840



K795+K1186
K216+K1694:

No image.

Other possible fragments:



K15



K527



K75



K757



K218



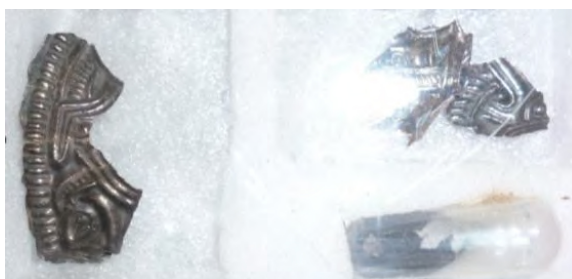
K1088



K520



K1574



K1690

Silver-gilt sheet:
Frieze 11. Moustached Heads. Annotated Images.

Joined across K numbers:



K1775+K795x2+K1701

Other possible fragments:



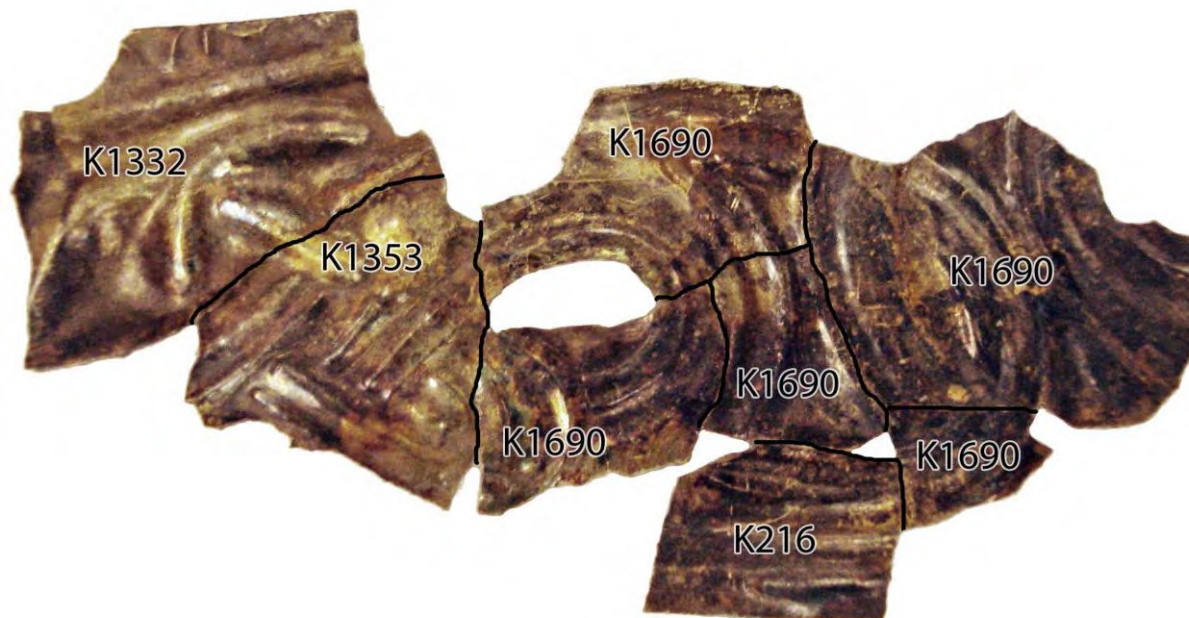
K1621



K1769

**Die-impressed/decorated silver-gilt sheet:
BM 12+ Miscellaneous fragments. Annotated Images.**

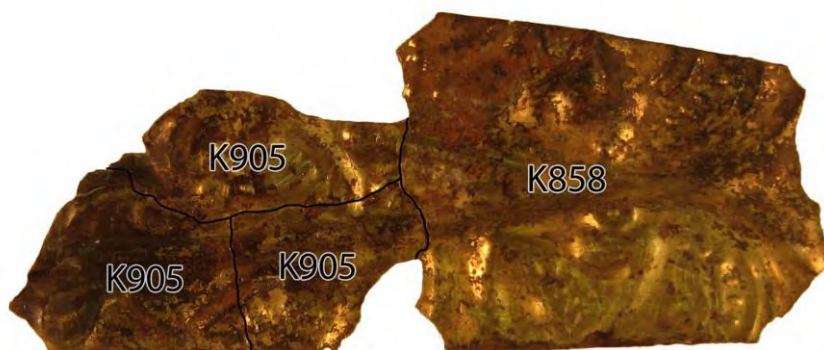
Joined across K numbers:



Gripping beast K1690x5+K1353+K216+K1332



Knotwork K542x3+K1340x2



Different Feet K858+K905x3



Back leg K1493+K1495

Joined within K number:



Different Feet K5020

K178:

No image

Other fragments:



Different Feet K185



Different feet K5079

K1504

Silver-gilt sheet:

Reeded Strip 5mm, 8mm, 11mm, 14mm. Annotated Images.

Joined across K numbers:

Reeded Strip, 5mm:



K507+K1327+K5076



Reeded Clip K1513+K1327+K1719

Reeded Strip, 8mm:



K1491+K1493



K1628x2+K1494x2

Reeded Strip, 11mm:



K762+K841+K1331

Reeded Strip, 14mm:



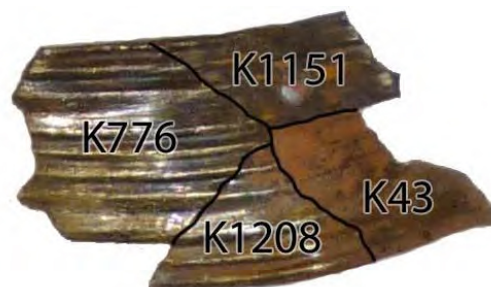
'Wide Strip 1' K1524x6+K1459+K1628+K1413+K794+K99+K36



'Wide Strip 2' K1130+K1213+K526+K147+K1553x2+K1678+K1576+K1689x2



'Wide Strip 3' K35+K750+K628



'Wide Strip 4' K776+K1208+K1151+K43

Joined within K number:

Reeded Strip, 8mm



K1413



K1443

K1443x2



K1592

K1592



K1617x2

Reeded Strip, 11mm: No images: K1506, K1553, K1590

Silver-gilt sheet:

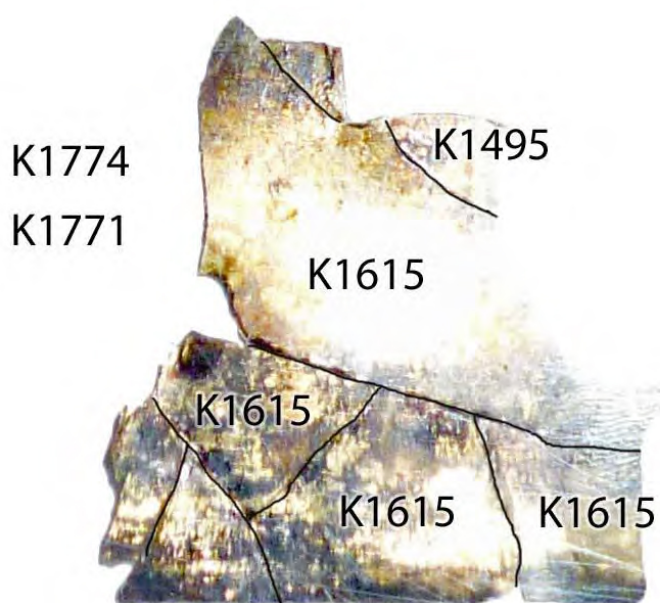
Plain silver-gilt.

Annotated Images.

Joined across K numbers:



K1493+K1627



K1615x4+K1495+K1774+K1771:



K818+K171

Joined within K number:



K1373



K1493

K435, K1091, K1363, K1373, K1417:

No images.

Possible related fragments



K166



K634



K1065



K1393



K1504 etc

Appendix 3 - Post-conservation Packing guide - BM die-impressed sheet project

Container Box Label	Group	Name of Group	Material in Box	Notes
'WARRIORS MOVING TO LEFT. WARRIORS FRAGMENTS MISC'	Friezes 1, 3, 5	Warriors moving to left.	Silver-gilt die-impressed sheet, reconstructed elements and other misc. fragments of warriors moving to left.	1 of 2 boxes
'LEFT'	Friezes 1, 3, 5	Warriors moving to left.	Silver-gilt die-impressed sheet, reconstructed elements and other fragments of warriors moving to left.	2 of 2 boxes.
'WARRIORS MOVING TO RIGHT'	Friezes 2,4,6	Warriors moving to right.	Silver-gilt die-impressed sheet, reconstructed elements and other misc. fragments of warriors moving to right.	One box
'RUNNING MAN FR 7'	Frieze 7	Running, kneeling warriors	Running, kneeling warriors (aka running man or crouching warrior) plus 'tray'	1 of 2 boxes
'RUNNING MAN FR 7'	Frieze 7	Running, kneeling warriors	Running, kneeling warriors (aka running man or crouching warrior) plus 'tray'	2 of 2 boxes.
'FRIEZE 8 HORSEMAN. FRIEZE 11 MALE FACE' '8A'	Frieze 8	Horseman riding down warrior	Silver-gilt die-impressed sheet, reconstructed elements and other misc. fragments of three different groups, 8, 8a & 11.	One box
	Frieze BM 8a	Atypical warriors: miscellaneous.		
	Frieze 11	Facing moustached heads.		
'8B WARRIORS ATYPICAL. PROBABLE FRIEZE 8' '8B'	BM 8a	Atypical warriors: miscellaneous.		One shallow box
	BM 8b	Warrior, Caenby type (silver).		
'FRIEZE 9 ZOOMORPHIC WITH DUCK HEADS'	Frieze 9	'Beaked' quadrupeds (also called serpentine, zoomorphic).	Silver-gilt die-impressed sheet, reconstructed elements and other fragments of Frieze 9.	One shallow box
'FRAGMENTS SMALL VARIOUS'	Frieze 9 etc	'Beaked' quadrupeds (also called serpentine, zoomorphic).	Silver-gilt die-impressed sheet, reconstructed elements and other fragments of Frieze 9 and others.	One shallow box

'SILVER FRIEZE 10'	Panel 10	Interlace panels (silver, non-linear).	Silver die-impressed sheet, reconstructed elements and other fragments of group 10.	One shallow box
'12 PLUS'	BM 12+	Miscellaneous fragments, die-impressed/decorated silver-gilt sheet.	Silver-gilt die-impressed sheet, reconstructed elements and other misc. fragments: knotwork, haunches, beast with 'paperclip' jaws etc	
'5MM FLUTED STRIP'	Reeded strip	5mm	5mm reeded strip, silver-gilt, reconstructed elements and related fragments.	One shallow box
'FLUTED STRIPS Box 1'	Reeded strip	8mm	8mm reeded strip, silver-gilt, reconstructed elements and related fragments.	Deep box, 1 of 2 boxes.
'FLUTED STRIPS Box 2'	Reeded strip	8mm	8mm reeded strip, silver-gilt, reconstructed elements and related fragments.	Deep box, 2 of 2 boxes.
'FLUTED STRIPS 11MM'	Reeded strip	11mm	11mm reeded strip, silver-gilt, reconstructed elements and related fragments.	One shallow box
'WIDE 14MM FLUTED STRIP'	Reeded strip	14mm	14mm reeded strip, silver-gilt, reconstructed elements and related fragments.	One shallow box
'MISC. METALS 1 / 2'		Miscellaneous	Sword fittings, gold, copper alloy, garnets etc. which had shared K-numbers with fragments subsequently allocated to die-impressed sheet project.	Deep box, 1 of 2 boxes
'2 / 2 MISC. MIXED FRAGMENTS'		Miscellaneous	Mainly unallocated sheet fragments, including silver-gilt.	Shallow box, 2 of 2 boxes.
'ORGANIC REMAINS AND SAMPLES'		n/a	Organic remains and samples.	One shallow box
ASSOCIATED SOIL K. NUMBERS'		n/a	Soil removed during conservation, bagged by K number	Deep box
'NAT. GEO. ASSOCIATED WOOD. SILVER BORDER'		Silver bracket fitting K787 Silver border fragments (not associated with K787)	K787 and associated K-numbered fragments. Ag border fragments.	One shallow box

INDEX of K numbers referenced in the report

K no.	Page
7	33,59
24	41, 81
35	38,78
36	38,78
43	38,78
50	38
51	29,57,58
55	28,52
74	38
75	41,83
80	38
85	38
96	29,58
98	41
99	38,78
102	38
110	38
146	23,41,80
147	38,78
166	15,38,40,61,81
170	41
171	39,46,96
178	37,74
185	37,74
190	38
191	39
207	34,67
208	38
209	34,68
210	46
212	41
213	41
216	34,35,37,38,71,74
218	41,83
219	47
220	38
225	41
226	35
227	38
228	35
234	29,54,57
235	5,11,13,29,54,57
237	19,27,29,34,38,41,47,54,65
243	29,59
250	29,57
255	29,57
282	28,29,38,41,52,57
333	38
345	32
385	38

K no.	Page
407	38
416	34,38
423	38
424	38
426	38
433	38
435	27,38,40,44,81
436	27,40,44
493	28,48
502	38
507	38,75
508	38
517	38
520	35,71
521	41,81
525	38
526	38,78
527	35,71
532	38
533	38
598	34,64
599	38
605	38
621	19,38,72
628	38,78
634	46,98
637	46
683	38
707	38
748	28,52
749	38
750	38,78
754	47
757	35,71
762	16,32,38,41,60,77
763	32,41
770	38
776	38,78
785	19,35,69
787	3,84
790	35
791	38
793	17,33,63
794	29,38,40,56,58,77
794	29,38,40,57,59,78
795	27,34,35,36,46,67,70,72
813	35
818	40,80
819	28,52
828	27,32,61
829	27,46

K no.	Page
832	38
834	29,58
839	35,70
840	35,70
841	38,77
858	37,73
861	38
866	16,32,61
869	38
889	38
905	37,73
914	38
915	38
922	38
930	38
966	34,65
981	38
1008	18,63,33,
1013	28,38,50
1015	38
1016	27
1023	37
1027	41
1031	32,61
1065	38,40,81
1068	41
1088	35,72
1091	38,40,81
1109	28,32,53,62
1115	34,66
1151	38,78
1154	38
1156	38
1157	38
1161	35
1171	34,67
1172	34,67
1173	38
1186	35,70
1203	34,68
1207	38
1208	38,78
1213	38,78
1214	38
1262	38
1270	38
1288	38
1301	38
1303	38
1304	38
1305	38
1319	27,43

K no.	Page
1320	38
1327	38,76
1331	38,77
1332	27,37,40,41,46,73
1333	32,61
1340	37,73
1342	16,32,59
1348	38
1353	37,73
1354	38
1360	38
1362	38
1363	32,34,40,68,80
1370	38
1373	31,80
1382	9,27,46
1383	27,34,46,65,66,69
1392	27,34,45,64
1393	40,81
1395	29
1397	31,32,59
1400	27,31,59
1405	27,31,42
1406	5,34,64
1407	27,42
1409	27,31,59
1410	38
1413	38,78,79
1416	27,34,44,45,46,64,65,66
1417	27,34,40,44,45,64,65,80
1418	29,34,64,66
1419	34,64
1420	27,44,45
1423	27,28,34,45,51,66
1423	27,28,34,44,51,66
1432	29,53
1433	38
1437	29,31,53,59
1451	38
1459	78
1460	27
1466	41
1476	28,49
1478	38
1490	41
1491	7,23,38,77
1493	7,23,37,38,40,41,74,76,79,80
1494	38,77
1495	27,34,37,40,43,65,68,74,79
1503	27,28,45,52
1504	32,40,76,82
1506	38,79
1513	24,38,76

K no.	Page
1515	29,55
1517	34,65
1519	34,65
1524	38,78
1532	29,34,53,64
1533	40
1541	29,41,57
1545	38
1550	29,54,58
1553	38,78,79
1556	29,53,55
1561	29,57
1562	27,29,41,56
1566	38
1567	40,41
1574	28,29,35,49,54,56,72
1576	38,78
1577	27,28,29,38,49,57,58
1582	41
1586	38
1590	38,79
1592	38,79
1593	28,29,34,50,55,65
1596	27,28,29,50
1608	29,40,41,56
1615	29,31,40,58,60,80
1617	38,79
1621	28,31,36,50,60,73
1624	31,59
1627	29,40,55,57,80
1628	29,38,54,77,78
1634	29,56
1636	27
1643	29,55
1650	29,57
1655	41
1657	41
1664	27,28,34,44,50
1667	28,29,41,49
1668	38
1676	29,35,41,58
1678	38,78
1679	36,38
1680	38
1689	38,78
1690	27,28,34,35,37,40,43,51,66, 72,74
1694	27,28,35,38,43,48,71
1699	38
1701	33,36,40,63,72
1715	38
1719	38,76
1734	12,57

K no.	Page
1743	38
1744	38
1769	72
1771	27,40,44,50,80
1774	27,40,44,80
1775	36,73
5012	38
5017	28,52
5020	37,75
5024	38
5029	38
5039	28,51
5059	38
5064	40
5067	28,48
5072	38
5076	38,76
5079	37,75
5080	38



Staffordshire Hoard Research Reports

Staffordshire Hoard Research Reports were produced by the project

Contextualising Metal-Detected Discoveries: Staffordshire Anglo-Saxon Hoard

Historic England Project 5892

The Staffordshire Hoard is owned by the Birmingham City Council and the Stoke-on-Trent City Council and cared for on their behalf by Birmingham Museums Trust and The Potteries Museum & Art Gallery.

The Staffordshire Hoard research project was conducted by Barbican Research Associates Ltd and funded by Historic England and the owners.

