Contextualising Metal-Detected Discoveries: Staffordshire Anglo-Saxon Hoard

(Project 5892)

Stage 2 Project Design

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Appendix 1: Conservation programme. Assessment report[1]

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1 Conservation programme

1.1 Introduction

The hoard conservation project is unique for archaeological materials recovered in the UK. Since 2010 the project has taken an innovative, open and collegiate approach to conservation. The main focus of this aspect of the programme was to conserve the objects to a high standard and to liaise with the research programme led by PMAG[2]. Further to this it has successfully engaged both conservation professionals and public audiences, and has delivered an extraordinary range of activities over a short time period, raising the conservation profile in the UK public domain.

The programme is also committed to having a selection of objects always on display, in four venues across the region (PMAG, BMAG (now BMT), Lichfield Cathedral and Tamworth Castle). This has added a layer of complexity, entailing movement of conserved and unconserved objects across four locations.

BMAG took the lead on the conservation programme because it had an established conservation department; to facilitate the programme three new positions were established; two full-time conservators and a dedicated Hoard Conservation Manager.

To manage the conservation programme in a controlled framework, a formal Conservation Plan[3]. was developed and agreed. The plan was written in conjunction with the BM's conservation department. It outlined the techniques to be used, procedures and order of the work, including how the process would be documented. The overarching conservation aim was stated in the plan as 'The conservation work on the hoard will produce objects which are physically and chemically stable and will reveal and preserve all the surviving surface detail and any related information, such as organic material, by means which will not be prejudicial to the wider study of the Hoard'[4].

[1] This Appendix was produced at the end of Stage 1 and is an accurate Assessment of the work that had been carried out during that Stage. In the interval since then BMT has been able to commit additional resources to Stage 2 through the grant from the Esmeé Fairbairn Foundation. What these posts will do has been finalised at a very late stage in the product of this project design. They are outline in the main body of the text with cross-references provided here where appropriate by footnotes.
[2] Cool 2013 – PD 2013.
[3] Cane 2010.
[4] Cane 2010, 2.

Alongside the conservation plan, a Conservation Advisory Panel, composed of specialists in the area of archaeological, science, metals conservation and conservation ethics was established to advise and support the process.

1.2 Methodology

The conservation carried out was based on the condition of the object and the requirements of the research. The conservation problems posed by the Hoard were reasonably straightforward in comparison with more complex multi-component objects such as iron or copper alloy objects, which may have complex corrosion layers or mineralised organics. The Hoard largely consists of gold and garnet, which are relatively chemically stable materials, with minimal associated organic material. The Hoard does, however, contain primarily broken objects and fragments, damaged prior to burial by their physical removal from larger entities. This creates issues with physical stability, as the majority of pieces have damaged edges and detached or loose components. For example, often the garnets are held within the cells by residual soils, which added a further complication in that a balance needs to be struck between removing soils and applying adhesives or consolidants, which could compromise further analysis. Care was also required to uncover any remaining organics that could have survived the burial environment; during conservation several small fragments of textile closely attached to silver fragments had emerged from the soils.

Some of the silver components demonstrate embrittlement from the burial environment, but not to a point where immediate consolidation is required.

Since 2010 the BMAG conservation team have conserved some 95% of the 4000 objects and fragments that make up the assemblage, with the BM conservation team the other 5%. The conservation falls into three main categories (investigative, remedial and display), with most conserved to the remedial conservation requirement.

Investigative conservation – processes used to examine and record artefacts by non-invasive means, by removing accretions or by sampling for analysis. The conservation will consist of cleaning specified areas only, in order to reveal the area or material of interest.

Remedial conservation – treatments used to stabilise objects for handling and storage; this includes the repair and consolidation of broken and fragile objects. The majority of the conservation to this point falls into this category.

Display conservation – any further work that is required for display.
The conservation team remove soils from the exterior surfaces to allow the decoration to be viewed. For display purposes, it is unnecessary to remove soil from internal areas. Consolidation may be required if the object is to travel over long distances. Very little of this work has been carried out on the Hoard material.

1.2i Conservation procedure

The high levels of repetitive conservation justified creating a template to standardise and document all the conservation work. The documents contain all the important information on the objects pre- and post-conservation, including a full photographic record. Photomicrographs were taken as appropriate to document pre-conservation if movement of fragile or loose components might occur during conservation. Examples of conservation reports can be found at the end of this appendix (Addendum 1).

1.2ii Treatment

Treatment was standardised across the conservation programme, although with variations between filigree and cloisonné objects.

Soils were removed under the microscope using a thorn in a pin vice. If the soil is particularly compacted and hard and there are no organics or evidence in the soil, then a soft brush and distilled, ph neutral water or industrialised methylated sprits (IMS) could be used to wet the surface prior to this procedure. The surfaces were not overly wetted as this may travel into and under fine cracks. Care was especially taken around garnet cells since any migration of liquids could discolour under the garnets. Care was also taken around the garnets, and soil was not removed if it was felt that this factor was holding the garnet into the cell.

If consolidation was required for a garnet or a loose component of an object, Paraloid B72 (composed of an ethyl methacrylate (70%) and methyl acrylate (30%) copolymer) in acetone was applied. A 20% solution applied with a micro pipette will consolidate the garnet but also run into the foil and paste below. Alternatively, Paraloid from the tube (propane-2-ol, nitrocellulose) was mixed with acetone to make a thicker adhesive that can be applied as a spot, in one application, with the tip of a cocktail pick (pin if used with great care) or thorn. This will hold the garnet in place at one edge only. A visual document of the consolidation locations was created and added to the reports as required.

Small fragments that were not associated with the object but found within the soil matrix were cleaned and retained under the original K number. These new fragments have been renumbered by Chris Fern and will be separated as required, based on Chris Fern's recommendations.

All organic materials were recorded; organic material was left *in situ* for research and analysis if possible. If it was felt that any material was susceptible to loss, it was documented and then sampled. Where possible, any pastes or probable pastes were recorded but otherwise left untouched and *in situ* for later analysis.

Impressions of washers, contact material etc. were recorded, photographed, measured, and described in condition reports as observed by conservation team.

All corrosion products will be left *in situ* and recorded and photographed. This applies to surface tarnish and lumps of copper corrosion.

All soil and residue was kept, stored in the sample tubes, labelled and placed into the sample storage boxes as per the protocol (see **1.2.iii**).

After conservation, a small paper label with the K number was attached to the object with Paraloid B72.

1.2.iii Samples

Samples were retained of all materials removed from the objects. Soils as well as organic residues and pastes were documented and collected for further analysis. The full sample procedure can be found at the end of this appendix (addendum 2)[5].

1.3 Observations recorded during conservation

As conservation proceeded, it was clear that objects could be grouped based on typology. A working document was created of potential and confirmed groupings (available on request from BMT) of all the conservation observations; this information was shared with the research team.

Further to this, all observations of construction lines and marks were detailed, any repairs were highlighted in the conservation report, possible makers' marks and recording of damage – all were noted in the conservation records. A complete synthesis of these observations has yet to be made.

2 Characterisation projects

In 2011 Cymbeline Storey and Deborah Magnoler worked on two characterisation projects that aimed to arrange and identify the niello and cloisonné garnet objects better. Both these pieces of work were completed and fed into the continuing work of Chris Fern[6]. As both reports were during the initial stages and contain some uncleaned objects, some of the observations and conclusions are no longer correct as work has continued since the reports were completed.

2.1 Niello

Cymbeline Storey's work on the niello aimed to assess the physical stability of the objects for handling, as well as to identify specific groups and types of objects within the niello group based on material, shape, decoration, etc. This would enable joins to be found between fragments which, in turn, would provide more information about the composition of the hoard. The intention was to locate and document joins (where possible) but not physically to join the objects.

[5] See **14.8iv** for what will happen to these in Stage 2.
[6] Magnoler 2012 , Storey 2013.

The document created was not intended to serve as a full technical report on the objects. Rather, it is a preliminary report outlining groups of objects and the key features of each group to help the research and conservation teams make sense of this largely fragmentary set of objects.

Fourteen groups were identified during the project, denoted by the letters A through N in the report, as well as seven stand-alone objects. There are now 141 fragments in the niello group; however, the identification of niello is visual only and further analysis should be used to confirm the classification[7].

2.2 Cloisonné garnet

Deborah Magnoler worked on the cloisonné garnet report. The purpose of this work is to provide an overview of the cloisonné decorated objects in the Staffordshire Hoard and to find possible associations of objects with the same or similar cloisonné pattern. Objects decorated with single stones, such as fittings and hilt plates, were not taken into account.

Magnoler concluded that there is a variety of cloisonné patterns within the Staffordshire Hoard, the two main distinctions being geometric and zoomorphic. Manufacturing techniques also seem to vary, ranging from objects with larger garnets, orderly patterns and virtually undisturbed cell work (for example the lentoids, the curved, pointed and edging strips groups, the fin-shaped fittings and the fish-scale pattern fittings), to objects where the cell work appears to be smaller as well as less precise geometrically. Generally the latter appear to be in a worse state of preservation (for example the small cloisonné collars and pommel groups).

3 Outreach

The outreach programme created by the conservation team has formed an important part of the project. The idea of carrying out conservation in the public eye is not a new one. The hoard programme, however, has been unique in the intensity and regularity with which it was able to provide outreach, and by using social media has gained an international audience that has been sustained over the years.

This programme provides an example of how conservation can drive different aspects of a project other than the conservation of the objects themselves, and has acted as a catalyst to encourage public access and participation in the wider project. The hoard has generated interest beyond its historical context to create a stronger sense of local identity and pride in the region, as demonstrated by the formation of the Mercian Trail (see **3.2** below).

[7] See Appendix 2 Section 2.15.

Engagement activities take the form of professional placements, placements for conservation students, and non-conservation placements. A programme of open lectures and talks, publications, studio tours, family days, written blogs and video blogs was launched to create a supportive public community of interest.

The conservation team have been rewarded for its efforts, firstly in late 2013 with the announcement that it had received the Archaeological Institute of America's Conservation and Heritage award, and secondly in early 2014 with the shortlisting of the conservation outreach programme for the Museum and Heritage awards.

3.1 Creating the collegiate environment

The aim of the collegiate conservation programme was to allow the project to be as inclusive as possible and to maintain the professional interest already generated by the discovery. To this end, a programme of professional and student placements, including volunteers and non-conservation specialists, was put in place. Between 2010 and 2013 there were 14 professional, 27 student and 10 non-specialist placements who participated in both the hands-on conservation programme and the public engagement programme. The placement programme proved very successful, attracting participants for the professional and student placements from Germany, Canada, the Netherlands, Greece, the USA, as well as the UK.

The professional placements were able to experience working on the hoard objects while sharing their conservation experience with the hoard team, the conservation students and the non-specialists, creating a vibrant learning environment where everyone could openly discuss ideas. The conservation students were also able to gain confidence by using their knowledge to demonstrate to the non-specialists how to handle tools, the ethics of conservation and how to approach the treatment of an object. Non-specialists came from the National Heritage Ironwork Group (NHIG), a body that promotes good conservation practice in the restoration of historic ironwork by supporting museum placements for its members; the NHIG students consisted of professional and trainee blacksmiths, who learnt about conservation on the micro scale, by using microscopes. The exchange of knowledge relating to metals, tools and metal-working once again created an invigorating cross-disciplinary debate regarding the treatment of metals within different disciplines of the heritage sector.

All the participants experienced practical conservation but also participated in public tours, social media and, on occasion, were part of the team used when the conservation process was filmed for National Geographic, Time Team (an archaeological programme shown on Channel 4, UK), Country File (BBC) and for local and national news items.

3.2 Collaborations

The main funding collaboration was with National Geographic, who received facilitated filming for television and exhibition rights in return for £150,000. Partnerships have been established with the British Museum Department of Conservation and Scientific Research, where the hoard project has benefitted from the expertise of the conservation and research departments, and with the Centre de Recherche et de Restauration des Musées de la France (C2RMF) research laboratory at the Louvre through the EU-funded CHARISMA programme, where analytical work allowed the project to gain a snap-shot of possible provenance for the garnets and gold analysis. Both institutions hold important collections of comparable material to the hoard; these collaborations have facilitated the exchange of expertise and scientific data, and helped establish the conservation and research project in its wider context.

The conservation programme has also forged long-term academic partnerships with Birmingham University and Birmingham City University, relating to the use of scanning and digital technology to interpret the hoard. Birmingham is a centre for the UK jewellery industry and for the study of jewellery, and the conservation team have widened their professional networks to ensure that this local academic and professional expertise can be harnessed for the benefit of the conservation project. This cross-disciplinary dialogue is particularly important for a collection like the Staffordshire Hoard, where debate about the manufacturing techniques and function of the objects is ongoing. Links with Anglo-Saxon re-enactors such as the 7th-century specialists Wulfheodenas, who make and use replica artefacts, likewise brings new perspectives to the collection and its conservation.

The wider project has also created a long-term partnership with local government organisations and historic sites across the region. Known as the Mercian Trail, the aim of the partnership is to generate longer-term social and economic benefits for the region by building on high levels of public interest both in the finds and in the broader Mercian past of the area. The partnership brings together BMAG, PMAG, Lichfield Cathedral, Lichfield District Council, Tamworth Borough Council and Staffordshire County Council. Their vision is to position the region as the heartland of Anglo-Saxon England, through the creation of a permanent visitor trail, with each location telling a different part of the Mercian story.

3.3 Meeting the public: tours, talks and events

The conservation team met the public in face-to-face events that allowed people to see and discuss the material directly and ensured that the conservation was accessible to all demographics.

Through a programme of monthly charged tours, the conservation team opened the studio to members of the public. During the tour, conservation techniques and discoveries were shared with the public. Members of the public were given the opportunity to learn from the conservators, ask questions about the conservation process and look down a microscope at some of the hoard objects. Between 2010

and 2013 there have been 30 public tours with a total of 296 participants. Access was also provided for stakeholders and VIP visits; in total 164 visits in groups of varying sizes, totalling over 2,000 visitors.

Talks are a cost-effective and popular way to disseminate information to the public. In this case, the public interest in the Staffordshire Hoard provided the conservation team with an opportunity to gain audiences who would not traditionally be attracted to a conservation-focused talk. Since 2010, 41 talks have been completed, with an estimated total audience of 1,940 people in a range of groups from special interest to the wider public.

The conservation team has also participated in several family days. During these events children of all ages got to clean an object covered in soil. Often these were small tokens or small toys, but the experience of cleaning and examining objects under the microscope and using thorns and bamboo cocktail picks was a real one. The team also carried out conservation in a 'pop-up' conservation studio in the museum galleries. As time was limited, and it was a un-trialled format at BMAG, the event was conducted over four days in a glass-fronted room where the public could enter and either watch the conservation under way or talk to the conservators. This proved to be popular and attracted 1179 visitors over the four days.

3.4 Social media

To help with the dissemination of information the museums decided to create a web profile so that people could follow the work carried out on and around the hoard from the moment of acquisition to the present, including conservation as it happened. The web profile took several forms; a dedicated webpage with written and video blogs and a social media presence on sites such as Facebook and Twitter feeds as well as YouTube.

The positive benefit of this approach was a large audience, obtained with low start-up costs and connecting with an existing audience already familiar with the platforms in use. It also had a positive effect on the conservation programme with all the participants benefiting from the knowledge that they were supported in their efforts by the public.

The monthly video blogs were made by the team in an honest and simple style. The videos documented the individual conservation events to create a real-time feeling of the studio and the conservation work, along with an insight into the team and their personalities.

By autumn 2013, 51 video blogs and 41 written blogs had been posted on-line. They proved to be very popular and the initial demographic of public interest was mapped. The data showed not only a huge interest within the Midlands, and also across the UK, but surprisingly more than half of the use was from outside the UK. From 2010-2013, the web site had 646,901 individual hits, 45.5 % from the

UK, 33% from the USA and 21.5% from the rest of the world. The hoard Facebook page has to date 1,493 friends, Twitter generated 2,719 followers and YouTube videos have had over 12,000 viewings.

4 Stage 2 conservation

In stage 2 there is still a need for conservation by BMT, who would like to take an active role in some of the analysis; it will also keep up the active outreach programme that has become popular.

4.1 Die-impressed sheet and reeded strips

The rejoining and fragment-matching work for the sheets continues. The work by the BM has been important in establishing the types and possibilities of these. As these items are rare in Anglo-Saxon material and may represent a helmet, we think it is important that this work continues into stage 2. There will, of course, be a law of diminishing returns at some point with the sheets but at present we believe that more significant advances can be made, both with the sheets and with matching as many of the reeded strips as possible. Refining connections between the two materials will also help interpret the materials and either prove or rule out the existence of a helmet, or show other ranges or construction for other types of objects[8].

4.2 Rejoining objects

A lot of work is needed to rejoin fragments in order to achieve whole or mostly whole objects. This will be important for Chris Fern so he can see the style and form of the material; it will also be important for the publication and drawings. The niello objects, for example, would benefit from rejoining not only for study and research, but also for their long-term preservation. Another important task will be the continuation of the renumbering process and the documentation of the objects as Chris Fern requires[9].

4.3 Analysis

There is potential in additional scientific analysis and to this end BMT has applied for and received funding from the Esmée Fairbairn Foundation to facilitate this[10].

4.3i Metals

More analysis is required to understand the alloys of the metals, in particular the silver. However, there may be cause to look at some of the gold once specialists begin to consider the work the BM have already completed. BMT already have in house XRF equipment that could give us data capable of comparison with the work by the BM[11].

[8] See **14.5iii** in the main document
[9] See **14.5ii** in the main document.
[10] See **14.8i** in main document.
[11] See **14.8iii** in the main document.

The niello would benefit from a small programme of work. As there are few objects (14 in total), it would be possible to study the whole collection and carry out further analysis on the niello composition, selecting more appropriate samples that would give us a more complete picture of the niello both on the silver and gold objects[12].

The 'green' material in some of the cells should be investigated further. This material seems to be unique within the hoard and the opportunity to study it now that everything has been cleaned and samples can be taken more selectively would be advantageous[13].

We also believe that metallographic analysis of the metals, both silver and gold alloys, would be beneficial as this could inform us how the metals were manufactured and in particular how they were enriching their surfaces[14].

It would also be beneficial to have someone familiar with gold and silver working who could look at the material and give their opinion on manufacturing and construction techniques[15].

4.3ii Analysis of organics

BMT would like to explore the organics, pastes etc. A selective sample of already exposed material could be studied to gain a better understanding of regional or time period differences with regard to choice of organic materials; also studies of any residues of possible resin or adhesives already exposed during conservation would be beneficial. The risk to the organics is high at this point as they are very fragile and prone to contamination because of the need for frequent movement associated with display and study[16].

4.4 Garnets

The garnets could be looked at further. We are scoping the resources at Birmingham University this month (April) to assess the possibility of working in collaboration with them to help with the identification of the garnets. They have in-house gemologists and will also have a Raman spectrometer soon; they also have skills in identifying the methods in which stones were cut and polished that we may be able to utilise[17].

4.5 Outreach

BMT will continue with the outreach programme described in section 3 here.

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[12] No resources for this are present in Stage 2.
[13] See **14.8ii** in the main document.
[14] See **14.8v** in the main document.
[15] See **14.8v** in the main document.
[16] See **14.8iii** in the main document.
[17] These discussions are ongoing and do not require any additional resources. Should a programme of collaborative work take place during Stage 2, the results will be included in the final publication.