UCL

INSTITUTE OF ARCHAEOLOGY
CONSERVATION FOR ARCHAEOLOGY & MUSEUMS

CONSERVATION TREATMENT RECORD

1.1 TREATMENT CONTEXT

Donor name: Norfolk Museum Services	**Date submitted: 14/11/2013**
Owner/Accession number: NWHCM: 1954.219	Date returned: 12/06/2015

Brief account of why this object needed conservation: When I received the object, it was in pieces and actively falling apart at the joins. It was put together last year with a batch of HXTAL NYL-1 (Hydrogenated Bisphenol A : diglycidal ether polyoxypropylene triamine) that failed to cure. This was partially removed before I received it, but some pieces still need to be taken down others fell apart on their own. The fragments of the toasting glass needed to be reattached and fills needed to be made in the smashed areas for it to be interpreted as it was originally meant to be and safely displayed.

Brief account of the projected use and/or context of the object: The object will go on an exhibition about the life of Admiral Lord Nelson.

1.2 INFO FOR OBJECT ID

Student name: Madeline Hagerman	**Object name: Glass**
Lab number: **9028**	Brief descriptor: Commemorative toasting goblet
Date allocated: **14/11/2013**	Weight: 1861.31g
Date completed:**04/06/2015**	Diagnostic dimensions: 25.0cm x 17.2 cm

2. OBJECT DESCRIPTION

Admiral Lord Nelson commemorative toasting goblet, rummer. Made of lead glass (Burke 2014, Table 3 attached to Treatment Proposal). The front of the goblet displays a profile of Nelson in his Royal Navy uniform framed by a double oval border. "Admiral Lord Nelson" is inscribed above the profile. A garland of berries and leaves encircles the portrait. Downturned, crossed oak leaves and acorns adorn the opposite side of the goblet, ostensibly to balance out the portrait on the other side. The object came into the lab in many fragments.

3.1 PRE-TREATMENT SIGNIFICANCE STATEMENT

The rummer's inscription and portrait mark it out as a commemorative symbol to the sacrifice of Admiral Lord Nelson. Born in Norfolk 29 September, 1758, Admiral Lord Horatio Nelson died shortly after famously telling his men, "England expects that every man will do his duty," during the Battle of Trafalgar October 21, 1805 (BBC). His famous epitaph is represented on the glass. Burke posits that the vessel was probably constructed shortly after Nelson's death in 1805 as a commemorative toasting glass (2014).

Figure 1. Admiral Horatio Lord Nelson. Image from Wikipedia.

Burke concluded that the bowl of the goblet was hand-blown with the stem and foot attached subsequently (Burke 2014, Table 2). The pontil mark where pontil iron rod attached to the blown glass was ground down, suggesting it was made after 1800 (Burke 2014; Newton & Davison 1989). The goblet was incised with a rotating mechanical abrasive wheel to create the effect of *intaglio*, a common technique from the Georgian period (Newton and Davison 1989, 46). The glass contains a high percentage of lead oxide (Burke 2014, Table 3). High quantities of lead oxide prevent the glass from weeping or crizzling and acted as a decolourant, producing transparent glass (Newton and Davidson 1989, 11)

No information is available as to the exact manufacturer or history of vessel prior to the Norfolk Museums' acquisition of it in the 1950s. However, as Nelson was born in Norfolk, Norfolk Museum Services has a vested interest in collecting items relating to the famous Admiral. Burke cites that in 2013 Norfolk Museums Head of Conservation, Man-Yee Liu stated that the goblet would be displayed in an exhibit about Admiral Lord Nelson.

Treating this glass represents an opportunity to work on a very complex treatment. It will allow me to apply my experience working with capillary action application of epoxy resins to a much larger and more fragmented object. The vessel represents a beautiful example of early 19th century glassmaking and presents an interesting and hopefully rewarding challenge.

3.2 PRE-TREATMENT CONDITION ASSESSMENT

The main damage to the vessel is structural. It is currently in about 32 useable fragments with many small chips and glass dust. It appears as if the goblet was dropped or hit against the rim to the right of Nelson's portrait, as fractures radiate from this point. There are also many hairline cracks visible throughout the bowl and in the larger fragments. HXTAL NYL-1 is adhered to the joint surfaces of many of the fragments.

The object came into the conservation lab in 2013 in one piece (Figure 2, left). It had been reconstructed with a yellowing adhesive and fill (Figure 2, red). The previous conservator made the decision to take down the joins and re-adhere them with HXTAL NYL-1, an epoxy resin that is yellowing-resistant and matches the refractive index of glass. Unfortunately, during the reconstruction process it became apparent that the HXTAL was contaminated and Burke had to take down the

already-cured joins with dichloromethane. Some of the smaller fragments have traces of cotton wool adhered to them, ostensibly from when Burke used dichloromethane on cotton to remove the failed HXTAL NYL-1 treatment.

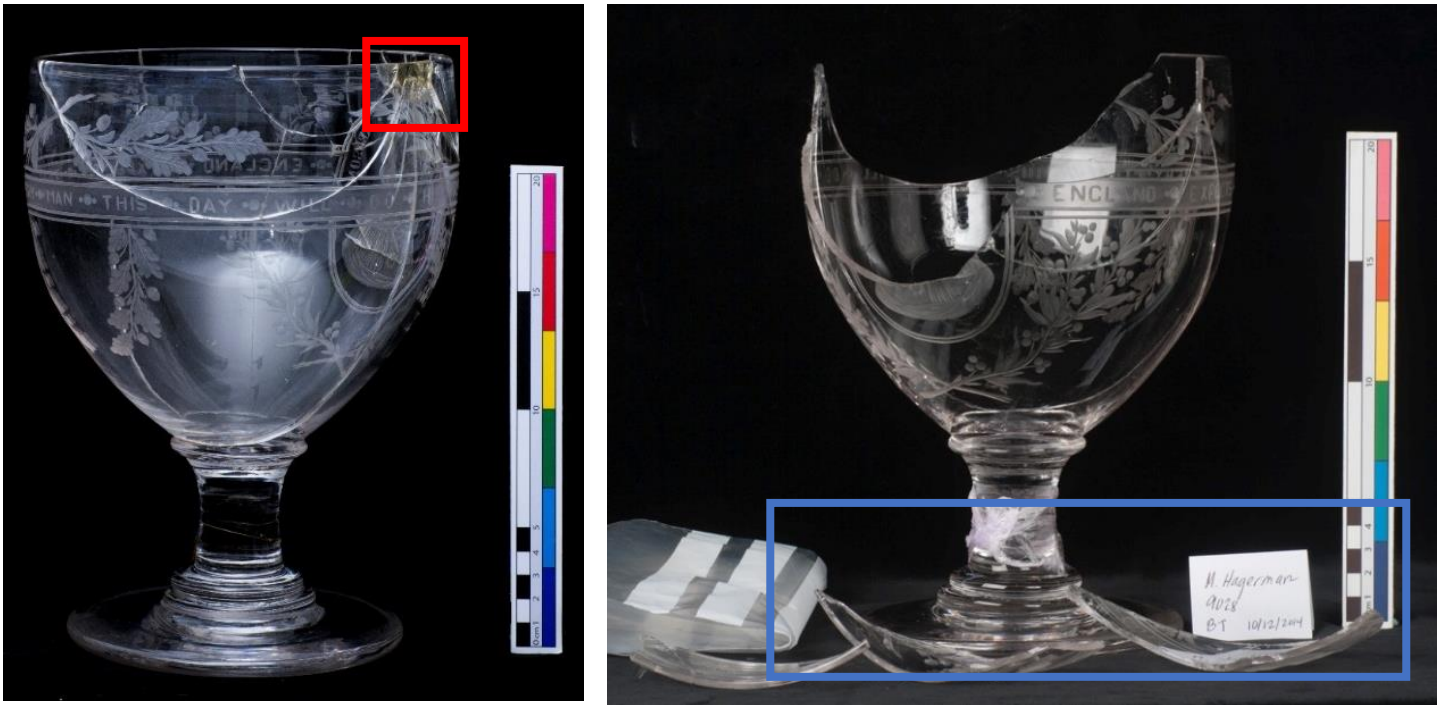

Figure 2. Glass before treatment 2013 (Burke 2014; left) and before treatment 2014 (Hagerman 2014; right).

During careful handling for photography and examination, two large pieces of the glass which had been adhered with contaminated HXTAL NYL-1 [Hydrogenated Bisphenol A : diglycidal ether polyoxypropylene triamine] in 2013/2014 detached from the body (Figure 2, right, blue). This is particularly worrying, because after reviewing Burke's treatment record, she states that about 75% of the vessel was reconstructed as of June 2014 with uncontaminated HXTAL NYl-1

3.3 STATEMENT OF CONSERVATION

Treatment will hopefully restore the structure integrity and aesthetic features of the vessel, allowing it to be placed on exhibition. As it stands, the rummer is in fragments. When it was in one piece, small chips along each of the joins as well as hairline cracks and fissures within the fragments detracted from the interpretation of the cut glass decoration. A beautiful example of glassmaking techniques and decoration, the vessel should be restored to go on exhibition and represent the legacy of one of Britain's naval heroes.

4.1 CLEANING

All the fragments had remnants of dried HXTAL on them. As pieces fell off of the vessel, they had to be cleaned of HXTAL to allow them to be reconstructed. Pieces also had greasy deposits, possibly from handling without gloves. Cleaning was accomplished with a combination of mechanical and solvent cleaning methods.

Cleaning Before Reconstruction

-Join edges were swabbed with acetone to soften the HXTAL adhered to all surfaces of the class

-A large "puddle" of HXTAL had pooled in the bottom of the glass. This was removed by the persistent application of acetone followed up with abrasion using a Number 15 scalpel.

-Initial cleaning of HXTAL took place under a microscope at 1.0 magnification in order to assure that scratches were not being made in the glass

-A combination of acetone and gentle mechanical action using a bamboo stick and Number 15 scalpel removed all of the failed HXTAL from the joins

Cleaning After Reconstruction
-HXTAL was applied to the surface of the glass to flow into the joins under capillary action. Excess HXTAL that did not go into the joins was cleaned from the surface gently with a scalpel. No solvent was used in order not to disrupt the new joins
-Throughout treatment excess HXTAL was allowed to cure before removal. This ensured that excess HXTAL would not be spread on the surface of the glass.
-After approximately 3 months of curing, acetone was once again used on the surface of the glass without fear of it taking down the joins.

4.2 STABILISATION

Not applicable

4.3 RECONSTRUCTION/REPAIR

As the object was being photographed on 10/12/2014, a large piece fell off (Figure 2, right image). This was the first sign that perhaps the previous conservator had not accomplished as much reconstruction as had been stated in the treatment record. Approximately a week later, half of the bowl of the vessel broke off from the base.
After cleaning, the object was put together in two phases.

Figure 3. Phases of reconstruction. Phase 1 (left) and phase 2 (right).

Phase 1
-Phase 1 (Figure 3, left) involved joining the two large halves of the glass vessel (Figure 3 left, dashed line)
-Small pieces of Magic Tape (pressure sensitive tape) were applied as “sutures” on the outside of the vessel to hold the glass together during reconstruction.
-The half with the base attached was laid down on a piece of Plastazote (polyethylene foam) cut to support the curve of the bowl
-Sand bags were added to stop the glass from moving during curing
-Tiny drops of HXTAL NYL-1were applied to the join surface on the inside of the glass with a Number 2 size silicone brush
-The glass was allowed to cure for the recommended 7 days before the tape was taken off and excess HXTAL removed

Phase 2

-Phase 2 (Figure 3, right) involved joining the remaining 30 pieces to the reconstructed base
-The glass was stood on its base, cushioned with sand bags to ensure the two large halves were secure
-Small pieces of Magic Tape were applied as "sutures" on the join surface of the larger pieces on the outside of the vessel--Full-size pieces of Magic Tape were used on the outside of the glass as a backing for the tiny, smashed fragments (Figure 3 right, red)
-Tiny drops of HXTAL were applied to all join edges on the inside of the glass using a small silicone brush
-Parafilm (thermoplastic paraffin film) was wrapped around the glass and held in place with Magic Tape to counteract springing that occurred when the glass initially broke

Figure 4. Realigning the step in the rim.

Clean-up

-One piece along the rim was misaligned (Figure 4, red)
-Acetone was introduced to the join on cotton swabs
-This gradually loosed the piece until it could be repositioned carefully by gently moving the step
-The piece was then clamped in the correct alignment with alligator clips
-HXTAL was reapplied to the join
-The step was successfully removed

4.4 Loss Compensation

Two large areas of loss required fills. While they improved the aesthetic appearance of the vessel, they also imparted structural stability. Large fills (Figure 5, a and b) were accomplished using silicone moulds. Each week the vessel was rotated to add more HXTAL into either fill a or fill b. Small chips and areas of loss were filled purely for aesthetic reasons.

Fill a (Red rectangle, Figure 5; Figure 6)

-Tiranti quick-set T40 (two-part thixotropic silicone) was cast on an area of the rim with no decoration for fill a
-A second application of the silicone was used to seal the mould onto the glass
-The glass was laid on its side at a high angle on a Plastazote support with sand bags to fill the rim of the fill
-HXTAL was added to the join using a silicone brush
-4 further applications of HXTAL were required, each with the glass at a slightly lower angle, to bring the level of the fill up to that of the surrounding glass
-After drying for over a week the fill was polished using first a Number 15 scalpel to remove bumps and surface irregularities, then Micromesh (abrasive paper) in grades 2400, 4000, 6000, 8000, and 12000. A leather chamois was used to give a final polish
-Even after polishing, the fills were not transparent. To correct for this, a thin layer of HXTAL was applied as a finish with a silicone brush. This made the surface transparent.


Figure 5. Image indicating HXTAL fills on the glass.

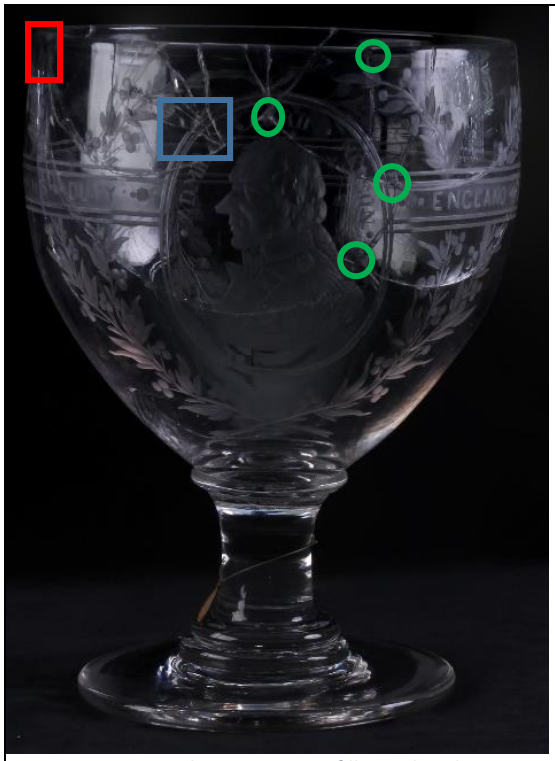

Figure 6. Image indicating HXTAL fills on the glass.

Fill b (Blue rectangle, Figure 5; Figure 6)
-The mould for fill b was accomplished by fitting white modelling wax into the area to be filled. This was shaped to the exact surface and incised elements, creating a precise fill
-This mould was sealed with a second application of silicone and the glass was laid on its side with the area to be filled facing down
-HXTAL was added to the area to be filled
-2 further applications of HXTAL were required to bring the fill up to the surface of the glass
-No polishing was necessary

Small Chips/Join surfaces (Green circles, Figure 6)
-After the large fills were finished, the glass was stood on its base for finishing
-Small chips were filled with HXTAL using a backing of Magic Tape
-Small chips along the join edges were filled using a tiny brush under a head loop

4.5 PACKAGING

The glass will go back on open storage or display in an exhibition. It did not require a bespoke box for permanent storage. The glass was placed back in the large Stewart box (polyethylene) in which it came into the lab. As the box is quite a bit larger than needed, Plastazote (polyethylene foam) supports were carved to cushion the glass during transport back to Norfolk Museums. The foam was covered in Tyvek (flash-spun high-density polyethylene fibres) to provide a softer mount for the glass.

5. TREATMENT JUSTIFICATIONS

As the object is so large/extensively damaged, I dry-fit and applied HXTAL to the joins in two phases. In the first phase, I adhered the two large halves and joined all the other pieces in the second phase all at once. This prevented misalignment, which can occur because the concoidal fractures of glass do not lock back into place when rejoined piece by piece.

I filled the areas of loss directly on the glass vessel because they are meant to be permanent. Other institutions, such as the British Museum, cast fills using either two-part silicone moulds or by casting HXTAL on Melanex (polyester film) (Hogan pers. comm., April 2015). The fills were intentionally under-filled to allow more surface control. My main aim for the first application of the larger fills was to get a good outer surface. The fills took a long time because HXTAL flowed out of the fill area if angle was wrong or the glass was rotated to soon.

6.1 POST-TREATMENT SIGNIFICANCE ALTERATIONS

The objects historical, aesthetic, and research values have all been enhanced by the treatment. The glass is now in one piece, making its form and function easily visible. Though cracks in the surface are still visible, it looks much better than it did in the before photos from 11/2013 (Figure 2, left). It is much more display-able than it was with the yellowed adhesive in the joins and yellow fill.

6.2 POST-TREATMENT CONDITION ALTERATIONS

The object is now all in one piece. Though small chips remain, there are nowhere near as many as there were prior to treatment. The joins are much less visible. The fills blend in much better with the glass than the yellowed adhesive. The HXTAL used to reconstruct it this year cured properly. It now has a strong, hardy repair.

7. STUDENT EVALUATION

I am relatively happy with the results of my treatment. I wish I could have made the joins invisible, but I think I have succeeded in making them much less noticeable. The fills fit in well with the surface of the glass. The joins are sturdy and generally spot on with only a few tiny steps in the whole vessel. I am very glad I chose to work on this object. It has definitely been a challenge, but it has been very rewarding to see it come together from the tiny fragments I received in November.

8. FUTURE CARE

Handle with care while wearing nitrile gloves (to prevent fingerprints and provide grip) over a padded surface. Cotton gloves may cause the object to slip. Two hands should always be used when handling the glass as it is surprisingly heavy. Bulky jewellery that is not covered by gloves should be removed to prevent scratching the surface of the glass. The glass can be cleaned using a soft cloth with no physical pressure.

9. REFERENCES AND SOURCES

BBC, 2014. Admiral Horatio Lord Nelson (1758-1805). *BBC History.* Retrieved on 23/05/2015 from World Wide Web: http://www.bbc.co.uk/history/historic_figures/nelson_admiral_horatio_lord.shtml

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