WEST DEAN
CONSERVATION

Conservation of Ceramics

Condition and treatment report

Conservator Jamie Rigsby	**Date assessed** 27/11/2018
Object Small green glass archaeological bowl	
Treatment start date 30/11/2019	**Treatment completion date** 12/03/2019

ROMAN GLASS VESSEL

Image of Object as Received

Figure 1, Bowl before treatment

Dimensions: **Height: 6.3cm x Diameter: 11cm**

Description of Object

The bowl is made of thin green glass with several large bubbles in the walls. The glass is mostly matte with some areas of dirt and abrasion. The bowl appears to have been made separately from the footing and then bonded while the glass was still hot. There is an

aggregate substance inside the foot-ring that does not look as though it fully vitrified in the forming. There is some iridescence to the surface and the glass is slightly flaky in texture, though no shedding has been observed. The information from the institution states that it is a Saxon glass bowl, probably from Kent. The Saxons were prominent in the area from 410 AD to 1066 AD, and many objects from this time period including coins, glass, and weapons, were found in burials (Kent County Council, 2018).

Condition in Detail

The bowl is in three pieces with extensive previous repair along the break edges. Microscopic viewing of the surface of the glass shows microfracturing throughout, indicating that the glass may be in an active state of deterioration. The old adhesive has yellowed and extends well beyond the break edges in many places. Bench testing shows that the adhesive does not dissolve in water but swells instantly in acetone. The adhesive is brittle, but yet has a strong bond to the glass walls. It appears that the glass pieces were previously bonded and out of alignment as it cured. Some of the adhesive has broken away from the break edges leaving holes between the pieces (Figure 2).

Figure 2, showing areas of damage, losses, and misalignment.

The bowl has some stress fractures, with several of them radiating from the bubbles and the losses in the walls of the bowl. The foot-ring has several stress fractures running around it. There are two large areas of loss. There is a piece of the glass that is suspended between the two losses, but it is showing stress at both sides. The piece is not in alignment and there may be enough torsion in the glass that it caused the piece to crack. Because of

these strong misalignments and the nature of the crack running around the bowl in a circular direction, it is possible that the structure of the bowl is under pressure and it may not allow for complete realignment. The thin glass may not be able to accept the pressure necessary to move the loose pieces back into alignment (Figure 3).

Figure 3, showing fractures in the base, the accession number and the losses.

Treatment Proposal

The bowl could be lightly cleaned with a soft brush to remove any dust on the surface. The adhesive is extremely yellowed and failing in areas and could be removed. The adhesive immediately swells in acetone, but the surface should be tested to ensure that there is no reactivity with the solvent. The bowl would be placed in a supportive environment that would cradle the pieces if the bonds released during treatment. Since the adhesive is very thin, a cotton wool swab held next to the break edges with the adhesive might be enough to release the bond without having prolonged contact with the surface. Moving around the largest break, the solvent would be lightly touched to the break edge, swelling the adhesive until the entire break edge is softened. Once the top piece is removed, the same process would be

repeated with the remaining piece. However, this area has significantly more adhesive on it with large excesses over-spilling the break and may take longer to release. It may even require that cotton wool with acetone be placed in the area for a longer period to soften the adhesive. The solvent should be localised so as not to stain any surface or damage the ink accession number on the bottom of the bowl. The bowl should be watched carefully for any signs of stress from the swelling of the adhesive.

Once the pieces are apart, the edges could be cleaned with acetone. There are several areas where stress fractures are running through the glass. A 30% solution of Paraloid B-72[1] in acetone could be applied to the areas to attempt to secure them through capillary action.

A 50:50 solution of Paraloid B-72 in acetone could be used to reconstruct the bowl, but the pieces of the bowl could undergo a dry reconstruction to see how they behave without the adhesive to determine if the pieces have too much torsion to realign properly or if they can be put back in their proper places. If they do not go back into place, the pieces may have to be reconstructed as well as possible with the understanding that the bowl may have inherent weakness in the bonds, but any adhesive used would be clear and at the minimum, be less visually distracting than the current yellow adhesive. The pieces could be held together with cloth tape or some other gentle tape so as not to remove any weakened areas on the surface.

Treatment Report

Excess dust was removed from the surface of the bowl with a soft brush. Surface testing with acetone revealed no reactivity with the glass. Fourier Transfer Infrared Testing (FTIR) testing was attempted on the adhesive but was inconclusive in determining what had been used on the bowl.

The bowl was placed upside down on a cushion of tissue paper to support the structure of the bowl during the reversal of the adhesive. A cotton wool swab saturated with acetone was touched to areas with old adhesive and capillary action pulled it around the break edges. In large areas of adhesive, the swabs were held against the accumulations for a few seconds. This was the preferred method of applying solvent to control the amount of swelling to watch for any pressure or instability on the bowl. As the adhesive swelled, small pieces were manually removed with a scalpel, allowing for more saturation of the acetone. The rim, the largest piece to be reversed, was easily removed and gave access to the other areas of

[1] *Paraloid® B-72:* Ethyl methacrylate (70%) and Methyl acrylate (30%) copolymer; Tg 40C; IR 1.479-1.489; manufactured by Rohm & Haas. Glass transition temperature: 40 C. Soluble in toluene, xylene, acetone, carbon tetrachloride, MEK, others.

repair. When all the pieces had been deconstructed, the edges were cleaned with a cotton wool swab in acetone (Figure 4).

Figure 4, Photo of bowl after removal of old adhesive.

With removal of the other pieces, there was clear access to the area of overlapped glass in the old repair. The piece was gently put back in place without any resistance or attempts to go back to its old placement (Figure 5). It appears that the incorrect placement of the larger rim piece put pressure on the lower piece in such a way that it caused it to overlap its natural position. Though this piece was easily moved, it does appear that there is torsion in the larger rim piece, and it does not completely align when put together without adhesive.

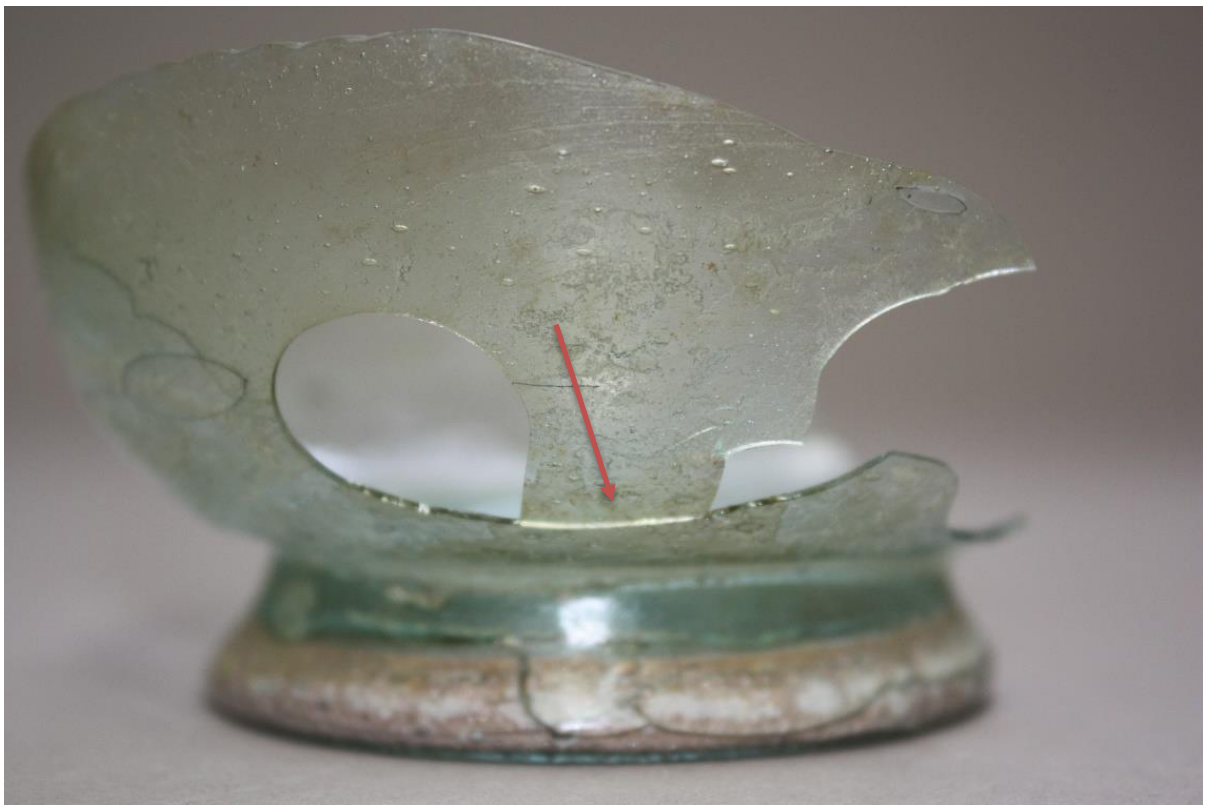

Figure 5, Realignment of overlapped piece

The fractures in the main portion of the bowl were secured with a 30% solution of Paraloid B-72 in acetone. The adhesive was wicked into the cracks using capillary action and was applied with a small sable brush. The adhesive was allowed to set before further reconstruction. The fractures within the base were encased within the glass and could not be accessed.

The rest of the pieces were reconstructed using a 50% solution of Paraloid B-72 in acetone applied with a small sable brush (Figure 6). Because of the thinness of the glass walls and the precarious nature of getting the pieces as closely aligned as possible, it was necessary to reactivate the solvent in a few small areas to reposition the main rim piece. However, it is thought with the light weight of the glass and thinness of the walls, that there is enough adhesive to sufficiently hold the piece together indefinitely. It is also thought that even though the tensioned areas were mostly put back in place, the bowl may still be in a state of movement. Any fillwork may impede the movement of the glass and cause more damage to the glass. Because the piece is archaeological and mostly complete, it is thought that the losses do not detract from the overall appearance or legibility of the piece and was not addressed at this time.

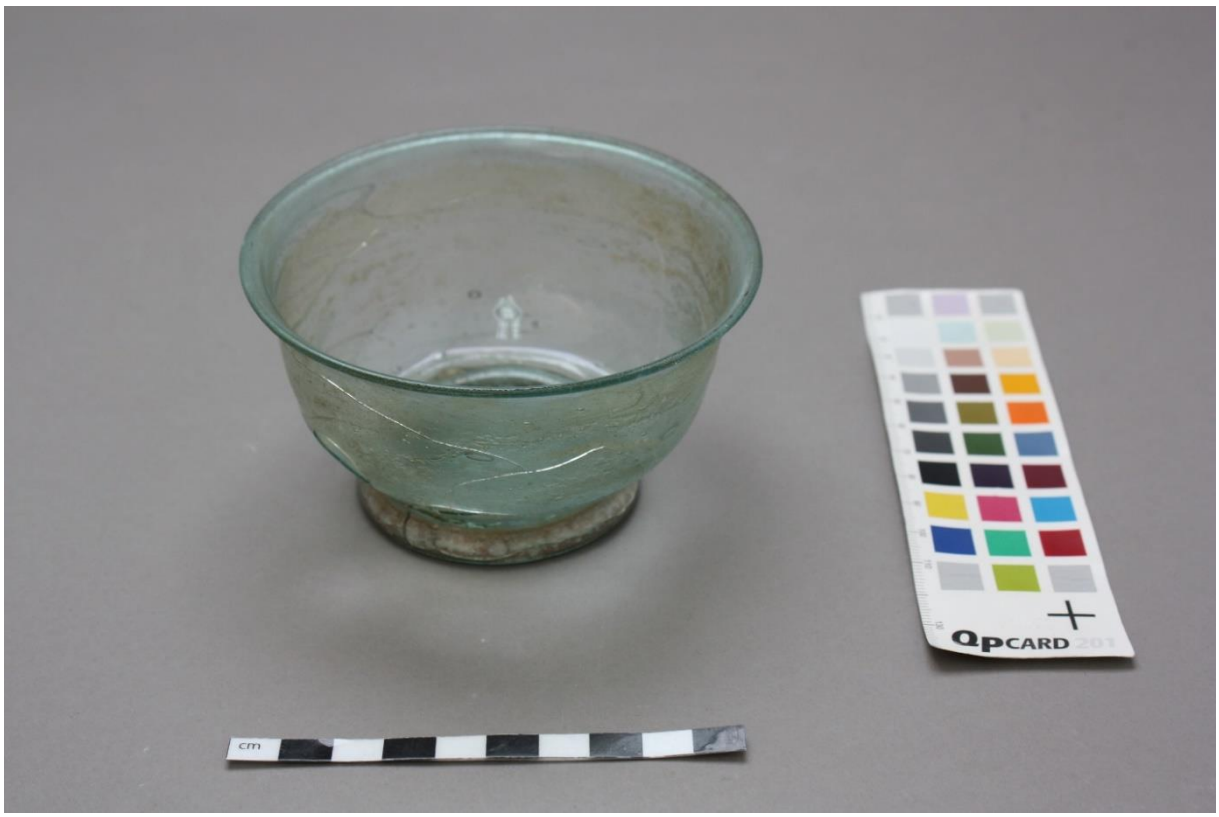

Figure 6, After Treatment

Detail Images After Treatment

Recommended Continuing Care

It is recommended that the bowl be kept in climate-controlled conditions of approximately 15-23°C with relative humidity around 45-55%. The bowl could have a custom enclosure to accommodate the height and the width of the artefact. The box that accompanied the bowl was modified with the following features. If the box is ever replaced it is recommended that it also have the following features. The bowl would be best stored sitting on its base with an inset in a platform that could be slid out of the box. The box should have a flip-down side so that the bowl can be removed from the box sideways rather than lifting by the rim to remove it from the box. To remove the bowl from the platform, it should be gently lifted with both hands at the body, being careful not to touch the lost areas on the wall of the bowl.

References

Websites

Kent County Council (2018) Exploring Kent's Past [online] https://webapps.kent.gov.uk/KCC.ExploringKentsPast.Web.Sites.Public/SingleResult.aspx?uid=Tke1070 (accessed 30/11/2018)