Description

The ceramic being discussed in this report is a glazed earthenware tureen dish measuring 24.5cm in width, 35 cm in length and approximately 7cm in depth. The ground is cream with an in-glazed floral design and gilded handles (see fig 1).

Figure 1

The trade mark printed on the base reads 'WAA &Co.' This is an abbreviation of 'William Alsager Adderley' who ran the Daisy Bank Pottery in Longton Stoke-on-Trent. It produced earthenware and china between 1876 and 1905; originally marking the productions 'WAA', the succeeding '& Co' was added from January 1886 onwards. The tureen dish being discussed falls into this period (www.thepotteries.org). The pattern is also marked as 'Devon roses' on the base (see figs 2a & 2b).

Figure 2a

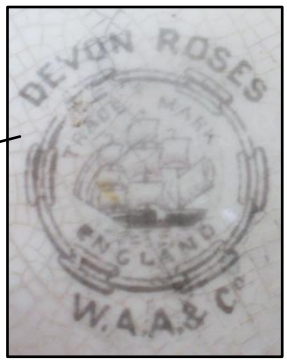

Figure 2b

Condition:

The dish was received with former restoration still in place. It consisted of twelve pieces dominantly clustered around one half along the rim (see figure 3).

Figure 3

The adhesive used was aesthetically unpleasing, it was dark orange in colour and in some places protruded from the break edges onto the body. As a result, noticeable steps could be seen across every break edge. This may just be evidence of a poor bond or that the ceramic has sprung (see figure 4).

Figure 4

Some attempted fills portrayed similar concerns; they also protruded onto the body and had an untreated surface. The fill material could be seen with an unnecessary thickness along the majority of break edges, whereas chips along the rim were not attempted. This would suggest they were either in place as a bonding material (as lack of restoration knowledge was displayed in this field) or the other losses were made after the original restoration (see figure 5).

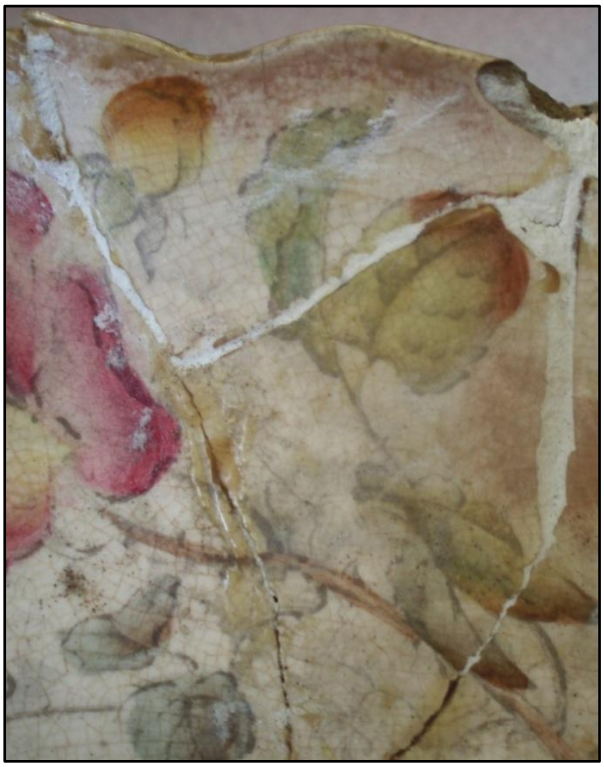

Figure 5

Apart from the restoration, the glaze and decoration was in reasonable condition. The glaze had crazed leaving an even brown webbed pattern across the body. However it was still smooth to touch and had no surface scratches, meaning the decoration was still intact, apart from in the minor losses.

Treatment proposal:

Before conservation could take place, an initial plan of anticipated treatments had to be decided. The proposal was as follows:

3.1 Cleaning

3.1.1 The removal of previous restoration

This will consist of two different methods; physical and chemical. As the adhesive has severely swollen, with the aid of a scalpel it should be possible to carefully lift the excess. This has a low risk as long as long as no excessive force is used and deposits are lifted, rather than scratched off. The rest will have to be removed chemically with a solvent. The solvent used will depend on the type of the adhesive, and how badly it has aged. However, before any contact, a spot test in an inconspicuous area will be undertaken.

Its dark colour would suggest a possibility of animal glue or a synthetic resin, as both yellow with age (see figure 6).

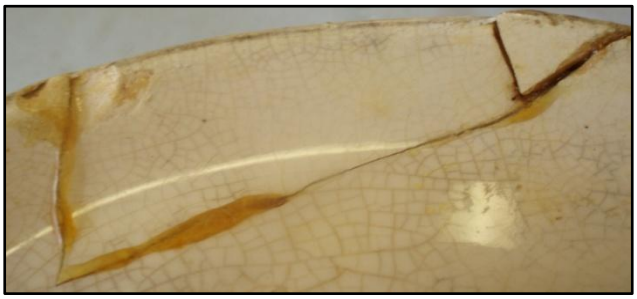

Figure 6

Animal glue is readily removed with warm water, whereas synthetic resins have to be softened with solvents. The solvents recommended for softening range between acetone, white spirit and industrial methylated spirits. These can be applied directly onto the ceramic with a cotton wool swab to establish which solvent will affect the adhesive. If successful, it will be applied to long cotton wool rolls along the break edges and left to absorb into the cracks to aid the softening and thus remove the shards (Acton & McAuley, 2003).

Once all the shards have been dismantled, the remains of adhesive will be removed from the break edges with a scalpel and additional solvent where needed. A microscope will be used to make sure grains within the edges are not disrupted, as this will be detrimental to the re-aligning of the shards.

3.1.2 The removal of surface dirt

General surface cleaning

From observation, no dirt appeared to have accumulated on the surface; therefore wet and chemical treatments will be used to remove any surface dirt as opposed to using a dry brush for dusting. Cleaning will commence with a method of no abrasion. Distilled water on cotton wool will give a representation of the amount of surface dirt on the ceramic. A suitable detergent or white spirit can be used to remove any greasy deposits successfully (Oakley & Jain, 2002). These methods will remove general surface dirt; however will not tackle the stains within the crazing.

Stains within the crazing

Poulticing has been used successfully for removing stains within the ceramic body. The poulticing material is saturated with a solvent which draws out the satins as it evaporates. They can then be removed from the surface. The main commercial materials used for poulticing are Sepiolite and Laponite RD. Sepiolite is naturally occurring clay with exceptional ability to absorb solvent to form a thick paste. Studies show it has been used very successfully, however has some health and safety risks.

It acts as an irritant and harmful particles indicate dust masks have to be worn to avoid inhalation. (Buys & Oakley, 1993). It has also been shown that complete removal from irregular surfaces is sometimes difficult and the 'impurities present in the clay can cause additional problems.' (Buys and Oakley, 1993, 187).

Therefore Laponite RD will be used for the following reasons: It forms a thixotropic gel which stays in place, can removed successfully with water and is only effective as an irritant when in prolonged contact with the skin. This problem is easily eradicated by wearing latex gloves (The low health and safety issues are in reference to its gel state). It will be applied liberally directly to the ceramic and then covered with cling film for up to three days; this will delay evaporation. The cling film will then be removed and the ceramic will be left for another three days. This will allow time for the stains to be drawn out. The dish can then be thoroughly washed in water and another treatment of Laponite can be applied, this may be necessary as the staining is noticeably dark in colour (see figure 7).

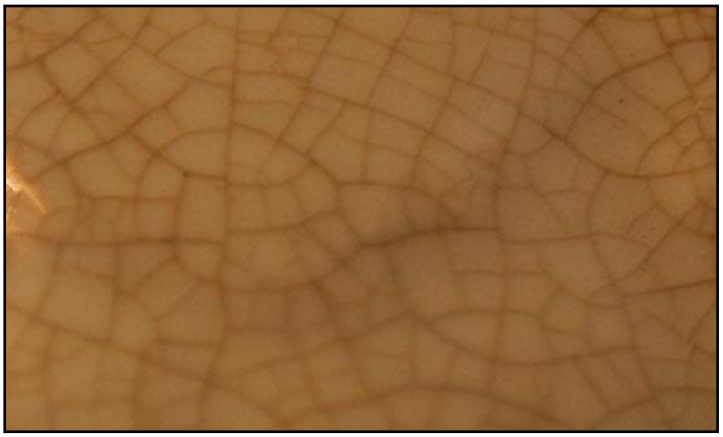

Figure 7

However some research claims there may be possible harmful effects of the use of Laponite RD on ceramic surfaces. Reports suggest that after poulticing, surfaces appear to be smoother to the touch and more slippery when wet. This is due to the accumulation of Laponite in minute cracks which are inaccessible to clean. Another concern is the 'evidence of low level ion exchange at the interface between the Laponite RD gel coat and substrate' (Lee, Rogers, Oakley & Navarro, 1997). As a result this means that not only does the treatment alter the physical characteristics of the ceramic, but also its chemical composition.
Although this is a worry, it has also been stated that the impact of these concerns so far have proved to be negligible. However like many conservation treatments time can only tell. (Lee, Rogers, Oakley & Navarro, 1997). However, as laponite products were first introduced commercially in the 1960's and no damage has been recorded, treatment will commence. (www.laponite.com). As the possible improved outcomes may be more beneficial.

3.2 Bonding

Sticking the pieces together with tape first will allow for a sticking order to be established, and any difficulties such as shards being locked out can be addressed. As the ceramic is

porous, Paraloid B72 will be used as the adhesive for the final bonding. It was chosen for its strength, good ageing and reversibility.

3.3 Filling

For losses within the main body of the dish, dental plaster will be used. It can be easily poured into losses when coupled with a mould created with dental wax. Its composition fits harmoniously with that of ceramic and can be sanded using micromesh to create a glossy finish.

The small cracks along the break edges will also need to be filled to avoid dirt accumulating within. Filler such as Flugger will be used due to its malleability, and ease of removal. This is important due to the small scale fills, as the filler will most defiantly lay on the surface. Again the Flugger can be sanded to a glossy finish, but must be coated in at least a 5-10% paraloid solution before pigment is added to deter absorption.

3.4 Retouching

Retouching will be done using a variety of golden acrylic colours.

3.5 Time management

All the proposed treatments will be completed in a desired time period. This plan is in the form of a standard Gantt chart.

4. Treatment

4.1: Cleaning

4.1.1: The removal of previous restoration

Many solvents were tested in order of increasing potency. Extra attention was given to spot testing the gilded areas for any damaging effects. The results can be seen below:

Solvent	Method	Any Effect?
Distilled Water	Adhesive sample immersed in a beaker of water	No
Acetone	Adhesive sample immersed in a beaker of acetone	small
	Cotton bud application to the adhesive on the ceramic surface	A very small difference to the thinnest layer of adhesive, not sufficient for complete removal

White Spirit	Immersed sample and applied a damp cotton bud on the adhesive on the ceramic	No
IMS	Cotton bud application to adhesive	No
Dichloromethane (nitromors)	Applied liberally to all the break edges, and left to absorb.	Was treated several times to cause effect.

Dichloromethane was applied liberally to the break edges directly, and then topped with cotton wool rolls to hold the solution in place. Shock method was also applied by running the dish under hot and cold water simultaneously. This coupled with the force necessary to part the shards resulted in a few small breakages. Although nitromors weakened the adhesive sufficiently, the treatment had to be repeated at least three times for some of the bonds to detach. Once all the shards were separated, the remaining adhesive was easily removed with a scalpel while it was still damp.

4.1.2: The removal of surface dirt

General surface cleaning
Distilled water proved to be sufficient to remove any surface dirt from the ceramic body. Acetone and a symperonic and water solution was also used, but not advantageously.

Stains within the crazing
Laponite RD was used to poultice the ceramic, drastic results appeared, however not necessarily in way which was expected. The laponite was applied in the way stated in the treatment proposal. The shards were then thoroughly washed in water and left to dry.

Through this drying process dark brown staining appeared across the ceramic, dominantly along the porous break edges (see figures 8 & 8a).

Figure 8

Figure 8a

This result suggested the ceramic would benefit from more poulticing treatments. However after three treatments the resulting brown staining did not decrease in intensity. Damp cotton swabs were used in a rolling action to attempt to remove the deposits from the shard edges. The majority of the staining dissolved, however deposits settled under the glaze could not be removed. This created a brown line when the shards were aligned (see figure 9).

Figure 9

4.2 Bonding

Before any adhesive was applied, a sticking order was established by firstly holding the shards together with tape. They fitted together well and no springing was apparent.

The dish was then bonded with Paraloid B72 shard by shard in coalition with the sticking plan. It was originally used undiluted, however due to its thickness it created a barrier between the shards which led to their movement from position. Therefore the adhesive was mixed with a small amount of acetone. This created a more fluid solution which held the shards in the desired place. After twenty-four hours, the bonds were checked, and no steps were present. A scalpel was then used to carefully remove any adhesive excess along the joining edges.

4.3 Filling

As planned, the small cracks were filled with Flugger whereas dental plaster was used for the larger losses (see figure 10). Flugger was also used along the majority of the joining edges to avoid the build up of dirt. All fills were then sanded with micromesh to a glossy finish and coated with a 10% Paraloid in acetone solution in preparation to paint.

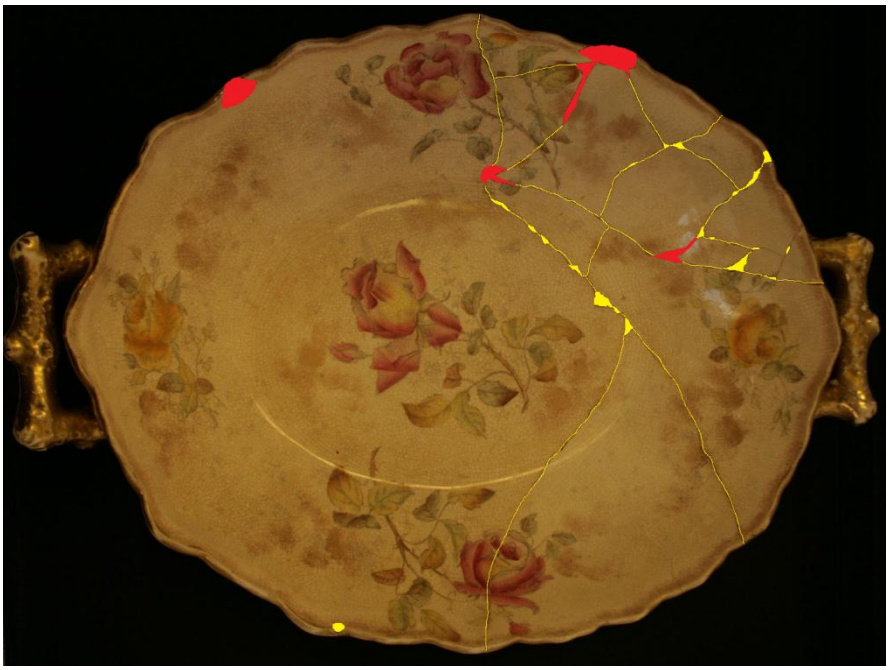

Figure 10 KEY: Red: Plaster fills, Yellow: flugger fills

4.4 Retouching

4.4.1 Base colours and detail

The base colour and floral patterns were accomplished using a range of different golden acrylics. To achieve a light consistency, air brush acrylics were added and lightly sanded between layering. This avoided a thick paint film, as this would result in the fills becoming proud.

4.4.2 Imitating crazing

Before this process was applied to the dish, different techniques were first tested on small plaster blocks.

- A sharp 4H pencil worked adequately, however the colour was not satisfactory. A brown pencil was tried but was not hard enough to create sharp enough lines.
- Acrylic paint was applied using a one haired brush. This method had positive results, but the steadiness needed to create lines of excellent clarity proved to be difficult.
- A very fine needle was used to lightly scratch the surface, and then a diluted pigment was then washed across the markings. This was left to settle for a few seconds, and then wiped away from the surface. This method worked best as very fine lines could be achieved and the pigment settled successfully within them.

The needle method was applied to the ceramic for its clarity and excellent sharpness. However in practice the resulting effects were not as admirable as those on the plaster blocks (see figures 11 and 12).

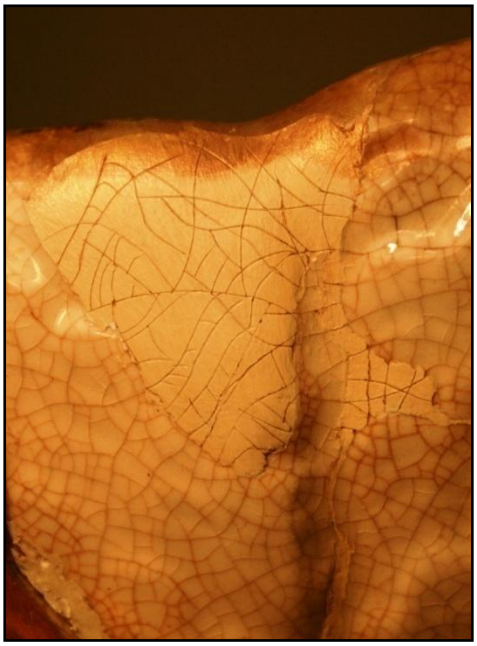

Figure 11

Figure 12

Although the markings were made with little pressure, small particles of paint lifted on contact. This reduced the sharpness of the lines, resulting in an inadequate imitation of the crazing. It also meant that fine clusters of lines could not be achieved from fear of lifting large portions of paint.

4.4.3 Imitating the glaze

The final process of retouching was to imitate the glossy finish of the ceramic. This was achieved relatively easily by using a glossy porcelain glaze. It was applied with a paint brush to every retouched area, this had to be done in a very thin layer to avoid visible brush strokes.

4.5 Health and Safety procedures

Throughout treatment certain health and safety regulations had to be followed. These were as follows:

- Keeping a tidy work space: this is important to avoid accidental spillages or possible breakages.
- Wear a lab coat at all times to protect clothing and avoid any unnecessary contact with harmful materials.
- Wear latex gloves where necessary, and when not make sure hands are thoroughly washed on a regular basis. This is for protection of the user but also the ceramic, as greasy residues can be damaging.

Any specific health and safety requirements for solvents and materials used throughout the treatment process were recorded on COSHH sheets.

5 Evaluation

5.1: Unforeseen results or problems

The strength of the adhesive used for previous restoration was not expected. In some cases bonds were left in nitromors for a couple of hours which is over the recommended time for treatment. Unavoidable force had to be applied to part some of the shards, as stated previously this resulted in a few extra breakages. Although not ideal, it was a small sacrifice to achieve a positive end result.

Poulticing also caused unexpected problems. Instead drawing stains from the crazing, iron was drawn out drastically along the break edges. This permanently stained the brakedges causing disfiguring brown lines along all the joins. Further poulticing treatments could have been carried out, but the stains may have kept reappearing indefinitely. In terms of the surface appearance, the stains did not appear lessened. Therefore the positive effects of the treatment is questionable.

5.1.2: Places for improvement

The imitation of crazing showed disappointing results. This may have been because the plaster blocks used for practice runs did not hold an exact representation of the amount of paint layers on the fills within the ceramic. If time permitted, the fills would have been coated in Flugger and retouched again. Further analysis into the techniques of producing crazing could have been tried.

5.1.3 Time management

The proposed time designated in the Gantt chart for certain processes was followed as much as possible. Certain delays such as the removal of previous adhesive, and the Poulticing treatment prohibited the movement to the next treatment at the desired time. This meant that finishing touches such as the imitation of crazing could not be fully developed.

6 After Care

The ceramic is owned by a private collector as opposed to a museum, therefore it is most likely to be displayed rather than being put into storage. It also means that specialised environmental conditions are unlikely to be met. However even a small steps can be taken to prolong the life of the ceramic.

All ceramics should be handled as little as possible, but if necessary great care should be taken.The dish should be stored in an environment as dust free as possible and should never be stacked with other dishes or objects. Precautions such as storing the ceramic on slightly padded surfaces to reduce shock from vibrations would be good practice (Ambrose, Paine, 2007).

The condition of the object and the conservation and restoration processes used should be available for the owner at least in a summarised format. This ensures that the owner is aware of the physical state of the object, which will aid in the knowledge of after care.

Bibliography

Source	Author, Date of publication, Title and Publication.
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	'A-Z of Stoke-on-Trent Potters' [accessed: 16th November 2009]
Book	Acton, L/ McAuley, P. (2003 [first published in 1996]) *'Repairing Pottery and Porcelain: A practical Guide'* – second edition A & C Black Publishers
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Journal	Lee, L-M/ Rogers, P/ Oakley, V/ Navarro, J *'Investigations into the Use of Laponite as a Poulticing Material in Ceramics Conservation'* V & A Conservation Journal 1997 Issue No 22
Internet	http://www.laponite.com/faqs.asp#_In_which_decade *'FAQs'* SCP | Rockwood Additives [accessed 7th December 2009]