

Saltmarsh *Paintings Conservation*

**Conservation treatment report for the
Royal Coat of Arms to George III**

St. Andrews Church, Coston (diocese of Leicester)



September 2020

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Ref: SAC/2020/01

15th September 2020

Introduction

The author would like to thank David Chubb, Churchwarden; Gareth Jones and the late Keith Hamilton from Darnton B3 Architecture for their help and support during the project. The conservation treatment was generously funded by the following institutions: Heritage Lottery Fund, Leicestershire Historic Churches Trust, Garfield Weston and All Churches Trust. Their support for the project is gratefully acknowledged.

Practical treatment of the painting was undertaken by the author with Alexandra Taylor and Ulla-Satu Grimmet. For a full account of the condition of the Royal Arms prior to treatment please refer to the following report, *Condition report and recommendations for conservation treatment of the Royal Coat of Arms to George III, SAC/2018/02* dated 30th April 2018.

Condition report

The Royal Coat of Arms is executed in oil on panel. The panel is constructed of four boards in horizontal alignment. The original tool marks are evident on the reverse of the boards where a tool has been used to smooth the wood before it had been seasoned. Two vertical battens hold the boards in position and are placed into carved channels on the reverse of the panel. Over time the individual boards have shrunk causing gaps between the joints. The battens appear to be part of the original construction of the Royal Arms and are nailed directly into the top and bottom member of the frame. There is a split in the third panel down at the right hand side. The panels and the frame have suffered from woodworm damage with numerous exit holes, although the overall structure of the wood is still sound. There is water staining on the reverse of the panel indicating exposure to water ingress at some stage in its history.

The paint layers are in a good condition; stable with no flaking or extensive areas of loss. In the background, just below the III a stone has become embedded in the structure. It is unclear how this has occurred. It is possible that some of the lettering, horse's mane and tail, lion's tail and details in the crowns were originally gilded as evidence of a metallic finish are visible. It is unclear what has caused this degradation, during cleaning it became apparent the gold may sit below a toning layer. This area was found to be very sensitive to mechanical action and cleaning was kept to a minimum.

The painting has a coating of natural resin varnish which has degraded and is now matte and dull. The varnish has discoloured and is uneven; for example the head of the Unicorn has a more yellow appearance than the rest of its body. Church paintings of this date commonly have more than one layer of varnish present. The upper layer of varnish has been affected by bat urine which has caused the white, opaque spots most apparent at the top edge of the work. The varnish is no longer adequately saturating the paint layer below and combined with the degradation caused by bats and the environment many parts of the composition are now difficult to read. There is a thick layer of surface dirt on top of the varnish including bat droppings.

There are two large holes on either side of the frame, located in the upper half. These holes, which penetrate through the frame from the front, suggest that there was a different hanging method prior to the current use of wall brackets and wire. The wire and string have been attached directly into the reverse of the second board from the top. Probably the insertion of two large square-shaped nails, as indicated by size, shape and direction of the holes. Two further indentations along the bottom edge of the frame are the result of the current supporting brackets which the painting rests on. The moulding along the sight edge is loose in many areas and at the top edge an old split has been secured with a rusted nail.

Treatment report

Cleaning and treatment of woodworm

A soft brush and vacuum were used to remove a build up of cobwebs and dirt from the reverse of the painting. As all components of the painting appeared to be structurally sound it was not necessary to remove the panels from the frame. A variety of blunt-edged tools were used to sweep out remaining deposits and a swab in deionised water removed ingrained dirt from within the cracks. Examination of the woodworm holes on both the front and reverse of the panel indicated evidence of active infestation. The panel and frame were treated with Constrain, a permethrin based insecticide designed especially for use with historic objects.

Cleaning tests were carried out to find a suitable method for removing the surface dirt lying on top of the varnish. A solution of 1.5% sodium tri-polyphosphate (STPP) , applied with a cotton swab and cleared with deionised water, effectively removed these dirt layers.

Varnish removal

The degraded varnish no longer saturated the paint layers below and had become dull, yellow and patchy. The varnish was so degraded that it was no longer soluble in free solvents as would be expected of a natural resin varnish. Extensive testing resulted in some unusual cleaning solutions which were tailor made to different areas of the painting, as indicated in the chart below. Particular care was given to sections of blue and red, which were found to be sensitive to many of the tested solutions. The cleaning was taken to a level where a uniform, even surface was achieved without pushing the cleaning too far and accepting a degree of age and staining.

Location	Solution	Results
Crimson reds in the banner of arms, visor, and crowns	<ul style="list-style-type: none"> • STPP 2% • STPP 1.5% 	Lightly applied in rolling motion across majority of areas. Weaker solutions of STPP in deionised water were used where paint was found to be particularly sensitive.
Black (outlines)	<ul style="list-style-type: none"> • Industrial methylated spirits (IMS) 	Neat IMS effectively removed varnish from black lines.
Blues in banner and shield	<ul style="list-style-type: none"> • Ammonia pH 9, followed with STPP 1.5% • STPP 2% 	Ammonia followed by STPP 1.5% provided a relatively even surface clean. In more stubborn areas STPP 2%.

Conservation treatment report

Lion	<ul style="list-style-type: none"> Industrial methylated spirits (IMS) 	Majority of varnish was removed with neat IMS. Patchiness resulting from degradation caused by bat urine.
Whites in unicorn, rose, pillar and mid-upper-mantle (sections with ermine pattern)	<ul style="list-style-type: none"> Gel formula of STPP 3% in xanthum gum, cleared with STPP 2% and followed AAA formula (1:1:1 mix of ammonia, deionised water and acetone). 	An application of 3% STPP gelled with xanthan gum, left on the surface for maximum of five minutes before clearing with deionised water. After area had dried further cleaning could be achieved with 2% STPP as a solution. Once evaporated, this was followed with a light swab roll of AAA. No more than three swab rolls were necessary to remove the remaining varnish residues, this was only used in the most disturbing areas of staining.
Background	<ul style="list-style-type: none"> IMS/White Spirits 1:3 IMS 100% 	The background behaved in a variety of ways. The varnish in the lower panels seemed to retain grittiness after solubilising, requiring alternating swabs of IMS/White Spirits 1:3 with IMS 100%. In contrast, the majority of top panel cleared evenly with IMS/White Spirits 1:3 but areas around mantle on right required several swab rolls with neat IMS to remove residue.
Cool reds in mantle	<ul style="list-style-type: none"> IMS/White Spirits 1:3 IMS 100% 	Varnish removal varied. Mantling responded well to IMS/White Spirit 1:3, but blanching occurred in proper right, second panel from top. Remedied this with swab rolls of IMS 100%.
Yellows. Inscriptions:	<ul style="list-style-type: none"> STPP 1.5% IMS/White Spirits 1:3 IMS 100% and scalpel 	Crusty surface and gold speckling in these areas suggested possible application of oil gilding. These residues were vulnerable to strong solvents and particulate matter pulled away with swab.
Frame	<ul style="list-style-type: none"> IMS 100% 	Varnish thinned with IMS solvent

Varnishing and retouching

Once cleaning had finished a coat of conservation grade varnish was applied to adequately saturate the paint layers. Two brush coats of Paraloid B72 (15% in Shellsol A) were applied to the main panel. Retouching was carried out using dry pigments ground in Laropal A81 (25% in Shellsol A and white spirits). Retouching sought to address the most disturbing staining in the background and in the whites, caused by a combination of bat urine and old varnish. The aim was to draw together the main elements of the composition and make it legible as a whole once again. A final varnish of Laropal A81 (15% in Shellsol A and white spirits) was applied with a spray gun to achieve a uniform surface gloss.

Structural treatment of the panel

In the area of the unicorn a crack was present at the far right hand side following the woodgrain, the middle section was intact but the split was slightly open at the other end, near the centre of the panel. During seasonal fluctuations the crack opened along the middle section. A full examination of the panel showed it was stable overall. To further support the boards strips of balsa wood were placed between the opened joints. The balsa was stained black and secured in place with a small amount of Resin W adhesive. The balsa wood is soft enough that it will not restrict the panels should they need to move, but strong enough to offer some support between the joints.

Frame

The four holes located in the frame were plugged with a section of balsa wood and filled with a mix of Resin W with 1:1 coconut shell flour and microballoons. Once dry the fills were then sanded down to the level of the frame. The split in the sight edge and lifted areas were secured with Resin W held in place with clamps as it cured. Losses and fills were retouched with artists quality watercolour and the frame was finished with wax.

Conclusion

Conservation treatment of the painting has successfully addressed structural issues with the frame and treated woodworm infestation, making the work stable for the foreseeable future. Aesthetically the painting once again shows the bold, heraldic colour scheme, making it once again legible, while not seeking to hide its age and the natural degradation of the materials. The painting has been treated with the church environment in mind and stable materials were sought where possible. It is hoped that it can once again be enjoyed by visitors to the newly restored church.

Materials used

<i>Ammonium Hydroxide</i>	An aqueous solution of ammonia. NH ₄ OH in H ₂ O
<i>Coconut shell flour</i>	Made from the ground shell of the coconut, the flour is used to add strength and durability to wood filler mixtures
<i>Constrain</i>	A conservation-tested water-based residual insecticide containing permethrin.
<i>IMS</i>	Industrial methylated spirits
<i>Laropal A81</i>	Urea-aldehyde resin.
<i>Melinex</i>	Polyester film
<i>Microballoons</i>	Hollow phenolic resin spheres used as a bulking agent in wood fill material
<i>Paraloid B72</i>	Ethyl Methacrylate co-polymer acrylic resin
<i>Renaissance wax</i>	Microcrystalline wax polish
<i>Resin W</i>	Polyvinyl acetate adhesive
<i>Shellsol A</i>	Solvent naphtha (petroleum) light aromatic.
<i>Sodium tri-polyphosphate</i>	Surfactant
<i>Tri-ammonium citrate</i>	Chelating agent and surfactant
<i>Xanthan gum</i>	A polysaccharide used as a thickening agent

PLATES



Plate 1 The Royal Coat of Arms (George III), recto, before treatment.



Plate 2 The Royal Coat of Arms (George III), verso, before treatment



Plate 3 Detail showing build up of spider web and dirt on reverse of the painting



Plate 4 Detail of woodworm infestation on panel and frame

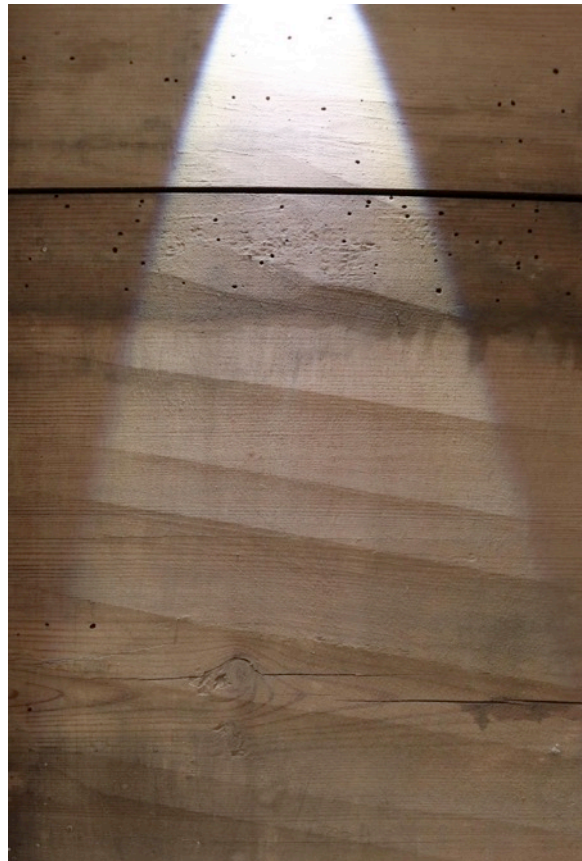


Plate 5 Raking light detail showing original tool marks on the reverse of the boards



Plate 6 Nail hole in frame, on left from recto

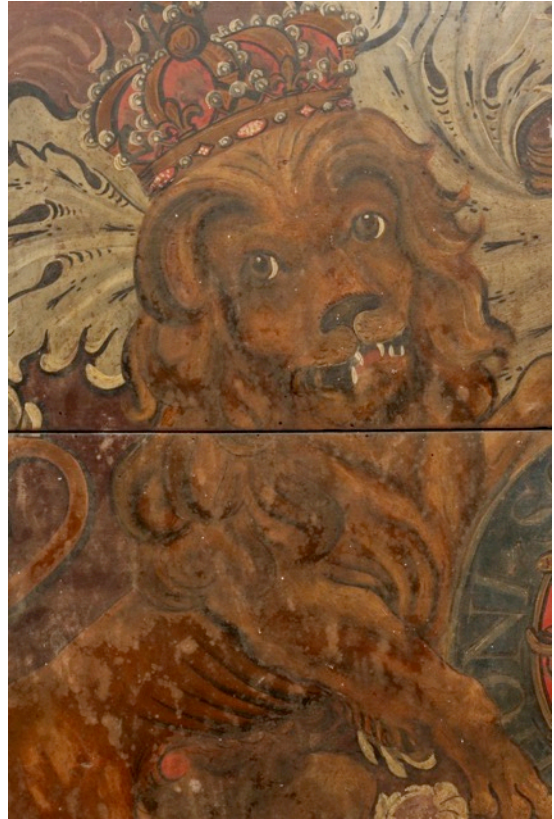


Plate 7 Mottled surface of lion

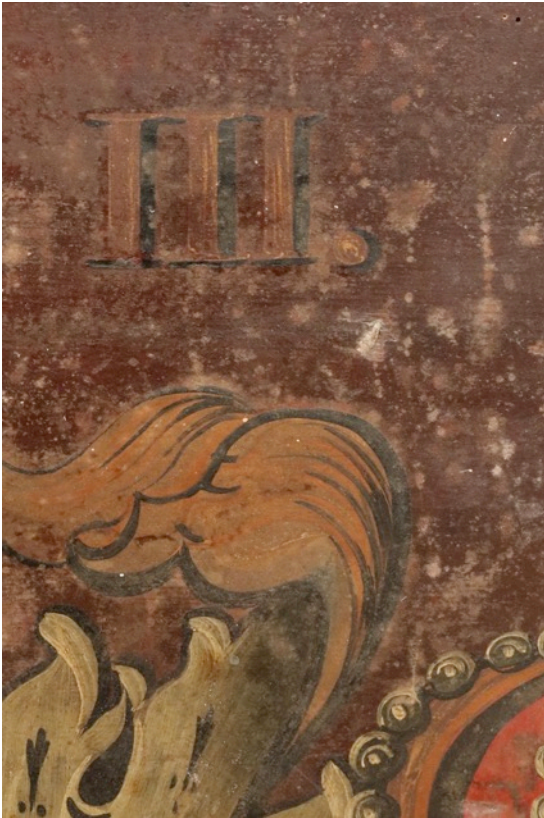


Plate 8 Detail of embedded stone



Plate 9 Aged varnish, causing whites areas to appear yellow



Plate 10 During varnish removal. The level of staining caused by the bat urine affecting the varnish and embedding it into the upper surface of the paint layer is visible. Some of the staining was removed by further cleaning. The most visible remnants were addressed with retouching



Plates 11 & 12 Details during varnish removal



Plate 13 During varnish removal



Plate 14 After varnishing, before retouching



Plate 15 The Royal Coat of Arms (George III), recto, after treatment.



Plate 16 The Royal Coat of Arms (George III), verso, after treatment.