Recent Advances in Barkcloth Conservation and Technical Analysis

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Conserving a Polynesian Barkcloth for the *Pacific Encounters* Gallery at Royal Museums Greenwich

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Introduction

Royal Museums Greenwich (RMG) opened four new galleries at the National Maritime Museum in September 2018. The collectively named *Endeavour Galleries* project was funded by the Heritage Lottery Fund, and aimed to increase the Museum's offer by showcasing a large number of previously unseen objects, and related programming to engage new audiences. The subject of this paper, a large Polynesian barkcloth, was prepared for display in the *Pacific Encounters* gallery, which reflects on the complex legacy of European exploration and how this has shaped the Pacific as we know it today (Royal Museums Greenwich 2018).

In the centre of *Pacific Encounters,* a display case was designed to house a rotation of Polynesian barkcloths. They were donated to the Museum in 2013 by the Council for World Mission, previously called the London Missionary Society (LMS) (Mundus 2000). Through their display, visitors are introduced to the traditional art of barkcloth, and learn about the impact of European missions in the area. The RMG Exhibitions and Conservation teams established a system of rotation for the barkcloths, with the aim of limiting damaging light exposure and physical strain during their display in the gallery. It seemed fitting that the largest barkcloth (museum ID: ZBA5494), measuring 2.2 meters by 3.6 meters, would go on display first (Figure 1). This piece was produced around 1834, when it was collected in Western Polynesia by missionary John Williams (National Library of Australia 2015). It is beautifully decorated with an intricate, painted design (Pritchard 1984, 61) in black and brown colours over a natural light brown background.

Figure 1. The barkcloth (museum ID: ZBA5494) before treatment. © National Maritime Museum, Greenwich, London.

The refinement of the object's display requirements was followed by a detailed condition asessment, which led to the creation of a conservation and mounting plan. Once the treatment was successfully completed and the mounting support prepared, the strategy for transport and installation was agreed and implemented. The following sections discuss the processes step-by-step, providing an accurate account of the project and the solutions found for specific challenges.

Display setting

The exhibition designs were created by Casson Mann Designers (Casson Mann 2018). The barkcloth mount was agreed to be a vertical panel with gently angled sides and a curved top (Figure 2). This would allow the large barkcloth to be displayed with half of it resting on either side of the mount, and the smaller barkcloths in the following rotations to be displayed on one side only. The angled sides were intended to provide some support to the object while the stainless steel construction of the mount would allow the use of magnets to help secure the barkcloth in place. Casson Mann designed the mount to fix securely into the base of the showcase, leaving only a few centimetres' gap between it and the glass along the sides and the top. As the mount had to be assembled inside the case, the barkcloth would also have to be installed *in situ*. Smaller objects would then be installed in the showcase, hanging from the top of the case or placed onto the plinths on either side of the barkcloth.

Figure 2. The mount before installation of the barkcloth. © National Maritime Museum, Greenwich, London.

Condition of the barkcloth

In 2013, each of the LMS barkcloths came into the collection in tightly folded packages (Figure 3). Every item was assessed and documented, and minimal conservation treatment was carried out to enable their rolled storage, which was the Museum's only storage option due to their large size (Meller 2014).

Figure 3. The barkcloth was folded before its acquisition. © National Maritime Museum, Greenwich, London

The barkcloth was relatively well preserved for its age; however its past folded storage had caused a range of condition issues (Figure 4). Firstly, it had ingrained soiling, presumably from the lack of covering during storage and also from handling. Secondly, the fold lines and creases were strong and the material stretched and weakened along the folds. This caused the formation of holes and tears, while handling contributed to physical damage along the edges. Thirdly, channels bored by insects were evident along the folds of the barkcloth. Lastly, the folding caused some delamination and flaking of the painted surface.

To prepare the barkcloth for display on a nearly vertical mount, it needed to be physically stabilised by supporting holes and tears and consolidating delaminating areas. To enable the support treatments, the fold lines and creases had to be lessened. Cleaning prior to the humidification was then considered desirable; the exposure to increased moisture would cause the soiling to be driven into the fibre structure and make it difficult to remove in future. Cleaning was also felt to aid the object's long-term preservation, and provide better visibility of the intricate design.

Figure 4. Condition of the barkcloth before treatment. © National Maritime Museum, Greenwich, London.

Collaborating to achieve the best results

Collaboration was a very important aspect of this conservation project. The RMG does not have a designated ethnography conservation studio, and barkcloths form only a small part of the collection. Moreover, *Pacific Encounters* is the first gallery in the history of the Museum to display barkcloths. In 2013, the newly acquired LMS barkcloths were allocated for treatment to the Textile Conservation Studio, but it quickly became apparent that their conservation required input from other studios within and outside our institution. We found that the material behaves similarly to, but also differently from, traditional textiles and papers, and that treatments needed to be modified and combined in order to suit the specific needs of the objects. Our consultation in 2014 with the Organics Artefacts Conservation Studio from the British Museum (BM) was greatly informative in our barkcloth storage and preparatory treatment. Our visit to the BM's *Shifting Patterns: Pacific Barkcloth Clothing* exhibition (2015) and conservation studios further increased our knowledge of barkcloth conservation and mounting techniques, including the use of magnets for display (Meller 2015).

In preparing the largest barkcloth for display in 2018, collaboration between the RMG's Textile and Paper Conservation Studios was essential. The Textile Conservation Studio took the treatment lead, and carried out the cleaning and humidification treatments. The Paper Conservation Studio provided expertise in adhesive patch supports and infilling losses, as well as helping to prepare mounting aids and to install the object in the gallery. The collaboration was fruitful as each conservator's expertise was utilised in the specific processes. Working together also meant that the barkcloth could be safely handled – a task that required a minimum of two people due to its large size. In addition, it allowed each of us to learn conservation techniques that do not fall strictly within our own specialisation.

Conservation treatment

The time spent on the conservation of the object amounted to 136 hours.

Cleaning

Conservation started with cleaning of the painted surface. The front and back of the barkcloth was surface cleaned first, using low powered vacuum suction with a soft brush attachment, and nylon net inserted in the nozzle as an extra protection against vacuuming up any fragments.

To lessen the ingrained soiling on the front, dry mechanical cleaning methods were tested. Polyurethane cosmetic sponges by Boots® proved to be the most effective in removing the grey soiling, while being non-abrasive to the fragile surface, and leaving only a minimal amount of residue (Figure 5). The sponges were thoroughly washed in warm deionised water and dried before application. They were applied in gentle strokes, and the saturated surfaces of the sponge were cut off to expose clean areas and thus maximise their cleaning capacity. To ensure even application, the sections undergoing cleaning were partitioned off using long curtain weights. Unwanted residues were removed section by section by low powered vacuum suction.

Figure 5. Cleaning the front of the barkcloth with cosmetic sponges. © National Maritime Museum, Greenwich, London.

The soiled sponges were preserved in case the soiling needs to be analysed in the future, though as the polyurethane sponge material will degrade in time, the soiling which was left in place on the back of the object could be looked at instead. After cleaning, the painted surface looked considerably fresher with the design more clearly visible.

Humidification

Preceding humidification to lessen the fold lines and creases, the paint colours were tested for wet-fastness and were found to be stable. Due to the extent of the areas needing humidification and the difficulty of reaching the middle of the barkcloth when it was fully unrolled, contact humidification was opted for. The treatment focused on the folds and creases instead of humidifying areas more generally; as the latter was tested it caused a shift in the position of the undulations but not the desired lessening of the fold lines. Where contact humidification was not sufficient in itself, it was followed immediately by ultrasonic humidification (Figure 6).

The layers of contact humidification materials placed on top of the barkcloth were: Hydra Air PTFE humidification membrane against the object, followed by a strip of synthetic non-woven capillary matting slightly wetted with deionised water, and polyethylene sheeting to cover the area. The poultice was left for approximately 10-15 minutes, then the treated areas were smoothed out and weighted down with dry blotting paper under glass weights, with an interleaving layer of Bondina® (non-woven polyester sheet) to prevent the paint sticking to the blotters. Where necessary, ultrasonic humidification was carried out with deionised water, concentrating on strong folds and creases, and the areas were weighted in the same way. The humidification treatment successfully softened the folds and creases to enable the consolidation and support treatments.

Figure 6. Contact and ultrasonic humidification of the folds and creases. © National Maritime Museum, Greenwich, London.

Consolidation and support treatments

Starch pastes have been used by other studios in the conservation of barkcloths (Austin-Dennehy et al. 2013; Hill 2001; Holdcraft 2001; Johnson 2001), and the RMG carried out successful support treatments with wheat and arrowroot starch pastes while preparing the LMS barkcloths for storage in 2014 (Meller 2014). It was selected as both the consolidant and the adhesive for the support patches and infills. The paste was made of Zin Shofu® at 20%v/v strength, and was dried or diluted before application as necessary.

To consolidate the surface, the paste was brushed under delaminating areas, which were then held down under Bondina® with the help of Teflon® bone folders. Consolidation made the fragile surface less vulnerable without leaving it glossy. Holes and tears were supported from the back with uncoloured Japanese tissue patches (RK-0 machine-made, 5gsm). The patches were torn to shape, positioned over the holes and tears, and the paste was brushed through them. The areas were dried using blotting paper under glass weights, with an interleaving layer of Bondina®. Due to the fineness of the Japanese tissue, the support patches are only noticeable on close inspection. As the fibres lie in all directions in the tissue, the patches are sufficiently strong yet flexible.

Larger holes and one larger tear were also infilled from the front in order to visually blend and physically strengthen them (Figure 7). For the infills, a suitable quality paper (Usumino K-38, 16gsm) was toned with watercolours. The areas needing infilling were marked on Melinex® (transparent polyester sheet) and the paper was pricked and torn according to the shapes. The infills were pasted out and adhered on the front, making sure that the fibres along the edges of the infill slightly overlapped the barkcloth fibres on the edges of the loss. Two layers were built up to compensate for the object's thickness. The infills successfully strengthened the areas of loss, and they are only noticeable to the trained eye.

Preparation for installation

Magnets were prepared to help distribute the object's weight so that it does not hang solely from the curved top edge of the mount (Figure 8). Flat, disk-shaped, Neodymium magnets (N42, 14mm diameter x 2mm thickness) were selected (Spicer 2017). The magnets were covered and padded, based on methods used by the British Museum's Organic Artefacts Conservation studio (Meller 2015). They were wrapped in papers toned to beige and dark grey using acrylic paints, so that they blended in well with the pattern of the barkcloth. 10%w/v solution of Klucel™ G (hydroxypropyl-cellulose) in deionised water was used to adhere the toned paper to the magnets. A round piece of scoured cotton jersey padding was then adhered to the bottom of the magnet, to provide further cushioning. To protect the paper covering of the magnets, they were separated with square Plastazote® (polyethylene foam) spacers, inside bubble wrap and small polyethylene sample bags until required for the installation.

Figure 7. Infilling a large tear on the edge of the barkcloth. © National Maritime Museum, Greenwich, London.

Figure 8. The magnets covered with toned paper and padded with jersey. © National Maritime Museum, Greenwich, London.

The barkcloth was rolled onto a large tube padded with polyester wadding and covered with acid free tissue, in order to compensate for the natural unevenness of the object. To provide a layer of padding underneath the barkcloth on display, scoured cotton fabrics were seamed together to create a large sheet which was cut to the shape of the object, approximately 5cm inside the outlines. This was also rolled onto a large cardboard roller, ready for installation.

Installation process

Installation of the object was undertaken by the Museum's Art and Object Handlers, and Textile and Paper Conservators (Figure 9). It was a challenging task as the barkcloth had to be unrolled inside the showcase, with little space for manoeuvring. As the display case only opened on one side at a time, the object's position had to be adjusted in stages. The team first positioned the cotton fabric padding on the mount, and put a layer of acid free tissue over the top to help the bark cloth slide over the fabric. The barkcloth was unrolled through the narrow gap along the top, until half of its length was on the other side. When it was in the correct position, the tissue paper was removed from underneath. Magnets were distributed on both sides, their colours corresponding to the pattern of the barkcloth. The magnets were not located in a grid but applied where the barkcloth was unsupported or undulating. As the installation of the barkcloth was completed, smaller objects were installed on both sides of the showcase (Figure 10).

Figure 9. Unrolling the barkcloth onto its mount. © National Maritime Museum, Greenwich, London.

Figure 10. The barkcloth installed in the *Pacific Encounters* gallery. © National Maritime Museum, Greenwich, London.

Conclusions

This paper described the complex conservation and installation of a Polynesian barkcloth which went on display in the RMG's new *Pacific Encounters* gallery in September 2018. The object in question (museum ID: ZBA5494) is the largest and perhaps most intricately decorated of the barkcloths which were donated to the Museum in 2013 by the Council for World Mission. Its conservation and installation was challenging not only because of its size and the range of condition issues, but because the task was new to the RMG which has not displayed barkcloths before. The project required collaboration between the Museum's Textile and Paper Conservation Studios, as well as drawing on expertise from other institutions with experience in the conservation of barkcloths. The completion of the project provided the RMG Textile and Paper Conservators with numerous learning opportunities, and the knowledge and experience gained has prepared us to face the new challenges raised by the upcoming rotations. Last but not least, it taught us to appreciate the beauty of this special art and unique material.

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Suppliers

Hydra Air PTFE humidification membrane
Conservation by Design Ltd
Material: expanded PTFE laminated to 100% non-woven polyester
Product code: PAHYMB0002
http://www.cxdglobal.com/category.aspx?id=809
Address: 2 Wolseley Road, Bedford, MK42 7AD, UK

Capillary matting
Conservation by Design Ltd
Material: 100% non-woven polyester
Product code: PACAMA0160
http://www.cxdglobal.com/category.aspx?id=322
Address: 2 Wolseley Road, Kempston, Bedford, MK42 7AD, UK

Machine-made Japanese paper, RK-0, 5gsm
Conservation by Design Ltd
Product code: PAJARK0000
http://www.cxdglobal.com/productdetails.aspx?id=298&itemno=PAJARK0000
Address: 2 Wolseley Road, Bedford, MK42 7AD, UK

Handmade Japanese paper, Usumino K-38, 16gsm
Conservation by Design Ltd
Product code: PAJAPK0038
http://www.cxdglobal.com/productdetails.aspx?id=297&itemno=PAJAPK0038
Address: 2 Wolseley Road, Bedford, MK42 7AD, UK

Klucel™ G
Conservation by Design Ltd
Material: hydroxypropyl cellulose
Product code: SUKLUC0001
http://www.cxdglobal.com/productdetails.aspx?id=347&itemno=SUKLUC0001
Address: 2 Wolseley Road, Bedford, MK42 7AD, UK

Conservac vacuum cleaner
Conservation by Design Ltd
Product code: EQGSCB0240
http://www.cxdglobal.com/category.aspx?id=104
Address: 2 Wolseley Road, Bedford, MK42 7AD, UK

Bondina® 30gsm
Preservation Equipment Ltd

Material: non-woven polyester with a smooth surface
Product code: 492-3228
https://www.preservationequipment.com/Catalogue/Conservation-Materials/Other-Materials/Bondina
Address: Vinces rd., Diss, Norfolk, IP22 4HQ, UK

Zin Shofu® wheat starch
Preservation Equipment Ltd
Product code: 996-8000
https://www.preservationequipment.com/Catalogue/Conservation-Materials/Adhesives/Jin-Shofu-Wheat-Paste-P996-8000
Address: Vinces rd., Diss, Norfolk, IP22 4HQ, UK

Ultrasonic humidifier
Preservation Equipment Ltd
https://www.preservationequipment.com/Catalogue/Equipment-Tools/Instruments-Meters/Ultrasonic-Humidifier
Address: Vinces rd., Diss, Norfolk, IP22 4HQ, UK

Teflon® bone folder
Preservation Equipment Ltd
Product code: 870-9101
https://www.preservationequipment.com/Catalogue/Equipment-Tools/Hand-Tools/Teflon-Bone-Folders
Address: Vinces rd., Diss, Norfolk, IP22 4HQ, UK

Cosmetic wedges
Boots® UK Ltd
Material: polyurethane
Preparation: sponges washed and dried thoroughly before application
https://www.boots.com/boots-assorted-cosmetic-wedges-x-16-10244105
Address: 1 Thanke Road West, Nottingham, NG2 3AA, UK

Rembrandt watercolours
Royal Talens UK
https://www.royaltalens.com/brands/rembrandt/
Address: First Floor Unit 2, Millars Brook, Wokingham, RG41 2AD, UK

Finity Artists' Acrylic Colour
Windsor & Newton
https://www.winsornewton.com/assets/Leaflets/finityaaceng.pdf
Address: 21 Evesham Street, London, W11 4AJ, UK

Neodymium magnets, N42, 14mm diameter x 2mm thick
Magnet Expert Ltd
https://www.first4magnets.com/circular-disc-rod-magnets-c34/14mm-dia-x-2mm-thick-n42-neodymium-magnet-1-7kg-pull-p3490#ps_1-3272
Address: Walker Industrial Estate, Ollerton Road, Tuxford, NG22 0PQ, UK

Cotton jersey and plain weave cotton
Whaleys Bradford Ltd
https://www.whaleys-bradford.ltd.uk/
Address: Harris Court, Great Horton, Bradford, BD7 4EQ, UK

Author biography

Nora Meller graduated from the Centre for Textile Conservation, University of Glasgow, with MPhil Textile Conservation in 2013. Prior to this she gained a Conservation Assistant Diploma in the conservation and preservation of organic and inorganic objects in 2010 (Hungarian University of Fine Arts, Budapest), and a BSc in Applied Environmental Research in 2011 (Eotvos Lorant University, Budapest). She worked in the Textile Conservation studio of Royal Museums Greenwich between 2013-2019, caring for the diverse collections and preparing objects for exhibitions and loans. Her interest in the conservation of ethnographic objects, and barkcloths in particular became apparent during her first year at RMG, when she was entrusted with the conservation of objects donated to the Museum by the Council for World Mission (London Missionary Society). She now works as a Textile and Organics Conservator at the Victoria and Albert Museum.